

***ARMY TM 9-6115-749-24&P
AIR FORCE TO 35C2-3-531-2
MARINE CORPS TM 09292B-OI/1
NAVY TM 7610-LL-L1A-0019**

TECHNICAL MANUAL

**FIELD AND SUSTAINMENT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST**

FOR

GENERATOR SET, SKID MOUNTED

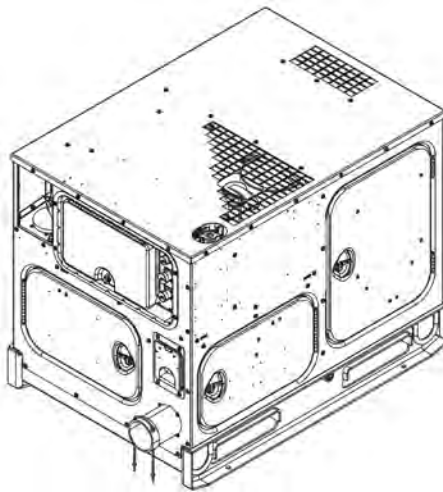
**5KW ADVANCED MEDIUM MOBILE POWER SOURCES
(AMMPS)**

MEP-1030, 50/60 Hz

(NSN: 6115-01-561-7329) (EIC: MA2)

MEP-1031, 400 Hz

(NSN: 6115-01-561-7438) (EIC: N/A)



***SUPERSEDURE NOTICE** This manual supersedes TM 9-6115-749-24&P, TO 35C2-3-531-2, TM 09292B-OI/1, AND TM 7610-LL-L1A-0019 dated 1 June 2011. Date of issue for the revised manual is 31 January 2012.

DISTRIBUTION STATEMENT A — Approved for public release; distribution is unlimited.

**HEADQUARTERS, DEPARTMENTS OF THE ARMY,
AIR FORCE, NAVY, AND
HEADQUARTERS, US MARINE CORPS**

31 JANUARY 2012

PCN 184 092921 00

WARNING SUMMARY

FIRST AID

For First Aid information, refer to Field Manual (FM) 4-25.11.



5

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK:

1

Do not try to pull or grab the individual.

2

If possible, turn off the electrical power.

3

If you cannot turn off the electrical power, pull, push, or lift the person to safety using a dry wooden pole, dry rope, or some other insulating material.

4

Send for help as soon as possible.

5

After the injured person is free of contact with the source of electrical shock, move the person a short distance away. Immediately start artificial respiration if necessary.

The Warning Summary summarizes critical safety and hazardous material warnings that must be understood and applied during operation and maintenance of the Advanced Medium Mobile Power Sources (AMMPS) generator sets.

These warnings are important.

Study and understand all warnings.

These warnings can save your life and the lives of personnel with whom you work.

Some general warnings found in the Warning Summary will not be repeated within the Technical Manual(TM).

Specific warnings will be listed above the task or paragraph to which they apply.

Operation and maintenance of the AMMPS generator set contains many possibilities for injury or death to personnel. Be sure to be familiar with general first aid procedures as referenced in FM 4-25.11, First Aid.

WARNING ICONS

The following icons are used in conjunction with warnings so that you do not miss important information. They are not meant to be a substitute for reading the warnings, but they provide graphic description of the danger.



EAR PROTECTION — Headphones over ears shows that noise level will harm ears.



ELECTRICAL — Electrical wire to arm with electricity symbol running through human body shows that life-threatening shock hazard is present.



ELECTRICAL — Electrical wire to hand with electricity symbol running through hand shows that shock hazard is present.



FLYING PARTICLES — Objects striking person shows that the material presents a danger to life or health.



HEAVY OBJECT — Human figure stooping over heavy object shows physical injury potential from improper lifting technique.



HEAVY PARTS — Heavy object on human figure shows that heavy parts present a danger to life or limb.



HIGH PRESSURE — Human hand being penetrated by high pressure shows system pressures present a danger to life or limb.



HOT AREA — Hand over object radiating heat shows that equipment is hot and can burn.



MOVING PARTS — Human figure with an arm caught between the gears shows that the larger moving parts of the equipment present a danger to life or limb.



MOVING PARTS — Hand with fingers caught between gears shows that the smaller moving parts of the equipment present a danger to life or limb.



SHARP OBJECT — Human hand being punctured shows equipment presents a danger to life or limb.

WARNING DESCRIPTIONS

WARNING



Electrical

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.

High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

WARNING



Electrical — Continued.

High voltages may be present at the generator terminals when unit is rotating. Tools, equipment, clothing, and your body must be kept clear of rotating parts and electrical connections. Special precautions must be taken during troubleshooting because protective covers and safety devices may be removed or disabled to gain access and perform tests. Use extreme caution. Failure to comply may cause injury or death to personnel by electrocution.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

Dangerously high voltage can exist across Current Transformer (CT) output with engine operating. CT can explode if disconnected from load with engine running. Do not disconnect CT with Alternating Current (AC) generator rotating. Failure to comply may cause injury or death to personnel by electrocution.

Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.

Power is available to the convenience receptacle only when the main contactor is closed. Avoid accidental contact. Electrocution is possible. Failure to comply may cause injury or death to personnel.

Ensure equipment/vehicles being used to jump-start the generator set are not touching. Touching of metal surfaces can cause improper grounding. Do not allow the cable ends to touch each other or any part of the generator set/vehicle/equipment other than the North Atlantic Treaty Organization (NATO) slave receptacle. Failure to comply may cause injury or death to personnel.

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main Direct Current (DC) circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

Ensure the frequency of any device powered by the GFCI convenience receptacle matches the frequency of the generator set. Failure to comply can cause serious injury or death to personnel.

WARNING



Heat

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

When operating, winterization heater has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow heater to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Top and some housing panels can get very hot. Allow panels to cool down before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.

A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

WARNING



Jewelry/Clothing

Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.

While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply can cause injury or death to personnel.

WARNING



Lifting

Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.

When lifting the engine, use lifting equipment with minimum lifting capacity of 500 pounds (lb) (227 kilograms (kg)). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit engine to swing while hoisted. Failure to comply may cause injury or death to personnel.

Engine assembly weighs approximately 160 lb (72 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.

When lifting generator set, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.

AC generator assembly weighs approximately 252 – 262 lb (114 – 119 kg). Use suitable lifting device with capacity to lift the weight of assembly. Do not stand or put arms, legs, or any body part under hoisted load. Failure to comply may cause injury or death to personnel.

When lifting generator set, use lifting equipment with minimum lifting capacity of 1100 lb (500 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.

Engine assembly weighs approximately 355 lb (161 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.

WARNING



Operating

Starting engine when the unit is partially disassembled is dangerous. Run the engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

WARNING



Sharp Object

Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fan. Failure to comply may cause injury or death to personnel.

HAZARDOUS MATERIALS ICONS



CHEMICAL — Drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



EXPLOSION — Rapidly expanding symbol shows that the material may explode if subjected to high temperatures, source of ignition or high pressure.



EYE PROTECTION — Person with goggles shows that the material will injure the eyes.



FIRE — Flame shows that a material may ignite and cause burns.



POISON — Skull and crossbones shows that a material is poisonous or is a danger to life.



VAPOR — Human figure in a cloud shows that material vapors present a danger to life or health.

HAZARDOUS MATERIALS WARNING DESCRIPTIONS

There is a potential risk that soldiers and other users may be exposed to chemical substances and diesel engine exhaust during the operation, maintenance, and repair of the AMMPS generator sets.

Potential sources of chemical substances include fuels, oils, lubricants, paints, cleaners/solvents, engine coolant fluids, cold start fluid, fire extinguishing agents, battery acid/chemicals, and miscellaneous chemicals used during the setup/operation/maintenance and sustainment throughout the life-cycle of the AMMPS generator sets.

WARNING



This manual describes physical and chemical processes that may require the use of chemicals, solvents, paints, and/or other commercially available material. Users of the manual should obtain the Material Safety Data Sheets (MSDS), Occupational Safety and Health Act (OSHA) Form 20, or the equivalent from the manufacturers or suppliers of materials to be used. Failure to comply with all procedures, recommendations, warnings and cautions for safe use, handling, storage, and disposal of these materials may result in serious injury or death to personnel.

Batteries

Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.

Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.

WARNING



Cleaning

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

Engine cooling system cleaning compound MIL-C-0010597F(ME) will not be used as a routine maintenance procedure each time antifreeze is added or drained from the cooling system. The compound will be used only when necessary to clean heavily rusted or partially clogged cooling systems. Failure to comply may cause injury or death to personnel.

Engine cleaning compound MIL-C-0010597F(ME) for cooling systems is designed to clean the interiors of cooling systems, to neutralize residual cleaning acids, and to coat the interiors with a silicate. Failure to comply may cause injury or death to personnel.

WARNING



Exhaust

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.

Exhaust gases are most dangerous in places with poor ventilation. The best defense against exhaust gas poisoning is very good ventilation. To protect yourself and others, always obey the following rules:

- Do not run engine indoors unless you have very good ventilation.

- Do not idle engine for a long time unless there is very good ventilation.

- Be alert at all times. Check for smell of exhaust fumes.

- Failure to comply may cause injury or death to personnel.

Exhaust gas poisoning causes dizziness, headache, loss of muscle control, sleepiness, coma, and death. If anyone shows signs of exhaust gas poisoning, get all personnel clear of AMMPS. Make sure they have lots of fresh air. Keep them warm, calm, and inactive. Get medical help. If anyone stops breathing, give artificial respiration. Failure to comply may cause injury or death to personnel.

WARNING



Eye

Flying debris or material may enter eyes or strike the face. Wear appropriate eye/face protection while performing maintenance tasks. Failure to comply may cause injury or death to personnel.

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

WARNING



Fuel

Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Fuels used in the generator set are combustible. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to Electrostatic Discharge (ESD). Fire and possible explosion may occur. Failure to comply may cause injury or death to personnel.

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change soaked clothing promptly if exposed to fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

Do not operate generator set if any fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.

Make sure engine control switch is only set to PRIME & RUN during fuel system checks. Failure to comply may cause injury or death to personnel.

WARNING



Fuel — Continued.

Hot engine surfaces from engine and generator circuitry are possible sources of ignition. When hot refueling during unit operation with DF-1, DF-2, JP5, or JP8, avoid fuel splash and fuel spill. Do not smoke or use open flame when performing refueling. Remember PMCS are still required. Flames and possible explosion may result. Failure to comply may cause injury or death to personnel.

WARNING



High Temperature/Pressure

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

WARNING



Noise

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: Zero in the "Change No." column indicates an original page or work package.

Date of issue for the original manual is:

Original 31 January 2012

TOTAL NUMBER OF PAGES FOR FRONT MATTER AND REAR MATTER IS 76 AND TOTAL NUMBER OF WORK PACKAGES IS 164, CONSISTING OF THE FOLLOWING:

Page/WP No.	Change No.	Page/WP No.	Change No.
Front cover	0	WP 0026 (12 pgs)	0
Blank	0	WP 0027 (6 pgs)	0
Warning summary (12 pgs)	0	WP 0028 (4 pgs)	0
i – xxviii	0	WP 0029 (6 pgs)	0
Chp 1 title page	0	WP 0030 (6 pgs)	0
Chp 1 index	0	WP 0031 (4 pgs)	0
WP 0001 (12 pgs)	0	WP 0032 (4 pgs)	0
WP 0002 (16 pgs)	0	WP 0033 (6 pgs)	0
WP 0003 (8 pgs)	0	WP 0034 (6 pgs)	0
Chp 2 title page	0	WP 0035 (8 pgs)	0
Chp 2 index	0	WP 0036 (8 pgs)	0
WP 0004 (10 pgs)	0	WP 0037 (6 pgs)	0
WP 0005 (8 pgs)	0	WP 0038 (4 pgs)	0
WP 0006 (6 pgs)	0	WP 0039 (8 pgs)	0
WP 0007 (8 pgs)	0	WP 0040 (8 pgs)	0
WP 0008 (30 pgs)	0	WP 0041 (6 pgs)	0
WP 0009 (8 pgs)	0	WP 0042 (8 pgs)	0
WP 0010 (12 pgs)	0	WP 0043 (4 pgs)	0
WP 0011 (22 pgs)	0	WP 0044 (6 pgs)	0
WP 0012 (12 pgs)	0	WP 0045 (4 pgs)	0
WP 0013 (8 pgs)	0	WP 0046 (6 pgs)	0
Chp 3 title page	0	WP 0047 (6 pgs)	0
Chp 3 index	0	WP 0048 (8 pgs)	0
WP 0014 (10 pgs)	0	WP 0049 (12 pgs)	0
WP 0015 (4 pgs)	0	WP 0050 (12 pgs)	0
WP 0016 (8 pgs)	0	WP 0051 (32 pgs)	0
WP 0017 (6 pgs)	0	WP 0052 (8 pgs)	0
WP 0018 (20 pgs)	0	WP 0053 (6 pgs)	0
WP 0019 (4 pgs)	0	WP 0054 (8 pgs)	0
WP 0020 (8 pgs)	0	WP 0055 (4 pgs)	0
WP 0021 (10 pgs)	0	WP 0056 (10 pgs)	0
WP 0022 (6 pgs)	0	WP 0057 (6 pgs)	0
WP 0023 (4 pgs)	0	WP 0058 (8 pgs)	0
WP 0024 (8 pgs)	0	WP 0059 (16 pgs)	0
WP 0025 (12 pgs)	0	WP 0060 (6 pgs)	0

Page/WP No.	Change No.	Page/WP No.	Change No.
WP 0061 (10 pgs)	0	WP 0105 (4 pgs)	0
WP 0062 (6 pgs)	0	WP 0106 (4 pgs)	0
WP 0063 (4 pgs)	0	WP 0107 (4 pgs)	0
WP 0064 (14 pgs)	0	WP 0108 (6 pgs)	0
WP 0065 (18 pgs)	0	WP 0109 (10 pgs)	0
WP 0066 (10 pgs)	0	WP 0110 (4 pgs)	0
WP 0067 (6 pgs)	0	WP 0111 (4 pgs)	0
WP 0068 (6 pgs)	0	WP 0112 (4 pgs)	0
WP 0069 (8 pgs)	0	WP 0113 (4 pgs)	0
WP 0070 (8 pgs)	0	WP 0114 (4 pgs)	0
WP 0071 (12 pgs)	0	WP 0115 (10 pgs)	0
WP 0072 (8 pgs)	0	WP 0116 (2 pgs)	0
WP 0073 (4 pgs)	0	WP 0117 (8 pgs)	0
WP 0074 (4 pgs)	0	WP 0118 (2 pgs)	0
WP 0075 (8 pgs)	0	WP 0119 (6 pgs)	0
WP 0076 (6 pgs)	0	WP 0120 (4 pgs)	0
WP 0077 (6 pgs)	0	WP 0121 (6 pgs)	0
WP 0078 (4 pgs)	0	WP 0122 (6 pgs)	0
WP 0079 (6 pgs)	0	WP 0123 (4 pgs)	0
WP 0080 (6 pgs)	0	WP 0124 (4 pgs)	0
WP 0081 (6 pgs)	0	WP 0125 (2 pgs)	0
WP 0082 (4 pgs)	0	WP 0126 (2 pgs)	0
WP 0083 (6 pgs)	0	WP 0127 (4 pgs)	0
WP 0084 (6 pgs)	0	WP 0128 (4 pgs)	0
WP 0085 (4 pgs)	0	WP 0129 (4 pgs)	0
WP 0086 (6 pgs)	0	WP 0130 (4 pgs)	0
WP 0087 (4 pgs)	0	WP 0131 (2 pgs)	0
WP 0088 (4 pgs)	0	WP 0132 (4 pgs)	0
Chp 4 title page	0	WP 0133 (2 pgs)	0
Chp 4 index	0	WP 0134 (2 pgs)	0
WP 0089 (2 pgs)	0	WP 0135 (2 pgs)	0
WP 0090 (2 pgs)	0	WP 0136 (2 pgs)	0
Chp 5 title page	0	WP 0137 (2 pgs)	0
Chp 5 index	0	WP 0138 (2 pgs)	0
WP 0091 (2 pgs)	0	WP 0139 (2 pgs)	0
WP 0092 (2 pgs)	0	WP 0140 (4 pgs)	0
WP 0093 (60 pgs)	0	WP 0141 (4 pgs)	0
WP 0094 (4 pgs)	0	WP 0142 (4 pgs)	0
WP 0095 (6 pgs)	0	WP 0143 (4 pgs)	0
WP 0096 (4 pgs)	0	WP 0144 (4 pgs)	0
WP 0097 (2 pgs)	0	WP 0145 (4 pgs)	0
Chp 6 index	0	WP 0146 (4 pgs)	0
Chp 6 title page	0	WP 0147 (4 pgs)	0
WP 0098 (6 pgs)	0	WP 0148 (2 pgs)	0
WP 0099 (8 pgs)	0	WP 0149 (2 pgs)	0
WP 0100 (6 pgs)	0	WP 0150 (2 pgs)	0
WP 0101 (2 pgs)	0	WP 0151 (4 pgs)	0
WP 0102 (18 pgs)	0	WP 0152 (2 pgs)	0
WP 0103 (4 pgs)	0	WP 0153 (20 pgs)	0
WP 0104 (8 pgs)	0	WP 0154 (4 pgs)	0

Page/WP No.	Change No.
WP 0155 (6 pgs)	0
WP 0156 (2 pgs)	0
WP 0157 (2 pgs)	0
WP 0158 (8 pgs)	0
WP 0159 (12 pgs)	0
Chp 7 title page	0
Chp 7 index	0
WP 0160 (2 pgs)	0
WP 0161 (4 pgs)	0
WP 0162 (14 pgs)	0
WP 0163 (2 pgs)	0
WP 0164 (2 pgs)	0
Glossary-1 – Glossary-3	0
Glossary-4 – Blank	0
FP-1	0
FP-2 Blank	0
FP-3	0
FP-4 Blank	0
FP-5	0
FP-6 Blank	0
FP-7	0
FP-8 Blank	0
FP-9	0
FP-10 Blank	0
FP-11	0
FP-12 Blank	0
FP-13	0
FP-14 Blank	0
FP-15	0
FP-16 Blank	0
Inside back cover	0
Back cover	0

HEADQUARTERS,
DEPARTMENTS OF THE ARMY, AIR FORCE,
NAVY, AND HEADQUARTERS, US MARINE CORPS
WASHINGTON, D.C., 31 JANUARY 2012

TECHNICAL MANUAL
FIELD AND SUSTAINMENT MAINTENANCE MANUAL
INCLUDING REPAIRS PARTS AND SPECIAL TOOLS LIST

FOR

GENERATOR SET, SKID MOUNTED

5KW ADVANCED MEDIUM MOBILE POWER SOURCES (AMMPS)

MEP-1030, 50/60 Hz,
(NSN: 6115-01-561-7329) (EIC: MA2)
MEP-1031, 400 Hz,
(NSN: 6115-01-561-7438) (EIC: N/A)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Reports, as applicable by the requiring Service, should be submitted as follows:

- (a) (A) Army — Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) located in the back of this manual, directly to: Commander, U.S. Army CECOM Life Cycle Management Command (LCMC), ATTN: AMSEL-LCL-ECM, Aberdeen Proving Ground, MD 21005-1846. You may also send in your recommended changes via electronic mail or by fax. Our fax number is 443-861-5521, DSN 848-5521. Our e-mail address is MONM-AMSELLEOPUBSCHG@conus.army.mil. Our online web address for entering and submitting DA Form 2028s is <http://edm.apg.army.mil/pubs/2028.html>.
- (b) (MC) Marine Corps — Submit notice of discrepancies or suggested changes on a NAVMC 10772. The NAVMC may be submitted using either of the following:
 - a. The first method of submittal does not require a Common Access Card (CAC) to access the form. Click on URL <http://192.156.19.109/ar/mcefs.nsf>, select the 'By Form Type' button, choose 'NAVMC' then advance several pages to 'NAVMC 10772 R 10-09'. Once the form is completed, click on the mail envelope in the PDF toolbar above the .pdf form, in the pop-up screen select " Send copy" and this will open up an email message and attach the NAVMC as a PDF file, including your information. On the "To" line add: SMB.LOG.Tech.Pubs.fct@usmc.mil and any add any additional information / instructions in the body of the email.
 - b. The <https://pubs.logcom.usmc.mil/fron/htm> URL will allow access to the Albany Publications web site (CAC required) where the form can be filled out and be submitted to the NAVMC web master. Problems or questions regarding the NAVMC 10772 program should be reported by calling DSN 567-7628 or DSN 567-5017 (Commercial number is (229) 639-7628 or (229) 639-5017).
- (c) (N) Navy — By letter directly to Commander, Space and Naval Warfare Systems Command, ATTN: SPAWAR 8122, Washington, DC 20363-5100.
- (d) (F) Air Force — By Air Force AFTO Form 22 (Technical Manual (TM) Change Recommendation and Reply) in accordance with paragraph 6-5, Section VI, TO 00-5-1 directly to prime ALC/MST.

A reply will be furnished to you.

***SUPERSEDURE NOTICE** This manual supersedes TM 9-6115-749-24&P, TO 35C2-3-531-2, TM 09292B-OI/1, AND TM 7610-LL-L1A-0019 dated 1 June 2011. Date of issue for the revised manual is 31 January 2012.

DISTRIBUTION STATEMENT A — Approved for public release; distribution is unlimited.

PCN 184 092921 00

TABLE OF CONTENTS

Page No.
WP Sequence No.

How To Use This Manual

Chapter 1 — General Information, Equipment Description, And Theory Of Operation

General Information	WP 0001
Scope	WP 0001-1
Table 1. Model Number(s) and Equipment Name(s)	WP 0001-1
Figure 1. Skid Mounted 5 KW AMMPS Generator Set	WP 0001-1
Maintenance Forms, Records, and Reports	WP 0001-2
Reporting Equipment Improvement Recommendations (EIR)	WP 0001-2
Corrosion Prevention and Control (CPC)	WP 0001-2
Ozone Depleting Substances (ODS)	WP 0001-3
Destruction of Army Materiel to Prevent Enemy Use	WP 0001-3
Demolition of Marine Corps Materiel to Prevent Enemy Use	WP 0001-3
Table 2. Demolition Priority Levels	WP 0001-4
Preparation for Storage and Shipment	WP 0001-4
Warranty Information	WP 0001-4
Nomenclature Cross-Reference List	WP 0001-6
List of Abbreviations/Acronyms	WP 0001-7
Quality of Material	WP 0001-11
Safety, Care, and Handling	WP 0001-11
Equipment Description and Data	WP 0002
Equipment Characteristics, Capabilities, and Features	WP 0002-1
Location and Description of Major Components	WP 0002-1
Figure 1. 5 KW Generator Set With Doors Closed	WP 0002-1
Housing	WP 0002-1
Figure 2. Rear and Right-Side View With Doors Open	WP 0002-2
Figure 3. Front and Left-Side View with Door Open	WP 0002-3
DCS	WP 0002-3
Skid Assembly	WP 0002-4
Figure 4. Skid	WP 0002-4
Engine Assembly	WP 0002-4
Figure 5. Engine Components — Left Side	WP 0002-5
Major Engine Components/Assemblies	WP 0002-5
Figure 6. Engine Components — Right Side	WP 0002-6
Figure 7. Cooling System Components — Left Side	WP 0002-7
Unit Cooling System	WP 0002-7
Figure 8. Coolant Overflow Bottle — Location	WP 0002-8
Figure 9. Systems Components — Left Side	WP 0002-9
Air Cleaner Assembly	WP 0002-9
Exhaust System	WP 0002-9
Unit Fuel System	WP 0002-9
Figure 10. Winterization Kit, 24-VDC Electrical and AC Generator Components — Left Side	WP 0002-10
24-VDC Electrical System	WP 0002-10
Figure 11. Dead Crank Switch — Right Side	WP 0002-11

TABLE OF CONTENTS — CONTINUED.

	Page No. <u>WP Sequence No.</u>
Figure 12. Output Box Components — Right Side.....	WP 0002-12
AC Generator.....	WP 0002-12
Output Box Assembly	WP 0002-12
Differences Between Models.....	WP 0002-13
Equipment Data	WP 0002-13
Table 1. Equipment Data.....	WP 0002-13
Theory Of Operation	WP 0003
Scope.....	WP 0003-1
Operation	WP 0003-1
DCS	WP 0003-1
Figure 1. AMMPS Control Overview	WP 0003-2
Technical Principles of Operation.....	WP 0003-2
Engine Starting System	WP 0003-2
Figure 2. Engine Starting System.....	WP 0003-3
Fuel System.....	WP 0003-3
Figure 3. Fuel System	WP 0003-4
Engine Cooling System	WP 0003-4
Figure 4. Engine Cooling System	WP 0003-5
Lubrication System	WP 0003-5
Figure 5. Engine Lubrication System	WP 0003-6
Air Intake and Exhaust System	WP 0003-6
Figure 6. Air Intake and Exhaust System	WP 0003-7
Output Supply System.....	WP 0003-7
Figure 7. Output Supply System	WP 0003-8
Chapter 2 —Troubleshooting Procedures	
Troubleshooting Index	WP 0004
General Troubleshooting Information	WP 0004-1
Malfunction/Symptom Index	WP 0004-1
DCS Fault/Warning Codes	WP 0004-1
Operational Checkout.....	WP 0004-1
Indications from Manual Troubleshooting Techniques.....	WP 0004-1
After Corrective Action.....	WP 0004-2
Specific Troubleshooting Procedures.....	WP 0004-2
Cooling System	WP 0004-2
Electrical System Troubleshooting With A DCS Code	WP 0004-2
Electrical System Troubleshooting Without A DCS Code	WP 0004-5
Engine System Troubleshooting With A DCS Code	WP 0004-6
Engine System Troubleshooting Without A DCS Code	WP 0004-6
Exhaust System Troubleshooting Without A DCS Code.....	WP 0004-9
Winterization Kit Troubleshooting.....	WP 0004-10
Operational Checkout.....	WP 0005
Inspect Ground Connection.....	WP 0005-2
Check Digital Control System (DCS) Function.....	WP 0005-4
Check Engine Function	WP 0005-5
Check AC Generator Functions.....	WP 0005-5

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Warning and Fault Codes	WP 0006
Table 1. Fault Codes	WP 0006-2
Table 2. Warning Codes	WP 0006-4
Cooling System Troubleshooting With A DCS Code	WP 0007
Table 1. Cooling Fan PWM Signal	WP 0007-5
Electrical System Troubleshooting With A DCS Code	WP 0008
Electrical System Troubleshooting Without A DCS Code	WP 0009
Engine System Troubleshooting With A DCS Code	WP 0010
Engine System Troubleshooting Without A DCS Code	WP 0011
Exhaust System Troubleshooting Without A DCS Code	WP 0012
Winterization Kit Troubleshooting	WP 0013

Chapter 3 — Field Maintenance Instructions

Service Upon Receipt	WP 0014
Siting	WP 0014-4
Service Upon Receipt of Materiel	WP 0014-4
Unpacking	WP 0014-4
Figure 1. Generator Set Unpacking	WP 0014-5
Packing	WP 0014-6
Checking Equipment	WP 0014-7
Table 1. Inspection Criteria for Packaging	WP 0014-7
Installation Instructions	WP 0014-8
Batteries	WP 0014-8
Radiator	WP 0014-8
Fuel Tank	WP 0014-8
Table 2. Fuel	WP 0014-9
Installation of Ground Rod	WP 0014-9
Preliminary Servicing Of Equipment	WP 0014-9
Lubricating Oil	WP 0014-9
Table 3. Lubricating Oil	WP 0014-9
Preliminary Checks and Adjustment of Equipment	WP 0014-9
Field PMCS Introduction	WP 0015
Introduction	WP 0015-1
General	WP 0015-1
Explanation of Columns Found in the PMCS Table	WP 0015-1
CPC	WP 0015-2
Rust Definition	WP 0015-2
Deterioration Definition	WP 0015-2
Cracking Definition	WP 0015-2
Inspection	WP 0015-2
Cleaning and Lubrication	WP 0015-3
Oil Filters	WP 0015-3
AOAP Sampling Intervals	WP 0015-3
Warranty Hard Time Statement	WP 0015-3
Fluid Leakage	WP 0015-4
Field PMCS	WP 0016

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Table 1. Preventive Maintenance Checks and Services	WP 0016-2
Table 2. PMCS Mandatory Replacement Parts List	WP 0016-7
Remove/Install DCS	WP 0017
Remove DCS	WP 0017-1
Figure 1. DCS — Location	WP 0017-2
Figure 2. DCS Detail — Front	WP 0017-3
Inspect DCS	WP 0017-3
Install DCS	WP 0017-4
Figure 3. DCS Detail — Rear	WP 0017-4
Adjust Governor Gain	WP 0017-5
Repair DCS	WP 0018
Remove DCS Control Panel Assembly	WP 0018-2
Figure 1. DCS Control Panel and Enclosure	WP 0018-2
Test/Replace Switches	WP 0018-4
Figure 2. BATTLESHORT Switch	WP 0018-4
Figure 3. EMERGENCY STOP and Engine Control Switches	WP 0018-6
Install DCS Control Panel Assembly	WP 0018-11
Check DCS Diagnostic LEDs	WP 0018-12
Figure 4. Accessing DCS Diagnostic LEDs	WP 0018-13
Figure 5. DCS Enclosure LEDs	WP 0018-14
Table 1. DCS Enclosure LEDs	WP 0018-14
Figure 6. DCS Control Panel LEDs	WP 0018-16
Table 2. DCS Control Panel LEDs	WP 0018-16
Remove DCS Door Assembly	WP 0018-18
Figure 7. DCS Door — Removal	WP 0018-18
Disassemble DCS Door Assembly	WP 0018-19
Figure 8. DCS Door — Disassembly	WP 0018-19
Inspect DCS Door Components	WP 0018-19
Assemble DCS Door Assembly	WP 0018-20
Install DCS Door Assembly	WP 0018-20
Remove/Install Air Intake Hose Assemblies	WP 0019
Remove Air Intake Hose Assemblies	WP 0019-2
Figure 1. Air Intake Hose Assembly — Location	WP 0019-2
Figure 2. Air Intake Hose Assembly — Detail	WP 0019-3
Inspect Air Intake Hose Assemblies	WP 0019-3
Install Air Intake Hose Assemblies	WP 0019-4
Service Air Cleaner	WP 0020
Remove Air Cleaner Filter Element	WP 0020-2
Figure 1. Air Cleaner — Location	WP 0020-2
Install Air Cleaner Filter Element	WP 0020-3
Figure 2. Air Cleaner Assembly	WP 0020-3
Remove Air Cleaner Assembly	WP 0020-4
Figure 3. Air Cleaner Assembly and Mounting	WP 0020-4
Install Air Cleaner Assembly	WP 0020-5
Disassemble Air Cleaner Assembly	WP 0020-6
Figure 4. Air Cleaner Assembly — Detail	WP 0020-6
Assemble Air Cleaner Assembly	WP 0020-7
Service Cooling System	WP 0021

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Test Cooling System	WP 0021-2
Figure 1. Cooling System Test — Radiator	WP 0021-2
Drain Engine Coolant	WP 0021-3
Figure 2. Coolant Drain Line — Location	WP 0021-3
Figure 3. Cooling System	WP 0021-4
Figure 4. Repair Coolant Drain Hose	WP 0021-5
Clean Radiator Interior	WP 0021-7
Fill Radiator with Engine Coolant	WP 0021-8
Figure 5. Radiator Fill Port	WP 0021-8
Remove/Install Coolant Recovery System	WP 0022
Remove Coolant Recovery System	WP 0022-2
Figure 1. Coolant Recovery System — Location	WP 0022-2
Figure 2. Coolant Recovery System	WP 0022-3
Install Coolant Recovery System	WP 0022-4
Remove/Install Cooling Fan	WP 0023
Remove Cooling Fan	WP 0023-2
Figure 1. Cooling Fan — Location	WP 0023-2
Figure 2. Cooling Fan — Details	WP 0023-3
Inspect Cooling Fan	WP 0023-3
Install Cooling Fan	WP 0023-3
Remove/Install Radiator Hose and Tube Assemblies	WP 0024
Remove Upper Radiator Hose Assembly	WP 0024-2
Figure 1. Upper Radiator Hose Assembly — Location	WP 0024-2
Figure 2. Upper Radiator Hose Assembly	WP 0024-3
Inspect Upper Radiator Hose Assembly	WP 0024-4
Install Upper Radiator Hose Assembly	WP 0024-4
Remove Lower Radiator Hose Assembly	WP 0024-5
Figure 3. Lower Radiator Assembly — Location	WP 0024-5
Figure 4. Lower Radiator Hose Assembly	WP 0024-6
Inspect Upper Radiator Hose Assembly	WP 0024-7
Install Lower Radiator Hose Assembly	WP 0024-7
Remove/Install Winterization Kit Components	WP 0025
Test Winterization Kit Fuel Flow	WP 0025-2
Figure 1. Heater — Location	WP 0025-2
Figure 2. Heater Fuel Line	WP 0025-3
Figure 3. Test Winterization Kit Fuel Flow	WP 0025-4
Remove Winterization Kit Fuel Pump	WP 0025-5
Figure 4. Winterization Kit Fuel Pump	WP 0025-5
Install Winterization Kit Fuel Pump	WP 0025-6
Inspect Winterization Kit	WP 0025-7
Remove Heater Assembly	WP 0025-7
Figure 5. Winterization Kit	WP 0025-7
Install Heater Assembly	WP 0025-9
Figure 6. Heater Mounting Brackets	WP 0025-9
Install Winterization Kit	WP 0026
Install Winterization Kit	WP 0026-3
Figure 1. Winterization Kit Mounting — Location	WP 0026-3
Figure 2. Winterization Kit Assembly	WP 0026-4

TABLE OF CONTENTS — CONTINUED.

	Page No. <u>WP Sequence No.</u>
Figure 3. Coolant Heater Fuel Line Assembly.....	WP 0026-5
Figure 4. Winterization Kit Bracket — Installation	WP 0026-6
Figure 5. Air Exhaust Tube Bracket Installation	WP 0026-7
Figure 6. Air Exhaust Tube — Installation.....	WP 0026-8
Figure 7. Coolant Heater Inlet Hose Assembly	WP 0026-9
Figure 8. Coolant Heater Outlet Hose Assembly	WP 0026-10
Figure 9. Operating Instructions Plate — Installation	WP 0026-12
Remove/Install Radiator	WP 0027
Remove Radiator.....	WP 0027-2
Figure 1. Radiator — Location.....	WP 0027-2
Figure 2. Radiator Removal — Forward.....	WP 0027-3
Figure 3. Radiator Removal — Rear	WP 0027-4
Inspect/Clean Radiator	WP 0027-5
Install Radiator.....	WP 0027-5
Remove/Install Top Body Panel	WP 0028
Remove Top Body Panel.....	WP 0028-2
Figure 1. Top Body Panel — Location	WP 0028-2
Figure 2. Top Body Panel Removal — Detail.....	WP 0028-3
Inspect Top Body Panel	WP 0028-3
Install Top Body Panel.....	WP 0028-4
Remove/Install Front Body Panel	WP 0029
Remove Front Body Panel	WP 0029-2
Figure 1. Front Body Panel — Location	WP 0029-2
Figure 2. Front Body Panel — Removal/Installation	WP 0029-3
Inspect Front Body Panel	WP 0029-3
Install Front Body Panel	WP 0029-4
Figure 3. Front Body Panel — Reverse	WP 0029-4
Remove Access Panel	WP 0029-5
Figure 4. Remove Access Panel	WP 0029-5
Install Access Panel	WP 0029-6
Remove/Install Rear Body Panel.....	WP 0030
Remove Rear Body Panel.....	WP 0030-2
Figure 1. Rear Body Panel — Location.....	WP 0030-2
Figure 2. Rear Body Panel Removal — Detail.....	WP 0030-3
Figure 3. Convenience Receptacle Removal — Detail.	WP 0030-4
Inspect Rear Body Panel.....	WP 0030-5
Install Rear Body Panel.....	WP 0030-5
Remove/Install Left-Side Body Panel	WP 0031
Remove Left-Side Body Panel	WP 0031-2
Figure 1. Left-Side Body Panel — Location	WP 0031-2
Figure 2. Left-Side Body Panel — Removal.....	WP 0031-3
Inspect Left-Side Body Panel	WP 0031-4
Install Left-Side Body Panel	WP 0031-4
Remove/Install Right-Side Body Panel	WP 0032
Remove Right-Side Body Panel.....	WP 0032-2
Figure 1. Right-Side Body Panel — Location.....	WP 0032-2
Figure 2. Right-Side Body Panel — Removal	WP 0032-3
Inspect Right-Side Body Panel.....	WP 0032-4

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Install Right-Side Body Panel	WP 0032-4
Remove/Install Door	WP 0033
Remove Door.....	WP 0033-2
Figure 1. Door Locations	WP 0033-2
Figure 2. Remove/Install Door.....	WP 0033-3
Inspect Door	WP 0033-4
Install Door.....	WP 0033-4
Remove Door Stay and Brackets	WP 0033-5
Figure 3. Door Stay, Bracket, and Hinge — Detail.....	WP 0033-5
Inspect Door Stay and Brackets.....	WP 0033-5
Install Door Stay and Brackets	WP 0033-6
Repair Door	WP 0034
Remove Latch.....	WP 0034-2
Figure 1. Door Repair — Locations	WP 0034-2
Figure 2. Door Latch Components	WP 0034-3
Install Latch.....	WP 0034-4
Remove Hinge	WP 0034-5
Figure 3. Door Hinge Components.....	WP 0034-5
Install Hinge	WP 0034-6
Remove/Install Interior Body Panels	WP 0035
Remove Fuel System and Fan Support Panels	WP 0035-1
Figure 1. Interior Panel — Locations	WP 0035-2
Figure 2. Fuel Neck Panel	WP 0035-3
Figure 3. Remove Fan Support Panel.....	WP 0035-4
Install Fan Support Panel	WP 0035-4
Remove Radiator Support Panel.....	WP 0035-5
Figure 4. Remove Radiator Support Panel	WP 0035-5
Install Radiator Support Panel.....	WP 0035-6
Remove Unit Bulkhead	WP 0035-6
Figure 5. Main Breaker	WP 0035-7
Figure 6. Remove Bulkhead	WP 0035-7
Install Unit Bulkhead	WP 0035-8
Remove/Install Batteries.....	WP 0036
Remove Batteries	WP 0036-2
Figure 1. Battery — Location.....	WP 0036-2
Figure 2. Remove/Install Batteries	WP 0036-3
Test/Inspect Batteries	WP 0036-5
Table 1. Charging Recommendations	WP 0036-5
Install Batteries	WP 0036-6
Remove/Install Main DC Circuit Breaker.....	WP 0037
Remove Main DC Circuit Breaker	WP 0037-2
Figure 1. Main DC Circuit Breaker — Location	WP 0037-2
Figure 2. Main DC Circuit Breaker — Removal.....	WP 0037-3
Test Main DC Circuit Breaker.....	WP 0037-3
Figure 3. Test Main DC Circuit Breaker — Continuity.....	WP 0037-4
Figure 4. Test Main DC Circuit Breaker — Ground.....	WP 0037-5
Install Main DC Circuit Breaker	WP 0037-5
Figure 5. Install Main DC Circuit Breaker	WP 0037-6

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Remove/Install NATO Slave Receptacle	WP 0038
Remove NATO Slave Receptacle	WP 0038-2
Figure 1. NATO Slave Receptacle — Location	WP 0038-2
Figure 2. NATO Slave Receptacle Detail	WP 0038-2
Inspect NATO Slave Receptacle	WP 0038-3
Install NATO Slave Receptacle	WP 0038-3
Service Fuel System	WP 0039
Purge Fuel Lines	WP 0039-2
Figure 1. Air Bleed Vent Plug	WP 0039-2
Check Fuel Flow	WP 0039-3
Drain Fuel Tank	WP 0039-5
Figure 2. Fuel Drain — Location	WP 0039-5
Figure 3. Fuel Drain — Detail	WP 0039-6
Fill Fuel Tank	WP 0039-7
Figure 4. Fuel Filler — Location	WP 0039-7
Service Fuel Strainers	WP 0039-7
Figure 5. Fuel Strainer — Detail	WP 0039-8
Remove/Install Fuel Manifold	WP 0040
Remove Fuel Manifold Assembly	WP 0040-2
Figure 1. Fuel Manifold Assembly — Location	WP 0040-2
Figure 2. Fuel Manifold Assembly — Removal	WP 0040-3
Disassemble Fuel Manifold Assembly	WP 0040-5
Figure 3. Fuel Manifold Assembly — Components	WP 0040-5
Inspect Fuel Manifold Assembly	WP 0040-6
Assemble Fuel Manifold Assembly	WP 0040-6
Install Fuel Manifold Assembly	WP 0040-7
Remove/Install Fuel Pump, Main/Auxiliary	WP 0041
Remove Fuel Pump	WP 0041-2
Figure 1. Fuel Pump — Location	WP 0041-2
Figure 2. Fuel Pump — Detail	WP 0041-4
Inspect Fuel Pump	WP 0041-5
Install Fuel Pump	WP 0041-5
Remove/Install Fuel Filter/Water Separator Assembly	WP 0042
Remove Fuel Filter/Water Separator Assembly	WP 0042-2
Figure 1. Fuel Filter/Water Separator Assembly — Location	WP 0042-2
Figure 2. Fuel Filter/Water Separator — Detail	WP 0042-3
Figure 3. Fuel Filter/Water Separator — Removal	WP 0042-4
Inspect Fuel Filter/Water Separator Assembly	WP 0042-6
Install Fuel Filter/Water Separator Assembly	WP 0042-6
Remove/Install Fuel Filter/Water Separator Element	WP 0043
Remove Fuel Filter/Water Separator Element	WP 0043-2
Figure 1. Fuel Filter/Water Separator — Location	WP 0043-2
Figure 2. Fuel Filter/Water Separator — Detail	WP 0043-3
Install Fuel Filter/Water Separator Element	WP 0043-4
Remove/Install Fuel Hoses and Clamp Bands	WP 0044
Remove Fuel Hoses with Assembly Attachments	WP 0044-2
Table 1. Fuel Hoses — Location	WP 0044-2
Figure 1. Fuel Hoses — Location	WP 0044-3

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Figure 2. Fuel Hoses	WP 0044-4
Install Fuel Hoses with Assembly Attachments	WP 0044-5
Remove Fuel Hose with Clamp Bands	WP 0044-5
Install Fuel Hose with Clamp Bands	WP 0044-6
Remove/Install Fuel Level Sensor	WP 0045
Remove Fuel Level Sensor	WP 0045-2
Figure 1. Fuel Level Sensor — Location	WP 0045-2
Figure 2. Fuel Level Sensor — Detail	WP 0045-3
Inspect Fuel Level Sensor	WP 0045-3
Install Fuel Level Sensor	WP 0045-4
Remove/Install Fuel Tank	WP 0046
Remove Fuel Tank	WP 0046-2
Figure 1. Fuel Tank — Location	WP 0046-2
Figure 2. Fuel Tank Mounting Brackets	WP 0046-2
Figure 3. Fuel Tank Drain Line	WP 0046-3
Inspect Fuel Tank	WP 0046-4
Clean Fuel Tank	WP 0046-4
Figure 4. Clean Fuel Tank	WP 0046-4
Install Fuel Tank	WP 0046-5
Remove/Install Fuel Tank Drain Valve Assembly	WP 0047
Remove Fuel Tank Drain Valve Assembly	WP 0047-2
Figure 1. Fuel Tank Drain Valve Assembly — Location	WP 0047-2
Figure 2. Fuel Tank Drain Valve — Detail	WP 0047-4
Inspect Fuel Tank Drain Valve Assembly	WP 0047-5
Install Fuel Tank Drain Valve Assembly	WP 0047-5
Remove/Install Fuel Tank Filler Neck	WP 0048
Remove Fuel Filler Neck	WP 0048-2
Figure 1. Fuel Tank Filler Neck — Location	WP 0048-2
Figure 2. Fuel Filler Neck Ground Cable — Removal	WP 0048-3
Figure 3. Fuel Filler Cap and Strainer — Removal	WP 0048-4
Figure 4. Fuel Tank Filler Neck — Detail	WP 0048-5
Inspect Fuel Filler Neck	WP 0048-6
Install Fuel Filler Neck	WP 0048-6
Remove/Install 50/60 Hz AC Generator Assembly	WP 0049
Remove 50/60 Hz AC Generator Assembly (UOC 98E)	WP 0049-2
Figure 1. 50/50 Hz AC Generator — Location	WP 0049-2
Figure 2. 50/60 Hz AC Generator— Rear	WP 0049-3
Figure 3. 50/60 Hz AC Generator Wiring — Removal	WP 0049-4
Figure 4. 50/60 Hz AC Generator Lift	WP 0049-5
Figure 5. 50/60 Hz AC Generator — Removal	WP 0049-6
Figure 6. 50/60 Hz AC Generator and Engine Separation	WP 0049-7
Inspect 50/60 Hz AC Generator Assembly (UOC 98E)	WP 0049-8
Install 50/60 Hz AC Generator Assembly (UOC 98E)	WP 0049-9
Remove/Install 400 Hz AC Generator Assembly	WP 0050
Remove 400 Hz AC Generator Assembly (UOC 98F)	WP 0050-2
Figure 1. 400 Hz AC Generator — Location	WP 0050-2
Figure 2. 400 Hz AC Generator— Rear	WP 0050-3
Figure 3. 400 Hz AC Generator Screen — Removal	WP 0050-4

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Figure 4. 400 Hz AC Generator Wiring — Removal.....	WP 0050-5
Figure 5. 400 Hz AC Generator Lift.....	WP 0050-6
Figure 6. 400 Hz AC Generator and Engine Separation.....	WP 0050-7
Figure 7. 400 Hz AC Generator — Removal.....	WP 0050-8
Inspect 400 Hz AC Generator Assembly (UOC 98F).....	WP 0050-9
Install 400 Hz AC Generator Assembly (UOC 98F).....	WP 0050-9
Test AC Generator.....	WP 0051
Test 50/60 Hz AC Generator.....	WP 0051-2
Remove End Bell.....	WP 0051-2
Figure 1. 50/60 Hz AC Generator — Location.....	WP 0051-2
Figure 2. 50/60 Hz Generator End Bell — Removal.....	WP 0051-3
Test Exciter Stator Winding.....	WP 0051-4
Figure 3. Test 50/60 Hz Exciter Stator Winding — Detail.....	WP 0051-5
Replace Exciter Stator.....	WP 0051-6
Figure 4. 50/60 Hz Exciter Stator — Removal.....	WP 0051-6
Inspect Rectifier and Surge Suppressor.....	WP 0051-7
Test Rectifier.....	WP 0051-7
Figure 5. Test 50/60 Hz Rectifier and Generator Rotor.....	WP 0051-7
Figure 6. 50/60 Hz Rectifier Removal — Detail.....	WP 0051-8
Test Surge Suppressor.....	WP 0051-9
Replace Rectifier.....	WP 0051-9
Test Exciter Rotor Winding.....	WP 0051-10
Test Generator Rotor Winding.....	WP 0051-11
Test Generator Stator Winding.....	WP 0051-11
Figure 7. Test 50/60 Hz Generator Stator Q1/Q2 Winding — Detail.....	WP 0051-12
Inspect Bearing.....	WP 0051-13
Figure 8. 50/60 Hz Generator Bearing Removal — Detail.....	WP 0051-13
Replace Bearing.....	WP 0051-14
Install End Bell.....	WP 0051-14
Test 400 Hz AC Generator.....	WP 0051-17
Remove End Bell.....	WP 0051-17
Figure 9. 400 Hz AC Generator — Location.....	WP 0051-17
Figure 10. 400 Hz Generator End Bell — Removal.....	WP 0051-18
Test Exciter Stator Winding.....	WP 0051-19
Figure 11. Test 400 Hz Exciter Stator Winding — Detail.....	WP 0051-20
Replace Exciter Stator.....	WP 0051-21
Figure 12. 400 Hz Exciter Stator — Removal.....	WP 0051-21
Inspect Rectifier and Surge Suppressor.....	WP 0051-22
Test Rectifier.....	WP 0051-22
Figure 13. Test 400 Hz Rectifier and Generator Rotor.....	WP 0051-22
Figure 14. 400 Hz Rectifier Removal — Detail.....	WP 0051-23
Test Surge Suppressor.....	WP 0051-24
Replace Rectifier.....	WP 0051-25
Test Exciter Rotor Winding.....	WP 0051-25
Test Generator Rotor Winding.....	WP 0051-26
Test Generator Stator Winding.....	WP 0051-27
Figure 15. Test 400 Hz Generator Stator Q1/Q2 Winding — Detail.....	WP 0051-28
Inspect Bearing.....	WP 0051-29

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Figure 16. 400 Hz Generator Bearing Removal — Detail	WP 0051-29
Replace Bearing	WP 0051-30
Install End Bell	WP 0051-30
Remove/Install Contactor	WP 0052
Remove Contactor	WP 0052-2
Figure 1. Contactor — Location	WP 0052-2
Figure 2. Contactor — Details	WP 0052-3
Figure 3. Contactor Wire — Removal	WP 0052-4
Figure 4. Contactor Wire Labels	WP 0052-5
Inspect Contactor	WP 0052-5
Test Contactor	WP 0052-6
Figure 5. Contactor — Terminals	WP 0052-6
Install Contactor	WP 0052-7
Remove/Install Output Terminal Board	WP 0053
Remove Output Terminal Board	WP 0053-2
Figure 1. Output Terminal Board — Location	WP 0053-2
Figure 2. Output Terminal Board — Detail	WP 0053-3
Figure 3. Output Terminal Board Detail — Reverse Side	WP 0053-4
Inspect Output Terminal Board	WP 0053-5
Install Output Terminal Board	WP 0053-5
Remove/Install Voltage Selection Switch	WP 0054
Remove Voltage Selection Switch	WP 0054-1
Figure 1. Voltage Selection Switch — Location	WP 0054-2
Figure 2. Voltage Selection Switch Wire — Removal	WP 0054-3
Figure 3. Voltage Selection Switch Handle— Removal	WP 0054-4
Figure 4. Voltage Selection Switch — Removal	WP 0054-5
Figure 5. Voltage Selection Switch Wire Labels	WP 0054-6
Figure 6. Voltage Selection Switch Mounting Bracket — Removal	WP 0054-7
Inspect Voltage Selection Switch	WP 0054-7
Install Voltage Selection Switch	WP 0054-7
Remove/Install Hour Meter	WP 0055
Remove Hour Meter	WP 0055-2
Figure 1. Hour Meter — Location	WP 0055-2
Figure 2. Hour Meter — Detail	WP 0055-3
Inspect Hour Meter	WP 0055-4
Install Hour Meter	WP 0055-4
Remove/Install Convenience Receptacle	WP 0056
Remove Convenience Receptacle Housing	WP 0056-2
Figure 1. Convenience Receptacle — Location	WP 0056-2
Figure 2. Convenience Receptacle Rear — Removal	WP 0056-3
Disassemble Convenience Receptacle Housing	WP 0056-4
Figure 3. Convenience Receptacle — Removal	WP 0056-4
Figure 4. Convenience Receptacle Components — Removal	WP 0056-5
Inspect Convenience Receptacle	WP 0056-5
Assemble Convenience Receptacle Housing	WP 0056-6
Install Convenience Receptacle Housing	WP 0056-7
Remove Convenience Receptacle GFI	WP 0056-8
Figure 5. Convenience Receptacle Components GFI — Removal	WP 0056-8

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Install Convenience Receptacle GFI	WP 0056-9
Remove/Install Current Transformers	WP 0057
Remove Current Transformers.....	WP 0057-2
Figure 1. Current Transformers — Location.....	WP 0057-2
Figure 2. Transformer — Removal.....	WP 0057-3
Inspect Transformers.....	WP 0057-4
Install Transformers.....	WP0057-4
Remove/Install Printed Circuit Board Module	WP 0058
Remove Printed Circuit Board Module	WP 0058-2
Figure 1. Printed Circuit Board Module — Location	WP 0058-2
Figure 2. Printed Circuit Board Module Wiring Labels	WP 0058-3
Figure 3. Printed Circuit Board Module Wiring — Removal	WP 0058-4
Figure 4. Printed Circuit Board — Removal	WP 0058-6
Inspect Printed Circuit Board Module	WP 0058-6
Install Printed Circuit Board Module	WP 0058-7
Figure 5. Dip Switch Settings	WP 0058-7
Table 1. 5 kW Dip Switch Configuration	WP 0058-7
Remove/Install Engine Wiring Harness	WP 0059
Remove Engine Wiring Harness	WP 0059-2
Figure 1. Engine Wiring Harness — Location	WP 0059-2
Figure 2. Right-Side Door — Upper View	WP 0059-3
Figure 3. Right-Side Door — Lower View	WP 0059-4
Figure 4. Right-Side Rear — Output Box View	WP 0059-5
Figure 5. Left-Side — Upper View.....	WP 0059-6
Figure 6. Left-Side — Lower View.....	WP 0059-7
Figure 7. Right-Side Rear — AC Generator.....	WP 0059-8
Figure 8. Drain Wires — Output Box and AC Generator	WP 0059-9
Figure 9. Cooling Fan Connection.....	WP 0059-10
Figure 10. Rear Door — Fuel System	WP 0059-11
Figure 11. Rear Door — Relay Panel.....	WP 0059-12
Figure 12. Loop Clamps	WP 0059-13
Inspect Engine Wiring Harness	WP 0059-14
Install Engine Wiring Harness	WP 0059-14
Remove/Install Power Wiring Harness	WP 0060
Remove Power Wiring Harness	WP 0060-2
Figure 1. Power Wiring Harness — Location	WP 0060-2
Figure 2. Left-Side Door View	WP 0060-3
Figure 3. Main DC Circuit Breaker.....	WP 0060-4
Figure 4. Relay Panel Connectors.....	WP 0060-5
Inspect Power Wiring Harness	WP 0060-5
Install Power Wiring Harness	WP 0060-5
Remove/Install Relay Panel	WP 0061
Remove Relay Panel.....	WP 0061-2
Figure 1. Relay Panel — Location.....	WP 0061-2
Figure 2. Relay Panel — Removal	WP 0061-3
Inspect Relay Panel.....	WP 0061-3
Install Relay Panel.....	WP 0061-4
Service Relay Panel	WP 0061-5

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Figure 3. Relay Panel — Internal Layout	WP 0061-5
Figure 4. Relay Panel — Legend	WP 0061-8
Figure 5. Test Relay	WP 0061-9
Table 1. Relay Test for Ohms and Continuity	WP 0061-9
Test Engine Compression	WP 0062
Test Engine Compression	WP 0062-2
Figure 1. Compression Test in Fuel Injector Opening — Location	WP 0062-2
Figure 2. Governor Actuator Connector — Removal	WP 0062-3
Figure 3. Compression Gage in Fuel Injector Opening	WP 0062-4
Test Engine Oil Pressure	WP 0063
Check Engine Oil Pressure	WP 0063-2
Figure 1. Engine Oil Pressure Sensor — Location	WP 0063-2
Figure 2. Engine Oil Pressure Sensor — Removal	WP 0063-3
Figure 3. Check Engine Oil Pressure	WP 0063-4
Remove/Install 50/60 Hz Engine Assembly	WP 0064
Remove 50/60 Hz Engine Assembly	WP 0064-3
Figure 1. Engine — Location	WP 0064-3
Figure 2. Fuel Injection Pump Lines — Removal	WP 0064-4
Figure 3. Electrical Connectors Right-Side	WP 0064-5
Figure 4. Electrical Connectors Exhaust-Side — Removal	WP 0064-6
Figure 5. Engine Oil Drain Hose Assembly — Removal	WP 0064-7
Figure 6. Lifting Eyes — Detail	WP 0064-8
Figure 7. Engine Mounts — Removal	WP 0064-9
Figure 8. Engine — Removal	WP 0064-10
Inspect 50/60 Hz Engine Assembly	WP 0064-10
Install 50/60 Hz Engine Assembly	WP 0064-11
Remove/Install 400 Hz Engine Assembly	WP 0065
Remove 400 Hz Engine Assembly	WP 0065-3
Figure 1. Engine — Location	WP 0065-3
Figure 2. Fuel Injection Pump Lines — Removal	WP 0065-4
Figure 3. Electrical Connectors — Removal	WP 0065-5
Figure 4. Electrical Connectors Exhaust-Side — Removal	WP 0065-6
Figure 5. Engine Oil Drain Hose Assembly — Removal	WP 0065-7
Figure 6. Block AC Generator — Detail	WP 0065-8
Figure 7. Lifting Eyes — Detail	WP 0065-9
Figure 8. 400 Hz AC Generator Screen — Removal	WP 0065-10
Figure 9. AC Generator Separation, 400 Hz — UOC 98F	WP 0065-11
Figure 10. Engine Mounts — Removal	WP 0065-12
Figure 11. Engine — Removal	WP 0065-13
Inspect 400 Hz Engine Assembly	WP 0065-14
Install 400 Hz Engine Assembly	WP 0065-14
Service Lubrication System	WP 0066
Remove Oil Drain Hose Assembly	WP 0066-2
Figure 1. Oil Drain Hose Assembly — Location	WP 0066-2
Figure 2. Oil Drain Hose — Detail	WP 0066-3
Repair Oil Drain Hose Assembly	WP 0066-4
Install Engine Oil Drain Hose Assembly	WP 0066-4
Drain Engine Oil and Remove Oil Filter	WP 0066-5

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Figure 3. Oil Filler — Location	WP 0066-6
Figure 4. Oil Filter — Location	WP 0066-7
Figure 5. Oil Filler — Detail	WP 0066-8
Figure 6. Oil Filter — Detail	WP 0066-9
Replace Oil Filter and Fill Engine Oil	WP 0066-9
Table 1. Lubricating Oil	WP 0066-10
Remove/Install Engine Speed Sensor	WP 0067
Adjust Engine Speed Sensor	WP 0067-2
Figure 1. Engine Speed Sensor — Location	WP 0067-2
Figure 2. Engine Speed Sensor — Adjust	WP 0067-3
Remove Engine Speed Sensor	WP 0067-4
Figure 3. Engine Speed Sensor — Removal	WP 0067-4
Test Engine Speed Sensor	WP 0067-5
Install Engine Speed Sensor	WP 0067-5
Remove/Install Glow Plugs	WP 0068
Remove Glow Plug	WP 0068-2
Figure 1. Glow Plug — Location	WP 0068-2
Figure 2. Glow Plug — Detail	WP 0068-3
Inspect Glow Plug	WP 0068-4
Test Glow Plug	WP 0068-4
Figure 3. Test Glow Plug	WP 0068-4
Install Glow Plug	WP 0068-5
Remove/Install Fuel Injector	WP 0069
Remove Fuel Injector	WP 0069-2
Figure 1. Fuel Injector — Location	WP 0069-2
Figure 2. Fuel Injector Detail	WP 0069-3
Inspect Fuel Injector	WP 0069-5
Install Fuel Injector	WP 0069-5
Test Fuel Injector Spray Pattern	WP 0069-7
Figure 3. Test Fuel Injector Spray Pattern	WP 0069-7
Figure 4. Nozzle Spray Patterns	WP 0069-8
Test Fuel Injector Pressure	WP 0069-8
Remove/Install Speed Control Plate	WP 0070
Remove Speed Control Plate	WP 0070-2
Figure 1. Speed Control Plate — Location	WP 0070-2
Figure 2. Speed Control Plate — Lever Adjustment	WP 0070-3
Figure 3. Speed Control Plate — Spring Removal	WP 0070-4
Figure 4. Speed Control Plate — Removal	WP 0070-5
Inspect Speed Control Plate	WP 0070-5
Replace Speed Control Plate Screws	WP 0070-6
Figure 5. Speed Control Plate Screws — Replace	WP 0070-6
Install Speed Control Plate	WP 0070-7
Remove/Install Fuel Injection Pump	WP 0071
Remove Fuel Injection Pump	WP 0071-2
Figure 1. Fuel Injection Pump — Location	WP 0071-2
Figure 2. Fuel Injection Pump — Hoses	WP 0071-3
Figure 3. Fuel Injection Pump — Start Spring and Bracket	WP 0071-4
Figure 4. Fuel Injection Pump — Removal	WP 0071-5

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Figure 5. Fuel Injection Pump — Start Spring to Fuel Injection Pump.....	WP 0071-6
Inspect Fuel injection Pump	WP 0071-7
Install Fuel injection Pump.....	WP 0071-7
Figure 6. Fuel Injection Pump — Install	WP 0071-8
Check Fuel Injection Adjustment	WP 0071-9
Figure 7. Flywheel and Fuel Delivery Valve	WP 0071-10
Figure 8. Flywheel Timing Marks Aligned	WP 0071-10
Table 1. Fuel Injection Adjustment Specification.....	WP 0071-11
Adjust Fuel Injection Timing	WP 0071-11
Figure 9. Fuel Injection Pump Shims.....	WP 0071-11
Table 2. Fuel Injection Pump Shim Sizes.....	WP 0071-12
Remove/Install Thermostat Housing	WP 0072
Remove Thermostat Housing	WP 0072-2
Figure 1. Thermostat Housing — Location.....	WP 0072-2
Figure 2. Thermostat Housing — Detail	WP 0072-3
Figure 3. Temperature Sensor — Removal	WP 0072-4
Inspect Thermostat Housing.....	WP 0072-4
Test Temperature Sensor.....	WP 0072-5
Figure 4. Test Temperature Sensor.	WP 0072-5
Table 1. Temperature Sensor Resistance.....	WP 0072-5
Install Thermostat Housing	WP 0072-6
Remove/Install Thermostat.....	WP 0073
Remove Thermostat	WP 0073-2
Figure 1. Thermostat — Location	WP 0073-2
Figure 2. Thermostat Replacement — Detail	WP 0073-2
Test Thermostat.....	WP 0073-3
Figure 3. Test Thermostat	WP 0073-3
Install Thermostat	WP 0073-4
Remove/Install Water Pump	WP 0074
Remove Water Pump	WP 0074-1
Figure 1. Water Pump — Location	WP 0074-2
Figure 2. Water Pump — Detail.....	WP 0074-2
Inspect Water Pump Assembly	WP 0074-3
Install Water Pump	WP 0074-4
Remove/Install Battery-Charging Alternator Assembly	WP 0075
Test Battery-Charging Alternator Assembly	WP 0075-2
Figure 1. Battery-Charging Alternator — Test.....	WP 0075-3
Remove Battery-Charging Alternator Assembly.....	WP 0075-5
Figure 2. Battery-Charging Alternator — Location	WP 0075-5
Figure 3. Battery-Charging Alternator — Wiring.....	WP 0075-6
Figure 4. Battery-Charging Alternator — Remove/Install	WP 0075-7
Inspect Battery-Charging Alternator Assembly	WP 0075-7
Install Battery-Charging Alternator Assembly.....	WP 0075-8
Remove/Install Battery-Charging Alternator Belt.....	WP 0076
Remove Battery-Charging Alternator Belt	WP 0076-2
Figure 1. Battery-Charging Alternator Belt — Location	WP 0076-2
Figure 2. Battery-Charging Alternator Belt — Removal	WP 0076-3
Inspect Battery-Charging Alternator Belt.....	WP 0076-4

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Install Battery-Charging Alternator Belt	WP 0076-4
Figure 3. Battery-Charging Alternator Belt — Install	WP 0076-4
Table 1. Belt Deflection	WP 0076-5
Remove/Install Starter	WP 0077
Remove Starter Assembly	WP 0077-2
Figure 1. Starter Assembly — Location	WP 0077-2
Figure 2. Starter — Lower Mounting Starter Stud	WP 0077-3
Figure 3. Starter Solenoid	WP 0077-4
Inspect Starter	WP 0077-4
Install Starter	WP 0077-5
Test Starter	WP 0077-6
Remove/Install Governor Actuator	WP 0078
Remove Governor Actuator	WP 0078-2
Figure 1. Governor Actuator — Location	WP 0078-2
Figure 2. Governor Actuator — Removal Details	WP 0078-3
Inspect Governor Actuator	WP 0078-3
Install Governor Actuator	WP 0078-4
Remove/Install Intake Manifold	WP 0079
Remove Intake Manifold	WP 0079-2
Figure 1. Intake Manifold — Location	WP 0079-2
Figure 2. Intake Manifold Details	WP 0079-3
Figure 3. Intake Manifold Gasket — Details	WP 0079-4
Inspect Intake Manifold	WP 0079-4
Install Intake Manifold	WP 0079-5
Remove/Install Exhaust Manifold	WP 0080
Remove Exhaust Manifold	WP 0080-2
Figure 1. Exhaust Manifold — Location	WP 0080-2
Figure 2. Heat Shield and Flex Pipe	WP 0080-3
Figure 3. Exhaust Manifold — Removal	WP 0080-4
Inspect Exhaust Manifold	WP 0080-4
Install Exhaust Manifold	WP 0080-5
Remove/Install Muffler	WP 0081
Remove Muffler	WP 0081-2
Figure 1. Muffler — Location	WP 0081-2
Figure 2. Weather Shield and Air Cleaner	WP 0081-3
Figure 3. Clamp and Bracket	WP 0081-4
Figure 4. Muffler — Removal	WP 0081-5
Clean and Inspect Muffler	WP 0081-5
Install Muffler	WP 0081-6
Remove/Install Valve Cover	WP 0082
Remove Valve Cover	WP 0082-1
Figure 1. Valve Cover and Gasket — Location	WP 0082-2
Figure 2. Valve Cover and Gasket — Detail	WP 0082-2
Inspect Valve Cover	WP 0082-3
Install Valve Cover	WP 0082-4
Check/Adjust Engine Valves	WP 0083
Check/Adjust Valves	WP 0083-1
Figure 1. Intake and Exhaust Valve — Locations	WP 0083-2

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Figure 2. Flywheel Alignment Markings	WP 0083-2
Figure 3. Check/Adjust Valve Clearance.....	WP 0083-4
Table 1. Adjust Engine Valves on Compression Stroke.....	WP 0083-4
Table 2. Adjust Engine Valves at Overlap Position	WP 0083-5
Remove/Install Oil Pan and Strainer	WP 0084
Remove Oil Pan and Strainer.....	WP 0084-1
Figure 1. Oil Pan — Location	WP 0084-2
Figure 2. Oil Pan — Removal.....	WP 0084-2
Figure 3. Oil Strainer — Removal.....	WP 0084-3
Inspect Oil Pan and Strainer.....	WP 0084-4
Install Oil Pan and Strainer	WP 0084-4
Figure 4. Liquid Gasket Application.....	WP 0084-5
Remove/Install Flywheel	WP 0085
Remove Flywheel	WP 0085-2
Figure 1. Flywheel — Location	WP 0085-2
Figure 2. Remove Flywheel.....	WP 0085-3
Inspect Flywheel.....	WP 0085-4
Install Flywheel	WP 0085-4
Remove/Install Crankcase Rear Bearing Case Cover	WP 0086
Remove Crankcase Rear Bearing Case Cover.....	WP 0086-1
Figure 1. Crankcase Rear Bearing Case Cover — Location	WP 0086-2
Figure 2. Crankcase Rear Bearing Case Cover — Removal.....	WP 0086-2
Figure 3. Crankcase Rear Bearing Case Cover — Details	WP 0086-3
Inspect Crankcase Rear Bearing Case Cover	WP 0086-3
Install Crankcase Rear Bearing Case Cover.....	WP 0086-4
Figure 4. Crankcase Rear Bearing Case Cover — Component Alignment	WP 0086-4
Lubrication Instructions	WP 0087
Table 1 Lubrication Orders	WP 0087-2
Change Engine Oil and Engine Oil Filter.....	WP 0087-2
Table 2. Table of Lubricants — Engine	WP 0087-2
Change Engine Coolant	WP 0087-2
Table 3. Table of Coolants — Engine	WP 0087-2
Lubricate Hinges.....	WP 0087-3
Figure 1. Hinge Locations — Rear and Right-Side	WP 0087-3
Figure 2. Hinge Locations — Front and Left-Side	WP 0087-4
Table 4. Table of Lubricant — Hinges	WP 0087-4
Torque Limits	WP 0088
Scope.....	WP 0088-1
Table 1. Special Torque Limits.....	WP 0088-2
How to Use Torque Table.....	WP 0088-3
Figure 1. Screw/Bolt Measurement	WP 0088-3
Table 2. Standard Torque Limits	WP 0088-4

Chapter 4 — Sustainment Troubleshooting Procedures

Troubleshooting Index	WP 0089
General Troubleshooting Information	WP 0089-1
Malfunction/Symptom Index	WP 0089-1

TABLE OF CONTENTS — CONTINUED.

	Page No. <u>WP Sequence No.</u>
Troubleshooting Procedures	WP 0090
 Chapter 5 — Sustainment Maintenance Instructions	
Sustainment PMCS Introduction	WP 0091
Introduction	WP 0091-1
Sustainment PMCS	WP 0092
General Maintenance	WP 0093
Using a Fire Extinguisher	WP 0093-2
General Fuel Requirements	WP 0093-3
Table 1. Fuel.....	WP 0093-3
Using a Multimeter.....	WP 0093-4
Jump Starting the Generator Set.....	WP 0093-5
Figure 1. NATO Slave Receptacle — Location	WP 0093-5
Clean Battery Posts	WP 0093-7
Repair Electrical Connectors	WP 0093-8
Figure 2. Wiring Harness — Location	WP 0093-8
Figure 3. Simple Crimp-on Ring Connector	WP 0093-9
Table 2. Crimp-On Ring Connector Repair	WP 0093-10
Figure 4. Multipin Connector Repair.....	WP 0093-11
Table 3. Multipin Bulkhead-Mounted Connector Repair	WP 0093-12
Figure 5. Square-Type Connector	WP 0093-12
Figure 6. Square-Type Crimping Tool.....	WP 0093-13
Table 4. Square-Type Connector Repair	WP 0093-14
Figure 7. Flat-type Pin Connector	WP 0093-14
Table 5. Flat-Type Connector Repair	WP 0093-16
Figure 8. Winterization Kit Pin Connector	WP 0093-16
Table 6. Winterization Kit Connector Repair	WP 0093-17
Figure 9. Butt Connector	WP 0093-17
Installing InPower AMMPS to a Compatible PC.....	WP 0093-18
Using InPower AMMPS on a Compatible PC.....	WP 0093-19
Figure 10. PC And DCS Connections	WP 0093-20
Figure 11. AMMPS Main	WP 0093-21
Figure 12. Port Connect	WP 0093-21
Figure 13. Device MPC3330	WP 0093-22
Figure 14. Device Connect	WP 0093-22
Figure 15. Data Table.....	WP 0093-23
Figure 16. Capture File Yes or No.....	WP 0093-23
Figure 17. Capture File.....	WP 0093-24
Figure 18. InPower AMMPS Maintenance	WP 0093-24
Downloading Log Files from DCS	WP 0093-25
Figure 19. AMMPS Display	WP 0093-25
Figure 20. Port Connect for AMMPS Display	WP 0093-26
Figure 21. Device HMI400.....	WP 0093-26
Figure 22. Device Connect for AMMPS Display.....	WP 0093-27
Figure 23. Log File Retrieval Utility	WP 0093-27
Figure 24. Log File Retrieval Utility Dialog Box	WP 0093-28
Figure 25. Log File Retrieval Utility Download	WP 0093-29

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
Figure 26. Log File Retrieval Utility Download Status	WP 0093-30
Using a Capture File to Overlay Data	WP 0093-31
Figure 27. Capture File Explorer	WP 0093-32
Figure 28. Open Capture Files Explorer	WP 0093-32
Figure 29. Select Capture File	WP 0093-33
Figure 30. Parameters Dialog Box	WP 0093-33
Figure 31. Parameters Missing	WP 0093-34
Figure 32. Drag Capture File	WP 0093-34
Figure 33. Drop Capture File	WP 0093-35
Figure 34. Modify Values	WP 0093-35
Figure 35. Save Adjustments	WP 0093-36
Figure 36. About Parameters	WP 0093-36
Figure 37. Save Adjustments From Drop-Down Menu	WP 0093-37
Figure 38. Confirm Modify Values	WP 0093-37
Figure 39. Confirm Save Adjustments	WP 0093-38
Figure 40. Saved	WP 0093-39
Using Initial Calibration to Install Control Firmware Updates	WP 0093-39
Figure 41. Initial Calibration	WP 0093-40
Figure 42. Select Calibration	WP 0093-41
Figure 43. Calibration Erase	WP 0093-41
Figure 44. History	WP 0093-42
Figure 45. Save and Restore Parameters	WP 0093-42
Figure 46. Feature List Finish	WP 0093-43
Figure 47. Confirm Calibration	WP 0093-43
Figure 48. Calibration Progress	WP 0093-44
Figure 49. Calibration Completed Successfully	WP 0093-44
Figure 50. DCS Reconnect	WP 0093-45
Using Update Calibration to Install Display Firmware Updates	WP 0093-46
Figure 51. Connect to AMMPS Display	WP 0093-46
Figure 52. Port for AMMPS Display	WP 0093-47
Figure 53. AMMPS Display Device HMI400	WP 0093-47
Figure 54. Device Connect Menu for AMMPS Display	WP 0093-48
Figure 55. Highlight Display Device	WP 0093-48
Figure 56. AMMPS Display Update Calibration	WP 0093-49
Figure 57. AMMPS Display History	WP 0093-49
Figure 58. AMMPS Display Dialog Box	WP 0093-50
Recovering AMMPS DCS If Initial Calibration Fails	WP 0093-50
Figure 59. Failed Connection	WP 0093-50
Figure 60. Highlight	WP 0093-51
Preparation for Storage (Less Than Nine Months)	WP 0093-51
Preparation for Storage (9 Months to 36 Months)	WP 0093-52
Replace Freeze Plug	WP 0093-55
Figure 61. Remove Freeze Plug	WP 0093-55
Figure 62. Install Freeze Plug	WP 0093-56
Install Clinch Nut	WP 0093-57
Figure 63. Clinch Nut to Rivet Tool	WP 0093-57
Figure 64. Install Clinch Nut to Panel	WP 0093-58
Figure 65. Remove Rivet Nut Tool	WP 0093-59

TABLE OF CONTENTS — CONTINUED.

	Page No. <u>WP Sequence No.</u>
Figure 66. Installed Clinch Nut	WP 0093-60
Remove/Install Harmonic Balancer	WP 0094
Remove Harmonic Balancer	WP 0094-1
Figure 1. Harmonic Balancer — Removal	WP 0094-2
Inspect Harmonic Balancer	WP 0094-2
Install Harmonic Balancer	WP 0094-2
Remove/Install Gear Case Cover	WP 0095
Remove Gear Case Cover	WP 0095-1
Figure 1. Gear Case Cover — Detail	WP 0095-2
Figure 2. Remove Oil Filter and Mounting Hardware	WP 0095-3
Figure 3. Gear Case Cover Detail — Rear	WP 0095-3
Figure 4. Remove Idle Apparatus	WP 0095-4
Inspect Gear Case Cover	WP 0095-4
Install Gear Case Cover	WP 0095-4
Figure 5. Mounting Bolts Location — Length Detail	WP 0095-5
Table 1. Mounting Bolt Length	WP 0097-6
Replace Cylinder Head Gasket	WP 0096
Replace Cylinder Head Gasket	WP 0096-1
Figure 1. Cylinder Head Bolt Sequence	WP 0096-2
Figure 2. Remove/Install Cylinder Head — Detail	WP 0096-3
Wiring Diagram	WP 0097
Introduction	WP 0097-1
Wire Identification	WP 0097-1
Abbreviations	WP 0097-1
Wiring Diagrams	WP 0097-1

Chapter 6 — Parts Information

RPSTL Introduction	WP 0098
Scope	WP 0098-1
General	WP 0098-1
Explanation of Columns in the Repair Parts List and Special Tools List WPS	WP 0098-1
Table 1. SMR Code Explanation	WP 0098-2
Explanation of Cross-Reference Indexes Work Packages Format and Columns	WP 0098-5
Special Information	WP 0098-5
How to Locate Repair Parts	WP 0098-6
Abbreviations	WP 0098-6
GROUP 00 Generator Set Repair Parts List	WP 0099
Figure 1. Generator Set	WP 0099-1
GROUP 01 DC Electric Installation Repair Parts List	WP 0100
Figure 2. DC Electric Installation	WP 0100-1
GROUP 0101 Relay Panel Assembly Repair Parts List	WP 0101
Figure 3. Relay Panel Assembly	WP 0101-1
GROUP 02 Housing Installation Repair Parts List	WP 0102
Figure 4. Housing Installation	WP 0102-1
GROUP 03 DCS Installation Repair Parts List	WP 0103
Figure 5. DCS Installation	WP 0103-1

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
GROUP 0301 DCS Control Panel Assembly Repair Parts List	WP 0104
Figure 6. DCS Control Panel Assembly	WP 0104-1
GROUP 0302 DCS Enclosure Assembly Repair Parts List	WP 0105
Figure 7. DCS Enclosure Assembly	WP 0105-1
GROUP 04 Intake Air Installation Repair Parts List	WP 0106
Figure 8. Intake Air Installation	WP 0106-2
GROUP 05 Exhaust Installation Repair Parts List	WP 0107
Figure 9. Exhaust Installation	WP 0107-1
GROUP 06 Cooling System Installation Repair Parts List	WP 0108
Figure 10. Cooling System Installation	WP 0108-1
GROUP 07 Fuel System Installation Repair Parts List	WP 0109
Figure 11. Fuel System Installation	WP 0109-1
GROUP 0701 Fuel Manifold Assembly Repair Parts List	WP 0110
Figure 12. Fuel Manifold Assembly	WP 0110-2
GROUP 0702 Fuel Filter/Water Separator Assembly Repair Parts List	WP 0111
Figure 13. Fuel Filter/Water Separator Assembly	WP 0111-1
GROUP 08 Output Box Installation Repair Parts List	WP 0112
Figure 14. Output Box Installation	WP 0112-1
GROUP 0801 Contactor Repair Parts List	WP 0113
Figure 15. Contactor	WP 0113-1
GROUP 0802 Output Terminal Board Repair Parts List	WP 0114
Figure 16. Output Terminal Board	WP 0114-1
GROUP 0803 Voltage Selection Switch Repair Parts List	WP 0115
Figure 17. Voltage Selection Switch	WP 0115-1
GROUP 0804 Hour Meter Repair Parts List	WP 0116
Figure 18. Hour Meter	WP 0116-1
GROUP 0805 Convenience Receptacle Assembly Repair Parts List	WP 0117
Figure 19. Convenience Receptacle Assembly	WP 0017-1
GROUP 0806 Transformers Repair Parts List	WP 0118
Figure 20. Transformers	WP 0118-1
GROUP 0807 Printed Circuit Board Module Repair Parts List	WP 0119
Figure 21. Printed Circuit Board Module	WP 0119-2
GROUP 09 Power Plant Installation Repair Parts List	WP 0120
Figure 22. Power Plant Installation	WP 0120-1
GROUP 0901 AC Generator Assembly, 50/60 HZ Repair Parts List	WP 0121
Figure 23. AC Generator Assembly, 50/60 Hz	WP 0121-2
GROUP 0901 AC Generator Assembly, 400 HZ Repair Parts List	WP 0122
Figure 24. AC Generator Assembly, 400 Hz	WP 0122-1
GROUP 0902 Engine Assembly Repair Parts List	WP 0123
Figure 25. Engine Assembly	WP 0123-1
GROUP 090201 Lubrication System Repair Parts List	WP 0124
Figure 26. Lubrication System	WP 0124-1
GROUP 090202 Engine Speed Sensor Repair Parts List	WP 0125
Figure 27. Engine Speed Sensor	WP 0125-1
GROUP 090203 Glow Plugs Repair Parts List	WP 0126
Figure 28. Glow Plugs	WP 0126-1
GROUP 090204 Fuel Injectors Repair Parts List	WP 0127
Figure 29. Fuel Injectors	WP 0127-2

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
GROUP 090205 Speed Control Plate Repair Parts List	WP 0128
Figure 30. Speed Control Plate	WP 0128-1
GROUP 090206 Fuel Injection Pump Repair Parts List	WP 0129
Figure 31. Fuel Injection Pump.....	WP 0129-1
GROUP 090207 Thermostat Installation Repair Parts List	WP 0130
Figure 32. Thermostat Installation	WP 0130-2
GROUP 090208 Water Pump Repair Parts List	WP 0131
Figure 33. Water Pump	WP 0131-1
GROUP 090209 Battery-Charging Alternator and Belt Repair Parts List	WP 0132
Figure 34. Battery-Charging Alternator and Belt	WP 0132-2
GROUP 090210 Starter Repair Parts List.....	WP 0133
Figure 35. Starter.....	WP 0133-1
GROUP 090211 Governor Actuator Repair Parts List.....	WP 0134
Figure 36. Governor Actuator	WP 0134-1
GROUP 090212 Intake Manifold Repair Parts List	WP 0135
Figure 37. Intake Manifold	WP 0135-1
GROUP 090213 Exhaust Manifold Repair Parts List.....	WP 0136
Figure 38. Exhaust Manifold	WP 0136-1
GROUP 090214 Oil Pan And Strainer Repair Parts List	WP 0137
Figure 39. Oil Pan and Strainer	WP 0137-1
GROUP 090215 Flywheel Repair Parts List	WP 0138
Figure 40. Flywheel	WP 0138-1
GROUP 090216 Crankcase Rear Bearing Case Cover Repair Parts List.....	WP 0139
Figure 41. Crankcase Rear Bearing Case Cover.....	WP 0139-2
GROUP 090217 Cylinder Head Assembly Repair Parts List	WP 0140
Figure 42. Cylinder Head Assembly	WP 0140-2
GROUP 09021701 Valve Cover Repair Parts List.....	WP 0141
Figure 43. Valve Cover	WP 0141-2
GROUP 09021702 Engine Valves Repair Parts List	WP 0142
Figure 44. Engine Valves	WP 0142-2
GROUP 09021731 Rocker Arms and Push Rods Repair Parts List.....	WP 0143
Figure 45. Rocker Arms and Push Rods.....	WP 0143-2
GROUP 090218 Short Block Assembly Repair Parts List	WP 0144
Figure 46. Short Block Assembly	WP 0144-1
GROUP 09021801 Connecting Rods and Pistons Repair Parts List.....	WP 0145
Figure 47. Connecting Rods and Pistons.....	WP 0145-2
GROUP 09021802 Crankshaft Repair Parts List	WP 0146
Figure 48. Crankshaft	WP 0146-1
GROUP 09021803 Gear Case Cover Repair Parts List	WP 0147
Figure 49. Gear Case Cover	WP 0147-2
GROUP 09021804 Harmonic Balancer Repair Parts List.....	WP 0148
Figure 50. Harmonic Balancer	WP 0148-1
GROUP 09021805 Camshaft and Gear Repair Parts List.....	WP 0149
Figure 51. Camshaft and Gear	WP 0149-1
GROUP 09021806 Idler Gear Repair Parts List	WP 0150
Figure 52. Idler Gear	WP 0150-1
GROUP 09021807 Fuel Camshaft and Fork Assembly Repair Parts List	WP 0151
Figure 53. Fuel Camshaft and Fork Assembly	WP 0151-1

TABLE OF CONTENTS — CONTINUED.

	Page No.
	<u>WP Sequence No.</u>
GROUP 09021808 Oil Pump and Gear Repair Parts List.....	WP 0152
Figure 54. Oil Pump and Gear.....	WP 0152-1
GROUP 10 Engine Wiring Harness Repair Parts List.....	WP 0153
Figure 55. Engine Wiring Harness.....	WP 0153-1
GROUP 11 Power Wiring Harness Repair Parts List.....	WP 0154
Figure 56. Power Wiring Harness.....	WP 0154-1
GROUP 12 Winterization Kit Installation Repair Parts List	WP 0155
Figure 57. Winterization Kit Installation	WP 0155-1
Bulk Item.....	WP 0156
Special Tools List.....	WP 0157
Figure 58. Special Tools List	WP 0157-1
National Stock Number (NSN) Index.....	WP 0158
Part Number Index.....	WP 0159

Chapter 7— Supporting Information

References	WP 0160
Scope.....	WP 0160-1
Field Manuals	WP 0160-1
Forms.....	WP 0160-1
Technical Manuals.....	WP 0160-1
Miscellaneous Documents.....	WP 0160-2
Maintenance Allocation Chart (MAC) Introduction	WP 0161
Introduction	WP 0161-1
The Army Maintenance System MAC	WP 0161-1
Maintenance Functions	WP 0161-2
Explanation of Columns in the MAC.....	WP 0161-3
Explanation of Columns in the Tools and Test Equipment Requirements	WP 0161-4
Explanation of Columns in the Remarks	WP 0161-4
Maintenance Allocation Chart (MAC)	WP 0162
Table 1. MAC for AMMPS 5 kW Generator Set WP 0162-1	
Table 2. Tools and Test Equipment for AMMPS 5 kW Generator Set.....	WP 0162-10
Table 3. Remarks for the AMMPS 5 kW Generator Set.....	WP 0162-13
Expendable and Durable Items List.....	WP 0163
Introduction	WP 0163-1
Scope.....	WP 0163-1
Explanations of Column in the Expendable/Durable Items List	WP 0163-1
Table 1. Expendable and Durable Items	WP 0163-1
Maintenance and Deferred Maintenance Items List.....	WP 0164
General Information	WP 0164-1
Table 1. Maintenance Item Codes and Prompts.....	WP 0164-1
Table 2. Deferred Maintenance Item Codes and Prompts.....	WP 0164-2
Glossary	
Foldout Pages	
FO-1. Wiring Diagram.....	FP-1
FO-2. Schematic Diagram	FP-13

HOW TO USE THIS MANUAL

This manual contains field and sustainment maintenance instructions with Repair Parts and Special Tools List (RPSTL) for the 5 kW AMMPS skid-mounted generator sets, Mobile Electric Power (MEP)-1030 and MEP-1031.

This field and sustainment maintenance manual is part of a family of manuals which includes an operator's manual (TM 9-6115-749-10), an operator and field maintainer manual with Repair Parts and Special Tools List (RPSTL) manual for Power Units (PU) and Power Plants (PP) (TM 9-6115-755-13&P), and a National Maintenance Work Requirement (NMWR) maintenance manual (NMWR 9-6115-749).

NOTE

Throughout the family of manuals, generator set directional orientation is described from the point of view of the operator facing the operator's controls looking out over the generator set. From this perspective, the end of the generator set containing the operator's controls will be referred to as the rear of the generator set.

Manual Overview

This field and sustainment maintenance manual provides troubleshooting, PMCS, maintenance, parts information, and supporting information required to maintain and repair the AMMPS 5 kW generator set. Listed below are some of the features included in this TM to help locate and use the provided information.

WORK PACKAGES (WPs)

This TM has been organized using the WP concept. Each chapter contains a series of WP rather than sections and paragraphs. Each WP is designed to stand alone as a complete information module. If you keep your section(s) of this TM in a loose-leaf binder, you will be able to remove just the WP needed to complete a specific task.

Each WP is numbered using a four-digit number beginning with WP 0001. WPs are numbered sequentially throughout the TM (e.g. WP 0022, WP 0023, etc.). The Table of Contents lists each chapter and WP title, as well as all figures and tables contained within each WP. Figures and tables are numbered sequentially within each WP.

The WP number is located at the top right of each page. It is also located at the bottom of the page with the WP page number included (0001-1 would be page 1 of the General Information WP (WP 0001, General Information)).

Each WP starts on a right-hand page. This is done so you can remove a single WP from the paper TM if needed for a task. Blank pages are assigned a number, but it appears on the preceding or following page. For example, if page 0001-10 of a WP is blank, page 0001-9 will have the number 0001-9/10 blank; or if page 0001-1 of a WP is blank, page 0001-2 will have the number 0001-1 blank/2.

Each task within a maintenance or troubleshooting WP contains step-by-step procedures and will end with the words END OF TASK, and each WP ends with the statement END OF WORK PACKAGE. Think of each WP as a small, stand-alone TM.

References to equipment placarding are printed as they appear on the equipment whenever possible. On-screen text is shown in brackets in the manual (i.e. [Ready to Crank]).

Warnings, Cautions, and Notes Definitions

Warning, caution, and note headings, chapter titles, and paragraph headings are printed in bold type. Multiple warning, caution, or note paragraphs may appear above a procedure, task, or step with one warning, caution, or not heading. Prior to starting a WP, all warnings included in the WP should be reviewed, understood, and followed. Review the materials/parts in the initial setup of the WP for any hazardous materials used during maintenance of the equipment. Then refer to the detailed warnings for hazardous materials in the Warning Summary. Make sure to read all warnings within referenced WP that are required to complete tasks.

WARNING

Warning highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to, or death of, personnel or long-term health hazards.

CAUTION

Caution highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness.

NOTE

Note highlights an essential operating or maintenance procedure, condition, or statement.

TM CONTENT

Front Matter

The front cover of the manual identifies the exact model(s) covered by this manual. Be certain the generator set you are working on is covered by the information in the manual. Additional manuals will be required to provide information on models not covered by this manual.

The List of Effective Pages/WPs provides a list of pages/WPs that have been modified from a previous edition of the manual.

The Table of Contents will help you understand the organization of the manual. The overall Table of Contents in the front of the manual directs you to chapters and lists all WPs in the manual with tables and figures identified for each WP. The chapters contain descriptive information, maintenance procedures organized by maintenance level, and supporting data. Each chapter is divided into WPs with titles that describe the information or procedure in the WP. Each chapter contains its own chapter index that lists all the WPs within the chapter to help you find information.

Chapter 1 – General Information, Equipment Description, and Theory of Operation

The General Information WP (WP 0001, General Information) provides general information including characteristics, capabilities, features, and theory of operation for the AMMPS and its major components. It contains a nomenclature cross-reference list, a list of abbreviations and acronyms used in this TM, general information about this manual, and the related forms and records. Instructions are provided for making equipment improvement and recommendations. Coverage includes a reference to the manual that contains instructions on destruction of materiel to prevent enemy use.

The Equipment Description and Data WP (WP 0002, Equipment Description and Data) describes the characteristics, capabilities, and features of the generator set and provides information on location and description of major components.

The Theory of Operation WP (WP 0003, Theory of Operation) provides an overview of the operation of the generator set.

Chapter 2 – Field Maintenance Troubleshooting

The AMMPS generator set provides electronic troubleshooting through the Digital Control System (DCS). If a malfunction occurs or is about to occur to a component monitored by the DCS, a fault or warning code is displayed on the DCS screen at the rear of the generator set. This fault and warning information, along with manual troubleshooting guidelines, provide a comprehensive level of information to identify problems that may occur with the generator set and minimize downtime for repair.

An index organized by system (WP 0004, Troubleshooting Index) linking potential problems to troubleshooting WPs is provided for a quick reference.

The Operational Checkout WP (WP 0005, Operational Checkout) provides procedures to ensure the AMMPS 5 kW generator set is capable of performing as required and provides corrective action steps to take if it is not.

The warnings and fault codes displayed on the DCS screen are identified in the Warning and Fault Codes WP (WP 0006, Warning and Fault Codes).

WP 0007 through 0013 are used to troubleshoot problems with the major systems of the generator set (engine, electrical system, winterization kit, etc.). See the Table of Contents for specific WP numbers and titles for each system.

Chapter 3 – Field Maintenance Instructions

The service procedures required to be performed when a generator set is first received in the field are described in the Service Upon Receipt WP (WP 0014, Service Upon Receipt).

Every generator set requires some periodic scheduled maintenance. The theory of the scheduled maintenance or PMCS is outlined in Field PMCS Introduction WP (WP 0015, Field PMCS Introduction). A detailed table to guide through the scheduled maintenance tasks is provided by Field PMCS WP (WP 0016, Field PMCS).

Detailed instructions for removal, installation, test, and adjustment of critical components (Line Replaceable Units (LRUs)) of the generator set are the subject of WP 0017 through 0086. See the Table of Contents for specific WP numbers and titles for each LRU.

Each field maintenance WP begins with an initial setup table that contains information about the tools and equipment conditions, parts and supplies, reference WPs and manuals, and personnel required to perform each task.

Specific lubrication instructions are found in Lubrication Instructions WP (WP 0087, Lubrication Instructions).

If the design engineers responsible for the AMMPS generator set have specified a critical torque value for tightening fasteners, that value will be stated in the field maintenance WP for the appropriate LRU. Otherwise, information for nominal torque values of common U.S. standard units and metric hardware is provided in the Torque Limits WP (WP 0088, Torque Limits).

Chapter 4 – Sustainment Troubleshooting Procedures

All troubleshooting procedures for the AMMPS generator set will be handled at the field maintenance level.

Chapter 5 – Sustainment Maintenance Instructions

Maintenance tasks not specific to AMMPS generator sets but common to many types of equipment may be listed in the General Maintenance WP (WP 0093, General Maintenance).

Most maintenance tasks required above field maintenance level will be performed at NMWR level. However, detailed instructions for removal, installation, test, and adjustment of some critical components (LRU) of the generator set are the subject of WP 0094 through 0096. See the Table of Contents for specific WP numbers and titles for each LRU.

Large size electrical diagrams and drawings, such as schematics, are found in the Foldout Pages section in Rear Matter.

Chapter 6 – Parts Information

The Repair Parts and Special Tools List (RPSTL) contains parts that support both field and sustainment maintenance. This chapter covers WPs 0098 through 0159. The repair parts lists (WP 0098 through WP 0155) itemize all available parts required to maintain and repair the generator set.

The Special Tools List WP (WP 0157, Special Tools List) provides information on special tools, special Test, Measurement, and Diagnostic Equipment (TMDE), and other special support equipment authorized for maintenance of the AMMPS generator set. Bulk items (WP 0156, Bulk Item), National Stock Numbers (NSN) (WP 0158, National Stock Number (NSN) Index), and Part Number (P/N) (WP 0159, Part Number Index) indexes also are included in this chapter.

Chapter 7 – Supporting Information

The supporting information chapter provides the Maintenance Allocation Chart (MAC) (WP 0162, Maintenance Allocation Chart (MAC)) that lists the proper level of maintenance where critical tasks are to be performed. The MAC also provides a list of all tools, kits, and test equipment, both special and common, required to maintain the AMMPS 5 kW generator set.

Other WPs found in this chapter list commonly used supplies (WP 0163, Expendable and Durable Items List) and referenced material (WP 0160, References) used throughout this TM.

Rear Matter

Rear Matter includes a Glossary to define terms and phrases which are uncommon and not identified within the manual or within a standard dictionary.

The Department of the Army (DA) Form 2028, Recommended Changes to Publications and Blank Forms, is the document to be submitted to correct errors found in the manual or to make recommended changes that will improve the manual.

Large size electrical diagrams and drawings, such as schematics, are located in the Foldout Pages section at the rear of this manual.

Rear Matter also provides a conversion chart between SAE and metric values.

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND

THEORY OF OPERATION

FOR

AMMPS 5KW GENERATOR SET

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
GENERAL INFORMATION	0001
EQUIPMENT DESCRIPTION AND DATA	0002
THEORY OF OPERATION	0003

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
GENERAL INFORMATION

SCOPE

This field and sustainment maintenance including repair parts and special tools list TM contains instructions for troubleshooting and maintaining the AMMPS 5 kW generator set.

Type of Manual

Field and sustainment maintenance including repair parts and special tools list.

Model Number(s) and Equipment Name(s)

AMMPS 5 kW 50/60 and 400 hertz (Hz) generator set, skid mounted (Table 1):

Table 1. Model Number(s) and Equipment Name(s).

MODEL	HERTZ	NSN
MEP-1030	50/60	6115-01-561-7329
MEP-1031	400	6115-01-561-7438

Purpose of Equipment

The AMMPS 5 kW generator set is designed to provide tactical, quiet Alternating Current (AC) power in a combat setting. The generator set is designed for ease of transportation, operation, and maintenance. The Kubota D902-IV C engine supplied with the AMMPS 5 kW generator set eliminates wet stacking problems.

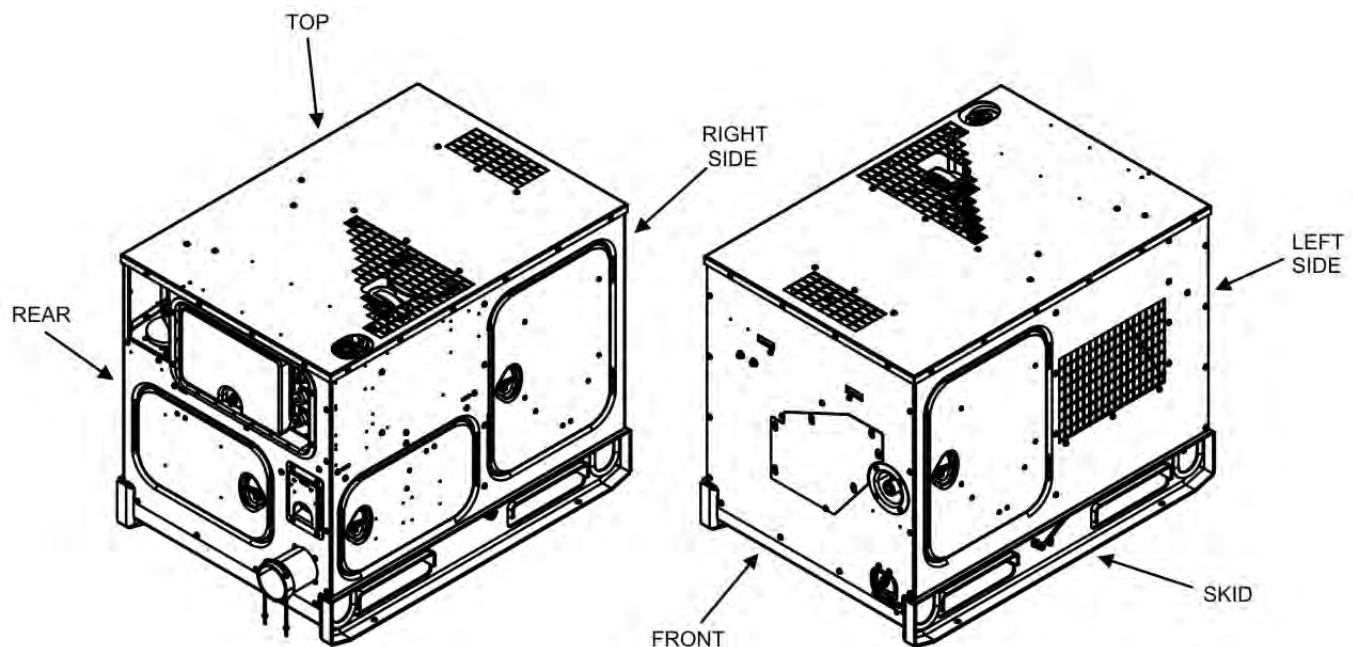


Figure 1. Skid-Mounted 5 kW AMMPS Generator Set.

MAINTENANCE FORMS, RECORDS, AND REPORTS

- (1) (Army). Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual; DA PAM 738-751, Functional Users Manual for the Army Maintenance Management System – Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.
- (2) (Marine Corps). Maintenance forms and records used by Marine Corps personnel are prescribed by TM 4700-15/1.
- (3) (Air Force). Maintenance forms and records used by Air Force personnel are prescribed in AFI 21-101 and the applicable TO 00-20, Series of Technical Orders.
- (4) (Navy). Navy users should refer to their service peculiar directives to determine applicable maintenance forms and records to be used.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

(1) (Army). If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. If you have Internet access, the easiest and fastest way to report problems or suggestions is to follow the instructions and links below:

If you have a user's account, you can submit the PQDR for ALL CECOM (B16) Warranty, EIR, and PQDRs (including those B16 Aviation related) through the Navy's Web Product Quality Deficiency Reporting (PQDR) site, <http://www.nslcptsmh.csd.disa.mil/webpqdr/webpqdr.htm>. If you do not, either go to EZPQDR, <http://www.nslcptsmh.csd.disa.mil/webpqdr/files/ezpqdr.htm> and input your PQDR there, or establish a new account. New accounts can be established at the following address: <http://www.nslcptsmh.csd.disa.mil/accessforms/uarform.htm>.

CECOM (B16) aviation PQDRs will not go to AMCOMs Joint Deficiency Reporting System (JDERS). If AMCOM should get a CECOM aviation PQDR, they will redirect it to the CECOM PQDR Team.

Use the PQDR for Warranties, EIRs, and PQDRs. There is a block on the PQDR that can be clicked if it is a Warranty. The originator can still put in the description that they want this investigated as an EIR and then enter what the issue is.

You may also submit your SF 368 (Product Quality Deficiency Report) via email (MONM-AMSELLEODCSCFO@CONUS.ARMY.MIL), facsimile (732-532-2929), or regular mail (call 732-532-8843 for the current mailing address).

We will send you a reply.

- (2) (Air Force). Air Force personnel are encouraged to submit EIRs IAW Air Force Regulation (AFR) 900-4.
- (3) (Navy). Navy personnel are encouraged to submit EIRs through their local Beneficial Suggestion Program.
- (4) (Marine Corps). QDR shall be reported on SF 368 IAW MCO P4855.10, Product Quality Deficiency Report Manual. Submit to Commanding General, Marine Corps Logistics Base (Code 850), Albany, Georgia 31704-5000. A reply will be furnished to you.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically Ultraviolet (UV)) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. SF 368, Product Quality Deficiency Report, should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

For aircraft TMs, this information shall include a reference to TM 1-1500-344-23, volumes 1 through 4 (Cleaning and Corrosion Control).

OZONE-DEPLETING SUBSTANCES (ODS)

The use of Class 1 Ozone-Depleting Substances (ODS) for new acquisitions has been curtailed by Section 326 of the National Defense Authorization Act of Fiscal Year 1993 (Public Law 102, 484) and related Army policy. ODS are listed in Title VI of the Clean Air Act. For systems procured and fielded prior to the effectiveness of the above law (June 1993) that use a Class 1 ODS, a listing of those substances required to operate and maintain the system shall be included in the TM. This requirement applies to any system procured or fielded after June 1993 that requires the use of a Class 1 ODS, where the use of the ODS has been properly documented and waived. The procuring activity will provide a list of Class 1 ODS on request.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Destruction of Army electronics materiel to prevent enemy use shall be IAW TM 750-244-2.

Destruction of Air Force materiel to prevent enemy use shall be IAW AFI 33-201.

Destruction of Navy materiel to prevent enemy use shall be IAW Navy direction.

Destruction of Marine Corps materiel to prevent enemy use shall be IAW MC direction.

DEMOLITION OF MARINE CORPS MATERIEL TO PREVENT ENEMY USE

Demolition to Render the Generator Set Inoperative

1. When capture or abandonment of the generator set to an enemy is imminent, the responsible unit commander must make the decision to either destroy or render the equipment inoperative.
2. Based on this decision, orders are issued which cover the desired extent of destruction.
 - a. Operators should be thoroughly familiar with all methods of destruction without referencing any particular manual.
 - b. Demolition of the generator set can be accomplished by explosives, fire, or tools such as a sledge hammer, pick, or ax. Demolition can also be accomplished by misuse.
3. The method used will depend on the time available and the availability of these materials in the vicinity of the generator set.
4. Demolition by mechanical means:
 - a. Use hammer, pick, ax, or any other available tool to destroy vital engine and control parts.
 - b. Control box, fuel injection lines, and the radiator should be smashed, engine and control box wires pulled and cut, and any other external engine components (fuel filter, alternator) should be damaged enough to make them inoperable.
5. Demolition by misuse:
 - a. Drain diesel generator crankcase oil.
 - b. Block diesel generator engine air supply ports.
 - c. Start diesel generator engine and allow it to operate until it fails.

- d. Pour sand, dirt, or other available abrasive compound in all exposed surfaces and access ports of the diesel engine and generator.
- e. Drain engine coolant.
6. Demolition by burning: Complete as much mechanical damage as possible, and then saturate unit with combustible fuel and ignite.
7. Demolition by explosives: Place explosive charges in priority order (Table 2).

Table 2. Demolition Priority Levels.

PRIORITY LEVEL	COMPONENT	EXPLOSIVE CHARGE REQUIRED
1	Generator Engine	1 pound (lb)
2	Control Box	1 lb
3	Generator Housing	1 lb
4	Housing/Structure	2 lb

PREPARATION FOR STORAGE OR SHIPMENT

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to assure operational readiness.

WARRANTY INFORMATION

1. The AMMPS 5 kW generator set is warranted for 1800 hours (hr) of operation or 36 months, whichever occurs first. The warranty starts on the date the equipment is accepted by the Government as defined on the Date Inspected block and the Date Manufactured block on the generator set data plate. The warranty block on the data plate contains the warranty period (hours/time limit) that the warranty covers. This warranty shall include furnishing of new items to replace any that prove to be nonconforming and/or defect within the warranty period. Such items shall be returned to the contractor's plant without cost to the Government.

The warranty is not an appropriate vehicle for maintaining readiness of AMMPS generator sets. The normal supply system should be used to maintain readiness. Parts provided in response to warranty claims should be used to replenish your supply stocks.

The Contractor, Cummins Power Generation (CPG), guarantees the supplies and parts at the time of acceptance or delivery conform to the design and manufacturing requirements, are free from all defects in materials and workmanship, and conform to all performance requirements delineated in the applicable specifications of the contract. This guarantee will be for 1800 operating hours on each unit, or 36 months, whichever occurs first.

The guarantee shall include furnishing of new items to replace any that prove to be nonconforming and/or defective within the warranty period. Such items shall be furnished without cost to the Government. When repair or replacement requires transportation of the nonconforming or defective items, shipping cost from the line item delivery point (irrespective of the Foreign Operating Base (F.O.B.) point or the point of acceptance) to the Contractor's plant and return shall be at the expense of the Contractor.

2. The Government activity responsible for administrative functions of the warranty program is the Commander, US Army CECOM LCMC, Attn: AMSEL-LC-LEO-DSS-PQ Aberdeen, W15GK8. Call or send message to voice (443) 861-6310 or DSN 848-6310 or (443) 861-6313 or DSN 848-6313; FAX (443) 861-6356 or (443) 861-6356. Email: AMSEL-LC-LEO-D-CSCFO@conus.army.mil. The following paragraphs describe the responsibilities of each Government activity.

-
- a. Failure to follow published maintenance procedures at the maintenance levels specified in the appropriate technical manual could result in a warranty claim being declared invalid. The following maintenance requirements must be performed: Preventive Maintenance Checks and Services (PMCS). All PMCS requirements are contained in the Operator's Manual (TM 9-6115-749-10) and the Field and Sustainment Maintenance Manual (TM 9-6115-749-24&P). Corrective maintenance for the equipment is given in TM 9-6115-749-24&P based upon the approved Maintenance Allocation Chart (MAC). Any deviation from the normal maintenance and repair procedures is not authorized.
 - b. The owning unit is responsible for operating and maintaining the generator sets in accordance with the technical manuals. All PMCS and lubrication order requirements must be met. In addition, all operating procedures will be strictly followed while observing all warnings, cautions, and notes. Upon experiencing a warranty-related failure, the owning unit shall prepare the required documentation.
 - c. Warranty Control Office Responsibilities. CECOM Warranty Control Office (WARCO) will handle all warranty claims generated by field units with exception of FMS customers. WARCO will determine whether or not each claim is a candidate for warranty consideration. The Government will initiate Warranty Claim Actions (WCA) for warranty items and Quality Deficiency Reports (QDR) for systematic failures in accordance with DA PAM 750-8 and this Technical Bulletin. CECOM WARCO will coordinate warranty claims with CECOM Contracting Officer as appropriate. FMS customers will administer their own WCA and QDRs.
 - d. Army Oil Analysis Program (AOAP). There are no warranty components of the generator set enrolled in the AOAP.
 - e. Alteration/Modifications. Alterations and modifications shall not be made unless expressly authorized or directed by: PM-MEP.
3. Nullification. The following examples of actions which will nullify the warranty are examples only and are not inclusive and do not alter the terms of the contract warranty provisions.
 - a. Any maintenance/repair procedure, improper use or operation, abuse, improper environmental exposure, and installation methods which are outside of the published guidelines and procedures contained in the technical manuals can be cause for nullifying a warranty claim.
 - b. In addition, the following actions will be cause for nullification of the warranty:
 - (1) Subsequent damage to components as a result of continued use after a component malfunction.
 - (2) Damage caused by combat conditions or acts of war.
 - (3) Operation of the unit with the BATTLESHORT switch on.
 - (4) Operation of the unit in an environment beyond that specified in the Operator's Technical Manual (TM 9-6115-749-10).
 - (5) Installation of equipment not in accordance with the technical manuals.
 - (6) Any abuse such as improper use, repair, or handling of warranted items.
 - (7) Any damage caused by (1) acts of God or the public enemy, (2) acts of the Government in either its sovereign or contractual capacity, (3) fires, (4) floods, or (5) unusually severe weather beyond the performance specifications.
 - (8) Use of improper or contaminated fuels, coolants, or lubricants.
 - c. Abuse Determination. In cases where generator set abuse is suspected (i.e., not obvious), the CECOM WARCO or Prime Contractor shall initiate an inquiry into the circumstances leading up to the generator set failure. This warranty is void for any generator set for which abuse is determined. The generator set may be returned to a functional condition by performing the necessary repair procedures in TM 9-6115-749-24&P.
 4. Claim Procedures. The following procedures provide instructions for processing warranty claims (refer to DA PAM 750-8).

- a. Identification of Failed Items. Generator set components that experience a warranty failure shall be tagged/identified to prevent improper repair or use. Tag the generator set component with an Exchange Tag, DA Form 2402 and complete the SF 368 form (refer to DA PAM 750-8). There are no items requiring special handling, storage, or shipment during the processing or warranty claims. Warranty claims can be electronically submitted through the NAVSEA (Naval Sea Systems Command (NAVSEA)) website under Submit Quality Deficiency Reports. The Website is located at <http://www.nslcptsmh.csd.disa.mil/>.
- b. Disposition. Upon notification by CECOM WARCO that the item is to be returned to the Contractor, the using activity will package and return in accordance with the disposition instructions provided by the CECOM WARCO. A copy of the Product Quality Deficiency Report, SF 368 (refer to DA PAM 750-8) will be forwarded with the failed item.

The using activity will also visually inspect the repaired part for evidence of physical damage incurred during shipping. No item testing will be required to ensure that the component was repaired properly. The Contractor assumes all responsibility for testing after repair.
- c. Reimbursement for Army Repair. Reimbursement for Army repair is not authorized by this warranty.
- d. Claim Denials/Disputes. Claim denials or disputes will be coordinated through the Contractor Warranty Administrator and the CECOM WARCO.
- e. Reporting. Reporting or recording action on a failed item shall be as specified in DA PAM 750-8. Contractor unique forms shall not be used.

NOMENCLATURE CROSS-REFERENCE LIST

Shortened nomenclature is used in this manual to make procedures easier to read. A cross-reference between the shortened, common name used in this manual and the official nomenclature is provided below.

Common Name	Official Nomenclature
5 kW Genset	5 kW Generator Set
24-VDC Electrical System	DC Electrical System
24-VDC Electrical System	Engine Electrical System
AC Generator	AC Generator Assembly
Cylinder Head	Cylinder Head Assembly
DCS	Control Box Assembly
DCS	Control Box
DCS Mounting Bracket	Control Box Frame
DCS Mounting Bracket	Control Box Side Panels
DCS Mounting Bracket	Control Box Tray
DCS Wiring Harness	Control Box Wiring Harness
Dipstick	Oil-Level Bayonet Gage
Doors	Access Doors
Engine Block	Main Bearing Case Assembly
Engine Block	Short Block
Engine Block Assembly	Crankcase Assembly
Engine Block Assembly	Short Block Assembly
Flywheel	Flywheel Assembly
Front Body Panel	Front Housing Section
Fuel Injection System	Engine Fuel System
Gear Case	Gear Case Assembly
Housing	Housing Assembly
Not used	Engine Accessories
Not used	End Bell Assembly
Oil Drain Hose Assembly	Oil Drain Assembly
Operator Control Panel	Main Control Panel
Output Box Assembly	Output Box
Output Box Harness	Output Box Harness And Cables

Common Name**Official Nomenclature**

Output Terminal Board
 Rear Body Panel
 Rectifier
 Speed Governor
 Starter
 Top Body Panel
 Unit Skid

Output Load Terminal Board
 Rear Housing Section
 Rectifier Assembly
 Governor System
 Starter Assembly
 Top Housing Section
 Skid Assembly

LIST OF ABBREVIATIONS/ACRONYMS

Acronyms and abbreviations used in this TM are provided and defined below.

Abbreviation/Acronym**Definition**

-	Negative
%	Percent
+	Positive
±	Plus Or Minus
°	Degree
°C	Degree Celsius
°F	Degree Fahrenheit
Ω	Ohm
mΩ	Megohm
A	Army
AAL	Additional Authorization List
AC	Alternating Current
ADC	Amperes Direct Current
AF	Air Force
AFI	Air Force Instruction
AFR	Air Force Regulation
AFTO	Air Force Technical Order
AGM	Absorbed Glass Mat
AH	Ampere Hour
AMMPS	Advanced Medium Mobile Power Sources
Amp	Ampere
AM – VM	Ampere Meter — Voltage Meter
AOAP	Army Oil Analysis Program
AR	Army Regulation
Aux	Auxiliary
AUX CONTACT	Auxiliary Contact
AVR	Automatic Voltage Regulation
BII	Basic Issue Items
BOI	Basis Of Issue
C	Crew (level of maintenance)
CAGEC	Commercial And Government Entity Code
CARC	Chemical Agent Resistant Coating
CB	Circuit Breaker
CBRN	Chemical, Biological, Radiological, and Nuclear
CECOM LCMC	Communications-Electronics Command Life Cycle Management Command
cm	Centimeters
cm ³	Cubic Centimeters
CPC	Corrosion Prevention And Control

Abbreviation/Acronym	Definition
CPG	Cummins Power Generation
CSV	Comma-Separated Values
CT	Current Transformer
CTA	Common Table Of Allowances
CTL	Control
Cyl	Cylinder
D	Depot (level of maintenance)
DA	Department Of The Army
DC	Direct Current
DCS	Digital Control System
DD	Department Of Defense (forms only)
DF	Diesel Fuel
DI	Direct Injection
DoD	Department Of Defense
DS2	Decontamination Solution number 2
E	Empty
ea.	Each
ECP	Engineering Change Proposal
EIR	Equipment Improvement Recommendation
e-mail	Electronic Mail
EMP	Electromagnetic Pulse
ESC	Equipment Service Criteria
ESD	Electrostatic Discharge
E-Stop	Emergency Stop
EX	Exhaust
F	Field (Level Of Maintenance)
F	Full
FGC	Functional Group Code
Fig.	Figure
FM	Field Manual
F.O.B.	Foreign Operating Base
ft	Foot
ft/lb	Foot-Pound
gal	Gallon
Genset	Generator Set
GFCI	Ground Fault Circuit Interrupter
GFI	Ground Fault Interrupter
Glow plg	Glow Plug
GMTK	General Mechanic's Tool Kit
GND	Ground
Gov	Governor
GPH	Gallon Per Hour
H	Below Depot (level of maintenance)
hr	Hour
Hz	Hertz
IAW	In Accordance With
IBM	International Business Machine
ID	Identification

Abbreviation/Acronym	Definition
in	Inch
in/lb	Inch-pound
in ³	Cubic inches
IN	Intake
IUID	Individual Unit Identification
JDRS	Joint Deficiency Reporting System
JP	Jet Propulsion Fuel
kg	Kilogram
kPa	Kilopascal
kVAR	Kilovolt-Ampere
kW	Kilowatt
L	Liter
lb	Pound
LCD	Liquid Crystal Display
L/Hr	Liters Per Hour
L-L	Line-To-Line
L-N	Line-To-Neutral
LRU	Line Replaceable Unit
m	Meter
mA	Milliampere
MAC	Maintenance Allocation Chart
MC	Marine Corps
MCO	Marine Corps Order
MEP	Mobile Electric Power
MG	Mobile Generator
min	Minute
mL	Milliliter
mm	Millimeter
MPa	MegaPascals
ms	Millisecond
MSD	Maintenance Support Device
MSDS	Material Safety Data Sheets
MTOE	Modified Table of Organization and Equipment
MWO	Modified Work Order
N/A	Not Applicable
N	Navy
N	Neutral
NATO	North Atlantic Treaty Organization
NAVSEA	Naval Sea Systems Command
NBC	Nuclear Biological Chemical
NEMA	National Electrical Manufacturers Association
NHA	Next Higher Assembly
NIIN	National Item Identification Number
Nm	Newton meter
NMWR	National Maintenance Work Requirement
No.	Number
NSN	National Stock Number
ODS	Ozone-Depleting Substances

Abbreviation/Acronym	Definition
OEM	Original Equipment Manufacture
OOR	Out Of Range
OSHA	Occupational Safety And Health Act
oz	Ounces
PAM	Pamphlet
PC	Personal Computer
PDA	Personal Data Assistant
PMG	Permanent Magnet Generator
PMCS	Preventive Maintenance Checks And Services
P/N	Part Number
PP	Power Plant
PQDR	Product Quality Deficiency Report
Press	Pressure
psi	Pounds Per Square Inch
PU	Power Unit
PWM	Pulse Width Modulated
QDR	Quality Deficiency Report
qt	Quart
Qty	Quantity
Qty. Recm.	Quantity Recommended
Qty. Rqr.	Quantity Required
RP	Relay Panel
rpm	Revolutions Per Minute
RPSTL	Repair Parts And Special Tools List
RTC	Real Time Clock
SAE	Society Of Automotive Engineers
sec	Second
SF	Standard Form
SMR	Source, Maintenance, And Recoverability
SOP	Standard Operating Procedure
SRA	Specialized Repair Activity
STB	Super-Tropical Bleach
TAMMS	The Army Maintenance Management System
TAMMS-A	The Army Maintenance Management System — Aviation
TBD	To Be Determined
TDA	Tactical Decision Aid
TDC	Top Dead Center
TDR	Transportation Discrepancy Report
Temp	Temperature
TM	Technical Manual
TO	Technical Order
TMDE	Test, Measurement, And Diagnostic Equipment
U/I	Unit Of Issue
UOC	Usable On Code
USB	Universal Serial Bus
UV	Ultraviolet
V	Volt

Abbreviation/Acronym	Definition
VAC	Volts Alternating Current
VDC	Volts Direct Current
WARCO	Warranty Control Office
WP	Work Package
Wtr	Winterization

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this AMMPS 5 kW generator set field and sustainment maintenance manual. If quality of material requirements is not stated in this field and sustainment maintenance manual, the material must meet the requirements of the drawings, standards, specifications, or approved Engineering Change Proposals (ECP) applicable to the subject equipment.

SAFETY, CARE, AND HANDLING

ESD. The AMMPS 5 kW generator set contains no radioactive components or parts or radioactive material requiring special handling or consideration. The AMMPS 5 kW generator set DCS contains printed circuit boards and control cards requiring special handling to protect them from ESD when being serviced. The operator does not need to use special handling for operation of the AMMPS 5 kW generator set.

This manual describes physical and chemical processes that may require the use of chemicals, solvents, paints, or other commercially available materials. Users of the TM should obtain the Material Safety Data Sheets (MSDS) (OSHA Form 20 or equivalent) from the manufacturers or suppliers of materials to be used. Users must be completely familiar with manufacturer/supplier information and adhere to their procedures, recommendations, warnings, and cautions for safe use, handling, storage, and disposal of these materials.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The AMMPS 5 kW generator set (Figure 1) is a fully-enclosed, self-contained, skid-mounted mobile unit. The generator set consists of six major assemblies: engine assembly, internal fuel assembly, external fuel assembly (not shown), AC generator assembly, Digital Control System (DCS), and output box assembly. An optional winterization kit is available for installation in cold weather climates.

The AMMPS 5 kW generator set is designed to accommodate the continuing proliferation of electronics (computers, Personal Data Assistants (PDA), etc.), life support systems, and global communications necessary in today's battlefield that require a continuous, uninterrupted flow of electricity to accommodate all tactical situations.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

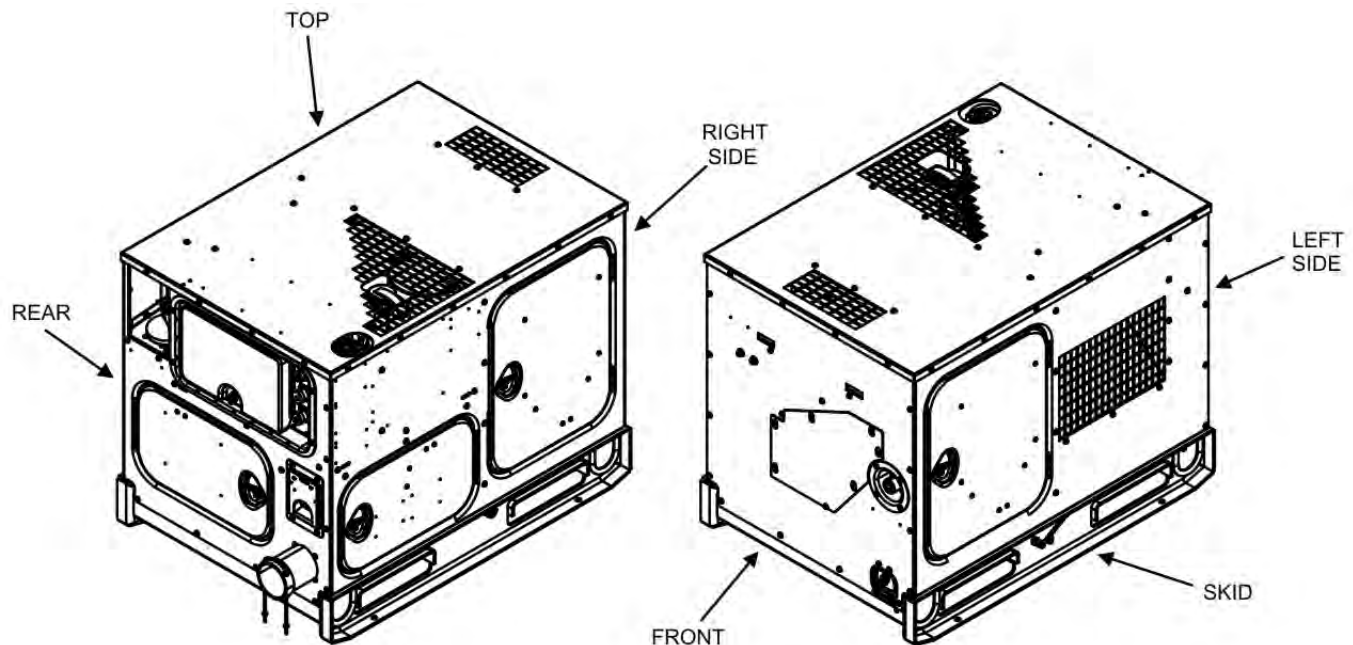


Figure 1. AMMPS 5 kW Generator Set with Doors Closed.

HOUSING

An aluminum housing consisting of several individual body panels encloses the AMMPS 5 kW generator set and protects it from the environment. The housing provides acoustical protection, entry access to generator set assemblies, control of air flow over internal surfaces, and mounting for generator set components.

The aluminum housing is durable enough so that no damage should occur with normal usage. The housing design prevents the invasion of wind-driven rain, snow, and sand to the interior of the units through the design and placement of the louver and a rain cap. The Chemical Agent Resistant Coating (CARC) paint, polyurethane coating on circuit boards, sealed connectors, and immersion-proof fan motor housing provide additional protection against moisture and condensation damage.

Self-supporting hinged doors allow easy interior access for scheduled service and preventive maintenance. Individual body panels are removable to allow additional access for service and replacement of major components.

Body Panels

All body panels are connected using corrosion-resistant captive nuts. All seals are interference fit to the housing panels.

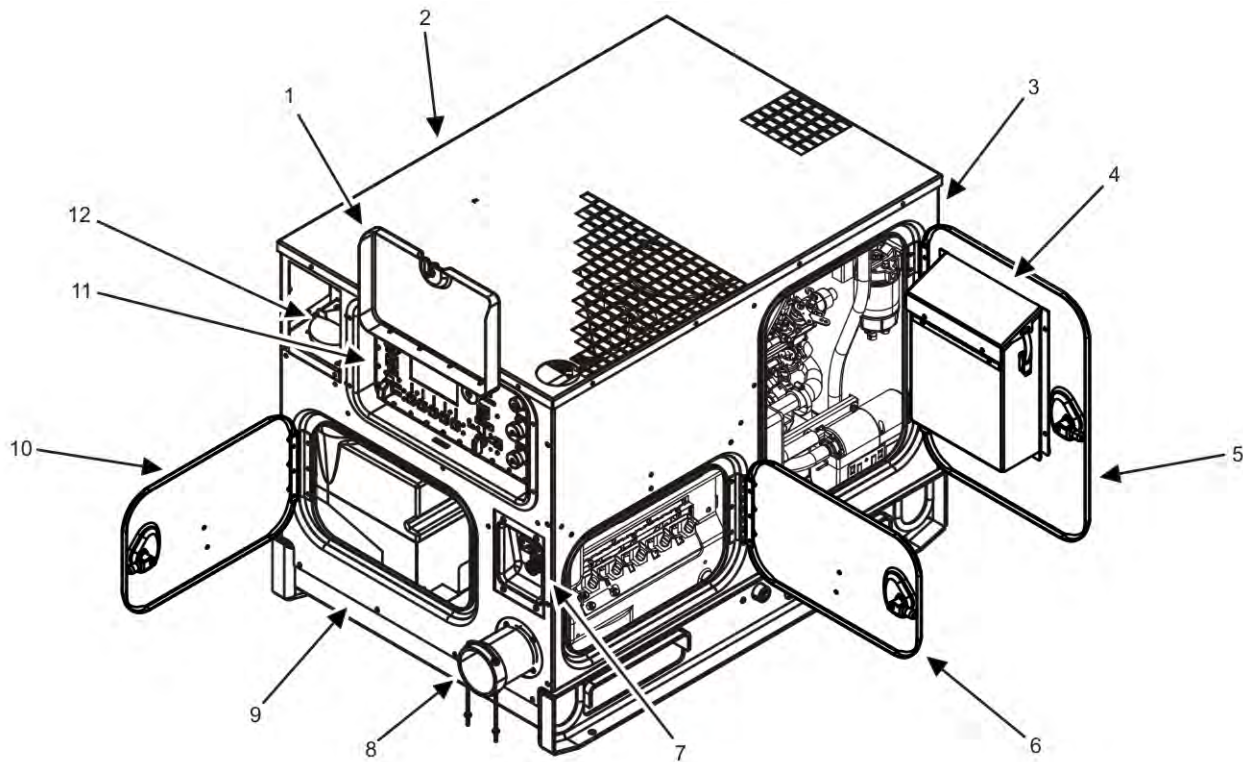


Figure 2. Rear and Right-Side View with Doors Open.

Top Body Panel (Figure 2, Item 2). The top body panel shields components from the elements.

Rear Body Panel (Figure 2, Item 9). The rear body panel is located at the rear of the generator set and contains the DCS access door (Figure 2, Item 1), DCS (Figure 2, Item 11), rear access door (Figure 2, Item 10), convenience receptacle (Figure 2, Item 7), entrance for load cables (Figure 2, Item 8), and fuel fill (Figure 2, Item 12).

Right-Side Body Panel (Figure 2, Item 3). The right-side body panel is located on the right side of the generator set and contains the right-side access door (Figure 2, Item 5) and output box door (Figure 2, Item 6).

Storage Box (Figure 2, Item 4). An accessory box, stenciled Storage Box, has been installed on the inside of the right-side access door (Figure 2, Item 5) to provide space for the paralleling cable, grounding rod connecting hardware, and auxiliary fuel line.

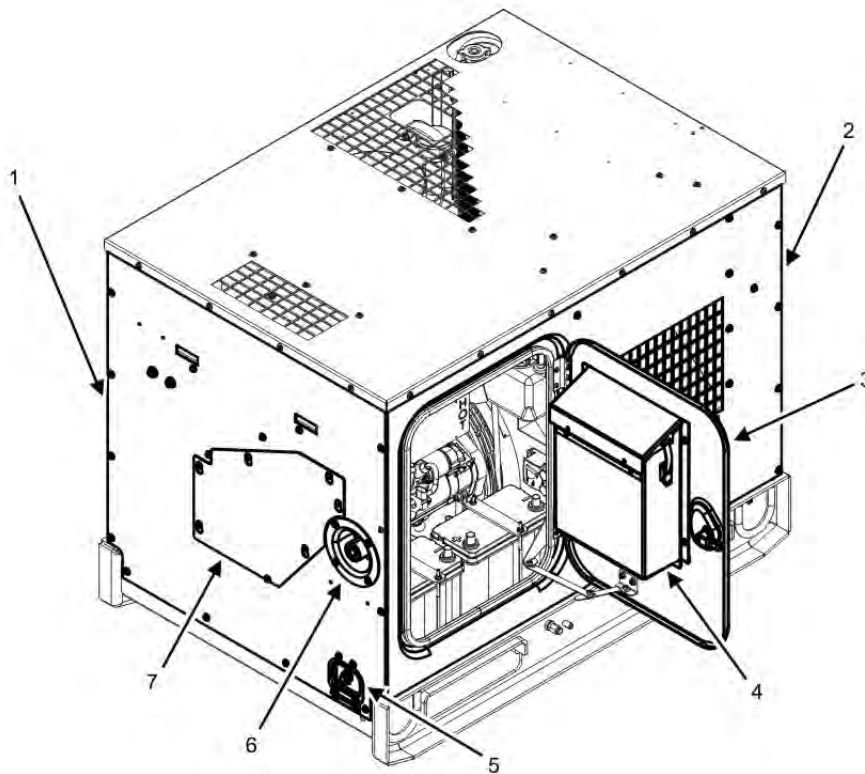


Figure 3. Front and Left-Side View with Door Open.

Front Body Panel (Figure 3, Item 1). The front body panel is located at the front of the generator set and contains the NATO slave receptacle (Figure 3, Item 6), the grounding rod storage access door (Figure 3, Item 5), and the access panel (Figure 3, Item 7).

Left-Side Body Panel (Figure 3, Item 2). The left-side body panel is located on the left side of the generator set and contains the left-side access door (Figure 3, Item 3).

Document Box (Figure 3, Item 4). An accessory box, stenciled Document Box, has been installed on the rear of the left-side access door (Figure 3, Item 3) to provide space for the TM.

Identification (ID) Plates. Identification (ID) plates and placards for system safety and operation are attached to the housing. See TM 9-6115-749-10 for the placement and contents of the identification and safety placards.

DCS (Figure 2, Item 11)

The DCS is a microprocessor-based control that allows the operator and maintainer to: start/stop the generator set and regulate fuel source using the engine control switch; stop the generator set in emergencies with the EMERGENCY STOP switch; operate the contactor using the AC CIRCUIT INTERRUPT switch; adjust voltage, frequency, gain, panel lights, and other settings using the adjustment screens with the soft keys; clear/reset generator faults using the FAULT RESET control; operate in parallel with other generator sets using the UNIT PARALLEL switch; and perform other necessary functions to provide output power.

The control unit is powered by the generator set 24 VDC system. The controls are fully functional after approximately 4 seconds (sec) (boot-up time). Once the generator set model, frequency, and voltage configurations are determined by the DCS programming, the control automatically adjusts the display value limits, menus, and operational parameters accordingly, reducing potential operator error.

The AMMPS 5 kW generator set provides limited remote operation capabilities through interface with an International Business Machine (IBM)-compatible Personal Computer (PC). The operational status of the generator set can be monitored, battleshort conditions can be set and released, and emergency stops can be executed from up to a 250-foot (ft) (76.2-meter (m)) distance. Loss of signal between the remote monitoring site and the generator set does not adversely affect the generator set operation.

The DCS display is a colored Liquid Crystal Display (LCD) with a 6.5-inch (in) (165.1 millimeters (mm)) diagonal viewing area. It provides a combination of switches and LCD soft keys to allow the operator and maintainer to control the generator set.

SKID ASSEMBLY (Figure 4)

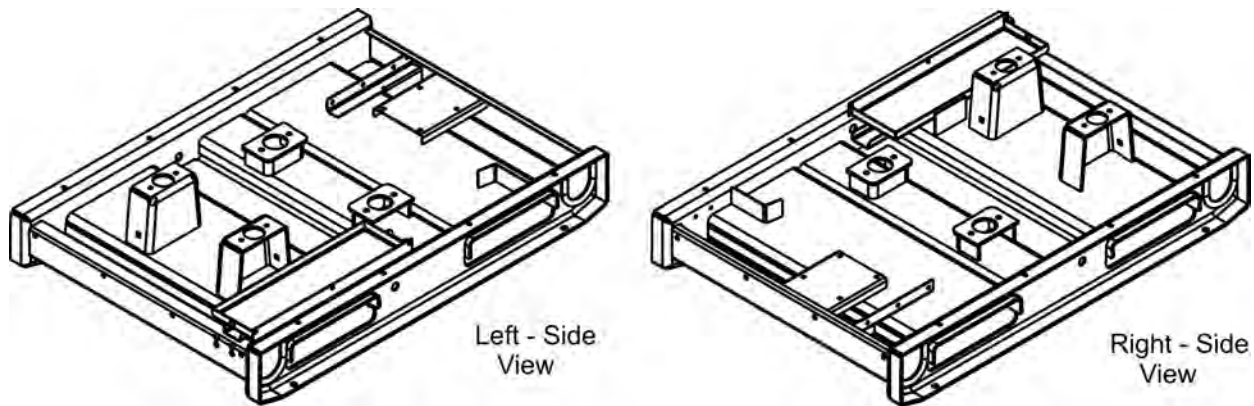


Figure 4. Skid.

The housing sits on an aluminum skid that extends beyond the housing walls by approximately 0.39 in (10 mm). The engine and AC generator are directly mounted to the skid with the focus toward the roll inertia axis. This improves vibration isolation. The skid is equipped with forklift pockets for transportation capability. The skid base has drains located between the fork lift pockets on each side for draining liquids from the generator set.

ENGINE ASSEMBLY

The AMMPS 5 kW generator set uses a Kubota D902 diesel engine. The vertical, water-cooled, four-cycle Direct Injection (DI) diesel engine utilizes a three-cylinder, naturally-aspirated process. It consists of the cylinder head and valve cover, crankcase assembly, pistons, main bearing case, and lubrication system. It is mounted to the skid toward the front body panel of the generator set. See Figure 5 and Figure 6 for a breakdown of major engine components.

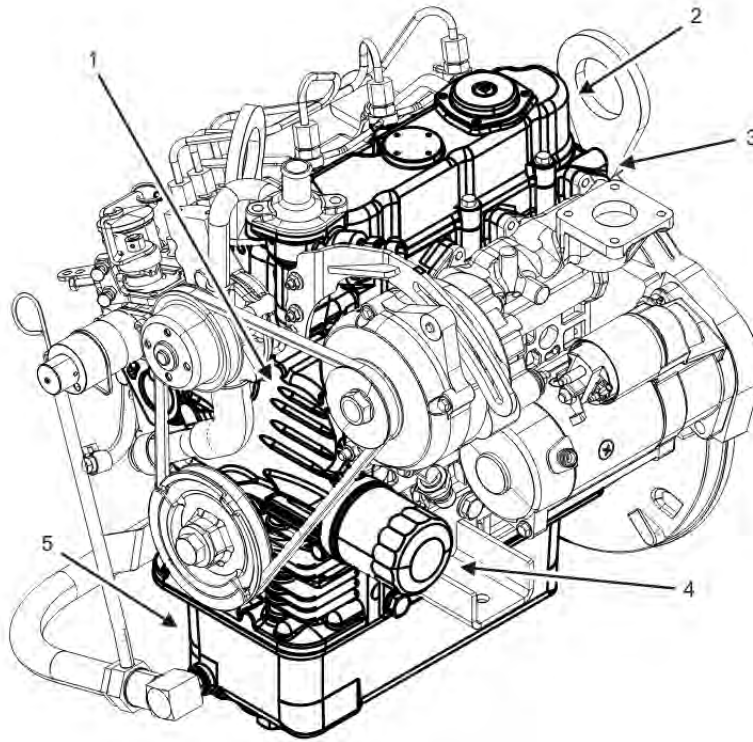


Figure 5. Engine Components — Left Side.

Major Engine Components/Assemblies

Major engine components/assemblies include: cylinder head and valve cover assembly, block assembly, lubrication system, gear case assembly, flywheel assembly, engine fuel injection system, cooling system, DC electrical system, and air intake and exhaust system.

Cylinder Head (Figure 5, Item 3) and Valve Cover (Figure 5, Item 2) Assembly. The cylinder head, located on the top of the block assembly (Figure 6, Item 7), seals the upper ends of the cylinders to provide compression, protects the portion of the engine where combustion takes place, and houses the valve assembly. The valve cover is located on top of the cylinder head assembly and protects the valve assembly from contamination.

Block Assembly (Figure 6, Item 7). The block assembly houses the connecting rods, crankshaft, pistons, camshaft, and bearings.

Lubrication System. The AMMPS 5 kW generator set lubrication system is compatible with MIL-PRF-21260E preservative oil. The lubricating oil conforms to MIL-PRF-46167C and MIL-PRF-2104H.

Operators can safely check and add oil to the lubricating system while the generator set is operating or in the off condition. The lubrication system includes an oil-filler opening with captive cap (Figure 6, Item 5) to permit oil-filling from a standard 8-qt capacity can, and a readily-accessible oil-level bayonet gage (dipstick) (Figure 6, Item 6). The dipstick (Figure 6, Item 6) is marked to ensure accurate reading of oil levels. See TM 9-6115-749-10 for more information.

Oil Filter (Figure 5, Item 4). The oil filter is located at the exhaust side front of the engine behind the battery-charging alternator belt. It removes impurities from the engine lubricating oil utilizing a full-flow, spin-on disposable oil filter cartridge.

Oil Drain Assembly (Figure 6, Item 9). The oil drain assembly is located between the oil pan (Figure 6, Item 8) (Figure 5, Item 5) and the unit skid. It allows the engine oil to be easily drained into a remote catch basin using a ball valve (Figure 6, Item 10).

Gear Case Assembly (Figure 5, Item 1). The gear case assembly is located on the front of the engine and protects the timing gears from contamination and damage.

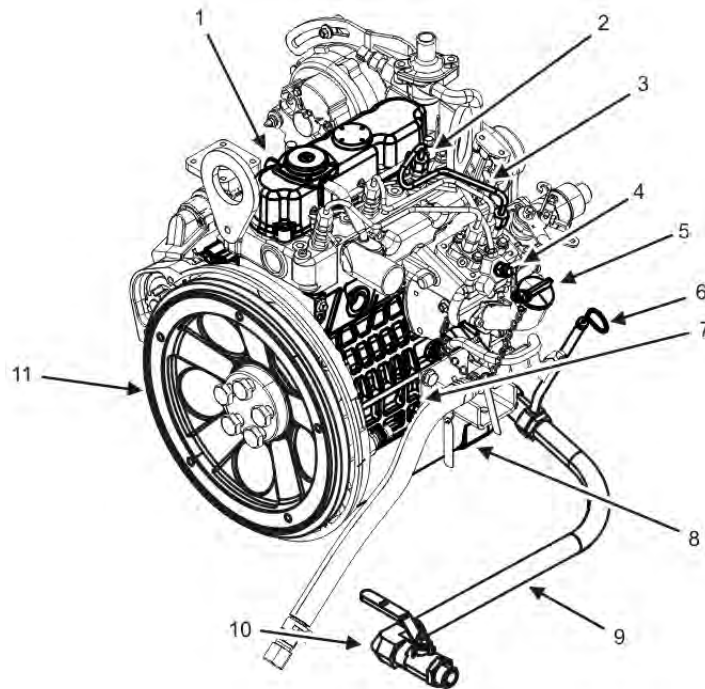


Figure 6. Engine Components — Right Side.

Fuel Injection System. Once fuel has passed through the fuel filter/water separator (Figure 9 Item 7), the fuel passes through the engine fuel injection pump (Figure 6, Item 4). The engine fuel injection pump (Figure 6, Item 4) divides equal amounts of fuel for each of the engine's three cylinders. The fuel then passes through the three injector lines (Figure 6, Item 3) to the three fuel injectors (Figure 6, Item 2) (one in each cylinder) located on the right side of the valve cover (Figure 6, Item 1). The three fuel injectors (Figure 6, Item 2) spray the fuel at high pressure into the cylinder where it is burned.

Flywheel Assembly (Figure 6, Item 11). The flywheel assembly connects the engine to the AC generator to transmit rotational mechanical energy for the generation of electricity.

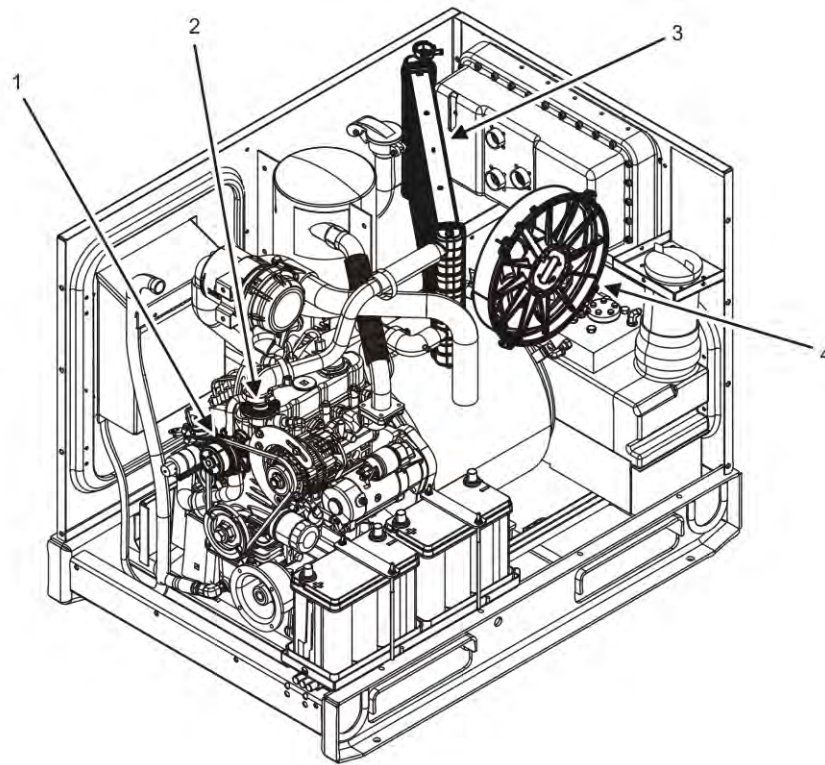


Figure 7. Cooling System Components — Left Side.

Unit Cooling System

Cooling Fan (Figure 7, Item 4). The cooling fan allows the generator set to operate in all required operational environments. The 16-in, variable-speed, 24-VDC cooling fan optimizes radiator location and airflow paths for improved cooling efficiency. Intake air for the cooling system is drawn by the cooling fan through a grille on the left-side body panel. This air passes through the cooling fins of the radiator (Figure 7, Item 3), transferring heat from the cooling system to the airflow. The warm air is then expelled into the atmosphere through a grille in the top body panel. The cooling system also reduces wear on the battery-charging alternator belt and water pump. Cold weather operation is also improved by regulating cabinet temperature at or near ideal operating temperatures.

Coolant Circulation System. This system consists of the radiator (Figure 7, Item 3), thermostat (Figure 7, Item 2), water pump (Figure 7, Item 1), and coolant overflow bottle (Figure 8). It is responsible for keeping the engine at a safe temperature. See TM 9-6115-749-10 for further information on maintaining the cooling system.

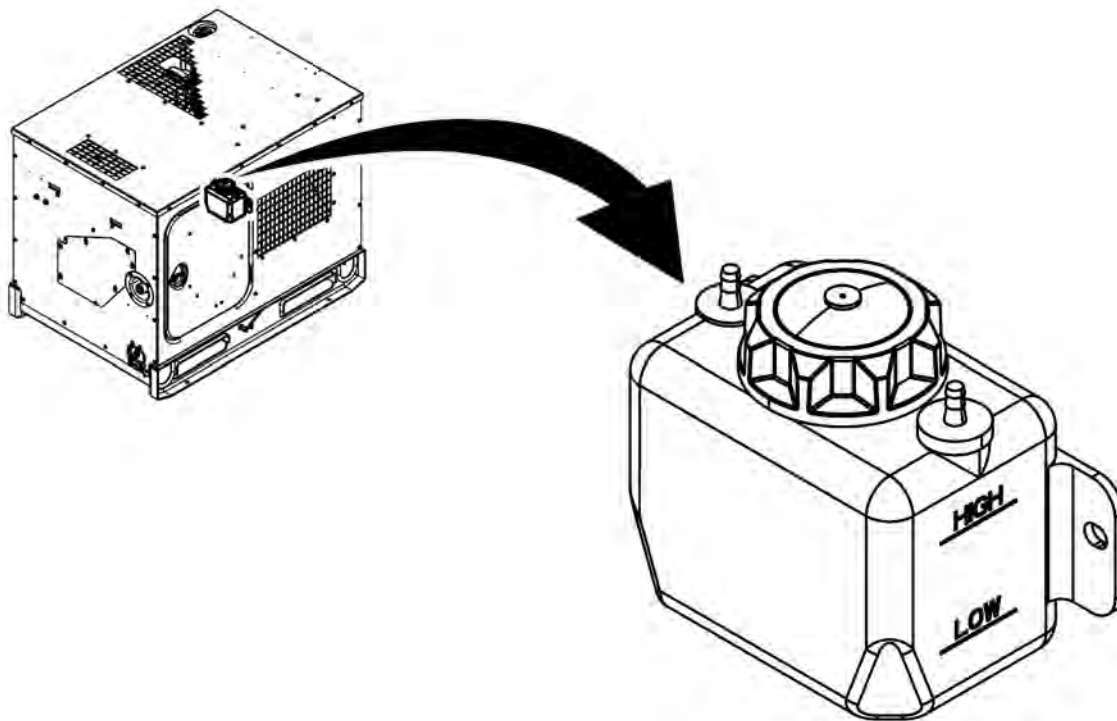


Figure 8. Coolant Overflow Bottle — Location.

Coolant Overflow Bottle (Figure 8). Mounted inside the left-side door on the bulkhead, the coolant overflow bottle is clearly visible with the door open. It provides easy access for examination of coolant level and coolant filling.

Radiator (Figure 7, Item 3). An aluminum radiator acts as a heat exchanger for the coolant. A radiator fill port is accessible on the top body panel. The captive radiator cap prevents loss of coolant.

Thermostat (Figure 7, Item 2). A thermostat is located inside the housing where the upper radiator hose connects to the top of the engine. It monitors coolant temperature and adjusts the cooling system accordingly.

Water Pump (Figure 7, Item 1). The water pump circulates the coolant through the block assembly (Figure 6, Item 7) and the radiator (Figure 7, Item 3).

Winterization Kit (Figure 10, Item 6). The optional winterization kit is located inside of the right-side body panel. The fuel-fired heater warms coolant in extreme cold conditions (-25°F to -50°F (-31.67°C to -46°C)) by utilizing the fuel from the generator set. The winterization kit automatically activates, depending on the temperature, and features automatic heat regulation. It is controlled by the DCS, which provides the [READY TO CRANK] indicator when the heater has completed its cycle.

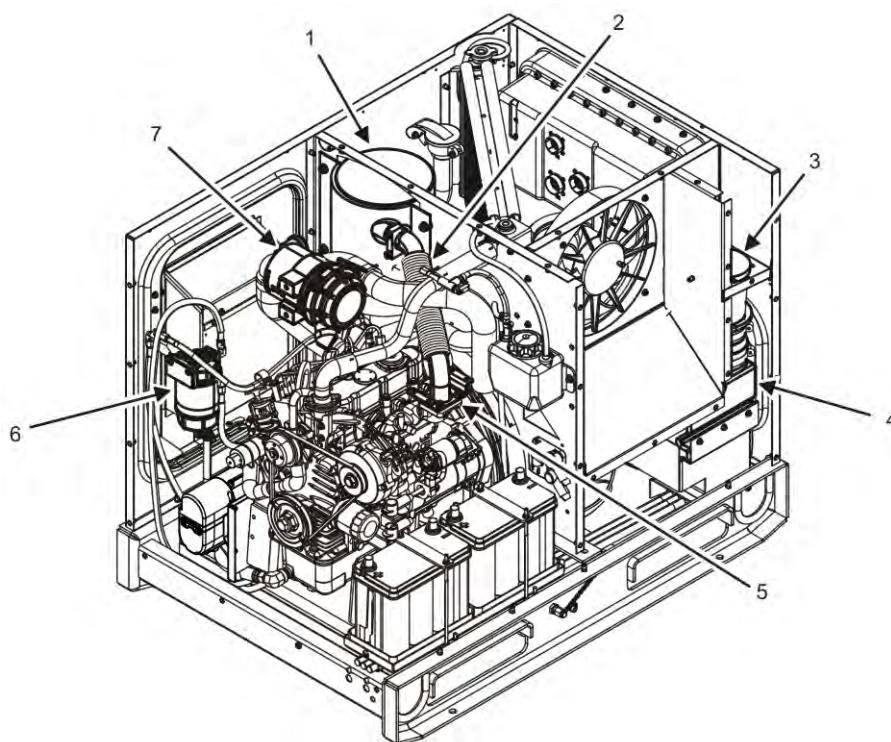


Figure 9. Systems Components — Left Side.

Air Cleaner Assembly (Figure 9, Item 7)

The air cleaner assembly, mounted on the top body panel, filters contaminants from the intake air. The air cleaner assembly contains an integrated, centrifugal precleaner that removes most dust particles prior to entering the air cleaner element. These larger contaminants are easily ejected from the air cleaner assembly through a squeeze-type fitting. This extends filter life and reduces maintenance costs and downtime. The air cleaner assembly is fitted with an indicator to show when the filter capacity is exceeded. The filter element is replaceable (TM 9-6115-749-10).

Exhaust System

The exhaust manifold (Figure 9, Item 5) is located on the exhaust side of the engine and is accessible through the left-side access door. As exhaust leaves the compression chamber, it is routed through the exhaust manifold (Figure 9, Item 5) into a single pipe (Figure 9, Item 2), and then into the muffler (Figure 9, Item 1) that is accessible through the right-side access door. The muffler (Figure 9, Item 1) silences the exhaust pulses from the engine and expels exhaust gases through the top body panel grille.

Unit Fuel System

Fuel Fill (Figure 9, Item 3) and Fuel Tank (Figure 9, Item 4). The AMMPS 5 kW generator set is designed to utilize diesel fuel or an acceptable substitute (Grade No. 1-d and Grade No. 2-d fuels per A-A-52557) and includes design adaptations to accommodate the usage of Jet Propulsion (JP)-8. The fuel fill is located on the rear body panel and allows refueling during operation (TM 9-6115-749-10). The fuel tank is mounted directly to the skid assembly behind the front access door. It is designed for 8 hr of operation at 75 percent (%) load on JP-8 fuel with the generator set at a 15-degree angle. The tank drain extends down into the skid area between the lifting attachments. The main fuel pump transmits lower-pressure fuel from the fuel tank and sends it through an in-line fuel filter to the fuel filter/water separator (Figure 9, Item 6).

Fuel Filter/Water Separator (Figure 9, Item 6). The fuel filter/water separator element is spin-on and removes debris and water particles from fuel before it enters the engine. A water drain cock is on the bottom of the filter (TM 9-6115-749-10).

External Fuel Tank and Auxiliary Connections. External fuel tank and auxiliary connections are located at the rear of the fuel fill (Figure 9, Item 3). The auxiliary fuel pump transfers fuel from the auxiliary fuel tank to the unit fuel tank.

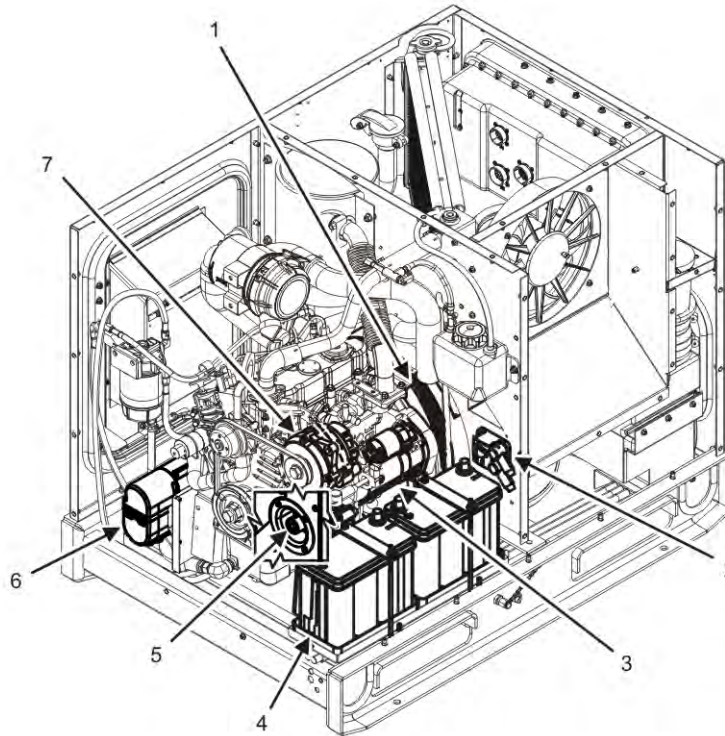


Figure 10. Winterization Kit, 24-VDC Electrical and AC Generator Components — Left Side.

24-VDC Electrical System

The 24-VDC electrical system uses two 12-volt (V) batteries (Figure 10, Item 4) connected in series. The batteries (Figure 10, Item 4) are standard commercial size, maintenance free, sealed, and located side-by-side on the left side of the unit. They are accessed through the left-side door. The batteries (Figure 10, Item 4) are capable of starting the generator set under all conditions between -50°F and +135°F (-46°C and +57°C) ambient temperatures. The starter (Figure 10, Item 3) is located on the exhaust side of the engine above the oil pan. A NATO slave receptacle (Figure 10, Item 5) is provided should the unit require jump-starting from another 24-VDC source. In the event the engine needs to be turned without starting, a three-position DEAD CRANK SWITCH (Figure 11, Item 2) is included. The 24-VDC system is protected by a 50 Amperes (Amp) main DC circuit breaker (Figure 10, Item 2). The main DC circuit breaker (Figure 10, Item 2) is accessed through the left-side door.

If the temperature is between +21°F and -25°F (-6°C and -32°C), glow plugs (Figure 11, Item 1) located in the intake manifold may be used to aid in starting. For temperatures between -25°F and -50°F (-32°C and -46°C), the optional winterization kit (Figure 10, Item 6) is to be used as an engine starting aid (TM 9-6115-749-10).

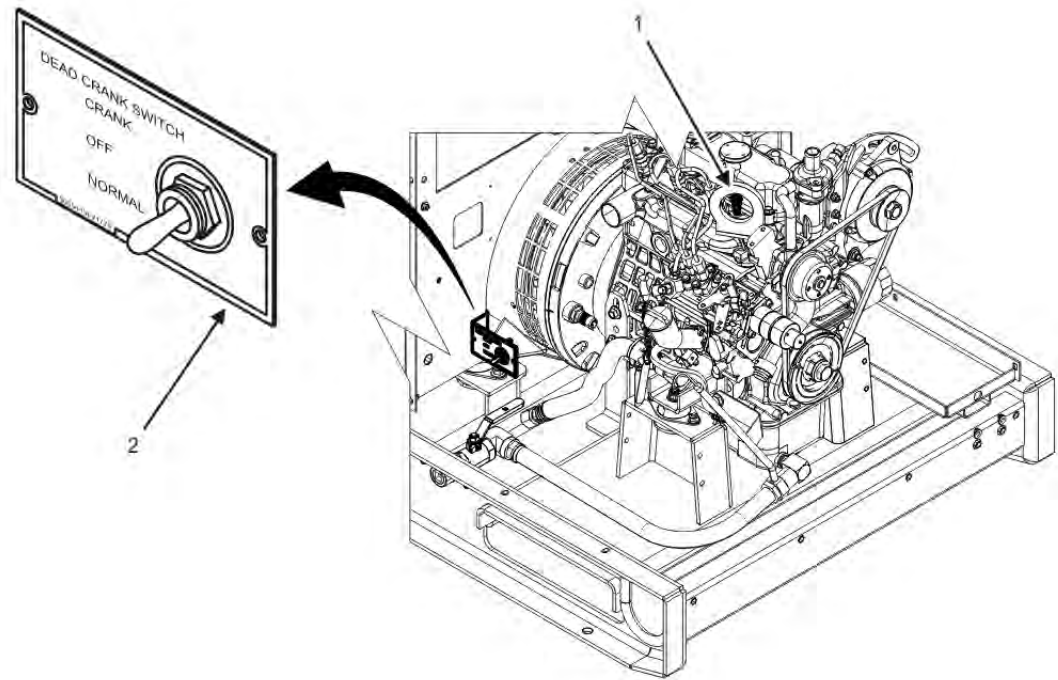


Figure 11. Dead Crank Switch — Right Side.

Belt-Driven Battery-Charging Alternator (**Figure 10, Item 7**). The standard belt-driven battery-charging alternator recharges the batteries which in turn provide power to the cooling fan, DCS, and engine systems. The charging system completely charges the batteries during operation within 4 hr of startup. A voltage regulator (internal to the alternator) controls the voltage output of the belt-driven battery-charging alternator.

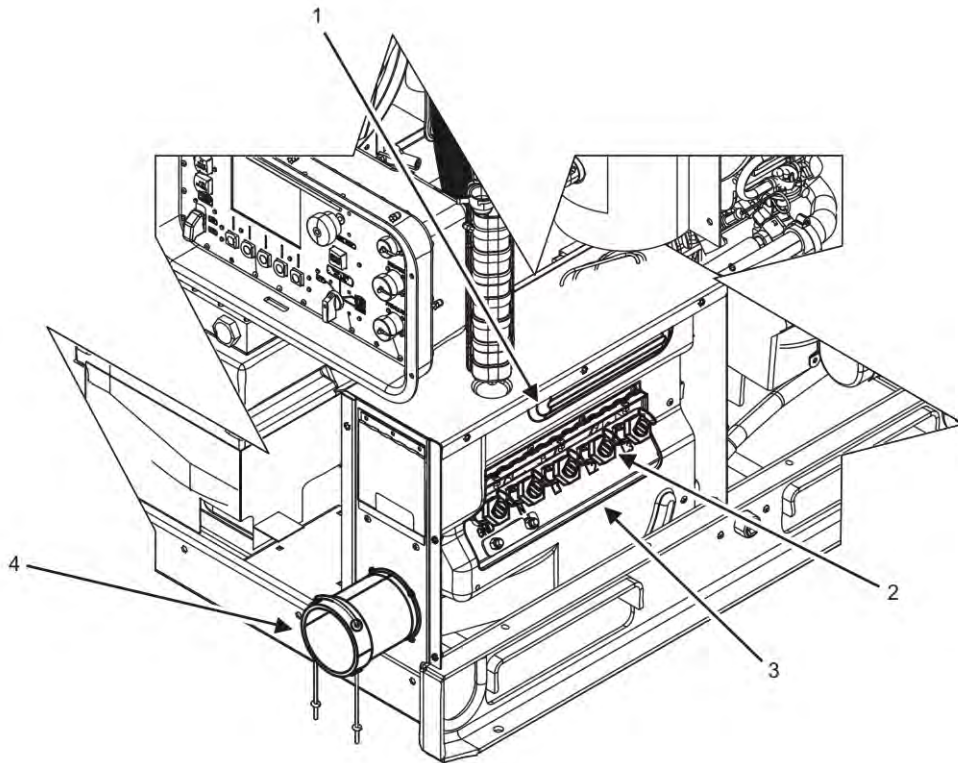


Figure 12. Output Box Components — Right Side.

AC GENERATOR (Figure 10, Item 1)

The AC generator converts the rotating mechanical energy from the engine into electrical energy. The electrical energy is then distributed from the output box (Figure 12, Item 1) through cables which enter the output box (Figure 12, Item 1) via a flexible sleeve (Figure 12, Item 4) from field equipment requiring electric power or a switch box.

The AC generator and voltage control system are drip-proof, guarded machine type, and are synchronous and brushless, as specified in National Electrical Manufacturers Association (NEMA) Standard No. MG, part 33. The bearings are sealed and permanently lubricated. System leads are identified with permanent marker and are brought out of the frame through non-abrasive bushings and holders in the output terminal board (Figure 12, Item 3). These isolate each lead and hold it securely in place.

When operating in three-phase at rated load and frequency, the AC generator can withstand, without damage, two consecutive short circuits at the load terminals of 10 sec or less in duration within a 5-min interval at less than 300% of rated output current. Given the same parameters in single-phase operation, the short circuits can be withstood for 5-sec durations.

OUTPUT BOX ASSEMBLY (Figure 12, Item 1)

The output box assembly is located behind the right-side output box door (Figure 2, Item 6) and distributes electricity produced by the AC generator (Figure 10, Item 1) through the output terminal board (Figure 12, Item 3). The output box (Figure 12, Item 1) contains the output terminal board (Figure 12, Item 3), individual output load terminals (Figure 12, Item 2), and unit relays. All relays are socket mounted and secured with a cover. The relay will not move unless the cover is removed.

DIFFERENCES BETWEEN MODELS

The differences between models of generator set covered in this TM are as follows:

Model MEP-1030 is equipped with a 50/60 Hz generator.

Model MEP-1031 is equipped with a 400 Hz generator.

EQUIPMENT DATA

For a list of leading particulars, refer to Table 1.

Table 1. Equipment Data.

GENERATOR SET: Model Numbers: 5 kW 50/60 Hz 5 kW 400 Hz National Stock Numbers (NSN): 5 kW 50/60 Hz 5 kW 400 Hz Overall Length: MEP-1030 MEP-1031 Overall Width: MEP-1030 MEP-1031 Overall Height: MEP-1030 MEP-1031 Dry Weights (less Basic Issue Items (BII)): MEP-1030 MEP-1031 Wet Weights: MEP-1030 MEP-1031	MEP-1030 MEP-1031 NSN 6115-01-561-7329 NSN 6115-01-561-7438 45.00 in (114.30 cm) 45.00 in (114.30 cm) 32 in (81.28 cm) 32 in (81.28 cm) 36 in (91.44 cm) 36 in (91.44 cm) 750 lb (340.19 kg) 750 lb (340.19 kg) 796.34 lb (361.21 kg) 830.64 lb (361.21 kg)
Engine: Manufacturer Model Type: Displacement Altitude Degradation, 4000 – 8000 ft (1220 m – 2440 m) Firing Order Winterization Kit Use Valve Tappet Clearance Adjustment	Kubota D902-IV C Direct injection, three cylinder, four cycle, vertical, water cooled 59 cubic inches (in ³) (0.9 L) 3.5% per 1000 ft (305 m) 1-2-3 -25°F to -50°F (-32°C to -46°C) 0.00571 – 0.00728 in (0.145 – 0.185 mm)
Cooling System: Type Capacity Normal Operating Temperature Range Temperature Indicating System Voltage Rating	Pressurized radiator, forced circulation with pump 5.3 qt (5.02 L) 185°F – 223°F (85°C – 106°C) 24 VDC

Table 1. Equipment Data — Continued.

Lubrication System: Type Oil Pump Type Normal Operating Pressure Oil Filter Type Lubricating System Capacity Pressure Indicating System Voltage Rating	Forced lubrication by trochoid pump Gear driven 28 – 64 pounds per square inch (psi) (196 – 441 kiloPascal (kPa)) Spin-on, cartridge 3.9 qt (3.7 L) 5 VDC
Fuel System: Type of Fuel Fuel Tank Capacity Fuel Consumption Rates for 50/60 Hz (MEP 1030): 400 Hz (MEP 1031): Auxiliary Fuel Pump: Voltage Rating Delivery Pressure Fuel Level Sensor: Type Current	DF-2D (ASTM D975) 3.80 gal (14.38 L) 0.39 Gallons Per Hour (GPH) (1.476 liters per hour (L/Hr)) 0.43 GPH (1.59 L/Hr) 24 VDC 6.3 – 9.7 psi (43.4 – 66.9 kPa) Capacitive 20 – 200 milliAmpere (mA) at 10 to 32 VDC
Starting System: Batteries Starter: Manufacturer Model Voltage Rating Drive Type Battery-Charging Alternator: Manufacturer Models Rating Protective Fuse	2 X 12 VDC (52 AH) in series ISKRA AZE4836 24 VDC Integral ISKRA DRWNG 19020205 45 Amp None
AC Generator: Manufacturer Type Load Capacity Current Ratings: 120 V 1-Phase connection 120/240 V 1-Phase connection 120/208 V 3-Phase connection Power Factor Cooling Drive Type Duty Classification	Cummins YD-6050-5 (50/60 Hz) and YD-400-5 (400 Hz) 5 kW 52 Amp 26 Amp 17 Amp 0.8 Fan cooled Direct coupling Continuous
Protection Devices: Low Oil Pressure Controller: Trip Pressure Voltage Rating Current Rating	10 psi (145 kPa) 5 VDC 4 – 5 mA

Table 1. Equipment Data — Continued.

Coolant High Temperature Controller:	
Trip Temperature, Mode I, 50/60 HZ	230°F (110°C)
Trip Temperature, Mode II, 400 HZ	230°F (110°C)
Voltage Rating	24 VDC
Current Rating	1 mA
Overvoltage:	
Trip Point Conditions	Not more than 30% of rated voltage.
Trip Point	No more than 1.25 sec after trip condition exists.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
THEORY OF OPERATION

SCOPE

The AMMPS 5 kW generator set consists of two modes as follows:

MODES: I – 50/60 Hz
 II – 400 Hz

The AMMPS 5 kW generator set is specifically designed for the best possible performance focusing on areas such as reliability, maintainability, weight, dimensions, and fuel consumption.

OPERATION

The AMMPS 5 kW generator set is designed for deployment in the battlefield to provide the personnel with the continuous power generation necessary for today's fielded electronic devices and various electrical equipment demands. The AMMPS 5 kW generator set is developed to be fixed (skid mounted) or mobile (trailer mounted) giving the flexibility of movement. The generator sets are designed to accommodate parallel operation of generator sets as well as additional and back-up power generation.

The housing assembly serves as the protective shell for the generator set. The housing has been designed with openings for ease of maintenance and additional acoustical protection to further silence the generator set while operating. The AMMPS 5 kW generator has enhancements for protection from unusual/harsh weather and to shield from debris.

The generator set is powered by a naturally-aspirated Kubota 59-in³ (0.9-L) DI D902 diesel engine mounted directly to the skid assembly. The engine produces mechanical energy and interconnects with the AC generator via a rotating shaft.

The AC generator is a Cummins Power Generation (CPG) YD-6050-5 (Mode I, Model 1030 (50/60 Hz)) or a YD-400-5 (Mode II, Model 1031 (400 Hz)). It is a synchronous, brushless design and was developed specifically to meet performance requirements. The AC generators receive mechanical energy from the engine and convert it to electrical energy. The electricity produced by the AC generators is transmitted to the output terminal board.

DCS

The DCS uses a menu-driven display format to control generator set operations. From the DCS, the operator and/or maintainer can start the generator set, adjust the output voltage and frequency (Model 1030, Mode I only), operate the contactor, stop the AC generator, clear faults, and perform other functions necessary to produce power (Figure 1). The AMMPS 5 kW generator set also provides limited remote operation capabilities through interface with an IBM-compatible PC. The operational status of the generator set can be monitored, battleshort conditions can be set and released, and emergency stops can be executed from up to a 250-ft (76.2-m) distance.

The AMMPS 5 kW generator set is capable of self-diagnostics at start up. This prognostics function monitors the protective system and will provide a warning of impending activation of protective devices. All operational data is captured every 15 min during operation. Faults and warnings are automatically captured upon operation of protective devices and stored in a Fault Log. Additionally, all maintenance prompts and actions are automatically captured and stored in a Maintenance Log.

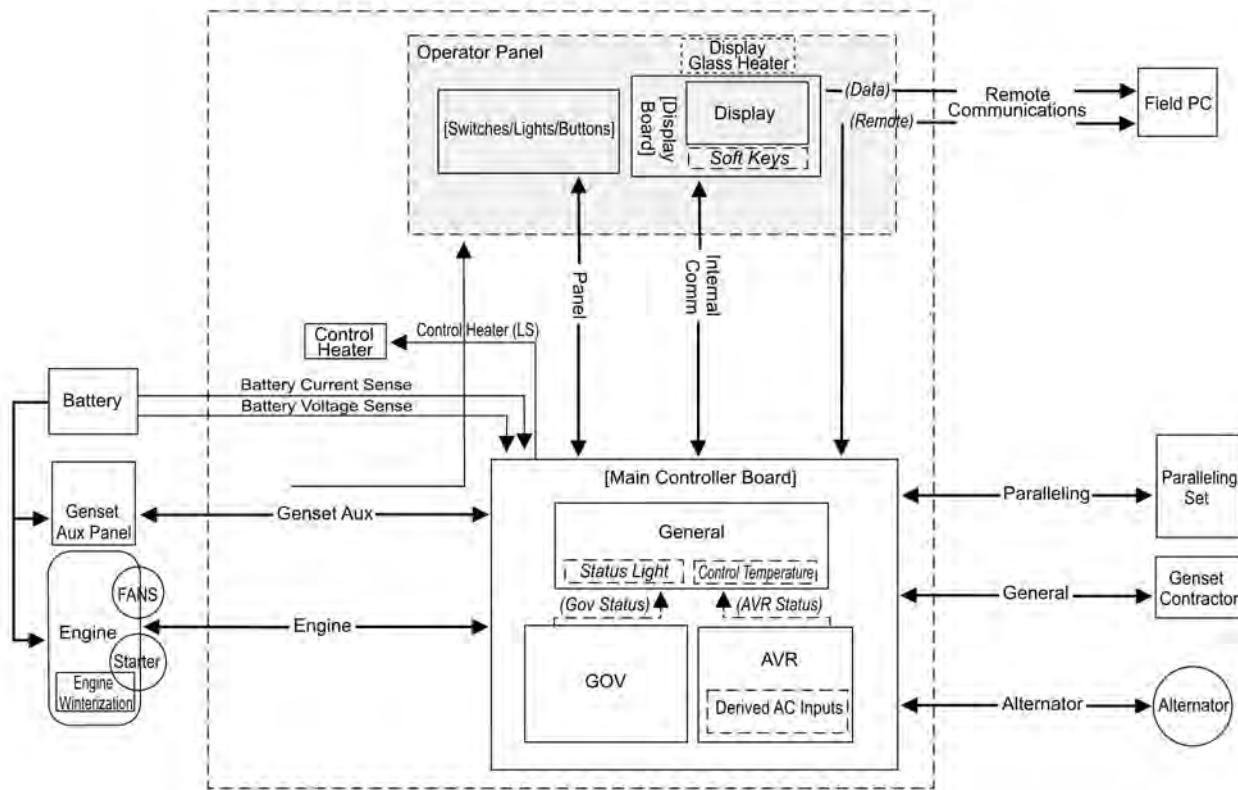


Figure 1. AMMPS Control Overview.

TECHNICAL PRINCIPLES OF OPERATION

Engine Starting System (Figure 2)

The engine starting system consists of two 12-V batteries connected in series to produce 24 V of electric power, a starter, a 24-V battery-charging alternator, a magnetic pickup (for sensing engine speed), and related switches and relays required for controlling the starting system (Figure 1). For engine cranking, battery power is supplied to the starter motor through the starter solenoid, which in turn is controlled by the cranking relay. The starter then engages the engine flywheel, causing the engine to turn over. For engine starting, the DEAD CRANK SWITCH must be in the NORMAL position, the main DC circuit breaker must be in the ON position, the EMERGENCY STOP switch must be pulled out, and the engine control switch must be moved to the START position. The cranking relay is then controlled by a circuit, consisting of the crank disconnect relay and crank disconnect switch. As the engine accelerates to the preset speed (sensed by the magnetic pickup), the crank disconnect switch opens and de-energizes the cranking relay to stop and disengage the starter. The starting sequence may also be stopped by moving the engine control switch to OFF. The engine may be cranked without starting by use of the DEAD CRANK SWITCH. With the DEAD CRANK SWITCH in the CRANK position, the cranking relay, starter solenoid, and starter motor are energized without activating any other starting or control functions. In the event the batteries become discharged, an alternative source of starting power is provided through the NATO slave receptacle.

The batteries are charged by the battery-charging alternator, which is belt-driven by the engine. The DCS is powered by the battery-charging alternator when the engine is operating and by the 24-V batteries at start up. Shown on the DCS display, the [Battery] ammeter indicates the charge/discharge rate of the batteries (from -80 Amps to +80 Amps, in 0.1-Amp increments). Normal operating indication depends on the state of charge in the batteries. A low charge, such as exists immediately after engine starting, will cause a high reading (needle moves toward [+] area). When the charge in the batteries has been restored, the indicator moves toward zero.

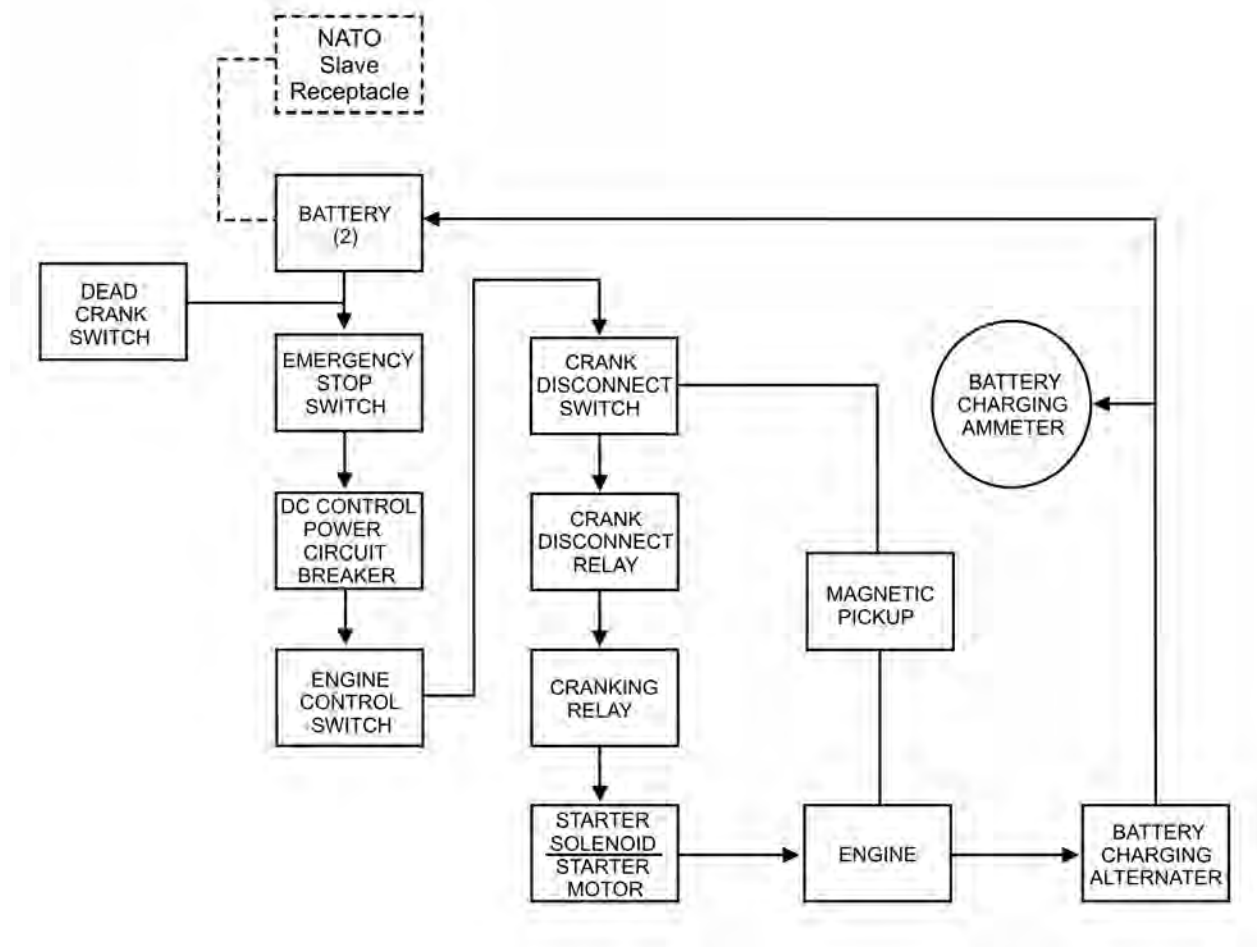


Figure 2. Engine Starting System.

Fuel System (Figure 3)

The fuel system consists of piping, fuel tank, fuel filter, 24-VDC fuel pumps, fuel filter/water separator, fuel level sensor, injection pump, and three fuel injectors (one for each cylinder). Fuel is drawn from the fuel tank by the transfer pump when the engine control switch is in the PRIME & RUN position. After reaching the transfer pump, fuel passes through a fuel filter/water separator where water and small impurities are removed. The fuel then goes to the injection pumps where it is pressurized and is forced into the injectors. Through the injectors, fuel is sprayed into the combustion chamber at high pressure, where it is mixed with air and ignited. The fuel that is not used is returned to the fuel tank via a fuel vent line.

The auxiliary fuel system consists of an external fuel supply, fuel filter pipe, 5-VDC auxiliary fuel pump, and fuel level switch. The engine control switch, when set to PRIME & RUN AUX FUEL, actuates the auxiliary fuel pump and transfers fuel from the external fuel supply to the generator fuel tank. The fuel level switch shuts off the auxiliary fuel pump when the generator fuel tank is full and reactivates the pump as the level drops to 75%. The [Fuel] indicator on the DCS displays the fuel level of the generator set fuel tank from empty [0] to full [100] in 1% increments.

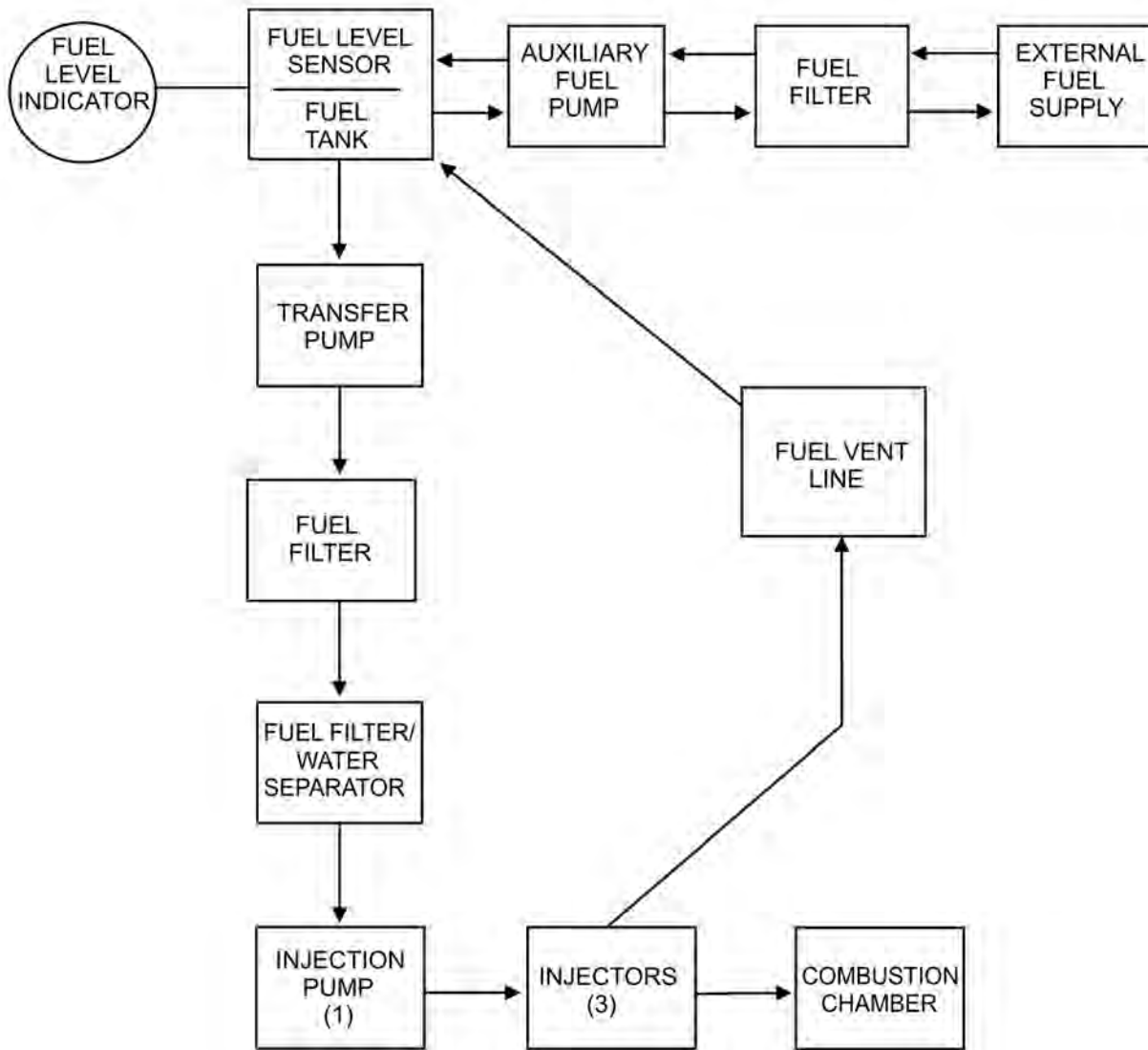


Figure 3. Fuel System.

Engine Cooling System (Figure 4)

The engine cooling system consists of a radiator, hoses, thermostat, water pump, electric fan, temperature sensor, and cooling jackets. The water pump forces coolant through passages (cooling jackets) in the engine block and cylinder head where the coolant absorbs heat from the engine. When the engine reaches normal operating temperature, the thermostat opens and the heated coolant flows through the upper radiator hose assembly into the radiator. Air circulates through the radiator, reducing coolant temperature.

A coolant high-temperature logic control provides automatic shutdown in the event that coolant temperature exceeds 225 plus or minus (\pm) 5°F ($107 \pm 3^\circ\text{C}$). The [Coolant] indicator on the DCS displays coolant temperature range from 100°F to 260°F (38°C to 127°C).

Cold outside temperatures make starting the engine difficult. To improve engine starting, the generator set has two starting aids: standard glow plugs and an optional winterization kit. The glow plugs warm the air in the combustion chamber to assist with ignition when the ambient air temperature is below +20°F (-6°C). The winterization kit warms the engine coolant and thus the engine block when the ambient air temperature is between -25°F and -50°F (-32°C and -45.56°C).

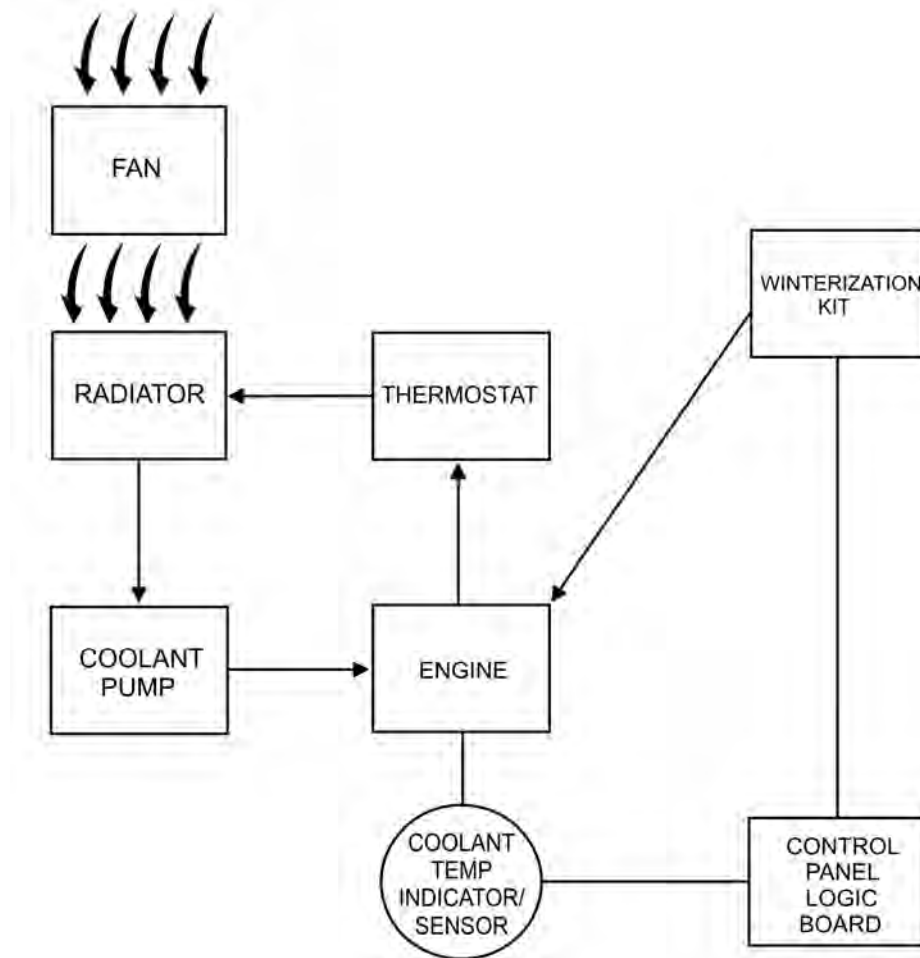


Figure 4. Engine Cooling System.

Lubrication System (Figure 5)

The lubrication system consists of an oil pan, dipstick, oil pump, oil pressure sensor, oil screen, and oil filter. The oil pan is a reservoir for engine lubricating oil. The dipstick indicates oil level in the pan. A pump draws oil from the pan through a screen removing large impurities. The oil then passes through a spin-on type filter where small impurities are removed. From the filter, oil enters the engine and is distributed to the engine's internal moving parts.

After passing through the engine, the oil returns to the oil pan. The [Oil] pressure indicator on the DCS shows oil pressure sensed by the oil pressure sensor in the engine. The engine automatically shuts off if oil pressure drops to a dangerously low level. It is recommended to check the engine oil when the engine is not operating, but it can be checked while the engine is operating (TM 9-6115-749-10).

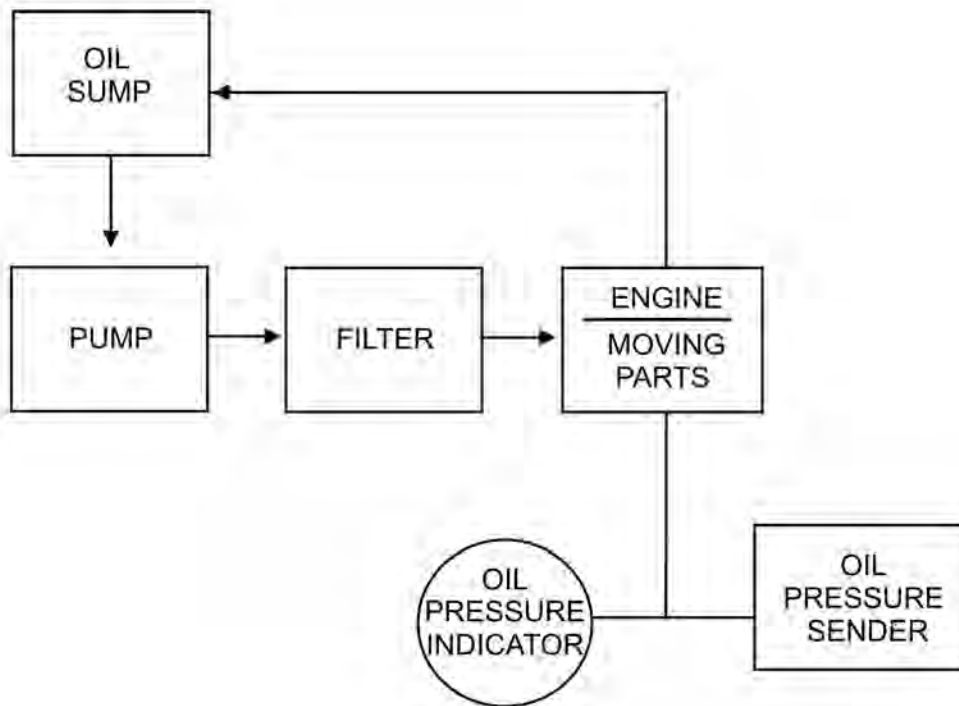


Figure 5. Engine Lubrication System.

Air Intake and Exhaust System (Figure 6)

The air intake and exhaust system consists of an air cleaner assembly, intake manifold, exhaust manifold, and muffler. Ambient air is drawn into the air cleaner assembly where it passes through the air cleaner element.

Airborne dirt is removed and trapped in the element. A restriction indicator, located on the air cleaner assembly housing, displays red when the air cleaner element should be serviced. Filtered air is drawn out of the air cleaner assembly through an air intake tube into the air intake manifold, where it passes into the engine and is mixed with fuel from the fuel injectors.

The engine exhaust gases are expelled into the exhaust manifold. The exhaust manifold channels the gases into the muffler to deaden the sound of the exhaust gases. The gases pass from the muffler outlet and are vented upward from the generator set housing grille.

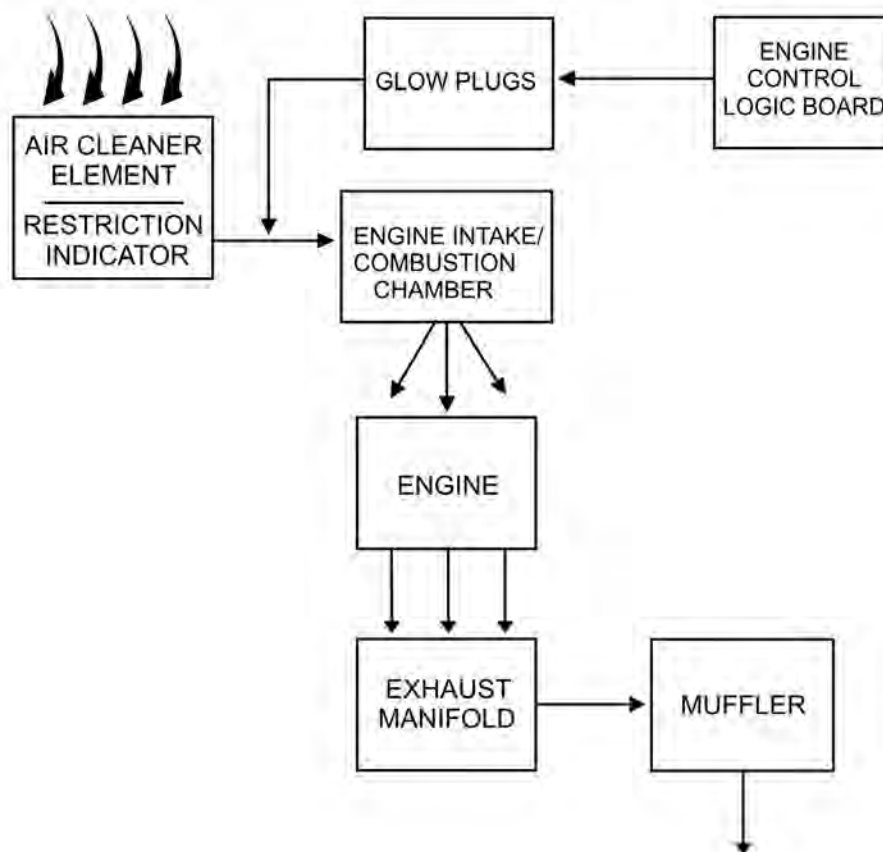


Figure 6. Air Intake and Exhaust System.

Output Supply System (Figure 7)

The output supply system consists of the AC generator, output terminal board, voltage selection switch, Automatic Voltage Regulator (AVR), Ampere Meter – Voltage Meter (AM – VM), AC circuit interrupt relay, and contactor. Power created by the generator is supplied through the voltage selection switch and the contactor to the output terminals on the output terminal board. For more information on the theory and practice of electrical generation, refer to FM 5-424, Theater of Operations Electrical Systems.

The voltage selection switch allows configuration of the generator set for the following voltage ranges:

- 120 V, single phase, 2-wire
- 120/240 V, single phase, 3-wire
- 120/208 V, 3 phase, 4-wire

The AC CIRCUIT INTERRUPT switch controls the AC circuit interrupter relay. The relay enables or interrupts the power flow between the voltage selection switch and the output terminals by opening and closing the contactor. The AC circuit interrupter relay also automatically opens the contactor during any of the faults that require a shutdown. The AVR senses AC voltage output and provides controlled voltage to the AC generator exciter to maintain the desired AC generator output voltage. [Voltage] and [Current] are indicated on the operator control screen on the DCS. The [Genset Voltage] panel on the DCS displays the [Voltage] AC output of the unit. The [Bus Voltage] panel on the DCS displays the [Voltage] AC output at the output terminal board. The [Genset Current] screen on the DCS displays the output of the unit in amperes.

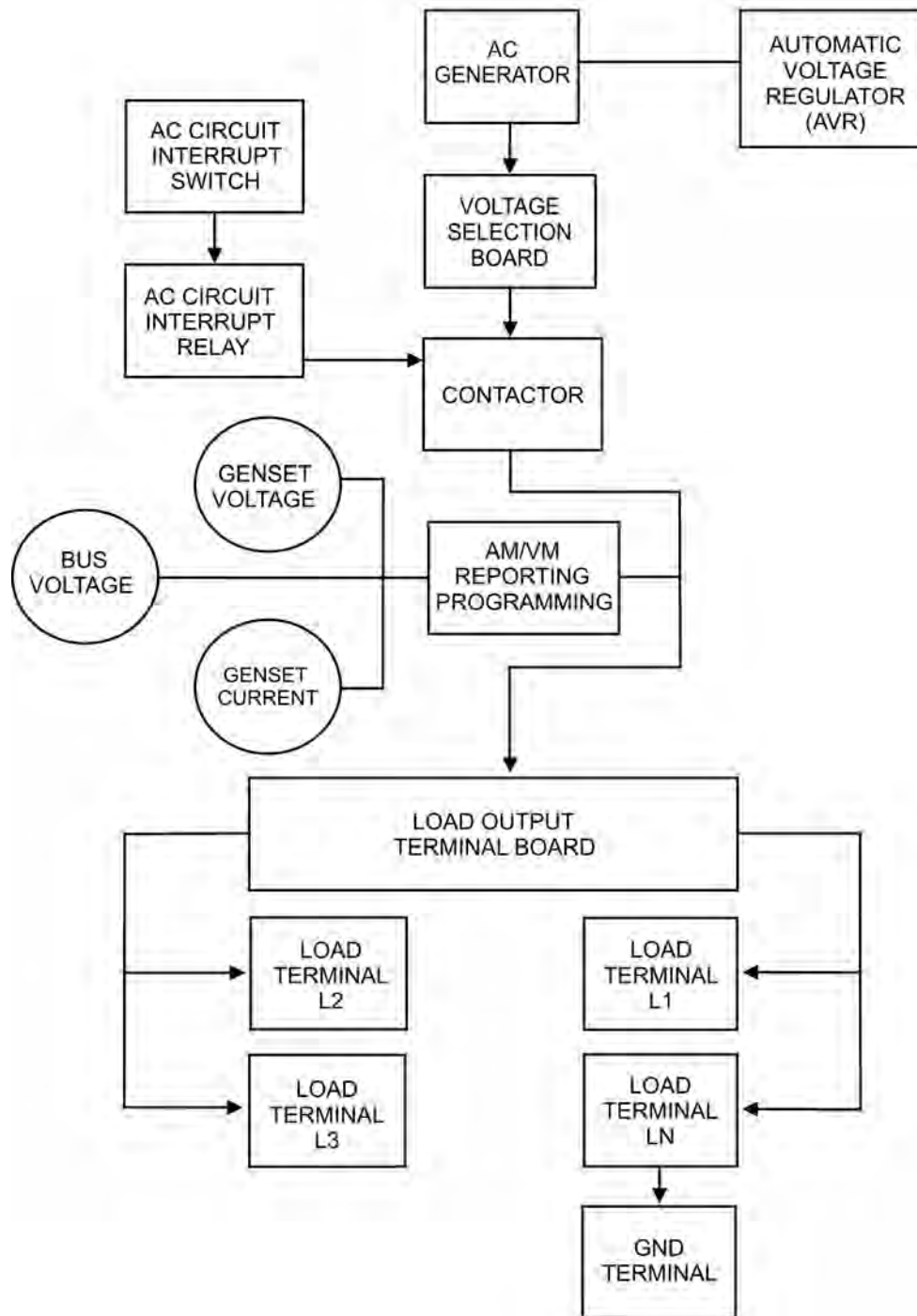


Figure 7. Output Supply System.

END OF WORK PACKAGE

CHAPTER 2

TROUBLESHOOTING PROCEDURES

FOR

AMMPS 5KW GENERATOR SET

CHAPTER 2
TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
TROUBLESHOOTING INDEX	0004
OPERATIONAL CHECKOUT	0005
WARNING AND FAULT CODES	0006
COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE	0007
ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE	0008
ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE	0009
ENGINE SYSTEM TROUBLESHOOTING WITH A DCS CODE	0010
ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE	0011
EXHAUST SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE	0012
WINTERIZATION KIT TROUBLESHOOTING	0013

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
TROUBLESHOOTING INDEX

GENERAL TROUBLESHOOTING INFORMATION

Troubleshooting procedures are designed to isolate AMMPS faults to the LRU level. Troubleshooting techniques apply to all AMMPS components as indicated.

Troubleshooting procedures list the symptoms, malfunctions, and corrective actions required to resolve the problem(s). Perform all steps in the order they appear in the WP. Troubleshooting procedures are listed according to symptom, followed by the malfunction, then any corrective action(s). All necessary references to procedures/instructions can be found within the applicable Troubleshooting WP (see the Malfunction/Symptom Index below).

The DCS constantly monitors the engine sensors for abnormal conditions, such as low oil pressure and high coolant temperature. If any of these conditions occur, the DCS control panel display screen will display a message indicating a fault or warning code. The system will shut down if a fault code is indicated. The system will not normally shut down from warning codes. If a warning is indicated but not addressed, it may become a fault. If a malfunction or failure occurs during an operation or performance check, perform troubleshooting IAW the Malfunction/Symptom Index and any displayed fault or warning codes (WP 0006, Warning and Fault Codes). Troubleshooting is offered in two formats when necessary: a fault with a DCS code and a fault without a DCS code. Always check DCS screen for any warning or fault codes before performing troubleshooting procedures.

DO NOT BEGIN A TASK UNTIL:

You understand the task.

You have the tools and equipment you need.

MALFUNCTION/SYMPTOM INDEX

The Malfunction/Symptom Index is a quick reference for locating troubleshooting procedures. Troubleshooting procedures are arranged based on the location of the malfunction (i.e. engine, exhaust system, cooling system) and the presence of a DCS code.

DCS Fault/Warning Codes

WP 0006, Warning and Fault Codes describes each fault and warning code with applicable reference. When applicable, there are two versions for each troubleshooting system WP: faults with a DCS code and faults without a DCS code.

Operational Checkout

Field maintenance is responsible for performing operational checkout procedures (WP 0005, Operational Checkout) prior to determining generator set as operational or before detailed troubleshooting is attempted.

Indications from Manual Troubleshooting Techniques

Field maintenance is responsible for performing manual troubleshooting techniques, including continuity tests and voltage checks.

After Corrective Action

After the corrective action is completed, the equipment must be tested to verify that the problem is corrected. Locate the malfunction in the troubleshooting procedures and perform the test or inspection. If the correct response is not obtained, continue troubleshooting all suspected malfunctions and performing corresponding corrective actions until the equipment is operational or is replaced with operational equipment.

Specific Troubleshooting Procedures

This TM cannot list all malfunctions that may occur or all tests or inspections and corrective actions. If the malfunction encountered is not listed or is not corrected by the listed corrective action, replace the lowest level LRU component that will remedy the malfunction.

Malfunction/Symptom

Troubleshooting Procedure WP and Page

COOLING SYSTEM

1. [Fault 151: High Coolant Temperature] displayed on DCS screen WP 0007, Page 2
 - a. Low coolant level, improper type used, or clogged cooling fins in radiator WP 0007, Page 2
 - b. Loose, defective, or improperly fitted radiator cap or coolant overflow bottle cap WP 0007, Page 3
 - c. Coolant system leak WP 0007, Page 3
 - d. Inoperable thermostat WP 0007, Page 4
 - e. Inoperable cooling fan WP 0007, Page 4
 - f. Defective temperature sensor WP 0007, Page 5
 - g. Generator set overload WP 0007, Page 5
 - h. Excessive slack in battery-charging alternator belt causing water pump malfunction WP 0007, Page 6
 - i. Improperly operating water pump WP 0007, Page 6
 - j. Insufficient cooling effect of radiator WP 0007, Page 6
 - k. Low engine oil level WP 0007, Page 7
 - l. Clogged muffler or clog in exhaust system WP 0007, Page 7
 - m. Engine used at high temperatures or high altitude WP 0007, Page 7
 - n. Improper fuel injection WP 0007, Page 7
 - o. Incorrect fuel injection timing or governor actuator fault WP 0007, Page 8
 - p. Internal engine problem WP 0007, Page 8
2. [Warning 146: Pre-High Coolant Temperature] displayed on DCS screen WP 0007, Page 8

Cooling system malfunction WP 0007, Page 8

ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE

3. [Fault 115: Speed Signal Lost] displayed on DCS screen WP 0008, Page 2

Engine speed sensor malfunction WP 0008, Page 2
4. [Fault 1433: Local E-Stop] displayed on DCS screen WP 0008, Page 3

Malfunctioning EMERGENCY STOP push button or malfunctioning DCS WP 0008, Page 3

Malfunction/Symptom**Troubleshooting Procedure WP and Page**

5. [Fault 1434: Remote E-Stop] displayed on DCS screen	WP 0008, Page 3
Defective remote operating cable, pins on DCS, or remote operating source	WP 0008, Page 3
6. [Fault 1445: Short Circuit] displayed on DCS screen	WP 0008, Page 4
Load cables have been shorted or overloaded	WP 0008, Page 4
7. [Fault 1446: High AC Voltage] displayed on DCS screen	WP 0008, Page 5
Incorrect setting or shorted load	WP 0008, Page 5
8. [Fault 1447: Low AC Voltage] displayed on DCS screen	WP 0008, Page 6
Overload, damage to wiring, or damage to DCS.....	WP 0008, Page 6
9. [Fault 1448: Underfrequency] displayed on DCS screen	WP 0008, Page 6
Generator set was subjected to a reduction in speed for a period of time	WP 0008, Page 6
10. [Fault 1452: Genset Contactor Fail To Close] displayed on DCS screen	WP 0008, Page 7
Contactor or wiring malfunction	WP 0008, Page 7
11. [Fault 1453: Genset Contactor Fail To Open] displayed on DCS screen.....	WP 0008, Page 8
Contactor or wiring malfunction	WP 0008, Page 8
12. [Fault 1472: High Current] displayed on DCS screen	WP 0008, Page 9
Short, overload, or AC generator malfunction	WP 0008, Page 9
13. [Fault 1918: Fuel Level Low] displayed on DCS screen	WP 0008, Page 10
Low fuel level or fuel level sensor malfunction	WP 0008, Page 10
14. [Fault 2335: Excitation Fault] displayed on DCS screen	WP 0008, Page 10
Circuit breaker, wiring, or AC generator malfunction.....	WP 0008, Page 10
15. [Fault 2914: Genset AC Meter Failed] displayed on DCS screen	WP 0008, Page 12
Generator set AC meter failure.....	WP 0008, Page 12
16. [Fault 2972: Field Overload] displayed on DCS screen	WP 0008, Page 13
Faulty AC generator components or AVR	WP 0008, Page 13
17. [Fault 3664: Invalid Genset Configuration] displayed on DCS screen	WP 0008, Page 13
Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.....	WP 0008, Page 13
18. [Fault 3665: Invalid Voltage Configuration] displayed on DCS screen.....	WP 0008, Page 14
Voltage selection fault	WP 0008, Page 14
19. [Fault 3668: Output Voltage Configuration Bit 0 Changed] or [Fault 3669: Output Voltage Configuration Bit 1 Changed] displayed on DCS screen	WP 0008, Page 15
Voltage selection fault	WP 0008, Page 15
20. [Fault 3673: Convenience Receptacle AC Meter Failed] displayed on DCS screen	WP 0008, Page 15
Convenience receptacle AC meter failed	WP 0008, Page 15
21. [Fault 3677: Genset Config Factory Test Fault] displayed on DCS screen.....	WP 0008, Page 15
Factory calibration error.....	WP 0008, Page 15

Malfunction/Symptom**Troubleshooting Procedure WP and Page**

22. [Warning 135: Oil Pressure Sensor High] displayed on DCS screen.....	WP 0008, Page 16
Voltage above normal or shorted to a high source.....	WP 0008, Page 16
23. [Warning 141: Oil Pressure Sensor Low] displayed on DCS screen	WP 0008, Page 17
Voltage below normal or shorted to a low source	WP 0008, Page 17
24. [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen.....	WP 0008, Page 17
Defective temperature sensor, poor wiring connection, or a short.....	WP 0008, Page 18
25. [Warning 145: Coolant Temp Sensor OOR Low] displayed on DCS screen	WP 0008, Page 19
Voltage below normal or shorted to a low source	WP 0008, Page 19
26. [Warning 319: Real Time Clock Error] displayed on DCS screen.....	WP 0008, Page 19
Clock no longer accurate due to temporary power loss or backup battery failure	WP 0008, Page 19
27. [Warning 441: Low Battery Voltage] displayed on DCS screen	WP 0008, Page 19
Battery or charging failure	WP 0008, Page 19
28. [Warning 442: High Battery Voltage] displayed on DCS screen	WP 0008, Page 19
Alternator or DCS failure	WP 0008, Page 19
29. [Warning 1131: Battle Short Active] displayed on DCS screen.....	WP 0008, Page 20
BATTLESHORT switch malfunction	WP 0008, Page 20
30. [Warning 1417: Power Down Failure] displayed on DCS screen.....	WP 0008, Page 20
DCS malfunction.....	WP 0008, Page 20
31. [Warning 1441: Low Fuel Level] displayed on DCS screen	WP 0008, Page 20
Low fuel level or sensor malfunction	WP 0008, Page 20
32. [Warning 1442: Weak Battery] displayed on DCS screen.....	WP 0008, Page 21
a. Battery connections are loose or batteries are insufficiently charged	WP 0008, Page 21
b. Loose belt, defective battery-charging alternator, or defective electrical component.....	WP 0008, Page 21
33. [Warning 1444: KW Overload] displayed on DCS screen.....	WP 0008, Page 21
Load cable or wiring malfunction	WP 0008, Page 22
34. [Warning 1449: Overfrequency] displayed on DCS screen.....	WP 0008, Page 22
Generator AC output frequency is high	WP 0008, Page 22
35. [Warning 1451: Genset/Bus Voltage Mismatch].....	WP 0008, Page 22
DCS fault	WP 0008, Page 22
36. [Warning 1469: Speed/Hz Mismatch] displayed on DCS screen	WP 0008, Page 24
Speed sensor error or flywheel damage.....	WP 0008, Page 24
37. [Warning 1471: High Current Warning] displayed on DCS screen	WP 0008, Page 24
Short, overload, or AC generator malfunction	WP 0008, Page 24
38. [Warning 1689: Reset Real Time Clock] displayed on DCS screen	WP 0008, Page 24
Clock no longer accurate due to temporary power loss or backup battery failure	WP 0008, Page 24

Malfunction/Symptom**Troubleshooting Procedure WP and Page**

39. [Warning 2336: Checksum Fault] displayed on DCS screen	WP 0008, Page 24
Calibration file error	WP 0008, Page 24
40. [Warning 2915: Genset Bus AC Meter Failed] displayed on DCS screen	WP 0008, Page 25
Generator set Bus AC meter failed.....	WP 0008, Page 25
41. [Warning 2917: Genset Bus Voltage High] displayed on DCS screen.....	WP 0008, Page 25
Paralleling or voltage sense fault.....	WP 0008, Page 25
42. [Warning 2936: Fuel Level Sensor High] displayed on DCS screen.....	WP 0008, Page 26
Fuel level sensor malfunction	WP 0008, Page 26
43. [Warning 2937: Fuel Level Sensor Low] displayed on DCS screen.....	WP 0008, Page 27
Fuel level sensor malfunction	WP 0008, Page 27
44. [Warning 2967: Governor Fault] displayed on DCS screen	WP 0008, Page 27
Governor actuator malfunction	WP 0008, Page 27
45. [Warning 2968: AVR Fault] displayed on DCS screen	WP 0008, Page 28
Wiring or AC generator failure	WP 0008, Page 28
46. [Warning 3662: Battery Discharge] displayed on DCS screen.....	WP 0008, Page 28
Loose belt, defective battery-charging alternator, or defective electrical component	WP 0008, Page 28
47. [Warning 3666: Master Control Switch Configuration] displayed on DCS screen	WP 0008, Page 29
Engine control switch fault.....	WP 0008, Page 29
48. [Warning 3672: Automatic Field Flash Not Complete] displayed on DCS screen	WP 0008, Page 30
Wiring or DCS malfunction	WP 0008, Page 30
49. [Warning 3674: Genset Configuration Change] displayed on DCS screen	WP 0008, Page 30
Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.....	WP 0008, Page 30

ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

50. DCS indicates no power available and no lighted display.....	WP 0009, Page 2
a. Battery malfunction	WP 0009, Page 2
b. Circuit breaker or wiring malfunction.....	WP 0009, Page 3
c. Defective DCS.....	WP 0009, Page 5
51. EMERGENCY STOP push button fails to stop generator set	WP 0009, Page 5
EMERGENCY STOP push button failure	WP 0009, Page 5
52. No power to convenience receptacle or convenience receptacle fails to work.....	WP 0009, Page 6
Convenience receptacle is defective or has been subjected to a ground fault condition.....	WP 0009, Page 6
53. Circuit interrupter will not close or open	WP 0009, Page 7
Contactor or wiring malfunction	WP 0009, Page 7

Malfunction/Symptom

Troubleshooting Procedure WP and Page

54. Hour meter is no longer recording operating hours WP 0009, Page 7
 Defective hour meter WP 0009, Page 7

ENGINE SYSTEM TROUBLESHOOTING WITH A DCS CODE

55. [Fault 234: Overspeed Shutdown] displayed on DCS screen WP 0010, Page 3
 Large block load removal or vapor drawn into intake air passage WP 0010, Page 3
56. [Fault 359: Fail to Start] displayed on DCS screen. WP 0010, Page 3
 a. Fuel tank is empty. WP 0010, Page 3
 b. Dirty air cleaner element, intake air restriction, or excess backpressure. WP 0010, Page 4
 c. Fuel system malfunction. WP 0010, Page 4
 d. Fuel injection timing incorrect or governor actuator malfunction WP 0010, Page 5
 e. Improper clearance (open or close timing) of intake/exhaust valves WP 0010, Page 5
 f. Cold weather conditions WP 0010, Page 5
 g. Leaking cylinder head gasket WP 0010, Page 5
 h. Fuel injection malfunction WP 0010, Page 6
 i. Internal engine problem WP 0010, Page 6
57. [Fault 415: Low Oil Pressure] displayed on DCS screen WP 0010, Page 6
 a. Low engine oil level WP 0010, Page 6
 b. Diluted engine oil WP 0010, Page 7
 c. Defective engine oil pressure sender WP 0010, Page 7
 d. Clogged oil strainer WP 0010, Page 8
 e. Internal engine problem WP 0010, Page 8
58. [Fault 1438: Fail to Crank] displayed on DCS screen WP 0010, Page 8
 a. DEAD CRANK SWITCH is not in NORMAL position or will not turn over engine WP 0010, Page 8
 b. Battery connections are loose or batteries are insufficiently charged WP 0010, Page 9
 c. Defective starter or flywheel WP 0010, Page 9
 d. Defective wiring or DCS WP 0010, Page 10
59. [Warning 143: Pre-Low Oil Pressure] displayed on DCS screen WP 0010, Page 10
 Engine oil malfunction WP 0010, Page 10
60. [Warning 1992: High Speed Warning] displayed on DCS screen WP 0010, Page 11
 Engine speed malfunction WP 0010, Page 11

ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

61. Evidence of fluid leakage found around engine WP 0011, Page 3
 a. Engine is leaking oil WP 0011, Page 3
 b. Engine is leaking coolant WP 0011, Page 4

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure WP and Page</u>
c. Engine is leaking fuel	WP 0011, Page 5
62. Engine cranks slowly and fails to start	WP 0011, Page 5
a. Battery connections are loose or batteries are insufficiently charged	WP 0011, Page 5
b. Dirty air cleaner element or intake air restriction	WP 0011, Page 6
c. Fuel system malfunction	WP 0011, Page 7
d. Fuel injection timing incorrect or governor actuator malfunction	WP 0011, Page 7
e. Cold weather conditions	WP 0011, Page 7
f. Starter is defective/wiring is incorrect	WP 0011, Page 8
g. Flywheel is defective	WP 0011, Page 8
h. Fuel injection malfunction	WP 0011, Page 8
i. Internal engine problem	WP 0011, Page 9
63. Engine will not shut down	WP 0011, Page 9
a. Governor actuator malfunction	WP 0011, Page 9
b. Engine control switch fault	WP 0011, Page 9
64. Engine cranks normally but fails to start	WP 0011, Page 9
Engine system malfunction	WP 0011, Page 9
65. Engine starts but stops after starting	WP 0011, Page 10
a. No or low fuel	WP 0011, Page 10
b. Fuel system malfunction	WP 0011, Page 10
c. Dirty air cleaner element or intake air restriction	WP 0011, Page 10
d. Fuel injection timing incorrect or governor actuator malfunction	WP 0011, Page 11
e. Engine control switch fault	WP 0011, Page 11
f. Fuel injection or DCS malfunction	WP 0011, Page 11
66. Engine stops suddenly from normal operation	WP 0011, Page 11
Engine malfunction	WP 0011, Page 11
67. Engine runs erratically, performs poorly (does not develop full power), or misfires	WP 0011, Page 12
a. Dirty air cleaner element	WP 0011, Page 12
b. Insufficient oil level	WP 0011, Page 12
c. Fuel system malfunction	WP 0011, Page 12
d. Fuel injection timing or governor actuator malfunction	WP 0011, Page 13
e. Valves improperly adjusted	WP 0011, Page 13
f. Fuel injection malfunction	WP 0011, Page 13
g. Internal engine problem	WP 0011, Page 13
68. Engine stability or hunting problems	WP 0011, Page 13
High or low ambient temperatures	WP 0011, Page 13

Malfunction/Symptom**Troubleshooting Procedure WP and Page**

69. Excessive oil consumption	WP 0011, Page 14
a. Oil change overdue, incorrect grade or type (for ambient temperature range), or oil level too high	WP 0011, Page 14
b. Leakage from oil lines, oil filter, or valve cover	WP 0011, Page 14
c. Diluted engine oil	WP 0011, Page 14
d. Leaking crankcase rear bearing case cover seal	WP 0011, Page 15
e. Crankcase breather hose clogged	WP 0011, Page 15
f. Improper seal of oil pan or clogged oil strainer	WP 0011, Page 15
g. Fuel injection malfunction	WP 0011, Page 15
h. Internal engine problem	WP 0011, Page 16
70. Engine knocks or makes excessive noise	WP 0011, Page 16
a. Oil level low	WP 0011, Page 16
b. Fuel injection or governor actuator malfunction	WP 0011, Page 16
c. Valves improperly adjusted	WP 0011, Page 16
d. Internal engine problem	WP 0011, Page 17
71. Abnormal or high-pitched ascending and descending sounds heard from engine compartment	WP 0011, Page 17
a. Dirty air cleaner element or intake air restriction	WP 0011, Page 17
b. Loose battery-charging alternator belt or defective pulleys	WP 0011, Page 17
c. Exhaust system malfunction	WP 0011, Page 17
d. Engine problem	WP 0011, Page 18
72. White smoke seen emitting from engine compartment	WP 0011, Page 18
a. Coolant leak	WP 0011, Page 18
b. Fuel injection timing or governor actuator malfunction	WP 0011, Page 18
c. Internal engine problem	WP 0011, Page 19
73. Blue or black smoke from engine compartment with strong odors.	WP 0011, Page 19
Wires burning	WP 0011, Page 19
74. Oil mixed with coolant	WP 0011, Page 19
Leaking cylinder head assembly gasket or internal engine problem	WP 0011, Page 19
75. Oil mixed with fuel	WP 0011, Page 20
Internal engine problem	WP 0011, Page 20
76. Cold weather starting aids fail to work properly	WP 0011, Page 20
Cold weather starting aid malfunction	WP 0011, Page 20

Malfunction/Symptom**Troubleshooting Procedure WP and Page****EXHAUST SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**

77. High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance.. WP 0012, Page 2
- a. High back pressure or restriction in exhaust system WP 0012, Page 2
 - b. Internal engine problem WP 0012, Page 3
78. Abnormal sounds heard in exhaust system with a decrease in engine performance WP 0012, Page 3
- a. Exhaust system leak WP 0012, Page 3
 - b. Internal engine problem WP 0012, Page 4
79. Intermittent hissing or popping noise is heard when engine is running..... WP 0012, Page 4
- Exhaust manifold gasket leak..... WP 0012, Page 4
80. Buzzing or rattling sound heard in exhaust system..... WP 0012, Page 5
- Loose or missing hardware of exhaust component..... WP 0012, Page 5
81. Engine emits blue or black smoke with insufficient engine output WP 0012, Page 6
- a. Overloaded generator set. WP 0012, Page 6
 - b. Dirty air cleaner element. WP 0012, Page 6
 - c. Obstruction in air intake system..... WP 0012, Page 6
 - d. High back pressure or restriction in exhaust system. WP 0012, Page 6
 - e. Improper or contaminated fuel WP 0012, Page 7
 - f. Improper open or close timing of intake/exhaust valves..... WP 0012, Page 7
 - g. Too much oil in oil pan/too much oil added..... WP 0012, Page 7
 - h. Engine used at high temperatures or at high altitude. WP 0012, Page 8
 - i. Fuel injection timing incorrect or governor actuator malfunction WP 0012, Page 8
 - j. Internal engine problem WP 0012, Page 8
82. Engine emits white exhaust smoke WP 0012, Page 8
- a. Fuel contaminated or improper fuel used WP 0012, Page 8
 - b. Excessive slack in battery-charging alternator belt causing water pump malfunction..... WP 0012, Page 9
 - c. Clogged exhaust pipe or muffler WP 0012, Page 9
 - d. Clogged air filter WP 0012, Page 10
 - e. Improper intake and exhaust valve open/closure WP 0012, Page 10
 - f. Engine used at high temperatures or at high altitude WP 0012, Page 10
 - g. Fuel injection timing incorrect or governor actuator malfunction WP 0012, Page 10
 - h. Internal engine problem WP 0012, Page 11

Malfunction/Symptom

Troubleshooting Procedure WP and Page

WINTERIZATION KIT

- 83. [Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen..... WP 0013, Page 2
 - a. Fuel tank is empty WP 0013, Page 2
 - b. Clogged intake port WP 0013, Page 2
 - c. Clogged exhaust pipe WP 0013, Page 3
 - d. Clogged winterization kit fuel pump or malfunctioning fuel pump WP 0013, Page 3
 - e. Winterization kit wiring or DCS failure..... WP 0013, Page 4
- 84. [Warning 3671: Winterization Kit Low Voltage Warning] displayed on
DCS screen WP 0013, Page 5
 - a. Battery connections are loose or batteries are insufficiently charged WP 0013, Page 5
 - b. Winterization kit wiring or DCS failure..... WP 0013, Page 6
- 85. Winterization kit fails to turn off..... WP 0013, Page 6
 - Defective flame or heat sensor..... WP 0013, Page 6
- 86. Winterization kit activates under usual operating conditions..... WP 0013, Page 7
 - Defective temperature sensor or DCS temperature sensor WP 0013, Page 7

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
OPERATIONAL CHECKOUT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Personnel Required

91D (1)

References

WP 0006, Warning and Fault Codes

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0010, Engine System Troubleshooting with a DCS Code

References

WP 0011, Engine System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

OPERATIONAL CHECKOUT

WARNING

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

WARNING

High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply may cause damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Inspect Ground Connection

STEP

1. Ensure equipment conditions are met in order presented in initial setup.
2. Ensure ground rod is in ground.
3. Ensure ground cable is connected to output panel.
4. Ensure ground cable is connected to ground rod.
5. Open ground rod door on front panel.
6. Verify that all ground rods (three) have been used.

INDICATION/CONDITION

Ground rods remain in rack or ground rod is not properly installed.

CORRECTIVE ACTION

Install ground properly or install remaining ground rods as required (TM 9-6115-749-10).

STEP**WARNING**

High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.

Inspect connection of ground wire to ground rods for tightness and metal-to-metal contact.

INDICATION/CONDITION

Connection is loose. Metal-to-metal contact is interrupted.

CORRECTIVE ACTION

Tighten connections and reset metal-to-metal contact as required (TM 9-6115-749-10).

STEP**WARNING**

Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.

1. Open output box assembly door.
2. Inspect connection of ground wire to ground post on output terminal board for tightness and metal-to-metal contact.

INDICATION/CONDITION

Connection is loose. Metal-to-metal contact is interrupted.

CORRECTIVE ACTION

Tighten connections and reset metal-to-metal contact as required (TM 9-6115-749-10).

Check Digital Control Screen (DCS) Function

STEP

Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).

NOTE

Under normal operating conditions, the control panel display will take 4 sec or more to establish contact with the Display and Main Controller Boards. While contact is being established, the screen display is gray. It will be indicated in the mode and status lines as: [Genset Mode: Unknown] and [Establishing Communications]. The length of time the screen is either blank or gray depends on ambient temperature. See TM 9-6115-749-10 for cold weather operations.

INDICATION/CONDITION

Operator control screen is not operating.

CORRECTIVE ACTION

1. Ensure battery cables are connected (WP 0008, Electrical System Troubleshooting with a DCS Code and WP 0009, Electrical System Troubleshooting without DCS Code).
2. Ensure batteries are charged (WP 0008, Electrical System Troubleshooting with a DCS Code and WP 0009, Electrical System Troubleshooting without a DCS Code).
3. Ensure wires in DCS are properly seated and in working condition (WP 0017, Remove/Install DCS).
4. Test DCS (WP 0018, Repair DCS) and replace DCS as required (WP 0017, Remove/Install DCS) if batteries are connected and charged and wires are attached and working properly, but DCS does not function.

STEP

1. Turn BATTLESHORT switch ON (TM 9-6115-749-10).
2. Watch DCS for [Warning 1131: Battle Short Active].

INDICATION/CONDITION

BATTLESHORT warning does not appear on DCS screen.

CORRECTIVE ACTION

Check wiring of DCS and BATTLESHORT switch and replace as required (WP 0017, Remove/Install DCS and WP 0018, Repair DCS).

Check Engine Function**STEP**

Start generator set (TM 9-6115-749-10).

INDICATION/CONDITION

Engine fails to start or never reaches rated speed.

CORRECTIVE ACTION**CAUTION**

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between attempted starts. Failure to comply may cause damage to equipment.

Troubleshoot engine (WP 0010, Engine System Troubleshooting with a DCS Code and WP 0011, Engine System Troubleshooting without a DCS Code).

Check AC Generator Functions**CAUTION**

All of the following steps must be performed before releasing the AMMPS generator set for use. Failure to comply may cause damage to equipment.

STEP**NOTE**

MEP 1031 operates at 400 Hz only. MEP 1031 needs to be checked for voltage/phase settings only. MEP 1030 operates at 50 Hz or 60 Hz and must be checked for voltage/phase and frequency. Repeat steps 1 through 4 with MEP 1030 set at each frequency. Set frequency on DCS using adjustments screen (TM 9-6115-749-10).

1. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
2. Set AC generator voltage selection switch to: 120/240-V, single-phase operation (TM 9-6115-749-10).
3. Push FAULT RESET (TM 9-6115-749-10) to clear [Warning 3667: Voltage Configuration Change] (WP 0006, Warnings and Fault Codes).
4. Start generator set (TM 9-6115-749-10).

INDICATION/CONDITION

Output is not as requested from operator's control screen.

CORRECTIVE ACTION

Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting with a DCS Code and WP 0009, Electrical System Troubleshooting without a DCS Code).

STEP**NOTE**

MEP 1031 operates at 400 Hz only. MEP 1031 needs to be checked for voltage/phase settings only. MEP 1030 operates at 50 Hz or 60 Hz and must be checked for voltage/phase and frequency. Repeat steps 1 through 4 with MEP 1030 set at each frequency. Set frequency on DCS using adjustments screen (TM 9-6115-749-10).

1. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
2. Set AC generator voltage selection switch to: 120/208-V, three-phase operation (TM 9-6115-749-10).
3. Push FAULT RESET (TM 9-6115-749-10) to clear [Warning 3667: Voltage Configuration Change] (WP 0006, Warnings and Fault Codes).
4. Start generator set (TM 9-6115-749-10).

INDICATION/CONDITION

Output is not as requested from operator's control screen.

CORRECTIVE ACTION

Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting With a DCS Code and WP 0009, Electrical System Troubleshooting Without a DCS Code).

STEP**NOTE**

MEP 1031 operates at 400 Hz only. MEP 1031 needs to be checked for voltage/phase settings only. MEP 1030 operates at 50 Hz or 60 Hz and must be checked for voltage/phase and frequency. Repeat steps 1 through 4 with MEP 1030 set at each frequency. Set frequency on DCS using adjustments screen (TM 9-6115-749-10).

1. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
2. Set AC generator voltage selection switch to: 120-V, single-phase operation (TM 9-6115-749-10).
3. Push FAULT RESET (TM 9-6115-749-10) to clear [Warning 3667: Voltage Configuration Change] (WP 0006, Warnings and Fault Codes).
4. Start generator set (TM 9-6115-749-10).

INDICATION/CONDITION

Output is not as requested from operator's control screen.

CORRECTIVE ACTION

Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting with a DCS Code and WP 0009, Electrical System Troubleshooting without a DCS Code).

STEP

1. Start generator set (TM 9-6115-749-10).
2. Allow generator set to warm up for 5 min.
3. Press AC CIRCUIT INTERRUPT button (TM 9-6115-749-10).
4. Look for CONTACTOR CLOSED indication on screen (TM 9-6115-749-10).

INDICATION/CONDITION

Contactor does not close.

CORRECTIVE ACTION

Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting with a DCS Code and WP 0009, Electrical System Troubleshooting without a DCS Code).

STEP**WARNING**

High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.

Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).

INDICATION/CONDITION

Generator set will not hold rated load for 30 minutes.

CORRECTIVE ACTION

Troubleshoot electrical or engine system (WP 0008, Electrical System Troubleshooting with a DCS Code; WP 0009, Electrical System Troubleshooting without a DCS Code; WP 0010, Engine System Troubleshooting with a DCS Code; and WP 0011, Engine System Troubleshooting without a DCS Code).

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
WARNING AND FAULT CODES

INITIAL SETUP:

Personnel Required

91D (1)

References

TM 9-6115-749-10

TM 9-6115-755-13&P

WP 0007, Cooling System Troubleshooting with a DCS Code

References

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0010, Engine System Troubleshooting with a DCS Code

WP 0013, Winterization Kit Troubleshooting

WP 0039, Service Fuel System

WP 0057, Remove/Install Current Transformers

WARNING AND FAULT CODES

The AMMPS DCS displays real-time fault and warning codes on the top two lines of the operator main screen. Faults will result in equipment shut down. Warnings indicate items that may result in faults if unattended. The descriptions displayed on-screen and listed below provide detail about the occurrence of the fault code or warning code. By accessing the [Maintenance] screen (TM 9-6115-749-10), troubleshooting suggestions can be accessed and possible solutions indicated. The DCS must be reset using FAULT RESET switch as faults and warnings are addressed. Use the codes displayed by the DCS and the -ACTION" column in Table 1 and Table 2 to resolve problems with the AMMPS system.

Table 1. Fault Codes.

MESSAGE WORD	MAINTENANCE SCREEN DESCRIPTION	CORRECTIVE ACTION
[Fault 115: Speed Signal Lost]	[Engine Magnetic Crankshaft Speed/Position lost both of two signals — Data Erratic Intermittent or Incorrect.]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 151: High Coolant Temp]	[Engine Coolant Temperature — Data Valid but Above Normal Operational Range — Most Severe Level]	WP 0007, Cooling System Troubleshooting with a DCS Code.
[Fault 234: Overspeed Shutdown]	[Engine Crankshaft Speed/Position — Data Valid but Above Normal Operational Range — Most Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Fault 359: Fail to Start]	[Engine Failed Automatic Start — Condition Exists]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Fault 415: Low Oil Pressure]	[Engine Oil Rifle Pressure — Data Valid but Below Normal Operational Range — Most Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Fault 1433: Local E-Stop]	[Local E-Stop Button Engaged]	The local EMERGENCY STOP button has been pressed. Pull the button out. Acknowledge the faults and reset them to return to normal operating mode. If symptom continues, see WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1434: Remote E-Stop]	[Remote E-Stop Signal Active]	Turn off the remote emergency stop. Acknowledge the faults and reset them to return to normal operating mode. If symptom continues, see WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1438: Fail To Crank]	[Engine Failed To Crank]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Fault 1445: Short Circuit]	[Alternator Current is Greater Than 175% of Maximum Line Current]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1446: High AC Voltage]	[AC Output Voltage is Greater Than High AC Voltage Threshold (130%)]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1447: Low AC Voltage]	[AC Output Voltage is Less Than Low AC Voltage Threshold (70%)]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1448: Underfrequency]	[Generator AC Output Frequency — Data Valid But Below Normal Operating Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code.

Table 1. Fault Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Fault 1452: Genset Contactor Fail To Close]	[Genset Contactor Failed to Close Within the Specified Close Time Delay]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1453: Genset Contactor Fail To Open]	[Genset Contactor Failed to Open Within the Specified Open Time Delay]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1459: Reverse Power]	[Generator is Absorbing Power from the Bus]	Ensure orientation of current transformers is correct (WP 0057, Remove/Install Current Transformers). See TM 9-6115-755-13&P if symptom continues.
[Fault 1461: Loss of Field]	[Generator is Absorbing Reactive Power from the Bus]	TM 9-6115-755-13&P
[Fault 1472: High Current Shutdown]	[Alternator Current is Between 110% — 175% of Maximum Line Current for More Than the Shutdown Set Time]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1918: Fuel Level Low]	[Very Low Fuel Level Detected by the Analog Sensor]	Fill generator set with proper fuel (WP 0039, Service Fuel System). See WP 0008, Electrical System Troubleshooting with a DCS Code if symptom continues.
[Fault 2335: Excitation Fault]	[Loss of AC Phase Voltage Sensing — Condition Exists]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 2914: Genset AC Meter Failed]	[Genset AC Meter Chip Failed Health Check]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 2972: Field Overload]	[AVR Field at Maximum Field Drive Limit for Greater than the Maximum Field Time]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3659: Switch Box Fail To Open]	[The Switch Box Contactor Failed to Open Within Specified Open Time Delay]	TM 9-6115-755-13&P
[Fault 3664: Invalid Genset Configuration]	[Engine Model Identification Bits are Set to an Invalid Setting]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3665: Invalid Voltage Configuration]	[Output Voltage Configuration is Invalid for the Given Genset Configuration]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3668: Output Voltage Config Bit 0 Changed]	[The State of the Output Voltage Configuration Bit 0 has Changed]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3669: Output Voltage Config Bit 1 Changed]	[The State of the Output Voltage Configuration Bit 1 has Changed]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3673: Convenience Receptacle AC Meter Failed]	[Convenience Receptacle AC Meter Chip Failed Health Check]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3677: Genset Configuration Factory Test Fault]	[Genset Configuration ID Bits Do Not Match the Expected Genset Configuration]	WP 0008, Electrical System Troubleshooting with a DCS Code.

Table 2. Warning Codes.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 135: Oil Pressure Sensor High]	[Engine Oil Rifle Pressure 1 Sensor Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 141: Oil Pressure Sensor Low]	[Engine Oil Rifle Pressure 1 Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 143: Pre-Low Oil Pressure]	[Engine Oil Rifle Pressure — Data Valid but Below Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Warning 144: Coolant Temp Sensor OOR High]	[Engine Coolant Temperature 1 Sensor Circuit - Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 145: Coolant Temp Sensor OOR Low]	[Engine Coolant Temperature 1 Sensor Circuit - Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 146: Pre-High Coolant Temp]	[Engine Coolant Temperature — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0007, Cooling System Troubleshooting with a DCS Code.
[Warning 319: Real Time Clock Error]	[Real Time Clock Power Interrupt — Data Erratic, Intermittent, or Incorrect]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 441: Low Battery Voltage]	[Battery 1 Voltage — Data Valid but Below Normal Operational Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 442: High Battery Voltage]	[Battery 1 Voltage — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1131: Battle Short Active]	[Battle Short Mode Active]	Displays on DCS screen when BATTLESHORT switch is ON (WP 0008, Electrical System Troubleshooting with a DCS Code).
[Warning 1416: Fail to Shutdown]	[The System Has Failed to Shutdown]	Displays on DCS screen when BATTLESHORT switch is ON and a fault occurs. Switch off BATTLESHORT (TM 9-6115-749-10) as required to address fault.
[Warning 1417: Power Down Failure]	[The System Has Failed to Power Down]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1441: Low Fuel Level]	[Low Fuel Level Detected by the Analog Sensor]	WP 0008, Electrical System Troubleshooting with a DCS Code.

Table 2. Warning Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 1442: Weak Battery]	[Battery Voltage Below Normal Operating Voltage During Genset Startup]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1444: KW Overload]	[The KW Load on Genset is Over the Overload Warning Threshold Continuously for More Than the Overload Warning Set Time]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1449: Overfrequency]	[Generator AC Output Frequency — Data Valid But Above Normal Operating Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1451: Genset/Bus Voltage Mismatch]	[Genset Output Voltage and Bus Voltage are Out of Calibration]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1456: Bus Out Of Synchronization Range]	[Bus Voltage and/or Frequency are Outside Set Limits for Synchronizing]	TM 9-6115-755-13&P
[Warning 1457: Fail To Synchronize]	[Genset Failed to Synchronize within Set Time]	TM 9-6115-755-13&P
[Warning 1458: Synch Phase Rotation Mismatch]	[Genset and Bus Phase Rotations are Reading Opposite for More Than the Dedicated Set Time]	TM 9-6115-755-13&P
[Warning 1469: Speed/Hz Mismatch]	[Genset Measured Speed and AC Output Frequency Conflict — Condition Exists]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1471: High Current Warning]	[Alternator Current Reading Between 110% – 175% of Maximum Line Current for More than the Warning Set Time]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1689: Reset Real Time Clock]	[Power to the RTC Chip has been Lost, Clock no Longer Accurate]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1992: High Speed Warning]	[Engine Crankshaft Speed/Position — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Warning 2336: Checksum Fault]	[The Controller Checksum Calculation Differs From the Calibration Download]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2915: Gen Bus AC Meter Failed]	[Genset Bus AC Meter Chip Failed Health Check]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2917: Genset Bus Voltage High]	[Genset Bus Voltage — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2936: Fuel Level Sensor High]	[Fuel Level OOR High Fault from the I/O Module]	WP 0008, Electrical System Troubleshooting with a DCS Code.

Table 2. Warning Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 2937: Fuel Level Sensor Low]	[Fuel Level OOR Low Fault from the I/O Module]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2967: Governor Fault]	[The Governor Fault Output is Active]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2968: AVR Fault]	[The AVR Fault Output is Active]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3658: Switch Box Fail To Close]	[The Switch Box Contactor Failed to Close Within Specified Close Time Delay]	TM 9-6115-755-13&P
[Warning 3661: Maintenance Item is Active]	[The Time Interval for a Genset Maintenance Item or Deferred Maintenance Item has Expired and Requires a Maintenance Action]	Address maintenance item and perform as required. Reset code once maintenance item is addressed (TM 9-6115-749-10).
[Warning 3662: Battery Discharge]	[Battery Discharge Condition Detected]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3663: Winterization Kit Failure to Heat]	[Winterization Kit Failed to Heat Engine Coolant]	WP 0013, Winterization Kit Troubleshooting.
[Warning 3666: Master Control Switch Configuration]	[The Number of Active Master Control Switch Inputs is Not Equal to 1]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3667: Voltage Configuration Change]	[The Output Voltage Configuration has Changed]	Displays on DCS screen when voltage selection switch is used to changed the generator set voltage configuration (TM 9-6115-749-10). Push FAULT RESET switch to clear fault on DCS display.
[Warning 3671: Winterization Kit Low Voltage Warning]	[The Genset Battery Voltage is Too Low to Run Winterization Kit]	WP 0013, Winterization Kit Troubleshooting.
[Warning 3672: Automatic Field Flash Not Complete]	[The Field Flash Cycle did not Complete Successfully]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3674: Genset Configuration Change]	[The Genset Configuration has Changed]	Displays on DCS screen when the DCS recognize the configuration has changed. This warning is most likely when a DCS is moved from one size generator set to a different size generator set. Push FAULT RESET and continue normal use of the generator set. If symptom continues, see WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3678: Genset Frequency Changed]	[The Genset Frequency has Changed]	MEP 1030 only. Displays on DCS screen after changing generator set frequency from 60 Hz to 50 Hz or 50 Hz to 60 Hz (TM 9-6115-749-10). Push FAULT RESET switch to clear fault on DCS display.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Personnel Required

91D (1)

References

TM 9-6115-749-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0011, Engine System Troubleshooting without a DCS Code

WP 0012, Exhaust System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0021, Service Cooling System

WP 0022, Remove/Install Coolant Recovery System

WP 0023, Remove/Install Cooling Fan

WP 0024, Remove/Install Radiator Hose and Tube Assemblies

WP 0025, Remove/Install Winterization Kit Components

References

WP 0027, Remove/Install Radiator

WP 0036, Remove/Install Batteries

WP 0059, Remove/Install Engine Wiring Harness

WP 0061, Remove/Install Relay Panel

WP 0062, Test Engine Compression

WP 0064, Remove/Install 50/60 Hz Engine Assembly

WP 0065, Remove/Install 400 Hz Engine Assembly

WP 0069, Remove/Install Fuel Injector

WP 0071, Remove/Install Fuel Injection Pump

WP 0073, Remove/Install Thermostat

WP 0074, Remove/Install Water Pump

WP 0076, Remove/Install Battery-Charging Alternator Belt

WP 0093, General Maintenance

WP 0096, Replace Cylinder Head Gasket

Foldout Pages

COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE**WARNING**

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

Capture spilled fluids and dispose of IAW local SOP.

SYMPTOM

[Fault 151: High Coolant Temperature] displayed on DCS screen.

NOTE

[Warning 146: Pre-High Coolant Temperature] is displayed on the DCS screen when coolant temperature reaches 220°F (104.4°C). [Fault 151: High Coolant Temperature] is displayed on the DCS screen and results in a generator set shutdown when coolant temperature reaches 230°F (110°C).

MALFUNCTION

Low coolant level, improper type used, or clogged cooling fins in radiator.

CORRECTIVE ACTION

- STEP 1. Check coolant level in coolant overflow bottle first and then check coolant level in radiator. Add coolant as required (TM 9-6115-749-10).
- STEP 2. Check radiator for excessive debris or clogs on cooling fins. Clean as required (WP 0021, Service Cooling System).
- STEP 3. If symptom continues, verify proper type of coolant is used (TM 9-6115-749-10).
- STEP 4. If improper coolant or mixture is suspected, drain cooling system and fill with proper coolant (WP 0021, Service Cooling System).
- STEP 5. If leak is suspected or symptom continues, proceed to next malfunction.

MALFUNCTION

Loose, defective, or improperly fitted radiator cap or coolant overflow bottle cap.

CORRECTIVE ACTION

- STEP 1. Check for loose, improperly fitted, or visibly defective radiator cap and coolant overflow bottle cap.
- STEP 2. Install properly if loose or improperly fitted or replace if damaged (WP 0027, Remove/Install Radiator and WP 0022, Remove/Install Coolant Recovery System).
- STEP 3. If properly secured, test radiator cap to determine proper operation (WP 0021, Service Cooling System).
- STEP 4. If defective, replace as required (WP 0027, Remove/Install Radiator).
- STEP 5. Check coolant level in coolant overflow bottle and radiator. Add coolant as required (TM 9-6115-749-10).
- STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Coolant system leak.

CORRECTIVE ACTION

- STEP 1. Perform a cooling system pressure check at radiator (WP 0021, Service Cooling System).
- STEP 2. If loss of pressure is observed on gage of cooling system tester, proceed to STEP 4.
- STEP 3. If no loss of pressure is observed, proceed to next malfunction.
- STEP 4. Check radiator and coolant overflow bottle hoses and clamps (WP 0022, Remove/Install Coolant Recovery System and WP 0024, Remove/Install Radiator Hose and Tube Assemblies), hoses and clamps at water pump (WP 0074, Remove/Install Water Pump), and hoses and clamps at winterization kit (as required) (WP 0025, Remove/Install Winterization Kit Components) for signs of leakage. Replace any hose or clamp as necessary.
- STEP 5. Check radiator for signs of leaks and replace as required (WP 0027, Remove/Install Radiator).

- STEP 6. Check coolant overflow bottle for signs of leaks and replace as required (WP 0022), Remove/Install Coolant Recovery System.
- STEP 7. Check water pump and hoses for leaks. Replace water pump, hoses, or gasket as required (WP 0074, Remove/Install Water Pump).
- STEP 8. Check freeze plugs on engine for leaks. Replace freeze plugs if leaks are found (WP 0093, General Maintenance).
- STEP 9. Flush cooling system and fill as required (WP 0021, Service Cooling System).
- STEP 10. If symptom continues, proceed to next malfunction.

MALFUNCTION

Inoperable thermostat.

CORRECTIVE ACTION

- STEP 1. Test thermostat and replace as required (WP 0073, Remove/Install Thermostat).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Inoperable cooling fan.

CORRECTIVE ACTION**WARNING**

Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fan. Failure to comply may cause injury or death to personnel.

NOTE

Cooling fan should run at high Pulse Width Modulated (PWM) signal when coolant temperature is above 223°F (106.1°C). Fan speed (controlled by PWM signal) is dependent on coolant temperature.

- STEP 1. Check air intake for obstruction and remove any obstruction.
- STEP 2. Test cooling fan operation by disconnecting engine temperature sensor wire (WP 0074, Remove/Install Water Pump) or by using InPower AMMPS software (WP 0093, General Maintenance).
- STEP 3. Start generator set and allow it to reach rated speed (TM 9-6115-749-10).

NOTE

Fan should run at high PWM signal.

- STEP 4. Compare fan speed visually or with InPower AMMPS software (WP 0093, General Maintenance) to coolant temperature. See Table 1.

Table 1. Cooling Fan PWM Signal.

COOLANT TEMPERATURE °F (°C)	PERCENTAGE OF PWM
-60°F (-51.1°C)	0
198°F (92.2°C)	0
199°F (92.7°C)	0
200°F (93.3°C)	20
210°F (98.9°C)	51
220°F (104.4°C)	69
223°F (106.1°C)	75
227°F (108.3°C)	75

- STEP 5. If fan is not operating, install engine temperature sensor connector and check cooling fan circuit breaker and relay, resetting or replacing as required (WP 0061, Remove/Install Relay Panel).
- STEP 6. If cooling fan is found to be operating properly, install engine temperature sensor connector and proceed to next malfunction.
- STEP 7. If symptom continues, remove battery ground cable (WP 0036, Remove/Install Batteries) and use wiring diagrams and a multimeter set to test continuity to check cooling fan wiring to relay panel and DCS for opens or shorts (WP 0093, General Maintenance and Foldout Pages).
- STEP 8. Replace or repair wiring or connectors as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 9. If symptom continues, replace cooling fan (WP 0023, Remove/Install Cooling Fan).
- STEP 10. If symptom continues, check DCS LEDs and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

MALFUNCTION

Defective temperature sensor.

CORRECTIVE ACTION

- STEP 1. Troubleshoot IAW [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Generator set overload.

CORRECTIVE ACTION

- STEP 1. Check for generator set overload by checking the generator line current indicator on the generator status display screen.
- STEP 2. Proceed to next malfunction if generator set is operating at proper load.
- STEP 3. If load is too great for the generator set, replace with a larger generator set to match load requirements.

MALFUNCTION

Excessive slack in battery-charging alternator belt causing water pump malfunction.

CORRECTIVE ACTION

STEP 1. Check battery-charging alternator belt for proper tension and excessive wear. Adjust or replace as required (WP 0076, Remove/Install Battery-Charging Alternator Belt).

WARNING

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 2. Check water pump pulley for smooth turning and proper seating of belt.

STEP 3. Replace water pump pulley if malfunction is detected (WP 0074, Remove/Install Water Pump).

STEP 4. If not defective, proceed to next malfunction.

MALFUNCTION

Improperly operating water pump.

CORRECTIVE ACTION**WARNING**

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Turn shaft/pulley of water pump to feel for excessive resistance and play in the shaft.

STEP 2. Replace water pump if improper operation is suspected (WP 0074, Remove/Install Water Pump).

STEP 3. Observe engine temperature after replacement, and check for engine overheating.

STEP 4. If water pump is operating properly, proceed to next malfunction.

MALFUNCTION

Insufficient cooling effect of radiator.

CORRECTIVE ACTION

STEP 1. Check radiator for excessive debris or clogs on cooling fins. Clean as required (WP 0021, Service Cooling System).

STEP 2. Check hoses for obstructions, rust, or buildup and for signs of kinking causing restriction. Repair or replace as required (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).

STEP 3. Observe engine temperature on DCS screen (TM 9-6115-749-10).

STEP 4. Replace radiator if insufficient cooling effect of radiator continues (WP 0027, Remove/Install Radiator).

STEP 5. If not defective, proceed to next malfunction.

MALFUNCTION

Low engine oil level.

CORRECTIVE ACTION

STEP 1. Add oil to the proper level (TM 9-6115-749-10).

STEP 2. If engine oil is low, troubleshoot lubrication system for oil consumption (WP 0011, Engine System Troubleshooting without a DCS Code).

STEP 3. If full, proceed to next malfunction.

MALFUNCTION

Clogged muffler or clog in exhaust system.

CORRECTIVE ACTION

STEP 1. Troubleshoot exhaust system for restriction (high back pressure/restriction in exhaust system) (WP 0012, Exhaust System Troubleshooting without a DCS Code).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine used at high temperatures or at high altitude.

CORRECTIVE ACTION

STEP 1. Check output drop and load matching requirements (TM 9-6115-749-10). Reduce load as required (TM 9-6115-749-10).

STEP 2. If not applicable, proceed to next malfunction.

MALFUNCTION

Improper fuel injection.

CORRECTIVE ACTION

WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

STEP 1. Check fuel injectors for proper spray pattern and pressure rating, and replace fuel injectors as required (WP 0069, Remove/Install Fuel Injector).

STEP 2. If not defective, proceed to next malfunction.

MALFUNCTION

Incorrect fuel injection timing or governor actuator fault.

CORRECTIVE ACTION

- STEP 1. Troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. If symptom continues, check fuel injection pump timing and adjust as required (WP 0071, Remove/Install Fuel Injection Pump).
- STEP 3. Replace fuel injection pump if timing cannot be adjusted or if found defective (WP 0071, Remove/Install Fuel Injection Pump).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

- STEP 1. Perform an engine compression check (WP 0062, Test Engine Compression).
- STEP 2. If compression check reveals fault, replace cylinder head gasket (WP 0096, Replace Cylinder Head Gasket).
- STEP 3. If symptom continues, replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

[Warning 146: Pre-High Coolant Temperature] displayed on DCS screen.

MALFUNCTION

Cooling system malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 151: High Coolant Temperature] displayed on DCS screen symptom.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE

INITIAL SETUP:

Test Equipment

Cable, Remote Control (WP 0162, Table 2, Item 6)
 Test Set, Electronic Systems (WP 0162, Table 2, Item 26)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Personnel Required

91D (1)
 Assistant (1)

References

TM 9-6115-749-10
 WP 0011, Engine System Troubleshooting without a DCS Code
 WP 0016, Field PMCS
 WP 0017, Remove/Install DCS
 WP 0018, Repair DCS
 WP 0036, Remove/Install Batteries
 WP 0039, Service Fuel System
 WP 0045, Remove/Install Fuel Level Sensor
 WP 0049, Remove/Install 50/60 Hz AC Generator Assembly
 WP 0050, Remove/Install 400 Hz AC Generator Assembly
 WP 0051, Test AC Generator
 WP 0052, Remove/Install Contactor

References

WP 0053, Remove/Install Output Terminal Board
 WP 0054, Remove/Install Voltage Selection Switch
 WP 0057, Remove/Install Current Transformers
 WP 0058, Remove/Install Printed Circuit Board Module
 WP 0059, Remove/Install Engine Wiring Harness
 WP 0061, Remove/Install Relay Panel
 WP 0063, Test Engine Oil Pressure
 WP 0067, Remove/Install Engine Speed Sensor
 WP 0071, Remove/Install Fuel Injection Pump
 WP 0072, Remove/Install Thermostat Housing
 WP 0075, Remove/Install Battery-Charging Alternator
 WP 0076, Remove/Install Battery-Charging Alternator Belt
 WP 0085, Remove/Install Flywheel
 WP 0093, General Maintenance
 Foldout Pages

ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

SYMPTOM

[Fault 115: Speed Signal Lost] displayed on DCS screen.

MALFUNCTION

Engine speed sensor malfunction.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect engine speed signal for loose wires, loose connections, and improper gap (WP 0067, Remove/Install Engine Speed Sensor).
- STEP 2. Remove engine speed sensor to clean tip, adjust engine speed sensor gap (WP 0067, Remove/Install Engine Speed Sensor), or replace or repair wiring as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 3. If symptom continues, remove wiring connector and use a multimeter selected for Ohms scale to measure resistance of engine speed sensor between the two pins (WP 0093, General Maintenance).
- STEP 4. If value of resistance measured in STEP 3 is within 225 to 275 Ohms (Ω) range, engine speed sensor is operable. Proceed to STEP 6.

- STEP 5. If value of resistance measured in STEP 3 is not within 225 to 275 Ω range, engine speed sensor is open or shorted. Replace engine speed sensor (WP 0067, Remove/Install Engine Speed Sensor).
- STEP 6. If malfunction continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries) and use wiring diagrams (Foldout Pages) to check wiring from sensor to DCS for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 7. Repair or replace wiring as required (WP 0093, General Maintenance and WP 0059, Remove/Install Engine Wiring Harness).
- STEP 8. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom.
- STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1433: Local E-Stop] displayed on DCS screen.

MALFUNCTION

Malfunctioning EMERGENCY STOP push button or malfunctioning DCS.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Ensure EMERGENCY STOP push button is pulled out and attempt to reset the fault code by pressing FAULT RESET switch.
- STEP 2. If symptom continues, test EMERGENCY STOP push button and replace as required (WP 0018, Repair DCS).
- STEP 3. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1434: Remote E-Stop] displayed on DCS screen.

MALFUNCTION

Defective remote operating cable, pins on DCS, or remote operating source.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. If operating from a remote source, ensure remote emergency stop was not intentionally activated from a remote source. Proceed to STEP 3.
- STEP 2. If not operating from a remote source, proceed to STEP 9.
- STEP 3. Confirm reason for use of remote emergency stop and continue normal operation as required (TM 9-6115-749-10).
- STEP 4. If remote emergency stop was not intentionally activated, restart computer and reconnect to DCS (TM 9-6115-749-10).
- STEP 5. If symptom continues, inspect remote control cable and computer for damaged, missing, or bent pins where connector of remote control cable attaches.
- STEP 6. Replace remote control cable or computer as required.
- STEP 7. If symptom continues, disconnect remote control cable and use a multimeter set to check continuity to test remote control cable for opens or shorts (WP 0093, General Maintenance).
- STEP 8. Replace remote control cable as required.
- STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1445: Short Circuit] displayed on DCS screen.

MALFUNCTION

Load cables have been shorted or overloaded.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Verify that load cables have been deenergized.
- STEP 2. Inspect load cables, load, and output box visually for signs of wire damage or short circuit. Repair or replace wires or components as required (WP 0053, Remove/Install Output Terminal Board; WP 0052, Remove/Install Contactor; WP 0054, Remove/Install Voltage Selection Switch; and WP 0057, Remove/Install Current Transformers).
- STEP 3. If symptom continues, check operation by disconnecting load cables from generator set and restarting generator set (TM 9-6115-749-10).

- STEP 4. If generator set reaches rated speed without fault code shutdown, shutdown generator set, verify proper load, and connect load cables (TM 9-6115-749-10). Proceed to STEP 6.
- STEP 5. If generator set operation results in a fault code shutdown, proceed to STEP 8.
- STEP 6. If symptom continues, ensure load cables are completely disconnected, and inspect load and load cables for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance). Replace as required.
- STEP 7. If symptom continues, compare load demands with generator set and utilize a larger generator set if load is too great for current size generator set.

WARNING

Dangerously high voltage can exist across CT output with engine operating. CT can explode if disconnected from load with engine running. Do not disconnect CT with AC generator rotating. Failure to comply may cause injury or death to personnel by electrocution.

- STEP 8. If symptom continues, check CTs for cracks, signs of heat damage, and resistance (WP 0057, Remove/Install Current Transformers). Replace as required (WP 0057, Remove/Install Current Transformers).
- STEP 9. If symptom continues, use wiring diagrams and inspect CT wires from CTs to printed circuit board module and from printed circuit board module to DCS for loose connections or damage (Foldout Pages).
- STEP 10. Repair or replace wiring as required (WP 0058, Remove/Install Printed Circuit Board Module; WP 0057, Remove/Install Current Transformers; WP 0017, Remove/Install DCS; and WP 0093, General Maintenance).
- STEP 11. If symptom continues, inspect wiring, connectors, and pins on connectors from the contactor to J511 on printed circuit board module for loose connections or damage. Replace as required (WP 0058, Remove/Install Printed Circuit Board Module).
- STEP 12. Inspect wiring running from contactor to output terminals and from contactor to voltage selection switch for loose connections or damage. Replace or repair as required (WP 0052, Remove/Install Contactor or WP 0093, General Maintenance).
- STEP 13. Inspect busbars on contactor for damage, and replace as required (WP 0052, Remove/Install Contactor).
- STEP 14. Inspect wiring, connectors, and pins on connectors running from the DCS to printed circuit board module for loose connections and damage. Replace as required (WP 0058, Remove/Install Printed Circuit Board Module).
- STEP 15. If symptom continues, test contactor for proper operation, and replace as required (WP 0052, Remove/Install Contactor).
- STEP 16. If symptom continues, check DCS LEDs and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1446: High AC Voltage] displayed on DCS screen.

MALFUNCTION

Incorrect setting or shorted load.

CORRECTIVE ACTION

- STEP 1. Clear fault and restart generator set (TM 9-6115-749-10).
- STEP 2. If symptom continues, check operation by disconnecting load cables from generator set and restarting generator set (TM 9-6115-749-10).
- STEP 3. If generator set reaches rated speed without fault code shutdown, shutdown generator set, verify proper load, and connect load cables (TM 9-6115-749-10). Proceed to STEP 5.
- STEP 4. If generator set operation results in a fault code shutdown, troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.
- STEP 5. If symptom continues, verify that voltage selection matches load requirements (TM 9-6115-749-10).
- STEP 6. Adjust as required (TM 9-6115-749-10).

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 7. If symptom continues, inspect load cables and cables at output box visually for signs of wire damage.
- STEP 8. Replace any damaged load cables.
- STEP 9. If symptom continues, check for use of large motors, inductive loads, AC air conditioning compressors, or other loads with large inrush currents.
- STEP 10. Reduce use of other loads while starting loads with large inrush currents and avoid sudden stopping of inrush current loads during operation.
- STEP 11. If symptom continues, ensure load cables are completely disconnected and inspect load and load cables for shorts using a multimeter set to test continuity (WP 0093, General Maintenance). Repair or replace any damaged load cables.

SYMPTOM

[Fault 1447: Low AC Voltage] displayed on DCS screen.

MALFUNCTION

Overload, damage to wiring, or damage to DCS.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1446: High AC Voltage] displayed on DCS screen symptom.

SYMPTOM

[Fault 1448: Underfrequency] displayed on DCS screen.

MALFUNCTION

Generator set was subjected to a reduction in speed for a period of time.

CORRECTIVE ACTION

- STEP 1. Disconnect load and restart engine (TM 9-6115-749-10).
- STEP 2. If symptom continues, compare load demands with generator set and utilize a larger generator set if load is too great for current size generator set.
- STEP 3. If symptom continues, confirm proper voltage and frequency settings for load usage and adjust as required (TM 9-6115-749-10).
- STEP 4. If symptom continues, test and adjust engine speed sensor, and replace as required (WP 0067, Remove/Install Engine Speed Sensor).
- STEP 5. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom.
- STEP 6. If symptom continues, troubleshoot engine system for fuel or air problems (poor performance) (WP 0011, Engine System Troubleshooting Without a DCS Code).

SYMPTOM

[Fault 1452: Genset Contactor Fail To Close] displayed on DCS screen.

NOTE

DCS receives signal from contactor within 260 milliseconds (ms) of close operation indicating a closed contactor. [Fault 1452: Genset Contactor Fail To Close] displays on DCS screen when the DCS does not receive the signal or the contactor does not close.

MALFUNCTION

Contactor or wiring malfunction.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect wiring, connectors, and pins on connectors from the contactor to J511 on printed circuit board module for loose connections or damage. Replace as required (WP 0058, Remove/Install Printed Circuit Board Module).
- STEP 2. Inspect wiring running from contactor to output terminals and from contactor to voltage selection switch for loose connections or damage. Replace or repair as required (WP 0052, Remove/Install Contactor and WP 0093, General Maintenance).
- STEP 3. Inspect busbars on contactor for damage and replace as required (WP 0052, Remove/Install Contactor).

STEP 4. Inspect wiring, connectors, and pins on connectors running from the DCS to printed circuit board module for loose connections and damage. Replace as required (WP 0058, Remove/Install Printed Circuit Board Module).

STEP 5. If symptom continues, test contactor for proper operation, and replace as required (WP 0052, Remove/Install Contactor).

NOTE

Wires P2-S and P2-F are contactor coil energizing wires from DCS P500 to printed circuit board module J500. Wires P3-H and P3-AA are contactor auxiliary wires (indicating to DCS when contactor is open or closed) from DCS P500 to printed circuit board module J500. Wires from the contactor (K1-Y, K1-X, K1-11, and K1-12) connect to printed circuit board module J511.

STEP 6. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove connectors, and test all wiring for shorts or opens using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0093, General Maintenance).

STEP 7. Repair or replace any wiring as required and install connectors (WP 0093, General Maintenance, WP 0052, Remove/Install Contactor; WP 0058, Remove/Install Printed Circuit Board Module; and WP 0059, Remove/Install Engine Wiring Harness).

STEP 8. If symptom continues, inspect the printed circuit board module and output terminal board for damage and replace as required (WP 0058, Remove/Install Printed Circuit Board Module and WP 0053, Remove/Install Output Terminal Board).

STEP 9. If symptom continues, check DCS LEDs, and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1453: Genset Contactor Fail To Open] displayed on DCS screen.

NOTE

The DCS receives a signal from the contactor within 1 sec of when it opens. [Fault 1453: Genset Contactor Fail To Open] displays on DCS screen when the DCS does not receive the signal or the contactor does not open.

MALFUNCTION

Contactor or wiring malfunction.

CORRECTIVE ACTION

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 1. Remove output box components as required to access contactor with multimeter leads (WP 0052, Remove/Install Contactor).

STEP 2. Turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-749-10).

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Terminals X and Y on contactor are for the wires that energize the contactor coil.

- STEP 3. Test contactor coil for 24 VDC using a multimeter set to test voltage (WP 0093, General Maintenance).
- STEP 4. If 24 VDC is not detected on contactor coil, troubleshoot IAW [Fault 1452: Genset Contactor Fail To Close] displayed on DCS screen symptom.
- STEP 5. If 24 VDC is detected on contactor coil, remove connectors, and test wiring from contactor, printed circuit board, and DCS for shorts or opens using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 6. Repair or replace any wiring as required, and install connectors (WP 0093, General Maintenance; WP 0052, Remove/Install Contactor; WP 0058, Remove/Install Printed Circuit Board Module; and WP 0059, Remove/Install Engine Wiring Harness).
- STEP 7. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1472: High Current] displayed on DCS screen.

MALFUNCTION

Short, overload, or AC generator malfunction.

CORRECTIVE ACTION

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

- STEP 1. Compare load demands with generator set capacity, and utilize a larger generator set if load is too great for current size generator set.
- STEP 2. If symptom continues, shut down generator set if not already shut down, and ensure load cables are completely disconnected (TM 9-6115-749-10).
- STEP 3. Check the load and load cables for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance). Remove load or repair as required.
- STEP 4. Connect load and check for proper operation (TM 9-6115-749-10).

- STEP 5. If symptom continues, check CTs for cracks, signs of heat damage, and resistance (WP 0057, Remove/Install Current Transformers). Replace as required (WP 0057, Remove/Install Current Transformers).
- STEP 6. If symptom continues, use wiring diagrams and inspect CT wires from CTs to printed circuit board module and from printed circuit board module to DCS for loose connections or damage (Foldout Pages).
- STEP 7. Repair or replace wiring as required (WP 0058, Remove/Install Printed Circuit Board Module; WP 0057, Remove/Install Current Transformers; WP 0017, Remove/Install DCS; and WP 0093, General Maintenance).
- STEP 8. If symptom continues, inspect wiring, connectors, and pins on connectors from the contactor to J511 on printed circuit board module for loose connections or damage. Replace as required (WP 0057, Remove/Install Current Transformers).
- STEP 9. Inspect wiring running from contactor to output terminals and from contactor to voltage selection switch for loose connections or damage. Replace or repair as required (WP 0052, Remove/Install Contactor or WP 0093, General Maintenance).
- STEP 10. Inspect busbars on contactor for damage and replace as required (WP 0052, Remove/Install Contactor).
- STEP 11. Inspect wiring, connectors, and pins on connectors running from the DCS to printed circuit board module for loose connections and damage. Replace as required (WP 0057, Remove/Install Current Transformers).
- STEP 12. If symptom continues, test contactor for proper operation, and replace as required (WP 0052, Remove/Install Contactor).
- STEP 13. If symptom continues, check DCS LEDs, and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1918: Fuel Level Low] displayed on DCS screen.

NOTE

[Fault 1918: Fuel Level Low] indicates that there are approximately 4 min left (1% of fuel supply left) until the generator set will be out of fuel.

MALFUNCTION

Low fuel level or fuel level sensor malfunction.

CORRECTIVE ACTION

- STEP 1. Verify generator set fuel level and refill as required (WP 0039, Service Fuel System).
- STEP 2. If symptom continues, proceed to [Warning 2936: Fuel Level Sensor High] displayed on DCS screen symptom.

SYMPTOM

[Fault 2335: Excitation Fault] displayed on DCS screen.

MALFUNCTION

Circuit breaker, wiring, or AC generator malfunction.

CORRECTIVE ACTION

- STEP 1. Check circuit breakers to ensure they are installed securely in relay panel (WP 0061, Remove/Install Relay Panel).
- STEP 2. If symptom continues, check circuit breaker CB10 ALT QUAD 1 and CB11 ALT QUAD 2 to see if tripped, and reset as required (WP 0061, Remove/Install Relay Panel).
- STEP 3. Attempt restart (TM 9-6115-749-10).
- STEP 4. If restart fails or circuit breaker trips again, proceed to STEP 5.

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

NOTE

Wires P1-A, P1-R, and P1-C run from DCS P1 through P500 which plugs into J500 on printed circuit board module. Wires P501-9, P501-5, and P501-11 run from J501 to P501 to contactor terminals A1 through C1 to sense generator set voltage.

- STEP 5. Use wiring diagrams (Foldout Pages) to locate and inspect wires from contactor (K1) to printed circuit board module J501 for damage, moisture, bent pins or connectors, or improper connections.
- STEP 6. Repair or replace wiring or connectors as required (WP 0093, General Maintenance).
- STEP 7. Use wiring diagrams (Foldout Pages) to locate and inspect wires P1-A, P1-R, and P1-C running from P500 and J500 on printed circuit board module to J1 and P1 of DCS for damage, moisture, bent pins or connectors, or improper connections.
- STEP 8. Repair or replace wiring or connectors as required (WP 0093, General Maintenance).
- STEP 9. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries), remove connectors, and check all wires inspected in STEP 5 and STEP 7 for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 10. Repair or replace wiring as required and install connectors (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).

NOTE

Wires P1-J and P1-K run to connector P90 from DCS (P1) to excite the AC alternator field. Wires P85-1 and P85-2 (quad circuit wires to sense AC generator voltage) run from the relay panel through plug P5D to the quad in the AC generator. Wires P1-L and P1-M run to P5D from the DCS (P1).

- STEP 11. If circuit breaker trips again, use wiring diagrams (Foldout Pages) to locate and check wires running from AC generator to plug P90 and to plug P85 for damage, moisture, bent pins or connectors, or improper connection.
- STEP 12. Repair or replace wiring or connectors as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 13. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries), remove wiring connector, and test wires running from P85 to P5D (wires P85-1 and P85-2) at relay panel (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 14. Repair or replace wiring as required, and install connector (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 15. Inspect P5D pins (A, B, G and H) and connector at relay panel (Foldout Pages) for damage to pins, poor connections, and moisture.
- STEP 16. Replace or repair wiring as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 17. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries), and remove connector to test wires running from P5D to DCS P1 (wires P1-L and P1-M) at relay panel (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 18. Repair or replace wiring as required and install connector (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 19. Inspect P1 and J1 at DCS (Foldout Pages) for damage to pins, poor connections, and moisture.
- STEP 20. Repair or replace wiring or connectors as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 21. If symptom continues, test AC generator (WP 0051, Test AC Generator), and replace as required (WP 0049, Remove/Install 50/60 Hz AC Generator Assembly or WP 0050, Remove/Install 400 Hz AC Generator Assembly).
- STEP 22. If symptom continues, troubleshoot engine for poor performance (WP 0011, Engine System Troubleshooting without a DCS Code).
- STEP 23. If symptom continues, check DCS LEDs for proper function (DS1100 for proper AVR function), and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
- STEP 24. If symptom continues, replace AC generator (WP 0049, Remove/Install 50/60 Hz AC Generator Assembly or WP 0050, Remove/Install 400 Hz AC Generator Assembly).

SYMPTOM

[Fault 2914: Genset AC Meter Failed] displayed on DCS screen.

MALFUNCTION

Generator set AC meter failure.

CORRECTIVE ACTION

Check DCS LEDs and replace DCS as required or if symptom continues (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 2972: Field Overload] displayed on DCS screen.

MALFUNCTION

Faulty AC generator components or AVR.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

SYMPTOM

[Fault 3664: Invalid Genset Configuration] displayed on DCS screen.

MALFUNCTION

Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

- STEP 1. Check position of dip switches against settings recorded during removal or replacement to see if there is an incorrect setting (WP 0058, Remove/Install Printed Circuit Board Module).
- STEP 2. Check dip switch settings against data in WP 0058, Remove/Install Printed Circuit Board Module.
- STEP 3. Move dip switch(es) to correct setting as required (WP 0058, Remove/Install Printed Circuit Board Module).

NOTE

Wires P3-m, P3-n, P3-s, P3-GG, P3-LL, and P3-MM are for dip switch settings. They are pins or sleeves 20, 28, 38, 39, 40, and 50 on P3, J3, P500, and J500.

- STEP 4. If symptom continues, use wiring diagrams (Foldout Pages) to find and inspect wires, pins, sleeves, and connectors on DCS P3 and plug P500 to J500 on printed circuit board module for damage to pins or sleeves, poor connections, and moisture.
- STEP 5. Replace or repair any wires, connectors, or pins as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).

- STEP 6. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove connectors, and use wiring diagrams (Foldout Pages) to check wiring inspected in STEP 4 for shorts and opens using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 7. Replace or repair any wires, connectors, or pins as required, and install connectors (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 8. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
- STEP 9. If symptom continues, replace printed circuit board module (WP 0058, Remove/Install Printed Circuit Board Module).

SYMPTOM

[Fault 3665: Invalid Voltage Configuration] displayed on DCS screen.

NOTE

[Fault 3665: Invalid Voltage Configuration] appears on DCS screen if an invalid voltage selection switch or some other fault or invalid selection occurs when generator set is not running.

MALFUNCTION

Voltage selection fault.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Examine the position of the voltage selection switch to determine that it is at desired voltage configuration and fasteners are to correct torque (WP 0054, Remove/Install Voltage Selection Switch).
- STEP 2. Move switch handle to the desired voltage position and tighten as required (WP 0054, Remove/Install Voltage Selection Switch and TM 9-6115-749-10).
- STEP 3. If symptom continues, use wiring diagrams (Foldout Pages) to confirm voltage selection switch is wired correctly.
- STEP 4. Adjust wiring as required (WP 0054, Remove/Install Voltage Selection Switch).
- STEP 5. If symptom continues, check connections and wiring from plug P503 to AUX CONTACT connector on printed circuit board module for damage to pins or sleeves, poor connections, or moisture.
- STEP 6. Repair or replace as required (WP 0058, Remove/Install Printed Circuit Board Module and WP 0093, General Maintenance).
- STEP 7. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove wires as required, and test wires P503-1, P503-2, P503-3, and P503-4 running to voltage selection switch terminals 81, 82, 83, and 84

(S501-AUX) using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0093, General Maintenance).

STEP 8. Repair or replace wiring as required and install wires (WP 0054, Remove/Install Voltage Selection Switch and WP 0093, General Maintenance).

STEP 9. If symptom continues, replace voltage selection switch (WP 0054, Remove/Install Voltage Selection Switch).

STEP 10. If symptom continues, check DCS LEDs, and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 3668: Output Voltage Configuration Bit 0 Changed] or [Fault 3669: Output Voltage Configuration Bit 1 Changed] displayed on DCS screen.

NOTE

[Fault 3668: Output Voltage Configuration Bit 0 Changed] or [Fault 3669: Output Voltage Configuration Bit 1 Changed] appears on DCS screen when a change occurs while generator set is running (e.g. voltage selection switch change or wire vibrating loose).

MALFUNCTION

Voltage selection fault.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 3665: Invalid Voltage Configuration] displayed on DCS screen symptom.

SYMPTOM

[Fault 3673: Convenience Receptacle AC Meter Failed] displayed on DCS screen.

MALFUNCTION

Convenience receptacle AC meter failed.

CORRECTIVE ACTION

Check DCS LEDs and replace DCS as required or if symptom continues (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 3677: Genset Config Factory Test Fault] displayed on DCS screen.

MALFUNCTION

Factory calibration error.

CORRECTIVE ACTION

Replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 135: Oil Pressure Sensor High] displayed on DCS screen.

MALFUNCTION

Voltage above normal or shorted to a high source.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at oil pressure sender and DCS. Reseat wiring connections into connection ends as required (WP 0017, Remove/Install DCS and WP 0063, Test Engine Oil Pressure).
- STEP 2. If symptom continues, inspect wiring connections at oil pressure sensor and DCS for damage to pins or wires.
- STEP 3. If damage to pins or wires is found, repair or replace as required (WP 0017, Remove/Install DCS; WP 0063, Test Engine Oil Pressure; and WP 0093, General Maintenance).

NOTE

Measure resistance of oil pressure sender from pin B (supply voltage) to pin C (signal) of oil pressure sender.

- STEP 4. If symptom continues, remove wire connector (WP 0063, Test Engine Oil Pressure) and test oil pressure sender for correct resistance using a multimeter set to test Ohms (WP 0093, General Maintenance).
- STEP 5. Replace oil pressure sender if value is more than 100,000 Ω or approximately 0 Ω , and install wire connector (WP 0063, Test Engine Oil Pressure).

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

The oil pressure sender (P40) runs directly to the DCS. P3-f supplies 5 VDC to the oil pressure sender, P3-g is the signal wire, and P3-k is the return. All wires enter the DCS through plug P3 (pins B, C, and A) to DCS J3.

- STEP 6. If symptom continues, turn engine control switch to PRIME & RUN (TM 9-6115-749-10), remove wiring connector (WP 0063, Test Engine Oil Pressure), and test supply voltage to oil pressure sender using a multimeter set to test VDC (WP 0093, General Maintenance).

- STEP 7. If supply voltage is within 4.75 VDC to 5.25 VDC range, proceed to STEP 11.
- STEP 8. If supply voltage is not within 4.75 VDC to 5.25 VDC range, turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and check engine wiring harness for shorts and opens using a multimeter set to test continuity (WP 0093, General Maintenance and TM 9-6115-749-10).
- STEP 9. Repair or replace engine wiring harness as required and install connector (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 10. If symptom continues, replace engine wiring harness (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 11. If symptom continues, turn engine control switch to OFF if not already in OFF position, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and use a multimeter set to test continuity to check signal wire P3-g for opens or shorts (WP 0093, General Maintenance and TM 9-6115-749-10).
- STEP 12. Repair or replace wiring as required and install connector (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 13. If symptom continues, replace oil pressure sender if not already replaced as a result of STEP 5 (WP 0063, Test Engine Oil Pressure).
- STEP 14. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 141: Oil Pressure Sensor Low] displayed on DCS screen.

MALFUNCTION

Voltage below normal or shorted to a low source.

CORRECTIVE ACTION**NOTE**

The troubleshooting procedures for DCS code 141 are IAW DCS code 135. The difference between the two codes is the type of short or open, resulting in low voltage for DCS code 141 or high voltage for DCS code 135.

Troubleshoot IAW [Warning 135: Oil Pressure Sensor High] displayed on DCS screen symptom.

SYMPTOM

[Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen.

NOTE

OOR means "Out Of Range." [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen indicates high signal voltage and/or a short to a high source. [Warning 145: Coolant Temp Sensor OOR Low] displayed on DCS screen indicates low signal voltage and/or a short to a low source (ground/return ground). A shorted return can cause multiple fault or warning codes to be active on the DCS screen.

MALFUNCTION

Defective temperature sensor, poor wiring connection, or a short.

CORRECTIVE ACTION

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at engine wiring harness, temperature sensor, and DCS. Tighten wires into connection ends if necessary (WP 0059, Remove/Install Engine Wiring Harness).
- STEP 2. If symptom continues, test temperature sensor and replace as required (WP 0072, Remove/Install Thermostat Housing).
- STEP 3. If symptom continues, inspect wiring connections at engine wiring harness, temperature sensor, and DCS for damage to pins or wires (WP 0059, Remove/Install Engine Wiring Harness).
- STEP 4. If damage to pins or wires is found, repair or replace as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Connector P35 attaches to coolant temperature sensor (MT35). From P35, wires P3-h and P3-q on connector P3 (pins A and B) run to DCS J3.

- STEP 5. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-749-10).
- STEP 6. Remove wiring connector and test supply voltage to coolant temperature sensor using wiring diagrams and a multimeter set to test VDC (WP 0093, General Maintenance and Foldout Pages).
- STEP 7. If supply voltage is within 9.5 VDC to 10.5 VDC range, proceed to STEP 11.
- STEP 8. If supply voltage is not within 9.5 VDC to 10.5 VDC range, turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and check engine wiring harness for shorts and opens using wiring diagrams and multimeter set to test continuity (WP 0093, General Maintenance; Foldout Pages; and TM 9-6115-749-10).
- STEP 9. Repair or replace wiring harness as required and install wiring connector (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 10. If symptoms continue, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
- STEP 11. If symptom continues, turn engine control switch to OFF and replace coolant temperature sensor if not already replaced as a result of STEP 2 (WP 0072, Remove/Install Thermostat Housing and TM 9-6115-749-10).
- STEP 12. If symptoms continue, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 145: Coolant Temp Sensor OOR Low] displayed on DCS screen.

MALFUNCTION

Voltage below normal or shorted to a low source.

CORRECTIVE ACTION

Troubleshoot IAW [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen symptom.

SYMPTOM

[Warning 319: Real Time Clock Error] displayed on DCS screen.

MALFUNCTION

Clock no longer accurate due to temporary power loss or backup battery failure.

CORRECTIVE ACTION

STEP 1. Reset clock IAW TM 9-6115-749-10.

STEP 2. If symptom continues, remove DCS control panel assembly (WP 0018, Repair DCS) to check for loose backup battery, and secure as required.

STEP 3. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 441: Low Battery Voltage] displayed on DCS screen.

MALFUNCTION

Battery or charging failure.

CORRECTIVE ACTION

Troubleshoot IAW [Warning 1442: Weak Battery] displayed on DCS screen symptom.

SYMPTOM

[Warning 442: High Battery Voltage] displayed on DCS screen.

MALFUNCTION

Alternator or DCS failure.

CORRECTIVE ACTION

STEP 1. Test battery-charging alternator assembly and replace as required (WP 0075, Remove/Install Battery-Charging Alternator).

STEP 2. If symptom continues, test DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 1131: Battle Short Active] displayed on DCS screen.

MALFUNCTION

BATTLESHORT switch malfunction.

CORRECTIVE ACTION

STEP 1. Ensure BATTLESHORT switch is in OFF position (TM 9-6115-749-10).

STEP 2. If BATTLESHORT is ON, determine reason for use and switch OFF as required (TM 9-6115-749-10).

STEP 3. If symptom continues, test BATTLESHORT switch and replace as required (WP 0018, Repair DCS).

STEP 4. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 1417: Power Down Failure] displayed on DCS screen.

MALFUNCTION

DCS malfunction.

CORRECTIVE ACTION

Check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 1441: Low Fuel Level] displayed on DCS screen.

NOTE

[Fault 1441: Fuel Level Low] indicates that there is 5% of fuel supply left until the generator set will be out of fuel.

MALFUNCTION

Low fuel level or sensor malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1918: Fuel Level Low] displayed on DCS screen symptom.

SYMPTOM

[Warning 1442: Weak Battery] displayed on DCS screen.

NOTE

[Warning 1442: Weak Battery] displays when battery voltage is below 14.4 V. [Warning 441: Low Battery Voltage] displays when battery voltage is below 21 V.

MALFUNCTION

Battery connections are loose or batteries are insufficiently charged.

CORRECTIVE ACTION**WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0036, Remove/Install Batteries).
- STEP 2. If symptom continues, test batteries (WP 0036, Remove/Install Batteries).
- STEP 3. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0036, Remove/Install Batteries and WP 0093, General Maintenance).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Loose belt, defective battery-charging alternator, or defective electrical component.

CORRECTIVE ACTION

- STEP 1. Check for loose battery-charging alternator belt and adjust tension or replace as required (WP 0076, Remove/Install Battery-Charging Alternator Belt).
- STEP 2. Observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-749-10).
- STEP 3. Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0075, Remove/Install Battery-Charging Alternator).
- STEP 4. If symptom continues, check DCS LEDs (WP 0018, Repair DCS) and replace as required (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 1444: KW Overload] displayed on DCS screen.

MALFUNCTION

Load cable or wiring malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1445: Short Circuit] displayed on DCS screen symptom.

SYMPTOM

[Warning 1449: Overfrequency] displayed on DCS screen.

MALFUNCTION

Generator AC output frequency is high.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

- STEP 1. Check for sudden reduction in load demands. Adjust governor gain as required (WP 0017, Remove/Install DCS).
- STEP 2. If symptom continues, ensure load cables are completely disconnected and check for shorts or opens in the load using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 3. Repair or replace load components as required.
- STEP 4. If symptom continues, check frequency, voltage selection, and voltage settings on DCS (TM 9-6115-749-10).
- STEP 5. If incorrect, adjust settings as required (TM 9-6115-749-10).
- STEP 6. If symptom continues, troubleshoot IAW [Fault 115: Speed Signal Lost] displayed on DCS screen symptom.

SYMPTOM

[Warning 1451: Genset/Bus Voltage Mismatch] displayed on DCS screen.

MALFUNCTION

DCS fault.

CORRECTIVE ACTION**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

[Warning 1451: Genset/Bus Voltage Mismatch] indicates a calibration error with the metering circuits on the DCS. The offset in the meters can be hand-calibrated using InPower AMMPS software.

If [Warning 1451: Genset/Bus Voltage Mismatch] is hardware and not calibration error related, there was an extreme voltage drop through the contactor and/or its connections. A damaged contactor, poor connections in the output box between the bus sense voltage and generator sense voltage, or a poor DCS harness connection could cause the warning.

- STEP 1. If operating in parallel, ensure all generator sets in parallel are shut down. If not operating in parallel proceed to STEP 3.
- STEP 2. Check connections between generators and ensure voltage and frequency of generator sets are at the same settings (TM 9-6115-749-10).

NOTE

Wires P1-A, P1-R, and P1-C run from DCS P1 through P500 which plugs into J500 on printed circuit board module. Wires P501-9, P501-5, and P501-11 run from J501 to P501 to contactor terminals A1 through C1 to sense generator set voltage.

- STEP 3. If symptom continues, check for loose voltage sense connections at DCS, printed circuit board module, and contactor (Foldout Pages). Tighten as required.
- STEP 4. If symptom continues, use wiring diagrams (Foldout Pages) to locate and inspect wires from contactor (K1) to printed circuit board module J501 for damage, moisture, bent pins or connectors, or improper connections.
- STEP 5. Repair or replace wiring or connectors as required (WP 0093, General Maintenance).
- STEP 6. If symptom continues, use wiring diagrams (Foldout Pages) to locate and inspect wires P1-A, P1-R, and P1-C running from P500 and J500 on printed circuit board module to J1 and P1 of DCS for damage, moisture, bent pins or connectors, or improper connections.
- STEP 7. Repair or replace wiring or connectors as required (WP 0093, General Maintenance).
- STEP 8. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries), remove wires as required, and check all wires inspected in STEP 4 and STEP 6 for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 9. Repair or replace wiring as required and install wires (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 10. If symptom continues, test contactor and replace as required (WP 0052, Remove/Install Contactor).
- STEP 11. If symptom continues, recalibrate DCS using InPower AMMPS software (WP 0093, General Maintenance).

STEP 12. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 1469: Speed/Hz Mismatch] displayed on DCS screen.

MALFUNCTION

Speed sensor error or flywheel damage.

CORRECTIVE ACTION

STEP 1. Inspect flywheel for missing teeth or other damage (WP 0085, Remove/Install Flywheel).

STEP 2. Replace as required (WP 0085, Remove/Install Flywheel).

STEP 3. If symptom continues or flywheel is not damaged, troubleshoot IAW [Fault 115: Speed Signal Lost] displayed on DCS screen symptom.

SYMPTOM

[Warning 1471: High Current Warning] displayed on DCS screen.

MALFUNCTION

Short, overload, or AC generator malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1472: High Current] displayed on DCS screen symptom.

SYMPTOM

[Warning 1689: Reset Real Time Clock] displayed on DCS screen.

MALFUNCTION

Clock no longer accurate due to temporary power loss or backup battery failure.

CORRECTIVE ACTION

STEP 1. Reset clock IAW TM 9-6115-749-10.

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2336: Checksum Fault] displayed on DCS screen.

MALFUNCTION

Calibration file error.

CORRECTIVE ACTION**NOTE**

[Warning 2336: Checksum Fault] only occurs while installing a calibration file. DCS code may display during process or at end of process.

STEP 1. Attempt to reinstall the calibration file IAW Recovering AMMPS DCS if Initial Calibration Fails task (WP 0093, General Maintenance).

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2915: Genset Bus AC Meter Failed] displayed on DCS screen.

MALFUNCTION

Generator set Bus AC meter failed.

CORRECTIVE ACTION**NOTE**

Failure of bus AC meter will disable paralleling functions for a generator set.

STEP 1. Press FAULT RESET to attempt to clear fault (TM 9-6115-749-10).

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2917: Genset Bus Voltage High] displayed on DCS screen.

MALFUNCTION

Paralleling or voltage sense fault.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 1. If operating in parallel, check connections between generators, and ensure voltage and frequency of both generator sets are at the same settings (TM 9-6115-749-10).

STEP 2. If symptom continues, troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

SYMPTOM

[Warning 2936: Fuel Level Sensor High] displayed on DCS screen.

MALFUNCTION

Fuel level sensor malfunction.

CORRECTIVE ACTION**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

The fuel level sensor contains three wires that run to connector P70: P3-F (12 VDC supply), P3-G (signal wire, 0.25 VDC empty tank to 4.75 VDC full tank range), and P3-j (return). All wires run to DCS through P3 connector.

- STEP 1. Ensure connections are installed securely at fuel level sensor and DCS (WP 0045, Remove/Install Fuel Level Sensor and WP 0017, Remove/Install DCS).
- STEP 2. If symptom continues, remove connector from fuel level sensor, turn engine control switch to PRIME & RUN (TM 9-6115-749-10), and use a multimeter set to test VDC (WP 0093, General Maintenance) to check P3-F and P3-j for voltage at P70 connector (Foldout Pages).
- STEP 3. If value is outside of 12 VDC range $\pm 10\%$, proceed to STEP 5.
- STEP 4. If value is within 12 VDC range $\pm 10\%$, proceed to STEP 8.
- STEP 5. Turn engine control switch to OFF (TM 9-6115-749-10), ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and use a multimeter set to continuity to test wiring (wires P3-F, P3-G, and P3-j) from fuel level sensor unit wiring harness connector to DCS for opens and shorts (WP 0093, General Maintenance).
- STEP 6. Repair or replace wiring as required and install connector (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 7. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
- STEP 8. Turn engine control switch to OFF and test fuel level sensor (MT70) RED/WHT wire (A) and BLACK wire (B) using a multimeter set to test Ohms (WP 0093, General Maintenance and TM 9-6115-749-10).
- STEP 9. Replace fuel level sensor if Ohms reading stays at zero or shows infinite reading indicating an open. Install connector as required (WP 0045, Remove/Install Fuel Level Sensor).
- STEP 10. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove connector, and test wire P3-j from P70 to DCS P3 for opens or shorts using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 11. Repair or replace wiring harness as required and install connector (WP 0059, Remove/Install Engine Wiring Harness).

STEP 12. If symptom continues and fuel level sensor has not been replaced, replace fuel level sensor (WP 0045, Remove/Install Fuel Level Sensor).

STEP 13. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2937: Fuel Level Sensor Low] displayed on DCS screen.

MALFUNCTION

Fuel level sensor malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Warning 2936: Fuel Level Sensor High] displayed on DCS screen symptom.

SYMPTOM

[Warning 2967: Governor Fault] displayed on DCS screen.

MALFUNCTION

Governor actuator malfunction.

CORRECTIVE ACTION

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

STEP 1. Inspect wiring connectors and wiring running to governor actuator on fuel injection pump (Foldout Pages) for loose connections, loose, damaged, or missing pins, and damaged wiring.

STEP 2. Replace or repair wiring as required (WP 0093, General Maintenance and WP 0059, Remove/Install Engine Wiring Harness).

NOTE

The governor actuator resistance specification of $19.9 \Omega \pm 5\%$ is for room temperature (68°F (20°C)). The resistance increases about 0.22% per degree Fahrenheit (0.12% per degree Celsius) above room temperature. It will decrease at the same rate below 68°F (20°C). The governor actuator will generally fail by way of an open circuit, coil short to actuator housing, or a resistance decrease due to a partial failure. Partial failure typically causes rapid failure (short circuit) once it begins.

STEP 3. If symptom continues, remove wiring connector from governor actuator and test pins on governor actuator for resistance (WP 0071, Remove/Install Fuel Injection Pump and WP 0093, General Maintenance).

STEP 4. Replace governor actuator if resistance is outside of specification or proceed to STEP 5 if within specification (WP 0071, Remove/Install Fuel Injection Pump).

NOTE

Wires P2-J and P2-M run from DCS to P37 at governor actuator.

STEP 5. Ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries) and test wiring from governor actuator to DCS (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance).

STEP 6. Repair or replace wiring as required and install connector (WP 0093 and WP 0059, Remove/Install Engine Wiring Harness).

STEP 7. If symptom continues, test DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2968: AVR Fault] displayed on DCS screen.

MALFUNCTION

Wiring or AC generator failure.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

SYMPTOM

[Warning 3662: Battery Discharge] displayed on DCS screen.

MALFUNCTION

Loose belt, defective battery-charging alternator, or defective electrical component.

CORRECTIVE ACTION

STEP 1. Check for loose battery-charging alternator belt and adjust tension or replace as required (WP 0076, Remove/Install Battery-Charging Alternator Belt).

STEP 2. If battery-charging alternator belt is not loose, test battery-charging alternator and replace as required (WP 0075, Remove/Install Battery-Charging Alternator).

STEP 3. If symptom continues, check wiring connections to ensure that they are seated securely into connection ends at battery current sensor and DCS. Reseat wiring connections into connection ends as required (WP 0059, Remove/Install Engine Wiring Harness).

STEP 4. If symptom continues, inspect wiring connections at battery current sensor and DCS for damage to pins or wires.

STEP 5. If damage to pins or wires is found, repair or replace as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Wires P3-E, P3-r, and P3-J run from DCS to connector P5 at battery current sensor. P3-E supplies 5 VDC to battery current sensor, P3-r is the return, and P3-J is the signal wire.

- STEP 6. If symptom continues, turn engine control switch to PRIME & RUN, remove connector, and use a multimeter set to test VDC to check connector P5 at battery current sensor for 4.75 to 5.25 VDC from P3-E to P3-r (WP 0093, General Maintenance and TM 9-6115-749-10).
- STEP 7. If voltage is within range, proceed to STEP 9.
- STEP 8. If voltage is not within range, proceed to STEP 12.
- STEP 9. Turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries) and use wiring diagrams (Foldout Pages) to check signal wire (P3-J) from battery current sensor to DCS for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 10. Repair or replace wiring as required and install connector (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 11. If symptom continues, replace battery current sensor as required.
- STEP 12. Turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries) and use wiring diagrams (Foldout Pages) to check wiring from battery current sensor to DCS for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 13. Repair or replace wiring as required and install connector (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 14. If symptom continues, check DCS LEDs and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 3666: Master Control Switch Configuration] displayed on DCS screen.

MALFUNCTION

Engine control switch fault.

CORRECTIVE ACTION

- STEP 1. Rotate engine control switch and confirm that engine control switch is not between two positions.
- STEP 2. Confirm proper installation of engine control switch and check for loose or damaged wires (WP 0018, Repair DCS). Repair or replace as required (WP 0018, Repair DCS).
- STEP 3. If symptom continues, test engine control switch and replace as required (WP 0018, Repair DCS).
- STEP 4. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 3672: Automatic Field Flash Not Complete] displayed on DCS screen.

MALFUNCTION

Wiring or DCS malfunction.

CORRECTIVE ACTION**NOTE**

DCS wires P1-J and P1-K run from DCS P1 to connector P90 to flash the AC alternator field.

- STEP 1. Use wiring diagrams (Foldout Pages) to locate and check wires running from AC generator to plug P90 to DCS J1 for damage, moisture, bent pins or connectors, or improper connection.
- STEP 2. Repair or replace as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 3. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove connector (WP 0059, Remove/Install Engine Wiring Harness), and test wires P1-J and P1-K to pins J and K in DCS P1 (Foldout Pages) for opens or shorts using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 4. Repair or replace wiring as required and install connector (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 5. If symptom continues, test AC generator (WP 0051, Test AC Generator) and replace as required (WP 0049, Remove/Install 50/60 Hz AC Generator Assembly or WP 0050, Remove/Install 400 Hz AC Generator Assembly).
- STEP 6. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 3674: Genset Configuration Change] displayed on DCS screen.

NOTE

[Warning 3674: Genset Configuration Change] displays on DCS screen when the control cards of the DCS recognize the configuration has changed. This warning is most likely when a DCS is moved from one size generator set to a different size generator set. FAULT RESET can be selected and normal use of the generator set can continue. If the symptom continues, then troubleshooting procedures will need to be followed.

MALFUNCTION

Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 3664: Invalid Genset Configuration] displayed on DCS screen symptom.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

TM 9-6115-749-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0036, Remove/Install Batteries

WP 0037, Remove/Install Main DC Circuit Breaker

References

WP 0055, Remove/Install Hour Meter

WP 0056, Remove/Install Convenience Receptacle

WP 0058, Remove/Install Printed Circuit Board Module

WP 0059, Remove/Install Engine Wiring Harness

WP 0060, Remove/Install Power Wiring Harness

WP 0061, Remove/Install Relay Panel

WP 0068, Remove/Install Glow Plugs

WP 0075, Remove/Install Battery-Charging Alternator

WP 0093, General Maintenance

Foldout Pages

ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are operating. Failure to comply may cause injury or death to personnel.

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

SYMPTOM

DCS indicates no power available and no lighted display.

MALFUNCTION

Battery malfunction.

CORRECTIVE ACTION

WARNING

Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.

Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. If main DC circuit breaker is in OFF/TRIP position, move switch handle to RESET→ON position to reset circuit breaker.
- STEP 2. If main DC circuit breaker remains in the RESET→ON position and DCS illuminates, resume operation.
- STEP 3. If main DC circuit breaker continues to trip, proceed to next malfunction.
- STEP 4. If main DC circuit breaker remains in the RESET→ON position and DCS still has no lighted display, proceed to STEP 5.
- STEP 5. Use DEAD CRANK SWITCH to see if batteries turn engine over (TM 9-6115-749-10).
- STEP 6. If engine turns over, proceed to Defective DCS malfunction.
- STEP 7. If engine does not turn over, continue to STEP 8.
- STEP 8. Examine battery posts, cables, and connectors for looseness, corrosion, or other damage.
- STEP 9. Clean and tighten corroded and loose connectors and replace any connecting cables that show signs of damage.
- STEP 10. If symptom continues, completely disconnect the batteries from battery cables (WP 0036, Remove/Install Batteries).

STEP 11. Test batteries and jump start, charge, or replace as required (WP 0036, Remove/Install Batteries and WP 0093, General Maintenance).

STEP 12. If symptom continues, proceed to next malfunction.

MALFUNCTION

Circuit breaker or wiring malfunction.

CORRECTIVE ACTION

WARNING

High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

- STEP 1. Check circuit breakers in relay panel (RP201) to see if tripped (WP 0061, Remove/Install Relay Panel).
- STEP 2. Reset circuit breaker(s) if tripped and check for signs of damage such as excessive heat or burned insulation (WP 0061, Remove/Install Relay Panel).
- STEP 3. If heat or insulation damage is found, replace circuit breaker or relay and proceed to STEP 5 and follow troubleshooting to find failed component or location of short.
- STEP 4. If no signs of excessive heat or burned insulation are found but circuit breaker trips again, troubleshoot appropriate circuit using wiring diagrams and a multimeter set to test continuity (WP 0061, Remove/Install Relay Panel; WP 0093, General Maintenance; and Foldout Pages).
- STEP 5. If symptom continues, test main DC circuit breaker (WP 0037, Remove/Install Main DC Circuit Breaker). Replace as required.
- STEP 6. If main DC circuit breaker test shows main DC circuit breaker functioning properly, disconnect battery leads (WP 0036, Remove/Install Batteries) and proceed to STEP 7.

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

If continuity is found between ground and load wire, a short circuit exists within Relay Panel 201 (RP201), battery-charging alternator, the glow plugs relay (K18), or the glow plug circuit to ground.

- STEP 7. Ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries) and use a multimeter selected to test continuity to check for shorts to ground in load wires from the main DC circuit breaker (Foldout Pages and WP 0093, General Maintenance).
- STEP 8. If short circuit is found, continue to STEP 10.
- STEP 9. If no short circuit is found, proceed to next malfunction.

-
- STEP 10. Disconnect load wires from load terminal of the main DC circuit breaker to separate for individual circuit analysis (WP 0061, Remove/Install Relay Panel and Foldout Pages).
- STEP 11. Test wires for shorts using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 12. If short circuit is found, examine wiring and components within the isolated short circuit(s) visually to determine the wiring or component that is creating the short circuit.
- STEP 13. If visual examination reveals damaged wiring and/or components, repair and/or replace the damaged wiring (WP 0060, Remove/Install Power Wiring Harness) and/or components (WP 0061, Remove/Install Relay Panel; WP 0075, Remove/Install Battery-Charging Alternator; and WP 0068, Remove/Install Glow Plugs).
- STEP 14. If visual examination does not reveal damage caused by a short circuit, disconnect each component at the terminal wires and check for shorts to ground of each component using a multimeter set to test continuity (Foldout Pages and WP 0093, General Maintenance).
- STEP 15. Replace battery-charging alternator if continuity is found (WP 0075, Remove/Install Battery-Charging Alternator).
- STEP 16. If continuity is found in glow plug circuit, test glow plugs (WP 0068, Remove/Install Flow Plugs), and repair or replace as required (WP 0068, Remove/Install Glow Plugs).
- STEP 17. If continuity is found in RP201, determine whether the relay panel or a circuit or component powered from the relay panel is short circuited to ground using wiring diagrams and a multimeter set to test continuity (Foldout Pages and WP 0093, General Maintenance).
- STEP 18. Identify, isolate, and repair or replace plug connectors and/or components or wires that show evidence of a short circuit (WP 0059, Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 19. If there are no visual damages or odor of burned insulation, open relay panel cover to examine internal components for signs of excessive heat and/or the odor of burned insulation.
- STEP 20. If the wiring and/or components subjected to short circuit have been identified by a tripped circuit breaker (STEPS 1 through 4), remove the tripped circuit breaker and use wiring diagrams to find the cause of the short circuit (Foldout Pages).
- STEP 21. Repair or replace wiring as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 22. If symptom continues, test relays (WP 0061, Remove/Install Relay Panel).
- STEP 23. Replace any relays and/or wiring that indicate short circuit until the cause of the short circuit has been eliminated (WP 0061, Remove/Install Relay Panel).
- STEP 24. If symptom continues, proceed to next malfunction.

MALFUNCTION

Defective DCS.

CORRECTIVE ACTION

- STEP 1. Check P1, P2, and P3 at DCS, and ensure they are connected and tight. Connect or tighten as required (WP 0017, Remove/Install DCS).
- STEP 2. If symptom continues, check connections at relay control panel, and ensure they are tight and secure. Tighten or secure as required (WP 0061, Remove/Install Relay Panel).
- STEP 3. If symptom continues, check CB7 in relay control panel to make sure it is secure and has not been tripped. Secure or reset as required (WP 0061, Remove/Install Relay Panel).

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

Wires P2-A, P2-B, and P2-C provide battery power to the DCS.

- STEP 4. If breaker trips again, check wires P2-A, P2-B, and P2-C to DCS J2 and RP 201 P5D for proper connections, opens, or shorts using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 5. Repair or replace wires, and reset or replace CB7 as required (WP 0093, General Maintenance and WP 0061, Remove/Install Relay Panel).
- STEP 6. If symptom continues or breaker was not tripped in STEP 3, check DCS LEDs, and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

EMERGENCY STOP push button fails to stop generator set.

MALFUNCTION

EMERGENCY STOP push button failure.

CORRECTIVE ACTION

- STEP 1. Push AC CIRCUIT INTERRUPT switch to place generator contactor in [CONTACTOR OPEN] position (TM 9-6115-749-10).

WARNING

While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply can cause injury or death to personnel.

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are operating. Failure to comply may cause injury or death to personnel.

STEP 2. Remove CB7 from relay panel (WP 0061, Remove/Install Relay Panel).

STEP 3. Place main DC circuit breaker in OFF/TRIP position (TM 9-6115-749-10).

STEP 4. Reinstall CB7 to relay panel (WP 0061, Remove/Install Relay Panel).

STEP 5. Test EMERGENCY STOP push button, and replace as required (WP 0018, Repair DCS).

SYMPTOM

No power to convenience receptacle or convenience receptacle fails to work.

MALFUNCTION

Convenience receptacle is defective or has been subjected to a ground fault condition.

CORRECTIVE ACTION

WARNING

Power is available to the convenience receptacle only when the main contactor is closed. Avoid accidental contact. Electrocution is possible. Failure to comply may cause injury or death to personnel.

STEP 1. Ensure [CONTACTOR] reads [CLOSED] on the DCS screen and generator set is generating power.

STEP 2. If contactor will not close, troubleshoot IAW Circuit interrupter will not close or open symptom.

NOTE

MEP 1030 and MEP 1031 contain a duplex receptacle as the convenience receptacle and a Ground Fault Interrupter (GFI) located inside the rear access door.

STEP 3. If generator set is operating and the [CONTACTOR] reads [CLOSED] (TM 9-6115-749-10), reset GFI and reset circuit breaker located above GFCI convenience receptacle as required (WP 0056, Remove/Install Convenience Receptacle). Proceed to STEP 4.

STEP 4. If circuit breaker located above convenience receptacle will not reset, replace circuit breaker (WP 0056, Remove/Install Convenience Receptacle).

STEP 5. If GFI will not reset, replace GFI (WP 0056, Remove/Install Convenience Receptacle).

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 6. If symptom continues (GFI and/or circuit breaker will not reset), replace convenience receptacle (WP 0056 Remove/Install Convenience Receptacle).

STEP 7. If symptom continues, shutdown generator set and remove battery ground cable (WP 0036, Remove/Install Batteries). Inspect wiring from L1, neutral, and ground output terminals to circuit breaker and GFI (Foldout Pages) for loose wires, corrosion, frayed wires, or damaged insulation.

STEP 8. Repair or replace wires as required (WP 0056, Remove/Install Convenience Receptacle and WP 0093, General Maintenance).

STEP 9. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), disconnect wires as required, and test all wires for shorts or opens using a multimeter set to test continuity (Foldout Pages and WP 0093, General Maintenance).

STEP 10. Repair or replace wires as required (WP 0056, Remove/Install Convenience Receptacle and WP 0093, General Maintenance).

STEP 11. If symptom continues, troubleshoot IAW [Fault 1445: Short Circuit] (WP 0008, Electrical System Troubleshooting with a DCS Code).

SYMPTOM

Circuit interrupter will not close or open.

MALFUNCTION

Contactor or wiring malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1452: Genset Contactor Fail To Close] (WP 0008, Electrical System Troubleshooting with a DCS Code).

SYMPTOM

Hour meter is no longer recording operating hours.

MALFUNCTION

Defective hour meter.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

Wires P2-T and P2-a run from DCS J2 to connector P2, which runs to P500. From P500, the wires go into the printed circuit board module pins 37 and 46 of J500. Wires M3-A and M3-C run from the printed circuit board module to the hour meter.

- STEP 1. Check wiring from hour meter to printed circuit board module for loose connections, bent tabs or pins, or frayed wiring (WP 0097, Wiring Diagrams).
- STEP 2. Repair or replace wiring as required (WP 0093, General Maintenance and WP 0058, Remove/Install Printed Circuit Board Module).
- STEP 3. If symptom continues, check wiring from DCS to printed circuit board module for loose connections, bent tabs or pins, or frayed wiring (Foldout Pages).
- STEP 4. Repair or replace wiring as required (WP 0093, General Maintenance and WP 0059, Remove/Install Engine Wiring Harness).
- STEP 5. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), disconnect wires as required, and check all wiring for shorts or opens using a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 6. Repair or replace as required (WP 0093, General Maintenance; WP 0058, Remove/Install Printed Circuit Board Module; and WP 0059, Remove/Install Engine Wiring Harness).
- STEP 7. If symptom continues, replace hour meter (WP 0055, Remove/Install Hour Meter).
- STEP 8. If symptom continues, check DCS LEDs, and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
ENGINE SYSTEM TROUBLESHOOTING WITH A DCS CODE

INITIAL SETUP:**Test Equipment**

Cable, Remote Control (WP 0162, Table 2, Item 6)
 Test Set, Electronic Systems (WP 0162, Table 2, Item 26)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Personnel Required

91D (1)

References

TM 9-6115-749-10
 WP 0008, Electrical System Troubleshooting with a DCS Code
 WP 0011, Engine System Troubleshooting without a DCS Code
 WP 0012, Exhaust System Troubleshooting without a DCS Code
 WP 0013, Winterization Kit Troubleshooting
 WP 0016, Field PMCS
 WP 0017, Remove/Install DCS
 WP 0018, Repair DCS
 WP 0019, Remove/Install Air Intake Hose Assemblies
 WP 0020, Service Air Cleaner Assembly
 WP 0029, Remove/Install Front Body Panel
 WP 0036, Remove/Install Batteries
 WP 0039, Service Fuel System
 WP 0040, Remove/Install Fuel Manifold
 WP 0041, Remove/Install Fuel Pump, Main/Auxiliary
 WP 0042, Remove/Install Fuel Filter/Water Separator Assembly

References

WP 0043, Remove/Install Fuel Filter/Water Separator Element
 WP 0059, Remove/Install Engine Wiring Harness
 WP 0060, Remove/Install Power Wiring Harness
 WP 0061, Remove/Install Relay Panel
 WP 0062, Test Engine Compression
 WP 0063, Test Engine Oil Pressure
 WP 0064, Remove/Install 50/60 Hz Engine Assembly
 WP 0065, Remove/Install 400 Hz Engine Assembly
 WP 0066, Service Lubrication System
 WP 0067, Remove/Install Engine Speed Sensor
 WP 0068, Remove/Install Glow Plugs
 WP 0069, Remove/Install Fuel Injector
 WP 0070, Remove/Install Speed Control Plate
 WP 0071, Remove/Install Fuel Injection Pump
 WP 0075, Remove/Install Battery-Charging Alternator
 WP 0077, Remove/Install Starter
 WP 0078, Remove/Install Governor Actuator
 WP 0083, Check/Adjust Engine Valves
 WP 0084, Remove/Install Oil Pan and Strainer
 WP 0085, Remove/Install Flywheel
 WP 0086, Remove/Install Crankcase Rear Bearing Case Cover
 WP 0093, General Maintenance
 WP 0096, Replace Cylinder Head Gasket
 Foldout Pages

ENGINE ASSEMBLY**WARNING**

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

NOTE

Capture spilled fluids and dispose of IAW local SOP.

SYMPTOM

[Fault 234: Overspeed Shutdown] displayed on DCS screen.

NOTE

[Warning 1992: High Speed Warning] displays on DCS when engine speed is 9% greater than rated speed. [Fault 234: Overspeed Shutdown] occurs when engine speed is 10% greater than rated speed.

MALFUNCTION

Large block load removal or vapor drawn into intake air passage.

CORRECTIVE ACTION

- STEP 1. Shut down and restart generator set (TM 9-6115-749-10).
- STEP 2. If symptom continues, adjust engine speed sensor (WP 0067, Remove/Install Engine Speed Sensor).
- STEP 3. If symptom continues, troubleshoot IAW [Fault 115: Speed Signal Lost] (WP 0008, Electrical System Troubleshooting With a DCS Code).

WARNING

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

- STEP 4. If symptom continues, check for source of flammable vapor being drawn into the intake air passage.
- STEP 5. Remove source of flammable vapor or relocate generator set as required.
- STEP 6. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 7. If symptom continues, replace speed control plate (WP 0070, Remove/Install Speed Control Plate).

SYMPTOM

[Fault 359: Fail to Start] displayed on DCS screen.

NOTE

[Fault 359: Fail to Start] displays once a failure to start results after a continuous crank engage time of 75 sec.

MALFUNCTION

Fuel tank is empty.

CORRECTIVE ACTION

- STEP 1. Check to see if there is fuel in the tank visually and check DCS screen for fuel status (TM 9-6115-749-10).
- STEP 2. If tank is empty, fill fuel tank (TM 9-6115-749-10).

- STEP 3. If symptom continues, ensure governor actuator connector is installed to wiring harness, and install as required (WP 0078, Remove/Install Governor Actuator).
- STEP 4. If symptom continues, inspect wiring harness at main and auxiliary fuel pumps, and ensure two connectors are installed to correct fuel pumps (WP 0041, Remove/Install Fuel Pump, Main/Auxiliary; WP 0059, Remove/Install Engine Wiring Harness; and Foldout Pages).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Dirty air cleaner element, intake air hose restriction, or excess backpressure.

CORRECTIVE ACTION

- STEP 1. Check air cleaner element and replace as required (WP 0020, Service Air Cleaner).
- STEP 2. Inspect intake hose for restriction or signs of damage and replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).
- STEP 3. If symptom continues, check for excess backpressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel system malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel filter/water separator for water, and drain fuel filter/water separator as required (TM 9-6115-749-10).
- STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0039, Service Fuel System).
- STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0043, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0039, Service Fuel System), and inspect fuel manifold for leaks or damage. Repair or replace as required (WP 0040, Remove/Install Fuel Manifold).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. Troubleshoot IAW [Warning 2967: Governor Fault] (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. Check fuel injection timing, and adjust as required (WP 0071, Remove/Install Fuel Injection Pump).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper clearance (open or close timing) of intake/exhaust valves.

CORRECTIVE ACTION

- STEP 1. Adjust valve clearance (WP 0083, Check/Adjust Engine Valves).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Cold weather conditions.

CORRECTIVE ACTION

NOTE

Glow plugs will turn on between 20°F and -25°F (-6°C and -32°C) and winterization kit will turn on below -25°F (-32°C).

- STEP 1. Allow time for winterization kit/starting aids to work if outside normal temperature range (TM 9-6115-749-10).
- STEP 2. If malfunction is suspected, troubleshoot IAW Cold weather starting aids fail to work properly (WP 0011, Engine System Troubleshooting without a DCS Code).
- STEP 3. If not operating in cold weather conditions, proceed to next malfunction.

MALFUNCTION

Leaking cylinder head gasket.

CORRECTIVE ACTION

- STEP 1. Visually inspect area around cylinder head gasket for leaks or signs of separation. Replace cylinder head gasket as required (WP 0096, Replace Cylinder Head Gasket).
- STEP 2. If symptom continues, examine oil on dipstick for evidence of coolant or other foreign fluid (TM 9-6115-749-10).
- STEP 3. If coolant or foreign fluid is found, change oil if not already changed as a result of troubleshooting (WP 0066, Service Lubrication System).
- STEP 4. If oil remains contaminated with coolant or foreign fluid, check engine compression (WP 0062, Test Engine Compression).

STEP 5. If compression is low or erratic or oil remains contaminated with coolant or foreign fluid, replace cylinder head gasket (WP 0096, Replace Cylinder Head Gasket).

STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection malfunction.

CORRECTIVE ACTION

STEP 1. Check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0069, Remove/Install Fuel Injector).

STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0069, Remove/Install Fuel Injector).

STEP 3. If symptom continues, replace fuel injection pump (WP 0071, Remove/Install Fuel Injection Pump).

STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

[Fault 415: Low Oil Pressure] displayed on DCS screen.

NOTE

[Warning 143: Pre-Low Oil Pressure] will display on DCS when oil pressure reaches 15 psi at rated load or 13 psi at idle. [Fault 415: Low Oil Pressure] will display on the DCS and cause a generator set shutdown when oil pressure reaches 10 psi at rated load or 8 psi at idle.

MALFUNCTION

Low engine oil level.

CORRECTIVE ACTION

WARNING

Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.

NOTE

Capture drained engine oil and dispose of IAW local SOP.

STEP 1. Check engine oil level and appearance. If oil appears diluted or contaminated, proceed to next malfunction or add engine oil as required (TM 9-6115-749-10).

- STEP 2. If engine oil was added in STEP 1, proceed to STEP 4.
- STEP 3. If engine oil was not added in STEP 1, proceed to next malfunction.
- STEP 4. Check oil lines for leaks or damage at fuel injection pump and engine oil drain valve and hose. Repair as required (WP 0066, Service Lubrication System and WP 0071, Remove/Install Fuel Injection Pump).
- STEP 5. If symptom continues, inspect area around flywheel and AC generator for signs of oil leaks. Replace crankcase rear bearing case cover if signs of oil leaks are found (WP 0086, Remove/Install Crankcase Rear Bearing Case Cover)
- STEP 6. If low and no leaks are found, troubleshoot IAW Excessive Oil Consumption symptom (WP 0011, Engine System Troubleshooting without a DCS Code).

MALFUNCTION

Diluted engine oil.

CORRECTIVE ACTION

WARNING

When operating, engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- STEP 1. Examine oil on dipstick for evidence of coolant or other foreign fluid (TM 9-6115-749-10).
- STEP 2. If coolant or foreign fluid is found, change oil and oil filter, if not already changed as a result of troubleshooting (WP 0066, Service Lubrication System).
- STEP 3. If oil remains contaminated with coolant or foreign fluid, check engine compression (WP 0062, Test Engine Compression).
- STEP 4. If compression is low or erratic or oil remains contaminated with coolant or foreign fluid, replace cylinder head gasket (WP 0096, Replace Cylinder Head Gasket).
- STEP 5. If compression check does not reveal fault and coolant or foreign fluid is no longer on dipstick, proceed to next malfunction.
- STEP 6. If coolant or foreign fluid continues to show on dipstick after cylinder head gasket replacement, replace engine assembly (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

MALFUNCTION

Defective engine oil pressure sender.

CORRECTIVE ACTION

- STEP 1. Perform oil pressure test to determine engine oil pressure on DCS screen is accurate (WP 0063, Test Engine Oil Pressure).
- STEP 2. If oil pressure reading on DCS is not accurate, troubleshoot IAW [Warning 135: Oil Pressure Sensor High] symptom (WP 0008, Electrical System Troubleshooting With a DCS Code).
- STEP 3. If symptom continues or oil pressure reading is accurate, proceed to next malfunction.

MALFUNCTION

Clogged oil strainer.

CORRECTIVE ACTION

STEP 1. Inspect and replace oil strainer as required (WP 0084, Remove/Install Oil Pan and Strainer).

STEP 2. If strainer is not clogged or symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

[Fault 1438: Fail to Crank] displayed on DCS screen.

NOTE

[Fault 1438: Fail to Crank] displays when the engine fails to rotate or the DCS fails to sense the engine rotation. When engine control switch turns over the engine, but [Fault 1438: Fail to Crank] appears and prevents starting, the malfunction is speed signal related. See [Fault 115: Speed Signal Lost] (WP 0008, Electrical System Troubleshooting with a DCS Code).

MALFUNCTION

DEAD CRANK SWITCH is not in NORMAL position or will not turn over engine.

CORRECTIVE ACTION

STEP 1. Ensure the DEAD CRANK SWITCH is in NORMAL position (TM 9-6115-749-10).

STEP 2. If not in NORMAL position, place DEAD CRANK SWITCH in the NORMAL position (TM 9-6115-749-10).

STEP 3. If symptom continues, use DEAD CRANK SWITCH to turn over engine (TM 9-6115-749-10).

STEP 4. If engine turns over, proceed to Defective wiring or DCS malfunction.

STEP 5. If engine does not turn over, proceed to next malfunction.

MALFUNCTION

Battery connections are loose or batteries are insufficiently charged.

CORRECTIVE ACTION

WARNING

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0036, Remove/Install Batteries).
- STEP 2. Check DCS voltage meter for a reading less than 24 VDC indicating battery voltage is low (TM 9-6115-749-10).
- STEP 3. If battery voltage is not low, proceed to next malfunction.
- STEP 4. If battery voltage is low, use a multimeter selected for the appropriate VDC scale to measure the voltage of each battery at the battery terminals (WP 0093, General Maintenance and WP 0036, Remove/Install Batteries).
- STEP 5. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0036, Remove/Install Batteries and WP 0093, General Maintenance).
- STEP 6. Start generator set and observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-749-10). Test battery-charging alternator if batteries are not charging properly, and replace battery-charging alternator or components as required (WP 0075, Remove/Install Battery-Charging Alternator).
- STEP 7. If symptom continues, proceed to next malfunction.

MALFUNCTION

Defective starter or flywheel.

CORRECTIVE ACTION

- STEP 1. Test starter and replace as required (WP 0077, Remove/Install Starter).
- STEP 2. If symptom continues, check flywheel for damage or obstruction. Repair or replace as required (WP 0085, Remove/Install Flywheel).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Defective wiring or DCS.

CORRECTIVE ACTION

STEP 1. Test relay K10 for resistance and proper operation and replace as required (WP 0061, Remove/Install Relay Panel).

NOTE

When performing starter test in STEP 2, use engine control switch in the START position instead of using DEAD CRANK SWITCH. Test will determine if DCS is supplying voltage to the starter.

STEP 2. If symptom continues, test starter IAW WP 0077, Remove/Install Starter using START position of engine control switch.

STEP 3. If proper voltage is detected at starter, replace starter as required if not already replaced (WP 0077, Remove/Install Starter).

STEP 4. If low or no voltage is detected at starter, remove battery ground cable (WP 0036, Remove/Install Batteries) and test starter wiring leads for shorts or opens using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0093, General Maintenance).

STEP 5. Repair or replace wiring as required (WP 0093, General Maintenance) (WP 0060, Remove/Install Power Wiring Harness).

STEP 6. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries) and use wiring diagrams (Foldout Pages) and a multimeter set to test continuity to check wires P3-Y and P2-L for opens or shorts (WP 0093, General Maintenance).

STEP 7. Repair or replace wiring as required (WP 0093, General Maintenance) (WP 0059, Remove/Install Engine Wiring Harness).

STEP 8. If symptom continues, test engine control switch and replace as required (WP 0018, Repair DCS).

STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 143: Pre-Low Oil Pressure] displayed on DCS screen.

NOTE

[Warning 143: Pre-Low Oil Pressure] will display on DCS when oil pressure reaches 15 psi at rated load or 13 psi at idle. [Fault 415: Low Oil Pressure] will display on the DCS and cause a generator set shutdown when oil pressure reaches 10 psi at rated load or 8 psi at idle.

MALFUNCTION

Engine oil malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 415: Low Oil Pressure] displayed on DCS screen symptom.

SYMPTOM

[Warning 1992: High Speed Warning] displayed on DCS screen.

MALFUNCTION

Engine speed malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 234: Overspeed Shutdown] displayed on DCS screen symptom.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Personnel Required

91D (1)

References

TM 9-6115-749-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0010, Engine System Troubleshooting with a DCS Code

WP 0012, Exhaust System Troubleshooting without a DCS Code

WP 0013, Winterization Kit Troubleshooting

WP 0016, Field Maintenance PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0019, Remove/Install Air Intake Hose Assemblies

WP 0020, Service Air Cleaner

WP 0021, Service Cooling System

WP 0022, Remove/Install Coolant Recovery System

WP 0024, Remove/Install Radiator Hose and Tube Assemblies

WP 0025, Remove/Install Winterization Kit Components

WP 0027, Remove/Install Radiator

WP 0036, Remove/Install Batteries

References

WP 0039, Service Fuel System

WP 0040, Remove/Install Fuel Manifold

WP 0041, Remove/Install Fuel Pump, Main/Auxiliary

WP 0042, Remove/Install Fuel Filter/Water Separator Assembly

WP 0044, Remove/Install Fuel Hoses and Clamp Bands

WP 0046, Remove/Install Fuel Tank

WP 0047, Remove/Install Fuel Tank Drain Valve Assembly

WP 0048, Remove/Install Fuel Tank Filler Neck

WP 0060, Remove/Install Power Wiring Harness

WP 0061, Remove/Install Relay Panel

WP 0062, Test Engine Compression

WP 0064, Remove/Install 50/60 Hz Engine Assembly

WP 0065, Remove/Install 400 Hz Engine Assembly

WP 0066, Service Lubrication System

WP 0068, Remove/Install Glow Plugs

WP 0069, Remove/Install Fuel Injector

WP 0071, Remove/Install Fuel Injection Pump

WP 0073, Remove/Install Thermostat

WP 0074, Remove/Install Water Pump

WP 0075, Remove/Install Battery-Charging Alternator

WP 0076, Remove/Install Battery-Charging Alternator Belt

WP 0077, Remove/Install Starter

WP 0082, Remove/Install Valve Cover

WP 0083, Check/Adjust Engine Valves

WP 0084, Remove/Install Oil Pan and Strainer

INITIAL SETUP — CONTINUED:**References**

WP 0085, Remove/Install Flywheel

WP 0086, Remove/Install Crankcase Rear Bearing
Case Cover

WP 0093, General Maintenance

WP 0096, Replace Cylinder Head Gasket

Foldout Pages

ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**WARNING**

Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

WARNING

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

Capture spilled fluids and dispose of IAW local SOP.

SYMPTOM

Evidence of fluid leakage found around engine.

NOTE

Capture spilled fluids and dispose of IAW local SOP.

MALFUNCTION

Engine is leaking oil.

CORRECTIVE ACTION

WARNING

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Check for oil leaks at oil filter. Replace or repair as required (WP 0066, Service Lubrication System).

STEP 2. If loose, tighten oil filter as required (WP 0066, Service Lubrication System).

STEP 3. If symptom continues, inspect valve cover and valve cover gasket (WP 0082, Remove/Install Valve Cover). Replace as required.

- STEP 4. If symptom continues, inspect engine oil drain valve and hose (WP 0066, Service Lubrication System).
- STEP 5. Replace line if found to be leaking or damaged (WP 0066, Service Lubrication System).
- STEP 6. If symptom continues, inspect area around flywheel and AC generator for signs of oil leaks. Replace crankcase rear bearing case cover assembly as required (WP 0086, Remove/Install Crankcase Rear Bearing Case Cover).
- STEP 7. If symptom continues, inspect oil pan. Replace oil pan as required (WP 0084, Remove/Install Oil Pan and Strainer).
- STEP 8. If symptom continues with Class III leak, replace engine assembly (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

MALFUNCTION

Engine is leaking coolant.

CORRECTIVE ACTION

WARNING

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

CAUTION

Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.

- STEP 1. Inspect radiator hoses and coolant recovery bottle and hoses for leaks. Repair or replace as required (WP 0022, Remove/Install Coolant Recovery System and WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
- STEP 2. If symptom continues, inspect radiator and test cap (WP 0027, Remove/Install Radiator and WP 0021, Service Cooling System). Replace as required.
- STEP 3. If symptom continues, inspect water pump and/or thermostat for leaks. Replace as required (WP 0074, Remove/Install Water Pump and WP 0073, Remove/Install Thermostat).
- STEP 4. If symptom continues, inspect winterization kit, if applicable, and repair or replace as required (WP 0025, Remove/Install Winterization Kit Components).
- STEP 5. If symptom continues, inspect cylinder head gasket and freeze plugs on engine for signs of a Class III leak. Replace cylinder head gasket and/or freeze plugs as required (WP 0096, Replace Cylinder Head Gasket and WP 0093, General Maintenance).
- STEP 6. If symptom continues, examine oil on dipstick for evidence of coolant or other foreign fluid.
- STEP 7. If evidence of coolant or other foreign fluid is found on dipstick, check engine compression (WP 0062, Test Engine Compression).

- STEP 8. Replace engine as required (WP 0064, Remove/Install 50/60 Hz Engine Assembly and WP 0065, Remove/Install 400 Hz Engine Assembly).

MALFUNCTION

Engine is leaking fuel.

CORRECTIVE ACTION

WARNING

Do not operate generator set if any fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect all fuel hoses (WP 0044, Remove/Install Fuel Hoses and Clamp Bands). Replace as required.
- STEP 2. If symptom continues, inspect fuel filter/water separator assembly (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly). Replace as required.
- STEP 3. If symptom continues, inspect fuel injectors, fuel injection pump, and lines (WP 0069, Remove/Install Fuel Injector and WP 0071, Remove/Install Fuel Injection Pump). Replace as required.
- STEP 4. If symptom continues, inspect fuel tank (WP 0046, Remove/Install Fuel Tank) and fuel filler neck (WP 0048, Remove/Install Fuel Tank Filler Neck) for leaks. Replace as required.
- STEP 5. If symptom continues, tighten fuel drain line valve if necessary and inspect fuel drain line for leaks (WP 0047, Remove/Install Fuel Tank Drain Valve Assembly). Repair or replace as required.
- STEP 6. If symptom continues, inspect fuel pumps and fuel manifold for leaks (WP 0041 Remove/Install Fuel Pump, Main/Auxiliary and WP 0040, Remove/Install Fuel Manifold). Replace as required.

SYMPTOM

Engine cranks slowly and fails to start.

MALFUNCTION

Battery connections are loose or batteries are insufficiently charged.

CORRECTIVE ACTION**WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0036, Remove/Install Batteries).
- STEP 2. Check DCS voltage meter for a reading less than 24 VDC indicating battery voltage is low (TM 9-6115-749-10).
- STEP 3. If battery voltage is not low, proceed to next malfunction.
- STEP 4. If battery voltage is low, use a multimeter selected for the appropriate VDC scale to measure the voltage of each battery at the battery terminals (WP 0093, General Maintenance and WP 0036).
- STEP 5. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0036, Remove/Install Batteries and WP 0093, General Maintenance).
- STEP 6. Start generator set and observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-749-10). Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0075, Remove/Install Battery-Charging Alternator).
- STEP 7. If symptom continues, proceed to next malfunction.

MALFUNCTION

Dirty air cleaner element or intake air restriction.

CORRECTIVE ACTION

- STEP 1. Check air cleaner element and replace as required (WP 0020, Service Air Cleaner).
- STEP 2. If symptom continues, inspect intake hose for restriction or signs of damage and replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).
- STEP 3. If symptom continues, check exhaust system for excess back pressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel system malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-749-10).
- STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0039, Service Fuel System).
- STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0039, Service Fuel System), and inspect fuel manifold for leaks or damage. Repair or replace as required (WP 0040, Remove/Install Fuel Manifold).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. Check fuel injection timing, and adjust as required (WP 0071, Remove/Install Fuel Injection Pump).

MALFUNCTION

Cold weather conditions.

CORRECTIVE ACTION**NOTE**

Glow plugs will turn on between 20°F and -25°F (-6°C and -32°C) and winterization kit will turn on at -25°F and below.

- STEP 1. Allow time for winterization kit/starting aids to work if outside normal temperature range (TM 9-6115-749-10).
- STEP 2. If malfunction is suspected, proceed to Cold weather starting aids fail to work properly symptom.
- STEP 3. If not operating in cold start conditions, proceed to next malfunction.

MALFUNCTION

Starter is defective/wiring is incorrect.

CORRECTIVE ACTION

- STEP 1. Test starter and replace as required (WP 0077, Remove/Install Starter).
- STEP 2. If symptom continues, ensure wiring is correctly installed to starter and adjust as required (WP 0077, Remove/Install Starter).

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 3. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries) and test starter wiring leads for shorts using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0093, General Maintenance).
- STEP 4. Repair or replace wiring as required (WP 0093, General Maintenance and WP 0060, Remove/Install Power Wiring Harness).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Flywheel is defective.

CORRECTIVE ACTION

- STEP 1. Inspect starter/flywheel connection and look for damaged or missing flywheel teeth.
- STEP 2. If flywheel is defective (missing teeth), replace flywheel (WP 0085, Remove/Install Flywheel).
- STEP 3. If symptom continues or flywheel is not defective, proceed to next malfunction.

MALFUNCTION

Fuel injection malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel injection lines for loose nuts or leakage. Replace or repair as required (WP 0069, Remove/Install Fuel Injector).
- STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0069, Remove/Install Fuel Injector).
- STEP 3. If symptom continues, replace fuel injection pump (WP 0071, Remove/Install Fuel Injection Pump).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Engine will not shut down.

MALFUNCTION

Governor actuator malfunction.

CORRECTIVE ACTION

STEP 1. Use EMERGENCY STOP push button to shut down generator set (TM 9-6115-749-10).

STEP 2. Troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting With a DCS Code).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine control switch fault.

CORRECTIVE ACTION

STEP 1. Rotate engine control switch and confirm that engine control switch is not between two positions.

STEP 2. Confirm proper installation of engine control switch (WP 0018, Repair DCS).

STEP 3. Check for loose or damaged wires (WP 0018, Repair DCS).

STEP 4. Test engine control switch and replace as required (WP 0018, Repair DCS).

STEP 5. If symptom continues, test DCS LEDs and replace DCS as required (WP 0017, Remove/Install DCS).

SYMPTOM

Engine cranks normally but fails to start.

MALFUNCTION

Engine system malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 359: Fail to Start] displayed on DCS screen symptom (WP 0010, Engine System Troubleshooting with a DCS Code).

SYMPTOM

Engine starts but stops after starting.

MALFUNCTION

No or low fuel.

CORRECTIVE ACTION

STEP 1. Check fuel tank. Fill as required (WP 0039, Service Fuel System).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel system malfunction.

CORRECTIVE ACTION

STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-749-10).

STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0039, Service Fuel System).

STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).

STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0039, Service Fuel System), and inspect fuel manifold for leaks or damage. Repair or replace as required (WP 0040, Remove/Install Fuel Manifold).

STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Dirty air cleaner element or intake air restriction.

CORRECTIVE ACTION

STEP 1. Check air cleaner element and replace as required (WP 0020, Service Air Cleaner).

STEP 2. If symptom continues, inspect intake hose for restriction or signs of damage and replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).

STEP 3. If symptom continues, check exhaust system for excess back pressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).

STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting With a DCS Code).
- STEP 2. Check fuel injection timing, and adjust as required (WP 0071, Remove/Install Fuel Injection Pump).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine control switch fault.

CORRECTIVE ACTION

- STEP 1. Rotate engine control switch and confirm that engine control switch is not between two positions.
- STEP 2. If symptom continues, confirm proper installation of engine control switch and check for loose or damaged wires (WP 0018, Repair DCS).
- STEP 3. If symptom continues, test engine control switch and replace as required (WP 0018, Repair DCS).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection or DCS malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel injection lines for loose nuts or leakage. Replace or repair as required (WP 0069, Remove/Install Fuel Injector).
- STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0069, Remove/Install Fuel Injector).
- STEP 3. If symptom continues, replace fuel injection pump (WP 0071, Remove/Install Fuel Injection Pump).
- STEP 4. If symptom continues, check DCS LEDs and replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

Engine stops suddenly during normal operation.

MALFUNCTION

Engine malfunction.

CORRECTIVE ACTION

Troubleshoot IAW Engine starts but stops after starting symptom.

SYMPTOM

Engine runs erratically, performs poorly (does not develop full power), or misfires.

MALFUNCTION

Dirty air cleaner element.

CORRECTIVE ACTION

- STEP 1. Check air filter restriction indicator and inspect air cleaner element (TM 9-6115-749-10). Replace air cleaner element as required (TM 9-6115-749-10).
- STEP 2. If symptom continues, check exhaust system for excess back pressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Insufficient oil level.

CORRECTIVE ACTION

- STEP 1. Check oil level and fill as required (WP 0066, Service Lubrication System).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel system malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-749-10).
- STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0039, Service Fuel System).
- STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0039, Service Fuel System) and inspect fuel manifold for leaks or damage (WP 0040, Remove/Install Fuel Manifold).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing or governor actuator malfunction.

CORRECTIVE ACTION

STEP 1. Troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).

STEP 2. If symptom continues, check fuel injection timing and adjust as required (WP 0071, Remove/Install Fuel Injection Pump).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Valves improperly adjusted.

CORRECTIVE ACTION

STEP 1. Adjust valves (WP 0083, Check/Adjust Engine Valves).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection malfunction.

CORRECTIVE ACTION

STEP 1. Check fuel injection lines for loose nuts or leakage. Replace or repair as required (WP 0069, Remove/Install Fuel Injector).

STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0069, Remove/Install Fuel Injector).

STEP 3. If symptom continues, replace fuel injection pump (WP 0071, Remove/Install Fuel Injection Pump).

STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Engine stability or hunting problems.

MALFUNCTION

High or low ambient temperatures.

CORRECTIVE ACTION

Adjust gain settings (WP 0017, Remove/Install DCS).

SYMPTOM

Excessive oil consumption.

MALFUNCTION

Oil change overdue, incorrect grade or type (for ambient temperature range), or oil level too high.

CORRECTIVE ACTION

STEP 1. Perform a lubrication system change (WP 0066, Service Lubrication System).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Leakage from oil lines, oil filter, or valve cover.

CORRECTIVE ACTION**WARNING**

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Check for oil leaks at oil filter. Replace or repair as required (WP 0066, Service Lubrication System).

STEP 2. If loose, tighten oil filter as required (WP 0066, Service Lubrication System).

STEP 3. Inspect valve cover and valve cover gasket (WP 0082, Remove/Install Valve Cover). Replace as required.

STEP 4. Inspect engine oil drain valve and hose (WP 0066, Service Lubrication System).

STEP 5. Replace line if found to be leaking or damaged (WP 0066, Service Lubrication System).

STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Diluted engine oil.

CORRECTIVE ACTION

STEP 1. Examine oil on dipstick for evidence of coolant or other foreign fluid (TM 9-6115-749-10).

STEP 2. Change oil, if not already changed as a result of troubleshooting (WP 0066, Service Lubrication System).

STEP 3. If oil remains contaminated with coolant or foreign fluid, check engine compression (WP 0062, Test Engine Compression).

- STEP 4. If compression check reveals fault, replace cylinder head gasket (WP 0096, Replace Cylinder Head Gasket).
- STEP 5. If compression check does not reveal fault and coolant or foreign fluid is no longer on dipstick, proceed to next malfunction.
- STEP 6. If coolant or foreign fluid continues to show on dipstick after cylinder head gasket has been replaced, replace engine assembly (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

MALFUNCTION

Leaking crankcase rear bearing case cover seal.

CORRECTIVE ACTION

- STEP 1. Inspect area around flywheel and AC generator for signs of oil leaks.
- STEP 2. Replace crankcase rear bearing case cover assembly if signs of oil leaks are found (WP 0086, Remove/Install Crankcase Rear Bearing Case Cover).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Crankcase breather hose clogged.

CORRECTIVE ACTION

- STEP 1. Remove and clean crankcase breather hose (WP 0082, Remove/Install Valve Cover).
- STEP 2. Replace as required (WP 0082, Remove/Install Valve Cover).
- STEP 3. If symptom continues, proceed to Engine runs erratically, performs poorly (does not develop full power), or misfires symptom.
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper seal of oil pan or clogged oil strainer.

CORRECTIVE ACTION

- STEP 1. Replace oil pan or repair seal (WP 0084, Remove/Install Oil Pan and Strainer).
- STEP 2. Inspect and replace oil strainer as required (WP 0084, Remove/Install Oil Pan and Strainer).
- STEP 3. If strainer is not clogged or symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel injector spray pattern and replace fuel injectors as required (WP 0069, Remove/Install Fuel Injector).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine assembly (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Engine knocks or makes excessive noise.

MALFUNCTION

Oil level low.

CORRECTIVE ACTION

WARNING

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Check engine oil level and refill as required (WP 0066, Service Lubrication System).

STEP 2. Troubleshoot IAW Excessive oil consumption symptom.

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection or governor actuator malfunction.

CORRECTIVE ACTION

STEP 1. Troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting With a DCS Code).

STEP 2. If symptom continues, check fuel injection timing and adjust as required (WP 0071, Remove/Install Fuel Injection Pump).

STEP 3. If symptom continues, check fuel injector spray pattern and replace fuel injectors as required (WP 0069, Remove/Install Fuel Injector).

STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Valves improperly adjusted.

CORRECTIVE ACTION

STEP 1. Adjust valves (WP 0083, Check/Adjust Engine Valves).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Abnormal or high-pitched ascending and descending sounds heard from engine compartment.

MALFUNCTION

Dirty air cleaner element or intake air restriction.

CORRECTIVE ACTION

STEP 1. Check air cleaner element, and replace as required (WP 0020, Service Air Cleaner).

STEP 2. If symptom continues, inspect intake hose for restriction or signs of damage. Replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Loose battery-charging alternator belt or defective pulleys.

CORRECTIVE ACTION

STEP 1. Check battery-charging alternator belt for proper tension and tighten or replace belt as required (WP 0076, Remove/Install Battery-Charging Alternator Belt).

STEP 2. Inspect water pump pulley and battery-charging alternator pulley for damage or restricted turning. Replace water pump pulley or battery-charging alternator as required (WP 0074, Remove/Install Water Pump and WP 0075, Remove/Install Battery-Charging Alternator Assembly).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Exhaust system malfunction.

CORRECTIVE ACTION

STEP 1. Troubleshoot for high pitched hiss or whistle heard at exhaust outlet with decrease in engine performance (WP 0012, Exhaust System Troubleshooting without a DCS Code).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine problem.

CORRECTIVE ACTION

Troubleshoot IAW Engine knocks or makes excessive noise symptom.

SYMPTOM

White smoke seen emitting from engine compartment.

MALFUNCTION

Coolant leak.

CORRECTIVE ACTION**WARNING**

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect hoses for leaks (WP 0024, Remove/Install Radiator Hoses and Clamps). Replace as required.
- STEP 2. If symptom continues, pressure test cooling system for evidence of leaks (WP 0021, Service Cooling System).
- STEP 3. Proceed to STEP 5 if evidence of leaks is found.
- STEP 4. Proceed to next malfunction if no evidence of leaks is found.
- STEP 5. Inspect radiator and test cap (WP 0027, Remove/Install Radiator and WP 0021, Service Cooling System). Replace as required.
- STEP 6. Inspect water pump and/or thermostat for leaks. Replace as required (WP 0074, Remove/Install Water Pump and WP 0073, Remove/Install Thermostat).
- STEP 7. Inspect winterization kit for leaks, if applicable (WP 0025, Remove/Install Winterization Kit Components).
- STEP 8. Inspect freeze plugs on engine block for leaks and replace as required (WP 0093, General Maintenance).
- STEP 9. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. Troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting With a DCS Code).
- STEP 2. If symptom continues, check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0069, Remove/Install Fuel Injector).

STEP 3. If symptom continues, test fuel injectors and replace as required (WP 0069, Remove/Install Fuel Injector).

STEP 4. If symptom continues, check fuel injection pump timing and adjust as required (WP 0071, Remove/Install Fuel Injection Pump).

STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Blue or black smoke from engine compartment with strong odors.

MALFUNCTION

Wires burning.

CORRECTIVE ACTION

STEP 1. Shut down generator set.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 2. Inspect engine compartment for fire/wires burning.

STEP 3. Extinguish any flames IAW SOP.

STEP 4. If fire is not visible, inspect wires for damage due to excessive heat or odor of burned insulation.

STEP 5. If evidence of wire burning is found, locate cause of problem before replacing any components or attempting restart.

SYMPTOM

Oil mixed with coolant.

MALFUNCTION

Leaking cylinder head assembly gasket or internal engine problem.

CORRECTIVE ACTION

- STEP 1. Replace cylinder head gasket (WP 0096, Replace Cylinder Head Gasket).
- STEP 2. If coolant or foreign fluid continues to show on dipstick after cylinder head gasket has been replaced, replace engine assembly (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Oil mixed with fuel.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

- STEP 1. Drain all fuel from system (WP 0039, Service Fuel System).
- STEP 2. Purge fuel system (WP 0039, Service Fuel System).
- STEP 3. If symptom continues, replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Cold weather starting aids fail to work properly.

MALFUNCTION

Cold weather starting aid malfunction.

CORRECTIVE ACTION**NOTE**

Glow plugs will turn on between 20°F and -25°F (-6°C and -32°C), and winterization kit will turn on at -25°F and below.

- STEP 1. If using a generator set with a winterization kit and a malfunction is suspected, troubleshoot IAW WP 0013, Winterization Kit Troubleshooting.
- STEP 2. If not using a winterization kit or if another malfunction is suspected, test batteries and ensure battery voltage is at proper level (WP 0036, Remove/Install Batteries).
- STEP 3. If symptom continues, check for loose connections, moisture, loose pins or wires, or other damage at connections at relay panel and glow plugs (WP 0068, Remove/Install Glow Plugs and WP 0061, Remove/Install Relay Panel). Repair or replace as required (WP 0093, General Maintenance).
- STEP 4. If symptom continues, check CB6 and K16 in relay panel for breaker trip and proper installation. Reset or seat properly as required (WP 0061, Remove/Install Relay Panel).
- STEP 5. If symptom continues, test CB6 and K16 for proper function (WP 0061, Remove/Install Relay Panel).

-
- STEP 6. If symptom continues, use a multimeter set to test VDC and wiring diagrams to check from wire P5B-F to a ground for proper voltage (approximately battery voltage value obtained in STEP 2) (WP 0093, General Maintenance and Foldout Pages).
- STEP 7. If proper voltage is found, test glow plugs, and replace as required (WP 0068, Remove/Install Glow Plugs).
- STEP 8. If proper voltage is not found, use a multimeter set to test Ohms and wiring diagrams to check wires P5B-F and P3-X for opens or shorts (WP 0093, General Maintenance and Foldout Pages). Repair or replace as required (WP 0093, General Maintenance).
- STEP 9. If symptom continues, check DCS LEDs, and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
EXHAUST SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 31)

Materials/Parts

Not Applicable

Personnel Required

91D (1)

References

TM 9-6115-749-10

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0010, Electrical System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0019, Remove/Install Air Intake Hose Assemblies

WP 0020, Service Air Cleaner

WP 0025, Remove/Install Winterization Kit Components

WP 0039, Service Fuel System

References

WP 0043, Remove/Install Fuel Filter/Water Separator Element

WP 0064, Remove/Install 50/60 Hz Engine Assembly

WP 0065, Remove/Install 400 Hz Engine Assembly

WP 0066, Service Lubrication System

WP 0068, Remove/Install Glow Plugs

WP 0069, Remove/Install Fuel Injector

WP 0071, Remove/Install Fuel Injection Pump

WP 0076, Remove/Install Battery-Charging Alternator Belt

WP 0079, Remove/Install Intake Manifold

WP 0080, Remove/Install Exhaust Manifold

WP 0081, Remove/Install Muffler

WP 0083, Check/Adjust Engine Valves

EXHAUST SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

WARNING

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

WARNING

When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.

Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

SYMPTOM

High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance.

MALFUNCTION

High back pressure or restriction in exhaust system.

CORRECTIVE ACTION**WARNING**

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- STEP 1. Check exhaust outlet on top of generator set to be sure it is clear of obstructions.
- STEP 2. Check that protection cap is operating properly. Repair or replace as required (WP 0081, Remove/Install Muffler).
- STEP 3. Check pipes throughout exhaust system for dents or kinks that could be causing restriction in the exhaust system. Replace or repair as required (WP 0081, Remove/Install Muffler).
- STEP 4. Remove flex pipe and inspect muffler for visual damage, restriction, or excess carbon buildup. Remove restrictions, install or replace flex pipe as required, or replace muffler as required (WP 0081, Remove/Install Muffler).
- STEP 5. Inspect exhaust manifold for signs of damage or restriction. Remove restrictions or replace as required (WP 0080, Remove/Install Exhaust Manifold).
- STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine assembly (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Abnormal sound heard in exhaust system with a decrease in engine performance.

MALFUNCTION

Exhaust system leak.

CORRECTIVE ACTION**WARNING**

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- STEP 1. Check cylinder head to exhaust manifold connection, flex pipe to exhaust manifold connection, flex pipe to muffler connection, and muffler to rain cap connection for signs of damage or leaks (WP 0080, Remove/Install Exhaust Manifold and WP 0081, Remove/Install Muffler). Look for signs of heat escape such as discoloration or heat damage to surrounding components and discolored or burned paint around gasket and cylinder head exhaust outlet ports.
- STEP 2. Replace any connection or gasket that shows signs of damage or leaking (WP 0080, Remove/Install Exhaust Manifold and WP 0081, Remove/Install Muffler).
- STEP 3. If symptom continues, check muffler for damage or exhaust leaks. Replace as required (WP 0081, Remove/Install Muffler).
- STEP 4. If symptom continues, inspect exhaust manifold for cracks or signs of damage. Replace as required (WP 0080, Remove/Install Exhaust Manifold).
- STEP 5. If symptom continues, wrap wiping rags around exhaust pipes at areas susceptible to wear or corrosion and use pliers to gently squeeze for weak spots or damage. Replace exhaust pipes as required (WP 0081, Remove/Install Muffler).
- STEP 6. If operating generator set in cold weather conditions, inspect system for signs of water corrosion. If evidence of condensation is found, inspect and test winterization kit and glow plugs and replace as required (WP 0025, Remove/Install Winterization Kit Components and WP 0068, Remove/Install Glow Plugs).
- STEP 7. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine assembly (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Intermittent hissing or popping noise is heard when engine is running.

MALFUNCTION

Exhaust manifold gasket leak.

CORRECTIVE ACTION**WARNING**

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect exhaust manifold and cylinder head for discoloration or burning around exhaust outlet ports.
- STEP 2. Replace exhaust manifold gasket if discoloration or burning is found (WP 0080, Remove/Install Exhaust Manifold).
- STEP 3. If symptom continues, troubleshoot IAW Abnormal sound heard from exhaust system with a decrease in engine performance symptom.

SYMPTOM

Buzzing or rattling sound heard.

MALFUNCTION

Loose or missing hardware of exhaust component.

CORRECTIVE ACTION**WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
 - STEP 1. Check for loose or missing fasteners attaching heat shield to exhaust manifold (WP 0080, Remove/Install Exhaust Manifold).
 - STEP 2. Tighten any loose fasteners and replace any missing fasteners (WP 0080, Remove/Install Exhaust Manifold).
 - STEP 3. Use a small pry bar to gently press on heat shield to check for broken welds or damage. Replace as required (WP 0080, Remove/Install Exhaust Manifold).
 - STEP 4. Check muffler hardware and fasteners for loose fasteners, missing parts, or broken welds. Replace or repair as required (WP 0081, Remove/Install Muffler).

- STEP 5. Check exhaust outlet connection at muffler connections and exhaust pipes for missing clamps, loose hardware, or damage. Replace or tighten hardware as required (WP 0081, Remove/Install Muffler).

SYMPTOM

Engine emits blue or black smoke with insufficient engine output.

MALFUNCTION

Overloaded generator set.

CORRECTIVE ACTION

- STEP 1. Increase generator set size or reduce load usage.
- STEP 2. Troubleshoot electrical system for load issues (WP 0010, Electrical System Troubleshooting without a DCS Code).
- STEP 3. If symptoms continue, proceed to next malfunction.

MALFUNCTION

Dirty air cleaner element.

CORRECTIVE ACTION

- STEP 1. Check the air cleaner element and service air cleaner assembly as needed (WP 0020, Service Air Cleaner).
- STEP 2. If symptoms continue, proceed to next malfunction.

MALFUNCTION

Obstruction in air intake system.

CORRECTIVE ACTION

- STEP 1. Check air intake hoses for kinks, damage, or signs of restriction. Replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).

WARNING

When operating, engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- STEP 2. Inspect intake manifold for cracks or damage. Inspect air intake hose to intake manifold. Replace either as required (WP 0079, Remove/Install Intake Manifold).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

High back pressure or restriction in exhaust system.

CORRECTIVE ACTION**WARNING**

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1 Check exhaust outlet on top of generator set to be sure it is clear of obstructions (WP 0081, Remove/Install Muffler).

STEP 2 Check that protection cap is operating properly. Repair or replace as required (WP 0081, Remove/Install Muffler).

STEP 3 Check pipes throughout exhaust system for dents or kinks that could be causing restriction in the exhaust system. Replace or repair as required (WP 0081, Remove/Install Muffler).

STEP 4 Remove flex pipe and inspect muffler for visual damage, restriction, or excess carbon buildup. Remove restrictions, install or replace flex pipe as required, or replace muffler as required (WP 0081, Remove/Install Muffler).

STEP 5 Inspect exhaust manifold for signs of damage or restriction. Remove restrictions or replace as required (WP 0080, Remove/Install Exhaust Manifold).

STEP 6 If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper or contaminated fuel.

CORRECTIVE ACTION

STEP 1. Drain fuel tank and refill with clean fuel (WP 0039, Service Fuel System).

STEP 2. Drain fuel filter/water separator (TM 9-6115-749-10) and replace fuel filter/water separator element (WP 0043, Remove/Install Fuel Filter/Water Separator Element).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper open or close timing of intake/exhaust valves.

CORRECTIVE ACTION

STEP 1. Adjust valve clearance (WP 0083, Check/Adjust Engine Valves).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Too much oil in oil pan/too much oil added.

CORRECTIVE ACTION

STEP 1. Drain oil from engine and refill with proper amount (WP 0066, Service Lubrication System).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine used at high temperatures or at high altitude.

CORRECTIVE ACTION

STEP 1. Adjust governor gain and/or reduce load as required (WP 0017, Remove/Install DCS).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

STEP 1. Troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0009, Electrical System Troubleshooting With a DCS Code).

STEP 2. If symptom continues, check fuel injection lines for loose nuts or leakage. Repair or replace as required (WP 0069, Remove/Install Fuel Injector).

STEP 3. If symptoms continue, check fuel injection timing and adjust as required (WP 0071, Remove/Install Fuel Injection Pump).

STEP 4. If symptom continues, test fuel injectors and replace as required (WP 0069, Remove/Install Fuel Injector).

STEP 5. If symptom continues, replace fuel injection pump (WP 0071, Remove/Install Fuel Injection Pump).

STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Engine emits white exhaust smoke.

MALFUNCTION

Fuel contaminated or improper fuel used.

CORRECTIVE ACTION

- STEP 1. Inspect fuel type being used and check with specification on labels and in manual (TM 9-6115-749-10).
- STEP 2. Drain fuel tank and refill with clean fuel (WP 0039, Service Fuel System).
- STEP 3. Replace fuel filter/water separator element (WP 0043, Remove/Install Fuel Filter/Water Separator Element).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Excessive slack in battery-charging alternator belt causing water pump malfunction.

CORRECTIVE ACTION

- STEP 1. Check belt for wear and proper tension and replace or adjust as required (WP 0076, Remove/Install Battery-Charging Alternator Belt).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged exhaust pipe or muffler.

CORRECTIVE ACTION**WARNING**

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- STEP 1. Check exhaust outlet on top of generator set to be sure it is clear of obstructions (WP 0081, Remove/Install Muffler).
- STEP 2. Check that protection cap is operating properly. Repair or replace as required (WP 0081, Remove/Install Muffler).
- STEP 3. Check pipes throughout exhaust system for dents or kinks that could be causing restriction in the exhaust system. Replace or repair as required (WP 0081, Remove/Install Muffler).
- STEP 4. Remove flex pipe and inspect muffler for visual damage, restriction, or excess carbon buildup. Remove restrictions, install or replace flex pipe as required, or replace muffler as required (WP 0081, Remove/Install Muffler).
- STEP 5. Inspect exhaust manifold for signs of damage or restriction. Remove restrictions or replace as required (WP 0080, Remove/Install Exhaust Manifold).
- STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged air filter.

CORRECTIVE ACTION

STEP 1. Replace air filter (TM 9-6115-749-10).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper intake and exhaust valve open/closure.

CORRECTIVE ACTION

STEP 1. Adjust engine valves (WP 0083, Check/Adjust Engine Valves).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine used at high temperatures or at high altitude.

CORRECTIVE ACTION

STEP 1. Reduce load as required.

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

STEP 1. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0009, Electrical System Troubleshooting With a DCS Code).

STEP 2. If symptom continues, check fuel injection lines for loose nuts or leakage. Repair or replace as required (WP 0069, Remove/Install Fuel Injector).

STEP 3. If symptom continues, test fuel injectors and replace as required (WP 0069, Remove/Install Fuel Injector).

STEP 4. Check fuel injection timing and adjust as required (WP 0071, Remove/Install Fuel Injection Pump).

STEP 5. If symptom continues, replace fuel injection pump (WP 0071, Remove/Install Fuel Injection Pump).

STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
WINTERIZATION KIT TROUBLESHOOTING

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Personnel Required

91D (1)

References

TM 9-6115-749-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

References

WP 0025, Remove/Install Winterization Kit Components

WP 0036, Remove/Install Batteries

WP 0037, Remove/Install Main DC Circuit Breaker

WP 0039, Service Fuel System

WP 0059, Remove/Install Engine Wiring Harness

WP 0075, Remove/Install Battery-Charging Alternator

WP 0093, General Maintenance

Foldout Pages

WINTERIZATION KIT TROUBLESHOOTING**WARNING**

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

Capture spilled fuel and dispose of IAW local SOP.

SYMPTOM

[Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen.

NOTE

[Warning 3663: Winterization Kit Failure to Heat] displays on DCS when coolant temperature fails to rise 5°F (2.75°C) in 5 min.

MALFUNCTION

Fuel tank is empty.

CORRECTIVE ACTION**NOTE**

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

STEP 1. Fill fuel tank as required (WP 0039, Service Fuel System).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged intake port.

CORRECTIVE ACTION**WARNING**

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

STEP 1. Clean air intake port with compressed air.

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged exhaust pipe.

CORRECTIVE ACTION

STEP 1. Remove exhaust pipe (WP 0025, Remove/Install Winterization Kit Components).

WARNING

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

STEP 2. Clean exhaust pipe with compressed air.

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged winterization kit fuel pump or malfunctioning fuel pump.

CORRECTIVE ACTION**NOTE**

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

STEP 1. Perform fuel flow test (WP 0025, Remove/Install Winterization Kit Components).

STEP 2. Test and replace fuel system components (WP 0039, Service Fuel System) or replace winterization kit if necessary (WP 0025, Remove/Install Winterization Kit Components).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Winterization kit wiring or DCS failure.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

CB201-LOAD/P20A-1 (positive battery current) runs between main DC circuit breaker (CB201) and winterization kit (L20). Winterization kit wires P2-R (signal) and P2-U (negative) run between DCS P2 and winterization kit connectors.

Wire P2-R runs between DCS P2 and P20A at winterization kit. J20C-4 runs from plug P20A (pin 2) on winterization kit (L20, BROWN) and J20C-2 runs from P21-2 (fuel metering pump (M21, pin 2)). Both wires junction at J20C. Wire P2-U is the return from J20C to DCS P2. P20A-4 (green) runs between winterization kit and fuel metering pump (P21-1 to M21).

- STEP 1. Use wiring diagrams (Foldout Pages) to locate and check winterization kit wiring at P20A, P21, J20C, CB201, and DCS P2 for loose connections and bent or broken pins.
- STEP 2. Install connections, or repair or replace as required (WP 0059, Remove/Install Engine Wiring Harness; WP 0037, Remove/Install Main DC Circuit Breaker; and WP 0093, General Maintenance).
- STEP 3. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-749-10), remove connector P20A from winterization kit, and check voltage between pins P20A-1 and P20A-2 using a multimeter set to test VDC (WP 0093, General Maintenance).
- STEP 4. If voltage is greater than 21 VDC, proceed to STEP 10.
- STEP 5. If voltage is equal to or less than 21 VDC, proceed to STEP 6.
- STEP 6. Install P20A and test batteries. Charge or replace as required (WP 0036, Remove/Install Batteries).
- STEP 7. If symptom continues, remove battery ground cable (WP 0036, Remove/Install Batteries), remove wires from components as required, and use wiring diagrams and a multimeter set to test continuity to check CB201-LOAD and P2-U for opens or shorts (WP 0093, General Maintenance and Foldout Pages).
- STEP 8. Replace or repair wiring as required (WP 0093, General Maintenance and WP 0059, Remove/Install Engine Wiring Harness).
- STEP 9. If symptom continues, check DCS LEDs, and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS). Resume operation.
- STEP 10. Leave P20A unplugged, and select winterization kit test from DCS screen (TM-9-6115-749-10).
- STEP 11. Use a multimeter set to test VDC to check voltage between pins P20A-7 and P20A-2 (WP 0093, General Maintenance).
- STEP 12. Record voltage, and stop winterization kit test (TM-9-6115-749-10).

- STEP 13. If voltage is greater than 21 VDC, proceed to STEP 17.
- STEP 14. If voltage is equal to or less than 21 VDC, remove battery ground cable (WP 0036, Remove/Install Batteries), and use wiring diagrams and a multimeter set to test Ohms to check wire P2-R for shorts or opens (WP 0093, General Maintenance and Foldout Pages).
- STEP 15. Repair or replace wire P2.R as required (WP 0093, General Maintenance and WP 0059, Remove/Install Engine Wiring Harness).
- STEP 16. If symptom continues, troubleshoot IAW "Defective DCS" malfunction under DCS has no power or no lighted display symptom (WP 0009, Electrical System Troubleshooting without a DCS Code).
- STEP 17. Select winterization kit test from DCS screen (TM-9-6115-749-10), and proceed to STEP 18.
- STEP 18. Install P20A to winterization kit, and remove P21 from fuel metering pump at winterization kit.
- STEP 19. Use a multimeter set to test VDC to check voltage between pins P21-1 and P21-2 (WP 0093, General Maintenance).
- STEP 20. If voltage is within 11.97 to 14.63 VDC range, replace fuel metering pump (WP 0025, Remove/Install Winterization Kit Components).
- STEP 21. If voltage is not within 11.97 to 14.63 VDC range, remove battery ground cable (WP 0036, Remove/Install Batteries) and use a multimeter set to test continuity with wiring diagrams to check connector J20C and wires P20A-4 (green), J20C-2, and P2-U for opens or shorts (WP 0093, General Maintenance and Foldout Pages).
- STEP 22. Repair or replace wires or connectors as required (WP 0059, Remove/Install Engine Wiring Harness and WP 0093, General Maintenance).
- STEP 23. If symptom continues, replace winterization kit (WP 0025, Remove/Install Winterization Kit Components).

SYMPTOM

[Warning 3671: Winterization Kit Low Voltage Warning] displayed on DCS screen.

WARNING

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

NOTE

When [Warning 3671: Winterization Kit Low Voltage Warning] appears on DCS screen, winterization kit is draining the batteries or DCS is reading the signal as a battery drain signal. The batteries are below 20 VDC when [Warning 3671: Winterization Kit Low Voltage Warning] appears on DCS screen.

MALFUNCTION

Battery connections are loose or batteries are insufficiently charged.

CORRECTIVE ACTION**WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0036, Remove/Install Batteries).
- STEP 2. Check DCS voltage meter for a reading less than 20 VDC indicating battery voltage is low (TM 9-6115-749-10).
- STEP 3. If battery voltage is not low, proceed to next malfunction.
- STEP 4. If battery voltage is low, use a multimeter selected for the appropriate VDC scale to measure the voltage of each battery at the battery terminals (WP 0093, General Maintenance and WP 0036, Remove/Install Batteries).
- STEP 5. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0036, Remove/Install Batteries and WP 0093, General Maintenance).
- STEP 6. Start generator set (TM 9-6115-749-10) and observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-749-10). Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0075, Remove/Install Battery-Charging Alternator).
- STEP 7. If symptom continues, proceed to next malfunction.

MALFUNCTION

Winterization kit wiring or DCS failure.

CORRECTIVE ACTION

Troubleshoot IAW Winterization kit wiring or DCS failure malfunction under [Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen symptom.

SYMPTOM

Winterization kit fails to turn off.

MALFUNCTION

Defective flame or heat sensor.

CORRECTIVE ACTION

Troubleshoot IAW Winterization kit activates under usual operating conditions symptom.

SYMPTOM

Winterization kit activates under usual operating conditions.

MALFUNCTION

Defective temperature sensor.

CORRECTIVE ACTION

- STEP 1. Test temperature sensor IAW [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. If symptom continues, troubleshoot IAW Winterization kit wiring or DCS failure malfunction under [Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen symptom.

END OF WORK PACKAGE

CHAPTER 3

FIELD MAINTENANCE INSTRUCTIONS

FOR

AMMPS 5KW GENERATOR SET

CHAPTER 3

FIELD MAINTENANCE INSTRUCTIONS

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
SERVICE UPON RECEIPT	0014
FIELD PMCS INTRODUCTION	0015
FIELD PMCS	0016
REMOVE/INSTALL DCS	0017
REPAIR DCS	0018
REMOVE/INSTALL AIR INTAKE HOSE ASSEMBLIES	0019
SERVICE AIR CLEANER	0020
SERVICE COOLING SYSTEM	0021
REMOVE/INSTALL COOLANT RECOVERY SYSTEM	0022
REMOVE/INSTALL COOLING FAN	0023
REMOVE/INSTALL RADIATOR HOSE AND TUBE ASSEMBLIES	0024
REMOVE/INSTALL WINTERIZATION KIT COMPONENTS	0025
REMOVE/INSTALL WINTERIZATION KIT	0026
REMOVE/INSTALL RADIATOR	0027
REMOVE/INSTALL TOP BODY PANEL	0028
REMOVE/INSTALL FRONT BODY PANEL	0029
REMOVE/INSTALL REAR BODY PANEL	0030
REMOVE/INSTALL LEFT-SIDE BODY PANEL	0031
REMOVE/INSTALL RIGHT-SIDE BODY PANEL	0032
REMOVE/INSTALL DOOR	0033
REPAIR DOOR	0034
REMOVE/INSTALL INTERIOR BODY PANELS	0035
REMOVE/INSTALL BATTERIES	0036
REMOVE/INSTALL MAIN DC CIRCUIT BREAKER	0037
REMOVE/INSTALL NATO SLAVE RECEPTACLE	0038
SERVICE FUEL SYSTEM	0039
REMOVE/INSTALL FUEL MANIFOLD	0040
REMOVE/INSTALL FUEL PUMP, MAIN/AUXILIARY	0041
REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ASSEMBLY	0042
REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ELEMENT	0043
REMOVE/INSTALL FUEL HOSES AND CLAMP BANDS	0044

CHAPTER 3

FIELD MAINTENANCE INSTRUCTIONS — CONTINUED.

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
REMOVE/INSTALL FUEL LEVEL SENSOR	0045
REMOVE/INSTALL FUEL TANK	0046
REMOVE/INSTALL FUEL TANK DRAIN VALVE ASSEMBLY	0047
REMOVE/INSTALL FUEL TANK FILLER NECK	0048
REMOVE/INSTALL 50/60 HZ AC GENERATOR ASSEMBLY	0049
REMOVE/INSTALL 400 HZ AC GENERATOR ASSEMBLY	0050
TEST AC GENERATOR	0051
REMOVE/INSTALL CONTACTOR	0052
REMOVE/INSTALL OUTPUT TERMINAL BOARD	0053
REMOVE/INSTALL VOLTAGE SELECTION SWITCH	0054
REMOVE/INSTALL HOUR METER	0055
REMOVE/INSTALL CONVENIENCE RECEPTACLE	0056
REMOVE/INSTALL CURRENT TRANSFORMERS	0057
REMOVE/INSTALL PRINTED CIRCUIT BOARD MODULE	0058
REMOVE/INSTALL ENGINE WIRING HARNESS	0059
REMOVE/INSTALL POWER WIRING HARNESS	0060
REMOVE/INSTALL RELAY PANEL	0061
TEST ENGINE COMPRESSION	0062
TEST ENGINE OIL PRESSURE	0063
REMOVE/INSTALL 50/60 HZ ENGINE ASSEMBLY	0064
REMOVE/INSTALL 400 HZ ENGINE ASSEMBLY	0065
SERVICE LUBRICATION SYSTEM	0066
REMOVE/INSTALL ENGINE SPEED SENSOR	0067
REMOVE/INSTALL GLOW PLUGS	0068
REMOVE/INSTALL FUEL INJECTOR	0069
REMOVE/INSTALL SPEED CONTROL PLATE	0070
REMOVE/INSTALL FUEL INJECTION PUMP	0071
REMOVE/INSTALL THERMOSTAT HOUSING	0072
REMOVE/INSTALL THERMOSTAT	0073
REMOVE/INSTALL WATER PUMP	0074
REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR	0075
REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR BELT	0076
REMOVE/INSTALL STARTER	0077

CHAPTER 3

FIELD MAINTENANCE INSTRUCTIONS — CONTINUED.

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
REMOVE/INSTALL GOVERNOR ACTUATOR	0078
REMOVE/INSTALL INTAKE MANIFOLD	0079
REMOVE/INSTALL EXHAUST MANIFOLD	0080
REMOVE/INSTALL MUFFLER	0081
REMOVE/INSTALL VALVE COVER	0082
CHECK/ADJUST ENGINE VALVES.....	0083
REMOVE/INSTALL OIL PAN AND STRAINER.....	0084
REMOVE/INSTALL FLYWHEEL.....	0085
REMOVE/INSTALL CRANKCASE REAR BEARING CASE COVER	0086
LUBRICATION INSTRUCTIONS	0087
TORQUE LIMITS	0088

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
SERVICE UPON RECEIPT

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Belt, V (WP 0132, Repair Parts List, Figure 34, Item 8)

Filter, engine oil (WP 0124, Repair Parts List, Figure 26, Item 5)

Antifreeze, ethylene glycol (WP 163, Expendable and Durable Items List, Item 2)

Bag, barrier (WP 0163, Item 3)

Cap set, protective (WP 0163, Item 8)

Cleaning compound, engine cooling system (WP 0163, Item 9)

Detergent, general purpose (WP 0163, Item 16)

Distilled water (WP 0163, Item 17)

Fuel, diesel (WP 0163, Item 18)

Fuel, diesel (WP 0163, Item 19)

Grease, electrically conductive (WP 0163, Item 20)

Lubricating oil, engine (WP 0163, Item 23)

Lubricating oil, engine (WP 0163, Item 24)

Lubricating oil, engine (WP 0163, Item 25)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Personnel Required

91D (1)

References

A-A-52557A

DA Form 2258

DA PAM 750-8

MIL-PRF-2104H

MIL-PRF-22191F

MIL-PRF-46167D

MIL-STD-129

SF 361

WP 0015, Field PMCS Introduction

WP 0016, Field PMCS

WP 0021, Service Cooling System

WP 0036, Remove/Install Batteries

WP 0039, Service Fuel System

WP 0066, Service Lubrication System

WP 0076, Remove/Install Battery-Charging Alternator Belt

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

SERVICE UPON RECEIPT

WARNING

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.

Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

WARNING

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.

Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Comply with all lifting requirements. Observe the decals on equipment which identify the weight and determine if an assistant is needed. Maximum lift is 37 lb (16.81 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.

When lifting generator set, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

CAUTION

While filling the coolant, air must be vented from the engine coolant passages. Vent air by opening pressure release valve and pouring slowly into the filler opening. Failure to comply may cause damage to equipment.

Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

Do not move or lift batteries by the terminal studs. Failure to comply will cause damage to equipment.

NOTE

Capture spilled fuel/coolant and dispose of IAW local SOP.

This WP provides information and guidance for service upon receipt of the AMMPS 5 kW generator set. These procedures ensure the AMMPS unit is adequately inspected, serviced, sited, and operationally tested before being subjected to use.

SITING

See the siting requirements contained in TM 9-6115-749-10.

SERVICE UPON RECEIPT OF MATERIEL**Unpacking****NOTE**

The generator set should take approximately 0.5 hours to unpack.

1. Inspect all packaging for damage incurred during transit. See Checking Equipment task and Table 1.
2. Remove 14 lag bolts (Figure 1, Items 4 and 20) and washers (Figure 1, Items 3 and 21) securing top (Figure 1, Item 1) of plywood box.
3. Remove top (Figure 1, Item 1) of plywood box.
4. Remove seven lag bolts (Figure 1, Items 16 and 18) and washers (Figure 1, Items 15 and 19) from front end (Figure 1, Item 17) of plywood box.
5. Remove front end (Figure 1, Item 17) of plywood box and set aside.
6. Repeat for inspection end (Figure 1, Item 2) of plywood box being sure to remove seven lag bolts (Figure 1, Item 16) and washers (Figure 1, Item 15) securing side panels.

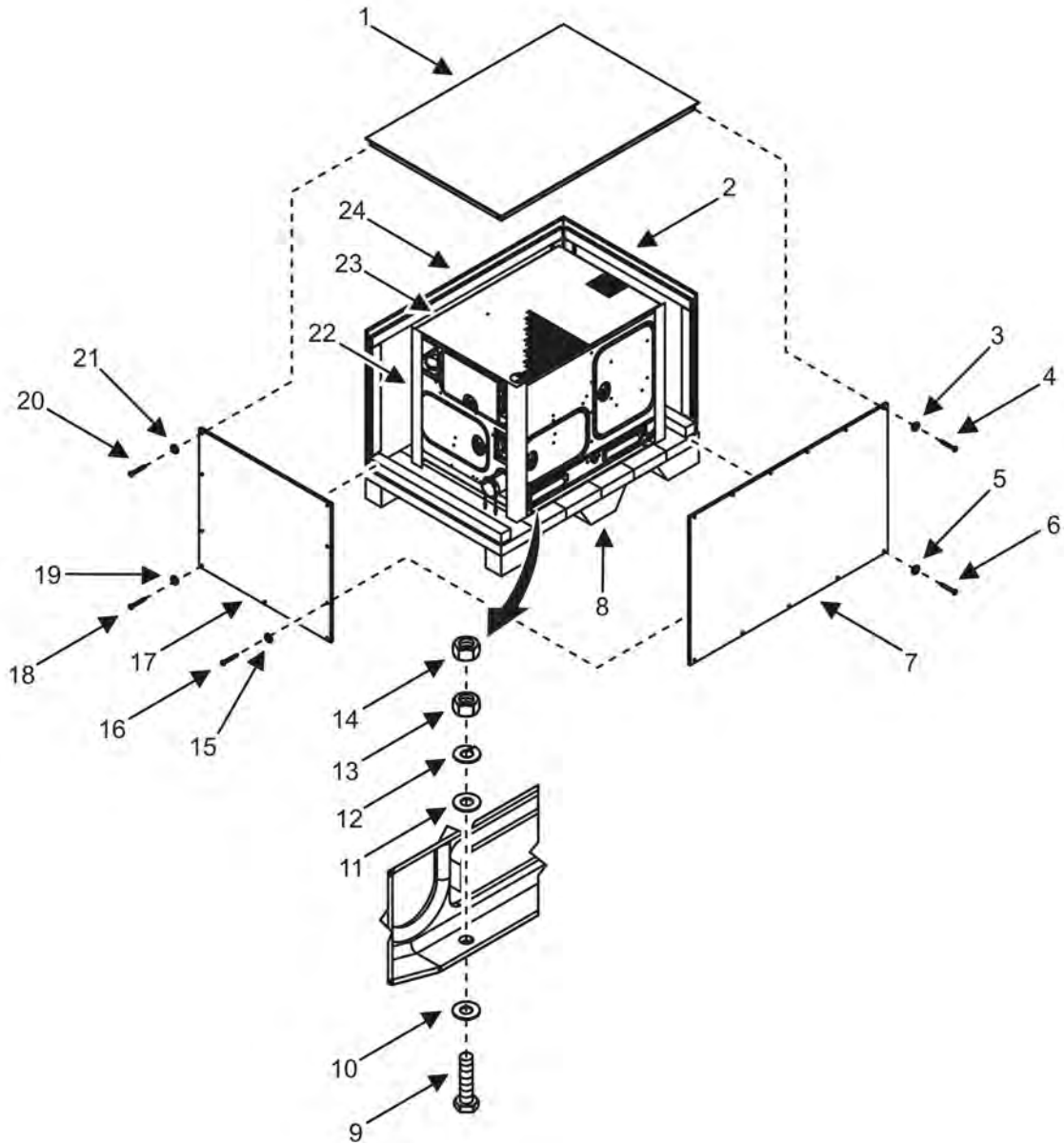


Figure 1. Generator Set Unpacking.

7. Remove inspection end (Figure 1, Item 2) of plywood box and set aside.
8. Remove five lag bolts (Figure 1, Item 6) and washers (Figure 1, Item 5) from right side (Figure 1, Item 7) of plywood box.
9. Remove right side (Figure 1, Item 7) of plywood box and set aside.
10. Repeat for left side (Figure 1, Item 24) of plywood box. Remove left side (Figure 1, Item 24) of plywood box and set aside.
11. Check humidity gage at rear side of generator set (Figure 1, Item 23) for color change and record reading.

12. Report any abnormal reading IAW Checking Equipment task, step 2.
13. Remove polyethylene bag (not pictured) and paperboard corner protectors (Figure 1, Item 22).
14. Remove eight nuts (Figure 1, Items 13 and 14), four lock washers (Figure 1, Item 12), and four washers (Figure 1, Item 11) securing generator set (Figure 1, Item 23) to bolts (Figure 1, Item 9) on wooden pallet (Figure 1, Item 8).
15. Lift generator set (Figure 1, Item 23) clear of wooden pallet (Figure 1, Item 8) using a suitable lifting device.
16. Remove four bolts (Figure 1, Item 9) and four washers (Figure 1, Item 10) from underneath pallet.
17. Stack all side and end panels on wooden pallet (Figure 1, Item 8) and save for reuse.
18. Package all lags, bolts, and nuts and store with wooden pallet (Figure 1, Item 8) for reuse.
19. Dispose of all packaging materials for the 5 kW generator set IAW local SOP.
20. Store wooden pallet, sides, and hardware for the 5 kW generator set IAW local SOP.

END OF TASK

Packing

1. Ensure oil level is full and fill as required (WP 0066, Service Lubrication System).
2. Service cooling system (WP 0021, Service Cooling System).
3. Run engine for at least 5 min to preserve cooling system (TM 9-6115-749-10).
4. Shut down generator set and allow engine to cool.
5. Prepare generator set IAW Preparation for Movement WP (TM 9-6115-749-10).
6. Ensure auxiliary fuel lines and paralleling cables are stored in the proper storage box within the generator set (TM 9-6115-749-10).
7. Ensure technical publications are sealed into plastic bag IAW MIL-PRF-22191F, Performance Specification, Barrier Materials, Transparent, Flexible, Heat-Sealable and stored in document box (TM 9-6115-749-10).
8. Ensure one copy of DA Form 2258, Depreservation Guide for Vehicles and Equipment is stored in plastic bag in the document box IAW MIL-B-22191.
9. Attach one copy of DA Form 2258, Depreservation Guide for Vehicles and Equipment stored in plastic bag IAW MIL-B-22191 to outside of generator set.
10. Position wooden pallet (Figure 1, Item 8) on a level surface.
11. Position generator set (Figure 1, Item 23) on wooden pallet (Figure 1, Item 8) using a suitable lifting device.
12. Secure generator set (Figure 1, Item 23) to wooden pallet (Figure 1, Item 8) with one washer (Figure 1, Item 11), one lock washer (Figure 1, Item 12), and two nuts (Figure 1, Item 13 and 14) on one bolt (Figure 1, Item 9) with washer (Figure 1, Item 10).
13. Repeat for three other bolts and hardware securing generator set (Figure 1, Item 23) to wooden pallet (Figure 1, Item 8).
14. Position right side (Figure 1, Item 7) of plywood box on wooden pallet (Figure 1, Item 8) using five lag bolts (Figure 1, Item 6) and washers (Figure 1, Item 5) to secure to wooden pallet (Figure 1, Item 8).
15. Repeat for left side (Figure 1, Item 24) of plywood box.
16. Position front end (Figure 1, Item 17) of plywood box on wooden pallet (Figure 1, Item 8) using three lags (Figure 1, Item 18) and washers (Figure 1, Item 15).
17. Install two lags (Figure 1, Item 16) and washers (Figure 1, Item 15) to each side of front end (Figure 1, Item 17) of plywood box to secure to left and right sides (Figure 1, Items 24 and 7).

18. Position inspection end (Figure 1, Item 2) of plywood box on wooden pallet (Figure 1, Item 8) and secure with same number of lags and washers (Figure 1, Items 15, 16, 18, 19, 20, and 21) used on front end (Figure 1, Item 17) of plywood box.
19. Install top (Figure 1, Item 1) of plywood box.
20. Install two lags (Figure 1, Item 20) and washers (Figure 1, Item 21) to top of each end (Figure 1, Items 2 and 17) of plywood box and six lags (Figure 1, Item 4) and washers (Figure 1, Item 3) to top of each side (Figure 1, Items 7 and 24) of plywood box.
21. Inspect to ensure box is adequately sealed and correctly assembled.
22. Label box IAW MIL-STD-129 as required.

END OF TASK

Checking Equipment

Table 1. Inspection Criteria for Packaging.

Component	Acceptable	Reparable	Nonreparable
Wooden Boxes and Crates			
Hardware	Operative and tight. Lag screws, nuts, washers.	Inoperative or loose. Lag screws, nuts, washers.	None.
Ends	Free from damage.	Broken or missing portions.	Damage that requires disassembly of box.
Wood	Splits less than 3 in (7.62 cm) long, no closer than 1 in (2.54 cm) to edge of board or adjoining split. The board must be secured by at least one lag screw on each side of the split when it extends to the end of the board.	Splits more than 3 in (7.62 cm) but no closer than 1 in (2.54 cm) to edge of board or adjoining split or 1/2 in (1.27 cm) wide that can be repaired by use of corrugated fasteners.	Splits closer than 1 in (2.54 cm) to edge of board or adjoining split or over 1/2 in (1.27 cm) wide.

1. Ensure all authorized components, materials, and accessories are present upon receipt of the AMMPS 5 kW generator set by checking the equipment against the packing slips to see if the shipment is complete.
2. Check to see if the equipment has been modified and report all discrepancies IAW applicable service instructions (for Army instructions, see DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual).
3. Inspect the equipment for any exterior or interior damage incurred during shipment.
4. Report any damaged item(s) IAW the instructions in the warranty technical bulletin and note the damage on SF 361, Transportation Discrepancy Report (TDR).
5. Check that all packing materials have been removed and are in "Acceptable" condition. See Table 1.
6. Inspect generator set assemblies, subassemblies, and accessories for any internal or external shipping damage.
7. Check generator set identification plates for positive identification (TM 9-6115-749-10).
8. Inspect generator set for loose or missing mounting hardware or damaged or missing parts.
9. Open left-side door and inspect batteries for damage.

10. Check battery cables for damage.
11. Open output terminal door and check output terminals and cover for damage.
12. Check output terminal board for loose wires or damage.
13. Open DCS cover and visually check DCS for damage.
14. Check air cleaner assembly and exhaust opening for obstruction or damage.
15. Check battery-charging alternator belt for proper adjustment (WP 0076, Remove/Install Battery-Charging Alternator Belt).
16. Open grounding rod compartment door on front panel and ensure items are complete and free of damage.
17. Open right-side door and ensure auxiliary hose is in place and free of damage.

END OF TASK**INSTALLATION INSTRUCTIONS****Batteries**

For battery service, see WP 0036, Remove/Install Batteries.

END OF TASK**Radiator****NOTE**

The AMMPS 5 kW generator set normally ships without lubricant, coolant, or fuel.

For radiator service, see WP 0021, Service Cooling System.

END OF TASK**Fuel Tank****NOTE**

The AMMPS 5 kW generator set normally ships without lubricant, coolant, or fuel.

1. Check that fuel drain valve (WP 0039, Service Fuel System) is closed.
2. Fill generator set fuel tank (TM 9-6115-749-10) with fuel type specified in Table 2. Fuel capacity is 3.80 gal (14.38 L).

Table 2. Fuel.

AMBIENT TEMPERATURE	FUEL
-50°F to +135°F (-45.6°C to 57.2°C)	JP8
+25°F to +135°F (-3.9°C to 57.2°C)	A-A-52557A ^a GR 2-D
0°F to +20°F (-17.7°C to -6.7°C)	A-A-52557A GR 1-D

^a Fuel Oil, Diesel; for Posts, Camps, and Stations.

END OF TASK

Installation of Ground Rod

Ground the AMMPS 5 kW generator set IAW TM 9-6115-749-10.

END OF TASK

PRELIMINARY SERVICING OF EQUIPMENT

Lubricating Oil

NOTE

The AMMPS 5 kW generator set normally ships without lubricant, coolant, and fuel.

1. Remove dipstick to check for presence of engine oil (WP 0066, Service Lubrication System).
2. Fill engine with proper engine oil IAW Table 3 to FULL mark on dipstick (WP 0066, Service Lubrication System). Lubrication system capacity is 3.9 qt (3.7 L).

Table 3. Lubricating Oil.

AMBIENT TEMPERATURE	SPECIFICATION	CAPACITY	EXPECTED TEMPERATURES
+ 5°F to +135°F (-15°C to 57°C)	MIL - PRF – 2104H ^a OE/HDO 15W40	Crankcase and engine 3.9 qt (3.7 L) with filter	Not Applicable
-15°F to +5°F (-26°C to -15°C)	MIL - PRF – 2104H OE/HDO-10		
-50°F to +40°F (-45°C to 4°C)	MIL - PRF – 46167D ^b		

^a Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service.

^b Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic.

END OF TASK

PRELIMINARY CHECKS AND ADJUSTMENT OF EQUIPMENT

Checks and adjustments shall be made on all newly-installed AMMPS 5 kW generator sets. Information on the location of items such as controls and components is located in individual WPs. Before any equipment is put into use, checks are required to ensure proper operation of the equipment.

NOTE

To conduct some of these preliminary checks and adjustments, it is necessary to run the AMMPS 5 kW generator set under load.

1. Perform before PMCS (TM 9-6115-749-10).
2. Inspect panels, access doors, and plates.
3. Check for grounding, including earth ground circuits and earth conditioning for conduction, as well as a check of the grounding circuit for negligible resistance.
4. Check for firm seating and connection of all plug-in parts, mating connectors, jacks, and plugs.
5. Check cable and wiring harness routing, dressing, and fastening.
6. Check operation of safety interlocks and switches.
7. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
8. Start unit and generate electrical load at a frequency of 50 Hz and 60 Hz for MEP-1030 and 400 Hz for MEP-1031 (TM 9-6115-749-10).
9. Turn engine control switch to OFF (TM 9-6115-749-10) when generator set has reached normal operating temperature, voltage, and frequency.
10. Check content and operation of liquid cooling systems (WP 0021, Service Cooling System).
11. Complete lubricants and CPC procedures (WP 0015, Field Maintenance PMCS Introduction).
12. Check terminal connections (TM 9-6115-749-10).
13. Perform after PMCS (TM 9-6115-749-10) on AMMPS 5 kW generator set.

END OF TASK

END OF WORK PACKAGE

**FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
FIELD PMCS INTRODUCTION**

INTRODUCTION

This section contains information you will need to perform field maintenance PMCS. Steps are included to help you perform these procedures easily and quickly. PMCS consist of scheduled maintenance items used to make sure the AMMPS are ready for operation at all times. Inspect the system regularly and carefully so you can find, correct, and prevent any defects.

GENERAL

PMCS are performed to keep the equipment in operating condition. The checks are used to find, correct, or report problems. Pay attention to warning and caution statements. A warning indicates the possibility of injury or death to personnel. A caution means the potential for equipment damage.

Intervals are given in operating hours, calendar intervals, or in both operating hours and calendar intervals. Check or service should be performed using interval that occurs first when both operating hours and calendar intervals are given.

First 50 hours.

Every 250 hours.

Every 500 hours.

Every 1000 hours.

Every 1500 hours.

Every 250 hours or every 3 months.

Every 500 hours or every 6 months.

Every 1500 hours or every 1 year.

Every 1500 hours or every 2 years.

Under harsh environmental conditions, PMCS should be conducted more frequently.

EXPLANATION OF THE COLUMNS FOUND IN THE PMCS TABLE

Column (1) – Item No. The item number lists the checks and services in the order they are to be completed. This column will be used as a source of item for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, or DA Form 5988E (electronic version), Equipment Inspection and Maintenance Worksheet, in recording the result of the PMCS.

Column (2) – Interval. References when the PMCS should be performed.

Column (3) – Item to be Checked or Serviced. Identifies the portion of the system to be inspected.

Column (4) – Procedure. Provides the procedures for performing the checks.

Column (5) – Equipment is not Ready/Available if. Contains the criteria that will render the system incapable of performing its primary mission. If the system does not perform as required, refer to Chapter 2, Field Maintenance Troubleshooting (WP 0004, Field Maintenance Troubleshooting Index). If equipment appears to be malfunctioning and the problem cannot be fixed, immediately report it to your supervisor and report it on DA Form 2404, Equipment Inspection and Maintenance Worksheet.

CPC

CPC of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent future problems.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), salivation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking.

SF 368, Product Quality Deficiency Report (PQDR) should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

Rust Definition

Rust is defined as any various scaly or powdery reddish-brown or reddish-yellow materials that form on iron and iron-coated materials in the presence of moisture, deteriorating as a result of disuse or neglect.

Deterioration Definition

Deterioration is defined as any condition that causes material to be defective or lessens the quality or value of the material.

Cracking Definition

Cracking is defined as when material is found to be split or broken, either completely or partially.

INSPECTION

Look for signs of problems or troubles. Most problems can be detected by sight, touch, smell, or sound. Be alert when around the AMMPS generator set.

Inspect to ensure that all components are in good condition. Are they correctly assembled, stowed, or secured? Are any components worn, corroded, or rusty? Correct any problems found or notify your immediate supervisor.

There are common items that should be checked. These include the following:

Bolts, clamps, screws, and nuts: Continuously inspect for looseness. Inspect for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts. Replace as necessary. Tighten hardware as required.

Welds: Some components of the AMMPS generator set are welded. To inspect welds, look for chipped paint, rust, corrosion, or gaps. When these conditions are found, repair or replace as required.

WARNING

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are operating. Failure to comply may cause injury or death to personnel.

Electrical wires, connectors, and harnesses: Tighten loose connections. Inspect for cracked or broken insulation, bare wires, and broken connectors. If any are found, repair or replace as required.

Hoses and fluid lines: Inspect for wear, damage, and leaks. Ensure clamps and fittings are tight. Wet spots indicate a leak. A stain by a fitting or connector can also mean a leak. When this is found, repair or replace as required.

CLEANING AND LUBRICATION

Proper cleaning and lubrication can aid in avoiding possible problems or trouble. Make it a habit to do the following:

CAUTION

Follow all cleaning and lubrication instructions carefully. Failure to comply may cause damage to equipment.

Under harsh environmental conditions, conduct PMCS more frequently.

Use only the recommended cleaning solutions and lubricants found in the Expendable and Durable Items List (WP 0162, Expendable and Durable Items List).

Clean the lenses and screens of the DCS using the proper electronic cleaning cloth found in the Expendable and Durable Items List (WP 0162, Expendable and Durable Items List).

Oil Filters

Oil filters shall be serviced/cleaned/changed, as applicable, when:

They are known to be contaminated or clogged, or at prescribed hard time intervals.

AOAP Sampling Intervals

This generator set is not enrolled in the Army Oil Analysis Program. HARDTIME INTERVALS APPLY.

Warranty Hard Time Statement

For equipment under manufacturer's warranty, hardtime oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer-than-usual operating hours, extended idling periods, extreme dust).

FLUID LEAKAGE**WARNING**

Do not operate generator set if any fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change soaked clothing promptly if exposed to fuel. Failure to comply may cause injury or death to personnel.

CAUTION

When operating with Class I or II leaks, continue to check fluid level as required by PMCS. Class III leaks should be noted and repaired immediately. Any Class I, II, or III fuel leak requires equipment shut down. Failure to comply may cause damage to equipment.

It is necessary for you to know how fluid leakage affects the status of the AMMPS 5 kW generator sets. Following are types/classes of leakage you need to know to be able to determine the status of the AMMPS 5 kW generator sets. Learn these leakage definitions and remember—when in doubt, notify your supervisor. Equipment operation is allowed with minor leakage (Class I or II). Consideration must be given to fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

Any Class I, II, or III fuel leak requires equipment shut down.

When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS.

Class III leaks should be reported immediately to your supervisor.

- (1) Class I: Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
- (2) Class II: Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
- (3) Class III: Leakage of fluid great enough to form drops that fall from item being checked/inspected.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
FIELD PMCS

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Belt, V (WP 0132, Repair Parts List, Figure 34, Item 8)

Element, air filter (WP 0106, Repair Parts List, Figure 8, Item 2)

Filter, element (WP 0111, Repair Parts List, Figure 13, Item 7)

Filter, engine oil (WP 0124, Repair Parts List, Figure 26, Item 5)

Gasket (3) (WP 0127, Repair Parts List, Figure 29, Item 10)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items List, Item 2)

Brush, wire, scratch, brass (WP 0163, Item 7)

Cap set, protective (WP 0163, Item 8)

Cleaning compound, engine cooling system (WP 0163, Item 9)

Cleaning compound, solvent (WP 0163, Item 10)

Cloth, cleaning, electronics (WP 0163, Item 12)

Distilled water (WP 0163, Item 17)

Fuel, diesel (WP 0163, Item 19)

Grease, electrically conductive (WP 0163, Item 20)

Lubricating oil, engine (WP 0163, Item 23)

Pan, drain (WP 0163, Item 28)

Penetrating oil (WP 0163, Item 29)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Personnel Required

91D (1)

References

WP 0018, Repair DCS

WP 0020, Service Air Cleaner Assembly

WP 0021, Service Cooling System

WP 0025, Remove/Install Winterization Kit Components

WP 0039, Service Fuel System

WP 0043, Remove/Install Fuel Filter/Water Separator Element

WP 0061, Remove/Install Relay Panel

WP 0066, Service Lubrication System

WP 0069, Remove/Install Fuel Injector

WP 0076, Remove/Install Battery-Charging Alternator Belt

WP 0082, Remove/Install Valve Cover

WP 0083, Check/Adjust Engine Valves

WP 0087, Lubrication Instructions

Table 1. Preventive Maintenance Checks and Services.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
<p style="text-align: center;">WARNING</p> <p>Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.</p> <p>While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply may cause injury or death to personnel.</p> <p>Flying debris or material may enter eyes or strike the face. Wear appropriate eye/face protection while performing maintenance tasks. Failure to comply may cause injury or death to personnel.</p> <p>Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.</p> <p>Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.</p> <p>Do not operate generator set if fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.</p> <p>Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.</p> <p>Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change soaked clothing promptly if exposed to fuel. Failure to comply may cause injury or death to personnel.</p> <p>Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.</p> <p>Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.</p>				

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
<p style="text-align: center;">WARNING</p> <p>When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.</p> <p>Make sure engine control switch is only set to PRIME & RUN during fuel system checks. Failure to comply may cause injury or death to personnel.</p> <p>NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.</p> <p>High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.</p> <p>High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.</p> <p>Battery acid can cause burns to unprotected skin. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.</p> <p>Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.</p> <p>A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.</p>				

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
<p style="text-align: center;">CAUTION</p> <p>Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.</p> <p>Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.</p> <p style="text-align: center;">NOTE</p> <p>Ensure operator level PMCS (TM 9-6115-749-10) has been performed before performing field maintenance level PMCS.</p> <p>Perform PMCS task at the hour or calendar interval that comes first.</p>				
1	50 hr	Engine oil and filter	Perform first engine oil and filter change (WP 0066, Service Lubrication System)	
2	250 hr	DCS	1. Ensure BATTLESORT switch, engine control switch, and EMERGENCY STOP push button operate as required (TM 9-6115-749-10). Repair or replace as required (WP 0018, Repair DCS).	Indicators are not working properly, switches fail to operate, or emergency stop does not work.
			2. Ensure screen is clean of dirt and excess debris by using an electronic cleaning cloth. Ensure DCS screen is not damaged or scratched.	Screen is damaged or scratched.
3	250 hr	Relay panel	Check circuit breakers/relays for proper operation and reset or replace as required (WP 0061, Remove/Install Relay Panel).	Circuit breaker or relay missing or blown.
4	250 hr or 3 months	GFCI receptacle	Ensure TEST and RESET functions on GFCI receptacle operate properly (TM 9-6115-749-10)	GFCI TEST or RESET function does not operate properly.

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
<p style="text-align: center;">WARNING</p> <p>Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.</p> <p style="text-align: center;">CAUTION</p> <p>Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.</p>				
5	250 hr or 3 months	Radiator	Remove dirt or debris from radiator exterior surfaces that is preventing air flow.	Airflow through radiator is restricted.
6	250 hr	Crankcase breather	Inspect breather tube for damage or clogging. Clean or replace as necessary (WP 0082, Remove/Install Valve Cover).	Crankcase breather tube is clogged.
7	500 hr or 6 months	Fuel system	1. Replace main/auxiliary fuel strainers as required (WP 0039, Service Fuel System)	Strainer is damaged or clogged.
			2. Drain 1 quart (qt) of fuel from fuel tank to remove sediment (WP 0039, Service Fuel System).	
8	500 hr or 6 months	Fuel filter/water separator	Replace fuel filter/water separator element (WP 0043, Remove/Install Fuel Filter/Water Separator Element).	
9	500 hr or 6 months	Engine oil and filter	Change engine oil and oil filter (WP 0066, Service Lubrication System).	
10	500 hr or 6 months	Voltage selection switch	Ensure voltage selection switch displays selected voltage on DCS screen when moved into desired position (TM 9-6115-749-10).	Voltage does not change when voltage selection switch is moved.

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
<p style="text-align: center;">WARNING</p> <p>Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.</p> <p style="text-align: center;">CAUTION</p> <p>Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.</p>				
11	500 hr or 6 months	Radiator cap	1. Inspect radiator cap for corrosion, torn or deteriorated seal, and obvious damage.	Radiator cap is damaged.
			2. Test radiator cap for proper operation (WP 0021, Service Cooling System).	Radiator cap fails to open at proper pressure.
12	500 hr or 6 months	Air filter element	Replace air filter element (WP 0020, Service Air Cleaner Assembly).	Air filter element is restricted.
13	500 hr	Battery-charging alternator belt	Replace battery-charging alternator belt (WP 0076, Remove/Install Battery-Charging Alternator Belt).	Battery-charging alternator belt is loose, damaged, or missing.
14	1500 hr or 1 year	Cooling system	1. Clean water jacket and radiator interior (WP 0021, Service Cooling System).	
			2. Drain, flush, and refill cooling system with new coolant (WP 0021, Service Cooling System).	
15	1500 hr or 2 years	Engine valves	Inspect and adjust engine valves (WP 0083, Check/Adjust Engine Valves).	
16	1500 hr	Fuel injectors	Clean, test, and replace fuel injectors as required (WP 0069, Remove/Install Fuel Injector)	Spray pattern is abnormal or pressure is incorrect.
17	1 year	Winterization kit (if applicable)	Test winterization kit and inspect for damage (WP 0025, Remove/Install Winterization Kit Components).	Winterization kit test fails or damage is found during inspection.

Table 2. PMCS Mandatory Replacement Parts List.

ITEM NO.	PART NUMBER (CAGE C)	NSN	NOMENCLATURE	QTY
500 HR OR 6 MONTHS				
1	HH150-3243-0 (0XWR1)		Filter, oil	01
2	R15S (55752)		Filter, element, fuel filter/water separator	01
3	AF26116 (33457)		Filter, air cleaner element	01
500 HR				
1	13353 (04NP0)		Belt, battery-charging alternator	01

LUBRICATION INSTRUCTIONS

There are no scheduled lubrication intervals for external components (i.e. hinges and latches). Lubrication instructions are contained in WP 0087, Lubrication Instructions.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL DCS

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Control box assembly (WP 0103, Repair Parts List, Figure 5, Item 3)

Washer, lock (WP 0103, Figure 5, Item 2)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Personnel Required

91D (1)

Assistant (1)

References

WP 0030, Remove/Install Rear Body Panel

WP 0033, Remove/Install Door

WP 0036, Remove/Install Batteries

WP 0093, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL DCS**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Remove DCS**NOTE**

The DCS (Figure 1) has a cover that can be closed over the panel and latched. To improve clarity, illustrations in this document show the DCS unit without the cover.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate DCS (Figure 1) at rear of generator set.

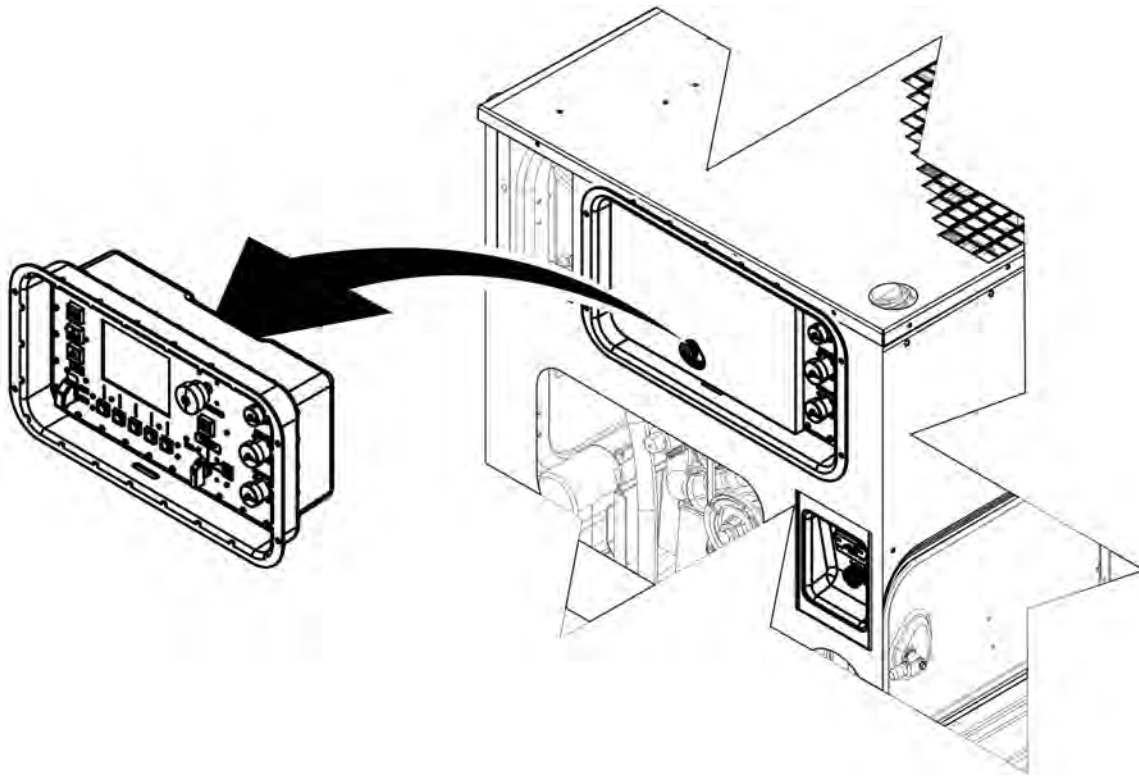


Figure 1. DCS — Location.

CAUTION

It is important to save the latest capture file from DCS being replaced (WP 0093, General Maintenance). Data can only be accessed using InPower AMMPS and a computer hard drive. If data is accessible, capture file can be used to overlay parameters and maintenance timers from the replaced DCS. If unable to access capture file data, maintenance timers will be reset and some parameters from replaced DCS will be lost. Use latest hard copy records to determine when maintenance actions are due. Failure to comply will cause damage to equipment.

It is important to save log data from DCS being replaced (WP 0093, General Maintenance). The maintenance, operational, and fault logs should be downloaded from the DCS and saved to the hard drive of a computer. Maintenance, operational, and fault logs cannot be uploaded to the new DCS, but can be saved for reference. All logs will start over with a new DCS. If unable to access logs, use latest hard copy records to access operational, maintenance, and fault events. Failure to comply may cause damage to equipment.

3. Remove four hex socket head screws (Figure 2, Item 5) securing DCS unit (Figure 2, Item 1) to rear body panel (Figure 2, Item 2) and save screws for reuse.
4. Remove DCS unit (Figure 2, Item 1) from rear body panel (Figure 2, Item 2) to expose grounding strap (Figure 2, Item 4) attached to rear of DCS.
5. Tag and remove three electrical connectors (Figure 2, Item 3) from DCS unit (Figure 2, Item 1).
6. Remove bolt (Figure 3, Item 4) and lock washer (Figure 3, Item 2) securing grounding strap (Figure 3, Item 3) to bottom of DCS unit (Figure 3, Item 1).
7. Discard lock washer (Figure 3, Item 2) and set bolt (Figure 3, Item 4) aside for reuse.

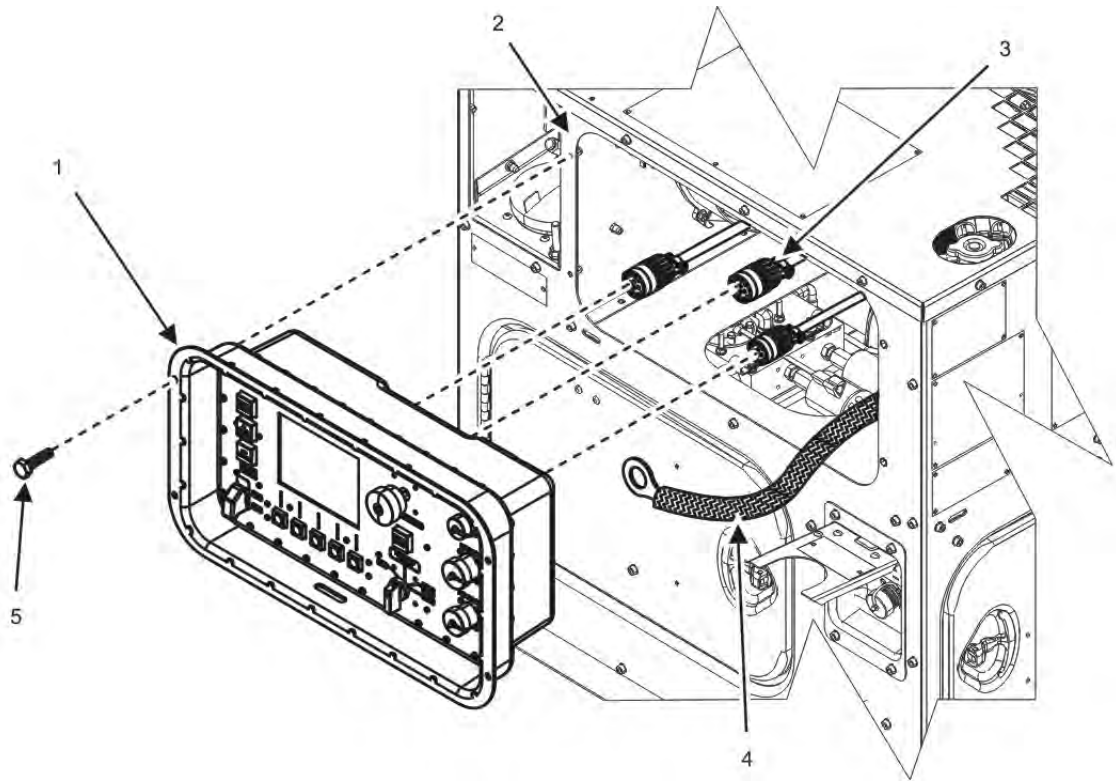


Figure 2. DCS Detail — Front.

8. Place DCS unit (Figure 3, Item 1) on a suitable work surface.

END OF TASK

Inspect DCS

1. Inspect DCS door and door hinge for corrosion or damage and replace as required (WP 0033, Remove/Install Door).
2. Inspect DCS unit (Figure 3, Item 1) for corrosion or damage and replace as required.
3. Inspect DCS unit (Figure 2, Item 1) front panel for broken switches or other damage. Repair or replace as required.
4. Inspect electrical connections (Figure 3, Item 6) in rear of DCS unit and in wiring harness (Figure 3, Item 5) for corrosion or other damage and replace unit if damage is found.
5. Inspect all mounting hardware for damage and replace as required.
6. Inspect DCS mounting area on rear body panel (Figure 2, Item 2) for damage or corrosion and replace body panel as required (WP 0030, Remove/Install Rear Body Panel).

END OF TASK

Install DCS

1. Position DCS unit (Figure 2, Item 1) on rear body panel (Figure 2, Item 2).

NOTE

Prior to installation, apply electrically conductive grease to the electrical connectors (Figure 2, Item 3) to prevent moisture from entering the connectors.

2. Attach DCS grounding strap (Figure 3, Item 3) to rear of DCS unit (Figure 3, Item 1) using bolt (Figure 3, Item 4) and new lock washer (Figure 3, Item 2).
3. Install DCS electrical connectors (Figure 2, Item 3) to back of DCS unit (Figure 3, Item 1) according to location tags.
4. Remove tags from electrical connectors (Figure 2, Item 3).

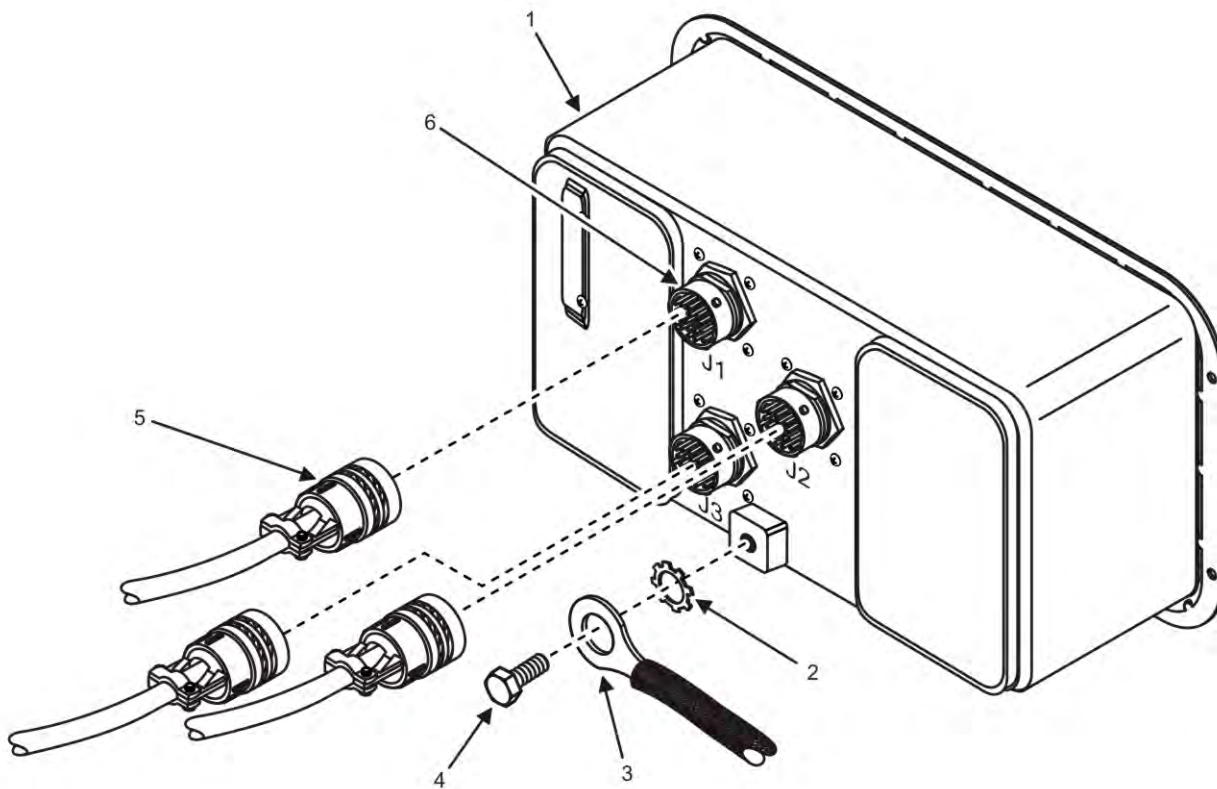


Figure 3. DCS Detail — Rear.

5. Install four hex socket head screws (Figure 2, Item 5) securing DCS unit (Figure 2, Item 1) to rear body panel (Figure 2, Item 2).
6. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
7. Close left-side door on generator set.
8. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).

9. Start engine (TM 9-6115-749-10).
10. Reset control panel for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
11. Repair as required.

END OF TASK**Adjust Governor Gain****NOTE**

[Governor Gain] has a default of 1 and a range of 0.1 Hz to 10 Hz. Adjusting to higher value increases output at higher ambient temperatures, but also increases instability and can cause hunting problems. A lower value decreases output at lower ambient temperatures, which can help with stability and hunting problems, but also decreases performance.

1. Ensure battery ground cable is installed (WP 0036, Remove/Install Batteries).
2. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
3. Reset [Governor Gain] option on [Adjustments] Screen 2 to default (TM 9-6115-749-10).
4. Start generator set (TM 9-6115-749-10).
5. Apply and remove load up to rated capacity. Observe frequency fluctuations.
6. Proceed to step 7 if frequency fluctuations are observed or continue normal use of DCS if fluctuations are not observed.
7. Access [Governor Gain] option from [Adjustments] Screen 2 (TM 9-6115-749-10).
8. Adjust [Governor Gain] down or up 0.1 Hz at a time until output, stability, or hunting problem is resolved.
9. Observe frequency fluctuations and continue to adjust [Governor Gain] by applying and removing loads until output, stability, or hunting problem is resolved.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REPAIR DCS

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)
Strap, Wrist, Electrostatic Discharge (WP 0162, Table 2, Item 24)
Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Gasket, control box (WP 0103, Repair Parts List, Figure 5, Item 5)
Ring, sealing (WP 0104, Repair Parts List, Figure 6, Item 16)
Switch, BATTLESHORT (WP 0104, Figure 6, Item 15)
Switch, EMERGENCY STOP (WP 0104, Figure 6, Item 4)
Switch, engine control (WP 0104, Figure 6, Item 5)
Washer, lock (WP 0105, Figure 5, Item 2)
Pad, scouring (WP 0163, Expendable and Durable Items List, Item 27)

Materials/Parts

Strap, tie-down (WP 0163, Item 34)
Wire, tie (WP 0163, Item 37)

Personnel Required

91D (1)
Assistant (1)

References

WP 0009, Electrical System Troubleshooting without a DCS Code
WP 0017, Remove/Install DCS
WP 0028, Remove/Install Top Body Panel
WP 0036, Remove/Install Batteries

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 005)
Engine cool

Special Environmental Conditions

Dry area with minimal dust

REPAIR DCS**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

CAUTION

Due to the use of delicate electronic components, repair of the DCS must be performed in a clean environment. Failure to comply may cause damage to equipment.

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Repair of the DCS at field level is limited to replacement of the BATTLESORT switch, EMERGENCY STOP switch, and engine control switch. Failure of any other component inside the DCS requires DCS replacement (WP 0017, Remove/Install DCS).

Remove DCS Control Panel Assembly

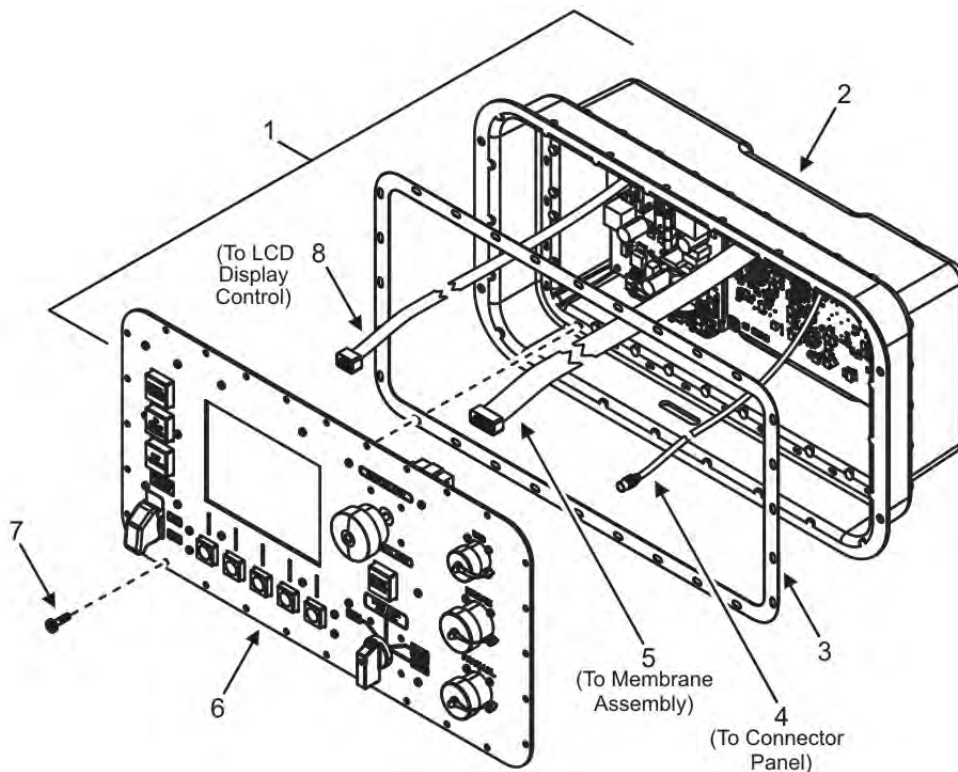


Figure 1. DCS Control Panel and Enclosure.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
3. Open DCS door, and secure in fully open position.
4. Remove 28 screws (Figure 1, Item 7) that secure DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2).
5. Break seal between DCS control panel (Figure 1, Item 6) and DCS enclosure (Figure 1, Item 2) using putty knife or other appropriate tool.

6. Lift DCS control panel (Figure 1, Item 6) from DCS enclosure (Figure 1, Item 2) high enough to access three wiring harnesses (Figure 1, Items 4, 5, and 8) connecting DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

7. Tag and remove three wiring harnesses (Figure 1, Items 4, 5, and 8) that connect DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2).
8. Unhook clips on wiring harnesses and remove harnesses from DCS control panel (Figure 1, Item 6):
 - a. Tag and remove six-pin wiring harness (Figure 1, Item 4) connected to connector panel control card (not shown) of DCS control panel (Figure 1, Item 6).
 - b. Tag and remove 14-pin wiring harness (Figure 1, Item 8) connected to display control card (not shown) of DCS control panel (Figure 1, Item 6).
 - c. Tag and remove 22-pin wiring harness (Figure 1, Item 5) connected to membrane panel assembly (not shown) of DCS control panel (Figure 1, Item 6).
9. Remove DCS control panel (Figure 1, Item 6) from DCS enclosure (Figure 1, Item 2), and place on a suitable work surface.
10. Remove and discard gasket (Figure 1, Item 3) from DCS control panel (Figure 1, Item 6).
11. Remove all residual gasket material from DCS control panel (Figure 1, Item 6) and DCS enclosure (Figure 1, Item 2) using an abrasive pad. Be sure to remove all loose gasket material from components.

END OF TASK

Test/Replace Switches

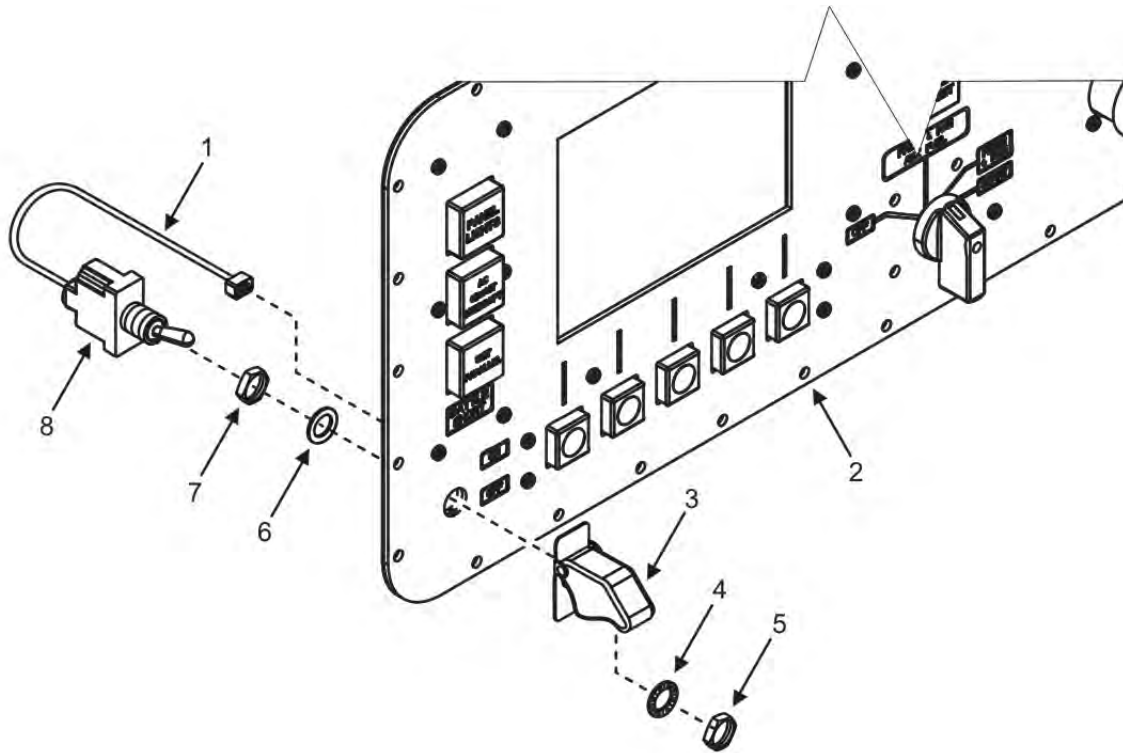


Figure 2. BATTLESHORT Switch.

1. Ensure equipment conditions are met in the order presented in initial setup.
2. Remove DCS control panel assembly and place on a suitable work surface (Remove DCS Control Panel Assembly task).
3. Test BATTLESHORT switch (Figure 2, Item 8):
 - a. Remove wiring harness (Figure 2, Item 1) from membrane panel assembly (not shown).

NOTE

Continuity should be present when BATTLESHORT switch (Figure 2, Item 8) is in ON position. There should be no continuity when BATTLESHORT switch (Figure 2, Item 8) is in OFF position.

- b. Place BATTLESHORT switch (Figure 2, Item 8) in ON position and test wires P1 (P1/SW-3) and P3 (P3/SW-2) through wiring harness (Figure 2, Item 1) using a multimeter set to test continuity.
- c. Proceed to step d if no continuity is found or step f if continuity is found.
- d. Leave BATTLESHORT switch (Figure 2, Item 8) in ON position and test two terminals on bottom of BATTLESHORT switch (Figure 2, Item 8) using a multimeter set to test continuity.
- e. Repair or replace wiring harness (Figure 2, Item 1) if continuity is found or replace BATTLESHORT switch (Figure 2, Item 8) if no continuity is found (step 4). Retest IAW step b and repair or replace wiring harness (Figure 2, Item 1) as required.
- f. Place BATTLESHORT switch (Figure 2, Item 8) in OFF position and test wires P1 (P1/SW-3) and P3 (P3/SW-2) through wiring harness (Figure 2, Item 1) using a multimeter set to test continuity.
- g. Proceed to step j if no continuity is found or step h if continuity is found.

- h. Leave BATTLESHORT switch (Figure 2, Item 8) in OFF position and test two terminals on bottom of BATTLESHORT switch (Figure 2, Item 8) using a multimeter set to test continuity.
 - i. Repair or replace wiring harness (Figure 2, Item 1) if continuity is found or replace BATTLESHORT switch (Figure 2, Item 8) if no continuity is found (step 4). Retest IAW step f and repair or replace wiring harness (Figure 2, Item 1) as required.
 - j. Install wiring harness (Figure 2, Item 1) to membrane panel assembly (not shown).
4. Remove BATTLESHORT switch (Figure 2, Item 8):

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

- a. Tag wiring harness (Figure 2, Item 1) from BATTLESHORT switch (Figure 2, Item 8) to membrane panel assembly (not shown) of DCS control panel (Figure 2, Item 2).
 - b. Unhook clip on wiring harness (Figure 2, Item 1) and remove wiring harness (Figure 2, Item 1) from membrane panel assembly (not shown).
 - c. Move BATTLESHORT switch cover (Figure 2, Item 3) on BATTLESHORT switch (Figure 2, Item 8) to open position.
 - d. Remove nut (Figure 2, Item 5) and internal tooth lock washer (Figure 2, Item 4) securing BATTLESHORT switch (Figure 2, Item 8) to front of DCS control panel (Figure 2, Item 2).
 - e. Discard internal tooth lock washer (Figure 2, Item 4) and sealing ring (Figure 2, Item 6).
 - f. Remove BATTLESHORT switch (Figure 2, Item 8) and BATTLESHORT switch cover (Figure 2, Item 3) from DCS control panel (Figure 2, Item 2).
 - g. Remove jam nut (Figure 2, Item 7) from BATTLESHORT switch (Figure 2, Item 8).
 - h. Inspect BATTLESHORT switch (Figure 2, Item 8) for signs of obvious damage. Replace as required.
5. Install BATTLESHORT switch (Figure 2, Item 8):
- a. Align tab on DCS control panel (Figure 2, Item 2) to slot in BATTLESHORT switch (Figure 2, Item 8).
 - b. Position BATTLESHORT switch (Figure 2, Item 8), jam nut (Figure 2, Item 7), and new sealing ring (Figure 2, Item 6) to mounting location on rear of DCS control panel (Figure 2 Item 2), engaging alignment tab on DCS control panel (Figure 2, Item 2) to slot in BATTLESHORT switch (Figure 2, Item 8).
 - c. Secure BATTLESHORT switch (Figure 2, Item 8) to DCS control panel (Figure 2, Item 2) by installing BATTLESHORT switch cover (Figure 2, Item 3), new internal tooth lock washer (Figure 2, Item 4), and nut (Figure 2, Item 5) to BATTLESHORT switch (Figure 2, Item 8).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

NOTE

Identification tags should remain in place until the DCS is completely reassembled and has been tested for proper operation.

- d. Install electrical connector on BATTLESHORT switch (Figure 2, Item 8) to corresponding connector on membrane panel control card (not shown).

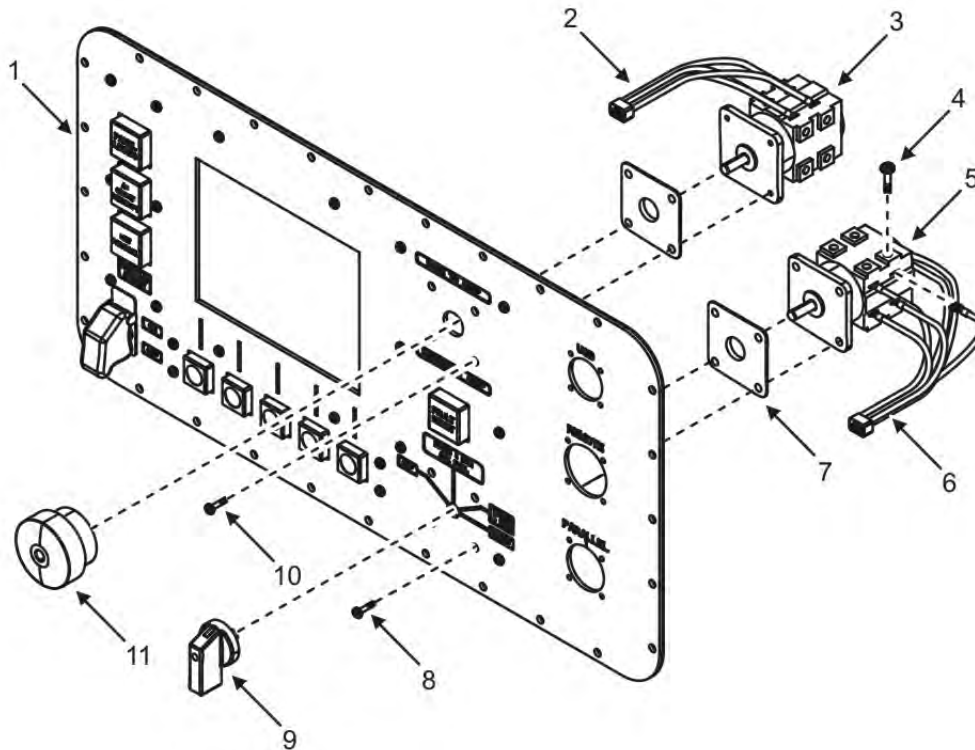


Figure 3. EMERGENCY STOP and Engine Control Switches.

6. Test EMERGENCY STOP switch (Figure 3, Item 3):
 - a. Remove wiring harness (Figure 3, Item 2) from membrane panel assembly (not shown).

NOTE

Continuity should be present when EMERGENCY STOP switch (Figure 3, Item 3) is in extended (off) position. There should be no continuity when EMERGENCY STOP switch (Figure 3, Item 3) is in PUSH TO STOP (on) position.

- b. Pull EMERGENCY STOP switch (Figure 3, Item 3) to extended position (off), and test wires to terminals 5 and 6 (P205-1/S202-5 and P205-2/S202-6) through wiring harness (Figure 3, Item 2) using a multimeter set to test continuity.
 - c. Proceed to step d if no continuity is found or step f if continuity is found.
 - d. Leave EMERGENCY STOP switch (Figure 3, Item 3) in extended position (off), and test terminals 5 and 6 on EMERGENCY STOP switch (Figure 3, Item 3) using a multimeter set to test continuity.
 - e. Repair or replace wiring harness (Figure 3, Item 2) if continuity is found or replace EMERGENCY STOP switch (Figure 3, Item 3) if no continuity is found (step 7). Retest IAW step b, and repair or replace wiring harness (Figure 3, Item 2) as required.
 - f. Repeat steps a through e for wires to terminals 7 and 8 (P205-4/S202-7 and P205-5/S202-8) and EMERGENCY STOP switch (Figure 3, Item 3) terminals 7 and 8.
 - g. Push EMERGENCY STOP switch (Figure 3, Item 3) to PUSH TO STOP position (on), and test wires to terminals 5 and 6 (P205-1/S202-5 and P205-2/S202-6) through wiring harness (Figure 3, Item 2) using a multimeter set to test continuity.
 - h. Proceed to step i if continuity is found or step k if no continuity is found.
 - i. Leave EMERGENCY STOP switch (Figure 3, Item 3) in PUSH TO STOP position (on), and test terminals 5 and 6 on EMERGENCY STOP switch (Figure 3, Item 2) using a multimeter set to test continuity.
 - j. Repair or replace wiring harness (Figure 3, Item 2) if no continuity is found or replace EMERGENCY STOP switch (Figure 3, Item 3) if continuity is found (step 7). Retest IAW step g, and repair or replace wiring harness (Figure 3, Item 2) as required.
 - k. Repeat steps g through j for wires to terminals 7 and 8 (P205-4/S202-7 and P205-5/S202-8) and EMERGENCY STOP switch (Figure 3, Item 3) terminals 7 and 8.
 - l. Install wiring harness (Figure 3, Item 2) to membrane panel assembly (not shown).
7. Remove EMERGENCY STOP switch (Figure 3, Item 3):

NOTE

Sealing gasket, sealing screws, and handle for EMERGENCY STOP switch are available only with a new EMERGENCY STOP switch.

- a. Loosen set screw (not shown) securing handle (Figure 3, Item 11) to EMERGENCY STOP switch (Figure 3, Item 3) on front of DCS control panel (Figure 3, Item 1).
- b. Remove and discard handle (Figure 3, Item 11) from EMERGENCY STOP switch (Figure 3, Item 3).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

- c. Tag wiring harness (Figure 3, Item 2) from EMERGENCY STOP switch (Figure 3, Item 3) to membrane panel assembly (not shown) of DCS control panel (Figure 3, Item 1).
 - d. Unhook clip on wiring harness (Figure 3, Item 2), and remove harness (Figure 3, Item 2) from membrane panel assembly (not shown).
 - e. Remove and discard four mounting screws (Figure 3, Item 10) securing EMERGENCY STOP switch (Figure 3, Item 3) to front of DCS control panel (Figure 3, Item 1).
 - f. Remove and discard EMERGENCY STOP switch (Figure 3, Item 3) and gasket (Figure 3, Item 7) from rear of DCS control panel (Figure 3, Item 1).
 - g. Tag and remove four wires from EMERGENCY STOP switch (Figure 3, Item 3) by removing screws (Figure 3, Item 4).
8. Install EMERGENCY STOP switch (Figure 3, Item 3):

NOTE

Identification tags should remain in place until the DCS is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

- a. Install four wires of wiring harness (Figure 3, Item 2) to contacts on EMERGENCY STOP switch (Figure 3, Item 3) using tags applied at removal as a guide.
- b. Position new gasket (Figure 3, Item 7) (supplied with new EMERGENCY STOP switch (Figure 3, Item 3)) and new EMERGENCY STOP switch (Figure 3, Item 3) to mounting location on rear of DCS control panel (Figure 3, Item 1) and align mounting holes.
- c. Secure EMERGENCY STOP switch (Figure 3, Item 3) to DCS control panel (Figure 3, Item 1) by installing four new mounting screws (Figure 3, Item 10) (supplied with new EMERGENCY STOP switch (Figure 3, Item 3)) through front of DCS control panel (Figure 3, Item 1).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

- d. Install connector of wiring harness (Figure 3, Item 2) to corresponding connector on membrane panel assembly (not shown).
- e. Install new handle (Figure 3, Item 11) (supplied with new EMERGENCY STOP switch (Figure 3, Item 3)) to EMERGENCY STOP switch (Figure 3, Item 3), and tighten set screw to secure.

9. Test engine control switch (Figure 3, Item 5):
 - a. Remove wiring harness (Figure 3, Item 6) from membrane panel assembly (not shown).

NOTE

Engine control switch will show continuity between SW COMMON (P206-6/S201-1) and one other wire for each corresponding position chosen. When holding between PRIME & RUN and START positions, continuity will be between PRIME/RUN SW (P206-3/S201-6) and ROTARY START SW (P206-4/S201-8).

- b. Turn engine control switch (Figure 3, Item 5) to OFF position and test wires SW COMMON (P206-6/S201-1) and OFF SW (P206-1/S201-2) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- c. Proceed to step f if continuity is found or step d if no continuity is found.
- d. Test terminals 1 and 2 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- e. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found, or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step b and repair or replace wiring harness (Figure 3, Item 6) as required.
- f. Turn engine control switch (Figure 3, Item 5) to PRIME & RUN AUX FUEL position and test wires SW COMMON (P206-6/S201-1) and PRIME/AUX SW (P206-2/S201-4) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- g. Proceed to step j if continuity is found or step h if no continuity is found.
- h. Test terminals 1 and 4 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- i. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found, or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step f and repair or replace wiring harness (Figure 3, Item 6) as required.
- j. Turn engine control switch (Figure 3, Item 5) to PRIME & RUN position and test wires SW COMMON (P206-6/S201-1) and PRIME/RUN SW (P206-3/S201-6) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- k. Proceed to step n if continuity is found or step l if no continuity is found.
- l. Test terminals 1 and 6 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- m. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step j and repair or replace wiring harness (Figure 3, Item 6) as required.

NOTE

Use of an assistant is required when holding engine control switch in START position to measure continuity. Engine control switch must be held in START position in order to obtain an accurate measurement.

- n. Hold engine control switch (Figure 3, Item 5) in START position and test wires SW COMMON (P206-6/S201-1) and ROTARY START SW (P206-4/S201-8) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- o. Proceed to step r if continuity is found or step p if no continuity is found.
- p. Test terminals 1 and 8 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- q. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found, or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step n and repair or replace wiring harness (Figure 3, Item 6) as required.

NOTE

When engine control switch (Figure 3, Item 5) is turned slowly from PRIME & RUN to START position, a momentary continuity reading should be obtained. Use of an assistant is required when moving engine control switch (Figure 3, Item 5) between PRIME & RUN and START positions to measure continuity. Engine control switch (Figure 3, Item 5) must be moved to position between PRIME & RUN and START in order to obtain accurate reading.

- r. Move engine control switch (Figure 3, Item 5) back and forth slowly from START to PRIME & RUN and from PRIME & RUN to START while testing wires PRIME/RUN SW (P206-3/S201-6) and ROTARY START SW (P206-4/S201-8) using a multimeter set to test continuity.
 - s. Proceed to step v if continuity is found or step t if no continuity is found.
 - t. Move engine control switch (Figure 3, Item 5) back and forth slowly from START to PRIME & RUN and from PRIME & RUN to START while testing terminals 6 and 8 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
 - u. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step r and repair or replace wiring harness (Figure 3, Item 6) as required.
 - v. Install wiring harness (Figure 3, Item 6) to membrane panel assembly (not shown).
10. Remove engine control switch (Figure 3, Item 5):

NOTE

Sealing gasket, sealing screws, and handle for engine control switch are available only with a new engine control switch.

- a. Loosen set screw (not shown) securing handle (Figure 3, Item 9) to engine control switch (Figure 3, Item 5) on front of DCS control panel (Figure 3, Item 1).
- b. Remove and discard handle (Figure 3, Item 9) from engine control switch (Figure 3, Item 5).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

- c. Tag wiring harness (Figure 3, Item 6) from engine control switch (Figure 3, Item 5) to membrane panel assembly (not shown) of DCS control panel (Figure 3, Item 1).
- d. Unhook clip on wiring harness (Figure 3, Item 6) and remove wiring harness (Figure 3, Item 6) from membrane panel assembly (not shown).
- e. Remove and discard four mounting screws (Figure 3, Item 8) securing engine control switch (Figure 3, Item 5) to front of DCS control panel (Figure 3, Item 1).
- f. Remove and discard engine control switch (Figure 3, Item 5) and gasket (Figure 3, Item 7) from front of DCS control panel (Figure 3, Item 1).
- g. Tag and remove six wires of wiring harness (Figure 3, Item 6) from engine control switch (Figure 3, Item 5) by removing six screws (Figure 3, Item 4).

11. Install engine control switch (Figure 3, Item 5):

- a. Install six wires of wiring harness (Figure 3, Item 6) to contacts on engine control switch (Figure 3, Item 5) using tags applied at removal as a guide. Secure with six screws (Figure 3, Item 4).
- b. Position new gasket (Figure 3, Item 7) (supplied with new engine control switch (Figure 3, Item 5)) and new engine control switch (Figure 3, Item 5) to mounting location on rear of DCS control panel (Figure 3, Item 1), and align mounting holes.
- c. Secure engine control switch (Figure 3, Item 5) to DCS control panel (Figure 3, Item 1) by installing four new mounting screws (Figure 3, Item 8) (supplied with new engine control switch (Figure 3, Item 5)) through front of DCS control panel (Figure 3, Item 1).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

NOTE

Identification tags should remain in place until the DCS is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

- d. Install connector of wiring harness (Figure 3, Item 6) to corresponding connector on membrane panel assembly (not shown).
- e. Install new handle (Figure 3, Item 9) (supplied with new engine control switch (Figure 3, Item 5)) to engine control switch (Figure 3, Item 5), and tighten set screw (not shown) to secure.

12. Install DCS control panel assembly. See Install DCS Control Panel Assembly task.

END OF TASK

Install DCS Control Panel Assembly

1. Remove protective strips from self-adhesive surface of new gasket (Figure 1, Item 3).
2. Align the mounting holes carefully and apply new gasket (Figure 1, Item 3) to rear face of DCS control panel (Figure 1, Item 6).

CAUTION

Do not secure DCS control panel at this time.

3. Position DCS control panel (Figure 1, Item 6) to its mounting location on DCS enclosure (Figure 1, Item 2).
4. Lift DCS control panel (Figure 1, Item 6) far enough from DCS enclosure (Figure 1, Item 2) to allow access to wiring harnesses.

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

5. Install three wiring harnesses to DCS control panel (Figure 1, Item 6) at corresponding connectors using tags applied at removal as a guide:
 - a. Install six-pin wiring harness (Figure 1, Item 4) to main control card (not shown).
 - b. Install 22-pin wiring harness (Figure 1, Item 5) to main control card (not shown).
 - c. Install 14-pin wiring harness (Figure 1, Item 8) to power supply control card (not shown).
6. Position DCS control panel (Figure 1, Item 6) to its mounting location on DCS enclosure (Figure 1, Item 2), and align mounting holes.
7. Secure DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2) by installing 28 new locking screws (Figure 1, Item 7).
8. Torque 28 locking screws (Figure 1, Item 7) to 15.9 – 19.5 in/lb (1.8 – 2.2 Nm).
9. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
10. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
11. Start engine and check for proper operation (TM 9-6115-749-10).
12. Repair as required.
13. Close DCS door.

END OF TASK

Check DCS Diagnostic LEDs

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open DCS door and secure in open position.

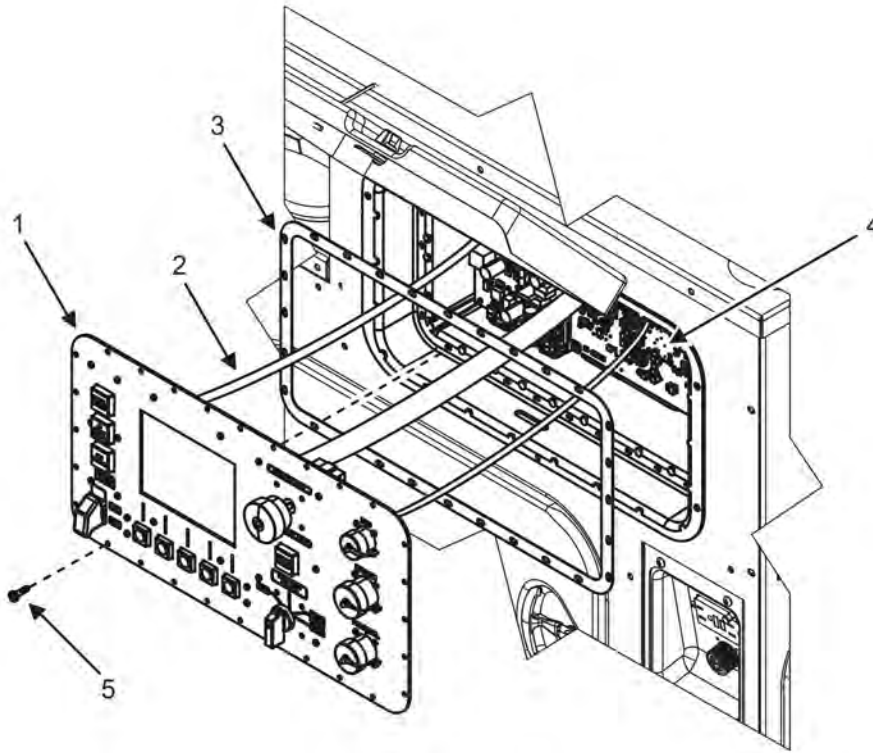


Figure 4. Accessing DCS Diagnostic LEDs.

3. Remove and discard 28 locking screws (Figure 4, Item 5) securing DCS control panel (Figure 4, Item 1) to DCS enclosure (Figure 4, Item 4).
4. Pull DCS control panel (Figure 4, Item 1) from DCS enclosure (Figure 4, Item 4) far enough to view printed circuit cards in rear of DCS enclosure (Figure 4, Item 4) and on rear of DCS control panel (Figure 4, Item 1).
5. Inspect seal (Figure 4, Item 3) between DCS enclosure (Figure 4, Item 4) and DCS control panel (Figure 4, Item 1) for signs of obvious damage. Remove and discard seal (Figure 4, Item 3) if damaged (WP 0017, Remove/Install DCS).
6. Secure DCS control panel (Figure 4, Item 1) with baling wire in a position that does not put stress on three cables (Figure 4, Item 2) running from DCS enclosure (Figure 4, Item 4) to DCS control panel (Figure 4, Item 1).

NOTE

Several LEDs should illuminate when engine control switch is in the PRIME & RUN position.

7. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
8. Troubleshoot electrical system (WP 0009, Electrical System Troubleshooting without a DCS Code) if LEDs do not illuminate.

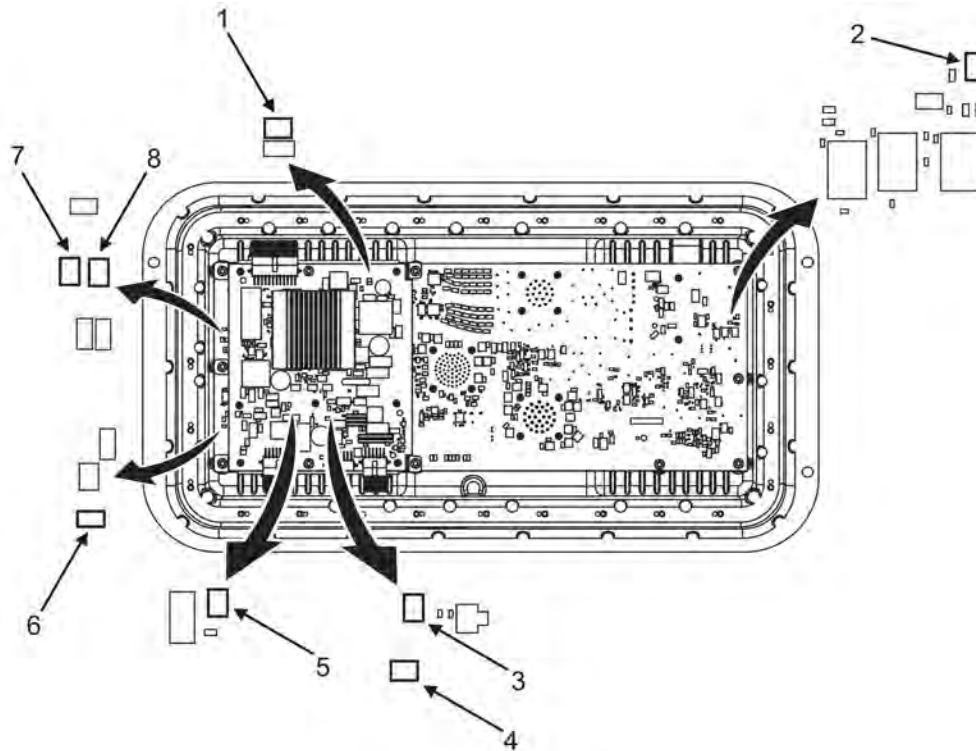


Figure 5. DCS Enclosure LEDs.

9. Observe LEDs on printed circuit boards inside DCS enclosure (Figure 4, Item 4).
10. Consult Figure 5 and Table 1 for proper function of LEDs.

Table 1. DCS Enclosure LEDs.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
5216 HEARTBEAT DS200 (Figure 5, Item 8)	Main processor function LED. The color is green.	<ol style="list-style-type: none"> 1. [Normal Mode]: Blinks at 0.5 Hz (1 sec on, 1 sec off) when U206 is running normally with application firmware. 2. [Boot Mode]: Blinks at 2 Hz (0.25 sec on, 0.25 sec off) when U206 is running boot firmware. 3. [OFF Mode]: Not blinking. 4. [Abnormal Mode]: 100% on. 	<ol style="list-style-type: none"> 1. [Normal Mode]: None. 2. [Boot Mode]: Load firmware into controller. Use InPower AMMPS Service Tool software. 3. [OFF Mode]: Check power to the controller. Make sure EMERGENCY STOP is not active. Rotate engine control switch from OFF position. If DS300 is blinking normally and DS200 is not blinking, see step 11. 4. [Abnormal Mode]: See step 11.

Table 1. DCS Enclosure LEDs — Continued.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
COMMON ALARM DS201 (Figure 5, Item 7)	Common alarm LED. The color is red.	LED is active when there is a warning or shutdown fault on the generator set.	Check warning/fault status on DCS. Take appropriate service response. Press FAULT RESET on DCS to clear the fault indicator.
5213 HEARTBEAT DS300 (Figure 5, Item 6)	Main control co-processor function LED. The color is green.	<ol style="list-style-type: none"> 1. [Normal Mode]: Blinks at 0.5 Hz (1 sec on, 1 sec off) when U206 is running normally with application firmware. 2. [Boot Mode]: Blinks at 2 Hz (0.25 sec on, 0.25 sec off) when U206 is running boot firmware. 3. [OFF Mode]: Not blinking. 4. [Abnormal Mode]: 100% on. 	<ol style="list-style-type: none"> 1. [Normal Mode]: None. 2. [Boot Mode]: Load firmware into controller. Use InPower AMMPS Service Tool software. 3. [OFF Mode]: Check power to the controller. Make sure EMERGENCY STOP is not active. Rotate engine control switch from OFF position. If DS200 is blinking normally and DS300 is not blinking, see step 11. 4. [Abnormal Mode]: See step 11.
DS1100 (Figure 5, Item 2)	Automatic Voltage Regulator (AVR) power supply status LED. The color is green.	If the DCS is powered and running normally, the LED will be active (on). This LED indicates the AVR section of the main board has power.	If the LED is off, check power to the controller. Make sure EMERGENCY STOP is not active. Rotate engine control switch from OFF position. If the LED does not turn on and the processor LEDs are working normally, see step 11.
DS100 (Figure 5, Item 1)	Non-isolated power supply LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 11.
DS101 (Figure 5, Item 5)	Isolated power supply LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 11.
DS200 (Figure 5, Item 4)	DCS control power LED. The color is green.	Should be 100% on when the DCS is powered and running normally. This will be off if the DCS is not powered up and running.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 11.
DS201 (Figure 5, Item 3)	Power supply control card heater LED. The color is green.	LED is normally off. This LED goes on when the DCS heater system is active. This will be at extremely low ambient temperatures (-51°F – -33°F (-46°C – -36°C)).	No service steps are required. Normal operation is not affected by this circuit. Only low temperature conditions can verify the operation of this circuit.

11. Replace DCS (WP 0017, Remove/Install DCS) if LEDs do not function IAW Table 1.

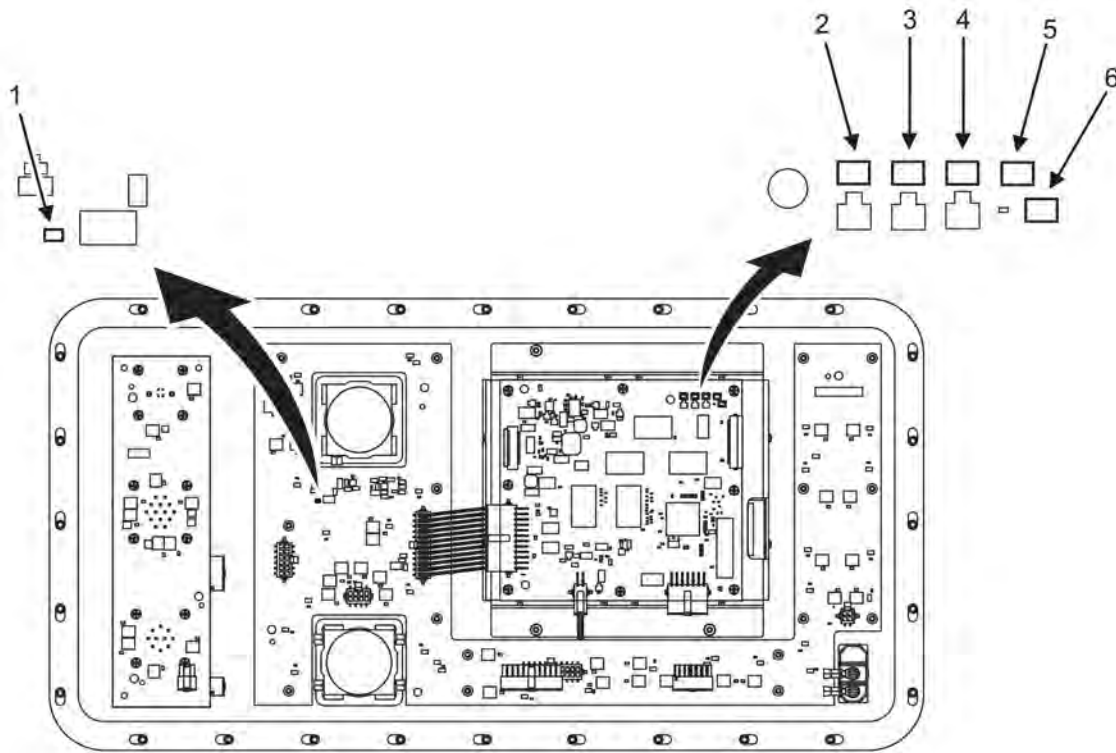


Figure 6. DCS Control Panel LEDs.

12. Observe LEDs on printed circuit boards on rear of DCS control panel (Figure 4, Item 1).
13. Consult Figure 6 and Table 2 for proper function of LEDs.

Table 2. DCS Control Panel LEDs.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
DS1 (Figure 6, Item 6)	3.3 V DCS power LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 14.
DS2 (Figure 6, Item 2)	Display controller microcontroller status LED. The color is green.	<ol style="list-style-type: none"> 1. [OFF Mode]: LED is off. 2. [Initialization Mode]: Blinks very fast during power-up initialization. 3. [Boot Mode]: Blinks at 2 Hz (0.25 sec on, 0.25 sec off) when U1 is running the boot block firmware. 4. [Normal Mode]: Blinks at 0.5 Hz (1 sec on, 1 sec off) when U1 microcontroller is running the application firmware. 5. [Abnormal Mode]: 100% on. This indicates the system is not running and has a fault. 	<ol style="list-style-type: none"> 1. If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. 2. If device is in initialization mode, wait 10 sec and check again. If system does not leave initialization mode, check for [Boot Mode] and see step 14. 3. If device is in the boot mode, load firmware into controller with InPower AMMPS software loaded on Maintenance Support Device (MSD). 4. Normal mode requires no service actions to this assembly. 5. If device LED is stuck 100% on, see step 14.

Table 2. DCS Control Panel LEDs — Continued.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
DS3 (Figure 6, Item 3)	Display controller main controller communication LED. The color is red.	LED is normally off.	If LED is off, no service action is required. If LED is on, wait 10 sec for LED to turn off as communications initialize. If LED stays on indefinitely, check the cables between the main controller and the display controller. If LED stays on and cables are ok, see step 14.
DS4 (Figure 6, Item 4)	LCD glass heater LED. The color is green.	LED is normally off. LED goes on when the DCS heater system is active. This will be at extremely low ambient temperatures (-51°F – -4°F (-46°C – -20°C)).	If ambient temperatures are above 32°F (0°C) and this LED is active, check display controller function. Check the cables for a short circuit between wires. See step 14 if LED is always active at temperatures above 32°F (0°C).
DS5 (Figure 6, Item 5)	Display controller heater LED. The color is yellow.	LED is normally off. LED goes on when the DCS heater system is active. This will be at extremely low ambient temperatures (-51°F – -33°F (-46°C – -36°C)).	No service steps are required. Normal operation is not affected by this circuit. Only low-temperature conditions can verify the operation of this circuit.
DS28 (Figure 6, Item 1)	Temperature sense circuitry LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 14.

14. Replace DCS (WP 0017, Remove/Install DCS) if LEDs do not function IAW Table 1.

NOTE

LEDs should go off after DCS powers down when engine control switch is in the OFF position.

15. Turn engine control switch to OFF (TM 9-6115-749-10).
16. Install new seal (Figure 4, Item 3) to DCS enclosure (Figure 4, Item 4) if old seal was removed. See Install DCS Control Panel Assembly task.
17. Position DCS control panel (Figure 4, Item 1) to its mounting location on DCS enclosure (Figure 4, Item 4) and align the mounting holes.
18. Secure DCS control panel (Figure 4, Item 1) to DCS enclosure (Figure 4, Item 4) by installing 28 screws (Figure 4, Item 5). Torque 28 screws (Figure 4, Item 5) to 15.9 – 19.5 in/lb (1.8 – 2.2 Nm).
19. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
20. Start engine and check for proper operation (TM 9-6115-749-10).
21. Repair as required.
22. Close DCS door.

END OF TASK

Remove DCS Door Assembly

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
3. Remove top body panel (WP 0028, Remove/Install Top Body Panel).

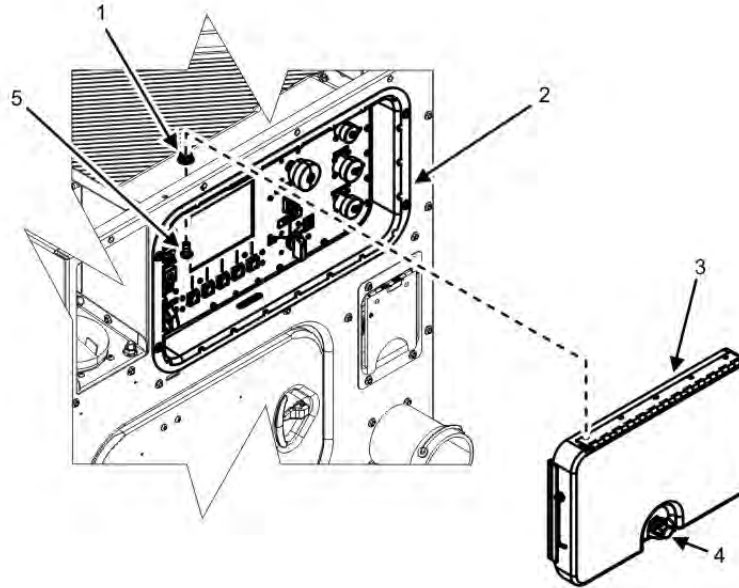


Figure 7. DCS Door — Removal.

4. Support DCS door (Figure 7, Item 3) and remove five nuts (Figure 7, Item 1) and five screws (Figure 7, Item 5) that secure DCS door (Figure 7, Item 3) to DCS enclosure (Figure 7, Item 2).
5. Rotate DCS door latch (Figure 7, Item 4) and remove DCS door (Figure 7, Item 3) from unit.
6. Place DCS door (Figure 7, Item 3) on a suitable work surface.

END OF TASK

Disassemble DCS Door Assembly

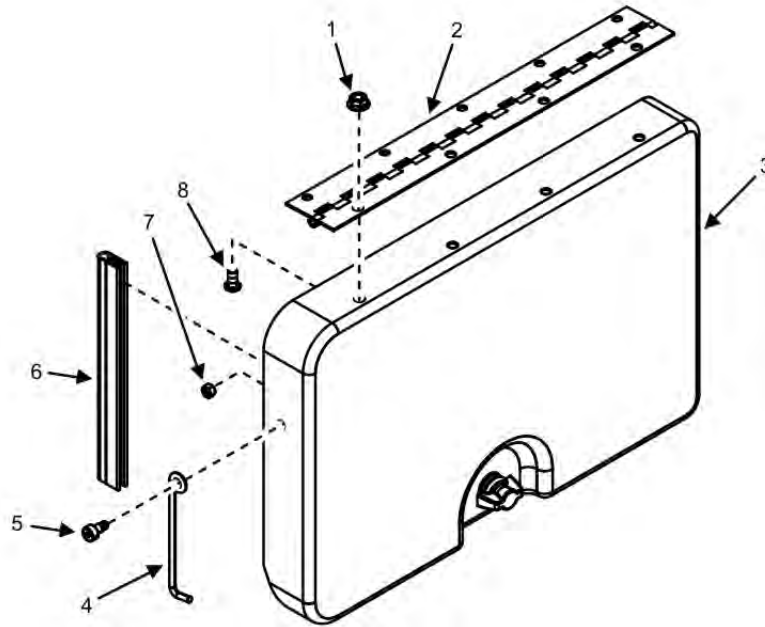


Figure 8. DCS Door — Disassembly.

1. Remove four screws (Figure 8, Item 8), four nuts (Figure 8, Item 1), and hinge (Figure 8, Item 2) from DCS door (Figure 8, Item 3).
2. Remove one screw (Figure 8, Item 5), one lock nut (Figure 8, Item 7), and door prop (Figure 8, Item 4) from DCS door (Figure 8, Item 3). Discard lock nut (Figure 8, Item 7).
3. Remove two rubber bumpers (Figure 8, Item 6) from edges of DCS door (Figure 8, Item 3).

END OF TASK

Inspect DCS Door Components

1. Inspect hinge (Figure 8, Item 2). Replace hinge (Figure 8, Item 2) if bent, corroded, or binding.
2. Inspect door prop (Figure 8, Item 4). Replace door prop (Figure 8, Item 4) if bent, cracked, or broken.
3. Inspect rubber bumpers (Figure 8, Item 6). Replace rubber bumpers (Figure 8, Item 6) if cracked or torn.
4. Inspect DCS door (Figure 8, Item 3). Replace DCS door (Figure 8, Item 3) if punctured, cracked, corroded, or badly bent. Repair minor dents by hammering out.

END OF TASK

Assemble DCS Door Assembly

1. Install two rubber bumpers (Figure 8, Item 6) to the inside edges of DCS door (Figure 8, Item 3).
2. Position door prop (Figure 8, Item 4) to its mounting position on outside of DCS door (Figure 8, Item 3) and secure by installing one screw (Figure 8, Item 5) and one new lock nut (Figure 8, Item 7).
3. Position hinge (Figure 8, Item 2) to DCS door (Figure 8, Item 3) and secure by installing four screws (Figure 8, Item 8) and four nuts (Figure 8, Item 1).

END OF TASK**Install DCS Door Assembly**

1. Position DCS door (Figure 7, Item 3) to its mounting position on DCS enclosure (Figure 7, Item 2).
2. Support DCS door (Figure 7, Item 3), while installing five screws (Figure 7, Item 5) and five nuts (Figure 7, Item 1) to secure DCS door (Figure 7, Item 3) to DCS enclosure (Figure 7, Item 2).
3. Close DCS door (Figure 7, Item 3) and secure DCS door latch (Figure 7, Item 4).
4. Install top body panel (WP 0028, Remove/Install Top Body Panel).
5. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
6. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
7. Start engine and check for proper operation (TM 9-6115-749-10).
8. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL AIR INTAKE HOSE ASSEMBLIES

INITIAL SETUP:**Tools and Special Tools**

Clamp, Vise-Grip, 11" Swivel Pad, Weld Type (WP 0162, Table 2, Item 7)
Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Clamp (4) (WP 0106, Repair Parts List, Figure 8, Item 4)
Clamp (WP 0106, Figure 8, Item 8)
Elbow, hose (WP 0106, Figure 8, Item 5)
Tubing, metallic (WP 0106, Figure 8, Item 6)
Tubing, nonmetallic (WP 0106, Figure 8, Item 9)
Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)
Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)
Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Top body panel removed (WP 0028, Remove/Install Top Body Panel)

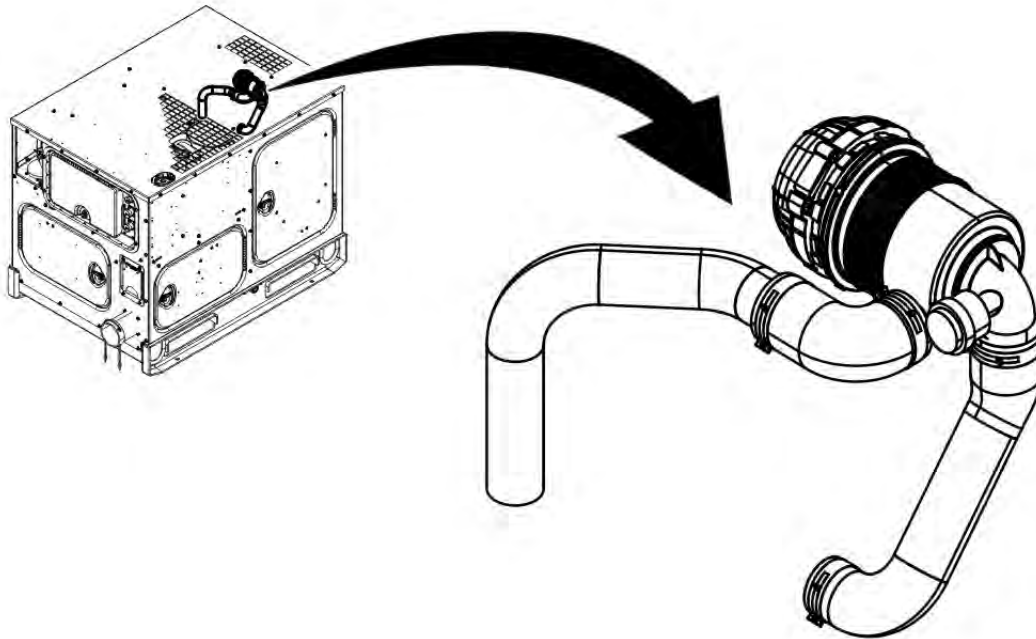
REMOVE/INSTALL AIR HOSE ASSEMBLIES**Remove Air Intake Air Hose Assemblies**

Figure 1. Air Intake Hose Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate all parts and connectors for air intake hose assembly (Figure 1).
3. Disengage clamp (Figure 2, Item 5) securing hose elbow (Figure 2, Item 4) to upper tube of air cleaner assembly (Figure 2, Item 6).

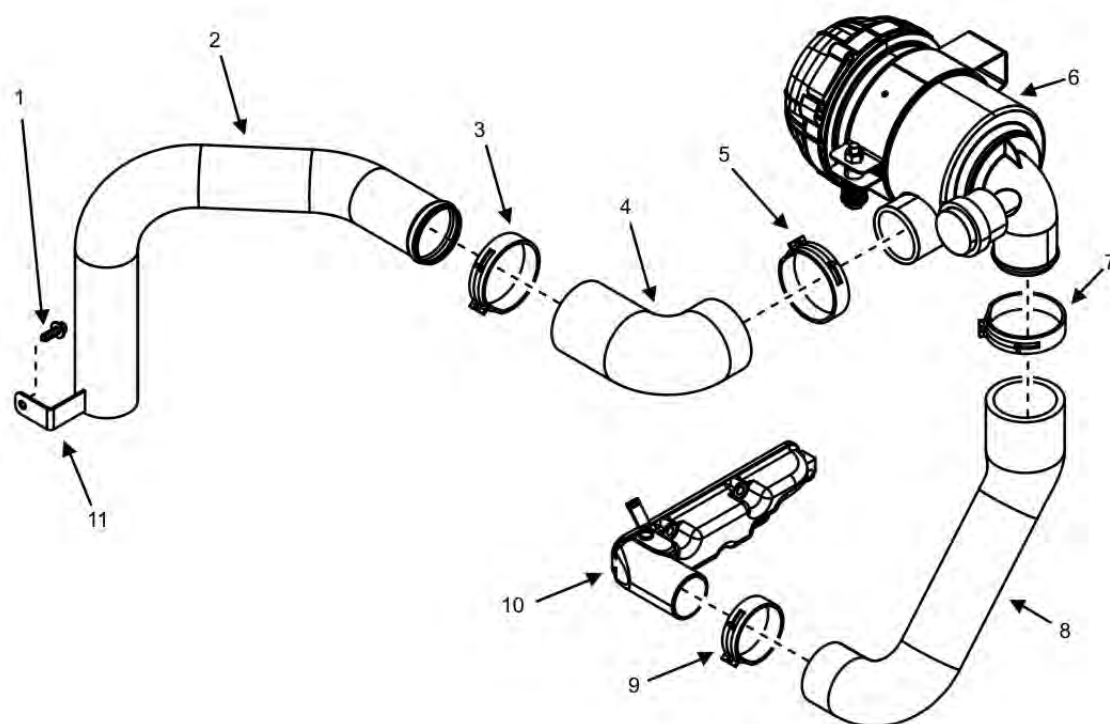


Figure 2. Air Intake Hose Assembly — Detail.

4. Remove hose elbow (Figure 2, Item 4) and clamp (Figure 2, Item 5) from air cleaner assembly (Figure 2, Item 6).
5. Remove hex socket head screw (Figure 2, Item 1) securing open end of metallic tubing (Figure 2, Item 2) to unit interior panel (not shown).
6. Remove hose elbow (Figure 2, Item 4), metallic tubing (Figure 2, Item 2), and clamps (Figure 2, Items 3 and 5) from unit, and place on a suitable work surface.
7. Disengage clamp (Figure 2, Item 7) and nonmetallic tubing (Figure 2, Item 8) from air cleaner assembly (Figure 2, Item 6).
8. Disengage clamp (Figure 2, Item 9) securing nonmetallic tubing (Figure 2, Item 8) to intake manifold (Figure 2, Item 10).
9. Remove nonmetallic tubing (Figure 2, Item 8) and clamps (Figure 2, Items 7 and 9) from unit, and place on a suitable work surface.

END OF TASK

Inspect Air Intake Hose Assemblies

1. Inspect hose elbow (Figure 2, Item 4), nonmetallic tubing (Figure 2, Item 8), and metallic tubing (Figure 2, Item 2) for damage or deterioration, and replace damaged or deteriorated parts as required.
2. Inspect hose elbow (Figure 2, Item 4), nonmetallic tubing (Figure 2, Item 8), and metallic tubing (Figure 2, Item 2) and remove any blockage such as debris, dirt, or kinks, or replace hose if blockage cannot be removed.
3. Inspect all clamps (Figure 2, Items 3, 5, 7, 9) for corrosion or damage, and replace as required.

END OF TASK

Install Air Intake Hose Assemblies**NOTE**

Wipe down air intake hoses, parts, and connectors with wiping rag prior to installation.

1. Position hose elbow (Figure 2, Item 4) and clamp (Figure 2, Item 5) to mounting location on air cleaner assembly (Figure 2, Item 6) but do not secure hose clamp (Figure 2, Item 5).
2. Install bracket (Figure 2, Item 11) at open end of metallic tubing (Figure 2, Item 2) to mounting location on unit interior panel (not shown) using one hex socket head screw (Figure 2, Item 1).
3. Secure clamp (Figure 2, Item 3) on metallic tubing (Figure 2, Item 2) at hose elbow (Figure 2, Item 4).
4. Position nonmetallic tubing (Figure 2, Item 8) and clamp (Figure 2, Item 9) at mounting location on intake manifold (Figure 2, Item 10), but do not secure clamp (Figure 2, Item 9).
5. Position nonmetallic tubing (Figure 2, Item 8) and clamp (Figure 2, Item 7) to mounting location on air cleaner assembly (Figure 2, Item 6), but do not secure clamp.
6. Verify proper position of nonmetallic tubing (Figure 2, Item 8), and secure clamps (Figure 2, Items 7 and 9).
7. Install top body panel (WP 0028, Remove/Install Top Body Panel).
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Close generator set doors.
10. Start engine and check for proper operation (TM 9-6115-749-10).
11. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
12. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
SERVICE AIR CLEANER ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Element, air filter (WP 0106, Repair Parts List, Figure 8, Item 2)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

WP 0019, Remove/Install Air Intake Hose Assemblies

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Air filter restriction indicator shows restricted filter (TM 9-6115-749-10)

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

SERVICE AIR CLEANER ASSEMBLY**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Remove Air Cleaner Filter Element

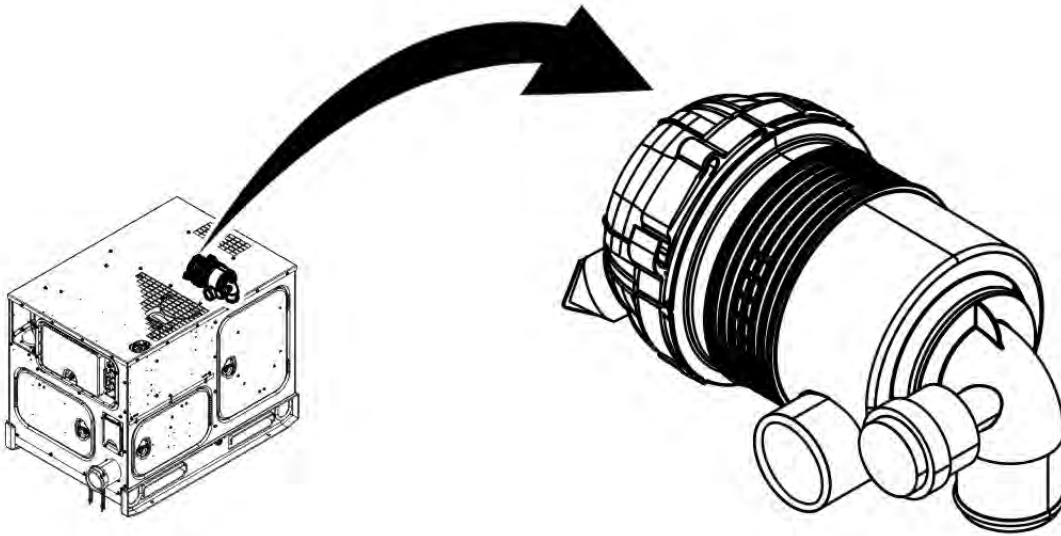
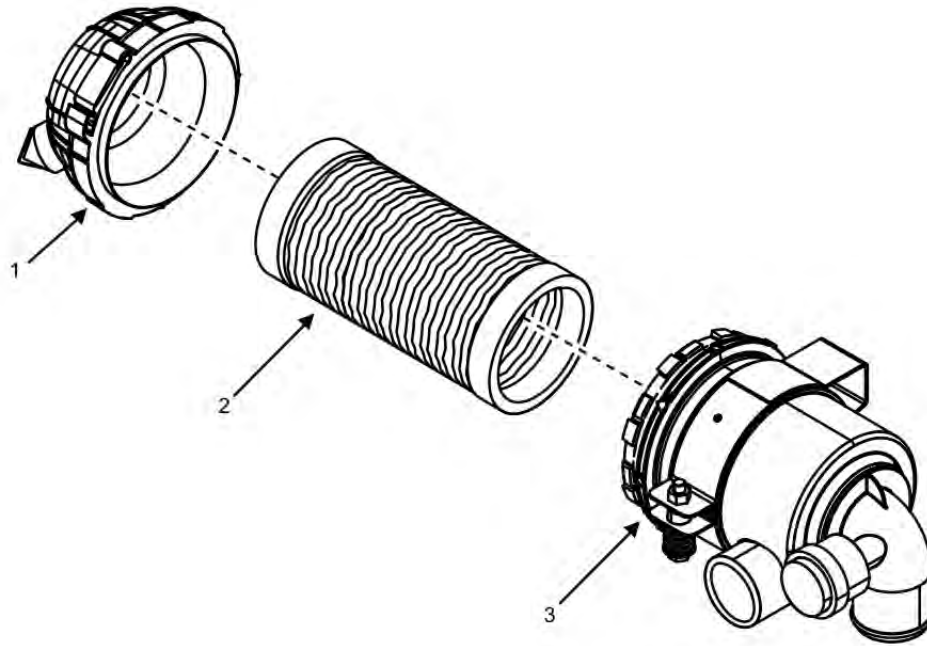


Figure 1. Air Cleaner — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate air cleaner assembly (Figure 1) attached to back side of unit weather shield.
3. Release lock lever on air cleaner assembly base cover (Figure 2, Item 1), and twist base cover counterclockwise until resistance is felt.
4. Pull base cover (Figure 2, Item 1) straight out to expose filter element (Figure 2, Item 2), and remove base cover (Figure 2, Item 1) from unit.
5. Inspect base cover (Figure 2, Item 1) for damage or corrosion and replace as required.
6. Turn end of filter element (Figure 2, Item 2) in either direction to disengage seal.
7. Remove filter element (Figure 2, Item 2) from air cleaner assembly (Figure 2, Item 3) by gently pulling outward. Discard element.
8. Inspect air cleaner assembly (Figure 2, Item 3) for damage or corrosion and replace as required. See Remove Air Cleaner Assembly task and Install Air Cleaner Assembly task.

END OF TASK

Install Air Cleaner Filter Element**Figure 2. Air Cleaner Assembly.**

1. Remove dirt and debris from base cover (Figure 2, Item 1), sealing surfaces, and inside of air cleaner assembly (Figure 2, Item 3).
2. Insert new filter element (Figure 2, Item 2) into air cleaner assembly (Figure 2, Item 3) and twist in either direction to secure.

NOTE

When base cover is placed on air cleaner assembly and turned clockwise, a click can be heard when the cover is properly secured.

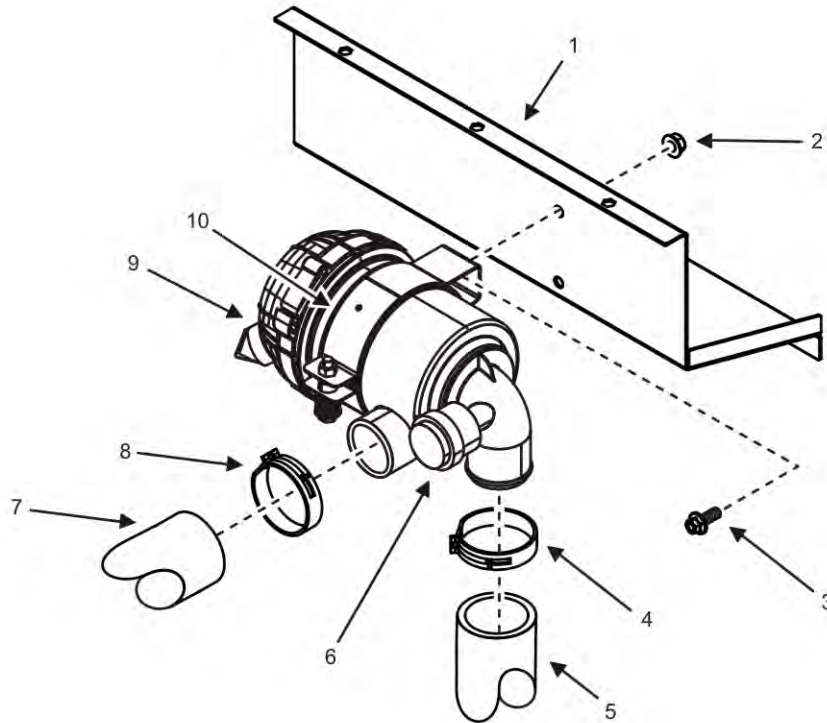
3. Position base cover (Figure 2, Item 1) on housing mount and turn clockwise to secure.

NOTE

Restriction indicator on air cleaner assembly should be reset only after a new air filter has been installed.

4. Reset restriction indicator (Figure 3, Item 6) on air cleaner assembly (Figure 3, Item 9) by pressing large yellow button on top of restriction indicator (Figure 3, Item 6).

END OF TASK

Remove Air Cleaner Assembly**Figure 3. Air Cleaner Assembly and Mounting.**

1. Remove air inlet hose (Figure 3, Item 7) connecting air cleaner assembly (Figure 3, Item 9) to inlet tube by releasing hose clip (Figure 3, Item 8) at air cleaner assembly end of hose (WP 0019, Remove/Install Air Intake Hose Assemblies).
2. Remove air outlet hose (Figure 3, Item 5) connecting air cleaner assembly (Figure 3, Item 9) to inlet manifold by releasing hose clip (Figure 3, Item 4) at air cleaner assembly end of hose.

CAUTION

Removing the nuts holding the air cleaner bracket to the weather shield will leave the screws free to come out of the bracket. Care should be taken that screw(s) are not dropped into the engine. Failure to comply may cause damage to equipment.

3. Disconnect air cleaner bracket (Figure 3, Item 10) from weather shield (Figure 3, Item 1) by removing two flange nuts (Figure 3, Item 2) and two flange head screws (Figure 3, Item 3) securing air cleaner bracket (Figure 3, Item 10) to weather shield (Figure 3, Item 1).
4. Remove air cleaner assembly (Figure 3, Item 9) and air cleaner bracket (Figure 3, Item 10) from unit and place on suitable work surface.
5. Inspect air cleaner assembly (Figure 3, Item 9) and air cleaner bracket (Figure 3, Item 10) for damage or corrosion and replace as required.
6. Inspect hose clips (Figure 3, Items 4 and 8) for damage or corrosion and replace as required.

END OF TASK

Install Air Cleaner Assembly

1. Position air cleaner assembly (Figure 3, Item 9) and air cleaner bracket (Figure 3, Item 10) to mounting location on weather shield (Figure 3, Item 1).
2. Secure air cleaner bracket (Figure 3, Item 10) and air cleaner assembly (Figure 3, Item 9) to weather shield (Figure 3, Item 1) by installing two flange head screws (Figure 3, Item 3) and two flange nuts (Figure 3, Item 2).

NOTE

Wipe down air cleaner assembly hoses, parts, and connectors with wiping rag prior to installation.

3. Rotate air cleaner assembly (Figure 3, Item 9) within the air cleaner bracket (Figure 3, Item 10) as necessary to align air cleaner inlet opening with air inlet hose (Figure 3, Item 7).
4. Install air inlet hose (Figure 3, Item 7) on air cleaner assembly (Figure 3, Item 9), and reposition hose clip (Figure 3, Item 8) to secure air inlet hose (Figure 3, Item 7) (WP 0019, Remove/Install Air Intake Hose Assemblies).
5. Install air outlet hose (Figure 3, Item 5) on air cleaner assembly (Figure 3, Item 9), and reposition hose clip (Figure 3, Item 4) to secure air outlet hose (Figure 3, Item 5) (WP 0019, Remove/Install Air Intake Hose Assemblies).
6. Close generator set doors.
7. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
8. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
9. Repair as required.

END OF TASK

Disassemble Air Cleaner Assembly

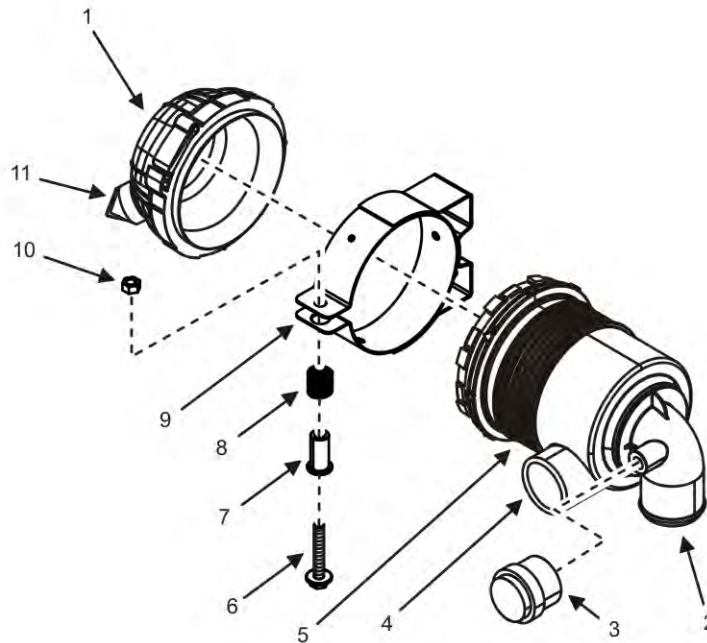


Figure 4. Air Cleaner Assembly — Detail.

1. Remove air cleaner assembly (Figure 3, Item 9) and air cleaner bracket (Figure 3, Item 10) from unit weather shield (Figure 3, Item 1). See Remove Air Cleaner Assembly task.
2. Remove air cleaner filter element (Figure 2, Item 2). See Remove Air Cleaner Filter Element task.
3. Rotate air filter restriction indicator (Figure 4, Item 3) counterclockwise from elbow (Figure 4, Item 2) of air cleaner housing (Figure 4, Item 4) to remove air filter restriction indicator (Figure 4, Item 3) from air cleaner housing (Figure 4, Item 4).
4. Inspect air filter restriction indicator (Figure 4, Item 3) for excessive corrosion or other signs of damage and replace as required.
5. Remove nut (Figure 4, Item 10), spring (Figure 4, Item 8), spacer (Figure 4, Item 7), and bolt (Figure 4, Item 6) securing air cleaner mounting bracket (Figure 4, Item 9) to air cleaner housing (Figure 4, Item 4).
6. Inspect air cleaner hardware for corrosion and other signs of obvious damage. Replace as required.
7. Remove mounting bracket (Figure 4, Item 9) from air cleaner housing (Figure 4, Item 4) by expanding mounting bracket (Figure 4, Item 9) to slide over air cleaner housing end (Figure 4, Item 5).
8. Inspect mounting bracket (Figure 4, Item 9) for corrosion, cracks, or other signs of obvious damage and replace as required.
9. Remove dust ejection valve (Figure 4, Item 11) from air cleaner base (Figure 4, Item 1).
10. Inspect dust ejection valve (Figure 4, Item 11) for corrosion, cracks, or other signs of obvious damage. Replace as required.

END OF TASK

Assemble Air Cleaner Assembly

1. Clean all air cleaner assembly components thoroughly before reassembling.
2. Install dust ejection valve (Figure 4, Item 11) on air cleaner base (Figure 4, Item 1).
3. Place air cleaner housing (Figure 4, Item 4) into mounting bracket (Figure 4, Item 9).

NOTE

Spacer and spring are installed on the bolt outside the strap, next to the bolt head.

4. Secure mounting bracket (Figure 4, Item 9) to air cleaner housing (Figure 4, Item 4) using bolt (Figure 4, Item 6), spacer (Figure 4, Item 7), spring (Figure 4, Item 8), and nut (Figure 4, Item 10).
5. Secure bolt (Figure 4, Item 6) finger-tight to allow rotation of air cleaner assembly housing (Figure 4, Item 4) during installation of air hoses.
6. Apply thread sealant to mounting threads of air filter restriction indicator (Figure 4, Item 3).
7. Install and secure air filter restriction indicator (Figure 4, Item 3) on elbow (Figure 4, Item 2) of air cleaner housing (Figure 4, Item 4).
8. Install air cleaner filter element. See Install Air Cleaner Filter Element task.
9. Install air cleaner assembly (Figure 3, Item 9) onto unit weather shield (Figure 3, Item 1). See Install Air Cleaner Assembly task.
10. Install top body panel on generator set (WP 0028, Remove/Install Top Body Panel).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Close generator set doors.
13. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
14. Start engine and check for proper operation (TM 9-6115-749-10).
15. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
SERVICE COOLING SYSTEM

INITIAL SETUP:**Test Equipment**

Test Kit, Radiator Pressure (WP 0162, Table 2, Item 25)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0163, Item 8)

Cleaning compound, engine cooling system (WP 0163, Item 9)

Distilled water (WP 0163, Item 17)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

MIL-C-10597F (ME)

WP 0024, Remove/Install Radiator Hose and Tube Assemblies

WP 0027, Remove/Install Radiator

WP 0087, Lubrication Instructions

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

SERVICE COOLING SYSTEM**WARNING**

Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

Test Cooling System

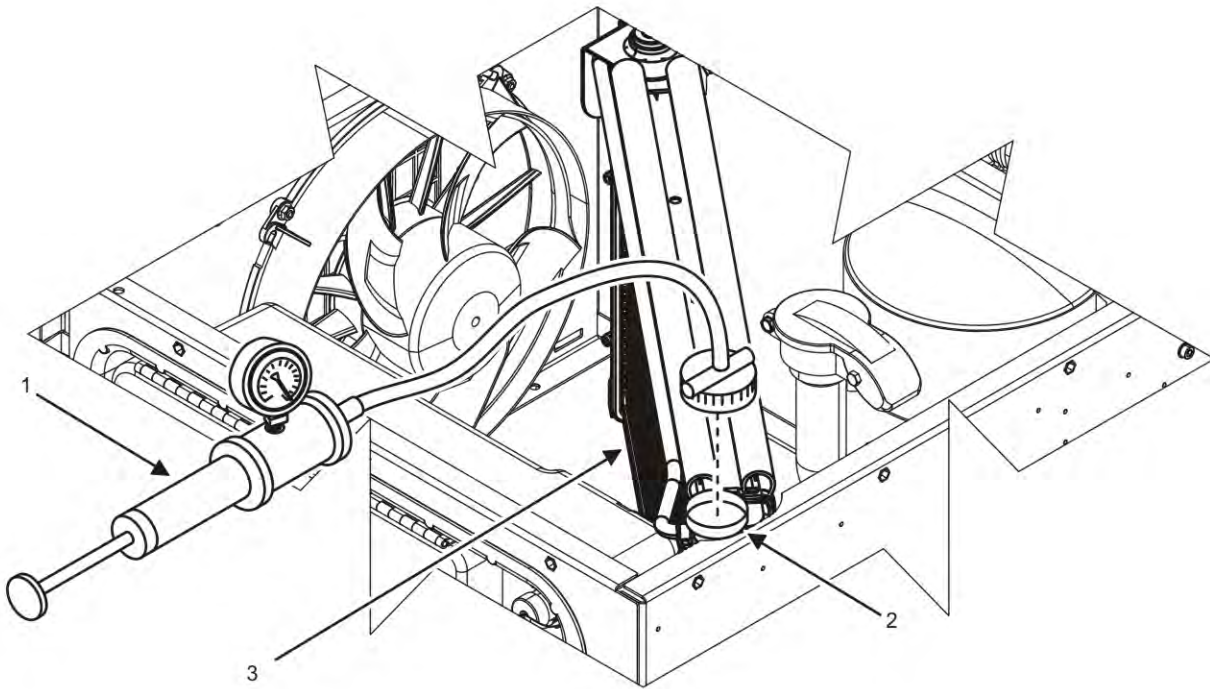


Figure 1. Cooling System Test — Radiator.

NOTE

Dispose of captured coolant IAW local SOP.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Ensure radiator (Figure 1, Item 3) is filled with engine coolant to proper level. See Fill Radiator with Engine Coolant task.
3. Remove radiator cap (Figure 3, Item 1) from radiator (Figure 1, Item 3).
4. Install radiator cap (Figure 3, Item 1) onto a cooling system tester (Figure 1, Item 1).
5. Apply 10.8 – 14.8 psi (75 – 105 kPa) to radiator cap.
6. Replace radiator cap (Figure 3, Item 1) if relief valve fails to open when pressure is above 13 psi (89.6 kPa).
7. Remove radiator cap (Figure 3, Item 1) from cooling system tester (Figure 1, Item 1).
8. Install cooling system tester to fill port (Figure 1, Item 2) on top of radiator.
9. Apply 10.8 – 14.8 psi (75 – 105 kPa) to radiator via fill port (Figure 1, Item 2).

NOTE

If pressure reading drops when applied to the radiator, the engine cooling system is leaking. Be sure to check radiator, hoses, and clamps when inspecting system for leaks.

10. Inspect cooling system for leaks in radiator hoses and around clamps (WP 0024, Remove/Install Radiator Hose and Tube Assemblies) if pressure reading drops after applying pressure to radiator (Figure 1, Item 3).
11. Remove and replace radiator (Figure 1, Item 3) if leaking (WP 0027, Remove/Install Radiator).

12. Remove and replace any hoses or clamps (WP 0024, Remove/Install Radiator Hose and Tube Assemblies) where leaks are found.
13. Remove cooling system tester (Figure 1, Item 1) from fill port (Figure 1, Item 2).

CAUTION

Be sure to close radiator cap securely. If radiator cap is loose or improperly closed, coolant may leak, causing engine to overheat. Failure to comply may cause damage to equipment.

14. Install radiator cap (Figure 3, Item 1) to radiator fill port (Figure 1, Item 2).

END OF TASK

Drain Engine Coolant

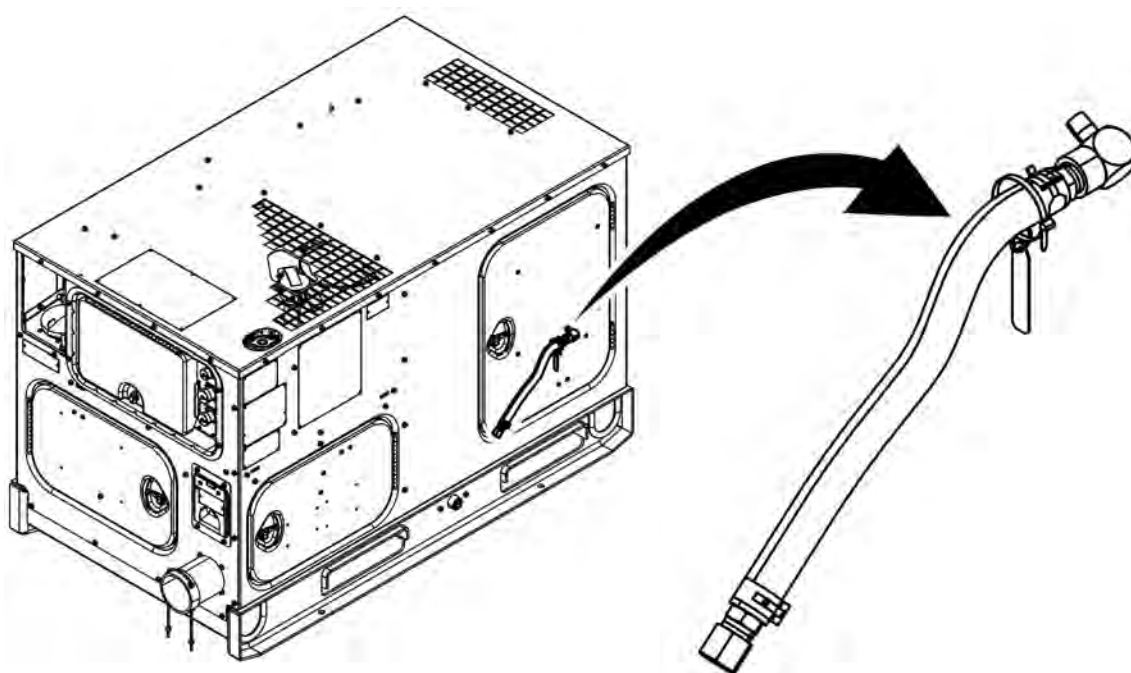


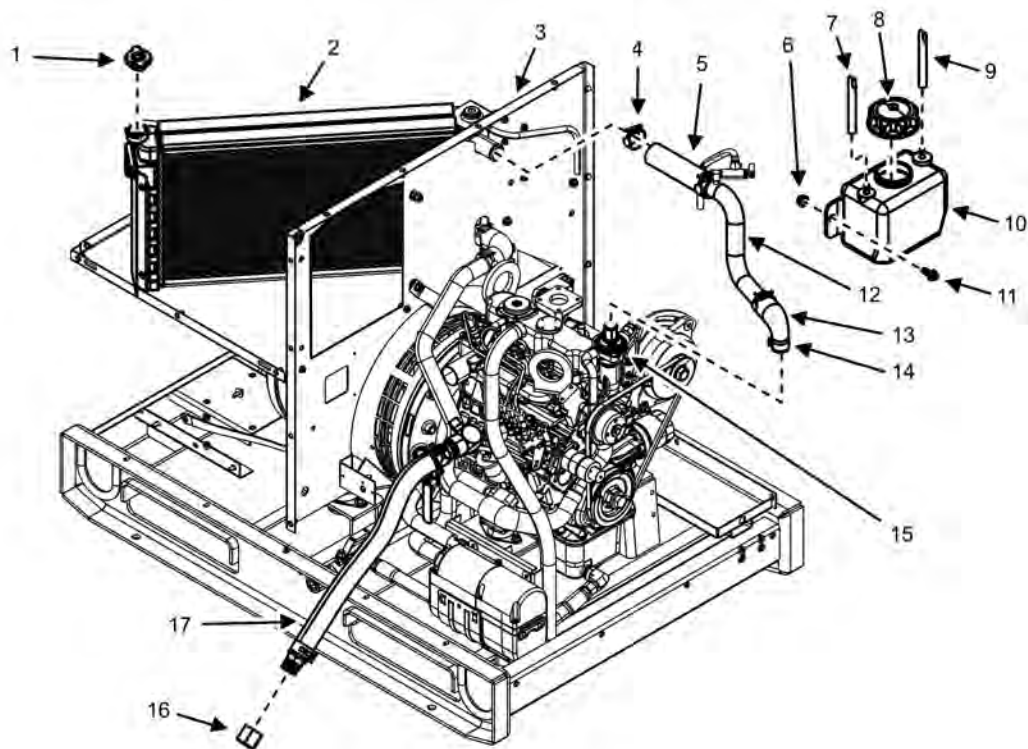
Figure 2. Coolant Drain Line — Location.

NOTE

The AMMPS 5 kW generator set is shipped from the factory filled with commercial-grade coolant. The color of the commercial-grade coolant may be different from the Mil-Standard coolant with which you are familiar.

The commercial-grade coolant is compatible with the Mil-Standard coolant specified in this manual. Mil-Standard coolant may be used to top-off coolant level prior to the first maintenance interval. Commercial-grade coolant should be drained and replaced with Mil-Standard coolant as directed at the first maintenance interval.

1. Drain coolant from engine:
 - a. Open left-side door on generator set.
 - b. Open right-side door on generator set to locate coolant drain hose assembly (Figure 2).



Legend

- | | |
|-----------------------|-----------------------------|
| 1. Radiator Cap | 9. Recovery Hose |
| 2. Radiator | 10. Coolant Recovery Bottle |
| 3. Bulkhead Panel | 11. Cap Screw |
| 4. Hose Clamp | 12. Tube |
| 5. Hose | 13. Hose |
| 6. Nut | 14. Hose Clamp |
| 7. Recovery Hose | 15. Thermostat |
| 8. Coolant Bottle Cap | 16. Drain Hose Cap |
| | 17. Coolant Drain Hose |

Figure 3. Cooling System.

- c. Pull coolant drain hose assembly (Figure 3, Item 17) through right-side door opening.
- d. Remove radiator cap (Figure 3, Item 1).

NOTE

Dispose of captured coolant IAW local SOP.

- e. Place a suitable container (minimum 2-gal capacity) under end of coolant drain hose assembly (Figure 3, Item 17).
- f. Remove drain hose cap (Figure 3, Item 16) from end of coolant drain hose assembly (Figure 3, Item 17) and allow coolant to drain into container.
- g. Install drain hose cap (Figure 3, Item 16) when coolant flow has stopped running.
- h. Inspect coolant drain hose assembly (Figure 3, Item 17) for signs of obvious damage.

- i. Replace damaged components as required. See step 2.
 - j. Store coolant drain hose assembly (Figure 3, Item 17) inside right-side of unit and close right-side door.
2. Repair coolant drain hose assembly.

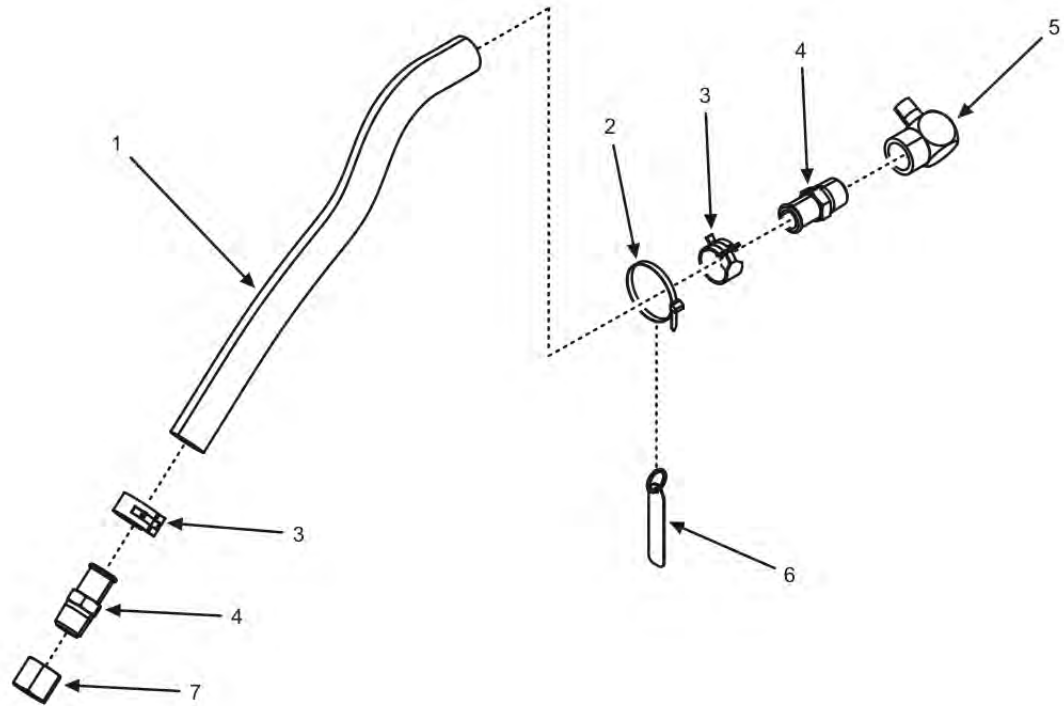


Figure 4. Repair Coolant Drain Hose.

- a. Reposition clamp (Figure 4, Item 3) to allow removal of hose assembly from tube adapter (Figure 4, Item 4). Remove hose assembly from tube adapter (Figure 4, Item 4).
- b. Remove tube adapter (Figure 4, Item 4) from elbow (Figure 4, Item 5).
- c. Remove elbow (Figure 4, Item 5) from engine oil pan.
- d. Disassemble coolant drain hose assembly into the following components:
 - (1) Tube adapter (1) (Figure 4, Item 4).
 - (2) Clamp (2) (Figure 4, Item 3).
 - (3) Cable tie (Figure 4, Item 2). Discard cable tie.
 - (4) Information coolant drain hose label (Figure 4, Item 6).
 - (5) Coolant drain hose (Figure 4, Item 1).
 - (6) Cap (Figure 4, Item 7).
- e. Discard and replace damaged component(s).
- f. Apply thread sealant to threads of tube adapter (Figure 4, Item 4), elbow (Figure 4, Item 5), and cap (Figure 4, Item 7) prior to assembly.
- g. Assemble cap (Figure 4, Item 7), tube adapter (Figure 4, Item 4), coolant drain hose (Figure 4, Item 1), two clamps (Figure 4, Item 3), new cable tie (Figure 4, Item 2), and information label (Figure 4, Item 6) into an assembly.

- h. Assemble tube adapter (Figure 4, Item 4) to elbow (Figure 4, Item 5).
 - i. Install elbow (Figure 4, Item 5) to engine oil pan.
 - j. Install hose assembly to tube adapter (Figure 4, Item 4) and reposition clamp (Figure 4, Item 3) to secure hose assembly (Figure 3, Item 17).
3. Remove upper radiator hose assembly:
- a. Remove recovery hoses (Figure 3, Items 7 and 9) from top of coolant recovery bottle (Figure 3, Item 10) and cap/plug open hoses and fittings on coolant recovery bottle (Figure 3, Item 10).
 - b. Remove hose (Figure 3, Item 5) and tube (Figure 3, Item 12) assembly from radiator fitting (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
 - c. Drain coolant from hose (Figure 3, Item 5) and tube (Figure 3, Item 12) by bending hose (Figure 3, Item 13) at thermostat (Figure 3, Item 15) while holding container under open end of hose (Figure 3, Item 5).
 - d. Disengage hose clamp (Figure 3, Item 14) securing hose (Figure 3, Item 13) to thermostat (Figure 3, Item 15).

NOTE

Residual coolant may drain from hose (Figure 3, Item 13) when removed from thermostat housing.

- e. Remove hose (Figure 3, Item 13) from thermostat (Figure 3, Item 15) (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
 - f. Remove upper radiator hose assembly (Figure 3, Items 4, 5, 12, 13, and 14) from unit.
 - g. Cap/plug openings in radiator (Figure 3, Item 2) and thermostat (Figure 3, Item 15) to prevent dirt and debris from entering cooling system.
4. Inspect and install upper radiator hose assembly:
- a. Remove residual coolant from flexible hose fittings on radiator (Figure 3, Item 2) and thermostat (Figure 3, Item 15) using scale remover and wiping rag.
 - b. Inspect two hoses (Figure 3, Items 5 and 13) and tube (Figure 3, Item 12) for damage, deterioration, and/or obstruction.
 - c. Remove any obstructions in hoses (Figure 3, Items 5 and 13), and replace damaged tube (Figure 3, Item 12) or hoses (Figure 3, Items 5 and 13) as required.
 - d. Inspect hose clamps (Figure 3, Items 4 and 14) for excessive corrosion or signs of damage and replace as required.
 - e. Remove caps/plugs from the fittings prior to installation of hoses.

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

- f. Install upper radiator hose assembly (Figure 3, Items 4, 5, 12, 13, and 14) to radiator (Figure 3, Item 2) and thermostat (Figure 3, Item 15) (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
5. Clean coolant recovery bottle:
- a. Place suitable container and wiping rag by coolant recovery bottle (Figure 3, Item 10).
 - b. Remove two cap screws (Figure 3, Item 11) and two nuts (Figure 3, Item 6) securing coolant recovery bottle (Figure 3, Item 10) to bulkhead panel (Figure 3, Item 3).

- c. Remove coolant recovery bottle (Figure 3, Item 10) from bulkhead panel (Figure 3, Item 3), and drain coolant from coolant recovery bottle (Figure 3, Item 10).

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

- d. Install coolant recovery bottle (Figure 3, Item 10) to bulkhead panel (Figure 3, Item 3) using two cap screws (Figure 3, Item 11) and two nuts (Figure 3, Item 6).
 - e. Install recovery hoses (Figure 3, Items 7 and 9) to coolant recovery bottle (Figure 3, Item 10).
 - f. Install coolant bottle cap (Figure 3, Item 8) and secure tightly.
 - g. Install radiator cap (Figure 3, Item 1) and secure tightly.
6. Complete the Clean Radiator Interior task followed by the Fill Radiator with Engine Coolant task if radiator requires flushing.
 7. Move to Fill Radiator with Engine Coolant task if radiator does not require flushing.

END OF TASK

Clean Radiator Interior

WARNING

Engine cooling system cleaning compound MIL-C-10597F (ME) Cleaning Compound with Conditioner for Engine Cooling Systems will not be used as a routine maintenance procedure each time antifreeze is added or drained from the cooling system. The compound will be used only when necessary to clean heavily rusted or partially clogged cooling systems. Failure to comply may cause injury or death to personnel.

Engine cleaning compound MIL-C-10597F (ME) for cooling systems is designed to clean the interiors of cooling systems, to neutralize residual cleaning acids, and to coat the interiors with a silicate. The engine cleaning compound is hazardous to personnel due to the nature of its use. Failure to comply may cause injury or death to personnel.

NOTE

The AMMPS 5 kW generator set is shipped from the factory filled with commercial-grade coolant. The color of the commercial-grade coolant may be different from the Mil-Standard coolant with which you are familiar.

The commercial-grade coolant is compatible with the Mil-Standard coolant specified in this manual. Therefore, Mil-Standard coolant may be used to top-off coolant level prior to the first maintenance interval. Commercial-grade coolant should be drained and replaced with Mil-Standard coolant as directed at the first maintenance interval.

Dispose of captured coolant IAW local SOP.

1. Drain engine coolant if not already drained. See Drain Engine Coolant task.
2. Open all drain cocks and remove engine block drain when engine is stopped and temperature of coolant is considerably below 200°F (93°C).
3. Add clean water and, while doing so, start the engine at fast idle (drains open). Flush by continually flooding cooling system with clean water while engine is running for 25 min.
4. Stop engine, close all pet cocks, install engine block drain, refill with clean water, and maintain level in cooling system.

5. Fill cooling system with coolant mixture when cleaning cycle is finished. Fill Radiator with Engine Coolant task.

END OF TASK

Fill Radiator with Engine Coolant

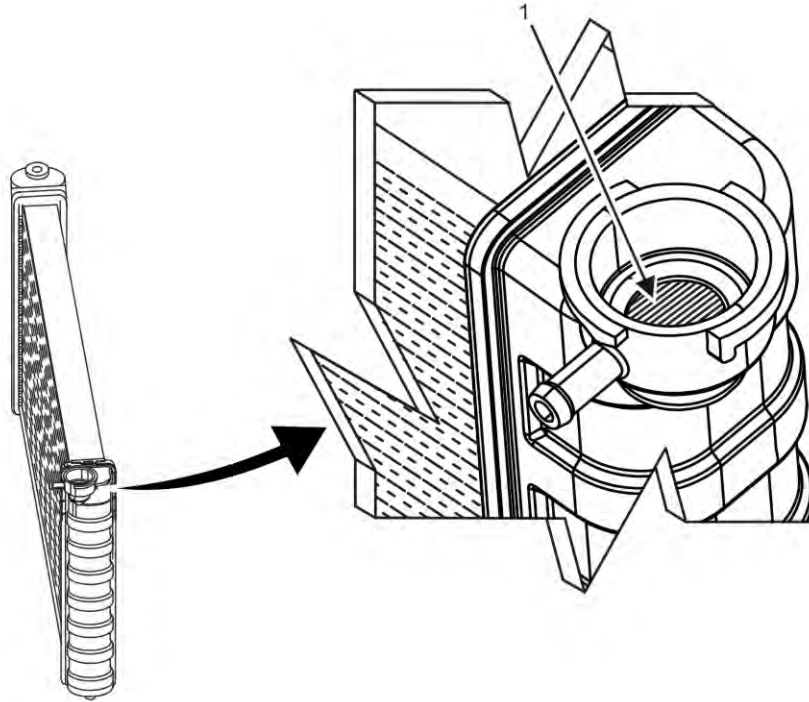


Figure 5. Radiator Fill Port.

NOTE

The AMMPS 5 kW generator set is shipped from the factory filled with commercial-grade coolant. The color of the commercial-grade coolant may be different from the Mil-Standard coolant with which you are familiar.

The commercial-grade coolant is compatible with the Mil-Standard coolant specified in this manual. Mil-Standard coolant may be used to top-off coolant level prior to the first maintenance interval. Commercial-grade coolant should be drained and replaced with Mil-Standard coolant as directed at the first maintenance interval.

1. Remove radiator cap (Figure 3, Item 1) from radiator (Figure 3, Item 2).
2. Remove coolant bottle cap (Figure 3, Item 8) from coolant recovery bottle (Figure 3, Item 10).
3. Open pressure relief valve on upper radiator tube (Figure 3, Item 12) by lifting the relief valve lever 90 degrees from position shown.
4. Add coolant until the level reaches the LOW mark on the coolant recovery bottle (Figure 3, Item 10).

NOTE

Pour coolant slowly into the radiator to allow trapped air to escape.

5. Fill radiator (Figure 3, Item 2) with approved mixture of one-half clean water and one-half engine coolant until coolant level reaches the narrow opening at the bottom of the filler neck (Figure 5, Item 1) (WP 0087, Lubrication Instructions).

CAUTION

Be sure to close radiator cap (Figure 3, Item 1) securely. If cap is loose or improperly closed, coolant may leak, causing engine to overheat. Failure to comply may cause damage to equipment.

6. Install radiator cap (Figure 3, Item 1) and tighten securely.
7. Install coolant bottle cap (Figure 3, Item 8) and tighten securely.
8. Return relief valve lever on upper radiator tube (Figure 3, Item 12) to original position as shown in Figure 3.
9. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
10. Close generator set doors.

WARNING

Starting engine when unit is partially disassembled is dangerous. Run engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

11. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
12. Start engine and run for 5 min (TM 9-6115-749-10).
13. Inspect cooling system (Figure 3) for leaks. Repair as required.
14. Stop engine and let cool.
15. Check coolant level in coolant recovery bottle (Figure 3, Item 10) and add coolant mixture as required to bring level of coolant in bottle to LOW marking line.

CAUTION

Be sure to close radiator cap securely. If cap is loose or improperly closed, coolant may leak, causing engine to overheat. Failure to comply may cause damage to equipment.

16. Install top body panel (WP 0028, Remove/Install Top Body Panel).
17. Close right- and left-side doors.
18. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
19. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
20. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL COOLANT RECOVERY SYSTEM

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Hose, vent radiator (2) (WP 0108, Repair Parts List, Figure 10, Item 14)

Hose, vent radiator (WP 0108, Figure 10, Item 18)

Hose, vent radiator (WP 0108, Figure 10, Item 21)

Tank, coolant assembly (WP 0108, Figure 10, Item 23)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items, Item 2)

Rag, wiping (WP 0163, Item 31)

Soap, lubricating (WP 0163, Item 33)

Personnel Required

91D (1)

Assistant (1)

References

WP 0021, Service Cooling System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

REMOVE/INSTALL COOLANT RECOVERY SYSTEM**WARNING**

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

Remove Coolant Recovery System

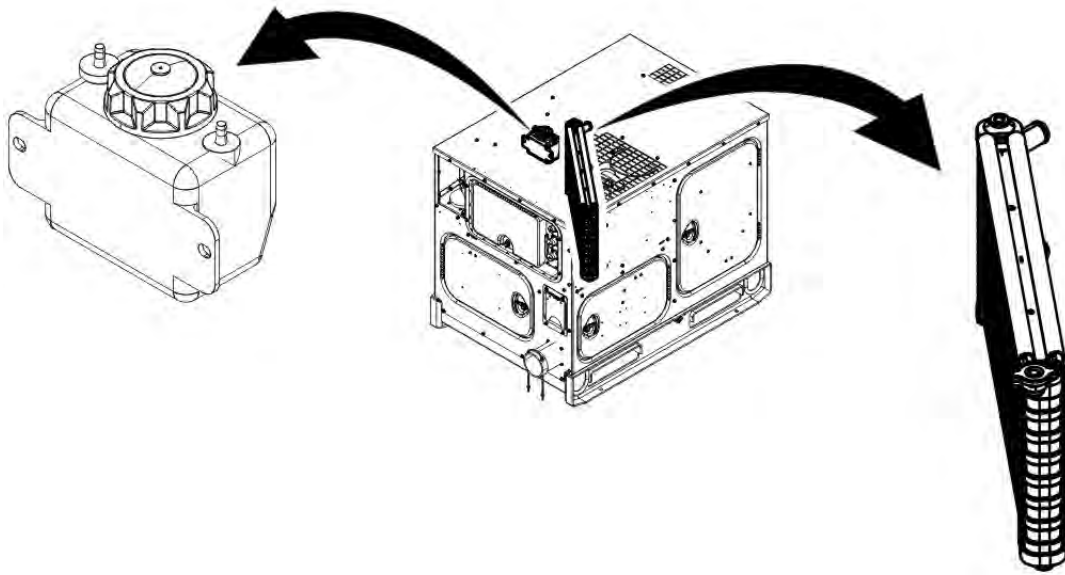


Figure 1. Coolant Recovery System — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate coolant recovery system units (Figure 1).

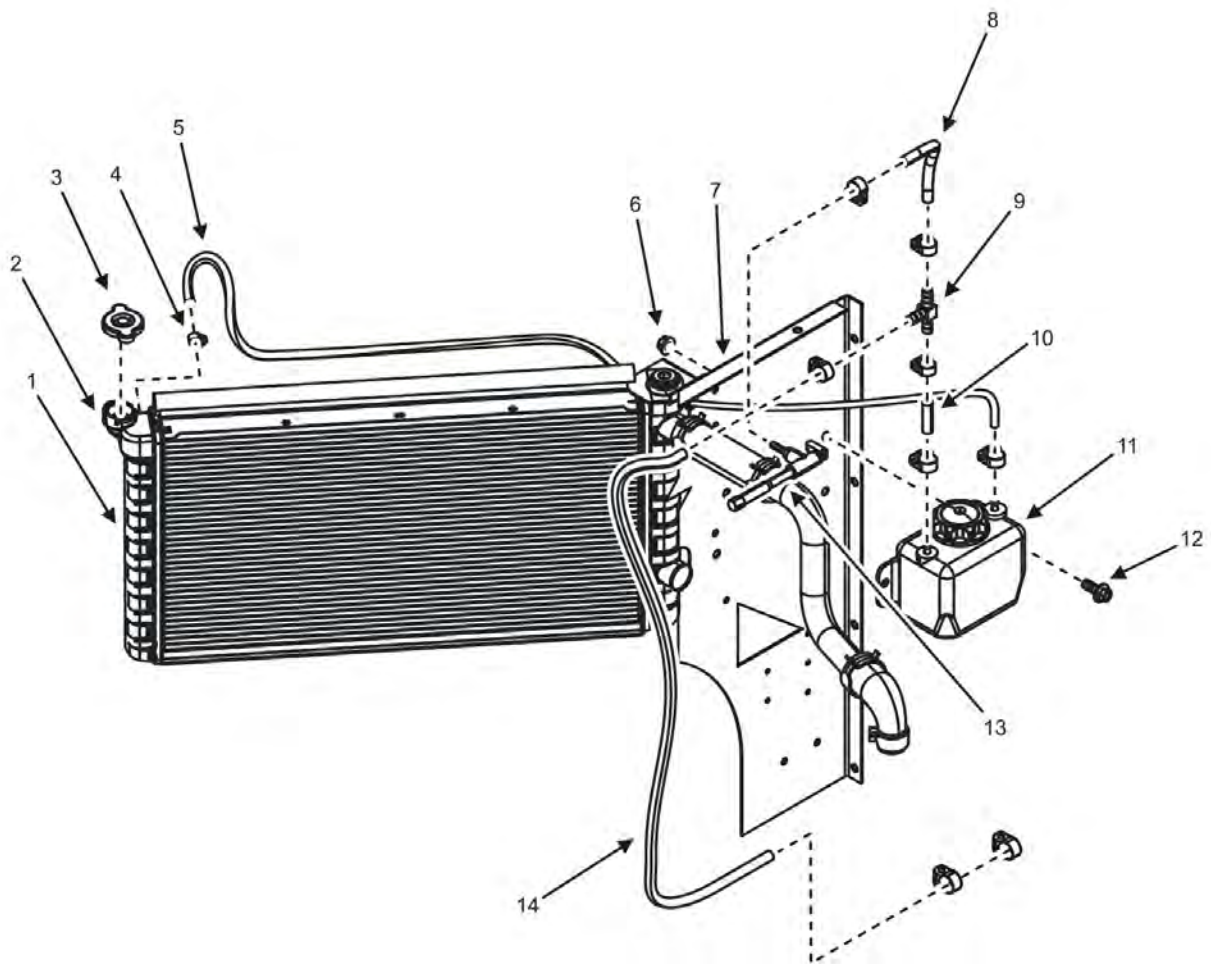


Figure 2. Coolant Recovery System.

3. Place wiping rag over radiator cap (Figure 2, Item 3).
4. Turn radiator cap (Figure 2, Item 3) gently counterclockwise to first détente to relieve residual pressure in cooling system.
5. Turn radiator cap (Figure 2, Item 3) counterclockwise to second détente after pressure is relieved.
6. Remove radiator cap (Figure 2, Item 3) and cover radiator filler neck (Figure 2, Item 2).
7. Inspect radiator cap (Figure 2, Item 3) for damage or cracked gasket and replace as required.

NOTE

Cap/plug all open coolant lines/fittings to prevent dirt and debris from entering the cooling system.

Dispose of captured coolant IAW local SOP.

8. Loosen two hose clamps (Figure 2, Item 4) and remove two radiator vent hoses (Figure 2, Items 5 and 10) from fittings on top of coolant tank assembly (Figure 2, Item 11).
9. Remove two screws (Figure 2, Item 12) and two nuts (Figure 2, Item 6) securing coolant tank assembly to engine side of internal bulkhead panel (Figure 2, Item 7).
10. Remove coolant tank assembly (Figure 2, Item 11) from unit, and set hardware aside for reuse.
11. Loosen hose clamp (Figure 2, Item 4) of long radiator vent hose (Figure 2, Item 5) from hose fitting at radiator filler neck (Figure 2, Item 2).
12. Remove rubber edge bulb seal (not shown) containing long radiator vent hose (Figure 2, Item 5) from top of radiator (Figure 2, Item 1), and extract long radiator vent hose (Figure 2, Item 5) from inside seal.
13. Extract long radiator vent hose (Figure 2, Item 5) by feeding hose through opening in internal bulkhead panel (Figure 2, Item 7), and place hose on a suitable work surface.
14. Loosen hose clamp (Figure 2, Item 4) and remove radiator vent hose (Figure 2, Item 8) from pressure relief valve (Figure 2, Item 13).
15. Loosen hose clamp (Figure 2, Item 4) and remove draining radiator vent hose (Figure 2, Item 14) from T-fitting (Figure 2, Item 9).
16. Remove T-fitting (Figure 2, Item 9) and two radiator vent hoses (Figure 2, Items 8 and 10) from unit and place parts on a suitable work surface.
17. Loosen two hose clamps (Figure 2, Item 4) at unit skid and remove draining radiator vent hose (Figure 2, Item 14) from unit, and place hose on a suitable work surface.
18. Loosen two hose clamps (Figure 2, Item 4) and remove two radiator vent hoses (Figure 2, Items 8 and 10) from T-fitting (Figure 2, Item 9).
19. Inspect coolant tank assembly (Figure 2, Item 11) for damage and replace as required.
20. Inspect all radiator vent hoses (Figure 2, Items 5, 8, 10, and 14) for damage and replace as required.
21. Inspect radiator (Figure 2, Item 1) for damage and replace as required.

END OF TASK

Install Coolant Recovery System

1. Position coolant tank assembly (Figure 2, Item 11) to its mounting location on internal bulkhead panel (Figure 2, Item 7).
2. Secure coolant tank assembly (Figure 2, Item 11) to internal bulkhead panel (Figure 2, Item 7) by installing two screws (Figure 2, Item 12) and two nuts (Figure 2, Item 6).

NOTE

Remove all caps/plugs from coolant lines prior to installation.

3. Attach two radiator vent hoses (Figure 2, Items 5 and 10) to fittings on top of coolant tank assembly (Figure 2, Item 11). Secure two radiator vent hoses (Figure 2, Items 5 and 10) with two hose clamps (Figure 2, Item 4).

4. Place free end of long radiator vent hose (Figure 2, Item 5) through opening in internal bulkhead panel (Figure 2, Item 7), and carefully pull hose through opening.
5. Place free end of long radiator vent hose (Figure 2, Item 5) inside rubber edge bulb seal (not shown) from top of radiator (Figure 2, Item 1), and feed hose through opening in seal.
6. Lubricate hose fitting on radiator filler neck (Figure 2, Item 2) with lubricating coolant to facilitate future removal.
7. Attach long radiator vent hose (Figure 2, Item 5) to fitting on radiator filler neck (Figure 2, Item 2). Secure hose with hose clamp (Figure 2, Item 4).
8. Attach rubber edge bulb seal (not shown) to top of radiator (Figure 2, Item 1), being careful not to damage long radiator vent hose (Figure 2, Item 5) inside seal.
9. Attach T-fitting (Figure 2, Item 9) to radiator vent hose (Figure 2, Item 10) on coolant tank assembly (Figure 2, Item 11).
10. Attach radiator vent hose (Figure 2, Item 8) to T-fitting (Figure 2, Item 9) and pressure relief valve (Figure 2, Item 13). Secure two hoses with two hose clamps (Figure 2, Item 4).
11. Attach draining radiator vent hose (Figure 2, Item 14) to last fitting of T-fitting (Figure 2, Item 9), and secure hose with hose clamp (Figure 2, Item 4).
12. Position draining radiator vent hose (Figure 2, Item 14) at bottom of skid and secure with two hose clamps (Figure 2, Item 4).
13. Fill cooling system (WP 0021, Service Cooling System); ensure a mixture of one-half clean water and one-half engine coolant fills coolant tank assembly (Figure 2, Item 11) up to level of LOW line.
14. Install and secure radiator cap (Figure 2, Item 3).
15. Install and secure lid on coolant tank assembly (Figure 2, Item 11).
16. Close generator set doors.

WARNING

Starting engine when unit is partially disassembled is dangerous. Run engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

Running the engine will reveal any leaks in the coolant recovery lines.

17. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
18. Start engine and run until fan cycles on and off two times (TM 9-6115-749-10).
19. Check all coolant hose fittings for leaks while engine is operating.
20. Turn engine OFF.
21. Allow engine to cool.
22. Check coolant level, and add coolant as required (WP 0021, Service Cooling System).

23. Install top body panel (WP 0028, Remove/Install Top Body Panel).
24. Close generator set doors.
25. Set engine control switch to PRIME & RUN.
26. Start engine and check for proper operation.
27. Repair as required.
28. Dispose of captured coolant IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL COOLING FAN

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Fan, engine cooling (WP 0108, Repair Parts List, Figure 10, Item 38)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

REMOVE/INSTALL COOLING FAN**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fan. Failure to comply may cause injury or death to personnel.

Remove Cooling Fan

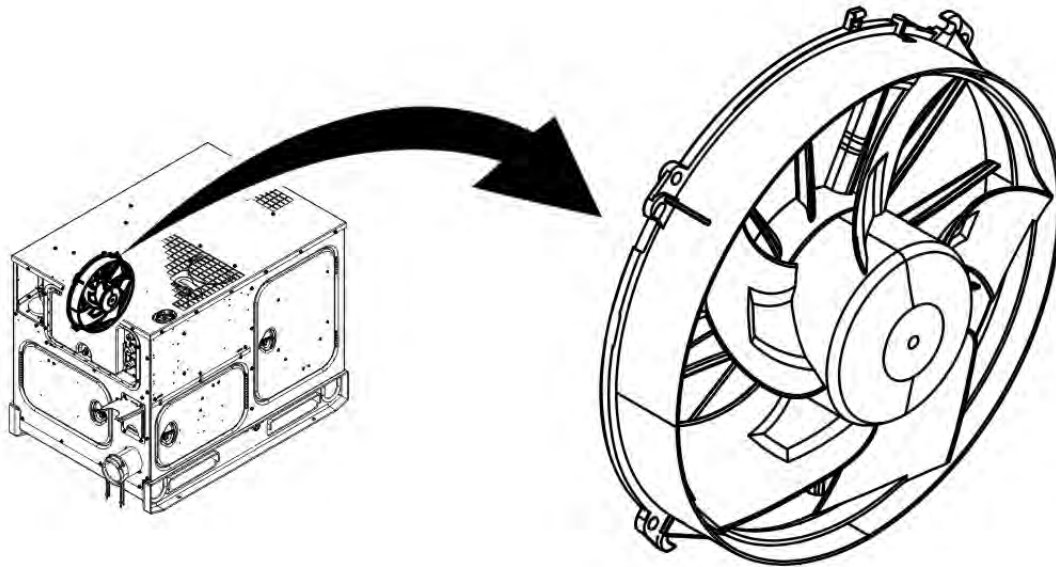


Figure 1. Cooling Fan — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate cooling fan (Figure 1) at rear of unit.

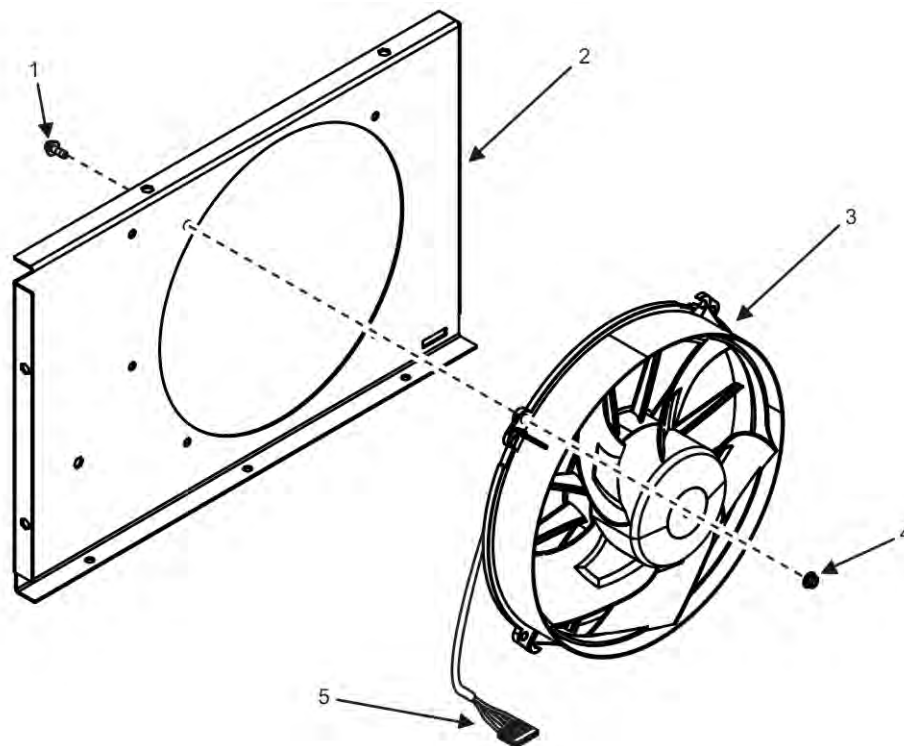


Figure 2. Cooling Fan — Details.

3. Disconnect cooling fan electrical lead (Figure 2, Item 5) from unit wiring harness at connector.
4. Remove four flange head screws (Figure 2, Item 1) and four flange nuts (Figure 2, Item 4) securing cooling fan (Figure 2, Item 3) to fan support panel (Figure 2, Item 2).
5. Remove cooling fan (Figure 2, Item 3) from unit and place on a suitable work surface.
6. Remove dirt and debris from surface of cooling fan (Figure 2, Item 3).

END OF TASK

Inspect Cooling Fan

1. Inspect cooling fan (Figure 2, Item 3) for damage to fan guard and fan blades and replace fan as required.
2. Inspect cooling fan electrical lead (Figure 2, Item 5) for cracked insulation, broken wires, or other signs of obvious damage. Replace fan as required.
3. Inspect fan support panel (Figure 2, Item 2) for excessive corrosion or other damage and replace as required.
4. Inspect cooling fan mounting hardware for excessive corrosion or damage and replace as required.

END OF TASK

Install Cooling Fan

1. Position cooling fan (Figure 2, Item 3) on fan support panel (Figure 2, Item 2) with cooling fan electrical lead (Figure 2, Item 5) oriented at bottom of fan toward radiator support panel.
2. Align cooling fan mounting holes with mounting holes in fan support panel (Figure 2, Item 2).

-
3. Secure cooling fan (Figure 2, Item 3) to fan support panel (Figure 2, Item 2) using four flange head screws (Figure 2, Item 1) and four flange nuts (Figure 2, Item 4).
 4. Connect cooling fan electrical lead (Figure 2, Item 5) to unit wiring harness at connector.
 5. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
 6. Install top body panel (WP 0028, Remove/Install Top Body Panel).
 7. Close left-side door.
 8. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
 9. Start engine and check for proper operation (TM 9-6115-749-10).
 10. Allow cooling fan to cycle on and off through two cycles to check for proper operation and repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL RADIATOR HOSE AND TUBE ASSEMBLIES

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Elbow, coolant (WP 0108, Repair Parts List, Figure 10, Item 35)

Elbow, coolant hose (WP 0108, Figure 10, Item 29)

Elbow, coolant hose (WP 0108, Figure 10, Item 31)

Hose, coolant (WP 0108, Figure 10, Item 34)

Tube, water lower (WP 0108, Figure 10, Item 27)

Tube, water upper (WP 0108, Figure 10, Item 33)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0163, Item 8)

Cleaning compound, engine cooling system (WP 0163, Item 9)

Distilled water (WP 0163, Item 17)

Grease, electrically conductive (WP 0163, Item 20)

Pan, drain (WP 0163, Item 28)

Materials/Parts

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Assistant (1)

References

WP 0021, Service Cooling System

WP 0027, Remove/ Install Radiator

WP 0029, Remove/Install Front Body Panel

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

REMOVE/INSTALL RADIATOR HOSE AND TUBE ASSEMBLIES
WARNING

Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

Remove Upper Radiator Hose Assembly

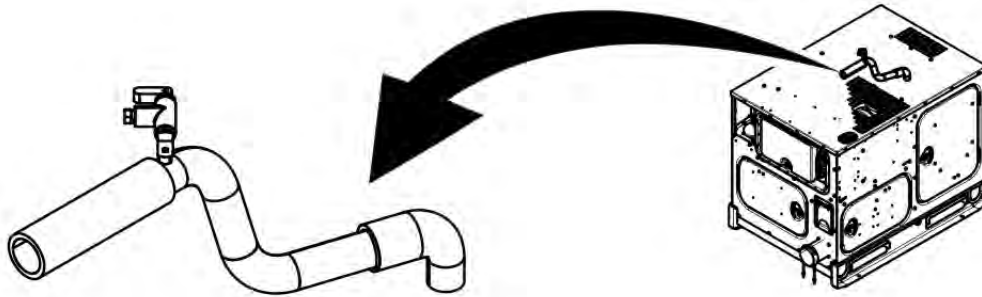


Figure 1. Upper Radiator Hose Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left- and right-side doors.
3. Locate upper radiator hose assembly (Figure 1).

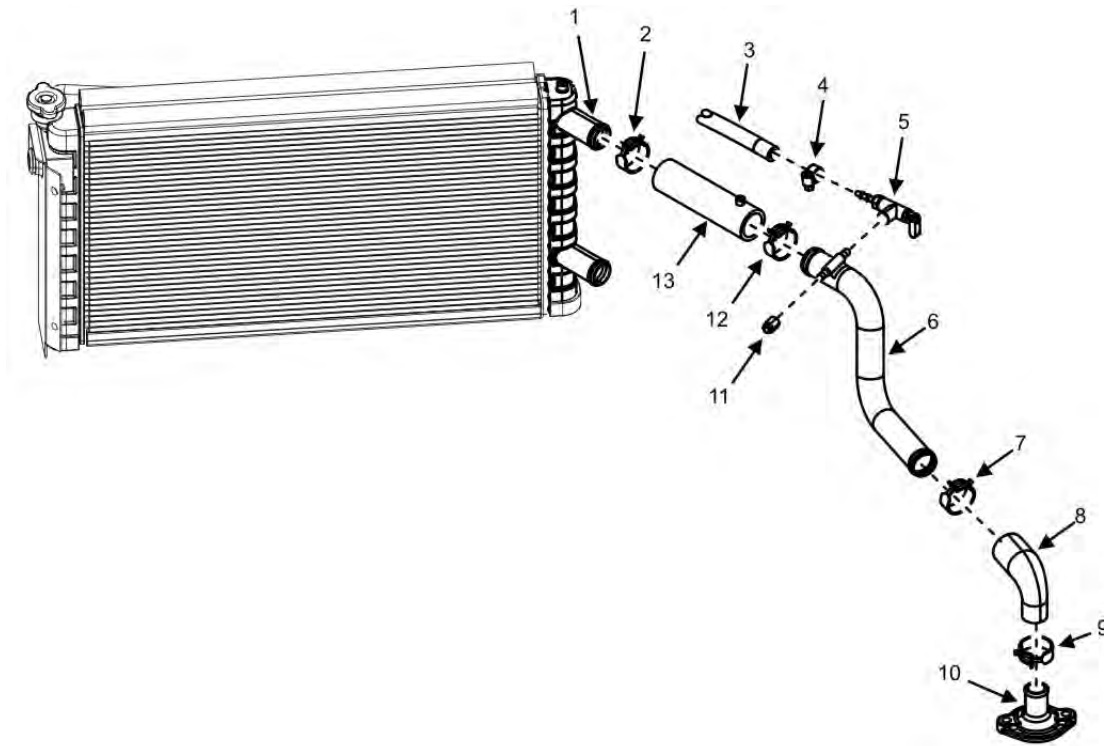


Figure 2. Upper Radiator Hose Assembly.

NOTE

Place a suitable container or rags under each hose connection prior to removal to capture any residual coolant that may be spilled when hoses are removed.

Cap/plug all open coolant hoses, ports, and fittings to prevent additional spillage and to prevent contamination from entering the cooling system.

4. Loosen hose clamp (Figure 2, Item 4) and remove hose (Figure 2, Item 3) from equalization valve (Figure 2, Item 5) on upper water tube (Figure 2, Item 6).
5. Loosen hose clip (Figure 2, Item 9) at thermostat housing (Figure 2, Item 10) and remove coolant hose elbow (Figure 2, Item 8) from thermostat housing (Figure 2, Item 10).
6. Loosen hose clip (Figure 2, Item 2) at upper port of radiator (Figure 2, Item 1) and remove coolant hose (Figure 2, Item 13) from radiator (Figure 2, Item 1).
7. Remove upper radiator hose assembly (Figure 1) from generator set and place on a suitable work surface.
8. Remove two hose clips (Figure 2, Items 2 and 12) and coolant hose (Figure 2, Item 13) from upper water tube (Figure 2, Item 6).

9. Remove two hose clips (Figure 2, Items 7 and 9) and coolant hose elbow (Figure 2, Item 8) from upper water tube (Figure 2, Item 6).
10. Remove equalization valve (Figure 2, Item 5) and plug (Figure 2, Item 11) from upper water tube (Figure 2, Item 6).

END OF TASK

Inspect Upper Radiator Hose Assembly

1. Inspect hose clips (Figure 2, Items 2, 7, 9, and 12) and hose clamp (Figure 2, Item 4) for cracks, excessive corrosion, or other signs of obvious damage and repair or replace as required.
2. Inspect hoses (Figure 2, Items 8 and 13) for firmness, cracks, wear, or other signs of obvious damage and repair or replace as required.
3. Remove any scale from all hose ends with scale-removing compound and wiping rag prior to installation.
4. Inspect equalization valve (Figure 2, Item 5) and plug (Figure 2, Item 11) for damage. Replace components as required.
5. Inspect upper water tube (Figure 2, Item 6) for cracks, damage, or excessive corrosion and replace as required.
6. Inspect upper port of radiator (Figure 2, Item 1) for damage and corrosion. Replace radiator (Figure 2, Item 1) if damaged (WP 0027, Remove/Install Radiator).

END OF TASK

Install Upper Radiator Hose Assembly

1. Wipe down all components with a wiping rag prior to installation.
2. Install coolant hose (Figure 2, Item 13) and two hose clips (Figure 2, Items 2 and 12) to radiator end of upper water tube (Figure 2, Item 6).
3. Install coolant hose elbow (Figure 2, Item 8) and two hose clips (Figure 2, Items 7 and 9) to thermostat housing end of upper water tube (Figure 2, Item 6).
4. Apply thread sealing compound to threads of tee on upper water tube (Figure 2, Item 6).
5. Install pressure equalization valve (Figure 2, Item 5) and plug (Figure 2, Item 11) onto tee of upper water tube (Figure 2, Item 6).
6. Position upper radiator hose assembly (Figure 1) to its mounting location in generator set and secure by installing coolant hose (Figure 2, Item 13) to upper port of radiator (Figure 2, Item 1) and coolant hose elbow (Figure 2, Item 8) to thermostat housing (Figure 2, Item 10). Secure by installing hose clips (Figure 2, Items 2, 7, 9, and 12) to their final locations.

CAUTION

Over-tightened hose clamps may cause hoses to crack and leak. Failure to comply may cause damage to equipment.

7. Install hose (Figure 2, Item 3) to equalization valve (Figure 2, Item 5) and secure by tightening hose clamp (Figure 2, Item 4).
8. Fill radiator with engine coolant (WP 0021, Service Cooling System).
9. Install front body panel (WP 0029, Remove/Install Front Body Panel).
10. Install top body panel (WP 0028, Remove/Install Top Body Panel).

11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Close left- and right-side doors.
13. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
14. Start engine and check for coolant leaks and proper operation (TM 9-6115-749-10).
15. Repair as required.

END OF TASK

Remove Lower Radiator Hose Assembly

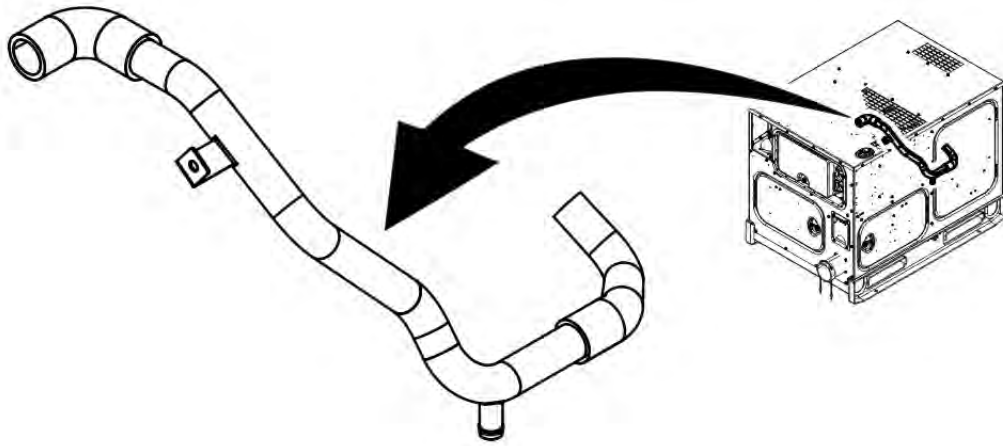


Figure 3. Lower Radiator Hose Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove front body panel (WP 0029, Remove/Install Front Body Panel).
3. Open right-side door.
4. Locate lower radiator hose assembly (Figure 3).

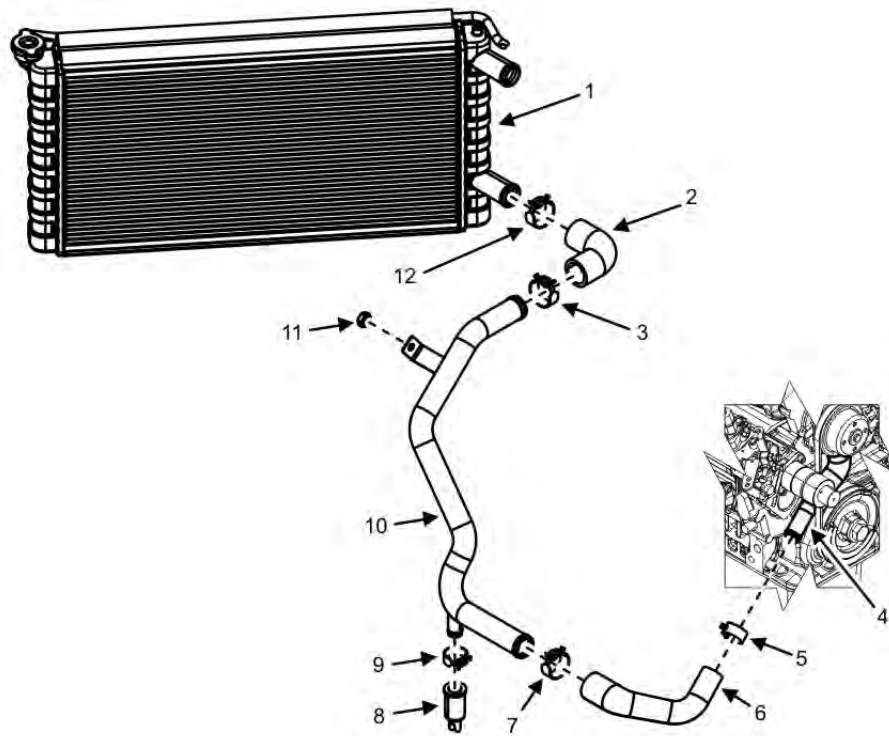


Figure 4. Lower Radiator Hose Assembly.

NOTE

Place a suitable container or rags under each hose connection prior to removal to capture any residual coolant that may be spilled when hoses are removed.

Cap/plug all open coolant hoses, ports, and fittings to prevent additional spillage and to prevent contamination from entering the cooling system.

5. Loosen hose clip (Figure 4, Item 5) at water pump (Figure 4, Item 4) and remove coolant elbow (Figure 4, Item 6) from water pump (Figure 4, Item 4).
6. Loosen hose clip (Figure 4, Item 12) at lower port of radiator (Figure 4, Item 1) and remove coolant hose elbow (Figure 4, Item 2) from radiator (Figure 4, Item 1).
7. Loosen hose clip (Figure 4, Item 9) and remove hose (Figure 4, Item 8) from lower water tube (Figure 4, Item 10).
8. Remove nut (Figure 4, Item 11) that secures lower water tube (Figure 4, Item 10) to unit.
9. Remove lower radiator hose assembly (Figure 3) from generator set and place on a suitable work surface.
10. Remove two hose clips (Figure 4, Items 3 and 12) and coolant hose elbow (Figure 4, Item 2) from lower water tube (Figure 4, Item 10).
11. Remove two hose clips (Figure 4, Items 5 and 7) and coolant elbow (Figure 4, Item 6) from lower water tube (Figure 4, Item 10).

END OF TASK

Inspect Upper Radiator Hose Assembly

1. Inspect hose clips (Figure 4, Items 3, 5, 7, 9, and 12) for cracks, excessive corrosion, or other signs of obvious damage and repair or replace as required.
2. Inspect hoses (Figure 4, Items 2 and 7) for firmness, cracks, wear, or other signs of obvious damage and repair or replace as required.
3. Remove any scale from all hose ends with scale-removing compound and wiping rag prior to installation.
4. Inspect lower water tube (Figure 4, Item 10) for cracks, damage, or excessive corrosion and replace as required.
5. Inspect lower port of radiator (Figure 4, Item 1) for damage. Replace radiator (Figure 4, Item 1) if damaged (WP 0027, Remove/Install Radiator).

END OF TASK**Install Lower Radiator Hose Assembly**

1. Wipe down all components with a wiping rag prior to installation.
2. Install coolant hose elbow (Figure 4, Item 2) and two hose clips (Figure 4, Items 3 and 12) to radiator end of lower water tube (Figure 4, Item 10).
3. Install coolant elbow (Figure 4, Item 6) and two hose clips (Figure 4, Items 5 and 7) to water pump end of lower water tube (Figure 4, Item 10).
4. Position lower radiator hose assembly (Figure 3) to its approximate mounting location in generator set.
5. Position bracket of lower water tube (Figure 4, Item 10) to mounting stud on unit bulkhead, and secure by installing nut (Figure 4, Item 11) finger-tight.
6. Install coolant hose elbow (Figure 4, Item 2) to lower port of radiator (Figure 4, Item 1) and coolant elbow (Figure 4, Item 6) to water pump (Figure 4, Item 4). Secure by installing hose clips (Figure 4, Items 3, 12, 5, and 7) to their final locations.
7. Install hose (Figure 4, Item 8) to lower water tube (Figure 4, Item 10), and secure by repositioning hose clip (Figure 4, Item 9).
8. Tighten nut (Figure 4, Item 11).
9. Fill radiator with engine coolant (WP 0021, Service Cooling System).
10. Install front body panel (WP 0029, Remove/Install Front Body Panel).
11. Install top body panel (WP 0028, Remove/Install Top Body Panel).
12. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
13. Close right-side door.
14. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
15. Start engine and check for coolant leaks and proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
16. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL WINTERIZATION KIT COMPONENTS

INITIAL SETUP:**Test Equipment**

Beaker, Laboratory (WP 0162, Table 2, Item 3)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Heater (1) (WP 0155, Repair Parts List, Figure 57, Item 2)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0163, Item 8)

Fuel, diesel (WP 0163, Item 19)

Pan, drain (WP 0163, Item 28)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

References

WP 0021, Service Cooling System

WP 0036, Remove/Install Batteries

WP 0039, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10) (WP 0005)

Engine cool

REMOVE/INSTALL WINTERIZATION KIT COMPONENTS**WARNING**

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

WARNING

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

When operating, winterization kit has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow heater to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

NOTE

Winterization kit is optional for AMMPS generator sets. This WP instructs how to test, remove, and install winterization kit components to an AMMPS generator set that is already equipped with a winterization kit.

Test Winterization Kit Fuel Flow

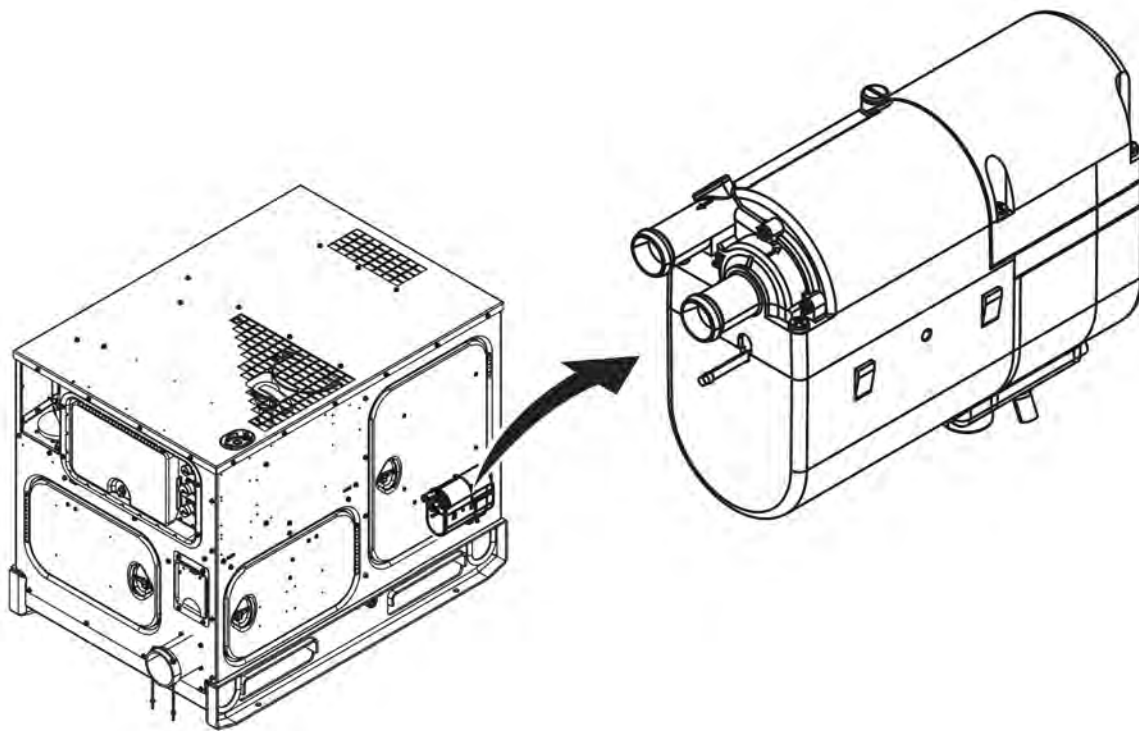


Figure 1. Heater — Location.

1. Ensure equipment conditions are met in order presented initial setup.
2. Locate heater (Figure 1) attached to generator set frame.
3. Place drip pan under winterization kit assembly (Figure 2) to catch spills.
4. Loosen clamp (Figure 2, Item 3), and remove fuel line (Figure 2, Item 4) from fuel inlet port (Figure 2, Item 2) on heater (Figure 2, Item 1).

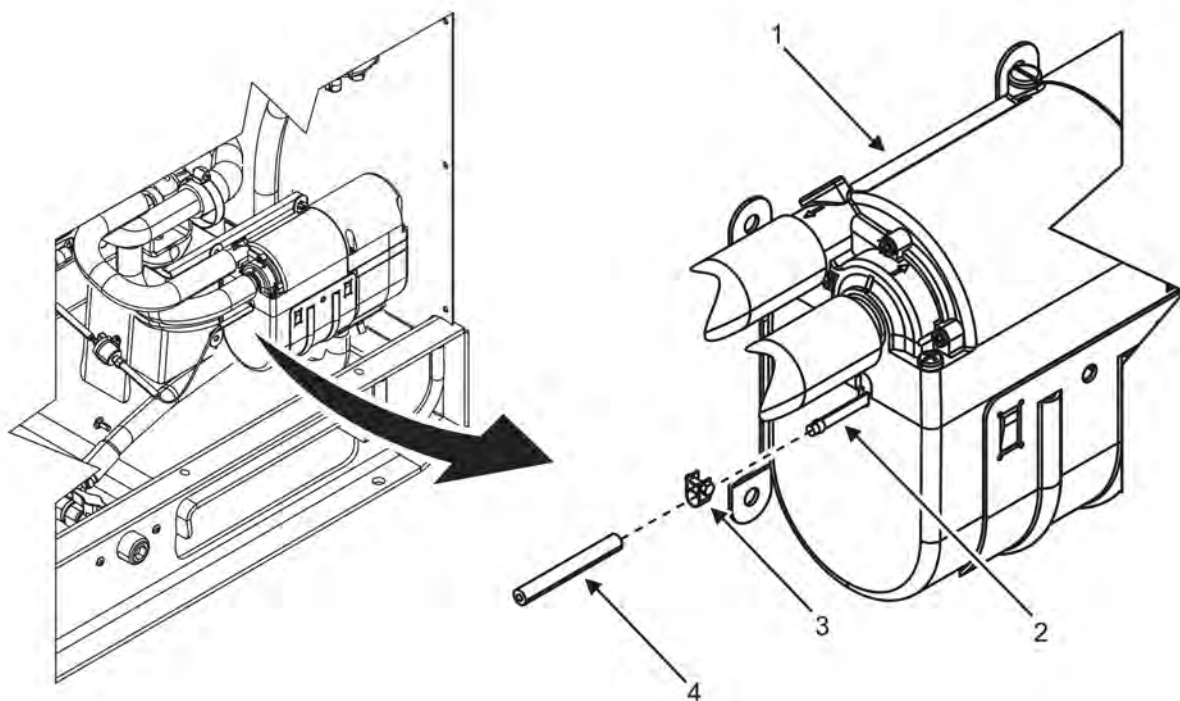


Figure 2. Heater Fuel Line.

NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

5. Place open fuel line (Figure 3, Item 3) into graduated cylinder (Figure 3, Item 4).
6. Run winterization test through DCS (TM 9-6115-749-10).
 - a. Move engine control switch to PRIME & RUN (TM 9-6115-749-10).
 - b. Listen for fuel injector pump to complete priming cycle before proceeding.
 - c. Press [ADJUSTMENTS] button (TM 9-6115-749-10).
 - d. Press [NEXT] button (TM 9-6115-749-10) until winterization kit test is highlighted.
 - e. Press [SELECT] button (TM 9-6115-749-10) to highlight [Start Test].
 - f. Press [ACCEPT] button (TM 9-6115-749-10).
7. Allow fuel to flow into graduated cylinder (Figure 3, Item 4) until flow is uniform (approximately 40 sec).
8. Stop winterization test.
 - a. Observe winterization test is highlighted
 - b. Press [SELECT] button (TM 9-6115-749-10) to highlight [Stop Test].
 - c. Press [ACCEPT] button (TM 9-6115-749-10).

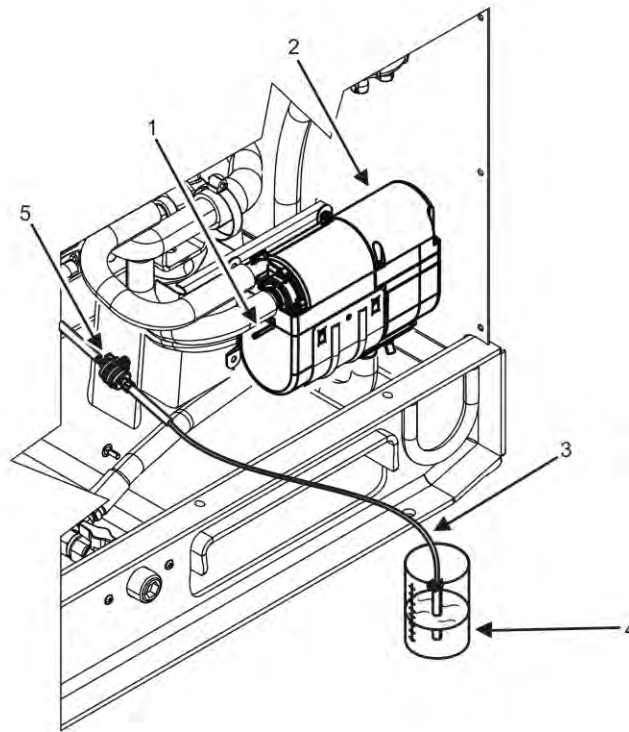


Figure 3. Test Winterization Kit Fuel Flow.

NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

9. Empty captured fuel from graduated cylinder (Figure 3, Item 4) into a suitable container for disposal.
10. Place open fuel line (Figure 3, Item 3) back into graduated cylinder (Figure 3, Item 4).
11. Repeat step 6 to run winterization test through DCS (TM 9-6115-749-10).
12. Allow fuel to flow into graduated cylinder (Figure 3, Item 4) for 90 sec.
13. Repeat step 8 to stop winterization test.
14. Check volume of fuel captured in graduated cylinder during 90-sec test.
 - a. If measured fuel flow is less than 7.5 cubic centimeters (cm^3) (0.25 ounces (oz)), follow the directions in this WP to inspect the winterization kit. See Inspect Winterization Kit task. If no clogs or leaks are found, follow instructions in this WP to replace winterization kit fuel pump (Figure 3, Item 5). See Remove Winterization Kit Fuel Pump and Install Winterization Kit Fuel Pump tasks below.
 - b. If measured fuel flow is greater than 8.6 cm^3 (0.29 oz), follow instructions in this WP to replace winterization kit fuel pump (Figure 3, Item 5). See Remove Winterization Kit Fuel Pump and Install Winterization Kit Fuel Pump tasks below.

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

15. Reconnect fuel line (Figure 3, Item 3) to fuel intake port (Figure 3, Item 1) on heater (Figure 3, Item 2) using clamp (Figure 2, Item 3) if winterization kit fuel pump (Figure 3, Item 5) is working properly.

16. Ensure fuel level is at proper operating level (TM 9-6115-749-10).
17. See Inspect Winterization Kit task if coolant is not being heated.

END OF TASK

Remove Winterization Kit Fuel Pump

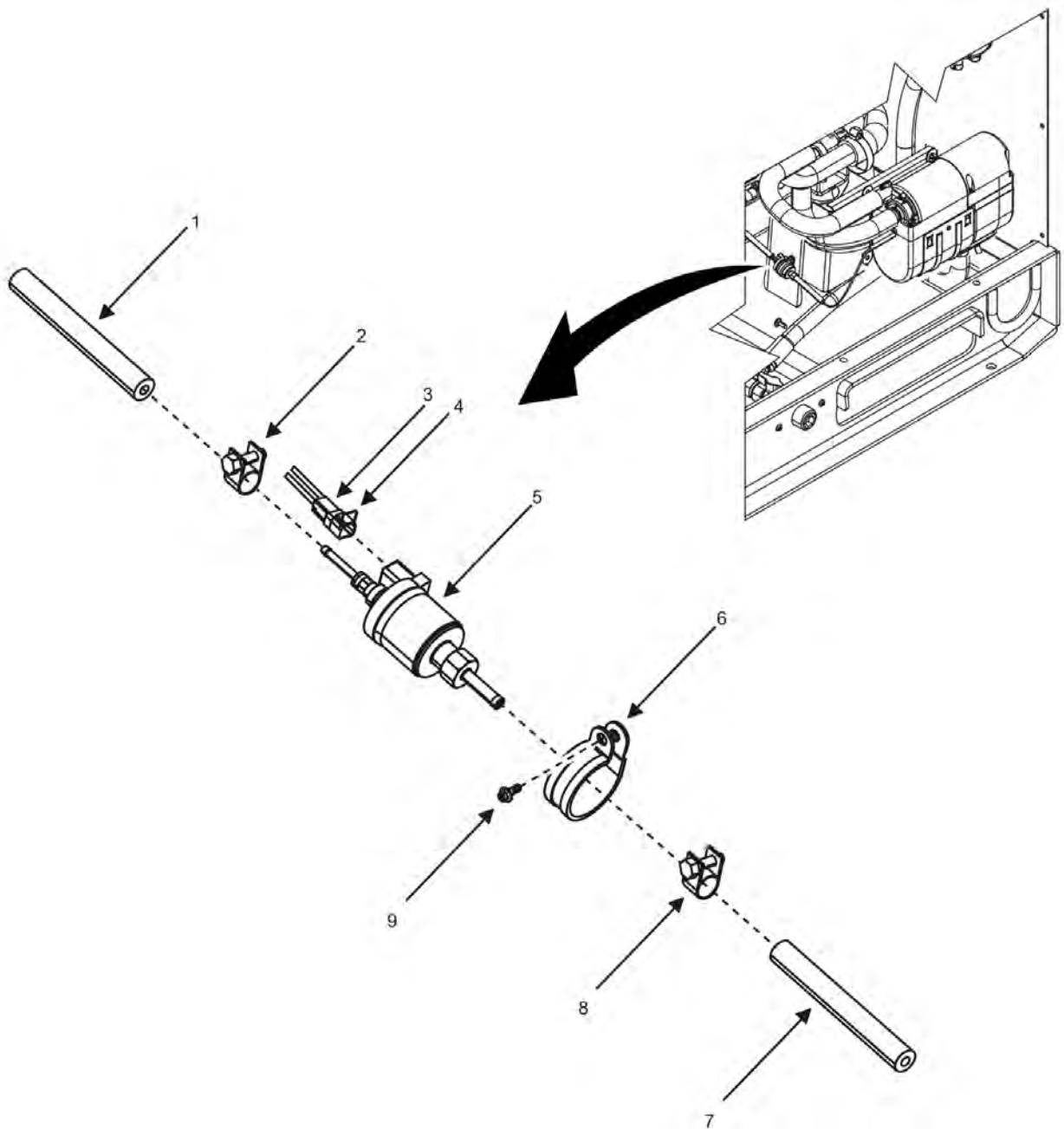


Figure 4. Winterization Kit Fuel Pump.

1. Open left-side generator set door.
2. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
3. Locate winterization kit fuel pump (Figure 4, Item 5) attached to generator set frame.
4. Remove metal clip (Figure 4, Item 4) and disconnect wiring harness (Figure 4, Item 3) from winterization kit fuel pump (Figure 4, Item 5).
5. Loosen screw (Figure 4, Item 9) securing rubber mounting bracket (Figure 4, Item 6) and winterization kit fuel pump (Figure 4, Item 5) to generator set frame.
6. Remove winterization kit fuel pump (Figure 4, Item 5) from rubber mounting bracket (Figure 4, Item 6).
7. Position winterization kit fuel pump (Figure 4, Item 5) outside of bulkhead.

NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

8. Place wiping rags under winterization kit fuel pump (Figure 4, Item 5) to catch spills.
9. Loosen clamps (Figure 4, Items 2 and 8), and disconnect fuel lines (Figure 4, Items 1 and 7) from heater (Figure 5, Item 1).
10. Insert caps/plugs into fuel lines (Figure 4, Items 1 and 7).
11. Dispose of captured fuel and coolant IAW local SOP.

END OF TASK

Install Winterization Kit Fuel Pump

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Inspect rubber mounting bracket (Figure 4, Item 6) securing winterization kit fuel pump (Figure 4, Item 5) to generator set frame. Replace rubber mounting bracket (Figure 4, Item 6) if worn or damaged.
2. Slide winterization kit fuel pump (Figure 4, Item 5) into rubber mounting bracket (Figure 4, Item 6).

NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

3. Remove caps/plugs from fuel lines (Figure 4, Items 1 and 7).
4. Connect fuel lines (Figure 4, Items 1 and 7) to winterization kit fuel pump (Figure 4, Item 5) using clamps (Figure 4, Items 2 and 8).
5. Use screw (Figure 4, Item 9) to secure rubber mounting bracket (Figure 4, Item 6) and winterization kit fuel pump (Figure 4, Item 5) to generator set frame.
6. Remove drip pan from under winterization kit fuel pump (Figure 4, Item 5).
7. Connect wiring harness (Figure 4, Item 3) to winterization kit fuel pump (Figure 4, Item 5) using metal clip (Figure 4, Item 4).
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Close and secure generator set doors.
10. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).

11. Ensure fluid level is at proper operating level (TM 9-6115-749-10).
12. Purge fuel system (WP 0039, Service Fuel System).
13. Start engine, and check for proper operation (TM 9-6115-749-10).
14. Inspect winterization kit if coolant is not being heated. See Inspect Winterization Kit task, steps 1 through 7.

END OF TASK

Inspect Winterization Kit

1. Inspect heater (Figure 5, Item 1) for obvious signs of damage and replace as required.
2. Inspect heater holder (Figure 6, Item 5) for obvious signs of damage and replace as required.
3. Inspect mounting bracket (Figure 6, Item 10) for obvious signs of damage and replace as required.
4. Inspect coolant inlet and outlet hoses (Figure 5, Items 11 and 12) for damage, deterioration, and obstruction and replace as required.
5. Inspect air exhaust port (Figure 5, Item 6) for obstructions and clear as required.
6. Inspect air exhaust tube (Figure 5, Item 5) for damage, deterioration, and obstructions and clear as required.
7. Follow instructions in this WP to remove heater (Figure 5, Item 1) if coolant is still not being heated. See Remove Heater Assembly task.

END OF TASK

Remove Heater Assembly

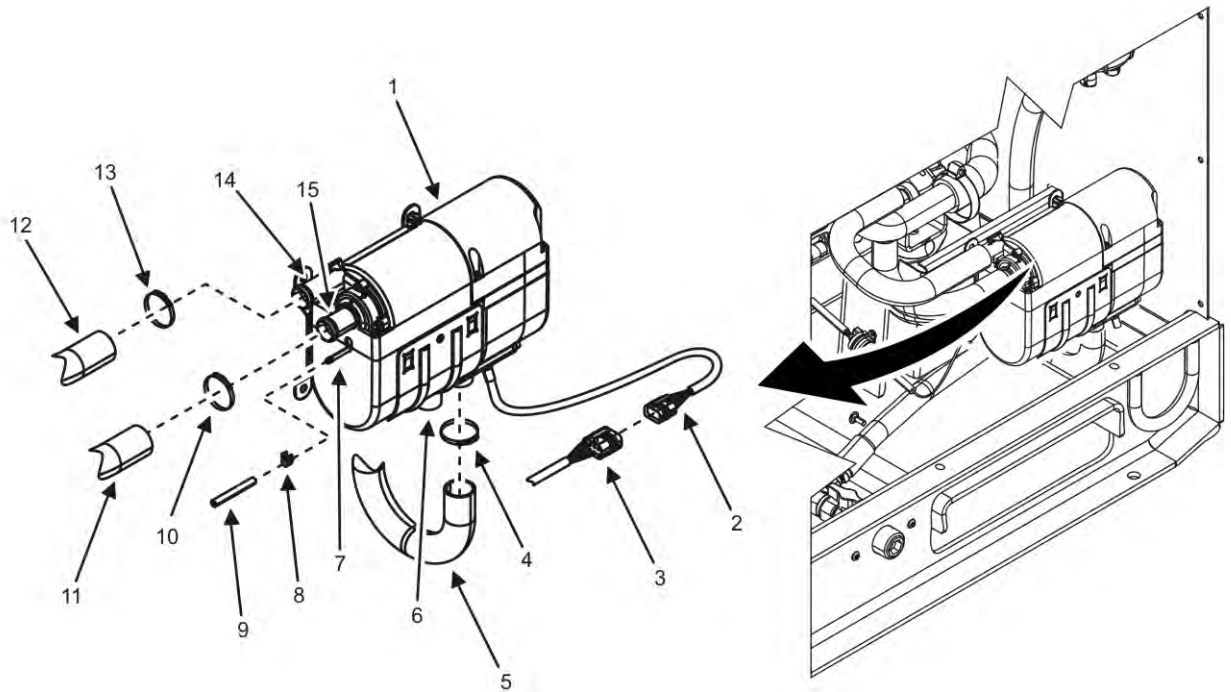


Figure 5. Winterization Kit.

1. Open left-side generator set door.
2. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
3. Drain coolant (WP 0021, Service Cooling System).
4. Disconnect winterization kit electrical plug (Figure 5, Item 2) from wiring harness (Figure 5, Item 3).
5. Remove winterization kit electrical plug (Figure 5, Item 2) from clamp (Figure 6, Item 3).

CAUTION

Cap/plug all coolant and fuel hoses to prevent contamination. Failure to comply may cause damage to equipment.

6. Remove bolt (Figure 6, Item 6) securing heater (Figure 6, Item 5) to heater holder (Figure 6, Item 7).
7. Loosen bolt (Figure 6, Item 4) behind heater (Figure 6, Item 5) that secures heater (Figure 6, Item 5) to heater holder (Figure 6, Item 7). Leave bolt (Figure 6, Item 4) installed as required.
8. Remove heater (Figure 6, Item 5) from heater holder (Figure 6, Item 7) by prying seating slots on heater holder (Figure 6, Item 7) from catches on heater (Figure 6, Item 5).
9. Position heater (Figure 6, Item 5) outside of unit.
10. Remove four screws (Figure 6, Item 8) securing heater holder (Figure 6, Item 7) and clamp (Figure 6, Item 3) to heater mounting bracket (Figure 6, Item 10).
11. Remove two screws (Figure 6, Item 9) from front of heater mounting bracket (Figure 6, Item 10) that secure heater mounting bracket (Figure 6, Item 10) to support bracket (Figure 6, Item 2).
12. Remove two screws (Figure 6, Item 1) that secure support bracket (Figure 6, Item 2) to unit skid.
13. Remove support bracket (Figure 6, Item 2) from unit skid.

NOTE

Bottom screw also secures winterization kit fuel pump (Figure 4, Item 5).

14. Remove two screws (Figure 6, Item 11) that secure heater mounting bracket (Figure 6, Item 10) to left side of unit skid.
15. Remove heater mounting bracket (Figure 6, Item 10) from unit skid.
16. Loosen tube clamp (Figure 5, Item 4) securing air exhaust tube (Figure 5, Item 5) to heater (Figure 5, Item 1).
17. Remove air exhaust tube (Figure 5, Item 5) from exhaust port (Figure 5, Item 6).

NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

18. Place a drain pan under winterization kit (Figure 5) to catch spilled fuel and coolant.
19. Loosen clamp (Figure 5, Item 13), and disconnect coolant inlet hose (Figure 5, Item 12) from coolant inlet port (Figure 5, Item 14).
20. Loosen clamp (Figure 5, Item 10), and disconnect coolant outlet hose (Figure 5, Item 11) from coolant outlet port (Figure 5, Item 15).

CAUTION

Cap/plug all coolant and fuel hoses to prevent contamination. Failure to comply may cause damage to equipment.

NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

21. Loosen clamp (Figure 5, Item 8), and remove fuel line (Figure 5, Item 9) from fuel inlet port (Figure 5, Item 7).
22. Remove drain pan, and dispose of spilled fluids IAW local SOP.

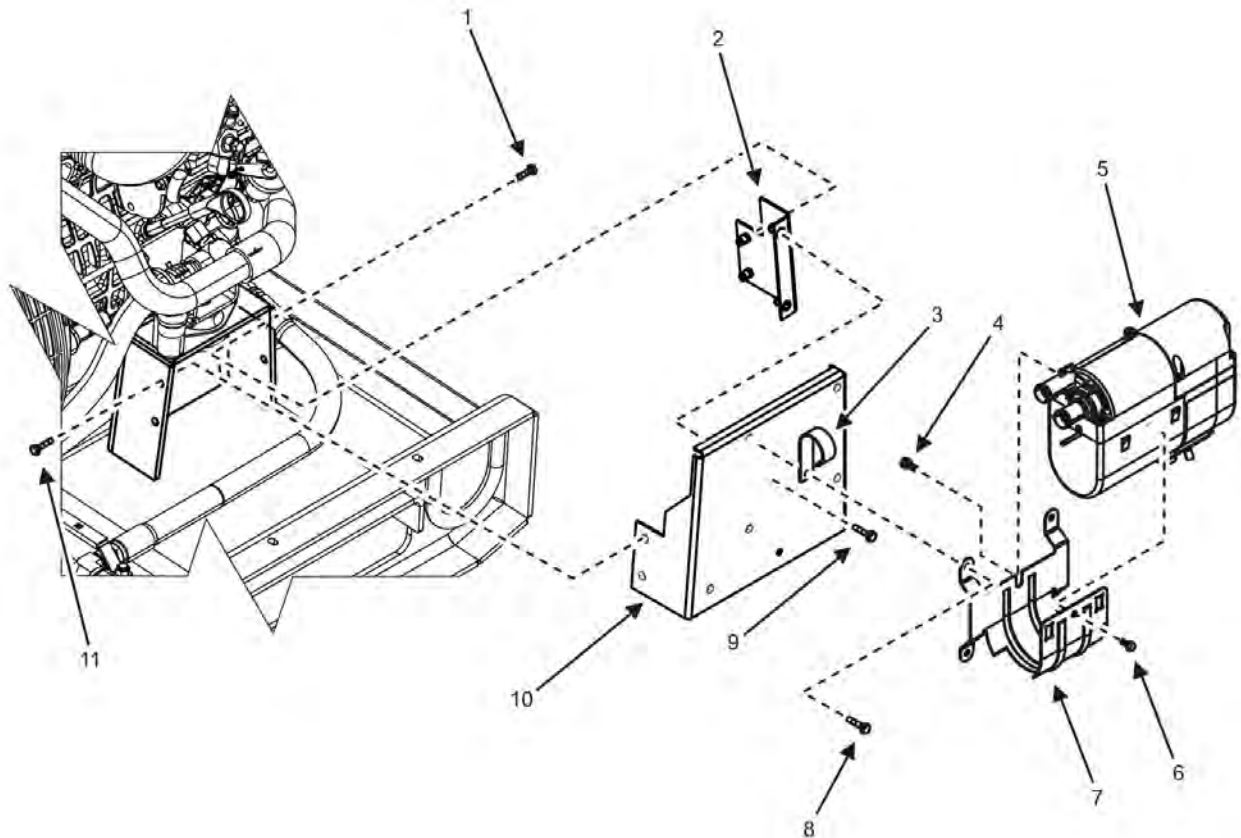
END OF TASK**Install Heater Assembly**

Figure 6. Heater Mounting Brackets.

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Position support bracket (Figure 6, Item 2) to right-side of installation location on unit skid and align mounting holes.

2. Install two screws (Figure 6, Item 1) to secure support bracket (Figure 6, Item 2) to unit skid. Torque screws (Figure 6, Item 1) to 87 – 105 in/lb (10 – 11 Nm).
3. Position heater mounting bracket (Figure 6, Item 10) to left side of unit skid and support bracket (Figure 6, Item 2). Align mounting holes.
4. Install two screws (Figure 6, Item 9) to front of heater mounting bracket (Figure 6, Item 10) to secure heater mounting bracket (Figure 6, Item 10) to support bracket (Figure 6, Item 2). Torque screws (Figure 6, Item 9) to 87 – 105 in/lb (10 – 11 Nm).
5. Install two screws (Figure 6, Item 11) to secure heater mounting bracket (Figure 6, Item 10) to left-side unit skid. Torque screws (Figure 6, Item 11) to 87 – 105 in/lb (10 – 11 Nm).
6. Align mounting holes in heater holder (Figure 6, Item 7) with holes in heater mounting bracket (Figure 6, Item 10).
7. Install four screws (Figure 6, Item 8) to secure heater holder (Figure 6, Item 7) and clamp (Figure 6, Item 3) to heater mounting bracket (Figure 6, Item 10).
8. Use tube clamp (Figure 5, Item 4) to secure air exhaust tube (Figure 5, Item 5) to heater (Figure 5, Item 1) exhaust port (Figure 5, Item 6).
9. Install heater (Figure 6, Item 5) into heater holder (Figure 6, Item 7).
10. Seat both catches on heater (Figure 6, Item 5) into seating slots on heater holder (Figure 6, Item 7).
11. Install bolt (Figure 6, Item 6) to secure heater (Figure 6, Item 5) to heater holder (Figure 6, Item 7).
12. Tighten bolt (Figure 6, Item 4) behind heater (Figure 6, Item 5) to secure heater (Figure 6, Item 5) to heater holder (Figure 6, Item 7).

CAUTION

Cap/plug all coolant and fuel hoses to prevent contamination. Failure to comply may cause damage to equipment.

NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

13. Place a drain pan under winterization kit to catch spilled coolant.
14. Secure fuel line (Figure 5, Item 9) to fuel inlet port (Figure 5, Item 7) using clamp (Figure 5, Item 8).
15. Install coolant inlet hose (Figure 5, Item 12) onto coolant inlet port (Figure 5, Item 14) using clamp (Figure 5, Item 13).
16. Install coolant outlet hose (Figure 5, Item 11) to coolant outlet port (Figure 5, Item 15) using clamp (Figure 5, Item 10).
17. Remove drain pan.
18. Insert winterization kit electrical plug (Figure 5, Item 2) into clamp (Figure 6, Item 3).
19. Reconnect winterization kit electrical plug (Figure 5, Item 2) into wiring harness (Figure 5, Item 3).
20. Replace negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
21. Fill cooling system (WP 0021, Service Cooling System).
22. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
23. Ensure fluid level is at proper operating level (TM 9-6115-749-10).

-
24. Purge fuel system (WP 0039, Service Fuel System).
 25. Release air through overflow vent line for 5 min before start-up (TM 9-6115-749-10).
 26. Close and secure generator set doors.
 27. Start engine and check for leaks and proper operation (TM 9-6115-749-10).
 28. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
INSTALL WINTERIZATION KIT

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, Blind, Fastener, Installation (WP 0162, Table 2, Item 31)

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Kit, winterization (WP 0155, Repair Parts List, Figure 57, Item 1)

Alcohol, denatured (WP 0163, Expendable and Durable Items List, Item 1)

Antifreeze, ethylene glycol (WP 0163, Item 2)

Grease, electrically conductive (WP 0163, Item 20)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Personnel Required

91D (1)

References

WP 0025, Remove/Install Winterization Kit Components

WP 0039, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Coolant drained (WP 0021, Service Cooling System)

INSTALL WINTERIZATION KIT**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

WARNING

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

NOTE

Winterization kit is optional for AMMPS generator sets. This WP instructs how to install a winterization kit to an AMMPS generator set that is not equipped with a winterization kit.

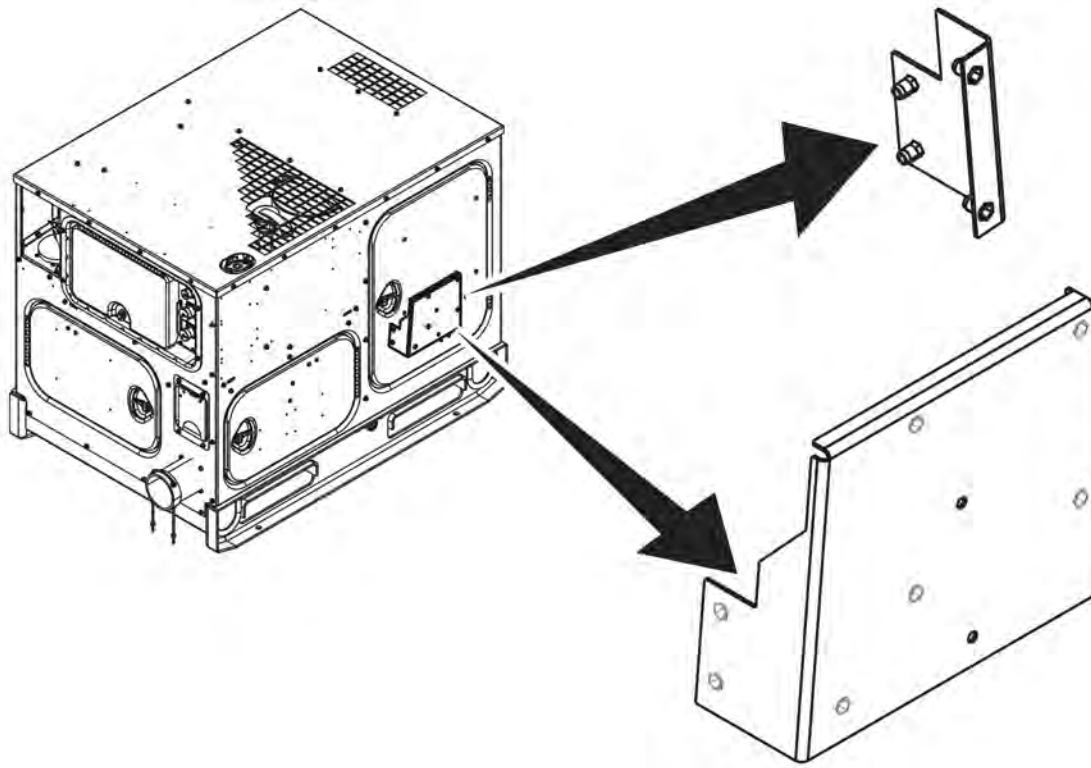
Install Winterization Kit

Figure 1. Winterization Kit Mounting — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door.
3. Locate winterization kit mounting location on unit skid (Figure 1).

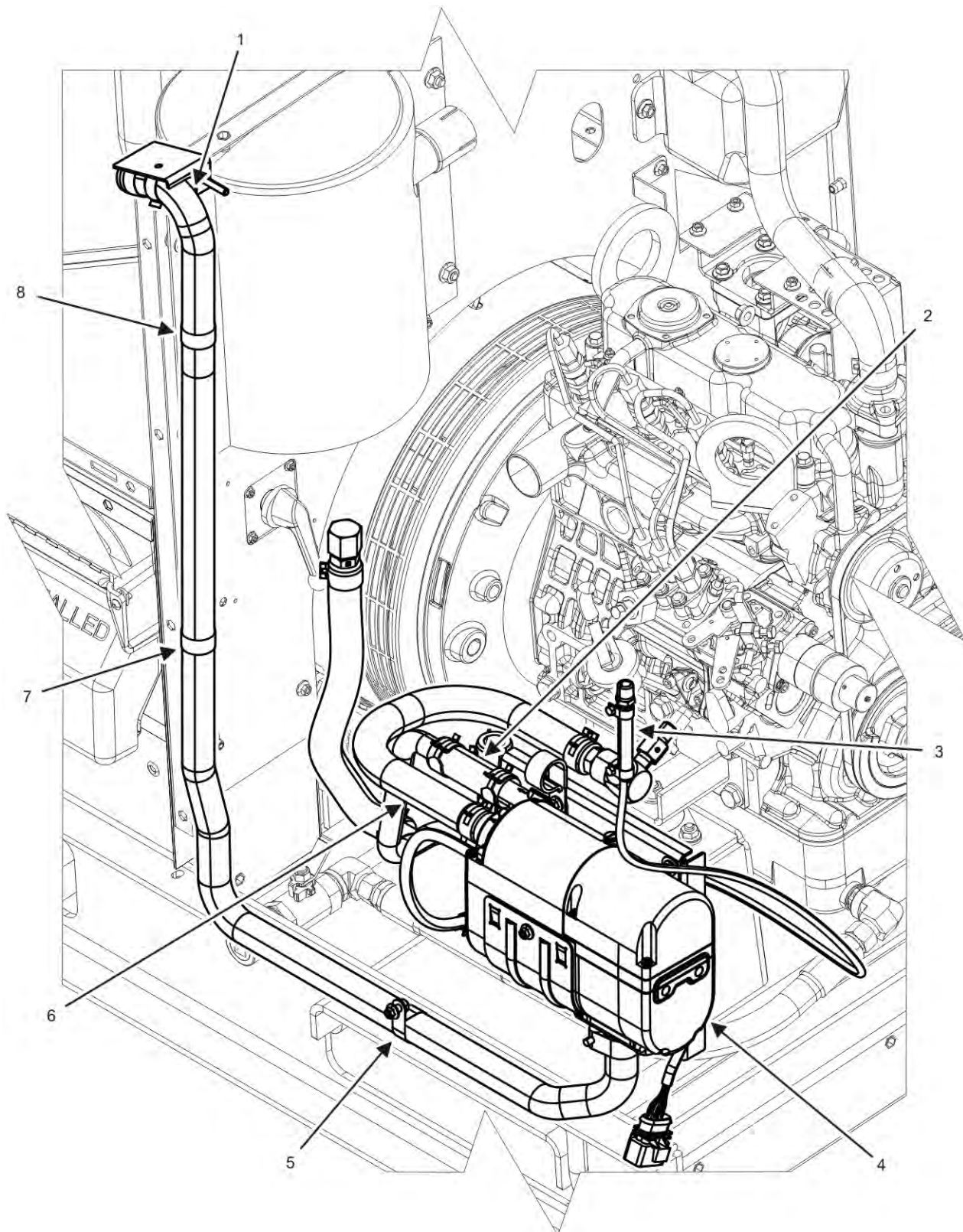


Figure 2. Winterization Kit Assembly.

NOTE

Winterization kit assembly (Figure 2) requires two fuel line (Figure 2, Item 3) assemblies. One fuel line (Figure 2, Item 3) assembly connects from the fuel manifold (Figure 3, Item 2) to the winterization kit fuel pump (not shown). The second fuel line connects the winterization kit fuel pump to the coolant heater (Figure 2, Item 4). Fuel line assembly that connects fuel pump (not shown) to coolant heater (Figure 2, Item 4) is installed in step 15 of this task.

4. Prepare coolant heater fuel lines (Figure 2, Item 3).
 - a. Insert one end of fuel tube (Figure 3, Item 3) into flexible hose (Figure 3, Item 5).

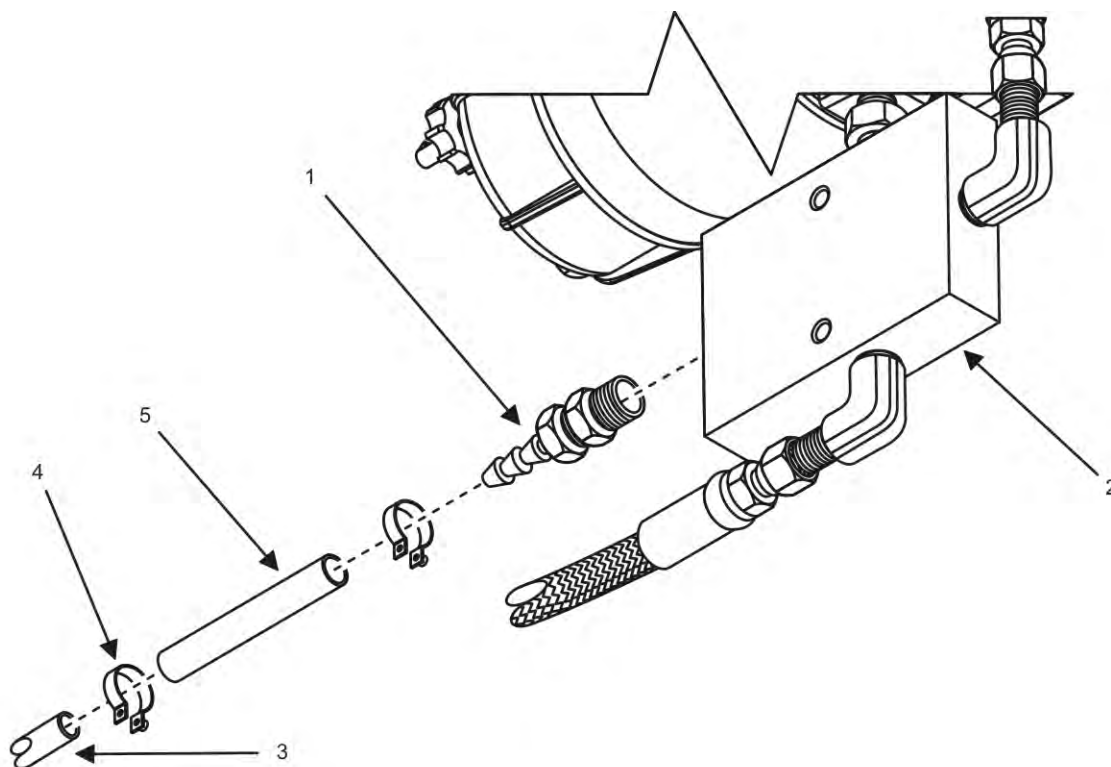


Figure 3. Coolant Heater Fuel Line Assembly.

- b. Secure with hose clamp (Figure 3, Item 4).
- c. Repeat steps a and b for other end of fuel tube (Figure 3, Item 3).
- d. Repeat steps a through c to assemble a second coolant heater fuel line assembly.
- e. Insert hose adaptor (Figure 3, Item 1) into flexible hose (Figure 3, Item 5) of fuel line (Figure 2, Item 3) assembly and secure with hose clamp (Figure 3, Item 4).

NOTE

Use pipe thread sealant on all pipe threads of hose adaptors (Figure 3, Item 1). Cure time is 30 min to use full system and 72 hr for full strength.

- f. Apply pipe thread sealant to male threads of hose adaptor (Figure 3, Item 1).

NOTE

Capture spilled fuel and dispose of with IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

- g. Remove plug (not shown) from fuel manifold (Figure 3, Item 2).
- h. Capture spilled fuel.
- i. Install hose adaptor (Figure 3, Item 1) to fuel manifold (Figure 3, Item 2) and secure to 1 – 1 1/2 turns past finger-tight.
- j. Reserve second fuel line assembly for installation in Step 15.

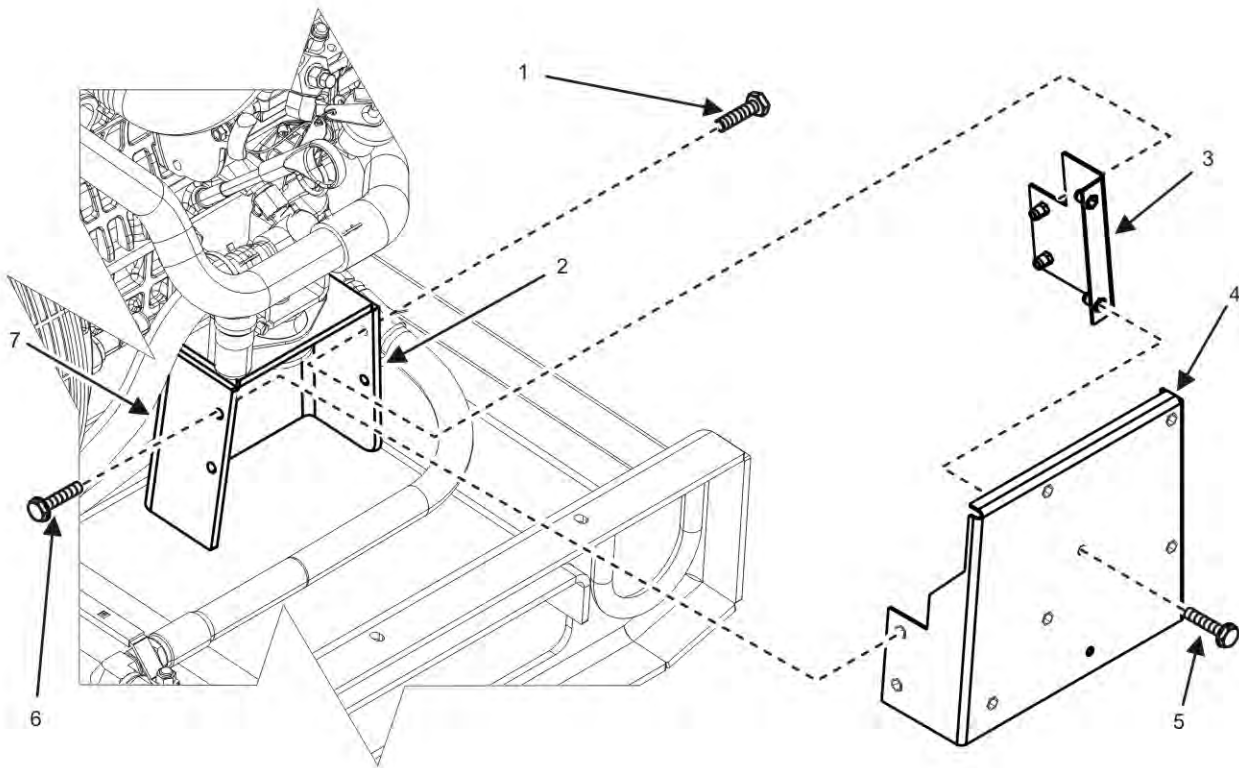


Figure 4. Winterization Kit Bracket — Installation.

- 5. Position support bracket (Figure 4, Item 3) to right side of installation location (Figure 4, Item 2) on unit skid and align mounting holes.
- 6. Install two screws (Figure 4, Item 1) to secure support bracket (Figure 4, Item 3) to unit skid. Torque screws (Figure 4, Item 1) to 87 – 105 ft/lb (10 – 11 Nm).
- 7. Position coolant heater mounting bracket (Figure 4, Item 4) to left side of installation location (Figure 4, Item 7) on unit skid and support bracket (Figure 4, Item 3). Align mounting holes.
- 8. Install two screws (Figure 4, Item 5) to front of coolant heater mounting bracket (Figure 4, Item 4) to secure coolant heater mounting bracket (Figure 4, Item 4) to support bracket (Figure 4, Item 3). Torque screws to (Figure 4, Item 5) 87 – 105 in/lb (10 – 11 Nm).
- 9. Install top screw (Figure 4, Item 6) to secure coolant heater mounting bracket (Figure 4, Item 4) to left side of installation location (Figure 4, Item 7) on unit skid. Reserve bottom screw (Figure 4, Item 6) to secure fuel pump rubber mounting bracket (not shown). Torque screw (Figure 4, Item 6) to 87 – 105 in/lb (10 – 11 Nm).

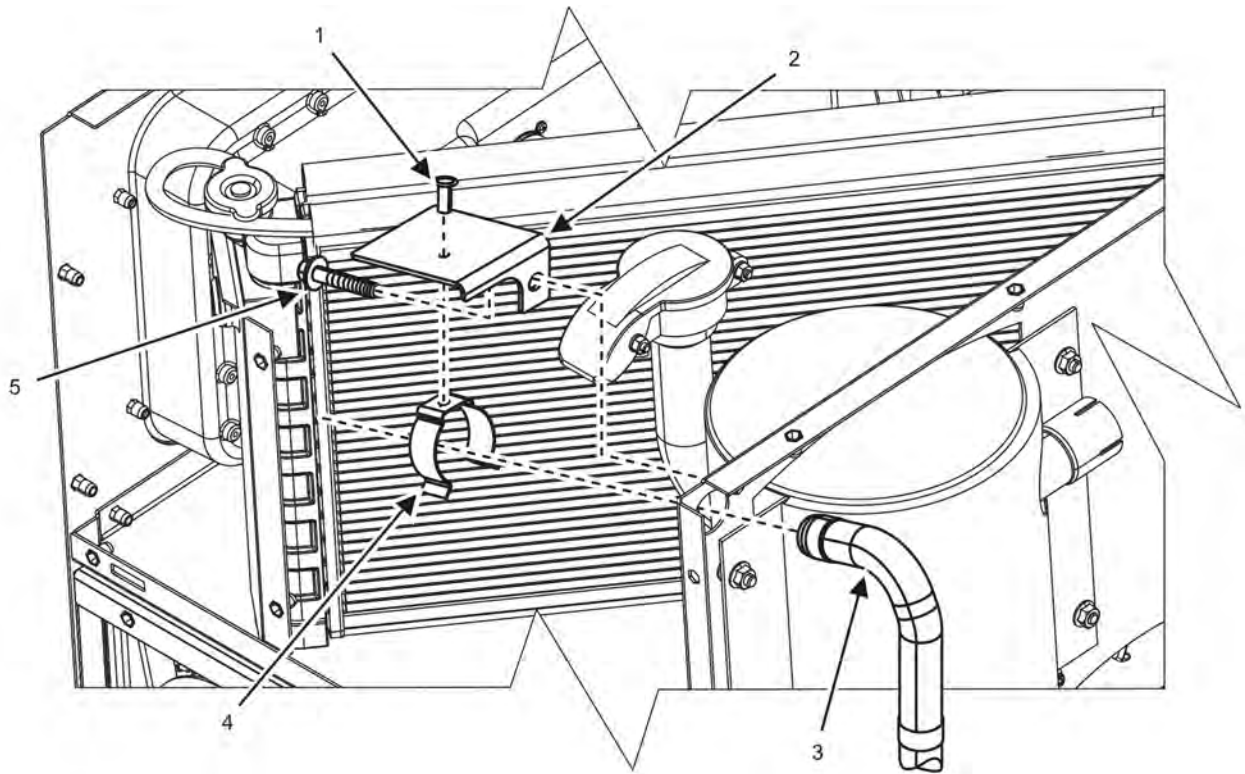


Figure 5. Air Exhaust Tube Bracket Installation.

10. Install fuel pump to coolant heater mounting bracket and connect coolant heater fuel lines (WP 0025, Remove/Install Winterization Kit Components).
11. Prepare air exhaust tube (Figure 2, Item 1).
 - a. Rivet clip (Figure 5, Item 4) to air exhaust tube bracket (Figure 5, Item 2) with blind rivet (Figure 5, Item 1).
 - b. Position air exhaust tube bracket (Figure 5, Item 2) to position on unit bulkhead.
 - c. Secure air exhaust tube bracket (Figure 5, Item 2) to unit bulkhead with mounting screw (Figure 5, Item 5).
 - d. Position air exhaust tube (Figure 2, Item 1) as depicted in Figure 2.
 - e. Insert end of air exhaust tube (Figure 5, Item 3) into clip (Figure 5, Item 4) of air exhaust tube bracket (Figure 5, Item 2).

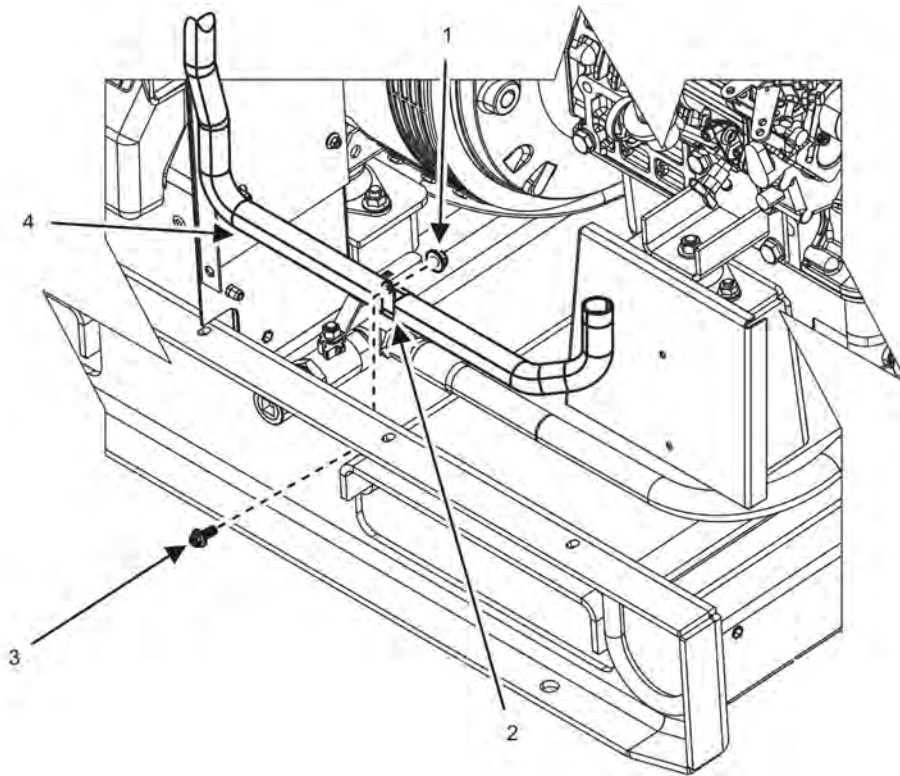


Figure 6. Air Exhaust Tube — Installation.

NOTE

Air exhaust tube (Figure 2, Item 1) will be installed to coolant heater (Figure 2, Item 4) during step 15.

- f. Insert air exhaust tube (Figure 6, Item 4) through three clamps (Figure 6, Item 2).
- g. Position clamps (Figure 2, Items 5, 7, and 8) to unit skid and bulkhead as depicted in Figure 2.

NOTE

Do not fully tighten screws (Figure 6, Item 3) and nuts (Figure 6, Item 1) securing clamps (Figure 2, Items 5, 7, and 8) to unit skid and bulkhead until installation of coolant heater (Figure 2, Item 4) is complete.

- h. Install clamps loosely to unit skid and bulkhead with screws (Figure 6, Item 3) and nuts (Figure 6, Item 1).

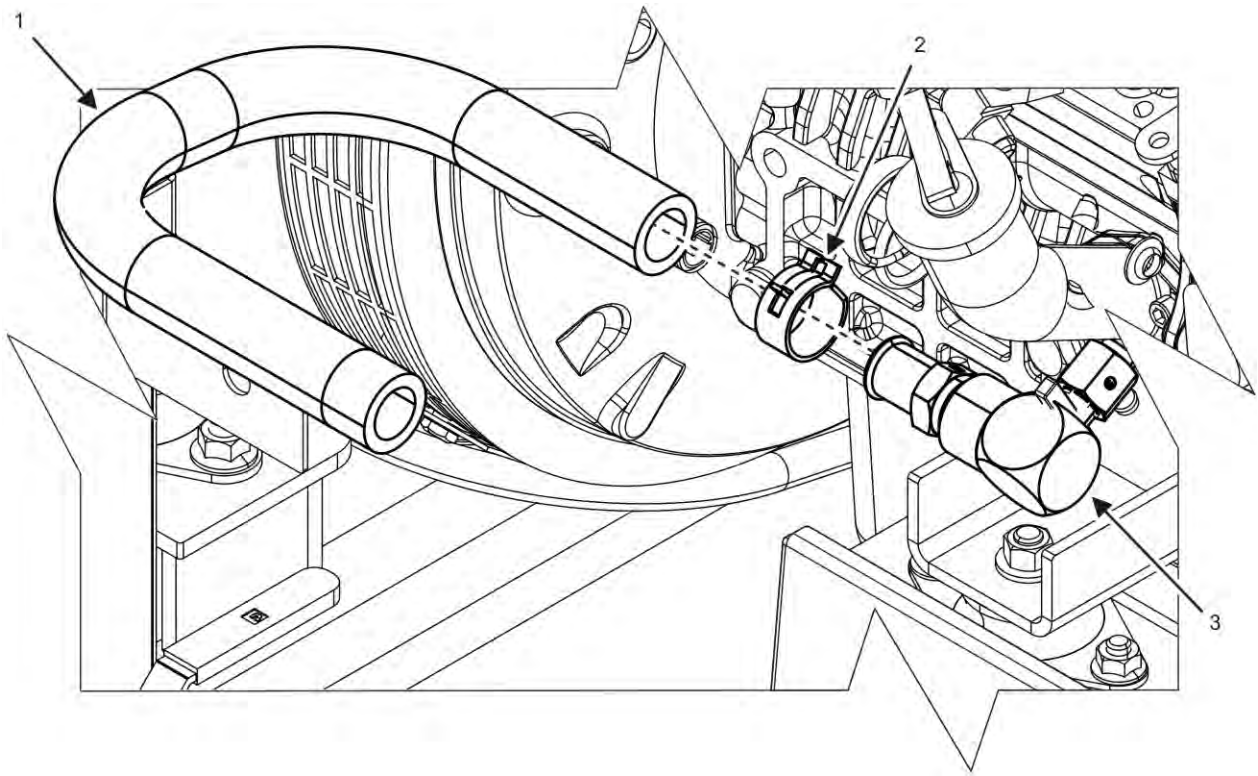


Figure 7. Coolant Heater Inlet Hose Assembly.

12. Prepare coolant heater inlet hose assembly (Figure 2, Item 6).

NOTE

Capture spilled coolant and dispose of with IAW local SOP. Cap/plug all open coolant lines/fittings to prevent dirt and debris from entering the cooling system.

- a. Remove coolant drain hose (not shown) from engine adaptor barb fitting (Figure 7, Item 3).
- b. Install one end of coolant heater inlet hose (Figure 7, Item 1) to engine adaptor barb fitting (Figure 7, Item 3) and secure with clip (Figure 7, Item 2).

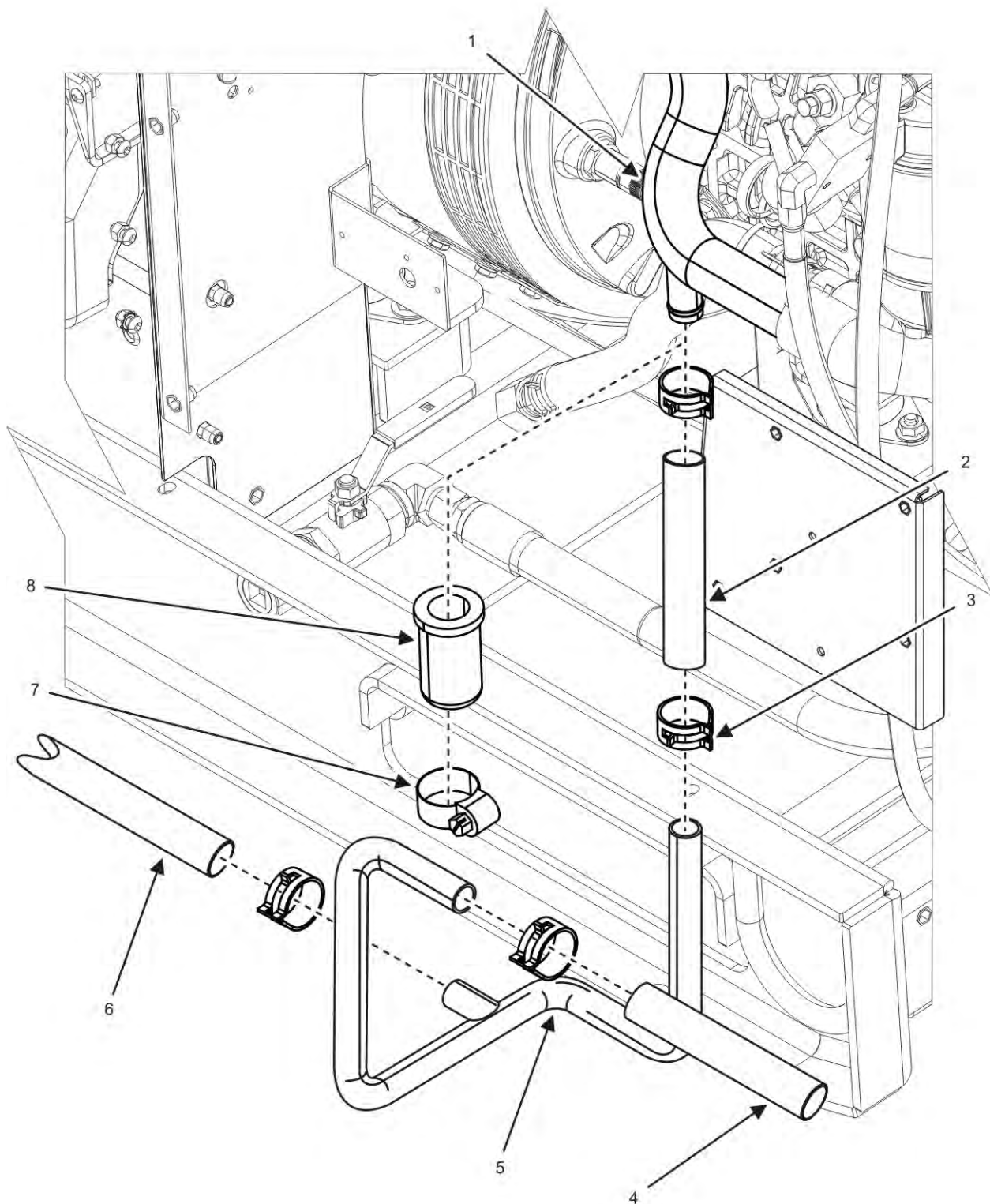


Figure 8. Coolant Heater Outlet Hose Assembly.

-
13. Prepare coolant heater outlet hose assembly (Figure 2, Item 2).
 - a. Loosen clamp (Figure 8, Item 7) and remove cap (Figure 8, Item 8) from lower radiator tube (Figure 8, Item 1).
 - b. Install flex hose (Figure 8, Item 2) to lower radiator tube (Figure 8, Item 1). Secure with clip (Figure 8, Item 3).
 - c. Install Y-pipe (Figure 8, Item 5) (in orientation shown in Figure 8) to open end of flex hose (Figure 8, Item 2). Secure with clip (Figure 8, Item 3).
 - d. Install coolant drain hose (Figure 8, Item 6) to Y-pipe (Figure 8, Item 5) opening. Secure with clip (Figure 8, Item 3).
 - e. Install flex hose (Figure 8, Item 4) to Y-pipe (Figure 8, Item 5) opening. Secure with clip (Figure 8, Item 3).
 14. Install coolant heater holder to coolant heater mounting bracket (WP 0025, Remove/Install Winterization Kit Components).
 15. Install coolant heater (Figure 2, Item 4), and connect coolant outlet and inlet hose assemblies (Figure 2, Item 2 and 6), fuel lines (Figure 2, Item 3), air exhaust tube (Figure 2, Item 1), and electrical connector (not shown) (WP 0025, Remove/Install Winterization Kit Components).
 16. Tighten screws (Figure 6, Item 3) and nuts (Figure 6, Item 1) securing clamps (Figure 2, Items 5, 7, and 8) that secure air exhaust tube (Figure 2, Item 1) to unit skid and bulkhead.
 17. Fill cooling system (WP 0021, Service Cooling System).
 18. Install top body panel (WP 0028, Remove/Install Top Body Panel).

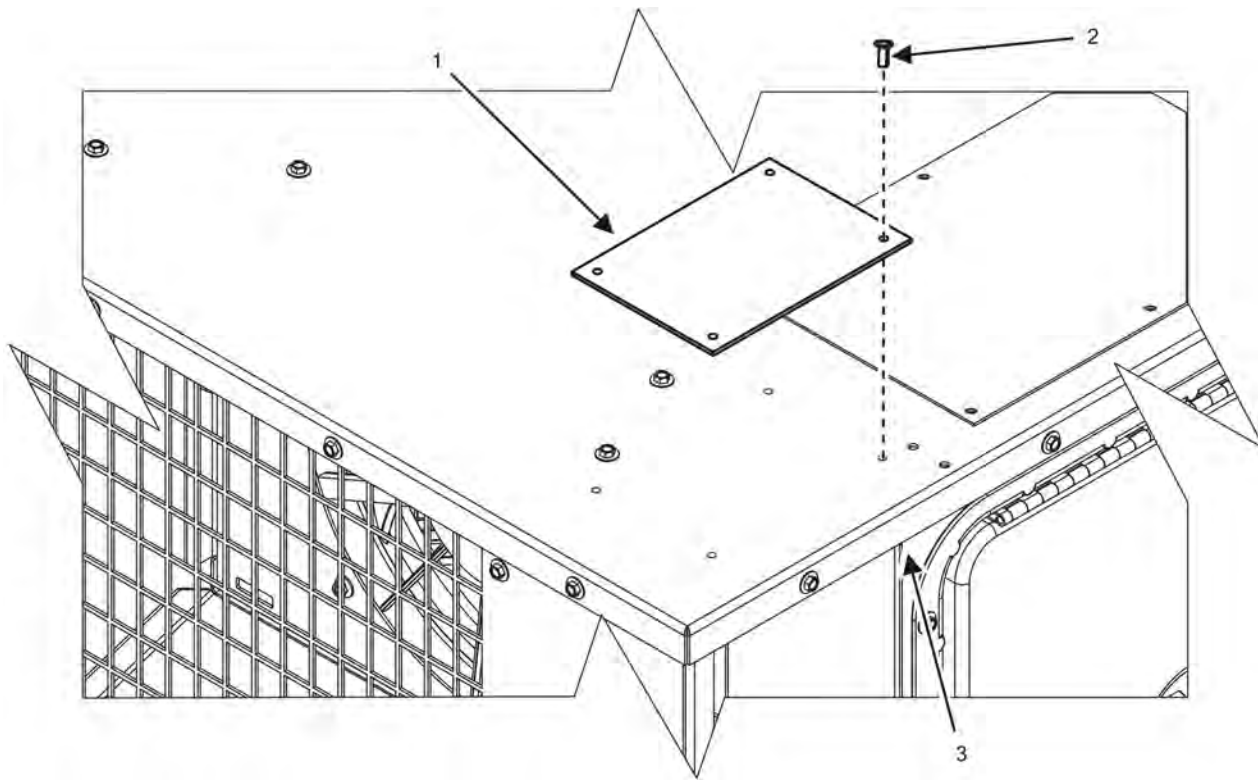


Figure 9. Operating Instructions Plate — Installation.

19. Drill four holes of 3.5 mm diameter in rear-left of top body panel (Figure 9, Item 3) using existing holes in operating instructions plate (Figure 9, Item 1) as a guide.
20. Rivet operating instructions plate (Figure 9, Item 1) to rear-left corner of top body panel (Figure 9, Item 3) with four blind rivets (Figure 9, Item 2).
21. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
22. Close and secure generator set doors.
23. Ensure fluid level is at proper operating level (TM 9-6115-749-10).
24. Release air through overflow vent line for 5 min before start-up (TM 9-6115-749-10).
25. Purge fuel system (WP 0039, Service Fuel System).
26. Test winterization kit (WP 0025, Remove/Install Winterization Kit Components).
27. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
28. Start engine and check for proper operation (TM 9-6115-749-10).
29. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL RADIATOR

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Radiator assembly (WP 0108, Repair Parts List, Figure 10, Item 9)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0163, Item 8)

Distilled water (WP 0163, Item 17)

Grease, electrically conductive (WP 0163, Item 20)

Pan, drain (WP 0163, Item 28)

Rag, wiping (WP 0163, Item 31)

Soap, ivory (WP 0163, Item 33)

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Cooling system drained (WP 0021, Service Cooling System)

Upper and lower radiator hoses removed from radiator (WP 0024, Remove/Install Radiator Hose and Tube Assemblies)

Coolant overflow hose removed from radiator (WP 0022, Remove/Install Coolant Recovery System)

REMOVE/INSTALL RADIATOR**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

WARNING

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

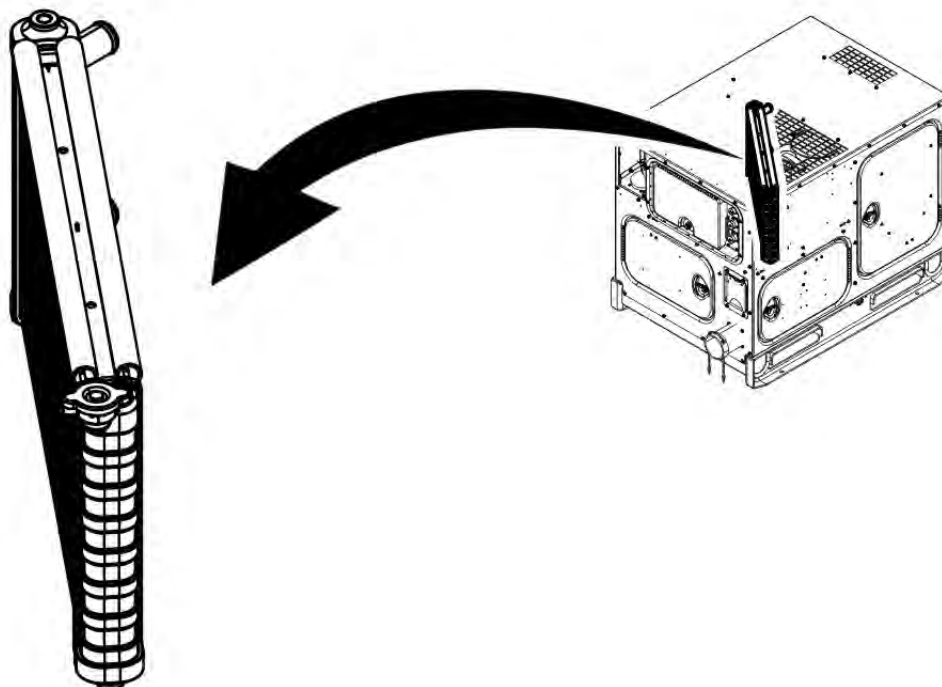
Remove Radiator

Figure 1. Radiator — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate radiator (Figure 1).

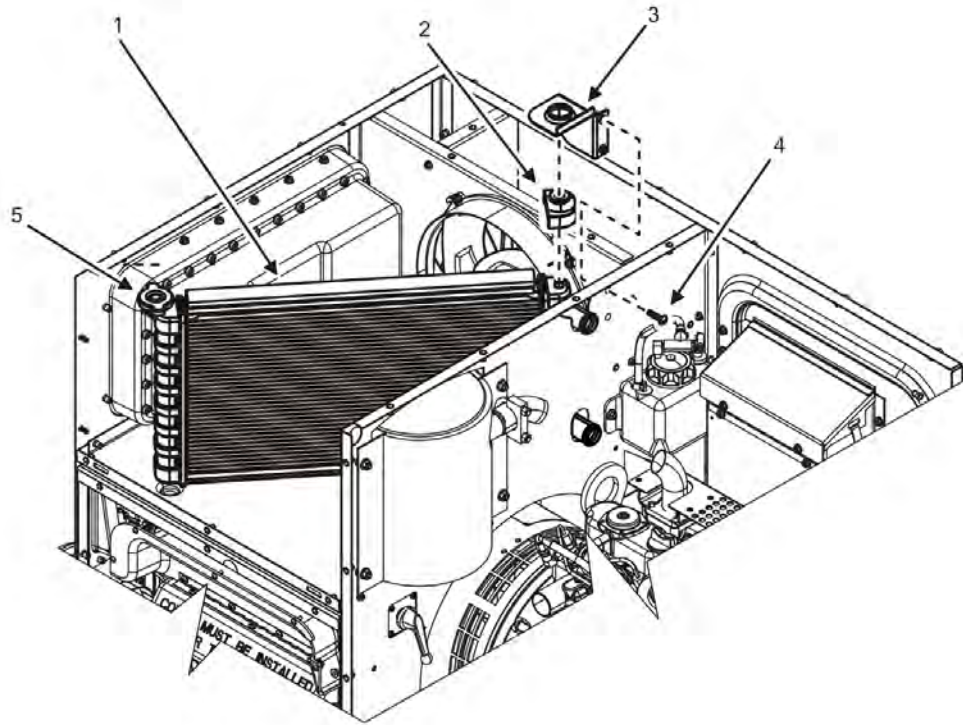


Figure 2. Radiator Removal — Forward.

NOTE

Capture any spilled residual coolant and dispose of IAW local SOP. Cap/plug all open coolant hoses and ports to minimize spilled residual coolant when radiator is removed. Caps/plugs also prevent dirt and debris from entering the cooling system.

3. Ensure radiator cap (Figure 2, Item 5) is installed on radiator (Figure 2, Item 1) to minimize residual coolant spilled when radiator is removed.
4. Remove two screws (Figure 2, Item 4) securing front radiator bracket (Figure 2, Item 3) and rubber isolator (Figure 2, Item 2) to unit bulkhead panel.
5. Inspect front radiator bracket (Figure 2, Item 3) and rubber isolator (Figure 2, Item 2) for corrosion, excessive wear, or other signs of obvious damage. Replace components as required.

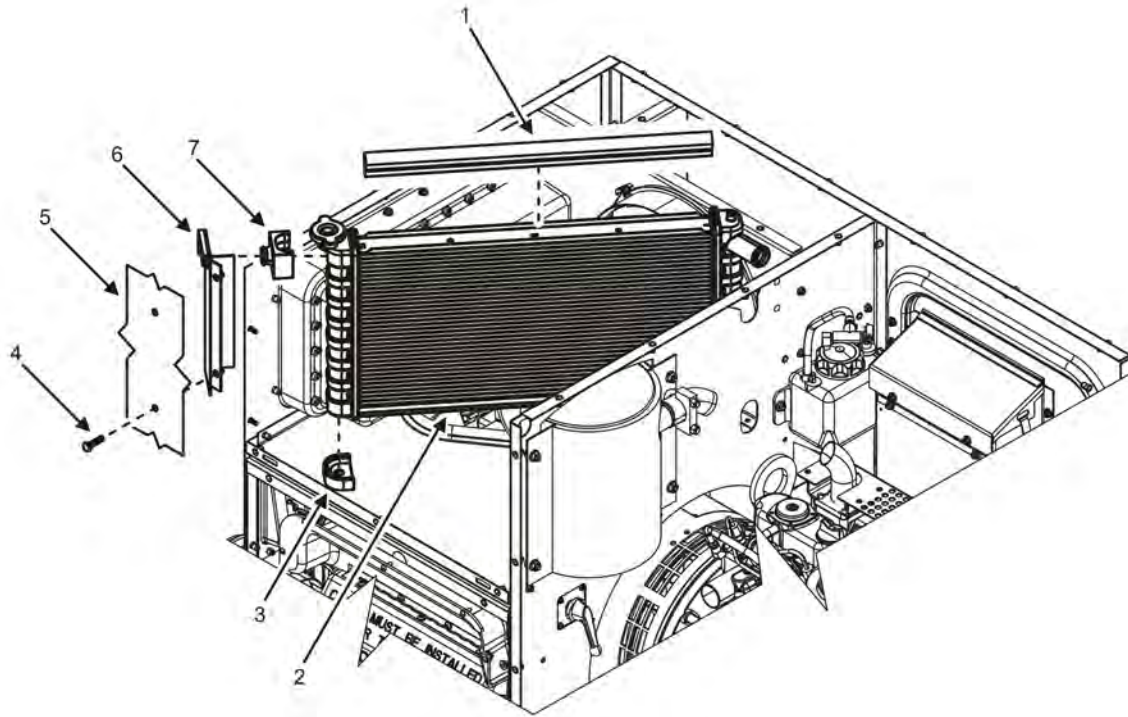


Figure 3. Radiator Removal — Rear.

6. Remove two screws (Figure 3, Item 4) that secure rear radiator bracket (Figure 3, Item 6) to right-side body panel (Figure 3, Item 5).
7. Remove rear radiator bracket (Figure 3, Item 6) and rubber isolator (Figure 3, Item 7).
8. Inspect rear radiator bracket (Figure 3, Item 6) and rubber isolator (Figure 3, Item 7) for corrosion, excessive wear, or other signs of obvious damage. Replace components as required.
9. Remove four rubber edge bulb seals (Figure 3, Item 1) from radiator (Figure 3, Item 2).
10. Inspect four rubber edge bulb seals (Figure 3, Item 1) for cuts, tears, brittleness, and other damage. Replace rubber edge bulb seals (Figure 3, Item 1) if cut, torn, brittle, or otherwise damaged.
11. Remove radiator (Figure 3, Item 2) from unit and place on suitable work surface.

END OF TASK

Inspect/Clean Radiator

1. Remove dirt and debris from radiator (Figure 3, Item 2) exterior.
2. Remove rubber mounts (Figure 3, Item 3) from bottom of radiator (Figure 3, Item 2).
3. Inspect rubber mounts (Figure 3, Item 3) for excessive wear or other signs of obvious damage. Replace rubber mounts (Figure 3, Item 3) as required.
4. Inspect radiator (Figure 3, Item 2) for punctures, tears, cracks, crushed fins, or damage to inlet, outlet, or overflow ports.
5. Inspect seams of radiator (Figure 3, Item 2) where side tanks meet radiator core for signs of leakage.
6. Replace radiator (Figure 3, Item 2) if any evidence of damage is found.

END OF TASK**Install Radiator**

1. Wipe down all components using wiping rags prior to installation.

NOTE

The radiator support tray contains two indentations to cradle the rubber mounts (Figure 3, Item 3).

2. Ensure rubber mounts (Figure 3, Item 3) are installed to bottom of radiator (Figure 3, Item 2).
3. Position radiator (Figure 3, Item 2) inside unit with rubber mounts (Figure 3, Item 3) located in support tray indentations.
4. Insert intake and outlet fittings of radiator (Figure 3, Item 2) through openings in unit bulkhead panel.
5. Position rubber isolator (Figure 3, Item 7) and rear radiator bracket (Figure 3, Item 6) to mounting location on radiator (Figure 3, Item 2) and right-side body panel (Figure 3, Item 5).
6. Install two screws (Figure 3, Item 4) finger-tight to secure rear radiator bracket (Figure 3, Item 6) to right-side body panel (Figure 3, Item 5).
7. Install two rubber edge bulb seals (Figure 3, Item 1) to top and two to bottom of radiator (Figure 3, Item 2).
8. Position rubber isolator (Figure 2, Item 2) and front radiator bracket (Figure 2, Item 3) to mounting location on radiator (Figure 2, Item 1) at bulkhead panel.
9. Install two screws (Figure 2, Item 4) finger-tight to secure front radiator bracket (Figure 2, Item 3) to bulkhead panel.
10. Torque screws (Figure 3, Item 4) (Figure 2, Item 4) to 87 – 105 in/lb (10 – 11 Nm).
11. Remove all caps/plugs from radiator ports and hoses prior to installation.
12. Install coolant overflow hose (WP 0022, Remove/Install Coolant Recovery System) to radiator (Figure 2, Item 1).
13. Install upper and lower radiator hoses to radiator (Figure 2, Item 1) (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
14. Fill cooling system (WP 0021, Service Cooling System) to proper level and ensure radiator cap is properly installed.
15. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
16. Close all generator set doors.

WARNING

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

Install top body panel after unit has been checked for leaks.

17. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
18. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
19. Check for leaks and repair as required.
20. Install top body panel (WP 0028, Remove/Install Top Body Panel).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL TOP BODY PANEL

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162,
Table 2, Item 32)

Materials/Parts

Panel, top (WP 0102, Repair Parts List, Figure 4,
Item 2)

Grease, electrically conductive (WP 0163,
Expendable and Durable Items List, Item 20)

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10,
WP 0005)

Engine cool

Battery ground cable removed (WP 0036,
Remove/Install Batteries)

REMOVE/INSTALL TOP BODY PANEL

Remove Top Body Panel

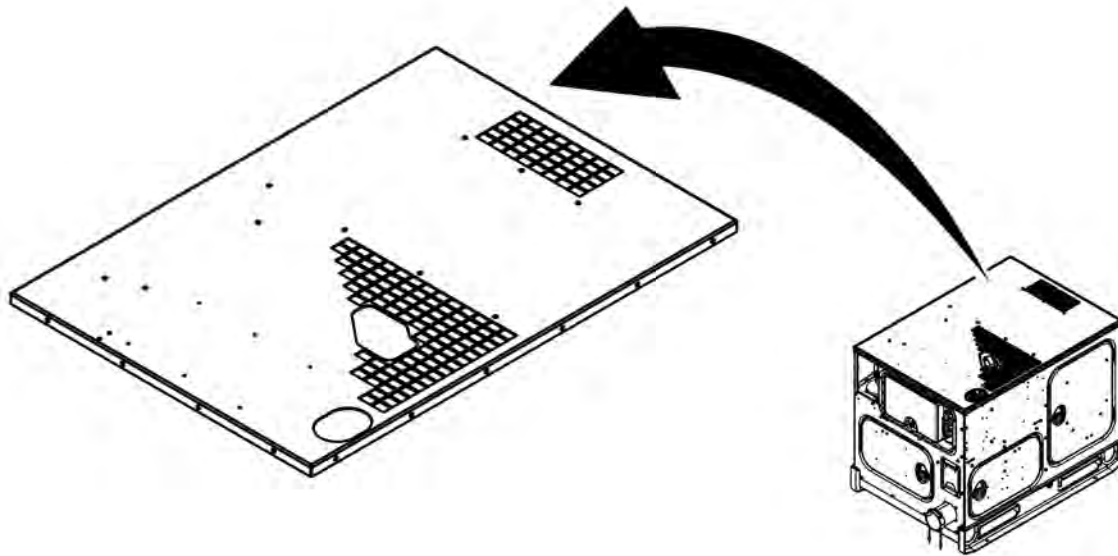


Figure 1. Top Body Panel — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate top body panel (Figure 1).

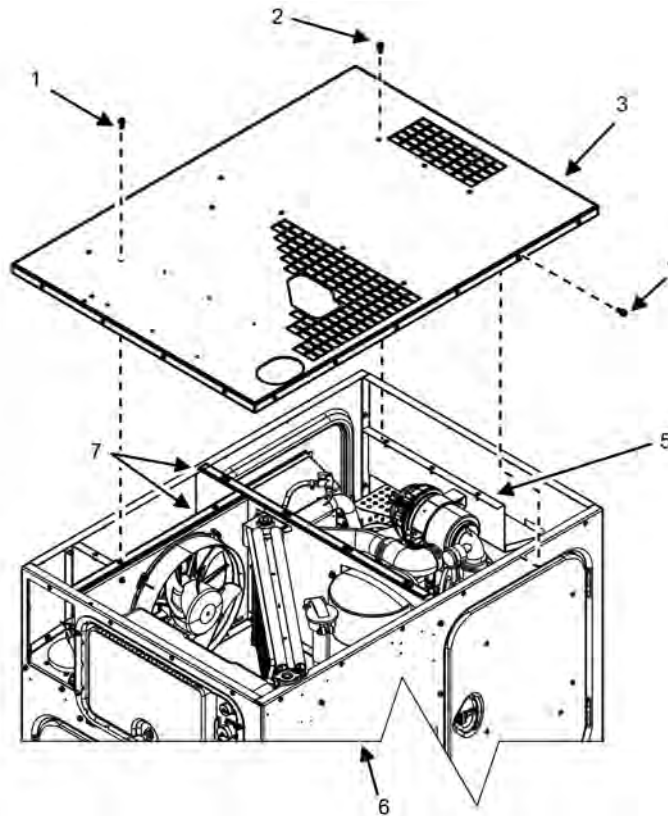


Figure 2. Top Body Panel Removal — Detail.

3. Remove 20 screws (Figure 2, Item 4) securing edges of top body panel (Figure 2, Item 3) to generator set (Figure 2, Item 6).
4. Remove seven screws (Figure 2, Item 1) securing top body panel (Figure 2, Item 3) to internal body panels (Figure 2, Item 7) of generator set (Figure 2, Item 6).
5. Remove three screws (Figure 2, Item 2) securing weather shield (Figure 2, Item 5) to top body panel (Figure 2, Item 3).
6. Remove top body panel (Figure 2, Item 3) from unit and place on flat surface to prevent damage to panel.

END OF TASK

Inspect Top Body Panel

1. Inspect top body panel (Figure 2, Item 3) for damage, cracks, or corrosion and repair minor damage as required.
2. Replace top body panel (Figure 2, Item 3) if cracked or showing major damage.
3. Inspect screws (Figure 2, Items 1, 2, and 4) for damage and replace any that are damaged.
4. Inspect weather shield (Figure 2, Item 5) for cracks, damage, or corrosion and repair minor damage as required.
5. Replace weather shield (Figure 2, Item 5) if cracked, corroded, or showing major damage.

END OF TASK

Install Top Body Panel

1. Position top body panel (Figure 2, Item 3) on generator set (Figure 2, Item 6) and align mounting holes.
2. Install and finger-tighten 20 screws (Figure 2, Item 4) securing top body panel (Figure 2, Item 3) along perimeter of unit.
3. Install and finger-tighten seven screws (Figure 2, Item 1) securing top body panel (Figure 2, Item 3) to internal panels (Figure 2, Item 7) of unit.
4. Install and finger-tighten three screws (Figure 2, Item 2) securing weather shield (Figure 2, Item 5) to top body panel (Figure 2, Item 3).
5. Tighten all screws installed in steps 2, 3, and 4 to 86 – 106 in/lb (10 – 12 Nm).
6. Install battery ground cable (WP 0036, Remove/Install Batteries).
7. Close generator set doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FRONT BODY PANEL

INITIAL SETUP:

Tools and Special Tools

Hex Key 5.0mm (WP 0162, Table 2, Item 15)
 Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Panel, enclosure, front (WP 0102, Repair Parts List, Figure 4, Item 19)
 Cap set, protective (WP 0163, Expendable and Durable items List, Item 8)
 Grease, electrically conductive (WP 0163, Item 20)
 Rag, wiping (WP 0163, Item 31)
 Strap, tie-down (WP 0163, Item 34)

Personnel Required

91D (1)
 Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
 Engine cool
 Battery ground cable removed (WP 0036, Remove/Install Batteries)
 Top body panel removed (WP 0028, Remove/Install Top Body Panel)
 NATO slave receptacle disconnected (WP 0038, Remove/Install NATO Slave Receptacle)
 Air cleaner assembly air hoses removed (WP 0019, Remove/Install Air Intake Hose Assemblies)
 Fuel filter/water separator separated from front body panel (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly)

REMOVE/INSTALL FRONT BODY PANEL

Remove Front Body Panel

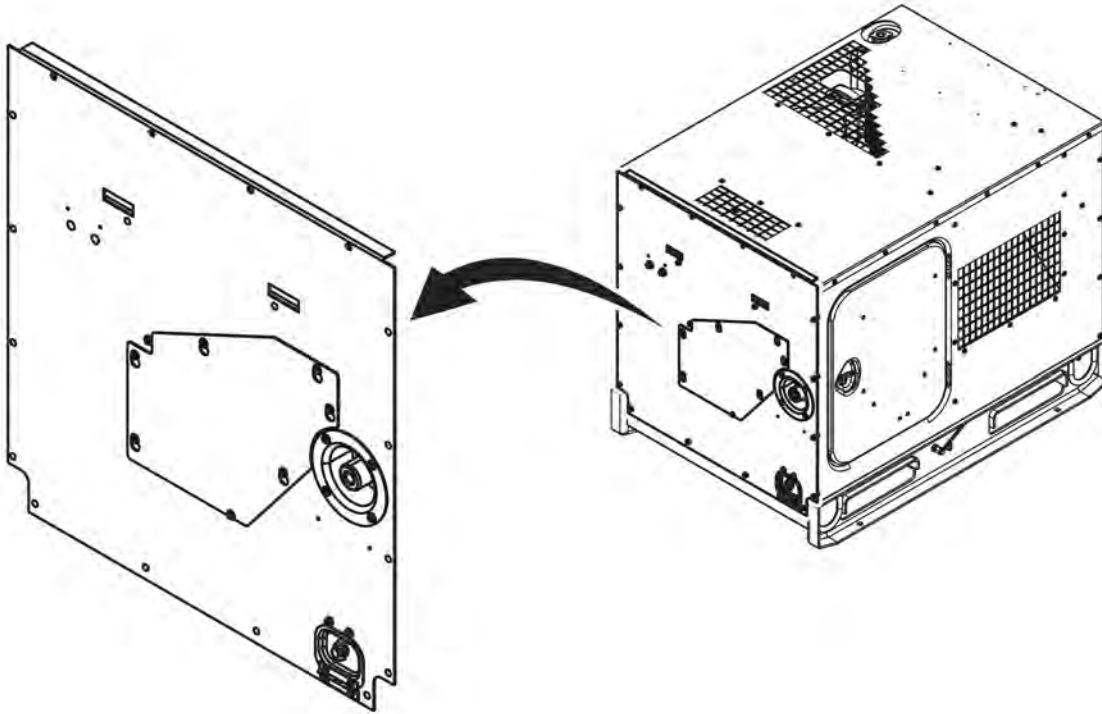


Figure 1. Front Body Panel — Location.

1. Ensure equipment conditions are met in order presented in initial setup.

CAUTION

When the front body panel (Figure 1) is removed, the NATO slave receptacle (Figure 3, Item 5), weather shield (Figure 3, Item 1), engine belt shields (Figure 3, Items 3 and 6), and air cleaner (Figure 3, Item 2) will remain attached to the front body panel. Handle the panel carefully when removing. Failure to comply may cause damage to equipment.

NOTE

The access panel (Figure 2, Item 3) does not need to be removed to remove or install the front body panel.

2. Remove 12 screws (Figure 2, Item 2) securing front body panel (Figure 2, Item 1) to unit.

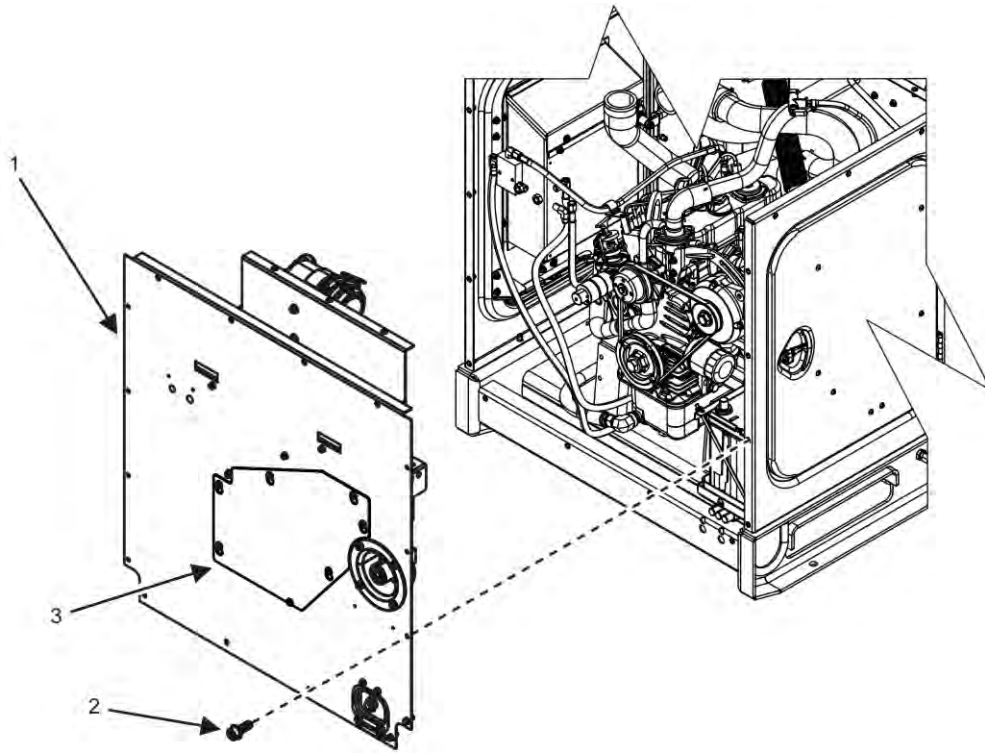


Figure 2. Front Body Panel — Removal/Installation.

3. Remove front body panel (Figure 2, Item 1) from generator set and place on suitable work surface.

END OF TASK

Inspect Front Body Panel

1. Inspect front body panel (Figure 2, Item 1) for damage or corrosion.
2. Repair minor damage or corrosion as required.
3. Replace front body panel (Figure 2, Item 1) if significant damage or corrosion is present.
4. Inspect mounting hardware, and replace as required.
5. Inspect NATO slave receptacle (Figure 3, Item 5), engine belt shields (Figure 3, Items 3 and 6), weather shield (Figure 3, Item 1), grounding rods door (Figure 3, Item 4), and air cleaner (Figure 3, Item 2) for signs of corrosion or damage. Repair or replace as required.

END OF TASK

Install Front Body Panel

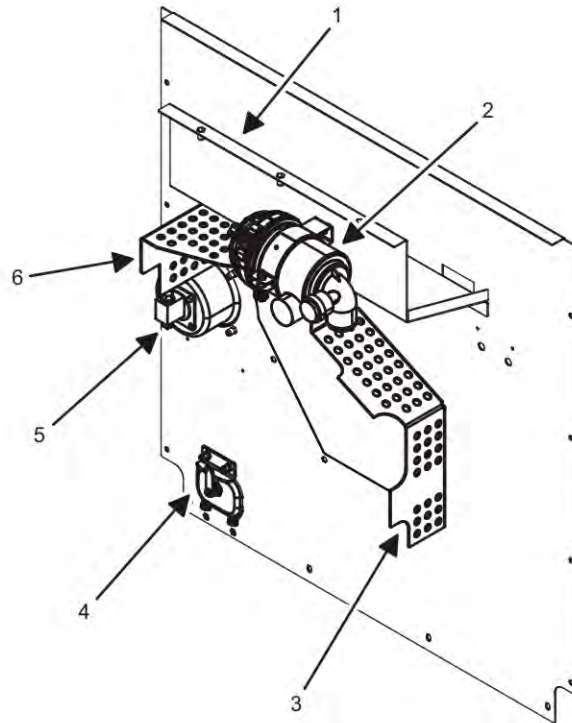


Figure 3. Front Body Panel — Reverse.

1. Place front body panel (Figure 2, Item 1) at mounting location on unit and align mounting holes.
2. Install front body panel (Figure 2, Item 1) with 12 screws (Figure 2, Item 2). Torque to 86 – 106 in/lb (10 – 12 Nm).
3. Remove plugs from air hoses and install hoses to air cleaner assembly (WP 0019, Remove/Install Air Intake Hose Assemblies).

WARNING

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

4. Install NATO slave receptacle positive and negative connections (WP 0038, Remove/Install NATO Slave Receptacle).
5. Install fuel filter/water separator assembly (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly) onto front body panel (Figure 2, Item 1) using screws and nuts from Remove Front Body Panel task.
6. Install top body panel (WP 0028, Remove/Install Top Body Panel).
7. Install battery ground cable (WP 0036, Remove/Install Batteries).
8. Close generator set doors.

9. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
10. Start engine and check for proper operation (TM 9-6115-749-10).
11. Repair as required.
12. Dispose of all captured fluids IAW local SOP.

END OF TASK

Remove Access Panel

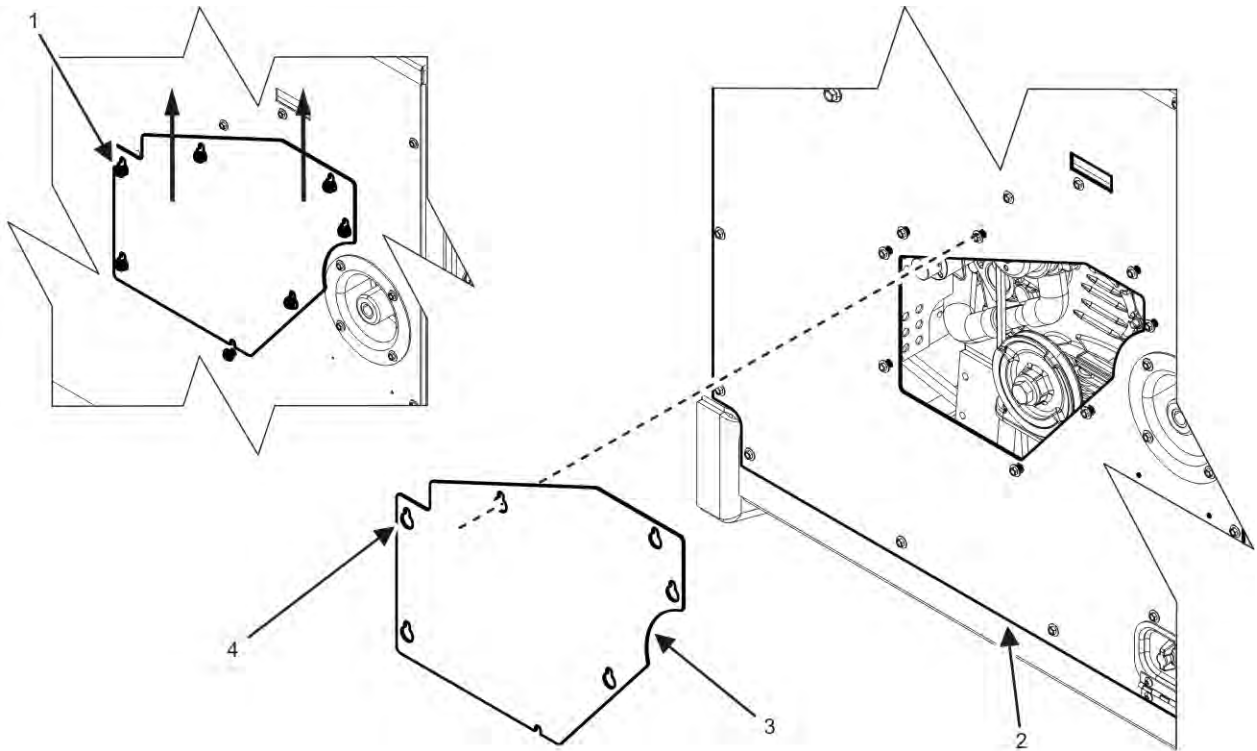


Figure 4. Remove Access Panel.

1. Turn seven screws (Figure 4, Item 1) securing access panel (Figure 2, Item 3) 2-1/2 turns counterclockwise.
2. Move access panel (Figure 4, Item 3) upwards until screws (Figure 4, Item 1) are centered in circular part of key-hole openings (Figure 4, Item 4).
3. Remove access panel (Figure 4, Item 3).
4. Inspect access panel (Figure 4, Item 3) for damage and corrosion. Repair or replace as required.

END OF TASK

Install Access Panel

1. Position access panel as shown in Figure 4.
2. Position access panel key-hole openings (Figure 4, Item 4) over screws (Figure 4, Item 1) on front panel (Figure 4, Item 2).
3. Slide access panel (Figure 4, Item 3) downwards until narrow portion of key-hole openings (Figure 4, Item 4) rest on screws (Figure 4, Item 1).
4. Turn seven screws (Figure 4, Item 1) clockwise 2-1/2 turns.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL REAR BODY PANEL

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Panel, rear (WP 0102, Repair Parts List, Figure 4, Item 45)

Washer, lock (WP 0102, Repair Parts List, Figure 4, Item 32)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0033, Remove/Install Door

WP 0056, Remove/Install Convenience Receptacle

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

DCS panel removed (WP 0017, Remove/Install DCS)

REMOVE/INSTALL REAR BODY PANEL

Remove Rear Body Panel

NOTE

DCS door and rear access door are attached to rear body panel. Rear body panel may be removed from the unit with or without the doors attached. See WP 0033, Remove/Install Door for procedure to remove/install DCS and rear access doors.

The DCS, mounted in the rear body panel (Figure 1), has a cover that can be closed over the panel and latched. To improve clarity, illustrations in this document show the DCS unit without the cover.

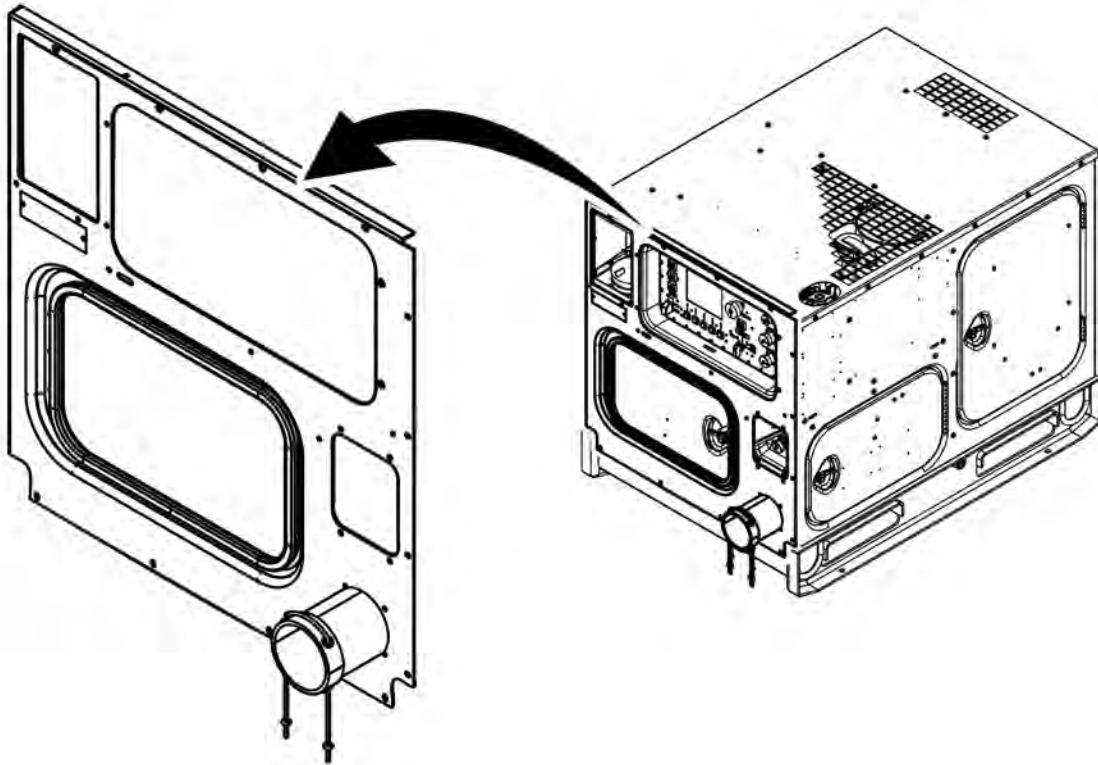


Figure 1. Rear Body Panel — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate rear body panel (Figure 1).

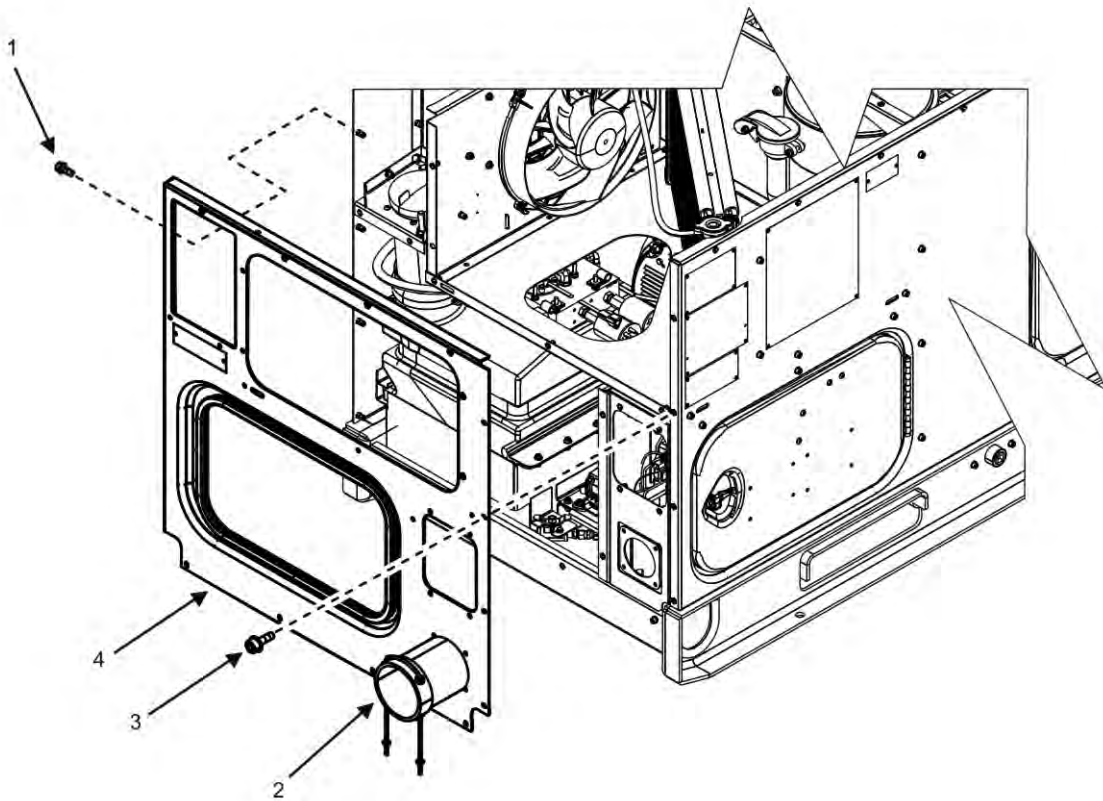


Figure 2. Rear Body Panel Removal — Detail.

3. Tag and disconnect all output cables from output box (TM 9-6115-749-10) and withdraw cables through cable outlet (Figure 2, Item 2) in rear body panel.
4. Remove four screws (Figure 2, Item 1) securing left-side body panel to rear body panel (Figure 2, Item 4).
5. Remove eight screws (Figure 2, Item 3) securing rear body panel (Figure 2, Item 4) to perimeter of unit.

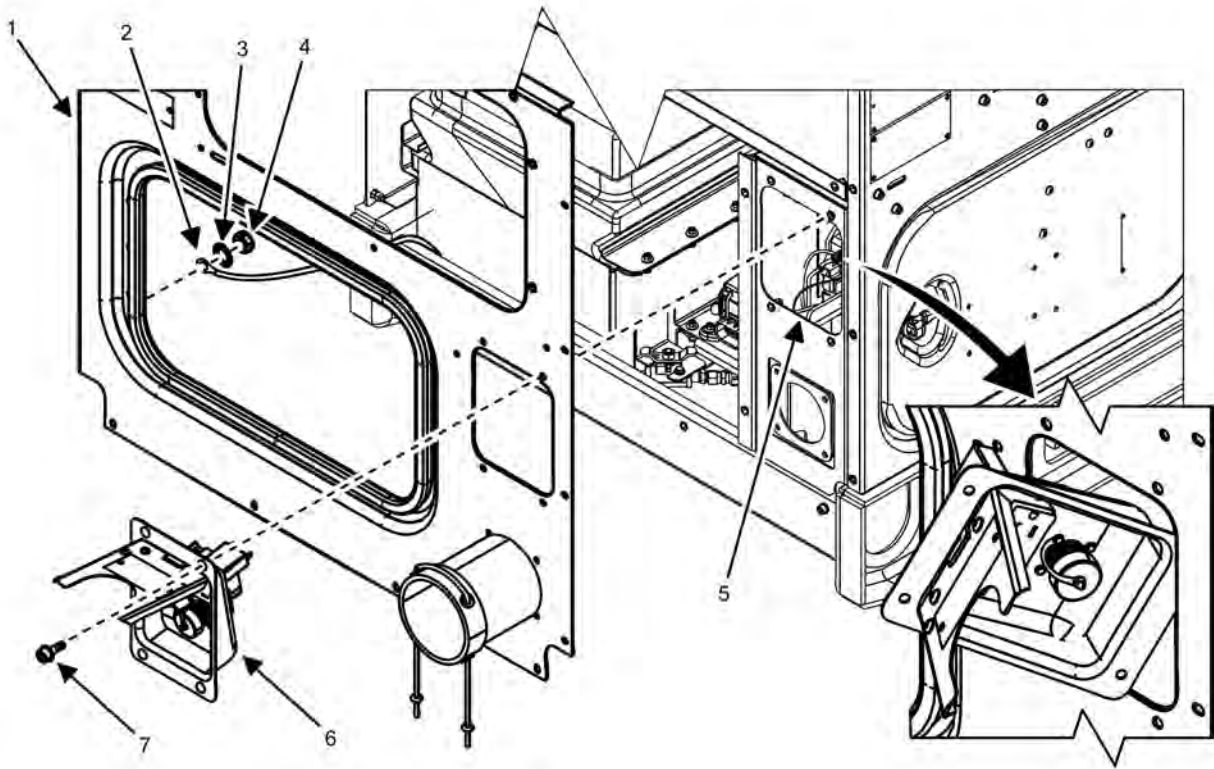


Figure 3. Convenience Receptacle Removal — Detail.

6. Remove four screws (Figure 3, Item 7) securing convenience receptacle (Figure 3, Item 6) to rear body panel (Figure 3, Item 1).
7. Disengage convenience receptacle (Figure 3, Item 6) from rear body panel (Figure 3, Item 1) carefully so as to not damage or stress any electrical connections.

CAUTION

When removing the final screws from the rear body panel (Figure 3, Item 1), be sure to support the panel and not allow it to fall. Failure to comply may cause damage to equipment.

8. Remove seven screws (Figure 2, Item 3) securing rear body panel (Figure 2, Item 4) to interior panels.
9. Remove rear body panel (Figure 3, Item 1) from unit, passing convenience receptacle (Figure 3, Item 6) diagonally through panel opening as panel is removed.
10. Remove nut (Figure 3, Item 4) and lock washer (Figure 3, Item 3) securing ground wire (Figure 3, Item 2) to rear body panel (Figure 3, Item 1). Discard lock washer (Figure 3, Item 3).
11. Remove ground wire (Figure 3, Item 2) from rear body panel (Figure 3, Item 1).
12. Place rear body panel (Figure 3, Item 1) on suitable work surface.
13. Place convenience receptacle (Figure 3, Item 6) at its mounting location, and install a single screw (Figure 3, Item 7) to hold convenience receptacle in place against output box (Figure 3, Item 5).

END OF TASK

Inspect Rear Body Panel

1. Inspect rear body panel (Figure 3, Item 1) for damage or corrosion.
2. Repair minor damage and corrosion as required.
3. Replace rear body panel (Figure 3, Item 1) if major damage or corrosion are present.
4. Inspect door on rear body panel for damage.
5. Replace door as required (WP 0033, Remove/Install Door).
6. Inspect convenience receptacle (Figure 3, Item 6) for damage, and replace if damaged (WP 0056, Remove/Install Convenience Receptacle).
7. Inspect all mounting hardware and replace as required.

END OF TASK**Install Rear Body Panel****NOTE**

The left edge of the rear body panel (Figure 3, Item 1) fits beneath the edge of the left-side body panel.

1. Remove screw (Figure 3, Item 7) securing convenience receptacle (Figure 3, Item 6) to output box (Figure 3, Item 5).
2. Place rear body panel (Figure 3, Item 1) on unit allowing convenience receptacle (Figure 3, Item 6) to pass diagonally out through receptacle opening in panel.
3. Install ground wire (Figure 3, Item 2), nut (Figure 3, Item 4), and new lock washer (Figure 3, Item 3) to rear body panel (Figure 3, Item 1).
4. Position rear body panel (Figure 3, Item 1) at mounting holes.
5. Install and finger-tighten seven screws (Figure 2, Item 3) securing rear body panel (Figure 2, Item 4) to interior panels.
6. Install and finger-tighten eight screws (Figure 2, Item 3) securing rear body panel (Figure 2, Item 4) to perimeter of unit.
7. Install and finger-tighten four screws (Figure 3, Item 7) securing convenience receptacle (Figure 3, Item 6) to rear body panel (Figure 3, Item 1).
8. Install and finger-tighten four screws (Figure 2, Item 1) securing left-side panel (not shown) to rear body panel (Figure 3, Item 1).
9. Tighten all screws to 86 – 106 in/lb (10 – 12 Nm).
10. Install DCS panel (WP 0017, Remove/Install DCS).
11. Install top body panel (WP 0028, Remove/Install Top Body Panel).
12. Install all output cables to proper locations in output box (TM 9-6115-749-10).
13. Install battery ground cable (WP 0036, Remove/Install Batteries).
14. Close generator set doors.

15. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
16. Start engine and check for proper operation (TM 9-6115-749-10).
17. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL LEFT-SIDE BODY PANEL

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Panel, left (WP 0102, Repair Parts List, Figure 4, Item 73)

Washer, lock (WP 0102, Figure 4, Item 32)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Personnel Required

91D (1)

Assistant (1)

References

WP 0033, Remove/Install Door

WP 0034, Repair Door

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

REMOVE/INSTALL LEFT-SIDE BODY PANEL**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Remove Left-Side Body Panel

NOTE

Left-side door is attached to left-side body panel (Figure 1). Left-side body panel may be removed from unit with or without left-side door attached. See WP 0033, Remove/Install Door for procedure to remove and install door.

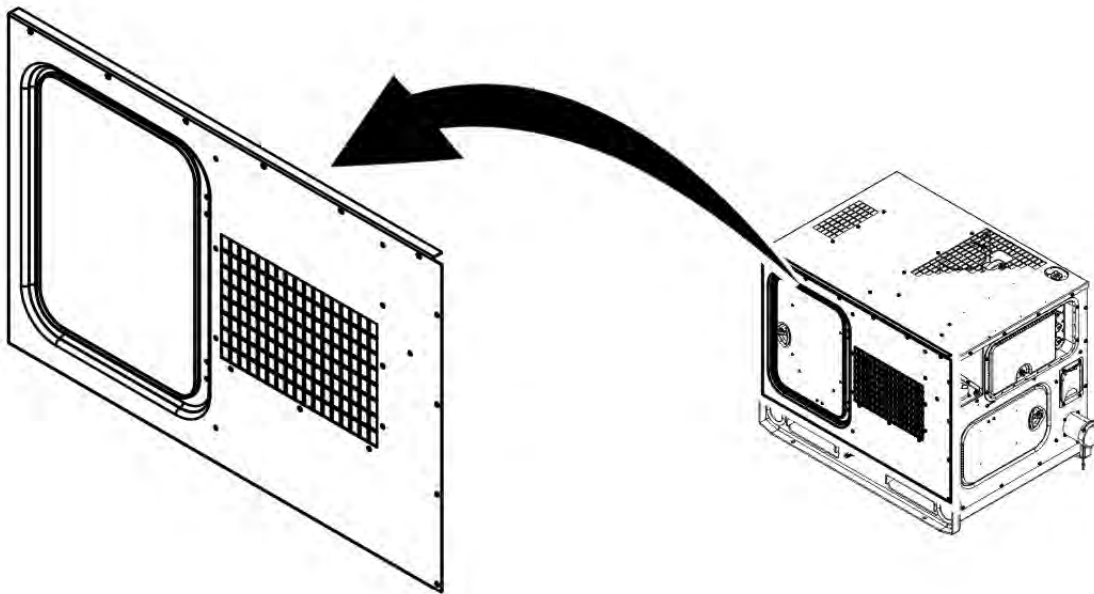


Figure 1. Left-Side Body Panel — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate left-side body panel (Figure 1).

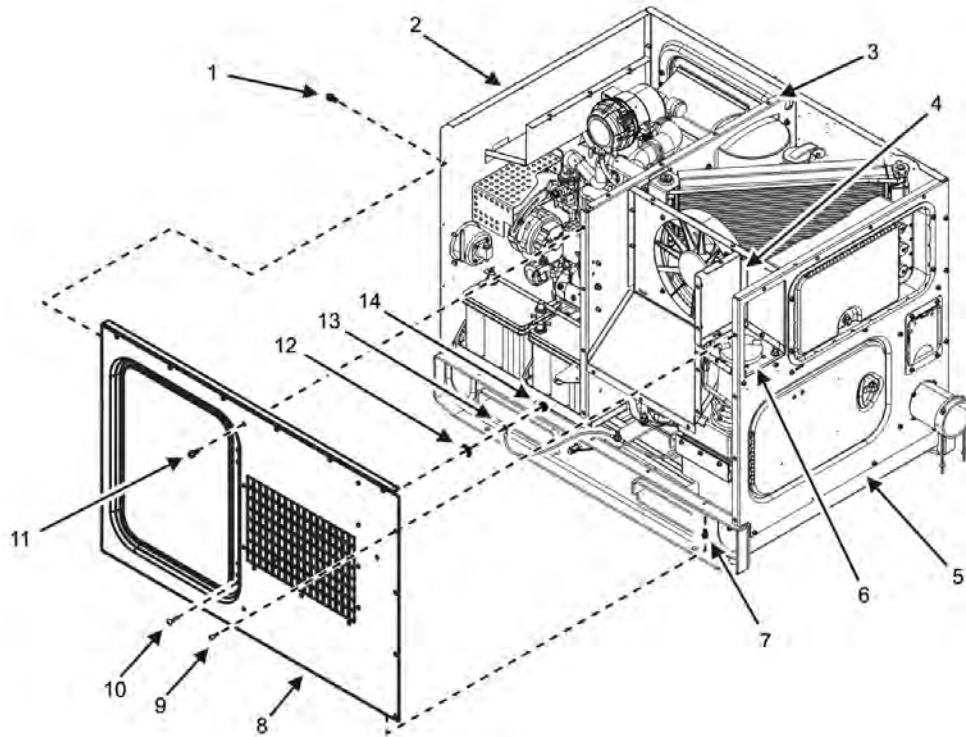


Figure 2. Left-Side Body Panel — Removal.

3. Remove four screws (Figure 2, Item 1) securing battery-side edge of front body panel (Figure 2, Item 2).
4. Remove five screws (Figure 2, Item 7) from underneath left-side body panel (Figure 2, Item 8) that secure panel to unit skid.
5. Remove four screws (Figure 2, Item 9) securing left-side body panel (Figure 2, Item 8) to rear body panel (Figure 2, Item 5).
6. Remove 12 screws (Figure 2, Item 11) securing left-side body panel (Figure 2, Item 8) to internal panel (Figure 2, Item 3), fuel system bracket (Figure 2, Item 6), and fuel tank guard (Figure 2, Item 4).
7. Remove screw (Figure 2, Item 10), lock washer (Figure 2, Item 12), ground wire (Figure 2, Item 13), and nut (Figure 2, Item 14) from left-side body panel (Figure 2, Item 8).
8. Remove left-side body panel (Figure 2, Item 8) from unit, and place on suitable work surface.

END OF TASK

Inspect Left-Side Body Panel

1. Inspect left-side body panel (Figure 2, Item 8) for damage or corrosion, and repair or replace panel as required.
2. Inspect panel door for damage or corrosion, and repair or replace as required (WP 0033, Remove/Install Door and WP 0034, Repair Door).
3. Inspect screws (Figure 2, Items 1, 7, 9, and 10) for damage or corrosion. Replace as required.

END OF TASK**Install Left-Side Body Panel**

1. Position left-side body panel (Figure 2, Item 8) at mounting location on unit.
2. Install screw (Figure 2, Item 10), lock washer (Figure 2, Item 12), ground wire (Figure 2, Item 13) and nut (Figure 2, Item 14) to left-side body panel (Figure 2, Item 8).

NOTE

Install body panel screws finger-tight at first to allow repositioning of panel during installation.

3. Install 12 screws (Figure 2, Item 11) finger-tight to secure left-side body panel (Figure 2, Item 8) to internal panel (Figure 2, Item 3), fuel system bracket (Figure 2, Item 6), and fuel tank guard (Figure 2, Item 4).
4. Install four screws (Figure 2, Item 9) finger-tight to secure left-side body panel (Figure 2, Item 8) to rear body panel (Figure 2, Item 5).
5. Install five screws (Figure 2, Item 7) finger-tight to secure bottom of left-side body panel (Figure 2, Item 8) to unit skid.
6. Install four screws (Figure 2, Item 1) finger-tight to secure left-side body panel (Figure 2, Item 8) to battery-side edge of front body panel (Figure 2, Item 2).
7. Tighten all screws in left-side body panel (Figure 2, Item 8), front body panel (Figure 2, Item 2), and rear body panel (Figure 2, Item 5) to 86 – 106 in/lb (10 – 12 Nm).
8. Install top body panel (WP 0028, Remove/Install Top Body Panel).
9. Install battery ground cable (WP 0036, Remove/Install Batteries).
10. Close all generator set doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL RIGHT-SIDE BODY PANEL

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Panel, right (WP 0102, Repair Parts List, Figure 4, Item 70)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Personnel Required

91D (1)

Assistant (1)

References

WP 0033, Remove/Install Door

WP 0034, Repair Door

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

REMOVE/INSTALL RIGHT-SIDE BODY PANEL**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

Remove Right-Side Body Panel

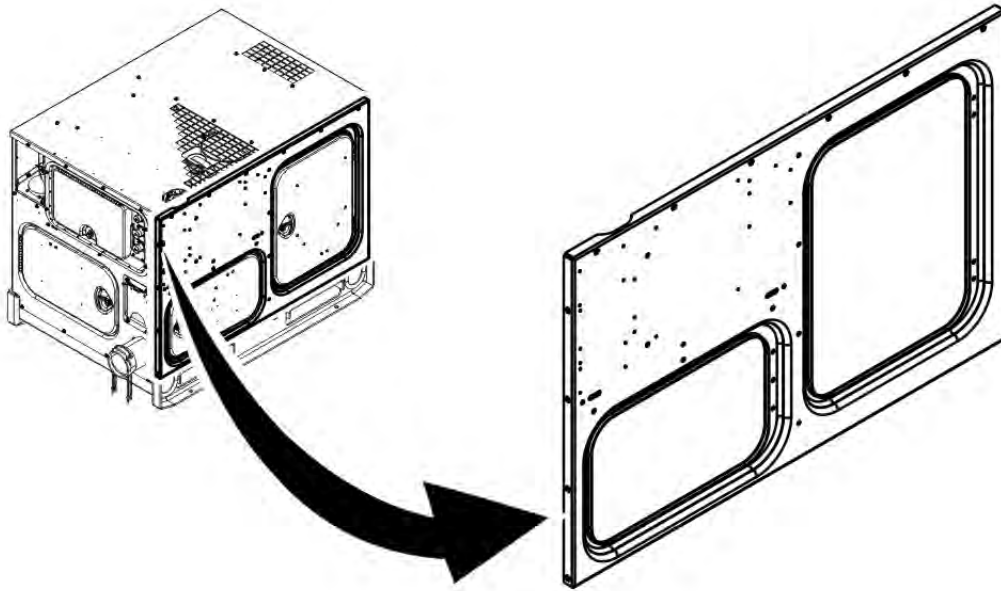
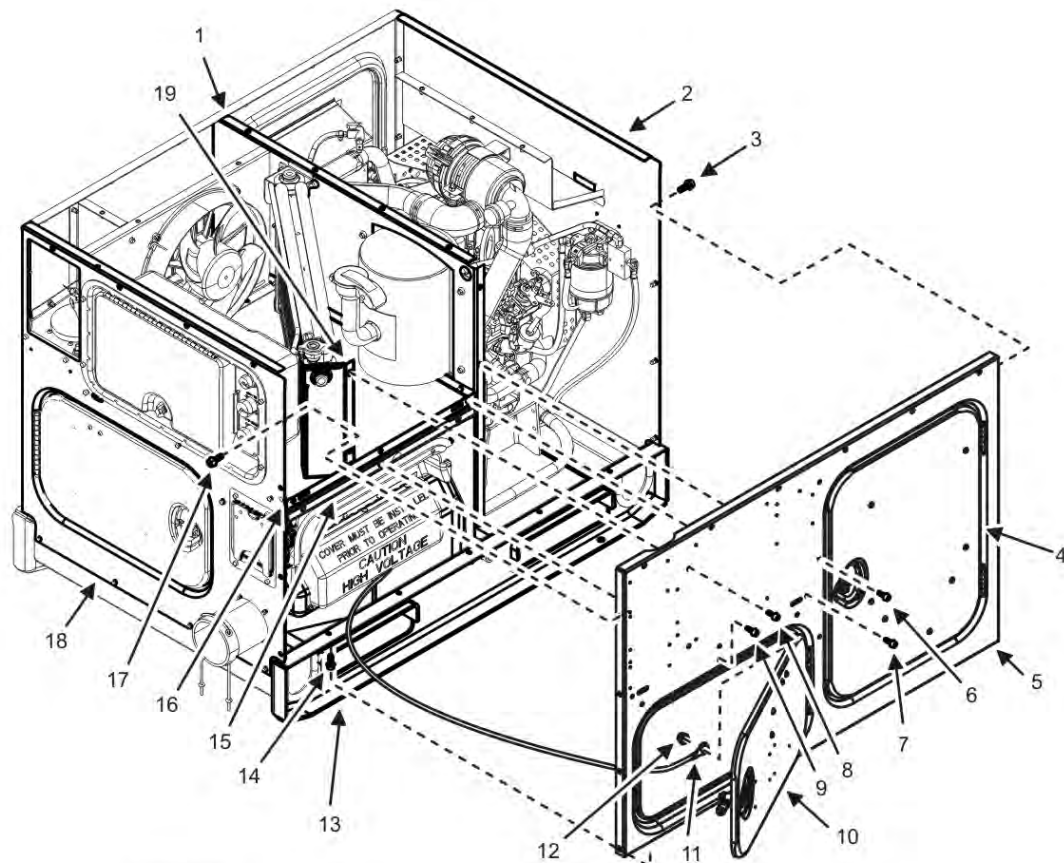


Figure 1. Right-Side Body Panel — Location.

NOTE

Output terminal door and right-side door are attached to right-side body panel (Figure 1). Right-side body panel (Figure 1) may be removed from the unit with or without doors attached. See WP 0034, Repair Door for procedure to remove/install unit access doors. Figure 2 shows the right-side body panel with the doors removed.

1. Ensure all equipment conditions are met in order presented in initial setup.
2. Remove four screws (Figure 2, Item 17) joining rear body panel (Figure 2, Item 18) with right-side body panel (Figure 2, Item 5), and set aside for reuse.



Legend

- | | |
|--------------------------|----------------------------|
| 1. Interior Panel | 11. Ground Wire |
| 2. Front Body Panel | 12. Nut |
| 3. Screws | 13. Unit Skid |
| 4. Right-side Panel Door | 14. Screws |
| 5. Right-side Body Panel | 15. Output Box |
| 6. Screws | 16. Radiator Support Panel |
| 7. Screws | 17. Screws |
| 8. Screws | 18. Rear Body Panel |
| 9. Screws | 19. Radiator Bracket |
| 10. Output Box Door | |

Figure 2. Right-Side Body Panel — Removal.

3. Remove four screws (Figure 2, Item 3) joining front body panel (Figure 2, Item 2) to right-side body panel (Figure 2, Item 5), and set aside for reuse.
4. Remove five screws (Figure 2, Item 14) securing right-side body panel (Figure 2, Item 5) to unit skid (Figure 2, Item 13).
5. Remove six screws (Figure 2, Items 7 and 9) securing right-side body panel (Figure 2, Item 5) to radiator support panel (Figure 2, Item 16) and output box (Figure 2, Item 15).
6. Remove six screws (Figure 2, Items 6 and 8) securing right-side body panel (Figure 2, Item 5) to unit interior panel (Figure 2, Item 1) and rear radiator bracket (Figure 2, Item 19).
7. Remove nut (Figure 2, Item 12) securing ground wire (Figure 2, Item 11) to right-side body panel (Figure 2, Item 5).
8. Remove ground wire (Figure 2, Item 11) from right-side body panel (Figure 2, Item 5).

NOTE

The output box cover (not shown) is attached to the inside of the output box door (Figure 2, Item 10) and will be removed whenever the right-side body panel (Figure 2, Item 5) is removed with the output box door (Figure 2, Item 10) attached.

9. Remove right-side body panel (Figure 2, Item 5) from unit, and place on suitable work surface.

END OF TASK**Inspect Right-Side Body Panel**

1. Check right-side body panel (Figure 2, Item 5) for damage or corrosion.
2. Repair minor damage or corrosion as required.
3. Replace right-side body panel (Figure 2, Item 5) if substantial damage or corrosion is present.
4. Inspect right-side panel door (Figure 2, Item 4) and output box door (Figure 2, Item 10) for damage and proper operation.
5. Repair or replace doors as required (WP 0033, Remove/Install Door and WP 0034, Repair Door).

END OF TASK**Install Right-Side Body Panel****NOTE**

Left-hand edge overlap of right-side body panel (Figure 2, Item 5) slides under rear body panel (Figure 2, Item 18) for installation. Right-hand edge overlap fits over front body panel (Figure 2, Item 2).

1. Secure ground wire (Figure 2, Item 11) to right-side body panel (Figure 2, Item 5) with nut (Figure 2, Item 12).
2. Position right-side body panel (Figure 2, Item 5) on unit, and align mounting holes.
3. Install and finger-tighten six screws (Figure 2, Items 6 and 8) securing right-side body panel (Figure 2, Item 5) to unit interior panel (Figure 2, Item 1) and rear radiator bracket (Figure 2, Item 19).
4. Install and finger-tighten six screws (Figure 2, Items 7 and 9) securing right-side body panel (Figure 2, Item 5) to radiator support panel (Figure 2, Item 16) and output box (Figure 2, Item 15).
5. Install and finger-tighten five screws (Figure 2, Item 14) securing right-side body panel (Figure 2, Item 5) to unit skid (Figure 2, Item 13).
6. Install and finger-tighten four screws (Figure 2, Item 3) securing right-side body panel (Figure 2, Item 5) to front body panel (Figure 2, Item 2).
7. Install and finger-tighten four screws (Figure 2, Item 17) securing right-side body panel (Figure 2, Item 5) to rear body panel (Figure 2, Item 18).
8. Tighten all screws installed in steps 3, 4, 5, 6, and 7 to 86 – 106 in/lb (10 – 12 Nm).
9. Install top body panel (WP 0028, Remove/Install Top Body Panel).
10. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
11. Close generator set doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL DOOR

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Brace, door stay, bottom (WP 0102, Repair Parts List, Figure 4, Item 26)

Brace, door stay, top (WP 0102, Figure 4, Item 25)

Bracket, door (WP 0102, Figure 4, Item 22)

Bracket, left and right door stay (WP 0102, Figure 4, Item 57)

Bracket, output box door stay (WP 0102, Figure 4, Item 46)

Door, assembly (WP 0102, Figure 4, Item 34)

Door, assembly, right and left (WP 0102, Figure 4, Item 59)

Door, output box assembly (WP 0102, Figure 4, Item 49)

Materials/Parts

Link, door (WP 0102, Figure 4, Item 23)

Washer, lock (WP 0102, Figure 4, Item 32)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Personnel Required

91D (1)

References

WP 0034, Repair Door

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL DOOR**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Remove Door

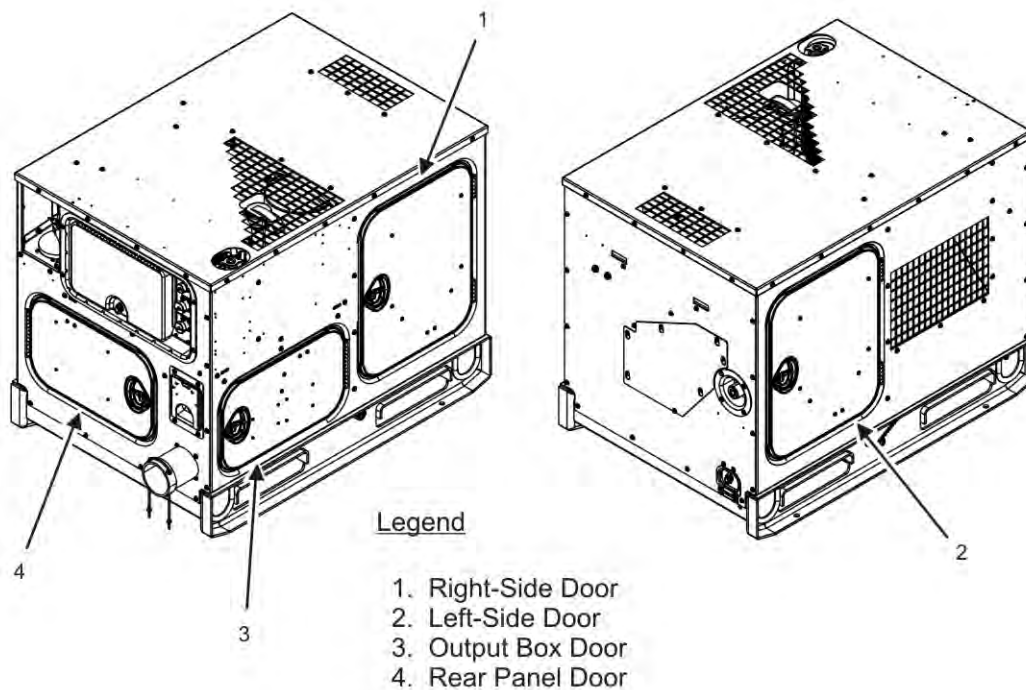


Figure 1. Door Locations.

NOTE

Four doors are installed on the AMMPS 5 kW generator set (Figure 1, Items 1 through 4). Each door may be removed with its corresponding body panel installed or removed from generator set. Door hinges on the generator set vary. Some doors have two hinges and some have only one. The doors with only one hinge also vary with respect to attaching hardware. The procedures provided in this WP are for a door with two hinges. Hinge removal, inspection, and install procedures are the same for each door with the exception of hinge mounting hardware quantities (WP 0034, Repair Door).

Each door is secured in closed position by a latch. Remove and install procedures are the same for all latches (WP 0034, Repair Door).

Each door has a door stay with locking link to hold the door in the open position. On doors with one hinge, the door stay is mounted at the top of the door. On doors with two hinges, the door stay is mounted at the bottom of the door. Mounting brackets for door stays are different depending on mounting location. Verify correct repair parts before beginning maintenance. Remove and install procedures are the same for all door stays (WP 0034, Repair Door).

1. Ensure equipment conditions are met in order presented in initial setup.

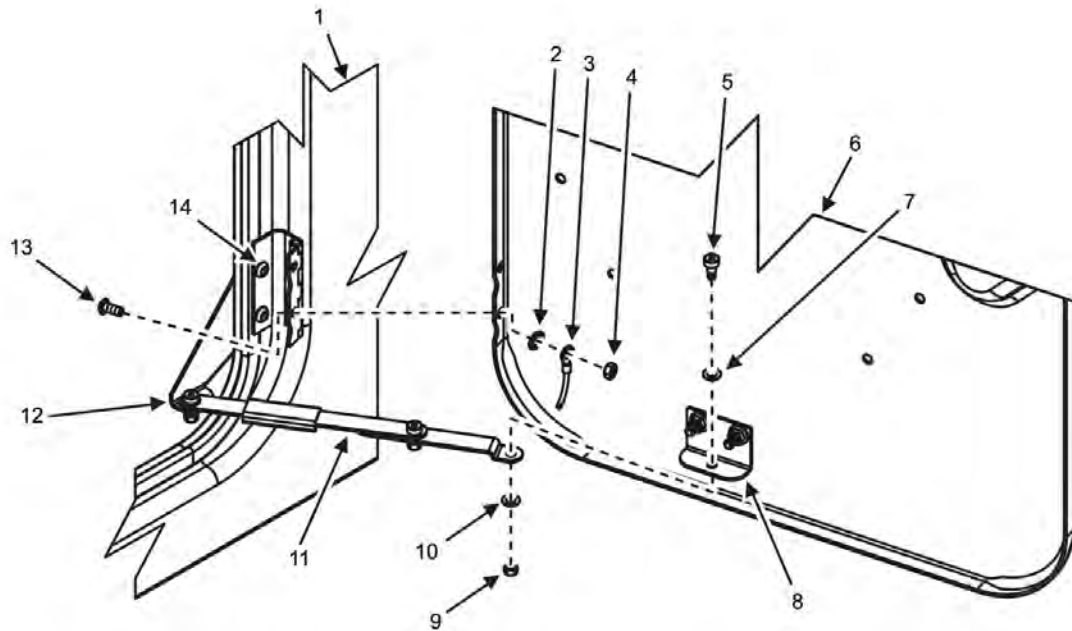


Figure 2. Remove/Install Door.

2. Open and support door (Figure 2, Item 6) to be removed.
3. Remove nut (Figure 2, Item 9) and two washers (Figure 2, Items 7 and 10) from hex shoulder bolt (Figure 2, Item 5) securing door stay (Figure 2, Item 11) to door stay bracket (Figure 2, Item 8).

NOTE

One of the four hinge screws (Figure 2, Item 13) and nuts (Figure 2, Item 4) also secures ground wire (Figure 2, Item 3) to door (Figure 2, Item 6).

4. Remove four screws (Figure 2, Item 13) and four nuts (Figure 2, Item 4) securing door (Figure 2, Item 6) to two hinges (Figure 2, Item 14) on unit body panel (Figure 2, Item 1). Discard lock washer (Figure 2, Item 2) as required.
5. Remove door (Figure 2, Item 6), and place on a suitable work surface.

END OF TASK

Inspect Door

1. Inspect door (Figure 2, Item 6) for excessive corrosion or obvious damage, and repair (WP 0034, Repair Door) or replace as required.
2. Inspect hinge(s) (Figure 2, Item 14) for freedom of movement and for excessive corrosion or obvious damage, and repair (WP 0034, Repair Door) or replace as required.
3. Inspect mounting hardware, door stay (Figure 2, Item 11), door stay bracket (Figure 2, Item 8), and body panel stay bracket (Figure 2, Item 12) for excessive corrosion or obvious damage, and repair (WP 0034, Repair Door) or replace as required.
4. Inspect door latch (not shown) for excessive corrosion or obvious damage, and repair (WP 0034, Repair Door) or replace as required.
5. Remove door stay bracket (Figure 2, Item 8) from door (Figure 2, Item 6) if door is being replaced. See Remove Door Stay and Brackets task.
6. Remove body panel stay bracket (Figure 2, Item 12) from unit body panel (Figure 2, Item 1) if unit body panel (Figure 2, Item 1) or body panel stay bracket (Figure 2, Item 12) is being replaced. See Remove Door Stay and Brackets task.

END OF TASK**Install Door**

1. Position door (Figure 2, Item 6) to two hinges (Figure 2, Item 14), and align mounting holes.

NOTE

One of the four hinge screws (Figure 2, Item 13) and four nuts (Figure 2, Item 4) secures ground wire (Figure 2, Item 3) to door (Figure 2, Item 6).

2. Install four screws (Figure 2, Item 13) and four nuts (Figure 2, Item 4) and ground wire (Figure 2, Item 3) to secure door (Figure 2, Item 6) to two hinges (Figure 2, Item 14) on unit body panel (Figure 2, Item 1).
3. Install hex shoulder bolt (Figure 2, Item 5) and two washers (Figure 2, Items 7 and 10) through door stay (Figure 2, Item 11) and door stay bracket (Figure 2, Item 8), and secure with nut (Figure 2, Item 9).
4. Verify proper operation of door (Figure 2, Item 6), hinges (Figure 2, Item 14), door latch (not shown), and door stay (Figure 2, Item 11).
5. Repair as required.

END OF TASK

Remove Door Stay and Brackets

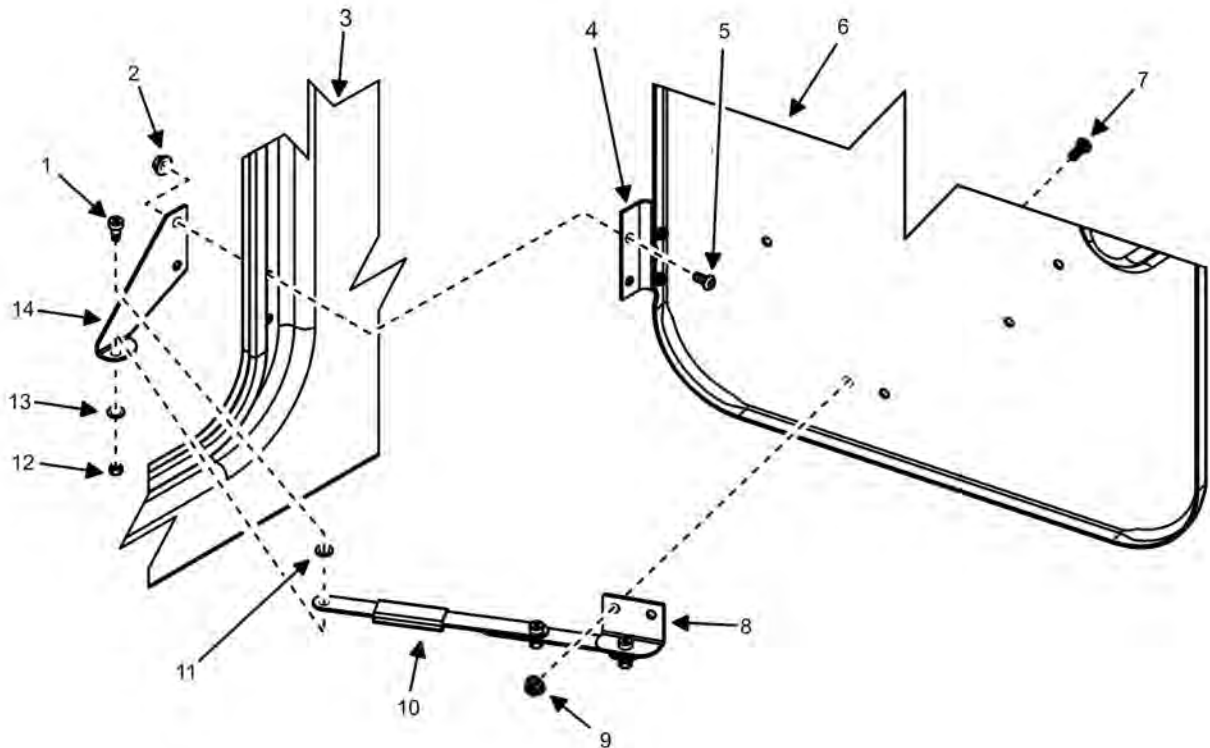


Figure 3. Door Stay, Bracket, and Hinge — Detail.

1. Remove hex head shoulder bolt (Figure 3, Item 1), two washers (Figure 3, Items 11 and 13), and nut (Figure 3, Item 12), and remove door stay (Figure 3, Item 10) from body panel stay bracket (Figure 3, Item 14).
2. Remove two hex socket head screws (Figure 3, Item 5) and two nuts (Figure 3, Item 2) to separate hinge (Figure 3, Item 4) and body panel stay bracket (Figure 3, Item 14) from unit body panel (Figure 3, Item 3).
3. Remove remaining hinge (not shown) by removing two hex socket head screws (Figure 3, Item 5) and two nuts (Figure 3, Item 2), and separate hinge (not shown) from unit body panel (Figure 3, Item 3).
4. Remove two hex socket head screws (Figure 3, Item 7) and nuts (Figure 3, Item 9) securing door stay bracket (Figure 3, Item 8) to inside of door (Figure 3, Item 6).
5. Place hinge(s) (Figure 3, Item 4), door stay (Figure 3, Item 10), door stay bracket (Figure 3, Item 8), body panel bracket (Figure 3, Item 14), and all mounting hardware on a suitable work surface.

END OF TASK

Inspect Door Stay and Brackets

1. Inspect door stay (Figure 3, Item 10), door stay bracket (Figure 3, Item 8), body panel bracket (Figure 3, Item 14), and mounting hardware for damage or corrosion.
2. Inspect hinge(s) (Figure 3, Item 4) for freedom of movement, damage, or corrosion, and repair (WP 0034, Repair Door) or replace as required.
3. Repair or replace damaged, broken, or excessively corroded hardware.

END OF TASK

Install Door Stay and Brackets**NOTE**

Doors with only one hinge have the door stay mounted at the top. Doors with two hinges have the door stay mounted at the bottom.

1. Position body panel stay bracket (Figure 3, Item 14) and hinge (Figure 3, Item 4) onto unit body panel (Figure 3, Item 3) and align mounting holes.
2. Install two hex socket head screws (Figure 3, Item 5) and two nuts (Figure 3, Item 2) securing body panel stay bracket (Figure 3, Item 14) and hinge (Figure 3, Item 4) to unit body panel (Figure 3, Item 3).
3. Position door stay bracket (Figure 3, Item 8) onto door (Figure 3, Item 6), and align mounting holes. Ensure proper orientation of door stay bracket (Figure 3, Item 8).
4. Install hex socket head screws (Figure 3, Item 7) through door (Figure 3, Item 6) and door stay bracket (Figure 3, Item 8) and secure with two nuts (Figure 3, Item 9).
5. Install hex head shoulder bolt (Figure 3, Item 1), two washers (Figure 3, Items 11 and 13), and nut (Figure 3, Item 12) to secure door stay (Figure 3, Item 10) to body panel stay bracket (Figure 3, Item 14).
6. Verify proper operation of door (Figure 3, Item 6), hinges (Figure 3, Item 4), and door stay (Figure 3, Item 10) by opening and closing door (Figure 3, Item 6) and using door stay (Figure 3, Item 10) to hold door (Figure 3, Item 6) in open position.
7. Repair as required.
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Close all unit doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REPAIR DOOR

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Hinge (WP 0102, Repair Parts List, Figure 4, Item 36)

Hinge (WP 0102, Figure 4, Item 61)

Latch (WP 0102, Figure 4, Item 39)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Personnel Required

91D (1)

References

WP 0033, Remove/Install Door

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

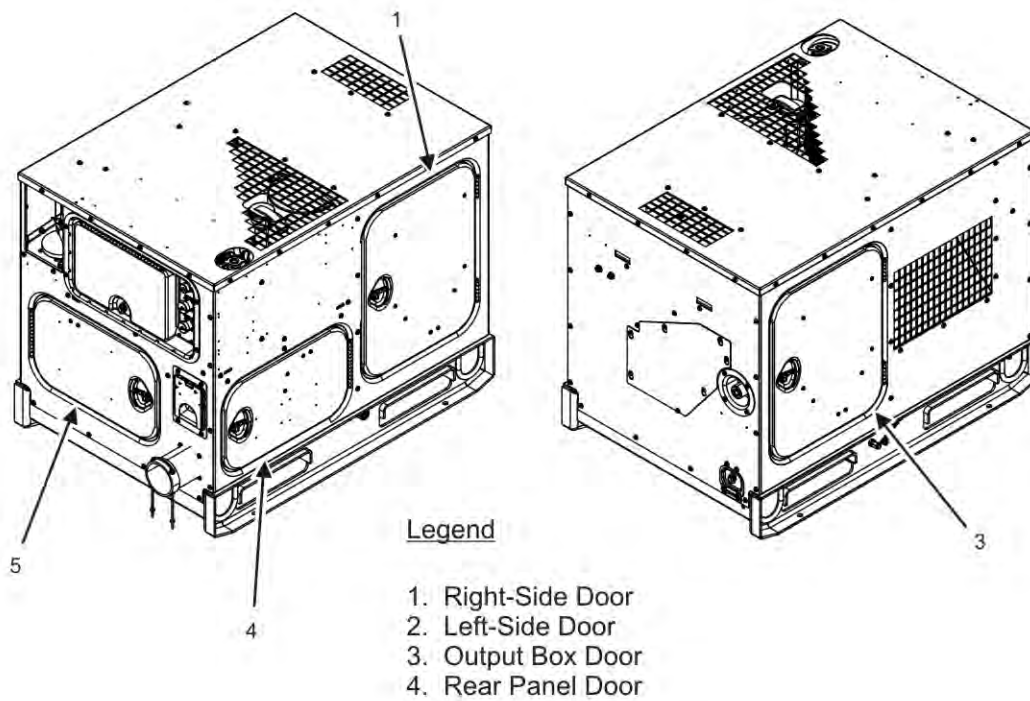
Battery ground cable removed (WP 0036, Remove/Install Batteries)

REPAIR DOOR**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

Four doors (Figure 1, Items 1 through 4) are installed on the generator set. Repair of doors is accomplished by replacement of door latch and/or hinges. Door latches and hinges can be replaced with panel installed on the unit or with panel removed. Except for the number of screws and size of hinges, basic replacement procedures for the door latch and hinges are the same for all doors. Procedures are also the same whether unit panel is installed or removed from unit.

Remove Latch**Figure 1. Door Repair — Locations.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate door to be repaired (Figure 1).

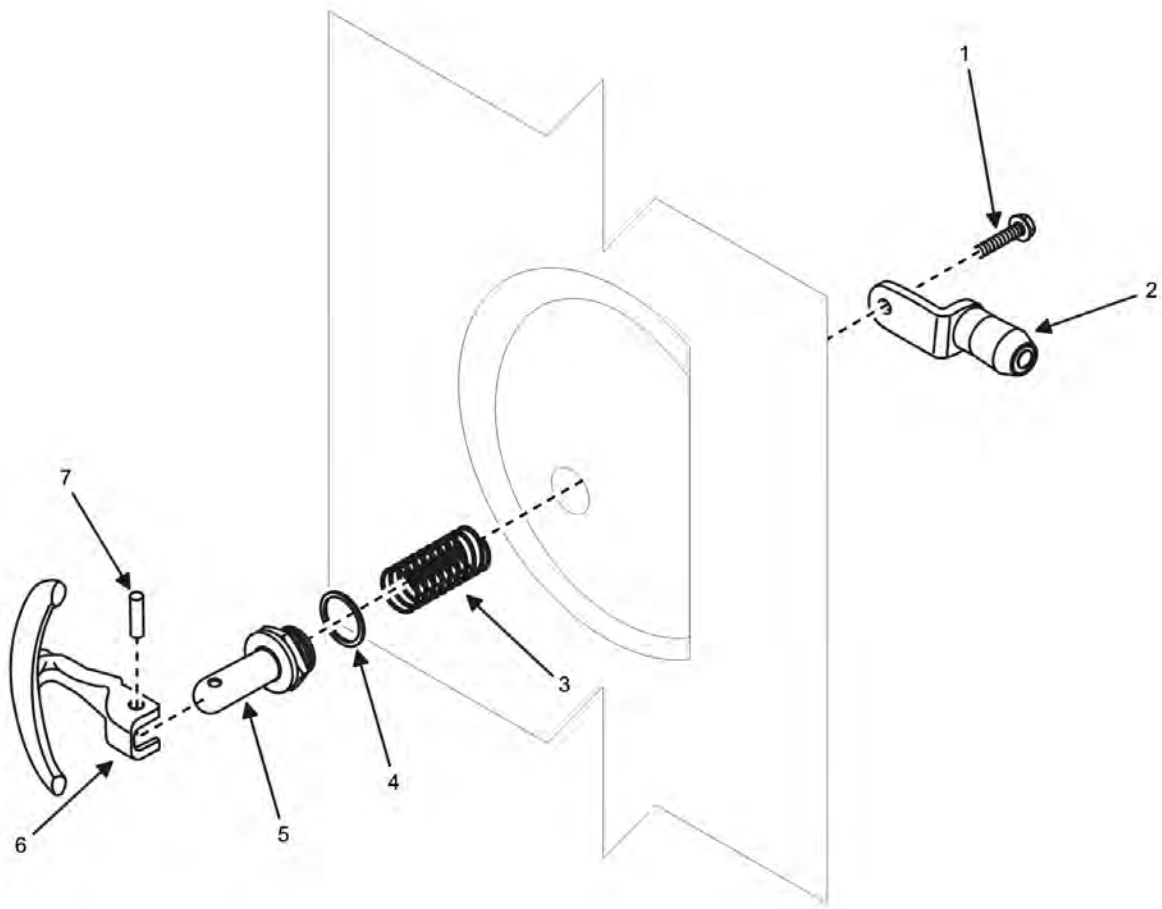


Figure 2. Door Latch Components.

NOTE

Separating the inner latch and outer latch components releases a spring inside the outer latch. Ensure that this spring is not lost during disassembly.

3. Remove bolt (Figure 2, Item 1) securing inner latch (Figure 2, Item 2) to outer latch pivot mounting (Figure 2, Item 5), and place on a suitable work surface.
4. Disconnect inner latch (Figure 2, Item 2) and outer latch pivot mounting (Figure 2, Item 5), and remove from door. Place latch parts and spring (Figure 2, Item 3) on a suitable work surface.
5. Remove roll pin (Figure 2, Item 7) securing T-handle (Figure 2, Item 6) to outer latch pivot mounting (Figure 2, Item 5), and place pin on a suitable work surface.
6. Remove T-handle (Figure 2, Item 6) from latch pivot mounting (Figure 2, Item 5), and place on a suitable work surface.

NOTE

Door latches on left- and right-side access doors include a washer (Figure 2, Item 4) on the latch pivot mounting (Figure 2, Item 5).

7. Remove washer (Figure 2, Item 4) from latch pivot mounting (Figure 2, Item 5) as required.

8. Inspect all door latch parts for corrosion or other damage. Replace as required.

END OF TASK

Install Latch

NOTE

Door latches on left- and right-side access doors include a washer (Figure 2, Item 4) on the latch pivot mounting (Figure 2, Item 5).

1. Install washer (Figure 2, Item 4) to latch pivot mounting (Figure 2, Item 5) as required.

NOTE

If T-handle (Figure 2, Item 6) has been removed from latch pivot, then complete steps 2 through 4 to reassemble outer door latch parts. If T-handle (Figure 2, Item 6) has not been removed, proceed to step 5.

2. Position T-handle (Figure 2, Item 6) to outer latch pivot mounting (Figure 2, Item 5), and align mounting holes.
3. Install roll pin (Figure 2, Item 7) through mounting holes to secure T-handle (Figure 2, Item 6) to latch pivot mounting (Figure 2, Item 5).
4. Install spring (Figure 2, Item 3) inside outer latch pivot mounting (Figure 2, Item 5).
5. Position inner latch (Figure 2, Item 2) and outer latch (Figure 2, Items 5 and 6) parts to their mounting locations on either side of door.
6. Secure inner latch (Figure 2, Item 2) and outer latch (Figure 2, Items 5 and 6) to door by installing bolt (Figure 2, Item 1).
7. Check door latch for proper operation.
8. Install battery ground cable (WP 0036, Remove/Install Batteries).

END OF TASK

Remove Hinge

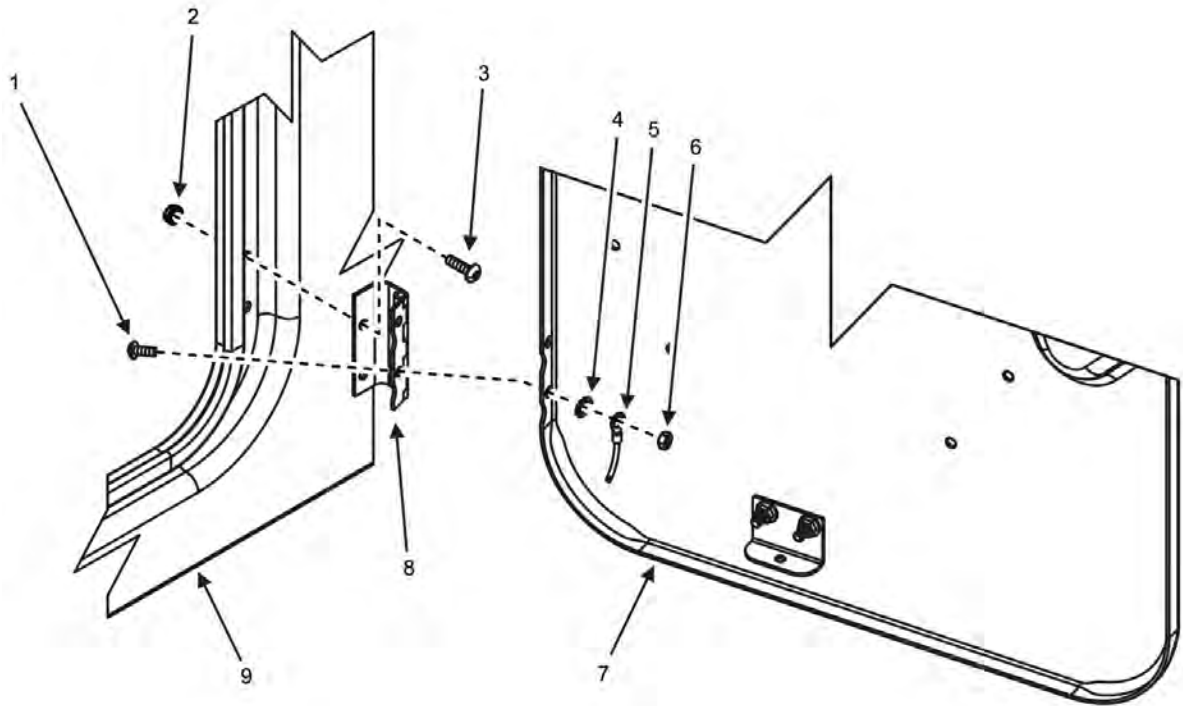


Figure 3. Door Hinge Components.

NOTE

Doors (Figure 3, Item 7) are attached to mounting locations by either a single hinge or two hinges. For doors with two hinges, one hinge can be replaced without removing the door from the unit. Remove and install procedures are the same for all hinges. Hinge may contain ground wire and lock washer.

For hinges (Figure 3, Item 8) with door stay brackets attached, release bracket from hinge mounting location, but leave opposite end of door stay fastened to door when possible.

1. Open door (Figure 3, Item 7) with hinge(s) (Figure 3, Item 8) to be removed.

NOTE

Screws (Figure 3, Item 1) and nuts (Figure 3, Item 6) securing hinge (Figure 3, Item 8) to door (Figure 3, Item 7) may also secure ground wire(s) (Figure 3, Item 5) and lock washer (Figure 3, Item 4).

2. Remove screws (Figure 3, Item 1) and nuts (Figure 3, Item 6) securing hinge (Figure 3, Item 8) to door (Figure 3, Item 7).
3. Discard lock washer (Figure 3, Item 4) as required.
4. Remove screws (Figure 3, Item 3) and nuts (Figure 3, Item 2) securing hinge (Figure 3, Item 8) to body panel (Figure 3, Item 9).
5. Remove hinge (Figure 3, Item 8) and door (Figure 3, Item 7) from unit, and place on a suitable work surface.

6. Inspect all door and hinge parts for corrosion or other damage, and replace as required.

END OF TASK

Install Hinge

NOTE

If the hinge (Figure 3, Item 8) being replaced is also the mounting location for a door stay bracket (not shown), align the bracket mounting holes with the hinge mounting holes when installing the hinge.

1. Position hinge (Figure 3, Item 8) to its mounting location on door (Figure 3, Item 7) and align mounting holes.
2. Install hinge (Figure 3, Item 8) to door (Figure 3, Item 7) using screws (Figure 3, Item 1) and nuts (Figure 3, Item 6), attaching ground wire (Figure 3, Item 5) and new lock washer (Figure 3, Item 4) as required. Finger-tighten.
3. Position door stay bracket (not shown), if needed, by aligning bracket mounting holes with mounting holes in hinge (Figure 3, Item 8) and in body panel (Figure 3, Item 9).
4. Install hinge (Figure 3, Item 8) and door stay bracket (WP 0033, Remove/Install Door) to body panel (Figure 3, Item 9) using screws (Figure 3, Item 3) and nuts (Figure 3, Item 2). Finger-tighten.
5. Secure all hinge screws (Figure 3, Item 3) to a torque value of 8 ft/lb (10 – 12 Nm).
6. Verify proper hinge operation by opening and closing door and repair as needed.
7. Verify proper door stay operation. Repair or replace as required (WP 0033, Remove/Install Door).
8. Repeat Replace Door Hinge task as needed for other hinges.
9. Install battery ground cable (WP 0036, Remove/Install Batteries).
10. Close all generator set doors.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL INTERIOR BODY PANELS

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Crossmember, enclosure (WP 0102, Repair Parts List, Figure 4, Item 80)

Duct, air, fan (WP 0102, Figure 4, Item 76)

Panel, radiator (WP 0102, Figure 4, Item 79)

Panel, support (WP 0102, Figure 4, Item 77)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0163, Item 8)

Grease, electrically conductive (WP 0163, Item 20)

Pan, drain (WP 0163, Item 28)

Rag, wiping (WP 0163, Item 31)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0020, Service Air Cleaner

WP 0027, Remove/Install Radiator

WP 0032, Remove/Install Right-Side Body Panel

WP 0081, Remove/Install Muffler

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)

Coolant bottle removed (WP 0022, Remove/Install Coolant Recovery System)

Cooling fan removed (WP 0023, Remove/Install Cooling Fan)

REMOVE/INSTALL INTERIOR PANELS**NOTE**

Interior panels (Figure 1) must be removed in sequence as written in this document.

Remove Fuel System and Fan Support Panels

1. Ensure equipment conditions are met in order presented in initial setup.

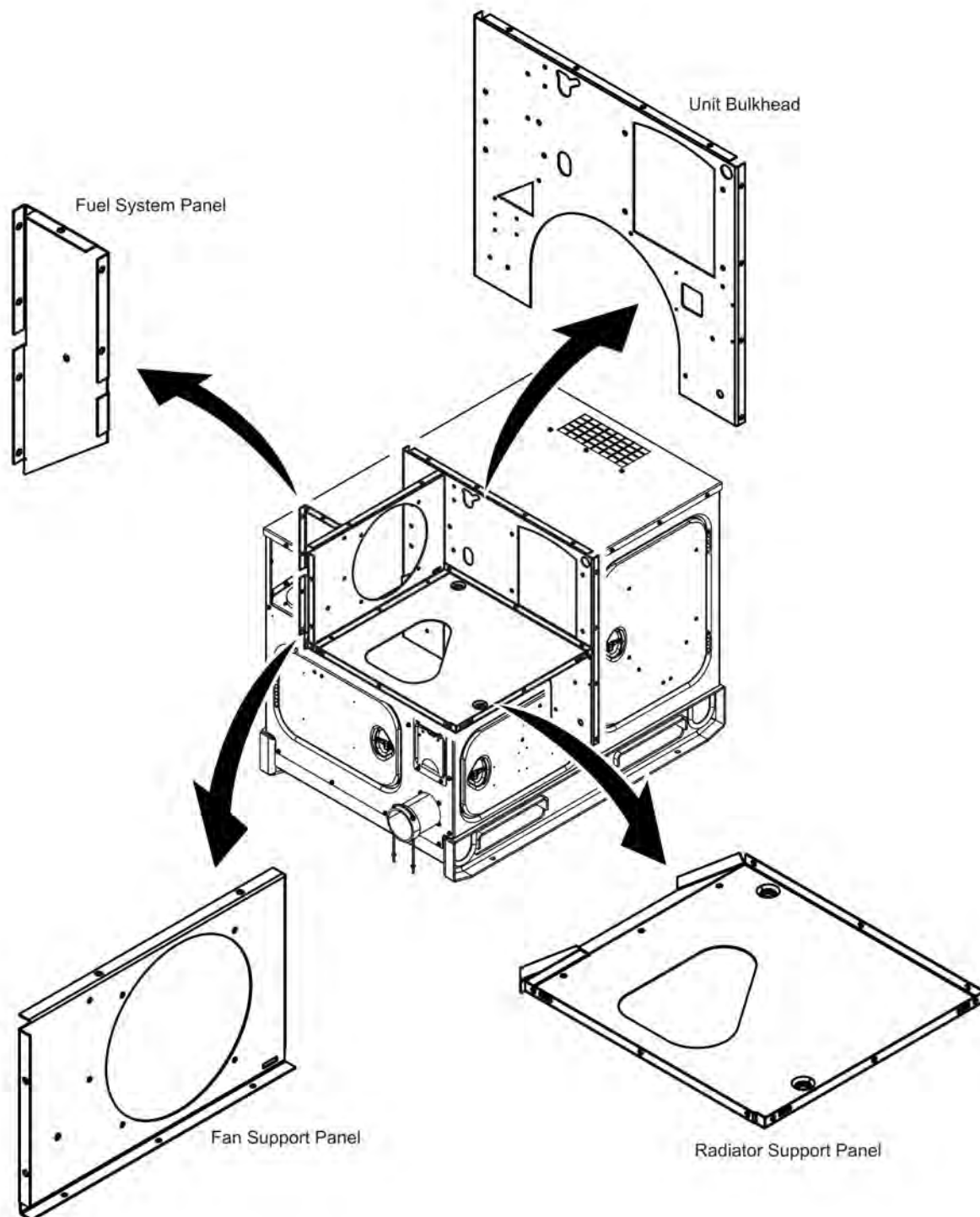


Figure 1. Interior Panel — Locations.

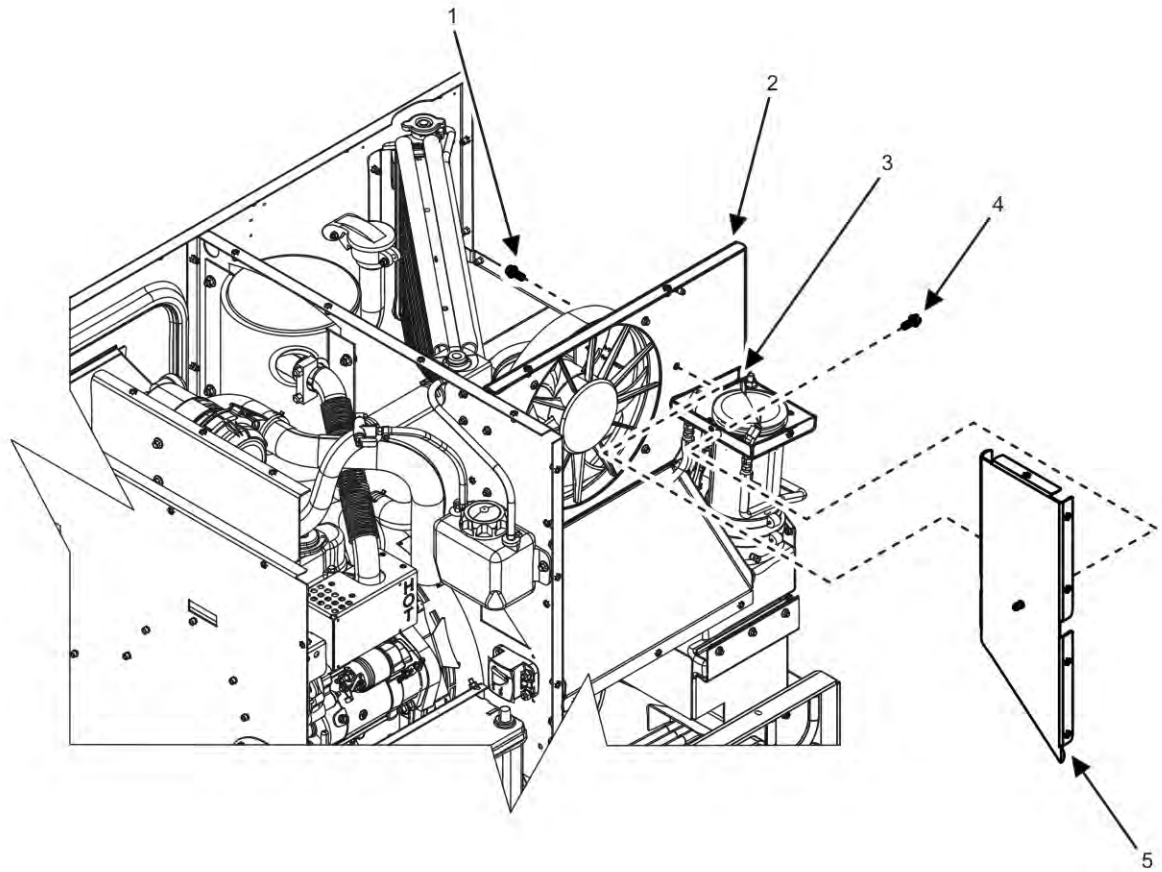


Figure 2. Fuel Neck Panel.

2. Remove two screws (Figure 2, Item 1) securing fan support panel (Figure 2, Item 2) to edge of fuel system panel (Figure 2, Item 5).
3. Remove one screw (Figure 2, Item 4) securing fuel filler neck bracket (Figure 2, Item 3) to center of fuel system panel (Figure 2, Item 5).

NOTE

Screw (Figure 2, Item 4) is located between fuel filler neck bracket (Figure 2, Item 3) and fuel filler and is difficult to access.

4. Remove fuel system panel (Figure 2, Item 5) from unit, and inspect for damage. Replace fuel system panel (Figure 2, Item 5) as required.
5. Remove two screws (Figure 3, Item 5) securing fan support panel (Figure 3, Item 3) to unit bulkhead (Figure 3, Item 1).
6. Remove three screws (Figure 3, Item 2) securing fan support panel (Figure 3, Item 3) to radiator support panel (Figure 3, Item 4).
7. Remove fan support panel (Figure 3, Item 3) from unit, and place on suitable work surface.
8. Inspect fan support panel (Figure 3, Item 3) for damage or corrosion. Replace fan support panel (Figure 3, Item 3) as required.

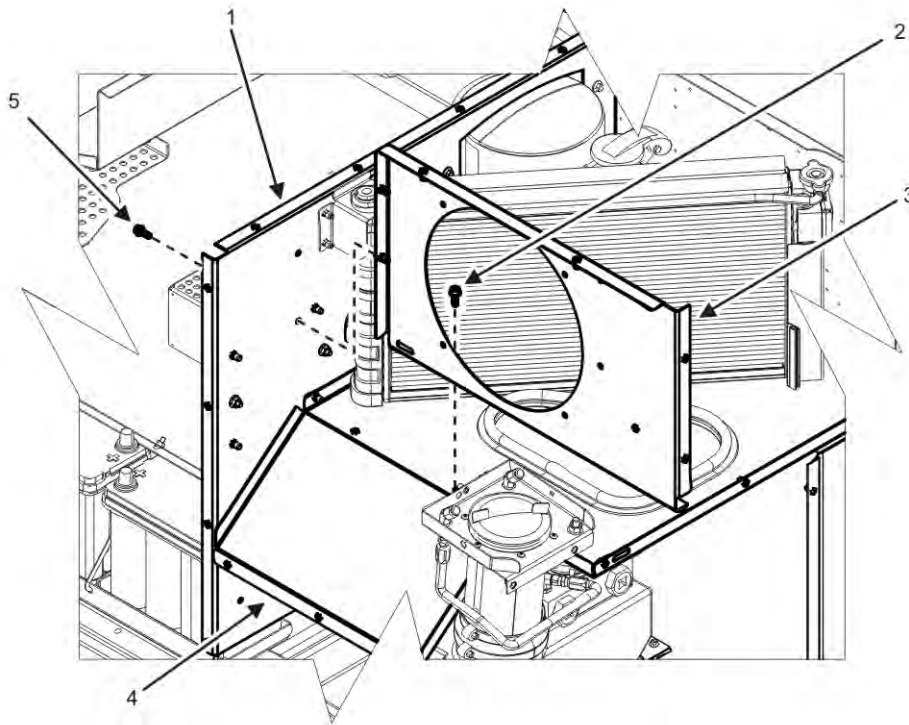


Figure 3. Remove Fan Support Panel.

9. Repair minor damage or corrosion, or replace fan support panel (Figure 3, Item 3) as required.

END OF TASK

Install Fan Support Panel

1. Position fan support panel (Figure 3, Item 3) in unit, ensuring proper orientation.

NOTE

Brace the fan support panel (Figure 3, Item 3) while installing screws securing fan support panel (Figure 3, Item 3) to unit bulkhead (Figure 3, Item 1) and radiator support panel (Figure 3, Item 4).

2. Secure fan support panel (Figure 3, Item 3) to unit bulkhead (Figure 3, Item 1) by installing two screws (Figure 3, Item 5) finger-tight.
3. Secure fan support panel (Figure 3, Item 3) to radiator support panel (Figure 3, Item 4) by installing three screws (Figure 3, Item 2) finger-tight.
4. Position fuel system panel (Figure 2, Item 5) to fan support panel (Figure 2, Item 2), and secure by installing two screws (Figure 2, Item 1) finger-tight.
5. Secure fuel system panel (Figure 2, Item 5) to fuel filler neck bracket (Figure 2, Item 3) by installing one screw (Figure 2, Item 4) finger-tight.
6. Tighten all screws installed in steps 2 through 5.
7. Install cooling fan (WP 0023, Remove/Install Cooling Fan).
8. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
9. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).

10. Install top body panel (WP 0028, Remove/Install Top Body Panel).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Close generator set doors.
13. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
14. Start engine, and check for proper operation (TM 9-6115-749-10).
15. Repair as required.

END OF TASK

Remove Radiator Support Panel

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove fuel system and fan support panels. See Remove Fuel System and Fan Support Panels task.
3. Remove radiator (WP 0027, Remove/Install Radiator).

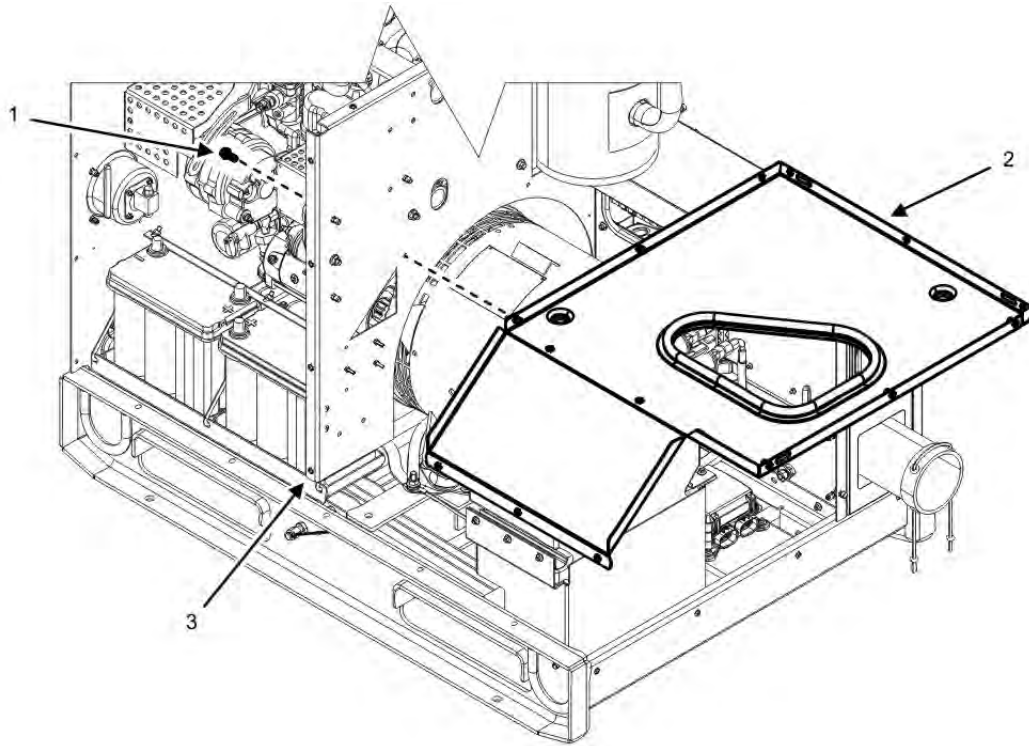


Figure 4. Remove Radiator Support Panel.

4. Remove right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).

NOTE

Support the radiator support panel (Figure 4, Item 2) while removing screws (Figure 4, Item 1) from unit bulkhead (Figure 4, Item 3).

5. Remove three screws (Figure 4, Item 1) securing radiator support panel (Figure 4, Item 2) to unit bulkhead (Figure 4, Item 3).
6. Remove radiator support panel (Figure 4, Item 2) from unit, and place on suitable work surface.

7. Inspect radiator support panel (Figure 4, Item 2) for damage or excessive corrosion. Replace radiator support panel (Figure 4, Item 2) as required.
8. Repair minor damage and corrosion, or replace radiator support panel (Figure 4, Item 2) as required.

END OF TASK**Install Radiator Support Panel**

1. Position radiator support panel (Figure 4, Item 2) to mounting location in unit.

NOTE

Support the radiator support panel (Figure 4, Item 2) while installing screws (Figure 4, Item 1) to unit bulkhead (Figure 4, Item 3).

2. Secure radiator support panel (Figure 4, Item 2) to unit bulkhead (Figure 4, Item 3) by installing three screws (Figure 4, Item 1) finger-tight.

NOTE

Step 3 will have been completed if unit bulkhead (Figure 6, Item 6) has been removed and re-installed.

3. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
4. Tighten screws installed in step 2.
5. Install the radiator (WP 0027, Remove/Install Radiator).
6. Install fuel system and fan support panels. See Install Fan Support Panel task.

END OF TASK**Remove Unit Bulkhead**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove radiator support panel. See Remove Radiator Support Panel task.

CAUTION

Since both side body panels have been removed, the unit bulkhead (Figure 6, Item 6) has only minimal support. Proceed with unit bulkhead (Figure 6, Item 6) removal carefully. Failure to comply may cause damage to equipment.

3. Remove the air cleaner and hose assembly (WP 0020, Service Air Cleaner).
4. Remove the muffler (WP 0081, Remove/Install Muffler).
5. Remove three screws (Figure 5, Item 4) and three nuts (Figure 5, Item 3) securing main DC circuit breaker (Figure 5, Item 1) to engine side of unit bulkhead (Figure 5, Item 2).
6. Tag all electrical leads of main DC breaker (Figure 5, Item 1).
7. Remove main DC circuit breaker (Figure 5, Item 1) from unit bulkhead (Figure 5, Item 2).

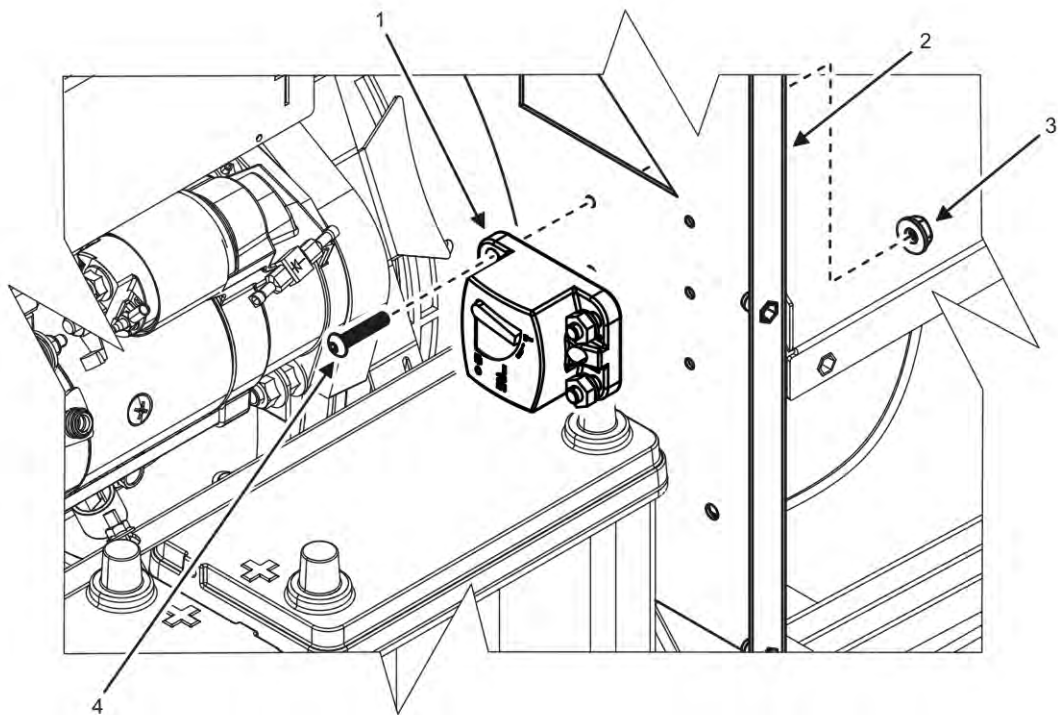


Figure 5. Main Breaker.

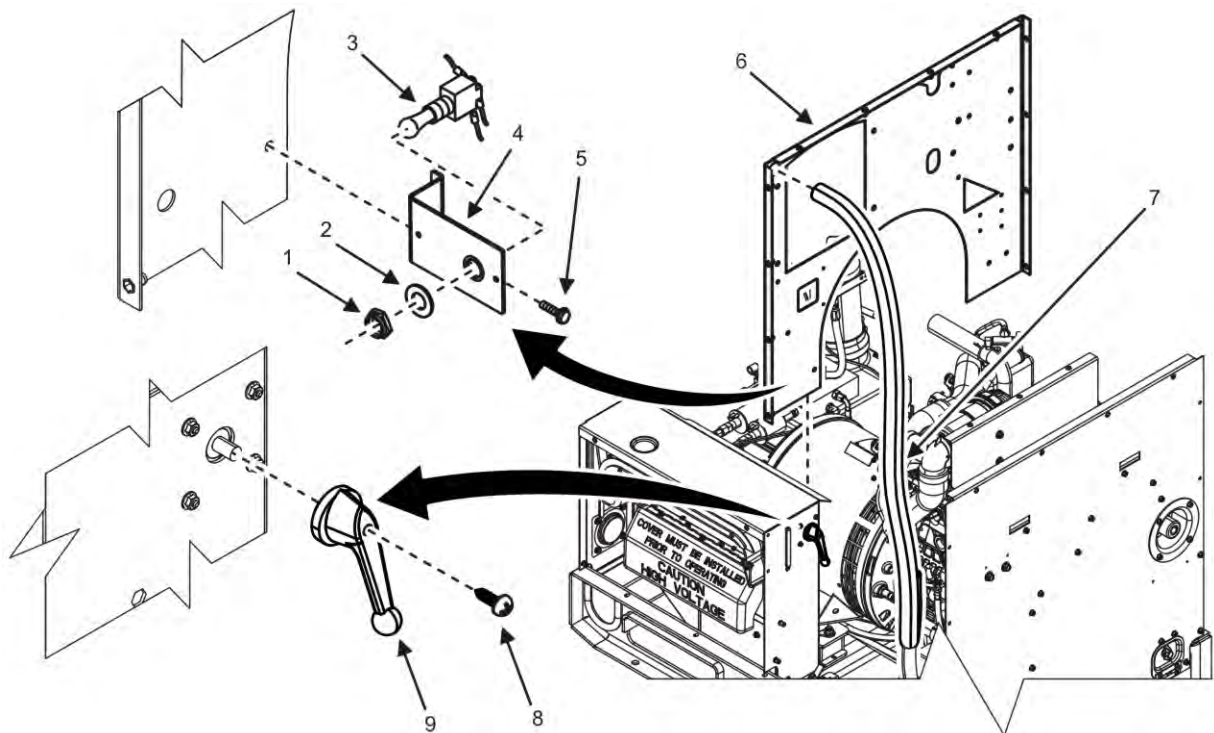


Figure 6. Remove Bulkhead.

8. Remove winterization kit exhaust tube (Figure 6, Item 7), if installed, from opening in top of unit bulkhead (Figure 6, Item 6).
9. Remove screw (Figure 6, Item 8) securing voltage selection switch handle (Figure 6, Item 9), and remove screw (Figure 6, Item 8) and handle (Figure 6, Item 9) from unit.
10. Remove nut (Figure 6, Item 1), threaded collar (Figure 6, Item 2), and DEAD CRANK SWITCH (Figure 6, Item 3) from bracket (Figure 6, Item 4). Re-position DEAD CRANK SWITCH (Figure 6, Item 3) away from unit bulkhead (Figure 6, Item 6).
11. Remove screw (Figure 6, Item 5) and bracket (Figure 6, Item 4) from unit bulkhead (Figure 6, Item 6).
12. Remove unit bulkhead (Figure 6, Item 6) from unit, and place on suitable work surface.
13. Inspect unit bulkhead (Figure 6, Item 6) for damage or excessive corrosion. Replace unit bulkhead (Figure 6, Item 6) as required.
14. Repair minor damage or corrosion, or replace unit bulkhead (Figure 6, Item 6) as required.

END OF TASK

Install Unit Bulkhead

1. Position unit bulkhead (Figure 6, Item 6) to unit skid, and ensure proper orientation.
2. Position bracket (Figure 6, Item 4) to unit bulkhead (Figure 6, Item 6), and secure by installing screw (Figure 6, Item 5).
3. Position DEAD CRANK SWITCH (Figure 6, Item 3) to its mounting position in bracket (Figure 6, Item 4), and secure by installing threaded collar (Figure 6, Item 2) and nut (Figure 6, Item 1).
4. Position handle (Figure 6, Item 9) to its mounting position, and secure by installing screw (Figure 6, Item 8).
5. Position winterization kit exhaust tube (Figure 6, Item 7) to its mounting position at top of unit bulkhead (Figure 6, Item 6).
6. Position voltage selection switch shaft through unit bulkhead (Figure 6, Item 6), and install handle (Figure 6, Item 9).
7. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
8. Install muffler (WP 0081, Remove/Install Muffler).
9. Install air cleaner and hose assembly (WP 0020, Service Air Cleaner).
10. Place winterization kit exhaust tube (Figure 6, Item 7), if installed, through opening in unit bulkhead (Figure 6, Item 6).
11. Position main DC circuit breaker (Figure 5, Item 1) on engine side of unit bulkhead (Figure 5, Item 2), and align mounting holes.
12. Install three screws (Figure 5, Item 4) and three nuts (Figure 5, Item 3) to secure main DC circuit breaker (Figure 5, Item 1) to left side of unit bulkhead (Figure 5, Item 2).
13. Install radiator support panel. See Remove Radiator Support Panel task.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL BATTERIES

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Battery, storage (2) (WP 0100, Repair Parts List, Figure 2, Item 6)

Brush, battery terminal (WP 0163, Expendable and Durable Items List, Item 6)

Grease, electrically conductive (WP 0163, Item 20)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

REMOVE/INSTALL BATTERIES**WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.

Remove Batteries

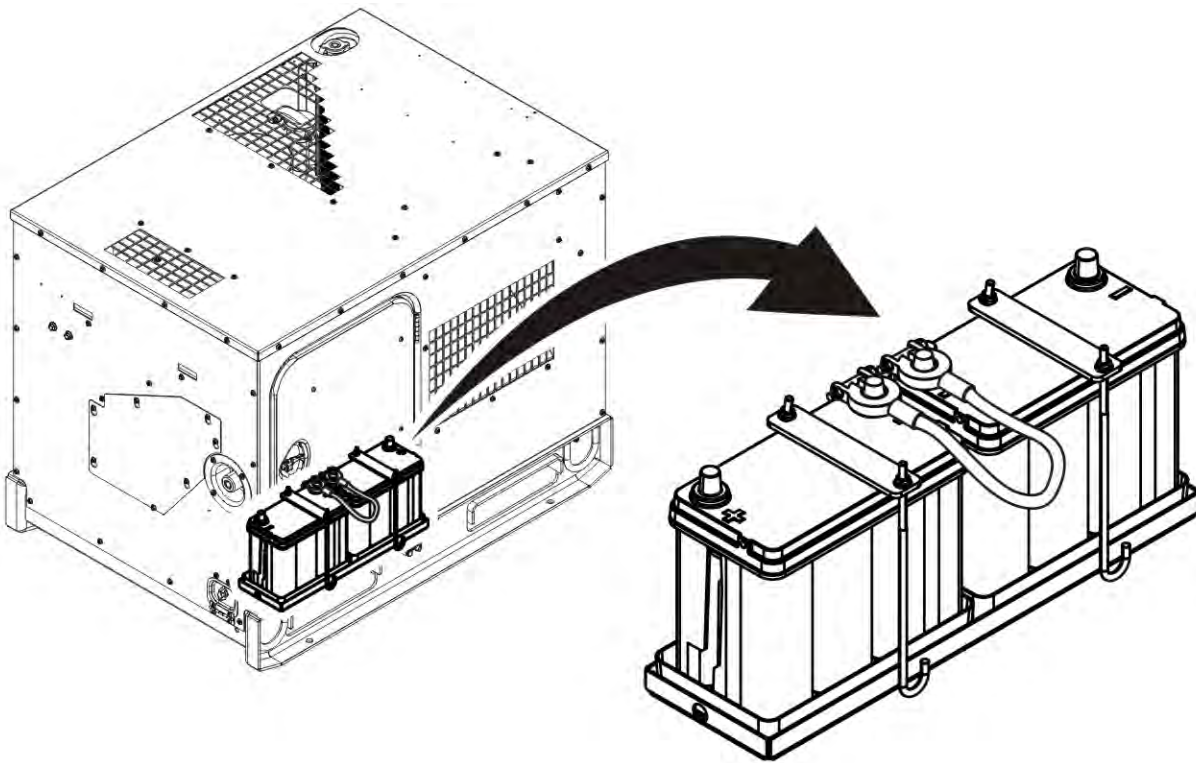


Figure 1. Battery — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door of generator set to locate batteries (Figure 1).

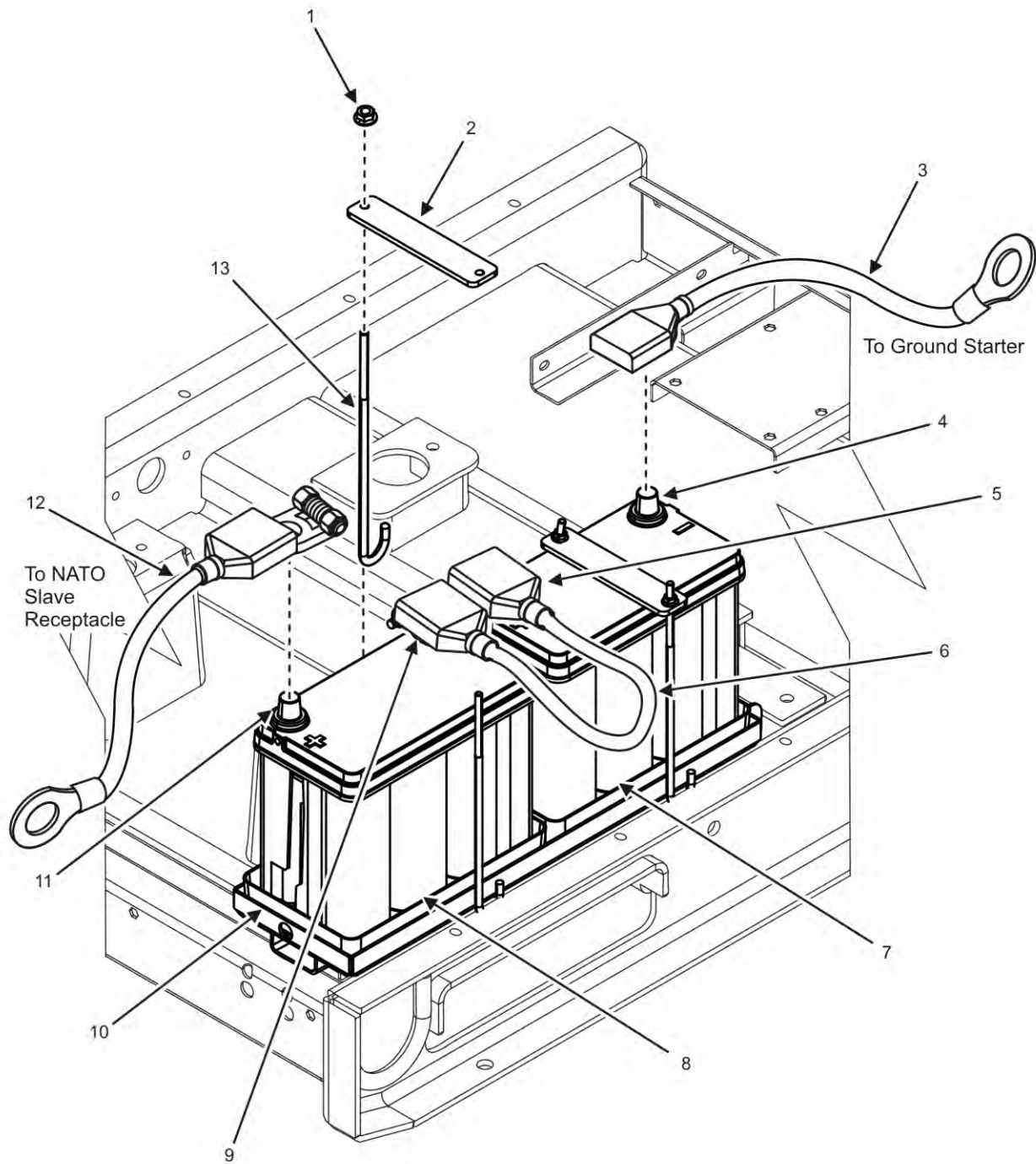


Figure 2. Remove/Install Batteries.

3. Disconnect battery unit ground cable (Figure 2, Item 3) from negative battery terminal (Figure 2, Item 4) of right-hand battery (Figure 2, Item 7).
4. Disconnect battery jumper cable (Figure 2, Item 6) from negative battery terminal (Figure 2, Item 9) of left-hand battery (Figure 2, Item 8).

NOTE

Sealed lead acid batteries do not leak in normal usage. The battery can be moved out of the tray and tilted to allow movement of left-hand battery (Figure 2, Item 8) for ease of terminal removal.

5. Disconnect battery unit power cable (Figure 2, Item 12) from positive battery terminal (Figure 2, Item 11) of left-hand battery (Figure 2, Item 8).
6. Disconnect battery jumper cable (Figure 2, Item 6) from positive battery terminal (Figure 2, Item 5) of right-hand battery (Figure 2, Item 7).
7. Remove battery jumper cable (Figure 2, Item 6) from unit.
8. Inspect battery jumper cable (Figure 2, Item 6) for frayed edges, cracked insulation, and other obvious signs of damage. Replace as required.
9. Loosen and remove four nuts (Figure 2, Item 1) from four J-hooks (Figure 2, Item 13) securing two battery holders (Figure 2, Item 2) to unit.
10. Remove two battery holders (Figure 2, Item 2) from unit.
11. Inspect battery holders (Figure 2, Item 2) for corrosion, excessive wear, and other signs of obvious damage. Replace battery holders (Figure 2, Item 2) as required.

CAUTION

Do not move or lift batteries by the terminal studs. Lift batteries using battery lifting strap if supplied with battery. Failure to comply will cause damage to equipment.

12. Lift and remove two batteries (Figure 2, Items 7 and 8) from unit.
13. Lift and remove two removable battery trays (Figure 2, Item 10) from unit.

WARNING

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

14. Clean dirt and debris from removable battery trays (Figure 2, Item 10) with compressed air and wiping rag.
15. Inspect removable battery trays (Figure 2, Item 10) for corrosion, dents, and other signs of obvious damage. Replace as required.
16. Remove four J-hooks (Figure 2, Item 13) from unit.
17. Inspect J-hooks (Figure 2, Item 13) for corrosion, excessive wear, and other signs of obvious damage. Replace as required.
18. Clean dirt and debris from battery compartment with wiping rag.

END OF TASK

Test/Inspect Batteries

1. Inspect batteries (Figure 2, Items 7 and 8) for leaks, cracks, swelling, and corrosion. Replace batteries (Figure 2, Items 7 and 8) as required.
2. Inspect battery terminals (Figure 2, Items 4, 5, 9 and 11) for melting, bends, or other damage. Replace batteries (Figure 2, Items 7 and 8) as required.
3. Ensure equipment conditions are met in order presented in initial setup.
4. Remove dirt and debris from all battery terminals (Figure 2, Items 4, 5, 9, and 11) with serrated nose of lifter-scraper.

NOTE

The DCS provides a constant real-time monitor of battery voltage and current.

5. Test voltage of each battery (Figure 2, Items 7 and 8) with a multimeter set to test VDC.

WARNING

Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.

CAUTION

When recharging batteries (Figure 2, Items 7 and 8) always use a voltage regulated battery charger, and strictly adhere to all limits in Table 1. When first turning on a charger, always watch the ammeter for the first few minutes to verify that each battery (Figure 2, Items 7 and 8) is accepting amperage. Batteries (Figure 2, Items 7 and 8) will get slightly warm during charging. Any battery (Figure 2, Items 7 and 8) that is hot to the touch indicates a malfunction and charging must be stopped immediately. Failure to comply will cause damage to equipment.

NOTE

A completely discharged battery is considered to have 11.2 VDC or less. A deeply discharged battery (10.5 VDC or less) may not accept a charge from a charger. A deeply discharged battery may need to be charged while in parallel with another fully charged 12 VDC automotive battery until deeply discharged battery reaches 10.5 VDC or above. Once deeply discharged battery reaches 10.5 VDC, normal charging procedures can be followed.

6. Charge any battery (Figure 2, Items 7 and 8) with voltage reading less than 12 VDC (Table 1).

Table 1. Charging Recommendations.

CHARGER TYPE	TARGET VOLTAGE RANGE (VDC)	MAXIMUM CURRENT (AMPS)
Regular/Automatic	13.8 to 15.0	10
Float Charge	13.2 to 13.8	1
Constant Voltage Charger	15.6 maximum	No limit as long as battery temperature remains below 125°F (51.7°C)

NOTE

After charging, allow each charged battery (Figure 2, Items 7 and 8) to settle ("rest") for a minimum of 8 hours. Batteries (Figure 2, Items 7 and 8) should have approximately 12.85 VDC open circuit voltage after charging and settling period.

7. Use a multimeter set to test VDC, and check each settled ("rested") battery (Figure 2, Items 7 and 8) for proper voltage.
8. Use battery (Figure 2, Items 7 and 8) if within specification, or attempt recharge, and replace battery (Figure 2, Items 7 and 8) if discharge continues after one additional charging attempt.
9. Ensure batteries are connected. See Install Batteries task.

NOTE

Use of an assistant is required to load test batteries. Batteries should hold proper voltage during a load test of 15 sec.

10. Use a multimeter set to test VDC to measure the voltage of each battery while an assistant positions DEAD CRANK SWITCH in CRANK position for 15 sec (TM 9-6115-749-10).
11. Follow charge procedures (steps 6 through 8) for any battery (Figure 2, Items 7 and 8) that drops below 10 VDC during load test.

END OF TASK**Install Batteries**

1. Insert four J-hooks (Figure 2, Item 13) through openings in battery compartment permanent tray (not shown) beneath removable battery trays (Figure 2, Item 10).

NOTE

Place battery (Figure 2, Items 7 and 8) and removable battery tray (Figure 2, Item 10) in center of permanent tray for ease of installation. Battery and removable battery tray (Figure 2, Item 10) may be placed in position after attaching unit power cable.

2. Place two battery trays (Figure 2, Item 10) into mounting position in unit.

CAUTION

Do not move or lift batteries by the terminal studs. Lift batteries using battery lifting strap if supplied with battery. Failure to comply will cause damage to equipment.

3. Position left-hand battery (Figure 2, Item 8) in removable battery tray (Figure 2, Item 10) with positive battery terminal (Figure 2, Item 11) facing to the left.
4. Position battery holder (Figure 2, Item 2) across top-center of battery, and align holes with two J-hooks (Figure 2, Item 13).
5. Install one nut (Figure 2, Item 1) to each J-hook (Figure 2, Item 13), and hand-tighten both nuts (Figure 2, Item 1).
6. Install right-hand battery (Figure 2, Item 7) using steps 3 through 5.
7. Apply a light coating of electrically conductive grease to all battery terminals (Figure 2, Items 4, 5, 9, and 11).
8. Attach battery unit power cable (Figure 2, Item 12) to positive battery terminal (Figure 2, Item 11) of left-hand battery (Figure 2, Item 8).

-
9. Attach battery jumper cable (Figure 2, Item 6) to positive battery terminal (Figure 2, Item 5) of right-hand battery (Figure 2, Item 7).
 10. Attach battery jumper cable (Figure 2, Item 6) to negative battery terminal (Figure 2, Item 9) of left-hand battery (Figure 2, Item 8).
 11. Adjust position of two battery holders (Figure 2, Item 2) to secure batteries (Figure 2, Items 7 and 8) in position.

CAUTION

Excessive tightening of the battery holder (Figure 2, Item 2) may crack the battery case. Do not over-tighten nuts (Figure 2, Item 1) on J-hooks (Figure 2, Item 13). Failure to comply may cause damage to equipment.

12. Tighten four nuts (Figure 2, Item 1) to secure batteries.
13. Attach battery unit ground cable (Figure 2, Item 3) to negative battery terminal (Figure 2, Item 4) of right-hand battery (Figure 2, Item 7).
14. Close generator set doors.
15. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
16. Start engine, and check for proper operation (TM 9-6115-749-10).
17. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL MAIN DC CIRCUIT BREAKER

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Circuit breaker (WP 0100, Repair Parts List, Figure 2, Item 19)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Remove left-side body panel (WP 0031, Remove/Install Left-Side Body Panel)

REMOVE/INSTALL MAIN DC CIRCUIT BREAKER

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Main DC Circuit Breaker

NOTE

The main DC circuit breaker can be tested while installed or when removed from the unit. Multimeter readings should be the same as noted below regardless of breaker location. To test the main DC circuit breaker without removing it from the unit, see Test Main DC Circuit Breaker task.

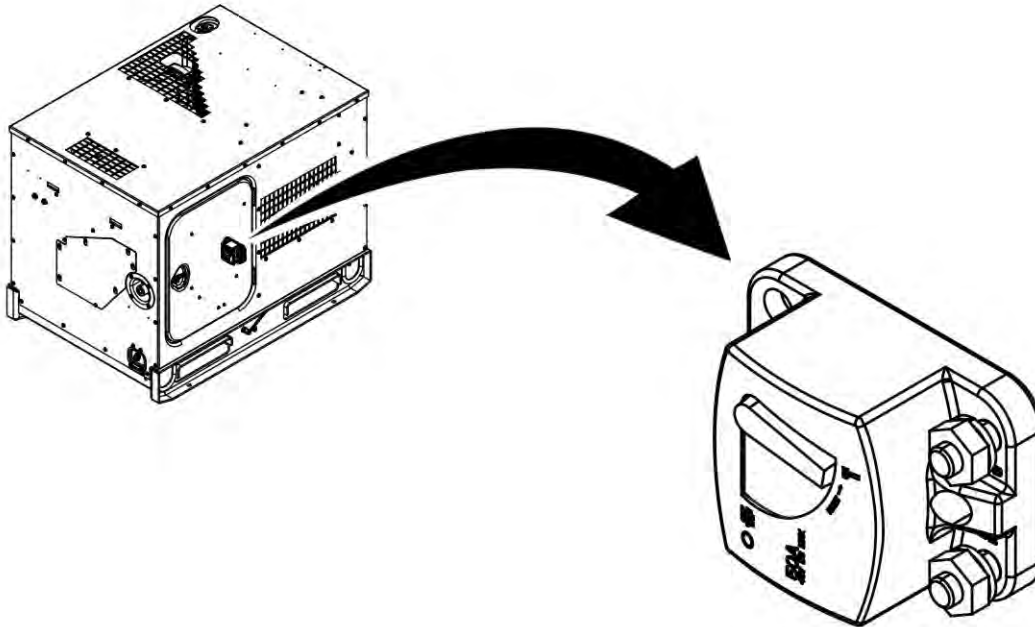


Figure 1. Main DC Circuit Breaker — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door and locate main DC circuit breaker (Figure 1) below coolant bottle on internal bulkhead panel.

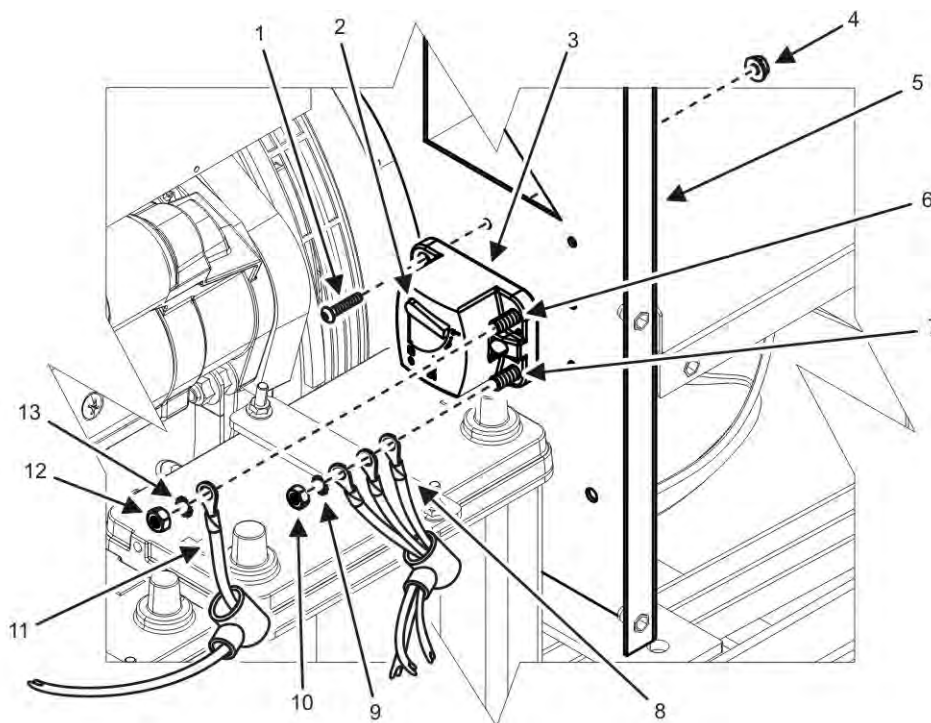


Figure 2. Main DC Circuit Breaker — Removal

3. Set main DC circuit breaker switch (Figure 2, Item 2) to OFF/TRIP position.
4. Remove protective caps from wires (Figure 2, Item 8) on load (lower) terminal (Figure 2, Item 7) and from wire (Figure 2, Item 11) on line (upper) terminal (Figure 2, Item 6) on the main DC circuit breaker (Figure 2, Item 3).
5. Tag and disconnect wires (Figure 2, Item 8) attached to load (lower) terminal (Figure 2, Item 7) of circuit breaker (Figure 2, Item 3) by removing nut (Figure 2, Item 10) and lock washer (Figure 2, Item 9) securing wires (Figure 2, Item 8) to load (lower) terminal (Figure 2, Item 7).
6. Tag and disconnect wire (Figure 2, Item 11) attached to line (upper) terminal (Figure 2, Item 6) of circuit breaker (Figure 2, Item 3) by removing nut (Figure 2, Item 12) and lock washer (Figure 2, Item 13) securing wire (Figure 2, Item 11) to line (upper) terminal (Figure 2, Item 6).
7. Discard lock washers (Figure 2, Items 9 and 13), and set remaining mounting hardware aside for reuse.
8. Remove three hex socket head screws (Figure 2, Item 1) and three nuts (Figure 2, Item 4) securing main DC circuit breaker (Figure 2, Item 3) to interior bulkhead panel (Figure 2, Item 5), and set mounting hardware aside for reuse.
9. Remove main DC circuit breaker (Figure 2, Item 3) from interior bulkhead panel (Figure 2, Item 5), and place on a suitable work surface, or discard if being replaced.

END OF TASK

Test Main DC Circuit Breaker

1. Inspect main DC circuit breaker (Figure 2, Item 3) for signs of damage or corrosion, and replace as required.

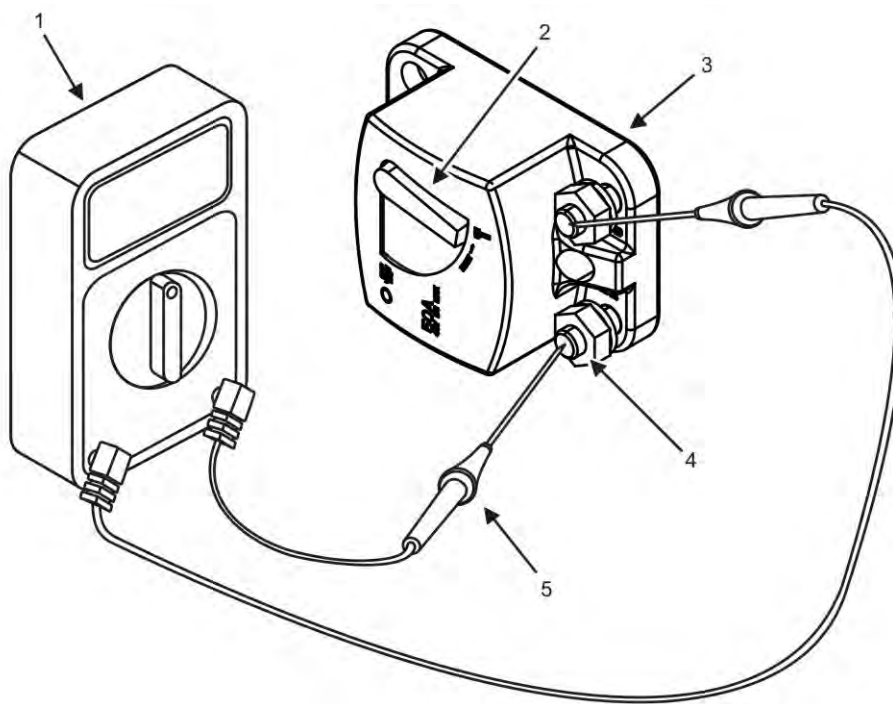


Figure 3. Test Main DC Circuit Breaker — Continuity.

2. Test main DC circuit breaker (Figure 3, Item 3) for proper continuity:
 - a. Set multimeter (Figure 3, Item 1) to ohms (Ω), and verify that multimeter (Figure 3, Item 1) is operating correctly by touching meter probes together and observing less than approximately 1 Ω on multimeter (Figure 3, Item 1).
 - b. Set main DC circuit breaker switch (Figure 3, Item 2) to ON position.

NOTE

Any multimeter (Figure 3, Item 1) reading greater than approximately 1 Ω during continuity test indicates the main DC circuit breaker (Figure 3, Item 3) is faulty and should be replaced. If main DC circuit breaker (Figure 3, Item 3) fails the continuity test, a short to ground test (see step 3) is not necessary.

- c. Place one probe (Figure 3, Item 5) on each main DC circuit breaker terminal (Figure 3, Item 4), and verify multimeter reading is no greater than approximately 1 Ω .
- d. Replace main DC circuit breaker (Figure 3, Item 3) if multimeter reading is greater than approximately 1 Ω when main DC circuit breaker terminals (Figure 3, Item 4) are tested.

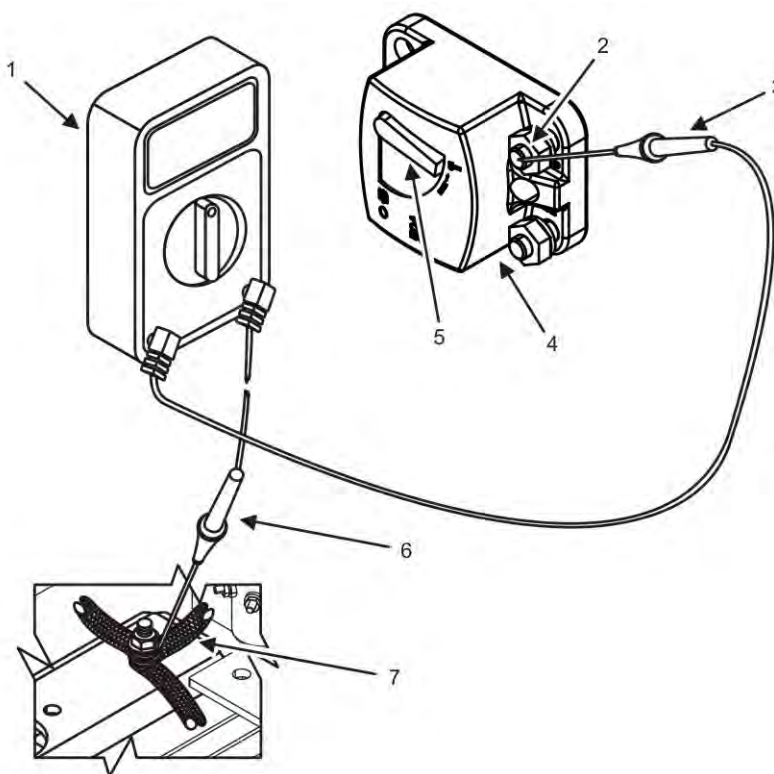


Figure 4. Test Main DC Circuit Breaker — Ground.

NOTE

A short to ground test is not necessary if the main DC circuit breaker failed the continuity test above.

The main DC circuit breaker must be installed when testing for short to ground.

3. Test main DC circuit breaker (Figure 4, Item 4) for short to ground:
 - a. Set multimeter (Figure 4, Item 1) to ohms (Ω).
 - b. Set main DC circuit breaker switch (Figure 4, Item 5) to ON position.
 - c. Place one multimeter probe (Figure 4, Item 3) on either main DC circuit breaker terminal (Figure 4, Item 2) and remaining probe (Figure 4, Item 6) on unit grounding strap (Figure 4, Item 7).
 - d. Replace main DC circuit breaker (Figure 4, Item 4) if multimeter reading is less than 1 megohm ($M\Omega$).

END OF TASK

Install Main DC Circuit Breaker

1. Set main DC breaker switch (Figure 5, Item 2) to OFF/TRIP position.
2. Place main DC circuit breaker (Figure 5, Item 3) at mounting location below coolant recovery bottle on internal bulkhead panel (Figure 5, Item 5).
3. Install main DC circuit breaker (Figure 5, Item 3) to internal bulkhead panel (Figure 5, Item 5) using three hex socket head screws (Figure 5, Item 1) and three nuts (Figure 5, Item 4).

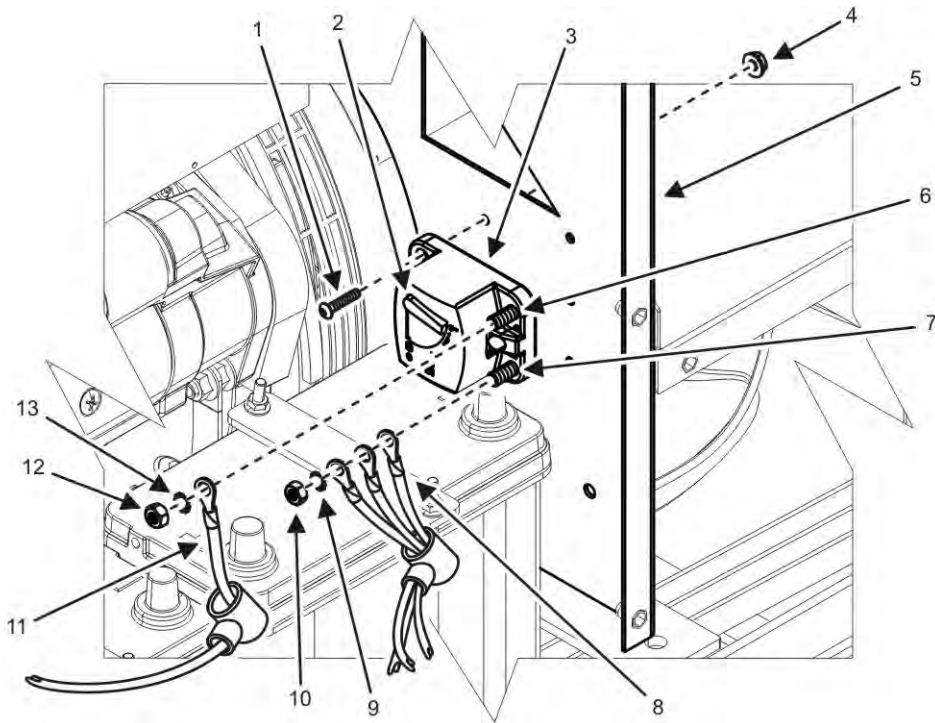


Figure 5. Install Main DC Circuit Breaker.

4. Install wires (Figure 5, Item 8) to load (lower) circuit breaker terminal (Figure 5, Item 7) as indicated by wiring tags, using new lock washer (Figure 5, Item 9) and nut (Figure 5, Item 10) to secure wires (Figure 5, Item 8) to load (lower) terminal (Figure 5, Item 7).
5. Install wire (Figure 5, Item 11) to line (upper) circuit breaker terminal (Figure 5, Item 6) as indicated by wiring tags, using new lock washer (Figure 5, Item 13) and nut (Figure 5, Item 12) to secure wire (Figure 5, Item 11) to line (upper) terminal (Figure 5, Item 6).
6. Replace protective caps over all DC main breaker wires (Figure 5, Items 8 and 11) and terminals (Figure 5, Items 6 and 7).
7. Verify three breaker mounting hex socket head screws (Figure 5, Item 1) and nuts (Figure 5, Item 4) are fully secured.
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Set main DC circuit breaker switch (Figure 5, Item 2) to ON position.
10. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
11. Install top body panel (WP 0028, Remove/Install Top Body Panel).
12. Close generator set doors.
13. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
14. Start engine and check for proper operation (TM 9-6115-749-10).
15. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL NATO SLAVE RECEPTACLE

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Connector, receptacle (WP 0100, Repair Parts List, Figure 2, Item 17)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL NATO SLAVE RECEPTACLE**WARNING**

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

Remove NATO Slave Receptacle

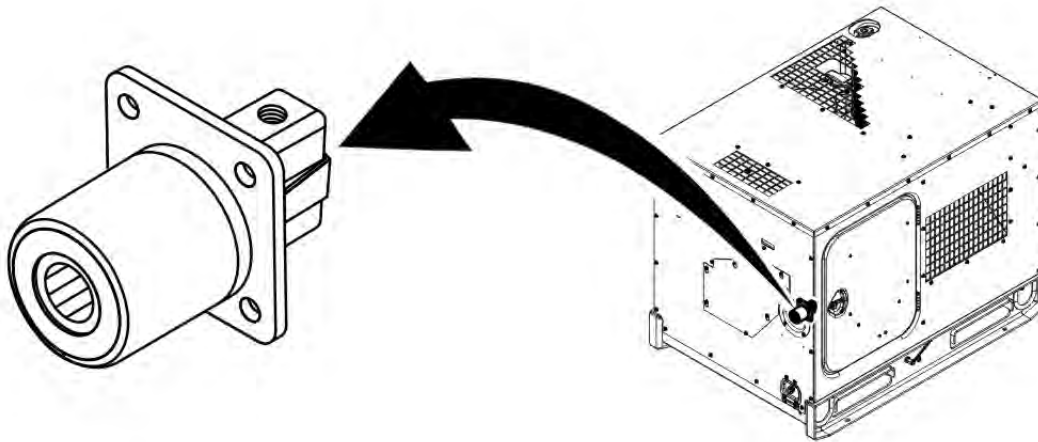


Figure 1. NATO Slave Receptacle — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door on unit to locate NATO slave receptacle (Figure 1) and batteries.
3. Disconnect jumper cable from negative battery terminal of left-hand battery (WP 0036, Remove/Install Batteries).

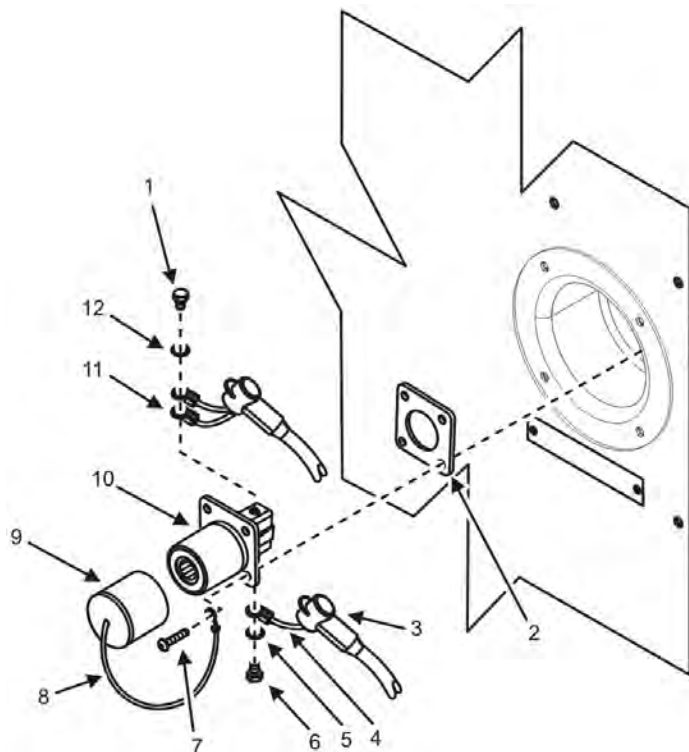


Figure 2. NATO Slave Receptacle Detail.

NOTE

Negative (-) and positive (+) symbols are stamped on the NATO slave receptacle terminal ends.

4. Re-position boot (Figure 2, Item 3). Remove bolt (Figure 2, Item 6), lock washer (Figure 2, Item 5), and ground cable (Figure 2, Item 4) from negative side of NATO slave receptacle (Figure 2, Item 10).
5. Tag and identify ground cable (Figure 2, Item 4) for installation purposes.
6. Re-position boot (Figure 2, Item 3). Remove bolt (Figure 2, Item 1), lock washer (Figure 2, Item 12), and two power cables (Figure 2, Item 11) from positive side of NATO slave receptacle (Figure 2, Item 10).
7. Tag and identify power cables (Figure 2, Item 11) for installation purposes.
8. Discard lock washers (Figure 2, Items 5 and 12).
9. Remove four bolts (Figure 2, Item 7), NATO slave receptacle (Figure 2, Item 10), gasket (Figure 2, Item 2), protective cap (Figure 2, Item 9), and tether (Figure 2, Item 8) from front body panel of unit.

END OF TASK**Inspect NATO Slave Receptacle**

1. Inspect NATO slave receptacle (Figure 2, Item 10), protective cap (Figure 2, Item 9), and tether (Figure 2, Item 8) for obvious signs of damage, corrosion, or burning.
2. Replace NATO slave receptacle (Figure 2, Item 10), protective cap (Figure 2, Item 9), and tether (Figure 2, Item 8) as required.
3. Inspect power and ground cables (Figure 2, Items 4 and 11) and cable ends for signs of damage. Repair or replace as required.
4. Inspect boots (Figure 2, Item 3) on positive and negative cables (Figure 2, Items 4 and 11). Replace if damaged.

END OF TASK**Install NATO Slave Receptacle**

1. Install new gasket (Figure 2, Item 2) onto terminal end of NATO slave receptacle (Figure 2, Item 10), and align mounting holes.

NOTE

For easier tool access during installation, the NATO slave receptacle can be installed with the terminals one above the other, rather than side by side.

2. Position and insert terminal end of NATO slave receptacle (Figure 2, Item 10) through mounting location on front of unit, and align mounting holes.

NOTE

Protective cap tether (Figure 2, Item 8) is attached to lower right-hand bolt (Figure 2, Item 7).

3. Position NATO slave receptacle (Figure 2, Item 10) to front of unit by installing four bolts (Figure 2, Item 7).

CAUTION

Negative (-) and positive (+) symbols are stamped on the NATO slave receptacle terminal ends. Ensure positive (+) and negative (-) cables are attached to the correct terminal ends. Failure to comply may cause damage to equipment.

4. Position two power cables (Figure 2, Item 11) onto positive side of NATO slave receptacle (Figure 2, Item 10). Refer to cable tags installed during disassembly.
5. Secure two power cables (Figure 2, Item 11) to positive side of NATO slave receptacle (Figure 2, Item 10) using bolt (Figure 2, Item 1) and new lock washer (Figure 2, Item 12).
6. Cover bolt (Figure 2, Item 1) and new lock washer (Figure 2, Item 12) of positive cables (Figure 2, Item 11) with boot (Figure 2, Item 3).

CAUTION

Negative (-) and positive (+) symbols are stamped on the NATO slave receptacle terminal ends. Ensure positive (+) and negative (-) cables are attached to the correct terminal ends. Failure to comply may cause damage to equipment.

7. Position ground cable (Figure 2, Item 4) onto negative side of NATO slave receptacle (Figure 2, Item 10).
8. Secure ground cable (Figure 2, Item 4) to negative side of NATO slave receptacle (Figure 2, Item 10) using bolt (Figure 2, Item 6) and new lock washer (Figure 2, Item 5).
9. Cover mounting bolt (Figure 2, Item 6) and new lock washer (Figure 2, Item 5) with boot (Figure 2, Item 3).
10. Install protective cap (Figure 2, Item 9) on exterior of NATO slave receptacle (Figure 2, Item 10).
11. Connect jumper cable to negative battery terminal of left-hand battery (WP 0036, Remove/Install Batteries).
12. Close left-side door of generator set.
13. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
14. Start engine and check for proper operation (TM 9-6115-749-10).
15. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
SERVICE FUEL SYSTEM

INITIAL SETUP:**Test Equipment**

Beaker, Laboratory (WP 0162, Table 2, Item 3)

Tools and Special Tools

Adapter, Socket Wrench Drive, 1/2" Male – 3/8" Female (WP 0162, Table 2, Item 33)

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Cap set, protective (WP 0163, Expendable Durable Items List, Item 8)

Cleaning compound, solvent (WP 0163, Item 10)

Detergent, general purpose (WP 0163, Item 16)

Fuel, diesel (WP 0163, Item 19)

Grease, electrically conductive (WP 0163, Item 20)

Pan, drain (WP 0163, Item 28)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Assistant (1)

References

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0036, Remove/Install Batteries

WP 0040, Remove/Install Fuel Manifold

WP 0041, Remove/Install Fuel Pump, Main/Auxiliary

WP 0042, Remove/Install Fuel Filter/Water Separator Assembly

WP 0043, Remove/Install Fuel Filter/Water Separator Element

WP 0059, Remove/Install Engine Wiring Harness

WP 0093, General Maintenance

Foldout Pages

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

SERVICE FUEL SYSTEM**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

WARNING

Make sure engine control switch is only set to PRIME & RUN during fuel system checks. Failure to comply may cause injury or death to personnel.

Purge Fuel Lines

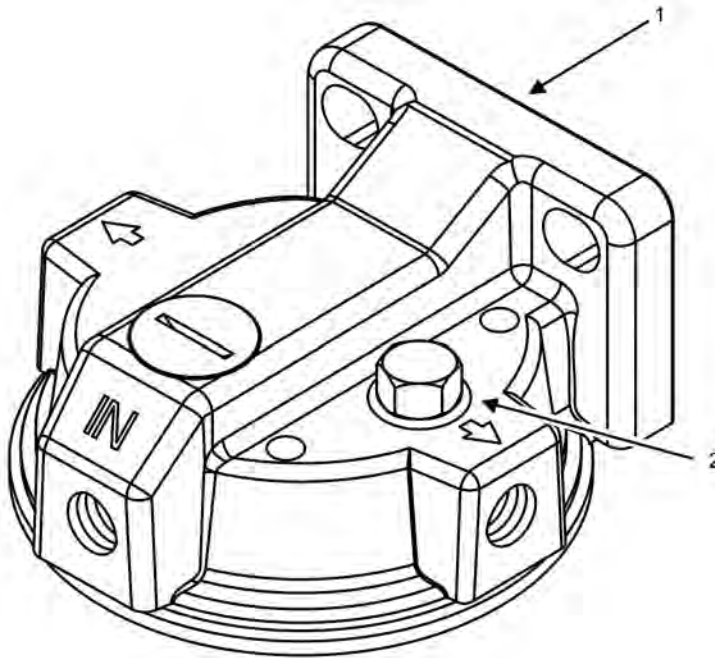


Figure 1. Air Bleed Vent Plug.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door.
3. Locate air bleed vent plug (Figure 1, Item 2) on fuel filter/water separator head (Figure 1, Item 1).
4. Place suitable container and wiping rags under and around air bleed vent plug (Figure 1 Item 2).
5. Remove dirt and debris on fuel filter/water separator head (Figure 1 Item 1) to prevent contamination of fuel system.

NOTE

Capture spilled fuel and dispose of IAW local SOP.

6. Remove air bleed vent plug (Figure 1, Item 2) from fuel filter/water separator head (Figure 1, Item 1).

NOTE

The use of an assistant is required for the following procedure.

7. Turn engine control switch to PRIME & RUN (using assistant) to pump fuel (TM 9-6115-749-10).
8. Observe fuel flow for evidence of air in the fuel line as indicated by bubbles, frothy appearance, or breaks in flow.
9. Turn engine control switch to OFF (using assistant) when evidence of air in fuel no longer appears for 2 – 3 sec (TM 9-6115-749-10).
10. Install air bleed vent plug (Figure 1, Item 2) to fuel filter/water separator head (Figure 1, Item 1).

11. Close right-side door.
12. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
13. Start engine and check for leaks and proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
14. Repeat steps 1 through 13 if engine stops.
15. Dispose of captured fuel IAW local SOP.

END OF TASK

Check Fuel Flow

1. Ensure equipment conditions are met in order presented in initial setup.
2. Check fuel level. Add fuel to fuel tank if empty. See Fill Fuel Tank task.
3. Purge fuel lines. See Purge Fuel Lines task.
4. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10) and listen to confirm fuel pump operation.
5. Continue to step 12 if fuel pump activates.
6. Ensure electrical connector is attached to main fuel pump if fuel pump does not activate (WP 0041, Remove/Install Fuel Pump, Main/Auxiliary).

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

7. Disconnect main fuel pump connector (P65) and use a multimeter set to test VDC to check electrical connector pins for 24 VDC \pm 10% if electrical connector is attached but main fuel pump is not operating (WP 0093, General Maintenance).
8. Replace main fuel pump if voltage is within 24 VDC \pm 10% range (WP 0041, Remove/Install Fuel Pump, Main/Auxiliary).
9. Use wiring diagrams and troubleshoot electrical wires P2-N and P2-V for opens or shorts if voltage is outside 24 VDC \pm 10% range (Foldout Pages).
10. Repair or replace wiring if a short or open is found (WP 0093, General Maintenance and WP 0059, Remove/Install Engine Wiring Harness).
11. Test and replace DCS as required if no short or open is found (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
12. Turn engine control switch to OFF (TM 9-6115-749-10).
13. Remove fuel supply hose at fuel injection pump (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).
14. Place open end of fuel supply hose into suitable container of at least 16 oz (500 mL) to catch pumped fuel.

NOTE

The use of an assistant is required for the following procedure.

15. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply hose (TM 9-6115-749-10).
16. Turn engine control switch to OFF (TM 9-6115-749-10).

- a. Install fuel supply hose and proceed to step 24 if fuel flow volume is approximately 12 oz (355 mL) after 15 sec (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).
 - b. Install fuel supply hose and remove fuel supply line from IN port of fuel filter/water separator if no fuel exits fuel supply hose or volume is less than approximate value in step a (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).
17. Place open end of fuel supply line into suitable container to catch pumped fuel.
18. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply line (TM 9-6115-749-10).
19. Turn engine control switch to OFF (TM 9-6115-749-10).
- a. If fuel flow volume is approximately 12 oz (355 mL) after 15 sec, replace fuel filter/water separator element, install fuel supply line, and proceed to step 24 (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly and WP 0043, Remove/Install Fuel Filter/Water Separator Element).
 - b. If no fuel exits fuel supply line or volume is less than specification when engine control switch is turned to PRIME & RUN, service strainers in fuel manifold. See Service Fuel Strainers task.
20. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply line again (TM 9-6115-749-10).
21. Turn engine control switch to OFF (TM 9-6115-749-10).
- a. Install fuel supply line and proceed to step 24 if fuel flow volume is approximately 12 oz (355 mL) after 15 sec (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).
 - b. If no fuel exits fuel supply line at fuel filter/water separator or volume is less than specification when engine control switch is turned to PRIME & RUN, inspect fuel manifold fuel pickup tube for signs of damage or restriction. Replace or repair as required (WP 0040, Remove/Install Fuel Manifold).
22. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply line again (TM 9-6115-749-10).
23. Turn engine control switch to OFF (TM 9-6115-749-10).
- a. Install fuel supply line and proceed to step 24 if fuel flow volume is approximately 12 oz (355 mL) after 15 sec (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).
 - b. If no fuel exits fuel supply line at fuel filter/water separator or volume is less than specification when engine control switch is turned to PRIME & RUN, install fuel supply line, replace main fuel pump, and proceed to step 24 (WP 0041, Remove/Install Fuel Pump, Main/Auxiliary and WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).

NOTE

Wipe down all fuel lines, parts, and fittings with wiping rag prior to installation.

24. Close right-side door.
25. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
26. Start engine and check for leaks and proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
27. Repeat steps 1 through 26 if engine stops.
28. Dispose of captured fuel IAW local SOP.

END OF TASK

Drain Fuel Tank

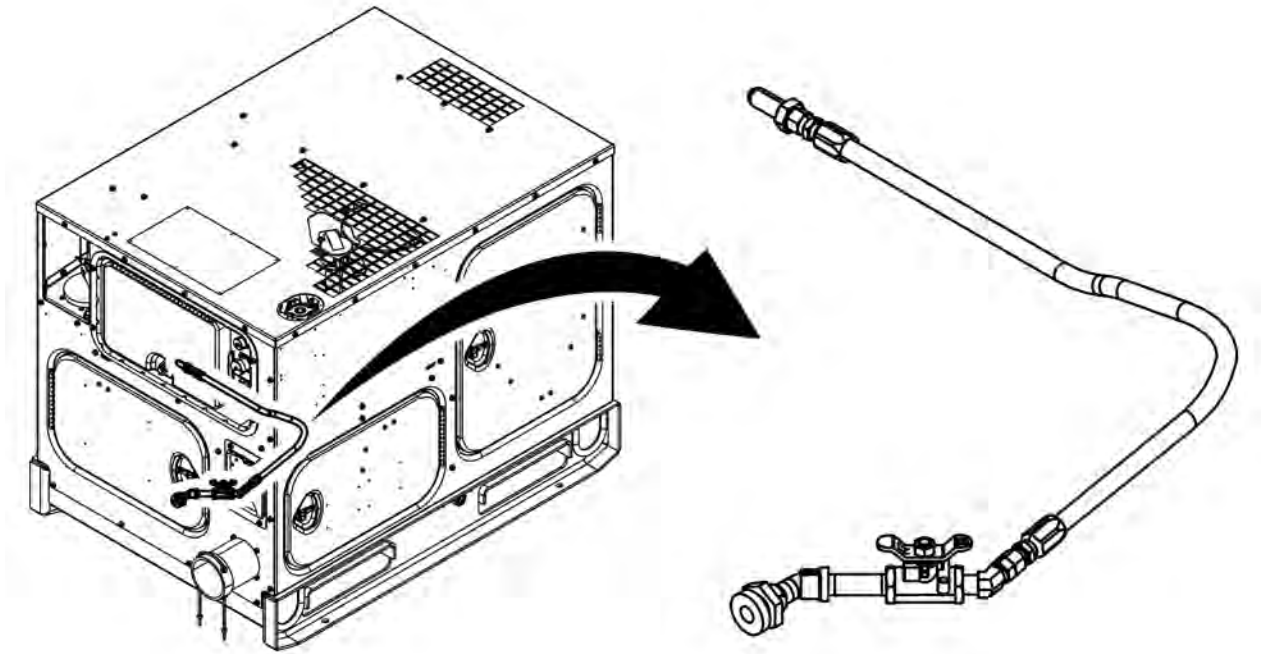


Figure 2. Fuel Drain — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove any dirt and debris around fuel drain outlet cap (Figure 3, Item 4).
3. Place suitable container under fuel drain outlet (Figure 3, Item 3) to catch drained fuel.
4. Remove fuel drain outlet cap (Figure 3, Item 4) from fuel drain outlet (Figure 3, Item 3) in left-side of unit skid.
5. Obtain auxiliary fuel line (Figure 3, Item 2) from accessory box inside right-side access door.
6. Connect auxiliary fuel line (Figure 3, Item 2) to fuel drain outlet (Figure 3, Item 3).
7. Remove fuel filler cap (Figure 4, Item 2) from fuel filler neck (Figure 4, Item 1).
8. Open rear door of generator set.
9. Locate fuel drain assembly (Figure 2).

NOTE

Capture spilled fuel and dispose of IAW local SOP.

10. Open ball valve (Figure 3, Item 1) by rotating lever counter-clockwise to the open position.
11. Close ball valve (Figure 3, Item 1) when flow of fuel stops by rotating clockwise to the shut position.

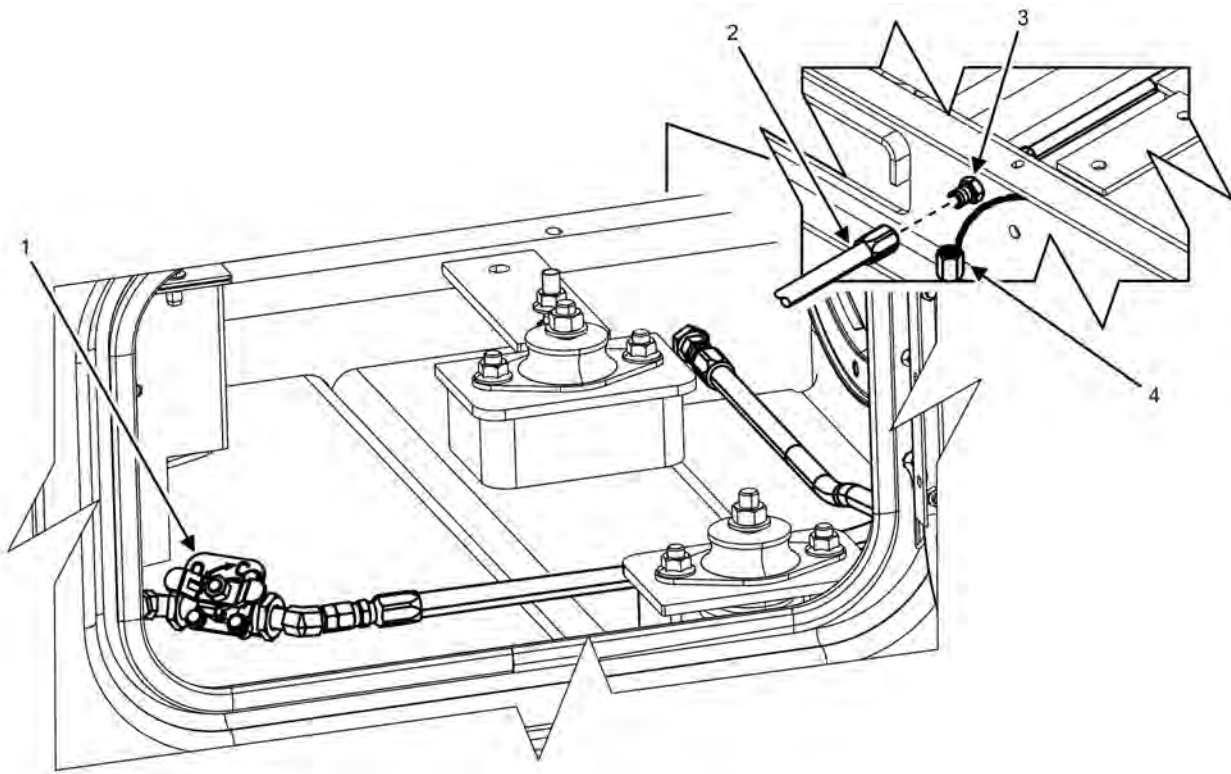


Figure 3. Fuel Drain — Detail.

12. Remove auxiliary fuel line (Figure 3, Item 2) from fuel drain outlet (Figure 3, Item 3).
13. Replace fuel drain outlet cap (Figure 3, Item 4) on fuel drain outlet (Figure 3, Item 3).
14. Wipe down auxiliary fuel line (Figure 3, Item 2) and store it in accessory box inside right-side access door.
15. Clean fuel drain outlet (Figure 3, Item 3) area of fuel and dirt.
16. Dispose of soiled rags IAW local SOP.
17. Replace fuel filler cap (Figure 4, Item 2) to previous orientation.

END OF TASK

Fill Fuel Tank

WARNING

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Failure to comply may cause injury or death to personnel.

NOTE

Note orientation of fuel cap before removal to aid in installation.

1. Ensure equipment conditions are met in order presented in initial setup.

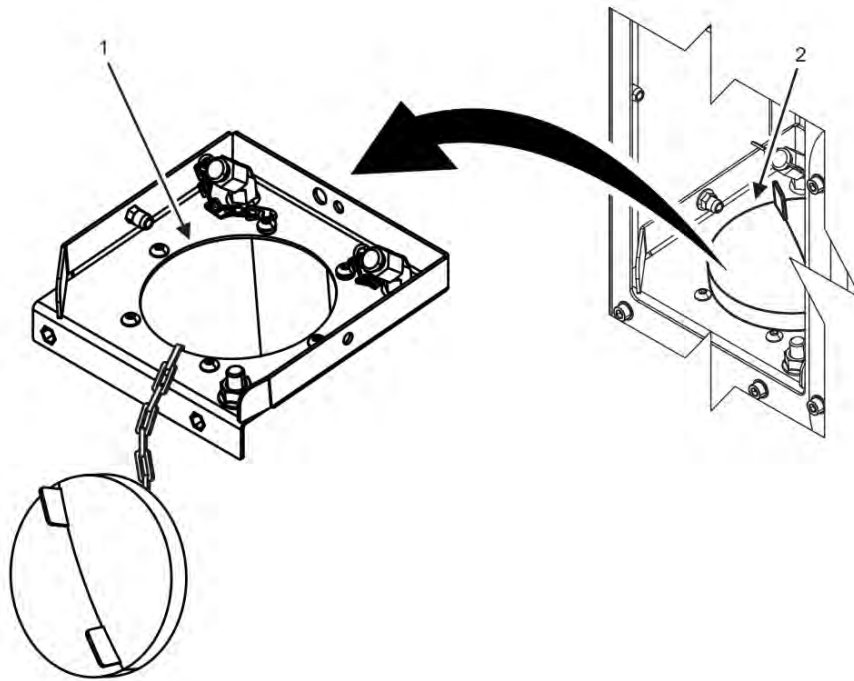


Figure 4. Fuel Filler — Location.

2. Remove fuel filler cap (Figure 4, Item 2).
3. Ensure ball valve (Figure 3, Item 1) is securely closed and 90 degrees from direction of fuel flow.
4. Add approved fuel into fuel filler opening (Figure 4, Item 1) until the level of fuel is at the top of the fuel tank.

NOTE

Capture and dispose of spilled fluid IAW local SOP.

5. Replace fuel filler cap (Figure 4, Item 2) to previous orientation.

END OF TASK

Service Fuel Strainers

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).

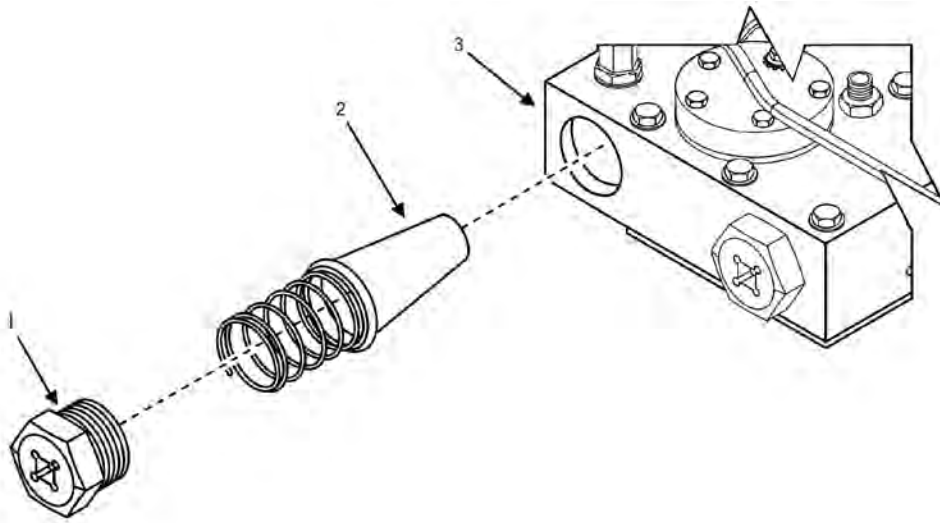


Figure 5. Fuel Strainer — Detail.

4. Open rear door and locate fuel strainer plugs (Figure 5, Item 1) on fuel manifold (Figure 5, Item 3).
5. Remove fuel strainer plugs (Figure 5, Item 1) from fuel manifold (Figure 5, Item 3).
6. Remove strainers (Figure 5, Item 2) from fuel manifold (Figure 5, Item 3).

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

7. Remove any dirt, debris, or blockages, and clean strainers with dry cleaning solvent.
8. Inspect strainers for holes, tears, and other signs of obvious damage and replace if required.
9. Install strainers (Figure 5, Item 2) to fuel manifold (Figure 5, Item 3).

NOTE

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

10. Use a 3/8-in female to 1/2-in male adapter and install fuel strainer plugs (Figure 5, Item 1) to a torque value of 18 – 22 ft/lb (24 – 30 Nm).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Close generator set doors.
13. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
14. Start engine and check for leaks and proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
15. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL MANIFOLD

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Torque Tube, 5-75 FT-LB (WP 0162, Table 2, Item 35)

Torque Wrench Head End, 1/4" X 3/8" Drive, 5/8" (WP 0162, Table 2, Item 36)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0162, Table 2, Item 42)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Gasket, fuel system (WP 0109, Repair Parts List, Figure 11, Item 49)

Manifold, fuel (WP 0110, Repair Parts List, Figure 12, Item 20)

Pipe, fuel 5 kW (WP 0110, Figure 12, Item 17)

Seal, O-ring (WP 0110, Figure 12, Item 2)

Washer, sealing (6) (WP 0109, Figure 11, Item 50)

Brush, acid swabbing (WP 0163, Expendable and Durable Items List, Item 5)

Cap set, protective (WP 0163, Item 8)

Cleaning compound, solvent (WP 0163, Item 10)

Compound, sealing (WP 0163, Item 14)

Grease, electrically conductive (WP 0163, Item 20)

Materials/Parts

Pan, drain (WP 0163, Item 28)

Primer, sealing compound (WP 0163, Item 30)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0041, Remove/Install Fuel Pump, Main/Auxiliary

WP 0045, Remove/Install Fuel Level Sensor

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Radiator support panel removed (WP 0035, Remove/Install Interior Body Panels)

Fuel tank drained (WP 0039, Service Fuel System)

REMOVE/INSTALL FUEL MANIFOLD**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Fuel Manifold Assembly**NOTE**

Tag and/or index all connections before removal.

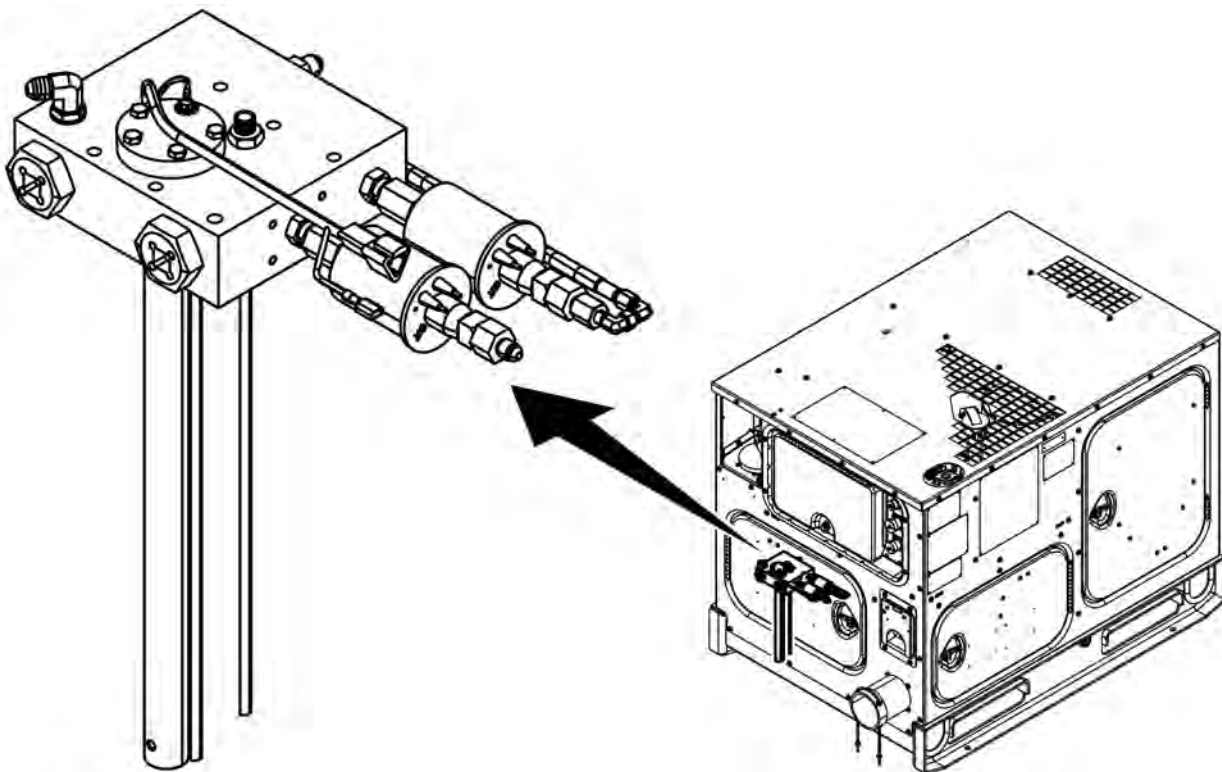


Figure 1. Fuel Manifold Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel manifold assembly (Figure 1).
3. Disconnect electrical connector (Figure 2, Item 12) from engine wiring harness (Figure 2, Item 11).

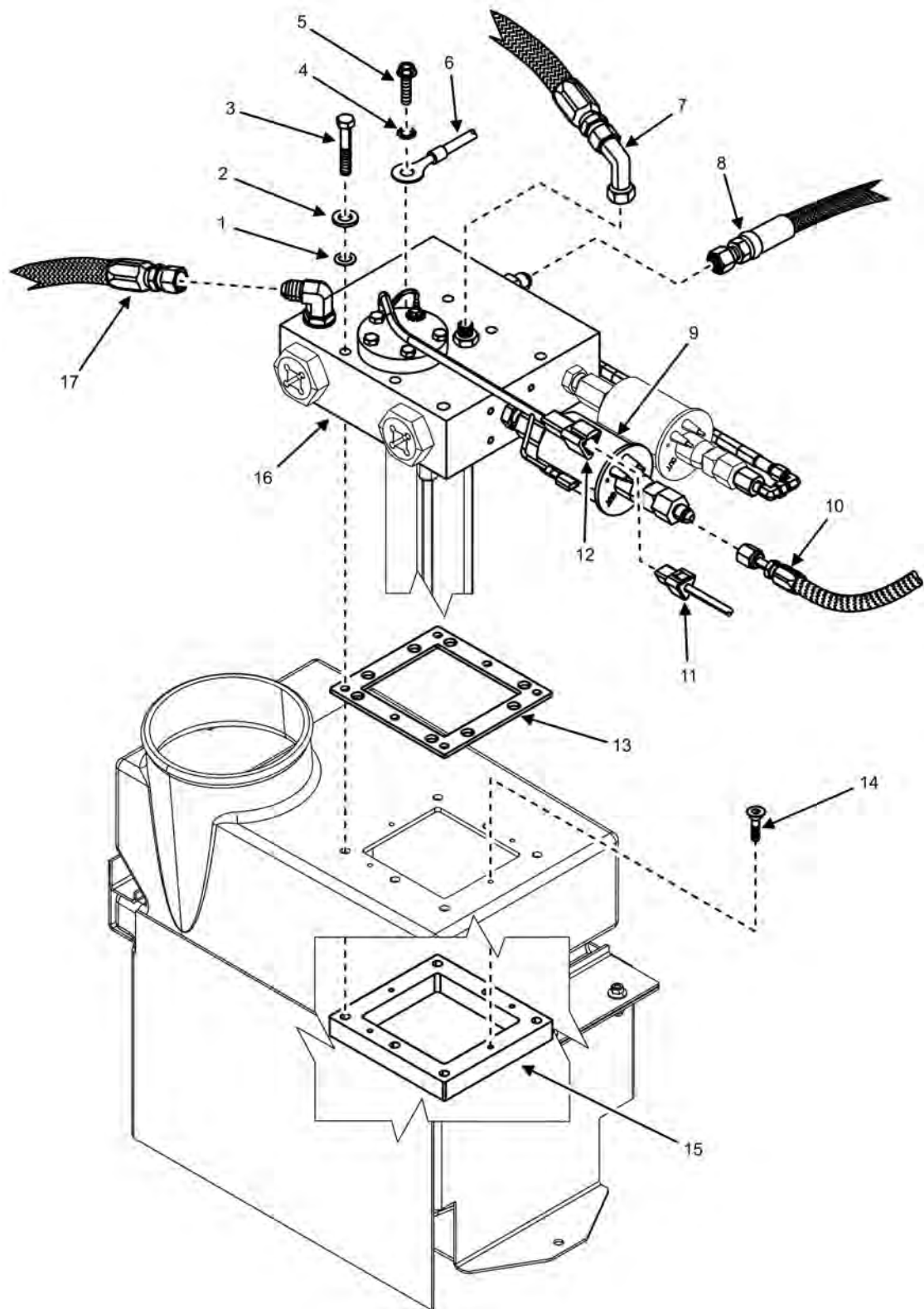


Figure 2. Fuel Manifold Assembly — Removal.

4. Remove screw (Figure 2, Item 5), external tooth lock washer (Figure 2, Item 4), and ground wire (Figure 2, Item 6) from fuel manifold (Figure 3, Item 16).

NOTE

Capture spilled fuel and dispose of IAW local SOP. Dispose of soiled rags IAW local SOP.

To prevent contamination from entering the fuel system, cap/plug all open fuel lines and fittings.

5. Remove fuel supply line (Figure 2, Item 10) from main fuel pump (Figure 2, Item 9).
6. Place wiping rags around auxiliary fuel intake and vent lines (Figure 2, Items 17 and 7) on fuel manifold assembly (Figure 2, Item 16) to capture spilled fuel when lines are removed.
7. Remove auxiliary fuel intake line (Figure 2, Item 17) from fuel manifold assembly (Figure 2, Item 16).
8. Inspect auxiliary fuel intake line (Figure 2, Item 17) for obvious damage and replace as required.
9. Remove auxiliary fuel vent line (Figure 2, Item 7) from fuel manifold assembly (Figure 2, Item 16).
10. Inspect auxiliary fuel vent line (Figure 2, Item 7) for obvious damage and replace as required.
11. Remove fuel return line (Figure 2, Item 8) from fuel manifold assembly (Figure 2, Item 16).
12. Inspect fuel return line (Figure 2, Item 8) for obvious damage and replace as required.
13. Remove six screws (Figure 2, Item 3), flat washers (Figure 2, Item 2), and sealing washers (Figure 2, Item 1) that secure fuel manifold assembly (Figure 2, Item 16) to fuel tank.
14. Discard six sealing washers (Figure 2, Item 1).
15. Remove fuel manifold assembly (Figure 2, Item 16) from fuel tank and place on a suitable work surface.
16. Remove fuel manifold assembly gasket (Figure 2, Item 13) from fuel tank. Discard fuel manifold assembly gasket (Figure 2, Item 13).
17. Inspect gasket retainer (Figure 2, Item 15) inside fuel tank for signs of obvious damage. Replace gasket retainer (Figure 2, Item 15) as required.
 - a. Remove two flat screws (Figure 2, Item 14) while supporting gasket retainer (Figure 2, Item 15).
 - b. Tilt and remove gasket retainer (Figure 2, Item 15) through fuel tank opening.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

18. Remove any residual gasket material from fuel tank and fuel manifold assembly (Figure 2, Item 16) using solvent, brush, and rags.
19. Cover hole in fuel tank to prevent dirt and debris from contaminating the fuel system.

END OF TASK

Disassemble Fuel Manifold Assembly

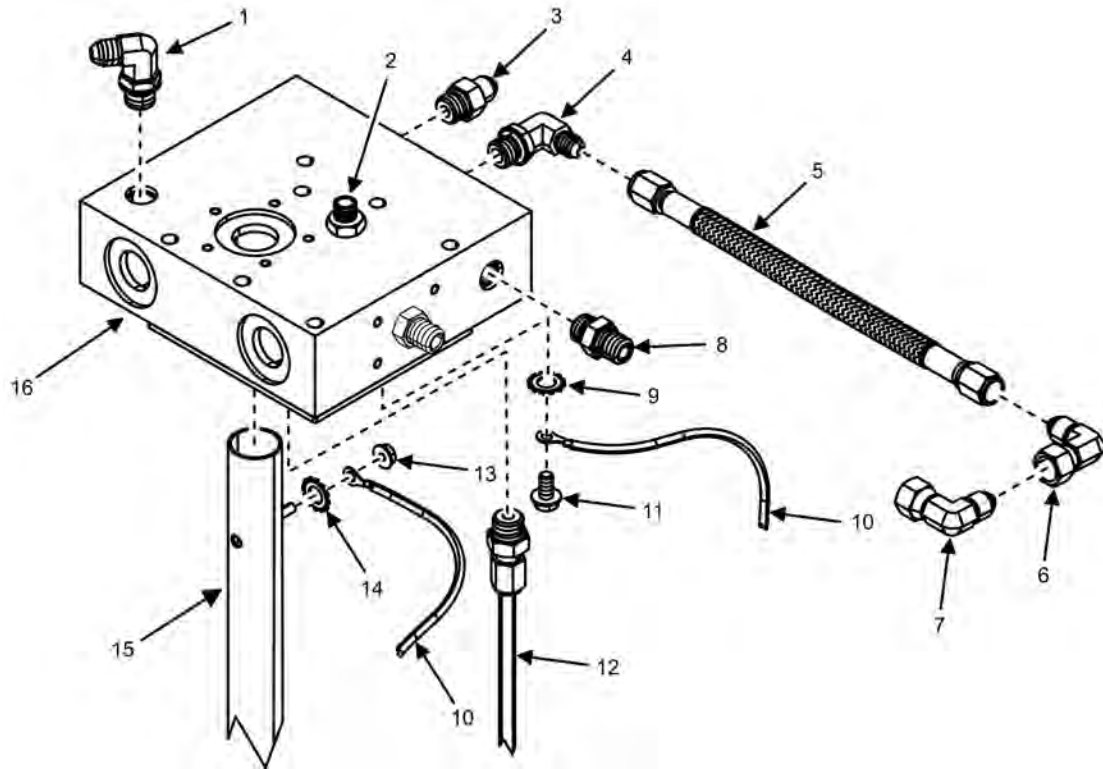


Figure 3. Fuel Manifold Assembly — Components.

1. Remove screw (Figure 3, Item 11), external tooth lock washer (Figure 3, Item 9), and wire (Figure 3, Item 10) from under fuel manifold (Figure 3, Item 16).
2. Remove nut (Figure 3, Item 13), external tooth lock washer (Figure 3, Item 14), and wire (Figure 3, Item 10) from stud of fuel tube (Figure 3, Item 15).
3. Remove main and auxiliary fuel pumps (WP 0041, Remove/Install Fuel Pump, Main/Auxiliary).
4. Remove fuel level sensor (WP 0045, Remove/Install Fuel Level Sensor).
5. Remove fuel strainers (WP 0039, Service Fuel System).
6. Disconnect fuel auxiliary line (Figure 3, Item 5) from fuel manifold (Figure 3, Item 16).
7. Inspect fuel auxiliary line (Figure 3, Item 5) for obvious signs of damage and replace as required.
8. Inspect two elbow fittings (Figure 3, Items 6 and 7) on fuel auxiliary line (Figure 3, Item 5) for obvious signs of damage and replace damaged elbow fitting (Figure 3, Items 6 and 7) as required.
9. Remove two fuel supply tubes (Figure 3, Item 12) from fuel manifold (Figure 3, Item 16).
10. Inspect two fuel supply tubes (Figure 3, Item 12) for obvious signs of damage and replace as required or save for reuse.
11. Remove two pump fittings (Figure 3, Item 8) from fuel manifold (Figure 3, Item 16).
12. Inspect two pump fittings (Figure 3, Item 8) for obvious signs of damage and replace as required or save for reuse.

NOTE

Note orientation of auxiliary fuel elbow (Figure 3, Item 1) before removal to aid in installation.

13. Remove auxiliary fuel elbow (Figure 3, Item 1) and straight fitting (Figure 3, Item 2) from fuel manifold (Figure 3, Item 16).
14. Inspect auxiliary fuel elbow (Figure 3, Item 1) and straight fitting (Figure 3, Item 2) for obvious signs of damage. Replace as required or save for reuse.
15. Remove elbow fitting (Figure 3, Item 4) from fuel manifold assembly (Figure 2, Item 16).
16. Inspect elbow fitting (Figure 3, Item 4) for obvious signs of damage. Replace as required or save for reuse.
17. Remove straight fitting (Figure 3, Item 3) from fuel manifold assembly (Figure 2, Item 16).
18. Inspect straight fitting (Figure 3, Item 3) for obvious signs of damage. Replace as required or save for reuse.

END OF TASK**Inspect Fuel Manifold Assembly****NOTE**

Fuel tube (Figure 3, Item 15) is permanently attached to fuel manifold (Figure 3, Item 16) at assembly. If either part is damaged, both parts must be replaced.

1. Inspect fuel manifold (Figure 3, Item 16) and fuel tube (Figure 3, Item 15) for cracks, leaks, and other signs of obvious damage. If either part is damaged, replace fuel manifold (Figure 3, Item 16) and fuel tube (Figure 3, Item 15).
2. Remove any residual sealant from fuel manifold ports and all fittings that will be reused at assembly.

END OF TASK**Assemble Fuel Manifold Assembly****WARNING**

Follow tag index procedure performed during removal task for assembly of fuel manifold. Failure to comply may cause injury or death to personnel or damage to equipment.

NOTE

If replacing fuel manifold (Figure 3, Item 16), new fuel tube (Figure 3, Item 15) must be assembled to new fuel manifold (Figure 3, Item 16) using primer and adhesive. Cure time for this process is 24 hr before the assembly can be exposed to fuel.

Wipe down fuel lines, manifold, and fittings with wiping rag prior to installation.

1. Apply primer and adhesive to mounting surfaces of new fuel tube (Figure 3, Item 15) and new fuel manifold (Figure 3, Item 16).
2. Insert new fuel tube (Figure 3, Item 15) into new fuel manifold (Figure 3, Item 16).
3. Remove any beads of adhesive from inside fuel tube (Figure 3, Item 15) and fuel manifold (Figure 3, Item 16). Adhesive must cure 24 hr before contact with fuel.
4. Install screw (Figure 3, Item 11), external tooth lock washer (Figure 3, Item 9), and wire (Figure 3, Item 10) to under fuel manifold (Figure 3, Item 16). Torque screw (Figure 3, Item 11) to 44 – 53 in/lb (5 – 6 Nm).

5. Install nut (Figure 3, Item 13), external tooth lock washer (Figure 3, Item 14), and wire (Figure 3, Item 10) from stud of fuel tube (Figure 3, Item 15). Torque nut (Figure 3, Item 13) to 1 ft/lb (1 – 2 Nm).

NOTE

To provide proper seal against fuel leaks, apply thread sealant to pipe threads of all fittings prior to assembly. Sealant must cure for 30 min before fuel manifold can be exposed to fuel. Torque value for fittings is 18 – 20 ft/lb (25 – 27 Nm).

6. Apply thread sealant to pipe threads of elbow fitting (Figure 3, Item 4).
7. Install elbow fitting (Figure 3, Item 4) to proper orientation on fuel manifold assembly (Figure 2, Item 16) to a torque value of 18 – 20 ft/lb (25 – 27 Nm). Do not expose fuel manifold assembly (Figure 2, Item 16) to fuel for 30 min until sealant has cured.
8. Apply thread sealant to pipe threads of straight fitting (Figure 3, Item 3).
9. Install straight fitting (Figure 3, Item 3) to fuel manifold (Figure 3, Item 16) to a torque value of 18 – 20 ft/lb (25 – 27 Nm). Do not expose fuel manifold (Figure 3, Item 16) to fuel for 30 min until sealant has cured.
10. Apply thread sealant to pipe threads of auxiliary fuel elbow (Figure 3, Item 1) and straight fitting (Figure 3, Item 2).
11. Install auxiliary fuel elbow (Figure 3, Item 1) to proper orientation and straight fitting (Figure 3, Item 2) on fuel manifold (Figure 3, Item 16) to a torque value of 18 – 20 ft/lb (25 – 27 Nm). Do not expose fuel manifold to fuel for 30 min until sealant has cured.
12. Apply thread sealant to pipe threads of two pump fittings (Figure 3, Item 8).
13. Install two pump fittings (Figure 3, Item 8) to fuel manifold (Figure 3, Item 16) to a torque value 18 – 20 ft/lb (25 – 27 Nm). Do not expose fuel manifold to fuel for 30 min until sealant has cured.
14. Apply thread sealant to pipe threads of two fuel supply tubes (Figure 3, Item 12).
15. Install fuel supply tubes (Figure 3, Item 12) to fuel manifold (Figure 3, Item 16) to a torque value of 18 – 20 ft/lb (25 – 27 Nm). Do not expose fuel manifold to fuel for 30 min until sealant has cured.

NOTE

To provide proper seal against fuel leaks, apply thread sealant to pipe threads of all fittings prior to assembly. Sealant must cure for 30 min before fuel manifold can be exposed to fuel. Torque value for fittings is 156 – 228 in/lb (17– 19 Nm).

16. Apply thread sealant to pipe threads of two elbow fittings (Figure 3, Items 6 and 7) if removed.
17. Install two elbow fittings (Figure 3, Items 6 and 7) to fuel auxiliary line (Figure 3, Item 5) as required.
18. Install fuel auxiliary line (Figure 3, Item 5) to fuel manifold (Figure 3, Item 16) assembly.
19. Install fuel plugs and strainers (WP 0039, Service Fuel System).
20. Install fuel level sensor (WP 0045, Remove/Install Fuel Level Sensor).
21. Install fuel pumps (WP 0041, Remove/Install Fuel Pump, Main/Auxiliary).

END OF TASK

Install Fuel Manifold Assembly

1. Install gasket retainer (Figure 2, Item 15) if removed.
 - a. Insert gasket retainer (Figure 2, Item 15) through opening in fuel tank and align mounting holes.

- b. Install two flat screws (Figure 2, Item 14) through mounting holes in tank to secure gasket retainer (Figure 2, Item 15) to inside fuel tank.
- c. Tighten two flat screws (Figure 2, Item 14) to 8 – 10 in/lb (1 Nm).
2. Position new fuel manifold assembly gasket (Figure 2, Item 13) on top of fuel tank and align mounting holes.
3. Position fuel manifold assembly (Figure 2, Item 16) to top of fuel tank and fuel manifold assembly gasket (Figure 2, Item 13) and align mounting holes.
4. Secure fuel manifold assembly (Figure 2, Item 16) to fuel tank by installing six screws (Figure 2, Item 3) with flat washers (Figure 2, Item 2) and six new sealing washers (Figure 2, Item 1) through fuel manifold assembly (Figure 2, Item 16) and gasket retainer (Figure 2, Item 15).
5. Tighten six screws (Figure 2, Item 3) in a cross pattern to a torque value of 43 – 47 in/lb (5 Nm).

NOTE

Wipe down fuel lines, manifold, and fittings with wiping rag prior to installation.

6. Install auxiliary fuel vent line (Figure 2, Item 7) to straight fitting on fuel manifold assembly (Figure 2, Item 16). Torque to 120 – 192 in/lb ft/lb (14 – 16 Nm).
7. Install auxiliary fuel intake line (Figure 2, Item 17) to elbow on fuel manifold assembly (Figure 2, Item 16). Torque to 120 – 192 in/lb (14 – 16 Nm).
8. Install fuel return line (Figure 2, Item 8) to fuel manifold assembly (Figure 2, Item 16).
9. Install fuel supply line (Figure 2, Item 10) to main fuel pump (Figure 2, Item 9).
10. Install screw (Figure 2, Item 5), external tooth lock washer (Figure 2, Item 4), and ground wire (Figure 2, Item 6) to fuel manifold assembly (Figure 2, Item 16). Torque screw (Figure 2, Item 5) to 84 – 108 in/lb (10 – 12 Nm).
11. Connect electrical connector (Figure 2, Item 12) to engine wiring harness (Figure 2, Item 11).
12. Fill fuel tank (WP 0039, Service Fuel System).
13. Install radiator support panel (WP 0035, Remove/Install Interior Body Panels). Fill fuel tank (WP 0039, Service Fuel System).
14. Install negative ground cable to right-hand battery (WP 0036 Remove/Install Batteries).
15. Purge fuel system (WP 0039, Service Fuel System).
16. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
17. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
18. Repair as required.
19. Dispose of captured fuel and soiled rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL PUMP, MAIN/AUXILIARY

INITIAL SETUP:**Tools and Special Tools**

Crowfoot Attachment Set, Socket Wrench, Flare Nut,
Standard (WP 0162, Table 2, Item 12)

Tool Kit, General Mechanic's (GMTK) (WP 0162,
Table 2, Item 32)

Wrench, Torque, Click, Ratcheting, 3/8" Drive,
75 FT-LB (WP 0162, Table 2, Item 41)

Materials/Parts

Pump, fuel, electric (2) (WP 0110, Repair Parts List,
Figure 12, Item 11)

Cap set, protective (WP 0163, Expendable and
Durable Items List, Item 8)

Grease, electrically conductive (WP 0163, Item 20)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0039, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10,
WP 0005)

Engine cool

Battery ground cable removed (WP 0036,
Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install
Top Body Panel)

DCS removed (WP 0017, Remove/Install DCS)

REMOVE/INSTALL FUEL PUMP, MAIN/AUXILIARY**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Removing the main fuel pump and the auxiliary fuel pump require the same procedure. Fuel supply line connects main fuel pump to fuel filter/water separator. An auxiliary fuel line attaches auxiliary fuel pump to fuel manifold.

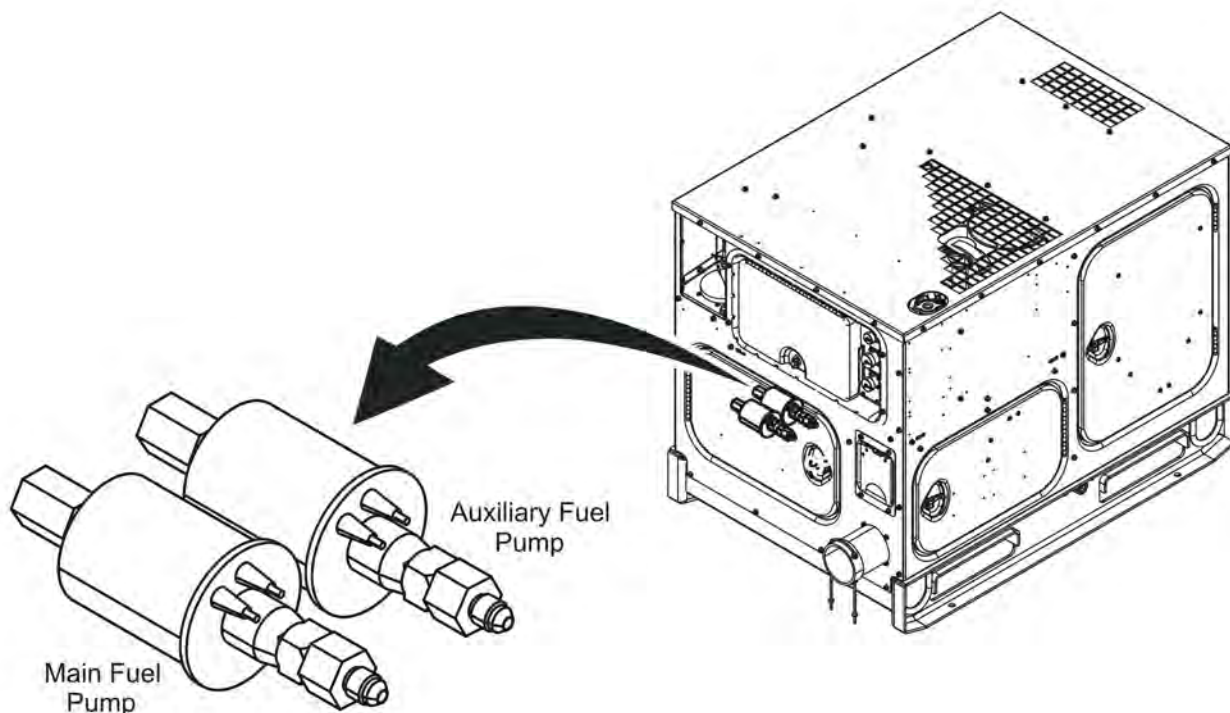
Remove Fuel Pump

Figure 1. Fuel Pump — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open rear panel door.
3. Locate fuel pump to be removed (Figure 1) through interior panel gap.
4. Tag electrical connectors (Figure 2, Item 2) to facilitate installation if removing both fuel pumps.

-
5. Disconnect electrical connectors (Figure 2, Item 2) from unit wiring harness connector (Figure 2, Item 3).
 6. Inspect electrical connectors (Figure 2, Item 2) for fraying and other signs of obvious damage and replace as required.

NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug open fuel lines to prevent dirt and debris from entering the fuel system.

7. Place suitable catch container and wiping rag under fuel pumps (Figure 2, Item 6) to capture spilled fuel.

NOTE

Two wrenches are required to separate this fitting.

8. Disconnect fitting of fuel line (Figure 2, Item 4) from fuel pump male fitting (Figure 2, Item 5). Cap/plug line to prevent dirt and debris from entering the fuel system.
9. Inspect fuel line (Figure 2, Item 4) line and fitting for obvious signs of damage and replace as required.
10. Loosen fuel pump fitting (Figure 2, Item 7) from fuel manifold connector fitting (Figure 2, Item 8).
11. Remove fuel pump (Figure 2, Item 6) from manifold (Figure 2, Item 1) by turning fuel pump fitting (Figure 2, Item 7) counterclockwise.

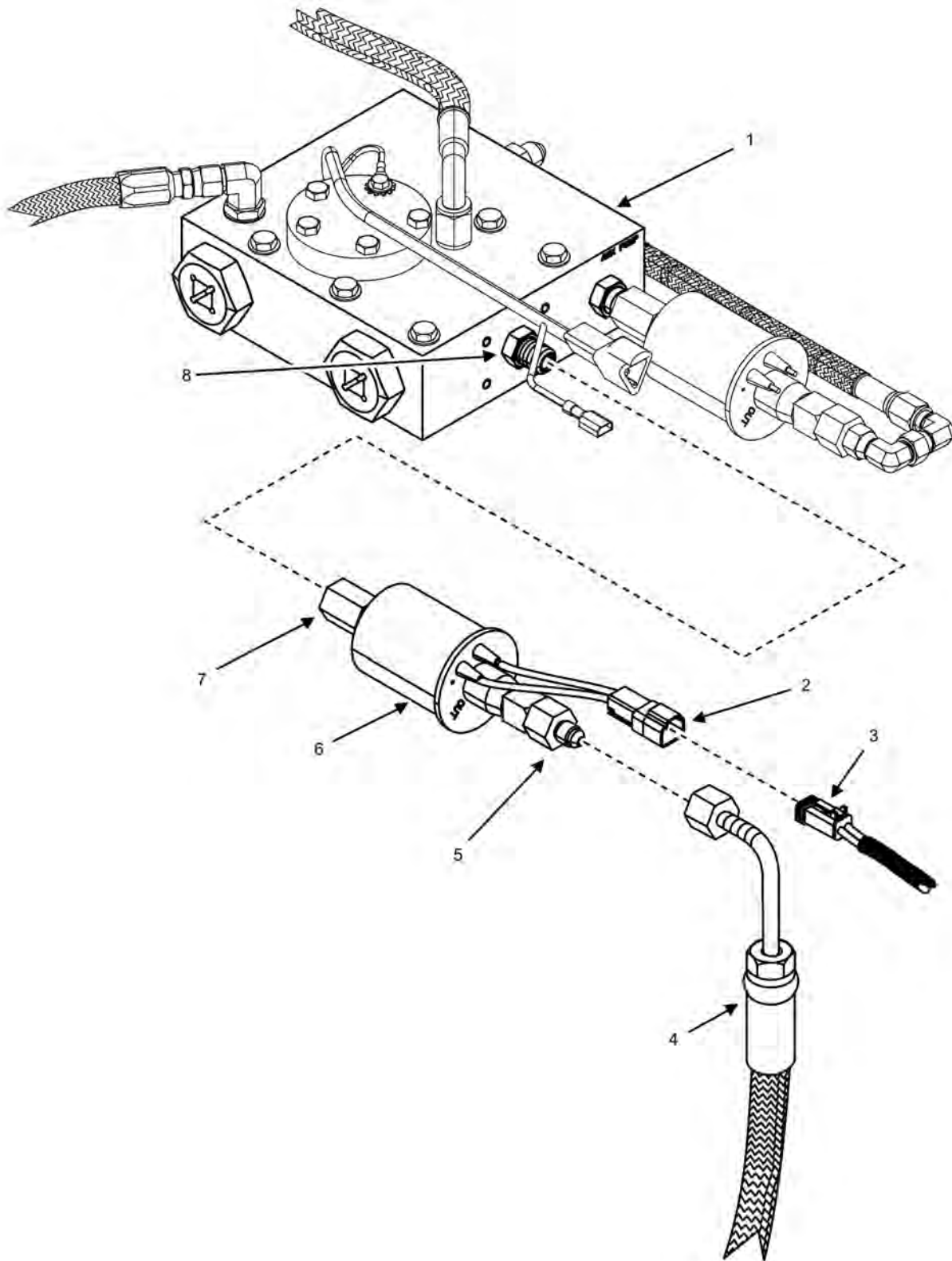


Figure 2. Fuel Pump — Detail.

12. Place fuel pump (Figure 2, Item 6) on suitable work surface.
13. Remove old thread sealant from fuel manifold connector fitting (Figure 2, Item 8) and fuel pump male fitting (Figure 2, Item 5).

END OF TASK

Inspect Fuel Pump

1. Inspect fuel pump fitting (Figure 2, Item 7) for cracks and other obvious signs of damage. Replace pump as required.
2. Inspect fuel pump male fitting (Figure 2, Item 5) for cracks and other obvious signs of damage. Replace pump as required.
3. Inspect fuel pump (Figure 2, Item 6) for wear and other signs of obvious damage. Replace as required.
4. Inspect fuel manifold connector fitting (Figure 2, Item 8) for signs of obvious damage and replace as required.

END OF TASK

Install Fuel Pump

CAUTION

Be sure to install fuel pump (Figure 2, Item 6) in proper direction relative to fuel flow. The flow from this pump is outward. Failure to comply may cause damage to equipment.

NOTE

Installing the main fuel pump and the auxiliary fuel pump require the same procedure. Fuel supply line connects main fuel pump to fuel filter/water separator. An auxiliary fuel line attaches auxiliary fuel pump to fuel manifold.

Capture and dispose of spilled fluid IAW local SOP. Remove all caps/plugs from fuel lines/fittings prior to installation of each fuel line.

Wipe down fuel lines, pumps, and fittings with wiping rag prior to installation.

Sealant cure time is 30 min to use fuel system and 72 hr for full strength.

1. Apply thread sealant to fuel manifold connector fitting (Figure 2, Item 8) and fuel pump male fitting (Figure 2, Item 5).
2. Position fuel pump (Figure 2, Item 6) to fuel manifold connector fitting (Figure 2, Item 8) and finger-tighten.
3. Tighten fuel pump (Figure 2, Item 6) 1 to 1-1/2 turns past finger-tight.
4. Tighten fuel pump fitting (Figure 2, Item 7) an extra one and one-half turns.
5. Position fuel line (Figure 2, Item 4) to fuel pump male fitting (Figure 2, Item 5) and finger-tighten fuel pump male fitting (Figure 2, Item 5).
6. Tighten fuel pump male fitting (Figure 2, Item 5) an extra one and one-half turns.
7. Remove tags from electrical connectors (Figure 2, Item 2) if necessary.
8. Connect fuel pump electrical connector (Figure 2, Item 2) to unit wiring harness connector (Figure 2, Item 3).
9. Install DCS (WP 0017, Remove/Install DCS).
10. Install top body panel (WP 0028, Remove/Install Top Body Panel).

11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Purge fuel system (WP 0039, Service Fuel System).
13. Close generator set doors.
14. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
15. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
16. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
 Wrench, Oil Filter, Strap (WP 0162, Table 2, Item 40)

Materials/Parts

Filter, element (1) (WP 0111, Repair Parts List, Figure 13, Item 7)
 Separator, fuel water (1) (WP 0111, Figure 13, Item 6)
 Cap set, protective (WP 0163, Expendable and Durable Items List, Item 8)
 Grease, electrically conductive (WP 0163, Item 20)
 Rag, wiping (WP 0163, Item 31)
 Sealant (WP 0163, Item 32)
 Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)
 Assistant (1)

References

WP 0043, Remove/Install Fuel Filter/Water Separator Element

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
 Engine cool
 Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ASSEMBLY

WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

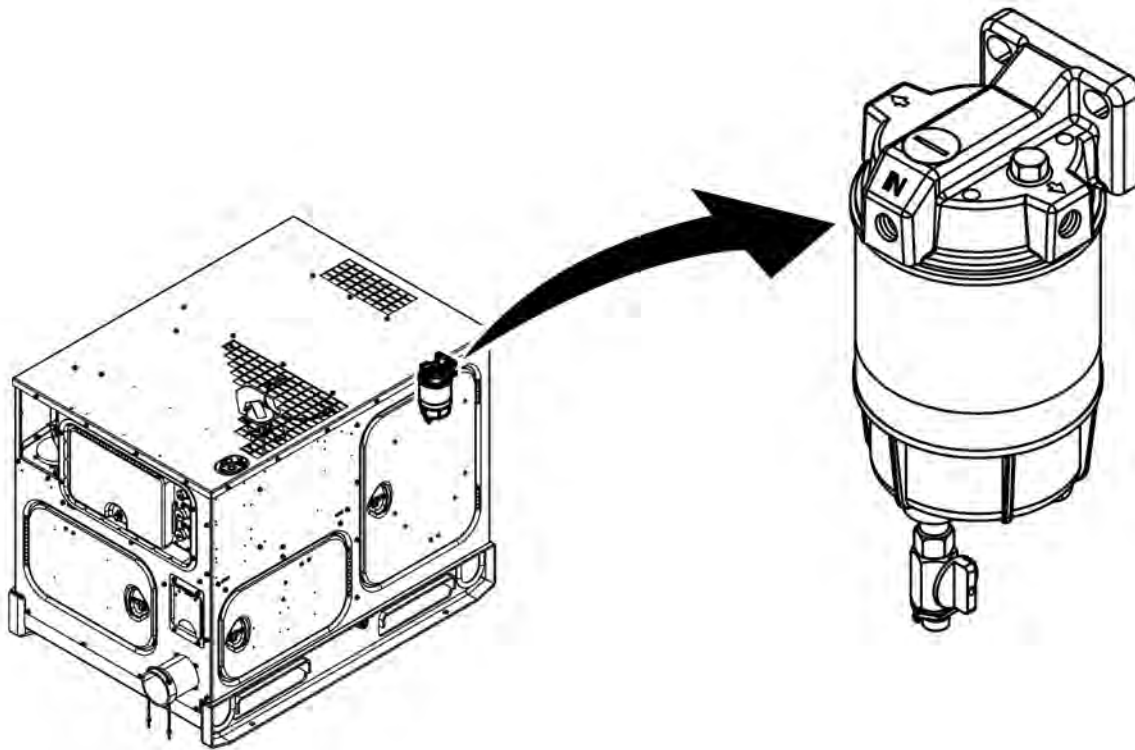
Remove Fuel Filter/Water Separator Assembly

Figure 1. Fuel Filter/Water Separator Assembly — Location.

NOTE

Capture spilled fuel and dispose of with IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

Tag fuel lines and hoses after removal of each line to aid installation.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel filter/water separator assembly (Figure 1) through right-side door.

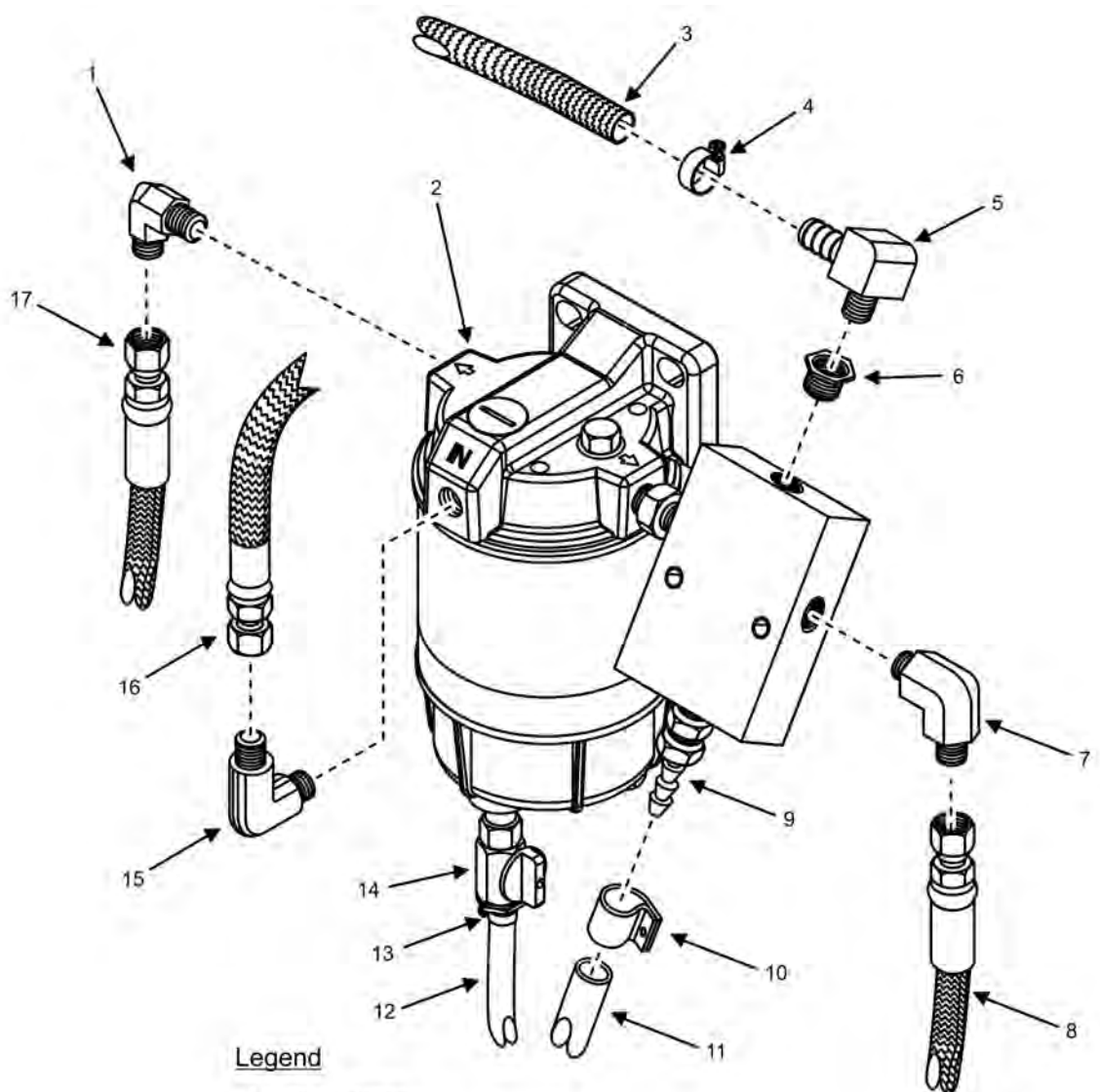


Figure 2. Fuel Filter/Water Separator — Detail.

3. Place suitable container and wiping rag under fuel filter/water separator assembly (Figure 3, Item 7) and fuel manifold (Figure 3, Item 4) to catch spilled fuel.
4. Open drain valve (Figure 2, Item 14) on bottom of water bowl (Figure 3, Item 6).
5. Allow fuel to drain into container until flow stops.
6. Close fuel drain valve (Figure 2, Item 14).
7. Remove dirt and debris from fuel filter/water separator head (Figure 2, Item 2) to prevent contamination of fuel system.

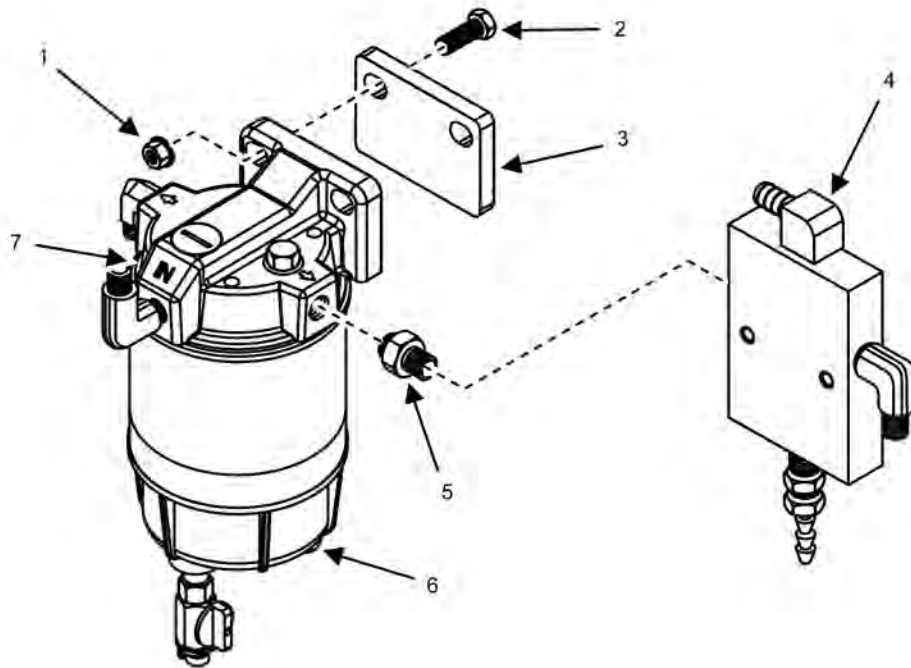


Figure 3. Fuel Filter/Water Separator — Removal.

8. Remove two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 1) securing fuel filter/water separator assembly (Figure 3, Item 7) and spacer (Figure 3, Item 3) to front body panel. Place spacer (Figure 3, Item 3) on suitable work surface.
9. Reposition fuel filter/water separator assembly (Figure 3, Item 7) to gain access to fuel lines to be removed.
10. Loosen hose clamp (Figure 2, Item 13) and remove drain hose (Figure 2, Item 12) from drain valve (Figure 3, Item 14).
11. Disconnect fuel supply line (Figure 2, Item 16) at IN pipe adaptor (Figure 2, Item 15) on fuel filter/water separator head (Figure 2, Item 2). Cap/plug fuel supply line (Figure 2, Item 16) and IN pipe adaptor (Figure 2, Item 15) to prevent dirt and debris from entering fuel system.
12. Inspect fuel supply line (Figure 2, Item 16) for obvious signs of damage and replace as required.
13. Disconnect fuel supply engine line (Figure 2, Item 17) from fuel filter/water separator head (Figure 2, Item 2) pipe adaptor (Figure 2, Item 1). Cap/plug fuel supply engine line (Figure 2, Item 17) and pipe adaptor (Figure 2, Item 1) to prevent dirt and debris from entering fuel system.

14. Inspect fuel supply engine line (Figure 2, Item 17) for cracks and other signs of obvious damage and replace as required.
15. Loosen and slide back hose clamp (Figure 2, Item 4) and remove fuel return engine line (Figure 2, Item 3) from fuel filter/water separator manifold (Figure 3, Item 4) pipe adaptor (Figure 2, Item 5). Cap/plug fuel return engine line (Figure 2, Item 3) and pipe adaptor (Figure 2, Item 5) to prevent dirt and debris from entering fuel system.
16. Inspect fuel return engine line (Figure 2, Item 3) for cracks and other signs of obvious damage and replace as required.

NOTE

Winterization kit is optional for AMMPS. Removal of heater hose (Figure 2, Item 11) is only necessary if winterization kit is installed in unit.

17. Loosen and slide clamp (Figure 2, Item 10) on heater hose (Figure 2, Item 11) away from manifold joint (Figure 2, Item 9).
18. Remove heater hose (Figure 2, Item 11) from manifold joint (Figure 2, Item 9). Cap/plug heater hose (Figure 2, Item 11) and manifold joint (Figure 2, Item 9) to prevent dirt and debris from entering fuel system.
19. Inspect heater hose (Figure 2, Item 11) and clamps (Figure 2, Item 10) for obvious signs of damage and replace as required.
20. Disconnect fuel return line (Figure 2, Item 8) at pipe adaptor (Figure 2, Item 7). Cap/plug fuel return line (Figure 2, Item 8) and pipe adaptor (Figure 2, Item 7) to prevent dirt and debris from entering fuel system.
21. Inspect fuel return line (Figure 2, Item 8) for obvious signs of damage and replace as required.

NOTE

Removal of fuel filter/water separator manifold (Figure 3, Item 4) may require use of a vice.

22. Disconnect fuel filter/water separator manifold (Figure 3, Item 4) from fuel filter/water separator assembly (Figure 3, Item 7) by loosening pipe nipple (Figure 3, Item 5).

NOTE

If the fuel filter/water separator requires replacement, continue with steps 23 and 24. Otherwise, continue to Inspect Fuel Filter/Water Separator Assembly task.

23. Remove pipe adaptors (Figure 2, Items 1, 5, and 7), manifold joint (Figure 2, Item 9), reducer (Figure 2, Item 6), and IN pipe adaptor (Figure 2, Item 15) from fuel filter/water separator assembly (Figure 3, Item 7) and fuel filter/water separator manifold (Figure 3, Item 4).
24. Remove pipe nipple (Figure 3, Item 5) that connects fuel filter/water separator assembly (Figure 3, Item 7) to fuel filter/water separator manifold (Figure 3, Item 4).

END OF TASK

Inspect Fuel Filter/Water Separator Assembly

1. Inspect fuel filter/water separator assembly (Figure 3, Item 7) for obvious signs of damage and replace as required.
2. Inspect pipe adaptors (Figure 2, Items 1, 5, and 7), manifold joint (Figure 2, Item 9), reducer (Figure 2, Item 6), and IN pipe adaptor (Figure 2, Item 15) for obvious signs of damage and replace as required.
3. Inspect fuel filter/water separator manifold (Figure 3, Item 4) for obvious signs of damage and replace as required.
4. Inspect screws (Figure 3, Item 2) and nuts (Figure 3, Item 1) for obvious signs of damage and replace as required.

END OF TASK**Install Fuel Filter/Water Separator Assembly**

1. Replace fuel filter/water separator element prior to installation (WP 0043, Remove/Install Fuel Filter/Water Separator Element).

NOTE

Use pipe thread sealant on all pipe threads of pipe adaptors (Figure 2, Items 1, 5, and 7), manifold joint (Figure 2, Item 9), reducer (Figure 2, Item 6), and IN pipe adaptor (Figure 2, Item 15), and pipe nipple (Figure 3, Item 5). Cure time is 30 min to use fuel system and 72 hr for full strength.

2. Apply pipe thread sealant to pipe adaptors (Figure 2, Items 1, 5, and 7), manifold joint (Figure 2, Item 9), reducer (Figure 2, Item 6), IN pipe adaptor (Figure 2, Item 15), and pipe nipple (Figure 3, Item 5).

NOTE

Continue with steps 3 through 5 if installation of pipe adaptors (Figure 2, Items 1, 5, and 7), manifold joint (Figure 2, Item 9), reducer (Figure 2, Item 6), IN pipe adaptor (Figure 2, Item 15), and pipe nipple (Figure 3, Item 5) is required. Otherwise, continue to step 6.

Reassemble fuel filter/water separator assembly (Figure 3, Item 7) and fuel filter/water separator manifold (Figure 3, Item 4) according to Figure 2.

3. Install pipe adaptors (Figure 2, Items 1, 5, and 7), manifold joint (Figure 2, Item 9), reducer (Figure 2, Item 6), IN pipe adaptor (Figure 2, Item 15), and pipe nipple (Figure 3, Item 5) to fuel filter/water separator assembly (Figure 3, Item 7) and fuel filter/water separator manifold (Figure 3, Item 4) 1-1/2 turns past finger-tight, if required.
4. Apply pipe thread sealant to pipe nipple (Figure 3, Item 5) connecting fuel filter/water separator manifold (Figure 3, Item 4) to fuel filter/water separator assembly (Figure 3, Item 7).
5. Install pipe nipple (Figure 3, Item 5) to fuel filter/water separator assembly (Figure 3, Item 7).
6. Install fuel filter/water separator manifold (Figure 3, Item 4) to fuel filter/water separator assembly (Figure 3, Item 7) at pipe nipple (Figure 3, Item 5).

NOTE

Place a suitable container under fuel filter/water separator assembly to catch spilled fuel. Dispose of captured fuel IAW local SOP.

Remove all caps/plugs from fuel lines/fittings prior to installation of each fuel line.

Wipe down fuel lines, fuel filter/water separator assembly, and fittings with wiping rag prior to installation.

Identification tags should remain in place until the fuel system is completely reassembled and has been tested for proper operation.

7. Connect fuel return line (Figure 2, Item 8) to pipe adaptor (Figure 2, Item 7). Torque to 195 – 212 in/lb (22 – 24 Nm).
8. Connect fuel supply line (Figure 2, Item 16) at IN pipe adaptor (Figure 2, Item 15) on fuel filter/water separator head (Figure 2, Item 2). Torque to 150 – 159 in/lb (17 – 18 Nm).
9. Connect fuel supply engine line (Figure 2, Item 17) to pipe adaptor (Figure 2, Item 1). Torque to 150 – 159 in/lb (17 – 18 Nm).
10. Install fuel return engine line (Figure 2, Item 3) and hose clamp (Figure 2, Item 4) to pipe adaptor (Figure 2, Item 5).
11. Tighten hose clamp (Figure 2, Item 4) over fuel return engine line (Figure 2, Item 3) and pipe adapter (Figure 2, Item 5).

NOTE

Winterization kit is optional for AMMPS. Installation of heater hose (Figure 2, Item 11) is only necessary if winterization kit is installed in unit.

12. Install heater hose (Figure 2, Item 11) to manifold joint (Figure 2, Item 9).
13. Slide and position one clamp (Figure 2, Item 10) on heater hose (Figure 2, Item 11) at manifold joint (Figure 2, Item 9).
14. Secure clamp (Figure 2, Item 10) over heater hose (Figure 2, Item 11) and manifold joint (Figure 2, Item 9).
15. Install drain hose (Figure 2, Item 12) to drain valve (Figure 3, Item 14) and secure hose clamp (Figure 2, Item 13).
16. Position fuel filter/water separator assembly (Figure 3, Item 7) and fuel filter/water separator manifold (Figure 3, Item 4) to mounting location on front body panel.
17. Secure fuel filter/water separator assembly (Figure 3, Item 7) to front body panel with two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 1).
18. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
19. Close generator set doors.
20. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
21. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
22. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ELEMENT

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Oil Filter, Strap (WP 0162, Table 2, Item 38)

Materials/Parts

Filter, element (WP 0111, Repair Parts List, Figure 13, Item 7)

Fuel, diesel (WP 0163, Expendable and Durable Items List, Item 19)

Grease, electrically conductive (WP 0163, Item 20)

Pan, drain (WP 0163, Item 28)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

References

WP 0039, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ELEMENT**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

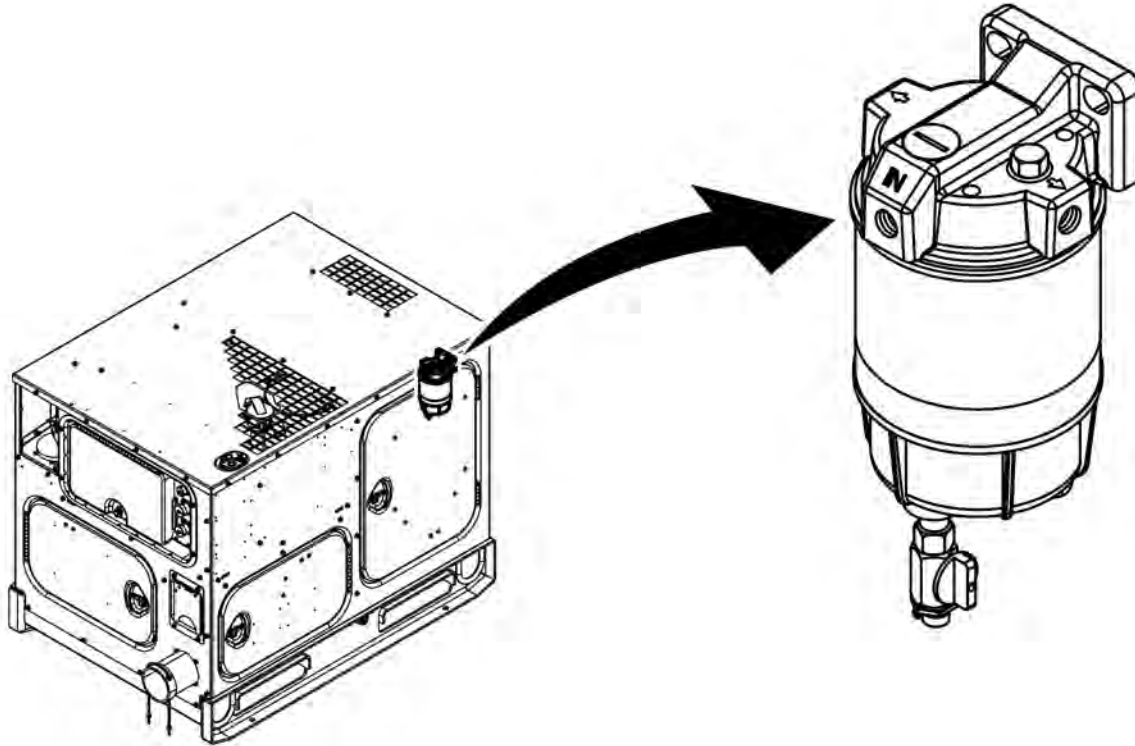
Remove Fuel Filter/Water Separator Element

Figure 1. Fuel Filter/Water Separator — Location.

NOTE

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel filter/water separator element (Figure 1) attached to fuel filter/water separator head on front panel next to right-side door.

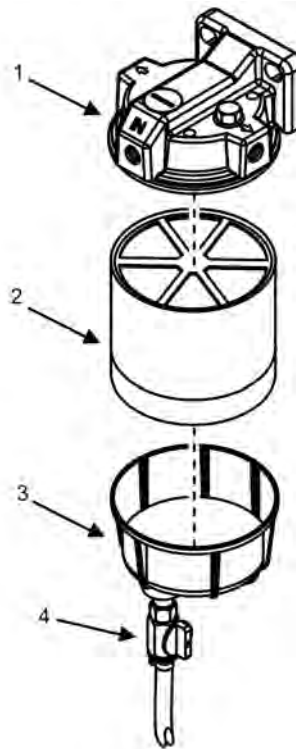


Figure 2. Fuel Filter/Water Separator — Detail.

3. Open drain valve (Figure 2, Item 4) on bottom of water bowl (Figure 2, Item 3).
4. Allow fuel to drain into container until flow stops.
5. Close drain valve (Figure 2, Item 4).
6. Place drain pan and wiping rag under fuel filter/water separator element (Figure 2, Item 2).
7. Remove dirt and debris from area around fuel filter/water separator element (Figure 2, Item 2) to prevent contamination.
8. Rotate fuel filter/water separator element (Figure 2, Item 2) counterclockwise to remove fuel filter/water separator element (Figure 2, Item 2) from fuel filter/water separator head (Figure 2, Item 1) using filter wrench.
9. Remove fuel filter/water separator element (Figure 2, Item 2) and gaskets (not shown) from fuel filter/water separator head (Figure 2, Item 1).
10. Remove any remaining gasket residue from fuel filter/water separator head (Figure 2, Item 1) and water bowl (Figure 2, Item 3).
11. Disconnect water bowl (Figure 2, Item 3) from fuel filter/water separator element (Figure 2, Item 2).
12. Inspect water bowl (Figure 2, Item 3) for cracks, leaks, and other signs of obvious damage. Replace as required or set aside for reuse.
13. Discard fuel filter/water separator element (Figure 2, Item 2) and gaskets (not shown) IAW local SOP.
14. Remove dirt and fuel from gasket mating surface at mounting locations on fuel filter/water separator head (Figure 2, Item 1) and water bowl (Figure 2, Item 3).
15. Discard captured fuel and soiled rags IAW local SOP.

END OF TASK

Install Fuel Filter/Water Separator Element**NOTE**

Wipe down fuel lines, manifold, and fittings with wiping rag prior to installation.

1. Place drain pan under mounting location for fuel filter/water separator element (Figure 2, Item 2).

NOTE

Element gaskets (not shown) are included with fuel filter/water separator element (Figure 2, Item 2).

2. Apply light film of clean diesel fuel to new fuel filter/water separator element gaskets (not shown).
3. Fill new fuel filter/water separator element (Figure 2, Item 2) to level of the mounting threads with approved diesel fuel.
4. Position new fuel filter/water separator element (Figure 2, Item 2) on fuel filter/water separator head (Figure 2, Item 1).
5. Secure water bowl (Figure 2, Item 3) to bottom of fuel filter/water separator element (Figure 2, Item 2).
6. Rotate fuel filter/water separator element (Figure 2, Item 2) clockwise until gasket makes contact with fuel filter/water separator head (Figure 2, Item 1).
7. Rotate fuel filter/water separator element (Figure 2, Item 2) an additional three-fourths of a turn clockwise to secure.
8. Remove fuel catch container from unit. Dispose of captured fuel IAW local SOP.
9. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
10. Purge fuel system (WP 0039, Service Fuel System).
11. Close generator set doors.
12. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
13. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
14. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL HOSES AND CLAMP BANDS

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Line, fuel (1) (WP 0109, Repair Parts List, Figure 11, Item 22)

Line, fuel (1) (WP 0109, Figure 11, Item 23)

Line, fuel (1) (WP 0111, Repair Parts List, Figure 13, Item 19)

Line, fuel (1) (WP 0111, Figure 13, Item 20)

Line, fuel (1) (WP 0111, Figure 13, Item 21)

Line, fuel (1) (WP 0111, Figure 13, Item 22)

Tube, flexible (1) (WP 0155, Repair Parts List, Figure 57, Item 25)

Cap set, protective (WP 0163, Expendable and Durable Items List, Item 8)

Grease, electrically conductive (WP 0163, Item 20)

Pan, drain (WP 0163, Item 28)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Assistant (1)

References

WP 0035, Remove/Install Interior Body Panels

WP 0039, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL FUEL HOSES AND CLAMP BANDS**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

The unit has numerous fuel lines utilizing two attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluids IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

Remove Fuel Hoses with Assembly Attachments**NOTE**

Figure 1 displays the routing of the generator set fuel hoses except for the fuel tank drain valve assembly. Table 1 identifies the name of the fuel hose and the specific equipment conditions required to remove and install the fuel hose.

Table 1. Fuel Hoses — Location.

FIGURE 1 FIND #	HOSE	EQUIPMENT CONDITIONS
1	Auxiliary Fuel Intake Line	Radiator support panel removed (WP 0035, Remove/Install Interior Body Panels)
2	Auxiliary Fuel Vent Line	Radiator support panel removed (WP 0035, Remove/Install Interior Body Panels)
3	Fuel Return Engine Line	Right-side door opened
4	Fuel Supply Line	Rear and right-side doors opened
5	Heater Hose	Right-side door opened
6	Fuel Supply Engine Line	Right-side door opened
7	Drain Hose	Right-side door opened
8	Fuel Return Line	Right-side door opened Radiator support panel removed (WP 0035, Remove/Install Interior Body Panels)

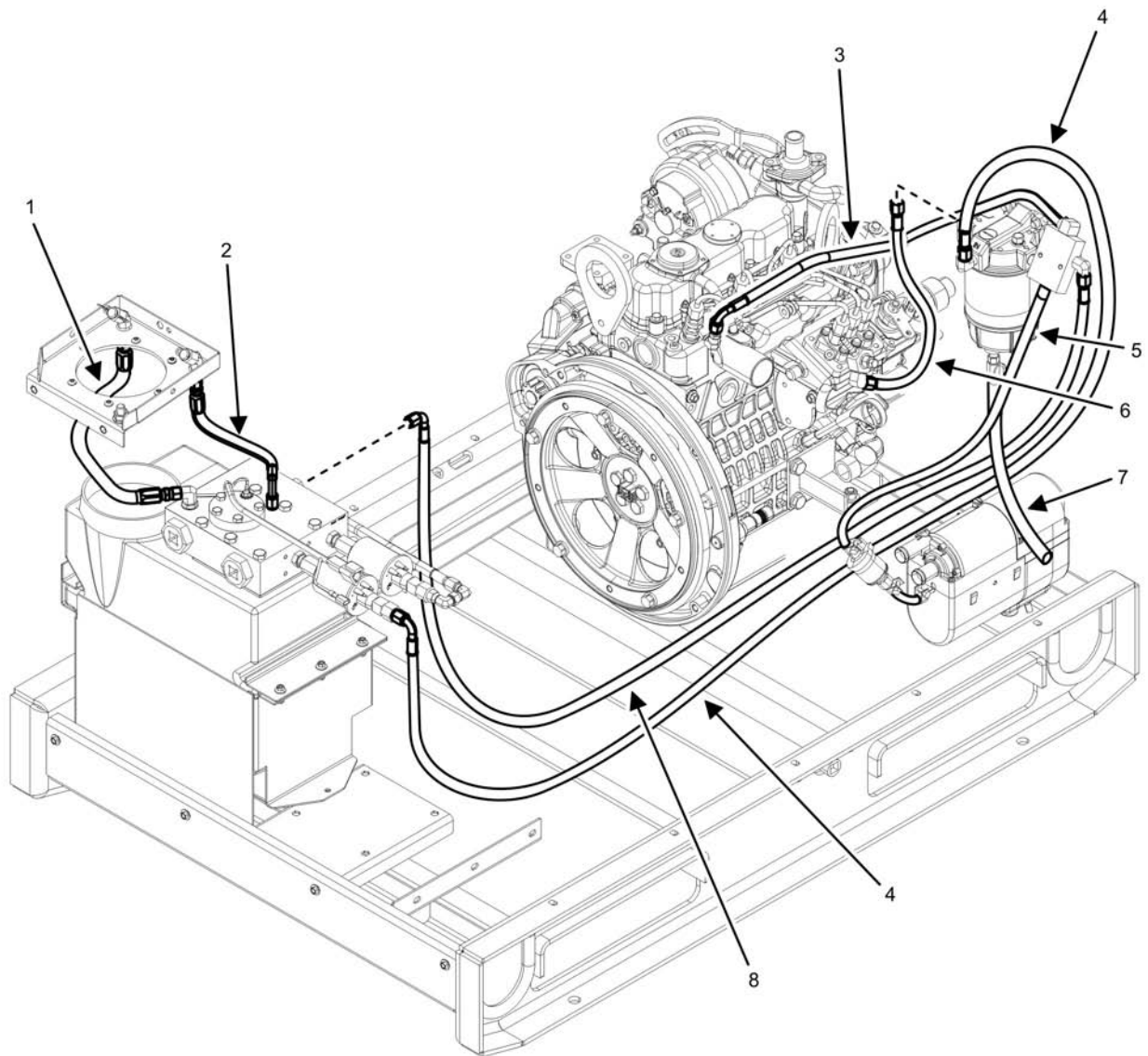


Figure 1. Fuel Hoses — Location.

NOTE

Unit has numerous fuel lines utilizing two attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluids IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

1. Ensure equipment conditions are met in order presented in initial setup and Table 1.
2. Locate fuel line to be removed (Figure 1).

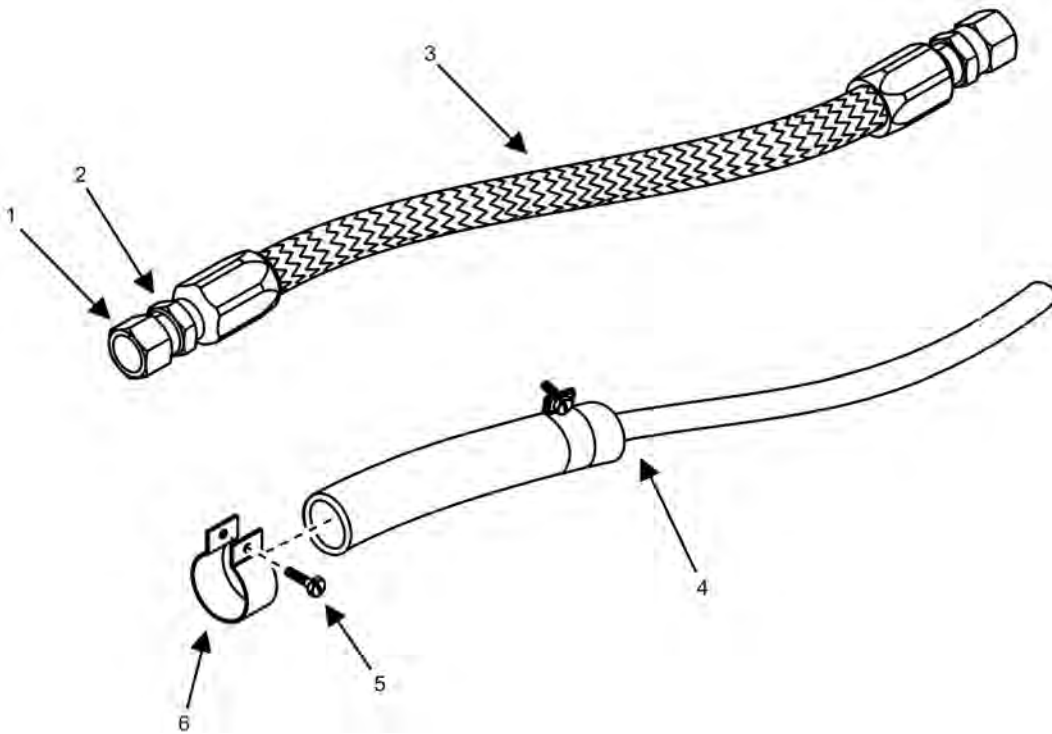


Figure 2. Fuel Hoses.

3. Place suitable catch container and wiping rags under fuel line (Figure 2, Item 3) to catch spilled fuel.
4. Place a suitable wrench on fuel line fitting (Figure 2, Item 1) on fuel line (Figure 2, Item 3).
5. Place a suitable wrench on fuel line lock fitting (Figure 2, Item 2).
6. Loosen fuel line fitting (Figure 2, Item 1) from device using wrenches on fuel line fittings (Figure 2, Items 1 and 2).
7. Remove fuel line (Figure 2, Item 3) from device.
8. Repeat steps 3 through 7 on opposite end of fuel line (Figure 2, Item 3).
9. Remove fuel line (Figure 2, Item 3) from unit.
10. Inspect fuel line (Figure 2, Item 3) for frayed edges, cracks, and other obvious signs of damage and replace as required.

END OF TASK

Install Fuel Hoses with Assembly Attachments**NOTE**

The unit has numerous fuel lines utilizing two attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluid IAW local SOP. Remove cap/plug from fuel lines/fittings before installation.

Wipe down fuel line, pump, and fittings with wiping rag prior to installation.

1. Place suitable catch container and wiping rag under work area to catch spilled fuel.
2. Remove caps/plugs from fuel lines/fittings.
3. Position fuel line fitting (Figure 2, Item 1) onto fixture.
4. Screw fuel line fitting (Figure 2, Item 1) to fixture and finger-tighten.
5. Place a suitable wrench on fuel line fitting (Figure 2, Item 1).
6. Place a suitable wrench on fuel line lock fitting (Figure 2, Item 2).
7. Tighten fuel line fitting (Figure 2, Item 1) on device.
8. Repeat steps 1 through 7 on opposite end of fuel line.
9. Remove fuel catch container from unit.
10. Install radiator support panel if removed (WP 0035, Remove/Install Interior Body Panels).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Purge fuel system (WP 0039, Service Fuel System).
13. Close all generator set doors.
14. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
15. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
16. Repair as required.

END OF TASK**Remove Fuel Hose with Clamp Bands****NOTE**

The unit has numerous fuel lines utilizing two attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluid IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

Winterization kit is optional for AMMPS. Removal of heater fuel hose is only necessary if winterization kit is installed in unit.

1. Ensure equipment conditions are met in order presented in initial setup and Table 1.
2. Locate fuel line or hose (Figure 1).
3. Place suitable catch container and wiping rag under work area to catch spilled fuel.

4. Loosen screw (Figure 2, Item 5).
5. Slide clamp band (Figure 2, Item 6) away from fitting.
6. Remove fuel line or hose (Figure 2, Item 4) from fitting.
7. Repeat steps 3 through 6 on opposite end of fuel hose assembly.
8. Remove fuel line or hose (Figure 2, Item 4) from unit.
9. Inspect clamp bands (Figure 2, Item 6) for excessive corrosion and other signs of obvious damage and replace as required.
10. Inspect fuel line or hose (Figure 2, Item 4) for frayed edges, cracks, and other obvious signs of damage and replace as required.

END OF TASK

Install Fuel Hose with Clamp Bands

NOTE

The unit has numerous fuel lines utilizing two attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluid IAW local SOP. Capture and dispose of spilled fluid IAW local SOP.

Wipe down hose, parts, and connectors with wiping rag prior to installation.

Winterization kit is optional for AMMPS. Installation of heater fuel hose is only necessary if winterization kit is installed in unit.

1. Place suitable catch container under work area to catch spilled fuel.
2. Install fuel line or hose (Figure 2, Item 4) to fitting.
3. Slide and position clamp band (Figure 2, Item 6) on fuel line or hose (Figure 2, Item 4)
4. Tighten clamp band screw (Figure 2, Item 5) over fuel line or hose (Figure 2, Item 4) and fitting.
5. Repeat steps 1 through 4 on opposite end of fuel line or hose assembly.
6. Remove fuel catch container from unit.
7. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
8. Purge fuel system (WP 0039, Service Fuel System).
9. Close all generator set doors.
10. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
11. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
12. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL LEVEL SENSOR

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Seal, O-ring (WP 0110, Repair Parts List, Figure 12, Item 2)

Sensor, fuel level (WP 0110, Figure 12, Item 3)

Washer, lock 1/4 external tooth (WP 0109, Repair Parts List, Figure 11, Item 16)

Cap set, protective (WP 0163, Expendable and Durable Items List, Item 8)

Cleaning compound, solvent (WP 0163, Item 10)

Fuel, diesel (WP 0163, Item 19)

Grease, electrically conductive (WP 0163, Item 20)

Pan, drain (WP 0163, Item 28)

Primer, sealing compound (WP 0163, Item 30)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

WP 0039, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Radiator support panel removed (WP 0035, Remove/Install Interior Body Panels)

REMOVE/INSTALL FUEL LEVEL SENSOR**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug all openings to prevent dirt and debris from entering the fuel system.

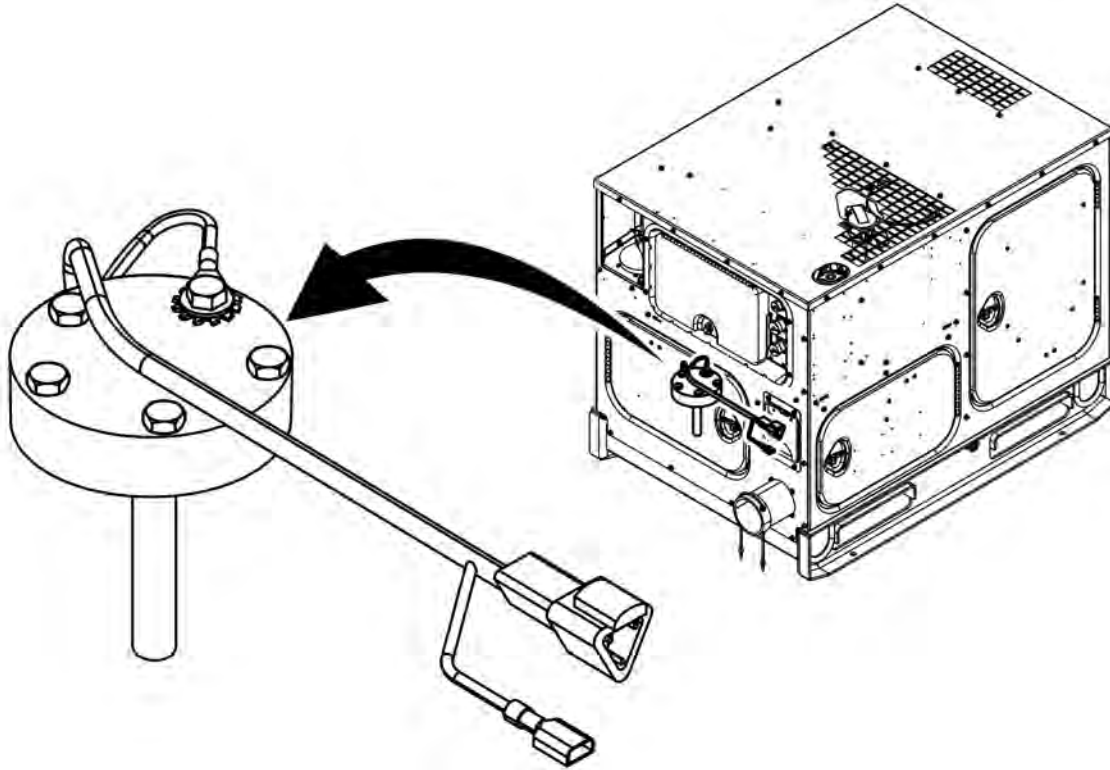
Remove Fuel Level Sensor

Figure 1. Fuel Level Sensor — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel level sensor (Figure 1) on top of fuel tank manifold (Figure 2, Item 6).
3. Disconnect fuel level sensor electrical leads (Figure 2, Item 5) from wiring harness (not shown).
4. Remove dirt and debris from around fuel level sensor (Figure 2, Item 1).
5. Remove five machine screws (Figure 2, Item 3) and one external tooth lock washer (Figure 2, Item 4) securing fuel level sensor (Figure 2, Item 1) to top of fuel tank manifold (Figure 2, Item 6).

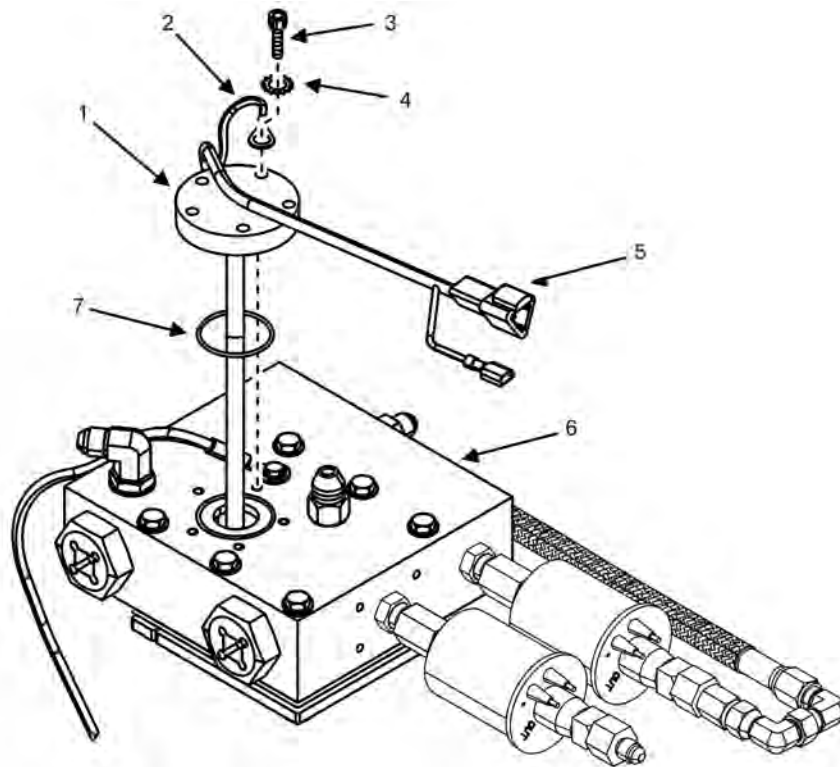


Figure 2. Fuel Level Sensor — Detail.

NOTE

Use care during removal to prevent loss of any parts, such as the fuel level sensor (Figure 2, Item 1) and O-ring (Figure 2, Item 7).

Note orientation of fuel level sensor (Figure 2, Item 1) prior to removal to aid in installation.

6. Remove fuel level sensor (Figure 2, Item 1) and O-ring (Figure 2, Item 7) from fuel tank manifold (Figure 2, Item 6). Discard O-ring (Figure 2, Item 7).

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

7. Clean fuel tank manifold (Figure 2, Item 6) of O-ring residue using dry cleaning solvent and wiping rag.
8. Cover fuel tank manifold (Figure 2, Item 6) opening to prevent dirt and debris from entering fuel system.

END OF TASK

Inspect Fuel Level Sensor

1. Inspect fuel level sensor (Figure 2, Item 1) for cracks and other signs of obvious damage. Replace as required.

2. Inspect fuel level sensor electrical leads (Figure 2, Item 5) for cut/broken wire or worn insulation. Replace fuel level sensor (Figure 2, Item 1) if wires are cut or broken or if insulation is excessively worn.

END OF TASK**Install Fuel Level Sensor****NOTE**

Wipe down fuel level sensor (Figure 2, Item 1) and fuel tank manifold (Figure 2, Item 6) with wiping rag prior to installation.

1. Remove all dirt, debris, and old gasket residue from fuel level sensor (Figure 2, Item 1) mounting area on fuel tank manifold (Figure 2, Item 6).
2. Lubricate new O-ring (Figure 2, Item 7) with clean diesel fuel and install to fuel tank manifold (Figure 2, Item 6).

NOTE

Apply a thin coat of electrically conductive grease to mounting surface between fuel tank manifold (Figure 2, Item 6) and fuel level sensor (Figure 2, Item 1).

3. Position fuel level sensor (Figure 2, Item 1) on fuel tank manifold (Figure 2, Item 6) in proper orientation.

NOTE

Follow all manufacturer instructions for primer and sealant application.

4. Apply primer and sealant to five machine screws (Figure 2, Item 3).

NOTE

One of the five machine screws (Figure 2, Item 3) also secures ground wire (Figure 2, Item 2) with external tooth lock washer (Figure 2, Item 4).

5. Install five machine screws (Figure 2, Item 3), one external tooth lock washer (Figure 2, Item 4), and ground wire (Figure 2, Item 2).
6. Connect fuel level sensor electrical leads (Figure 2, Item 5) to unit wiring harness at connector (not shown).
7. Tighten screws to 11 – 13 in/lb (1 Nm).
8. Install radiator support panel (WP 0035, Remove/Install Interior Body Panels).
9. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
10. Purge fuel system (WP 0039, Service Fuel System).
11. Dispose of spilled fuel IAW local SOP.
12. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
13. Start engine and check for proper operation (TM 9-6115-749-10).
14. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL TANK

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)
Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Fitting, bulkhead, 1/4-18 NPT port (WP 0109, Repair Parts List, Figure 11, Item 37)
Gasket, fuel system (1) (WP 0109, Figure 11, Item 49)
Tank, fuel 5 kW (WP 0109, Figure 11, Item 36)
Alcohol, denatured (WP 0163, Expendable and Durable Items List, Item 1)
Cap set, protective (WP 0163, Item 8)
Detergent, general purpose (WP 0163, Item 16)
Fuel, diesel (WP 0163, Item 19)
Pan, drain (WP 0163, Item 28)
Rag, wiping (WP 0163, Item 31)
Sealant (WP 0163, Item 32)

Personnel Required

91D (1)
Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Drained fuel tank (WP 0039, Service Fuel System)
Fuel tank filler neck removed (WP 0048, Remove/Install Fuel Tank Filler Neck)
Radiator support panel removed (WP 0035, Remove/Install Interior Body Panels)
Fuel manifold removed (WP 0040, Remove/Install Fuel Manifold)

REMOVE/INSTALL FUEL TANK

WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Fuel Tank

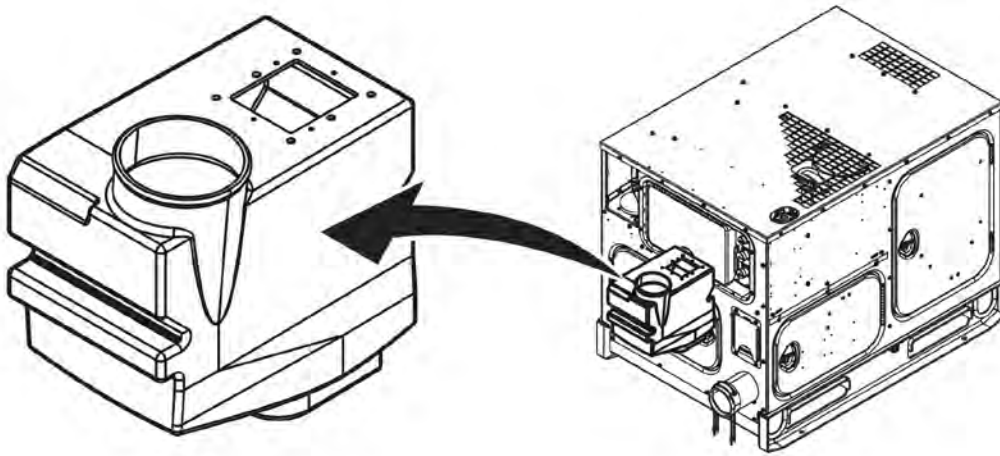


Figure 1. Fuel Tank — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel tank (Figure 1).

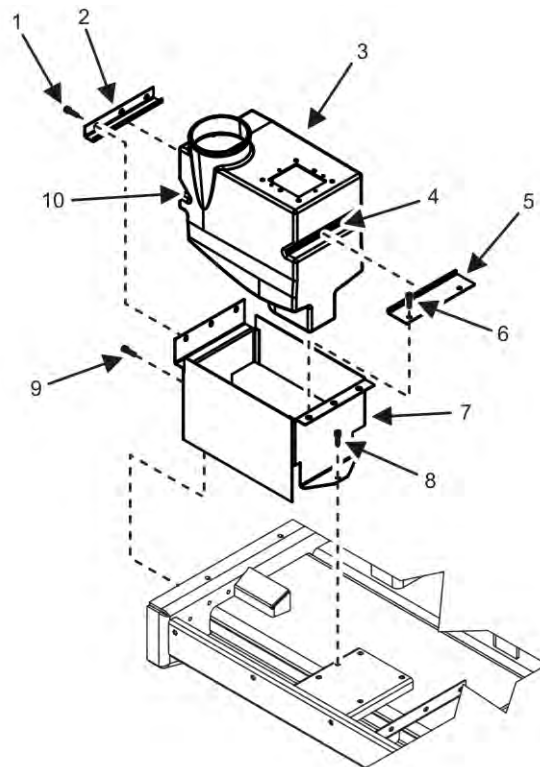


Figure 2. Fuel Tank Mounting Brackets.

NOTE

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

3. Locate mounting brackets (Figure 2, Items 2 and 5) on left and right sides of fuel tank (Figure 2, Item 3) that secure fuel tank to fuel tank support (Figure 2, Item 7).
4. Remove three hex flange screws (Figure 2, Item 1) from left-side mounting bracket (Figure 2, Item 2).
5. Remove three hex flange screws (Figure 2, Item 6) from right-side mounting bracket (Figure 2, Item 5).
6. Remove mounting brackets (Figure 2, Items 2 and 5) and save for reuse.
7. Inspect mounting brackets (Figure 2, Items 2 and 5) and hardware for damage, and replace as required.
8. Remove three screws (Figure 2, Item 9) that attach fuel tank support (Figure 2, Item 7) to unit skid.
9. Remove screw (Figure 2, Item 8) that secures fuel tank support (Figure 2, Item 7) to relay panel mount.
10. Lift fuel tank (Figure 3, Item 1) and fuel tank support (Figure 3, Item 2) to gain access to bulkhead fitting (Figure 3, Item 5) and elbow (Figure 3, Item 3) of fuel drain line assembly.
11. Ensure drain ball valve (Figure 3, Item 4) is closed.
12. Remove elbow (Figure 3, Item 3) from bulkhead fitting (Figure 3, Item 5).
13. Remove fuel tank (Figure 3, Item 1) and fuel tank support (Figure 3, Item 2) from unit.
14. Remove fuel tank (Figure 3, Item 1) from fuel tank support (Figure 3, Item 2) and place on suitable work surface.

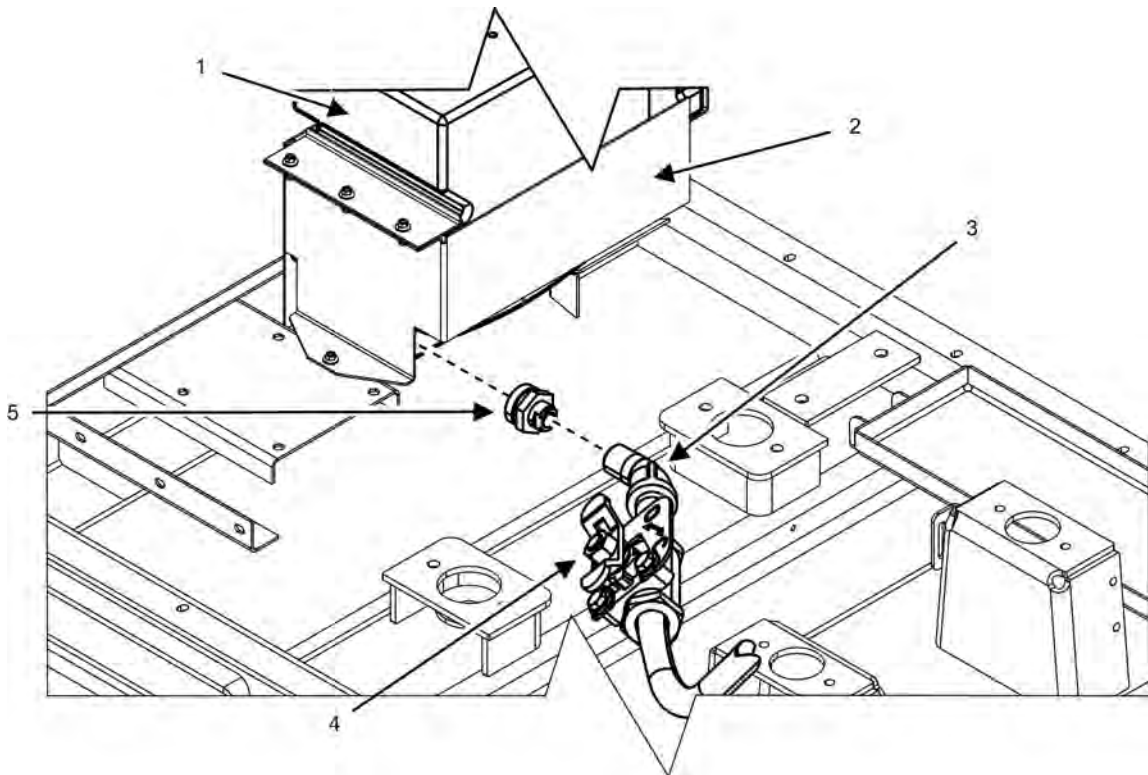


Figure 3. Fuel Tank Drain Line.

NOTE

Bulkhead fitting (Figure 3, Item 5) is left-handed threaded.

15. Remove bulkhead fitting (Figure 3, Item 5) (left-handed thread) from fuel tank (Figure 3, Item 1) and discard.
16. Inspect fuel tank support (Figure 3, Item 2) for damage and replace as required.

END OF TASK**Inspect Fuel Tank**

1. Inspect fuel tank (Figure 3, Item 1) for damage, leaks, or cracks.
2. Replace fuel tank (Figure 3, Item 1) if damaged, leaking, or cracked.

END OF TASK**Clean Fuel Tank**

1. Place suitable container under the fuel tank (Figure 4, Item 2).
2. Cap/plug fuel tank outlet (Figure 4, Item 3).
3. Drain any residual fuel.
4. Fill the fuel tank (Figure 4, Item 2) to three-fourths capacity with solution of 16 oz general purpose detergent and 1 gal water through the fuel filler neck opening (Figure 4, Item 1).
5. Agitate fuel tank (Figure 4, Item 2) manually for 10 min.

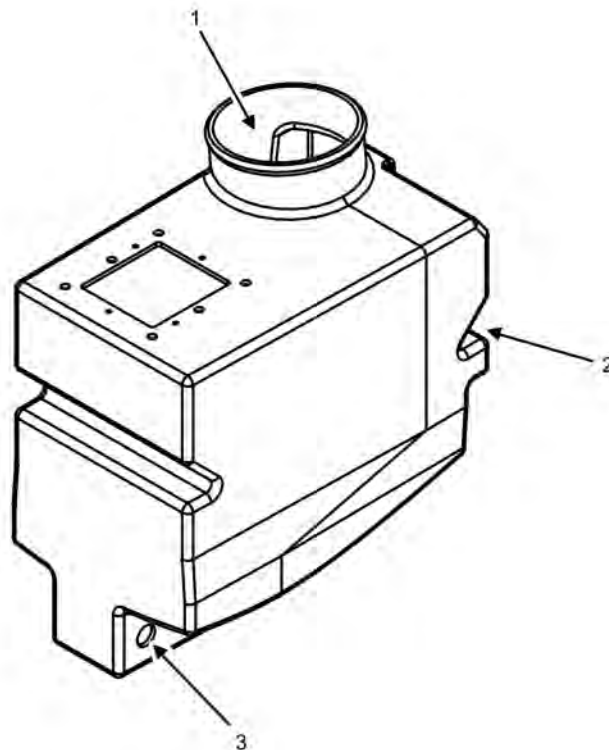


Figure 4. Clean Fuel Tank.

6. Turn fuel tank (Figure 4, Item 2) upside down and drain solution through fuel filler neck opening (Figure 4, Item 1).
7. Fill fuel tank (Figure 4, Item 2) to three-fourths full capacity with clean water through fuel filler neck opening (Figure 4, Item 1).
8. Agitate fuel tank (Figure 4, Item 2) manually for 10 min.
9. Turn fuel tank (Figure 4, Item 2) upside down and drain water through fuel filler neck opening (Figure 4, Item 1).
10. Pour 16 oz denatured alcohol into fuel tank (Figure 4, Item 2) through fuel filler neck opening (Figure 4, Item 1).
11. Distribute alcohol over interior of fuel tank (Figure 4, Item 2) by manual rotation.
12. Remove cap/plug from fuel tank outlet (Figure 4, Item 3).
13. Drain any remaining alcohol through fuel tank outlet (Figure 4, Item 3).
14. Allow fuel tank (Figure 4, Item 2) to dry for 2 hr.

END OF TASK

Install Fuel Tank

NOTE

Wipe down lines, parts, and fittings with wiping rag prior to installation.

1. Install new bulkhead fitting (Figure 3, Item 5) to fuel tank (Figure 3, Item 1).
2. Secure bulkhead fitting (Figure 3, Item 5) to torque value 35 – 44 in/lb (4 – 5 Nm).
3. Position fuel tank (Figure 3, Item 1) in fuel tank support (Figure 3, Item 2).

NOTE

Thread pipe sealant must cure for 30 min before exposure to fuel and 72 hr for full strength.

4. Apply sealant to both threads of elbow (Figure 3, Item 3).
5. Install elbow (Figure 3, Item 3) of fuel drain line assembly to bulkhead fitting (Figure 3, Item 5).
6. Position fuel tank (Figure 3, Item 1) and fuel tank support (Figure 3, Item 2) to mounting location in unit.
7. Install three screws (Figure 2, Item 9) that secure fuel tank support (Figure 2, Item 7) to unit skid.
8. Install screw (Figure 2, Item 8) that secures fuel tank support (Figure 2, Item 7) to relay panel mount.
9. Position left-side mounting bracket (Figure 2, Item 2) to left-side fuel tank (Figure 2, Item 10).
10. Install three hex flange screws (Figure 2, Item 1) to left-side mounting bracket (Figure 2, Item 2). Tighten to 86 – 106 in/lb (10 – 12 Nm).
11. Position right-side mounting bracket (Figure 2, Item 5) on right-side fuel tank (Figure 2, Item 4).
12. Install three hex flange screws (Figure 2, Item 6) to right-side mounting bracket (Figure 2, Item 5). Tighten to 86 – 106 in/lb (10 – 12 Nm).
13. Install fuel manifold (WP 0040, Remove/Install Fuel Manifold).
14. Install fuel tank filler neck (WP 0048, Remove/Install Fuel Tank Filler Neck).
15. Install radiator support panel (WP 0035, Remove/Install Interior Body Panels).
16. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).

NOTE

To close drain ball valve (Figure 3, Item 4), rotate valve handle one-fourth turn so the handle aligns with drain line.

17. Ensure that drain ball valve (Figure 3, Item 4) is closed.

WARNING

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

18. Add a small amount of fuel to fuel tank (Figure 3, Item 1) for test after pipe thread sealant has cured.
19. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).

WARNING

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

20. Start engine and check for fuel leaks and proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
21. Stop engine, repair any leaks, and then start engine again to check leak repairs. Repeat as needed until all leaks have been repaired.
22. Close generator set doors.
23. Fill fuel tank to proper level (WP 0039, Service Fuel System).
24. Purge fuel system (WP 0039, Service Fuel System).
25. Dispose of captured fuel and soiled cleaning rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL TANK DRAIN VALVE ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard (WP 0162, Table 2, Item 12)

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Connector, tube bulkhead, 1/2-20 inch JIC flare (WP 0109, Repair Parts List, Figure 11, Item 42)

Elbow pipe (1) (WP 0109, Figure 11, Item 38)

Fitting bulkhead, 1/4-18 NPT port (1) (WP 0109, Figure 11, Item 37)

Fitting, pipe nipple 1/4 inch NPT x 50.8 mm long (1) (WP 0109, Figure 11, Item 39)

Fitting, tube elbow 1/4-NPT x 1/2-20 (1) (WP 0109, Figure 11, Item 41)

Line, fuel (1) (WP 0109, Figure 11, Item 43)

Valve, ball 1/4 female NPT (1) (WP 0109, Figure 11, Item 40)

Washer, lock (M6) (2) (WP 0109, Figure 11, Item 45)

Materials/Parts

Cap set, protective (WP 0163, Expendable and Durable Items, Item 8)

Fuel, diesel (WP 0163, Item 18)

Grease, electrically conductive (WP 0163, Item 20)

Pan, drain (WP 0163, Item 28)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Fuel tank removed (WP 0046, Remove/Install Fuel Tank)

REMOVE/INSTALL FUEL TANK DRAIN VALVE ASSEMBLY**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Fuel Tank Drain Valve Assembly**NOTE**

Removal of the fuel tank requires the disconnection of the fuel tank drain valve assembly (Figure 1) from the fuel tank at pipe elbow (Figure 2, Item 2) and bulkhead fitting (Figure 2, Item 1). Fuel tank must be removed and disconnected from fuel tank drain valve assembly prior to beginning this task (WP 0046, Remove/Install Fuel Tank).

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel tank drain valve assembly (Figure 1).

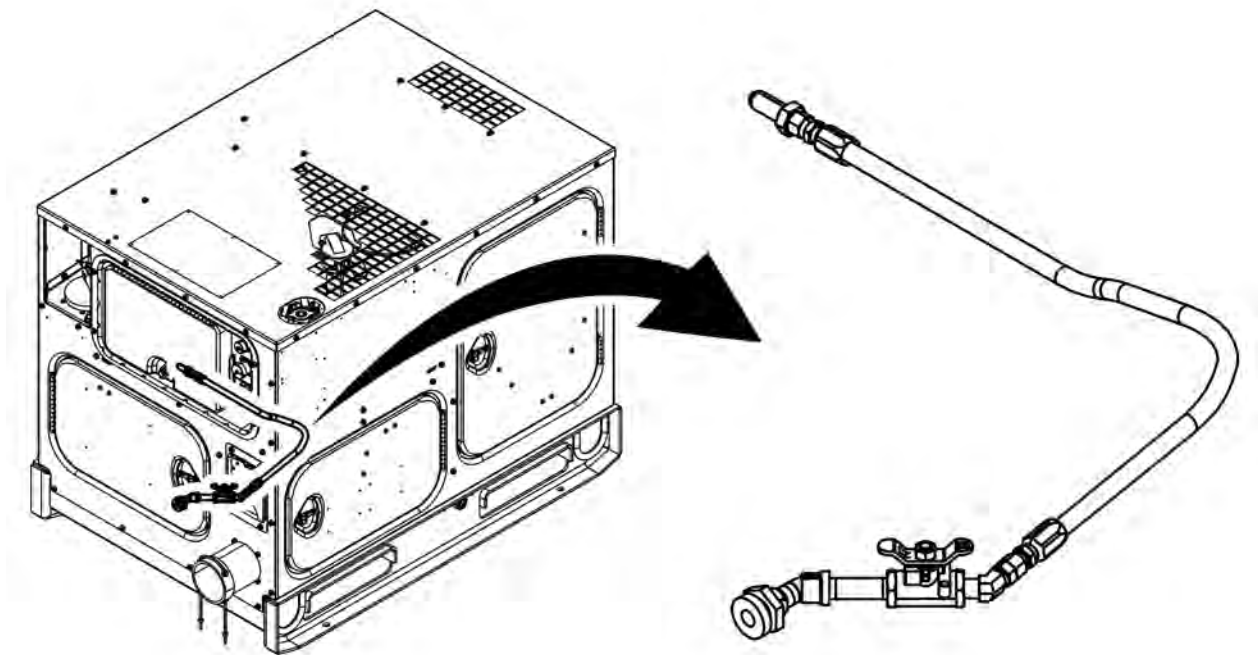


Figure 1. Fuel Tank Drain Valve Assembly — Location.

-
3. Remove any dirt and debris from around fuel drain outlet (Figure 2, Item 7).

NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

4. Remove fuel drain cap (Figure 2, Item 9) from fuel drain outlet (Figure 2, Item 7).
5. Disconnect fuel drain cap (Figure 2, Item 9) chain (not shown) from flange head screw (not shown) on unit skid.

NOTE

Note orientation of elbow fittings and ball valve before removal to aid in installation.

6. Remove nut (Figure 2, Item 8) securing fuel drain outlet (Figure 2, Item 7) to left-side skid.
7. Remove fuel tank drain valve assembly (Figure 1) from unit and place on suitable work surface.
8. Disconnect fuel drain outlet (Figure 2, Item 7) from fuel line (Figure 2, Item 6).
9. Disconnect fuel line (Figure 2, Item 6) from tube elbow fitting (Figure 2, Item 5).

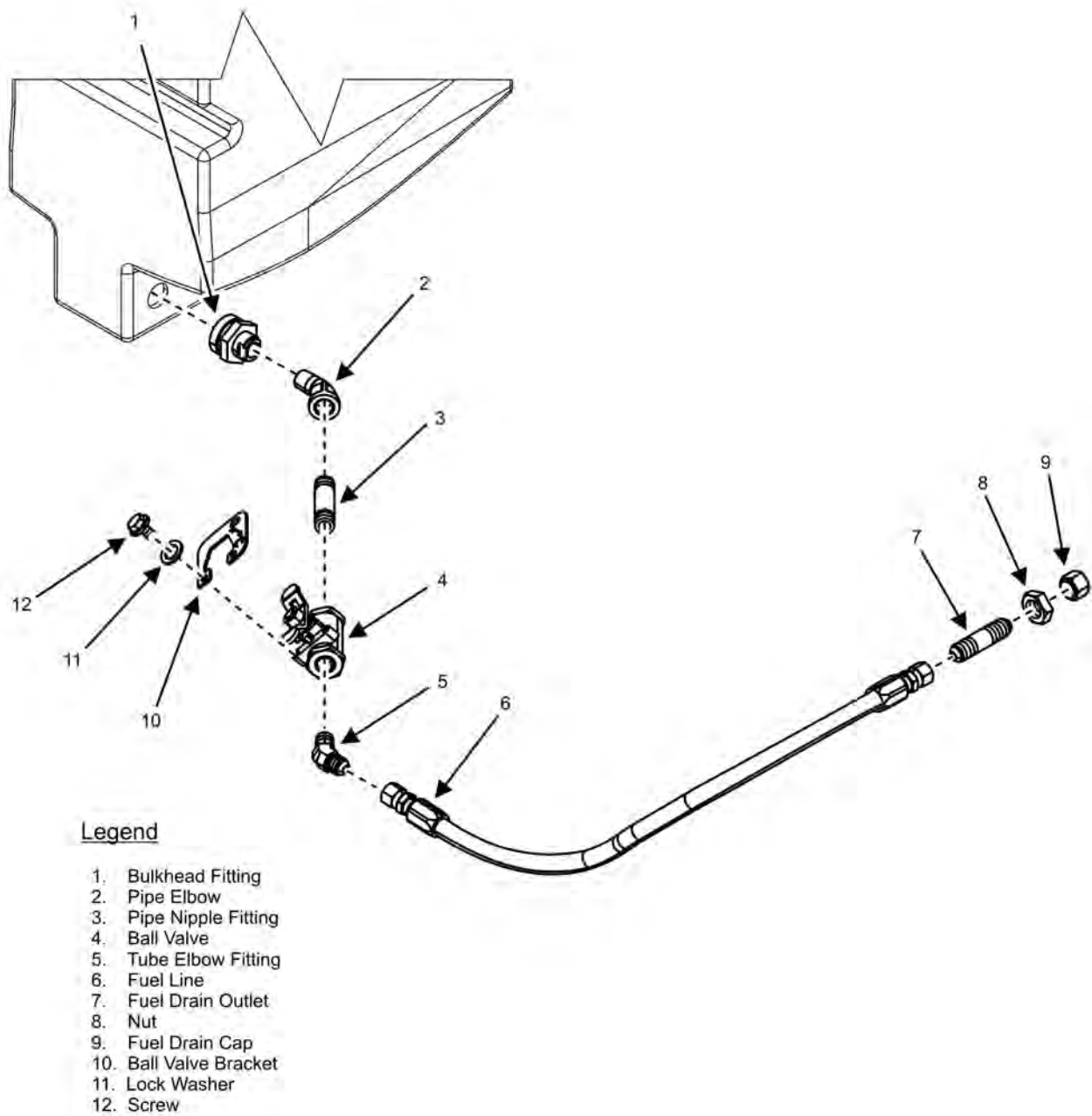


Figure 2. Fuel Tank Drain Valve — Detail.

10. Disconnect tube elbow fitting (Figure 2, Item 5) from ball valve (Figure 2, Item 4).
11. Disconnect ball valve (Figure 2, Item 4) from pipe nipple fitting (Figure 2, Item 3).
12. Disconnect pipe nipple fitting (Figure 2, Item 3) from pipe elbow (Figure 2, Item 2).
13. Remove two screws (Figure 2, Item 12) and two lock washers (Figure 2, Item 11) securing ball valve bracket (Figure 2, Item 10) to ball valve (Figure 2, item 4).
14. Discard lock washers (Figure 2, Item 11).
15. Place fuel drain assembly parts on suitable work surface.

END OF TASK

Inspect Fuel Tank Drain Valve Assembly

1. Inspect fuel drain outlet (Figure 2, Item 7) for cracks, worn threads, excessive corrosion, and other signs of obvious damage. Replace as required.
2. Inspect nut (Figure 2, Item 8) for worn threads, excessive corrosion, and other signs of obvious damage. Replace as required.
3. Inspect fuel line (Figure 2, Item 6) for frayed cover, cracks, kinks, and other signs of obvious damage. Replace as required.
4. Inspect tube elbow fitting (Figure 2, Item 5) for worn threads, excessive corrosion, cracks, and other signs of obvious damage. Replace as required.
5. Inspect ball valve (Figure 2, Item 4) for cracks, broken/damaged handle, restricted handle movement, excessive corrosion, and other signs of obvious damage. Replace as required.
6. Inspect pipe nipple fitting (Figure 2, Item 3) for worn threads, excessive corrosion, and other signs of obvious damage. Replace as required.
7. Inspect pipe elbow (Figure 2, Item 2) for worn threads, excessive corrosion, and other signs of obvious damage. Replace as required.
8. Inspect fuel drain cap (Figure 2, Item 9) and chain for cracks, excessive corrosion, and other signs of obvious damage. Replace as required.
9. Inspect bulkhead fitting (Figure 2, Item 1) for worn threads, excessive corrosion, and other signs of obvious damage. Replace as required.

END OF TASK

Install Fuel Tank Drain Valve Assembly

NOTE

Wipe down fuel line, parts, and fittings with wiping rag prior to installation.

1. Position ball valve bracket (Figure 2, Item 10) over ball valve (Figure 2, Item 4).
2. Secure ball valve bracket (Figure 2, Item 10) to ball valve (Figure 2, Item 4) with two screws (Figure 2, Item 12) and two new lock washers (Figure 2, Item 11).
3. Install fuel drain outlet (Figure 2, Item 7) to fuel line (Figure 2, Item 6). Tighten line to 151 – 185 in/lb (17 – 21 Nm).

NOTE

Thread pipe sealant must cure for 30 min before exposure to fuel and 72 hr for full strength.

4. Apply sealant to both threads of tube elbow fitting (Figure 2, Item 5).
5. Install tube elbow fitting (Figure 2, Item 5) to fuel line (Figure 2, Item 6). Tighten line to 151 – 185 in/lb (17 – 21 Nm).
6. Install ball valve (Figure 2, Item 4) to tube elbow fitting (Figure 2, Item 5). Tighten ball valve (Figure 2, Item 4) 1 – 1 1/2 turns past finger-tight.
7. Apply sealant to both threads of pipe nipple fitting (Figure 2, Item 3).
8. Install pipe nipple fitting (Figure 2, Item 3) to ball valve (Figure 2, Item 4). Tighten pipe nipple fitting (Figure 2, Item 3) 1 – 1 1/2 turns past finger-tight.
9. Apply sealant to male threads of pipe elbow (Figure 2, Item 2).
10. Install pipe elbow (Figure 2, Item 2) to pipe nipple fitting (Figure 2, Item 3). Tighten pipe elbow (Figure 2, Item 2) 1 – 1 1/2 turns past finger-tight.
11. Install fuel tank to secure fuel drain assembly to fuel tank (WP 0046, Remove/Install Fuel Tank).
12. Install fuel drain outlet (Figure 2, Item 7) through unit skid.
13. Secure fuel drain outlet (Figure 2, Item 7) to skid with nut (Figure 2, Item 8).
14. Install fuel drain cap (Figure 2, Item 9) to fuel drain outlet (Figure 2, Item 7).
15. Secure fuel drain cap (Figure 2, Item 9) chain (not shown) to screw (not shown) on left-side of unit skid.
16. Ensure ball valve (Figure 2, Item 4) is in closed position.
17. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
18. Purge fuel system (WP 0039, Service Fuel System).
19. Close generator set doors.
20. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
21. Start engine and check for fuel leaks and proper operation (TM 9-6115-749-10).
22. Repair as required.
23. Dispose of captured fuel and soiled wiping rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL TANK FILLER NECK

INITIAL SETUP:**Tools and Special Tools**

Hammer, Hand, Soft Face, Dead Blow (WP 0162, Table 2, Item 14)
Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)
Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Clamp (2) (WP 0109, Repair Parts List, Figure 11, Item 20)
Coupling, hose (WP 0109, Figure 11, Item 21)
Module, fuel filler neck (WP 0109, Figure 11, Item 24)
Tube, fuel fill (WP 0109, Figure 11, Item 25)
Washer, lock 1/4 external tooth (WP 0109, Figure 11, Item 16)
Washer, lock M10 external tooth (WP 0109, Figure 11, Item 27)
Cap set, protective (WP 0163, Expendable and Durable Items List, Item 8)

Materials/Parts

Fuel, diesel (WP 0163, Item 19)
Pan, drain (1) (WP 0163, Item 28)
Rag, wiping (WP 0163, Item 31)
Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)
Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)
Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)
Fuel tank drained to half capacity (WP 0039, Service Fuel System)

REMOVE/INSTALL FUEL FILLER NECK**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

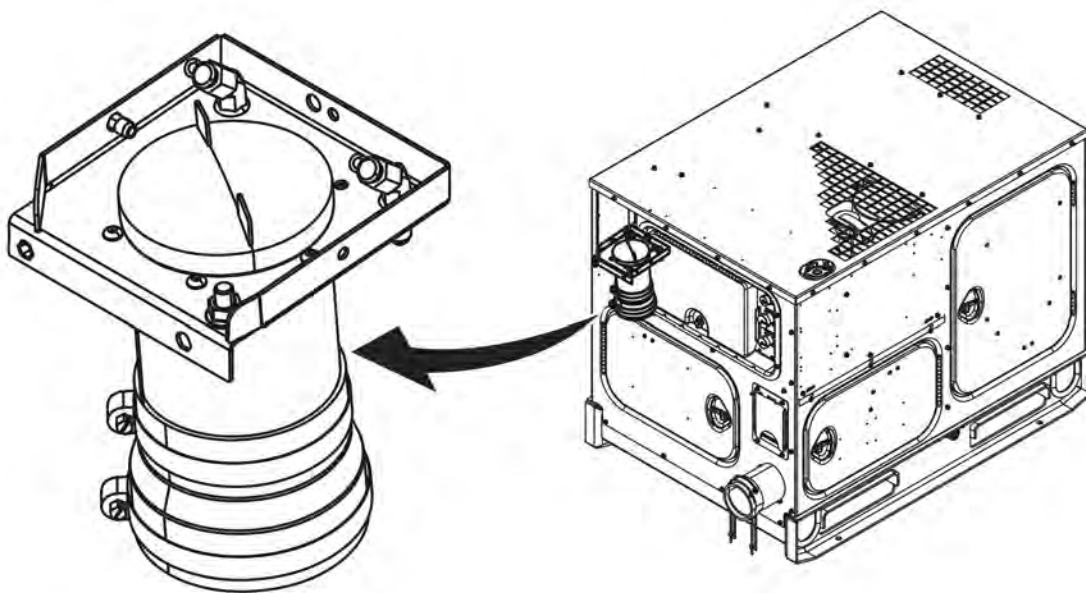
Remove Fuel Filler Neck

Figure 1. Fuel Tank Filler Neck — Location.

1. Ensure equipment conditions are met in order presented in initial setup.

NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system

Note orientation of fuel cap before removal to aid in installation.

2. Locate fuel filler neck on located on top of fuel tank (Figure 1).

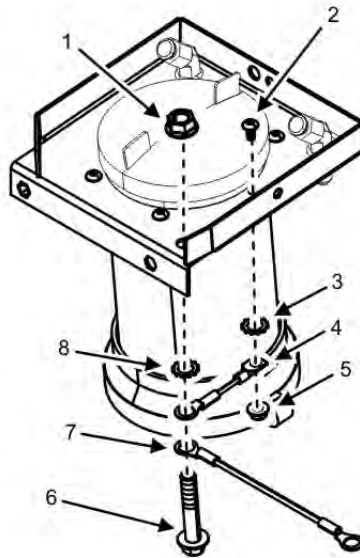


Figure 2. Fuel Filler Neck Ground Cable — Removal.

3. Remove screw (Figure 2, Item 6), external tooth lock washer (Figure 2, Item 8), and nut (Figure 2, Item 1) that secure ground cables (Figure 2, Items 4 and 7) to fuel system bracket.
4. Discard external tooth lock washer (Figure 2, Item 8).

NOTE

One of six screws securing fuel filler neck to fuel system bracket also secures ground wire cable to fuel system bracket.

5. Remove cap screw (Figure 2, Item 2), external tooth lock washer (Figure 2, Item 3), and nut (Figure 2, Item 5) that secure ground cable (Figure 2, Item 4) to fuel system bracket.
6. Discard external tooth lock washer (Figure 2, Item 3).
7. Inspect ground cables (Figure 2, Items 4 and 7) for damage and replace as required.

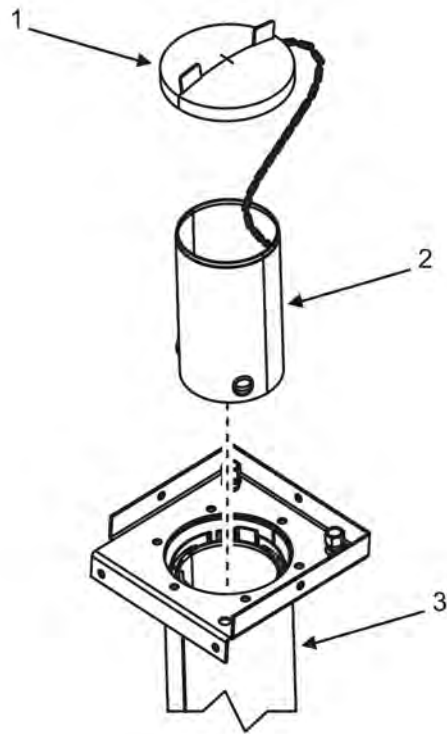


Figure 3. Fuel Filler Cap and Strainer — Removal.

8. Remove fuel filler cap (Figure 3, Item 1) and strainer (Figure 3, Item 2) from fuel filler neck (Figure 3, Item 3).
9. Inspect fuel filler cap (Figure 3, Item 1) and chain for damage. Replace as required or set aside for reuse.
10. Inspect fuel strainer (Figure 3, Item 2) for damage. Replace as required or set aside for reuse.
11. Cover opening in fuel filler neck (Figure 3, Item 3) to prevent dirt and debris from entering fuel system.

NOTE

Two wrenches may be required to disconnect auxiliary fuel lines. Tag and mark lines for proper reinstallation.

12. Disconnect auxiliary fuel intake line (Figure 4, Item 6) from fuel system bracket (Figure 4, Item 2). Cap/plug line to prevent dirt and debris from entering fuel system.
13. Remove two screws (Figure 4, Item 3) securing edges of fuel system bracket (Figure 4, Item 2) to interior panels of generator set.

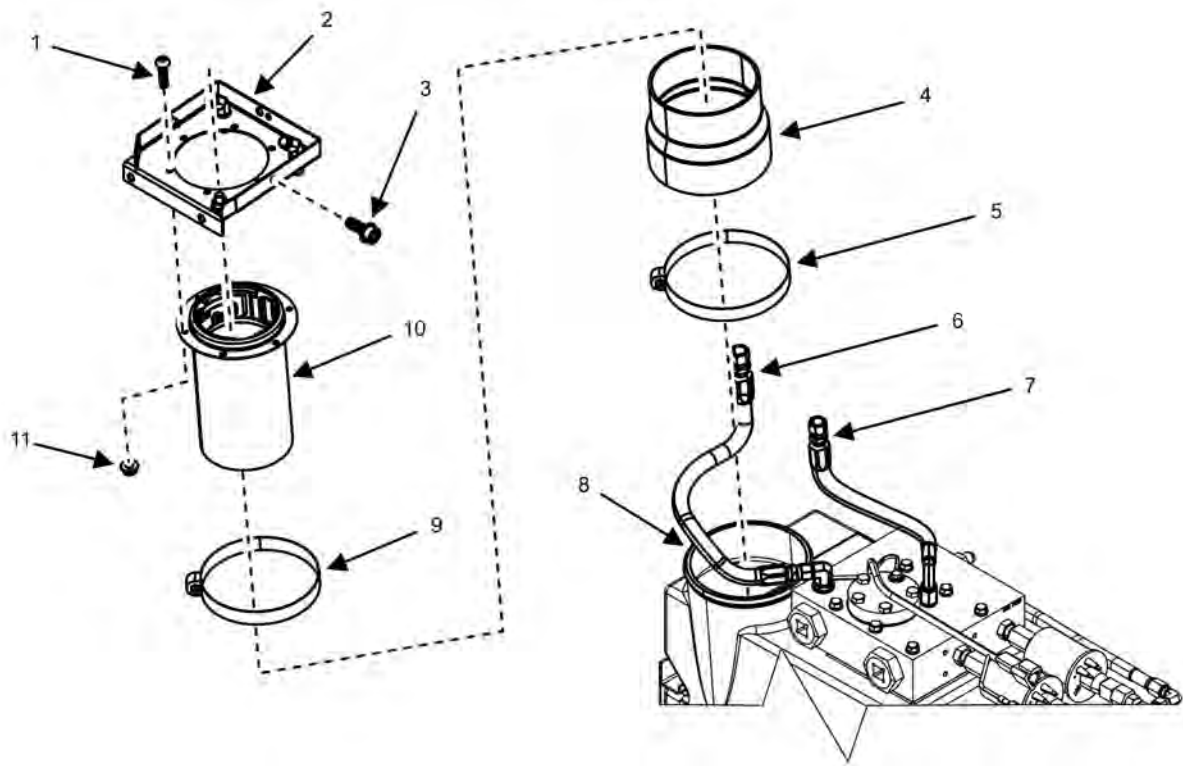


Figure 4. Fuel Tank Filler Neck — Detail.

14. Loosen and slide hose clamps (Figure 4, Items 5 and 9) and hose coupling (Figure 4, Item 4) away from fuel tank opening (Figure 4, Item 8).

NOTE

Fuel filler neck fits snugly over fuel tank opening. Light percussion from a rubber mallet will assist with the removal of filler neck.

15. Reposition fuel filler neck (Figure 4, Item 10) and fuel system bracket (Figure 4, Item 2) to disconnect auxiliary vent line (Figure 4, Item 7) from fuel system bracket (Figure 4, Item 2). Cap/plug line to prevent dirt and debris from entering fuel system.
16. Remove fuel filler neck (Figure 4, Item 10), fuel system bracket (Figure 4, Item 2), hose clamps (Figure 4, Items 5 and 9), and hose coupling (Figure 4, Item 4) from unit and place on a suitable work surface.
17. Cover fuel tank opening (Figure 4, Item 8) to prevent dirt and debris from entering fuel system.
18. Remove hose clamps (Figure 4, Items 5 and 9) and hose coupling (Figure 4, Item 4) from fuel filler neck (Figure 4, Item 10).

NOTE

Chains for auxiliary fuel line caps are secured by two of six cap screws securing fuel system bracket to fuel filler neck. Note location of chains to aid in reinstallation.

19. Remove five cap screws (Figure 4, Item 1) and nuts (Figure 4, Item 11) securing fuel system bracket (Figure 4, Item 2) to fuel filler neck (Figure 4, Item 10) and set screws aside for reuse.

END OF TASK

Inspect Fuel Filler Neck

1. Inspect fuel filler neck (Figure 4, Item 10) for splits, cracks, or brittleness. Replace as required.
2. Inspect hose coupling (Figure 4, Item 4) for splits, cracks, or brittleness that would allow fuel to escape. Replace as required.
3. Inspect hose clamps (Figure 4, Items 5 and 9) for damage or corrosion. Replace as required.
4. Inspect fuel system bracket (Figure 4, Item 2) for damage or corrosion. Replace as required.

END OF TASK**Install Fuel Filler Neck****NOTE**

Capture and dispose of spilled fuel IAW local SOP. Remove all caps/plugs and tags from fuel lines/fittings prior to installation of each fuel line.

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Position top and bottom hose clamps to hose coupling.
2. Slide hose coupling (Figure 4, Item 4) and hose clamps (Figure 4, Items 5 and 9) onto fuel filler neck (Figure 4, Item 10).

NOTE

Fuel filler neck (Figure 4, Item 10) fits snugly over the fuel tank opening. Light percussion from a rubber mallet will assist with positioning filler neck.

3. Install hose coupling (Figure 4, Item 4) and fuel filler neck (Figure 4, Item 10) assembly to opening at top of fuel tank opening (Figure 4, Item 8).

NOTE

Chains for auxiliary fuel line caps are secured by two of six cap screws securing fuel system bracket to the fuel filler neck. Chains must be secured to same location as removed before tightening cap screws.

One of six cap screws securing fuel filler neck to fuel system bracket also secures ground cable to the fuel system bracket.

4. Install fuel system bracket (Figure 4, Item 2) to fuel filler neck (Figure 4, Item 10) using five cap screws (Figure 4, Item 1) and nuts (Figure 4, Item 11) tightened to a torque value of 89 – 106 in/lb (10 – 12 Nm).
5. Install ground cable (Figure 2, Item 4) to fuel system bracket with cap screw (Figure 2, Item 2), external tooth lock washer (Figure 2, Item 3), and nut (Figure 2, Item 5) tightened to a torque value of 89 – 106 in/lb (10 – 12 Nm).
6. Connect auxiliary vent line (Figure 4, Item 7) to fuel system bracket (Figure 4, Item 2). Torque to 124 – 133 in/lb (14 – 15 Nm).
7. Install two screws (Figure 4, Item 3) to secure edges of fuel system bracket (Figure 4, Item 2) to interior panel of generator set.
8. Install auxiliary fuel intake line (Figure 4, Item 6) to fuel system bracket (Figure 4, Item 2). Torque to 124 – 133 in/lb (14 – 15 Nm).
9. Ensure both hose clamps (Figure 4, Items 5 and 9) on hose coupling (Figure 4, Item 4).

-
10. Secure fuel filler neck (Figure 4, Item 10) to fuel tank opening (Figure 4, Item 8) by tightening hose clamps (Figure 4, Items 5 and 9).
 11. Install fuel strainer (Figure 3 Item 2).
 12. Secure fuel filler cap (Figure 3 Item 1).
 13. Secure ground cables (Figure 2, Items 4 and 7) to fuel system bracket by installing screw (Figure 2, Item 6), new external tooth lock washer (Figure 2, Item 8), and nut (Figure 2, Item 1).
 14. Tighten nut (Figure 2, Item 1) to 35 – 42 ft/lb (47 – 57 Nm).
 15. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
 16. Install rear body panel from generator set (WP 0030, Remove/Install Rear Body Panel).
 17. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
 18. Fill fuel tank to proper level (TM 9-6115-749-10).
 19. Dispose of captured fuel IAW local SOP.
 20. Close generator set doors.
 21. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
 22. Start engine and check for proper operation (TM 9-6115-749-10).
 23. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL 50/60 HZ AC GENERATOR ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0162, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)

Materials/Parts

Generator assembly, 5 kW, 50/60 Hz (WP 0121, Repair Parts List, Figure 23, Item 1)

Isolator, vibration, alternator mount (2) (WP 0120, Repair Parts List, Figure 22, Item 13)

Nut, Hexagon (2) (WP 0120, Figure 22, Item 8)

Washer, lock (4) (WP 0121, Figure 23, Item 20)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0163, Item 8)

Cleaning compound, solvent (WP 0163, Item 10)

Distilled water (WP 0163, Item 17)

Fuel, diesel (WP 0163, Item 19)

Grease, electrically conductive (WP 0163, Item 20)

Pan, drain (1) (WP 0163, Item 28)

Penetrating oil (WP 00163, Item 29)

Rag, wiping (WP 0163, Item 31)

Strap, tie-down (WP 0163, Item 34)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (2)

References

WP 0054, Remove/Install Voltage Selection Switch

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel).

DCS removed (WP 0017, Remove/Install DCS)

Front body panel removed (WP 0029, Remove/Install Front Body Panel)

Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)

Right-side body panel removed (WP 0032, Remove/Install Right-side Body Panel)

Left-side body panel removed (WP 0031, Remove/Install Left-side Body Panel)

Interior bulkhead panel removed (WP 0035, Remove/Install Interior Body Panels)

Fuel tank removed (WP 0046, Remove/Install Fuel Tank)

Starter removed (WP 0077, Remove/Install Starter)

Engine speed sensor removed (WP 0067, Remove/Install Engine Speed Sensor)

Relay panel removed (WP 0061, Remove/Install Relay Panel)

REMOVE/INSTALL 50/60 HZ AC GENERATOR ASSEMBLY**WARNING**

AC generator assembly weighs approximately 252 – 262 lb (114 – 119 kg). Use suitable lifting device with a capacity of at least 1,000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Failure to comply may cause injury or death to personnel.

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

Remove 50/60 Hz AC Generator Assembly (UOC 98E)**NOTE**

To assist during installation, tag all electrical wires and connectors prior to removal.

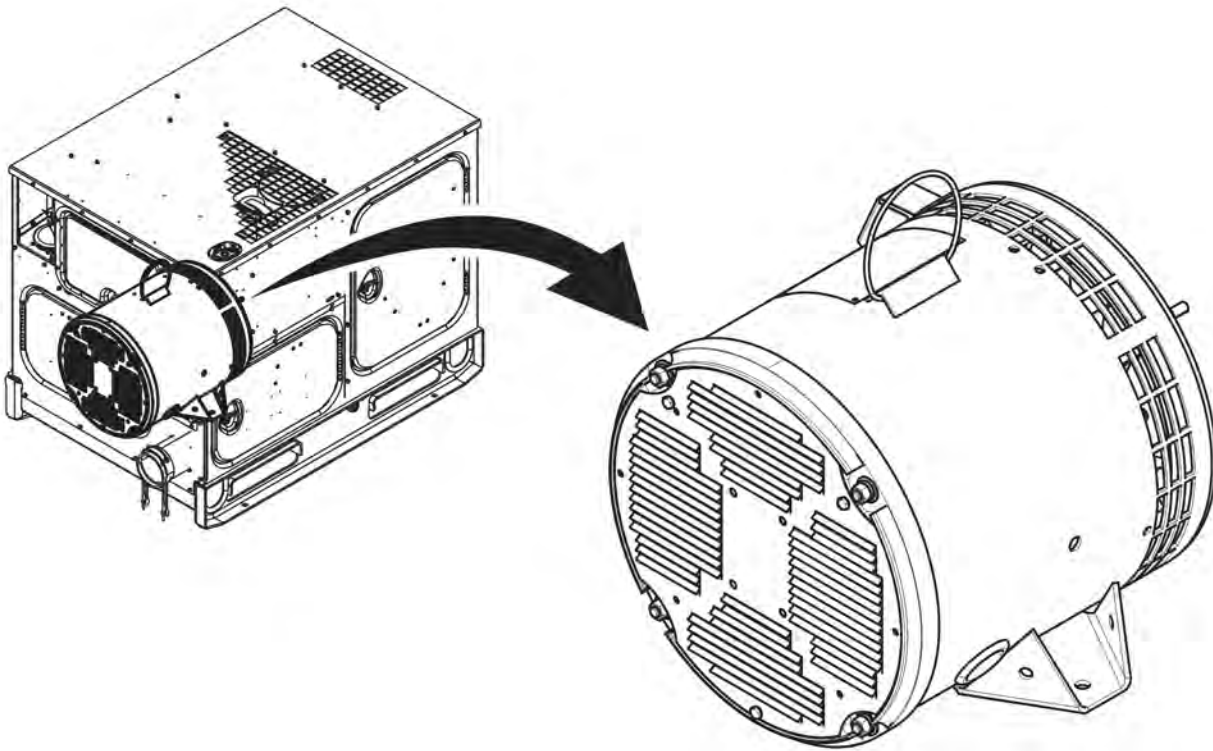


Figure 1. 50/60 Hz AC Generator — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate 50/60 Hz AC generator (Figure 1).

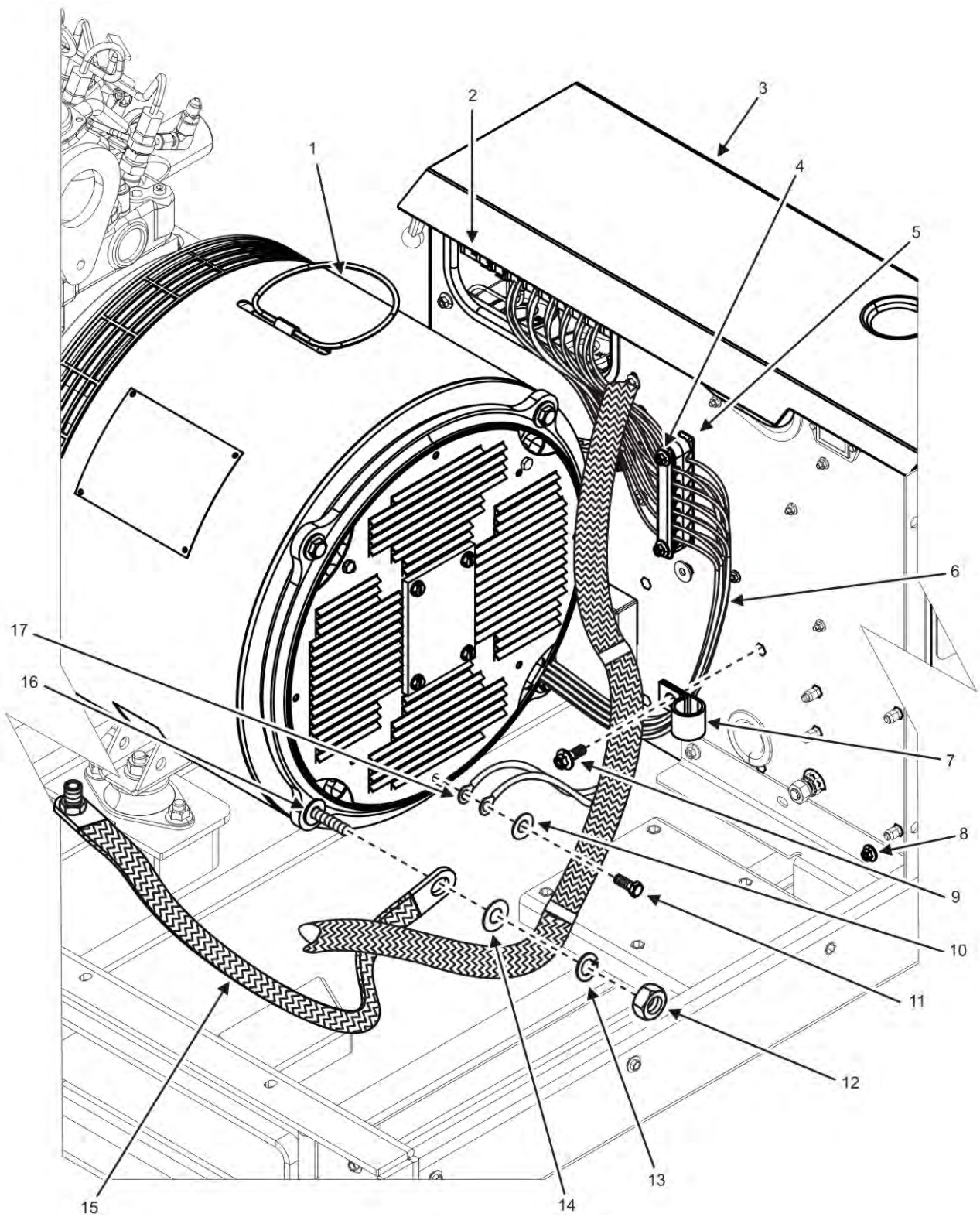


Figure 2. 50/60 Hz AC Generator — Rear.

3. Remove nut (Figure 2, Item 12), lock washer (Figure 2, Item 13), flat washer (Figure 2, Item 14), and ground strap (Figure 2, Item 15) from through-bolt (Figure 2, Item 16) at rear of AC generator (Figure 2, Item 1). Discard lock washer (Figure 2, Item 13).
4. Remove screw (Figure 2, Item 11) and washer (Figure 2, Item 10) securing two wire leads (Figure 2, Item 17) from rear of AC generator (Figure 2, Item 1). Tag two wire leads (Figure 2, Item 17) for identification at installation.
5. Remove screw (Figure 2, Item 9) and clamp (Figure 2, Item 7) securing 12 voltage selection switch wire leads (Figure 2, Item 6) to rear of output box (Figure 2, Item 3).
6. Remove two screws (Figure 2, Item 4) and finger retainer (Figure 2, Item 5) securing 12 voltage selection switch wire leads (Figure 2, Item 6) to rear of output box (Figure 2, Item 3).
7. Tag and remove 12 voltage selection switch wire leads (Figure 2, Item 6) from voltage selection switch (Figure 2, Item 2) in output box (Figure 2, Item 3) (WP 0054, Remove/Install Voltage Selection Switch).
8. Remove screw (Figure 3, Item 9), washer (Figure 3, Item 8), and clamp (Figure 3, Item 7) securing 12 voltage selection switch wire leads (Figure 3, Item 6) to AC generator (Figure 3, Item 1).

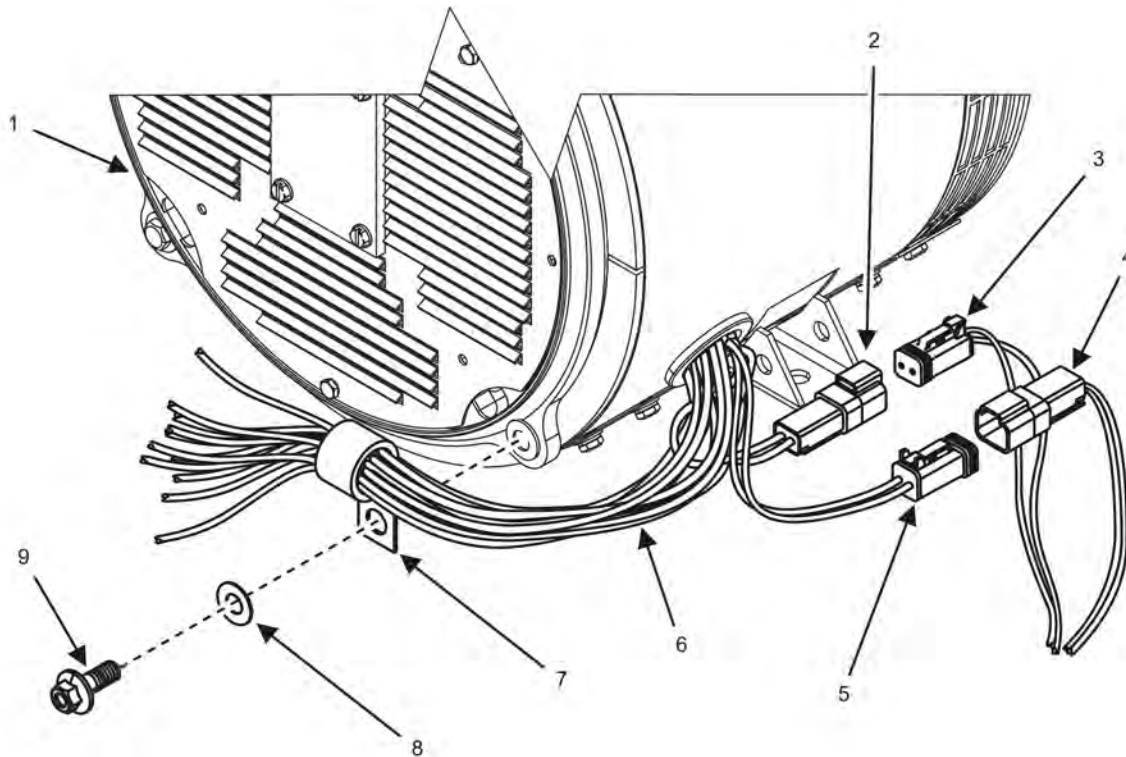


Figure 3. 50/60 Hz AC Generator Wiring — Removal.

9. Remove voltage selection switch (WP 0054, Remove/Install Voltage Selection Switch).
10. Remove output box (Figure 2, Item 3) by removing two lower screws (Figure 2, Item 8) from bottom of output box.
11. Reposition output box (Figure 2, Item 3) to allow removal of AC generator (Figure 3, Item 1).
12. Tag and disconnect wiring harness connector P90 (Figure 3, Item 3) from AC generator (Figure 3, Item 1) at female connector (Figure 3, Item 2).
13. Tag and disconnect wiring harness connector P85 (Figure 3, Item 4) from AC generator (Figure 3, Item 1) at male connector (Figure 3, Item 5).

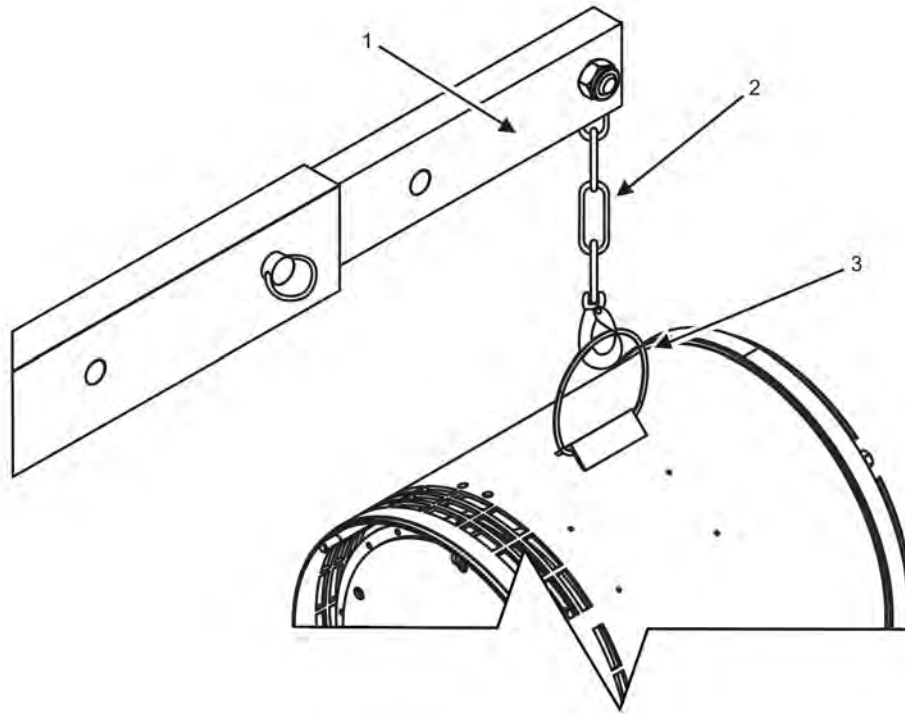


Figure 4. 50/60 Hz AC Generator Lift.

14. Attach suitable lifting device (Figure 4, Item 1) with at least a 1,000-lb (454-kg) capacity to AC generator lift ring (Figure 4, Item 3).
15. Raise lifting device (Figure 4, Item 1) to remove slack in chain/sling (Figure 4, Item 2).
16. Place wooden block (not shown) under engine to support engine when AC generator (Figure 2, Item 1) is removed.

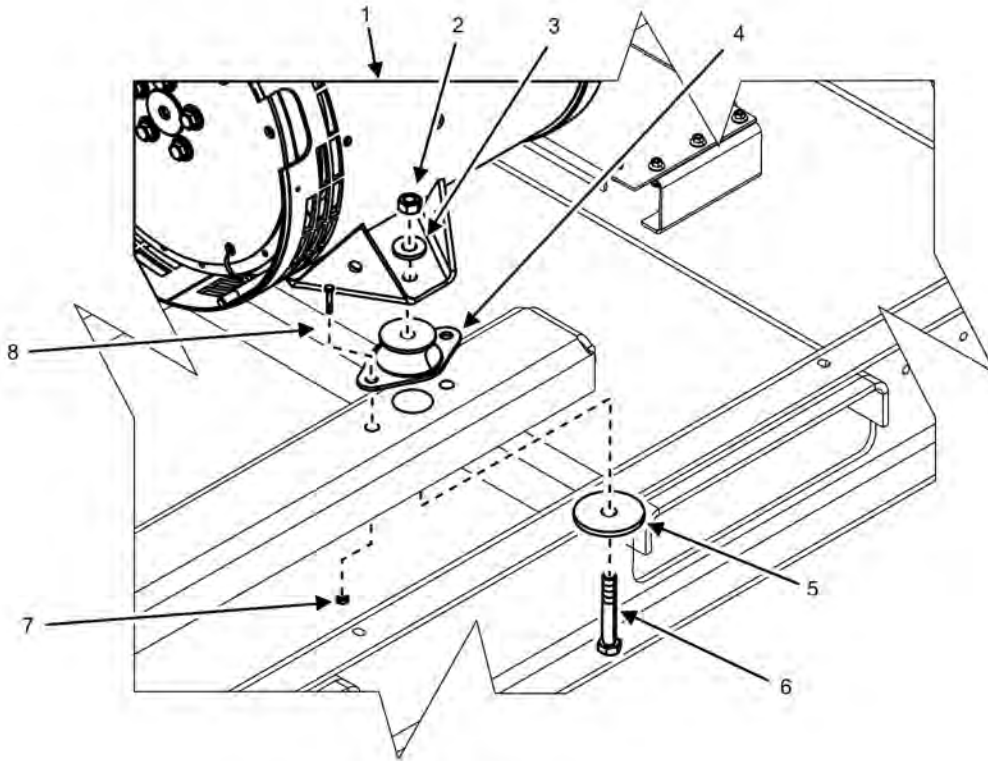


Figure 5. 50/60 Hz AC Generator — Removal.

17. Remove mounting screw (Figure 5, Item 6), snubbing washer (Figure 5, Item 5), flat washer (Figure 5, Item 3), and lock nut (Figure 5, Item 2) securing AC generator (Figure 5, Item 1) to left-side vibration isolator (Figure 5, Item 4). Discard lock nut (Figure 5, Item 2).
18. Remove mounting screw (Figure 5, Item 6), snubbing washer (Figure 5, Item 5), flat washer (Figure 5, Item 3), and lock nut (Figure 5, Item 2) securing AC generator (Figure 5, Item 1) to right-side vibration isolator (Figure 5, Item 4). Discard lock nut (Figure 5, Item 2).

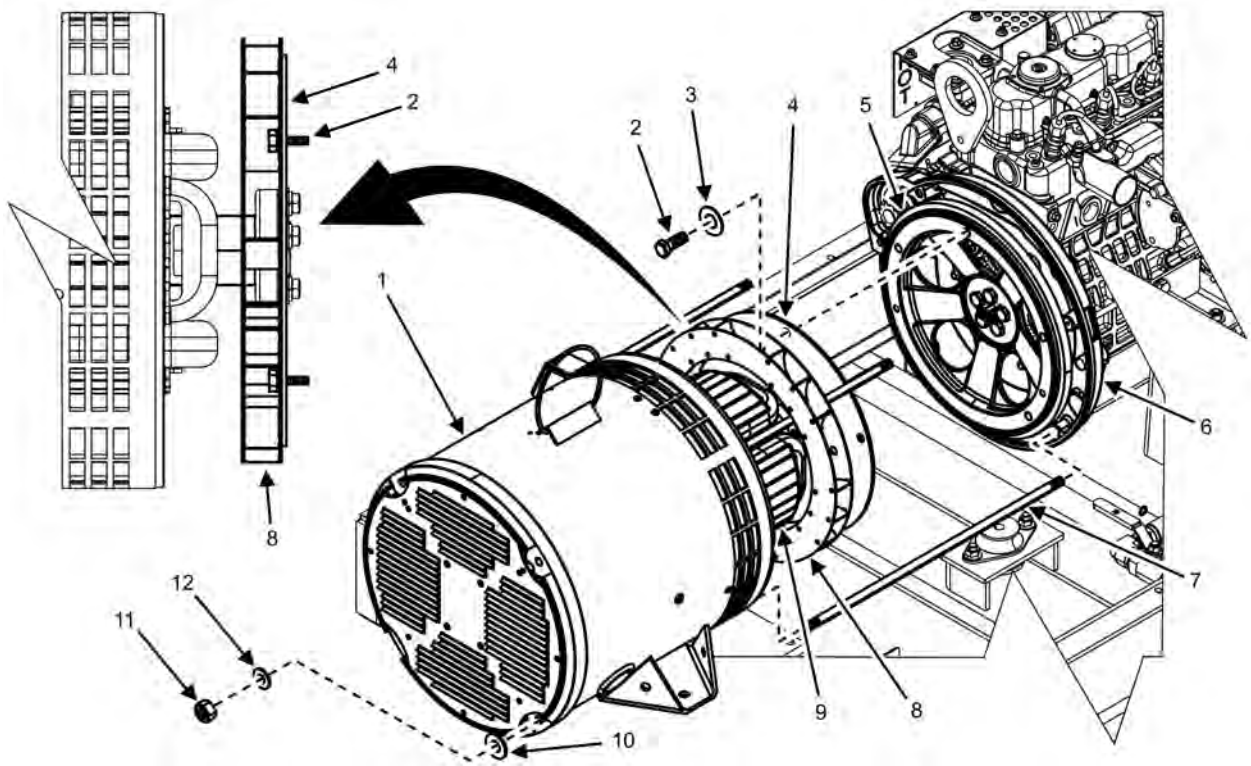


Figure 6. 50/60 Hz AC Generator and Engine Separation.

19. Remove four nuts (Figure 6, Item 11), four lock washers (Figure 6, Item 12), and four flat washers (Figure 6, Item 10) securing through-bolts (Figure 6, Item 7) on end bell of AC generator stator (Figure 6, Item 1). Discard lock washers (Figure 6, Item 12).
20. Install two nuts (Figure 6, Item 11) to one through-bolt (Figure 6, Item 7) without washers.
21. Loosen through-bolt (Figure 6, Item 7) by turning inner nut (Figure 6, Item 11) until through-bolt (Figure 6, Item 7) detaches from flywheel housing (Figure 6, Item 6).
22. Repeat steps 19 and 20 for remaining three through-bolts (Figure 6, Item 7).
23. Raise AC generator assembly slightly using the lifting device (Figure 4, Item 1) and remove generator stator housing. Place AC generator stator (Figure 6, Item 1) on a suitable work surface and remove lifting device.

CAUTION

Proper installation of AC generator fan (Figure 6, Item 8) affects cooling air flow. Maintain the orientation of fan (Figure 6, Item 8) and drive plate (Figure 6, Item 4) for proper installation. Use wire ties to maintain the orientation of fan (Figure 6, Item 8) and drive plate (Figure 6, Item 4) in at least two places as screws (Figure 6, Item 2) are removed. Failure to comply may cause damage to equipment.

24. Support generator rotor (Figure 6, Item 9) with a wooden block and suitable lifting device at the ball bearing to allow rotation of rotor (Figure 6, Item 9).
25. Attach the suitable lifting device to support the generator rotor assembly (Figure 6, Item 9) as it is unbolted from the engine.
26. Remove one screw (Figure 6, Item 2) and one washer (Figure 6, Item 3) securing fan (Figure 6, Item 8) and drive plate (Figure 6, Item 4) to engine flywheel (Figure 6, Item 5).

27. Secure fan (Figure 6, Item 8) to drive plate (Figure 6, Item 4) using wire tie to maintain proper orientation of components.
28. Rotate engine harmonic balancer hex cap screw clockwise (viewed from water pump end of engine) using socket and breaker bar to gain access to the remaining four screws (Figure 6, Item 2) as required.
29. Pull AC generator rotor (Figure 6, Item 9) to the rear, free of engine using lifting device.

NOTE

If AC generator rotor (Figure 6, Item 9) refuses to separate from engine, perform steps 30 through 32 to separate engine and rotor.

30. Saturate area where engine flywheel (Figure 6, Item 5) and drive plate (Figure 6, Item 4) are connected with penetrating oil.
31. Allow penetrating oil to soak for 1 hr.
32. Strike point of contact between engine flywheel (Figure 6, Item 5) and drive plate (Figure 6, Item 4) using a hammer and brass drift around circumference of flywheel until two components break free.

CAUTION

Be aware of generator set components, such as the output box, while maneuvering the AC generator stator (Figure 6, Item 1). Failure to comply may cause damage to equipment.

33. Place AC generator rotor (Figure 6, Item 9) on a suitable work surface.
34. Remove lifting device (Figure 4, Item 1) from AC generator rotor (Figure 6, Item 9).
35. Remove two screws (Figure 5, Item 8) and two nuts (Figure 5, Item 7) securing left-side vibration isolator (Figure 5, Item 4) to skid. Discard vibration isolator (Figure 5, Item 4).
36. Remove two screws (Figure 5, Item 8) and two nuts (Figure 5, Item 7) securing right-side vibration isolator (Figure 5, Item 4) to skid. Discard vibration isolator (Figure 5, Item 4).
37. Remove any remaining vibration isolator (Figure 5, Item 4) residue from mounts with dry cleaning solvent and wiping rag.

CAUTION

AC generator must be transported resting on the end bell. In this position, the rotor cannot slide out of the generator housing. Also, stabilize the rotor within the generator housing to prevent contact between the two components. Failure to comply may cause damage to equipment.

NOTE

Perform step 38 only if the AC generator is to be returned for repair.

38. Ensure through-bolts (Figure 6, Item 7), flat washers (Figure 6, Item 10), lock washers (Figure 6, Item 12), and nuts (Figure 6, Item 11) are returned to the repair facility with the AC generator assembly.

END OF TASK

Inspect 50/60 Hz AC Generator Assembly (UOC 98E)

1. Inspect AC generator stator (Figure 6, Item 1) for damage and replace as required.
2. Inspect left and right AC generator mounts on skid for indications of structural weakness. Replace skid as required.

3. Inspect all areas of skid for damage, corrosion, cracks, or other indications of structural weakness. Replace skid as required.

END OF TASK

Install 50/60 Hz AC Generator Assembly (UOC 98E)

1. Clean mounting area, hardware, and surrounding skid area of dirt, debris, and grease using wiping rags and dry cleaning solvent.
2. Dispose of wiping rags IAW local SOP.
3. Apply a thin coat of multipurpose grease to mounting surfaces of drive plate (Figure 6, Item 4), fan (Figure 6, Item 8), and engine flywheel (Figure 6, Item 5) to minimize formation of galvanic corrosion between components.
4. Position new vibration isolators (Figure 5, Item 4) to left- and right-side generator and skid mount.
5. Secure left- and right-side vibration isolators (Figure 5, Item 4) with two screws (Figure 5, Item 8) and two nuts (Figure 5, Item 7) to skid. Tighten nuts (Figure 5, Item 7) to 34 – 42 ft/lb (47 – 57 Nm).

NOTE

Perform step 6 only if a new or refurbished AC generator is being installed.

6. Remove any material used to prevent the rotor from contacting the generator housing during shipment.
7. Attach suitable lifting device (Figure 4, Item 1) with chain/sling (Figure 4, Item 2) to lift ring (Figure 4, Item 3) of AC generator rotor (Figure 6, Item 9).
8. Position AC generator rotor (Figure 6, Item 9) to its approximate mounting location on unit skid.
9. Align AC generator rotor (Figure 6, Item 9) with engine flywheel (Figure 6, Item 5).
10. Rotate engine harmonic balancer hex cap screw clockwise (as viewed from water pump end of engine) using socket and breaker bar to align mounting holes in AC generator drive plate (Figure 6, Item 4), fan (Figure 6, Item 8), and engine flywheel (Figure 6, Item 5) near the top of AC generator rotor to allow installation of screw (Figure 6, Item 2).

NOTE

Installation of the first screw (Figure 6, Item 2) to secure fan (Figure 6, Item 8), drive plate (Figure 6, Item 4), and flywheel (Figure 6, Item 5) is much easier if washer (Figure 6, Item 3) is not included. After the remaining four mounting screws (Figure 6, Item 2) with washers (Figure 6, Item 3) are installed, remove the initial screw (Figure 6, Item 2) and re-install with washer (Figure 6, Item 1) in place.

11. Install one screw (Figure 6, Item 2) and washer (Figure 6, Item 3) finger-tight to secure drive plate (Figure 6, Item 4), fan (Figure 6, Item 8), and engine flywheel (Figure 6, Item 5) in the proper orientation.
12. Continue to rotate crankshaft to position the remaining mounting holes one at a time in the AC generator drive plate (Figure 6, Item 4), fan (Figure 6, Item 8), and engine flywheel (Figure 6, Item 5).
13. Cut and discard wire ties installed during removal procedure to maintain orientation of AC generator drive plate (Figure 6, Item 4), fan (Figure 6, Item 8), and engine flywheel (Figure 6, Item 5) as they are presented.
14. Install remaining four screws (Figure 6, Item 2) and four washers (Figure 6, Item 3) finger-tight.
15. Tighten screws (Figure 6, Item 2) to 39 – 46 ft/lb (53 – 63 Nm).
16. Support AC generator rotor (Figure 6, Item 9) at ball bearing using a wooden block and remove the lifting device.

17. Attach a suitable lifting device to AC generator stator (Figure 6, Item 1) and position AC generator stator (Figure 6, Item 1) to AC generator rotor (Figure 6, Item 9).
18. Slide AC generator stator (Figure 6, Item 1) over AC generator rotor (Figure 6, Item 9) toward engine to completely cover AC generator rotor (Figure 6, Item 9).
19. Lower AC generator (Figure 5, Item 1) slowly, using lifting device (Figure 4, Item 1), until mounting holes on AC generator mounts align with mounting holes on vibration isolators (Figure 5, Item 4).
20. Insert mounting screw (Figure 5, Item 6) with snubbing washer (Figure 5, Item 5) through new vibration isolators (Figure 5, Item 4) on generator skid mounts to align mounting holes.
21. Install flat washers (Figure 5, Item 3) and lock nuts (Figure 5, Item 2) to generator mounting screws (Figure 5, Item 6) loosely.
22. Install two nuts (Figure 6, Item 11) to one through-bolt (Figure 6, Item 7).
23. Install through-bolt (Figure 6, Item 7) through AC generator stator (Figure 6, Item 1) by turning outer nut (Figure 6, Item 11) until through-bolt (Figure 6, Item 7) secures generator housing to flywheel housing (Figure 6, Item 6).
24. Remove two nuts (Figure 6, Item 11) from through-bolt (Figure 6, Item 7) once installed to flywheel housing (Figure 6, Item 6).
25. Repeat steps 21 through 23 to install remaining three through-bolts (Figure 6, Item 7).
26. Install nut (Figure 6, Item 11), new lock washer (Figure 6, Item 12), and flat washer (Figure 6, Item 10) to four through-bolts (Figure 6, Item 7).
27. Tighten four nuts (Figure 6, Item 11) to 28 to 32 ft/lb (38 to 43 Nm).
28. Remove supporting block (not shown) from under engine.
29. Tighten two lock nuts (Figure 5, Item 2) installed in step 21 to 62 – 76 ft/lb (85 – 104 Nm).
30. Remove lifting device (Figure 4, Item 1) from AC generator.
31. Reposition output box (Figure 2, Item 3) onto unit skid and secure by installing two screws (Figure 2, Item 8) into captive nuts.

NOTE

Use tags applied to electrical wires and connectors during removal to aide in installation. Identification tags should remain in place until generator is completely reassembled and has been tested for proper operation.

32. Apply a thin coat of electrically conductive grease to all electrical connections prior to installation.
33. Insert 12 voltage selection switch wire leads (Figure 2, Item 6) into rear of output box (Figure 2, Item 3) near voltage selection switch (Figure 2, Item 2).
34. Connect 12 voltage selection switch wire leads (Figure 2, Item 6) to voltage selection switch (Figure 2, Item 2) in output box (Figure 2, Item 3) (WP 0054, Remove/Install Voltage Selection Switch).
35. Secure 12 voltage selection switch wire leads (Figure 2, Item 6) to rear of AC generator (Figure 3, Item 1) by installing screw (Figure 3, Item 9), washer (Figure 3, Item 8), and clamp (Figure 3, Item 7).
36. Connect wiring harness connector P85 (Figure 3, Item 4) to AC generator (Figure 3, Item 1) at male connector (Figure 3, Item 5).
37. Connect wiring harness connector P90 (Figure 3, Item 3) to AC generator (Figure 3, Item 1) at female connector (Figure 3, Item 2).
38. Install ground strap (Figure 2, Item 15) to through-bolt (Figure 2, Item 16) at rear of AC generator (Figure 2, Item 1) and secure by new lock washer (Figure 2, Item 13), flat washer (Figure 2, Item 14), and nut (Figure 2, Item 12).

-
39. Tighten nut (Figure 2, Item 12) to 28 to 32 ft/lb (38 to 43 Nm).
 40. Install two wire leads (Figure 2, Item 17) to rear of AC generator (Figure 2, Item 1) using tags installed at removal as a guide.
 41. Secure wire leads (Figure 2, Item 17) to rear of AC generator (Figure 2, Item 1) by installing screw (Figure 2, Item 11) and washer (Figure 2, Item 10).
 42. Tighten screw (Figure 2, Items 11) to 20 in/lb (21 Nm).
 43. Install 12 voltage selection switch wire leads (Figure 2, Item 6) to two finger retainers (figure 2, Item 5) and secure finger retainers (Figure 2, Item 5) to rear of output box (Figure 2, Item 3) by installing two screws (Figure 2, Item 4).
 44. Install clamp (Figure 2, Item 7) securing 12 voltage selection switch wire leads (Figure 2, Item 6) to rear of output box (Figure 2, Item 3) and secure by installing screw Figure 2, Item 9).
 45. Install relay panel (WP 0061, Remove/Install Relay Panel).
 46. Install and adjust engine speed sensor (WP 0067, Remove/Install Engine Speed Sensor).
 47. Install starter (WP 0077, Remove Install Starter).
 48. Install fuel tank (WP 0046, Remove/Install Fuel Tank).
 49. Install interior body panels (WP 0035, Remove/Install Interior Body Panels).
 50. Install right-side body panel (WP 0032, Remove/Install Right-side Body Panel).
 51. Install left-side body panel (WP 0031, Remove/Install Left-side Body Panel).
 52. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
 53. Install front body panel (WP 0029, Remove/Install Front Body Panel).
 54. Install DCS (WP 0029, Remove/Install DCS).
 55. Install top body panel (WP 0028, Remove/Install Top Body Panel).
 56. Connect negative battery cable (WP 0036, Remove /Install Batteries).
 57. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
 58. Start engine, check for proper operation, and repair as required. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
 59. Check all fluid levels and fill as required (TM 9-6115-749-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL 400 HZ AC GENERATOR ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0162, Table 2, Item 39)
Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)

Materials/Parts

Generator, AC, 5 kW, 400 Hz (WP 0122, Repair Parts List, Figure 24, Item 1)
Isolator, vibration, alternator mount (2) (WP 0120, Repair Parts List, Figure 22, Item 13)
Nut, Hexagon (2) (WP 0120, Repair Parts List, Figure 22, Item 8)
Washer, lock (WP 0122, Figure 24, Item 13)
Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items List, Item 2)
Cap set, protective (WP 0163, Item 8)
Cleaning compound, solvent (WP 0163, Item 10)
Distilled water (WP 0163, Item 17)
Fuel, diesel (WP 0163, Item 19)
Grease, electrically conductive (WP 0163, Item 20)
Pan, drain (WP 0163, Item 28)
Penetrating oil (WP 00163, Item 29)
Rag, wiping (WP 0163, Item 31)
Strap, tie-down (WP 0163, Item 34)
Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)
Assistant (2)

References

WP 0054, Remove/Install Voltage Selection Switch

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Top body panel removed (WP 0028, Remove/Install Top Body Panel)
DCS removed (WP 0017, Remove/Install DCS)
Front body panel removed (WP 0029, Remove/Install Front Body Panel)
Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)
Right-side body panel removed (WP 0032, Remove/Install Right-side Body Panel)
Left-side body panel removed (WP 0031, Remove/Install Left-side Body Panel)
Interior bulkhead panel removed (WP 0035, Remove/Install Interior Body Panels)
Fuel tank removed (WP 0046, Remove/Install Fuel Tank)
Engine speed sensor removed (WP 0067, Remove/Install Engine Speed Sensor)
Relay panel removed (WP 0061, Remove/Install Relay Panel)

REMOVE/INSTALL 400 HZ AC GENERATOR ASSEMBLY**WARNING**

AC generator assembly weighs approximately 252 – 262 lb (114 – 119 kg). Use suitable lifting device with a capacity of at least 1,000 lb (453.6 kg) to lift the weight of the assembly. Do not stand or put arms, legs, or any body part under hoisted load. Failure to comply may cause injury or death to personnel.

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

Remove 400 Hz AC Generator Assembly (UOC 98F)**NOTE**

To assist during installation, tag all electrical wires and connectors prior to removal.

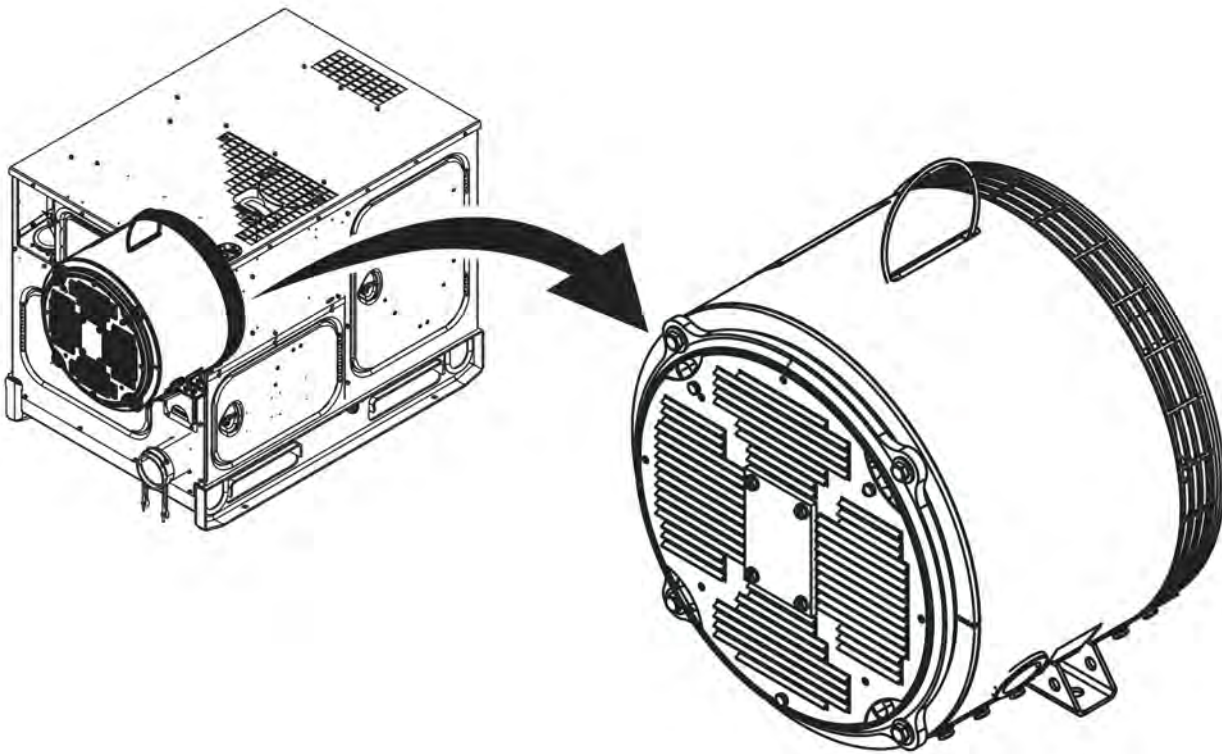


Figure 1. 400 Hz AC Generator — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate 400 Hz AC generator (Figure 1).

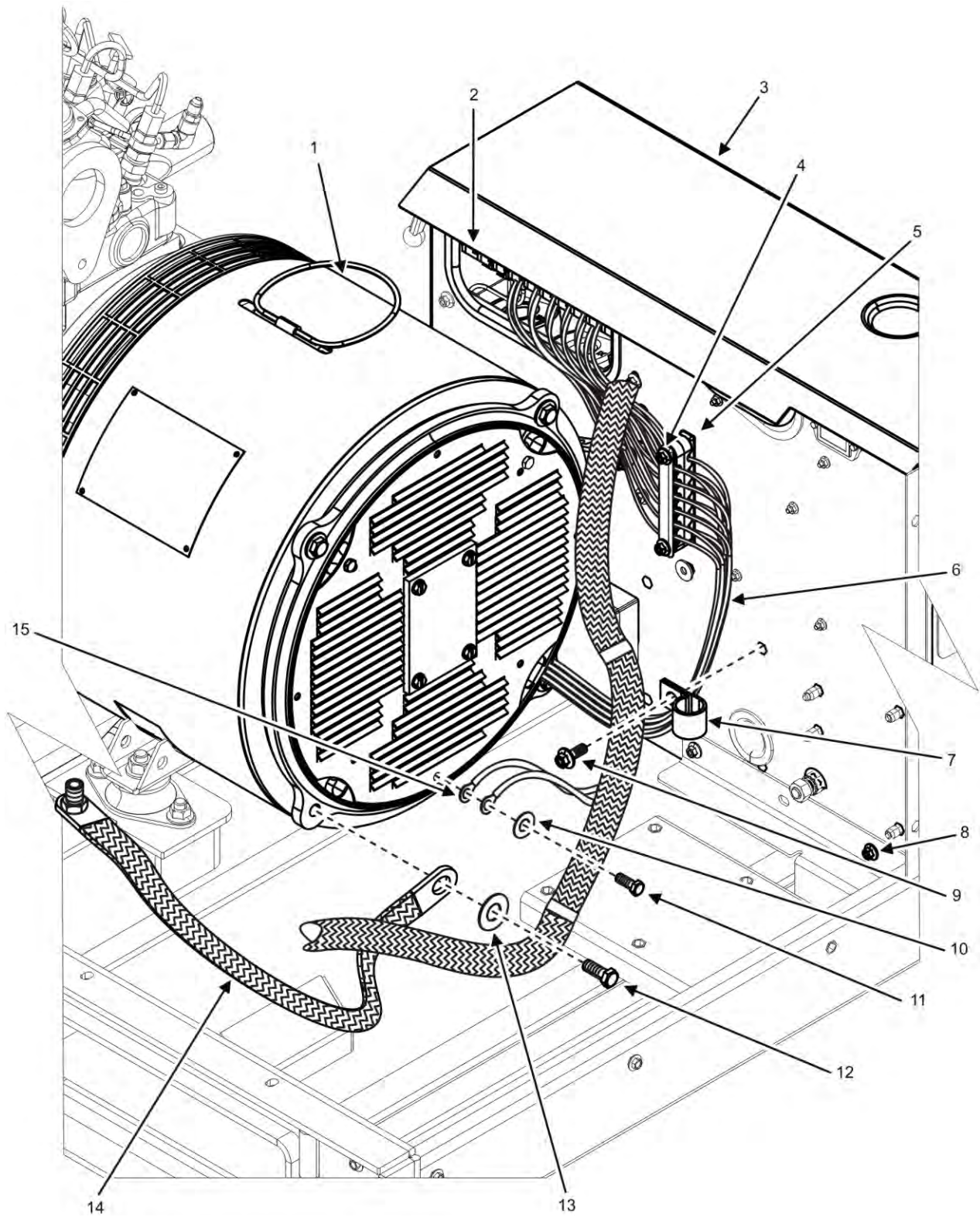


Figure 2. 400 Hz AC Generator — Rear.

3. Remove screw (Figure 2, Item 12), washer (Figure 2, Item 13), and ground strap (Figure 2, Item 14) from rear of AC generator (Figure 2, Item 1).
4. Remove screw (Figure 2, Item 11) and washer (Figure 2, Item 10) securing two wire leads (Figure 2, Item 15) from rear of AC generator (Figure 2, Item 1). Tag two wire leads (Figure 2, Item 15) for identification at installation.
5. Remove two screws (Figure 2, Item 4) and two finger retainers (Figure 2, Item 5) securing 12 voltage selection switch wire leads (Figure 2, Item 6) to rear of output box (Figure 2, Item 3).
6. Remove screw (Figure 2, Item 9) and clamp (Figure 2, Item 7) securing 12 voltage selection switch wire leads (Figure 2, Item 6) to rear of output box (Figure 2, Item 3).
7. Tag and remove 12 voltage selection switch wire leads (Figure 2, Item 6) from AC generator (Figure 2, Item 1) at voltage selection switch (Figure 2, Item 2) in output box (Figure 2, Item 3) (WP 0054, Remove/Install Voltage Selection Switch).
8. Loosen output box (Figure 2, Item 3) by removing two screws (Figure 2, Item 8) from captive nuts.
9. Reposition output box (Figure 2, Item 3) to allow removal of AC generator (Figure 2, Item 1).

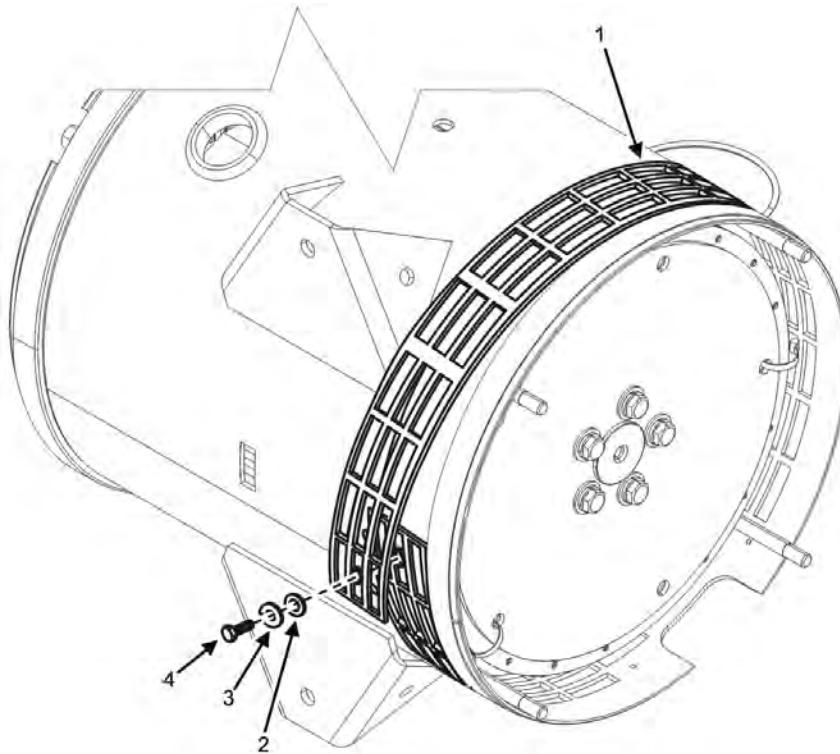


Figure 3. 400 Hz AC Generator Screen — Removal.

NOTE

The AC generator in Figure 3 is shown removed from the skid and rotated to show the mounting hardware for screen (Figure 3, Item 1) located on underside of AC generator.

10. Remove screw (Figure 3, Item 4), lock washer (Figure 3, Item 3), flat washer (Figure 3, Item 2), and screen (Figure 3, Item 1) from AC generator. Discard lock washer (Figure 3, Item 3).
11. Inspect screen (Figure 3, Item 1) for signs of obvious damage. Replace screen (Figure 3, Item 1) as required.

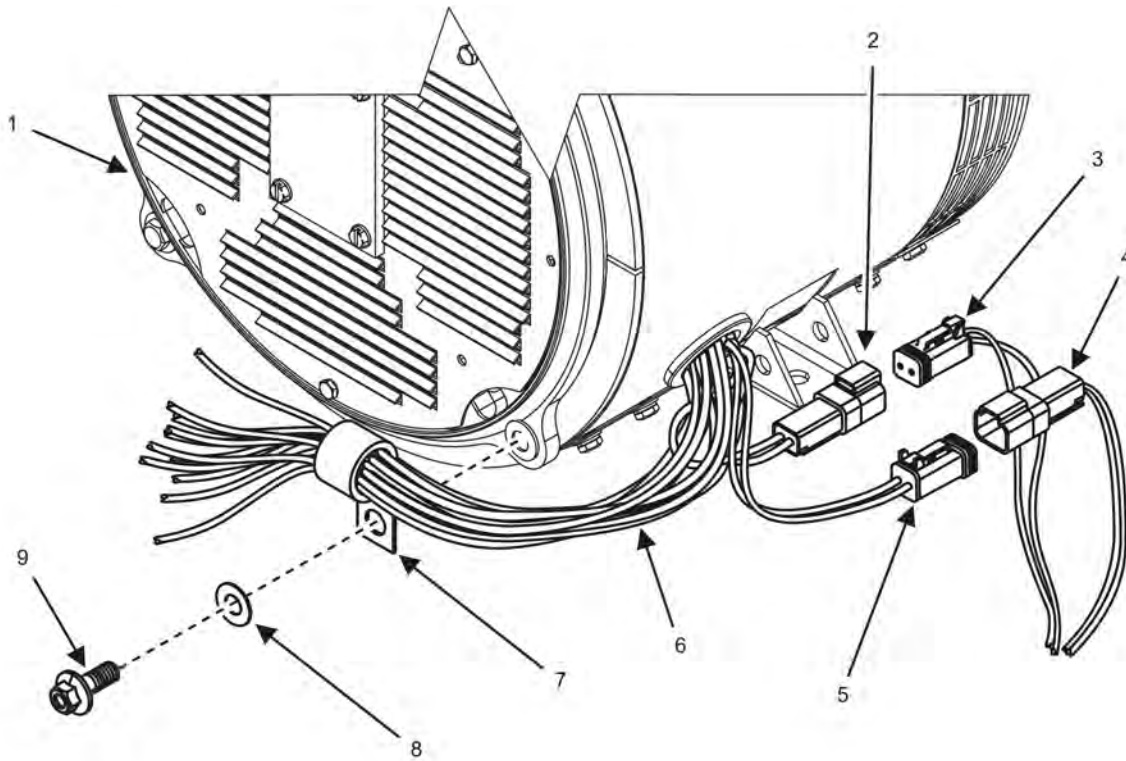


Figure 4. 400 Hz AC Generator Wiring — Removal.

12. Tag and disconnect wiring harness connector P90 (Figure 4, Item 3) from AC generator (Figure 4, Item 1) at female connector (Figure 4, Item 2).
13. Tag and disconnect wiring harness connector P85 (Figure 4, Item 4) from AC generator (Figure 4, Item 1) at male connector (Figure 4, Item 5).
14. Remove screw (Figure 4, Item 9), washer (Figure 4, Item 8), and clamp (Figure 4, Item 7) that secures 12 voltage selection switch wire leads (Figure 4, Item 6) to AC generator (Figure 4, Item 1).

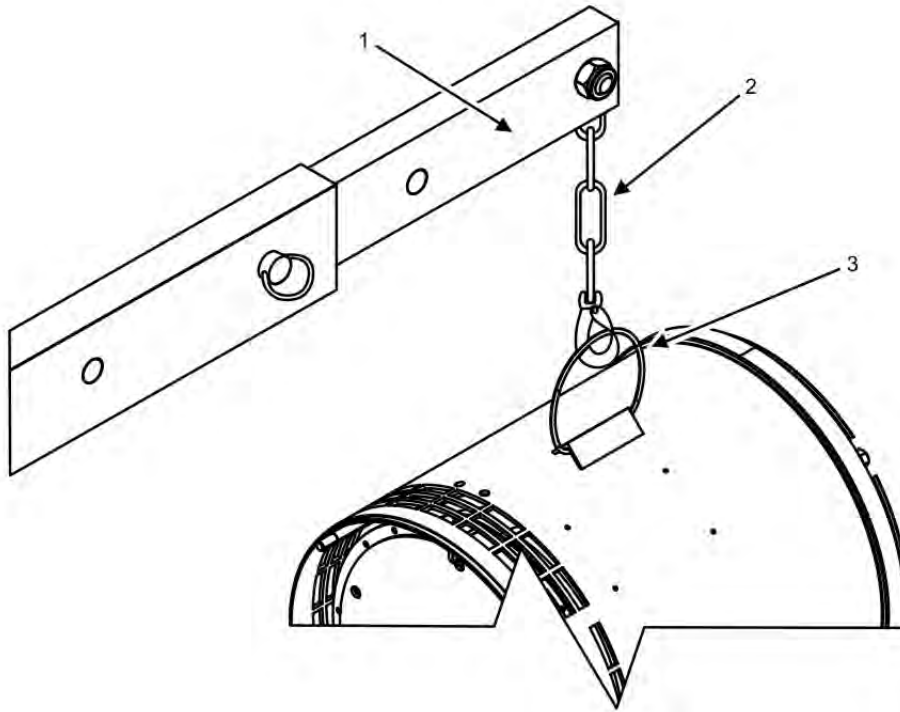


Figure 5. 400 Hz AC Generator Lift.

15. Attach suitable lifting device (Figure 5, Item 1) with at least a 1,000-lb (454-kg) capacity to AC generator lift ring (Figure 5, Item 3).
16. Raise lifting device (Figure 5, Item 1) to remove slack in chain/sling (Figure 5, Item 2).
17. Place wooden block (not shown) under engine to support engine when AC generator (Figure 6, Item 1) is removed.
18. Rotate engine harmonic balancer hex cap screw clockwise (viewed from water pump end of engine) using socket and breaker bar to gain access to one screw (Figure 6, Item 2) through slot in AC generator (Figure 6, Item 1) case.
19. Remove one screw (Figure 6, Item 2) and one washer (Figure 6, Item 3) securing fan (Figure 6, Item 4) and drive plate (Figure 6, Item 5) to engine flywheel (Figure 6, Item 6) through slot in AC generator housing opened by removal of screen (Figure 3, Item 1).

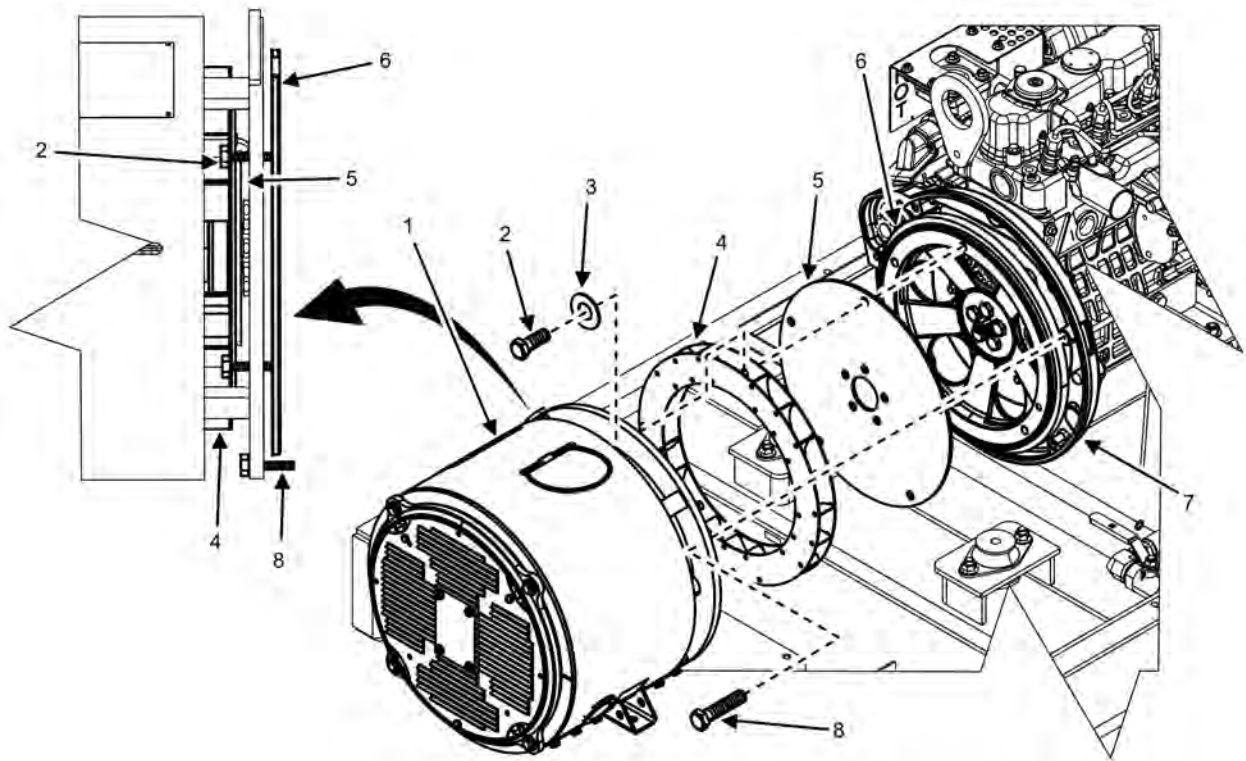


Figure 6. 400 Hz AC Generator and Engine Separation.

CAUTION

Proper installation of AC generator fan affects cooling air flow. Use wire ties to maintain the orientation of fan (Figure 6, Item 4) and drive plate (Figure 6, Item 5) in at least two places as screws are removed. Failure to comply may cause damage to equipment.

20. Secure generator fan (Figure 6, Item 4) to drive plate (Figure 6, Item 5) using wire tie to maintain proper orientation of components.
21. Rotate engine harmonic balancer hex cap screw clockwise (viewed from water pump end of engine) using socket and breaker bar to gain access to remaining four screws (Figure 6, Item 2) through slots in AC generator (Figure 6, Item 1) case.
22. Remove remaining four screws (Figure 6, Item 2) and four washers (Figure 6, Item 3) securing fan (Figure 6, Item 4) and drive plate (Figure 6, Item 5) to engine flywheel (Figure 6, Item 6).
23. Remove four screws (Figure 6, Item 8) securing AC generator (Figure 6, Item 1) to engine flywheel housing (Figure 6, Item 7).
24. Remove mounting screw (Figure 7, Item 6), snubbing washer (Figure 7, Item 5), flat washer (Figure 7, Item 3), and lock nut (Figure 7, Item 2) securing AC generator (Figure 7, Item 1) to left-side vibration isolator (Figure 7, Item 4). Discard lock nut (Figure 7, Item 2).
25. Remove mounting screw (Figure 7, Item 6), snubbing washer (Figure 7, Item 5), flat washer (Figure 7, Item 3), and lock nut (Figure 7, Item 2) securing AC generator (Figure 7, Item 1) to right-side vibration isolator (Figure 7, Item 4). Discard lock nut (Figure 7, Item 2).

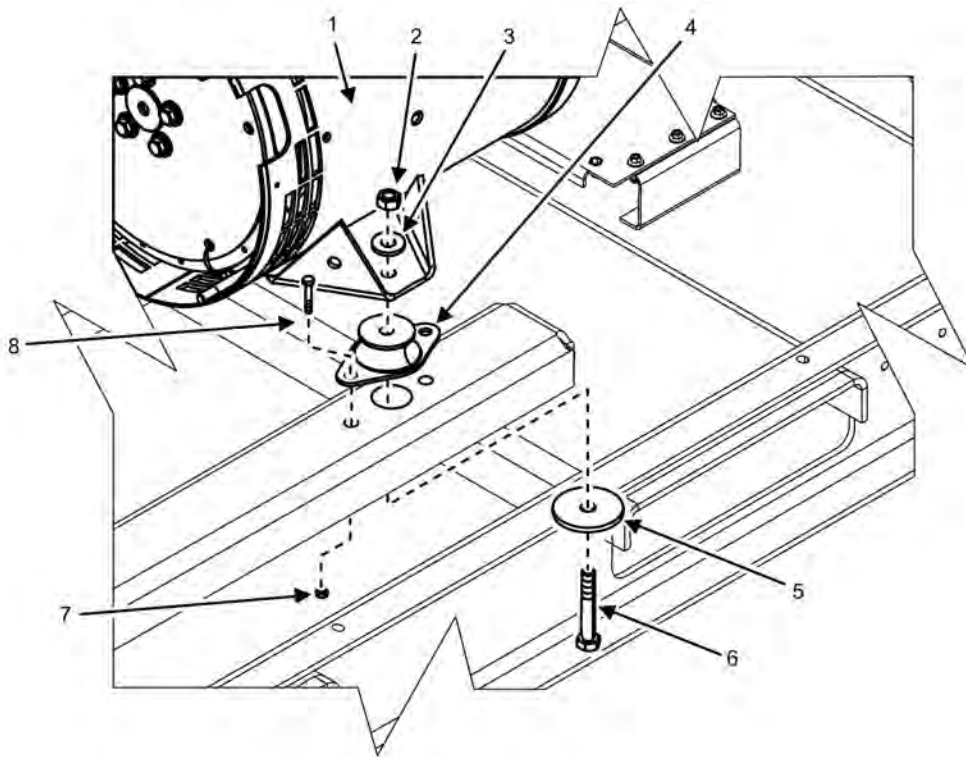


Figure 7. 400 Hz AC Generator — Removal.

26. Pull AC generator (Figure 7, Item 1) to the rear, free of engine using lifting device.

NOTE

If AC generator rotor refuses to separate from engine, perform steps 27 through 29 to separate engine and rotor.

27. Saturate area where engine flywheel (Figure 6, Item 6) and drive plate (Figure 6, Item 5) are connected with penetrating oil.
28. Allow penetrating oil to soak for 1 hr.
29. Strike point of contact between engine flywheel (Figure 6, Item 6) and drive plate (Figure 6, Item 5) using a hammer and brass drift around circumference of flywheel (Figure 6, Item 6) until two components break free.

CAUTION

Be aware of generator set components, such as the output box, while maneuvering the AC generator (Figure 7, Item 1). Failure to comply may cause damage to equipment.

30. Remove AC generator (Figure 7, Item 1) from unit skid using suitable lifting device (Figure 5, Item 1).
31. Place AC generator (Figure 7, Item 1) on a suitable work surface.
32. Remove lifting device (Figure 5, Item 1) from AC generator (Figure 7, Item 1) lifting ring.
33. Remove two screws (Figure 7, Item 8) and two nuts (Figure 7, Item 7) securing left-side vibration isolator (Figure 7, Item 4) to skid. Discard vibration isolator (Figure 7, Item 4).

34. Remove two screws (Figure 7, Item 8) and two nuts (Figure 7, Item 7) securing right-side vibration isolator (Figure 7, Item 4) to skid. Discard vibration isolator (Figure 7, Item 4).

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

35. Remove any remaining vibration isolator (Figure 7, Item 4) residue from mounts with dry cleaning solvent and wiping rag.

CAUTION

AC generator (Figure 7, Item 1) must be transported resting on the end bell. In this position, the rotor cannot slide out of the generator housing. Also, stabilize the rotor within the generator housing to prevent contact between the two components. Failure to comply may cause damage to equipment.

NOTE

Perform steps 34 – 36 only if the AC generator (Figure 7, Item 1) is to be returned for repair.

36. Install screen (Figure 3, Item 1) over AC generator and secure by installing screw (Figure 3, Item 4), new lock washer (Figure 3, Item 3), and flat washer (Figure 3, Item 2).

END OF TASK

Inspect 400 Hz AC Generator Assembly (UOC 98F)

1. Inspect AC generator (Figure 7, Item 1) for damage and replace as required.
2. Inspect left and right AC generator mounts on skid for indications of structural weakness. Replace skid as required.
3. Inspect skid for damage, corrosion, cracks, or other indications of structural weakness. Replace skid as required.

END OF TASK

Install 400 Hz AC Generator Assembly (UOC 98F)

1. Clean mounting area, hardware, and surrounding skid area of dirt, debris, and grease using wiping rags and dry cleaning solvent.
2. Dispose of wiping rags IAW local SOP.
3. Apply a thin coat of multipurpose grease to mounting surfaces of drive plate (Figure 6, Item 5), fan (Figure 6, Item 4), and engine flywheel (Figure 6, Item 6) to minimize formation of galvanic corrosion between components.
4. Position new vibration isolators (Figure 7, Item 4) to left- and right-side generator and skid mount.
5. Secure left- and right-side vibration isolators (Figure 7, Item 4) with two screws (Figure 7, Item 8) and two nuts (Figure 7, Item 7) to skid. Tighten nuts to 34– 42 ft/lb (to 47 – 57 Nm).

NOTE

Perform steps 6 and 7 only if a new or refurbished AC generator (Figure 7, Item 1) is being installed.

6. Remove screw (Figure 3, Item 4), lock washer (Figure 3, Item 3), flat washer (Figure 3, Item 2), and screen (Figure 3, Item 1) from AC generator. Discard lock washer (Figure 3, Item 3).
7. Remove any material used to prevent the rotor from contacting the generator housing during shipping.
8. Attach suitable lifting device (Figure 5, Item 1) with chain/sling (Figure 5, Item 2) to lift ring (Figure 5, Item 3) of AC generator (Figure 7, Item 1).
9. Position AC generator (Figure 7, Item 1) at its approximate mounting location on unit skid.
10. Insert two mounting screws (Figure 7, Item 6) with two snubbing washers (Figure 7, Item 5) through new vibration isolators (Figure 7, Item 4) on generator skid mounts to align mounting holes.
11. Lower AC generator (Figure 7, Item 1) slowly, using lifting device (Figure 5, Item 1), until mounting holes on AC generator mounts align with mounting screws (Figure 7, Item 6).
12. Install two flat washers (Figure 7, Item 3) and two lock nuts (Figure 7, Item 2) to two screws (Figure 7, Item 6) positioned in step 10 finger-tight.
13. Align AC generator (Figure 6, Item 1) with engine flywheel (Figure 6, Item 6).
14. Install four screws (Figure 6, Item 8) securing AC generator (Figure 6, Item 1) to flywheel housing (Figure 6, Item 7). Tighten screws (Figure 6, Item 8) to 22 – 26 ft/lb (31 to 36 Nm).
15. Rotate engine harmonic balancer hex cap screw clockwise (as viewed from water pump end of engine) using socket and breaker bar to align mounting holes in AC generator drive plate (Figure 6, Item 5), fan (Figure 6, Item 4), and engine flywheel (Figure 6, Item 6) near the top of AC generator housing to ease installation of screw (Figure 6, Item 2).
16. Install screw (Figure 6, Item 2) without washer (Figure 6, Item 3) finger-tight.
17. Continue to rotate the crankshaft to align the remaining mounting holes one at a time near the top of AC generator housing.
18. Cut and discard wire ties installed during removal procedure to maintain orientation of AC generator drive plate (Figure 6, Item 5), fan (Figure 6, Item 4), and engine flywheel (Figure 6, Item 6) as they are presented.
19. Install remaining four screws (Figure 6, Item 2) and four washers (Figure 6, Item 3) finger-tight.
20. Continue to rotate the crankshaft to position the first mounting screw (Figure 6, Item 2) that does not have a washer near the top of AC generator housing.
21. Remove the first mounting screw (Figure 6, Item 2) and re-install mounting screw (Figure 6, Item 2) this time with a washer (Figure 6, Item 3).
22. Rotate crankshaft again to position screws (Figure 6, Item 2) near the top of AC generator housing and tighten screws (Figure 6, Item 2) to 39 – 47 ft/lb (53 – 65 Nm).
23. Tighten two lock nuts (Figure 7, Item 2) installed in step 12 to 62 – 76 ft/lb (85-104 Nm).
24. Remove supporting wooden block from under engine.
25. Remove lifting device (Figure 5, Item 1) from lift ring (Figure 5, Item 3) on AC generator (Figure 6, Item 1).
26. Reposition output box (Figure 2, Item 3) to its mounting location on unit skid and secure by installing two screws (Figure 2, Item 8) into captive nuts.

NOTE

Use tags applied to electrical wires and connectors during removal to aide in installation. Identification tags should remain in place until generator is completely reassembled and has been tested for proper operation.

27. Apply a thin coat of electrically conductive grease to all electrical connections prior to installation.
28. Insert 12 voltage selection switch wire leads (Figure 2, Item 6) into rear of output box (Figure 2, Item 3) near voltage selection switch (Figure 2, Item 2).
29. Connect 12 voltage selection switch wire leads (Figure 2, Item 6) to voltage selection switch (Figure 2, Item 2) in output box (Figure 2, Item 3) (WP 0054, Remove/Install Voltage Selection Switch).
30. Connect wiring harness connector P85 (Figure 4, Item 4) to AC generator (Figure 4, Item 1) at male connector (Figure 4, Item 5).
31. Connect wiring harness connector P90 (Figure 4, Item 3) to AC generator (Figure 4, Item 1) at female connector (Figure 4, Item 2).
32. Secure 12 voltage selection switch wire leads (Figure 4, Item 6) to AC generator (Figure 4, Item 1) by installing screw (Figure 4, Item 9), washer (Figure 4, Item 8), and clamp (Figure 4, Item 7).
33. Install screen (Figure 3, Item 1) over AC generator and secure by installing screw (Figure 3, Item 4), new lock washer (Figure 3, Item 3), and flat washer (Figure 3, Item 2).
34. Install ground strap (Figure 2, Item 14) to rear of AC generator (Figure 2, Item 1) and secure by installing screw (Figure 2, Item 12) and washer (Figure 2, Item 13).
35. Install two wire leads (Figure 2, Item 15) to rear of AC generator (Figure 2, Item 1) using tags installed at removal as a guide.
36. Secure wire leads (Figure 2, Item 15) to rear of AC generator (Figure 2, Item 1) by installing screw (Figure 2, Item 11) and washer (Figure 2, Item 10).
37. Tighten screw (Figure 2, Item 12) to torque value of 28 to 32 ft/lb (38 to 43 Nm).
38. Tighten screw (Figure 2, Item 11) to torque value of 20 in/lb (2.5 Nm).
39. Install 12 voltage selection switch wire leads (Figure 2, Item 6) to two finger retainers (Figure 2, Item 5) and secure finger retainers (Figure 2, Item 5) to rear of output box (Figure 2, Item 3) by installing two screws (Figure 2, Item 4).
40. Install clamp (Figure 2, Item 7) securing 12 voltage selection switch wire leads (Figure 2, Item 6) to rear of output box (Figure 2, Item 3) and secure by installing screw (Figure 2, Item 9).
41. Install relay panel (WP 0061, Remove/Install Relay Panel).
42. Install and adjust engine speed sensor (WP 0067, Remove/Install Engine Speed Sensor).
43. Install fuel tank (WP 0046, Remove/Install Fuel Tank).
44. Install interior body panels (WP 0035, Remove/Install Interior Body Panels).
45. Install left-side body panel (WP 0031, Remove/Install Left-side Body Panel).
46. Install right-side body panel (WP 0032, Remove/Install Right-side Body Panel).
47. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
48. Install front body panel (WP 0029, Remove/Install Front Body Panel).
49. Install DCS (WP 0017, Remove/Install DCS).
50. Install top body panel (WP 0028, Remove/Install Top Body Panel).
51. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
52. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).

53. Start engine, check for proper operation, and repair as required. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).

54. Check all fluid levels and top-up as required (TM 9-6115-749-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
TEST AC GENERATOR

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Puller Set, Mechanical (WP 0162, Table 2, Item 19)

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0162, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Bearing, rotor (1) (WP 0121, Repair Parts List, Figure 23, Item 28; WP 0122, Repair Parts List, Figure 24, Item 20)

Exciter, rotor (1) (WP 0121, Figure 23, Item 29; WP 0122, Figure 24, Item 21)

Nut, plain, assembled (8) (WP 0121, Figure 23, Item 27; WP 0122, Figure 24, Item 19)

O-ring (1) (WP 0121, Figure 23, Item 5, WP 0122; Figure 24, Item 32)

Rectifier, negative (1) (WP 0121, Figure 23, Item 31; WP 0122, Figure 24, Item 22)

Rectifier, positive (1) (WP 0121, Figure 23, Item 30; WP 0122, Figure 24, Item 25)

Resistor, voltage sensitive (1) (WP 0121, Figure 23, Item 25; WP 0122, Figure 24, Item 17)

Stator, exciter (1) (WP 0121, Figure 23, Item 7; WP 0122, Figure 24, Item 34)

Washer, lock (4) (WP 0121, Figure 23, Item 8; WP 0122, Figure 24, Item 35)

Washer, lock (9) (WP 0121, Figure 23, Item 20)

Washer, lock (4) (WP 0121, Figure 23, Item 32; WP 0122, Figure 24, Item 24)

Washer, lock (5) (WP 0122, Figure 24, Item 13)

Materials/Parts

Cleaning compound, solvent (WP 0163, Expendable and Durable Items List, Item 10)

Rag, wiping (WP 0163, Item 31)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)

Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)

Interior body panels removed (WP 0035, Remove/Install Interior Body Panels)

Fuel tank removed (WP 0046, Remove/Install Fuel Tank)

Relay panel removed (WP 0061, Remove/Install Relay Panel)

Voltage selection switch removed (WP 0054, Remove/Install Voltage Selection Switch)

TEST AC GENERATOR**NOTE**

This WP is for testing 50/60 and 400 Hz AC generators. The first part of the procedure is for 50/60 Hz AC generators and the second part is for 400 Hz AC generators.

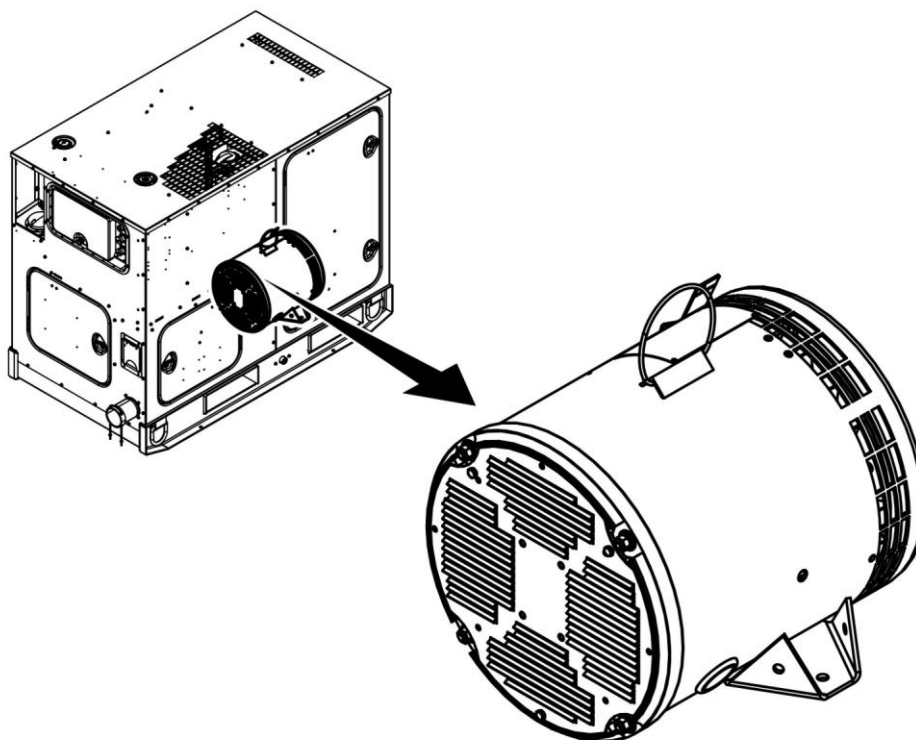
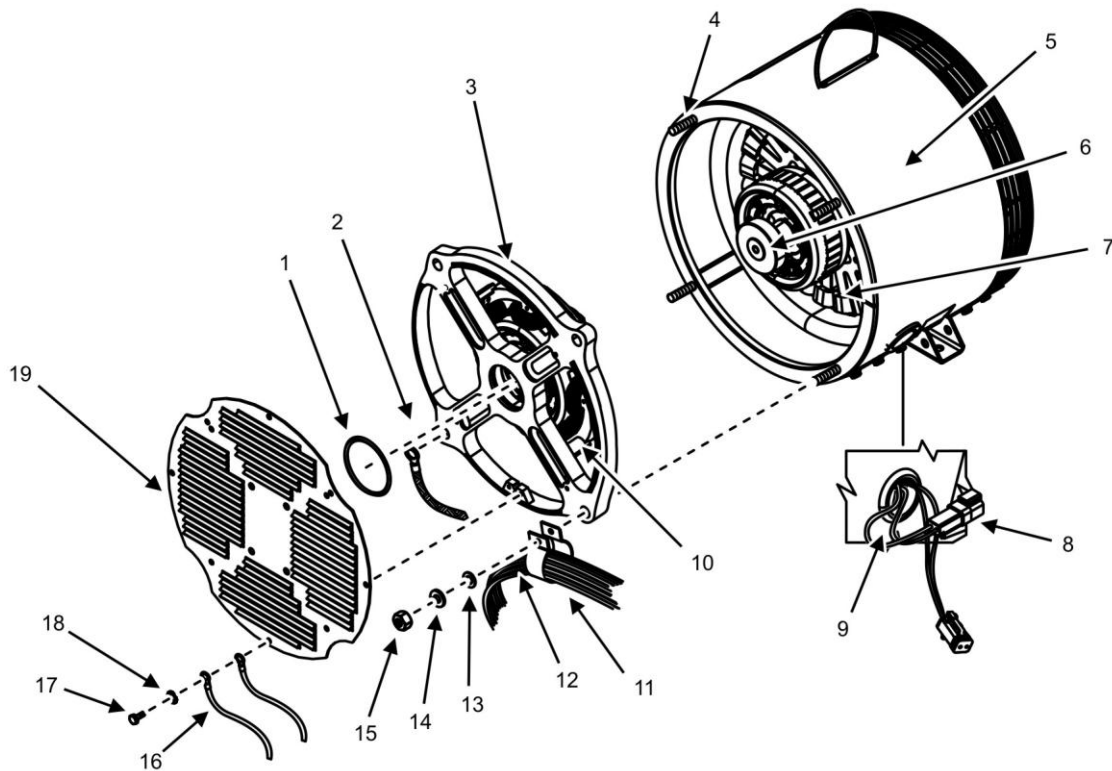
TEST 50/60 HZ AC GENERATOR**Remove End Bell**

Figure 1. 50/60 Hz AC Generator — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate AC generator on generator set skid (Figure 1).



Legend

- | | |
|----------------------------|---------------------------------|
| 1. O-Ring Packing | 11. Generator Output Wires |
| 2. Ground Strap | 12. Generator Output Wire Clamp |
| 3. End Bell | 13. Washer |
| 4. Through-Bolts | 14. Lock Washer |
| 5. Generator Stator | 15. Nut |
| 6. Bearing | 16. Shielded Wire Terminals |
| 7. Generator Rotor | 17. Screw |
| 8. P90 Plug | 18. External Tooth Lock Washer |
| 9. Wire Port | 19. End Bell Cover |
| 10. Exciter Stator Winding | |

Figure 2. 50/60 Hz Generator End Bell — Removal.

3. Place tag or mark on end bell cover (Figure 2, Item 19) and end bell (Figure 2, Item 3) to note relative position of end bell cover (Figure 2, Item 19) to end bell (Figure 2, Item 3).
4. Note location of shielded wire terminals (Figure 2, Item 16) to aid with installation.
5. Remove three screws (Figure 2, Item 17) and three lock washers (Figure 2, Item 18) that attach end bell cover (Figure 2, Item 19) and shielded wire terminals (Figure 2, Item 16) to end bell (Figure 2, Item 3).
6. Discard lock washers (Figure 2, Item 18).
7. Set end bell cover (Figure 2, Item 19) aside on suitable work surface.

8. Place tag or mark on end bell (Figure 2, Item 3) and generator stator (Figure 2, Item 5) to note relative position of end bell (Figure 2, Item 3) to generator stator (Figure 2, Item 5).
9. Remove four nuts (Figure 2, Item 15), four washers (Figure 2, Item 13), and four lock washers (Figure 2 Item 14) from through-bolts (Figure 2, Item 4).
10. Discard lock washers (Figure 2, Item 14).
11. Note location of ground strap (Figure 2, Item 2) to aid with installation. Remove ground strap (Figure 2, Item 2).
12. Note location of generator output wires (Figure 2, Item 11) and clamp (Figure 2, Item 12) to aid with installation. Remove generator output wires (Figure 2, Item 11) and clamp (Figure 2, Item 12).
13. Place tag or mark on P90 wiring plug (Figure 2, Item 8) wires to indicate the length that wires extend from generator stator (Figure 2, Item 5).
14. Disconnect P90 wiring plug (Figure 2, Item 8) at generator output wire clamp (Figure 2, Item 12).
15. Withdraw P90 wiring plug (Figure 2, Item 8) connected to the exciter stator winding (Figure 2, Item 10) through wire port in generator stator (Figure 2, Item 9).

CAUTION

End bell (Figure 2, Item 3) can be removed safely with a pry bar by applying force evenly and alternately to opposite sides of the end bell (Figure 2, Item 3). Failure to comply may cause damage to equipment.

Use extreme caution when removing end bell (Figure 2, Item 3) from generator stator (Figure 2, Item 5). End bell (Figure 2, Item 3) is awkward to handle while using tools to remove and must be removed without any exciter stator (Figure 2, Item 10) contact with the generator rotor (Figure 2, Item 7). Failure to comply will cause damage to equipment.

NOTE

Assistance is required to perform step 16.

16. Remove end bell (Figure 2, Item 3) and exciter stator (Figure 2, Item 10) and place on a suitable work surface.
17. Remove O-ring packing (Figure 2, Item 1) from end bell (Figure 2, Item 3) and discard.
18. Inspect end bell cover (Figure 2, Item 19), end bell (Figure 2, Item 3), and exciter stator (Figure 2, Item 10) for signs of metal fractures or fatigue, damaged threads, loose or broken wires, damaged insulation, excessive heat, and/or odor of burned insulation. Replace as required.

END OF TASK

Test Exciter Stator Winding

1. Select Ohms resistance function on multimeter (Figure 3, Item 4).
2. Touch either meter probe (Figure 3, Item 3 or 5) to either pin (Figure 3, Item 2 or 6) of P90 wiring plug (Figure 3, Item 1).
3. Touch second meter probe (Figure 3, Item 3 or 5) to second pin (Figure 3, Item 2 or 6) of P90 wiring plug (Figure 3, Item 1).

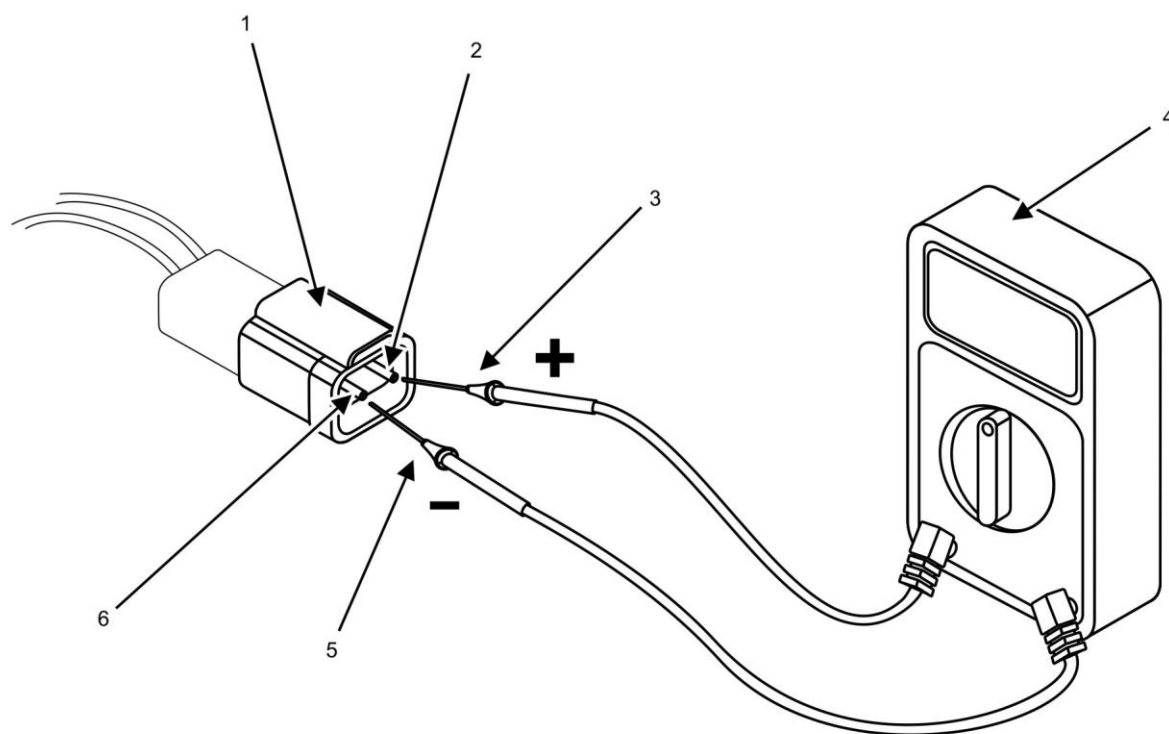


Figure 3. Test 50/60 Hz Exciter Stator Winding — Detail.

4. Observe and record value of resistance.
5. Touch either meter probe (Figure 3, Item 3 or 5) to either pin (Figure 3, Item 2 or 6) of P90 wiring plug (Figure 3, Item 1).
6. Touch second meter probe (Figure 3, Item 3 or 5) to a bare metal area (ground) of exciter stator (Figure 2, Item 10).
7. Observe and record value of insulation resistance.

NOTE

Resistance value of exciter stator (Figure 2, Item 10) winding obtained in step 4 should be 12.24 Ohms (Ω) \pm 10 percent (%). Resistance value of zero indicates a shorted exciter stator (Figure 2, Item 10) winding, and a resistance value of infinity indicates an open exciter stator (Figure 2, Item 10) winding.

Insulation resistance value of exciter stator (Figure 2, Item 10) winding to ground obtained in step 7 should be at least 1 megohms ($M\Omega$).

8. Compare resistance values obtained in step 4 and step 7 to specifications to determine if exciter stator (Figure 2, Item 10) is serviceable.
 - a. Proceed to Replace Exciter Stator task if step 8 indicates that exciter stator (Figure 2, Item 10) is not serviceable.
 - b. Set end bell (Figure 2, Item 3) and exciter stator (Figure 2, Item 10) aside for installation if serviceable.

END OF TASK

Replace Exciter Stator

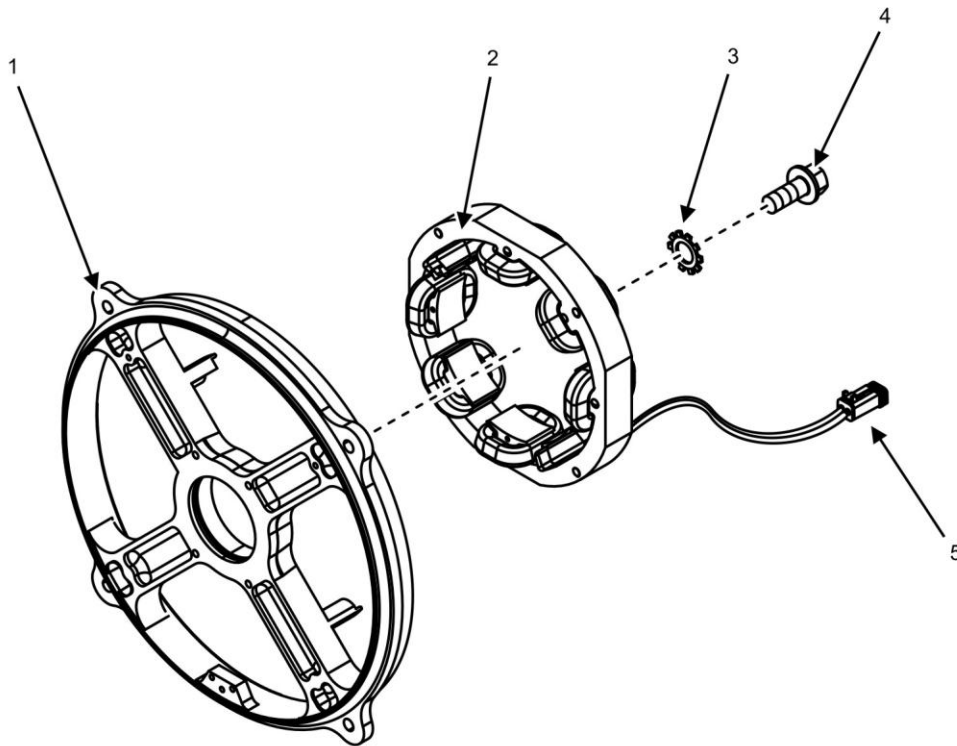


Figure 4. 50/60 Hz Exciter Stator — Removal.

1. Note orientation of P90 wiring plug (Figure 4, Item 5) to aid with installation.
2. Remove four bolts (Figure 4, Item 4) and four lock washers (Figure 4, Item 3) that attach exciter stator (Figure 4, Item 2) to end bell (Figure 4, Item 1).
3. Discard lock washers (Figure 4, Item 3).
4. Remove exciter stator (Figure 4, Item 2) from end bell (Figure 4, Item 1).
5. Examine machined surface of end bell (Figure 4, Item 1) for corrosion, dirt, and debris where exciter stator (Figure 4, Item 2) makes contact. Clean as required.
6. Perform Test Exciter Stator Winding task on new exciter stator (Figure 4, Item 2).
7. Examine mating surface of new exciter stator (Figure 4, Item 2) visually where it will contact end bell (Figure 4, Item 1).
8. Remove any material from the surface of exciter stator (Figure 4, Item 2) that will interfere with mating surfaces of end bell (Figure 4, Item 1).
9. Place exciter stator (Figure 4, Item 2) onto end bell (Figure 4, Item 1) using correct P90 wiring plug (Figure 4, Item 5) orientation noted in step 1.
10. Align holes in exciter stator (Figure 4, Item 2) with matching holes in end bell (Figure 4, Item 1).
11. Position four bolts (Figure 4, Item 4) and four new lock washers (Figure 4, Item 3) to attach exciter stator (Figure 4, Item 2) to end bell (Figure 4, Item 1).

12. Tighten four bolts (Figure 4, Item 4) to torque value of 8 ft/lb (10 Nm).
13. Set end bell (Figure 4, Item 1) and exciter stator (Figure 4, Item 2) aside for installation.

END OF TASK

Inspect Rectifier and Surge Suppressor

1. Inspect rectifier plates (Figure 5, Items 2 and 5) for signs of corrosion, heat, or other damage. Replace as required.
2. Inspect surge suppressor (Figure 6, Item 6) for signs of corrosion, heat, or other damage. Replace as required.

END OF TASK

Test Rectifier

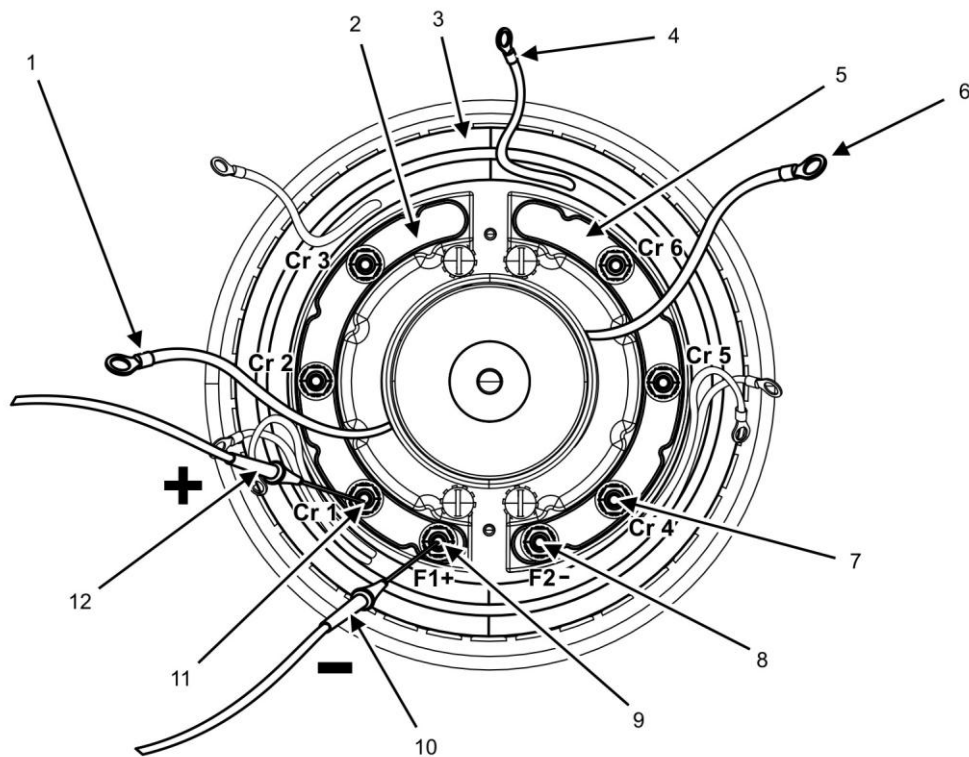


Figure 5. Test 50/60 Hz Rectifier and Generator Rotor.

CAUTION

Both F1+ and F2- rectifier plates (Figure 5, Items 2 and 5) must be replaced if either rectifier plate (Figure 5, Items 2 or 5) or any diode fails testing. Failure to comply may cause damage to equipment.

If F1+ and F2- rectifier plates (Figure 5, Items 2 and 5) and Cr1 through Cr6 diodes are not marked as shown in Figure 5, it is imperative that each is identified before it is removed and marked or tagged according to Figure 5. Failure to comply may cause damage to equipment.

1. Mark or tag orientation of each rectifier plate (Figure 5, Items 2 and 5).

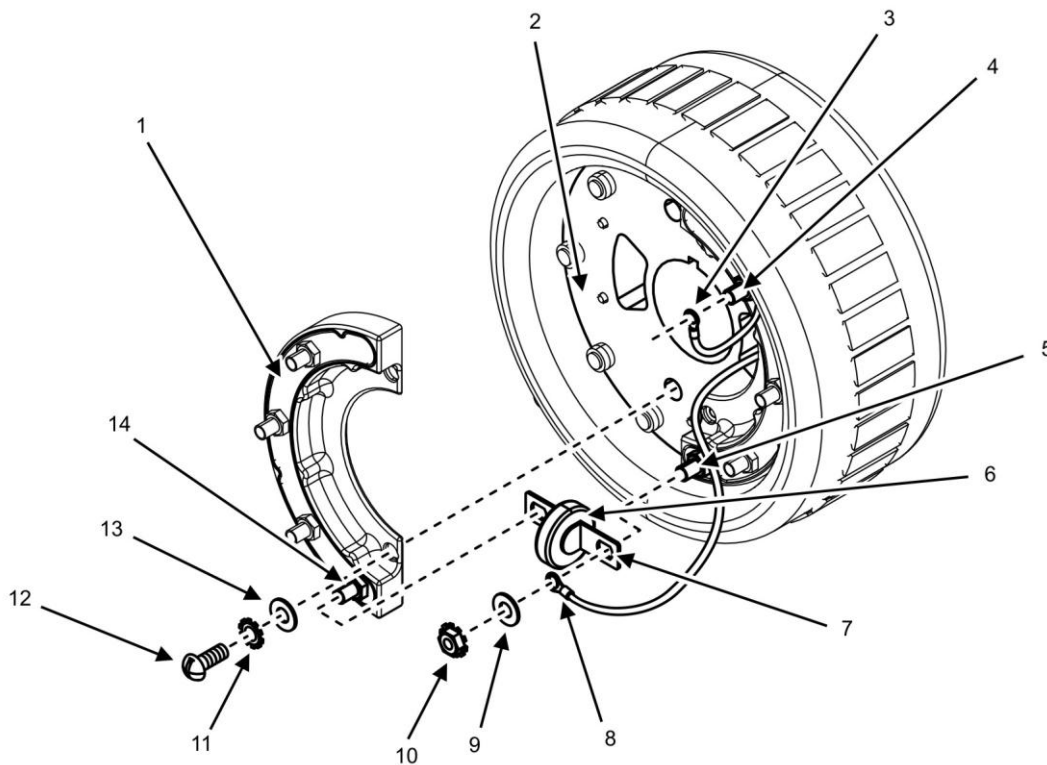


Figure 6. 50/60 Hz Rectifier Removal — Detail.

2. Mark or tag each wire (Figure 6, Items 3 and 8) as it is removed from diode (Figure 6, Item 4) and terminal studs (Figure 6, Item 5) to aid with installation.
3. Remove nut with captive lock washer (Figure 6, Item 10) and flat washer (Figure 6, Item 9) from F1+ terminal stud (Figure 6, Item 14).
4. Remove nut with captive lock washer (Figure 6, Item 10) and flat washer (Figure 6, Item 9) from F2- terminal stud (Figure 6, Item 5).
5. Discard two nuts with captive lock washers (Figure 6, Item 10).
6. Remove surge suppressor (Figure 6, Item 6) and place on suitable surface for testing.
7. Remove F1+ generator rotor wire (Figure 5, Item 1) from F1+ terminal (Figure 5, Item 9).
8. Remove F2- generator rotor wire (Figure 5, Item 6) from F2- terminal (Figure 5, Item 8).
9. Remove nut with captive lock washer (Figure 6, Item 10), flat washer (Figure 6, Item 9), and exciter rotor wire (Figure 5, Item 4) from diode CR1 (Figure 5, Item 11).
10. Repeat step 9 for remaining diodes.
11. Discard six nuts with captive lock washers (Figure 6, Item 10).
12. Select Ohms resistance function on multimeter (Figure 3, Item 4).
13. Touch negative meter probe (Figure 5, Item 10) to F1+ terminal (Figure 5, Item 9) and positive meter probe (Figure 5, Item 12) to diode CR1 (Figure 5, Item 11). Observe and record resistance value.
14. Touch positive meter probe (Figure 5, Item 12) to F1+ terminal (Figure 5, Item 9) and negative meter probe (Figure 5, Item 10) to diode CR1 (Figure 5, Item 11). Observe and record resistance value.
15. Repeat steps 13 and 14 for remaining diodes of F1+ rectifier plate (Figure 5, Item 2).

16. Touch negative meter probe (Figure 5, Item 10) to F2- terminal (Figure 5, Item 8) and positive meter probe (Figure 5, Item 12) to diode CR4 (Figure 5, Item 7). Observe and record resistance value.
17. Touch positive meter probe (Figure 5, Item 12) to F2- terminal (Figure 5, Item 8) and negative meter probe (Figure 5, Item 10) to diode CR4 (Figure 5, Item 7). Observe and record resistance value.
18. Repeat steps 16 and 17 for remaining diodes of F2- rectifier plate (Figure 5, Item 5).

NOTE

Resistance value obtained in step 13 and step 17 should be $2.74 \text{ M}\Omega \pm 10 \%$ and the resistance value obtained in step 14 and step 16 should be greater than $27 \text{ M}\Omega$.

Resistance value obtained in step 14 and step 16 will typically be infinite resistance.

19. Compare resistance values obtained in steps 13 through 18 to specifications to determine if rectifier plates (Figure 5, Items 2 and 5) are serviceable.

NOTE

Rectifier plates (Figure 5, Items 2 and 5) may remain attached to exciter rotor (Figure 6, Item 2) unless further tests reveal the need to remove rectifier plates (Figure 5, Items 2 and 5).

20. Proceed to Test Surge Suppressor task if rectifier is serviceable.
21. Proceed to Replace Rectifier task if rectifier is not serviceable.

END OF TASK

Test Surge Suppressor

1. Select Ohms resistance function on multimeter (Figure 3, Item 4).
2. Touch positive meter probe (Figure 3, Item 3) to either connection point (Figure 6, Item 7) of surge suppressor (Figure 6, Item 6).
3. Touch negative meter probe (Figure 3, Item 5) to opposite connection point of surge suppressor (Figure 6, Item 6). Observe and note resistance value.
4. Reverse the points of contact with meter probes (Figure 3, Items 3 and 5). Observe and note resistance value.

NOTE

Resistance value of surge suppressor (Figure 6, Item 6) should be equal when measured front-to-back and back-to-front. An acceptable value is greater than $1 \text{ M}\Omega$ and measured value will typically be infinite resistance.

5. Compare resistance values obtained in step 3 and step 4 to specifications to determine if surge suppressor (Figure 6, Item 6) is serviceable.
6. Set surge suppressor (Figure 6, Item 6) aside for installation if serviceable or replace as required.

END OF TASK

Replace Rectifier

1. Remove two screws (Figure 6, Item 12), two lock washers (Figure 6, Item 11), two flat washers (Figure 6, Item 13), and F1+ rectifier plate (Figure 5, Item 2) from exciter rotor (Figure 5, Item 3).
2. Discard lock washers (Figure 6, Item 11).
3. Repeat steps 1 and 2 for F2- rectifier plate (Figure 5, Item 5).

4. Inspect mounting surface of exciter rotor (Figure 5, Item 3) where rectifier plates (Figure 5, Items 2 and 5) were attached and clean as required.
5. Perform Test Rectifier task, steps 12 through 19 on replacement rectifier plates (Figure 5, Items 2 and 5).
6. Align holes in F1+ rectifier plate (Figure 5, Item 2) with holes in exciter rotor (Figure 5, Item 3) using orientation noted in Test Rectifier task, step 1.
7. Install two screws (Figure 6, Item 12), two new lock washers (Figure 6, Item 11), and two flat washers (Figure 6, Item 13) to attach F1+ rectifier plate (Figure 6, Item 1) to exciter rotor (Figure 6, Item 2).
8. Repeat steps 7 and 8 for F2- rectifier plate (Figure 5, Item 5).

END OF TASK

Test Exciter Rotor Winding

NOTE

Exciter rotor wires (Figure 5, Item 4) are paired according to a specific order. The order of pairs is Cr1 to Cr4, Cr2 to Cr5, and Cr3 to Cr6.

1. Identify each of six numbered exciter rotor wire (Figure 5, Item 4) terminals.
2. Select Ohms resistance function on multimeter (Figure 3, Item 4).
3. Touch either meter probe (Figure 3, Item 3 or 5) to exciter rotor wire (Figure 5, Item 4) terminal identified as CR1.
4. Touch second meter probe (Figure 3, Items 3 or 5) to exciter rotor wire (Figure 5, Item 4) terminal identified as Cr4.
5. Observe and record value of resistance.
6. Repeat steps 3 through 5 for remaining ordered pairs of exciter rotor wires (Figure 5, Item 4).
7. Touch either meter probe (Figure 3, Item 3 or 5) to exciter rotor wire (Figure 5, Item 4) terminal tagged or marked as CR1.
8. Touch second meter probe to bare metal area (ground) of exciter rotor (Figure 5, Item 3).
9. Observe and record value of resistance.
10. Repeat steps 7 through 9 for remaining exciter rotor wires (Figure 5, Item 4) terminals tagged or marked as Cr 2 and Cr3.

NOTE

Resistance values obtained in steps 3 through 6 should be $0.5 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . A measurement value greater than 1Ω or with a $\pm 10\%$ variance for any pair of wires indicates a defective exciter rotor (Figure 5, Item 3).

Resistance values obtained in step 7 through 10 of each wire to ground should be at least $1 M\Omega$.

11. Compare the resistance values obtained in steps 3 through 6 and steps 7 through 10 to specifications to determine if exciter rotor (Figure 5, Item 3) is serviceable.
12. Proceed to Test Generator Rotor Winding task if exciter rotor (Figure 5, Item 3) is serviceable or replace as required.

END OF TASK

Test Generator Rotor Winding

1. Identify generator rotor wires tagged or marked F1+ generator rotor wire (Figure 5, Item 1) and F2- generator rotor wire (Figure 5, Item 6).
2. Select Ohms resistance function on multimeter (Figure 3, Item 4).
3. Touch either meter probe (Figure 3, Item 3 or 5) to F1+ generator rotor wire (Figure 5, Item 1) terminal.
4. Touch second meter probe (Figure 3, Items 3 or 5) to F2- generator rotor wire (Figure 5, Item 6) terminal.
5. Observe and record value of resistance.
6. Touch either meter probe (Figure 3, Item 3 or 5) to F1+ generator rotor wire (Figure 5, Item 1) terminal.
7. Touch second meter probe (Figure 3, Item 3 or 5) to bare metal area (ground) of generator rotor (Figure 2, Item 7).
8. Observe and record value of resistance.

NOTE

Resistance value obtained in steps 3 through 5 should be $2.10 \Omega \pm 10 \%$. Resistance value of infinity indicates an open generator rotor (Figure 2, Item 7) winding and resistance value of zero indicates a shorted generator rotor (Figure 2, Item 7) winding.

Resistance value obtained in steps 6 through 8 of generator rotor (Figure 2, Item 7) winding to ground should be at least 1 M Ω .

9. Compare the resistance values obtained in steps 3 through 5 and steps 6 through 8 to specifications to determine if generator rotor (Figure 2, Item 7) is serviceable.
10. Proceed to Test Generator Stator Winding task if generator rotor (Figure 2, Item 7) is serviceable.

END OF TASK**Test Generator Stator Winding**

1. Identify each of the 12 numbered generator output wires (Figure 2, Item 11) removed from voltage selection switch during WP 0054, Remove/Install Voltage Selection Switch using imprinted wire markers.

NOTE

Generator stator winding output wires (Figure 2, Item 11) are paired according to a specific order. The order of pairs is: T1 – T4, T2 – T5, T3 – T6, T7 – T10, T8 – T11, and T9 – T12.

2. Arrange wires into ordered pairs.
3. Select Ohms resistance function on multimeter (Figure 3, Item 4).
4. Touch either meter probe (Figure 3, Item 3 or 5) to generator output wire terminal marked T1.
5. Touch second meter probe (Figure 3, Item 3 or 5) to generator output wire terminal marked T4.
6. Observe and record value of resistance.
7. Repeat steps 4 through 6 for the remaining ordered pairs of wires.
8. Touch either meter probe (Figure 3, Item 3 or 5) to generator output wire marked T1.
9. Touch second meter probe (Figure 3, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 2, Item 5).

10. Observe and record value of resistance.
11. Repeat steps 8 through 10 for generator output wire terminals marked T2, T3, T7, T8, and T9.

NOTE

Resistance values obtained in steps 4 through 7 should be $0.2557 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . A measurement value greater than 1Ω or with a $\pm 10\%$ variance for any part of wires indicates a defective generator stator (Figure 2, Item 5)

Resistance values obtained in steps 8 through 11 of each wire to ground should be at least $1 M\Omega$.

12. Compare resistance values obtained in steps 4 through 7 and steps 8 through 11 to specifications to determine if generator stator (Figure 2, Item 5) is serviceable.

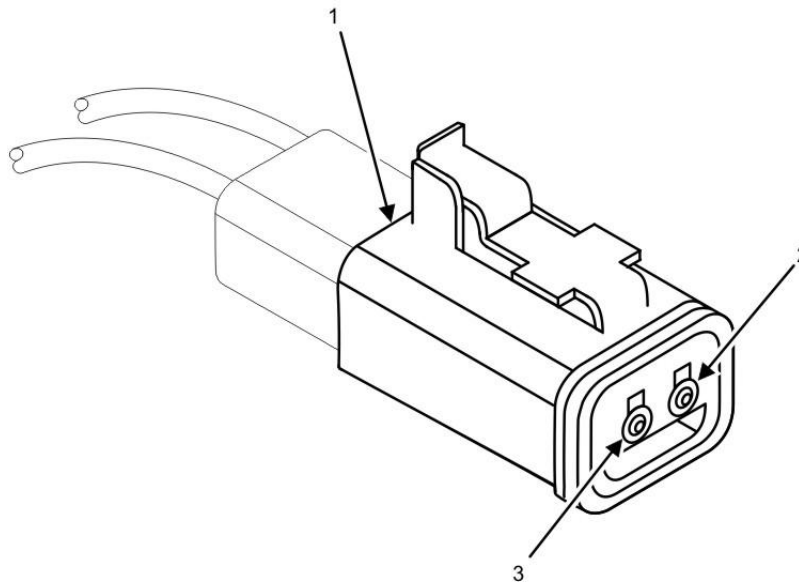


Figure 7. Test 50/60 Hz Generator Stator Q1/Q2 Winding — Detail.

13. Locate and disconnect Q1/Q2 wiring plug (Figure 7, Item 1) at wire port in generator stator (Figure 2, Item 9).
14. Select Ohms resistance function on multimeter (Figure 3, Item 4).
15. Touch either meter probe (Figure 3, Item 3 or 5) to either wiring plug (Figure 7, Item 1) connector (Figure 7, Item 2 or 3).
16. Touch second meter probe (Figure 3, Item 3 or 5) to second wiring plug (Figure 7, Item 1) connector (Figure 7, Item 2 or 3).
17. Observe and record value of resistance.
18. Touch either meter probe (Figure 3, Item 3 or 5) to either wiring plug (Figure 7, Item 1) connector (Figure 7, Item 2 or 3).
19. Touch second meter probe (Figure 3, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 2, Item 5).
20. Observe and record value of resistance.

NOTE

Resistance value obtained in steps 15 through 17 should be $1.013 \Omega \pm 10\%$.

Resistance value obtained in steps 18 through 20 to ground should be at least $1 \text{ M}\Omega$.

21. Compare the resistance values obtained in steps 15 through 17 and steps 18 through 20 to specifications to determine if generator stator (Figure 2, Item 5) is serviceable.

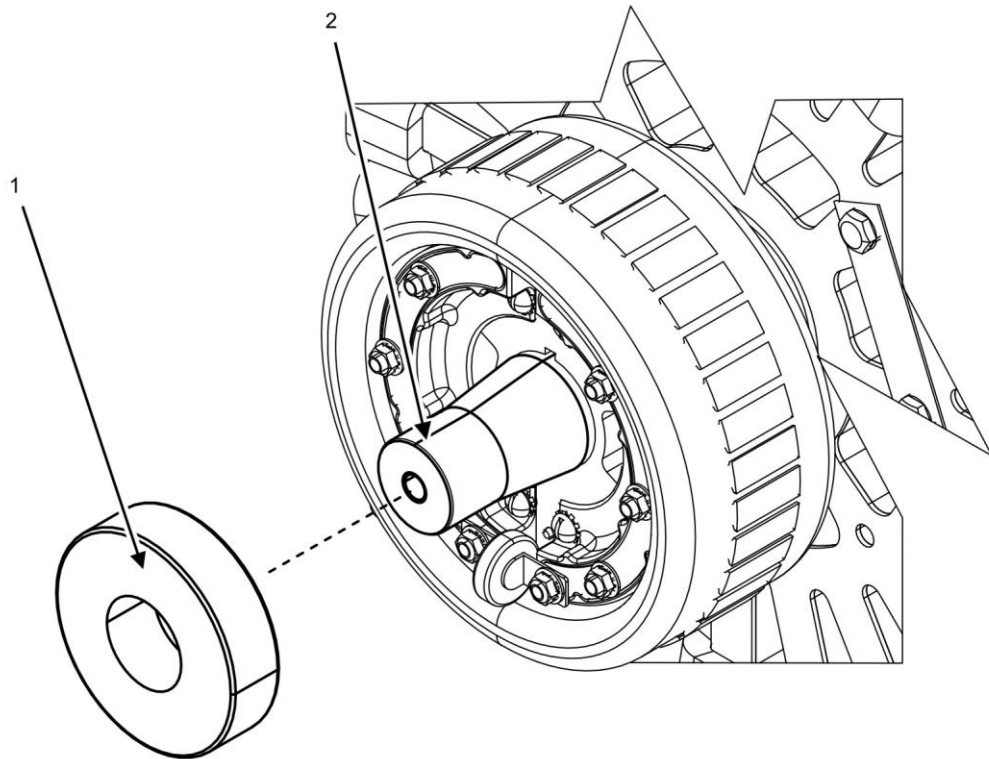
END OF TASK**Inspect Bearing**

Figure 8. 50/60 Hz Generator Bearing Removal — Detail.

1. Examine bearing (Figure 8, Item 1) for discoloration and corrosion that are signs of heat and contamination damage.
2. Touch outer race of bearing (Figure 8, Item 1) lightly with fingertips and rotate slowly in a back-and-forth motion to feel and listen for any signs of roughness and/or lack of lubrication.
3. Proceed to Replace Bearing task if any signs of damage are found or if bearing (Figure 8, Item 1) does not rotate freely.

END OF TASK

Replace Bearing

1. Attach bearing puller to bearing (Figure 8, Item 1).

CAUTION

When a bearing is removed for any reason, always install a new bearing (Figure 8, Item 1). Failure to comply may cause damage to equipment.

2. Remove bearing (Figure 8, Item 1) from generator rotor shaft (Figure 8, Item 2).
3. Clean bearing surface of generator rotor shaft (Figure 8, Item 2).
4. Press new bearing (Figure 8, Item 1) onto generator rotor shaft (Figure 8, Item 2).

END OF TASK**Install End Bell**

1. Perform Test Surge Suppressor task on new surge suppressor (Figure 6, Item 6).
2. Place surge suppressor (Figure 6, Item 6) onto F1+ terminal (Figure 5, Item 9) and F2- terminal (Figure 5, Item 8).
3. Place F1+ generator rotor wire (Figure 5, Item 1) onto F1+ terminal (Figure 5, Item 9).
4. Install flat washer (Figure 6, Item 9) and new nut with captive lock washer (Figure 6, Item 10) onto F1+ terminal (Figure 5, Item 9).
5. Place F2- generator rotor wire (Figure 5, Item 6) onto F2- terminal (Figure 5, Item 8).
6. Install flat washer (Figure 6, Item 9) and new nut with captive lock washer (Figure 6, Item 10) onto F2- terminal (Figure 5, Item 8).
7. Place exciter rotor wire (Figure 5, Item 4) tagged or marked Cr1 onto diode tagged or marked Cr1 (Figure 5, Item 11).
8. Install flat washer (Figure 6, Item 9) and new nut with captive lock washer (Figure 6, Item 10) onto diode tagged or marked Cr1 (Figure 5, Item 11).
9. Repeat steps 7 through 8 for remaining exciter rotor wires (Figure 5, Item 4) and diodes (Figure 6, Item 4).
10. Remove tags or marks that will interfere with generator operation.
11. Install new O-ring packing (Figure 2, Item 1) into end bell (Figure 2, Item 3).
12. Insert P90 wiring plug (Figure 2, Item 8) through wire port of generator stator (Figure 2, Item 9).

CAUTION

Use extreme caution when installing end bell (Figure 2, Item 3) onto generator stator (Figure 2, Item 5). End bell (Figure 2, Item 3) is awkward to handle and must be installed without any exciter stator (Figure 2, Item 10) contact with generator rotor (Figure 2, Item 7). Failure to comply will cause damage to equipment.

13. Align tag or mark on end bell (Figure 2, Item 3) with corresponding tag or mark on generator stator (Figure 2, Item 5).
14. Push end bell (Figure 2, Item 3) mating surface evenly into matching machined surface of generator stator (Figure 2, Item 5).

NOTE

End bell (Figure 2, Item 3) may resist installation onto bearing (Figure 2, Item 6). Use a tool that will not damage end bell (Figure 2, Item 3) to tap various points around outside of bearing mating surface until end bell (Figure 2, Item 3) machined surface makes contact with generator stator (Figure 2, Item 5) machined surface.

15. Examine area between end bell (Figure 2, Item 3) machined surface and generator stator (Figure 2, Item 5) machined surface to ensure distance is even.
16. Install four washers (Figure 2, Item 13) and four nuts (Figure 2, Item 15) without lock washers (Figure 2, Item 14) onto through-bolts (Figure 2, Item 4).
17. Tighten each nut (Figure 2, Item 15) gradually in crisscross sequence using the same number of turns each time for each nut (Figure 2, Item 15) to draw end bell (Figure 2, Item 3) onto generator stator (Figure 2, Item 5).
18. Verify end bell (Figure 2, Item 3) machined surface has fully engaged generator stator (Figure 2, Item 5) machined surface.
19. See Remove End Bell task, steps 9, 13, and 14 if end bell (Figure 2, Item 3) machined surface does not fully engage generator stator (Figure 2, Item 5) machined surface. Repeat steps 14 through 19 as required.
20. Loosen four nuts (Figure 2, Item 15) that attach end bell (Figure 2, Item 3) to generator stator (Figure 2, Item 5) 1/2 – 3/4 turn.
21. Remove lower two nuts (Figure 2, Item 15) and two washers (Figure 2, Item 13) that attach end bell (Figure 2, Item 3) to generator stator (Figure 2, Item 5).
22. Install ground strap (Figure 2, Item 2) according to location noted in Remove End Bell task, step 11.
23. Install generator output wires (Figure 2, Item 11) and clamp (Figure 2, Item 12) according to location noted in Remove End Bell task, step 12.
24. Install two washers (Figure 2, Item 13), two new lock washers (Figure 2, Item 14), and two nuts (Figure 2, Item 15) onto lower two through-bolts (Figure 2, Item 4).
25. Remove upper two nuts (Figure 2, Item 15) and two washers (Figure 2, Item 13) that attach end bell (Figure 2, Item 3) to generator stator (Figure 2, Item 5).
26. Install two washers (Figure 2, Item 13), two new lock washers (Figure 2, Item 14), and two nuts (Figure 2, Item 15) onto upper two through-bolts (Figure 2, Item 4).
27. Tighten four nuts (Figure 2, Item 15) to torque value of 28 – 32 ft/lb (38 – 43 Nm).
28. Remove tags or marks that will interfere with generator operation.
29. Pull excess P90 wiring plug (Figure 2, Item 8) wire from generator stator (Figure 2, Item 9) at wire port to length tagged or marked in Remove End Bell task, step 13.
30. Align holes in end bell cover (Figure 2, Item 19) with matching holes in end bell (Figure 2, Item 3).
31. Install upper two screws (Figure 2, Item 17) and two new lock washers (Figure 2, Item 18) to loosely attach end bell cover (Figure 2, Item 19) to end bell (Figure 2, Item 3).
32. Install screw (Figure 2, Item 17), new lock washer (Figure 2, Item 18), and two shielded wire terminals (Figure 2, Item 16) according to location noted in Remove End Bell task, step 4 into lower end bell cover (Figure 2, Item 19) hole.
33. Tighten three screws (Figure 2, Item 17) to torque of 20 in/lb (20.5 Nm).
34. Remove tags or marks that will interfere with generator operation.
35. Connect P90 wiring plug (Figure 2, Item 8) to connector (not shown) at generator output wire clamp (Figure 2, Item 12).

-
36. Install voltage selection switch (WP 0054, Remove/Install Voltage Selection Switch).
 37. Install relay panel (WP 0061, Remove/Install Relay Panel).
 38. Install fuel tank (WP 0046, Remove/Install Fuel Tank).
 39. Install interior body panels (WP 0035, Remove/Install Interior Body Panels).
 40. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
 41. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
 42. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
 43. Connect negative battery cable (WP 0036, Remove /Install Batteries).
 44. Close generator set doors.
 45. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
 46. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
 47. Repair as required.

END OF TASK

TEST 400 HZ AC GENERATOR

Remove End Bell

1. Ensure equipment conditions are met in order presented in initial setup.

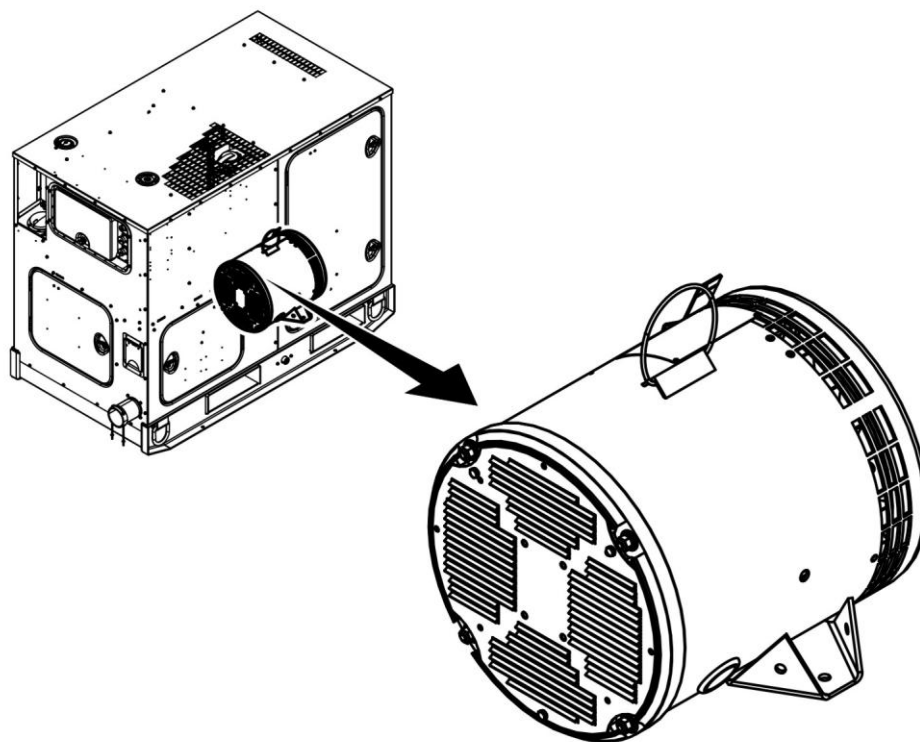
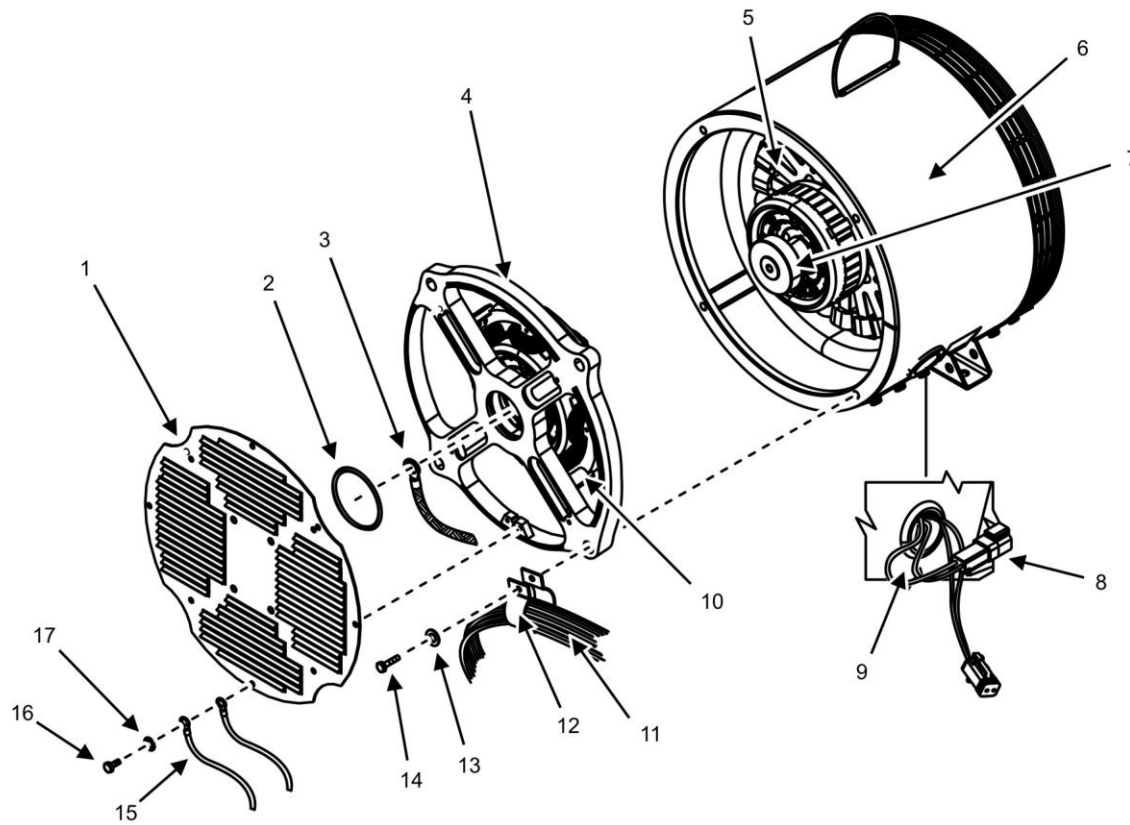


Figure 9. 400 Hz AC Generator — Location.

2. Locate AC generator on generator set skid (Figure 9).



Legend

- | | |
|---------------------|---------------------------------|
| 1. End Bell Cover | 10. Exciter Stator Winding |
| 2. O-Ring Packing | 11. Generator Output Wires |
| 3. Ground Strap | 12. Generator Output Wire Clamp |
| 4. End Bell | 13. Washer |
| 5. Generator Rotor | 14. Bolt |
| 6. Generator Stator | 15. Shielded Wire Terminals |
| 7. Bearing | 16. Screw |
| 8. P90 Plug | 17. External Tooth Lock Washer |
| 9. Wire Port | |

Figure 10. 400 Hz Generator End Bell — Removal.

3. Place tag or mark on end bell cover (Figure 10, Item 1) and end bell (Figure 10, Item 4) to note relative position of end bell cover (Figure 10, Item 1) to end bell (Figure 10, Item 4).
4. Note location of shielded wire terminals (Figure 10, Item 15) to aid with installation.
5. Remove three screws (Figure 10, Item 16) and three lock washers (Figure 10, Item 17) that attach end bell cover (Figure 10, Item 1) and shielded wire terminals (Figure 10, Item 15) to end bell (Figure 10, Item 4).
6. Discard three lock washers (Figure 10, Item 17).
7. Set end bell cover (Figure 10, Item 1) aside on suitable work surface for inspection.
8. Place tag or mark on end bell (Figure 10, Item 4) and generator stator (Figure 10, Item 6) to note relative position of end bell (Figure 10, Item 4) to generator stator (Figure 10, Item 6).

9. Note location of ground strap (Figure 10, Item 3) to aid with installation.
10. Note location of generator output wires (Figure 10, Item 11) and clamp (Figure 10, Item 12) to aid with installation.
11. Remove four bolts (Figure 10, Item 14) and four washers (Figure 10, Item 13) that attach end bell (Figure 10, Item 4) to generator stator (Figure 10, Item 6).
12. Place tag or mark on P90 wiring plug (Figure 10, Item 8) wires to indicate the length that wires extend from generator stator (Figure 10, Item 6).
13. Disconnect P90 wiring plug (Figure 10, Item 8) located at generator output wire clamp (Figure 10, Item 12).
14. Withdraw P90 wiring plug (Figure 10, Item 8) connected to the exciter stator (Figure 10 Item 10) through wire port in generator stator (Figure 10, Item 9).

CAUTION

End bell (Figure 10, Item 4) can be removed safely with a pry bar by applying force evenly and alternately to opposite sides of the end bell (Figure 10, Item 4). Failure to comply may cause damage to equipment.

Use extreme caution when removing end bell (Figure 10, Item 4) from generator stator (Figure 10, Item 6). End bell (Figure 10, Item 4) is awkward to handle while using tools to remove and must be removed without any exciter stator (Figure 10, Item 10) contact with generator rotor (Figure 10, Item 5). Failure to comply will cause damage to equipment.

NOTE

Assistance is required to perform step 15.

15. Remove end bell (Figure 10, Item 4) and exciter stator (Figure 10, Item 10) and place on a suitable work surface.
16. Remove O-ring packing (Figure 10, Item 2) from end bell (Figure 10, Item 4) and discard.
17. Inspect end bell cover (Figure 10, Item 1), end bell (Figure 10, Item 4), and exciter stator (Figure 10, Item 10) for signs of metal fractures or fatigue, damaged threads, loose or broken wires, damaged insulation, excessive heat, and/or odor of burned insulation. Replace as required.

END OF TASK

Test Exciter Stator Winding

1. Select Ohms resistance function on multimeter (Figure 11, Item 4).
2. Touch either meter probe (Figure 11, Item 3 or 5) to either pin (Figure 11, Item 2 or 6) of P90 wiring plug (Figure 11, Item 1).
3. Touch second meter probe (Figure 11, Item 3 or 5) to second pin (Figure 11, Item 2 or 6) of P90 wiring plug (Figure 11, Item 1).

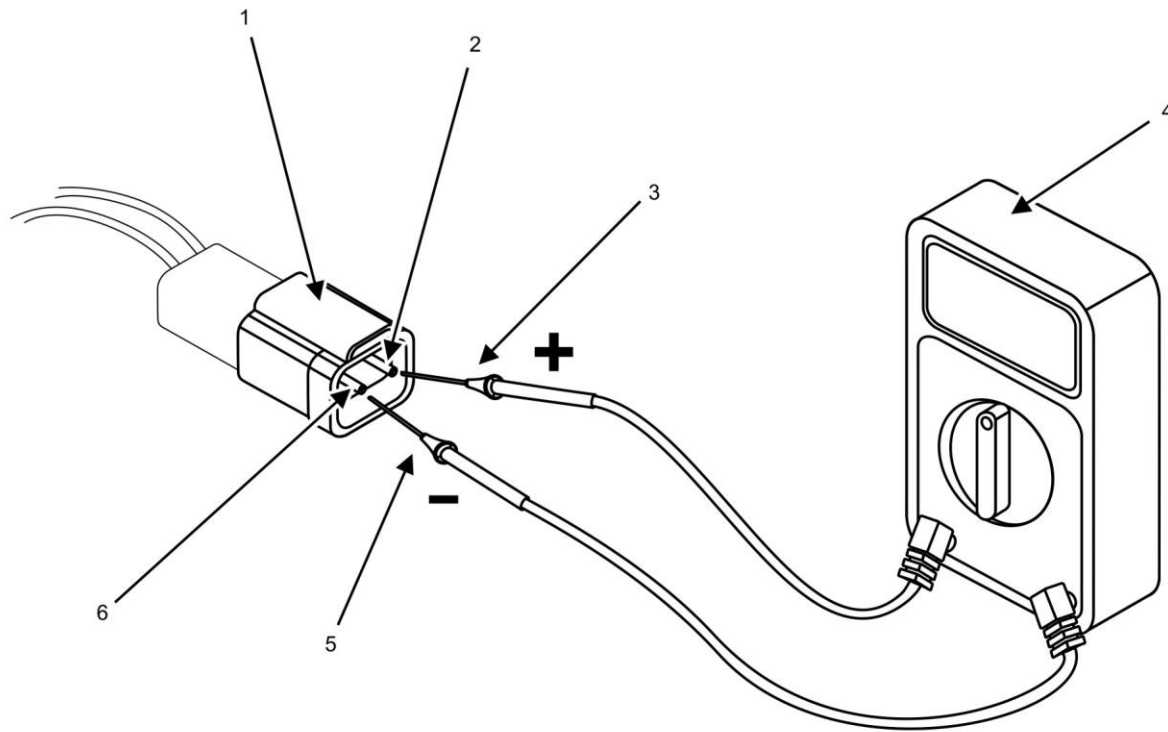


Figure 11. Test 400 Hz Exciter Stator Winding — Detail.

4. Observe and record value of resistance.
5. Touch either meter probe (Figure 11, Item 3 or 5) to either pin (Figure 11, Item 2 or 6) of P90 wiring plug (Figure 11, Item 1).
6. Touch second meter probe (Figure 11, Item 3 or 5) to a bare metal area (ground) of exciter stator winding (Figure 10, Item 10) frame.
7. Observe and record value of insulation resistance.

NOTE

Resistance value of exciter stator (Figure 10, Item 10) winding obtained in step 4 should be $12.4 \Omega \pm 10\%$. A resistance value of zero indicates a shorted exciter stator (Figure 10, Item 10) winding, and a resistance value of infinity indicates an open exciter stator (Figure 10, Item 10) winding.

Insulation resistance value of exciter stator (Figure 10, Item 10) winding to ground obtained in step 7 should be at least 1 M Ω .

8. Compare resistance values obtained in step 4 and step 7 to specifications to determine if exciter stator (Figure 10, Item 10) is serviceable.
 - a. Proceed to Replace Exciter Stator task if exciter stator (Figure 10, Item 10) winding is not serviceable.
 - b. Set end bell (Figure 10, Item 4) and exciter stator (Figure 10, Item 10) aside for installation if serviceable.

END OF TASK

Replace Exciter Stator

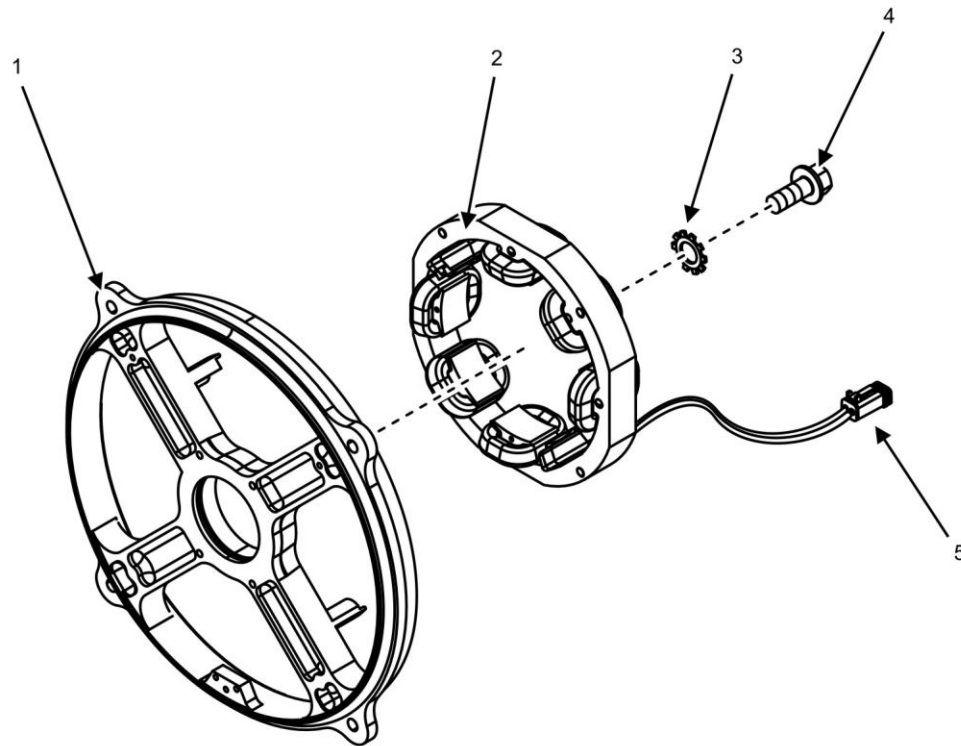


Figure 12. 400 Hz Exciter Stator — Removal.

1. Note orientation of P90 wiring plug (Figure 12, Item 5) to aid with installation.
2. Remove four bolts (Figure 12, Item 4) and four lock washers (Figure 12, Item 3) that attach exciter stator (Figure 12, Item 2) to end bell (Figure 12, Item 1).
3. Discard four lock washers (Figure 12, Item 3).
4. Remove exciter stator (Figure 12, Item 2) from end bell (Figure 12, Item 1).
5. Examine machined surface of end bell (Figure 12, Item 1) for corrosion, dirt, and debris where exciter stator (Figure 12, Item 2) makes contact. Clean as required.
6. Perform Test Exciter Stator Winding task on new exciter stator (Figure 12, Item 2).
7. Examine mating surface of new exciter stator (Figure 12, Item 2) visually where it will contact end bell (Figure 12, Item 1).
8. Remove any material from the surface of exciter stator (Figure 12, Item 2) that will interfere with mating surfaces of end bell (Figure 12, Item 1).
9. Place exciter stator (Figure 12, Item 2) onto end bell (Figure 12, Item 1) using correct P90 wiring plug (Figure 12, Item 5) orientation noted in step 1.
10. Align holes in exciter stator (Figure 12, Item 2) with matching holes in end bell (Figure 12, Item 1).
11. Install four bolts (Figure 12, Item 4) and four new lock washers (Figure 12, Item 3) to attach exciter stator (Figure 12, Item 2) to end bell (Figure 12, Item 1).

12. Tighten four bolts (Figure 12, Item 4) to torque value of 8 ft/lb (10 Nm).
13. Set end bell (Figure 12, Item 1) and exciter stator (Figure 12, Item 2) aside for installation.

END OF TASK

Inspect Rectifier and Surge Suppressor

1. Inspect rectifier plates (Figure 13, Items 2 and 5) for signs of corrosion, heat, or other damage. Replace as required.
2. Inspect surge suppressor (Figure 15, Item 6) for signs of corrosion, heat, or other damage. Replace as required.

END OF TASK

Test Rectifier

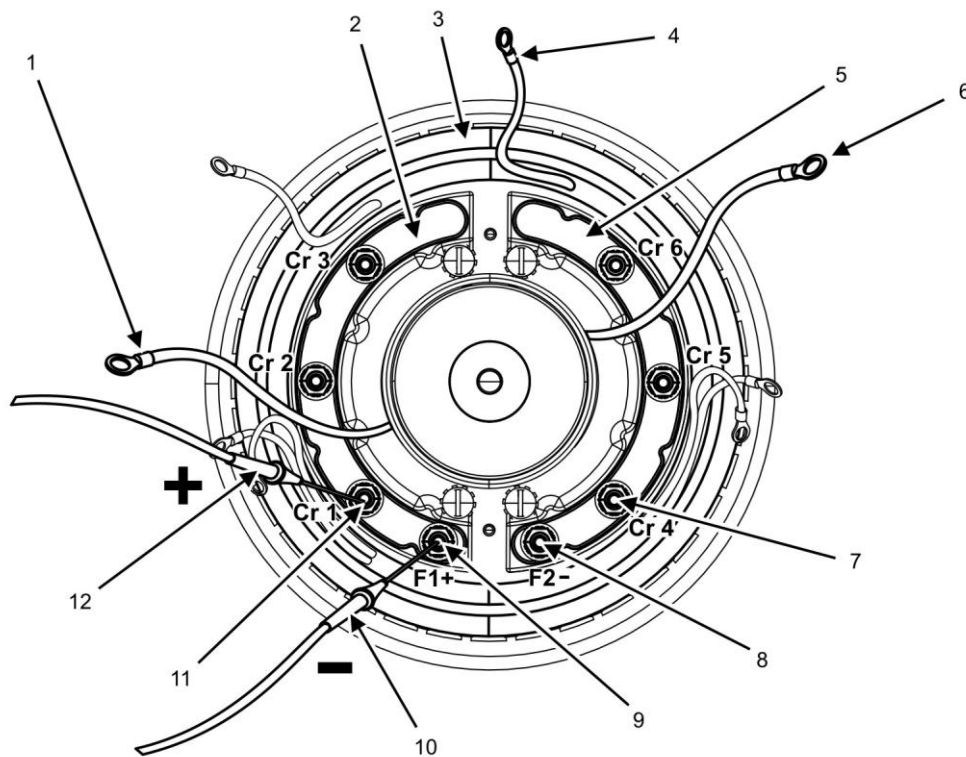


Figure 13. Test 400 Hz Rectifier and Generator Rotor.

CAUTION

Both F1+ and F2- rectifier plates (Figure 13, Items 2 and 5) must be replaced if either rectifier plate (Figure 13, Items 2 or 5) or any diode fails testing. Failure to comply may cause damage to equipment.

If the F1+ and F2- rectifier plates (Figure 13, Items 2 and 5) and Cr1 through Cr6 diodes are not marked as shown in Figure 13, it is imperative that each is identified before it is removed and marked or tagged according to Figure 13. Failure to comply may cause damage to equipment.

1. Mark or tag orientation of each rectifier plate (Figure 13, Items 2 and 5).

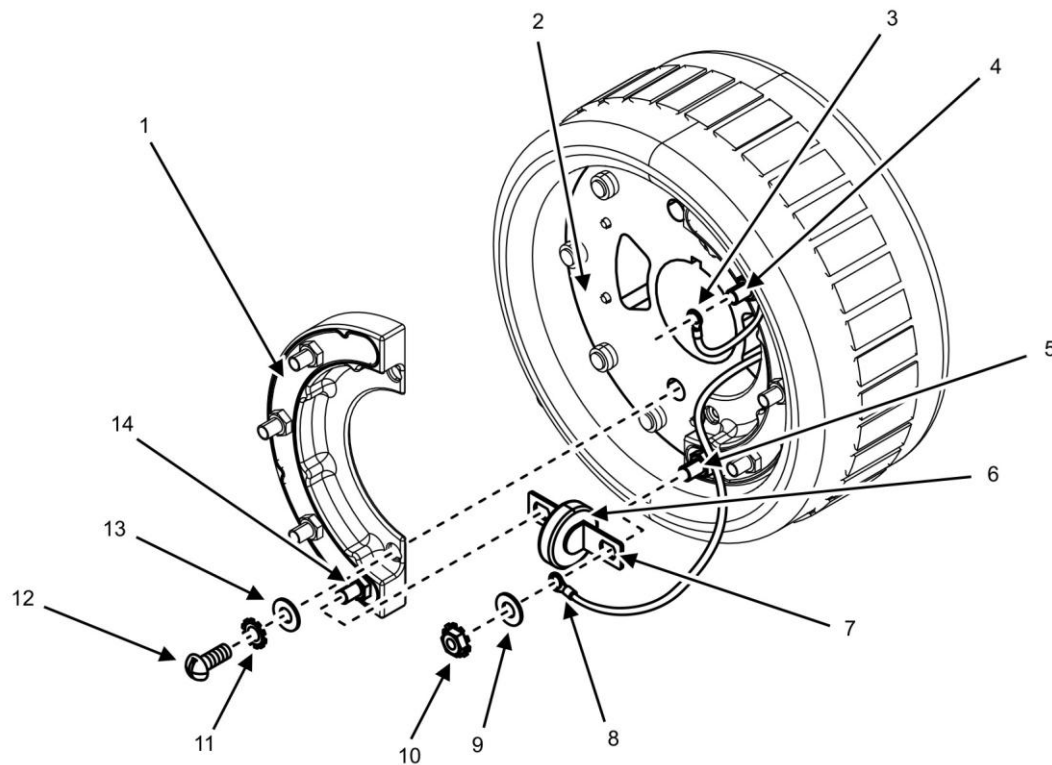


Figure 14. 400 Hz Rectifier Removal — Detail.

2. Mark or tag each wire (Figure 14, Items 3 and 8) as it is removed from diode (Figure 14, Item 4) and terminal studs (Figure 14, Item 5) to aid with installation.
3. Remove nut with captive lock washer (Figure 14, Item 10) and flat washer (Figure 14, Item 9) from F1+ terminal stud (Figure 14, Item 14).
4. Remove nut with captive lock washer (Figure 14, Item 10) and flat washer (Figure 14, Item 9) from F2- terminal stud (Figure 14, Item 5).
5. Discard two nuts with captive lock washers (Figure 14, Item 10).
6. Remove surge suppressor (Figure 14, Item 6) and place on suitable surface for testing.
7. Remove F1+ generator rotor wire (Figure 13, Item 1) from F1+ terminal (Figure 13, Item 9).
8. Remove F2- generator rotor wire (Figure 13, Item 6) from F2- terminal (Figure 13, Item 8).
9. Remove nut with captive lock washer (Figure 14, Item 10), flat washer (Figure 14, Item 9), and exciter rotor wire (Figure 13, Item 4) from diode CR1 (Figure 13, Item 11).
10. Repeat steps 8 through 9 for remaining diodes.
11. Discard six nuts with lock washers (Figure 14, Item 10).
12. Select Ohms resistance function on multimeter (Figure 11, Item 4).
13. Touch negative meter probe (Figure 13, Item 10) to F1+ terminal (Figure 13, Item 9) and positive meter probe (Figure 13, Item 12) to diode CR1 (Figure 13, Item 11). Observe and record resistance value.
14. Touch positive meter probe (Figure 13, Item 12) to F1+ terminal (Figure 13, Item 9) and negative meter probe (Figure 13, Item 10) to diode CR1 (Figure 13, Item 11). Observe and record resistance value.
15. Repeat steps 13 through 14 for remaining diodes of F1+ rectifier plate (Figure 13, Item 2).

16. Touch negative meter probe (Figure 13, Item 10) to F2- terminal (Figure 13, Item 8) and positive meter probe (Figure 13, Item 12) to diode CR4 (Figure 13, Item 7). Observe and record resistance value.
17. Touch positive meter probe (Figure 13, Item 12) to F2- terminal (Figure 13, Item 8) and negative meter probe (Figure 13, Item 10) to diode CR4 (Figure 13, Item 7). Observe and record resistance value.
18. Repeat steps 16 through 17 for remaining diodes of F2- rectifier plate (Figure 13, Item 5).

NOTE

Resistance value obtained in step 13 and step 17 should be $2.74 \text{ M}\Omega \pm 10\%$ and the resistance value obtained in step 14 and step 16 should be greater than $27 \text{ M}\Omega$.

Resistance value obtained in step 14 and step 16 will typically be infinite resistance.

19. Compare the resistance values obtained in steps 13 through 18 to specifications to determine if rectifier plates (Figure 13, Items 2 and 5) are serviceable.

NOTE

Rectifier plates (Figure 13, Items 2 and 5) may remain attached to exciter rotor (Figure 14, Item 2) unless further tests reveal the need to remove rectifier plates (Figure 13, Items 2 and 5).

20. Proceed to Test Surge Suppressor task if rectifier is serviceable.
21. Proceed to Replace Rectifier task if rectifier is not serviceable.

END OF TASK

Test Surge Suppressor

NOTE

Resistance value of surge suppressor (Figure 14, Item 6) should be equal when measured front-to-back and back-to-front. An acceptable value is greater than $1 \text{ M}\Omega$ and measured value will typically be infinite resistance.

1. Select Ohms resistance function on multimeter (Figure 11, Item 4).
2. Touch positive meter probe (Figure 11, Item 3) to either connection point (Figure 14, Item 7) of surge suppressor (Figure 14, Item 6).
3. Touch negative meter probe (Figure 11, Item 5) to opposite connection point (Figure 14, Item 7) of surge suppressor (Figure 14, Item 6). Observe and note the resistance value.
4. Reverse points of contact with meter probes (Figure 11, Items 3 and 5). Observe and note resistance value.
5. Compare resistance values obtained in step 3 and step 4 to specifications to determine if surge suppressor (Figure 14, Item 6) is serviceable.
6. Set surge suppressor (Figure 14, Item 6) aside for installation if serviceable or replace as required.

END OF TASK

Replace Rectifier

1. Remove two screws (Figure 14, Item 12), two lock washers (Figure 14, Item 11), two flat washers (Figure 14, Item 13), and F1+ rectifier plate (Figure 13, Item 2) from exciter rotor (Figure 13, Item 3).
2. Discard lock washers (Figure 14, Item 11).
3. Repeat steps 1 through 2 for F2- rectifier plate (Figure 13, Item 5).
4. Inspect mounting surface of exciter rotor (Figure 13, Item 3) where rectifier plates (Figure 13, Items 2 and 5) were attached and clean as required.
5. Perform Test Rectifier task, steps 12 through 19 on replacement rectifier plates (Figure 13, Items 2 and 5).
6. Align holes in F1+ rectifier plate (Figure 13, Item 2) with holes in exciter rotor (Figure 13, Item 3) using orientation noted in Test Rectifier task, step 1.
7. Position two screws (Figure 14, Item 12), two new lock washers (Figure 14, Item 11), and two flat washers (Figure 14, Item 13) to attach F1+ rectifier plate (Figure 14, Item 1) to exciter rotor (Figure 14, Item 2).
8. Repeat steps 8 through 9 for F2- rectifier plate (Figure 13, Item 5).

END OF TASK**Test Exciter Rotor Winding****NOTE**

Exciter rotor wires (Figure 13, Item 4) are paired according to a specific order. The order of pairs is Cr1 to Cr4, Cr2 to Cr5, and Cr3 to Cr6.

1. Identify each of six numbered exciter rotor wire (Figure 13, Item 4) terminals.
2. Select Ohms resistance function on multimeter (Figure 11, Item 4).
3. Touch either meter probe (Figure 11, Item 3 or 5) to exciter rotor wire (Figure 13, Item 4) terminal identified as CR1.
4. Touch second meter probe (Figure 11, Item 3 or 5) to exciter rotor wire (Figure 13, Item 4) terminal identified as Cr4.
5. Observe and record value of resistance.
6. Repeat steps 3 through 5 for remaining ordered pairs of exciter rotor wires (Figure 13, Item 4).
7. Touch either meter probe (Figure 11, Item 3 or 5) to exciter rotor wire (Figure 13, Item 4) terminal tagged or marked as CR1.
8. Touch second meter probe (Figure 11, Item 3 or 5) to bare metal area (ground) of exciter rotor (Figure 13, Item 3).
9. Observe and record value of resistance.
10. Repeat steps 7 through 9 for remaining exciter rotor wire (Figure 13, Item 4) terminals tagged or marked as Cr 2 and Cr3.

NOTE

Resistance values obtained in steps 3 through 6 should be $0.5 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . A measurement value greater than 1Ω or with a $\pm 10\%$ variance for any pair of wires indicates a defective excitor rotor (Figure 13, Item 3).

Resistance values obtained in steps 7 through 10 of each wire to ground should be at least $1 \text{ M}\Omega$.

11. Compare the resistance values obtained in steps 3 through 6 and steps 7 through 10 to specifications to determine if exciter rotor (Figure 13, Item 3) is serviceable.
12. Proceed to Test Generator Rotor Winding task if exciter rotor (Figure 13, Item 3) is serviceable.

END OF TASK**Test Generator Rotor Winding**

1. Identify generator rotor wires tagged or marked F1+ generator rotor wire (Figure 13, Item 1) and F2- generator rotor wire (Figure 13, Item 6).
2. Select Ohms resistance function on multimeter (Figure 11, Item 4).
3. Touch either meter probe (Figure 11, Item 3 or 5) to F1+ generator rotor wire (Figure 13, Item 1) terminal.
4. Touch second meter probe (Figure 11, Item 3 or 5) to F2- generator rotor wire (Figure 13, Item 6) terminal.
5. Observe and record value of resistance.
6. Touch either meter probe (Figure 11, Item 3 or 5) to F1+ generator rotor wire (Figure 13, Item 1) terminal.
7. Touch second meter probe (Figure 11, Item 3 or 5) to bare metal area (ground) of generator rotor (Figure 11, Item 5).
8. Observe and record value of resistance.

NOTE

Resistance value obtained in steps 3 through 5 should be $2.10 \Omega \pm 10\%$. Resistance value of infinity indicates an open generator rotor (Figure 11, Item 5) winding and resistance value of zero indicates a shorted generator rotor (Figure 11, Item 5) winding.

Resistance value obtained in steps 6 through 8 of generator rotor (Figure 11, Item 5) winding to ground should be at least $1 \text{ M}\Omega$.

9. Compare the resistance values obtained in steps 3 through 5 and steps 6 through 8 to specifications to determine if generator rotor (Figure 11, Item 5) is serviceable.
10. Proceed to Test Generator Stator Winding task if generator rotor winding (Figure 11, Items 5) is serviceable.

END OF TASK

Test Generator Stator Winding

1. Identify each of the 12 numbered generator output wires (Figure 10, Item 11) removed from voltage selection switch during WP 0054, Remove/Install Voltage Selection Switch using imprinted wire markers.

NOTE

Generator stator winding output wires (Figure 10, Item 11) are paired according to a specific order. The order of pairs is: T1 – T4, T2 – T5, T3 – T6, T7 – T10, T8 – T11, and T9 – T12.

2. Arrange wires into ordered pairs.
3. Select Ohms resistance function on multimeter (Figure 11, Item 4).
4. Touch either meter probe (Figure 11, Item 3 or 5) to generator output wire terminal marked T1.
5. Touch second meter probe (Figure 11, Item 3 or 5) to generator output wire terminal marked T4.
6. Observe and record value of resistance.
7. Repeat steps 4 through 6 for the remaining ordered pairs of wires.
8. Touch either meter probe (Figure 11, Item 3 or 5) to generator output wire marked T1.
9. Touch second meter probe (Figure 11, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 10, Item 6).
10. Observe and record value of resistance.
11. Repeat steps 8 through 10 for generator output wire terminals marked T2, T3, T7, T8 and T9.

NOTE

Resistance values obtained in steps 4 through 7 should be $0.209 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . Measurement value greater than 1Ω or with a $\pm 10\%$ variance for any pair of wires indicates a defective generator stator (Figure 10, Item 6).

Resistance values obtained in steps 8 through 11 of each wire to ground should be at least $1 M\Omega$.

12. Compare resistance values obtained in steps 4 through 7, and steps 8 through 11 to specifications to determine if generator stator (Figure 10, Item 6) is serviceable.

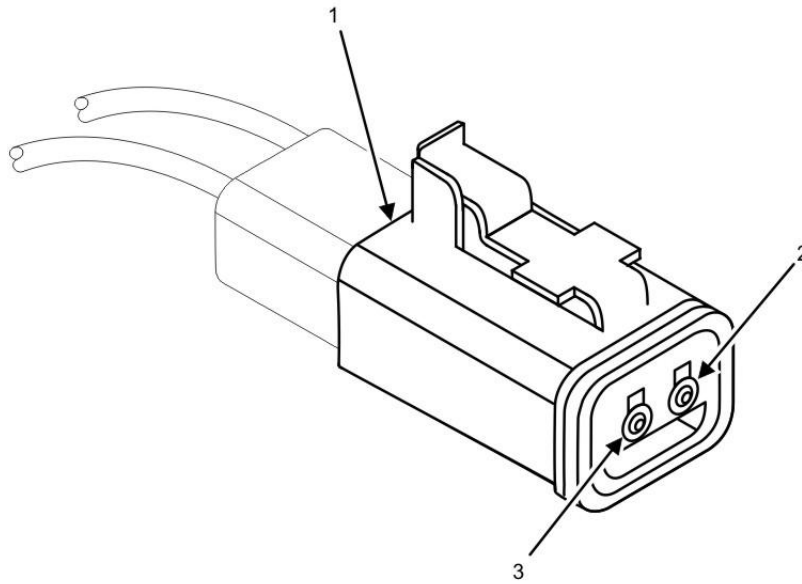


Figure 15. Test 400 Hz Generator Stator Q1/Q2 Winding — Detail.

13. Locate and disconnect Q1/Q2 wiring plug (Figure 15, Item 1) at wire port in generator stator (Figure 10, Item 6).
14. Select Ohms resistance function on multimeter (Figure 11, Item 4).
15. Touch either meter probe (Figure 11, Item 3 or 5) to either wiring plug (Figure 15, Item 1) connector (Figure 15, Item 2 or 3).
16. Touch second meter probe (Figure 11, Item 3 or 5) to second wiring plug (Figure 15, Item 1) connector (Figure 15, Item 2 or 3).
17. Observe and record value of resistance.
18. Touch either meter probe (Figure 11, Item 3 or 5) to either wiring plug (Figure 15, Item 1) connector (Figure 15, Item 2 or 3).
19. Touch second meter probe (Figure 11, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 10, Item 6).
20. Observe and record value of resistance.

NOTE

Resistance value obtained in steps 15 through 17 should be $0.97 \Omega \pm 10\%$.

Resistance value obtained in steps 18 through 20 to ground should be at least $1 M\Omega$.

21. Compare resistance values obtained in steps 15 through 17 and steps 18 through 20 to specifications to determine if generator stator (Figure 10, Item 6) is serviceable.

END OF TASK

Inspect Bearing

1. Examine bearing (Figure 16, Item 1) for discoloration and corrosion that are signs of heat and contamination damage.
2. Touch outer race of bearing (Figure 16, Item 1) lightly with fingertips and rotate slowly in a back-and-forth motion to feel and listen for any signs of roughness and/or lack of lubrication.
3. Proceed to Replace Bearing task if any signs of damage appear or if bearing (Figure 16, Item 1) does not rotate freely.

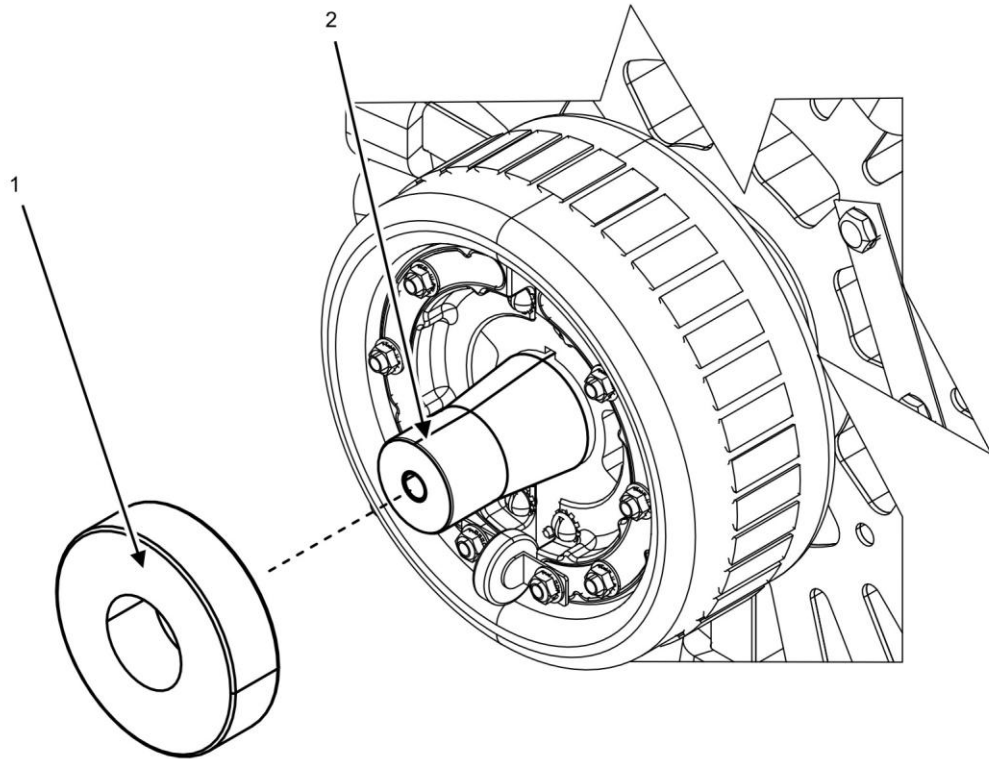


Figure 16. 400 Hz Generator Bearing Removal — Detail.

END OF TASK

Replace Bearing

1. Attach gear puller to bearing (Figure 16, Item 1).

CAUTION

When a bearing is removed for any reason, always install a new bearing (Figure 16, Item 1). Failure to comply may cause damage to equipment.

2. Remove bearing (Figure 16, Item 1) from generator rotor shaft (Figure 16, Item 2).
3. Clean bearing surface of generator rotor shaft (Figure 16, Item 2).
4. Press new bearing (Figure 16, Item 1) onto generator rotor shaft (Figure 16, Item 2).

END OF TASK**Install End Bell**

1. Perform Test Surge Suppressor task on new surge suppressor (Figure 14, Item 6).
2. Place surge suppressor (Figure 14, Item 6) onto F1+ terminal (Figure 13, Item 9) and F2- terminal (Figure 13, Item 8).
3. Place F1+ generator rotor wire (Figure 13, Item 1) onto F1+ terminal (Figure 13, Item 9).
4. Install flat washer (Figure 14, Item 9) and new nut with captive lock washer (Figure 14, Item 10) onto F1+ terminal (Figure 13, Item 9).
5. Place F2- generator rotor wire (Figure 13, Item 6) onto F2- terminal (Figure 13, Item 8).
6. Install flat washer (Figure 14, Item 9) and new nut with captive lock washer (Figure 14, Item 10) onto F2- terminal (Figure 13, Item 8).
7. Place exciter rotor wire (Figure 13, Item 4) tagged or marked CR1 onto diode tagged or marked CR1 (Figure 13, Item 11).
8. Install flat washer (Figure 14, Item 9) and new nut with captive lock washer (Figure 14, Item 10) onto diode tagged or marked CR1 (Figure 13, Item 11).
9. Repeat steps 7 through 8 for remaining exciter rotor wires and diodes (Figure 14, Item 4).
10. Remove tags or marks that will interfere with generator operation.
11. Install new O-ring packing (Figure 10, Item 2) into end bell (Figure 10, Item 4).
12. Insert P90 wiring plug (Figure 10, Item 8) through wire port of generator stator (Figure 10, Item 9).

CAUTION

Use extreme caution when installing end bell (Figure 10, Item 4) onto generator stator (Figure 10, Item 6). End bell (Figure 10, Item 4) is awkward to handle and must be installed without any exciter stator (Figure 10, Item 10) contact with generator rotor (Figure 10, Item 5). Failure to comply will cause damage to equipment.

13. Align tag or mark on end bell (Figure 10, Item 4) with corresponding tag or mark on generator stator (Figure 10, Item 6).
14. Push end bell (Figure 10, Item 4) mating surface evenly into matching machined surface of generator stator (Figure 10, Item 6).

NOTE

End bell (Figure 10, Item 4) may resist installation onto bearing (Figure 10, Item 7). Use a tool that will not damage end bell (Figure 10, Item 4) to tap various points around outside of bearing mating surface until end bell (Figure 10, Item 4) machined surface makes contact with generator stator (Figure 10, Item 6) machined surface.

15. Examine area between end bell (Figure 10, Item 4) machined surface and generator stator (Figure 10, Item 6) machined surface to ensure distance is even.
16. Insert four bolts (Figure 10, Item 14) and four washers (Figure 10, Item 13) into each mounting hole until threads are engaged with generator stator (Figure 10, Item 6).
17. Tighten each bolt (Figure 10, Item 14) gradually in crisscross sequence using the same number of turns each time for each bolt (Figure 10, Item 14) to draw end bell (Figure 10, Item 4) into the generator stator (Figure 10, Item 6).
18. Verify end bell (Figure 10, Item 4) machined surface has fully engaged generator stator (Figure 10, Item 6).
19. Use Remove End Bell task, steps 11 through 15 if end bell (Figure 10, Item 4) machined surface does not fully engage the generator stator (Figure 10, Item 6) machined surface. Repeat steps 13 through 18 as required.
20. Loosen four bolts (Figure 10, Item 14) that attach end bell (Figure 10, Item 4) to generator stator (Figure 10, Item 6) 1/2 – 3/4 turn.
21. Remove lower two bolts (Figure 10, Item 14) and two washers (Figure 10, Item 13) that attach end bell (Figure 10, Item 4) to generator stator (Figure 10, Item 6).
22. Install ground strap (Figure 10, Item 3) according to location noted in Remove End Bell task, step 9.
23. Install generator output wires (Figure 10, Item 11) and clamp (Figure 10, Item 12) according to location noted in Remove End Bell task, step 10.
24. Reinstall lower two bolts (Figure 10, Item 14) and two washers (Figure 10, Item 13) that attach end bell (Figure 10, Item 4) to generator stator (Figure 10, Item 6).
25. Tighten two bolts (Figure 10, Item 14) to torque value of 28-32 ft/lb (38-43 Nm).
26. Pull excess P90 wiring plug (Figure 10, Item 8) wire from generator stator (Figure 10, Item 9) at wire port to length tagged or marked in Remove End Bell task, step 12.
27. Align holes in end bell cover (Figure 10, Item 1) with matching holes in end bell (Figure 10, Item 4).
28. Install upper two screws (Figure 10, Item 16) and two new lock washers (Figure 10, Item 17) to loosely attach end bell cover (Figure 10, Item 1) to end bell (Figure 10, Item 4).
29. Install screw (Figure 10, Item 16), new lock washer (Figure 10, Item 17), and two shielded wire terminals (Figure 10, Item 15) according to location noted in Remove End Bell task step 4 into lower end bell cover (Figure 10, Item 1) hole.
30. Tighten three screws (Figure 10, Item 16) evenly.
31. Remove tags or marks that will interfere with generator operation.
32. Connect P90 wiring plug (Figure 10, Item 8) to connector (not shown) at generator output wire clamp (Figure 10, Item 12).
33. Install voltage selection switch (WP 0054, Remove/Install Voltage Selection Switch).
34. Install relay panel (WP 0061, Remove/Install Relay Panel).
35. Install fuel tank (WP 0046, Remove/Install Fuel Tank).
36. Install interior body panels (WP 0035, Remove/Install Interior Body Panels).
37. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).

-
38. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
 39. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
 40. Connect negative battery cable (WP 0036, Remove /Install Batteries).
 41. Close generator set doors.
 42. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
 43. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
 44. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL CONTACTOR

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Contactor, electrical (1) (WP 0113, Repair Parts List, Figure 15, Item 1)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0053, Remove/Install Output Terminal Board

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL CONTACTOR

Remove Contactor

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate contactor (Figure 1).

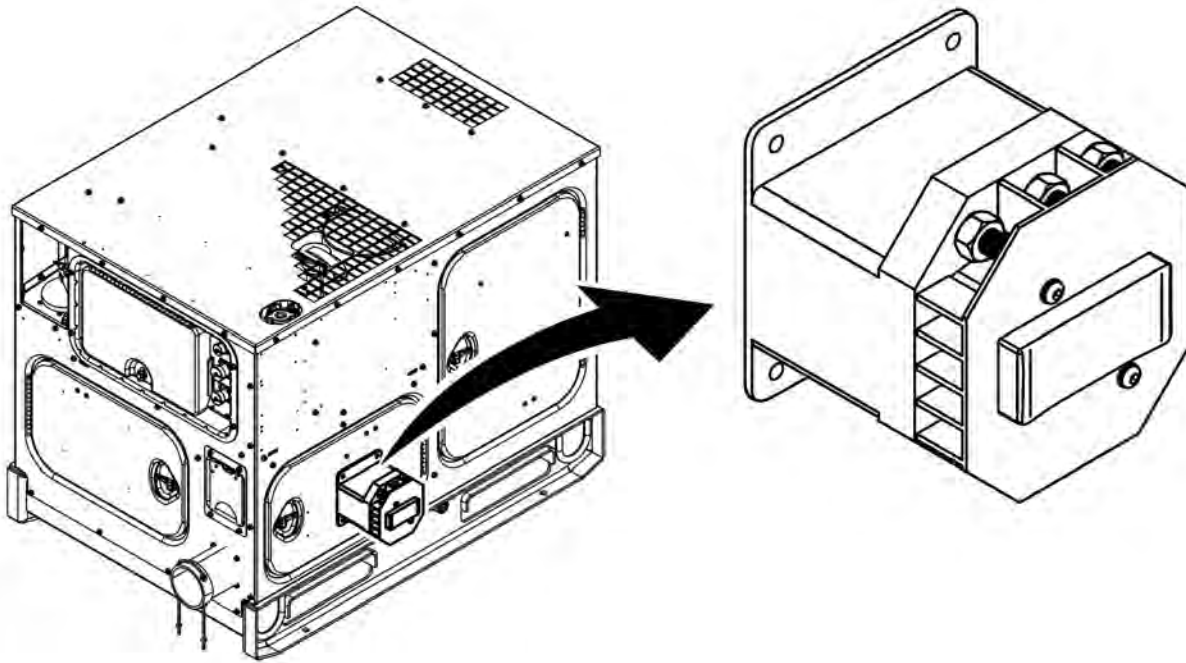


Figure 1. Contactor — Location.

3. Remove cable entry guard and output terminal board (WP 0053, Remove/Install Output Terminal Board).
4. Remove two screws and two captive flat washers (Figure 2, Item 2) securing contactor cover (Figure 2, Item 1).
5. Remove contactor cover (Figure 2, Item 1).

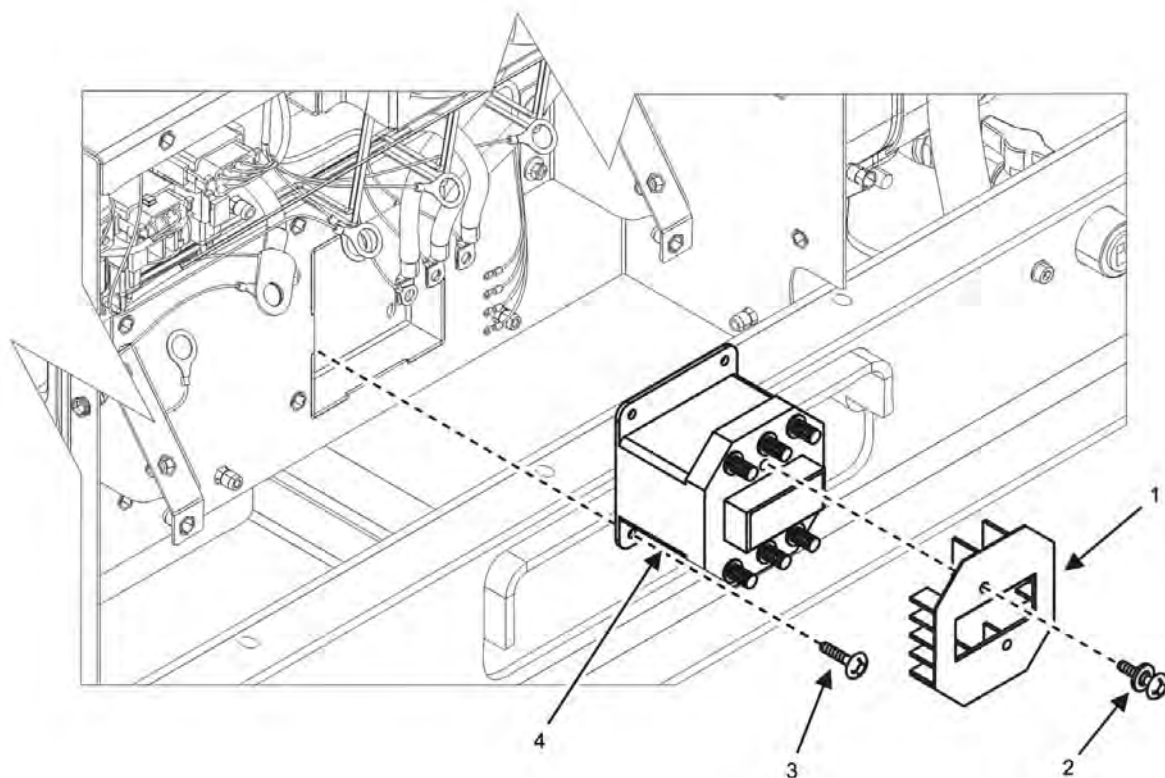


Figure 2. Contactor — Details.

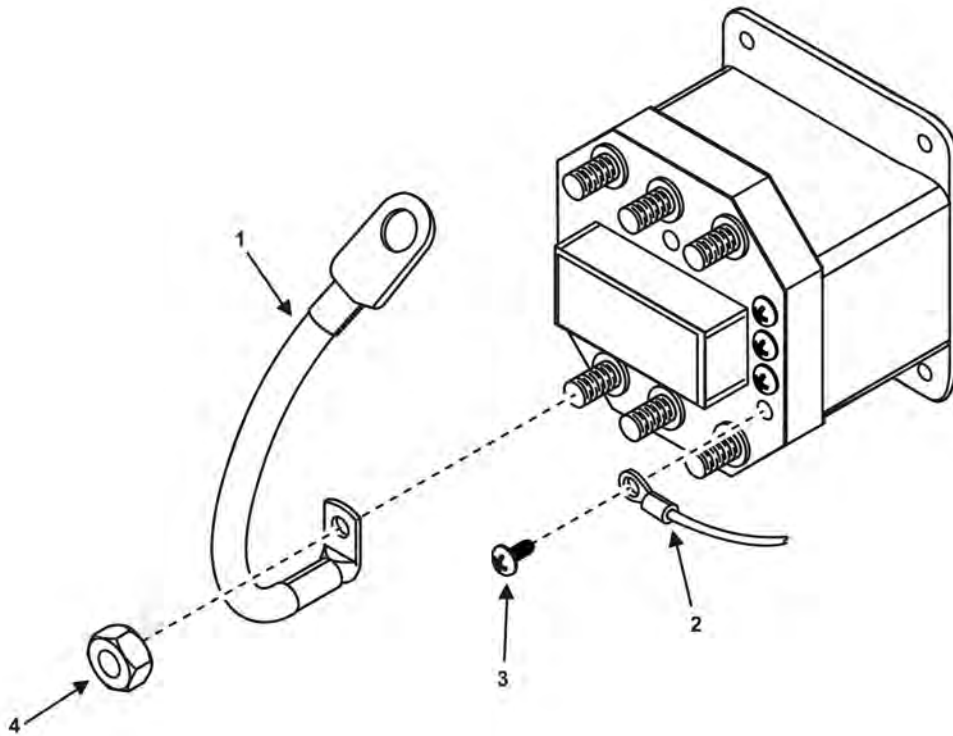


Figure 3. Contactor Wire — Removal.

NOTE

Prior to disassembly, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during reassembly.

Contactor is labeled (Figure 4). Label each wire according to the location label on the contactor to aid in installation.

6. Tag electrical leads (Figure 3, Item 1) on contactor (Figure 2, Item 4) according to location labels on contactor (Figure 4).
7. Remove six hex nuts (Figure 3, Item 4) securing electrical leads (Figure 3, Item 1) to contactor (Figure 2, Item 4).
8. Remove six electrical leads (Figure 3, Item 1) from contactor (Figure 2, Item 4).
9. Tag four wiring harness electrical leads (Figure 3, Item 2) on contactor (Figure 2, Item 4).
10. Remove four screws (Figure 3, Item 3) securing wiring harness electrical leads (Figure 3, Item 2) to contactor (Figure 2, Item 4).
11. Inspect electrical leads (Figure 3, Item 1) and wiring harness electrical leads (Figure 3, Item 2) for damage and replace as required.

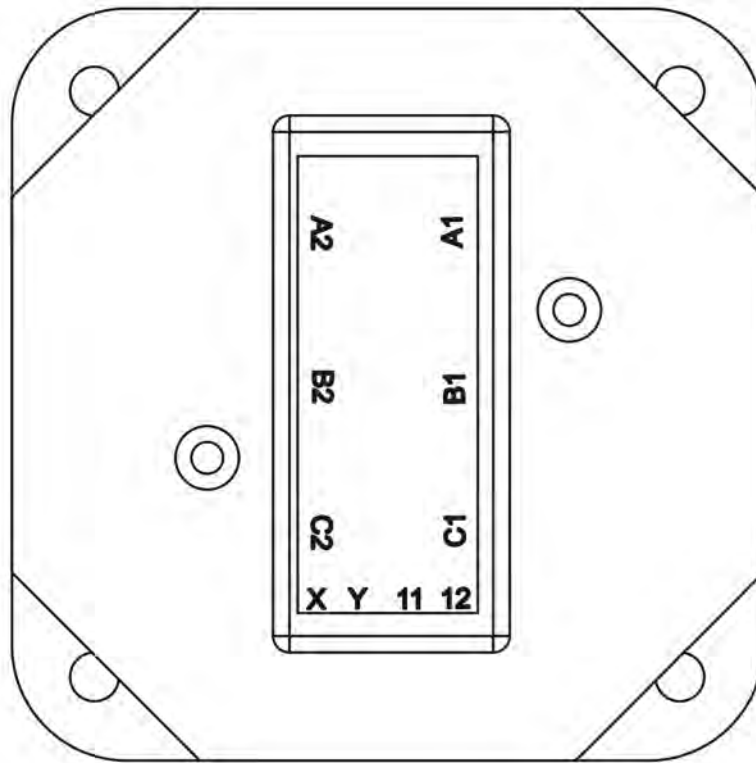


Figure 4. Contactor Wire Labels.

12. Remove four screws (Figure 2, Item 3) securing contactor (Figure 2, Item 4) to output box.
13. Remove contactor (Figure 2, Item 4) from output box and place on a suitable work surface.

END OF TASK

Inspect Contactor

1. Inspect contactor cover (Figure 2, Item 1) for cracks and damage and replace contactor (Figure 2, Item 4) as required.
2. Inspect two contactor cover screws and captive flat washers (Figure 2, Item 2) for worn threads and damaged captive flat washer and other signs of obvious damage and replace contactor (Figure 2, Item 4) as required.
3. Inspect contactor (Figure 2, Item 4) for signs of obvious damage and replace as required.
4. Inspect all mounting hardware and replace as required.

END OF TASK

Test Contactor

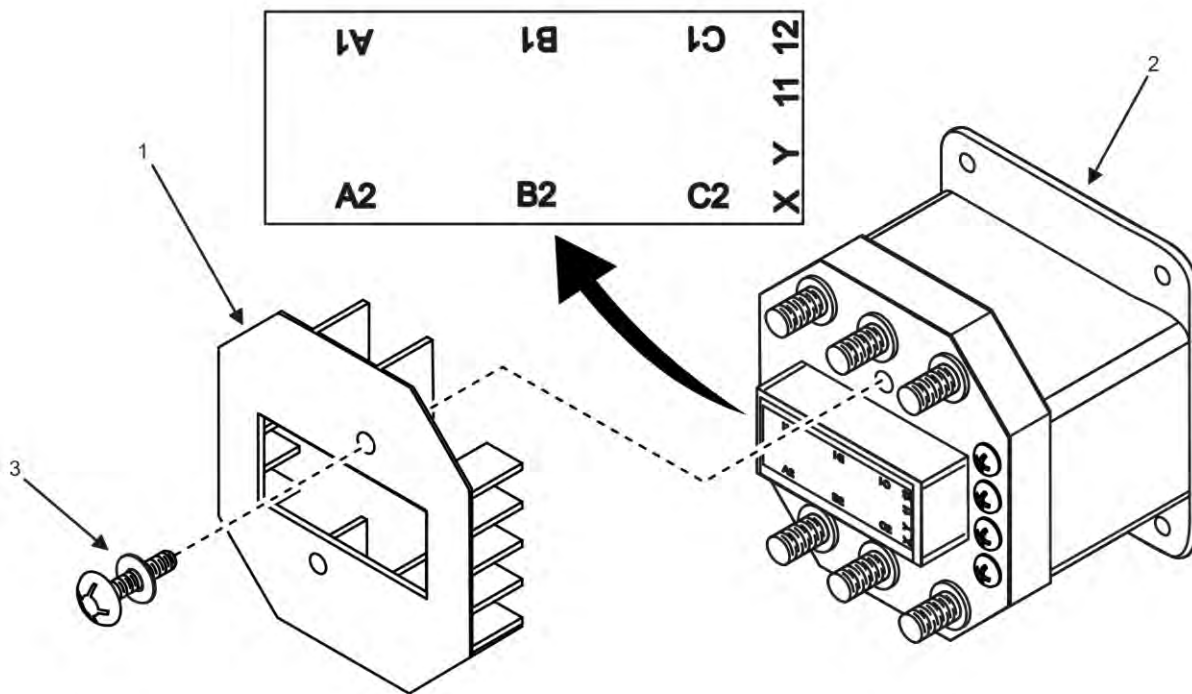


Figure 5. Contactor — Terminals.

1. Remove contactor (Figure 5, Item 2). See Remove Contactor task.
2. Remove two screws and captive washers (Figure 5, Item 3) securing contactor cover (Figure 5, Item 1) to contactor (Figure 5, Item 2) if not already removed.
3. Remove contactor cover (Figure 5, Item 1) if not already removed.

NOTE

Terminals A1 through C1 (Figure 5) are for the wiring from the voltage selection switch and A2 through C2 (Figure 5) are for the output box terminal wires. Terminals X and Y (Figure 5) are for the wires that energize the contactor coil. Terminals 11 and 12 (Figure 5) are for wires for the auxiliary contact.

4. Measure the resistance between each terminal of the input side of contactor (Figure 5, Item 2) (Terminals A1 through C1) and output side of contactor (Figure 5, Item 2) (Terminals A2 through C2). Ensure resistance between any two terminals is infinite or high (approximately 100,000 Ohms (Ω) or more).
5. Replace contactor (Figure 5, Item 2) if a low (10 Ω or less) or zero Ω value is obtained. See Install Contactor task.

NOTE

Resistance reading between terminals X and Y should be $47\ \Omega \pm 10\%$.

6. Measure the resistance between terminals X and Y (Figure 5) using a multimeter set to test resistance.
7. Replace contactor (Figure 5, Item 2) if reading is outside of specification. See Install Contactor task.

8. Measure for continuity between terminals 11 and 12 (Figure 5) and between each terminal and ground using a multimeter set to test continuity.
9. Replace contactor (Figure 5, Item 5) if continuity is found. See Install Contactor task.

NOTE

Any continuity measurement between wires A1, B1, and C1 with wires installed to contactor terminals A1 through C1 will result in continuity through the voltage selection switch. Ensure wires are removed when checking for continuity between terminals A1, B1, and C1 to obtain proper measurement.

10. Measure resistance between each contactor terminal (11, 12, A1, A2, B1, B2, C1, and C2) (Figure 5) using a multimeter set to test resistance. Ensure resistance between any two terminals is infinite or high.
11. Replace contactor (Figure 5, Item 2) if a low or zero Ω value is obtained. See Install Contactor task.
12. Measure resistance between terminal X and each terminal (11, 12, A1, A2, B1, B2, C1, and C2) (Figure 5) using a multimeter set to test resistance. Ensure resistance between X and any other terminal is infinite or high.
13. Replace contactor (Figure 5, Item 2) if resistance is low or zero Ω . See Install Contactor task.
14. Measure resistance between terminal Y and each terminal (11, 12, A1, A2, B1, B2, C1, and C2) (Figure 5) using a multimeter set to test resistance. Ensure resistance between Y and any other terminal is infinite or high.
15. Replace contactor (Figure 5, Item 2) if resistance is low or zero Ω . See Install Contactor task.

END OF TASK

Install Contactor

1. Position contactor (Figure 2, Item 4) to mounting location in output box and align the mounting holes.
2. Secure contactor (Figure 2, Item 4) to mounting location in output box by installing four screws (Figure 2, Item 3). Tighten nuts to 53 – 62 in/lb (6 – 7 Nm).

NOTE

Identification tags should remain in place until the output box is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

3. Install six electrical leads (Figure 3, Item 1) to contactor (Figure 2, Item 4) using tags and location labels on contactor (Figure 4).
4. Secure electrical leads (Figure 3, Item 1) with six hex nuts (Figure 3, Item 4). Tighten to 69 – 85 in/lb (8 – 12 Nm).
5. Position wiring harness electrical leads (Figure 3, Item 2) to contactor (Figure 2, Item 4) using tags from removal.
6. Install wiring harness electrical leads (Figure 3, Item 2) to contactor (Figure 2, Item 4) with four screws (Figure 3, Item 3).
7. Position contactor cover (Figure 2, Item 1) over contactor (Figure 2, Item 4).
8. Secure contactor cover (Figure 2, Item 1) with two screws with captive flat washers (Figure 2, Item 2).
9. Install cable entry guard and output terminal board (WP 0053, Remove/Install Output Terminal Board).

-
10. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
 11. Close generator set doors.
 12. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
 13. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
 14. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL OUTPUT TERMINAL BOARD

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0162, Table 2, Item 42)

Materials/Parts

Board, connection (1) (WP 0114, Repair Parts List, Figure 16, Item 4)

Nut, lock 3/8-16 UNC28, brass (4) (WP 0114, Figure 16, Item 5)

Nut, nylon lock 1/2-13 stainless steel (5) (WP 0114, Figure 16, Item 10)

Terminal stud, load (5) (WP 0114, Figure 16, Item 13)

Brush, wire, scratch, brass (WP 0163, Expendable and Durable Items List, Item 7)

Grease, electrically conductive (WP 0163, Item 20)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0093, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)

REMOVE/INSTALL OUTPUT TERMINAL BOARD

Remove Output Terminal Board

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate output terminal board (Figure 1) in output box.

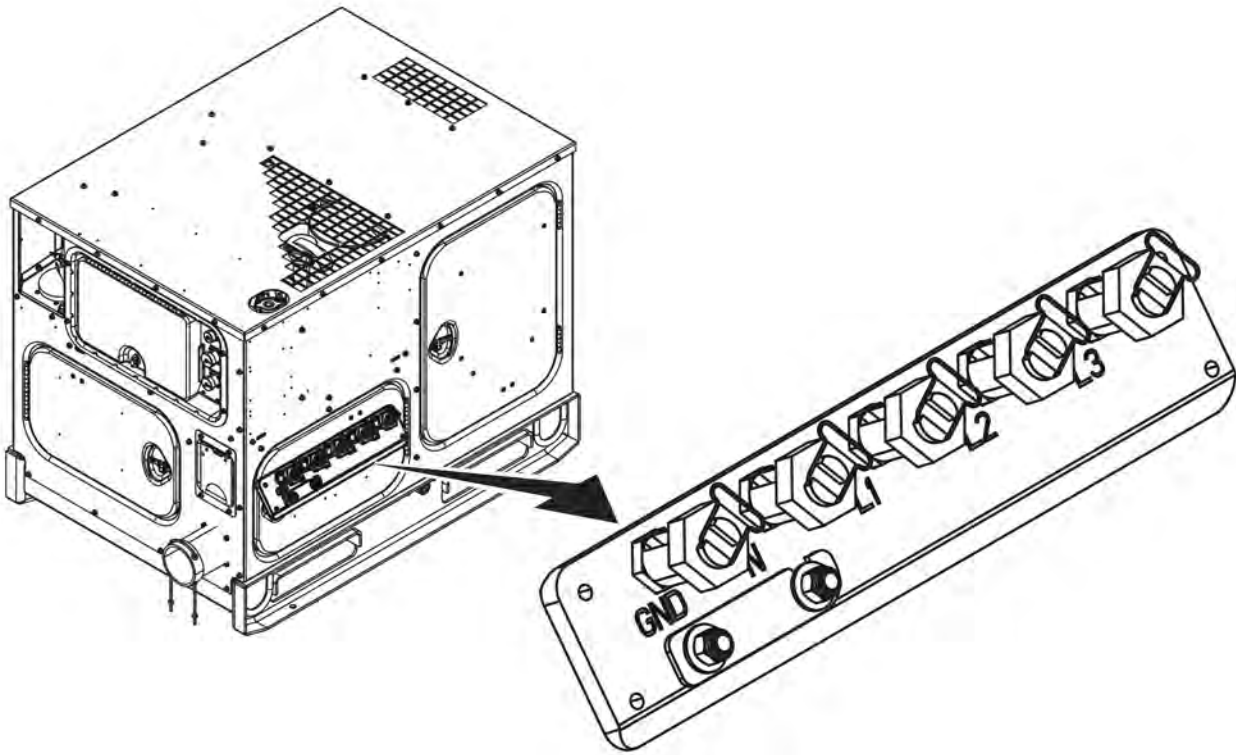


Figure 1. Output Terminal Board — Location.

3. Remove four screws (Figure 2, Item 7) securing cable entry guard (Figure 2, Item 6) over output terminal board (Figure 2, Item 1).
4. Inspect cable entry guard (Figure 2, Item 6) and screws (Figure 2, Item 7) for obvious signs of damage and replace as required.
5. Remove four screws (Figure 2, Item 8) securing output terminal board (Figure 2, Item 1) to output box.
6. Position output terminal board (Figure 2, Item 1) to access underside of board.

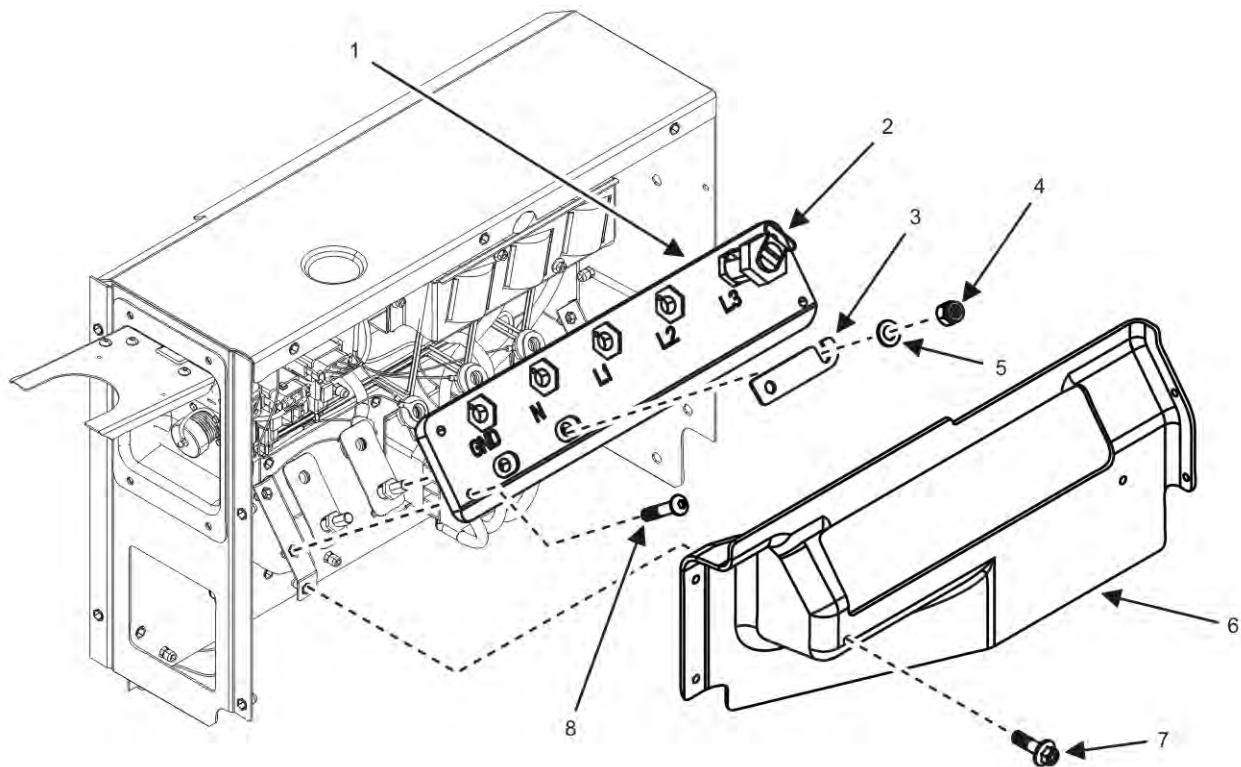


Figure 2. Output Terminal Board — Detail.

NOTE

Five large terminal studs (Figure 2, Item 2) are secured to the output terminal board (Figure 2, Item 1). Some terminal studs (Figure 2, Item 2) may have multiple wires (Figure 3, Item 10). Neutral (N) terminal stud also secures wire (not shown) from convenience receptacle to rear of output terminal board (Figure 2, Item 1). Ground (GND) terminal stud also secures grounding straps (not shown).

The procedure for removing wires (Figure 3, Item 10) is the same for all five terminal studs (Figure 3, Item 3). GND and N terminal stud positions have ground busbars (Figure 3, Item 5) installed to the rear and a neutral busbar (Figure 2, Item 3) installed to the front of the output terminal board (Figure 2, Item 1). To aid installation, tag all wires and connectors prior to removal.

7. Tag all wires (Figure 3, Item 10) according to their terminal stud (Figure 2, Item 2) locations on output terminal board (Figure 2, Item 1).

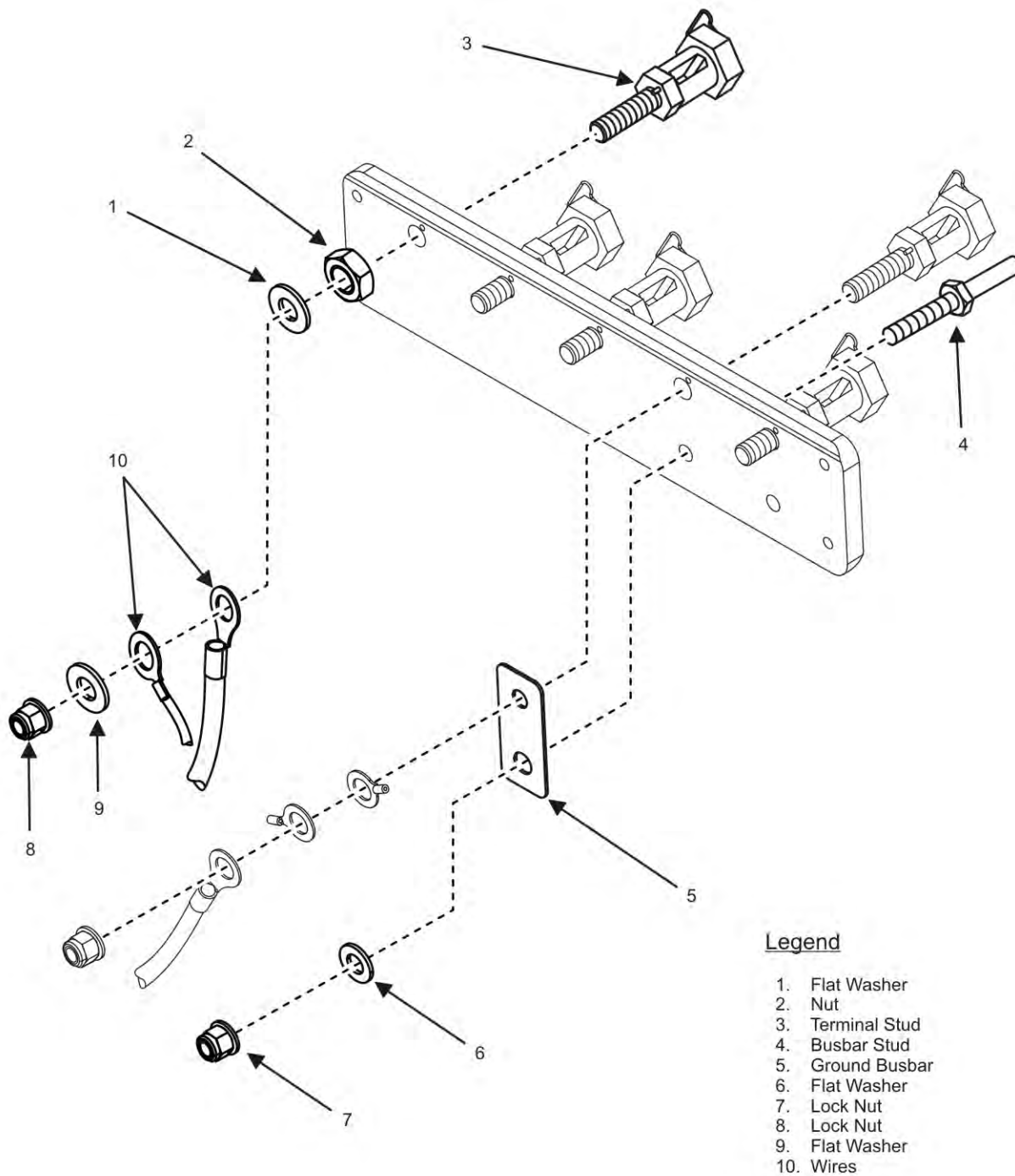


Figure 3. Output Terminal Board Detail — Reverse Side.

NOTE

Figure 3 is shown from the rear of the output terminal board to aid in visualization.

8. Remove nylon lock nut (Figure 3, Item 8) and flat washer (Figure 3, Item 9) securing wires (Figure 3, Item 10) to output terminal stud (Figure 3, Item 3). Discard nylon lock nut (Figure 3, Item 8).

9. Remove wires (Figure 3, Item 10) from terminal stud (Figure 3, Item 3).
10. Repeat steps 8 and 9 for all remaining wires (Figure 3, Item 10) on output terminal stud (Figure 3, Item 3).
11. Remove flat washer (Figure 3, Item 1) and nut (Figure 3, Item 2) securing terminal stud (Figure 3, Item 3) to output terminal board (Figure 2, Item 1).
12. Repeat step 11 for all remaining terminal studs (Figure 3, Item 3) on output terminal board (Figure 2, Item 1).
13. Remove terminal studs (Figure 3, Item 3) from output terminal board (Figure 2, Item 1).
14. Remove two GND busbar lock nuts (Figure 3, Item 7) and two flat washers (Figure 3, Item 6) that secure ground busbars (Figure 3, Item 5) on rear of output terminal board (Figure 2, Item 1).
15. Remove output terminal board (Figure 2, Item 1) from output box and place on a suitable work surface.
16. Remove lock nuts (Figure 2, Item 4) and washers (Figure 2, Item 5) that secure neutral busbar (Figure 2, Item 3) to front of output terminal board (Figure 2, Item 1).
17. Remove busbar studs (Figure 3, Item 4) from output terminal board (Figure 2, Item 1).

END OF TASK

Inspect Output Terminal Board

1. Inspect output terminal board (Figure 2, Item 1) for cracks or other damage. Replace as required.
2. Inspect cable entry guard (Figure 2, Item 6) for cracks or other signs of obvious damage and replace as required.
3. Inspect all nuts (Figure 3, Item 2), washers (Figure 2, Item 5 and Figure 3, Items 1, 6, and 9), and screws (Figure 2, Items 7 and 8) for obvious signs of damage and replace as required.
4. Inspect terminal studs (Figure 2, Item 2) for damage or corrosion.
5. Inspect wires (Figure 3, Item 10) for fraying, cracks, or corrosion. Repair wires or replace as required (WP 0093, General Maintenance).
6. Remove minor corrosion from wires (Figure 3, Item 10) using wire brush.
7. Inspect ground busbars (Figure 3, Item 5) and neutral busbar (Figure 2, Item 3) for damage and replace as required.

END OF TASK

Install Output Terminal Board

NOTE

GND busbar lock nut (Figure 3, Item 7) also secures grounding strap (not shown).

1. Install two busbar studs (Figure 3, Item 4) through output terminal board (Figure 2, Item 1).
2. Install two new GND busbar lock nuts (Figure 3, Item 7), two flat washers (Figure 3, Item 6), and two busbar studs (Figure 3, Item 4) that secure ground busbars (Figure 3, Item 5) on rear of output terminal board (Figure 2, Item 1).
3. Install lock nuts (Figure 2, Item 4) and washers (Figure 2, Item 5) that secure neutral busbar (Figure 2, Item 3) to front of output terminal board (Figure 2, Item 1).
4. Tighten lock nuts (Figure 2, Item 4 and Figure 3, Item 7) to a torque value of 124 – 159 in/lb (14 – 18 Nm).

NOTE

Five large terminal studs (Figure 2, Item 2) are secured to the output terminal board (Figure 2, Item 1). Some terminal studs (Figure 2, Item 2) may have multiple wires (Figure 3, Item 10). N terminal stud also secures wire (not shown) from convenience receptacle to rear of output terminal board (Figure 2, Item 1). GND terminal stud also secures grounding straps (not shown).

The procedure for removing wires (Figure 3, Item 10) is the same for all five terminal studs (Figure 3, Item 3). GND and N terminal stud positions have ground busbars (Figure 3, Item 5) installed to the rear and a neutral busbar (Figure 2, Item 3) installed to the front of the output terminal board (Figure 2, Item 1). To aid installation, tag all wires and connectors prior to removal.

5. Insert terminal stud (Figure 2, Item 2) through opening in front of output terminal board (Figure 2, Item 1).
6. Install nut (Figure 3, Item 2) to attach output terminal stud (Figure 3, Item 3) to output terminal board (Figure 2, Item 1).
7. Tighten each nut (Figure 3, Item 2) to 27 – 32 ft/lb (36 – 44 Nm).
8. Install flat washer (Figure 3, Item 1) to back of terminal stud (Figure 3, Item 3).
9. Install appropriately tagged wires (Figure 3, Item 10) over back of terminal stud (Figure 3, Item 3).
10. Install flat washer (Figure 3, Item 9) to back of output terminal stud (Figure 3, Item 3).
11. Install new nylon lock nut (Figure 3, Item 8) over wires (Figure 3, Item 10).

NOTE

Two wrenches are required to connect the nylon lock nut (Figure 3, Item 8).

12. Tighten new nylon lock nut (Figure 3, Item 8) to a torque value of 27 – 32 ft/lb (36 – 44 Nm).
13. Repeat steps 4 through 11 to attach all remaining terminal studs (Figure 3, Item 3) and wires (Figure 3, Item 10) to output terminal board (Figure 2, Item 1).
14. Position output terminal board (Figure 2, Item 1) to mounting location in output box.
15. Secure output terminal board (Figure 2, Item 1) to output box with four screws (Figure 2, Item 8). Torque four screws (Figure 2, Item 8) to 89 – 106 in/lb (10 – 12 Nm).
16. Position cable entry guard (Figure 2, Item 6) over output terminal board (Figure 2, Item 1).
17. Install four screws (Figure 2, Item 7) securing cable entry guard (Figure 2, Item 6) over output terminal board (Figure 2, Item 1). Torque four screws (Figure 2, Item 7) to 27 – 35 in/lb (3 – 4 Nm).
18. Install right-side body panel (WP 0032, Remove/Install Right-Side Panel).
19. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
20. Close generator set doors.
21. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
22. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
23. Repair as required.
24. Remove identification tags.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL VOLTAGE SELECTION SWITCH

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0162, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Switch, rotary (1) (WP 0115, Repair Parts List, Figure 17, Item 20)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Personnel Required

91D (1)

References

WP 0058, Remove/Install Printed Circuit Board Module

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL VOLTAGE SELECTION SWITCH**Remove Voltage Selection Switch**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open output box door.
3. Remove five screws (not shown) that secure cover (not shown) of output box.
4. Remove cover (not shown) from output box.
5. Inspect cover (not shown) for signs of obvious damage and replace as required or set aside for reuse.

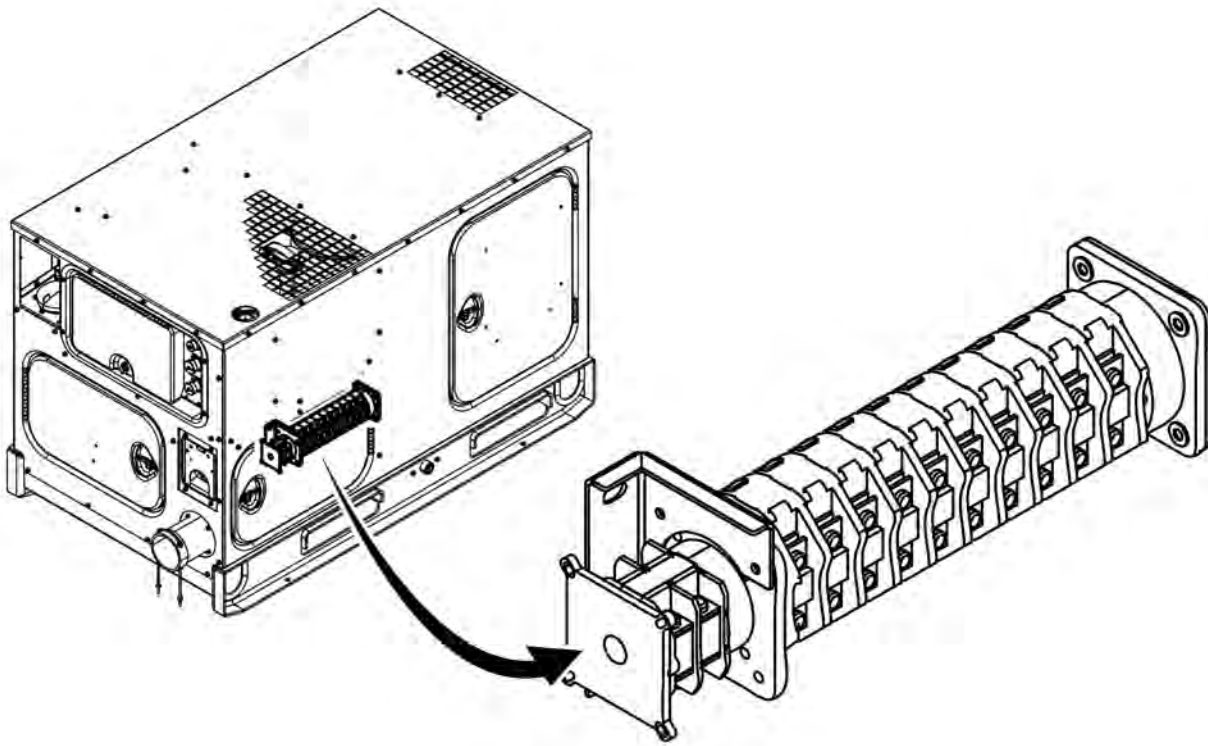


Figure 1. Voltage Selection Switch — Location.

6. Locate voltage selection switch (Figure 1).

NOTE

Prior to disassembly, tag all electrical wires and connectors for identification. Tags will be used as a guide during reassembly.

7. Tag three wires (Figure 2, Item 7) to voltage selection switch (Figure 4, Item 6).
8. Remove three nuts (Figure 2, Item 6) and three screws (Figure 2, Item 1) securing wires (Figure 2, Item 7) to voltage selection switch (Figure 4, Item 6).

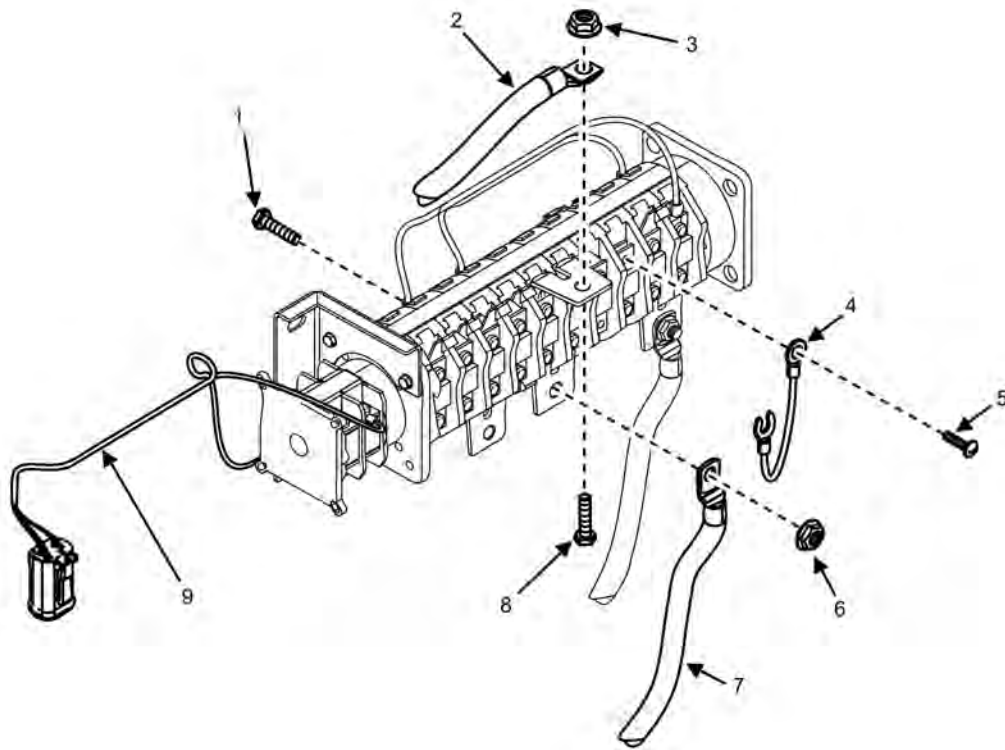


Figure 2. Voltage Selection Switch Wire — Removal.

9. Remove wires (Figure 2, Item 7) from voltage selection switch (Figure 4, Item 6).
10. Tag wire (Figure 2, Item 2) at top of voltage selection switch (Figure 4, Item 6).
11. Remove screw (Figure 2, Item 8) and nut (Figure 2, Item 3) that secure wire (Figure 2, Item 2) on top plate of voltage selection switch (Figure 4, Item 6).
12. Remove wire (Figure 2, Item 2) from top of voltage selection switch (Figure 4, Item 6).
13. Tag and remove wiring harness (Figure 2, Item 9) from printed circuit board module (WP 0058, Remove/Install Printed Circuit Board Module).
14. Inspect wiring harness (Figure 2, Item 9) for signs of obvious damage, and replace as required.
15. Open right-side door.

NOTE

Replacement voltage selection switch (Figure 4, Item 6) includes a new handle (Figure 3, Item 1) and gasket (not shown). Figure 3 shows output box with components removed for clarity.

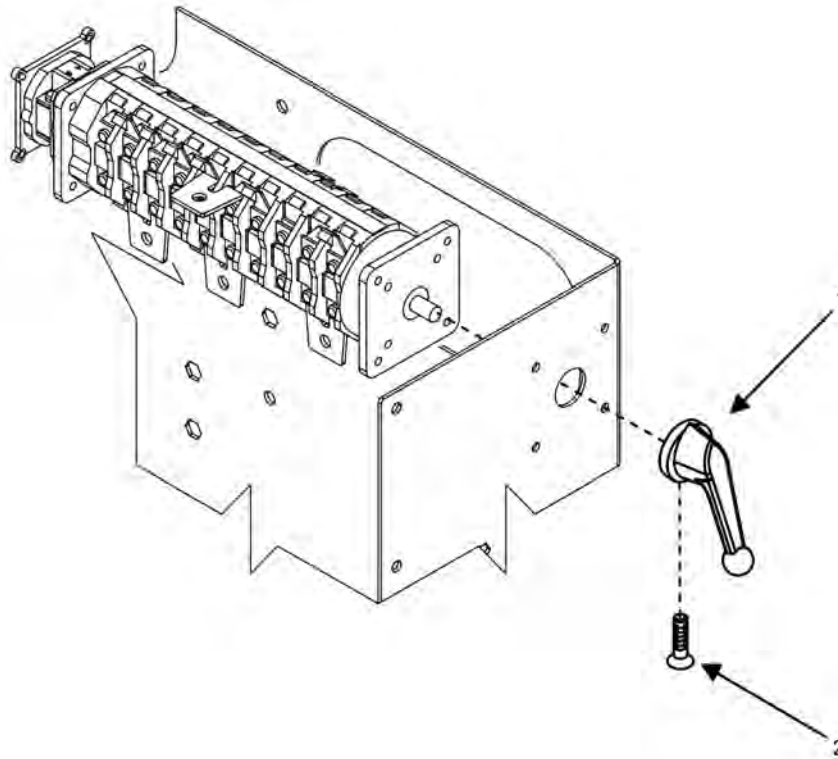


Figure 3. Voltage Selection Switch Handle — Removal.

16. Loosen set screw (Figure 3, Item 2) in center of handle (Figure 3, Item 1) that secures handle (Figure 3, Item 1) to voltage selection switch (Figure 4, Item 6).

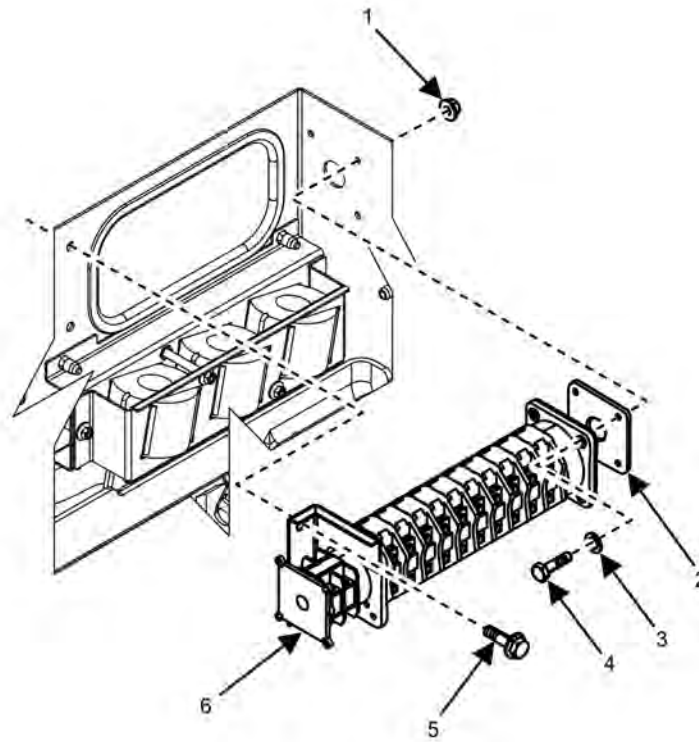


Figure 4. Voltage Selection Switch — Removal.

17. Remove four flare nuts (Figure 4, Item 1) that secure voltage selection switch (Figure 4, Item 6) and mounting plate (Figure 4, Item 2) to right-side of output box.
18. Remove two screws (Figure 4, Item 5) that secure mounting bracket (Figure 6, Item 1) to output box.
19. Reposition voltage selection switch (Figure 4, Item 6) to allow access to wires (Figure 2, Item 4).

NOTE

Voltage selection switch is labeled (Figure 5). Tag each wire (Figure 2, Item 4) according to the location label on the voltage selection switch to aid in installation.

20. Tag wires (Figure 2, Item 4) on voltage selection switch (Figure 4, Item 6) according to location label (Figure 5).
21. Remove screws (Figure 2, Item 5) securing wires (Figure 2, Item 4) to voltage selection switch (Figure 4, Item 6).
22. Inspect wires (Figure 2, Item 4) for damage and replace as required.
23. Remove three nuts (Figure 6, Item 3) and three washers (Figure 6, Item 2) that secure voltage selection switch (Figure 4, Item 6) to mounting bracket (Figure 6, Item 1).
24. Remove three screws (Figure 6, Item 5) and three washers (Figure 6, Item 4) that secure voltage selection switch (Figure 4, Item 6) to mounting bracket (Figure 6, Item 1).
25. Remove voltage selection switch (Figure 4, Item 6) from unit.

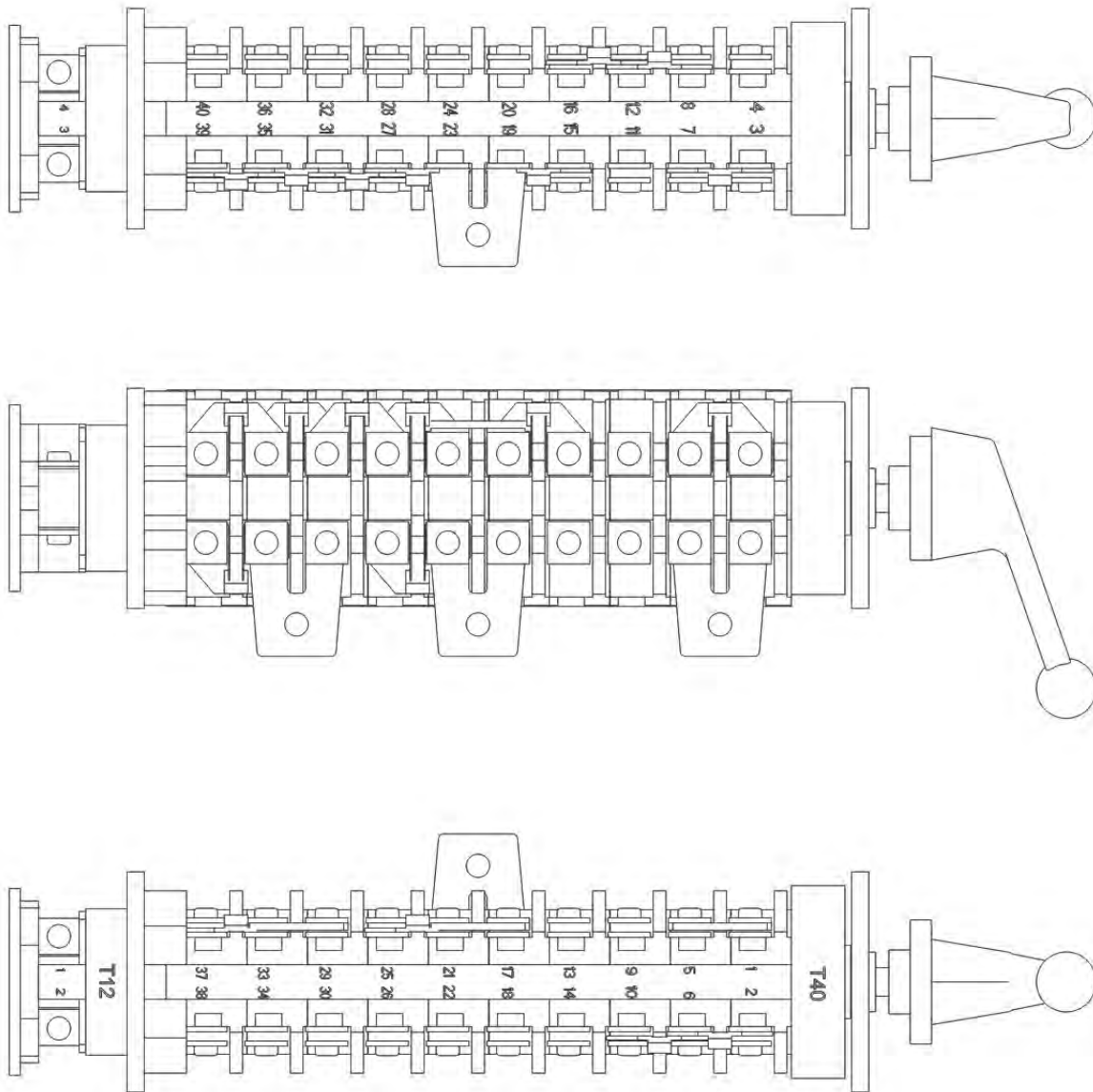


Figure 5. Voltage Selection Switch Wire Labels.

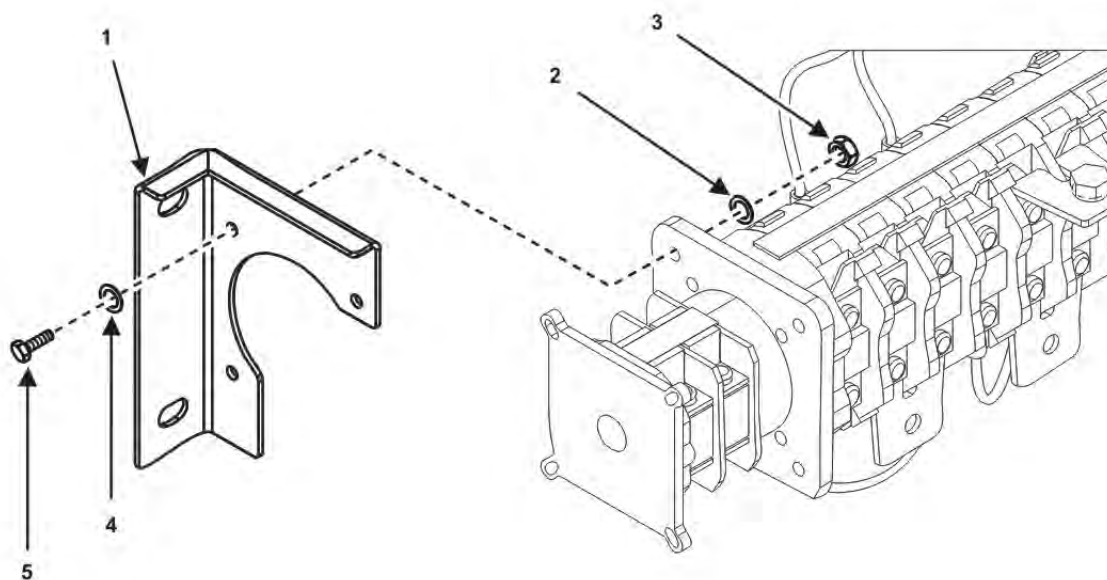


Figure 6. Voltage Selection Switch Mounting Bracket — Removal.

26. Remove four screws (Figure 4, Item 4) and four flat washers (Figure 4, Item 3) that secure voltage selection switch (Figure 4, Item 6) to mounting plate (Figure 4, Item 2).
27. Place voltage selection switch (Figure 4, Item 6) on a suitable work surface.

END OF TASK

Inspect Voltage Selection Switch

1. Inspect voltage selection switch (Figure 4, Item 6) for signs of obvious damage and replace as required.
2. Inspect wiring harness (Figure 2, Item 9) for signs of obvious damage and replace as required.
3. Inspect mounting bracket (Figure 6, Item 1) for signs of obvious damage and replace as required.
4. Inspect mounting plate (Figure 4, Item 2) for signs of obvious damage and replace as required.
5. Remove residual gasket material from inside output box in mounting area of voltage selection switch (Figure 4, Item 6) using an abrasive pad.
6. Inspect screws (Figure 2, Items 1, 5, and 8; Figure 4, Items 4 and 5; and Figure 6, Item 5), set screw (Figure 3, Item 2), nuts (Figure 2, Items 3 and 6 and Figure 6, Item 3), flare nuts (Figure 4, Item 1), and washers (Figure 4, Item 3; Figure 6, Items 2 and 4) for signs of damage and replace as required.

END OF TASK

Install Voltage Selection Switch

1. Position mounting plate (Figure 4, Item 2) to voltage selection switch (Figure 4, Item 6) and secure with four screws (Figure 4, Item 4) and four flat washers (Figure 4, Item 3).

2. Install three screws (Figure 6, Item 5) and three washers (Figure 6, Item 4) that secure mounting bracket (Figure 6, Item 1) to voltage selection switch (Figure 4, Item 6).
3. Install three washers (Figure 6, Item 2) and three nuts (Figure 6, Item 3) to secure mounting bracket (Figure 6, Item 1) to voltage selection switch (Figure 4, Item 6). Tighten to a value of 11 – 12 in/lb (1 Nm).

NOTE

Identification tags should remain in place until the output box is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

4. Secure wires (Figure 2, Item 4) to voltage selection switch (Figure 4, Item 6) with screws (Figure 2, Item 5) at locations (Figure 5) tagged in removal.
5. Position voltage selection switch (Figure 4, Item 6) to mounting location on output box.
6. Install two screws (Figure 4, Item 5) that secure mounting bracket (Figure 6, Item 1) to output box. Tighten to a value of 27 – 34 in/lb (3 – 6 Nm).
7. Open right-side door.
8. Install four flare nuts (Figure 4, Item 1) that secure voltage selection switch (Figure 4, Item 6) and mounting plate (Figure 4, Item 2) to right side of output box. Tighten to a value of 25 – 30 in/lb (3 – 4 Nm).
9. Position voltage selection switch handle (Figure 3, Item 1) and secure with set screw (Figure 3, Item 2) in center of handle (Figure 3, Item 1).
10. Connect wiring harness (Figure 2, Item 9) to printed circuit board (WP 0058, Remove/Install Printed Circuit Board Module).
11. Position appropriately tagged wire (Figure 2, Item 2) to top of voltage selection switch (Figure 4, Item 6).
12. Install screw (Figure 2, Item 8) and nut (Figure 2, Item 3) that secure wire (Figure 2, Item 2) on top plate of voltage selection switch (Figure 4, Item 6). Tighten to a value of 87 – 105 in/lb (10 – 12 Nm).
13. Position three wires (Figure 2, Item 7) to voltage selection switch (Figure 4, Item 6) according to tags.
14. Install three screws (Figure 2, Item 1) and three nuts (Figure 2, Item 6) that secure wires (Figure 2, Item 7) to voltage selection switch (Figure 4, Item 6). Tighten to a value of 87 – 105 in/lb (10 – 12 Nm).
15. Position cover (not shown) over output box.
16. Install five screws (not shown) that secure cover (not shown) over output box.
17. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
18. Close generator set doors.
19. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
20. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
21. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL HOUR METER

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
 Wrench, Torque, Dial, 1/4" drive, 30 IN-LB (WP 0162, Table 2, Item 39)

Materials/Parts

Hour meter assembly (WP 0116, Repair Parts List, Figure 18, Item 3)
 Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)
 Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

References

WP 0058, Remove/Install Printed Circuit Module Board

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
 Engine cool
 Battery ground cable removed (WP 0036, Remove/Install Batteries)

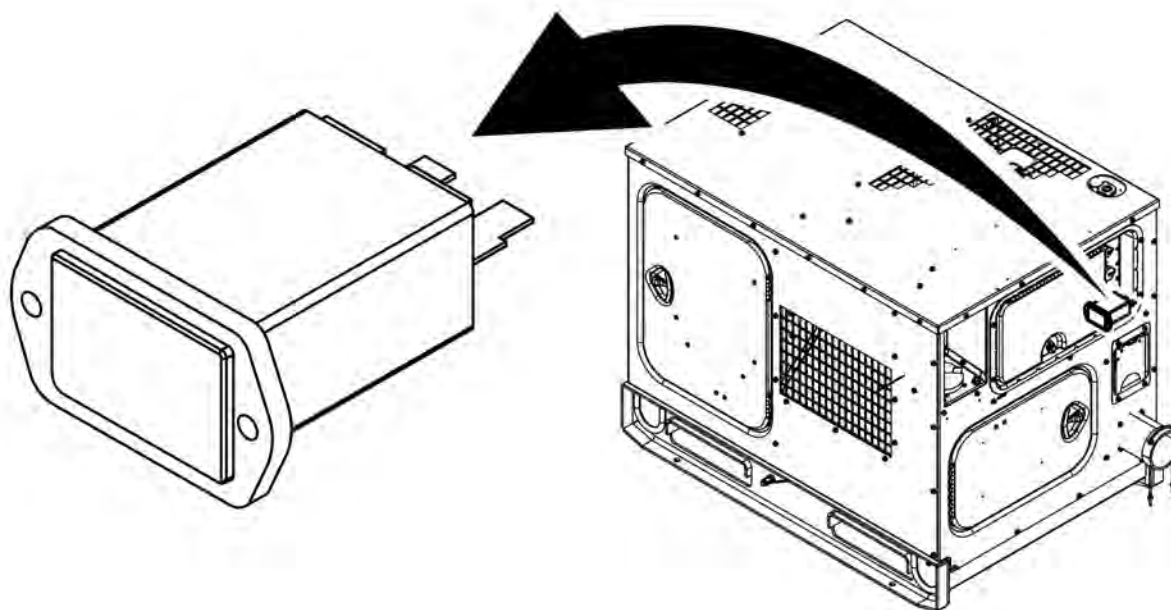
REMOVE/INSTALL HOUR METER**Remove Hour Meter**

Figure 1. Hour Meter — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open output box.
3. Remove five screws (not shown) that secure cover (not shown) of output box.
4. Remove cover from output box.
5. Open rear door.
6. Locate hour meter (Figure 1).

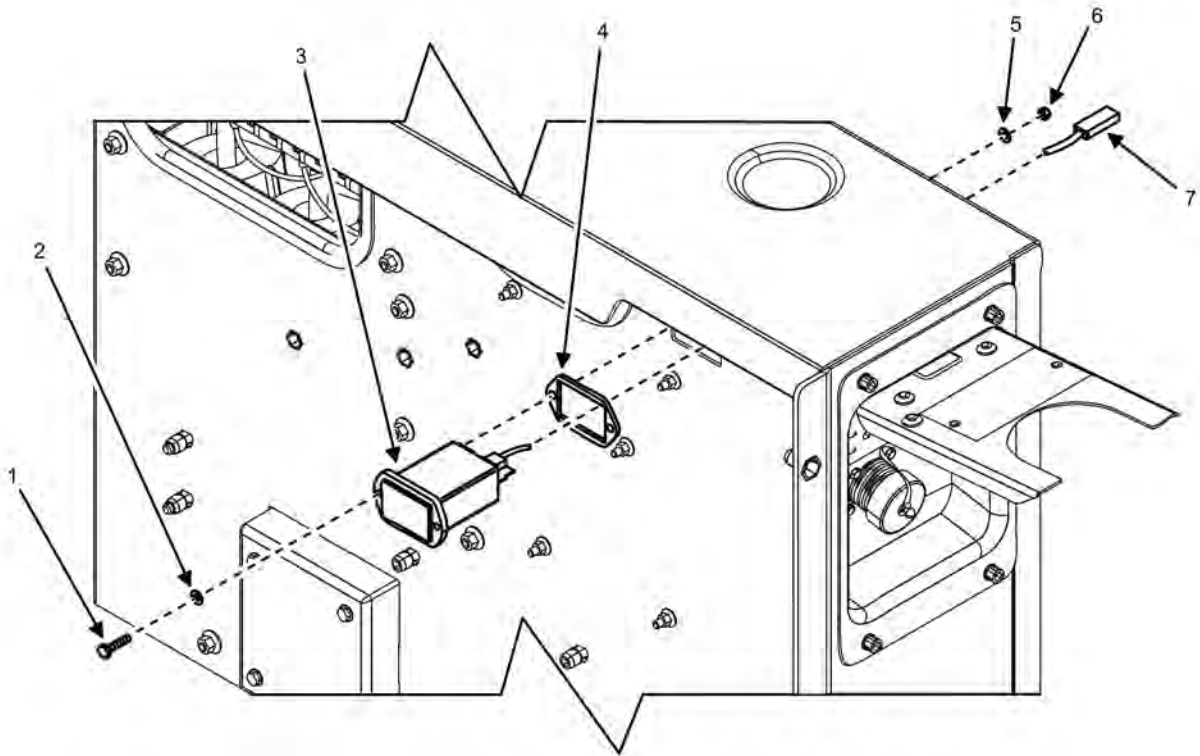


Figure 2. Hour Meter — Detail.

CAUTION

Printed circuit board contains components that are sensitive to static electricity. Always wear an anti-static wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

NOTE

Prior to disassembly, tag all electrical wires, cables, and connectors for identification. Tags will be used as a guide during reassembly.

7. Tag and disconnect wiring harness (Figure 2, Item 7) from printed circuit board module (not shown) of output box (WP 0058, Remove/Install Printed Circuit Board Module).

NOTE

Hour meter wiring harness and mounting gasket are supplied with replacement hour meter.

8. Remove two nuts (Figure 2, Item 6) and two washers (Figure 2, Item 5) from inside the output box and two screws (Figure 2, Item 1) and two washers (Figure 2, Item 2) from the rear of the output box that secure hour meter (Figure 2, Item 3) to back wall of output box.
9. Remove hour meter (Figure 2, Item 3), gasket (Figure 2, Item 4), and wiring harness (Figure 2, Item 7) from output box. Discard gasket (Figure 2, Item 4).

END OF TASK

Inspect Hour Meter

1. Inspect hour meter (Figure 2, Item 3) and wiring harness (Figure 2, Item 7) for signs of obvious damage. Replace as required.
2. Inspect all mounting hardware for signs of obvious damage. Replace as required.

END OF TASK**Install Hour Meter**

1. Position hour meter (Figure 2, Item 3), new gasket (Figure 2, Item 4), and wiring harness (Figure 2, Item 7) to mounting locations in output box and align the mounting holes.
2. Secure hour meter (Figure 2, Item 3) to output box by installing two screws (Figure 2, Item 1) and two washers (Figure 2, Item 2) to the back of output box and two washers (Figure 2, Item 5) and nuts (Figure 2, Item 6) to inside output box. Torque to a value of 11 – 12 in/lb (1 Nm).

CAUTION

Printed circuit board contains components that are sensitive to static electricity. Always wear an anti-static wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

NOTE

Identification tags should remain in place until the output box is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

3. Apply a thin coat of electrically conductive grease to wiring harness (Figure 2, Item 7).
4. Install wiring harness (Figure 2, Item 7) to printed circuit board module (not shown) using identification tags installed during removal as a guide (WP 0058, Remove/Install Printed Circuit Board Module).
5. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
6. Close generator set doors.
7. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
8. Start engine and check for proper operation (TM 9-6115-749-10).
9. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL CONVENIENCE RECEPTACLE

INITIAL SETUP:

Tools and Special Tools

Screwdriver, Torx, T20, 3" Long (WP 0162, Table 2, Item 22)

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0162, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Boot, terminal circuit breaker (WP 0117, Repair Parts List, Figure 19, Item 27)

Interrupter, ground fault 50/60 Hz (WP 0117, Figure 19, Item 30)

Interrupter, ground fault 400 Hz (WP 0117, Figure 19, Item 31)

Receptacle, duplex (WP 0117, Figure 19, Item 15)

Washer, flat M4 (WP 0117, Figure 19, Item 2)

Materials/Parts

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Washer, lock 1/4 ext tooth (WP 0117, Figure 19, Item 11)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

References

WP 0058, Remove/Install Printed Circuit Board Module

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL CONVENIENCE RECEPTACLE

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Convenience Receptacle Housing

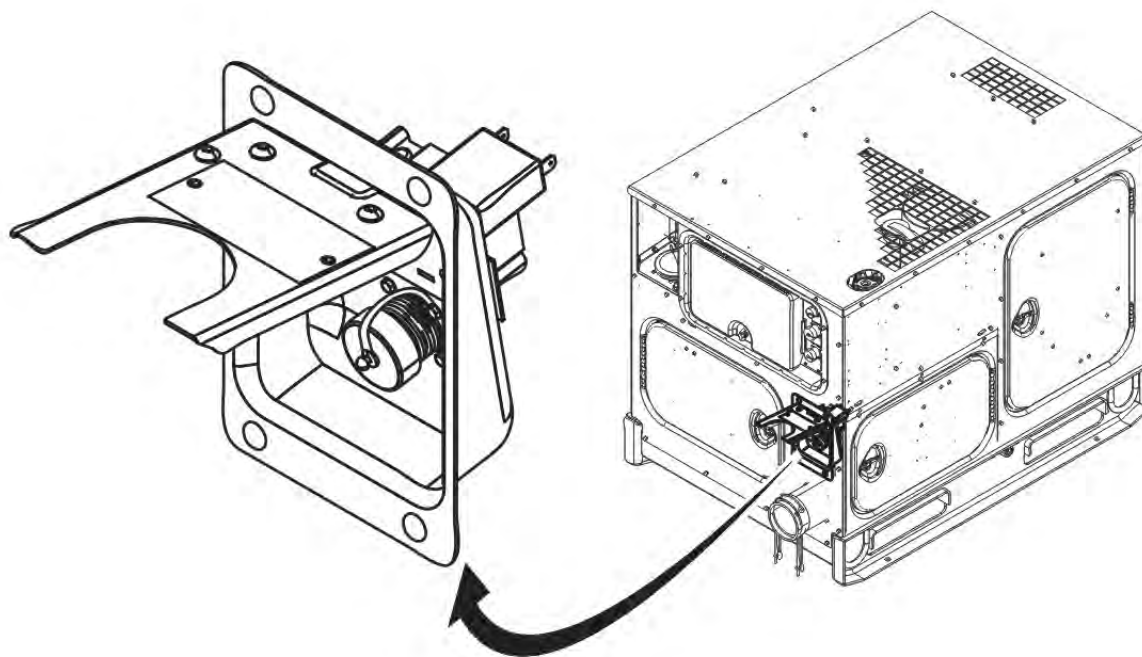


Figure 1. Convenience Receptacle — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate convenience receptacle (Figure 1) on rear body panel of generator set.
3. Remove four screws (Figure 3, Item 10) securing convenience receptacle housing (Figure 3, Item 9) to rear panel.
4. Position convenience receptacle housing (Figure 3, Item 9) to gain access to wiring.

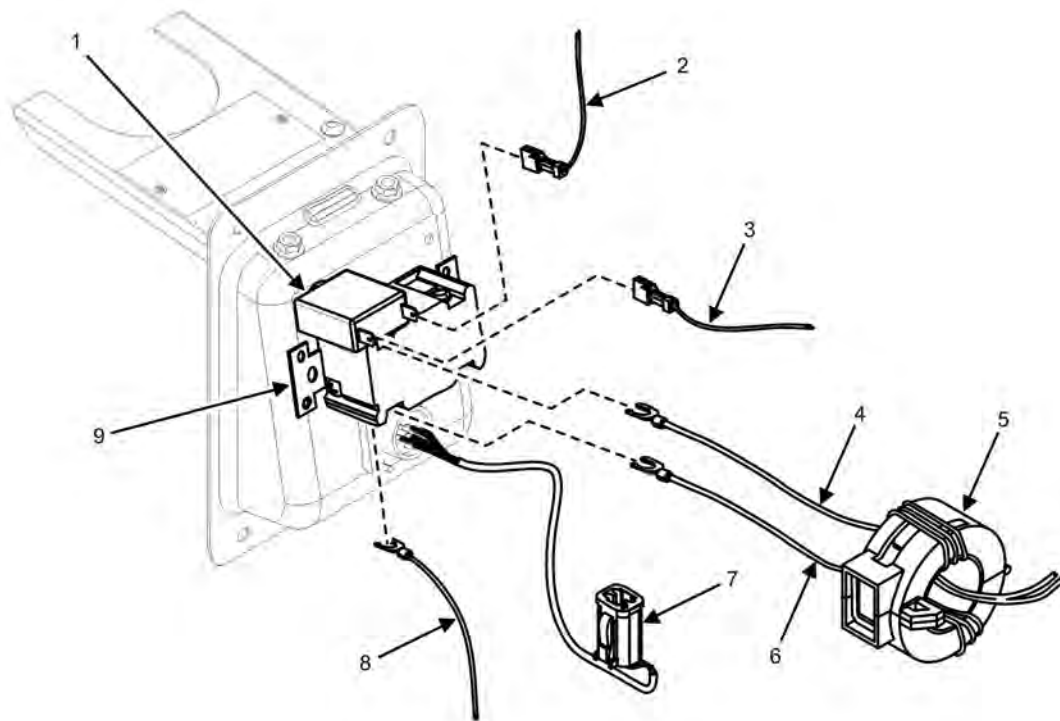


Figure 2. Convenience Receptacle Rear — Removal.

NOTE

To assist installation, tag all electrical wires and connectors prior to removal.

5. Loosen screw (not shown) and tag and remove GND wire (Figure 2, Item 8) from convenience receptacle (Figure 2, Item 9).

NOTE

Two GFI wires (Figure 2, Items 4 and 6) pass through GFI choke filter (Figure 2, Item 5) three times.

6. Loosen screw (not shown) and tag and GFI wire (Figure 2, Item 6) from convenience receptacle (Figure 2, Item 9).
7. Tag and remove GFI wire (Figure 2, Item 3) from rear of circuit breaker (Figure 2, Item 1).
8. Tag and remove L1 wire (Figure 2, Item 2) from rear of circuit breaker (Figure 2, Item 1).
9. Tag and disconnect switch box contactor receptacle wiring harness (Figure 2, Item 7) at printed circuit board module (not shown) (WP 0058, Remove/Install Printed Circuit Board Module).
10. Loosen screw (not shown) and tag and remove GFI wire (Figure 2, Item 4) from convenience receptacle (Figure 2, Item 9).
11. Remove convenience receptacle housing (Figure 3, Item 9) from rear panel and place on suitable surface.

END OF TASK

Disassemble Convenience Receptacle Housing

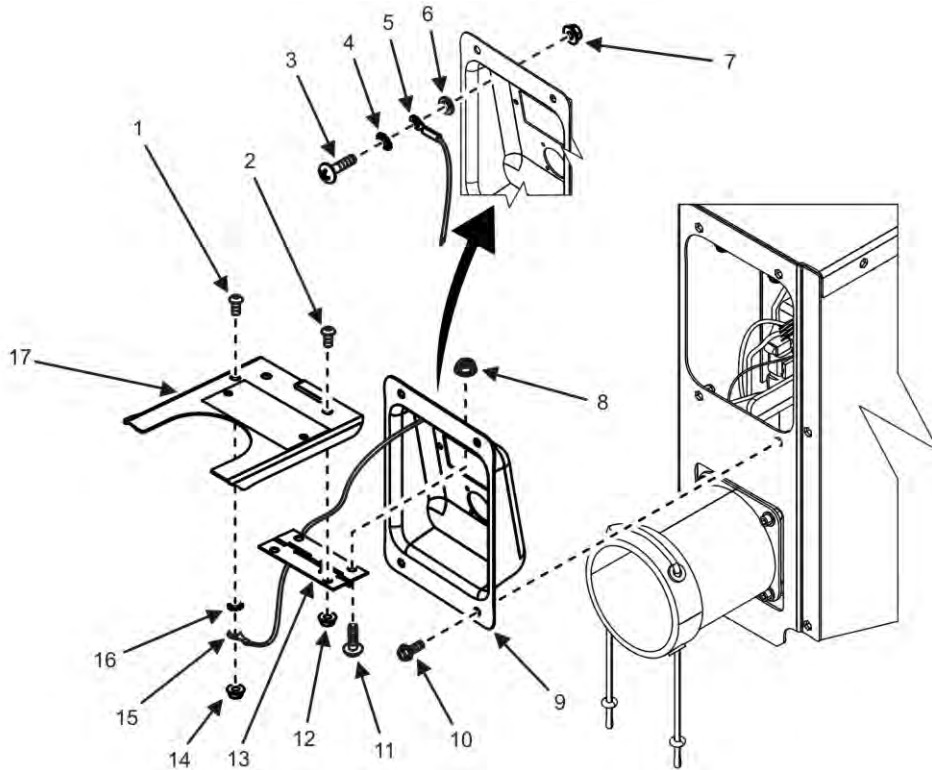


Figure 3. Convenience Receptacle — Removal.

1. Remove screw (Figure 3, Item 3), external tooth lock washer (Figure 3, Item 4), flat washer (Figure 3, Item 6), and nut (Figure 3, Item 7) that secure ground strap (Figure 3, Item 5) to back of convenience receptacle housing (Figure 3, Item 9).
2. Discard external tooth lock washer (Figure 3, Item 4).
3. Remove screw (Figure 3, Item 1), external tooth lock washer (Figure 3, Item 16), and nut (Figure 3, Item 14) that secure ground strap (Figure 3, Item 15) to convenience receptacle housing cover (Figure 3, Item 17).
4. Discard external tooth lock washer (Figure 3, Item 16).
5. Remove two screws (Figure 3, Item 11) and two nuts (Figure 3, Item 8) that secure convenience receptacle housing cover (Figure 3, Item 17) and hinge (Figure 3, Item 13) to convenience receptacle housing (Figure 3, Item 9).
6. Remove two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 12) that attach convenience receptacle housing cover (Figure 3, Item 17) to hinge (Figure 3, Item 13).
7. Remove four nuts (Figure 4, Item 7) and four flat washers (Figure 4, Item 8) that secure switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) to convenience receptacle housing (Figure 3, Item 9).
8. Remove four screws (Figure 4, Item 13) and four flat washers (Figure 4, Item 12) that secure switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) to convenience receptacle housing (Figure 3, Item 9).

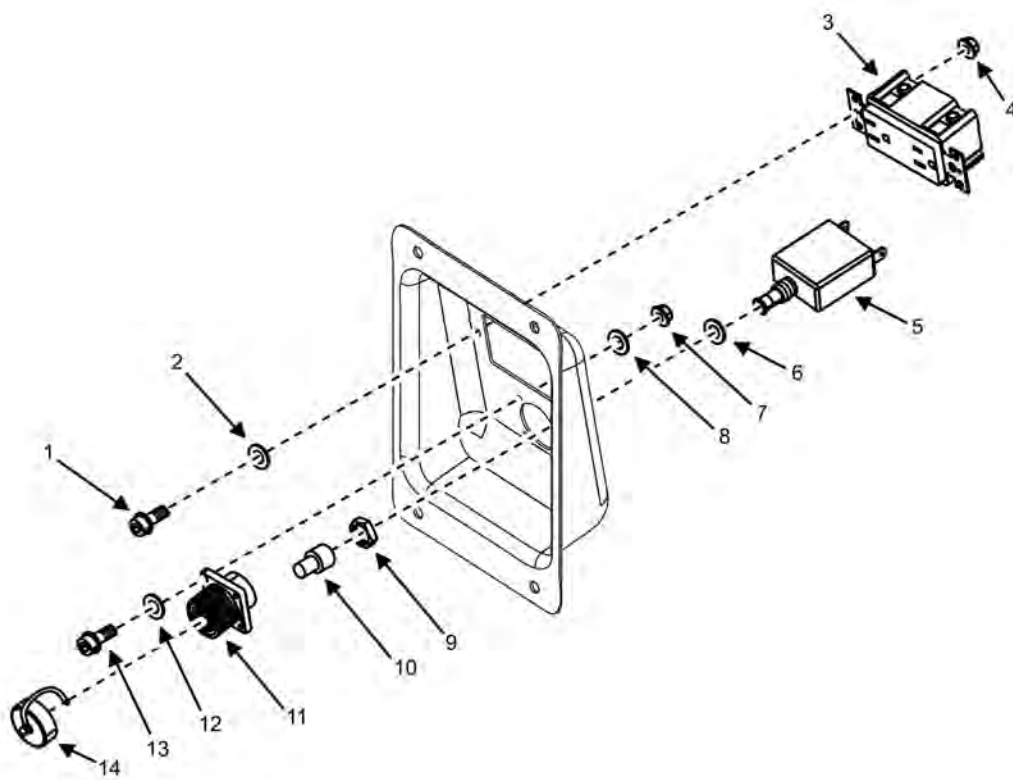


Figure 4. Convenience Receptacle Components — Removal.

9. Remove switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) from convenience receptacle housing (Figure 3, Item 9).
10. Remove circuit breaker boot (Figure 4, Item 10), mounting nut (Figure 4, Item 9), and washer (Figure 4, Item 6) that secure circuit breaker (Figure 4, Item 5) to convenience receptacle housing (Figure 3, Item 9).
11. Discard circuit breaker boot (Figure 4, Item 10).
12. Remove two screws (Figure 4, Item 1), two flat washers (Figure 4, Item 2), and two flange nuts (Figure 4, Item 4) that secure convenience receptacle (Figure 4, Item 3) to convenience receptacle housing (Figure 3, Item 9).
13. Remove convenience receptacle (Figure 4, Item 3) from convenience receptacle housing (Figure 3, Item 9).

END OF TASK

Inspect Convenience Receptacle

1. Inspect convenience receptacle housing (Figure 3, Item 9) for dents, cracks, or other signs of damage and replace as required.
2. Inspect convenience receptacle housing cover (Figure 3, Item 17) for dents, cracks, or other signs of damage. Replace as required.
3. Inspect hinge (Figure 3, Item 13) for functionality and replace as required.
4. Inspect switch box contactor receptacle (Figure 4, Item 11) for signs of damage and replace as required.
5. Inspect switch box contactor receptacle wiring harness (Figure 2, Item 7) for frayed wires and other signs of damage. Replace switch box contactor receptacle (Figure 4, Item 11) as required.

6. Inspect convenience receptacle (Figure 4, Item 3) for cracks and damage and replace as required.
7. Inspect circuit breaker (Figure 4, Item 5) for cracks and damage and replace as required.
8. Inspect all wires for damage and replace as required
9. Inspect all mounting hardware and replace as required.

END OF TASK

Assemble Convenience Receptacle Housing

1. Position convenience receptacle (Figure 4, Item 3) to mounting position on convenience receptacle housing (Figure 3, Item 9).
2. Secure convenience receptacle (Figure 4, Item 3) to convenience receptacle housing (Figure 3, Item 9) by installing two screws (Figure 4, Item 1), two flat washers (Figure 4, Item 2), and two flange nuts (Figure 4, Item 4). Tighten flange nuts (Figure 4, Item 4) to 25 – 39 in/lb (3 – 6 Nm).
3. Position circuit breaker (Figure 4, Item 5) to mounting position on convenience receptacle housing (Figure 3, Item 9).
4. Secure circuit breaker (Figure 4, Item 5) to convenience receptacle housing (Figure 3, Item 9) by installing washer (Figure 4, Item 6), mounting nut (Figure 4, Item 9), and new circuit breaker boot (Figure 4, Item 10).
5. Position switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) to mounting position on convenience receptacle housing (Figure 3, Item 9).
6. Install switch box contactor receptacle (Figure 4, Item 11) with four screws (Figure 4, Item 13) and four flat washers (Figure 4, Item 12) to front of switch box contactor receptacle (Figure 4, Item 11).
7. Install four washers (Figure 4, Item 8) and four nuts (Figure 4, Item 7) to rear of switch box contactor receptacle (Figure 4, Item 11). Tighten four nuts (Figure 4, Item 7).
8. Install two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 12) that attach convenience receptacle housing cover (Figure 3, Item 17) and hinge (Figure 3, Item 13). Tighten screws (Figure 3, Item 2) to 87 – 105 in/lb (10 – 12 Nm).
9. Install two screws (Figure 3, Item 11) and two nuts (Figure 3, Item 8) that secure convenience receptacle housing cover (Figure 3, Item 17) and hinge (Figure 3, Item 13) to convenience receptacle housing (Figure 3, Item 9). Tighten screws (Figure 3, Item 11) to 87 – 105 in/lb (10 – 12 Nm).
10. Install screw (Figure 3, Item 1), new external tooth lock washer (Figure 3, Item 16), and nut (Figure 3, Item 14) that secure ground strap (Figure 3, Item 15) to convenience receptacle housing cover (Figure 3, Item 17). Tighten screws (Figure 3, Item 1) to 87 – 105 in/lb (10 – 12 Nm).
11. Install screw (Figure 3, Item 3), new external tooth lock washer (Figure 3, Item 4), flat washer (Figure 3, Item 6), and nut (Figure 3, Item 7) that secure ground strap (Figure 3, Item 5) to back of convenience receptacle housing (Figure 3, Item 9). Tighten screws (Figure 3, Item 3) to 87 – 105 in/lb (10 – 12 Nm).

END OF TASK

Install Convenience Receptacle Housing

1. Position convenience receptacle housing (Figure 3, Item 9) to mounting position on rear panel.

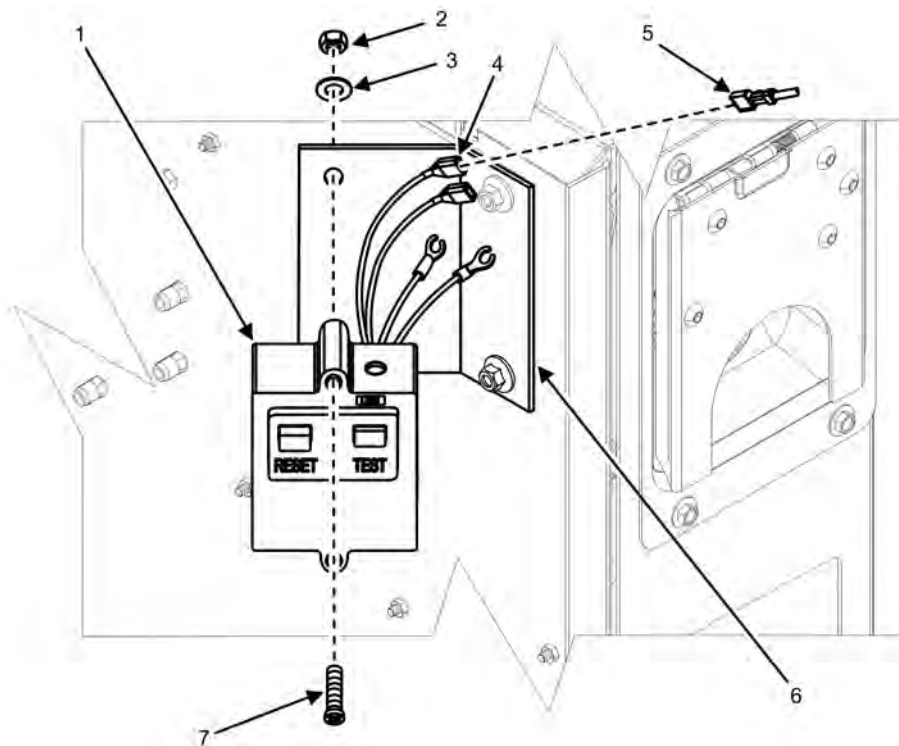
NOTE

Use tags installed on electrical wires and connectors prior to removal as a guide at installation. Remove tags once components have been installed.

Two GFI wires (Figure 2, Items 4 and 6) pass through GFI choke filter (Figure 2, Item 5) three times.

2. Install GFI wires (Figure 2, Items 4 and 6) to convenience receptacle (Figure 2, Item 9) and secure with screw (not shown), ensuring each GFI wire (Figure 2, Item 4) passes through GFI choke filter (Figure 2, Item 5) three times.
3. Install GND wire (Figure 2, Item 8) to convenience receptacle (Figure 2, Item 9).
4. Secure convenience receptacle housing (Figure 3, Item 9) to rear panel by installing four screws (Figure 3, Item 10).
5. Install GFI wire (Figure 2, Item 3) to circuit breaker (Figure 2, Item 1).
6. Install L1 wire (Figure 2, Item 2) to circuit breaker (Figure 2, Item 1).
7. Connect switch box contactor receptacle wiring harness (Figure 2, Item 7) to printed circuit board using identification tags installed during removal as a guide (WP 0058, Remove/Install Printed Circuit Board Module).
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Close generator set doors.
10. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
11. Start engine and check for proper operation (TM 9-6115-749-10).
12. Repair as required.

END OF TASK

Remove Convenience Receptacle GFI**Figure 5. Convenience Receptacle GFI — Removal.****NOTE**

Tag all wires and connectors prior to removal as a guide at installation.

1. Open rear access door.
2. Tag and loosen two screws and remove two GFI wires (Figure 2, Items 4 and 6) from convenience receptacle (Figure 2, Item 9) and GFI wire (Figure 2, Item 3) from rear of circuit breaker (Figure 2, Item 1). See Remove Convenience Receptacle Housing and Disassemble Convenience Receptacle Housing tasks.
3. Remove wire (Figure 5, Item 4) of GFI (Figure 5, Item 1) from neutral lead (Figure 5, Item 5).
4. Withdraw four wires through output box opening.
5. Remove two screws (Figure 5, Item 7), two flat washers (Figure 5, Item 3), and two nuts (Figure 5, Item 2) from GFI (Figure 5, Item 1).
6. Remove GFI (Figure 5, Item 1) from mounting bracket (Figure 5, Item 6).
7. Inspect GFI (Figure 5, Item 1) and replace as required.

END OF TASK

Install Convenience Receptacle GFI**NOTE**

Use tags installed on wires and connectors prior to removal as a guide at installation. Remove tags once unit has been reassembled and tested for proper operation.

1. Position GFI (Figure 5, Item 1) to mounting bracket (Figure 5, Item 6) and align mounting holes.
2. Insert two screws (Figure 5, Item 7) through GFI (Figure 5, Item 1) into mounting bracket (Figure 5, Item 6).
3. Install two flat washers (Figure 5, Item 3) and two nuts (Figure 5, Item 2) to rear of GFI (Figure 5, Item 1). Tighten two nuts (Figure 5, Item 2).
4. Insert four wires of GFI (Figure 5, Item 1) through output box opening.
5. Install two wires (Figure 2, Items 4 and 6) to convenience receptacle (Figure 2, Item 9) and one GFI wire (Figure 2, Item 3) to rear of circuit breaker (Figure 2, Item 1) according to tags. See Install Convenience Receptacle Housing and Assemble Convenience Receptacle Housing tasks.
6. Install wire (Figure 5, Item 4) to neutral lead (Figure 5, Item 5).
7. Close rear access door of generator set.
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Turn engine control switch to PRIME & RUN (TM-6115-749-10).
10. Start engine and check for proper operation (TM-6115-749-10).
11. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL CURRENT TRANSFORMERS

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0162, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Transformer, current 105 AMP (3) (WP 0118, Repair Parts List, Figure 20, Item 4)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Personnel Required

91D (1)

Assistant (1)

References

WP 0053, Remove/Install Output Terminal Board

WP 0058, Remove/Install Printed Circuit Board Module

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)

REMOVE/INSTALL CURRENT TRANSFORMERS

Remove Current Transformers

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove cable entry guard (WP 0053, Remove/Install Output Terminal Board).
3. Locate current transformers (Figure 1).

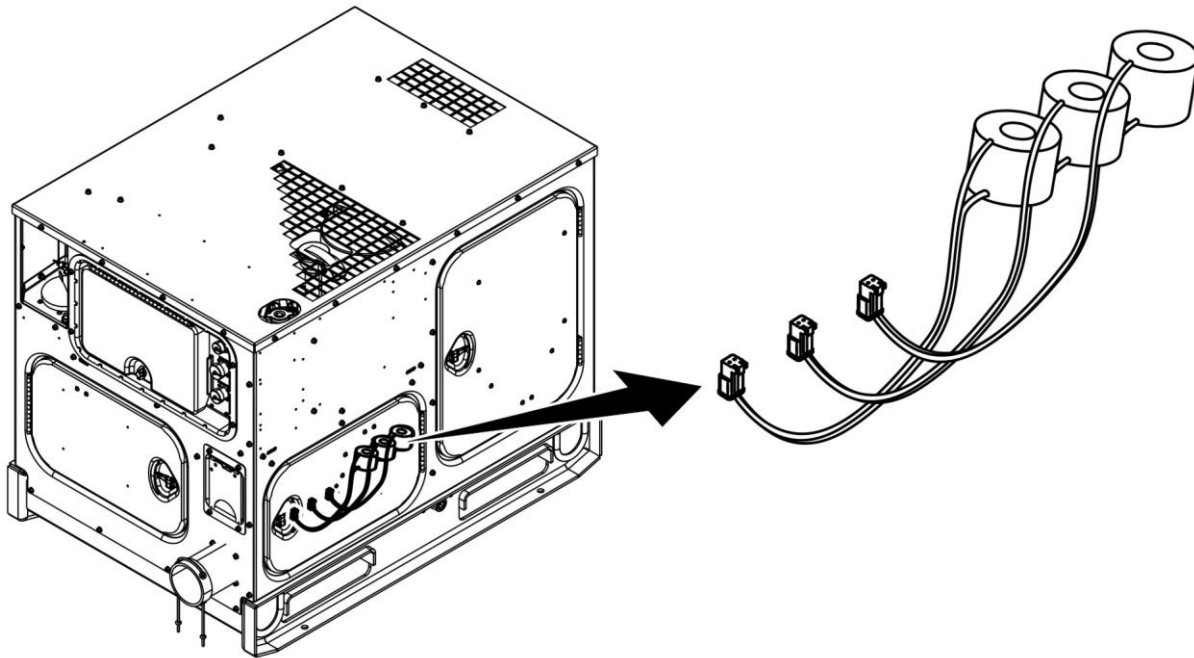


Figure 1. Current Transformers — Location.

4. Remove two short screws (Figure 2, Item 7) and two long screws (Figure 2, Item 5) that secure transformer top bracket (Figure 2, Item 6) to transformer bottom bracket (Figure 2, Item 1).
5. Remove transformer top bracket (Figure 2, Item 6) from output box.

CAUTION

Printed circuit board contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

NOTE

Prior to disassembly, tag all electrical wires, cables, and connectors for identification. Tags will be used as a guide during reassembly.

Transformer electrical wires (Figure 2, Item 8) are permanently attached to current transformers (Figure 2, Item 4). If transformer electrical wires (Figure 2, Item 8) are damaged beyond repair, replace current transformer (Figure 2, Item 4).

6. Tag and disconnect transformer electrical wires (Figure 2, Item 8) from printed circuit board module (not shown) (WP 0058, Remove/Install Printed Circuit Board Module).

7. Inspect transformer electrical wires (Figure 2, Item 8) and replace current transformer (Figure 2, Item 4) as required.
8. Tag three electrical leads (Figure 2, Item 2) to voltage selection switch (not shown).
9. Remove three nuts (Figure 2, Item 3) securing electrical leads (Figure 2, Item 2) to voltage selection switch (not shown).

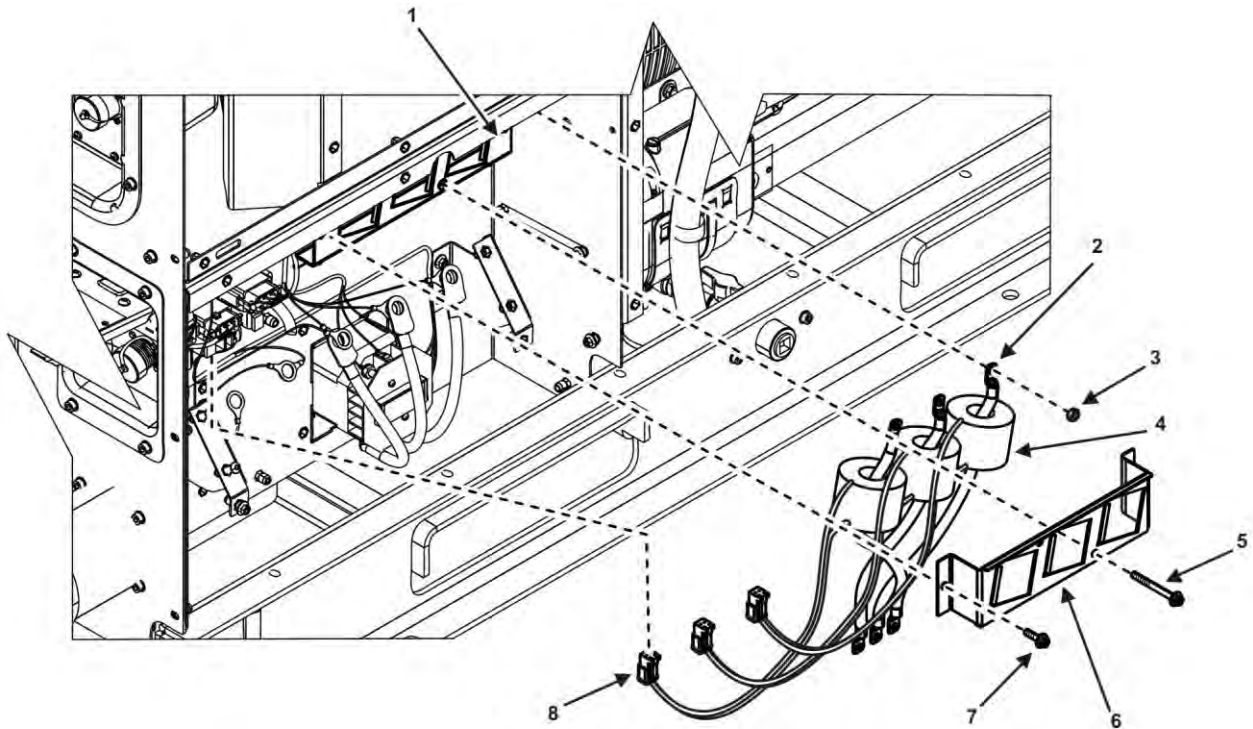


Figure 2. Transformer — Removal.

10. Remove three electrical leads (Figure 2, Item 2) to voltage selection switch (not shown).
11. Inspect three electrical leads (Figure 2, Item 2) for damage and replace as required.

CAUTION

Orientation of current transformers (Figure 2, Item 4) must be tagged prior to removal. X1 marking faces the top of the output box. Transformers are to be installed to the orientation they were removed. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag orientation of current transformers (Figure 2, Item 4). Tags will be used as a guide during reassembly.

12. Tag and remove three current transformers (Figure 2, Item 4) from transformer bottom bracket (Figure 2, Item 1) mounted in output box.

END OF TASK

Inspect Transformers

1. Inspect transformer bottom bracket (Figure 2, Item 1) in output box for signs of obvious damage. Replace as required.
2. Inspect three current transformers (Figure 2, Item 4) for signs of obvious damage. Replace as required.
3. Inspect three current transformers (Figure 2, Item 4) by using a multimeter set to test Ohms to check resistance between two sleeves of two electrical wires (Figure 2, Item 8) of each current transformer (Figure 2, Item 4).

NOTE

A measurement value greater than 2 Ω indicates a defective current transformer (Figure 2, Item 4).

4. Replace any current transformer (Figure 2, Item 4) outside of specification.
5. Inspect transformer top bracket (Figure 2, Item 6) for signs of obvious damage. Replace as required.
6. Inspect all mounting hardware for signs of obvious damage. Replace as required.

END OF TASK**Install Transformers****CAUTION**

Orientation of current transformers (Figure 2, Item 4) must be installed to proper orientation. X1 marking faces the top of the output box. Failure to comply may cause damage to equipment.

1. Position three current transformers (Figure 2, Item 4) to transformer bottom bracket (Figure 2, Item 1) in output box with X1 marking facing the top of the output box.

CAUTION

Printed circuit board contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

NOTE

Identification tags should remain in place until the output box is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

2. Insert electrical leads (Figure 2, Item 2) through current transformers (Figure 2, Item 4) to mounting location on voltage selection switch (not shown) using identifications tags installed during removal as a guide.
3. Apply a thin coat of electrically conductive grease to electrical leads (Figure 2, Item 2).
4. Secure electrical leads (Figure 2, Item 2) to voltage selection switch (not shown) with three nuts (Figure 2, Item 3).
5. Tighten nuts (Figure 2, Item 3) to 87 – 105 in/lb (10 – 12 Nm).
6. Connect transformer electrical wires (Figure 2, Item 8) to printed circuit board module (not shown) using identification tags installed during removal as a guide (WP 0058, Remove/Install Printed Circuit Board Module).

NOTE

Transformer top bracket (Figure 2, Item 6) is properly oriented over current transformers (Figure 2, Item 4) when the lip is facing the top of the unit.

7. Position transformer top bracket (Figure 2, Item 6) over current transformers (Figure 2, Item 4).
8. Secure transformer top bracket (Figure 2, Item 6) with two short screws (Figure 2, Item 7) and two long screws (Figure 2, Item 5).
9. Tighten short screws (Figure 2, Item 7) to 20 – 31 in/lb (3 – 4 Nm).
10. Tighten long screws (Figure 2, Item 5) to 87 – 105 in/lb (10 – 12 Nm).
11. Install cable entry guard (WP 0053, Remove/Install Output Terminal Board).
12. Install right-side body panel (WP 0032, Remove/Install Right-Side Panel).
13. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
14. Close generator set doors.
15. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
16. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
17. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL PRINTED CIRCUIT BOARD MODULE

INITIAL SETUP:**Tools and Special Tools**

Strap, Wrist, Electrostatic Discharge (WP 0162, Table 2, Item 24)
Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0162, Table 2, Item 39)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)

Materials/Parts

Module, printed circuit board (WP 0119, Repair Parts List, Figure 21, Item 3)
Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)
Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)
Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)
Output terminal board removed (WP 0053, Remove/Install Output Terminal Board)

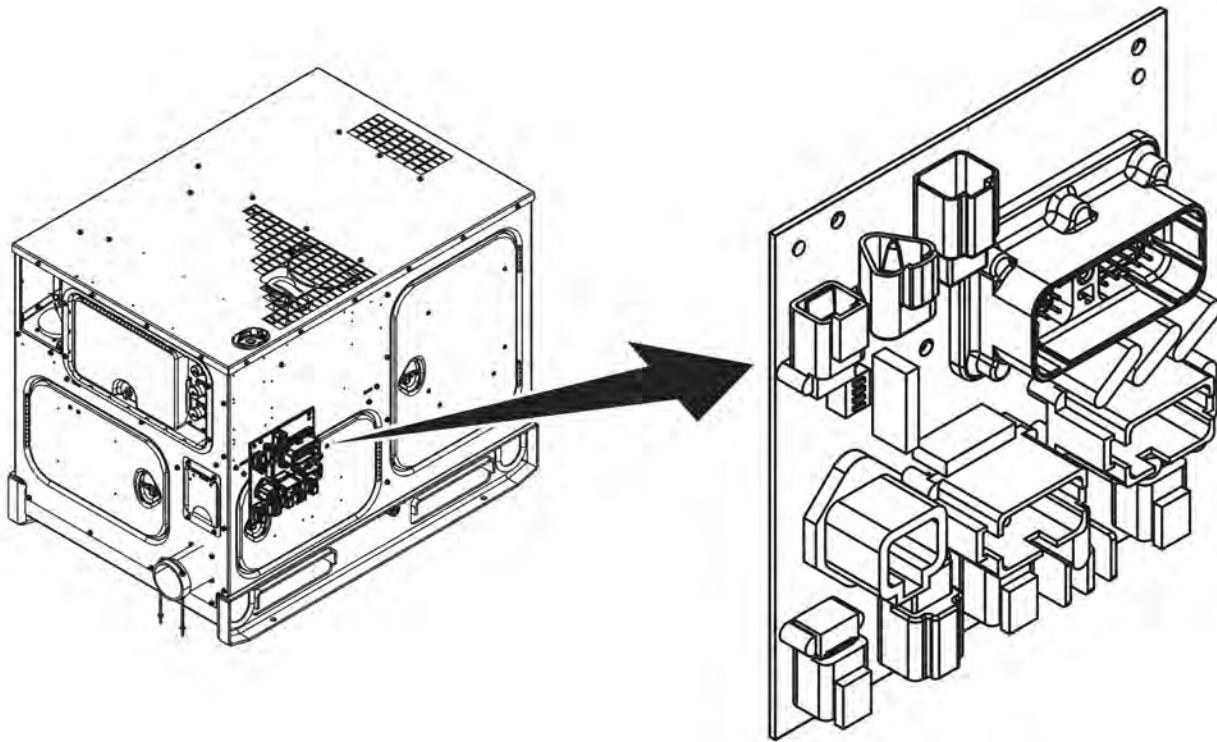
REMOVE/INSTALL PRINTED CIRCUIT BOARD MODULE**Remove Printed Circuit Board Module**

Figure 1. Printed Circuit Board Module — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate printed circuit board module (Figure 1).

NOTE

Prior to disassembly, tag and identify all wiring harnesses and electrical leads according to markings on printed circuit board module (Figure 2). Tags will be used as a guide during reassembly.

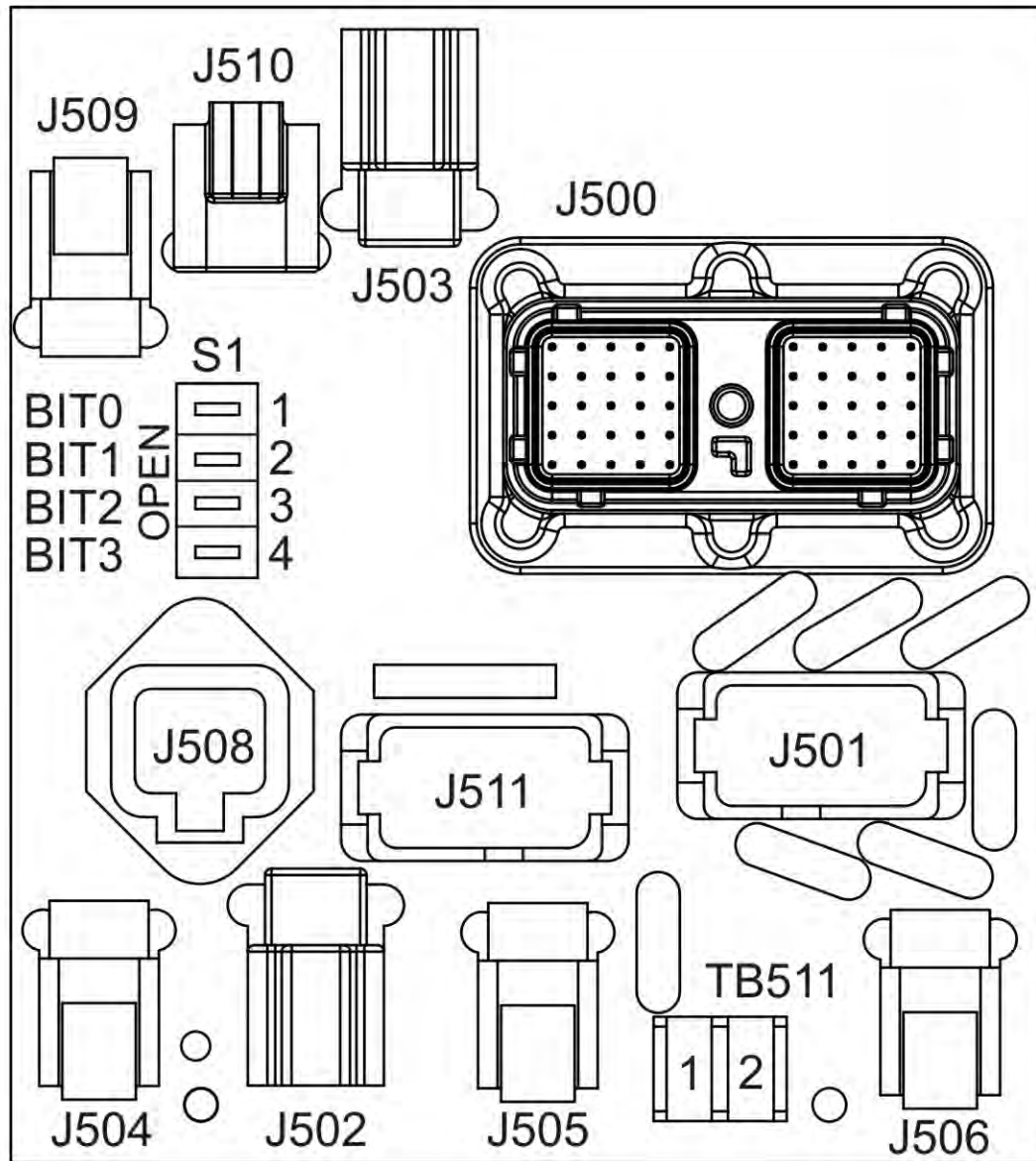


Figure 2. Printed Circuit Board Module Wiring Labels.

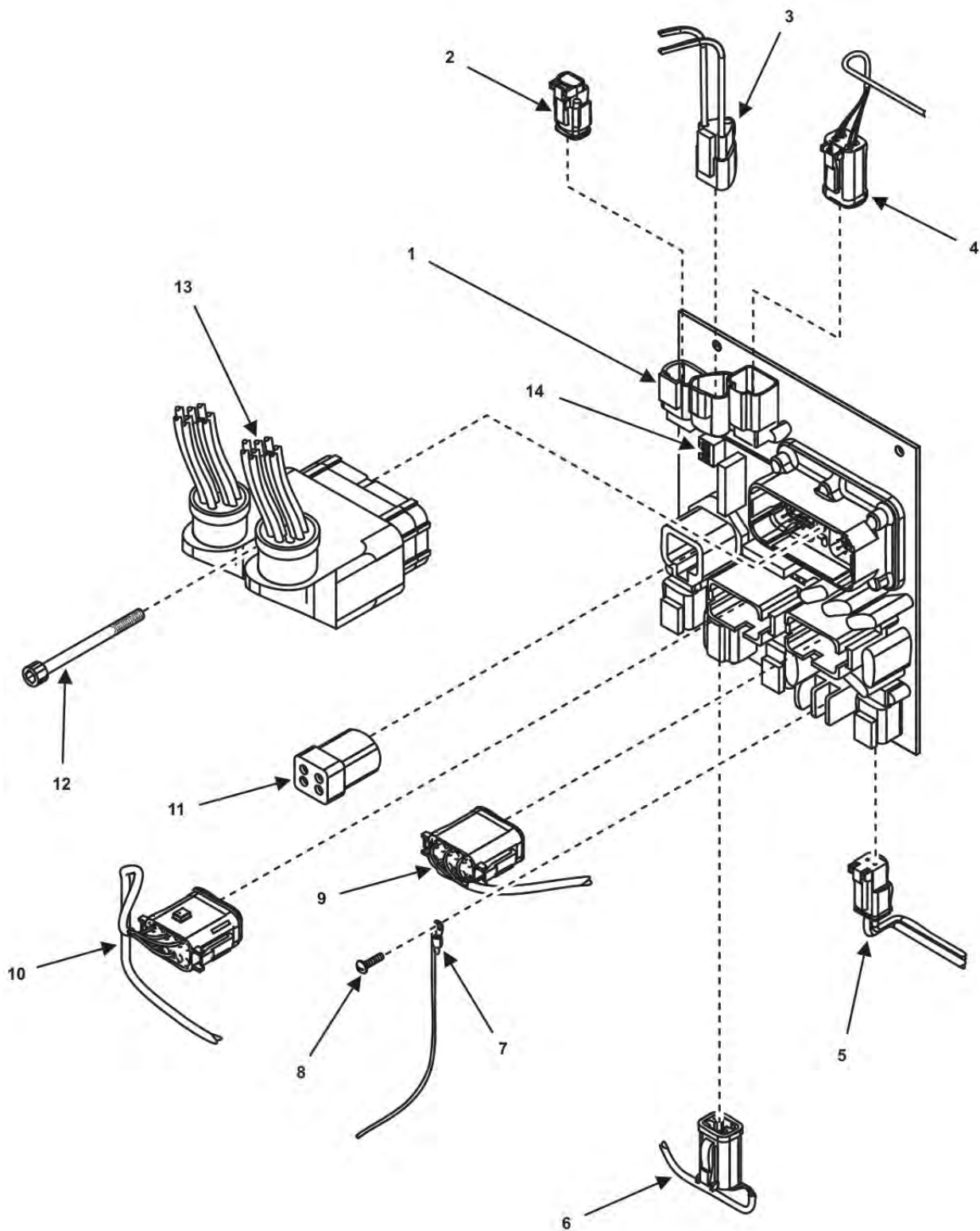


Figure 3. Printed Circuit Board Module Wiring — Removal.

CAUTION

Printed circuit board module contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

3. Tag and remove wiring harness (Figure 3, Item 3) from printed circuit board module (Figure 3, Item 1) to hour meter (not shown).
4. Inspect hour meter wiring harness (Figure 3, Item 3) for frayed wires and other signs of obvious damage and replace as required.
5. Tag and remove wiring harness (Figure 3, Item 4) from printed circuit board module (Figure 3, Item 1) to voltage selection switch (not shown).
6. Inspect voltage selection switch wiring harness (Figure 3, Item 4) for frayed wires and other signs of obvious damage and replace as required.
7. Tag wiring harness (Figure 3, Item 13) from printed circuit board module (Figure 3, Item 1) to DCS (not shown).
8. Remove screw (Figure 3, Item 12) securing DCS wiring harness (Figure 3, Item 13) to printed circuit board module (Figure 3, Item 1).
9. Remove DCS wiring harness (Figure 3, Item 13) from printed circuit board module (Figure 3, Item 1).
10. Inspect DCS wiring harness (Figure 3, Item 13) for frayed wires and other signs of obvious damage and replace as required.
11. Tag and remove wiring harness (Figure 3, Item 10) from printed circuit board module (Figure 3, Item 1) to N terminal (not shown) and contactor (not shown).
12. Inspect N terminal and contactor wiring harness (Figure 3, Item 10) for frayed wires and other signs of obvious damage and replace as required.
13. Tag and remove wiring harness (Figure 3, Item 9) from printed circuit board module (Figure 3, Item 1) to contactor (not shown) and line terminals (not shown).
14. Inspect contactor and line terminals wiring harness (Figure 3, Item 9) for frayed wires and other signs of obvious damage and replace as required.
15. Tag and remove three wiring harnesses (Figure 3, Item 5) from printed circuit board module (Figure 3, Item 1) to three transformers (not shown).
16. Inspect three transformer wiring harnesses (Figure 3, Item 5) for frayed wires and other signs of obvious damage and replace as required.
17. Tag and remove wiring harness (Figure 3, Item 6) from printed circuit board module (Figure 3, Item 1) to switch box contactor receptacle (not shown).
18. Inspect switch box contactor receptacle wiring harness (Figure 3, Item 6) for frayed wires and other signs of obvious damage and replace as required.
19. Tag electrical lead (Figure 3, Item 7) from printed circuit board module (Figure 3, Item 1) to ground strap bolt (not shown).
20. Remove screw and washer (Figure 3, Item 8) securing electrical lead (Figure 3, Item 7) to printed circuit board module (Figure 3, Item 1).
21. Remove electrical lead (Figure 3, Item 7) from printed circuit board module (Figure 3, Item 1).
22. Inspect electrical lead (Figure 3, Item 7) for frayed wire and other signs of obvious damage and replace as required.

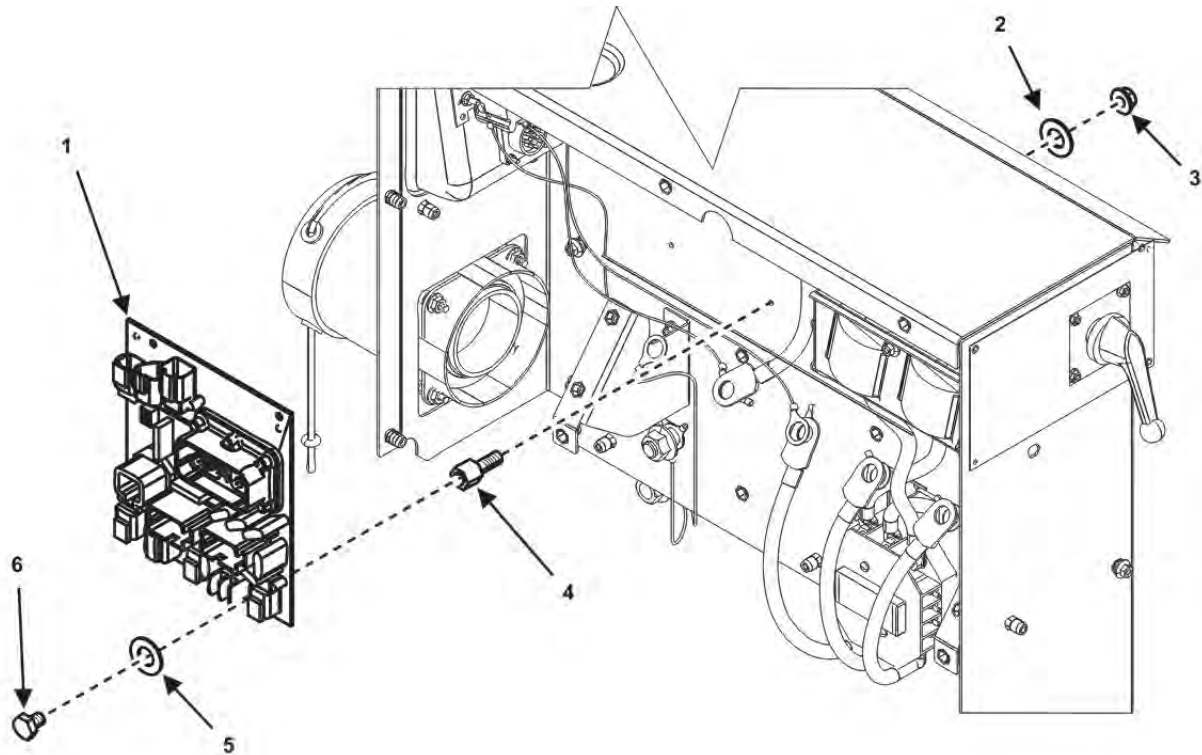


Figure 4. Printed Circuit Board — Removal.

23. Remove five nuts (Figure 4, Item 3) and five washers (Figure 4, Item 2) from back of output box that secure printed circuit board module (Figure 4, Item 1) to output box.
24. Remove printed circuit board module (Figure 4, Item 1) from output box and place on a suitable work surface.
25. Remove five screws (Figure 4, Item 6), five washers (Figure 4, Item 5), and five spacers (Figure 4, Item 4) from printed circuit board module (Figure 4, Item 1).
26. Note and record position of four dip switches (Figure 3, Item 14) on printed circuit board module (Figure 3, Item 1).
27. Tag and remove two plugs (Figure 3, Items 2 and 11) from printed circuit board module (Figure 3, Item 1).

END OF TASK

Inspect Printed Circuit Board Module

CAUTION

Printed circuit board module contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

1. Inspect printed circuit board module (Figure 3, Item 1) for signs of obvious damage. Replace as required.
2. Inspect two plugs (Figure 3, Items 2 and 11) from printed circuit board module for signs of obvious damage. Replace as required.

- Inspect all mounting hardware for signs of obvious damage. Replace as required.

END OF TASK

Install Printed Circuit Board Module

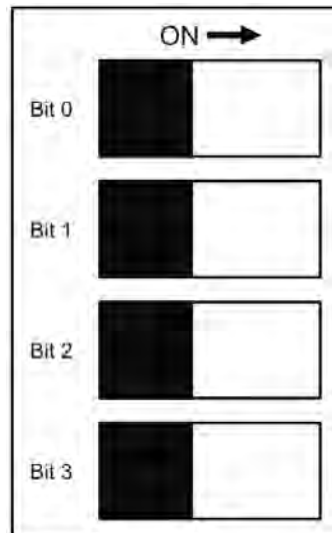


Figure 5. Dip Switch Settings.

CAUTION

Printed circuit board module contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Dip switch configurations should match Table 1. The dip switch is composed of four switches stacked vertically (Figure 5). The top switch is bit 0 and the bottom switch is bit 3 (Figure 5). In Table 1, 0 refers to the OFF position and 1 to the ON position. Figure 5 shows all switches in the OFF position.

Table 1. 5 kW Dip Switch Configuration.

GENSET HARDWARE CONFIGURATION	BIT 0	BIT 1	BIT 2	BIT 3
5 kW, 50/60 Hz	1	0	0	0
5 kW, 400 Hz	0	1	1	0

- Configure four dip switches (Figure 3, Item 14) located on printed circuit board module (Figure 3, Item 1) using Table 1 and Figure 5 or notes taken during removal as a guide.
- Install two plugs (Figure 3, Items 2 and 11) to printed circuit board module (Figure 3, Item 1) using identification tags installed during removal as a guide.
- Install five flat washers (Figure 4, Item 5) and five screws (Figure 4, Item 6) to printed circuit board module (Figure 4, Item 1).

4. Install five spacers (Figure 4, Item 4) to threads of five screws (Figure 4, Item 6) behind printed circuit board module (Figure 4, Item 1).
5. Position printed circuit board module (Figure 4, Item 1) to mounting location on output box.
6. Install five nuts (Figure 4, Item 3) and five washers (Figure 4, Item 2) to five screws (Figure 4, Item 6) on rear side of output box. Torque nuts (Figure 4, Item 3) to 25 – 31 in/lb (3 – 4 Nm).

NOTE

Identification tags should remain in place until the output box is completely re-assembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

7. Apply a thin coat of electrically conductive grease all printed circuit board module electrical leads and harnesses.
8. Install hour meter wiring harness (Figure 3, Item 3) to printed circuit board module (Figure 3, Item 1) using identifications tags installed during disassembly as a guide.
9. Install wiring harness (Figure 3, Item 4) from voltage selection switch to printed circuit board module (Figure 3, Item 1) using identifications tags installed during disassembly as a guide.
10. Install wiring harness (Figure 3, Item 13) from DCS to printed circuit board module (Figure 3, Item 1) using identifications tags installed during disassembly as a guide.
11. Secure wiring harness (Figure 3, Item 13) from DCS to printed circuit board module (Figure 3, Item 1) with screw (Figure 3, Item 12).
12. Install wiring harness (Figure 3, Item 10) from N terminal and contactor to printed circuit board module (Figure 3, Item 1) using identifications tags installed during disassembly as a guide.
13. Install wiring harness (Figure 3, Item 9) from terminals and contactor to printed circuit board module (Figure 3, Item 1) using identifications tags installed during disassembly as a guide.
14. Install wiring three harnesses (Figure 3, Item 5) from three transformers to printed circuit board module (Figure 3, Item 1) using identifications tags installed during disassembly as a guide.
15. Install wiring harness (Figure 3, Item 6) from switch box contactor receptacle to printed circuit board module (Figure 3, Item 1) using identifications tags installed during disassembly as a guide.
16. Position electrical lead (Figure 3, Item 7) from ground strap bolt to printed circuit board module (Figure 3, Item 1) using identifications tags installed during disassembly as a guide.
17. Secure electrical lead (Figure 3, Item 7) from ground strap bolt to printed circuit board module (Figure 3, Item 1) with screw and washer (Figure 3, Item 8).
18. Install output terminal board (WP 0053, Remove/Install Output Terminal Board).
19. Install right-side body panel (WP 0032, Remove/Install Right-Side Panel).
20. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
21. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
22. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
23. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL ENGINE WIRING HARNESS

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Insulation sleeving (WP 0153, Repair Parts List, Figure 55, Item 12)

Wiring harness (WP 0153, Figure 55, Item 1)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Strap, tie-down (WP 0163, Item 34)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0093, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed and right-side battery removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)

DCS removed (WP 0017, Remove/Install DCS)

Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)

REMOVE/INSTALL ENGINE WIRING HARNESS**NOTE**

Tag/mark all electrical connections prior to removal. Tags/markings applied at removal will aide at installation.

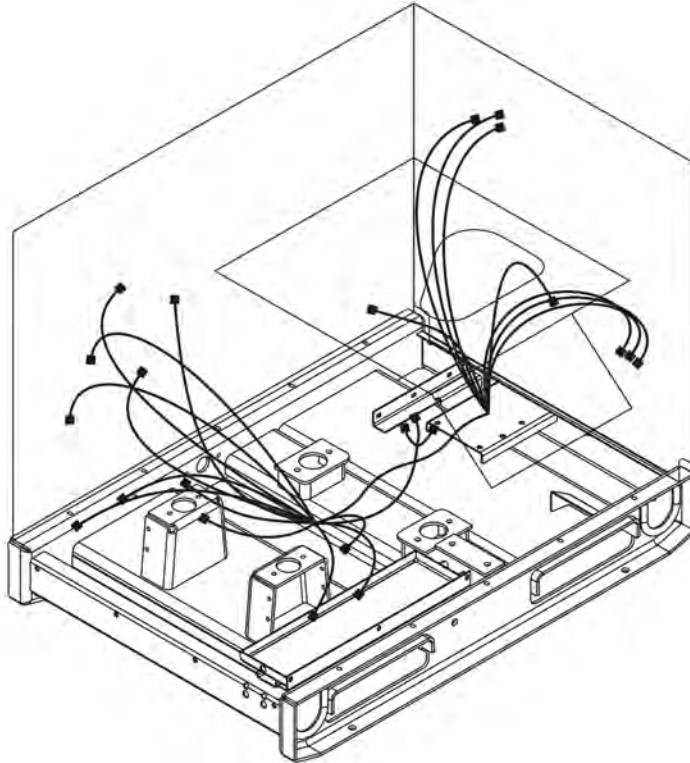
Remove Engine Wiring Harness

Figure 1. Engine Wiring Harness — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate engine wiring harness (Figure 1).
3. Tag all connections consistently to show (to and from) proper identification of devices prior to disconnecting.

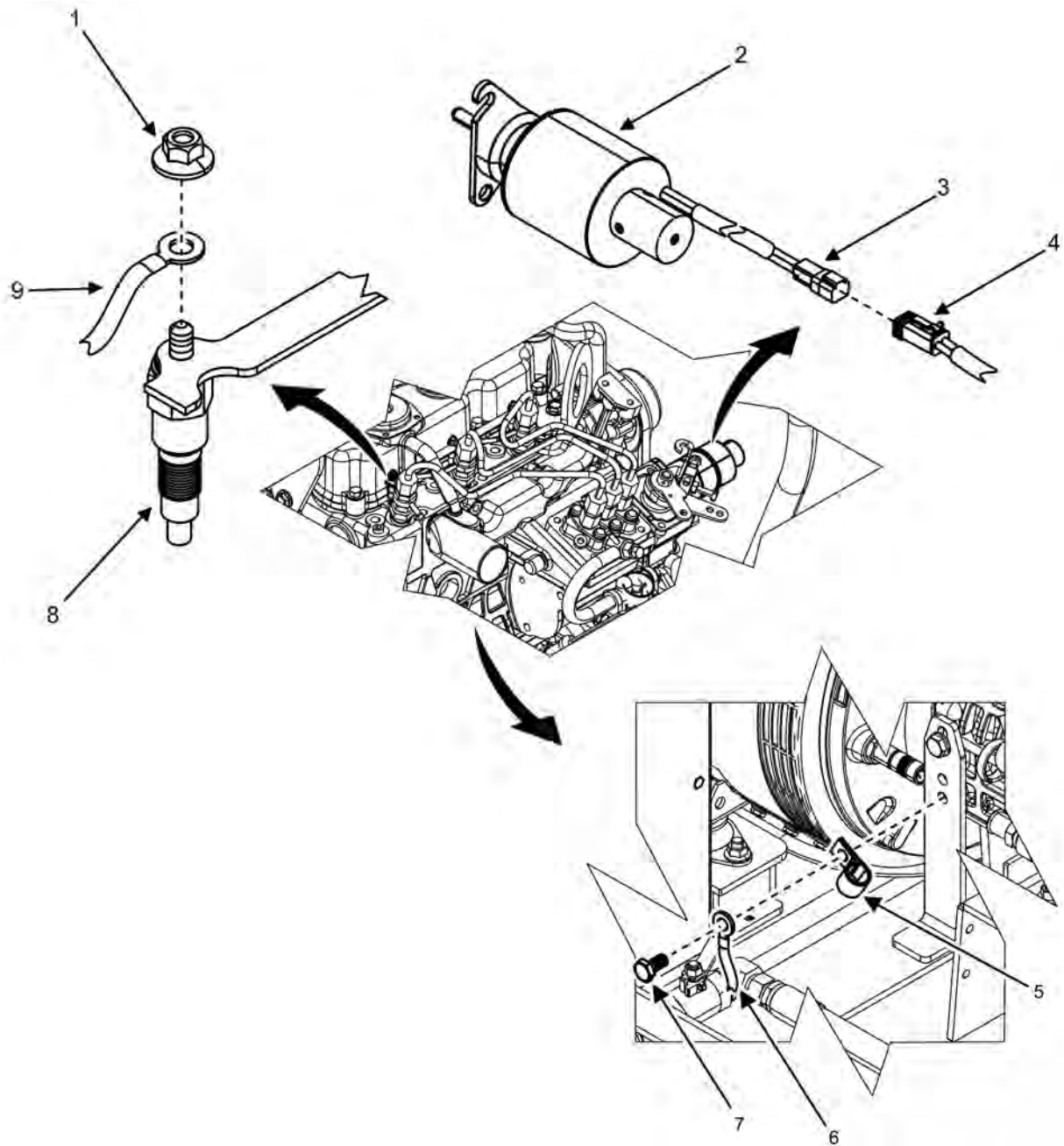


Figure 2. Right-Side Door — Upper View.

4. Remove nut (Figure 2, Item 1) that secures electrical lead (T5) (Figure 2, Item 9) to glow plug (Figure 2, Item 8) and remove lead (T5) (Figure 2, Item 9).
5. Disconnect electrical lead (P37) (Figure 2, Item 4) at pigtail (Figure 2, Item 3) of governor actuator (Figure 2, Item 2).
6. Remove bolt (Figure 2, Item 7), P37 drain wire (Figure 2, Item 6) and loop clamp (Figure 2, Item 5) from right side of engine block.
7. Remove bolt (Figure 2, Item 7) and loop clamp (Figure 2, Item 5) from beneath starter (not shown) on left side of engine. Allow loop clamp to remain on engine wiring harness.

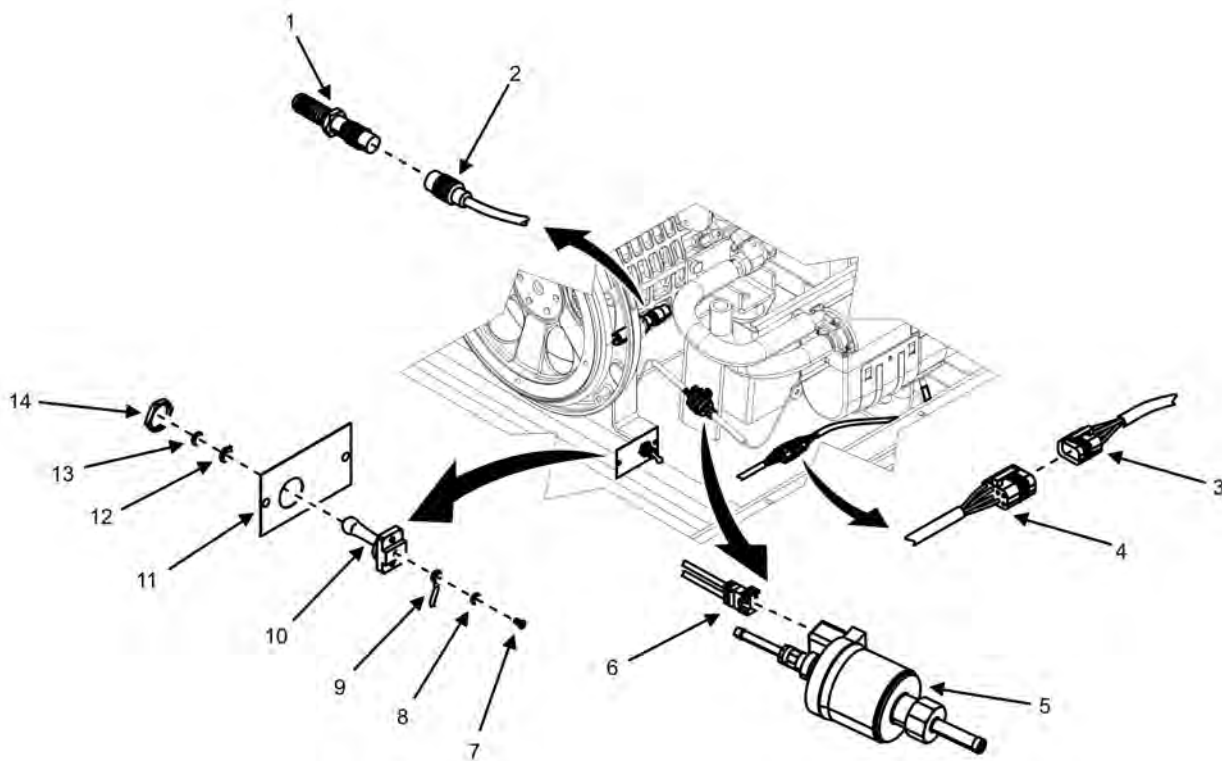


Figure 3. Right-Side Door — Lower View.

8. Remove nut (Figure 3, Item 14) and two washers (Figure 3, Items 13 and 12) that secure DEAD CRANK SWITCH (Figure 3, Item 10) to its mounting bracket (Figure 3, Item 11).
9. Remove DEAD CRANK SWITCH (Figure 3, Item 10) from mounting bracket (Figure 3, Item 11).
10. Remove three screws (Figure 3, Item 7) and three flat washers (Figure 3, Item 8) that secure three wires (S10-1, S10-2, and S10-3) (Figure 3, Item 9) at the rear of DEAD CRANK SWITCH (Figure 3, Item 10).
11. Remove three wires (S10-1, S10-2, and S10-3) (Figure 3, Item 9) from DEAD CRANK SWITCH (Figure 3, Item 10).
12. Disconnect electrical lead (P14) (Figure 3, Item 2) from engine speed sensor (Figure 3, Item 1).

NOTE

Steps 13 and 14 apply only to generator sets with winterization kit option installed.

13. Disconnect electrical lead (P20A) (Figure 3, Item 3) from winterization kit pigtail (Figure 3, Item 4).
14. Disconnect electrical lead (P21) (Figure 3, Item 6) from winterization kit fuel pump (Figure 3, Item 5) by depressing metallic clip on electrical lead (P21) (Figure 3, Item 6).
15. Locate two spare wiring harness electrical connectors (P75 and J20C) (not shown) on engine wiring harness near winterization kit fuel pump (Figure 3, Item 5).
16. Push all electrical leads removed in steps 4 through 14 (except winterization kit fuel pump lead) under AC generator (not shown) to the left side of the generator set.

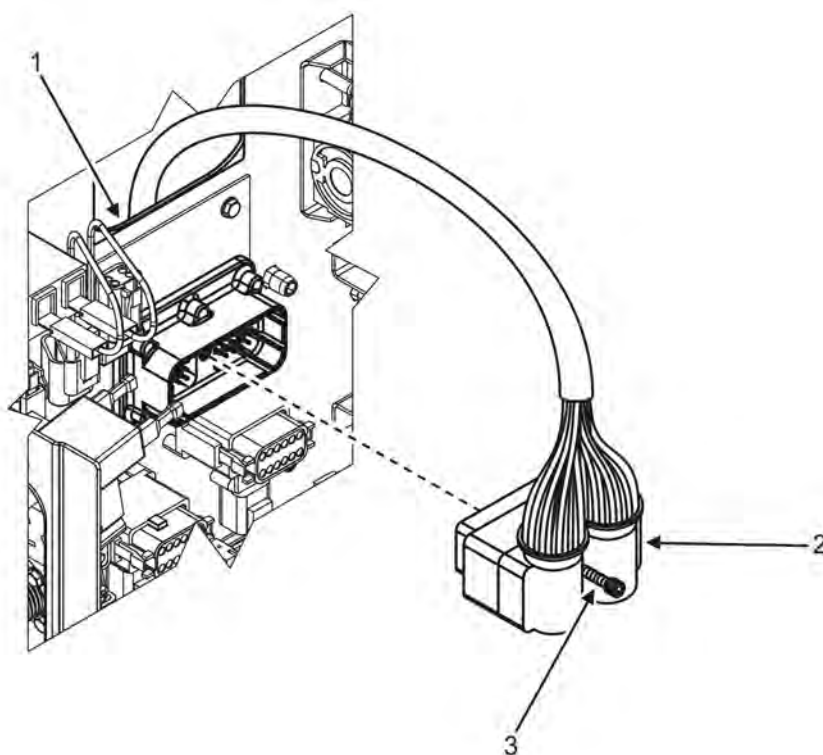


Figure 4. Right-Side Rear — Output Box View.

17. Loosen screw (Figure 4, Item 3) that secures connector (P500) (Figure 4, Item 2) inside output box. Push connector (P500) (Figure 4, Item 2) through large slot (Figure 4, Item 1) in output box into rear of generator set.

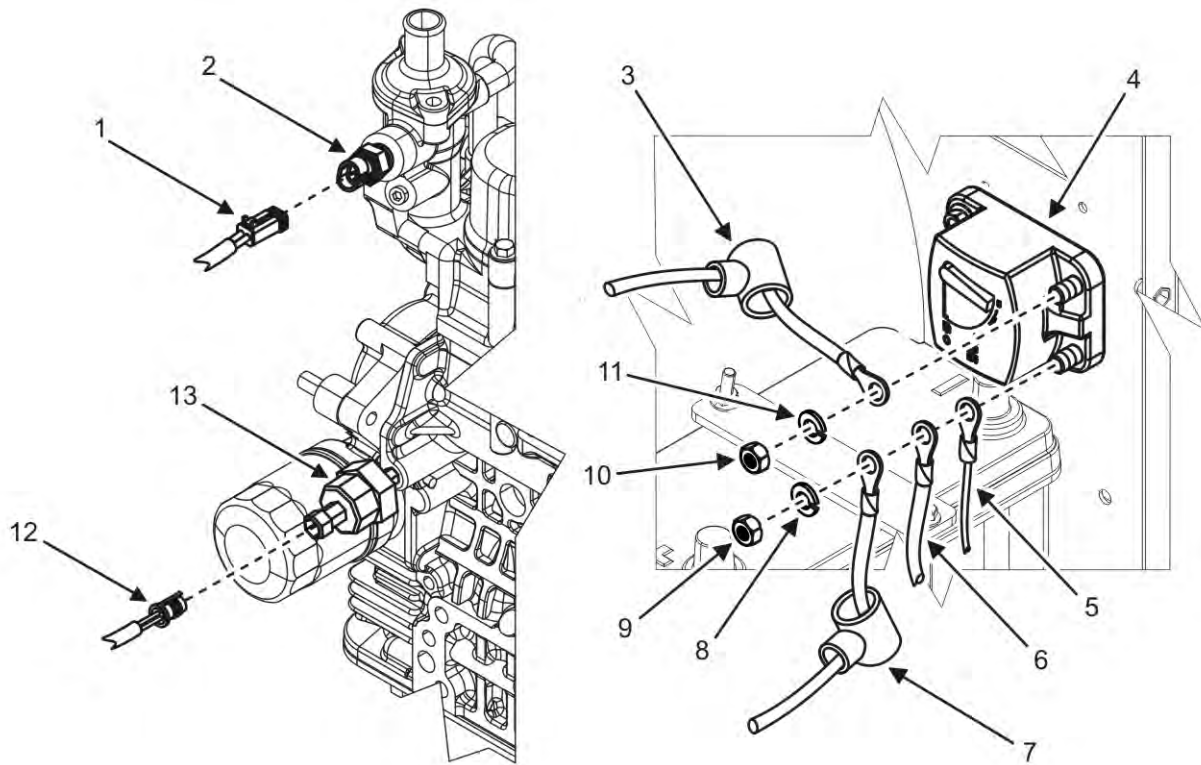


Figure 5. Left-Side — Upper View.

18. Disconnect electrical lead (P35) (Figure 5, Item 1) at coolant temperature sensor (Figure 5, Item 2).
19. Disconnect electrical lead (P40) (Figure 5, Item 12) at oil pressure sensor (Figure 5, Item 13).

NOTE

Steps 20 through 22 apply only to generator sets with winterization kit option installed.

20. Remove nut (Figure 5, Item 10), lock washer (Figure 5, Item 11), and wire (Figure 5, Item 3) from main DC circuit breaker (Figure 5, Item 4).
21. Remove nut (Figure 5, Item 9), lock washer (Figure 5, Item 8), and wires (Figure 5, Items 6 and 7) from main DC circuit breaker (Figure 5, Item 4).
22. Remove single white wire (CB201-LOAD) (Figure 5, Item 5) from main DC circuit breaker (Figure 5, Item 4).

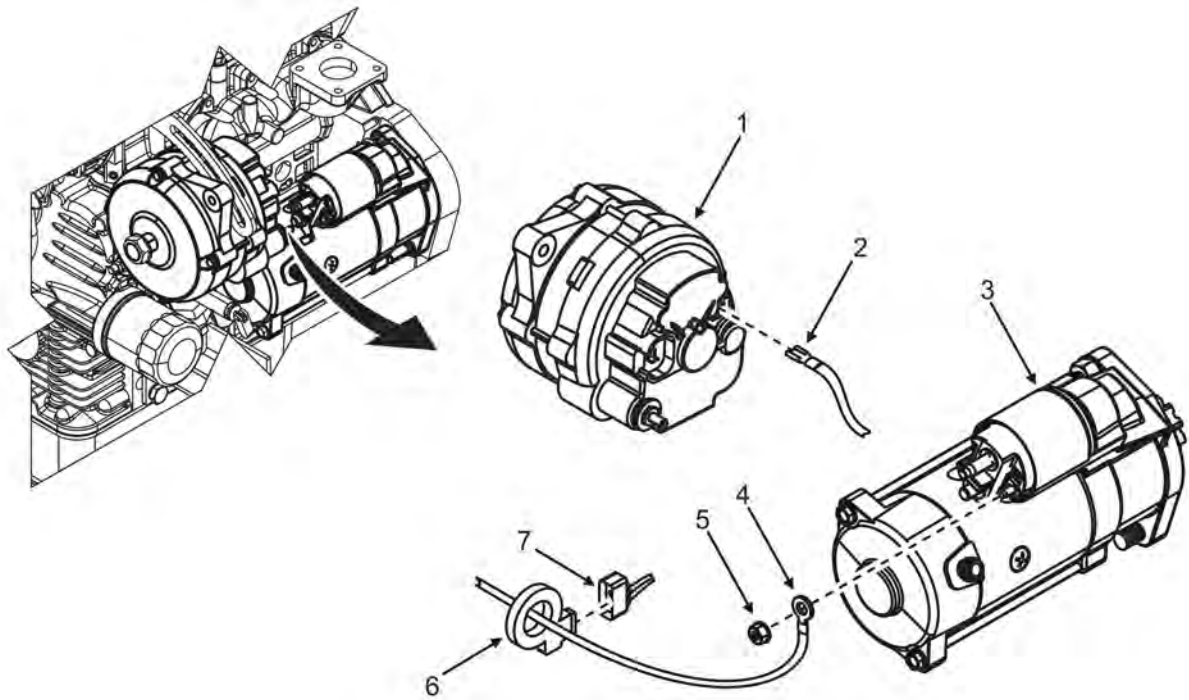


Figure 6. Left-Side — Lower View.

23. Disconnect spade connector (P1) (Figure 6, Item 2) at rear of battery-charging alternator (Figure 6, Item 1).
24. Disconnect electrical lead (P5) (Figure 6, Item 7) at battery current sensor (Figure 6, Item 6).
25. Remove nut (Figure 6, Item 5) that secures wire (T107) (Figure 6, Item 4) to starter (Figure 6, Item 3).
26. Remove wire (T107) (Figure 6, Item 4) from starter (Figure 6, Item 3).
27. Inspect battery current sensor (Figure 6, Item 6) for damage. Remove battery current sensor (Figure 6, Item 6) and wire tie from wire (T107) (Figure 6, Item 4) and replace as required.

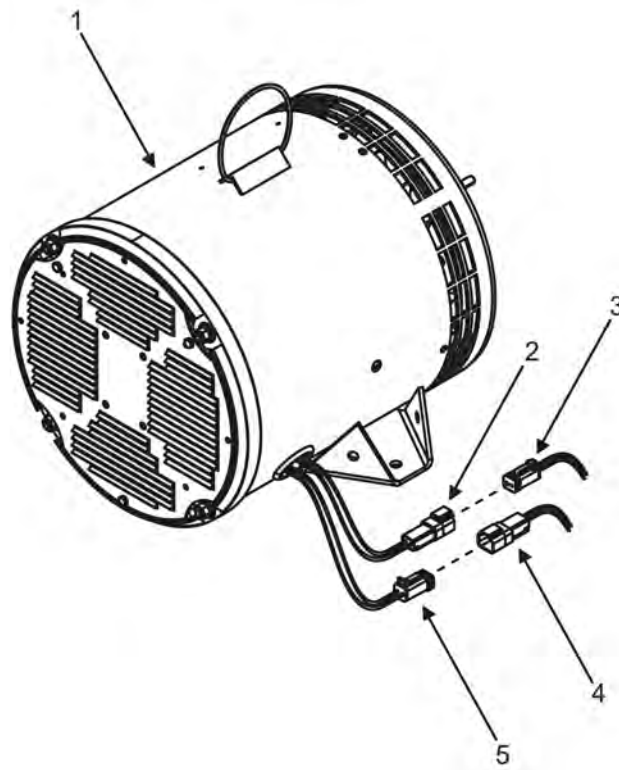


Figure 7. Right-Side Rear — AC Generator.

28. Remove connectors (P85 and P90) (Figure 7, Items 3 and 4) from pigtails (Figure 7, Items 2 and 5) on AC generator (Figure 7, Item 1).

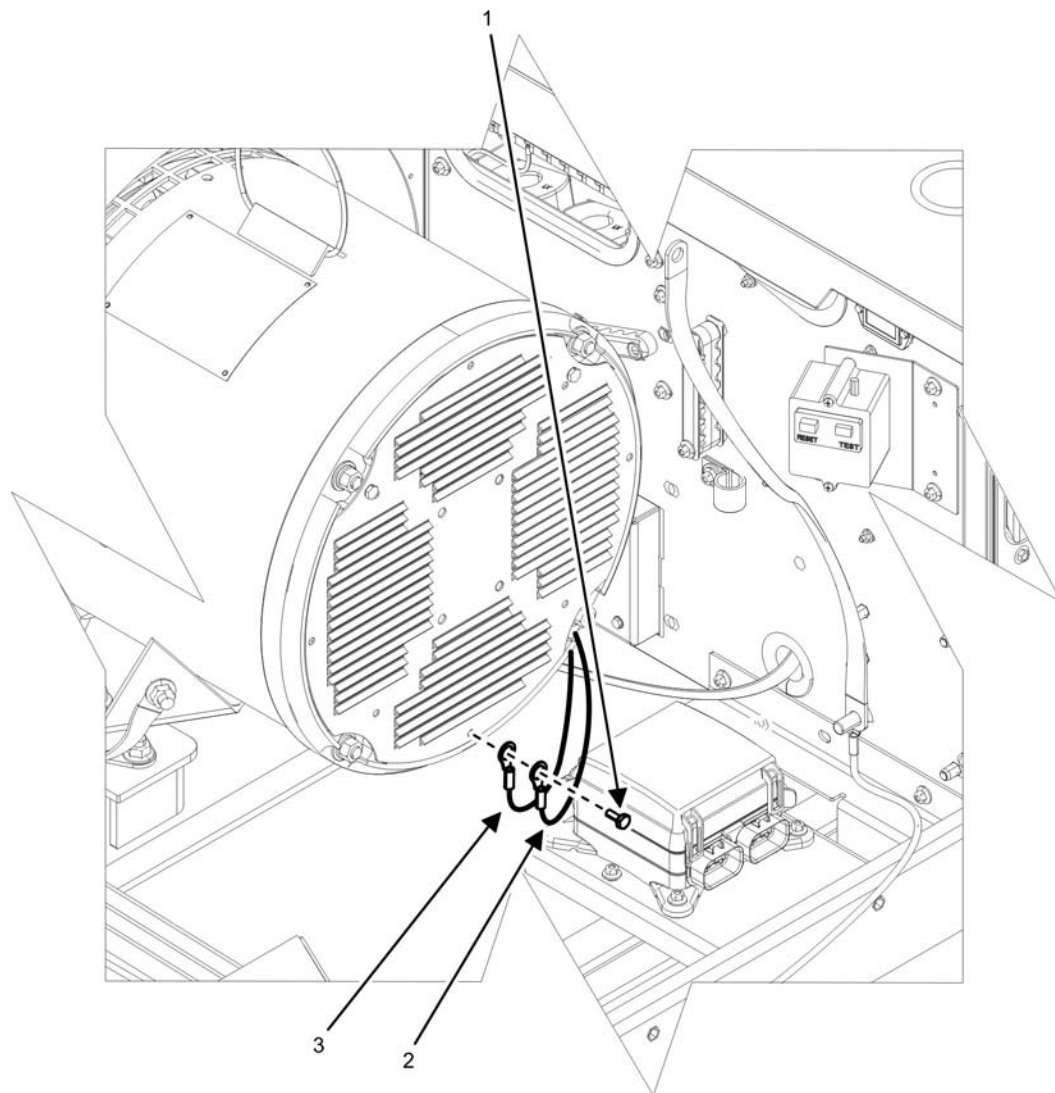


Figure 8. Drain Wires — Output Box and AC Generator.

29. Remove bolt (Figure 8, Item 1) and two drain wires (Figure 8, Items 2 and 3) from rear of AC generator.

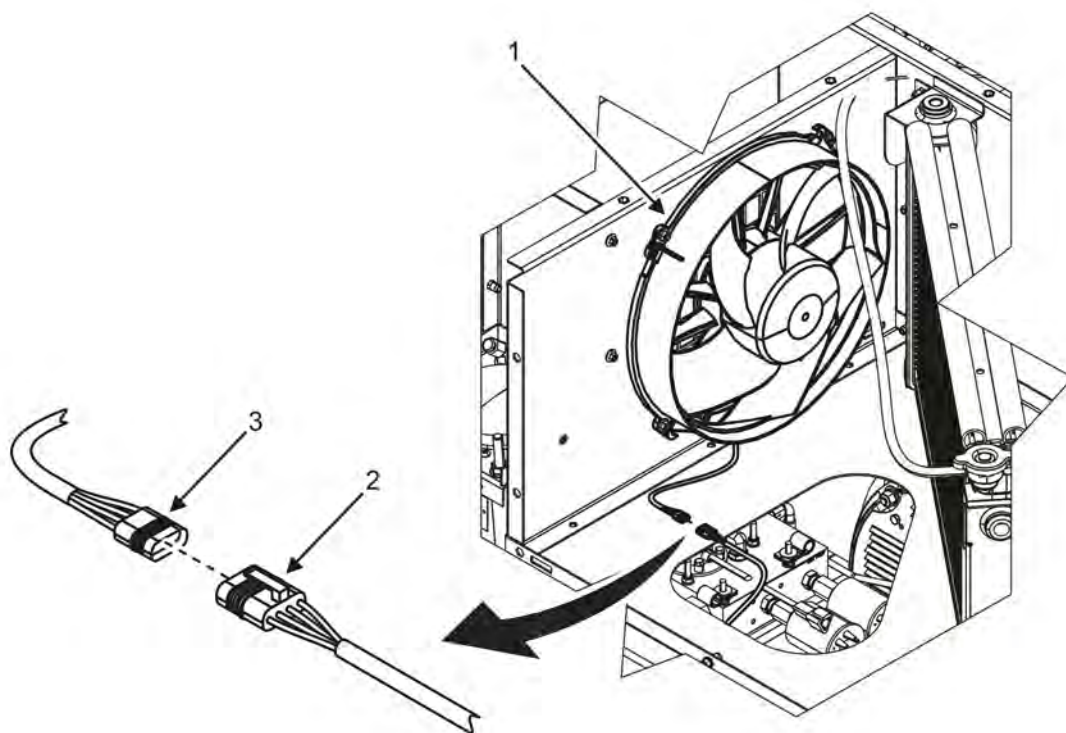


Figure 9. Cooling Fan Connection.

30. Remove wiring harness connector (P96) (Figure 9, Item 3) from pigtail (Figure 9, Item 2) on cooling fan (Figure 9, Item 1) and allow the connector (P96) (Figure 9, Item 3) to pass through the slot in radiator support panel into the lower rear of the generator set.

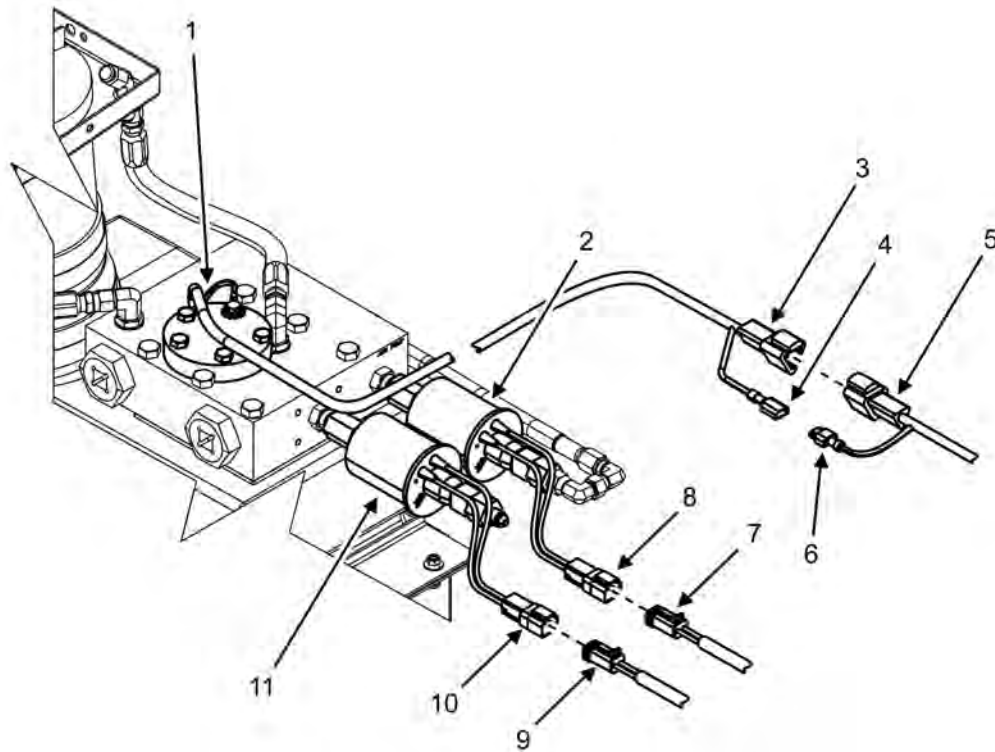


Figure 10. Rear Door — Fuel System.

31. Remove connector (P60) (Figure 10, Item 7) from pigtail (Figure 10, Item 8) on auxiliary fuel pump (Figure 10, Item 2).
32. Remove connector (P65) (Figure 10, Item 9) from pigtail (Figure 10, Item 10) on main fuel pump (Figure 10, Item 11).
33. Remove connector (P70) (Figure 10, Item 5) from pigtail (Figure 10, Item 3) on fuel level sender (Figure 10, Item 1). Remove terminal connector (Figure 10, Item 6) from terminal connector (Figure 10, Item 4) on pigtail (Figure 10, Item 3) of fuel level sender (Figure 10, Item 1).

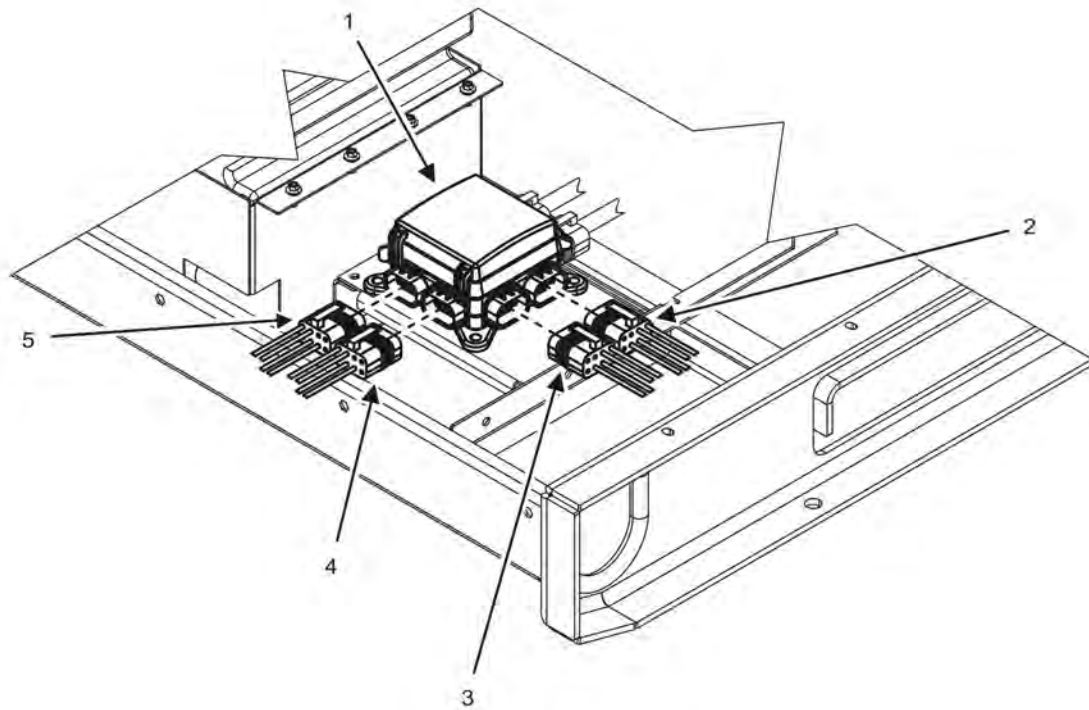


Figure 11. Rear Door — Relay Panel.

34. Remove connector (P5A) (Figure 11, Item 5) from relay panel (Figure 11, Item 1).
35. Remove connector (P5B) (Figure 11, Item 4) from relay panel (Figure 11, Item 1).
36. Remove connector (P5C) (Figure 11, Item 3) from relay panel (Figure 11, Item 1).
37. Remove connector (P5D) (Figure 11, Item 2) from relay panel (Figure 11, Item 1).

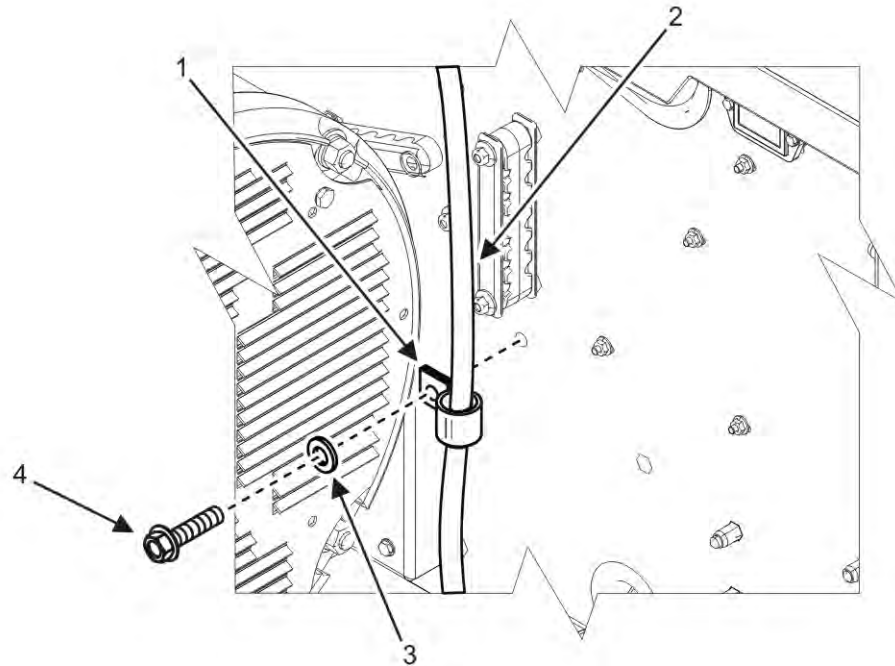


Figure 12. Loop Clamps.

NOTE

In addition to various electrical connectors, the engine wiring harness is attached to the engine in several places by loop clamps. The loop clamps must be removed from their mounting points before the engine wiring harness can be removed from the generator set.

All loop clamps are secured using a mounting screw mounted to a boss.

38. Locate remaining loop clamps (Figure 12, Item 1) securing engine wiring harness (Figure 12, Item 2) to the generator set.
39. Remove mounting screw (Figure 12, Item 4) and washer (as applicable) (Figure 12, Item 3) that secures each loop clamp (Figure 12, Item 1) to its mounting location on generator set. Leave loop clamps (Figure 12, Item 1) attached to engine wiring harness (Figure 12, Item 2).
40. Remove engine wiring harness (Figure 1) from unit skid through rear door being careful not to entangle electrical leads on unit components.
41. Remove loop clamps (Figure 12, Item 1) from engine wiring harness (Figure 1).

END OF TASK

Inspect Engine Wiring Harness

1. Inspect engine wiring harness (Figure 1) for damaged connectors and sheathing if harness is to be reused.
2. Repair damaged electrical connectors (WP 0093, General Maintenance).
3. Replace damaged sheathing as required.

END OF TASK**Install Engine Wiring Harness****CAUTION**

Use tags/markings applied to electrical components prior to removal as guides to installation. Leave tags/markings in place until all components have been installed and the equipment is operating properly. Failure to comply may cause damage to equipment.

1. Position engine wiring harness (Figure 1) to its approximate mounting location in unit skid, spreading branches of harness close to their points of installation.
2. Position loop clamps (Figure 12, Item 1) on engine wiring harness (Figure 1) at approximate mounting locations.
3. Secure loop clamp (Figure 12, Item 1) to each boss by installing mounting screw (Figure 12, Item 4), leaving loop clamp (Figure 12, Item 1) loose enough around engine wiring harness (Figure 12, Item 2) to allow engine wiring harness (Figure 12, Item 2) to slide through loop clamp (Figure 12, Item 1).
4. Install connector (P5D) (Figure 11, Item 2) to relay panel (Figure 11, Item 1).
5. Install connector (P5C) (Figure 11, Item 3) to relay panel (Figure 11, Item 1).
6. Install connector (P5B) (Figure 11, Item 4) to relay panel (Figure 11, Item 1).
7. Install connector (P5A) (Figure 11, Item 5) to relay panel (Figure 11, Item 1).
8. Install connector (P70) (Figure 10, Item 5) to pigtail (Figure 10, Item 3) of fuel level sender (Figure 10, Item 1). Install terminal connector (Figure 10, Item 6) to terminal connector (Figure 10, Item 4) on pigtail (Figure 10, Item 3) of fuel level sender (Figure 10, Item 1).
9. Install connector (P65) (Figure 10, Item 9) to pigtail (Figure 10, Item 10) of main fuel pump (Figure 10, Item 11).
10. Install connector (P60) (Figure 10, Item 7) to pigtail (Figure 10, Item 8) of auxiliary fuel pump (Figure 10, Item 2).
11. Pass wiring harness connector (P96) (Figure 9, Item 3) up through slot in radiator support panel into upper rear of generator set.
12. Install wiring harness connector (P96) (Figure 9, Item 3) to pigtail (Figure 9, Item 2) of cooling fan (Figure 9, Item 1).
13. Install two drain wires (Figure 8, Items 2 and 3) and bolt (Figure 8, Item 1) to rear of AC generator.
14. Push twin electrical connector (P500) (Figure 4, Item 2) through slot (Figure 4, Item 1) into output box.
15. Install two connectors (P85 and P90) (Figure 7, Items 3 and 4) to two pigtails (Figure 7, Items 2 and 5) of AC generator (Figure 7, Item 1).
16. Slide remaining portion of engine wiring harness (Figure 1) under AC generator (Figure 7, Item 1) and into left side of generator set skid.
17. Install battery current sensor (Figure 6, Item 6) to wire (T107) (Figure 6, Item 4) and secure with wire tie as required.

18. Install wire (T107) (Figure 6, Item 4) to right-side solenoid stud of starter (Figure 6, Item 3) and secure by installing nut (Figure 6, Item 5).
19. Connect electrical lead (P5) (Figure 6, Item 7) to battery current sensor (Figure 6, Item 6).
20. Install spade connector (P1) (Figure 6, Item 2) to rear of battery-charging alternator (Figure 6, Item 1).

NOTE

Steps 21 through 23 apply only to generator sets with winterization kit option installed.

21. Install single white wire (CB201-LOAD) (Figure 5, Item 5) to main DC circuit breaker (Figure 5, Item 4).
22. Install wires (Figure 5, Items 6 and 7) to main DC circuit breaker (Figure 5, Item 4) with lock washer (Figure 5, Item 8) and nut (Figure 5, Item 9).
23. Install remaining wire (Figure 5, Item 3), lock washer (Figure 5, Item 11), and nut (Figure 5, Item 10) to main DC circuit breaker (Figure 5, Item 4).
24. Connect electrical lead (P40) (Figure 5, Item 12) to oil pressure sensor (Figure 5, Item 13).
25. Connect electrical lead (P35) (Figure 5, Item 1) to coolant temperature sensor (Figure 5, Item 2).
26. Connect twin electrical connector (P500) (Figure 4, Item 2) to its mating connector in output box and secure by installing screw (Figure 4, Item 3).
27. Position winterization kit fuel pump lead (P21) (Figure 3, Item 6) under flywheel to its mounting location at winterization kit fuel pump (Figure 3, Item 5).

NOTE

Step 28 applies only to generator sets with winterization kit option installed.

28. Connect winterization kit fuel pump lead (P21) (Figure 3, Item 6) to winterization kit fuel pump (Figure 3, Item 5).
29. Allow two spare electrical connectors (P75 and J20C) (not shown) to hang free near winterization kit fuel pump (Figure 3, Item 5).

NOTE

Step 30 applies only to generator sets with winterization kit option installed.

30. Connect winterization kit electrical lead (P20A) (Figure 3, Item 3) to winterization kit pigtail (Figure 3, Item 4).
31. Connect engine speed sensor electrical lead (P14) (Figure 3, Item 2) to engine speed sensor (Figure 3, Item 1).
32. Position three wires (S10-1, S10-2, and S10-3) (Figure 3, Item 9) to their mounting locations on rear of DEAD CRANK SWITCH (Figure 3, Item 10) and secure by installing three flat washers (Figure 3, Item 8) and three screws (Figure 3, Item 7).
33. Position DEAD CRANK SWITCH (Figure 3, Item 10) to its mounting location on bracket (Figure 3, Item 11) and secure by installing nut (Figure 3, Item 14) and two washers (Figure 3, Items 12 and 13).
34. Install bolt (Figure 2, Item 7), P37 drain wire (Figure 2, Item 6), and loop clamp (Figure 2, Item 5) to engine block. Torque bolt (Figure 2, Item 7) to 35 to 42 ft/lbs (48 to 57 Nm).
35. Connect governor actuator electrical lead (P37) (Figure 2, Item 4) to pigtail (Figure 2, Item 3) of governor actuator (Figure 2, Item 2).
36. Position glow plug electrical wire (T5) (Figure 2, Item 9) to its mounting position on glow plug (Figure 2, Item 8) and secure by installing nut (Figure 2, Item 1).

-
37. Install all remaining mounting screws (Figure 12, Item 4) and washers (Figure 12, Item 3) on all remaining loop clamps (Figure 12, Item 1) to mounting location to secure engine wiring harness (Figure 12, Item 2).
 38. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
 39. Install DCS (WP 0017, Remove/Install DCS).
 40. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
 41. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
 42. Install top body panel (WP 0028, Remove/Install Top Body Panel).
 43. Install right-side battery and negative ground cable to right-side battery (WP 0036, Remove/Install Batteries).
 44. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
 45. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
 46. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL POWER WIRING HARNESS

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Insulation sleeving (WP 0154, Repair Parts List, Figure 56, Item 7)

Wiring harness, power (WP 0154, Figure 56, Item 1)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0093, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL POWER WIRING HARNESS**Remove Power Wiring Harness**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door to expose exhaust side of engine.

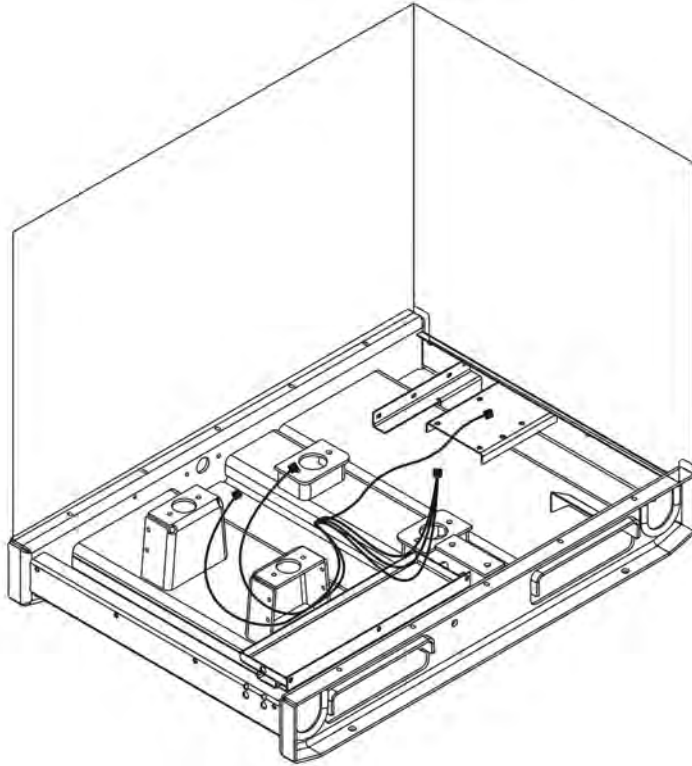


Figure 1. Power Wiring Harness — Location.

3. Locate power wiring harness (Figure 1).

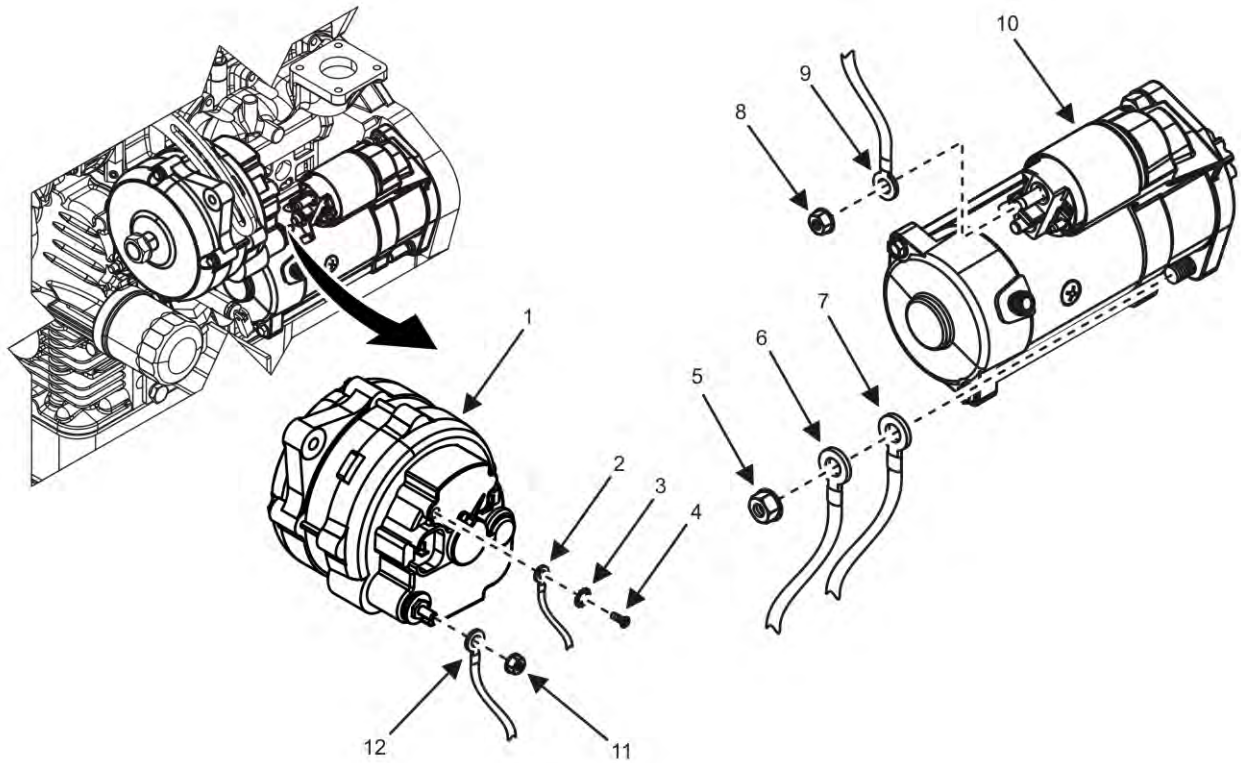


Figure 2. Left-Side Door View.

NOTE

Tag/mark all electrical wires prior to removal. Tags will serve as a guide during installation.

4. Reposition boot on wire (G2-GND) (Figure 2, Item 12) at stud of battery-charging alternator (Figure 2, Item 1) to expose nut (Figure 2, Item 11).
5. Remove nut (Figure 2, Item 11) at stud of battery-charging alternator (Figure 2, Item 1) and remove wire (G2-GND) (Figure 2, Item 12).
6. Remove screw (Figure 2, Item 4) and external tooth washer (Figure 2, Item 3) from rear of battery-charging alternator (Figure 2, Item 1) and remove wire (G2-B) (Figure 2, Item 2). Discard external tooth washer (Figure 2, Item 3).
7. Reposition boot on wire (L4-1) (Figure 2, Item 9) at upper solenoid stud of starter (Figure 2, Item 10) to expose nut (Figure 2, Item 8).
8. Remove nut (Figure 2, Item 8) at upper solenoid stud of starter (Figure 2, Item 10) and remove wire (L4-1) (Figure 2, Item 9).
9. Reposition boot on wire (B1-(-)) (Figure 2, Item 6) at lower mounting stud of starter (Figure 2, Item 10) to expose nut (Figure 2, Item 5).
10. Remove nut (Figure 2, Item 5) at lower mounting stud of starter (Figure 2, Item 10) and remove two wires (B1-(-)) (Figure 2, Items 6 and 7).

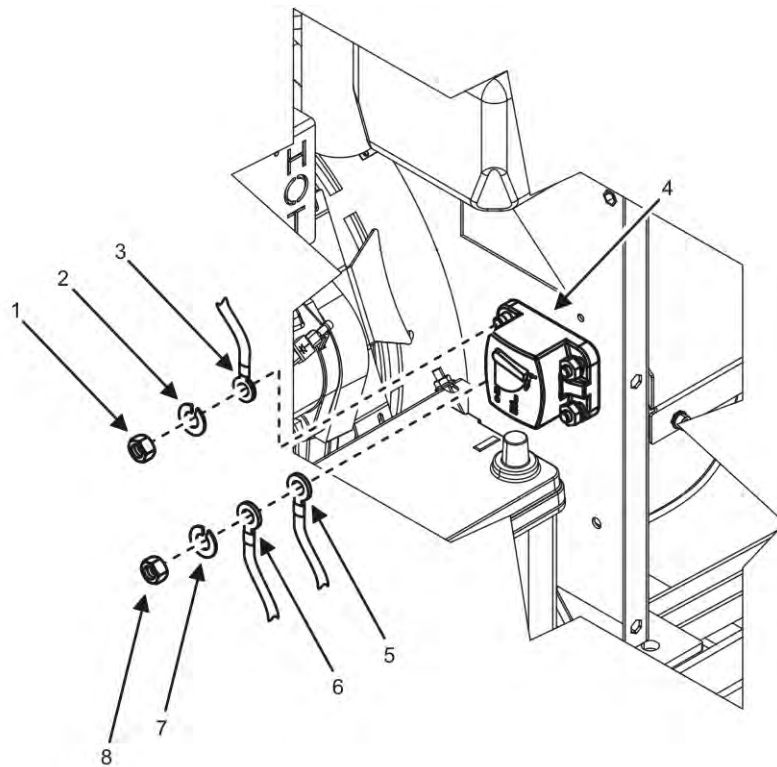


Figure 3. Main DC Circuit Breaker.

11. Reposition boot on wire (CB 201-Line) (Figure 3, Item 3) at upper terminal (line) of main DC circuit breaker (Figure 3, Item 4) to expose nut (Figure 3, Item 1).
12. Remove nut (Figure 3, Item 1) and lock washer (Figure 3, Item 2) at upper terminal (line) of main DC circuit breaker (Figure 3, Item 4) and remove wire (CB 201-Line) (Figure 3, Item 3). Discard lock washer (Figure 3, Item 2).
13. Reposition boot on wire (CB 201-Load) (Figure 3, Item 6) at lower terminal (load) of main DC circuit breaker (Figure 3, Item 4) to expose nut (Figure 3, Item 8).
14. Remove nut (Figure 3, Item 8) and lock washer (Figure 3, Item 7) at lower terminal (load) of main DC circuit breaker (Figure 3, Item 4) and remove two wires (CB 201-Load) (Figure 3, Items 5 and 6). Discard lock washer (Figure 3, Item 7).
15. Open rear door.

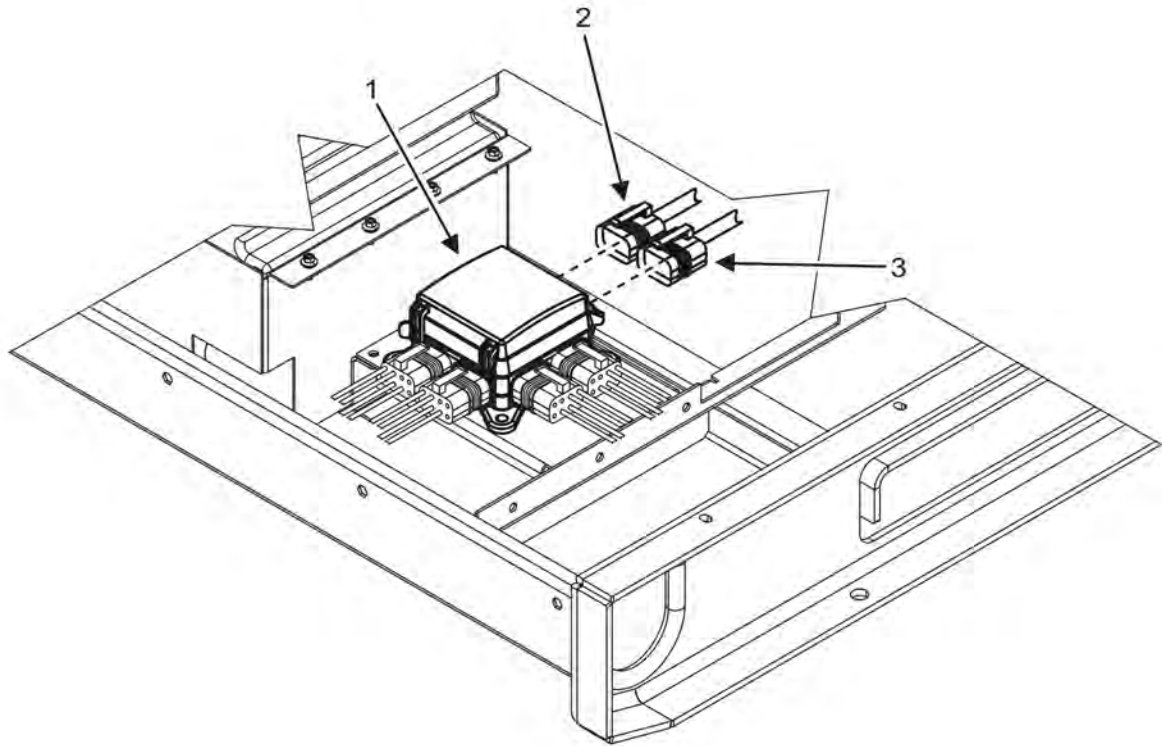


Figure 4. Relay Panel Connectors.

16. Remove connector (P10) (Figure 4, Item 2) from relay panel (Figure 4, Item 1).
17. Remove connector (P11) (Figure 4, Item 3) from relay panel (Figure 4, Item 1).
18. Remove power wiring harness (Figure 1) from unit skid, being careful not to entangle harness leads on unit components.

END OF TASK

Inspect Power Wiring Harness

1. Inspect power wiring harness (Figure 1) for damaged connectors and sheathing if harness is to be reused.
2. Repair damaged electrical connectors (WP 0093, General Maintenance).
3. Replace damaged sheathing as required.

END OF TASK

Install Power Wiring Harness

1. Position power wiring harness (Figure 1) to its approximate mounting location in unit skid, spreading branches of harness close to their points of installation.
2. Move to rear door of generator set.

NOTE

Tags/markings applied to electrical wires during removal should remain in place until all components are installed and equipment is operating properly.

3. Install connector (P11) (Figure 4, Item 3) to relay panel (Figure 4, Item 1).
4. Install connector (P10) (Figure 4, Item 2) to relay panel (Figure 4, Item 1).
5. Close rear door.
6. Move to left side of generator set.
7. Position wire (CB 201-Line) (Figure 3, Item 3) to upper terminal of main DC circuit breaker (Figure 3, Item 4) and secure by installing new lock washer (Figure 3, Item 2) and nut (Figure 3, Item 1).
8. Reposition boot on wire (CB 201-Line) (Figure 3, Item 3) to cover nut (Figure 3, Item 1).
9. Position two wires (CB 201-Load) (Figure 3, Items 5 and 6) to lower terminal of main DC circuit breaker (Figure 3, Item 4) and secure by installing new lock washer (Figure 3, Item 7) and nut (Figure 3, Item 8).
10. Reposition boot on wire (CB 201-Load) (Figure 3, Item 6) to cover nut (Figure 3, Item 8).
11. Install two wires (B1-(-)) (Figure 2, Items 6 and 7) to lower mounting stud of starter (Figure 2, Item 10) and secure by installing nut (Figure 2, Item 5).
12. Reposition boot on wire (B1-(-)) (Figure 2, Item 6) to cover nut (Figure 2, Item 5) on lower mounting stud of starter (Figure 2, Item 10).
13. Install wire (L4-1) (Figure 2, Item 9) to upper solenoid stud of starter (Figure 2, Item 10) and secure by installing nut (Figure 3, Item 8).
14. Reposition boot on wire (L4-1) (Figure 2, Item 9) to cover nut (Figure 2, Item 8) on upper solenoid stud of starter (Figure 2, Item 10).
15. Install wire (G2-B) (Figure 2, Item 2) to rear of battery-charging alternator (Figure 2, Item 1) and secure by installing new external tooth washer (Figure 2, Item 3) and screw (Figure 2, Item 4).
16. Install wire (G2-GND) (Figure 2, Item 12) to stud of battery-charging alternator (Figure 2, Item 1) and secure by installing nut (Figure 2, Item 11).
17. Reposition boot on wire (G2-GND) (Figure 2, Item 12) to cover nut (Figure 2, Item 11) on stud of battery-charging alternator (Figure 2, Item 1).
18. Install battery (WP 0036, Remove/Install Batteries).
19. Close left-side door.
20. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
21. Start engine and check for proper operation (TM 9-6115-749-10).
22. Repair as required.
23. Remove all temporary identification tags applied to electrical components.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL RELAY PANEL

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Circuit breaker (5) (WP 0101, Repair Parts List, Figure 3, Item 3)

Circuit breaker (WP 0101, Figure 3, Item 4)

Circuit breaker (2) (WP 0101, Figure 3, Item 5)

Panel, relay (WP 0101, Figure 3, Item 1)

Relay (8) (WP 0101, Figure 3, Item 2)

Cleaning compound, solvent (WP 0163, Expendable and Durable Items List, Item 10)

Grease, electrically conductive (WP 0163, Item 20)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

References

WP 0093, General Maintenance
Foldout Pages

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

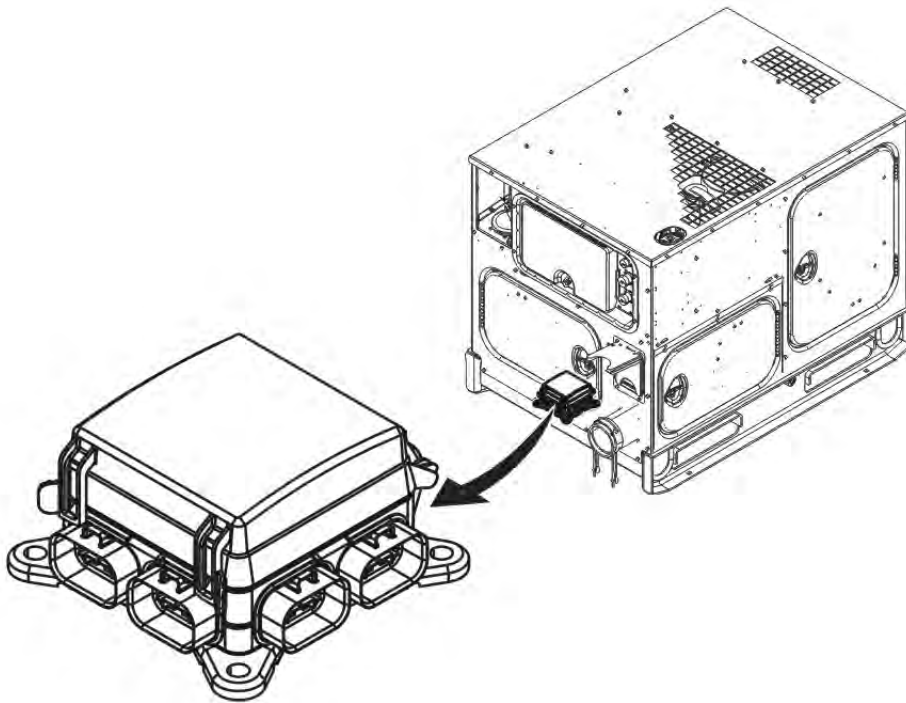
REMOVE/INSTALL RELAY PANEL**Remove Relay Panel**

Figure 1. Relay Panel — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open rear door and locate relay panel (Figure 1).

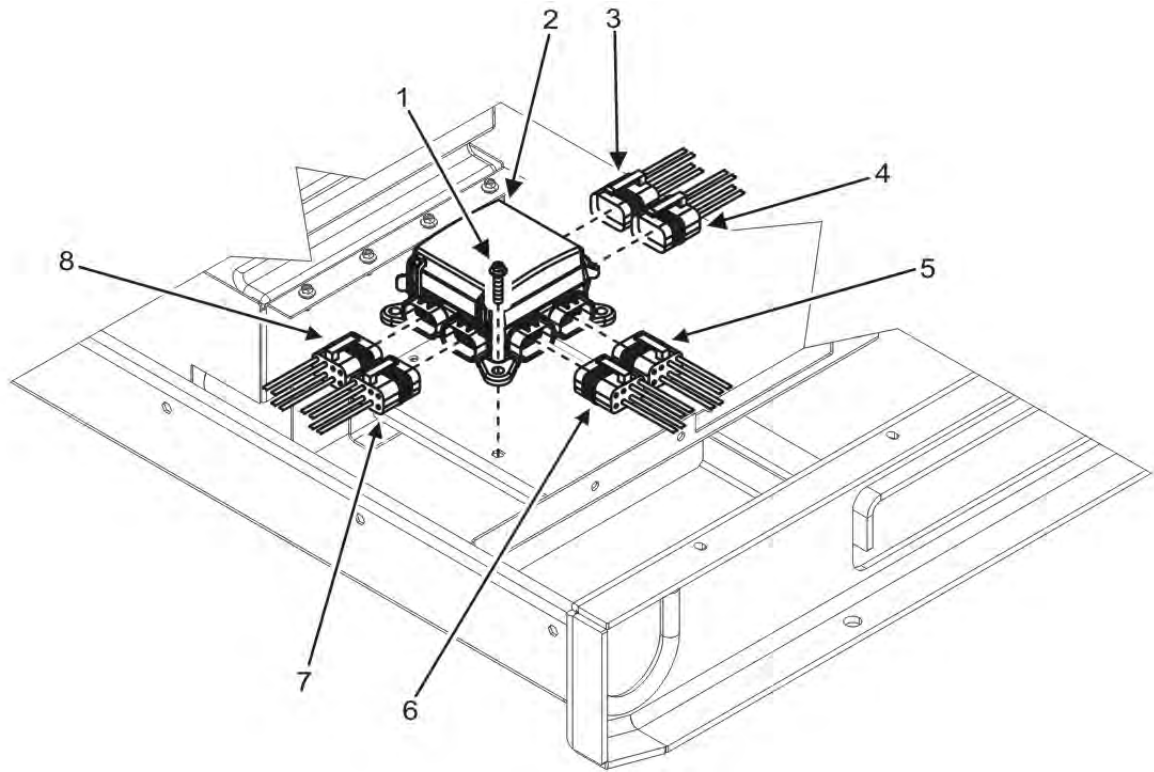


Figure 2. Relay Panel — Removal.

NOTE

The six electrical connectors attached to relay panel are all uniquely keyed and can only be installed in the proper locations. Tag/mark all electrical connectors for guide at installation.

3. Remove six electrical connectors (Figure 2, Items 3 through 8) from relay panel (Figure 2, Item 2).
4. Remove four flare head screws (Figure 2, Item 1) that secure relay panel (Figure 2, Item 2) to generator set skid.
5. Remove relay panel (Figure 2, Item 2) from generator set.

END OF TASK

Inspect Relay Panel

1. Inspect all relay panel electrical connectors (Figure 2, Items 3 through 8) for signs of obvious damage.
2. Repair damaged electrical connectors (WP 0093, General Maintenance).
3. Inspect relay panel (Figure 2, Item 2) for signs of obvious damage.
4. Replace damaged relay panel (Figure 2, Item 2).

END OF TASK

Install Relay Panel**WARNING**

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

1. Clean dirt and debris from relay panel mounting location in generator set skid using dry cleaning fluid and wiping rags.
2. Position relay panel (Figure 2, Item 2) to its mounting position on generator set skid and secure by installing four flare head screws (Figure 2, Item 1).
3. Torque four flare head screws (Figure 2, Item 1) to 44 – 53 in/lb (5.0 – 6.0 Nm).

NOTE

Leave all identification tags/markings in place until task is completed and generator set is fully operational.

4. Install six wiring harness connectors (Figure 2, Items 3 through 8) to relay panel using tags/markings applied at removal as a guide.
5. Close rear door.
6. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
7. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
8. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
9. Repair as required.

END OF TASK

Service Relay Panel

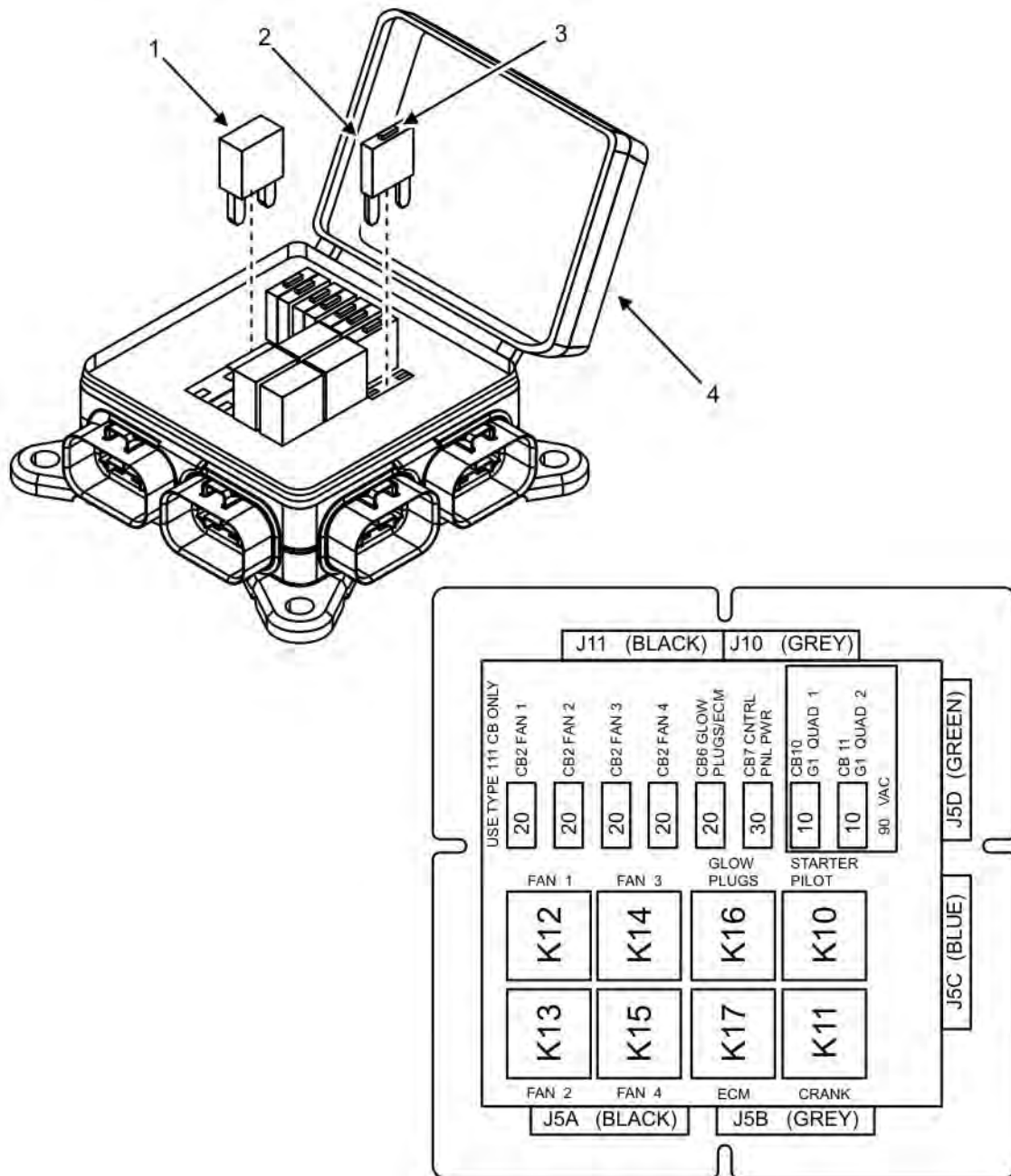


Figure 3. Relay Panel — Internal Layout.

CAUTION

When removing a circuit breaker (Figure 3, Item 2) or relay (Figure 3, Item 1) from the relay panel (Figure 2, Item 2), be careful not to tilt the circuit breaker or relay far enough to damage the contact pins. Failure to comply may cause damage to equipment.

NOTE

Service of the relay panel is accomplished by resetting or replacing a circuit breaker (Figure 3, Item 2) or by replacing a relay (Figure 3, Item 1).

The relay panel (Figure 2, Item 2) has the capacity to house eight circuit breakers (Figure 3, Item 2) and eight relays (Figure 3, Item 1). The number of circuit breakers (Figure 3, Item 2) or relays (Figure 3, Item 1) present in the relay panel (Figure 2, Item 2) is determined by the configuration of individual generator sets. A legend on the inside of the relay panel cover (Figure 3) identifies each individual relay and circuit breaker. Foldout Pages provided in the Rear Matter of this manual also identify the circuits protected by each circuit breaker (Figure 3, Item 2) or relay (Figure 3, Item 1).

An overload or short circuit in an electrical circuit may cause a circuit breaker (Figure 3, Item 2) to trip or fail completely. Circuit breakers (Figure 3, Item 2) may be reset or replaced as required. An overloaded electrical circuit may also cause failure of the relay (Figure 3, Item 1) in that circuit. Failed relays (Figure 3, Item 1) must be replaced.

Basic electrical troubleshooting procedures will enable the technician to trace an electrical circuit to a failed circuit breaker (Figure 3, Item 2) or relay (Figure 3, Item 1).

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open rear door and locate relay panel (Figure 3, Item 4).
3. Open relay panel (Figure 3, Item 4) cover.
4. Reset tripped circuit breaker (Figure 3, Item 2):
 - a. Open relay panel (Figure 3, Item 4) cover.

NOTE

A circuit breaker that has been tripped due to a short in the corresponding electrical circuit will be identified by an extended colored plastic indicator (Figure 3, Item 3) on the circuit breaker.

Technicians may only reset a circuit breaker (Figure 3, Item 2) once after it has tripped. If the circuit breaker trips a second time, it must be replaced.

- b. Check circuit breakers (Figure 3, Item 2) for a tripped-condition.
 - c. Press the extended colored plastic indicator (Figure 3, Item 3) to return it to the set position.
 - (1). Continue with generator set operation if circuit breaker (Figure 3, Item 2) remains in the set position.
 - (2). Troubleshoot electrical circuit to determine cause if circuit breaker (Figure 3, Item 2) will not remain in set position. See Foldout Pages.
 - d. Close relay panel (Figure 3, Item 4) cover.
 5. Replace a failed circuit breaker (Figure 3, Item 2):
 - a. Open relay panel (Figure 3, Item 4) cover.

CAUTION

Removing the circuit breaker by tilting it at more than a slight angle may damage circuit breaker contact pins and/or relay panel socket. Failure to comply may cause damage to equipment.

- b. Pull failed circuit breaker (Figure 3, Item 2) from relay panel (Figure 3, Item 4) by tilting the circuit breaker slightly.

CAUTION

Always replace a failed circuit breaker (Figure 3, Item 2) with one of the same value. Replacing a circuit breaker (Figure 3, Item 2) with one of a greater value may result in damage to equipment. Failure to comply may cause damage to equipment.

- c. Insert new circuit breaker (Figure 3, Item 2) into relay panel (Figure 3, Item 4) in the same slot that housed the failed circuit breaker (Figure 3, Item 2).
6. Replace a failed relay (Figure 3, Item 1):
 - a. Pull failed relay (Figure 3, Item 1) from relay panel (Figure 3, Item 4) by tilting the circuit breaker slightly.
 - b. Insert new relay (Figure 3, Item 1) into relay panel (Figure 3, Item 4) in the same slot that housed the failed relay (Figure 3, Item 1).

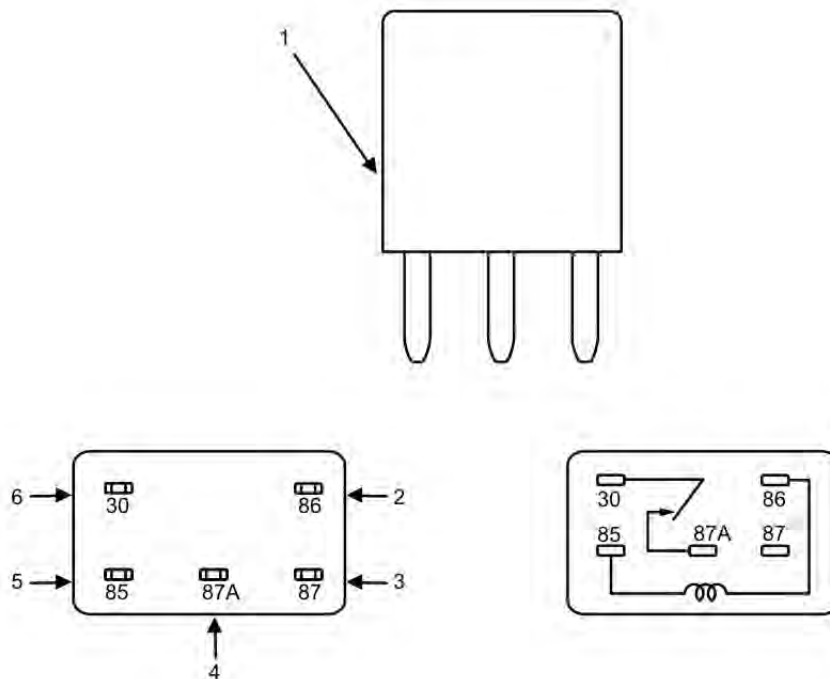


Figure 4. Test Relay.

7. Test a relay (Figure 4, Item 1):
 - a. Hold relay (Figure 4, Item 1) close to ear and shake it vigorously. Replace relay (Figure 4, Item 1) if the internals noticeably rattle.
 - b. Test relay (Figure 4, Item 1) for Ohms and continuity:
 - (1). Set multimeter to read either Ohms or continuity.
 - (2). Place multimeter probes on relay pins as shown in Table 1.

- (3). Compare multimeter reading with values in Table 1.
- (4). Retain relay (Figure 4, Item 1) for reuse if multimeter reading matches value in “Good” column.
- (5). Replace relay (Figure 4, Item 1) if multimeter reading matches value in “Bad” column.

Table 1. Relay Test for Ohms and Continuity.

Test Across Pins	Ohms – Good	Ohms - Bad	Continuity - Good	Continuity - Bad
85 to 86 (Figure 4, Items 5 to 2)	435 – 531 Ohms	Outside range of 435-531 Ohms	n/a	n/a
30 to 87A (Figure 4, Items 6 to 4)	0 Ohm short circuit	Infinity (∞) Ohms Open circuit	positive	negative
30 to 87 (Figure 4, Items 6 to 3)	Infinity (∞) Ohms Open circuit	0 Ohm short circuit	negative	positive
85 to 87, 87A, and 30 (Figure 4, Items 5 to 3, 4, and 6)	Infinity (∞) Ohms Open circuit	0 Ohm short circuit	negative	positive
86 to 87, 87A, and 30 (Figure 4, Items 2 to 3, 4, and 6)	Infinity (∞) Ohms Open circuit	0 Ohm short circuit	negative	positive

NOTE

Voltage required to operate relay is 14.4 to 31.9 VDC applied. Check voltage supply source using a multimeter to verify test voltage is within specification.

- c. Apply 24 VDC across pins 30 and 87 (Figure 4) and listen for an audible “click”.
 - (1). Retain relay (Figure 4, Item 1) for reuse if “click” is heard, indicating connection between pins 30 and 87 (Figure 4) is closed.
 - (2). Replace relay (Figure 4, Item 1) if no “click” is heard, indicating connection between pins 30 and 87 (Figure 4) remains open.
8. Close relay panel (Figure 3, Item 4) cover.
9. Close rear door.
10. Install negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
11. Close left-side door.
12. Set engine control switch to PRIME & RUN (TM 9-6115-749-10)

-
13. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
 14. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
TEST ENGINE COMPRESSION

INITIAL SETUP:**Test Equipment**

Adapter, Compression Test (WP 0162, Table 2, Item 1)
 Tester, Cylinder Compression (WP 0162, Table 2, Item 28)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Gasket (3) (WP 0127, Repair Parts List, Figure 29, Item 10)
 Seal, plain encased (3) (WP 0127, Figure 29, Item 11)
 Brush, wire, scratch, brass (WP 0163, Expendable and Durable Items List, Item 7)
 Cap set, protective (WP 0163, Item 8)
 Cleaning compound, solvent (WP 0163, Item 10)
 Compound, antiseize (WP 0163, Item 13)
 Compound, sealing (WP 0163, Item 15)
 Grease, electrically conductive (WP 0163, Item 20)
 Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

References

WP 0039, Service Fuel System
 WP 0064, Remove/Install 50/60 Hz Engine Assembly
 WP 0065, Remove/Install 400 Hz Engine Assembly
 WP 0068, Remove/Install Glow Plugs
 WP 0082, Remove/Install Valve Cover

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
 Engine cool
 Intake and exhaust valves adjusted to proper specification (WP 0083, Check/Adjust Engine Valves)

TEST ENGINE COMPRESSION**WARNING**

Starting engine when unit is partially disassembled is dangerous. Run engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

Test Engine Compression

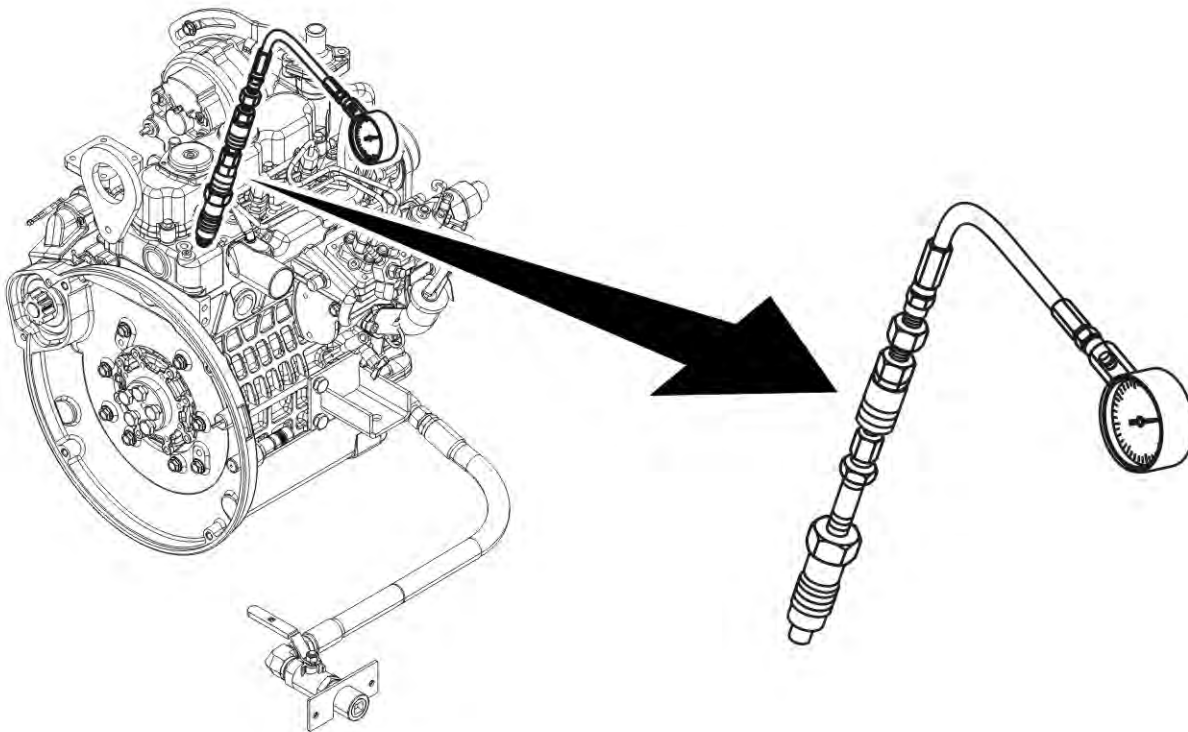


Figure 1. Compression Test in Fuel Injector Opening — Location.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

CAUTION

Intake and exhaust valves must be adjusted to specification prior to testing engine compression (WP 0083, Check and Adjust Engine Valves). Batteries must be fully charged prior to testing engine compression. Failure to comply will cause damage to equipment.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
3. Start engine and run until it reaches normal operating temperature.
4. Turn engine control switch to OFF (TM 9-6115-749-10).
5. Open left- and right-side doors on generator set.
6. Remove battery ground cable (WP 0036, Remove/Install Batteries).
7. Remove top body panel (WP 0028, Remove/Install Top Body Panel).
8. Remove fuel injection lines and injectors (WP 0069, Remove/Install Fuel Injector).

9. Ensure valve cover and glow plugs are installed (WP 0082, Remove/Install Valve Cover and WP 0068, Remove/Install Glow Plugs).
10. Locate fuel injector opening (Figure 1).

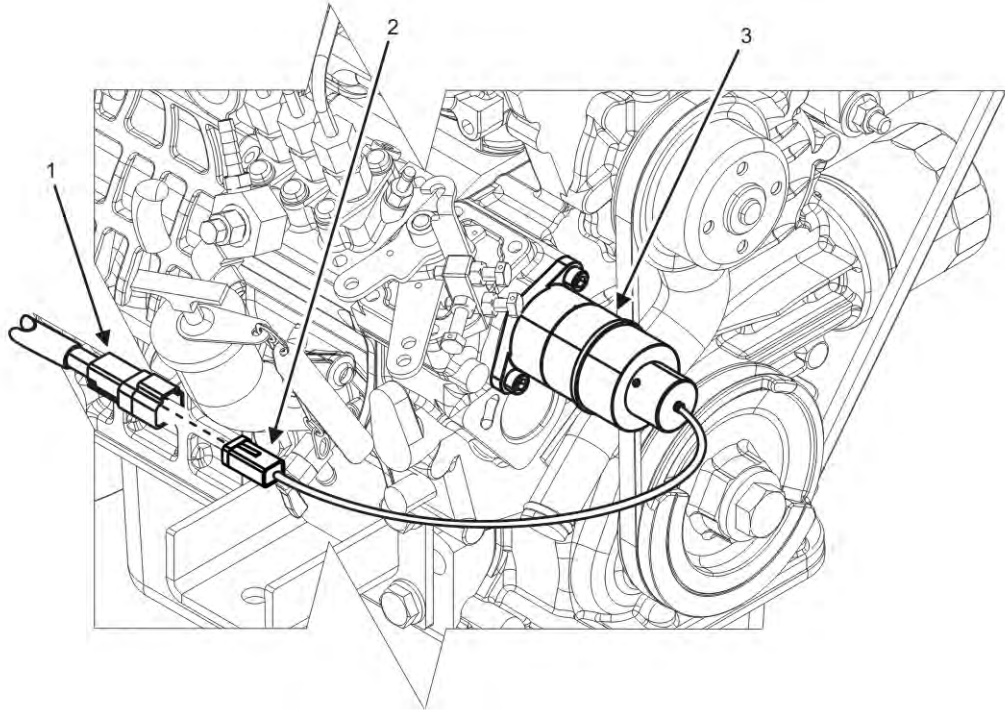


Figure 2. Governor Actuator Connector — Removal.

NOTE

Glow plugs must remain installed for this procedure. Test compression in each of the three cylinders, one at a time. The procedure for compression testing in all cylinders is the same.

11. Disconnect governor actuator (Figure 2, Item 3) electrical connector (Figure 2, Item 2) from wiring harness (Figure 2, Item 1).
12. Remove two nuts (Figure 3, Item 2) and engine front lifting bracket (Figure 3, Item 3) from engine.
13. Install battery ground cable (WP 0036, Remove/Install Batteries).
14. Crank engine for a few seconds using the DEAD CRANK SWITCH (TM 9-6115-749-10) to clear cylinders of any residual fuel.

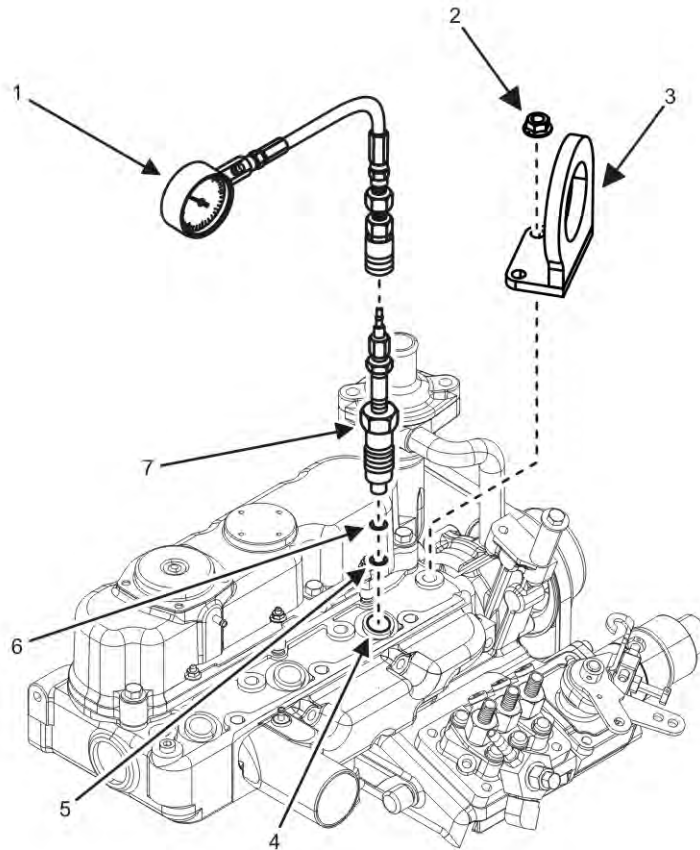


Figure 3. Compression Gage in Fuel Injector Opening.

15. Install new heat seal (Figure 3, Item 5) and new copper gasket (Figure 3, Item 6) to compression adapter (Figure 3, Item 7) and install compression adapter (Figure 3, Item 7) and compression gage (Figure 3, Item 1) to fuel injector opening of cylinder 1 (Figure 3, Item 4).

WARNING

Operating generator set with unit doors open or panels removed exposes personnel to a high noise level. Close unit doors and replace panels or wear hearing protection while operating or working near a running generator set. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

The compression gage needle will show compression reading at each stroke and will hold the highest reading of the four strokes.

16. Energize main DC circuit breaker (TM 9-6115-749-10).
17. Move DEAD CRANK SWITCH to CRANK (TM 9-6115-749-10) and hold through four compression strokes.
18. Note compression reading on gage.

CAUTION

Release pressure from compression gage (Figure 3, Item 1) using release button on gage before removing gage from engine. Failure to comply may cause damage to equipment.

19. Remove compression adapter (Figure 3, Item 7) and compression gage (Figure 3, Item 1) from fuel injector opening of cylinder 1 (Figure 3, Item 4) and remove and discard heat seal (Figure 3, Item 5) and copper gasket (Figure 3, Item 6) from compression adapter (Figure 3, Item 7) or fuel injector opening on cylinder 1 (Figure 3, Item 4).
20. Repeat steps 15 through 19 to record compression readings in cylinders 2 and 3.

NOTE

Factory specification for compression pressure is 512 – 583 psi (3.53 – 4.02 MPa). Lowest allowable limit is 370 psi (2.55 MPa).

21. Replace engine if compression pressure in any cylinder is not within specification (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).

NOTE

Compression pressures should not vary more than 10% between cylinders.

22. Compare compression pressure readings between cylinders.
23. Replace engine if compression pressures vary between cylinders by more than 10% (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).
24. Install two nuts (Figure 3, Item 2) and engine front lifting bracket (Figure 3, Item 3) to engine.
25. Connect governor actuator (Figure 2, Item 3) electrical connector (Figure 2, Item 2) to wiring harness (Figure 2, Item 1).
26. Install fuel injection lines and fuel injectors (WP 0069, Remove/Install Fuel Injector).

-
27. Install top panel (WP 0028, Remove/Install Top Body Panel).
 28. Close generator set doors.
 29. Purge fuel system (WP 0039, Service Fuel System).
 30. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
 31. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
 32. Repair as required.
 33. Check fuel level and fill as required (TM 9-6115-749-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
TEST ENGINE OIL PRESSURE

INITIAL SETUP:**Test Equipment**

Test Set, Oil Systems Pressure (WP 0162, Table 2, Item 27)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Materials/Parts

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Lubricating oil, engine (WP 0163, Item 23)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Personnel Required

91D (1)

References

WP 0010, Engine System Troubleshooting with a DCS Code

WP 0066, Service Lubrication System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

TEST ENGINE OIL PRESSURE**WARNING**

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

Starting engine when unit is partially disassembled is dangerous. Run engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

Check Engine Oil Pressure

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door on generator set.

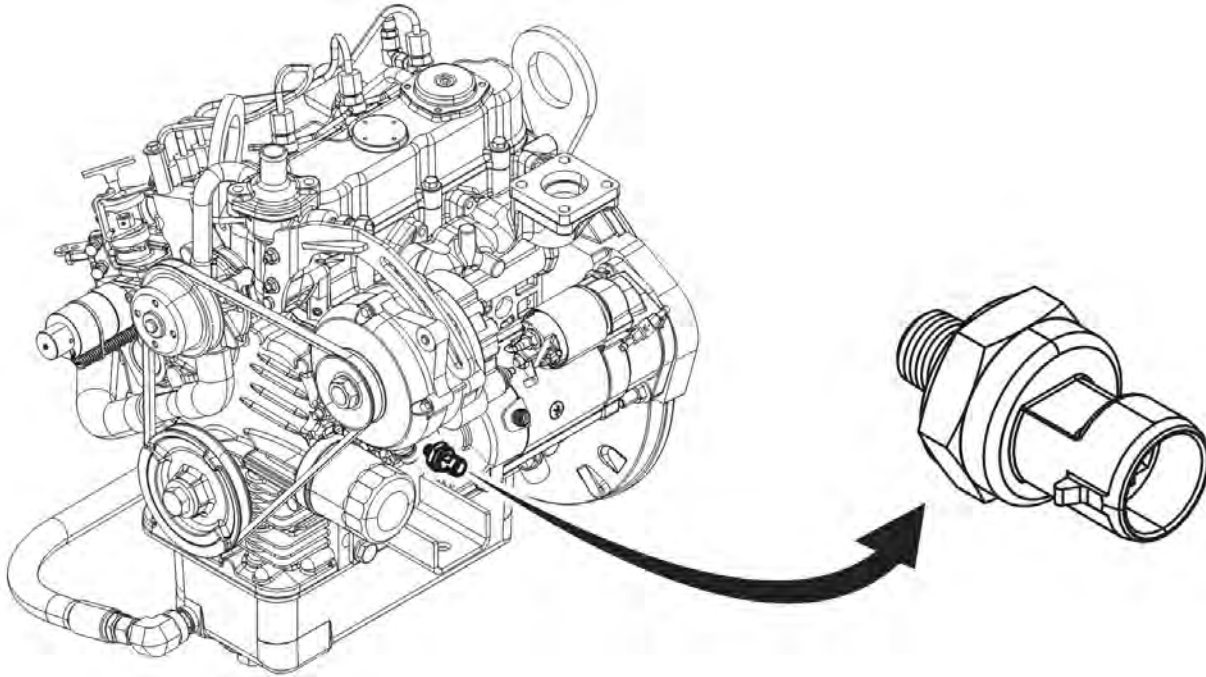


Figure 1. Engine Oil Pressure Sensor — Location.

3. Locate engine oil pressure sensor (Figure 1).

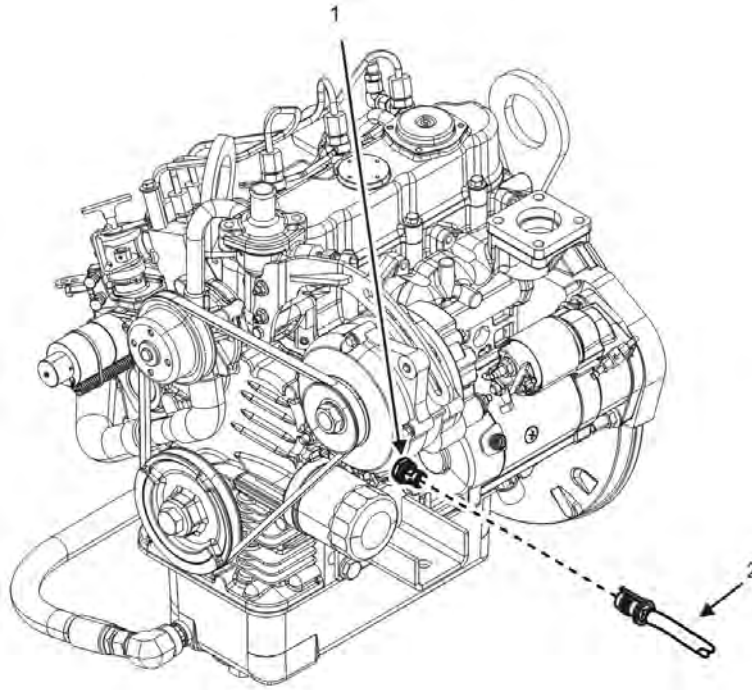


Figure 2. Engine Oil Pressure Sensor — Removal.

4. Disconnect electrical lead (Figure 2, Item 2) from oil pressure sensor (Figure 2, Item 1).

NOTE

Place a wiping rag under oil pressure sensor to capture oil spilled upon removal. Dispose of soiled rag IAW local SOP.

5. Remove engine oil pressure sensor (Figure 2, Item 1) from engine oil pressure port and save for reuse.
6. Apply pipe sealant to threads of oil pressure gage (Figure 3, Item 2).
7. Install oil pressure gage (Figure 3, Item 2) into engine oil pressure port (Figure 3, Item 1).
8. Install battery ground cable (WP 0036, Remove/Install Batteries).
9. Set engine control switch to PRIME & RUN. Start engine and allow engine to reach normal operating temperature (TM 9-6115-749-10).

NOTE

The lowest allowable oil pressure at rated speed is 21 psi (14 kPa). Oil pressure reading should fall between 28 – 64 psi (196 – 441 kPa).

10. Observe engine oil pressure at rated speed.

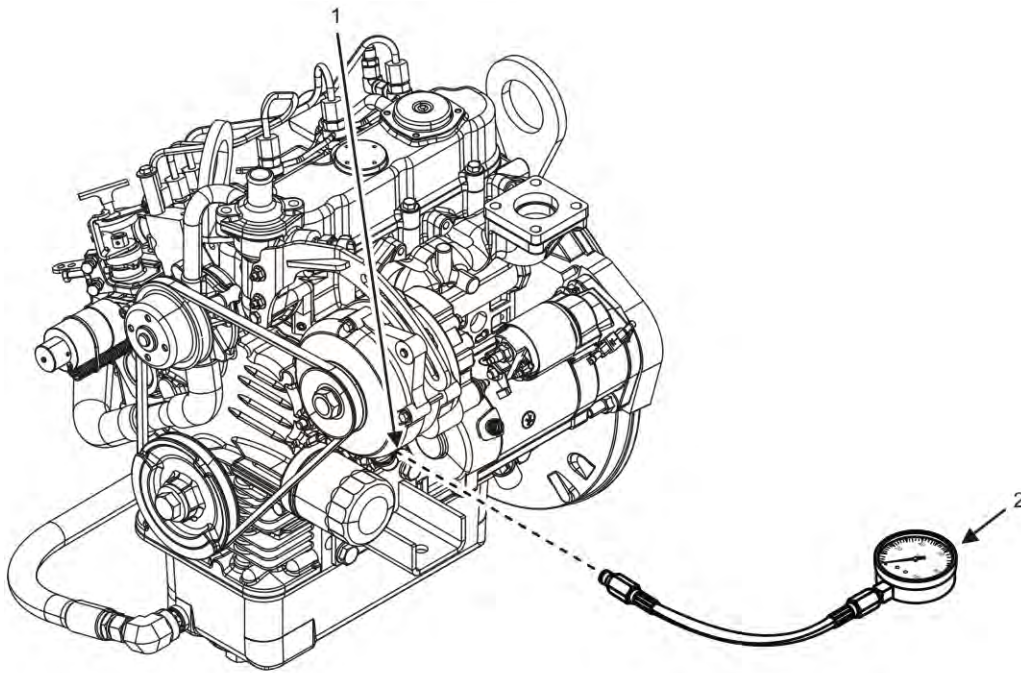


Figure 3. Check Engine Oil Pressure.

11. Determine and remedy cause of low engine oil pressure by troubleshooting IAW low pressure DCS code [Fault 415: Low Oil Pressure] (WP 0010, Engine System Troubleshooting with a DCS Code).
12. Remove battery ground cable (WP 0036, Remove/Install Batteries).
13. Remove oil pressure gage (Figure 3, Item 2) from engine.
14. Apply pipe sealant to threads of oil pressure sensor (Figure 2, Item 1).
15. Install engine oil pressure sensor (Figure 2, Item 1) to engine oil pressure port and tighten to torque value of 130 – 174 in/lb (15 – 20 Nm).
16. Connect electrical lead (Figure 2, Item 2) to oil pressure sensor (Figure 2, Item 1).
17. Install battery ground cable (WP 0036, Remove/Install Batteries).
18. Close left-side door.
19. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
20. Start engine and check for leaks and proper operation (TM 9-6115-749-10).
21. Repair as required.
22. Check engine oil level and fill as required (WP 0066, Service Lubrication System).
23. Dispose of soiled rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL 50/60 HZ ENGINE ASSEMBLY

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 31)

Torque Tube, 5-75 FT-LB (WP 0162, Table 2, Item 34)

Torque Wrench Head End, 1/4" X 3/8" Drive, 9/16" (WP 0162, Table 2, Item 36)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 39)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0162, Table 2, Item 41)

Materials/Parts

Assembly, engine (WP 0123, Repair Parts List, Figure 25, Item 1)

Gasket, exhaust (WP 0107, Repair Parts List, Figure 9, Item 9)

Isolator, vibration, engine mount (2) (WP 0120, Repair Parts List, Figure 22, Item 6)

Nut, hex flange (4) (WP 0120, Figure 22, Item 4)

Nut, hex, self-locking (2) (WP 0120, Figure 22, Item 1)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0163, Item 8)

Cloth, abrasive, crocus (WP 0163, Item 11)

Compound, antiseize (WP 0163, Item 13)

Distilled water (WP 0163, Item 17)

Fuel, diesel (WP 0163, Item 19)

Grease, electrically conductive (WP 0163, Item 20)

Lubricating oil, engine (WP 0163, Item 23)

Pan, drain (WP 0163, Item 28)

Materials/Parts

Penetrating oil (WP 0163, Item 29)

Rag, wiping (6) (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Soap, ivory (WP 0163, Item 33)

Tag, marker (WP 0163, Item 35)

References

WP 0059, Remove/Install Engine Wiring Harness

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Batteries removed (WP 0036, Remove/Install Batteries)

Fuel drained (WP 0039, Service Fuel System)

Coolant drained (WP 0021, Service Cooling System)

Engine oil drained (WP 0066, Service Lubrication System)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)

AC generator removed from engine flywheel and flywheel housing (WP 0049, Remove/Install 50/60 Hz AC Generator Assembly)

Upper and lower radiator hoses and tubes removed from engine (WP 0024, Remove/Install Radiator Hose and Tube Assemblies)

INITIAL SETUP — CONTINUED:**Equipment Conditions**

Fuel filter/water separator removed (WP 0042,
Remove/Install Fuel Filter/Water Separator
Assembly)

Front body panel removed (WP 0029,
Remove/Install Front Body Panel)

Exhaust flex pipe removed from engine (WP 0080,
Remove/Install Exhaust Manifold)

Winterization kit and mounting bracket removed (if
installed) (WP 0025, Remove/Install Winterization
Kit Components)

Wiring removed from battery-charging alternator (WP
0075, Remove/Install Battery-Charging Alternator
Assembly)

Wiring removed from starter (WP 0077,
Remove/Install Starter)

REMOVE/INSTALL 50/60 HZ ENGINE ASSEMBLY**WARNING**

Engine assembly weighs approximately 355 lb (161 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.

Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.

Remove 50/60 Hz Engine Assembly

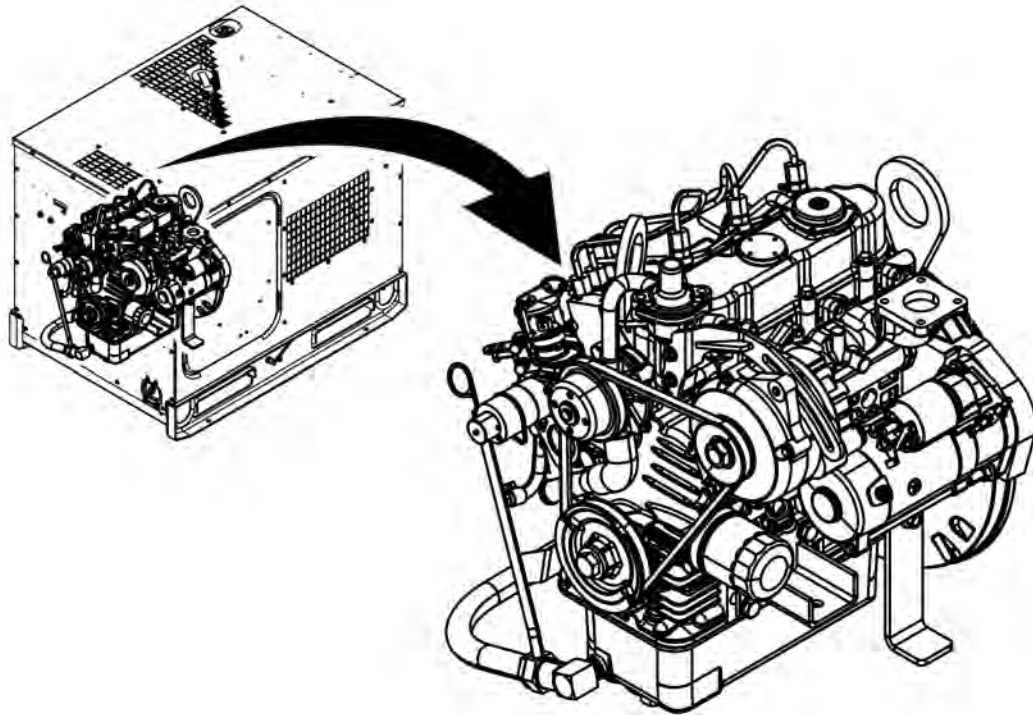


Figure 1. Engine — Location.

NOTE

Cap/plug all open fuel lines/fittings and cooling ports and hoses to prevent dirt and debris from entering the engine.

Tag all electrical wires and connectors prior to removal to aid installation. Remove tags from wires and connectors at installation.

All parts removed or disconnected from the engine assembly are intended for reuse at time of reassembly unless they are damaged and must be replaced.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate engine on generator set skid (Figure 1).

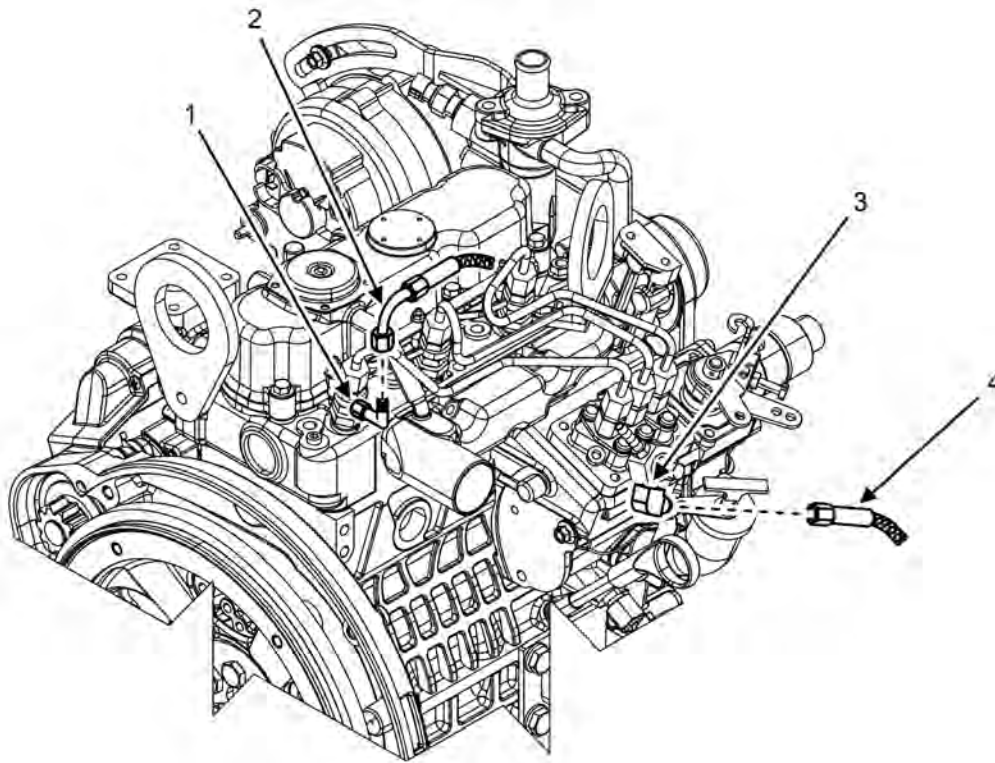


Figure 2. Fuel Injection Pump Lines — Removal.

WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change soaked clothing promptly if exposed to fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

3. Remove fuel supply hose (Figure 2, Item 4) from fuel injection pump (Figure 2, Item 3). Cap/plug hose and fuel injection pump openings to prevent dirt and debris from entering fuel system.
4. Inspect fuel supply hose (Figure 2, Item 4) for obvious signs of damage and replace as required.
5. Remove fuel vent hose (Figure 2, Item 2) from fuel injection overflow tube (Figure 2, Item 1). Cap/plug fuel vent hose and fuel injection overflow tube openings to prevent dirt and debris from entering fuel system.
6. Inspect fuel vent hose (Figure 2, Item 2) for obvious signs of damage and replace as required.

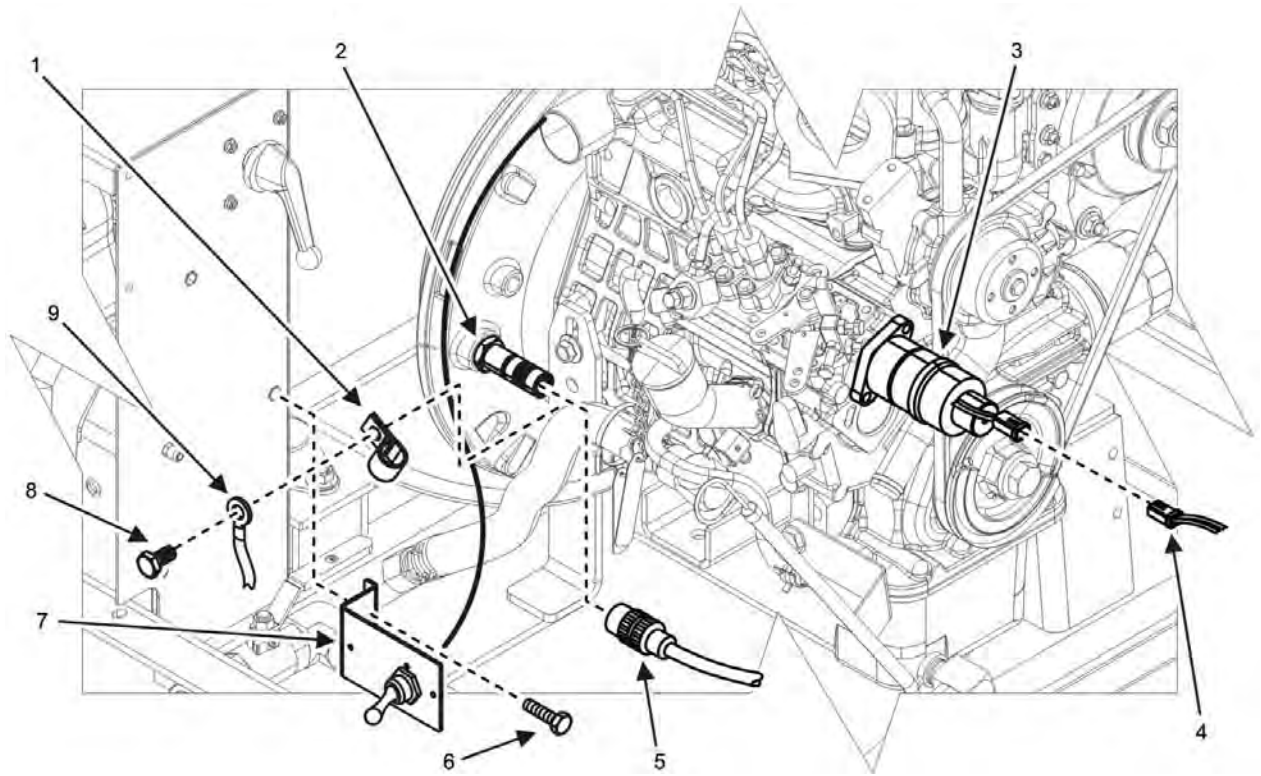


Figure 3. Electrical Connectors Right-Side.

7. Disconnect electrical connectors at the following locations:
 - a. Electrical connector (Figure 3, Item 4) at engine governor actuator (Figure 3, Item 3).
 - b. Electrical connector (Figure 3, Item 5) at the engine speed sensor (Figure 3, Item 2).
8. Inspect electrical connectors (Figure 3, Items 4 and 5) for signs of obvious damage.
9. Replace engine wiring harness if electrical connectors (Figure 3, Items 4 and 5) are damaged (WP 0059, Remove/Install Engine Wiring Harness).
10. Remove screw (Figure 3, Item 6) securing DEAD CRANK SWITCH bracket (Figure 3, Item 7) to interior body panel (not shown) if not already removed.
11. Move DEAD CRANK SWITCH bracket (Figure 3, Item 7) and wire away from top of engine assembly to allow clearance for engine removal.
12. Remove bolt (Figure 3, Item 8), P37 drain wire (Figure 3, Item 9), and loop clamp (Figure 3, Item 1) from right side of engine block.

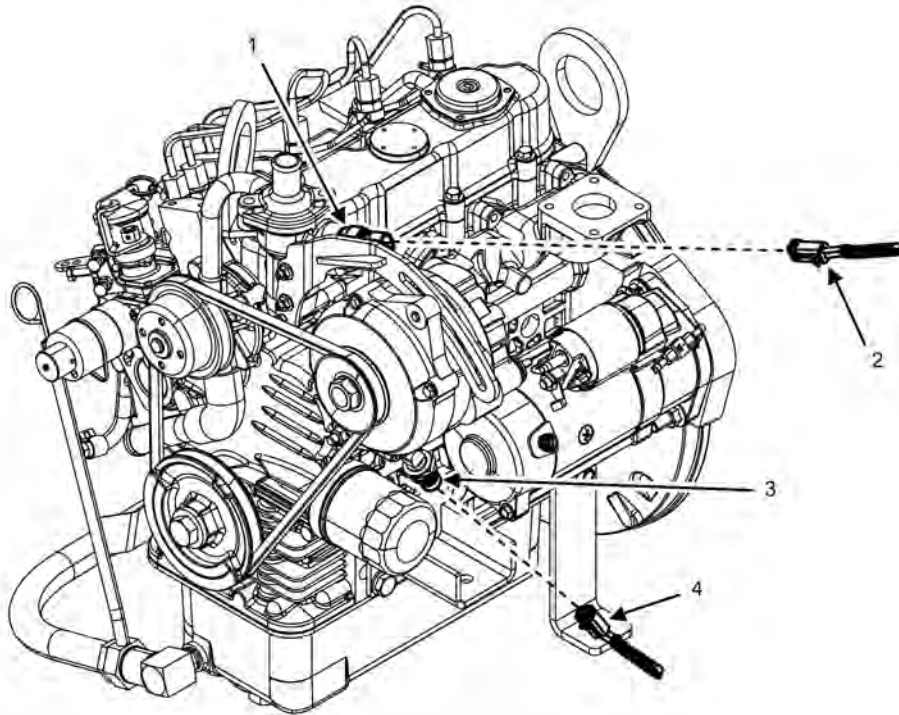


Figure 4. Electrical Connectors Exhaust-Side — Removal.

NOTE

Cap/plug all open lubrication lines/fittings to prevent dirt and debris from entering the lubrication system. Capture spilled engine oil and dispose of soiled rags IAW local SOP.

13. Disconnect electrical connectors at the following locations on the exhaust-side of engine.
 - a. Electrical connector (Figure 4, Item 2) at engine coolant temperature sensor (Figure 4, Item 1).
 - b. Electrical connector (Figure 4, Item 4) at engine oil pressure sender (Figure 4, Item 3).
14. Inspect electrical connectors (Figure 4, Items 2 and 4) for signs of obvious damage.
15. Replace engine wiring harness if electrical connectors (Figure 4, Items 2 and 4) are damaged (WP 0059, Remove/Install Engine Wiring Harness).

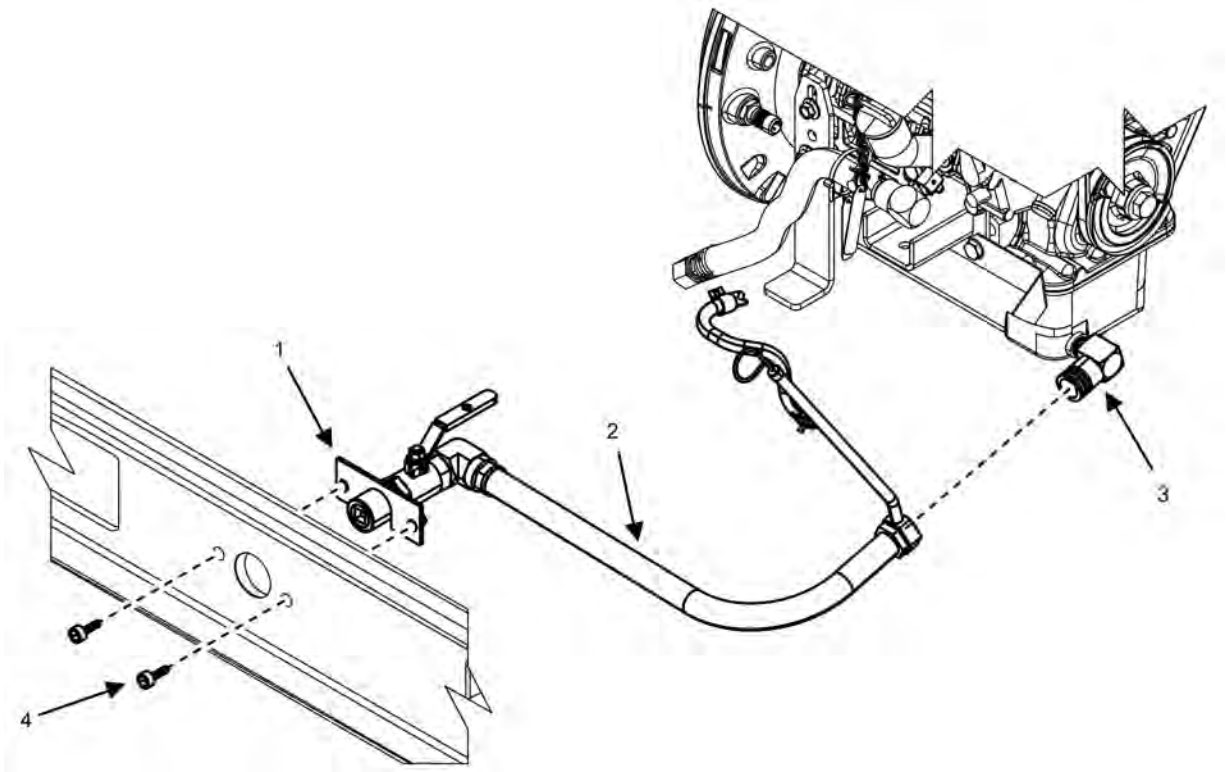


Figure 5. Engine Oil Drain Hose Assembly — Removal.

16. Remove two hex socket head screws (Figure 5, Item 4) that secure bulkhead fitting (Figure 5, Item 1) to unit skid.
17. Place wiping rags under engine oil drain hose assembly (Figure 5, Item 2) to capture any residual oil.

NOTE

Two wrenches are needed to separate engine oil drain hose assembly (Figure 5, Item 2) from degree elbow fitting (Figure 5, Item 3) at engine oil pan.

18. Remove oil drain hose assembly (Figure 5, Item 2) at 90-degree elbow fitting (Figure 5, Item 3) at oil pan.
19. Dispose of soiled rags IAW local SOP.

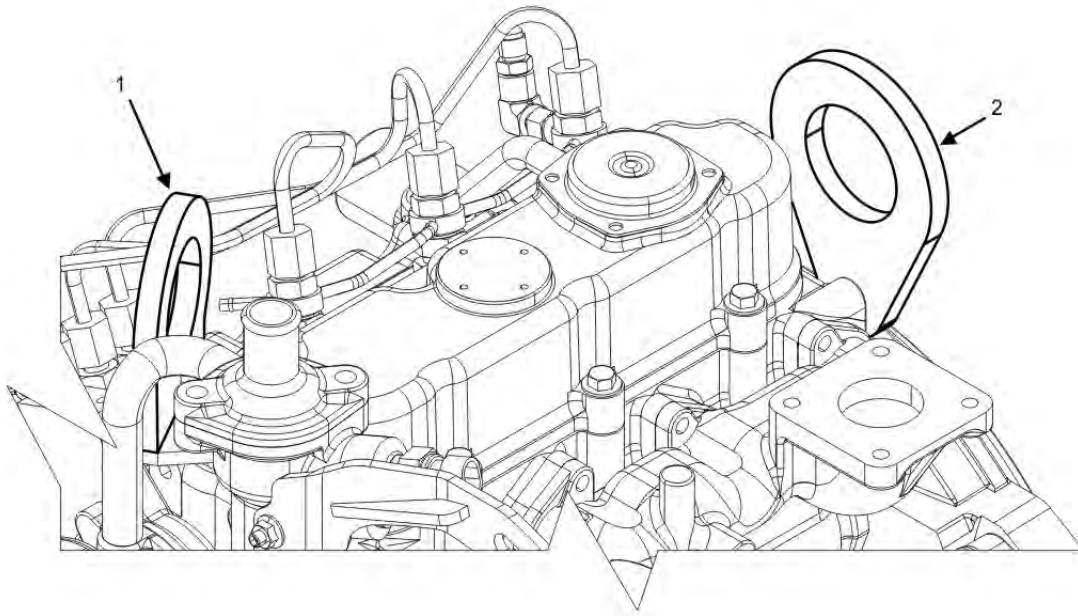


Figure 6. Lifting Eyes — Detail.

20. Inspect lifting eyes (Figure 6, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
21. Replace damaged lifting eyes (Figure 6, Items 1 and 2) and missing hardware (not shown) as required.
22. Tighten loose lifting eye hardware (not shown) to 17 – 21 ft/lb (23 – 29 Nm) as required.
23. Attach suitable lifting device to lifting eyes (Figure 6, Items 1 and 2) of engine.
24. Raise lifting device to remove slack in chains.

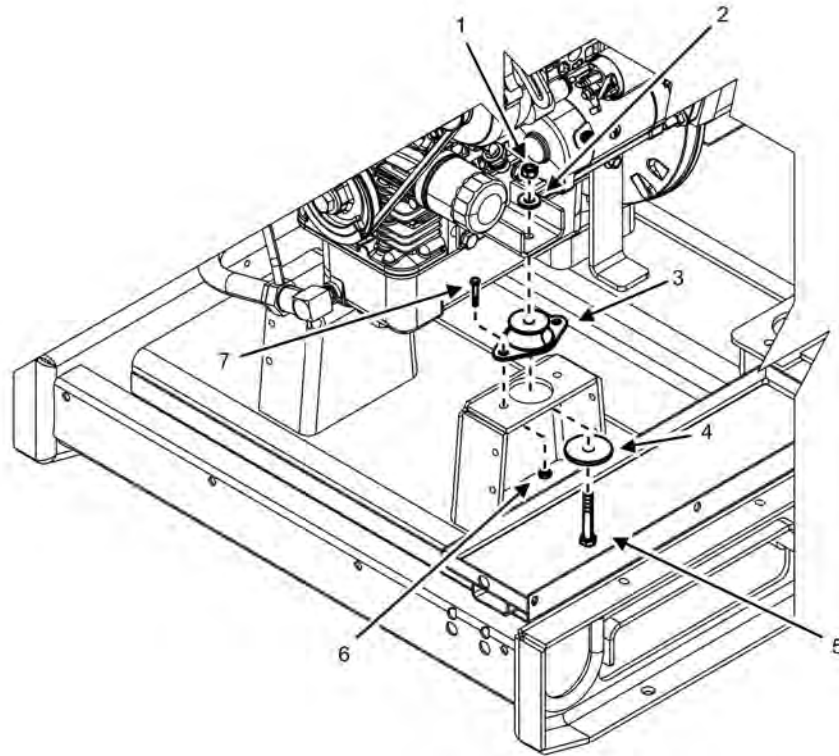


Figure 7. Engine Mounts — Removal.

25. Remove engine mounting bolt (Figure 7, Item 5), snubbing washer (Figure 7, Item 4), flat washer (Figure 7, Item 2), and lock nut (Figure 7, Item 1) securing engine mount plate to left-side vibration isolator (Figure 7, Item 3). Discard lock nut (Figure 7, Item 1).
26. Remove two bolts (Figure 7, Item 7) and two lock nuts (Figure 7, Item 6) that secure vibration isolator (Figure 7, Item 3) to unit skid. Discard lock nuts (Figure 7, Item 6).
27. Remove and discard vibration isolator (Figure 7, Item 3) from unit skid.
28. Repeat steps 25 through 27 for right-side vibration isolator.

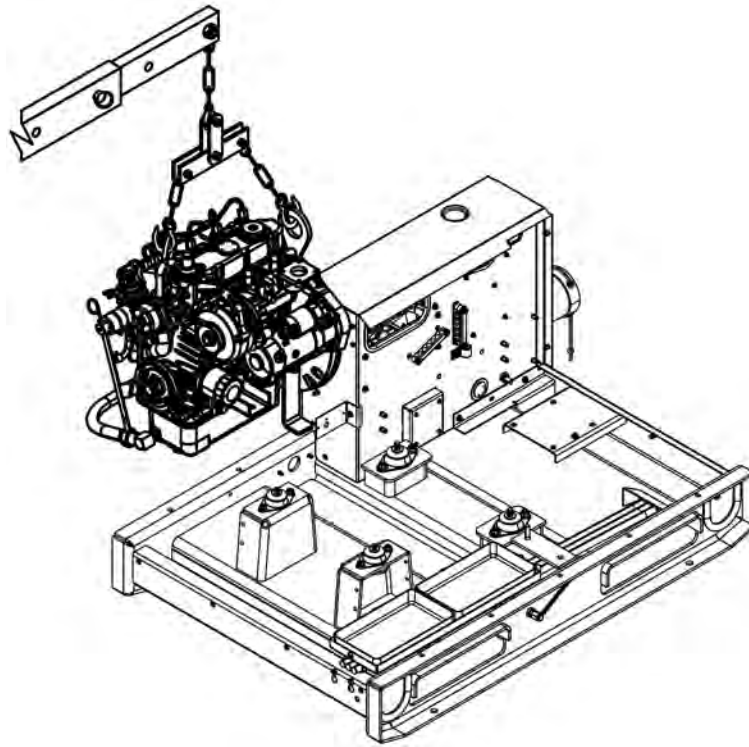


Figure 8. Engine — Removal.

WARNING

When lifting engine, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.

29. Lift engine slightly until free of engine mounts using suitable lifting device (Figure 8).
30. Pull engine away from generator set using lifting device (Figure 8).
31. Secure engine to engine stand or other suitable work surface.
32. Remove lifting device from engine.

END OF TASK

Inspect 50/60 Hz Engine Assembly

1. Inspect engine components for signs of obvious damage.
2. Replace damaged engine components as required.
3. Inspect all bolts and washers for damage, deterioration, or wear and replace as required.
4. Inspect mounting location on unit skid for damage, corrosion, or cracks. Replace unit skid as required.

END OF TASK

Install 50/60 Hz Engine Assembly

1. Position two new vibration isolators (Figure 7, Item 3) to mounting locations on unit skid and secure to each location by installing two bolts (Figure 7, Item 7) and two new lock nuts (Figure 7, Item 6) finger-tight.
2. Tighten new lock nuts (Figure 7, Item 6) to 18 – 21 ft/lb (24 – 29 Nm).
3. Inspect lifting eyes (Figure 6, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
4. Replace damaged lifting eyes (Figure 6, Items 1 and 2) and missing hardware (not shown) as required.
5. Tighten loose lifting eye hardware (not shown) to 17 – 21 ft/lb (23 – 29 Nm) as required.
6. Attach suitable lifting device to lifting eyes (Figure 6, Items 1 and 2) of engine.
7. Raise engine assembly using lifting device.
8. Position engine to its approximate mounting location in unit skid.
9. Clean mating surfaces of engine flywheel using a crocus cloth.
10. Apply antiseize compound to mating surfaces of engine flywheel to minimize corrosion of dissimilar metals.
11. Lower engine slowly, using lifting device, until mounting holes on engine mounts align with vibration isolator (Figure 7, Item 3).
12. Insert engine mounting bolts (Figure 7, Item 5) upside-down in engine mount to temporarily secure engine to vibration isolator (Figure 7, Item 3) on unit skid.
13. Remove left-side engine mounting bolt (Figure 7, Item 5) installed upside-down.
14. Install snubbing washer (Figure 7, Item 4) to engine mounting bolt (Figure 7, Item 5).
15. Install engine mounting bolt (Figure 7, Item 5) with snubbing washer (Figure 7, Item 4) through unit skid and bottom of vibration isolator (Figure 7, Item 3) on left-side of skid.
16. Install new lock nut (Figure 7, Item 1) and flat washer (Figure 7, Item 2) to engine mounting bolt (Figure 7, Item 5) finger-tight to secure engine to skid and vibration isolator (Figure 7, Item 3).
17. Repeat steps 13 through 16 to install engine mounting bolt (Figure 7, Item 5) to right-side of skid.
18. Tighten new lock nuts (Figure 7, Item 1) to 39 – 48 ft/lb (53 – 65 Nm).
19. Remove lifting device from engine.

NOTE

Prior to installation of engine oil drain hose assembly (Figure 5, Item 2), remove all caps/plugs from oil hoses/fittings. Capture spilled engine oil and dispose of IAW local SOP.

Two wrenches are needed to install engine oil drain hose assembly (Figure 5, Item 2) and fittings to engine oil pan.

Apply pipe joint compound to threads of fittings before reassembly.

20. Apply pipe joint compound to 90-degree elbow fitting (Figure 5, Item 3) and install engine oil drain hose assembly (Figure 5, Item 2) to 90-degree elbow fitting (Figure 5, Item 3) in engine oil pan.
21. Position engine oil drain hose assembly bulkhead fitting (Figure 5, Item 1) to its mounting position on unit skid.
22. Ensure engine oil drain hose assembly (Figure 5, Item 2) lies flat on unit skid.

23. Secure bulkhead fitting (Figure 5, Item 1) to unit skid by installing two hex socket head screws (Figure 5, Item 4).
24. Dispose of soiled rags IAW local SOP.

NOTE

Use tags placed on sensors/senders and wiring harness at removal to assist installation. Leave tags on electrical components until generator set is running properly.

25. Secure electrical connectors at the following locations on exhaust side of engine:
 - a. Electrical connector (Figure 4, Item 2) at engine coolant temperature sensor (Figure 4, Item 1).
 - b. Electrical connector (Figure 4, Item 4) at engine oil pressure sender (Figure 4, Item 3).
26. Install bolt (Figure 3, Item 8), P37 drain wire (Figure 3, Item 9), and loop clamp (Figure 3, Item 1) to engine block. Torque bolt (Figure 3, Item 8) to 35 to 42 ft/lbs (48 to 57 Nm).
27. Position wiring for DEAD CRANK SWITCH across rear of engine assembly and position DEAD CRANK SWITCH bracket (Figure 3, Item 7) to its mounting location on interior body panel and align the mounting holes.
28. Secure DEAD CRANK SWITCH bracket (Figure 3, Item 7) to interior body panel by installing screw (Figure 3, Item 6).
29. Secure electrical connectors at the following locations on intake side of engine:
 - a. Electrical connector (Figure 3, Item 4) at engine governor actuator (Figure 3, Item 3).
 - b. Electrical connector (Figure 3, Item 5) at the engine speed sensor (Figure 3, Item 2).

NOTE

Prior to installation, remove all caps/plugs from fuel lines/fittings.

30. Install fuel vent hose (Figure 2, Item 2) to fuel injection overflow tube (Figure 2, Item 1).
31. Install fuel supply hose (Figure 2, Item 4) to fuel injection pump (Figure 2, Item 3).
32. Install starter wiring (WP 0077, Remove/Install Starter)
33. Install battery-charging alternator wiring (WP 0075, Remove/Install Battery-Charging Alternator Assembly).
34. Install winterization kit and mounting bracket (WP 0025, Remove/Install Winterization Kit Components).
35. Install exhaust flex pipe (WP 0080, Remove/Install Exhaust Manifold).
36. Install front body panel (WP 0029, Remove/Install Front Body Panel).
37. Install fuel filter/water separator (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).
38. Install radiator hoses (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
39. Install AC generator (WP 0049, Remove/Install 50/60 Hz AC Generator Assembly).
40. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
41. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
42. Install top body panel (WP 0028, Remove/Install Top Body Panel).
43. Fill engine oil (WP 0066, Service Lubrication System).
44. Fill coolant (WP 0021, Service Cooling System).
45. Fill fuel tank (WP 0039, Service Fuel System).
46. Install batteries (WP 0036, Remove/Install Batteries).

-
47. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
 48. Start engine and check for proper operation and fluid leaks. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
 49. Repair as required.
 50. Turn engine control switch to OFF (TM 9-6115-749-10).
 51. Remove all temporary identification tags/markings from electrical components.
 52. Ensure oil and coolant levels are at proper operating level (TM 9-6115-749-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL 400 HZ ENGINE ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Torque Tube, 5-75 FT-LB (WP 0162, Table 2, Item 35)

Torque Wrench Head End, 1/4" X 3/8" Drive, 9/16" (WP 0162, Table 2, Item 37)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 40)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0162, Table 2, Item 42)

Materials/Parts

Assembly, engine (WP 0123, Repair Parts List, Figure 25, Item 1)

Gasket, exhaust (WP 0107, Repair Parts List, Figure 9, Item 9)

Isolator, vibration, engine mount (2) (WP 0120, Repair Parts List, Figure 22, Item 6)

Nut, hex flange (WP 0120, Repair Parts List, Figure 22, Item 4)

Washer, lock (WP 0122, Repair Parts List, Figure 24, Item 12)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0163, Item 8)

Cloth, abrasive, crocus (WP 0163, Item 11)

Compound, antiseize (WP 0163, Item 13)

Distilled water (WP 0163, Item 17)

Fuel, diesel (WP 0163, Item 19)

Grease, electrically conductive (WP 0163, Item 20)

Lubricating oil, engine (WP 0163, Item 23)

Pan, drain (WP 0163, Item 28)

Penetrating oil (WP 0163, Item 29)

Materials/Parts

Rag, wiping (6) (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Soap, ivory (WP 0163, Item 33)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0059, Engine Wiring Harness

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Batteries removed (WP 0036, Remove/Install Batteries)

Fuel drained (WP 0039, Service Fuel System)

Coolant drained (WP 0021, Service Cooling System)

Engine oil drained (WP 0066, Service Lubrication System)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Upper and lower radiator hoses and tubes removed from engine (WP 0024, Remove/Install Radiator Hose and Tube Assemblies)

Fuel filter/water separator removed (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly)

Front body panel removed (WP 0029, Remove/Install Front Body Panel)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

INITIAL SETUP — CONTINUED:**Equipment Conditions**

Right-side body panel removed (WP 0032,
Remove/Install Right-Side Body Panel)

Muffler removed (WP 0081, Remove/Install Muffler)

Exhaust flex pipe removed from engine (WP 0080,
Remove/Install Exhaust Manifold)

Unit bulkhead removed (WP 0035, Remove/Install
Interior Body Panels)

Winterization kit and mounting bracket removed (if
installed) (WP 0025, Remove/Install Winterization
Kit Components)

Wiring removed from battery-charging alternator (WP
0075, Remove/Install Battery-Charging Alternator
Assembly)

Wiring removed from starter (WP 0077,
Remove/Install Starter)

REMOVE/INSTALL 400 HZ ENGINE ASSEMBLY**WARNING**

Engine assembly weighs approximately 355 lb (161 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.

Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.

Remove 400 Hz Engine Assembly

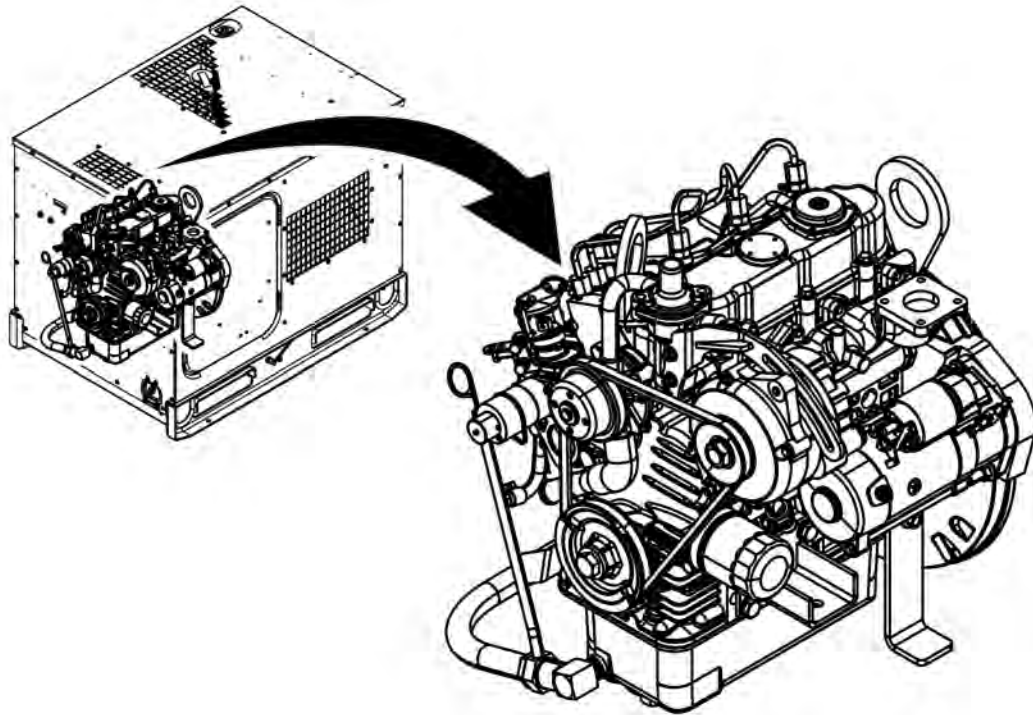


Figure 1. Engine — Location.

NOTE

Cap/plug all open fuel lines/fittings and cooling ports and hoses to prevent dirt and debris from entering the engine.

Tag all electrical wires and connectors prior to removal to aid installation. Remove tags from wires and connectors at installation.

All parts removed or disconnected from the engine assembly are intended for reuse at time of reassembly unless they are damaged and must be replaced.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate engine on generator set skid (Figure 1).

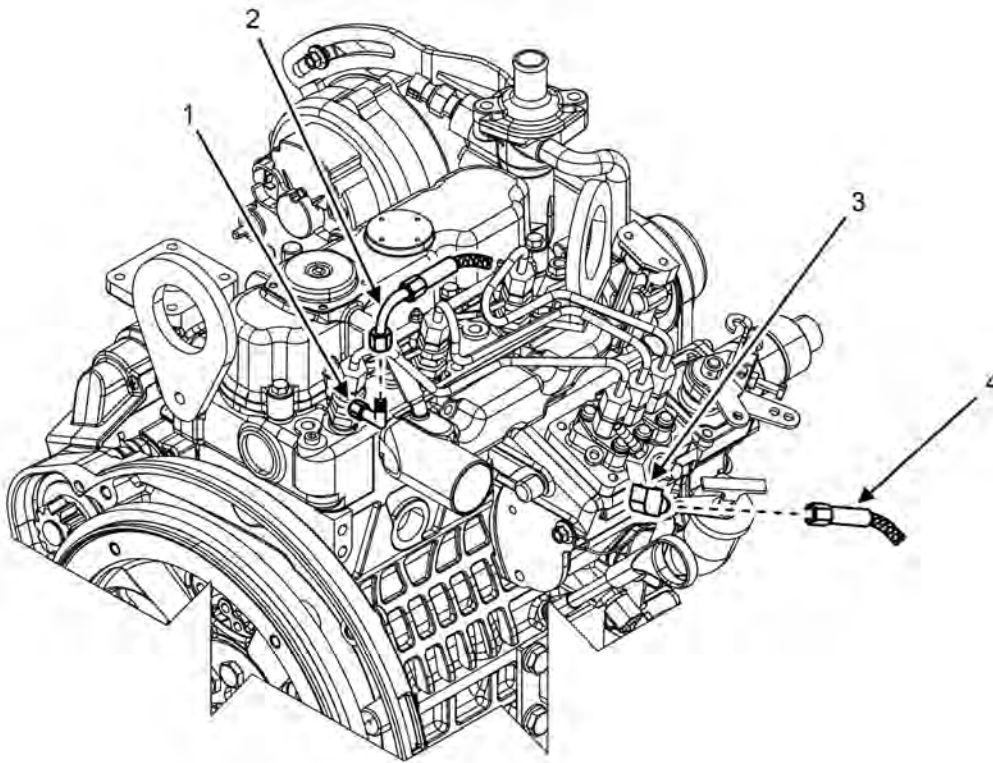


Figure 2. Fuel Injection Pump Lines — Removal.

WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

3. Remove fuel supply hose (Figure 2, Item 4) from fuel injection pump (Figure 2, Item 3). Cap/plug hose and fuel injection pump openings to prevent dirt and debris from entering fuel system.
4. Inspect fuel supply hose (Figure 2, Item 4) for obvious signs of damage and replace as required.
5. Remove fuel vent hose (Figure 2, Item 2) from fuel injection overflow tube (Figure 2, Item 1). Cap/plug fuel vent hose and fuel injection overflow tube openings to prevent dirt and debris from entering fuel system.
6. Inspect fuel vent hose (Figure 2, Item 2) for obvious signs of damage and replace as required.

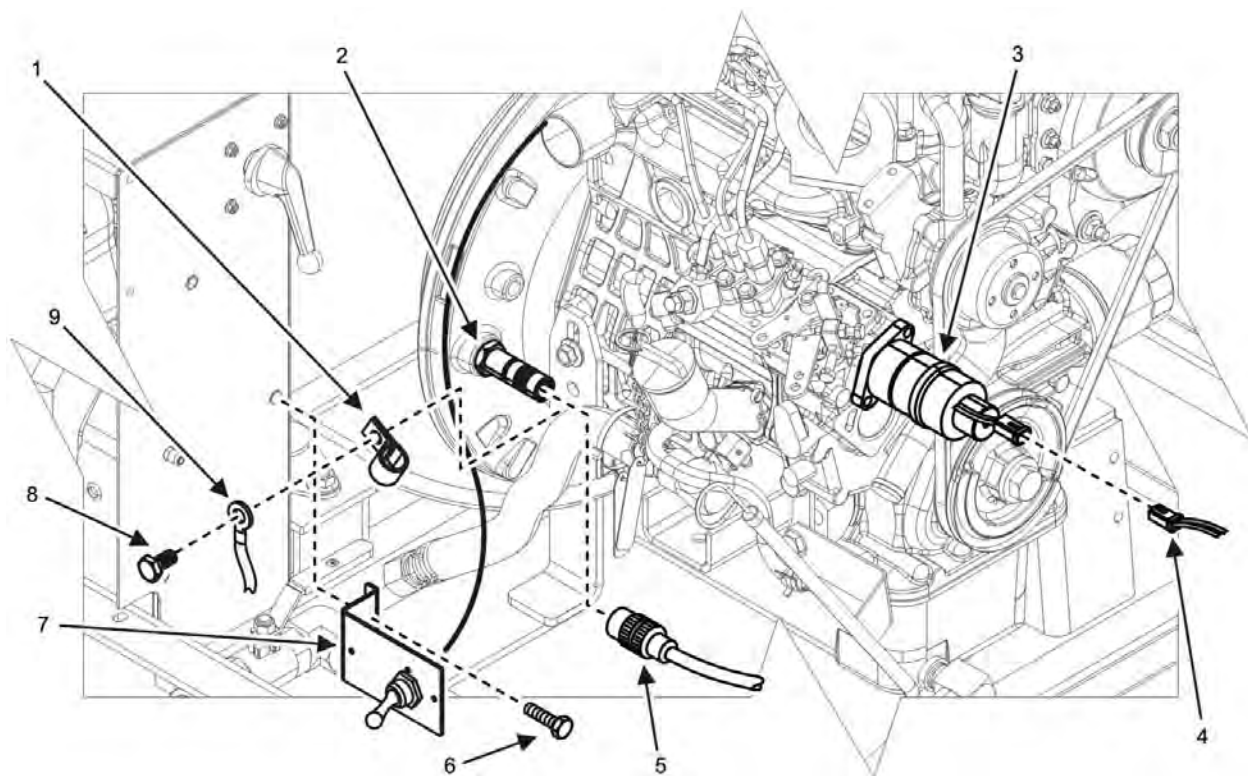


Figure 3. Electrical Connectors — Removal.

7. Disconnect electrical connectors at the following locations:
 - a. Electrical connector (Figure 3, Item 4) at engine governor actuator (Figure 3, Item 3).
 - b. Electrical connector (Figure 3, Item 5) at the engine speed sensor (Figure 3, Item 2).
8. Inspect electrical connectors (Figure 3, Items 4 and 5) for signs of obvious damage.

9. Replace engine wiring harness if electrical connectors (Figure 3, Items 4 and 5) are damaged (WP 0059, Remove/Install Engine Wiring Harness).
10. Remove screw (Figure 3, Item 6) securing DEAD CRANK SWITCH bracket (Figure 3, Item 7) to interior body panel.
11. Remove bolt (Figure 3, Item 8), P37 drain wire (Figure 3, Item 9), and loop clamp (Figure 3, Item 1) from right side of engine block.

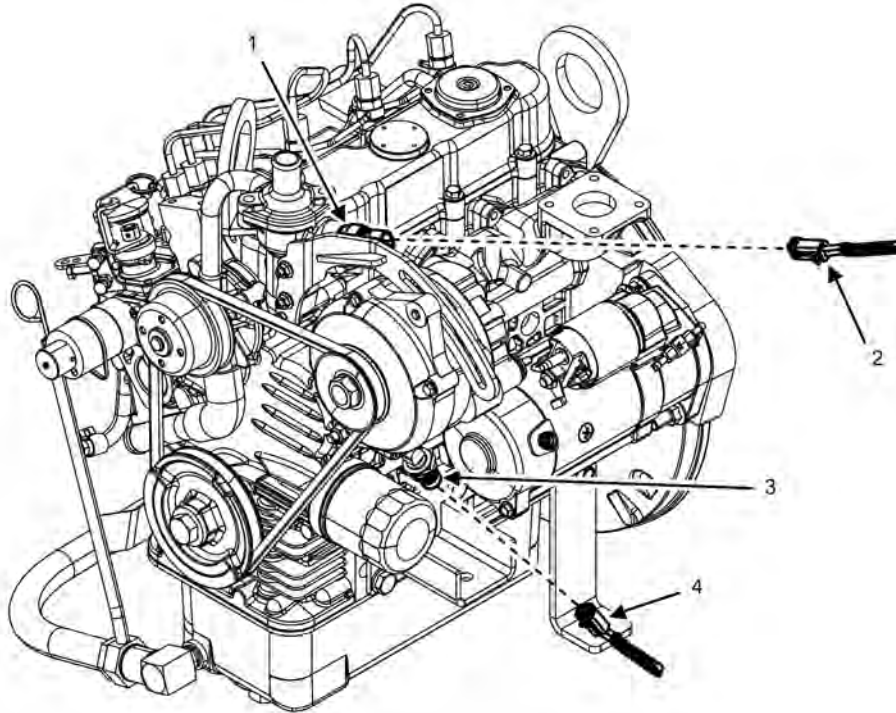


Figure 4. Electrical Connectors Exhaust-Side — Removal.

NOTE

Cap/plug all open lubrication lines/fittings to prevent dirt and debris from entering the lubrication system. Capture spilled engine oil and dispose of soiled rags IAW local SOP.

12. Disconnect electrical connectors at the following locations on the exhaust-side of engine.
 - a. Electrical connector (Figure 4, Item 2) at engine coolant temperature sensor (Figure 4, Item 1).
 - b. Electrical connector (Figure 4, Item 4) at engine oil pressure sender (Figure 4, Item 3).
13. Inspect electrical connectors (Figure 4, Items 2 and 4) for signs of obvious damage.
14. Replace engine wiring harness if electrical connectors (Figure 4, Items 2 and 4) are damaged (WP 0059, Remove/Install Engine Wiring Harness).

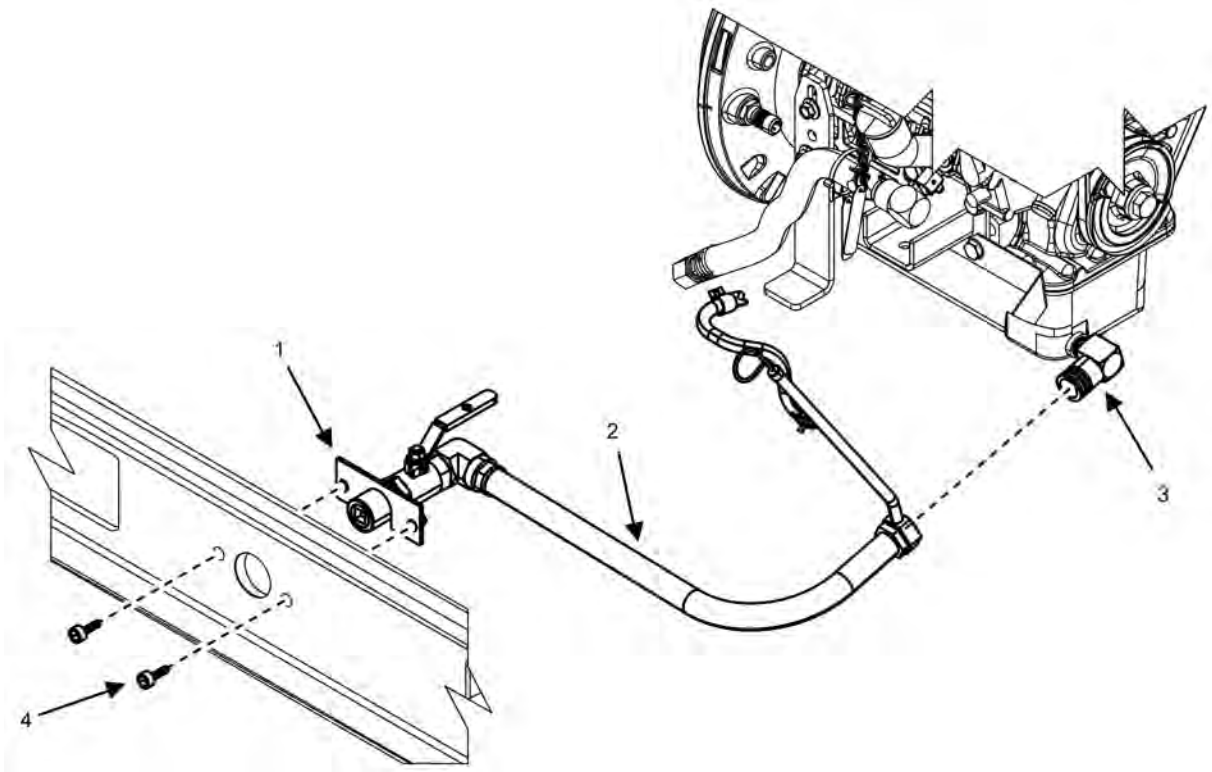


Figure 5. Engine Oil Drain Hose Assembly — Removal.

15. Remove two hex socket head screws (Figure 5, Item 4) that secure bulkhead fitting (Figure 5, Item 1) to unit skid.
16. Place wiping rags under engine oil drain hose assembly (Figure 5, Item 2) to capture any residual oil.

NOTE

Two wrenches are needed to separate engine oil drain hose assembly (Figure 5, Item 2) from 90-degree elbow fitting (Figure 5, Item 3) at engine oil pan.

17. Remove engine oil drain hose assembly (Figure 5, Item 2) at 90-degree elbow fitting (Figure 5, Item 3) at oil pan.
18. Dispose of soiled rags IAW local SOP.

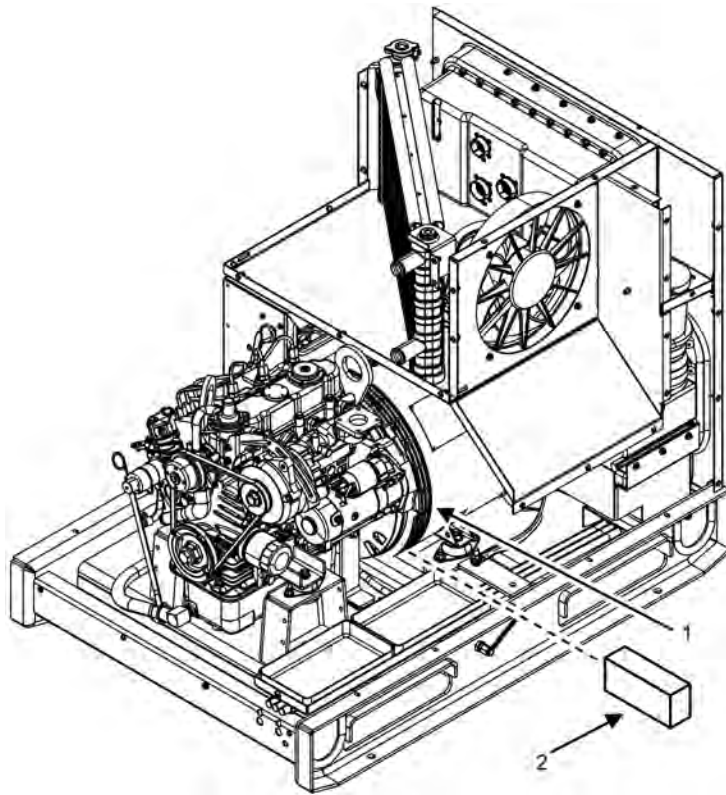


Figure 6. Block AC Generator — Detail.

19. Place blocking (Figure 6, Item 2) under AC generator (Figure 6, Item 1) to keep generator level.

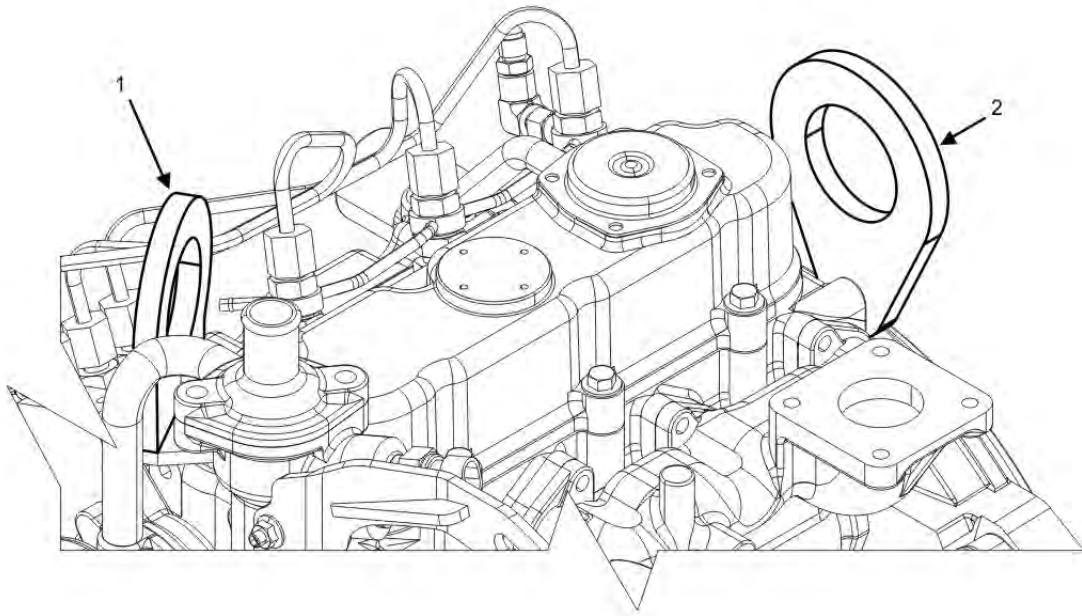


Figure 7. Lifting Eyes — Detail.

20. Inspect lifting eyes (Figure 7, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
21. Replace damaged lifting eyes (Figure 7, Items 1 and 2) and missing hardware (not shown) as required.
22. Tighten loose lifting eye hardware (not shown) to 17 – 21 ft/lb (23 – 29 Nm) as required.
23. Attach suitable lifting device to lifting eyes (Figure 7, Items 1 and 2) of engine.
24. Raise lifting device to remove slack in chains.

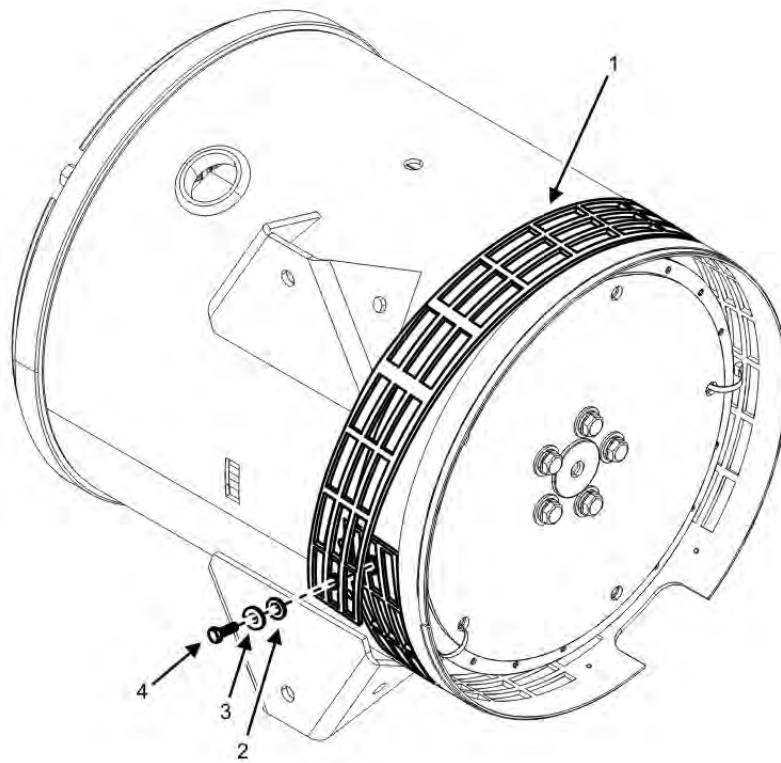


Figure 8. 400 Hz AC Generator Screen — Removal.

25. Remove screw (Figure 8, Item 4), lock washer (Figure 8, Item 3), and flat washer (Figure 8, Item 2) that secure screen (Figure 8, Item 1) to AC generator. Discard lock washer (Figure 8, Item 3).
26. Remove screen (Figure 8, Item 1) from AC generator.

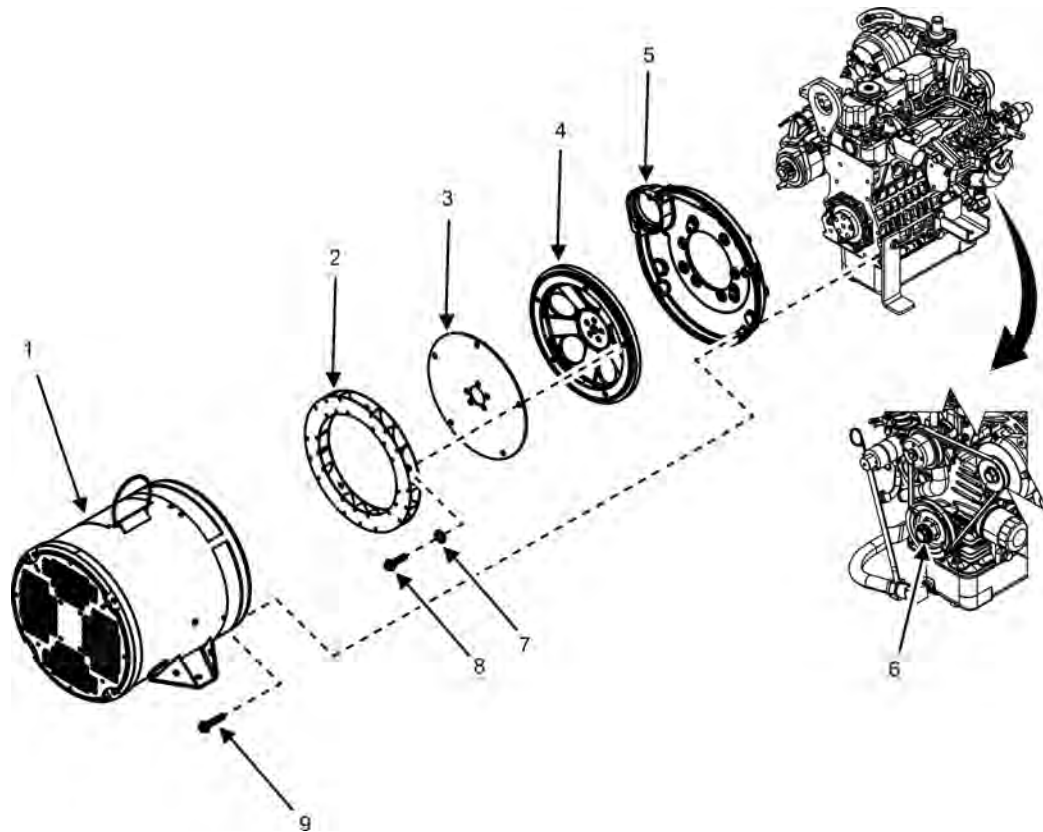


Figure 9. AC Generator Separation, 400 Hz — UOC 98F.

CAUTION

Secure harmonic balancer and do not brace against fan blades during procedure. Failure to comply may cause damage to equipment.

27. Rotate engine harmonic balancer hex cap screw (Figure 9, Item 6) clockwise (viewed from water pump end of engine) using socket and breaker bar to gain access to five screws (Figure 9, Item 8).
28. Remove five screws (Figure 9, Item 8) and five washers (Figure 9, Item 7) securing fan (Figure 9, Item 2) and AC generator drive plate (Figure 9, Item 3) to engine flywheel (Figure 9, Item 4) through opening in AC generator (Figure 9, Item 1) once screen (Figure 8, Item 1) has been removed.
29. Remove four screws (Figure 9, Item 9) that secure AC generator (Figure 9, Item 1) to engine flywheel housing (Figure 9, Item 5).

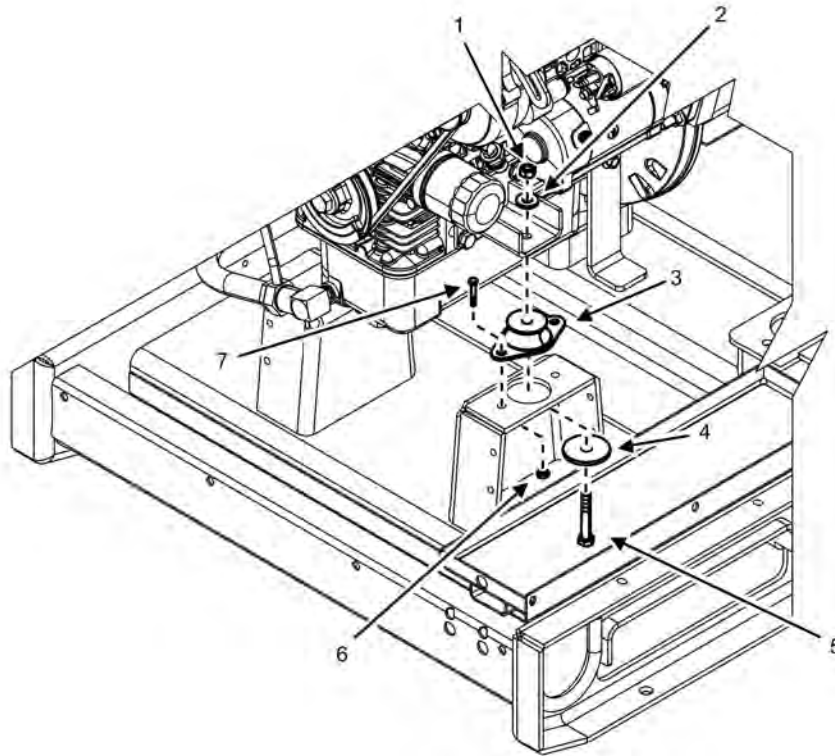


Figure 10. Engine Mounts — Removal.

30. Remove engine mounting bolt (Figure 10, Item 5), snubbing washer (Figure 10, Item 4), flat washer (Figure 10, Item 2), and lock nut (Figure 10, Item 1) securing engine mount plate to left-side vibration isolator (Figure 10, Item 3). Discard lock nut (Figure 10, Item 1).
31. Remove two bolts (Figure 10, Item 7) and lock nuts (Figure 10, Item 6) that secure vibration isolator (Figure 10, Item 3) to unit skid. Discard lock nuts (Figure 10, Item 6).
32. Remove and discard vibration isolator (Figure 10, Item 3) from unit skid.
33. Repeat steps 30 through 32 for right-side vibration isolator.

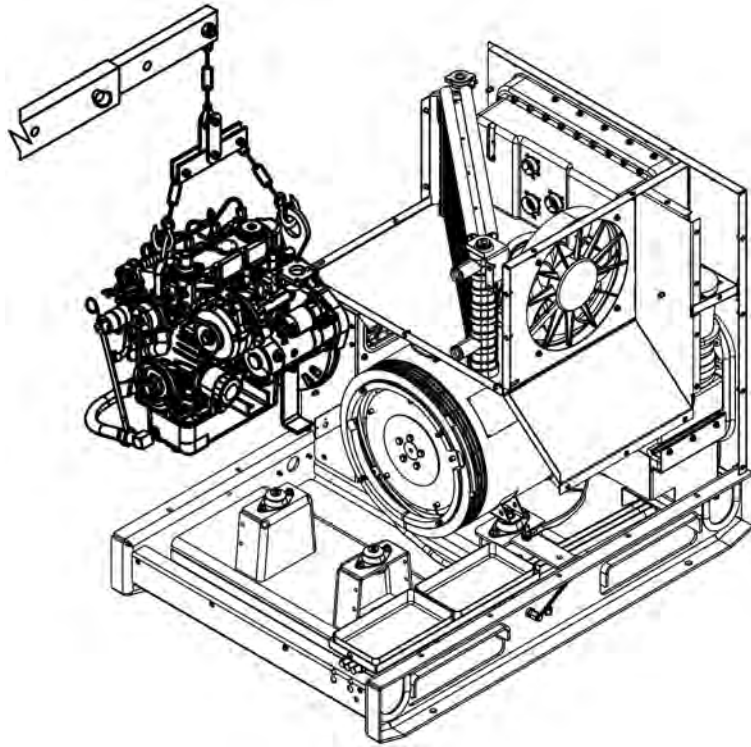


Figure 11. Engine — Removal.

WARNING

When lifting engine, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.

34. Lift engine slightly until free of engine mounts using suitable lifting device (Figure 11).

CAUTION

The main rotor of the AC generator (not shown) may remain attached to engine flywheel as engine is lifted. This is a result of galvanic corrosion between dissimilar metals of the engine flywheel and generator drive plate. Do not allow main rotor to be withdrawn from housing when engine is removed. Failure to comply may cause damage to equipment.

NOTE

If main rotor of AC generator (not shown) begins to withdraw from housing as it is pulled from engine, perform steps 35 through 37 to separate engine and main rotor.

35. Saturate area where engine flywheel (Figure 9, Item 4) and AC generator drive plate (Figure 9, Item 3) are connected with penetrating oil.
36. Allow penetrating oil to soak for 15 min.
37. Strike point of contact between engine flywheel (Figure 9, Item 4) and AC generator drive plate (Figure 9, Item 3) using a hammer and brass drift around circumference of engine flywheel (Figure 9, Item 4) until two components break apart.
38. Pull engine away from AC generator using lifting device (Figure 11).

39. Install wire tie to temporarily secure and align mounting holes in AC generator drive plate (Figure 9, Item 3) and fan (Figure 9, Item 2)
40. Secure engine to engine stand or other suitable work surface.
41. Remove lifting device from engine.

END OF TASK

Inspect 400 Hz Engine Assembly

1. Inspect engine components for signs of obvious damage.
2. Replace damaged engine components as required.
3. Inspect all bolts and washers for damage, deterioration, or wear and replace as required.
4. Inspect mounting location on unit skid for damage, corrosion, or cracks. Replace unit skid as required.

END OF TASK

Install 400 Hz Engine Assembly

1. Position two new vibration isolators (Figure 10, Item 3) to mounting locations on unit skid and secure to each location by installing two bolts (Figure 10, Item 7) and two new lock nuts (Figure 10, Item 6) finger-tight.
2. Tighten new lock nuts (Figure 10, Item 6) to 18 – 21 ft/lb (24 – 29 Nm).
3. Inspect lifting eyes (Figure 7, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
4. Replace damaged lifting eyes (Figure 7, Items 1 and 2) and missing hardware (not shown) as required.
5. Tighten loose lifting eye hardware (not shown) to 17 – 21 ft/lb (23 – 29 Nm) as required.
6. Attach suitable lifting device to lifting eyes (Figure 7, Items 1 and 2) of engine.
7. Raise engine assembly using lifting device.
8. Position engine to its approximate mounting location in unit skid.
9. Clean mating surfaces of engine flywheel (Figure 9, Item 4) and AC generator drive plate (Figure 9, Item 3) using a crocus cloth.
10. Apply antiseize compound to mating surfaces of engine flywheel (Figure 9, Item 4) and AC generator drive plate (Figure 9, Item 3) to minimize corrosion of dissimilar metals.
11. Lower engine slowly, using lifting device, until mounting holes on engine mounts align with vibration isolator (Figure 10, Item 3).
12. Insert engine mounting bolts (Figure 10, Item 5) upside-down in engine mount to temporarily secure engine to vibration isolator (Figure 10, Item 3) on unit skid.
13. Align engine assembly with AC generator (Figure 9, Item 1).
14. Align mounting holes between AC generator (Figure 9, Item 1) and engine flywheel housing (Figure 9, Item 5).
15. Install four screws (Figure 9, Item 9) to secure engine flywheel housing (Figure 9, Item 5) to AC generator (Figure 9, Item 1).
16. Remove wire tie temporarily holding AC generator drive plate (Figure 9, Item 3) to fan (Figure 9, Item 2).

NOTE

For ease of installation, temporarily install two or three screws (Figure 9, Item 8) to secure AC generator drive plate (Figure 9, Item 3) and fan (Figure 9, Item 2) to engine flywheel (Figure 9, Item 4) without washers (Figure 9, Item 7). Installation without washers (Figure 9, Item 7) allows easier alignment of the three mounting holes until the assembly is partially complete. Screws (Figure 9, Item 8) installed without washers (Figure 9, Item 7) will be removed and reinstalled with the washers (Figure 9, Item 7) to properly join the three components.

Orient washers (Figure 9, Item 7) with rounded surface facing drive plate (Figure 9, Item 3).

17. Rotate engine harmonic balancer hex cap screw (Figure 9, Item 6) clockwise (as viewed from front of engine) using socket and breaker bar to position a mounting hole in AC generator drive plate (Figure 9, Item 3), fan (Figure 9, Item 2), and engine flywheel (Figure 9, Item 4) near the top of AC generator (Figure 9, Item 1).
18. Align a mounting hole in each of the three components and temporarily secure by installing one screw (Figure 9, Item 8) without a washer (Figure 9, Item 7).
19. Rotate engine harmonic balancer hex cap screw (Figure 9, Item 6) clockwise (as viewed from front of engine) using socket and breaker bar to position another mounting hole in AC generator drive plate (Figure 9, Item 3), fan (Figure 9, Item 2), and engine flywheel (Figure 9, Item 4) near the top of AC generator (Figure 9, Item 1).
20. Install a second screw (Figure 9, Item 8) to secure AC generator drive plate (Figure 9, Item 3) and fan (Figure 9, Item 2) to engine flywheel (Figure 9, Item 4) without a washer (Figure 9, Item 7).
21. Continue to rotate the crankshaft to position remaining three mounting holes near the top of AC generator (Figure 9, Item 1) and install remaining three screws (Figure 9, Item 8) with washers (Figure 9, Item 7).
22. Rotate the engine harmonic balancer hex cap screw (Figure 9, Item 6) to return screws (Figure 9, Item 8) without washers (Figure 9, Item 7) to top of AC generator (Figure 9, Item 1).
23. Remove screw (Figure 9, Item 8) and reinstall screw (Figure 9, Item 8) with washer (Figure 9, Item 7).
24. Repeat steps 22 and 23 for the remaining screw (Figure 9, Item 8) installed without a washer (Figure 9, Item 7).
25. Tighten five screws (Figure 9, Item 8) to 18 – 21 ft/lb (24 – 29 Nm).
26. Tighten four screws (Figure 9, Item 9) securing engine flywheel housing (Figure 9, Item 5) to AC generator (Figure 9, Item 1) to 42 – 45 ft/lb (55 – 61 Nm).
27. Position screen (Figure 8, Item 1) to its mounting location on AC generator (Figure 9, Item 1).
28. Secure screen (Figure 8, Item 1) to AC generator by installing flat washer (Figure 8, Item 2), new lock washer (Figure 8, Item 3), and screw (Figure 8, Item 4).
29. Remove left-side engine mounting bolt (Figure 10, Item 5) installed upside-down in step 12.
30. Install snubbing washer (Figure 10, Item 4) to engine mounting bolt (Figure 10, Item 5).
31. Install engine mounting bolt (Figure 10, Item 5) with snubbing washer (Figure 10, Item 4) through unit skid and bottom of vibration isolator (Figure 10, Item 3) on left side of skid.
32. Install new lock nut (Figure 10, Item 1) and flat washer (Figure 10, Item 2) to engine mounting bolt (Figure 10, Item 5) finger-tight to secure engine to skid and vibration isolator (Figure 10, Item 3).
33. Repeat steps 29 through 32 to install engine mounting bolt (Figure 10, Item 5) to right side of skid.
34. Tighten new lock nuts (Figure 10, Item 1) to 39 – 45 ft/lb (53 – 65 Nm).
35. Remove blocking (Figure 6, Item 2) from beneath AC generator (Figure 6, Item 1).
36. Remove lifting device from engine.

NOTE

Prior to installation of engine oil drain hose assembly (Figure 5, Item 2), remove all caps/plugs from oil hoses/fittings. Capture spilled engine oil and dispose of IAW local SOP.

Two wrenches are needed to install engine oil drain hose assembly (Figure 5, Item 2) and fittings to engine oil pan.

Apply pipe joint compound to threads of fittings before reassembly.

37. Apply pipe joint compound to 90-degree elbow fitting (Figure 5, Item 3) and install engine oil drain hose assembly (Figure 5, Item 2) to 90-degree elbow fitting (Figure 5, Item 3) in engine oil pan.
38. Position engine oil drain hose assembly (Figure 5, Item 2) bulkhead fitting (Figure 5, Item 1) to its mounting position on unit skid.
39. Ensure oil drain hose assembly (Figure 5, Item 2) lies flat on unit skid.
40. Secure bulkhead fitting (Figure 5, Item 1) to unit skid by installing two hex socket head screws (Figure 5, Item 4).
41. Dispose of soiled rags IAW local SOP.

NOTE

Use tags placed on sensors/senders and wiring harness at removal to assist installation. Leave tags on electrical components until generator set is running properly.

42. Secure electrical connectors at the following locations on exhaust side of engine:
 - a. Electrical connector (Figure 4, Item 2) at engine coolant temperature sensor (Figure 4, Item 1).
 - b. Electrical connector (Figure 4, Item 4) at engine oil pressure sender (Figure 4, Item 3).
43. Install bolt (Figure 3, Item 8), P37 drain wire (Figure 3, Item 9), and loop clamp (Figure 3, Item 1) to engine block. Torque bolt (Figure 3, Item 8) to 35 to 42 ft/lbs (48 to 57 Nm).
44. Position wiring for DEAD CRANK SWITCH across rear of engine assembly and position DEAD CRANK SWITCH bracket (Figure 3, Item 7) to its mounting location on interior body panel and align the mounting holes.
45. Secure DEAD CRANK SWITCH bracket (Figure 3, Item 7) to interior body panel by installing screw (Figure 3, Item 6).
46. Secure electrical connectors at the following locations on intake side of engine:
 - a. Electrical connector (Figure 3, Item 4) at engine governor actuator (Figure 3, Item 3).
 - b. Electrical connector (Figure 3, Item 5) at the engine speed sensor (Figure 3, Item 2).

NOTE

Prior to installation, remove all caps/plugs from fuel lines/fittings.

47. Install fuel vent hose (Figure 2, Item 2) to fuel injection overflow tube (Figure 2, Item 1).
48. Install fuel supply hose (Figure 2, Item 4) to fuel injection pump (Figure 2, Item 3).
49. Install starter wiring (WP 0077, Remove/Install Starter)
50. Install battery-charging alternator wiring (WP 0075, Remove/Install Battery-Charging Alternator Assembly)
51. Install winterization kit and mounting bracket (as required) (WP 0025, Remove/Install Winterization Kit Components).

-
52. Install unit bulkhead (WP 0035, Remove/Install Interiors Body Panels).
 53. Install exhaust flex pipe (WP 0080, Remove/Install Exhaust Manifold).
 54. Install muffler (WP 0081, Remove/Install Muffler).
 55. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
 56. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
 57. Install front body panel (WP 0029, Remove/Install Front Body Panel).
 58. Install fuel filter/water separator (WP 0042, Remove/Install Fuel Filter/Water Separator Assembly).
 59. Install radiator hoses (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
 60. Install top body panel (WP 0028, Remove/Install Top Body Panel).
 61. Fill engine oil (WP 0066, Service Lubrication System).
 62. Fill coolant (WP 0021, Service Cooling System).
 63. Fill fuel tank (WP 0039, Service Fuel System).
 64. Install batteries (WP 0036, Remove/Install Batteries).
 65. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
 66. Start engine and check for proper operation and fluid leaks. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
 67. Repair as required.
 68. Turn engine control switch to OFF (TM 9-6115-749-10).
 69. Remove all temporary identification tags/markings from electrical components.
 70. Ensure oil and coolant levels are at proper operating level (TM 9-6115-749-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
SERVICE LUBRICATION SYSTEM

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Filter, engine oil (1) (WP 0124, Repair Parts List, Figure 26, Item 5)

Washer, seal (2) (WP 0124, Figure 25, Item 7)

Cap set, protective (WP 0163, Expendable and Durable Items List, Item 8)

Lubricating oil, engine (WP 0163, Item 23)

Lubricating oil, engine (WP 0163, Item 24)

Lubricating oil, engine (WP 0163, Item 25)

Rag, wiping (WP 0163, Item 31)

Sealant (WP 0163, Item 32)

Tag, marker (WP 0163, Item 35)

Personnel Required

91D (1)

References

MIL-PRF-2104H

MIL-PRF-46167D

WP 0029, Remove/Install Front Body Panel

WP 0036, Remove/Install Batteries

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

SERVICE LUBRICATION SYSTEM**WARNING**

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

Remove Oil Drain Hose Assembly

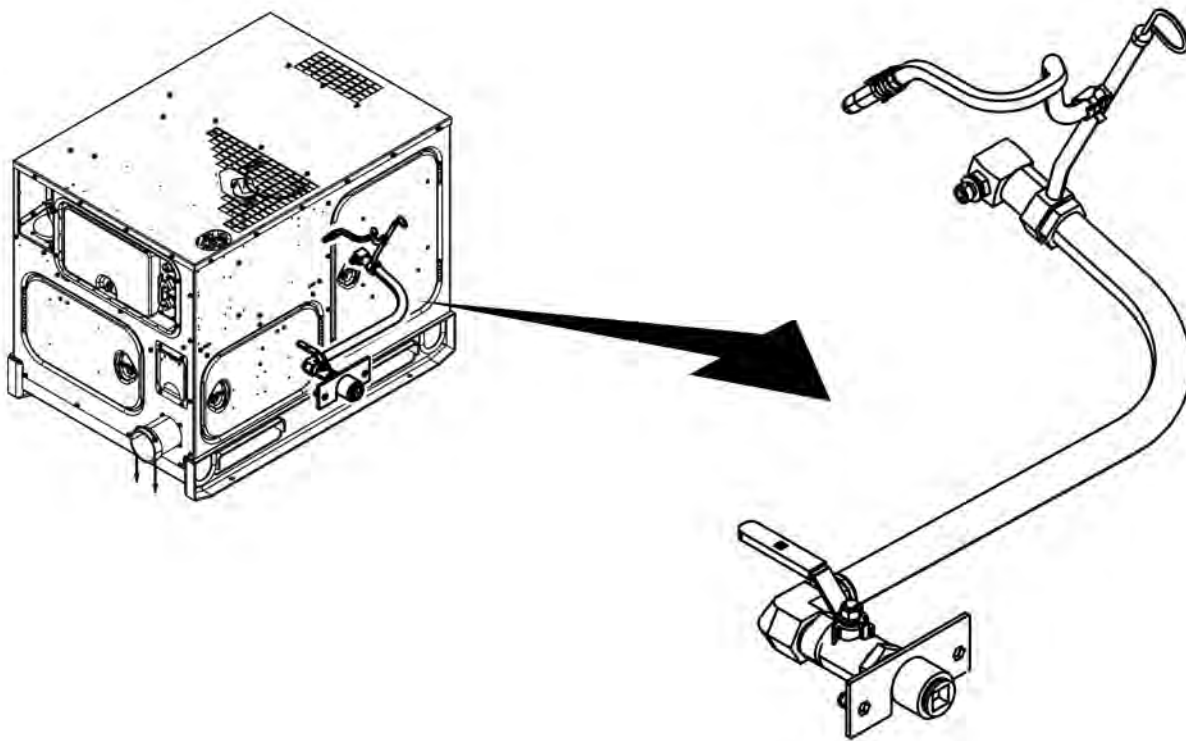


Figure 1. Oil Drain Hose Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Drain engine oil. See Drain Engine Oil and Remove Oil Filter tasks.
3. Ensure plug (Figure 2, Item 9) has been installed into bulkhead fitting (Figure 2, Item 11) after oil has been drained.
4. Open right-side door of generator set.
5. Locate engine oil drain hose assembly (Figure 1).

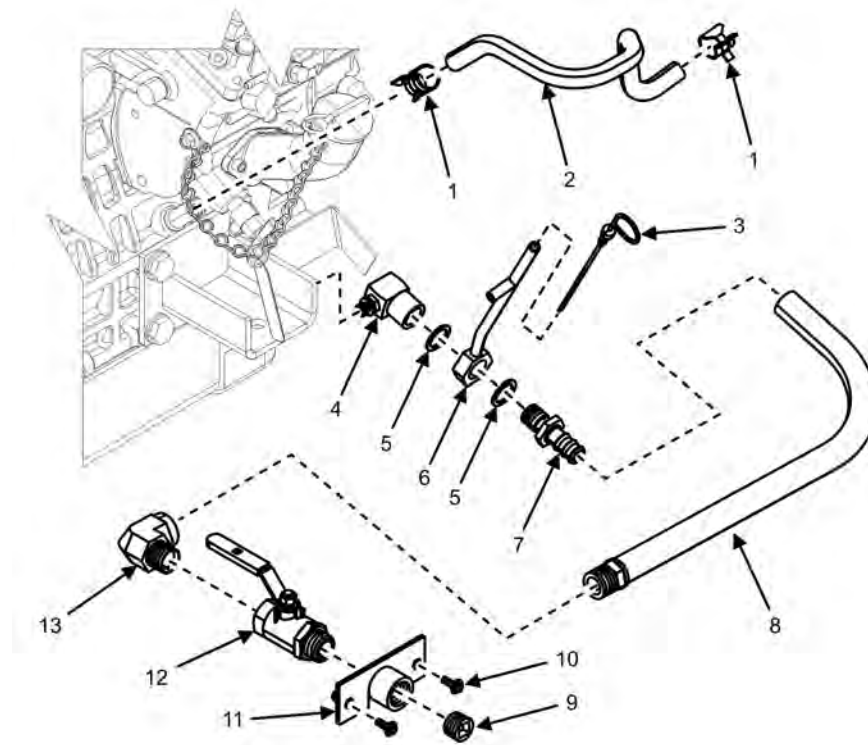


Figure 2. Oil Drain Hose — Detail.

NOTE

Ensure ball valve (Figure 2, Item 12) is in closed position (handle is perpendicular to valve).
Capture and dispose of spilled engine oil and soiled rags IAW local SOP.

6. Place wiping rags under oil drain hose assembly to capture spilled, residual oil.
7. Reposition breather hose clamp (Figure 2, Item 1) at nipple on dipstick tube (Figure 2, Item 6),
8. Remove breather hose (Figure 2, Item 2) from nipple at dipstick tube (Figure 2, Item 6).
9. Remove bulkhead fitting (Figure 2, Item 11) from unit skid by removing two screws (Figure 2, Item 10).

NOTE

Two wrenches will be required to separate the banjo adapter (Figure 2, Item 7) and elbow (Figure 2, Item 4). Capture and dispose of spilled engine oil and soiled rags IAW local SOP.

10. Disconnect banjo adapter (Figure 2, Item 7) from elbow (Figure 2, Item 4) at dipstick tube (Figure 2, Item 6).
11. Remove oil drain hose assembly, dipstick tube (Figure 2, Item 6) with dipstick (Figure 2, Item 3), and two seal washers (Figure 2, Item 5) from unit and place on a suitable work surface. Discard seal washers (Figure 2, Item 5).
12. Remove elbow (Figure 2, Item 4) from engine oil pan.
13. Cap/plug open port in engine oil pan to prevent dirt and contamination from entering engine.

END OF TASK

Repair Oil Drain Hose Assembly

1. Tag all oil drain hose assembly fittings before disassembly.
2. Apply index marks to fittings to aid in reassembly.
3. Disassemble engine oil drain hose assembly into component parts as shown in Figure 2.
 - a. Bulkhead fitting (Figure 2, Item 11)
 - b. Plug (Figure 2, Item 9)
 - c. Screw (Figure 2, Item 10)
 - d. Ball valve (Figure 2, Item 12)
 - e. Elbow (2) (Figure 2, Items 4 and 13)
 - f. Engine oil drain hose (Figure 2, Item 8) attached to banjo adapter (Figure 2, Item 7)
 - g. Breather hose (Figure 2, Item 2)
 - h. Clamp (2) (Figure 2, Item 1)
 - i. Dipstick tube (Figure 2, Item 6) with dipstick (Figure 2, Item 3)
 - j. Seal washer (2) (Figure 2, Item 5)

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

4. Clean dirt, grease and oil from oil drain hose assembly parts (Figure 2, Items 4, 6, 7, 12, and 13) using dry cleaning solvent and rags being careful not to erase index marks applied during removal.
5. Inspect engine oil drain hose assembly components (Figure 2, Items 4, 6, 7, 12, and 13) for corrosion, damaged fittings, frayed, cut, or crushed hose.
6. Replace damaged components as required.

NOTE

Apply pipe sealant to threads of all fittings before reassembly.

7. Assemble oil drain hose (Figure 2, Item 8) banjo adapter (Figure 2, Item 7), elbow (Figure 2, Item 13), ball valve (Figure 2, Item 12), drain plug (Figure 2, Item 9), and bulkhead fitting (Figure 2, Item 11) as shown in Figure 2 using index marks applied at removal as a guide.
8. Assemble breather hose (Figure 2, Item 2) and two clamps (Figure 2, Item 1) to dipstick tube (Figure 2, Item 6).

END OF TASK

Install Engine Oil Drain Hose Assembly

NOTE

Assemble all components of engine oil drain hose assembly finger-tight until entire assembly is installed in unit skid. Once assembly is installed in unit skid and adjusted to lie flat, tighten each fitting individually.

Remove cap/plugs from fittings as required during installation.

Apply pipe sealant to threads of elbow (Figure 2, Item 4) and banjo adapter (Figure 2, Item 7) before reassembly

1. Install elbow (Figure 2, Item 4) to engine oil pan.
2. Connect oil drain hose assembly to elbow (Figure 2, Item 13).
3. Install dipstick tube (Figure 2, Item 6) with dipstick (Figure 2, Item 3) and two new sealing washers (Figure 2, Item 5) to oil drain hose assembly at banjo adapter (Figure 2, Item 7).
4. Connect banjo adapter (Figure 2, Item 7) to elbow (Figure 2, Item 4).
5. Position bulkhead fitting (Figure 2, Item 11) to unit skid and secure with two screws (Figure 2, Item 10) finger-tight.
6. Adjust all components to lie flat on unit skid floor.
7. Ensure ball valve (Figure 2, Item 12) handle can move freely from fully open to fully closed positions.
8. Tighten each fitting in the engine oil drain hose assembly individually while ensuring assembly lies flat on unit skid.
9. Close ball valve (Figure 2, Item 12) (handle is perpendicular to valve).
10. Install breather hose (Figure 2, Item 2) to nipple at dipstick tube (Figure 2, Item 6).
11. Fill engine with oil (TM 9-6115-749-10).
12. Dispose of captured oil and soiled rags IAW local SOP.

END OF TASK

Drain Engine Oil and Remove Oil Filter

WARNING

While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply can cause injury or death to personnel.

NOTE

Engine oil filter should always be replaced when the engine oil is changed. Procedure to replace the engine oil filter is incorporated in the Replace Oil Filter and Fill Engine Oil task.

1. Warm engine oil. If engine has not recently been run, start engine and run for 15 min or until unit has reached normal operating temperature (195°F (90.5°C)) (TM 9-6115-749-10).
2. Stop engine.

WARNING

Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.

3. Open right- and left-side doors on generator set.
4. Remove access panel (WP 0029, Remove/Install Front Body Panel).

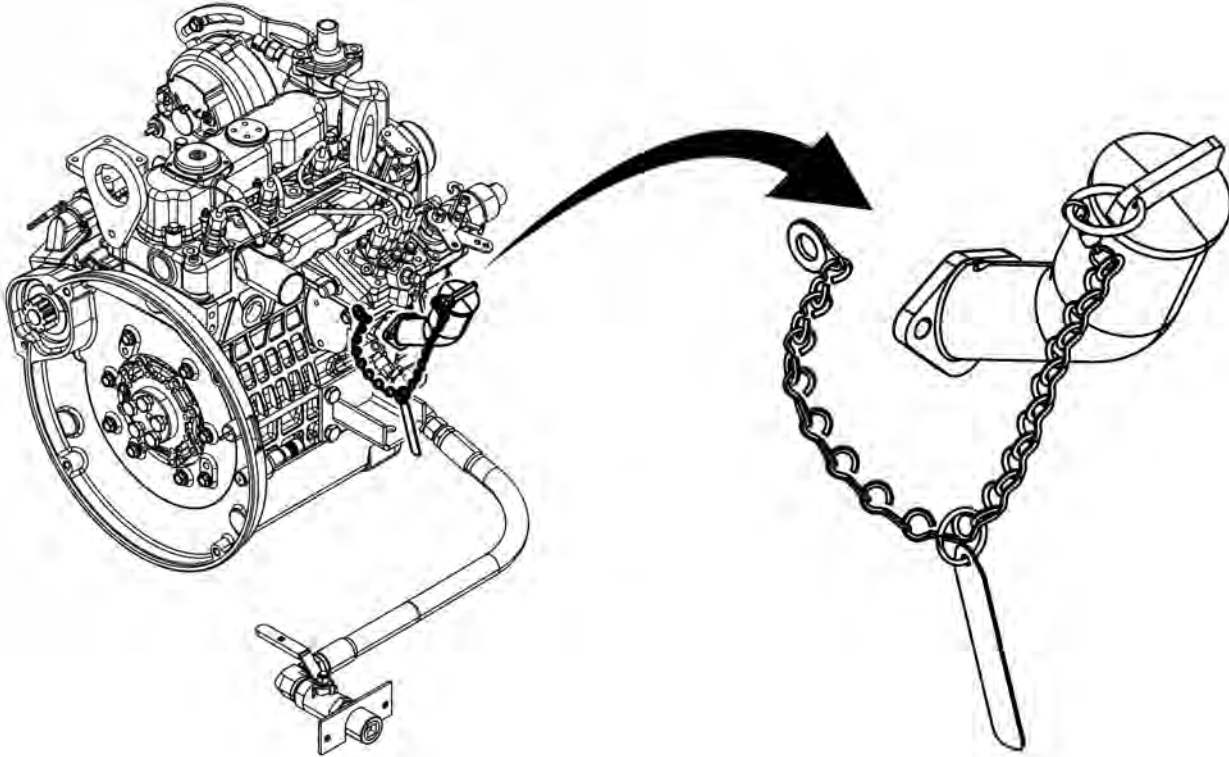


Figure 3. Oil Filler — Location.

5. Locate engine oil fill assembly on intake side of engine (Figure 3).

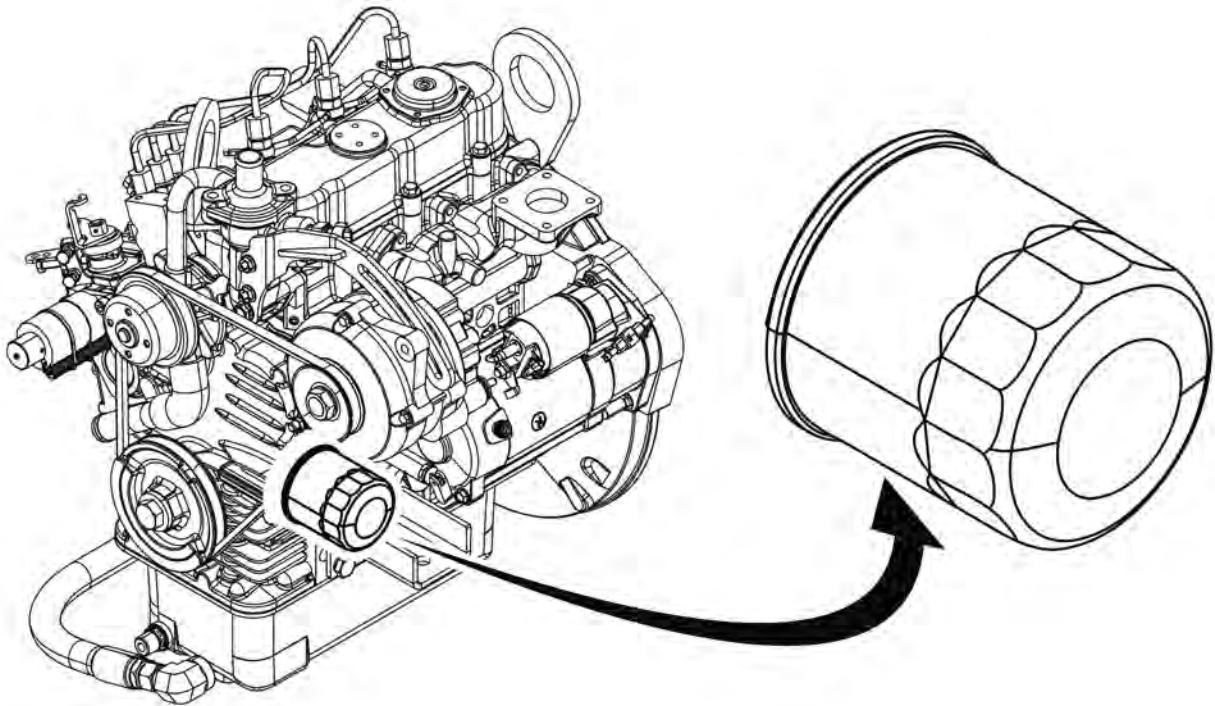


Figure 4. Oil Filter — Location.

6. Locate engine oil filter on exhaust side of engine (Figure 4).
7. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).

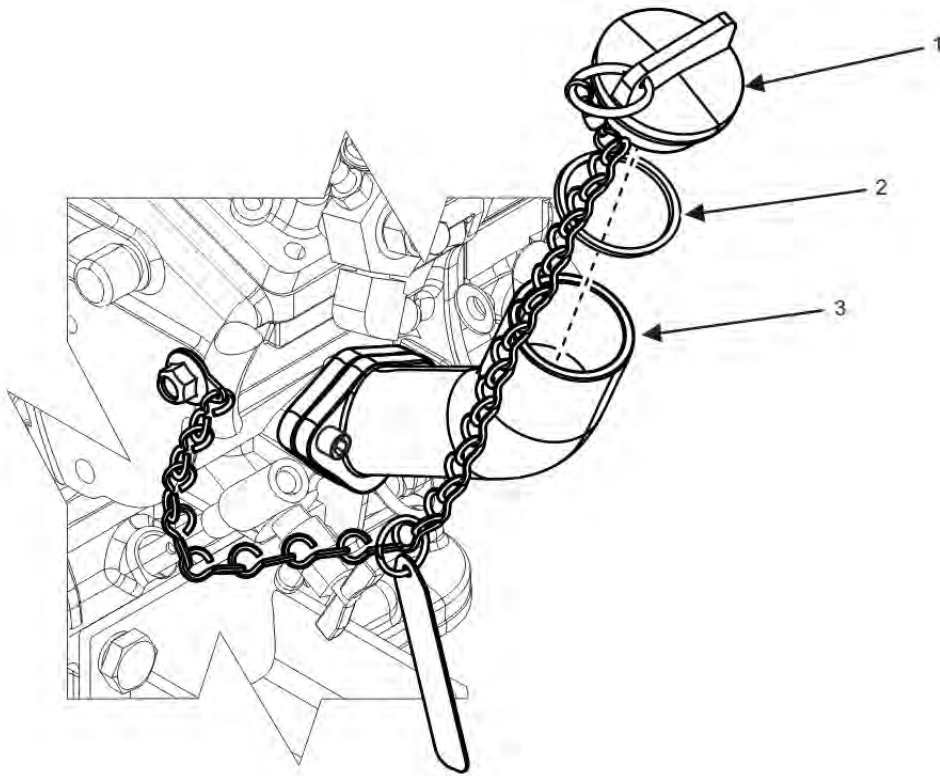


Figure 5. Oil Filler — Detail.

8. Remove engine oil filler cap (Figure 5, Item 1) from engine oil fill port (Figure 5, Item 3).
9. Inspect o-ring (Figure 5, Item 2) on oil filler cap (Figure 5, Item 1) for damage. Replace damaged o-ring (Figure 5, Item 2).

NOTE

Capture and dispose of spilled engine oil and soiled rags IAW local SOP.

10. Place a suitable container under engine oil drain plug (Figure 2, Item 9) to capture drained oil.
11. Remove drain plug (Figure 2, Item 9) from bulkhead fitting (Figure 2, Item 11).
12. Install a 6", 3/4" NPT galvanized nipple in bulkhead fitting (Figure 2, Item 11) on right-side of skid.
13. Open ball valve (Figure 2, Item 12) to allow oil to drain into container.
14. Close ball valve (Figure 2, Item 12) when oil flow has stopped.
15. Remove 6", 3/4" NPT galvanized nipple from bulkhead fitting (Figure 2, Item 11) on right-side of skid.
16. Install drain plug (Figure 2, Item 9) in bulkhead fitting (Figure 2, Item 11).

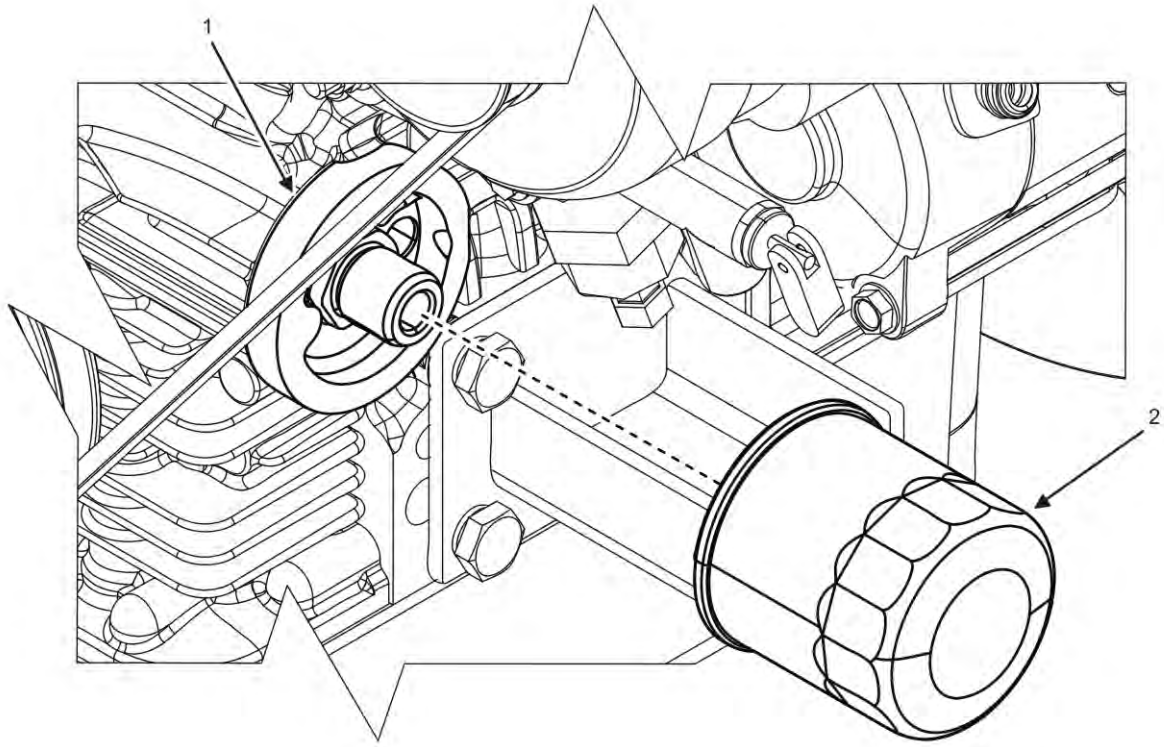


Figure 6. Oil Filter — Detail.

17. Place wiping rag under oil filter (Figure 6, Item 2) to capture residual oil when oil filter (Figure 6, Item 2) is removed.
18. Turn oil filter (Figure 6, Item 2) counterclockwise and remove from engine.
19. Place oil filter (Figure 6, Item 2) in oil drain pan to drain.

NOTE

The oil filter gasket is embedded in the groove at the base of the oil filter.

20. Verify that all oil filter gasket was removed from engine with oil filter (Figure 6, Item 2).
21. Remove any remaining oil filter gasket material from oil filter mounting surface (Figure 6, Item 1).

END OF TASK

Replace Oil Filter and Fill Engine Oil

1. Clean oil filter mounting surface (Figure 6, Item 1) with a clean wiping rag.

NOTE

The oil filter gasket is embedded in the groove at the base of the oil filter.

Choose specification oil based on ambient temperature requirements (Table 1).

2. Apply a thin coat of clean engine lubricating oil (Table 1) to gasket of new oil filter (Figure 6, Item 2).

Table 1. Lubricating Oil.

SPECIFICATION	RATED TEMPERATURE
MIL-PRF-2104H ^a OE/HDO 15W40	+5°F to +135°F (-15°C to +57°C)
MIL-PRF-2104H OE/HDO-10	-15°F to +5°F (-26°C to -15°C)
MIL-PRF-46167D ^b	-50°F to +40°F (-45°C to +4°C)

^a Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service.

^b Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic.

3. Install new oil filter (Figure 6, Item 2) to oil filter mounting surface (Figure 6, Item 1) by turning filter clockwise.
4. Continue turning oil filter (Figure 6, Item 2) three-fourths of a turn after gasket has contacted filter mounting surface (Figure 6, Item 1).
5. Install drain plug (Figure 2, Item 9) into bulkhead fitting (Figure 2, Item 11).

CAUTION

Improper engine oil level may cause internal engine failure. If the oil level is too high, engine oil pressure will rise and may result in failure of internal engine oil seals. If the oil level is too low, insufficient pressure may cause failure of internal engine components. Ensure engine oil is at proper level. Failure to comply may cause damage to equipment.

6. Close ball valve (Figure 2, Item 12) if not already closed.

NOTE

The oil capacity of the generator set engine is 3.9 qt (3.7 L).

7. Remove engine oil filler cap (Figure 5, Item 1) from engine.
8. Pour required amount of approved oil (Table 1) into engine at oil fill port (Figure 5, Item 3).
9. Apply a thin film of clean engine oil to o-ring (Figure 5, Item 2) on oil filler cap (Figure 5, Item 1).
10. Install engine oil filler cap (Figure 5, Item 1) oil fill port (Figure 5, Item 3).
11. Allow 5 min for engine oil to settle into oil pan and check engine oil level and fill to proper level (TM 9-6115-749-10).
12. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
13. Close right- and left-side doors on generator set.
14. Install access panel (WP 0029, Remove/Install Front Body Panel).
15. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
16. Start engine and run until it reaches normal operating temperature and check for proper operation (TM 9-6115-749-10).
17. Repair as required.
18. Ensure engine lubricating oil is at proper level (TM 9-6115-749-10).
19. Dispose of drained oil, used oil filter, and soiled rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL ENGINE SPEED SENSOR

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Sensor, magnetic speed (WP 0125, Repair Parts List, Figure 27, Item 1)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10 WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

REMOVE/INSTALL ENGINE SPEED SENSOR**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Adjust Engine Speed Sensor

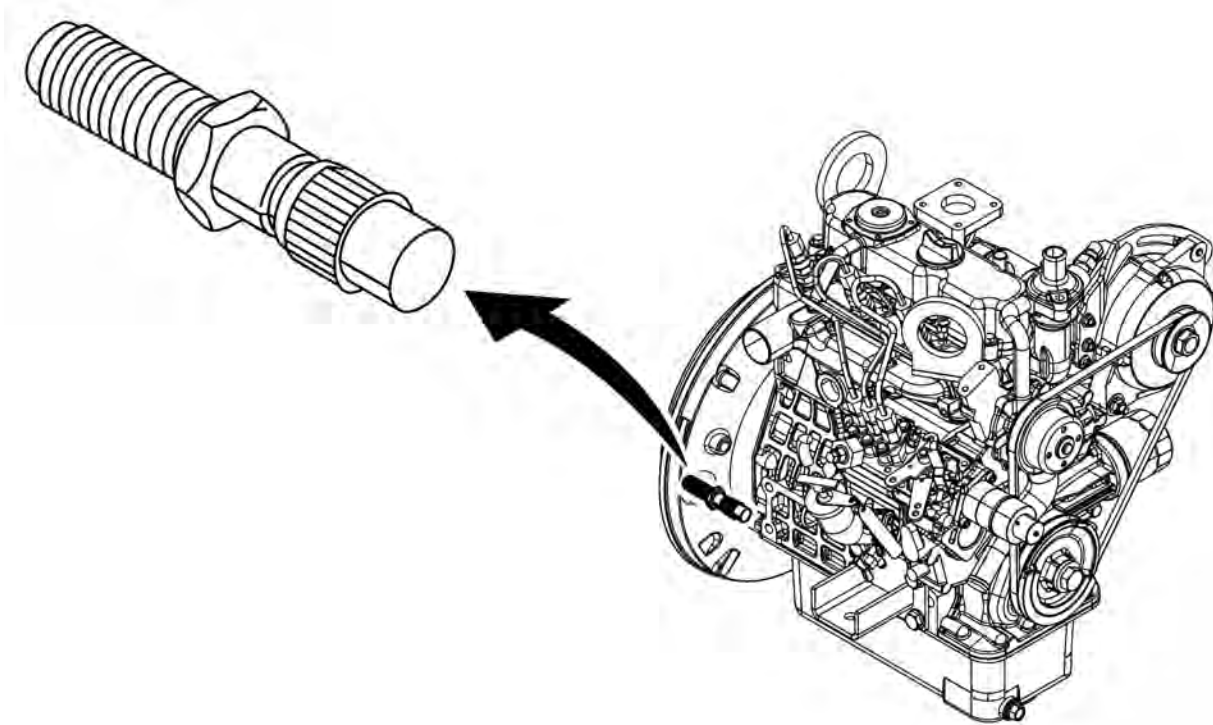


Figure 1. Engine Speed Sensor — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door.
3. Locate engine speed sensor (Figure 1).

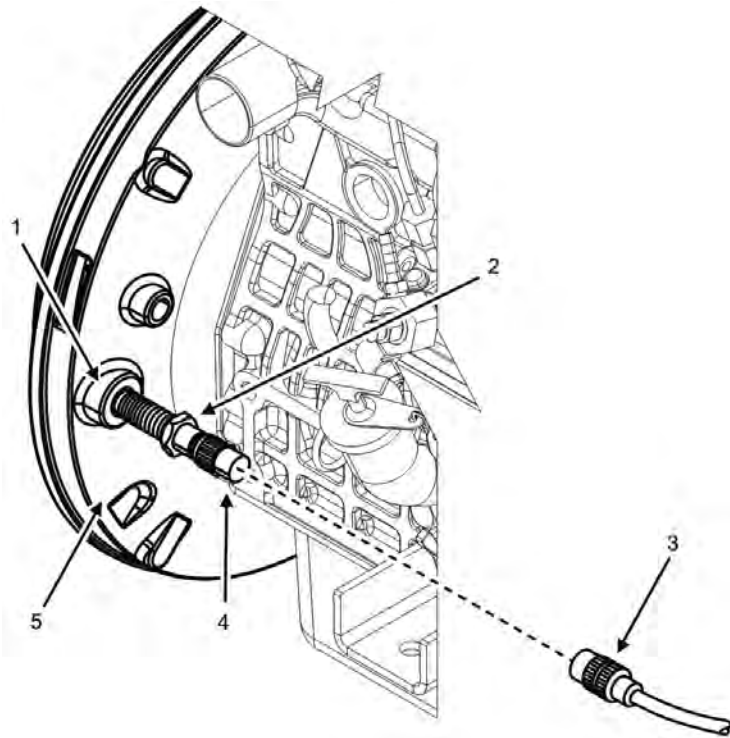


Figure 2. Engine Speed Sensor — Adjust.

CAUTION

Engine speed sensor is a magnetic pickup device. There must be a specific gap between engine speed sensor and flywheel. Engine speed reading will not be transmitted to unit DCS if gap is not within specification, if engine speed sensor is between two teeth, or if engine speed sensor contacts flywheel. Failure to comply will cause damage to equipment.

4. Adjust gap of engine speed sensor (Figure 2, Item 4) as follows:
 - a. Disconnect electrical connector (Figure 2, Item 3) from engine speed sensor (Figure 2, Item 4) if not already disconnected.
 - b. Loosen jam nut (Figure 2, Item 2) that secures engine speed sensor (Figure 2, Item 4) to flywheel housing (Figure 2, Item 5) in engine speed sensor port (Figure 2, Item 1) if not already loose.

CAUTION

Engine speed sensor is very fragile. When adjusting engine speed sensor, turn sensor inward very slowly until engine speed sensor just touches flywheel tooth. Hard contact with the flywheel tooth may cause engine speed sensor to fail. Failure to comply may cause damage to equipment.

- c. Turn engine speed sensor (Figure 2, Item 4) slowly inward (clockwise) until engine speed sensor (Figure 2, Item 4) just contacts flywheel tooth.
- d. Tighten jam nut (Figure 2, Item 2) until it lightly touches flywheel housing (Figure 2, Item 5).
- e. Turn engine speed sensor (Figure 2, Item 4) (with jam nut (Figure 2, Item 2) attached) outward (counterclockwise) until gap between flywheel housing (Figure 2, Item 5) and jam nut (Figure 2, Item 2) is 0.032 – 0.035 in.
- f. Tighten jam nut (Figure 2, Item 2) firmly against flywheel housing (Figure 2, Item 5) while holding the engine speed sensor (Figure 2, Item 4) stationary to maintain the correct gap.

- g. Connect electrical connector (Figure 2, Item 3) to engine speed sensor (Figure 2, Item 4).
- 5. Install battery ground cable (WP 0036, Remove/Install Batteries) to right-hand battery.
- 6. Close generator set doors.
- 7. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
- 8. Start engine and check for proper operation.
- 9. Repair as required.

END OF TASK

Remove Engine Speed Sensor

- 1. Ensure equipment conditions are met in order presented in initial setup.
- 2. Open right-side door.
- 3. Locate engine speed sensor (Figure 1).

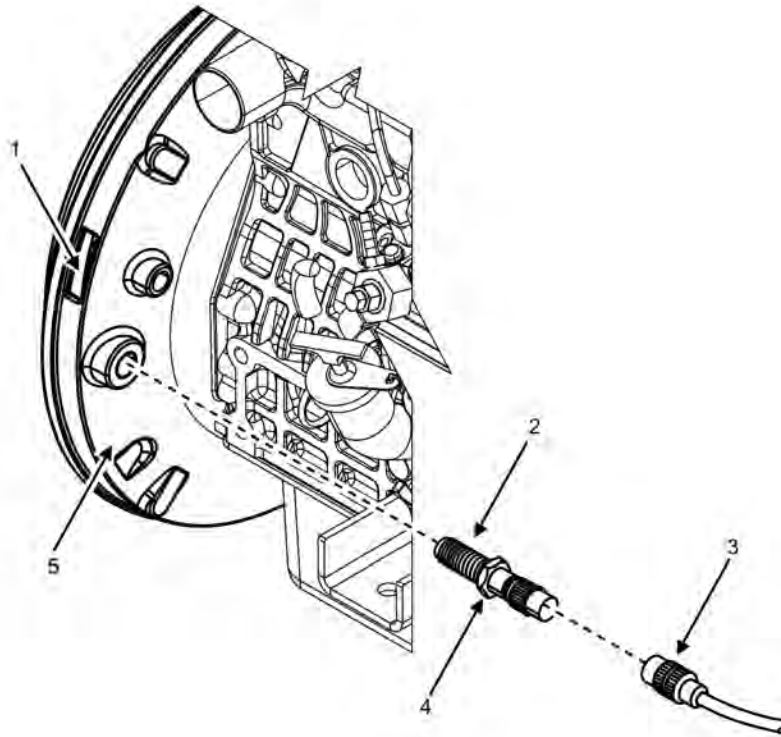


Figure 3. Engine Speed Sensor — Removal.

4. Disconnect electrical connector (Figure 3, Item 3) at engine speed sensor (Figure 3, Item 2).
5. Loosen jam nut (Figure 3, Item 4) that secures engine speed sensor (Figure 3, Item 2) to flywheel housing (Figure 3, Item 5).
6. Remove engine speed sensor (Figure 3, Item 2) from flywheel housing (Figure 3, Item 5) by turning engine speed sensor (Figure 3, Item 2) counterclockwise.

END OF TASK**Test Engine Speed Sensor**

1. Inspect engine speed sensor (Figure 3, Item 2) for signs of obvious damage.
2. Replace damaged engine speed sensor (Figure 3, Item 2).

END OF TASK**Install Engine Speed Sensor**

1. Position engine speed sensor (Figure 3, Item 2) to its mounting location on intake side of engine at flywheel housing (Figure 3, Item 5).

CAUTION

Engine speed sensor is a magnetic pickup device. There must be a specific gap between engine speed sensor and flywheel. Engine speed reading will not be transmitted to unit DCS if gap is not within specification, if engine speed sensor is between two teeth, or if engine speed sensor contacts flywheel. Failure to comply will cause damage to equipment.

2. Install engine speed sensor (Figure 3, Item 2) into flywheel housing (Figure 3, Item 5) by turning clockwise. Stop installation before engine speed sensor (Figure 3, Item 2) contacts flywheel.
3. Adjust gap between engine speed sensor (Figure 3, Item 2) and flywheel. See Adjust Engine Speed Sensor task.
4. Tighten jam nut (Figure 3, Item 4) on engine speed sensor (Figure 3, Item 2) to lock gap.
5. Connect electrical connector (Figure 3, Item 3) to engine speed sensor (Figure 3, Item 2).
6. Install battery ground cable (WP 0036, Remove/Install Batteries).
7. Close generator set doors.
8. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
9. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
10. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL GLOW PLUGS

INITIAL SETUP:**Tools and Special Tools**

Socket, Impact Wrench, 3/8" Dr, 6Pt, Deep, 10mm
(WP 0162, Table 2, Item 23)

Tool Kit, General Mechanic's (GMTK) (WP 0162,
Table 2, Item 32)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB
(WP 0162, Table 2, Item 40)

Materials/Parts

Glow plug (3) (WP 0126, Repair Parts List, Figure
28, Item 1)

Cap set, protective (WP 0163, Expendable and
Durable Items List, Item 8)

Grease, electrically conductive (WP 0163, Item 20)

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10,
WP 0005)

Engine cool

Battery ground cable removed (WP 0036,
Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install
Top Body Panel)

REMOVE/INSTALL GLOW PLUG**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Remove Glow Plug

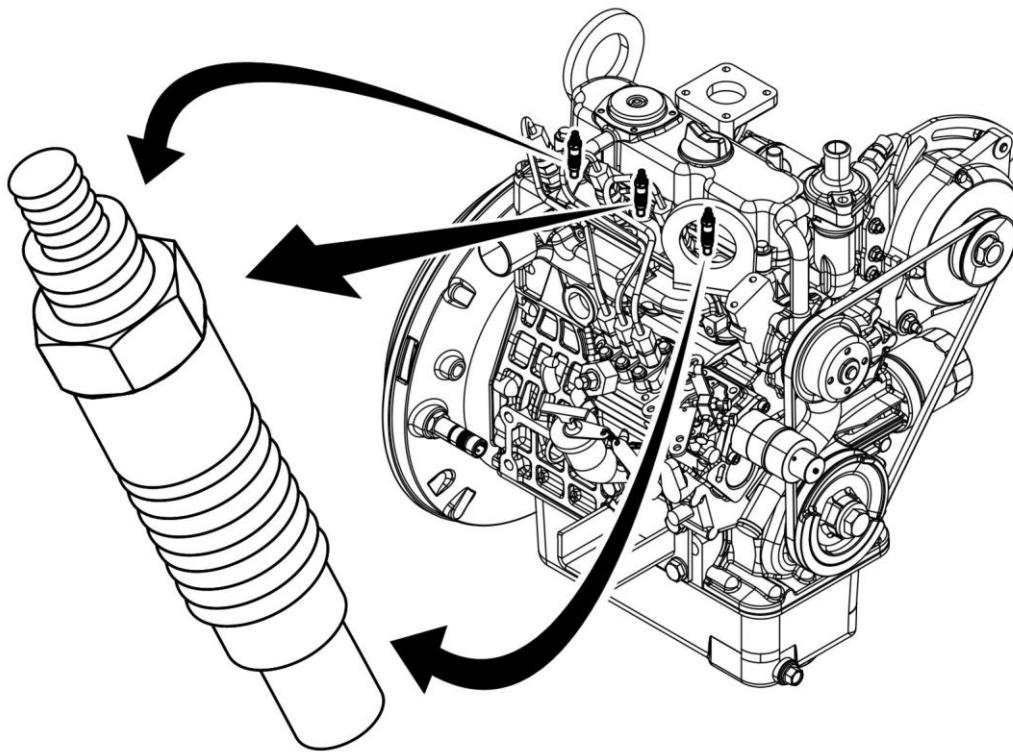


Figure 1. Glow Plug — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate glow plugs (Figure 1) on intake side of engine.

NOTE

Several engine parts have been omitted from Figure 2 for the sake of clarity.

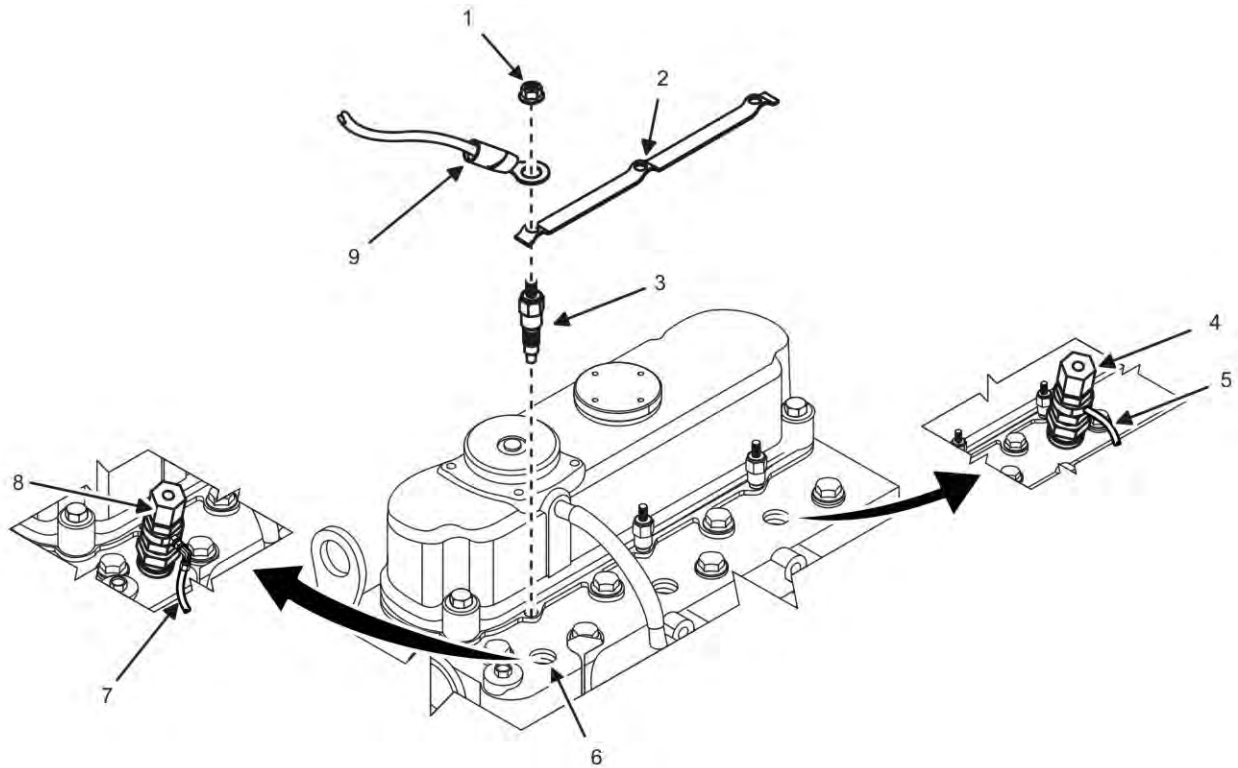


Figure 2. Glow Plug — Detail.

3. Remove nut (Figure 2, Item 1) securing glow plug contact strip (Figure 2, Item 2) and wire lead (Figure 2, Item 9) to number three glow plug (Figure 2, Item 3).
4. Remove wire lead (Figure 2, Item 9) from number three glow plug (Figure 2, Item 3).
5. Remove two nuts (Figure 2, Item 1) securing glow plug contact strip (Figure 2, Item 2) to remaining glow plugs.
6. Remove glow plug contact strip (Figure 2, Item 2) from glow plugs.

NOTE

Access to glow plug does not require removal of fuel return lines if using a 10 mm 3/8-in drive deep well socket. Skip steps 7 and 8 and proceed to step 9 as required.

Capture spilled fuel and dispose of IAW local SOP.

Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

7. Disconnect and cap/plug fuel return line (Figure 2, Item 7) running between number three injector (Figure 2, Item 8) and fuel filter/water separator (not shown) attached to front body panel.

8. Disconnect and cap/plug fuel overflow line (Figure 2, Item 5) running between number one injector (Figure 2, Item 4) and fuel injector pump (not shown).
9. Remove three glow plugs (Figure 2, Item 3) from engine head assembly (Figure 2, Item 6).

END OF TASK

Inspect Glow Plug

1. Inspect glow plug (Figure 2, Item 3) for damage or corrosion. Repair or replace as required.
2. Inspect glow plug contact strip (Figure 2, Item 2) and all nuts (Figure 2, Item 1) for damage or corrosion. Repair or replace as required.
3. Inspect wire lead (Figure 2, Item 9) for damage or corrosion. Repair or replace as required.
4. Inspect fuel overflow line (Figure 2, Item 5) and fuel return line (Figure 2, Item 7) for damage or corrosion. Repair or replace as required.

END OF TASK

Test Glow Plug

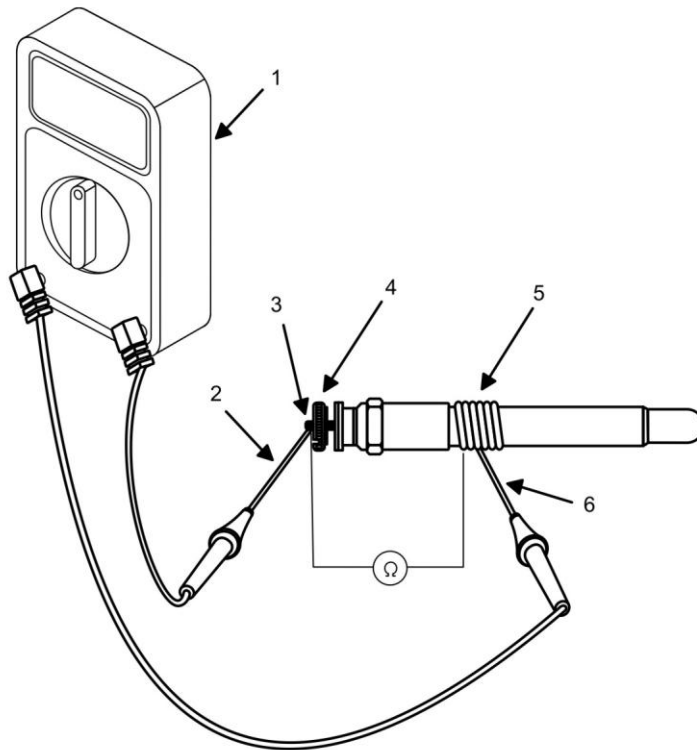


Figure 3. Test Glow Plug.

NOTE

Ensure that the multimeter probe (Figure 3, Item 2) makes contact with the glow plug terminal (Figure 3, Item 3) and not the glow plug insulator (Figure 3, Item 4).

1. Set multimeter (Figure 3, Item 1) for Ohms (Ω) and test on a known connection to verify accuracy.

2. Place one multimeter probe (Figure 3, Item 2) on glow plug terminal (Figure 3, Item 3) and one probe (Figure 3, Item 6) on glow plug chassis (Figure 3, Item 5) to measure resistance.
3. Replace glow plug if resistance (Ω) reading does not meet factory specification of approximately 5 Ω at 77°F (25°C).
4. Repeat steps 1 through 3 for remaining glow plugs.

END OF TASK

Install Glow Plug

1. Install three glow plugs (Figure 2, Item 3) finger-tight to mounting locations in engine head assembly (Figure 2, Item 6).
2. Secure glow plugs (Figure 2, Item 3) to a torque value of 6 – 11 ft/lb (8 – 15 Nm).
3. Position glow plug contact strip (Figure 2, Item 2) to terminals of three glow plugs (Figure 2, Item 3).
4. Position wire lead (Figure 2, Item 9) on top of number three glow plug (Figure 2, Item 3).
5. Install three nuts (Figure 2, Item 1) to terminals of three glow plugs (Figure 2, Item 3).

NOTE

Access to glow plug does not require removal and installation of fuel return lines if using a 10 mm 3/8-in drive deep well socket. Skip steps 6 through 9 and proceed to step 10 as required.

6. Remove plug from fuel return line (Figure 2, Item 7) running between number three injector (Figure 2, Item 8) and fuel filter/water separator (not shown).
7. Install fuel return line (Figure 2, Item 7) to number three injector (Figure 2, Item 8).
8. Remove plug from fuel overflow line (Figure 2, Item 5) running between number one injector (Figure 2, Item 4) and fuel injector pump (not shown).
9. Install fuel overflow line (Figure 2, Item 5) to number one injector (Figure 2, Item 4).
10. Install top body panel (WP 0028, Remove/Install Top Body Panel).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Close generator set doors.
13. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
14. Start engine and check for leaks and proper operation (TM 9-6115-749-10).
15. Dispose of spilled fuel and soiled rags IAW local SOP.
16. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL INJECTOR

INITIAL SETUP:**Test Equipment**

Kit, Nozzle (WP 0162, Table 2, Item 16)
Tester, Diesel Fuel Injector Nozzle (WP 0162, Table 2, Item 29)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)

Materials/Parts

Assembly fuel injector (3) (WP 0127, Repair Parts List, Figure 29, Item 8)
Gasket (3) (WP 0127, Figure 29, Item 10)
Seal, plain encased (3) (WP 0127, Figure 29, Item 11)
Cap set, protective (WP 0163, Expendable and Durable items List, Item 8)
Cleaning compound, solvent (WP 0163, Item 10)
Fuel, diesel (WP 0163, Item 19)
Grease, electrically conductive (WP 0163, Item 20)
Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)
Assistant (1)

References

WP 0039, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Top body panel removed (WP 0028, Remove/Install Top Body Panel)

REMOVE/INSTALL FUEL INJECTOR**WARNING**

Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Fuel Injector

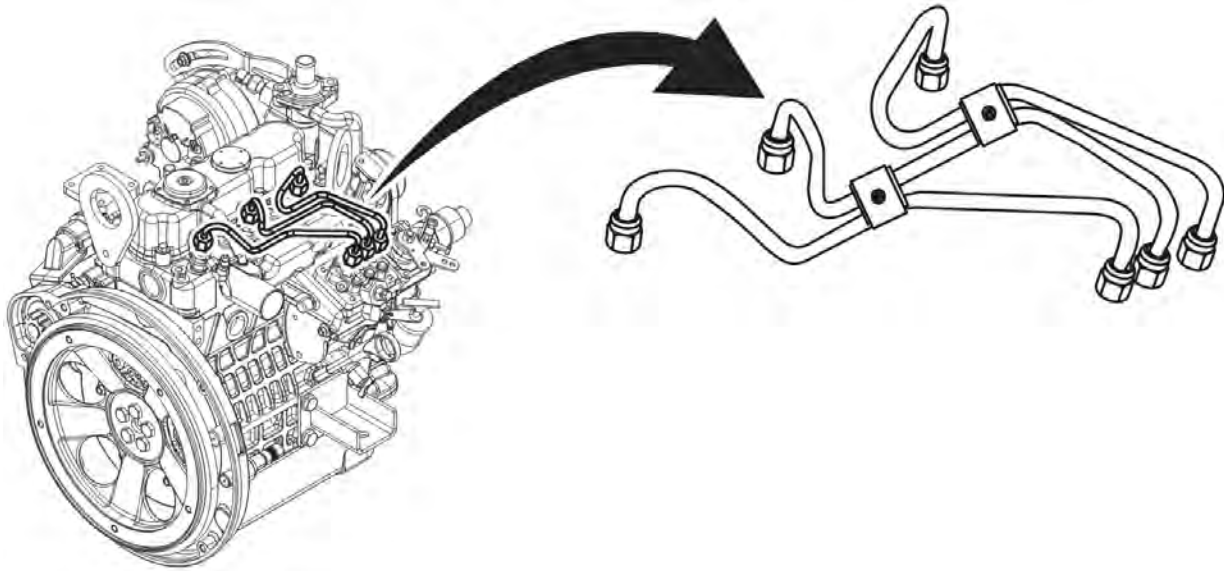


Figure 1. Fuel Injector — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door on generator set.
3. Locate fuel injectors (Figure 1) on intake side of engine.

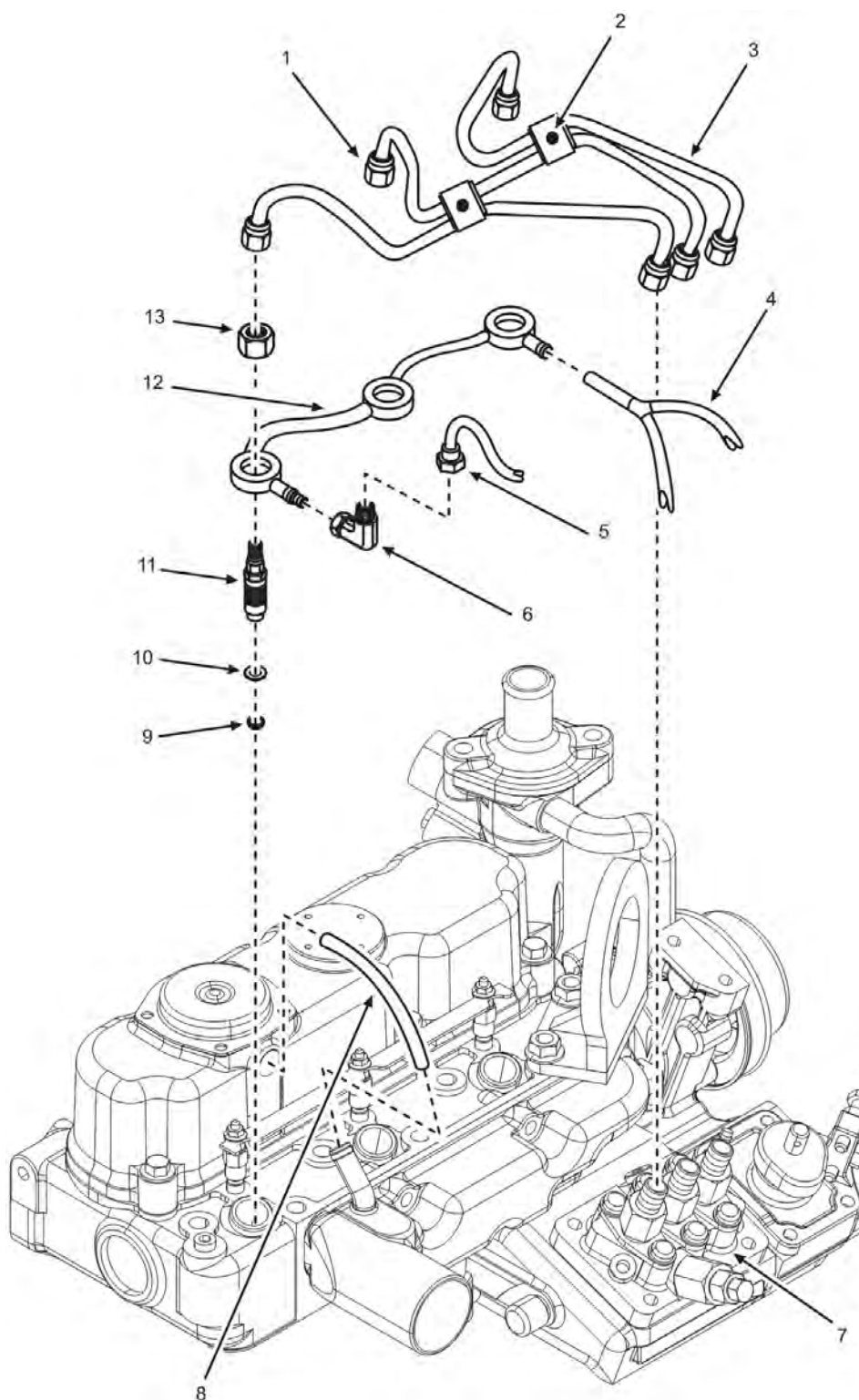


Figure 2. Fuel Injector Detail.

4. Disengage and loosen screws on two pipe clamps (Figure 2, Item 2) to allow movement of fuel injection lines (Figure 2, Item 3).

WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change soaked clothing promptly if exposed to fuel. Failure to comply may cause injury or death to personnel.

NOTE

Capture spilled fuel and dispose of soiled rags IAW local SOP.

Cap/plug all open fuel lines and fittings to prevent dirt and debris from entering the fuel system.

5. Place a wiping rag under fuel injection lines (Figure 2, Item 3) to capture spilled fuel.
6. Loosen nuts (Figure 2, Item 1) on fuel injection lines (Figure 2, Item 3) from fuel injectors (Figure 2, Item 11).
7. Loosen fuel injection lines (Figure 2, Item 3) from fuel injection pump (Figure 2, Item 7).
8. Remove and tag for identification in sequence from front to rear three fuel injection lines (Figure 2, Item 3) from fuel injectors (Figure 2, Item 11) and fuel injection pump (Figure 2, Item 7).
9. Place fuel injection lines (Figure 2, Item 3) on suitable work surface.
10. Inspect fuel injection lines (Figure 2, Item 3) for damage or corrosion and replace as required.
11. Remove Y-vent tube (Figure 2, Item 4) head section from front overflow tube (Figure 2, Item 12).
12. Remove Y-vent tube (Figure 2, Item 4) feet from fuel injector pump (Figure 2, Item 7) and place on a suitable work surface.
13. Inspect Y-vent tube (Figure 2, Item 4) for damage or excessive wear and replace if damaged or set aside for reuse.
14. Remove fuel return engine line (Figure 2, Item 5) from elbow fitting and adapter (Figure 2, Item 6).
15. Remove elbow fitting and adapter (Figure 2, Item 6) from rear overflow tube (Figure 2, Item 12).
16. Inspect fuel return engine line (Figure 2, Item 5) for damage or excessive wear and replace fuel return engine line if damaged.
17. Remove crankcase vent tube (Figure 2, Item 8) from intake manifold and place on a suitable work surface.
18. Inspect crankcase vent tube (Figure 2, Item 8) for signs of obvious damage. Replace damaged vent tube as required.
19. Remove and set aside three nuts (Figure 2, Item 13) securing overflow tube (Figure 2, Item 12) to three fuel injectors (Figure 2, Item 11).
20. Remove overflow tube (Figure 2, Item 12) from fuel injectors (Figure 2, Item 11) and inspect for damage or excessive wear.
21. Replace overflow tube (Figure 2, Item 12) if damaged or worn or set aside for reuse.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

22. Remove any dirt and debris from Y-vent tube (Figure 2, Item 4), overflow tube (Figure 2, Item 12), and fuel injection lines (Figure 2, Item 3) using wiping rags and dry cleaning solvent.
23. Remove three fuel injectors (Figure 2, Item 11) from engine and place on suitable work surface.

NOTE

Use a cross tip screwdriver with a diameter which is bigger than the heat seal hole or approximately 1/4 in (6 mm) when performing the following steps.

24. Insert screwdriver lightly into fuel injector locations if heat seals (Figure 2, Item 9) and copper gaskets (Figure 2, Item 10) are not removed with fuel injectors (Figure 2, Item 11).
25. Turn screwdriver three or four times to loosen heat seals (Figure 2, Item 9) and copper gaskets (Figure 2, Item 10).
26. Pull heat seals (Figure 2, Item 9) and copper gaskets (Figure 2, Item 10) out slowly while turning screwdriver.
27. Discard heat seals (Figure 2, Item 9) and copper gaskets (Figure 2, Item 10).
28. Dispose of captured fuel and soiled wiping rags IAW local SOP.

END OF TASK**Inspect Fuel Injector**

1. Inspect fuel injectors (Figure 2, Item 11) for obvious signs of damage or corrosion.
2. Replace fuel injectors (Figure 2, Item 11) if damaged or corroded.

END OF TASK**Install Fuel Injector**

1. Install new heat seals (Figure 2, Item 9) onto fuel injector mounting locations.
2. Install new copper gaskets (Figure 2, Item 10) into fuel injector mounting locations.
3. Install fuel injectors (Figure 2, Item 11) into mounting locations on engine finger-tight.
4. Torque fuel injectors (Figure 2, Item 11) to 36 – 51 ft/lb (49 – 69 Nm).
5. Position overflow tube (Figure 2, Item 12) on fuel injectors (Figure 2, Item 11).
6. Secure overflow tube (Figure 2, Item 12) to fuel injectors (Figure 2, Item 11) by installing three nuts (Figure 2, Item 13).
7. Tighten three nuts (Figure 2, Item 13) to 15 – 18 ft/lb (20 – 24 Nm).

NOTE

Remove caps/plugs from fuel lines/fittings prior to installation.

8. Install head of Y-vent tube (Figure 2, Item 4) on front overflow tube (Figure 2, Item 12).
9. Install Y-vent tube (Figure 2, Item 4) foot portions onto fuel injector pump (Figure 2, Item 7).
10. Install elbow fitting and adapter (Figure 2, Item 6) as an assembly to rear overflow tube (Figure 2, Item 12).
11. Install fuel return engine line (Figure 2, Item 5) to elbow fitting and adapter (Figure 2, Item 6).
12. Install crankcase vent tube (Figure 2, Item 8) onto valve cover.
13. Install crankcase vent tube (Figure 2, Item 8) to intake manifold.
14. Position fuel injection lines (Figure 2, Item 3) to their mounting locations at each fuel injector (Figure 2, Item 11) using tags applied during removal as a guide.
15. Finger-tighten each fuel injection line to fuel injector (Figure 2, Item 11).

-
16. Position fuel injection lines (Figure 2, Item 3) on the fuel injection pump (Figure 2, Item 7) using tags applied during removal as a guide.

CAUTION

Center nut on fuel line/fuel pump mounting must be installed and tightened before other nuts can be installed. If outside nuts are installed, center nut cannot be accessed with a wrench. Failure to comply may cause damage to equipment.

17. Finger-tighten each line-to-pump nut.
18. Tighten injection line nuts at injectors (Figure 2, Item 11) uniformly at fuel pump (Figure 2, Item 7).
19. Tighten two pipe clamps (Figure 2, Item 2) to their mounting locations on fuel injection lines (Figure 2, Item 3).
20. Purge fuel system (WP 0039, Service Fuel System).
21. Install top body panel (WP 0028, Remove/Install Top Body Panel).
22. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
23. Close generator set doors.
24. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
25. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
26. Repair as required.
27. Check fuel level and fill as required (TM 9-6115-749-10).

END OF TASK

Test Fuel Injector Spray Pattern

NOTE

Fluids used for fuel injection nozzle testing should be captured and disposed of IAW local SOP.

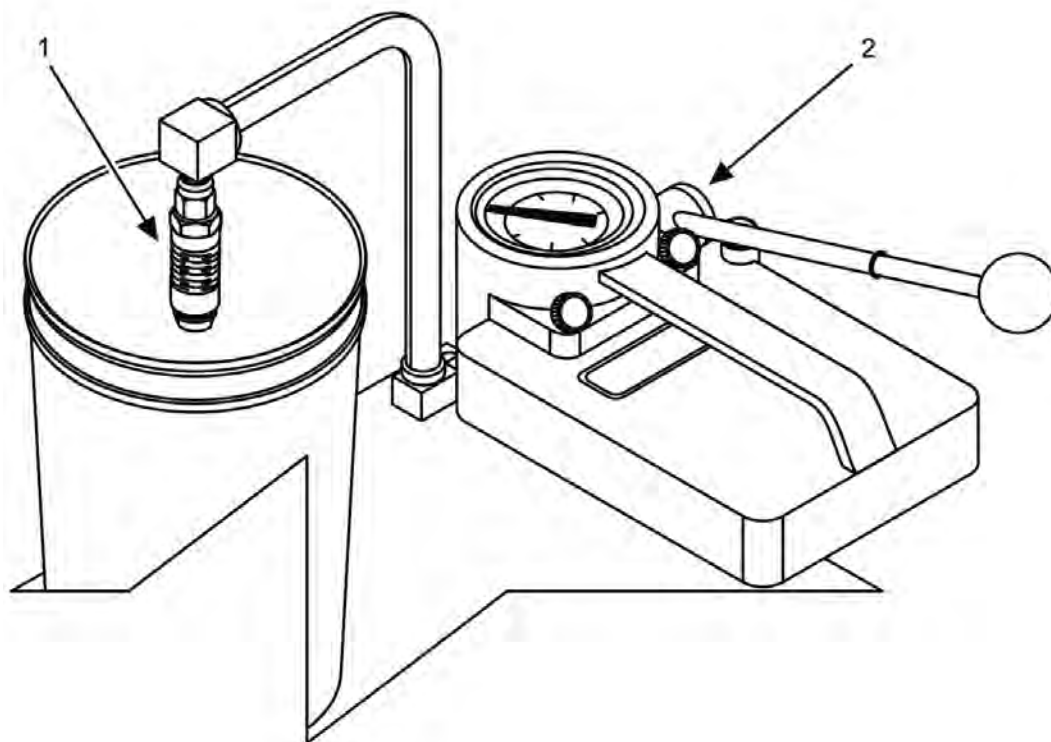


Figure 3. Test Fuel Injector Spray Pattern.

1. Place fuel injector (Figure 3, Item 1) on nozzle tester (Figure 3, Item 2).
2. Pump nozzle tester handle slowly to increase pressure until fuel injector (Figure 3, Item 1) is fully open.

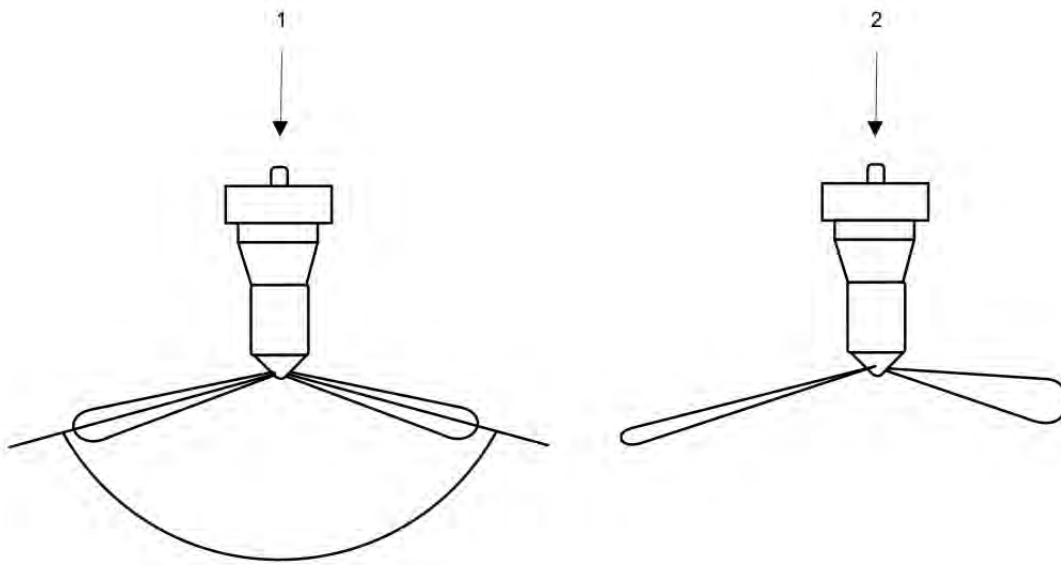


Figure 4. Nozzle Spray Patterns.

NOTE

Fluids used during fuel injection nozzle testing should be captured and disposed of IAW local SOP.

3. Ensure spray is evenly distributed in a fan-shaped pattern across entire spray area (Figure 4, Item 1).
4. Replace fuel injector (Figure 3, Item 1) if spray pattern is defective (Figure 4, Item 2).
5. Dispose of fuel IAW local SOP.

END OF TASK

Test Fuel Injector Pressure

1. Place fuel injector (Figure 3, Item 1) on nozzle tester (Figure 3, Item 2).
2. Pump nozzle tester handle slowly to increase pressure until fuel injector (Figure 3, Item 1) is fully open.
3. Determine spray pressure by reading pressure gage on nozzle tester (Figure 3, Item 2).
4. Fuel injector should be fully open between 1991 – 2134 psi (13.7 – 14.7 mPa).
5. Replace fuel injector (Figure 3, Item 1) if pressure does not meet specification when fully open.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL SPEED CONTROL PLATE

INITIAL SETUP:**Tools and Special Tools**

Pick, Dental (WP 0162, Table 2, Item 18)

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Assembly, speed control plate (WP 0128, Repair Parts List, Figure 30, Item 3)

Bolt (2) (WP 0128, Figure 30, Item 2)

Bolt, machine (2) (WP 0128, Figure 30, Item 1)

Gasket (WP 0128, Figure 30, Item 15)

Cap set, protective (WP 0163, Expendable and Durable Items, Item 8)

Grease, electrically conductive (WP 0163, Item 20)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Engine stop solenoid removed (WP 0078, Remove/Install Governor Actuator)

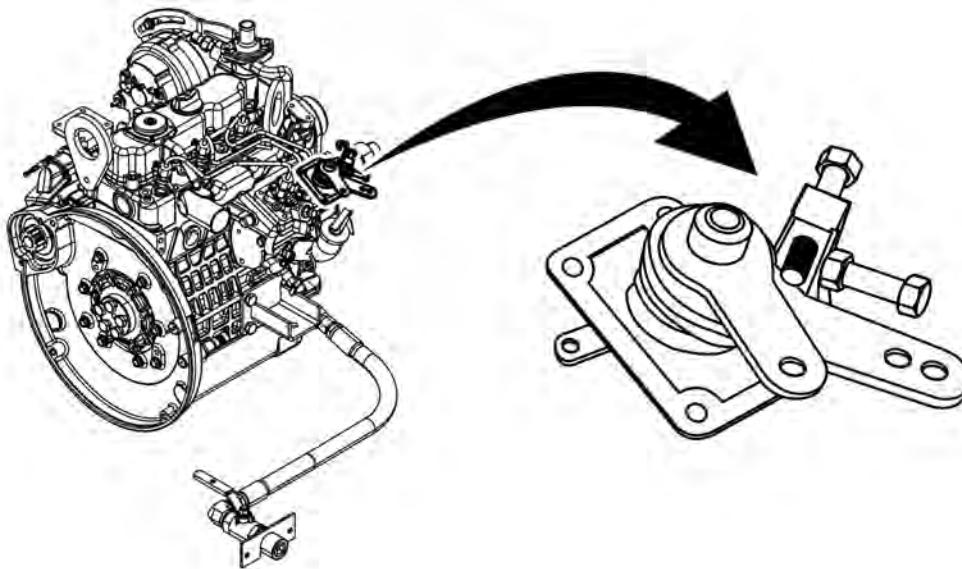
REMOVE/INSTALL SPEED CONTROL PLATE**Remove Speed Control Plate**

Figure 1. Speed Control Plate — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door of generator set.
3. Locate speed control plate (Figure 1).

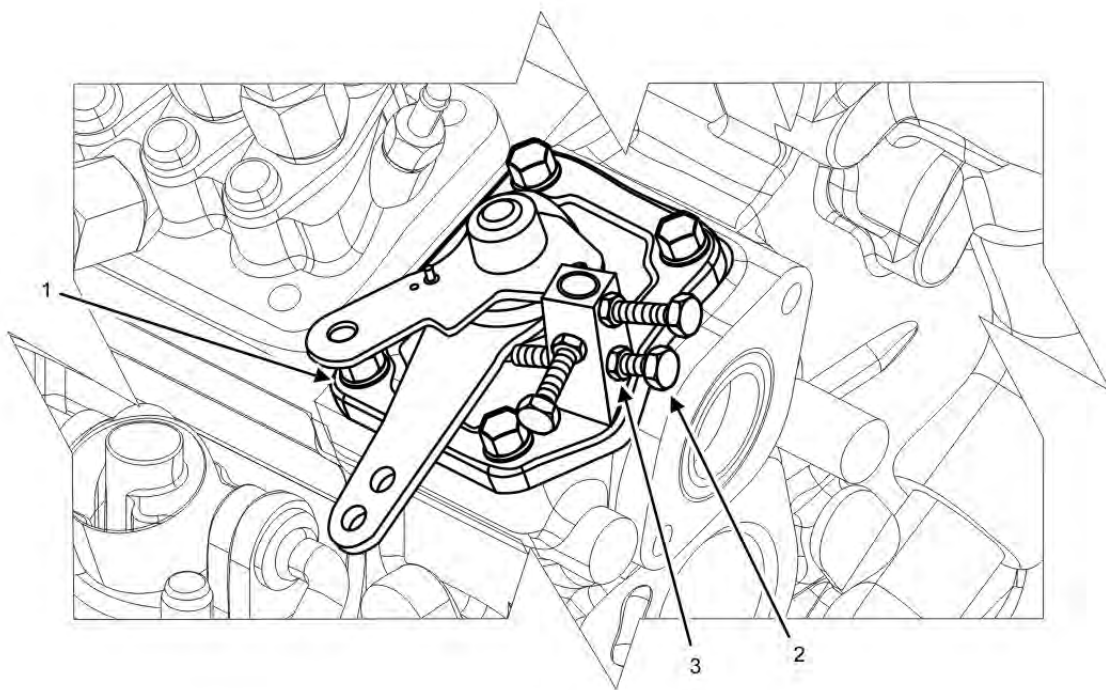


Figure 2. Speed Control Plate — Lever Adjustment.

4. Loosen locking nut (Figure 2, Item 3) on lever stop screw (Figure 2, Item 2).
5. Turn lever stop screw (Figure 2, Item 2) six complete turns counterclockwise to gain access to speed control plate mounting screw (Figure 2, Item 1).
6. Secure locking nut (Figure 2, Item 3) on lever stop screw (Figure 2, Item 2).

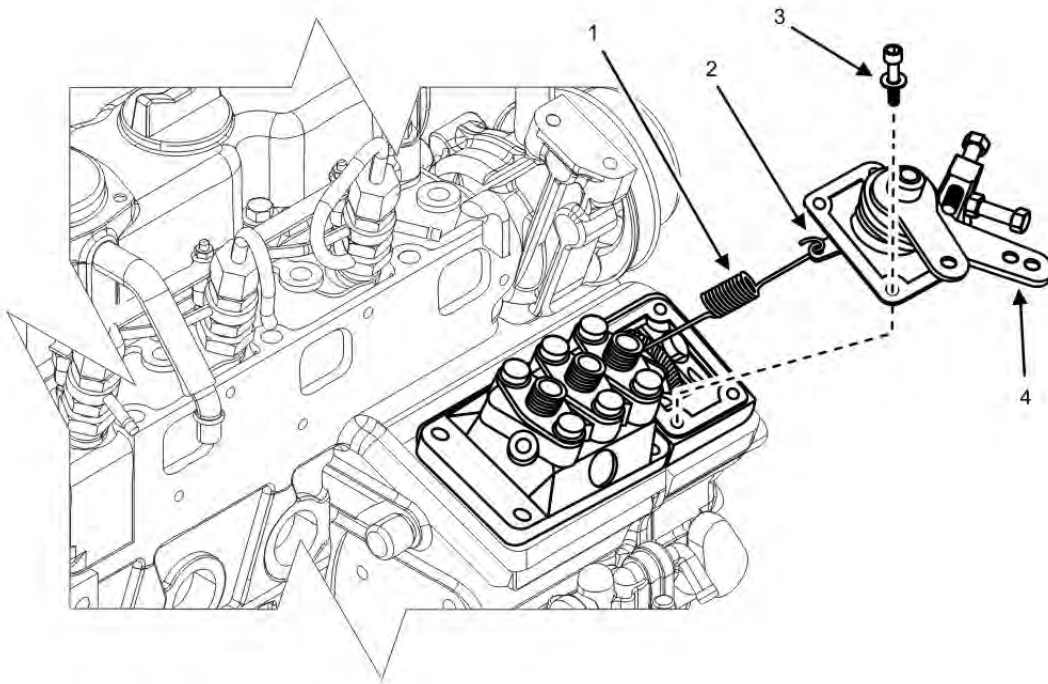


Figure 3. Speed Control Plate — Spring Removal.

7. Remove and discard four screws with lock washers (Figure 3, Item 3).

CAUTION

Governor control spring may be permanently stretched if speed control plate is lifted too far from engine with spring still attached. Disconnect governor control spring prior to removing speed control plate from engine. Failure to comply may cause damage to equipment.

8. Lift speed control plate (Figure 3, Item 4) from engine high enough to disconnect governor control spring (Figure 3, Item 1).
9. Disconnect governor control spring (Figure 3, Item 1) from speed control plate lever (Figure 3, Item 2) using a dental pick.
10. Allow other end of governor control spring (Figure 3, Item 1) to remain attached to engine.

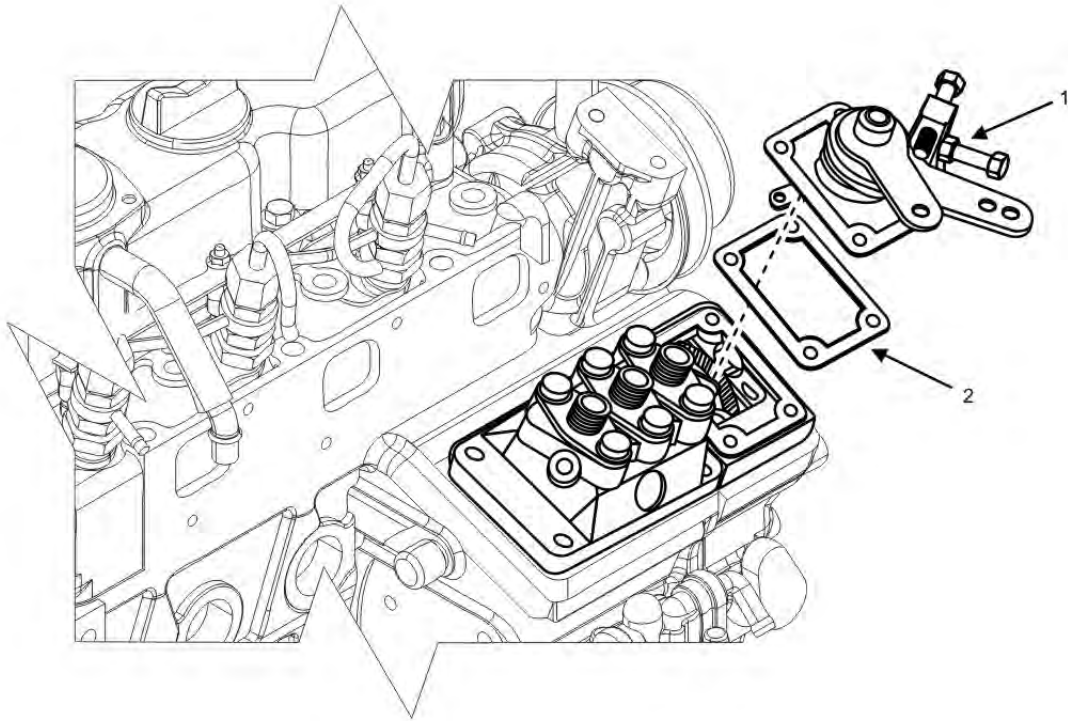


Figure 4. Speed Control Plate — Removal.

11. Remove speed control plate (Figure 4, Item 1) from engine.
12. Remove and discard gasket (Figure 4, Item 2) from beneath speed control plate (Figure 4, Item 1).
13. Cover speed control plate opening in engine block to prevent dirt and debris from entering engine.

END OF TASK

Inspect Speed Control Plate

NOTE

Do not move any adjustment screws from the speed control plate unless plate is damaged and will be replaced.

1. Inspect and replace governor control spring (Figure 3, Item 1) if damaged or stretched.
2. Inspect speed control plate (Figure 4, Item 1) for cracks, bent levers, and other damage do not replace old speed control plate if damaged until after all measurement for adjustment screws have been transferred to replacement speed control plate

END OF TASK

Replace Speed Control Plate Screws

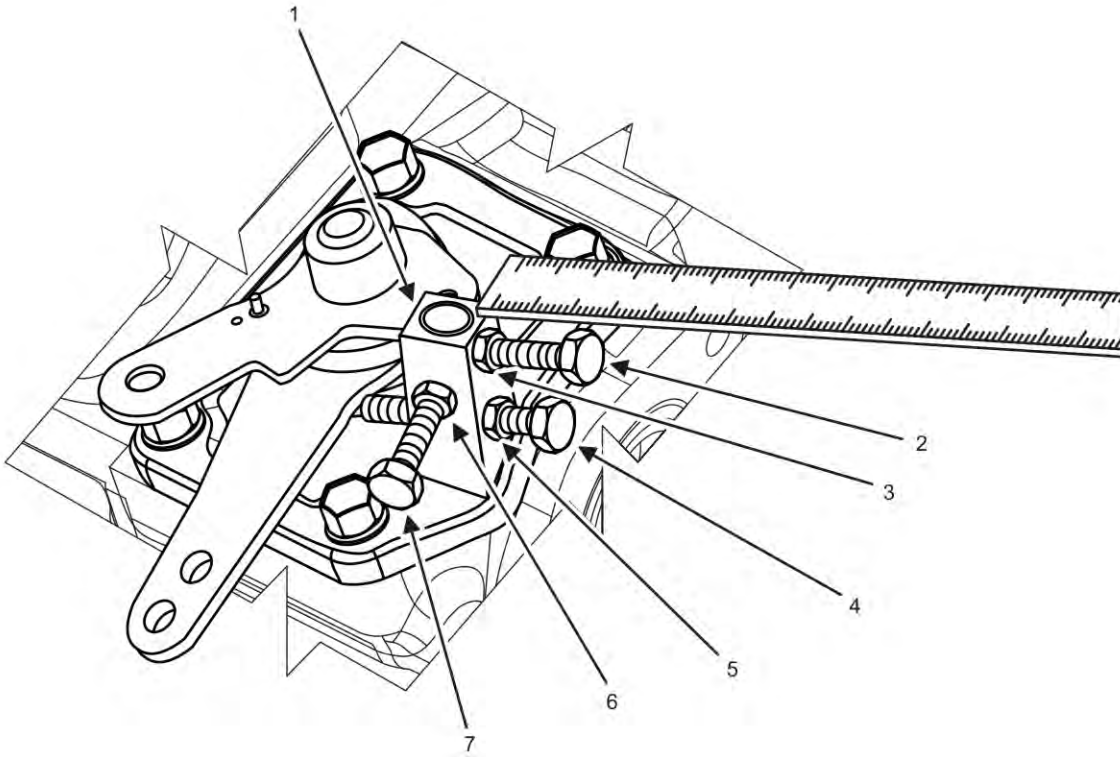


Figure 5. Speed Control Plate Screws — Replace.

NOTE

Stop lever screw (Figure 5, Item 4) and locking nut (Figure 5, Item 5) are not included with the replacement speed control plate.

1. Measure the distance between speed control plate mounting post (Figure 5, Item 1) and the underside of each adjustment screw (Figure 5, Items 2 and 7) head on old speed control plate.
2. Adjust corresponding adjustment screws (Figure 5, Items 2 and 7) on new speed control plate to match the measurements taken in step 1.
3. Lock the correct adjustments by tightening locking nuts (Figure 5, Items 3 and 6) on each adjustment screw (Figure 5, Items 2 and 7).
4. Measure and record length of stop lever screw (Figure 5, Item 4) from mounting post (Figure 5, Item 1) on old speed control plate.
5. Disengage and loosen locking nut (Figure 5, Item 5) on stop lever screw (Figure 5, Item 4).
6. Remove stop lever screw (Figure 5, Item 4) and locking nut (Figure 5, Item 5) from old speed control plate mounting post (Figure 5, Item 1).
7. Inspect stop lever screw (Figure 5, Item 4) and locking nut (Figure 5, Item 5) for damage and discard if damaged or set aside for reuse.
8. Install stop lever screw (Figure 5, Item 4) and locking nut (Figure 5, Item 5) to new speed control plate mounting post (Figure 5, Item 1).
9. Adjust length of stop lever screw (Figure 5, Item 4) from mounting post (Figure 5, Item 1) to under-side of screw head to match length measured in step 4.

10. Tighten locking nut (Figure 5, Item 5) to secure stop lever screw (Figure 5, Item 4) to mounting post (Figure 5, Item 1).
11. Recheck distance from mounting post (Figure 5, Item 1) to under-side of stop lever screw (Figure 5, Item 4) head to ensure distance remains the same as measured in step 4.

NOTE

Adjustment screws in speed control plate mounting post are of different sizes. Be sure to tag or mark screws with their proper location upon removal from speed control plate. Replace one adjustment screw at a time.

12. Measure and record length of adjustment screw (Figure 5, Item 2) from mounting post (Figure 5, Item 1).
13. Disengage and loosen locking nut (Figure 5, Item 3) on adjustment screw (Figure 5, Item 2).
14. Remove adjustment screw (Figure 5, Item 2) and locking nut (Figure 5, Item 3) from mounting post (Figure 5, Item 1).
15. Inspect adjustment screw (Figure 5, Item 2) and locking nut (Figure 5, Item 3) for damage and discard if damaged or set aside for reuse.
16. Install adjustment screw (Figure 5, Item 2) and locking nut (Figure 5, Item 3) to new mounting post (Figure 5, Item 1).
17. Adjust length of adjustment screw (Figure 5, Item 2) from mounting post (Figure 5, Item 1) to under-side of screw head to match length measured in step 12.
18. Tighten locking nut (Figure 5, Item 3) to secure adjustment screw (Figure 5, Item 2) to mounting post (Figure 5, Item 1).
19. Recheck distance from mounting post (Figure 5, Item 1) to under-side of adjustment screw (Figure 5, Item 2) head to ensure distance remains the same as measured in step 12.
20. Repeat steps 12 through 19 for adjustment screw (Figure 5, Item 7) and locking nut (Figure 5, Item 6).
21. Discard damaged speed control plate.

END OF TASK

Install Speed Control Plate

1. Uncover speed control plate cavity on engine.
2. Remove dirt, debris, and oil from speed control plate mounting surface.
3. Position new gasket (Figure 4, Item 2) to its mounting location on engine and align mounting holes.
4. Connect hook on governor control spring (Figure 3, Item 1) to speed control plate lever (Figure 3, Item 2) of using a dental pick.
5. Position speed control plate (Figure 3, Item 4) to its mounting location on engine and align mounting holes.
6. Secure speed control plate (Figure 3, Item 4) to engine by installing four new screws with lock washers (Figure 3, Item 3).
7. Disengage and loosen locking nut (Figure 2, Item 3) several turns.
8. Turn lever stop screw (Figure 2, Item 2) six complete clockwise turns to return to normal operating position.
9. Secure locking nut (Figure 2, Item 3).
10. Install engine stop solenoid (WP 0078, Remove/Install Governor Actuator).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).

12. Close generator set doors.
13. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
14. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
15. Repair as required.
16. Install safety wire to prevent three adjustment screws from changing position.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FUEL INJECTION PUMP

INITIAL SETUP:**Tools and Special Tools**

Hammer, Hand, Soft Face, Dead Blow (WP 0162, Table 2, Item 14)
Pick, Miniature (WP 0162, Table 2, Item 19)
Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Pump assembly, fuel injection (WP 0129, Repair Parts List, Figure 31, Item 11)
Shim (0.200mm) (WP 0129, Figure 31, Item 5)
Shim (0.250mm) (WP 0129, Figure 31, Item 6)
Shim (0.300mm) (WP 0129, Figure 31, Item 7)
Washer (2) (WP 0129, Figure 31, Item 1)
Cap set, protective (WP 0163, Expendable and Durable Items List, Item 8)
Grease, electrically conductive (WP 0163, Item 20)
Pan, drain (WP 0163, Item 28)
Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)
Assistant (1)

References

WP 0064, Remove/Install 50/60 Hz Engine Assembly
WP 0065, Remove/Install 400 Hz Engine Assembly

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Top body panel removed (WP 0028, Remove/Install Top Body Panel)
Fuel injection lines removed (WP 0069, Remove/Install Fuel Injector)
Governor actuator removed (WP 0078, Remove/Install Governor Actuator)
Speed control plate removed (WP 0070, Remove/Install Speed Control Plate)

REMOVE/INSTALL FUEL INJECTION PUMP**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Remove Fuel Injection Pump

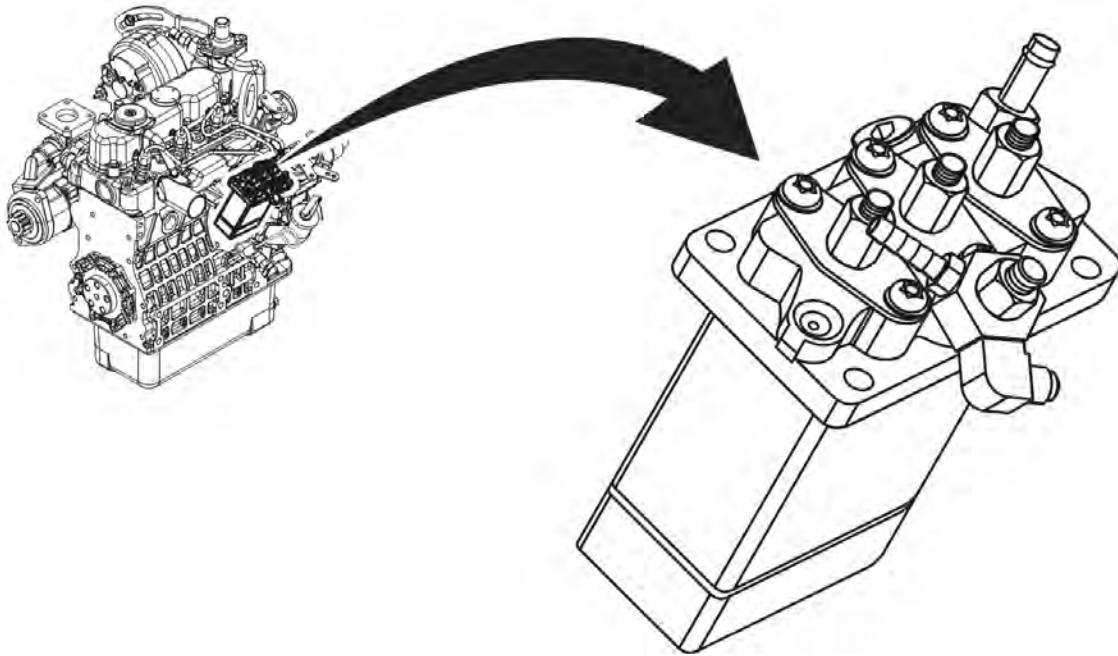


Figure 1. Fuel Injection Pump — Location.

WARNING

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Capture spilled fuel and dispose of IAW local SOP.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door of generator set.
3. Locate fuel injection pump (Figure 1).

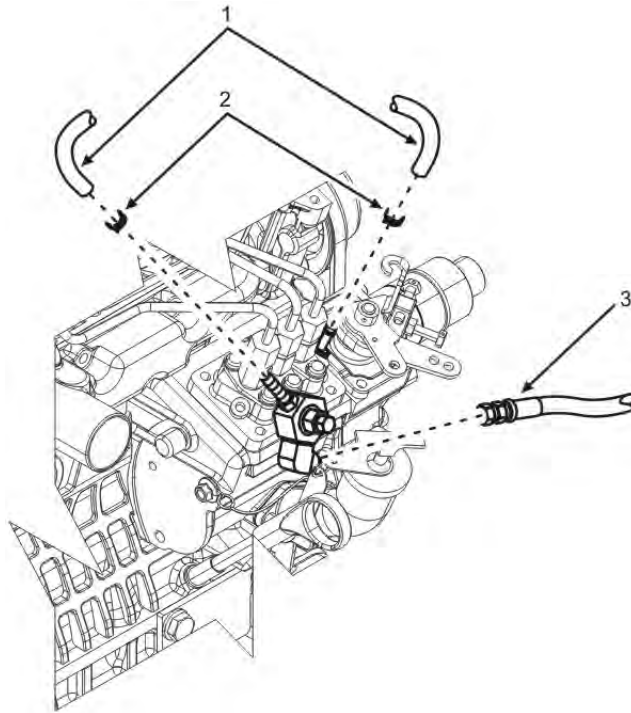


Figure 2. Fuel Injection Pump — Hoses.

4. Remove fuel supply engine line (Figure 2, Item 3) from fuel injection pump. Cap/plug fuel supply engine line (Figure 2, Item 3) and opening on fuel injection pump (Figure 4, Item 4).
5. Loosen hose clips (Figure 2, Item 2) and slide back on fuel return lines (Figure 2, Item 1) on fuel injection pump (Figure 4, Item 4).
6. Remove fuel return lines (Figure 2, Item 1) from fuel injection pump. Cap/plug fuel return lines (Figure 2, Item 1) and openings on fuel injection pump (Figure 4, Item 4).

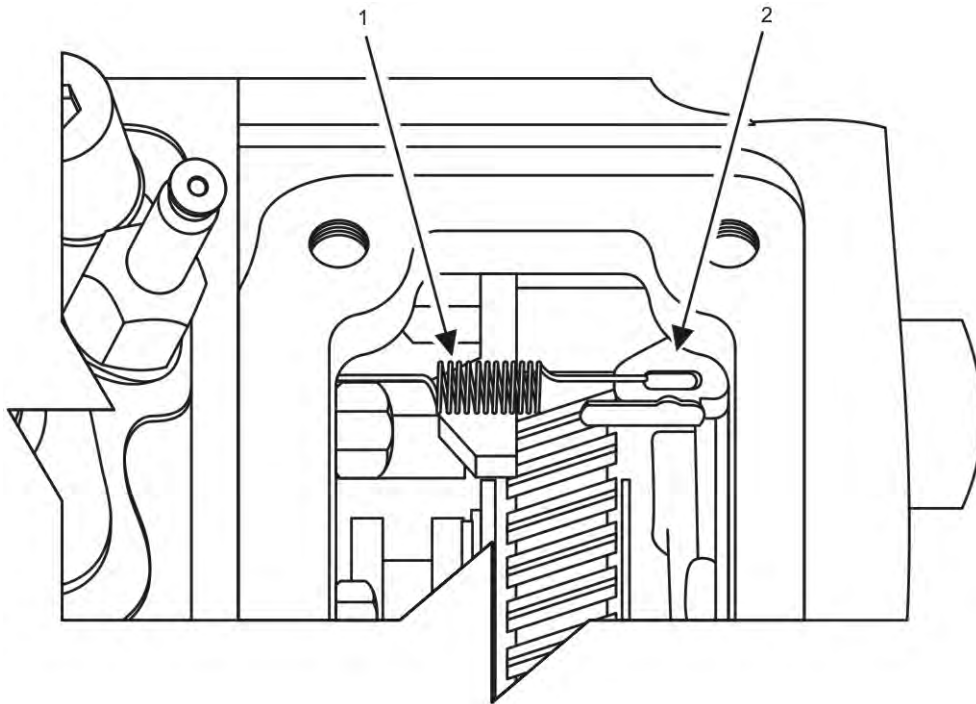


Figure 3. Fuel Injection Pump — Start Spring and Bracket.

CAUTION

Start spring (Figure 3, Item 1) must remain attached to fuel injection pump (Figure 4, Item 4) once disconnected from the speed control plate (Figure 3, Item 2). If start spring falls into engine cavity, it must be retrieved before proceeding and saved for reuse at installation. Failure to comply may cause damage to equipment.

7. Ensure start spring (Figure 3, Item 1) remains attached to fuel injection pump (Figure 4, Item 4) once disconnected from the speed control plate (Figure 3, Item 2).

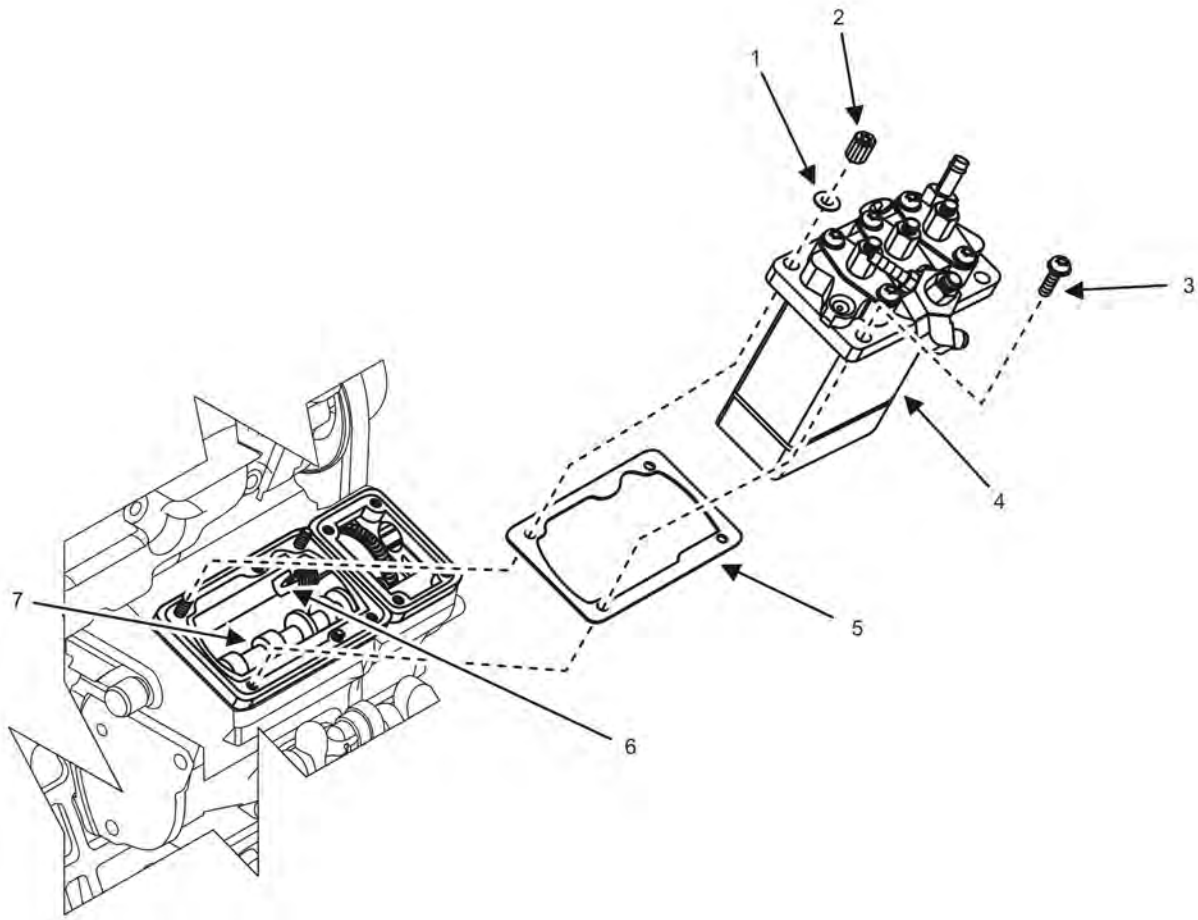


Figure 4. Fuel Injection Pump — Removal.

8. Remove two long socket head nuts (Figure 4, Item 2), two socket head screws (Figure 4, Item 3), and two lock washers (Figure 4, Item 1) securing fuel injection pump (Figure 4, Item 4) to engine. Discard lock washers (Figure 4, Item 1).

NOTE

Fuel injection pump (Figure 5, Item 1) is under slight spring tension. A light tap with a rubber mallet may be necessary to loosen the pump from the engine.

9. Remove fuel injection pump (Figure 5, Item 1) from engine with start spring (Figure 5, Item 2) attached.
10. Remove start spring (Figure 5, Item 2) from fuel injection pump (Figure 5, Item 1) and set aside for reuse.

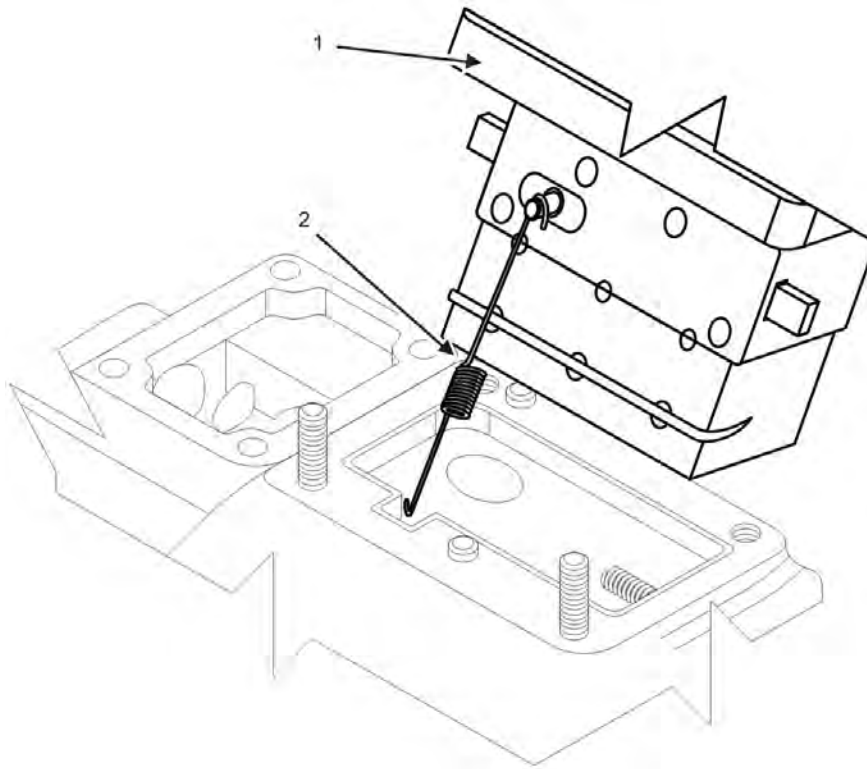


Figure 5. Fuel Injection Pump — Start Spring to Fuel Injection Pump.

CAUTION

Thickness of shim(s) (Figure 4, Item 5) is critical to performance of fuel injection system. Always replace damaged shim(s) (Figure 4, Item 5) with shim(s) (Figure 4, Item 5) of equivalent total thickness. Failure to comply may cause damage to equipment.

NOTE

Replace shims (Figure 4, Item 5) only when fuel injection pump (Figure 4, Item 4) and/or fuel camshaft (Figure 4, Item 7) are replaced or if the fuel injection system requires adjustment after performing the procedures in the Check Fuel Injection Adjustment task. If simply removing and installing fuel injection pump (Figure 4, Item 4), reuse the existing shims (Figure 4, Item 5).

11. Remove shim(s) (Figure 4, Item 5) from mounting location on engine.
12. Cover fuel injection pump cavity in engine block to prevent dirt and debris from entering engine.
13. Record thickness of shim(s) (Figure 4, Item 5) using markings on bottom of shims. See Adjust Fuel Injection Timing task.

END OF TASK

Inspect Fuel Injection Pump

1. Inspect fuel injection pump (Figure 5, Item 1) for damage and replace fuel injection pump if damaged.
2. Inspect start spring (Figure 5, Item 2) for damage and replace if damaged or overstretched.

END OF TASK**Install Fuel Injection Pump**

1. Remove cover from fuel injection pump cavity on engine block.
2. Remove any oil, dirt, and debris from fuel injection pump mounting surface on engine block.
3. Clean dirt and oil from shims (Figure 4, Item 5) using a wiping rag.
4. Move fork lever (Figure 4, Item 6) to gear case side of engine cavity.
5. Ensure that start spring (Figure 5, Item 2) is free for attachment to speed control plate.

CAUTION

Thickness of shim(s) (Figure 4, Item 5) is critical to performance of fuel injection system. Always replace damaged shim(s) (Figure 4, Item 5) with shim(s) (Figure 4, Item 5) of equivalent total thickness. Addition or reduction of shim thickness by 0.0020 in (0.06 mm) delays or advances injection timing approximately 0.5 degrees (0.00087 rad). Failure to comply may cause damage to equipment.

Do not apply liquid sealant or gasket adhesive to shims (Figure 4, Item 5), as this will adversely affect performance of the fuel injection system. Failure to comply may cause damage to equipment.

NOTE

Replace shims (Figure 4, Item 5) only when fuel injection pump (Figure 4, Item 4) and/or fuel camshaft (Figure 4, Item 7) are replaced or if the fuel injection system requires adjustment after performing the procedures in the Check Fuel Injection Adjustment task. If simply removing and installing fuel injection pump (Figure 4, Item 4), reuse the existing shims (Figure 4, Item 5).

6. Position clean shim(s) (Figure 4, Item 5) to mounting location on engine and align mounting holes.

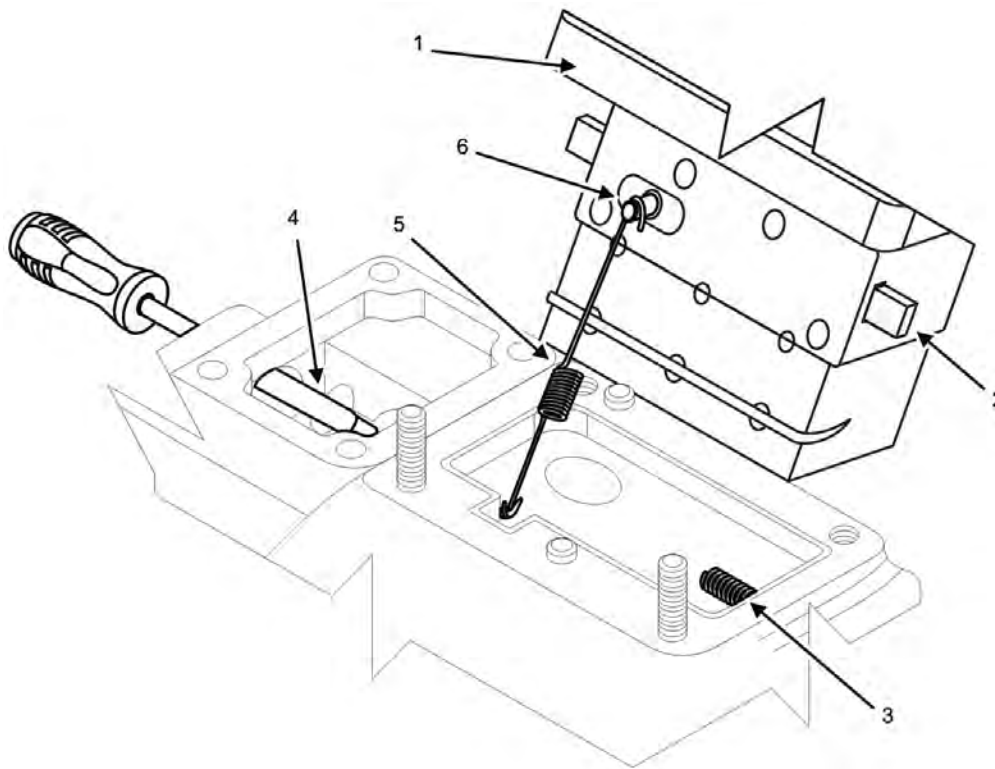


Figure 6. Fuel Injection Pump — Install.

7. Install start spring (Figure 6, Item 5) to injection pump control rack pin (Figure 6, Item 6) on back of fuel injection pump (Figure 6, Item 1).
8. Install fuel injection pump (Figure 6, Item 1) to mounting location on engine.

NOTE

Miniature pick may be inserted through the governor actuator opening in front of engine to retrieve the start spring (Figure 6, Item 5).

9. Engage open hook of start spring (Figure 6, Item 5) using hook end of miniature pick (Figure 6, Item 4).

CAUTION

Do not overstretch start spring (Figure 6, Item 5), as it may be permanently damaged if stretched too far. Failure to comply may cause damage to equipment.

10. Attach hook end of start spring (Figure 3, Item 1) to speed control plate (Figure 3, Item 2).
 - a. Search fuel pump cavity in engine block using a magnet if spring is dropped during installation.
 - b. Remove oil pan and/or front gear case cover if spring is dropped into engine during installation and cannot be retrieved from fuel pump cavity with a magnet.
 - c. Replace engine (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly) if spring cannot be found in steps a and b.
11. Check that control rod (Figure 6, Item 2) is pushed by adjusting spring (Figure 6, Item 3) and that injection pump control rack pin (Figure 6, Item 6) on control rod (Figure 6, Item 2) engages fork lever (Figure 4, Item 6).

NOTE

Due to spring tension, fuel injection pump (Figure 4, Item 4) will not rest completely on shim(s) (Figure 4, Item 5) until fuel injection pump (Figure 4, Item 4) is fully secured with mounting hardware (Figure 4, Items 1, 2, and 3).

12. Position fuel injection pump (Figure 4, Item 4) to mounting location on engine and align mounting holes.
13. Secure fuel injection pump (Figure 4, Item 4) to engine by installing two long socket head nuts (Figure 4, Item 2), two socket head screws (Figure 4, Item 3), and two new lock washers (Figure 4, Item 1).
14. Remove caps/plugs from fuel return lines (Figure 2, Item 1).
15. Install fuel return lines (Figure 2, Item 1) to fuel injection pump (Figure 4, Item 4).
16. Loosen hose clips (Figure 2, Item 2) and position to secure fuel return lines (Figure 2, Item 1) on fuel injection pump.
17. Install fuel supply engine line (Figure 2, Item 3) to fuel injection pump.

CAUTION

If fuel injection pump has been replaced, check fuel injection adjustment. See Check Fuel Injection Adjustment task. Failure to comply may cause damage to equipment.

18. Install speed control plate (WP 0070, Remove/Install Speed Control Plate).
19. Install governor actuator (WP 0078, Remove/Install Governor Actuator).
20. Install fuel injectors and lines (WP 0069, Remove/Install Fuel Injector).
21. Install top panel onto generator set (WP 0028, Remove/Install Top Body Panel).
22. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
23. Close right-side door of generator set.
24. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
25. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 minutes (TM 9-6115-749-10).
26. Repair as required.
27. Dispose of soiled rags IAW local SOP.

END OF TASK**Check Fuel Injection Adjustment**

1. Remove fuel injection lines (WP 0069, Remove/Install Fuel Injector) if not already removed.
2. Remove governor actuator (WP 0078, Remove/Install Governor Actuator) if not already removed.
3. Ensure fuel supply engine line (Figure 7, Item 3) is connected to fuel injection pump.
4. Turn flywheel (Figure 7, Item 1) counterclockwise (when facing flywheel (Figure 7, Item 1)) until fuel fills up hole of delivery valve holder (Figure 7, Item 2) for number one cylinder.
5. Turn flywheel (Figure 7, Item 4) clockwise (when facing flywheel (Figure 7, Item 4)) approximately 90 degrees.
6. Turn flywheel (Figure 8, Item 1) counterclockwise to 25-degree timing mark (Figure 8, Item 3) on flywheel (before TDC timing mark (Figure 8, Item 4)).

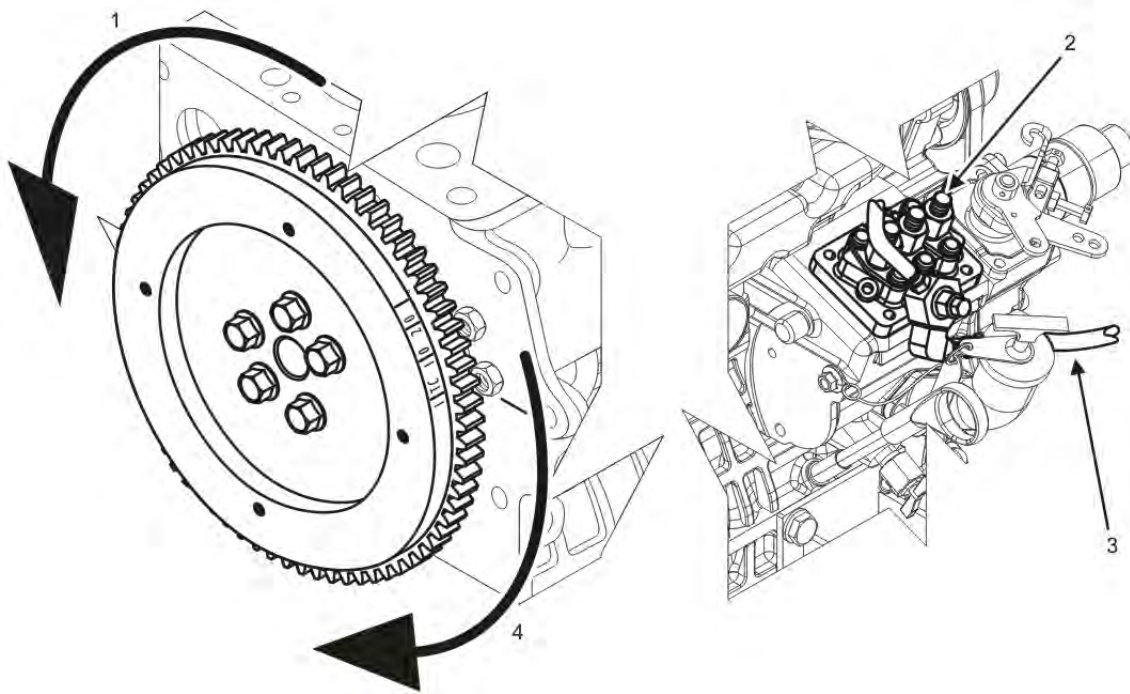


Figure 7. Flywheel and Fuel Delivery Valve.

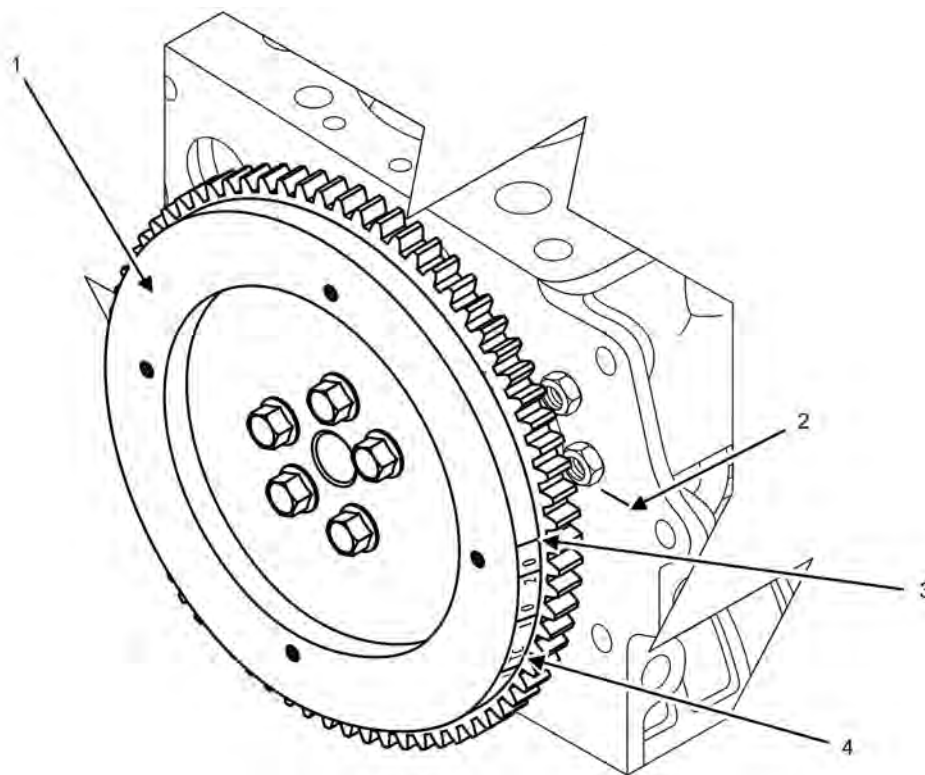


Figure 8. Flywheel Timing Marks Aligned.

7. Continue to turn flywheel (Figure 8, Item 1) counterclockwise slowly and stop when fuel level at tip of fuel delivery holder (Figure 7, Item 2) of number one cylinder begins to increase.
8. Compare position of flywheel timing mark aligned with alignment mark (Figure 8, Item 2) to factory specification in Table 1.

Table 1. Fuel Injection Adjustment Specification.

Injection timing/factory specification	19 – 21 degrees (0.33 – 0.37 rad before TDC)
--	--

9. Calculate difference between factory specification shown in Table 1 and position of flywheel timing marks on machine to determine extent of required adjustment.
10. Complete installation if fuel injection adjustment is to specification. See Install Fuel Injection Pump task.
11. Adjust fuel injection using shims (Figure 4, Item 5), if fuel injection adjustment is not to specification. See Adjust Fuel Injection Timing task.

END OF TASK

Adjust Fuel Injection Timing

1. Check fuel injection adjustment. See Check Fuel Injection Adjustment task.
2. Remove fuel injection pump. See Remove Fuel Injection Pump task.
3. Check and record number and size of shims (Figure 4, Item 5) removed with fuel injection pump (Figure 4, Item 4). Size of shim is determined by number of holes along bottom edge of shim. Shims are identified by the number of holes on the shim in the location shown in Figure 9.

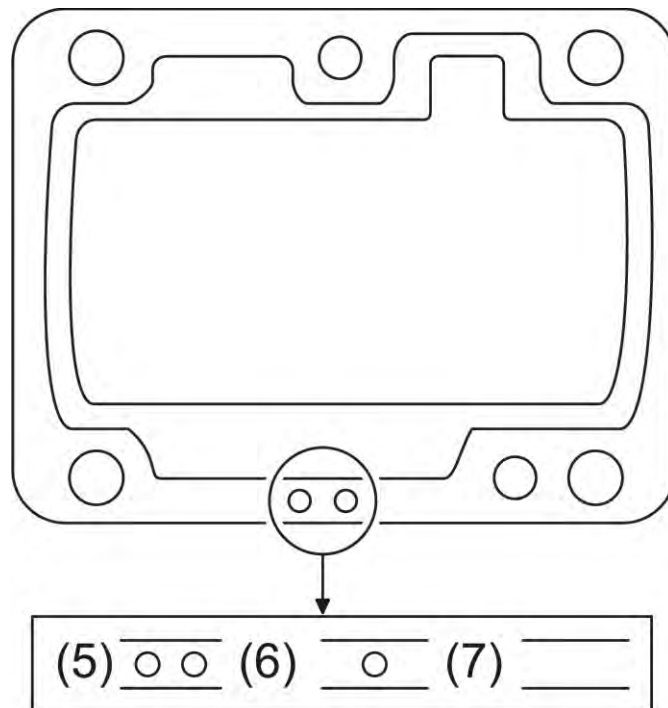


Figure 9. Fuel Injection Pump Shims.

NOTE

Fuel injection is adjusted by adding or reducing the number of shims (Figure 4, Item 5) at the fuel injection pump mounting. Shims (Figure 4, Item 5) are available in 0.20 in (0.5 mm) increments from 0.0079 in (0.20 mm) to 0.0118 in (0.30 mm). Addition or reduction of a shim (Figure 4, Item 5) (0.0020 in, 0.05 mm) delays or advances fuel injection adjustment by approximately 0.5 degrees (0.0087 rad).

4. Calculate correct number of fuel injection pump shims (Table 2) required to properly adjust fuel injection, using difference between factory specification and position of flywheel timing marks calculated when fuel injection adjustment was checked. See Check Fuel Injection Adjustment task.

Table 2. Fuel Injection Pump Shim Sizes.

NUMBER OF HOLES	THICKNESS OF SHIM
No holes	0.0118 in (0.30 mm)
1 hole	0.0098 in (0.25 mm)
2 holes	0.0079 in (0.20 mm)

CAUTION

Excess shim material will cause incorrect fuel injection adjustment which may lead to poor performance or engine damage. Be sure to remove all residual shim material from engine block when replacing shim. Failure to comply may cause damage to equipment.

5. Remove shim(s) (Figure 4, Item 5) from fuel injection pump mounting location on engine block.
6. Install proper number of clean shim(s) (Figure 4, Item 5) as calculated in step 4 to their mounting location on engine block and align mounting holes.
7. Install fuel injection pump. See Install Fuel Injection Pump task.
8. Recheck fuel injection adjustment and repair as required. See Check Fuel Injection Adjustment task.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL THERMOSTAT HOUSING

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Bolt, machine (2), (WP 0130, Repair Parts List, Figure 32, Item 1)
 Bolt, machine (1) (WP 0130, Figure 32, Item 11)
 Bolt, machine (2) (WP 0130, Figure 32, Item 13)
 Gasket (WP 0130, Figure 32, Item 7)
 Housing, thermostat (WP 0130, Figure 32, Item 8)
 Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items List, Item 2)
 Cleaning compound, solvent (WP 0163, Item 10)
 Compound, sealing (WP 0163, Item 15)
 Detergent, general purpose (WP 0163, Item 16)
 Grease, electrically conductive (WP 0163, Item 20)
 Rag, wiping (WP 0163, Item 31)
 Sealant (WP 0163, Item 32)

Personnel Required

91D (1)
 Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
 Engine cool
 Battery ground cable removed (WP 0036, Remove/Install Batteries)
 Top body panel removed (WP 0028, Remove/Install Top Body Panel)
 Thermostat removed (WP 0073, Remove/Install Thermostat)
 Battery-charging alternator removed (WP 0075, Remove/Install Battery-Charging Alternator Assembly)

REMOVE/INSTALL THERMOSTAT HOUSING**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Thermostat Housing

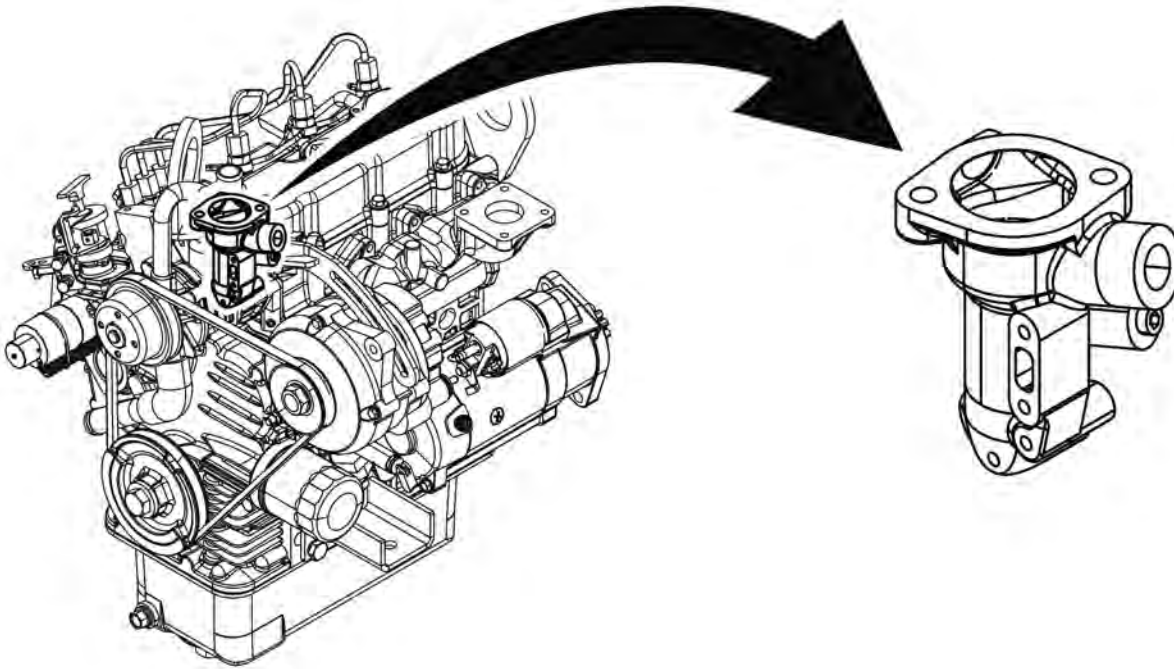


Figure 1. Thermostat Housing — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate thermostat housing (Figure 1).

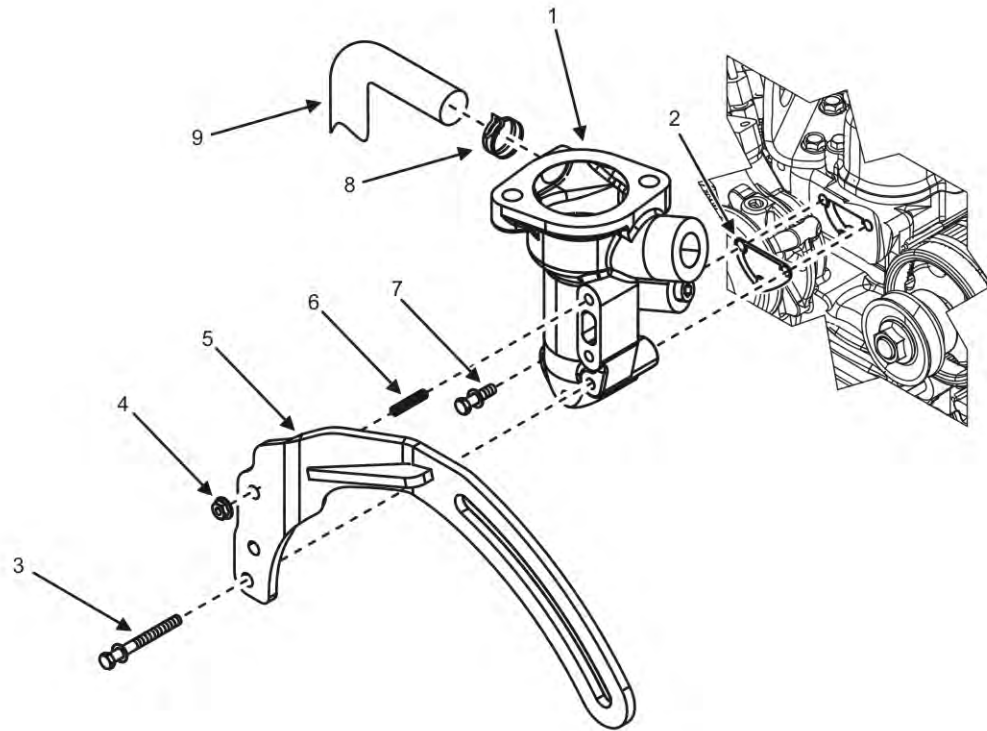


Figure 2. Thermostat Housing — Detail.

3. Remove two nuts (Figure 2, Item 4) securing battery-charging alternator bracket (Figure 2, Item 5) to two studs (Figure 2, Item 6) on thermostat housing (Figure 2, Item 1).
4. Remove and discard lower bolt with captive washer (Figure 2, Item 3).
5. Remove battery-charging alternator bracket (Figure 2, Item 5) from thermostat housing (Figure 2, Item 1).
6. Loosen hose clip (Figure 2, Item 8) on hose (Figure 2, Item 9) at thermostat housing (Figure 2, Item 1).
7. Remove hose (Figure 2, Item 9) from thermostat housing (Figure 2, Item 1).

NOTE

There are two different lengths for the thermostat housing bolts. Note location of current bolts for reference when installing new bolts.

8. Remove and discard two bolts with captive washers (Figure 2, Item 7) securing thermostat housing (Figure 2, Item 1) to cylinder head.

NOTE

Gasket (Figure 2, Item 2) material may stick to cylinder head when thermostat housing (Figure 2, Item 1) is removed.

9. Remove thermostat housing (Figure 2, Item 1) and gasket (Figure 2, Item 2) from cylinder head. Discard gasket (Figure 2, Item 2).

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

CAUTION

When scraping gasket material from engine block, keep gasket scrapings and other foreign material from entering the engine block. Do not use a screw driver to scrape gasket material. Failure to comply may cause damage to equipment.

10. Remove residual sealant material from cylinder head with a putty knife and drying cleaning solvent.

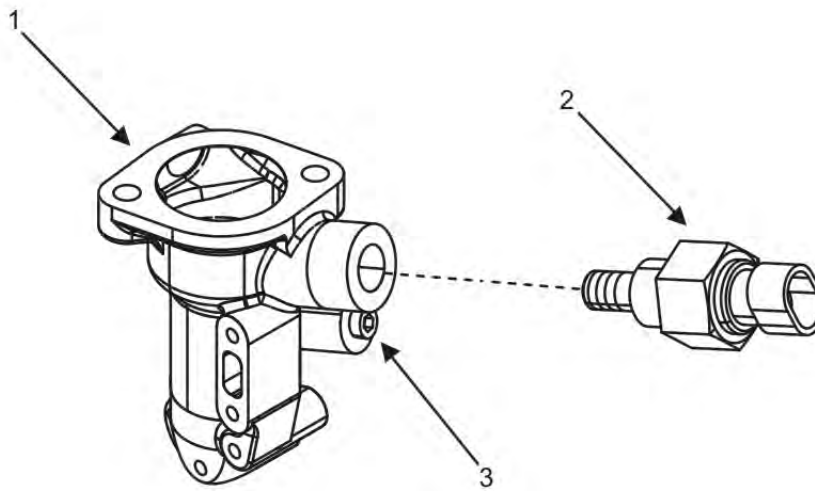


Figure 3. Temperature Sensor — Removal.

11. Disconnect wires (not shown) from water temperature sensor (Figure 3, Item 2).
12. Remove water temperature sensor (Figure 3, Item 2) from thermostat housing (Figure 3, Item 1).
13. Remove plug (Figure 3, Item 3) from thermostat housing (Figure 3, Item 1) if housing is being replaced.

END OF TASK**Inspect Thermostat Housing**

1. Inspect thermostat housing (Figure 2, Item 1) for damage and/or cracks and replace as required.
2. Inspect hose (Figure 2, Item 9) and hose clip (Figure 2, Item 8) for damage and replace as required.
3. Inspect plug (Figure 3, Item 3) found underneath temperature sensor (Figure 3, Item 2) on thermostat housing (Figure 3, Item 1) for damage and replace as required.
4. Inspect temperature sensor (Figure 3, Item 2) for damage and replace as required.

END OF TASK

Test Temperature Sensor

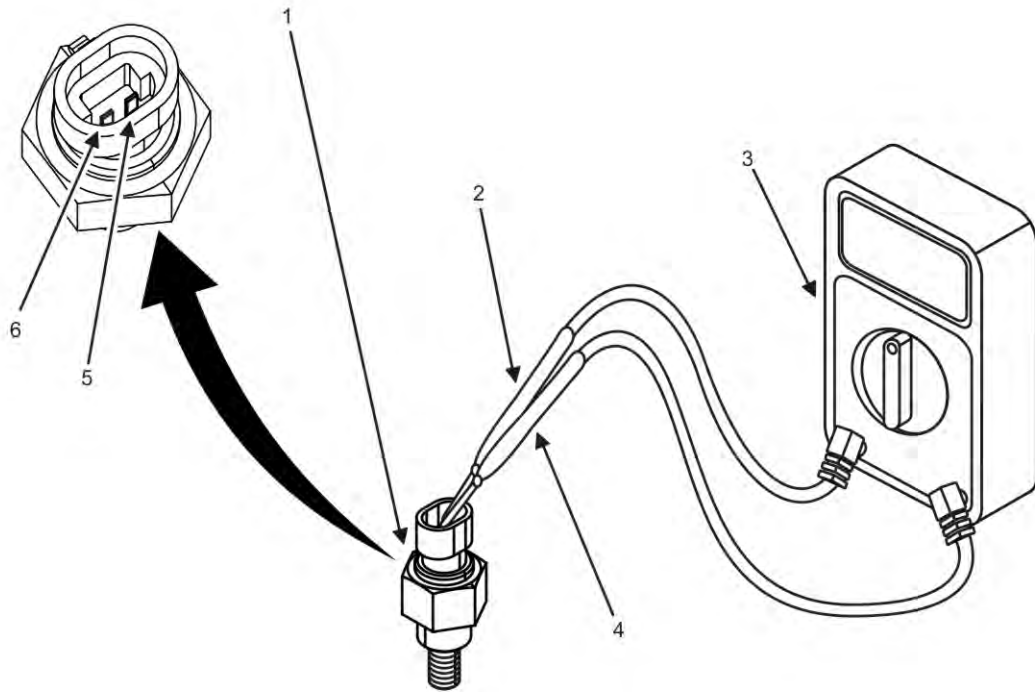


Figure 4. Test Temperature Sensor.

WARNING

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required.

NOTE

Temperature sensor can be tested while installed in the water pump or tested removed. Ambient air temperature will need to be determined when temperature sensor is removed from water pump. When testing while installed in water pump, DCS coolant temperature reading will need to be recorded before removing unit wiring connector from temperature switch. Use appropriate temperature range in Table 1 when comparing Ohm measurement obtained from test.

Table 1. Temperature Sensor Resistance.

DEGREES (F°)	RESISTANCE (OHMS)	DEGREES (°F)	RESISTANCE (OHMS)
0	700	120	1195
10	735	130	1245
20	770	140	1295
30	810	150	1347
40	848	160	1400
50	887	170	1455
60	928	180	1512
70	970	190	1570

Table 1. Temperature Sensor Resistance — Continued.

DEGREES (F°)	RESISTANCE (OHMS)	DEGREES (°F)	RESISTANCE (OHMS)
80	1012	200	1625
90	1056	210	1685
100	1100	220	1745
110	1148	230	1804

1. Position temperature sensor (Figure 4, Item 1) on a suitable work surface if removed from engine or open left-side door and leave installed in engine.
2. Allow 5 min for temperature sensor (Figure 4, Item 1) to reach ambient air temperature if testing temperature sensor (Figure 4, Item 1) removed from engine.
3. Determine ambient air temperature using a thermometer if testing temperature sensor (Figure 4, Item 1) removed from engine.
4. Determine coolant temperature on DCS screen by installing negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries) and turning engine control switch to PRIME & RUN if testing temperature sensor (Figure 4, Item 1) installed in engine (TM 9-6115-749-10).
5. Record reading, remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries), and turn engine control switch to OFF (TM 9-6115-749-10).

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

6. Disconnect unit wiring (not pictured) from temperature sensor (Figure 4, Item 1), if necessary.
7. Attach one multimeter lead (Figure 4, Item 2) set to Ohms to one connector lead (Figure 4, Item 5) of temperature sensor.
8. Attach second multimeter lead (Figure 4, Item 4) to second connector lead (Figure 4, Item 6) of temperature sensor.
9. Record multimeter (Figure 4, Item 3) measurement.
10. Compare multimeter (Figure 4, Item 3) measurement with corresponding temperature in Table 1.
11. Replace temperature sensor (Figure 4, Item 1) if multimeter (Figure 4, Item 3) measurement does not correspond to Table 1 Ohm values.
12. Remove multimeter leads (Figure 4, Items 2 and 4) and connect unit wiring (not pictured) to temperature sensor (Figure 4, Item 1) and close left-side door, if necessary.

END OF TASK

Install Thermostat Housing

1. Apply sealant to thermostat housing mounting surface on cylinder head.
2. Position gasket (Figure 2, Item 2) to its mounting location on cylinder head and align mounting holes.
3. Position thermostat housing (Figure 2, Item 1) to its mounting location on new gasket (Figure 2, Item 2) and align mounting holes.

CAUTION

Ensure that the longer of the thermostat housing bolts is installed on exhaust side of the housing.
Failure to comply may cause damage to equipment.

4. Secure thermostat housing (Figure 2, Item 1) and gasket (Figure 2, Item 2) to cylinder head by installing two new bolts with captive washers (Figure 2, Item 7).
5. Move to step 8 unless thermostat housing (Figure 2, Item 1) is being replaced.
6. Install plug (Figure 3, Item 3) into new thermostat housing (Figure 3, Item 1) using pipe joint compound.
7. Install water temperature sensor (Figure 3, Item 2) into new thermostat housing (Figure 3, Item 1) using pipe joint compound.
8. Position hose (Figure 2, Item 9) to thermostat housing (Figure 2, Item 1).
9. Secure hose (Figure 2, Item 9) with hose clip (Figure 2, Item 8) to thermostat housing (Figure 2, Item 1).
10. Connect electrical wiring to water temperature sensor (Figure 3, Item 2).
11. Position battery-charging alternator bracket (Figure 2, Item 5) to thermostat housing (Figure 2, Item 1).
12. Install new lower bolt with captive washer (Figure 2, Item 3).
13. Install two nuts (Figure 2, Item 4) securing battery-charging alternator bracket (Figure 2, Item 5) to studs (Figure 2, Item 6) on thermostat housing (Figure 2, Item 1).
14. Install battery-charging alternator (WP 0075, Remove/Install Battery-Charging Alternator Assembly).
15. Install thermostat (WP 0073, Remove/Install Thermostat).
16. Install top body panel (WP 0028, Remove/Install Top Body Panel).
17. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
18. Close generator set doors.
19. Release air through overflow vent line for 5 min (TM 9-6115-749-10).
20. Check coolant levels and fill as required (TM 9-6115-749-10).
21. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
22. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
23. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL THERMOSTAT

INITIAL SETUP:**Test Equipment**

Thermometer, Self-Indicating (WP 0162, Table 2, Item 30)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Bolt, machine (2) (WP 0130, Repair Parts List, Figure 32, Item 1)

Gasket (WP 0130, Figure 32, Item 3)

Thermostat, flow control (WP 0130, Figure 32, Item 4)

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0163, Item 8)

Distilled water (WP 0163, Item 17)

Fuel, diesel (WP 0163, Item 19)

Grease, electrically conductive (WP 0163, Item 20)

Sealant (WP 0163, Item 32)

Wire, tie (WP 0163, Item 37)

References

WP 0021, Service Cooling System

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Upper radiator hose removed (WP 0024, Remove/Install Radiator Hose and Tube Assemblies)

REMOVE/INSTALL THERMOSTAT**WARNING**

Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

Remove Thermostat

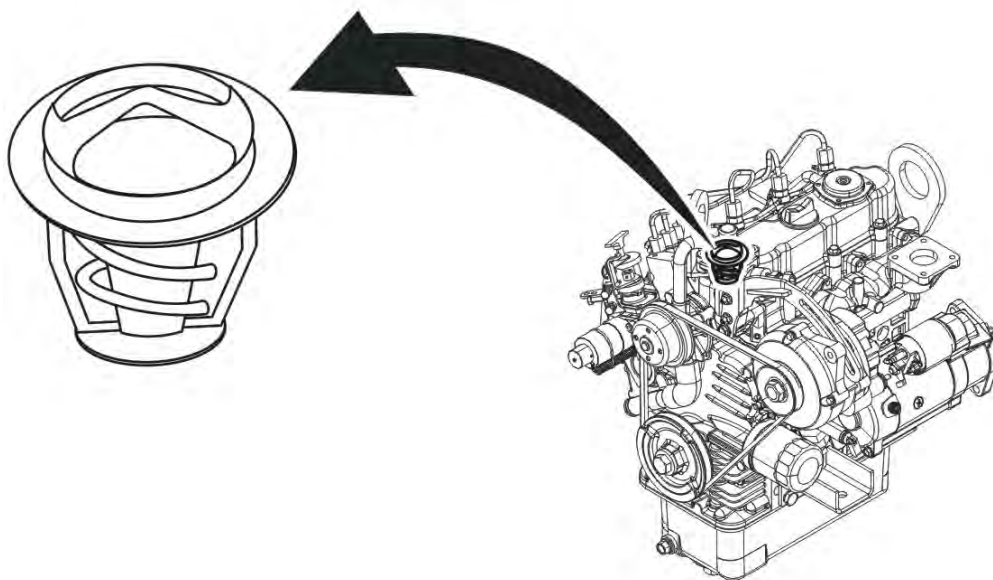


Figure 1. Thermostat — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate thermostat (Figure 1) inside thermostat housing.

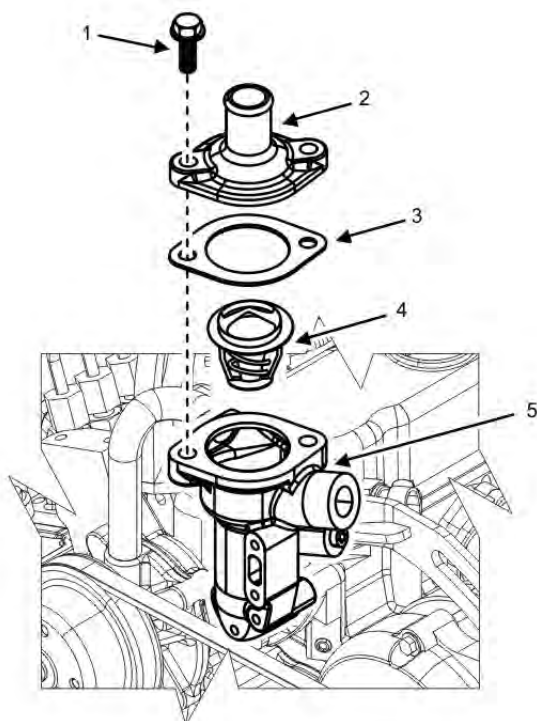


Figure 2. Thermostat Replacement — Detail.

NOTE

Captured coolant should be disposed of IAW local SOP.

3. Remove and discard two bolts with captive lock washers (Figure 2, Item 1) from thermostat cover (Figure 2, Item 2).
4. Remove thermostat cover (Figure 2, Item 2) and set aside for reuse.
5. Remove and discard thermostat gasket (Figure 2, Item 3).
6. Remove thermostat (Figure 2, Item 4) from thermostat housing (Figure 2, Item 5).
7. Inspect thermostat cover (Figure 2, Item 2) and thermostat housing (Figure 2, Item 5) for damage and/or cracks. Replace as required.
8. Cap/plug opening in thermostat housing (Figure 2, Item 5) to prevent dirt and debris from entering cooling system.

END OF TASK

Test Thermostat

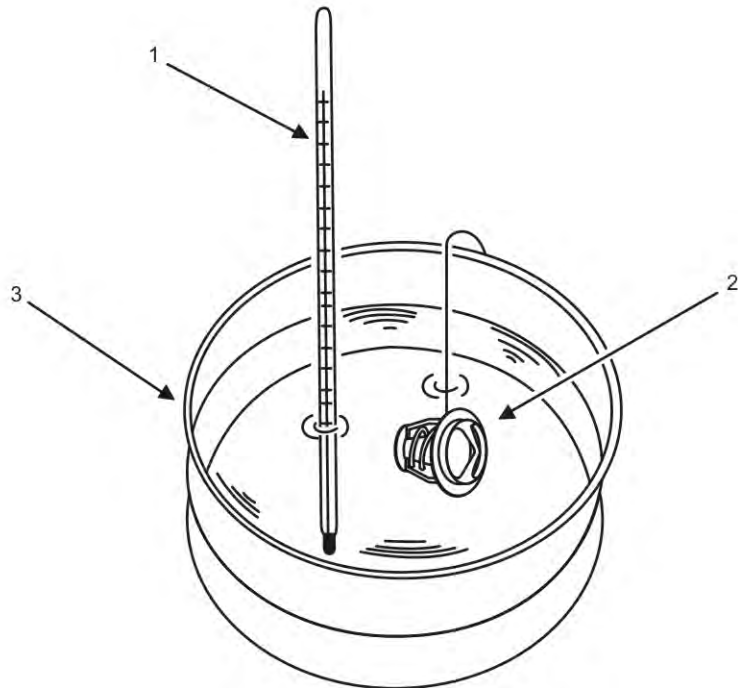


Figure 3. Test Thermostat.

1. Install thermostat (Figure 3, Item 2) and thermometer (Figure 3, Item 1) into bucket of water (Figure 3, Item 3) using wire.
2. Place bucket of water (Figure 3, Item 3) with suspended thermostat (Figure 3, Item 2) and thermometer (Figure 3, Item 1) over heat source.
3. Apply heat to bucket (Figure 3, Item 3) gradually and begin to monitor temperature on thermostat (Figure 3, Item 1).

NOTE

Thermostat should begin to open at 157°F – 163°F (69°C – 72.5°C). Thermostat should be fully open at 185°F (85°C).

4. Verify temperature at which thermostat (Figure 3, Item 2) begins to open.
5. Continue to apply heat to bucket (Figure 3, Item 3) and monitor water temperature.
6. Verify temperature at which thermostat (Figure 3, Item 2) completely opens (approximately 0.315 in (8 mm)).
7. Replace thermostat (Figure 3, Item 2) if thermostat (Figure 3, Item 2) does not react IAW either specification noted above.

END OF TASK**Install Thermostat**

1. Wipe down hoses, parts, and connectors with wiping rag prior to installation.
2. Remove any gasket residue from thermostat housing (Figure 2, Item 5) and thermostat cover (Figure 2, Item 2).

CAUTION

Spring portion of thermostat should be installed inside the thermostat housing. Failure to comply may cause damage to equipment.

3. Install thermostat (Figure 2, Item 4) in thermostat housing (Figure 2, Item 5).
4. Install new thermostat gasket (Figure 2, Item 3) over thermostat (Figure 2, Item 4).
5. Apply sealing compound to surface of thermostat cover (Figure 2, Item 2) that contacts thermostat gasket (Figure 2, Item 3).
6. Install thermostat cover (Figure 2, Item 2).
7. Secure thermostat cover (Figure 2, Item 2) using two new bolts with captive lock washers (Figure 2, Item 1).
8. Install upper coolant hose (not shown) (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
9. Fill cooling system as required (WP 0021, Service Cooling System).
10. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
11. Install top body panel (WP 0028, Remove/Install Top Body Panel).
12. Close generator set doors.
13. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
14. Start engine and run check for leaks and proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
15. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL WATER PUMP

INITIAL SETUP:**Tools and Special Tools**

Hammer, Hand, Soft Face, Dead Blow (WP 0162, Table 2, Item 14)
Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Bolt (1) (WP 0147, Repair Parts List, Figure 49, Item 15)
Bolt, flange (4) (WP 0131, Repair Parts List, Figure 33, Item 10)
Bolt, machine (4) (WP 0131, Figure 33, Item 1)
Gasket (1) (WP 0131, Figure 33, Item 3)
Pump, water (1) (WP 0131, Figure 33, Item 2)
Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items, Item 2)
Cap set, protective (WP 0163, Item 8)
Distilled water (WP 0163, Item 17)
Grease, electrically conductive (WP 0163, Item 20)
Pan, drain (1) (WP 0163, Item 28)

Personnel Required

91D (1)
Assistant (1)

References

WP 0076, Remove/Install Battery-Charging Alternator Belt

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Cooling system drained (WP 0021, Service Cooling System)
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Access panel removed (WP 0029 Remove/Install Front Body Panel)

REMOVE/INSTALL WATER PUMP**Remove Water Pump**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate water pump (Figure 1).

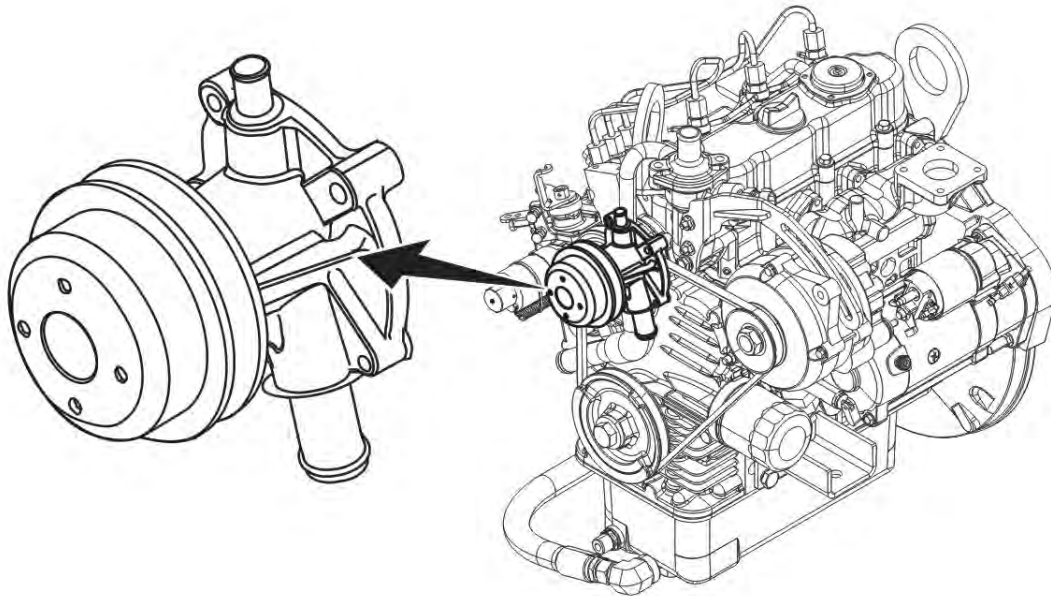


Figure 1. Water Pump — Location.

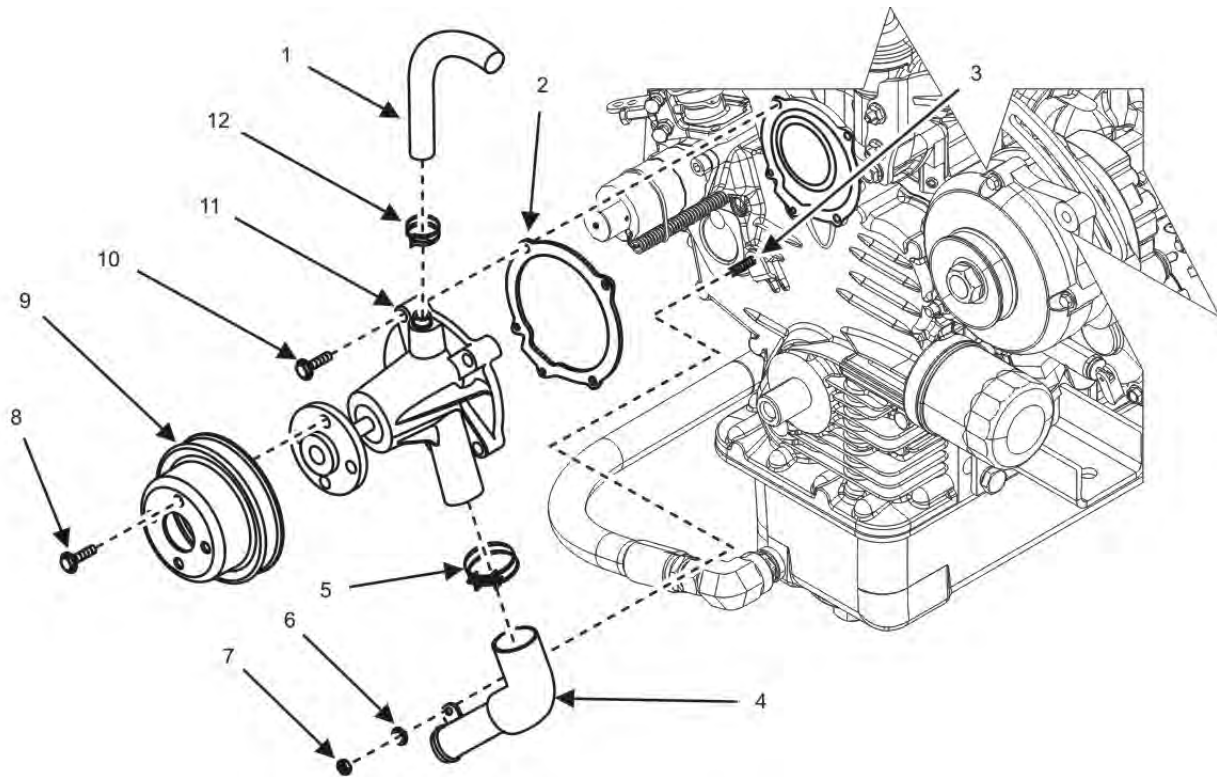


Figure 2. Water Pump — Detail.

3. Inspect flexible water hose (Figure 2, Item 1) for cracks, corrosion, and other damage.
4. Replace flexible water hose (Figure 2, Item 1) if damaged, or set aside for reuse.
5. Disengage hose clamp (Figure 2, Item 5) on lower water hose (Figure 2, Item 4) connection.
6. Remove nut (Figure 2, Item 7) and flat washer (Figure 2, Item 6) that secures lower water hose (Figure 2, Item 4) to stud (Figure 2, Item 3) on engine.
7. Remove lower water hose (Figure 2, Item 4) from water pump (Figure 2, Item 11) connection and inspect for cracks, corrosion, and other damage.
8. Replace lower water hose (Figure 2, Item 4) if damaged or set aside for reuse.

NOTE

Battery-charging alternator belt may help to hold pulley (Figure 2, Item 9) in place while screws are being removed. If belt tension is not strong enough, pulley (Figure 2, Item 9) can be held in place with slip joint pliers while the screws are being removed.

Cap/plug openings in cooling hoses to prevent debris from entering cooling system.

9. Remove four cap screws with captive lock washers (Figure 2, Item 8) from pulley (Figure 2, Item 9).
10. Remove battery-charging alternator belt (WP 0076, Remove/Install Battery-Charging Alternator Belt) and save for reuse.
11. Remove pulley (Figure 2, Item 9) and save for reuse.

NOTE

Lower left water pump bolt is the longer bolt. The other four are of equal length.

12. Remove and discard five bolts with captive lock washers (Figure 2, Item 10) from water pump (Figure 2, Item 11) assembly.
13. Remove water pump (Figure 2, Item 11) from engine.
14. Remove and discard water pump gasket (Figure 2, Item 2).
15. Loosen hose clip (Figure 2, Item 12) on flexible water hose (Figure 2, Item 1) connection at water pump (Figure 2, Item 11).
16. Remove flexible water hose (Figure 2, Item 1) from water pump (Figure 2, Item 11) connection.
17. Remove any residual gasket material from engine and water pump (Figure 2, Item 11).

END OF TASK

Inspect Water Pump Assembly

1. Inspect water pump (Figure 2, Item 11) for cracks, damage, or corrosion and replace as required.
2. Ensure that water pump shaft and impeller rotate freely within water pump housing. Replace water pump (Figure 2, Item 11) if shaft or impeller are obstructed or do not rotate freely.
3. Inspect pulley (Figure 2, Item 9) for cracks or damage and replace as required.

END OF TASK

Install Water Pump**NOTE**

Remove all caps/plugs before installation.

1. Position new water pump gasket (Figure 2, Item 2) onto water pump (Figure 2, Item 11) and align the mounting holes.
2. Position water pump (Figure 2, Item 11) to its location on engine and align the mounting holes.

NOTE

The lower left bolt is the longer water pump bolt. The other four are of equal length.

3. Secure water pump (Figure 2, Item 11) to engine by installing five new bolts with captive lock washers (Figure 2, Item 10).
4. Install hose clip (Figure 2, Item 12) on flexible water hose (Figure 2, Item 1).
5. Install lower water hose (Figure 2, Item 4) onto water pump (Figure 2, Item 11) and position hose clamp (Figure 2, Item 5).
6. Position lower water hose (Figure 2, Item 4) onto stud (Figure 2, Item 3) and secure by installing flat washer (Figure 2, Item 6) and nut (Figure 2, Item 7).
7. Position pulley (Figure 2, Item 9) assembly on water pump (Figure 2, Item 11).

NOTE

Pulley (Figure 2, Item 9) must be held in place with slip joint pliers or other tool to assist in tightening pulley bolts, or battery-charging alternator belt can be installed to help hold the pulley in place.

8. Secure pulley (Figure 2, Item 9) assembly with four new cap screws with captive lock washers (Figure 2, Item 8).
9. Tighten hose clamp (Figure 2, Item 5) on lower water hose (Figure 2, Item 4).
10. Install battery-charging alternator belt (WP 0076, Remove/Install Battery-Charging Alternator Belt).
11. Install access panel (WP 0029, Remove/Install Front Body Panel).
12. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
13. Fill cooling system (WP 0021, Service Cooling System).
14. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
15. Start engine and check for proper operation and leaks (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
16. Repair as required.
17. Check coolant level and fill as required (TM 9-6115-749-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR ASSEMBLY

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Alternator, battery charging (WP 0132, Repair Parts List, Figure 34, Item 7)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Assistant (1)

References

WP 0018, Repair DCS

References

WP 0076, Remove/Install Battery-Charging Alternator Belt

WP 0093, General Maintenance

Foldout Pages

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

Access panel removed (WP 0029, Remove/Install Front Body Panel)

REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR ASSEMBLY**Test Battery-Charging Alternator Assembly****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

This test is not necessary if you are removing the battery-charging alternator for access to other components.

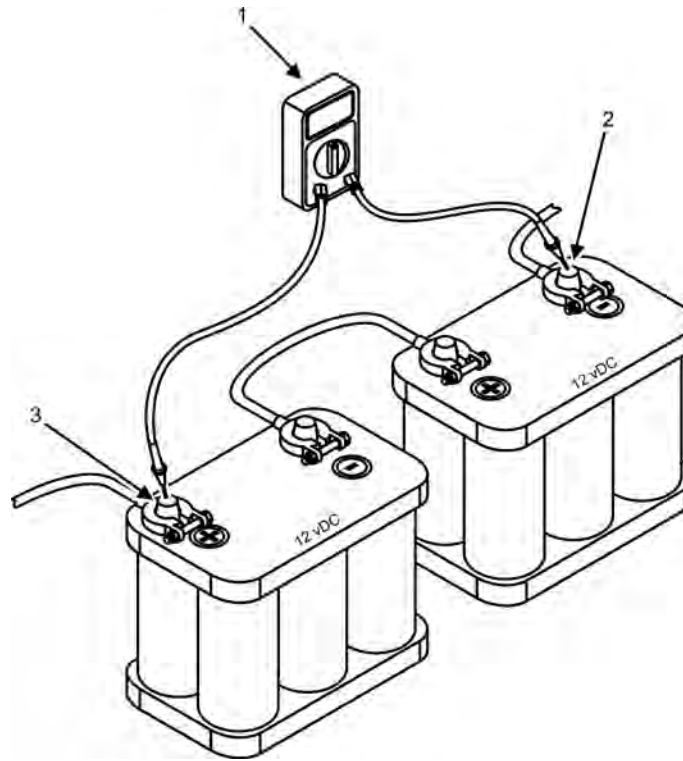


Figure 1. Battery-Charging Alternator — Test.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Set the multimeter (Figure 1, Item 1) to measure VDC.
4. Attach multimeter (Figure 1, Item 1) to right-side battery negative terminal (Figure 1, Item 2) and left-side battery positive terminal (Figure 1, Item 3).
5. Record voltage reading displayed on the multimeter (Figure 1, Item 1).
6. Install battery ground cable (WP 0036, Remove/Install Batteries).
7. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
8. Start generator set (TM 9-6115-749-10).
9. Attach multimeter leads to power wire (Figure 3, Item 7) stud (Figure 3, Item 8) and ground screw (Figure 3, Item 4) on battery-charging alternator (Figure 3, Item 1).

NOTE

If voltage at battery-charging alternator (Figure 3, Item 1) with engine operating is not between 26 and 31 VDC range, the battery-charging alternator (Figure 3, Item 1) or field flash wire (Figure 3, Item 5) may be defective. If voltage at battery-charging alternator (Figure 3, Item 1) is within 26 and 31 VDC range, wiring to starter (not shown) can be tested to confirm proper operation (see step 17).

10. Record voltage reading. Proceed to step 11 if voltage is not within 26 to 31 VDC range or proceed to step 17 if voltage is within 26 to 31 VDC range.
11. Shut down generator set (TM 9-6115-749-10).

12. Remove field flash wire (P2-P) (Figure 3, Item 5) and connect multimeter leads from field flash wire (Figure 3, Item 5) to ground screw (Figure 3, Item 4).
13. Use an assistant to start generator set (TM 9-6115-749-10).

CAUTION

Be sure to observe multimeter display throughout entire starting and running of generator set to obtain an accurate reading. Full field flash voltage reading should be observed within 30 seconds of starting. Failure to comply may cause damage to equipment.

NOTE

If voltage reading obtained in step 14 is the same $\pm 5\%$ as battery voltage reading obtained in step 5, battery-charging alternator (Figure 3, Item 1) is receiving proper field flash signal from DCS. If voltage reading obtained in step 14 is not the same $\pm 5\%$ as battery voltage reading obtained in step 5, field flash wire (Figure 3, Item 5) or DCS may be malfunctioning. See WP 0093, General Maintenance and Foldout Pages to check field flash wire (Figure 3, Item 5) and see WP 0018, Repair DCS to check DCS.

14. Record voltage reading and compare to reading obtained in step 5.
15. Shut down generator set (TM 9-6115-749-10).
16. Replace battery-charging alternator (Figure 3, Item 1) if voltage recorded in step 10 is outside 26 to 31 VDC range but field flash wire (Figure 3, Item 5) voltage in step 14 is the same as battery voltage (step 5).
17. Attach multimeter (Figure 1, Item 1) to right-side battery negative terminal (Figure 1, Item 2) and left-side battery positive terminal (Figure 1, Item 3).
18. Start generator set (TM 9-6115-749-10).
19. Record voltage reading displayed on the multimeter (Figure 1, Item 1).
20. Shut down generator set (TM 9-6115-749-10).
21. Test and replace wiring as required (WP 0093 and Foldout Pages) if voltage reading in step 19 does not match voltage reading $\pm 5\%$ obtained in step 10.
22. Remove multimeter (Figure 1, Item 1) from battery terminals.
23. Remove battery ground cable (WP 0036, Remove/Install Batteries).
24. Close left-side door.

END OF TASK

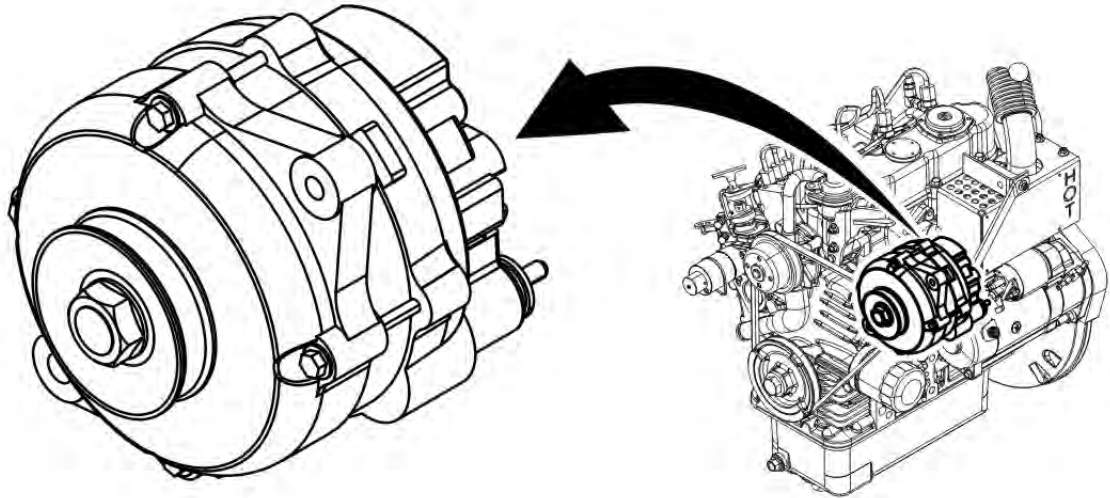
Remove Battery-Charging Alternator Assembly

Figure 2. Battery-Charging Alternator — Location.

WARNING

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

NOTE

To aid installation, tag and identify all electrical wires and connectors prior to removal.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Locate battery-charging alternator (Figure 2).

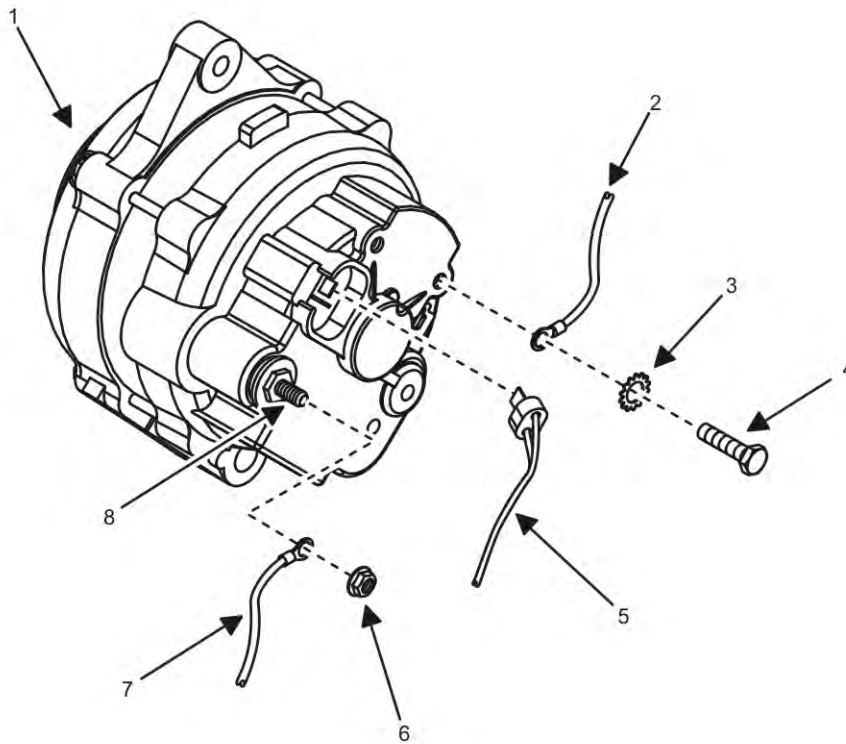


Figure 3. Battery Charging Alternator — Wiring.

4. Remove boot (not shown) to expose stud (Figure 3, Item 8) on rear of battery-charging alternator (Figure 3, Item 1).
5. Remove nut (Figure 3, Item 6) and power wire (Figure 3, Item 7) from stud (Figure 3, Item 8).
6. Disconnect field flash wire (Figure 3, Item 5) from rear of battery-charging alternator (Figure 3, Item 1).
7. Remove ground screw (Figure 3, Item 4) and external tooth washer (Figure 3, Item 3) securing ground wire (Figure 3, Item 2) to rear of battery-charging alternator (Figure 3, Item 1).
8. Loosen nut (Figure 4, Item 13) on mounting bolt (Figure 4, Item 10). Do not remove.
9. Loosen adjustment screw (Figure 4, Item 3), slide battery-charging alternator (Figure 4, Item 12) inward, and remove battery-charging alternator belt (not shown) from pulley on battery-charging alternator (Figure 4, Item 12).
10. Remove bolt (Figure 4, Item 9) and nut (Figure 4, Item 11) securing alternator support bracket (Figure 4, Item 8) to adjustment bracket (Figure 4, Item 1).
11. Remove bolt (Figure 4, Item 7) and nut (Figure 4, Item 6) securing alternator support bracket (Figure 4, Item 8) to heat shield alternator bracket (Figure 4, Item 5) located on top of heat shield (Figure 4, Item 4).

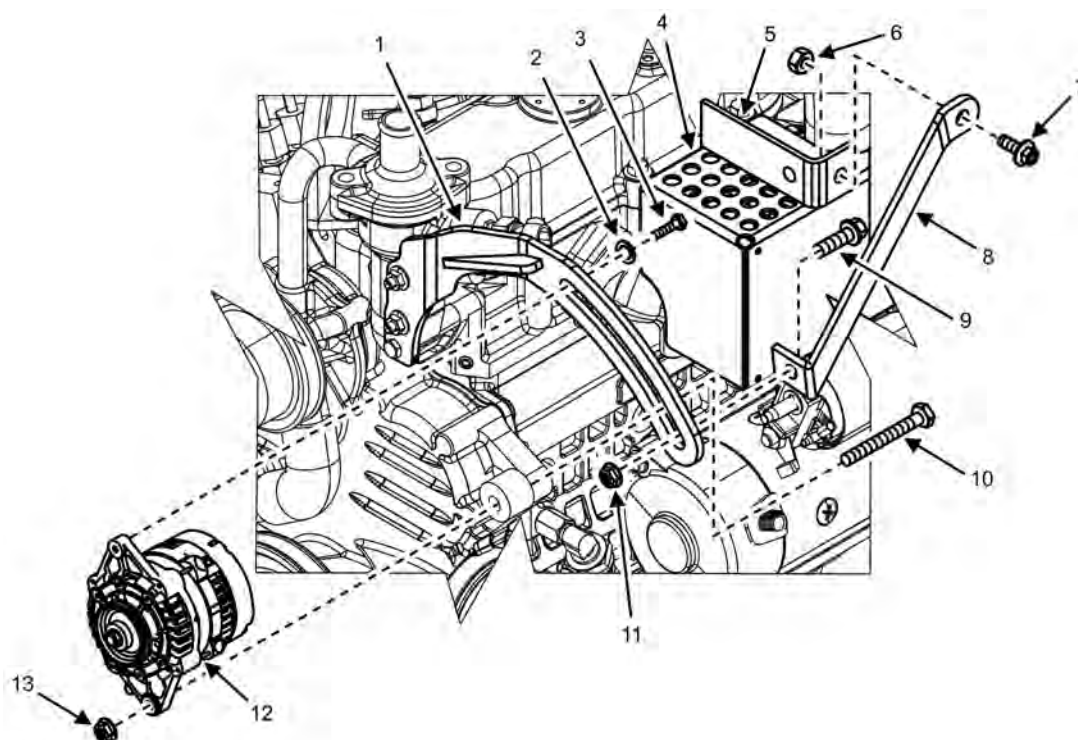


Figure 4. Battery-Charging Alternator — Remove/Install.

12. Remove alternator support bracket (Figure 4, Item 8).
13. Remove adjustment screw (Figure 4, Item 3) and flat washer (Figure 4, Item 2) from battery-charging alternator (Figure 4, Item 12) and adjustment bracket (Figure 4, Item 1).
14. Support battery-charging alternator (Figure 4, Item 12) and remove nut (Figure 4, Item 13) from mounting bolt (Figure 4, Item 10).
15. Remove battery-charging alternator (Figure 4, Item 12) from engine and place on a suitable work surface.
16. Inspect mounting bolt (Figure 4, Item 10) for obvious signs of damage.
17. Remove mounting bolt (Figure 4, Item 10) from engine only if damaged. Otherwise, leave installed.

END OF TASK

Inspect Battery-Charging Alternator Assembly

1. Inspect battery-charging alternator (Figure 4, Item 12) for signs of obvious damage.
2. Replace damaged battery-charging alternator (Figure 4, Item 12).
3. Inspect adjustment bracket (Figure 4, Item 1), alternator support bracket (Figure 4, Item 8), and heat shield alternator bracket (Figure 4, Item 5) for signs of obvious damage.
4. Replace damaged adjustment bracket (Figure 4, Item 1), alternator support bracket (Figure 4, Item 8), and heat shield alternator bracket (Figure 4, Item 5) as required.

END OF TASK

Install Battery-Charging Alternator Assembly**NOTE**

Remove tags from wires and connectors only after generator set is operating properly.

Mounting bolt installation is necessary only if the mounting bolt was removed because of damage.

1. Install mounting bolt (Figure 4, Item 10) to its mounting position on engine.
2. Support and install battery-charging alternator (Figure 4, Item 12) onto mounting bolt (Figure 4, Item 10).
3. Install nut (Figure 4, Item 13) onto mounting bolt (Figure 4, Item 10) finger-tight to secure battery-charging alternator (Figure 4, Item 12).
4. Position battery-charging alternator (Figure 4, Item 12) to adjustment bracket (Figure 4, Item 1) and install adjustment screw (Figure 4, Item 3) and flat washer (Figure 4, Item 2) through adjustment bracket (Figure 4, Item 1) and into battery-charging alternator (Figure 4, Item 12). Do not tighten.
5. Install bolt (Figure 4, Item 7) and nut (Figure 4, Item 6) to secure alternator support bracket (Figure 4, Item 8) to heat shield alternator bracket (Figure 4, Item 5).
6. Install bolt (Figure 4, Item 9) and nut (Figure 4, Item 11) to secure alternator support bracket (Figure 4, Item 8) to adjustment bracket (Figure 4, Item 1).
7. Torque bolts (Figure 4, Items 7, 9, and 10) to 18 to 21 ft/lb (24 to 29 Nm).
8. Install and adjust battery-charging alternator belt (WP 0076, Remove/Install Battery-Charging Alternator Belt).
9. Torque nut (Figure 4, Item 13) to bolt (Figure 4, Item 10) to 28 to 35 ft/lb (38 to 47 Nm). Torque adjustment screw (Figure 4, Item 3) to 17 to 21 ft/lb (24 to 29 Nm).
10. Install ground screw (Figure 3, Item 4) and external tooth washer (Figure 3, Item 3) through ground wire (Figure 3, Item 2) connector and secure to rear of battery-charging alternator (Figure 3, Item 1).
11. Torque ground screw (Figure 3, Item 4) 26 to 32 in/lb (3.0 to 3.6 Nm).
12. Apply electrically conductive grease to the connector on field flash wire (Figure 3, Item 5).
13. Connect field flash wire (Figure 3, Item 5) to rear of battery-charging alternator (Figure 3, Item 1).
14. Install power wire (Figure 3, Item 7) onto stud (Figure 3, Item 8) on rear of battery-charging alternator (Figure 3, Item 1).
15. Install nut (Figure 3, Item 6) to secure power wire (Figure 3, Item 7) to stud (Figure 3, Item 8).
16. Torque nut (Figure 3, Item 6) 91 to 110 in/lb (10 to 12 Nm).
17. Cover stud (Figure 3, Item 8) with boot (not shown).
18. Install access panel (WP 0029, Remove/Install Front Body Panel).
19. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
20. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
21. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
22. Start engine and check for proper operation (TM 9-6115-749-10).
23. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR BELT

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 31)

Materials/Parts

Belt, V (WP 0132, Repair Parts List, Figure 34, Item 8)

Cleaning compound, solvent (WP 0163, Expendable and Durable Items List, Item 10)

Grease, electrically conductive (WP 0163, Item 20)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

References

WP 0075, Remove/Install Battery-Charging Alternator Assembly

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Access panel removed (WP 0029, Remove/Install Front Body Panel)

REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR BELT**WARNING**

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

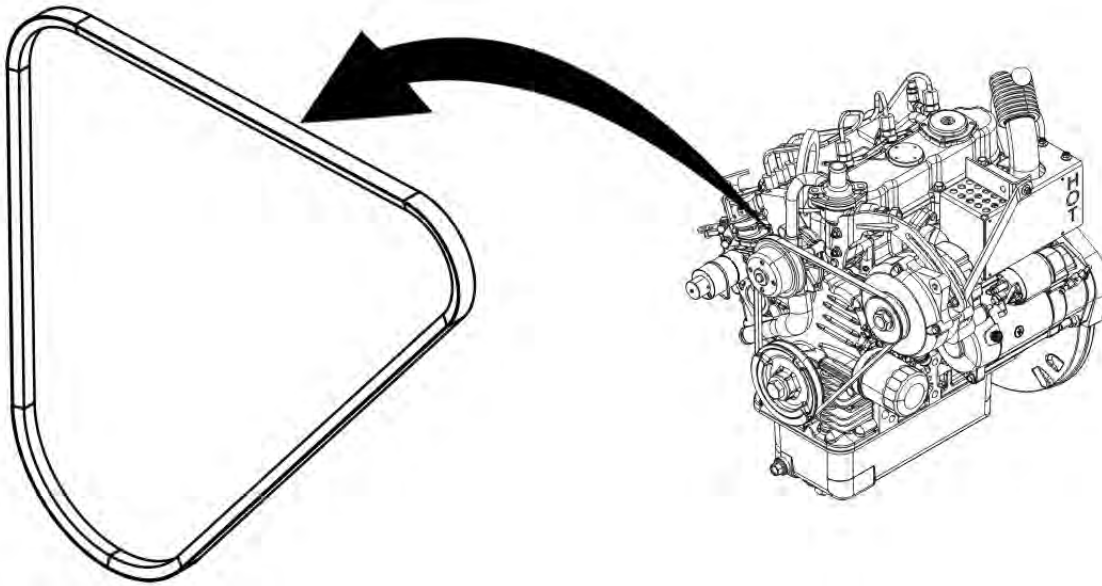
Remove Battery-Charging Alternator Belt

Figure 1. Battery-Charging Alternator Belt — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate battery-charging alternator belt (Figure 1).

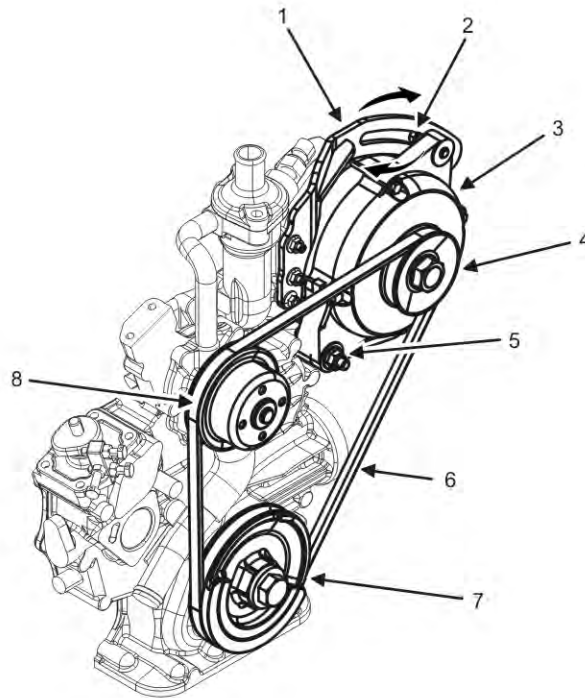


Figure 2. Battery-Charging Alternator Belt — Removal.

3. Loosen screw (Figure 2, Item 2) that secures battery-charging alternator (Figure 2, Item 3) to upper mounting bracket (Figure 2, Item 1).
4. Loosen nut (Figure 2, Item 5) that secures battery-charging alternator (Figure 2, Item 3) to engine.
5. Push battery-charging alternator (Figure 2, Item 3) toward engine to slacken tension on battery-charging alternator belt (Figure 2, Item 6).
6. Slide battery-charging alternator belt (Figure 2, Item 6) from battery-charging alternator pulley (Figure 2, Item 4).
7. Remove battery-charging alternator belt (Figure 2, Item 6) from other pulleys and clear of unit.

END OF TASK

Inspect Battery-Charging Alternator Belt

1. Inspect water pump pulley (Figure 2, Item 8), crankshaft pulley (Figure 2, Item 7), and battery-charging alternator pulley (Figure 2, Item 4) for damage. Replace components as required.
2. Inspect battery-charging alternator (Figure 2, Item 3) for damage. Replace as required (WP 0075, Remove/Install Battery-Charging Alternator Assembly).
3. Inspect battery-charging alternator belt (Figure 2, Item 6) for wear, cracks, or damage. Replace as required.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

4. Clean oil, grease, dirt and debris from water pump pulley (Figure 2, Item 8), crankshaft pulley (Figure 2, Item 7), and battery-charging alternator pulley (Figure 2, Item 4) using dry cleaning solvent and wiping rags.

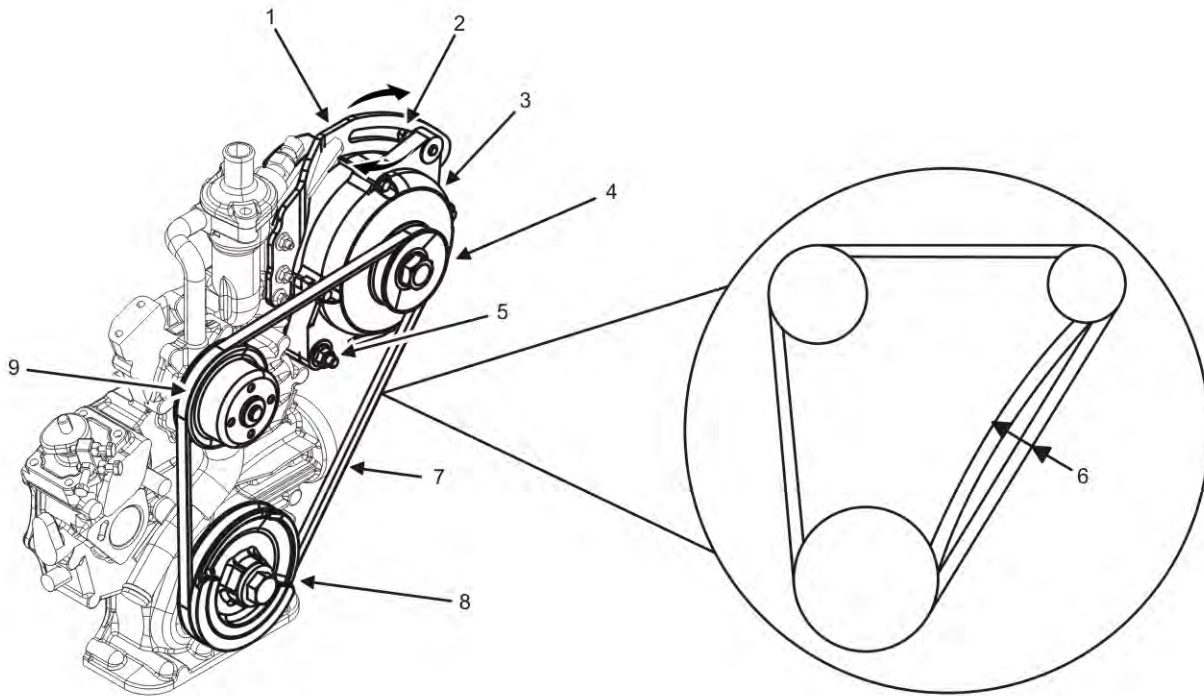
END OF TASK**Install Battery-Charging Alternator Belt**

Figure 3. Battery-Charging Alternator Belt — Install.

1. Position battery-charging alternator belt (Figure 3, Item 7) around crankshaft pulley (Figure 3, Item 8) and water pump pulley (Figure 3, Item 9).
2. Push battery-charging alternator (Figure 3, Item 3) toward engine to allow battery-charging alternator belt (Figure 3, Item 7) to be installed around battery-charging alternator pulley (Figure 3, Item 4).
3. Release battery-charging alternator (Figure 3, Item 3) and allow it to assume its natural position on battery-charging alternator belt (Figure 3, Item 7).

4. Pull battery-charging alternator (Figure 3, Item 3) away from engine until battery-charging alternator belt (Figure 3, Item 7) appears to be tight.
5. Tighten screw (Figure 3, Item 2) to lock battery-charging alternator (Figure 3, Item 3) in position on upper mounting bracket (Figure 3, Item 1).

NOTE

Instructions are given for checking belt deflection between the battery-charging alternator and the harmonic balancer pulley. Belt deflection can also be checked between the water pump and battery-charging alternator. Apply moderate pressure to center of battery-charging alternator belt (Figure 3, Item 7) between battery-charging alternator pulley (Figure 3, Item 4) and crankshaft pulley (Figure 3, Item 8) to deflect battery-charging alternator belt (Figure 3, Item 7) inward.

6. Check belt deflection (Figure 3, Item 6) with machinist's rule and compare belt deflection with values in Table 1. A used belt is defined as a belt that has been installed on a running engine for 5 min or more.

Table 1. Belt Deflection.

DEFLECTION CHECK POSITION	NEW BELT DEFLECTION	USED BELT DEFLECTION
Between battery-charging alternator and crankshaft	0.31 – 0.44 in (8 – 12 mm)	0.37 – 0.50 in (10 – 14 mm)
Between water pump and battery-charging alternator	0.19 – 0.31 in (5 – 8 mm)	0.25 – 0.37 in (7 – 10 mm)
Between water pump and crankshaft	0.25 – 0.44 in (7 – 11 mm)	0.31 – 0.50 in (9 – 13 mm)

NOTE

Belt adjustment is not necessary if belt deflection is within specification.

7. Adjust battery-charging alternator belt deflection (Figure 3, Item 6) if belt deflection (Figure 3, Item 6) is outside of specification.
8. Loosen screw (Figure 3, Item 2) from upper mounting bracket (Figure 3, Item 1).
9. Loosen nut (Figure 3, Item 5) that secures battery-charging alternator (Figure 3, Item 3) to engine.

CAUTION

When adjusting battery-charging alternator belt tension, apply pressure to battery-charging alternator housing when prying. Do not pry on battery-charging alternator pulley. Prying on battery-charging alternator pulley may cause damage to the battery-charging alternator. Failure to comply may cause damage to equipment.

10. Adjust belt deflection (Figure 3, Item 6) by prying battery-charging alternator (Figure 3, Item 3) away from engine until battery-charging alternator belt deflection (Figure 3, Item 6) is within specification.
11. Tighten screw (Figure 3, Item 2) to lock battery-charging alternator (Figure 3, Item 3) in position on upper mounting bracket (Figure 3, Item 1).
12. Repeat steps 8 through 11 to check belt deflection until proper tension is achieved.
13. Torque lower mounting nut (Figure 3, Item 5) to 28 – 35 ft/lb (38 – 47 Nm).
14. Torque upper mounting screw (Figure 3, Item 2) to 18 – 21 ft/lb (24 – 29 Nm).
15. Install front access panel (WP 0029, Remove/Install Front Body Panel).
16. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).

17. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
18. Start engine and check for proper operation (TM 9-6115-749-10).
19. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL STARTER

INITIAL SETUP:**Tools and Special Tools**

Crowfoot Attachment Set, Socket Wrench, Flare Nut, Metric (WP 0162, Table 2, Item 11)
Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)

Materials/Parts

Motor, starter, 24 volt (WP 0133, Repair Parts List, Figure 35, Item 1)
Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

References

WP 0036, Remove/Install Batteries
WP 0061, Remove/Install Relay Panel
WP 0080, Remove/Install Exhaust Manifold
WP 0093, General Maintenance
Foldout Pages

Personnel Required

91D (1)
Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool

REMOVE/INSTALL STARTER**WARNING**

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting the main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Remove Starter Assembly

NOTE

Identify and tag or mark all electrical wires and connectors prior to removal to aid at installation.

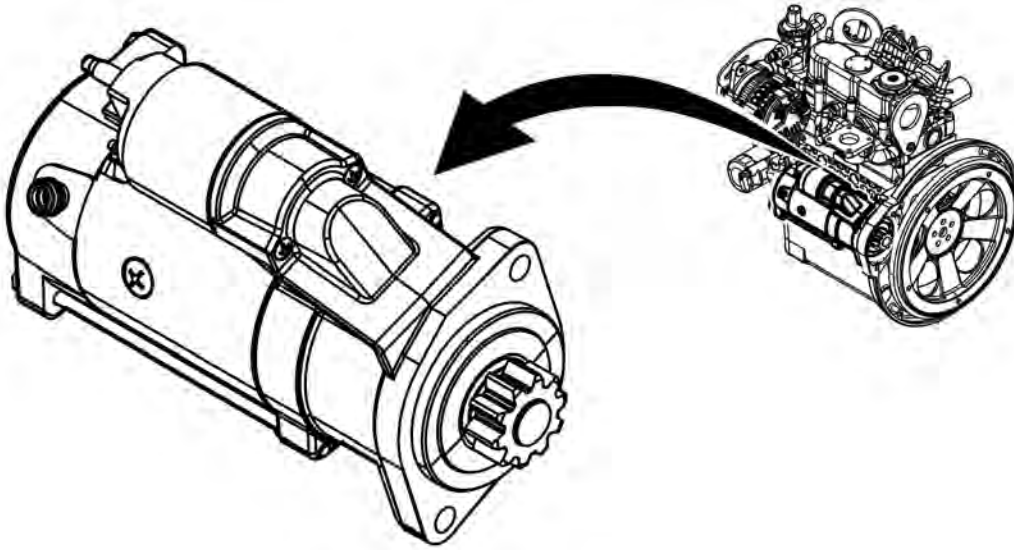


Figure 1. Starter Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove right-side battery (WP 0036, Remove/Install Batteries).
3. Remove heat shield from exhaust manifold (WP 0080, Remove/Install Exhaust Manifold).
4. Locate starter on exhaust-side of engine (Figure 1).

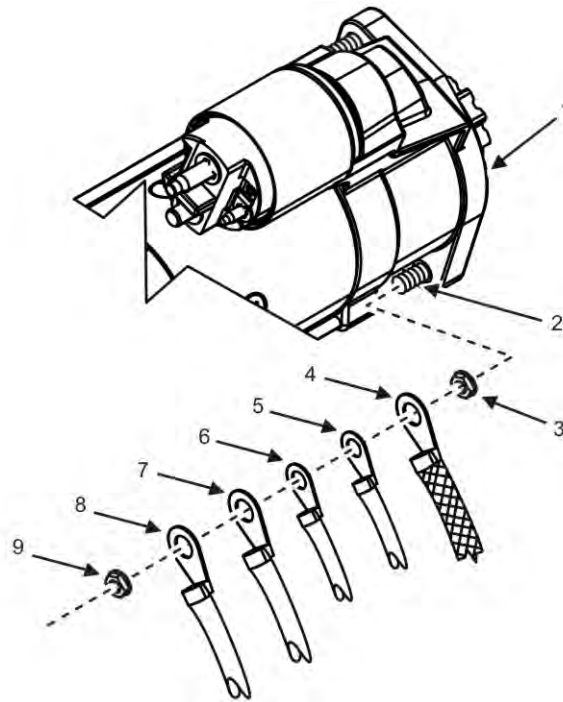


Figure 2. Starter — Lower Mounting Starter Stud.

NOTE

One of the white wires (Figure 2, Items 5 and 6) could be grounded to the upper mounting stud (Figure 3, Item 8) and may need to be removed after nut (Figure 3, Item 6) is removed from upper mounting stud (Figure 3, Item 8).

5. Reposition boot on black wire (Figure 2, Item 8) to expose nut (Figure 2, Item 9) on lower mounting stud (Figure 2, Item 2).
6. Remove nut (Figure 2, Item 9) from lower mounting stud (Figure 2, Item 2).
7. Remove two black wires (Figure 2, Items 7 and 8) from lower mounting stud (Figure 2, Item 2).
8. Remove two white wires (Figure 2, Items 5 and 6) from lower mounting stud (Figure 2, Item 2).
9. Remove braided ground strap (Figure 2, Item 4) from lower mounting stud (Figure 2, Item 2).
10. Remove a second nut (Figure 2, Item 3) from lower mounting stud (Figure 2, Item 2) securing starter (Figure 2, Item 1) to engine.
11. Loosen oil pressure sensor (not shown) and reposition for clearance to disconnect wiring harness.

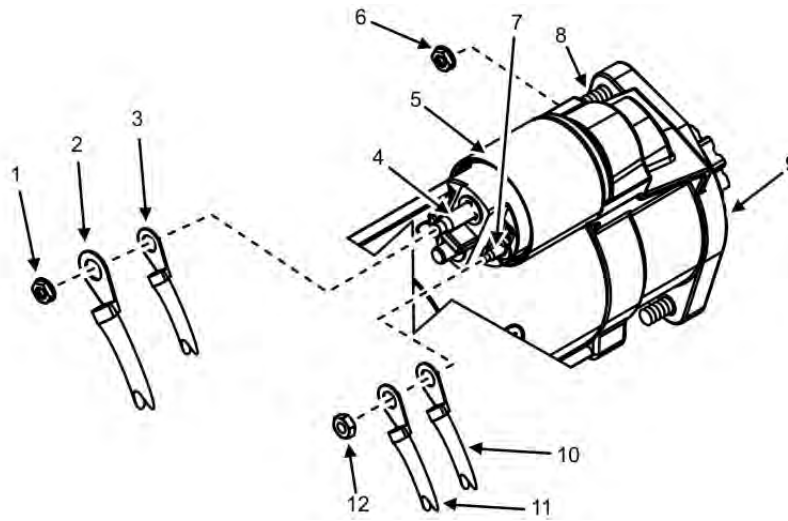


Figure 3. Starter Solenoid.

12. Reposition boot on black wire (Figure 3, Item 2) to expose nut (Figure 3, Item 1).
13. Remove nut (Figure 3, Item 1) and black wire (Figure 3, Item 2) from upper solenoid stud (Figure 3, Item 4) of starter solenoid (Figure 3, Item 5).
14. Remove white wire (Figure 3, Item 3) from upper solenoid stud (Figure 3, Item 4).
15. Reposition boot on white wire (Figure 3, Item 11) to expose nut (Figure 3, Item 12).
16. Remove nut (Figure 3, Item 12) from right-side solenoid stud (Figure 3, Item 7).
17. Remove two white wires (Figure 3, Items 10 and 11) from right-side solenoid stud (Figure 3, Item 7).
18. Support starter (Figure 3, Item 9) from underneath.

NOTE

One of the white wires (Figure 2, Items 5 and 6) could be grounded to the upper mounting stud (Figure 3, Item 8) and may need to be removed after nut (Figure 3, Item 6) is removed from upper mounting stud (Figure 3, Item 8).

19. Remove nut (Figure 3, Item 6) from upper mounting stud (Figure 3, Item 8).
20. Remove starter (Figure 3, Item 9) from engine and generator set.
21. Place starter (Figure 3, Item 9) on a suitable work surface.

END OF TASK

Inspect Starter

1. Inspect all wires and connectors for damage, fraying, or corrosion.
2. Replace any damaged wire or connector (WP 0093, General Maintenance).
3. Inspect starter (Figure 3, Item 9) for signs of obvious damage. Replace damaged starter (Figure 3, Item 9).
4. Inspect lower mounting stud (Figure 2, Item 2) and upper mounting stud (Figure 3, Item 8) for damaged threads, excessive wear, or corrosion. Replace as required.

END OF TASK

Install Starter

1. Position starter (Figure 3, Item 9) to lower mounting stud (Figure 2, Item 2) and upper mounting stud (Figure 3, Item 8) on exhaust-side of engine.
2. Install nut (Figure 3, Item 6) to upper mounting stud (Figure 3, Item 8) finger-tight.
3. Install nut (Figure 2, Item 3) to lower mounting starter stud (Figure 2, Item 2) finger-tight.
4. Tighten lower and upper starter mounting nuts to 38 – 42 ft/lb (47 – 57 Nm) with a crowfoot wrench head.

NOTE

Use tags and markings applied during removal as guides at installation. Leave tags and markings in place until installation is complete and generator set is operating properly.

5. Install two white wires (Figure 3, Items 10 and 11) to right-side solenoid stud (Figure 3, Item 7) using tags and markings applied at removal as a guide.
6. Install nut (Figure 3, Item 12) to right-side solenoid stud (Figure 3, Item 7). Torque nut (Figure 3, Item 12) to 26 – 32 in/lb (3.0 – 3.6 Nm).
7. Position boot of white wire (Figure 3, Item 11) to cover nut (Figure 3, Item 12).
8. Install white wire (Figure 3, Item 3) to upper solenoid stud (Figure 3, Item 4) using tag and marking applied at removal as a guide.
9. Install black wire (Figure 3, Item 2) to upper solenoid stud (Figure 3, Item 4) using tag and marking applied at removal as a guide.
10. Install nut (Figure 3, Item 1) to upper solenoid stud (Figure 3, Item 4). Torque nut (Figure 3, Item 1) to 106 – 133 in/lb (12 – 15 Nm).
11. Position boot of black wire (Figure 3, Item 2) to cover nut (Figure 3, Item 1).
12. Reposition and tighten oil pressure sensor (not shown).
13. Install braided ground strap (Figure 2, Item 4) to lower mounting stud (Figure 2, Item 2) using tags and markings applied at removal as a guide.
14. Install two white wires (Figure 2, Items 5 and 6) and two black wires (Figure 2, Items 7 and 8) to lower mounting stud (Figure 2, Item 2) using tags and markings applied at removal as a guide.
15. Install nut (Figure 2, Item 9) to lower mounting stud (Figure 2, Item 2).
16. Install heat shield to exhaust manifold (WP 0080, Remove/Install Exhaust Manifold).
17. Install right-side battery and battery ground cable (WP 0036, Remove/Install Batteries).
18. Close left-side door.
19. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
20. Start engine and check for proper operation (TM 9-6115-749-10).
21. Repair as required.

END OF TASK

Test Starter

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.

NOTE

When DCS indicates batteries are charged but engine will not crank, check for battery current at starter solenoid (Figure 3, Item 5).

3. Check control wire (white wire) (Figure 3, Item 11) at terminal (right-side solenoid stud) (Figure 3, Item 7) for approximately 24 VDC (not less than 20.0 VDC) by attaching the positive lead of the multimeter to control wire (white wire) (Figure 3, Item 11) and the negative lead to upper mounting stud (Figure 3, Item 8) while assistant operates the DEAD CRANK SWITCH (TM 9-6115-749-10).
4. Turn DEAD CRANK SWITCH to CRANK with help from assistant. Watch for rotation of harmonic balancer at front of engine, indicating starter is operational.
5. Listen for clicking and spinning sounds at starter solenoid (Figure 3, Item 5) when DEAD CRANK SWITCH is in the CRANK position and engine does not crank.

NOTE

When starter diode wire is tested, the multimeter should indicate a high resistance in one direction and a low resistance with the leads reversed. If the diode is shorted, the multimeter will indicate approximately zero resistance with the multimeter leads in either direction. If the diode is open, the multimeter will indicate infinite resistance or greater than 100,000 Ω with the multimeter leads in either direction. If starter diode wire is found to be defective by way of a short during the test in step 6, relays K11 and K10 must be checked in relay panel for proper function (WP 0061, Remove/Install Relay Panel).

6. Check starter diode wire (Foldout Pages) using a multimeter set to test ohms (Ω) (WP 0093, General Maintenance) for proper resistance if clicking and spinning sounds are not heard at starter solenoid (Figure 3, Item 5) in step 5. Replace diode wire as required.
7. Replace starter (Figure 3, Item 9) if clicking and spinning sounds are not heard at starter solenoid (Figure 3, Item 5) and starter diode wire is not defective.
8. Close left-side door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL GOVERNOR ACTUATOR

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Governor actuator (WP 0134, Repair Parts List, Figure 36, Item 2)

Gasket, actuator (WP 0134, Figure 36, Item 3)

Cap set, protective (WP 0163, Expendable and Durable Items List, Item 8)

Grease, electrically conductive (WP 0163, Item 20)

Lubricating oil, engine (WP 0163, Item 23)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Front body panel removed (WP 0029, Remove/Install Front Body Panel)

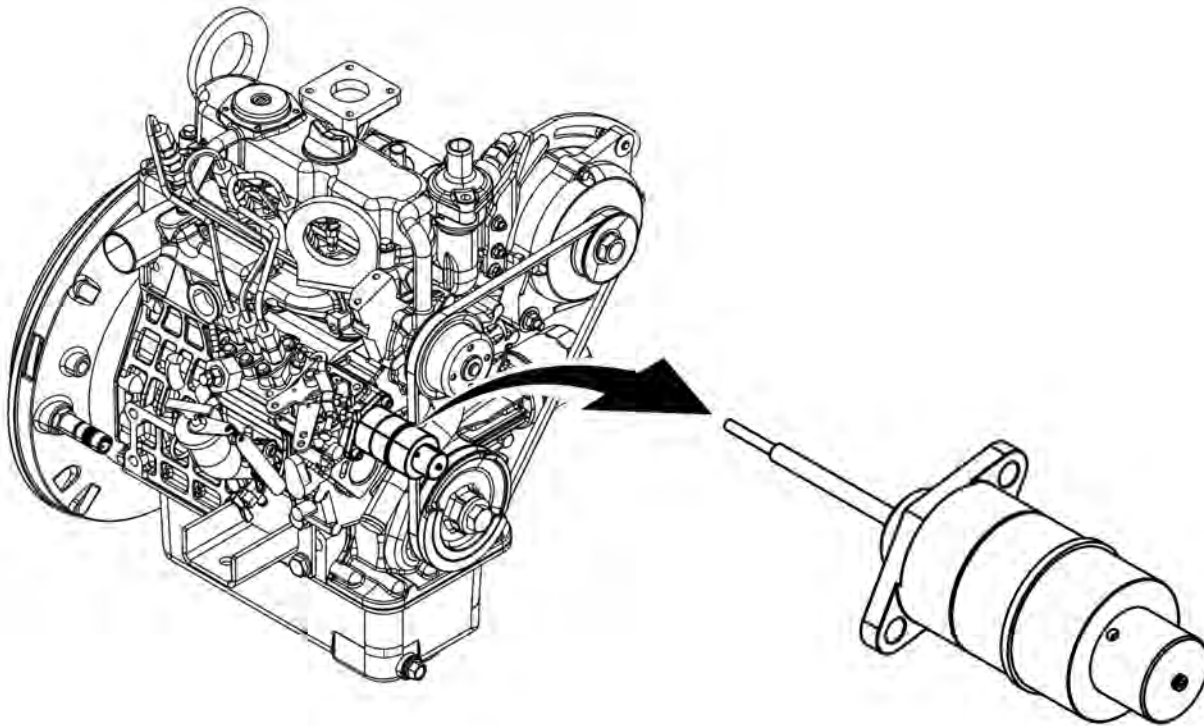
REMOVE/INSTALL GOVERNOR ACTUATOR**Remove Governor Actuator**

Figure 1. Governor Actuator — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate governor actuator (Figure 1).

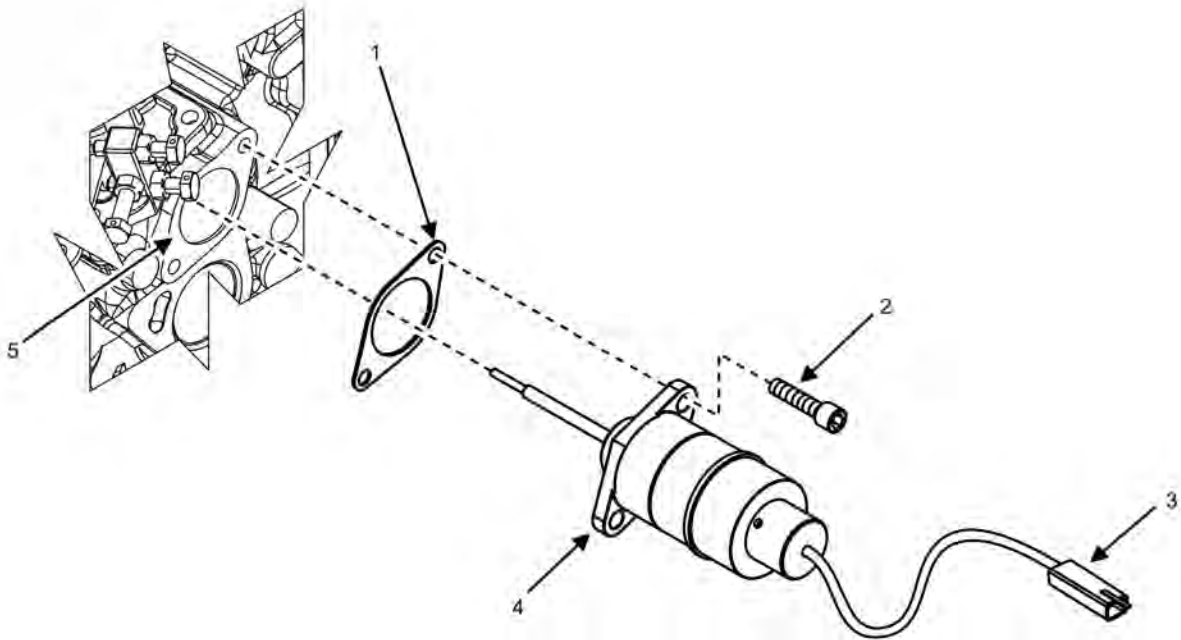


Figure 2. Governor Actuator — Removal Details.

3. Remove wiring harness (not shown) from governor actuator pigtail (Figure 2, Item 3).
4. Remove two socket head screws (Figure 2, Item 2) securing governor actuator (Figure 2, Item 4) to engine.

CAUTION

Use caution when removing governor actuator. Slowly pull straight from the engine to avoid bending probe on governor actuator. Failure to comply may cause damage to equipment.

5. Remove governor actuator (Figure 2, Item 4) from engine.
6. Remove and discard governor actuator gasket (Figure 2, Item 1) from engine.
7. Cap/plug governor actuator opening (Figure 2, Item 5) in engine to prevent dirt and debris from entering engine.

END OF TASK

Inspect Governor Actuator

1. Inspect governor actuator (Figure 2, Item 4) for bent probe or other signs of obvious damage.
2. Replace damaged governor actuator (Figure 2, Item 4).
3. Remove any residual gasket (Figure 2, Item 1) material from mounting surface on engine.

END OF TASK

Install Governor Actuator

1. Remove cap/plug from opening in engine.
2. Install new governor actuator gasket (Figure 2, Item 1) to its mounting location on engine.

CAUTION

Use caution when installing governor actuator. Install governor slowly and straight into engine to prevent bending probe on governor actuator. Failure to comply may cause damage to equipment.

3. Position governor actuator (Figure 2, Item 4) to its mounting location on engine.
4. Secure governor actuator (Figure 2, Item 4) to engine by installing two socket head screws (Figure 2, Item 2).
5. Attach wiring harness (not shown) to governor actuator pigtail (Figure 2, Item 3).
6. Install front body panel (WP 0029, Remove/Install Front Body Panel).
7. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
8. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
9. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
10. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL INTAKE MANIFOLD

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Hammer, Hand, Soft Face, Dead Blow (WP 0162, Table 2, Item 14)

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)

Materials/Parts

Assembly, intake manifold (WP 0135, Repair Parts List, Figure 37, Item 1)

Bolt (5) (WP 0135, Figure 37, Item 4)

Gasket, intake manifold (WP 0135, Figure 37, Item 3).

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Fuel injection lines removed (WP 0069, Remove/Install Fuel Injector)

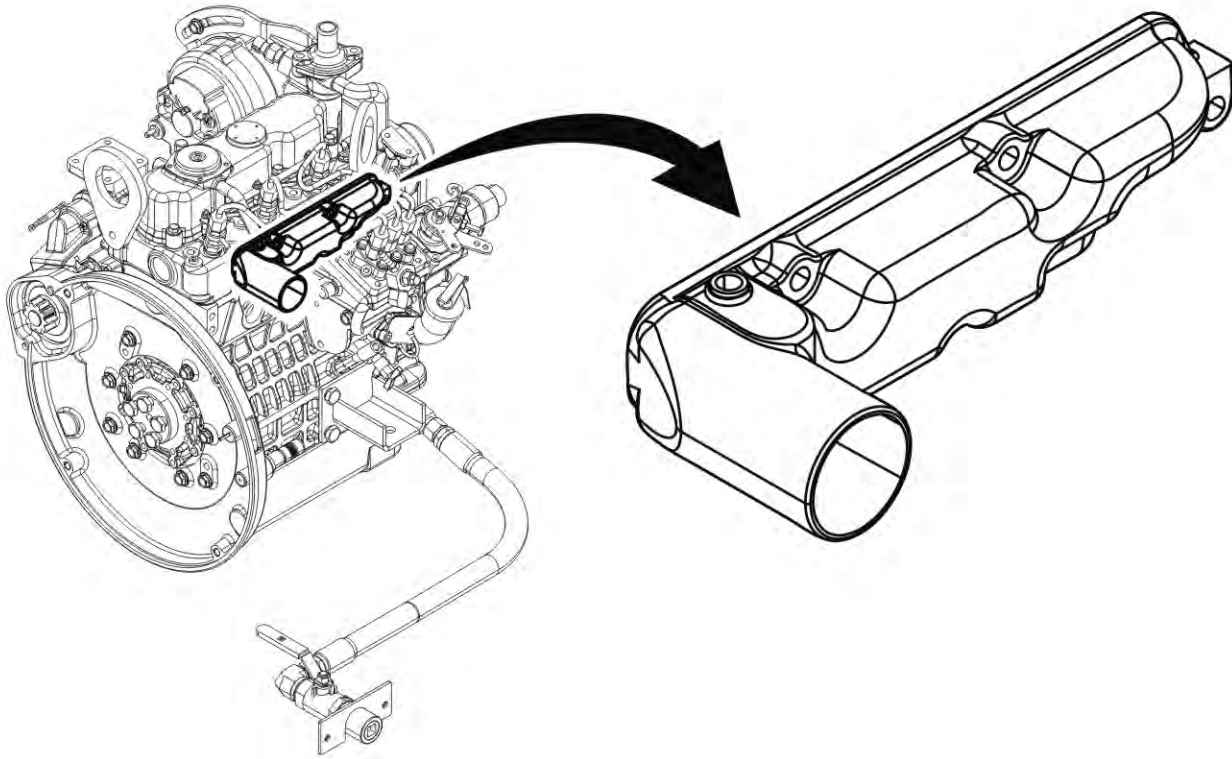
REMOVE/INSTALL INTAKE MANIFOLD**Remove Intake Manifold**

Figure 1. Intake Manifold — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door on generator set.
3. Locate intake manifold (Figure 1).

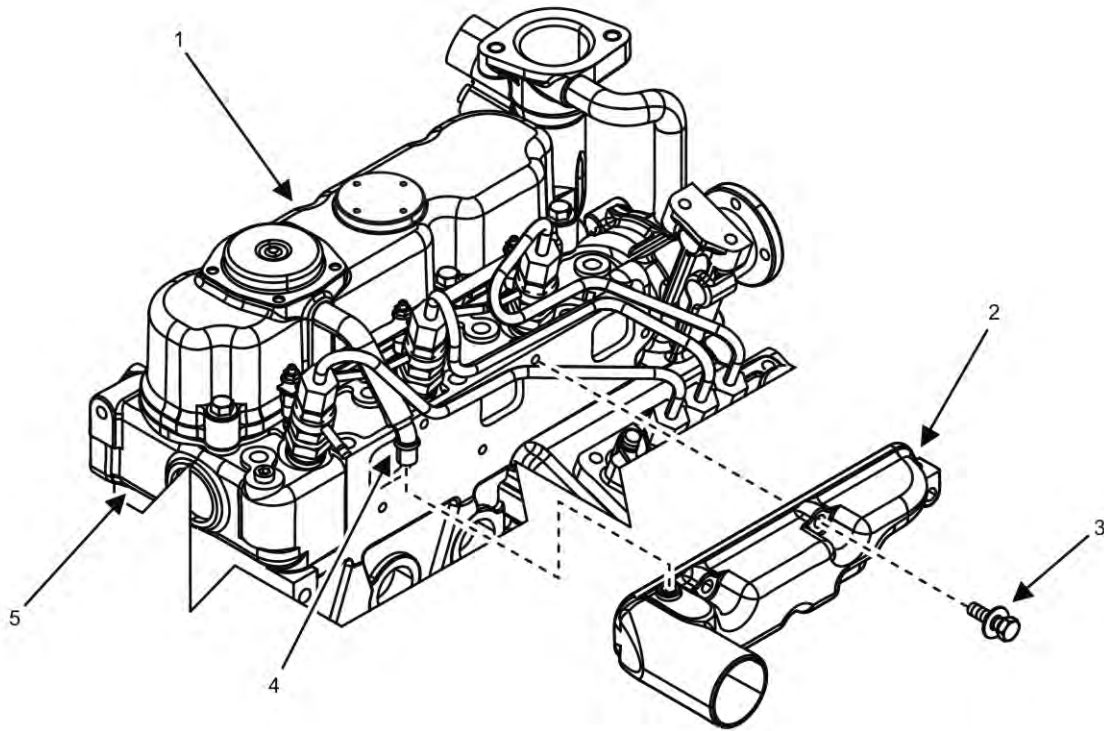


Figure 2. Intake Manifold Details.

4. Disengage clips securing breather hose (Figure 2, Item 4) between valve cover (Figure 2, Item 1) and intake manifold (Figure 2, Item 2).
5. Remove breather hose (Figure 2, Item 4) with clips attached. Inspect breather hose (Figure 2, Item 4) for damage and replace as required.
6. Remove and discard five bolts with captive lock washers (Figure 2, Item 3) securing intake manifold (Figure 2, Item 2) to cylinder head (Figure 2, Item 5). Discard five bolts with captive lock washers (Figure 2, Item 3).

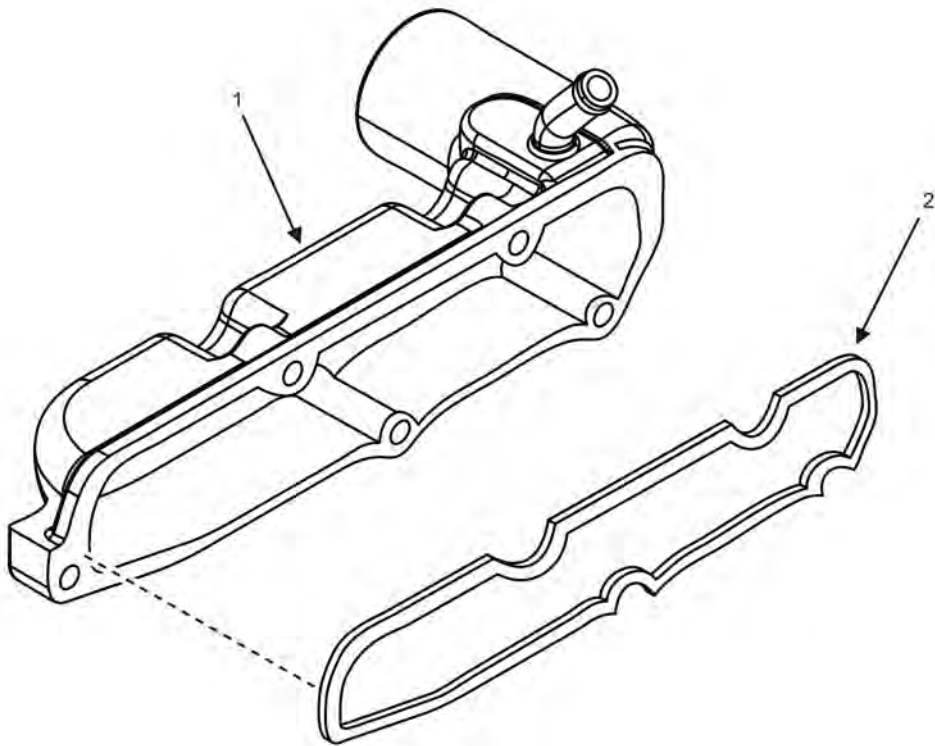


Figure 3. Intake Manifold Gasket — Details.

NOTE

It may be necessary to tap intake manifold (Figure 3, Item 1) with rubber mallet to loosen manifold from cylinder head (Figure 2, Item 5).

7. Remove intake manifold (Figure 3, Item 1) and gasket (Figure 3, Item 2) from cylinder head (Figure 2, Item 5).
8. Place intake manifold (Figure 3, Item 1) on suitable work surface and discard gasket (Figure 3, Item 2).
9. Cover intake ports on cylinder head (Figure 2, Item 5) to prevent dirt and debris from entering the system.

END OF TASK

Inspect Intake Manifold

1. Inspect intake manifold (Figure 3, Item 1) for damage and/or cracks.
2. Replace intake manifold (Figure 3, Item 1) if damaged or cracked.

END OF TASK

Install Intake Manifold**CAUTION**

When cleaning around cylinder head ports and intake manifold, use caution that no debris enters the ports. Failure to comply may cause damage to equipment.

1. Remove any dirt or debris from around cylinder head (Figure 2, Item 5) intake ports and mating surface of intake manifold (Figure 3, Item 1).
2. Uncover intake ports closed earlier for protection.
3. Install new gasket (Figure 3, Item 2) to its mounting location on intake manifold (Figure 3, Item 1).
4. Position intake manifold (Figure 3, Item 1) and gasket (Figure 3, Item 2) to its mounting location on cylinder head (Figure 2, Item 5).
5. Secure intake manifold (Figure 2, Item 2) to cylinder head (Figure 2, Item 5) by installing five new bolts with captive lock washers (Figure 2, Item 3) to a torque value of 17 – 20 ft/lb (24 – 28 Nm).
6. Install breather hose (Figure 2, Item 4) with clips to its mounting location on valve cover (Figure 2, Item 1) and intake manifold (Figure 2, Item 2).
7. Secure breather hose (Figure 2, Item 4) clips.
8. Install fuel injection lines (WP 0069, Remove/Install Fuel Injector).
9. Install top body panel (WP 0028, Remove/Install Top Body Panel).
10. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
11. Close right-side generator set door.
12. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
13. Start engine and check for proper operation (TM 9-6115-749-10).
14. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL EXHAUST MANIFOLD

INITIAL SETUP:

Test Equipment

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Gasket, exhaust (WP 0107, Repair Parts List, Figure 9, Item 9)

Gasket, exhaust manifold (WP 0136, Repair Parts List, Figure 38, Item 2)

Manifold, exhaust (1) (WP 0136, Figure 38, Item 3)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Alternator support bracket removed (WP 0075, Remove/Install Battery-Charging Alternator Assembly)

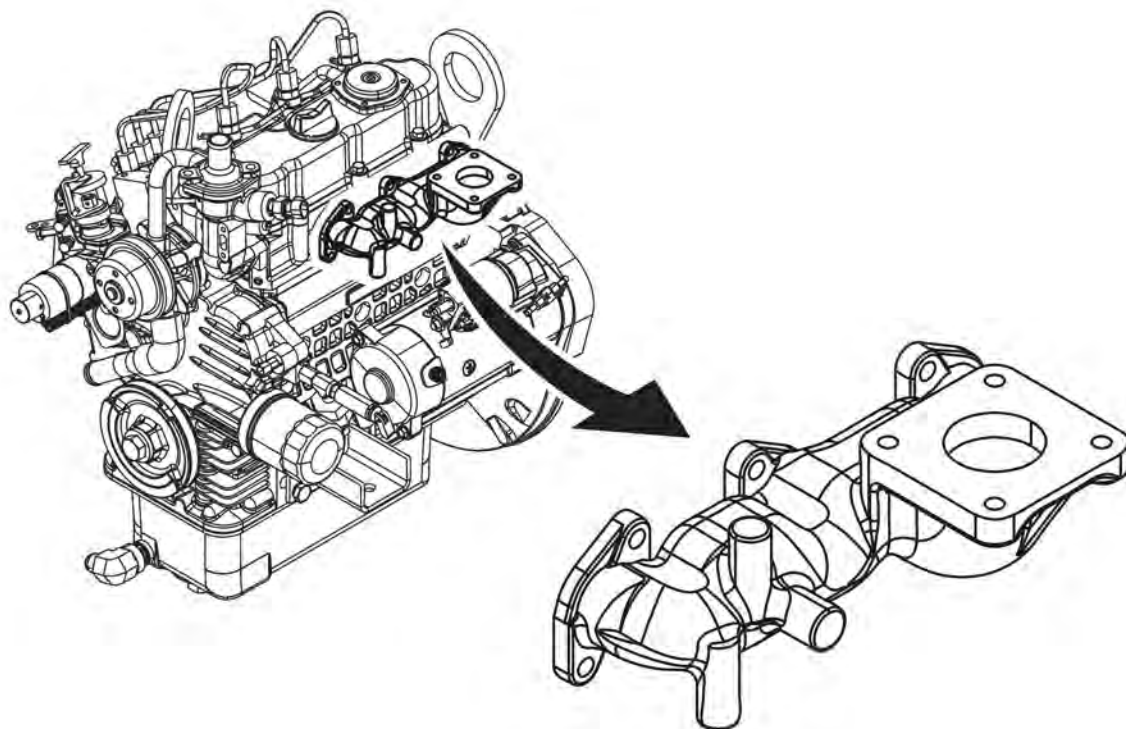
REMOVE/INSTALL EXHAUST MANIFOLD**Remove Exhaust Manifold**

Figure 1. Exhaust Manifold — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door on generator set.
3. Locate exhaust manifold (Figure 1).

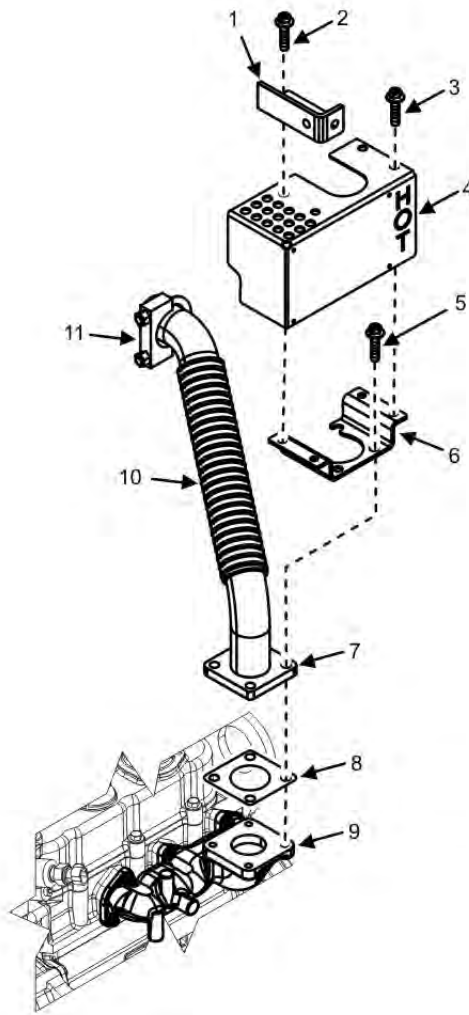


Figure 2. Heat Shield and Flex Pipe.

4. Loosen and reposition clamp (Figure 2, Item 11) that secures flex pipe (Figure 2, Item 10) to muffler (not shown).
5. Remove flex pipe (Figure 2, Item 10) from muffler (not shown).
6. Remove two bolts (Figure 2, Item 2) that secure heat shield alternator bracket (Figure 2, Item 1) to heat shield (Figure 2, Item 4).
7. Remove two bolts (Figure 2, Item 3) that secure heat shield (Figure 2, Item 4) to bracket (Figure 2, Item 6).
8. Remove heat shield (Figure 2, Item 4) and place on suitable work surface.
9. Inspect heat shield (Figure 2, Item 4) for signs of obvious damage and replace as required. Otherwise, set heat shield aside (Figure 2, Item 4) for reuse.
10. Remove four screws (Figure 2, Item 5) that secure flex pipe flange (Figure 2, Item 7), gasket (Figure 2, Item 8), and bracket (Figure 2, Item 6) to exhaust manifold (Figure 2, Item 9).
11. Remove flex pipe (Figure 2, Item 10) and gasket (Figure 2, Item 8) from exhaust manifold (Figure 2, Item 9). Discard gasket (Figure 2, Item 8).

12. Inspect flex pipe (Figure 2, Item 10), bracket (Figure 2, Item 6), heat shield alternator bracket (Figure 2, Item 1), and clamp (Figure 2, Item 11) for signs of obvious damage and replace as required. Otherwise, set flex pipe (Figure 2, Item 10), bracket (Figure 2, Item 6), heat shield alternator bracket (Figure 2, Item 1), and clamp (Figure 2, Item 11) aside for reuse.

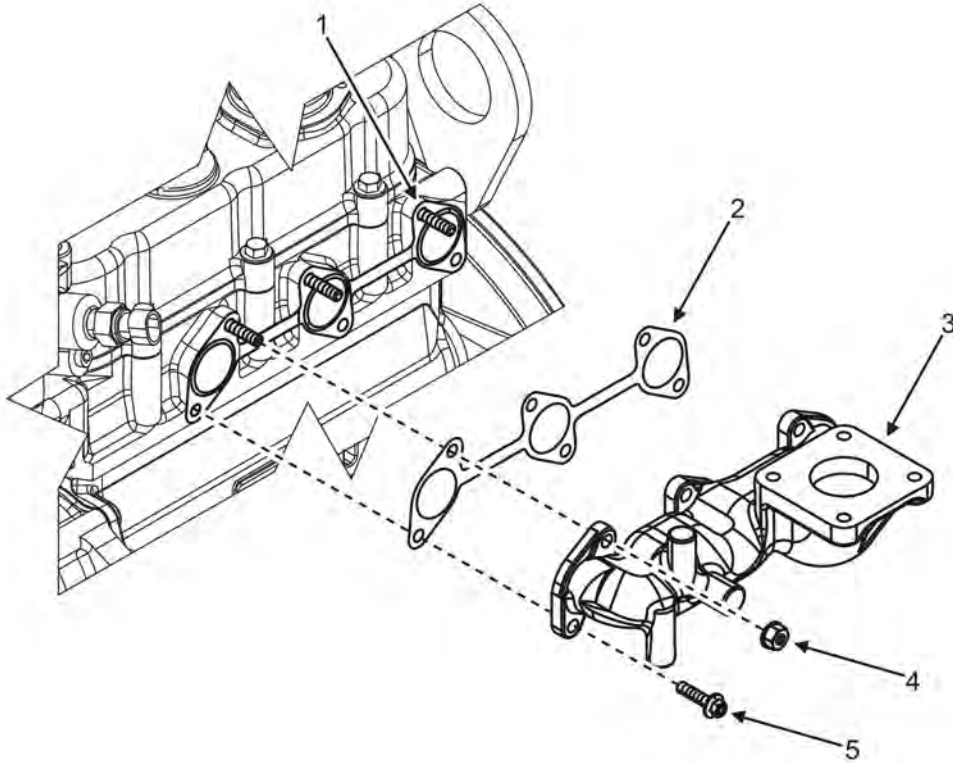


Figure 3. Exhaust Manifold — Removal.

13. Remove three nuts (Figure 3, Item 4) and three screws (Figure 3, Item 5) that secure exhaust manifold (Figure 3, Item 3) to engine (Figure 3, Item 1).
14. Remove exhaust manifold (Figure 3, Item 3) from engine (Figure 3, Item 1) and place on a suitable work surface.
15. Remove and discard exhaust manifold gasket (Figure 3, Item 2) from exhaust manifold (Figure 3, Item 3).
16. Place exhaust manifold (Figure 3, Item 3) on a suitable work surface.
17. Cover open exhaust ports to kept dirt and debris from entering the engine (Figure 3, Item 1).
18. Remove dirt, debris, and residual gasket material from exhaust manifold (Figure 3, Item 3) and engine (Figure 3, Item 1) mounting surfaces.

END OF TASK

Inspect Exhaust Manifold

1. Inspect exhaust manifold (Figure 3, Item 3) for damage and/or cracks.
2. Replace exhaust manifold (Figure 3, Item 3) if damaged or cracked.

END OF TASK

Install Exhaust Manifold

1. Remove protective cover from exhaust ports.
2. Remove dirt and debris from mounting surfaces of exhaust manifold (Figure 3, Item 3) and engine (Figure 3, Item 1) with wiping rag.
3. Position new gasket (Figure 3, Item 2) to its mounting location on exhaust manifold (Figure 3, Item 3).
4. Position exhaust manifold (Figure 3, Item 3) to its mounting location on engine (Figure 3, Item 1) by installing top of exhaust manifold (Figure 3, Item 3) over studs and aligning bottom mounting holes.
5. Secure exhaust manifold (Figure 3, Item 3) to engine (Figure 3, Item 1) by installing three nuts (Figure 3, Item 4) and three screws (Figure 3, Item 5).
6. Position new gasket (Figure 2, Item 8), flex pipe (Figure 2, Item 10), and bracket (Figure 2, Item 6) to mounting location on exhaust manifold (Figure 2, Item 9) and align mounting holes.
7. Secure flex pipe flange (Figure 2, Item 7) and bracket (Figure 2, Item 6) to exhaust manifold (Figure 2, Item 9) by installing four screws (Figure 2, Item 5).
8. Position heat shield (Figure 2, Item 4) to its mounting location on bracket (Figure 3, Item 6) and align mounting holes.
9. Secure heat shield alternator bracket (Figure 2, Item 1) to heat shield (Figure 2, Item 4) by installing two bolts (Figure 2, Item 2).
10. Secure heat shield (Figure 2, Item 4) to bracket (Figure 2, Item 6) by installing two bolts (Figure 2, Item 3).
11. Install flex pipe (Figure 2, Item 10) to muffler (not shown) and secure by positioning clamp (Figure 2, Item 11).
12. Tighten clamp (Figure 2, Item 11).
13. Install alternator support bracket (WP 0075, Remove/Install Battery-Charging Alternator Assembly).
14. Install top body panel (WP 0028, Remove/Install Top Body Panel).
15. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
16. Close left-side generator set door.
17. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
18. Start engine and check for proper operation (TM 9-6115-749-10).
19. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL MUFFLER

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Clamp, loop (WP 0107, Repair Parts List, Figure 9, Item 4)

Muffler (WP 0107, Figure 9, Item 5)

Brush, wire, scratch, brass (WP 0163, Expendable and Durable Items List, Item 7)

Cap set, protective (WP 0163, Item 8)

Cleaning compound, solvent (WP 0163, Item 10)

Grease, electrically conductive (WP 0163, Item 20)

Penetrating oil (WP 0163, Item 29)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

REMOVE/INSTALL MUFFLER**WARNING**

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Remove Muffler

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate muffler (Figure 1).

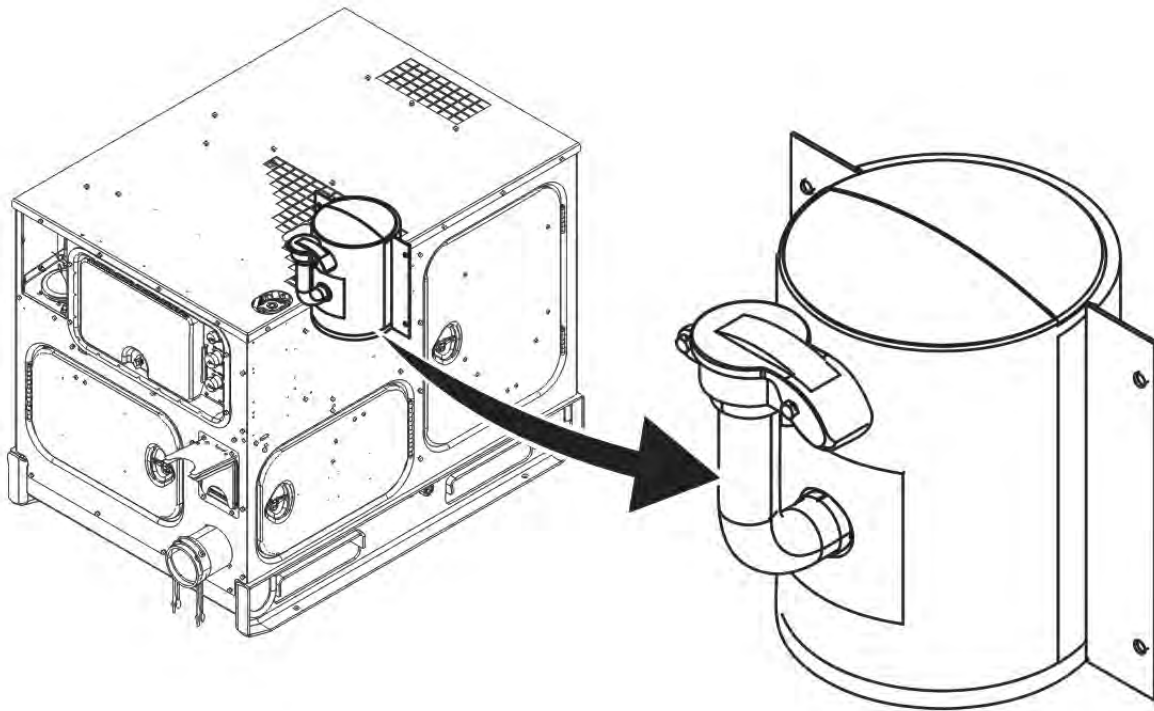


Figure 1. Muffler — Location.

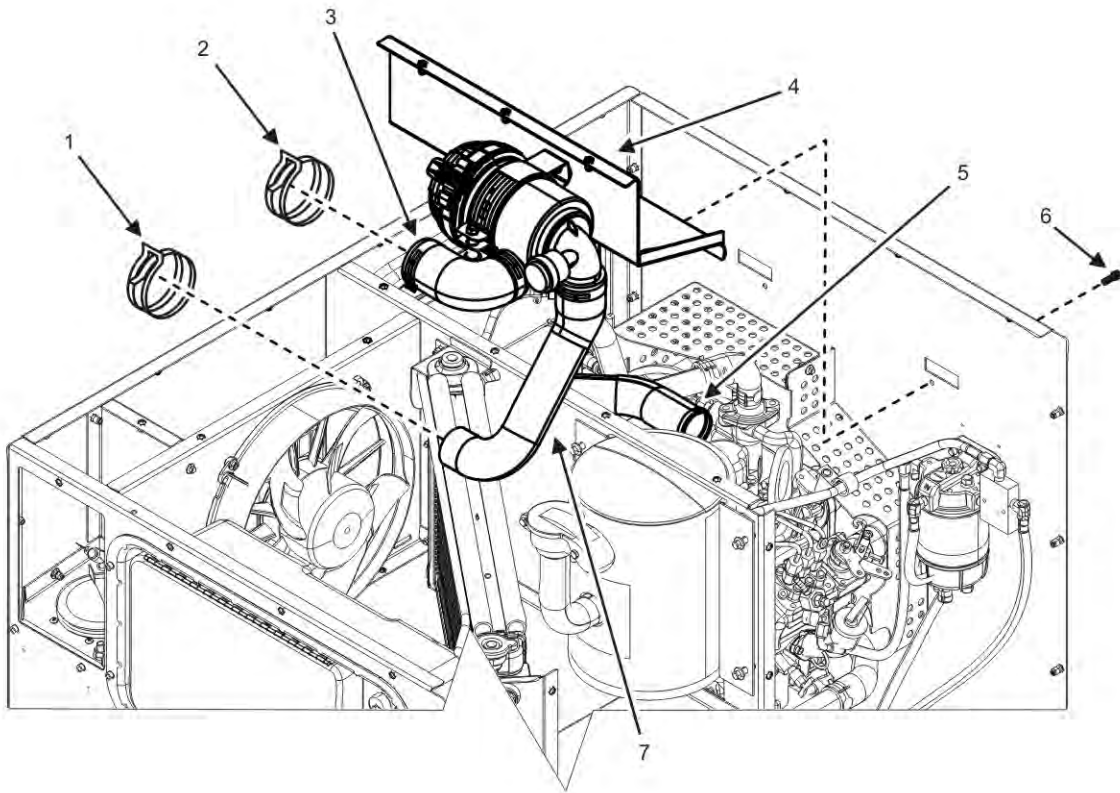


Figure 2. Weather Shield and Air Cleaner.

3. Reposition hose clip (Figure 2, Item 2) at air cleaner inlet hose (Figure 2, Item 3) and remove inlet hose (Figure 2, Item 3) from inlet air pipe (Figure 2, Item 5).
4. Reposition hose clip (Figure 2, Item 1) at air cleaner outlet hose (Figure 2, Item 7) and remove outlet hose (Figure 2, Item 7) from intake manifold (not shown).
5. Remove two socket-head screws (Figure 2, Item 6) that secure weather shield and air cleaner as an assembly (Figure 2, Item 4) to front body panel.
6. Remove weather shield/air cleaner assembly (Figure 2, Item 4) from generator set.
7. Inspect weather shield/air cleaner assembly (Figure 2, Item 4) and attached hoses for signs of obvious damage.
8. Replace damaged components as required. Otherwise, set weather shield/air cleaner assembly (Figure 2, Item 4) aside for reuse.

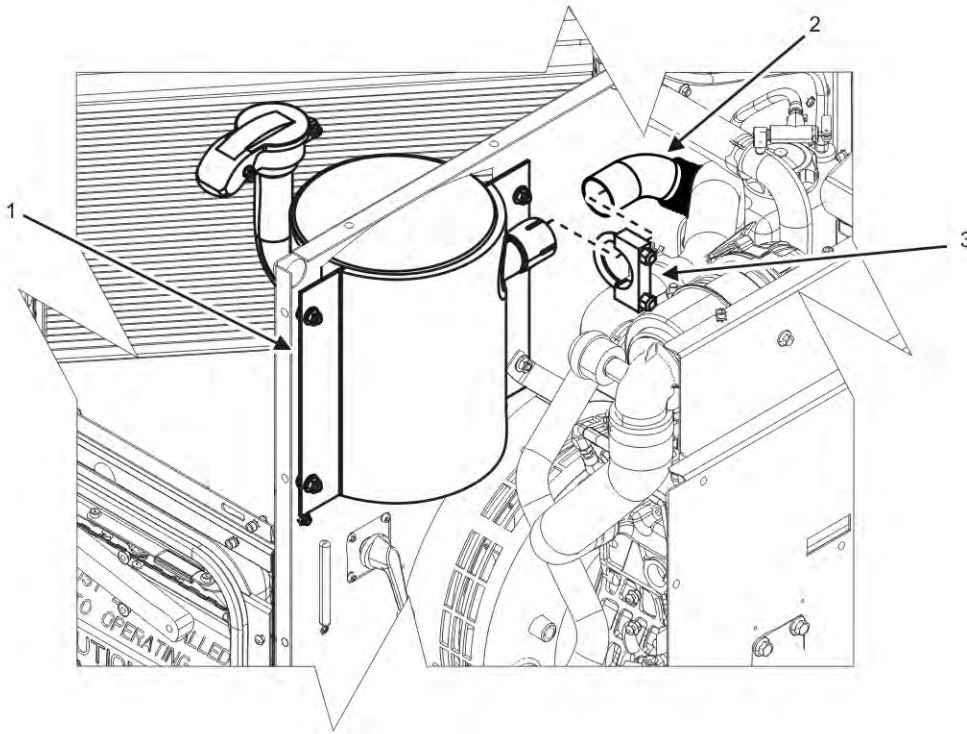


Figure 3. Clamp and Bracket.

9. Apply penetrating oil to nuts on clamp (Figure 3, Item 3) and the joint between muffler (Figure 3, Item 1) and flex pipe (Figure 3, Item 2). Allow penetrating oil to soak for 5 min.
10. Apply index marks to muffler (Figure 3, Item 1) and flex pipe (Figure 3, Item 2) to aid at installation.
11. Loosen and reposition clamp (Figure 3, Item 3) to allow separation between flex pipe (Figure 3, Item 2) and muffler (Figure 3, Item 1).
12. Remove flex pipe (Figure 3, Item 2) from muffler (Figure 3, Item 1).
13. Cap/plug open end of flex pipe (Figure 3, Item 2) to prevent dirt and debris from entering engine.
14. Remove bolt (Figure 4, Item 5) securing clamp (Figure 4, Item 6) to generator set and reposition winterization kit exhaust tube (if equipped) (Figure 4, Item 1) to gain access to muffler mounting nuts (Figure 4, Item 4).
15. Inspect winterization kit exhaust tube (Figure 4, Item 1) for signs of obvious damage.

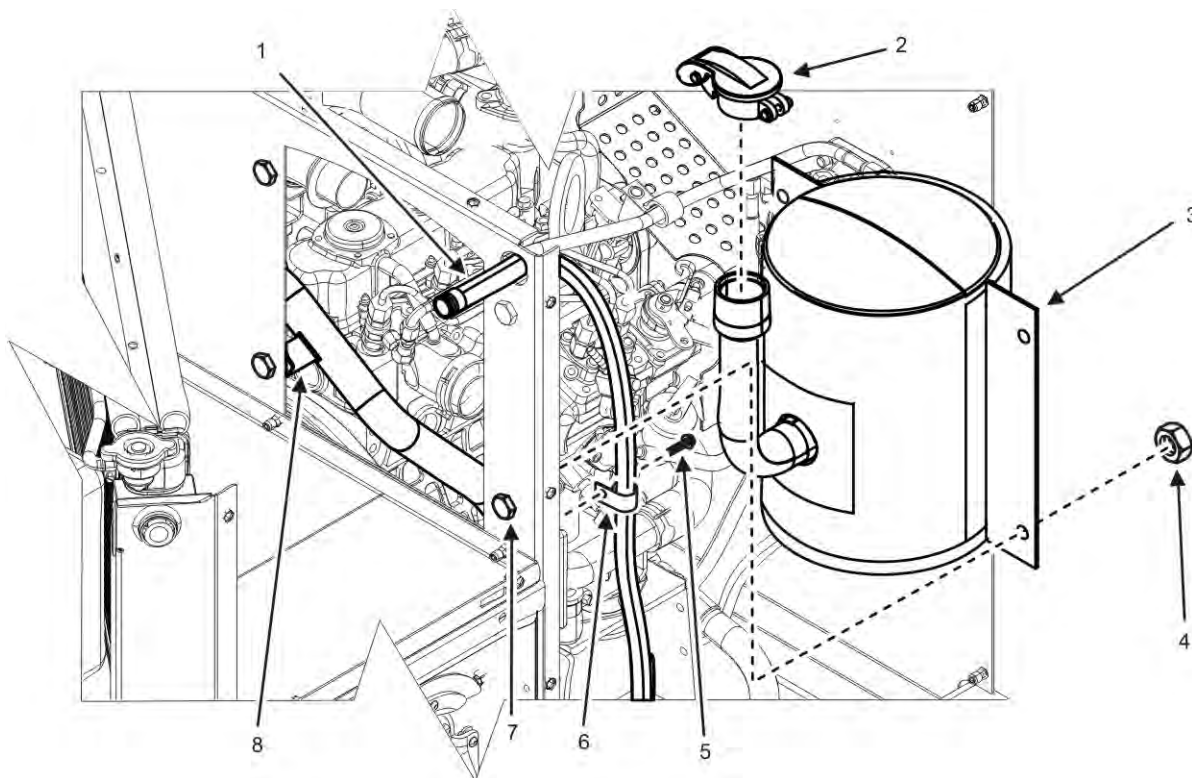


Figure 4. Muffler — Removal.

16. Replace damaged winterization kit exhaust tube (Figure 4, Item 1). Otherwise, set winterization kit exhaust tube (Figure 4, Item 1) aside for reuse.
17. Remove four muffler mounting nuts (Figure 4, Item 4) that secure muffler (Figure 4, Item 3) to interior panel.
18. Pry lower radiator pipe bracket (Figure 4, Item 8) from lower left muffler mounting screw.
19. Remove muffler (Figure 4, Item 3) from four mounting screws (Figure 4, Item 7) and place on a suitable work surface.
20. Loosen screw on rain cap (Figure 4, Item 2) and remove rain cap (Figure 4, Item 2) from muffler (Figure 4, Item 3).
21. Inspect rain cap (Figure 4, Item 2) for signs of obvious damage.
22. Replace damaged rain cap (Figure 4, Item 2). Otherwise set rain cap (Figure 4, Item 2) aside for reuse.

END OF TASK

Clean and Inspect Muffler

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

1. Clean muffler (Figure 4, Item 3) and flex pipe (Figure 3, Item 2) mating surfaces with stiff bristle brush and dry cleaning solvent.
2. Inspect muffler (Figure 4, Item 3) for dents, cracks, excessive corrosion, clogging, and other damage.

3. Replace damaged muffler (Figure 4, Item 3). Otherwise, set muffler (Figure 4, Item 3) aside for reuse.
4. Discard and replace clamp (Figure 3, Item 3) if damaged or corroded. Otherwise set clamp (Figure 3, Item 3) aside for reuse.
5. Transfer indexing marks from components to be replaced to new components.

END OF TASK

Install Muffler

1. Install rain cap (Figure 4, Item 2) to muffler (Figure 4, Item 3) and tighten mounting screw.
2. Position muffler (Figure 4, Item 3) to its mounting location on interior panel at four mounting screws (Figure 4, Item 7).
3. Position lower radiator pipe bracket (Figure 4, Item 8) to its mounting position on lower left muffler mounting screw.
4. Install four muffler mounting nuts (Figure 4, Item 4) finger-tight.
5. Remove protective plug from flex pipe (Figure 3, Item 2).
6. Assemble muffler (Figure 3, Item 1) and flex pipe (Figure 3, Item 2) using indexing marks applied at removal.
7. Install clamp (Figure 3, Item 3) to secure flex pipe (Figure 3, Item 2) to muffler (Figure 3, Item 1).
8. Torque four muffler mounting nuts (Figure 4, Item 4) at bulkhead to 17 – 21 ft/lb (23 – 29 Nm).
9. Position winterization kit exhaust tube (if equipped) (Figure 4, Item 1) to generator set, and secure clamp (Figure 4, Item 6) to generator set with bolt (Figure 4, Item 5).
10. Position weather shield/air cleaner assembly (Figure 2, Item 4) to mounting location on front body panel and align the mounting holes.
11. Secure weather shield/air cleaner assembly (Figure 2, Item 4) to front body panel by installing two socket-head screws (Figure 2, Item 6).
12. Install air cleaner outlet hose (Figure 2, Item 7) to intake manifold (not shown) and secure by installing hose clip (Figure 2, Item 1).
13. Install air cleaner inlet hose (Figure 2, Item 3) to inlet air pipe (Figure 2, Item 5) and secure by installing hose clip (Figure 2, Item 2).
14. Install top body panel (WP 0028, Remove/Install Top Body Panel).
15. Install ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
16. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
17. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
18. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL VALVE COVER

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 31)
Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0162, Table 2, Item 39)

Materials/Parts

Assembly, valve cover (WP 0141, Repair Parts List, Figure 43, Item 6)
Gasket, valve cover (1) (WP 0141, Figure 43, Item 11)
O-ring (1) (WP 0141, Figure 43, Item 1)
Cap set, protective (WP 0163, Expendable and Durable Items List, Item 8)
Cleaning compound, solvent (WP 0163, Item 10)
Grease, electrically conductive (WP 0163, Item 20)
Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)
Assistant (1)

References

WP 0064, Remove/Install 50/60 Hz Engine Assembly
WP 0065, Remove/Install 400 Hz Engine Assembly

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Top body panel removed (WP 0028, Remove/Install Top Body Panel)

REMOVE/INSTALL VALVE COVER**Remove Valve Cover**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate valve cover (Figure 1).

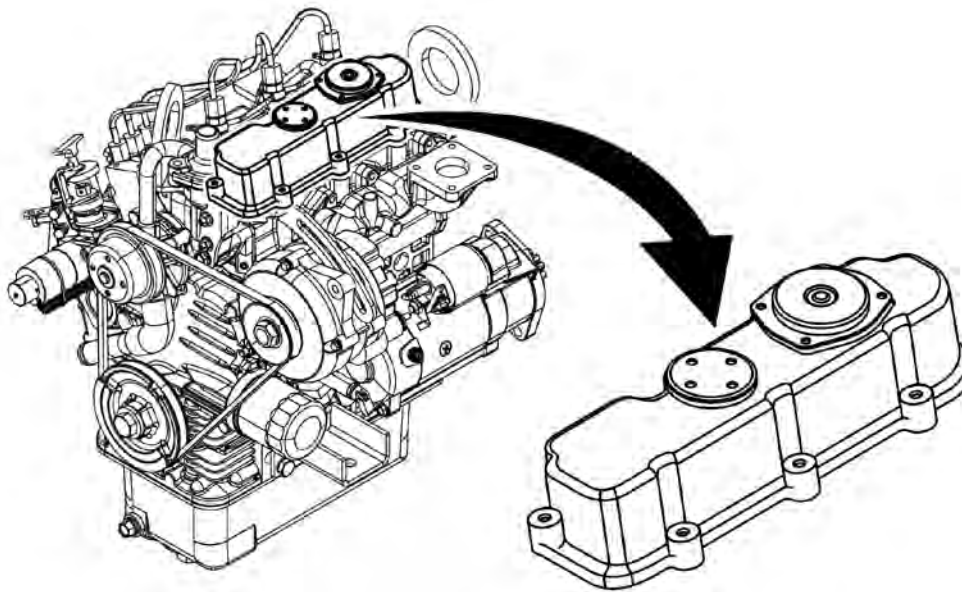


Figure 1. Valve Cover and Gasket — Location.

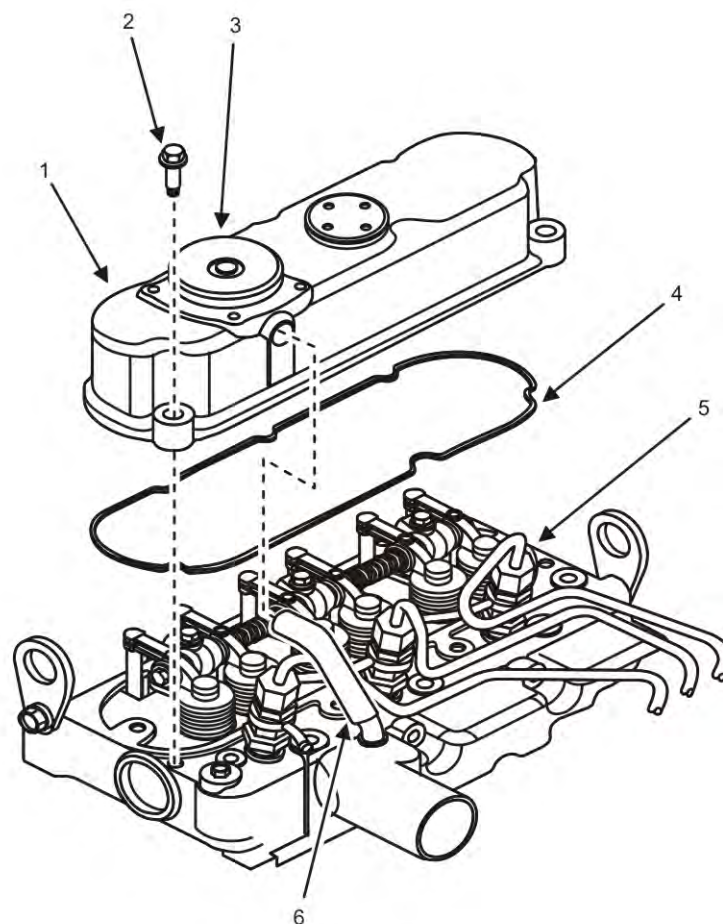


Figure 2. Valve Cover and Gasket — Detail.

3. Release clip securing breather hose (Figure 2, Item 6) to breather assembly (Figure 2, Item 3).
4. Remove breather hose (Figure 2, Item 6) from breather assembly (Figure 2, Item 3).
5. Cap/plug breather hose (Figure 2, Item 6) to prevent dirt or debris from entering the intake manifold.
6. Inspect breather hose (Figure 2, Item 6) for damage or corrosion and replace as required.
7. Remove four bolts (Figure 2, Item 2) securing valve cover (Figure 2, Item 1) to cylinder head (Figure 2, Item 5).
8. Inspect hardware for damage or corrosion and replace as required.
9. Remove valve cover (Figure 2, Item 1) from cylinder head (Figure 2, Item 5).
10. Cover cylinder head (Figure 2, Item 5) to prevent dirt or debris from entering engine.

END OF TASK

Inspect Valve Cover

1. Inspect valve cover (Figure 2, Item 1) to determine if valve cover gasket (Figure 2, Item 4) was removed with valve cover.

CAUTION

Dislodged gasket material can clog oil passages and lead to engine damage. If removal of gasket material from head assembly is required, be sure to prevent gasket debris from entering the head assembly. Failure to comply may cause damage to equipment.

NOTE

Valve cover gasket is embedded in groove on bottom of valve cover. Gasket may stick to top of cylinder head when valve cover is removed.

2. Remove and discard gasket (Figure 2, Item 4) and any residual gasket material from valve cover (Figure 2, Item 1) and cylinder head (Figure 2, Item 5) if present.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

3. Clean valve cover (Figure 2, Item 1) with dry cleaning solvent and rags to remove any dirt, debris, or excess oil.
4. Inspect valve cover (Figure 2, Item 1) for obvious signs of damage or corrosion and discard if damaged.
5. Clean gasket mounting surfaces on valve cover (Figure 2, Item 1) and cylinder head (Figure 2, Item 5) using dry cleaning solvent and a wiping rag prior to installation.
6. Inspect cylinder head (Figure 2, Item 5) for signs of obvious damage.
7. Replace engine if cylinder head is damaged (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).
8. Dispose of soiled rags IAW local SOP.

END OF TASK

Install Valve Cover

1. Position new gasket (Figure 2, Item 4) in groove on valve cover (Figure 2, Item 1).
2. Place valve cover (Figure 2, Item 1) on mounting location on top of cylinder head (Figure 2, Item 5).
3. Secure valve cover (Figure 2, Item 1) and gasket (Figure 2, Item 4) to cylinder head (Figure 2, Item 5) using four bolts (Figure 2, Item 2). Finger-tighten.
4. Tighten all valve cover mounting bolts (Figure 2, Item 2) to a torque value of 5 – 8 ft/lb (7 – 11 Nm) using a crossing pattern.
5. Install breather hose (Figure 2, Item 6) on breather assembly (Figure 2, Item 3).
6. Install clip securing breather hose (Figure 2, Item 6) to breather assembly (Figure 2, Item 3).
7. Install top body panel (WP 0028, Remove/Install Top Body Panel).
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Close right-side generator set door.
10. 10. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
11. Start engine and check for proper operation (TM 9-6115-749-10).
12. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
CHECK/ADJUST ENGINE VALVES

INITIAL SETUP:**Test Equipment**

Load Bank (WP 0162, Table 2, Item 2)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Gasket, valve cover (WP 0141, Repair Parts List, Figure 43, Item 11)

Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

References

WP 0064, Remove/Install 50/60 Hz Engine Assembly

WP 0065, Remove/Install 400 Hz Engine Assembly

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Valve cover removed (WP 0082, Remove/Install Valve Cover)

Glow plugs removed (WP 0068, Remove/Install Glow Plugs)

CHECK/ADJUST ENGINE VALVES**Check/Adjust Valves****NOTE**

As shown in Figure 1, the sequence of cylinder (Cyl) numbers is one, two, and three starting from gear case side of engine, or in reverse sequence (three, two, and one) when starting from flywheel side of engine. Each cylinder contains one intake (IN) valve and one exhaust (EX) valve.

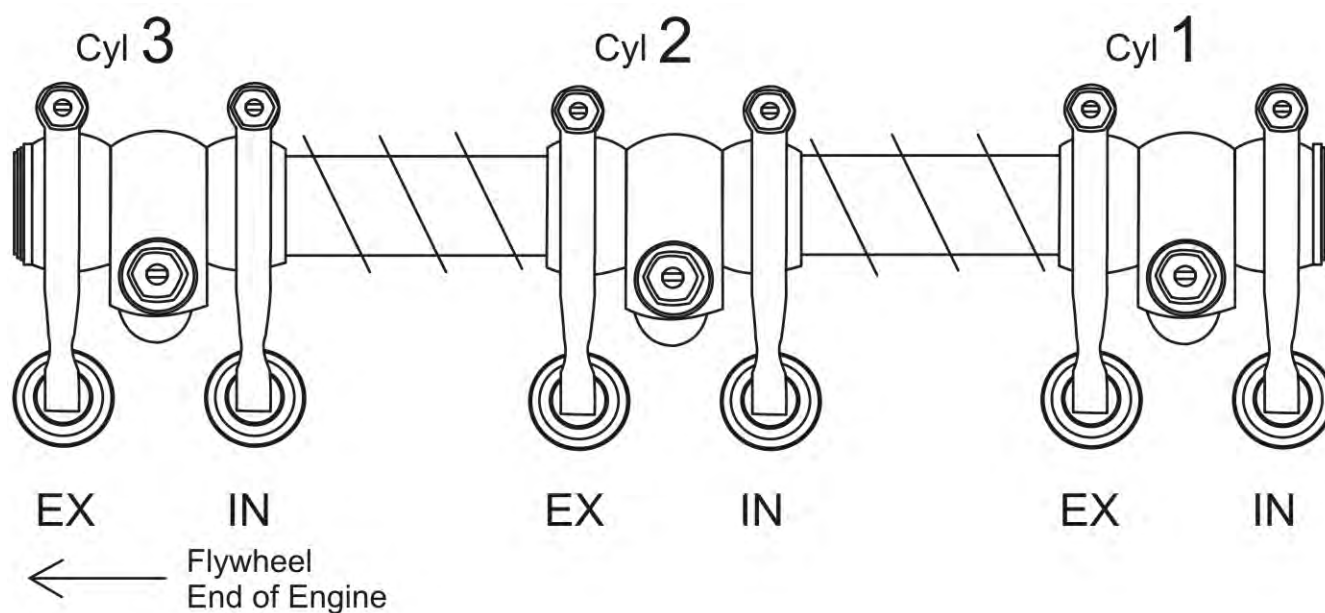


Figure 1. Intake and Exhaust Valve — Locations.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate intake and exhaust valves (Figure 1).

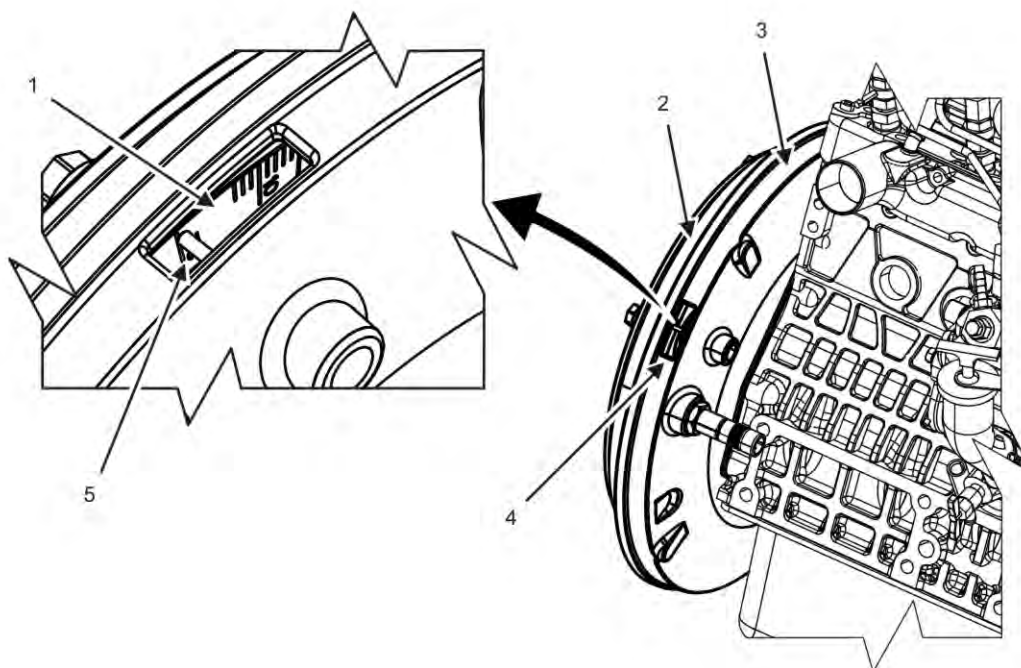


Figure 2. Flywheel Alignment Markings.

CAUTION

Valve clearance must be checked and adjusted when engine is cool. Adjusting valves when engine is hot may result in inaccurate settings, causing poor performance and/or engine damage. Valve clearance for intake and exhaust valves must be set to 0.00571 – 0.00728 in (0.145 – 0.185 mm). Failure to comply may cause damage to equipment.

NOTE

Timing marks (Figure 2, Item 1) are located on flywheel (Figure 2, Item 2) and are visible through a cut-out (Figure 2, Item 4) in flywheel housing (Figure 2, Item 3).

When piston number one is at TDC on the compression stroke, both rocker arms for cylinder number one can be moved. TDC on the overlap stroke permits movement of only one rocker arm for cylinder number one.

3. Rotate crankshaft at water pump end of engine until 1|TC mark on flywheel and pointer (Figure 2, Item 5) on flywheel housing (Figure 2, Item 3) are aligned.
4. Confirm TDC on compression stroke has been established in cylinder number one by moving rocker arms of cylinder number one intake and exhaust valves up and down.
 - a. Rotate crankshaft an additional 360 degrees and recheck for rocker arm movement if both cylinder number one rocker arms cannot be moved. Continue rotation until TDC is achieved.
 - b. Perform valve clearance checks as indicated in Table 1 when both cylinder number one rocker arms can be moved.

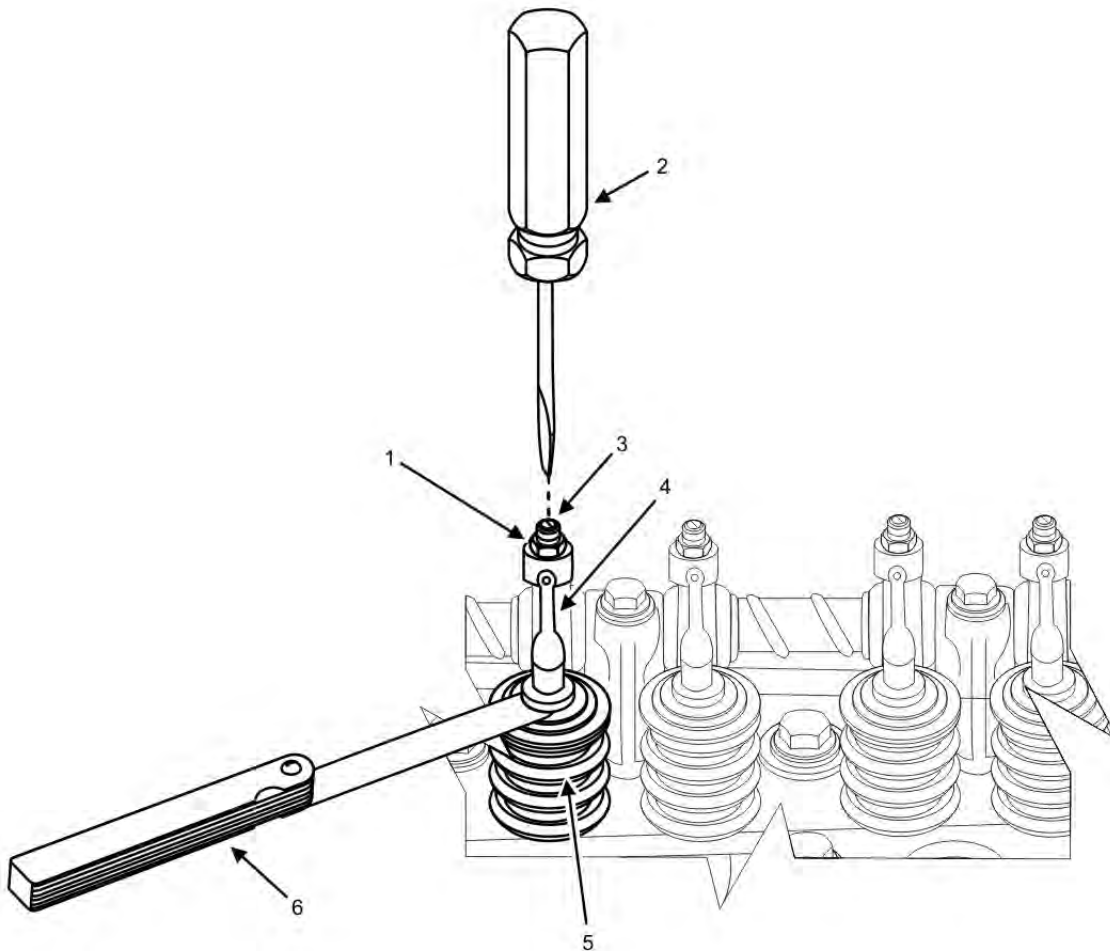


Figure 3. Check/Adjust Valve Clearance.

CAUTION

If any valve cannot be adjusted to specified tolerances, inspect rocker arms and push rods for damage or wear. Replace the engine assembly if there is damage to the rocker arms and/or push rods (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly). Do not run engine with valve(s) that cannot be adjusted to specifications. Failure to comply will cause damage to equipment.

Table 1. Adjust Engine Valves on Compression Stroke.

	Cylinder	Intake Valve	Exhaust Valve
Piston number one at TDC on compression stroke	1	Adjust	Adjust
	2	—	Adjust
	3	Adjust	—

- Check valve clearance on cylinder number one intake valve by inserting thickness gage (Figure 3, Item 6) of 0.00571–0.00728 in (0.145–0.185 mm) between rocker arm (Figure 3, Item 4) and valve stem (Figure 3, Item 5).

NOTE

If thickness gage (Figure 3, Item 6) is too large to fit between rocker arm (Figure 3, Item 4) and valve stem (Figure 3, Item 5) or if gage can be inserted and withdrawn without drag, valve clearance requires adjustment.

6. Insert thickness gage (Figure 3, Item 6) between rocker arm (Figure 3, Item 4) and valve stem (Figure 3, Item 5) and verify that gage can be inserted and removed with only slight drag.
7. Adjust valve clearance as follows:
 - a. Turn valve stem lock nut (Figure 3, Item 1) on rocker arm (Figure 3, Item 4) counterclockwise to open.
 - b. Turn valve adjustment screw (Figure 3, Item 3) clockwise using screwdriver (Figure 3, Item 2) to tighten valve clearance or counterclockwise to loosen valve clearance.
 - c. Turn valve adjustment screw (Figure 3, Item 3) until slight drag is detected on thickness gage (Figure 3, Item 6) as it is inserted and withdrawn between rocker arm (Figure 3, Item 4) and valve stem (Figure 3, Item 5).
8. Secure valve stem lock nut (Figure 3, Item 1) by turning it clockwise after correct valve adjustment has been established.
9. Verify valve clearance after tightening valve stem lock nut (Figure 3, Item 1) to ensure it is within specification in step 5 above.
10. Repeat steps 5 through 9 to check/adjust valve clearance on exhaust valve of cylinder number one, exhaust valve on cylinder number two, and intake valve on cylinder number three without moving crankshaft.
11. Rotate crankshaft 360 degrees at gear case end until 1|TC mark (Figure 2, Item 2) on flywheel and hash mark (Figure 2, Item 1) on rear end plate are aligned.
12. Repeat steps 6 through 9 to check/adjust valve clearance on intake valve of cylinder number two and exhaust valve on cylinder number three as shown in Table 2.

Table 2. Adjust Engine Valves at Overlap Position.

	Cylinder	Intake Valve	Exhaust Valve
Piston number one at TDC in overlap position (360 degrees past compression stroke TDC)	1	—	—
	2	Adjust	—
	3	—	Adjust

13. Install glow plugs (WP 0068, Remove/Install Glow Plugs).
14. Install valve cover and new valve cover gasket (WP 0082, Remove/Install Valve Cover).
15. Install top panel (WP 0028, Remove/Install Top Body Panel).
16. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
17. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
18. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
19. Repair as required.
20. Dispose of soiled rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL OIL PAN AND STRAINER

INITIAL SETUP:**Tools and Special Tools**

Hammer, Hand, Soft Face, Dead Blow (WP 0162, Table 2, Item 14)
Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Bolt (WP 0137, Repair Parts List, Figure 39, Item 1)
Bolt (22) (WP 0137, Figure 39, Item 2)
O-ring (WP 0137, Figure 39, Item 5)
Pan, oil (WP 0137, Figure 39, Item 3)
Strainer (WP 0137, Figure 39, Item 4)
Compound, sealing (WP 0163, Expendable and Durable Items List, Item 15)
Lubricating oil, engine (WP 0163, Item 23)
Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
Engine removed from generator set (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly)

REMOVE/INSTALL OIL PAN AND OIL STRAINER**Remove Oil Pan and Strainer**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Rotate engine 180 degrees on stand to bring oil pan (Figure 1) to top for easier access.

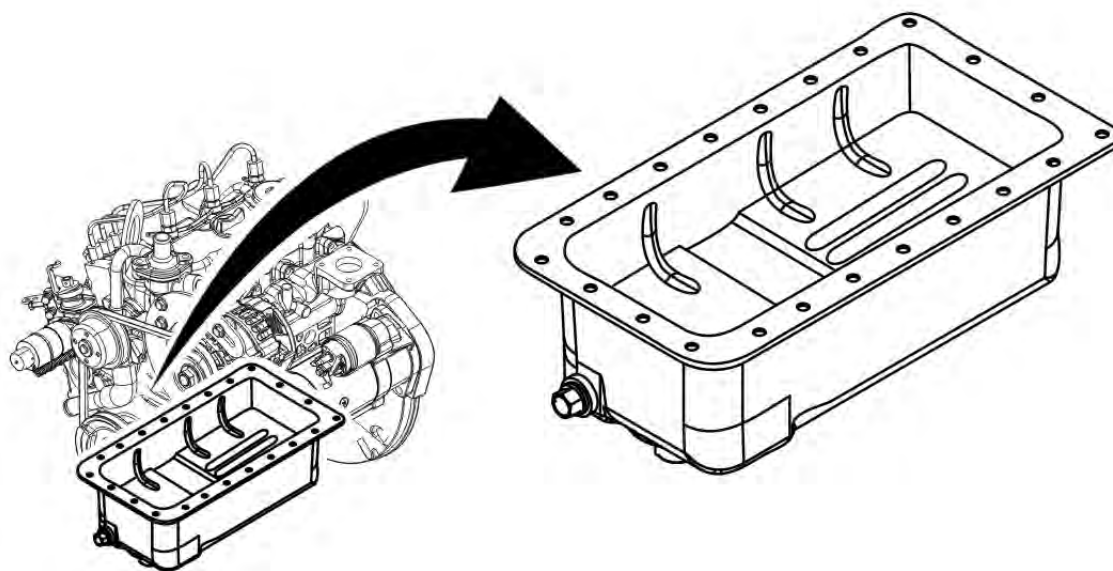


Figure 1. Oil Pan — Location.

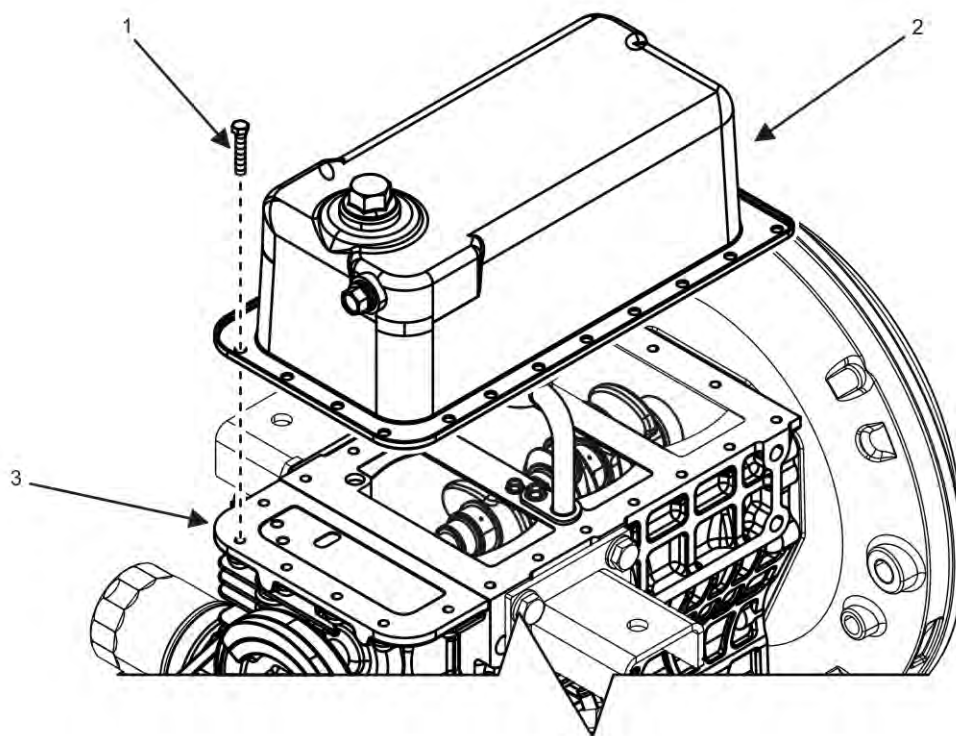


Figure 2. Oil Pan — Removal.

3. Remove and discard 22 screws with captive lock washers (Figure 2, Item 1) securing oil pan (Figure 2, Item 2) to engine block (Figure 2, Item 3).

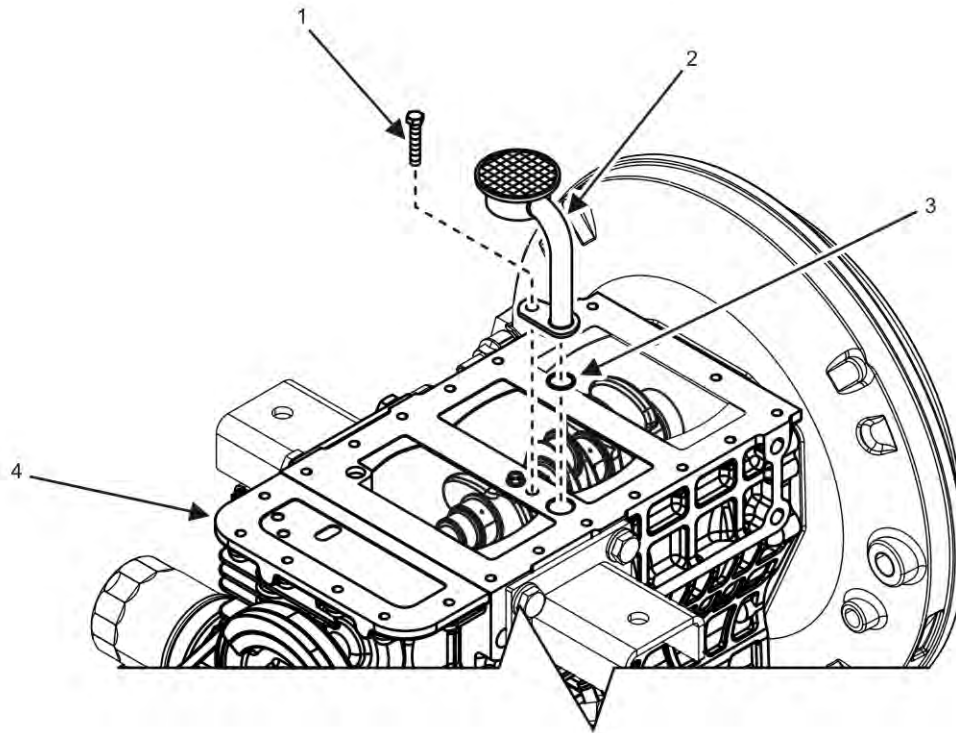


Figure 3. Oil Strainer — Removal.

4. Remove oil pan (Figure 2, Item 2) from engine block (Figure 2, Item 3) by lightly tapping oil pan (Figure 2, Item 2) with rubber mallet.

CAUTION

There are two possible mounting holes in the oil strainer mounting plate. Prior to removing the oil strainer mounting screw, mark the mounting hole used for mounting the strainer to the engine block. This will aid during installation. Failure to comply may cause damage to equipment.

5. Remove and discard screw with captive lock washer (Figure 3, Item 1) securing oil strainer suction tube (Figure 3, Item 2) to engine block (Figure 3, Item 4).
6. Remove oil strainer suction tube (Figure 3, Item 2) from engine block (Figure 3, Item 4).
7. Remove and discard O-ring (Figure 3, Item 3) from oil strainer suction tube (Figure 3, Item 2).

END OF TASK

Inspect Oil Pan and Strainer**CAUTION**

When removing gasket material from engine block, use caution to keep gasket residue and other foreign material from entering the engine block. Failure to comply may cause damage to equipment.

1. Remove all gasket material from mating surfaces of oil pan (Figure 2, Item 2) and engine block (Figure 2, Item 3).
2. Remove residual oil from oil pan (Figure 2, Item 2) with wiping rag prior to installation.
3. Inspect oil pan (Figure 2, Item 2) for cracks, dents, and other damage.
4. Repair small dents in oil pan (Figure 2, Item 2) by tapping dents back into place with rubber mallet.
5. Replace oil pan (Figure 2, Item 2) if large dents or cracks that may affect capacity or oil flow are present.
6. Inspect oil strainer suction tube (Figure 3, Item 2) for cracked or bent tube or broken screen.
7. Replace oil strainer suction tube (Figure 3, Item 2) if tube is cracked or bent or if screen is broken.
8. Remove dirt and debris from oil strainer suction tube (Figure 3, Item 2) prior to installation.

END OF TASK**Install Oil Pan and Strainer**

1. Apply a thin coat of clean engine oil to new oil strainer O-ring (Figure 3, Item 3).
2. Install new O-ring (Figure 3, Item 3) to oil strainer suction tube (Figure 3, Item 2).

CAUTION

There are two possible mounting holes in oil strainer mounting plate. Use mounting hole marked prior to removal to ensure the correct mounting hole is utilized at installation. Position the oil strainer as shown in Figure 3. The correct mounting hole will be the one closest to gear case end of the engine. Failure to comply may cause damage to equipment.

3. Position oil strainer suction tube (Figure 3, Item 2) to mounting location on engine block (Figure 3, Item 4) from which tube was removed.
4. Secure oil strainer suction tube (Figure 3, Item 2) to engine block (Figure 3, Item 4) by installing new bolt with captive lock washer (Figure 3, Item 1).

NOTE

Wait approximately 20 min after gasket sealant has been applied to install oil pan to engine block.

5. Apply a 0.20 in (5 mm) bead of liquid gasket (Figure 4, Item 1) to flange of oil pan (Figure 4, Item 2).
6. Position oil pan (Figure 2, Item 2) to its mounting location on engine block (Figure 2, Item 3).
7. Install oil pan (Figure 2, Item 2) to engine block by installing 22 new mounting screws with captive lock washers (Figure 2, Item 1) finger-tight.
8. Secure oil pan mounting screws with captive lock washers (Figure 2, Item 1) in a diagonal pattern to avoid uneven tightening of oil pan.

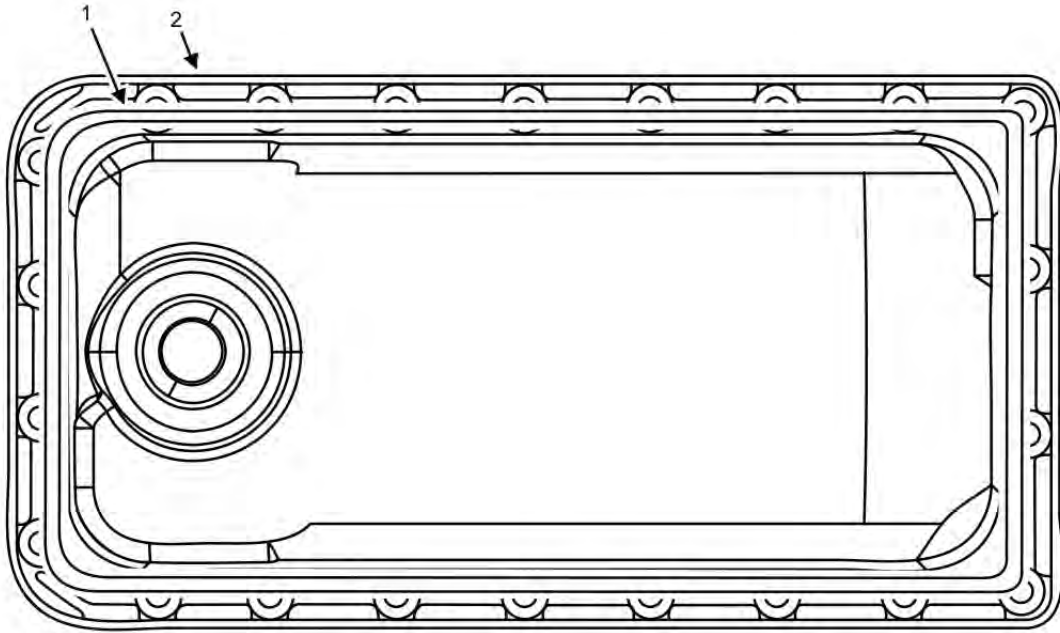


Figure 4. Liquid Gasket Application.

NOTE

Wait approximately 30 min before adding engine oil to oil pan.

9. Install engine into generator set (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).
10. Install ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
11. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
12. Start engine and check for proper operation (TM 9-6115-749-10).
13. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL FLYWHEEL

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0162, Table 2, Item 41)

Materials/Parts

Flywheel (WP 0138, Repair Parts List, Figure 40, Item 3)
Screws, hex head (M10 x 1.25 x 20) (5) (WP 0138, Figure 40, Item 4)
Alcohol, denatured (WP 0163, Expendable and Durable Items List, Item 1)
Grease, electrically conductive (WP 0163, Item 20)
Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)
Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Battery ground cable removed (WP 0036, Remove/Install Batteries)
AC generator removed (WP 0049, Remove/Install 50/60 Hz AC Generator Assembly or WP 0050, Remove/Install 400 Hz AC Generator Assembly)

REMOVE/INSTALL FLYWHEEL**WARNING**

The flywheel is heavy and must be securely supported during removal. Failure to comply may cause injury or death to personnel.

Remove Flywheel

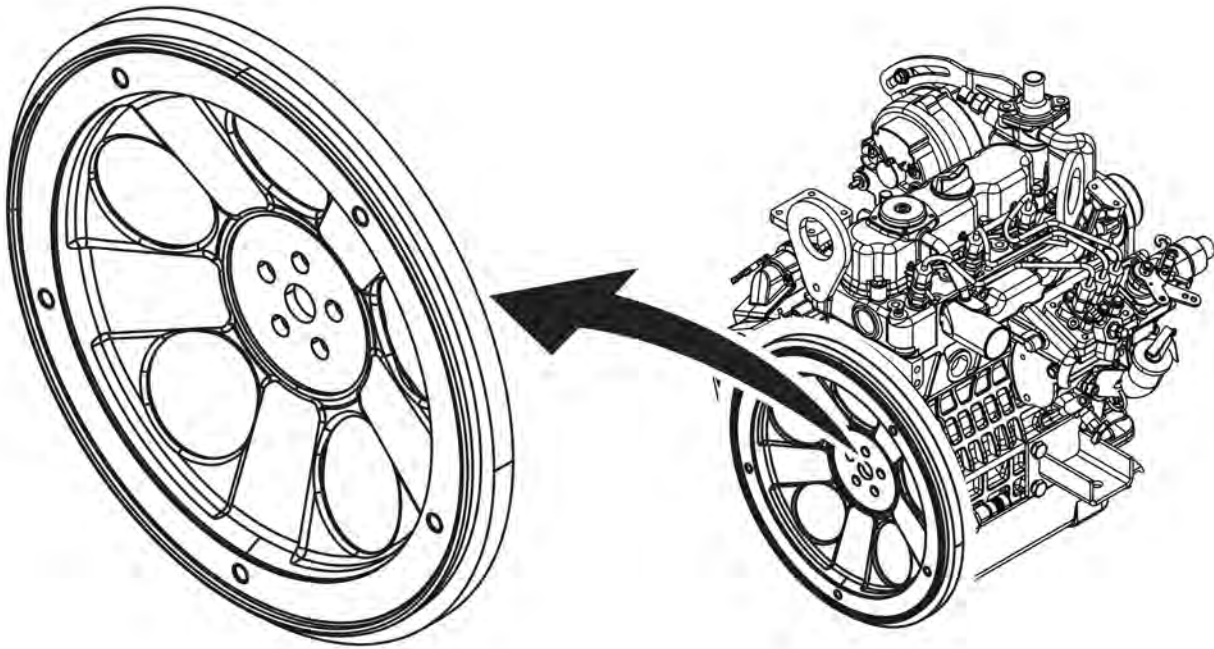


Figure 1. Flywheel — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate flywheel (Figure 1).

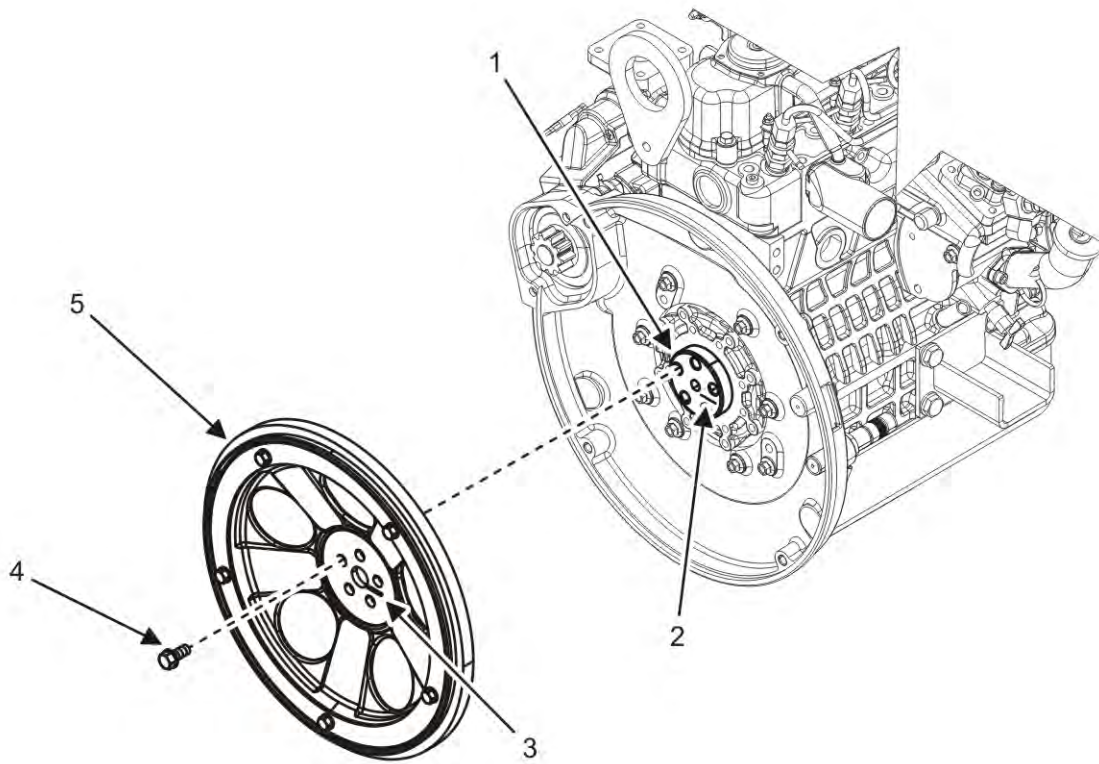


Figure 2. Remove Flywheel.

CAUTION

The position of the flywheel with respect to the crankshaft flange must be marked prior to removing the flywheel so the flywheel can be re-installed properly. Failure to comply may cause damage to equipment.

NOTE

TDC is sometimes marked as TC on flywheels.

3. Rotate crankshaft (crankshaft flange shown in Figure 2, Item 1) to ensure TDC marking on flywheel (Figure 2, Item 5) is aligned with pin visible through port in flywheel housing.
4. Place reference marks (Figure 2, Items 2 and 3) on flywheel (Figure 2, Item 5) noting flywheel position with respect to crankshaft flange (Figure 2, Item 1).
5. Secure flywheel (Figure 2, Item 5) from moving during removal.
6. Remove five screws (Figure 2, Item 4) securing flywheel (Figure 2, Item 5) to crankshaft flange (Figure 2, Item 1). Discard screws (Figure 2, Item 4).
7. Remove flywheel (Figure 2, Item 5) from engine and place on a suitable work surface.

END OF TASK

Inspect Flywheel

1. Inspect flywheel (Figure 2, Item 5) for obvious signs of damage or corrosion and replace if damaged or corroded.

NOTE

Dispose of soiled rags IAW local SOP.

2. Clean flywheel (Figure 2, Item 5) using denatured alcohol and wiping rag prior to installation being careful not to erase indexing mark (Figure 2, Item 3) applied at removal.

END OF TASK**Install Flywheel**

1. Remove any oil, dirt, or debris on mating surfaces of crankshaft flange (Figure 2, Item 1) to flywheel using denatured alcohol and a wiping rag prior to installing flywheel (Figure 2, Item 5).
2. Position flywheel (Figure 2, Item 5) to its mounting location on crankshaft flange (Figure 2, Item 1) using reference marks (Figure 2, Items 2 and 3) applied prior to removal as a guide.
3. Support flywheel (Figure 2, Item 5) on crankshaft flange (Figure 2, Item 1).

NOTE

Apply engine oil to threads and undercut of flywheel mounting screws prior to installation.

4. Secure flywheel (Figure 2, Item 5) to crankshaft flange (Figure 2, Item 1) by installing five new screws (Figure 2, Item 4) finger tight.
5. Secure five new flywheel mounting screws (Figure 2, Item 4) in a diagonal pattern to a torque value of 40 – 43 ft/lb (54 – 59 Nm).
6. Install AC generator assembly (WP 0049, Remove/Install 50/60 Hz AC Generator Assembly or WP 0050, Remove/Install 400 Hz AC Generator Assembly).
7. Install ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
8. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
9. Start engine and check for proper operation (TM 9-6115-749-10).
10. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL CRANKCASE REAR BEARING CASE COVER

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Cover, assembly, bearing case (WP 0139, Repair Parts List, Figure 41, Item 3)

Bolt (8) (WP 0139, Figure 41, Item 6)

Bolt (8) (WP 0139, Figure 41, Item 7)

Gasket, bearing case (WP 0139, Figure 41, Item 1)

Gasket, case cover (WP 0139, Figure 41, Item 2)

Seal, oil (WP 0139, Figure 41, Item 5)

Cleaning compound, solvent (WP 0163, Expendable and Durable Items List, Item 10)

Grease, electrically conductive (WP 0163, Item 20)

Lubricating oil, engine (WP 0163, Item 23)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Engine removed from generator set (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly)

REMOVE/INSTALL CRANKCASE REAR BEARING CASE COVER**Remove Crankcase Rear Bearing Case Cover**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate crankcase rear bearing case cover (Figure 1).

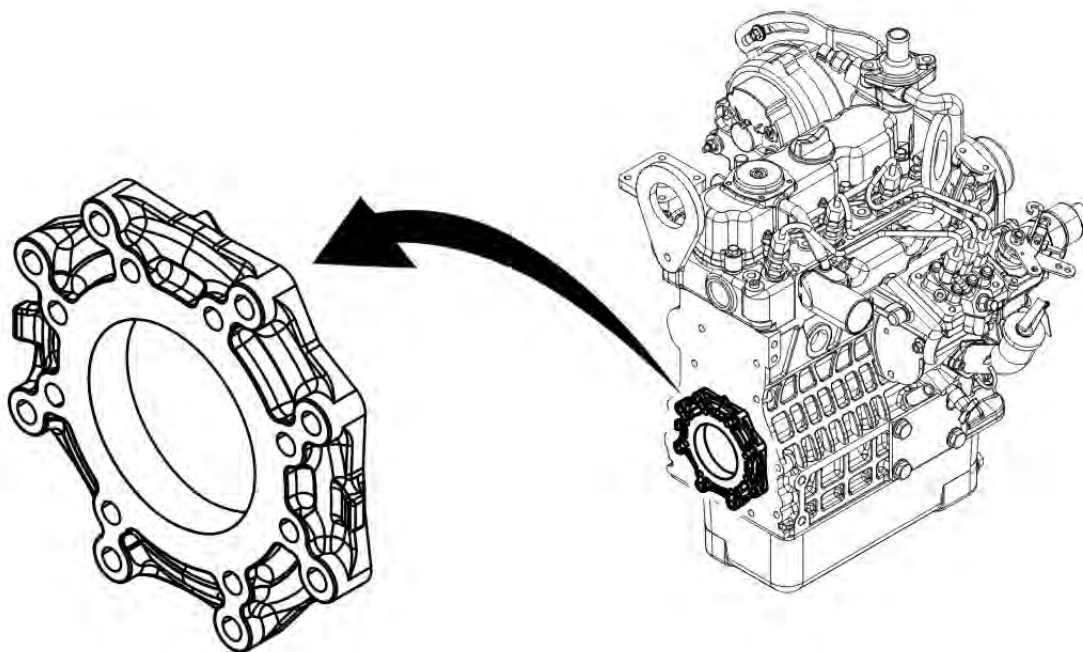


Figure 1. Crankcase Rear Bearing Case Cover — Location.

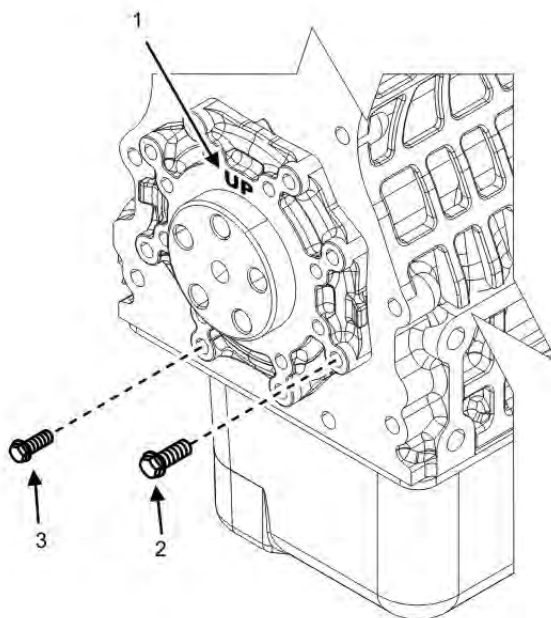


Figure 2. Crankcase Rear Bearing Case Cover — Removal.

3. Remove and discard eight 17-mm inner bearing case screws with captive lock washers (Figure 2, Item 3) from rear bearing case cover (Figure 2, Item 1).

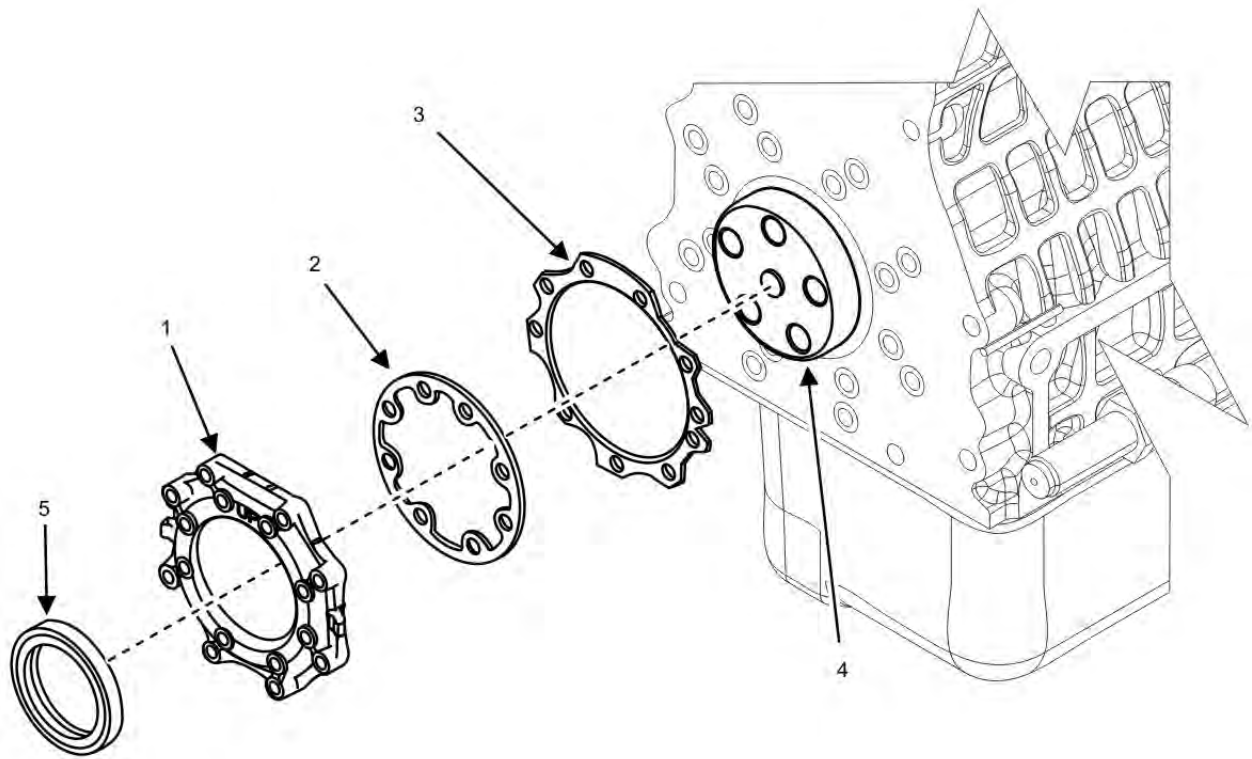


Figure 3. Crankcase Rear Bearing Case Cover — Details.

4. Remove and discard eight 20-mm outer bearing case screws with captive lock washers (Figure 2, Item 2) from rear bearing case cover (Figure 2, Item 1).
5. Remove rear bearing case cover (Figure 3, Item 1), oil seal (Figure 3, Item 5), and rear bearing case gasket (Figure 3, Item 2) from crankshaft (Figure 3, Item 4).
6. Discard rear bearing case gasket (Figure 3, Item 2).
7. Remove and discard oil seal (Figure 3, Item 5) from rear bearing case cover (Figure 3, Item 1).
8. Remove and discard rear bearing case cover gasket (Figure 3, Item 3) from engine block.
9. Remove any residual gasket material from both engine block and rear bearing case cover (Figure 3, Item 1).

END OF TASK

Inspect Crankcase Rear Bearing Case Cover

1. Inspect rear bearing case cover (Figure 3, Item 1) for cracks or damage.
2. Replace rear bearing case cover (Figure 3, Item 1) if cracked or damaged.

END OF TASK

Install Crankcase Rear Bearing Case Cover**WARNING**

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

1. Clean mating surfaces of crankshaft (Figure 3, Item 4), engine block, and rear bearing case cover (Figure 3, Item 1) with dry cleaning solvent to remove dirt, debris, grease, and oil.
2. Dispose of soiled rags IAW local SOP.
3. Coat outer diameter of new oil seal (Figure 3, Item 5) with clean engine oil.
4. Install new oil seal (Figure 3, Item 5) to its mounting location in rear bearing case cover (Figure 3, Item 1). Be careful not to damage outer surface of seal during installation.

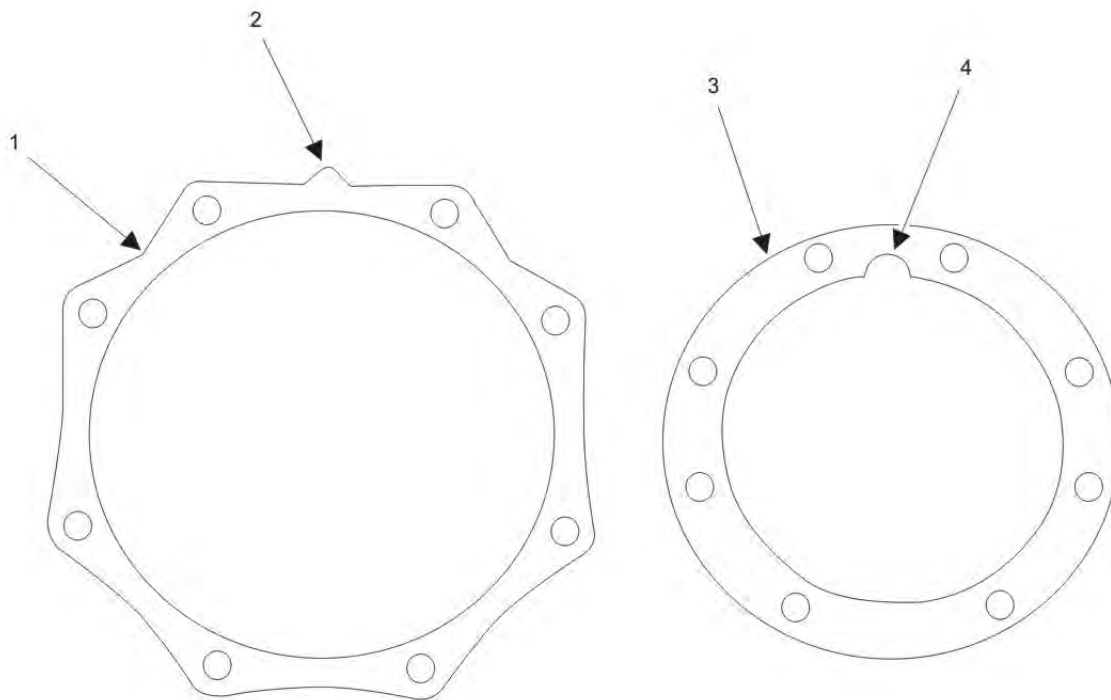


Figure 4. Crankcase Rear Bearing Case Cover — Component Alignment.

CAUTION

During assembly, rear bearing case gasket (Figure 3, Item 2), rear bearing case cover gasket (Figure 3, Item 3), and rear bearing case cover (Figure 3, Item 1) must be indexed as described in these steps to prevent engine oil leaks. Failure to comply may cause damage to equipment.

5. Position new rear bearing case cover gasket (Figure 4, Item 1) to its mounting location on engine block and align mounting holes so that triangular tip (Figure 4, Item 2) is facing toward top of engine.
6. Position new rear bearing case gasket (Figure 4, Item 3) to its mounting location on rear of bearing case cover (Figure 3, Item 1) with cutout (Figure 4, Item 4) facing top of bearing case cover

NOTE

Be sure to locate rear bearing case cover so UP stamp on case cover is aligned with top of engine block as shown in Figure 2.

7. Position rear bearing case cover (Figure 3, Item 1), oil seal (Figure 3, Item 5), and rear bearing case gasket (Figure 3, Item 2) to its mounting position against engine block and align mounting holes.
8. Slide rear bearing case cover (Figure 3, Item 1), oil seal (Figure 3, Item 5), and rear bearing case gasket (Figure 3, Item 2) onto crankshaft (Figure 3, Item 4) being careful not to roll inner surface of oil seal.
9. Secure rear bearing case cover (Figure 2, Item 1) to engine block by installing eight new 20-mm screws with captive lock washers (Figure 2, Item 2) to outer perimeter holes of rear bearing case cover (Figure 2, Item 1) finger-tight.
10. Install eight new 17-mm screws with captive lock washers (Figure 2, Item 3) to inner perimeter holes of rear bearing case cover (Figure 2, Item 1) finger-tight.
11. Torque all rear bearing case cover bolts installed in steps 9 and 10 to 7 – 8 ft/lb (10 – 11 Nm) using a crossing pattern.
12. Install engine assembly (WP 0064, Remove/Install 50/60 Hz Engine Assembly or WP 0065, Remove/Install 400 Hz Engine Assembly).
13. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
14. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
15. Start engine and check for proper operation (TM 9-6115-749-10).
16. Repair as required.

END OF TASK

END OF WORK PACKAGE

**FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
LUBRICATION INSTRUCTIONS**

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Antifreeze, ethylene glycol (WP 0163, Expendable and Durable Items List, Item 2)

Lubricating oil, engine (WP 0163, Item 23)

Lubricating oil, engine (WP 0163, Item 24)

Lubricating oil, engine (WP 0163, Item 25)

Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

References

A-A-52624A

MIL-PRF-2104H

MIL-PRF-46167D

MIL-A-53009A

TB 750-651

WP 0021, Service Cooling System

WP 0066, Service Lubrication System

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

LUBRICATION INSTRUCTIONS

The AMMPS 5 kW generator set uses a variety of lubricating and cooling fluids. Refer to Table 1 for the fluids and their applications.

WARNING

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

CAUTION

Ensure the lubrication and cooling systems have been filled to capacity before operating the unit. Failure to comply may cause damage to equipment.

Table 1. Lubrication Orders.

USAGE	FLUID/LUBRICANT	CAPACITIES	TEMPERATURES
Engine oil	MIL-PRF-2104H ^a OE/HDO-15/40	Crankcase and engine 3.9 qt (3.7 L) with filter	+5°F to +135°F (-15°C to +57°C)
	MIL-PRF-2104H OE/HDO-10		-15°F to +5°F (-26°C to -15°C)
	MIL-PRF-46167D ^b		-50°F to +40°F (-45°C to +4°C)
Engine antifreeze	A-A-52624A ^c	Radiator and engine 5.3 qt (5 L)	-50°F to +135°F (-45°C to +57°C)
Hinge/latch lubrication	MIL-PRF-2104H OE/HDO-15/40	Not applicable	Not applicable

^a Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service.

^b Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic.

^c Commercial Item Description: Antifreeze, Multi-engine Type.

Change Engine Oil and Engine Oil Filter

See Table 2 and WP 0066, Service Lubrication System.

Table 2. Table of Lubricants — Engine.

SPECIFICATION	TYPE OF LUBRICANT	FREQUENCY	TEMPERATURE
MIL-PRF-2104H OE/HDO-15/40	Engine oil	500 hr or 6 months	+5°F to +135°F (-15°C to +57°C)
MIL-PRF-2104H OE/HDO-10			-15°F to +5°F (-26°C to -15°C)
MIL-PRF-46167D			-50°F to +40°F (-45°C to +4°C)

END OF TASK

Change Engine Coolant

See Table 3 and WP 0021, Service Cooling System.

Table 3. Table of Coolants — Engine.

SPECIFICATION	TYPE OF LUBRICANT	FREQUENCY	TEMPERATURE
A-A-52624A	Antifreeze	1500 hr or 1 year	+50°F to +135°F (-45°C to +57°C)
MIL-A-53009A ^a	Liquid Cooling System Corrosion Inhibitor	See TB 750-651 ^b	+40°F to +135°F (+4°C to +57°C)

^a Military Specification, Additive, Antifreeze Extender, Liquid Cooling Systems.

^b Use of Antifreeze Solutions, Antifreeze Extender, Cleaning Compounds, and Test Kit in Engine Cooling Systems.

END OF TASK

Lubricate Hinges

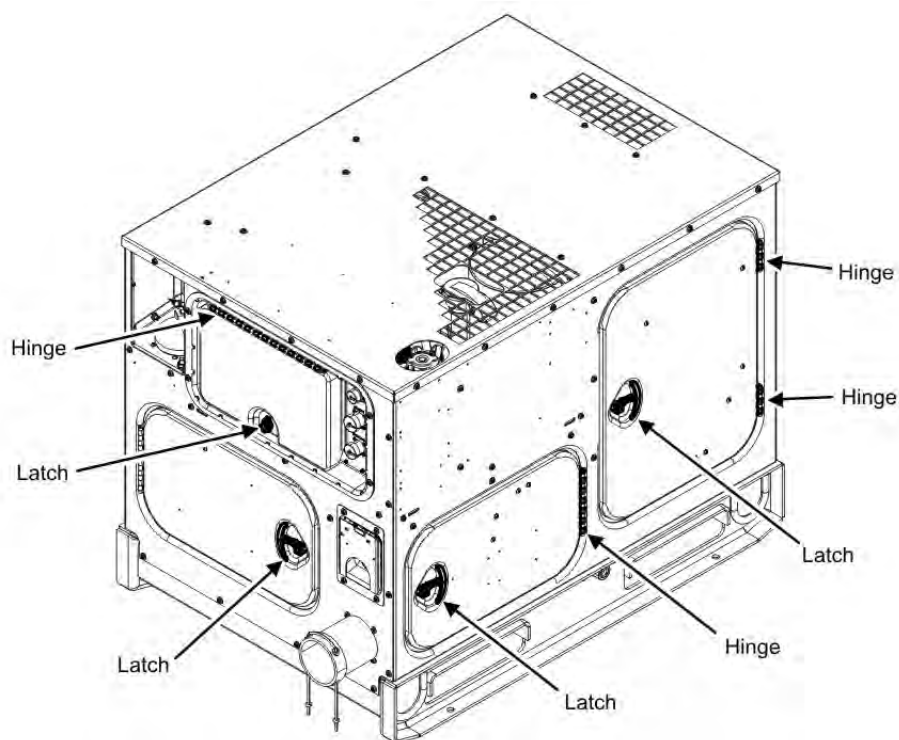


Figure 1. Hinge Locations — Rear and Right-Side.

1. Open doors (Figure 1 and Figure 2).
2. Apply one drop of lubrication oil (Table 4) to each hinge/latch.
3. Cycle door through three open-close sequences.

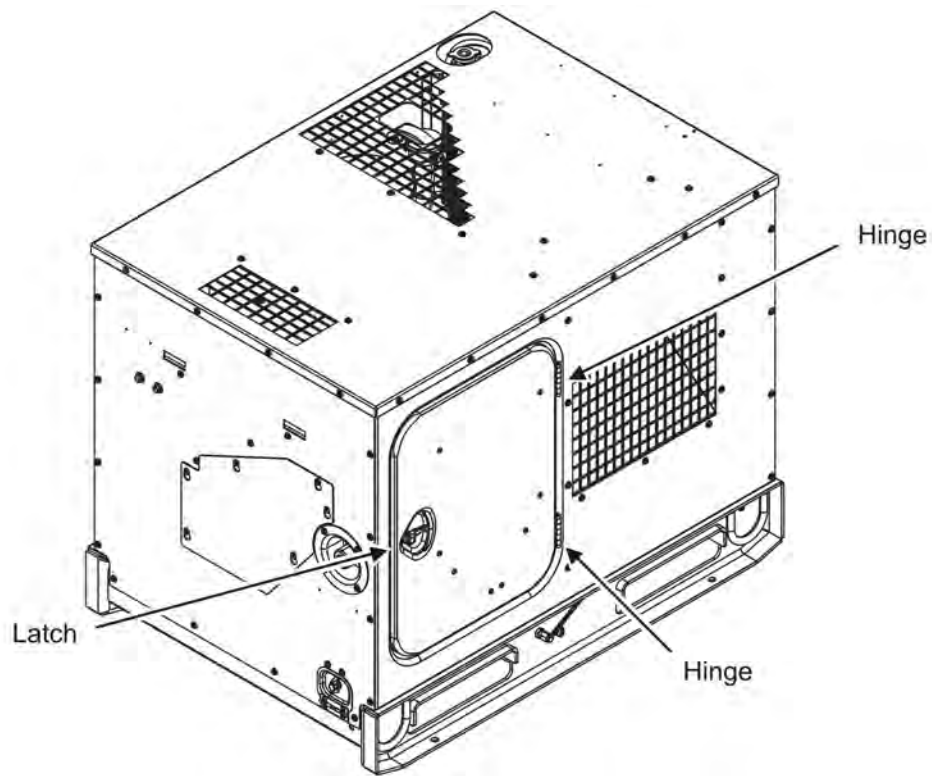


Figure 2. Hinge Locations — Front and Left-Side.

NOTE

Dispose of soiled rags IAW local SOP.

4. Wipe excess oil from hinge/latch.
5. Repeat steps 1 – 4 for each door.

Table 4. Table of Lubricant — Hinges.

SPECIFICATION	TYPE OF LUBRICANT	FREQUENCY	METHOD OF APPLICATION
MIL-PRF-2104H	MIL-PRF-2104H OE/HDO-15/40	500 hr	Oil can, mechanic's flexible

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 5KW GENERATOR SET
TORQUE LIMITS

SCOPE

This WP provides general torque limits for fasteners used on the AMMPS 5 kW generator set. Special torque limits are indicated in Table 1. Table 2 provides nominal torque limits to be used when they are not indicated in Table 1.

The following formula should be used to determine the setting used on the torque wrench when using a crowfoot extension: (SOCKET, CROWFOOT WRENCH HEAD 17105) $M1 = M2 \times L1 / L2$. The values from the formula are defined in the list below.

<u>Term</u>	<u>Definition</u>
M1	The torque setting of the wrench (this is what is being calculated).
M2	The desired torque to be applied to the nut.
L1	The normal length of the torque wrench (from center of grip to center of drive).
L2	The length of the torque wrench plus the length of crowfoot adapter (measured from the center of crowfoot drive to center of wrench drive).

The example shows the calculation of the torque to be set on an 18-in wrench with a 4-in crowfoot adapter to obtain 80 ft/lb of torque.

$$M1 (65.45) = 80 \times 18/22.$$

When any extension is 90 degrees from the torque wrench, no adjustment is necessary.

These general and special torque limits shall not be applied to fasteners that retain rubber components. The rubber components may be damaged before the correct torque limit is reached. If a special torque limit is not given in the maintenance instructions for rubber components, tighten the fastener until it touches the metal, and then tighten it one more turn.

Table 1. Special Torque Limits.

COMPONENT	THREAD DIAMETER AND PITCH	TORQUE	LUBRICATING OIL APPLICATION
Crankcase rear bearing case cover bolts	M8 – 1.25 mm	18 – 21 ft/lb 24.2 – 28.4 Nm	Not applied
Flywheel bolt	M10 – 1.25 mm	61 – 65 ft/lb 83.3 – 88.2 Nm	Applied
PCV flange bolt	M8 – 1.5 mm	83 – 91 ft/lb 113.0 – 123.0 Nm	Not applied
Main bearing cap bolt	M12 – 1.5 mm	69 – 72 ft/lb 93.2 – 98.1 Nm	Applied
Fuel injector bolt	M8 – 1.25 mm	18 – 21 ft/lb 24.2 – 28.4 Nm	Not applied
Fuel injector retainer bolt	Any	29 ft/lb 39.2 Nm	Not applied
Fuel pump drive gear nut	M14 – 1.5 mm	58 – 65 ft/lb 78.0 – 88.0 Nm	Not applied
High-pressure fuel lines bolt	M12 – 1.5 mm	22 – 25 ft/lb 29.4 – 34.3 Nm	Not applied
High-pressure fuel injector line nut	Any	22 – 25 ft/lb 29.0 – 34.0 Nm	Not applied
Fuel return line bolt	Any	69 – 87 in/lb 7.8 – 9.8 Nm	Not applied
Fuel injection pump mounting bolt	Any	17 – 21 ft/lb 23.0 – 28.0 Nm	Not applied
Fuel injector nozzle case nut	Any	30 – 33 ft/lb 39.2 – 44.1 Nm	Not applied
Fuel injection pump plunger plug	Any	22 – 26 ft/lb 30.0 – 35.0 Nm	Not applied

How to Use Torque Table

1. Measure the diameter of the fastener (Figure 1, Item 2).
2. Look down the left-hand column under the Diameter heading to find the diameter of the fastener.
3. Measure the distance between the thread ridges in millimeter to determine pitch (Figure 1, Item 1).
4. To locate torque value, look across to column matching description and size of fastener.

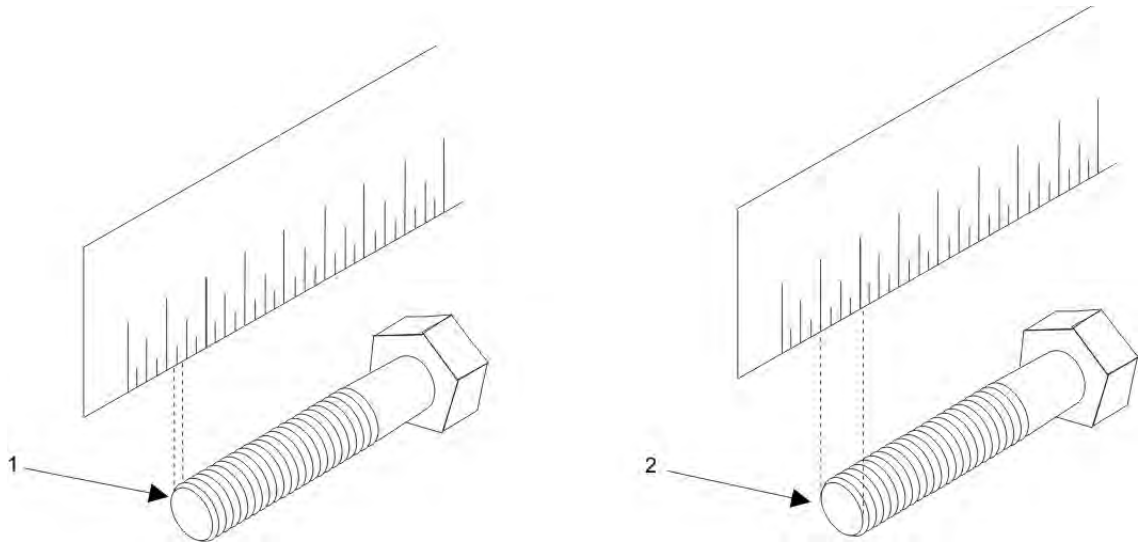


Figure 1. Screw/Bolt Measurement.

CAUTION

The torque values in Table 2 should be applied only to bolts marked 7 (7T strength). Failure to comply will cause damage to equipment.

NOTE

Apply 80% of listed torque value to fasteners tightened to aluminum alloys. Apply 60% of listed torque value to fasteners of 4T strength and all lock nuts.

Table 2. Standard Torque Limits.

ITEM	THREAD DIAMETER AND PITCH	TORQUE
Cap screw (7T) and nut	M6 – 1.0 mm	7 – 9 ft/lb 9.8 – 11.8 Nm
Cap screw (7T) and nut	M8 – 1.25 mm	17 – 21 ft/lb 22.6 – 28.4 Nm
Cap screw (7T) and nut	M10 – 1.5 mm	33 – 40 ft/lb 44.1 – 53.9 Nm
Cap screw (7T) and nut	M12 – 1.75 mm	58 – 72 ft/lb 78.4 – 98.0 Nm
Cap screw (7T) and nut	M14 – 1.5 mm	94 – 108 ft/lb 127.5 – 147.1 Nm
Cap screw (7T) and nut	M16 – 1.5 mm	159 – 174.0 ft/lb 215.7 – 235.4 Nm
PT Plug	0.125 mm – NA	7 ft/lb 9.8 Nm
PT plug	0.25 mm – NA	14 ft/lb 19.6 Nm
PT plug	0.375 mm – NA	22 ft/lb 29.4 Nm
PT plug	0.500 mm – NA	43 ft/lb 58.8 Nm
Pipe joint plug	M8 – NA	9 – 12 ft/lb 12.7 – 16.7 Nm
Pipe joint plug	M10 – NA	14 – 19 ft/lb 19.6 – 18.7 Nm
Pipe joint plug	M12 – NA	18 – 25 ft/lb 24.5 – 34.3 Nm
Pipe joint plug	M14 – NA	29 – 36 ft/lb 39.2 – 49.0 Nm
Pipe joint plug	M16 – NA	36 – 43 ft/lb 49.0 – 58.8 Nm

END OF TASK**END OF WORK PACKAGE**

CHAPTER 4

SUSTAINMENT TROUBLESHOOTING PROCEDURES

FOR

AMMPS 5KW GENERATOR SET

CHAPTER 4

SUSTAINMENT TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
TROUBLESHOOTING INDEX	0089
TROUBLESHOOTING PROCEDURES	0090

**SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
TROUBLESHOOTING INDEX**

GENERAL TROUBLESHOOTING INFORMATION

NOTE

Always perform Sustainment PMCS prior to beginning any troubleshooting procedure (WP 0092, Sustainment PMCS).

Sustainment maintenance is responsible for repair and/or replacement of failed LRUs as identified by field maintenance. There are no specific troubleshooting procedures for sustainment maintenance. The malfunction/symptom index found below lists malfunction(s) identified at the field level and their related sustainment maintenance corrective action (by WP). If engine or AC generator overhaul is required, notify your supervisor.

MALFUNCTION/SYMPTOM INDEX

Malfunction/Symptom

Troubleshooting Procedure WP and Page

Generator set inoperable

Failed LRU as determined by field maintenance..... WP 0090, Page 1

END OF WORK PACKAGE

**SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
TROUBLESHOOTING PROCEDURES**

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

References

WP 0004, Troubleshooting Index
WP 0092, Sustainment PMCS

Personnel Required

91D (1)

GENERATOR SET

NOTE

Always perform Sustainment PMCS prior to beginning any troubleshooting procedure (WP 0092, Sustainment PMCS).

SYMPTOM

Generator set inoperable.

MALFUNCTION

Failed LRU as determined by field maintenance.

CORRECTIVE ACTION

Repair/replace failed component(s) IAW maintenance procedures contained in WP 0004, Troubleshooting Index. If symptom continues, notify your supervisor.

END OF WORK PACKAGE

CHAPTER 5

SUSTAINMENT MAINTENANCE INSTRUCTIONS

FOR

AMMPS 5KW GENERATOR SET

CHAPTER 5

SUSTAINMENT MAINTENANCE INSTRUCTIONS

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
SUSTAINMENT PMCS INTRODUCTION	0091
SUSTAINMENT PMCS	0092
GENERAL MAINTENANCE	0093
REMOVE/INSTALL HARMONIC BALANCER	0094
REMOVE/INSTALL GEAR CASE COVER	0095
REPLACE CYLINDER HEAD GASKET	0096
WIRING DIAGRAMS	0097

**SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
SUSTAINMENT PMCS INTRODUCTION**

INTRODUCTION

This section contains information required to perform sustainment maintenance PMCS. All PMCS for the AMMPS 5 kW generator set are completed by the operator (TM 9-6115-749-10) or by field maintenance personnel (WP 0016, Field PMCS). There are no PMCS tasks to be performed by sustainment maintenance personnel.

END OF WORK PACKAGE

**SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
SUSTAINMENT PMCS**

INITIAL SETUP:

References

WP 0016, Field PMCS

TM 9-6115-749

There are no PMCS tasks to be performed by sustainment maintenance personnel. All PMCS for the AMMPS 5 kW generator set are completed by the operator (TM 9-6115-749-10) or by field maintenance personnel (WP 0016, Field PMCS).

END OF WORK PACKAGE

SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
GENERAL MAINTENANCE

INITIAL SETUP:**Test Equipment**

Cable, Local Control (WP 0162, Table 2, Item 5)
 Cable, Remote Control (WP 0162, Table 2, Item 6)
 Test Set, Electronic Systems (WP 0162, Table 2, Item 26)

Tools and Special Tools

Cable, Auxiliary with NATO Plug (WP 0162, Table 2, Item 4)
 Crimping, Tool, Terminal (WP 0162, Table 2, Item 9)
 Crimping, Tool, Terminal, Hand (WP 0162, Table 2, Item 10)
 Oiler, Hand (WP 0162, Table 2, Item 17)
 Remover, Electrical Contact (WP 0162, Table 2, Item 21)
 Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
 Tool, Rivet Nut (WP 0162, Table 2, Item 34)

Personnel Required

91D (1)

Materials/Parts

Boot, dust and moisture (19) (WP 0153, Repair Parts List, Figure 55, Item 30)
 Boot, dust and moisture seal (2) (WP 0154, Repair Parts List, Figure 56, Item 13)
 Cap, sealing (2) (WP 0144, Repair Parts List, Figure 46, Item 2)
 Cap, sealing (2) (WP 0144, Figure 46, Item 5)
 Cap, sealing (3) (WP 0144, Figure 46, Item 8)
 Cap, sealing (3) (WP 0144, Figure 46, Item 15)
 Connector, electrical magnetic sensor (WP 0153, Figure 55, Item 61)
 Connector, plug, electrical (WP 0153, Figure 55, Item 3)

Materials/Parts

Connector, plug, electrical (WP 0153, Figure 55, Item 6)
 Connector, plug, electrical (WP 0153, Figure 55, Item 8)
 Contact, electrical, 16–20 AWG (2) (WP 0153, Figure 55, Item 45)
 Contact, electrical 18–20 AWG (4) (WP 0153, Figure 55, Item 29)
 Contact, electrical, 22–16 AWG (33) (WP 0153, Figure 55, Item 14)
 Contact, electrical, 22–16 AWG (22) (WP 0153, Figure 55, Item 22)
 Contact, pin, 16–18 AWG (3) (WP 0153, Figure 55, Item 50)
 Nut, plain, clinch (WP 0102, Repair Parts List, Figure 4, Item 4)
 Plug, expansion (1) (WP 0144, Figure 46, Item 6)
 Plug, protective, dust and moisture seal (2) (WP 0154, Figure 56, Item 15)
 Seal (2) (WP 0154, Figure 56, Item 16)
 Seal (3) (WP 0153, Figure 55, Item 48)
 Terminal, disconnect (WP 0153, Figure 55, Item 57)
 Terminal, lug (4) (WP 0153, Figure 55, Item 58)
 Terminal, lug, ring (WP 0154, Figure 56, Item 2)
 Terminal, lug, ring (WP 0154, Figure 56, Item 10)
 Terminal, lug, ring, M8, 12–10 AWG (4) (WP 0154, Figure 56, Item 4)
 Terminal, lug, ring, 3/8 IN, 12–10 AWG (2) (WP 0154, Figure 56, Item 9)
 Terminal, lug, 16–14 AWG (WP 0153, Figure 55, Item 19)
 Terminal, lug, 16–20 AWG (2) (WP 0153, Figure 55, Item 63)

INITIAL SETUP — CONTINUED:

Materials/Parts

Terminal, quick disconnect (3) (WP 0153, Figure 55, Item 52)

Terminal, quick disconnect, 14–16 AWG (19) (WP 0153, Figure 55, Item 35)

Terminal, taper, receptacle (2) (WP 0154, Figure 56, Item 12)

Baking soda (WP 0163, Expendable and Durable Items List, Item 4)

Brush, wire, scratch, brass (WP 0163, Item 7)

Fuel, diesel (WP 0163, Item 18)

Fuel, diesel (WP 0163, Item 19)

Lubricating oil, engine, preservation (WP 0163, Item 26)

Rag, wiping (WP 0163, Item 31)

Tape, pressure sensitive (WP 0163, Item 36)

References

A-A-52557A

MIL-DLT-83133G

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

References

WP 0018, Repair DCS

WP 0019, Remove/Install Air Intake Hose Assemblies

WP 0021, Service Cooling System

WP 0039, Service Fuel System

WP 0040, Remove/Install Fuel Manifold

WP 0041, Remove/Install Fuel Pump Main/Auxiliary

WP 0043, Replace Fuel Filter/Water Separator Element

WP 0066, Service Lubrication System

WP 0087, Lubrication Instructions

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

GENERAL MAINTENANCE

This section provides general maintenance procedures for using a fire extinguisher, understanding general fuel requirements, using a multimeter, jump starting the generator set, cleaning battery terminals, repairing electrical connectors, accessing log files on DCS, using InPower AMMPS for troubleshooting and updating, and preparation for storage.

Using a Fire Extinguisher

Do not use a fire extinguisher without reading the instructions and receiving proper training. When using a fire extinguisher, choose the proper type of fire extinguisher for the class of fire. Be sure to use a type “A” on ordinary materials (paper, cardboard, and most plastics), type “B” on combustible or combustibles (diesel, gas, grease, and oil), type “C” on electrical fires, type “D” on combustible metal/chemical fires, or a multipurpose extinguisher designated with the proper letter for the class fire. For example, an “ABC” extinguisher will handle class “A,” “B,” and “C” fires. Using the improper fire extinguisher can result in spreading of the fire and failure to extinguish. Failure to comply may cause injury or death to personnel. Do not attempt to extinguish a fire that is large in size. Do not attempt to extinguish a fire when there is no clear exit visible. Be sure building is evacuated. Call for help IAW local SOP. Stay low to avoid smoke. Failure to comply may cause injury or death to personnel.

1. Determine the class of fire (“A,” “B,” “C,” or “D”).

2. Choose the correct type of extinguisher.
3. Pull the pin of the extinguisher.
4. Aim the extinguisher at the base of the fire.
5. Sweep back and forth toward the fire.
6. Continue until fire is extinguished.
7. Recharge or dispose of extinguisher IAW local SOP.

END OF TASK

General Fuel Requirements

WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

Fuels used in the generator set are combustible. Do not smoke or use open flames when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Hot engine surfaces from the engine and generator circuitry are possible sources of ignition. When hot refueling with DF-1, DF-2, JP5, or JP8, avoid fuel splash and fuel spill. Do not smoke or use open flame when performing refueling. Remember PMCS is still required. Flames and possible explosion may result. Failure to comply may cause injury or death to personnel.

NOTE

DF-2 and JP8 are the types of fuel for the generator set. See Table 1.

Table 1. Fuel.

AMBIENT TEMPERATURE	FUEL
-50°F to +135°F (-45.6°C to 57.2°C)	MIL-DTL-83133Ga JP8
+20°F to +135°F (-6.7°C to 57.2°C)	A-A-52557A ^a GR 2-D
-50°F to +135°F (-45.6°C to 57.2°C)	A-A-52557A GR 1-D

^aTurbine Fuel, Aviation, Kerosene Type, JP-8 (NATO F-34), NATO F-35, and JP-8+100 (NATO F-37).

^bFuel Oil, Diesel; for Posts, Camps and Stations.

END OF TASK

Using a Multimeter

1. Select turn dial for option to be used:
 - a. Ohms for resistance, continuity, and short circuit.
 - b. Volts for voltage.
 - c. Amperes for current.

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

CAUTION

Only use instruments known to be in good working order. When an instrument is used to measure resistance, proper function should be confirmed by touching metal tips of leads together and observing for minimum resistance indication. Failure to comply may cause damage to equipment.

2. Measure resistance value.
 - a. Connect multimeter leads to leads of item being checked.
 - b. Use red lead for positive terminal.
 - c. Use black lead for negative terminal.
 - d. Observe display for reading.
 - e. Compare reading to specifications.
3. Check for opens or continuity.
 - a. Connect multimeter leads to wiring circuit being checked.
 - b. Observe display for reading.
 - c. Consult specifications for maximum permissible reading.
4. Check for short circuit, wire to wire.
 - a. Connect multimeter leads to wires being checked.
 - b. Observe display for reading.
 - c. Reading must be greater than 100 kilohms (k Ω) wire to wire or short exists.
5. Check for short circuit to ground.
 - a. Connect one multimeter lead to wire being checked.
 - b. Touch multimeter probe to bare metal, such as engine block.
 - c. Observe display for reading.
 - d. Repeat steps a through c for remaining wires in circuit.
 - e. Reading must be greater than 100 k Ω or short to ground exists.
6. Place proper lead on proper terminal to check voltage:
 - a. Use red lead for positive terminal.
 - b. Use black lead for negative terminal.

- c. Observe display for reading.
- d. Compare reading to specifications.
- 7. Place proper lead on proper terminal to check current:
 - a. Use red lead for positive terminal.
 - b. Use black lead for negative terminal.
 - c. Observe display for reading.
 - d. Compare reading to specifications.

END OF TASK

Jump Starting the Generator Set

Jump starting requires the use of the NATO slave receptacle. NATO slave cables are required to jump start a 24-V system. The generator set cannot be jump started with a 12-V system. Ensure the vehicle/equipment being used to jump start the generator set is a 24-V system.

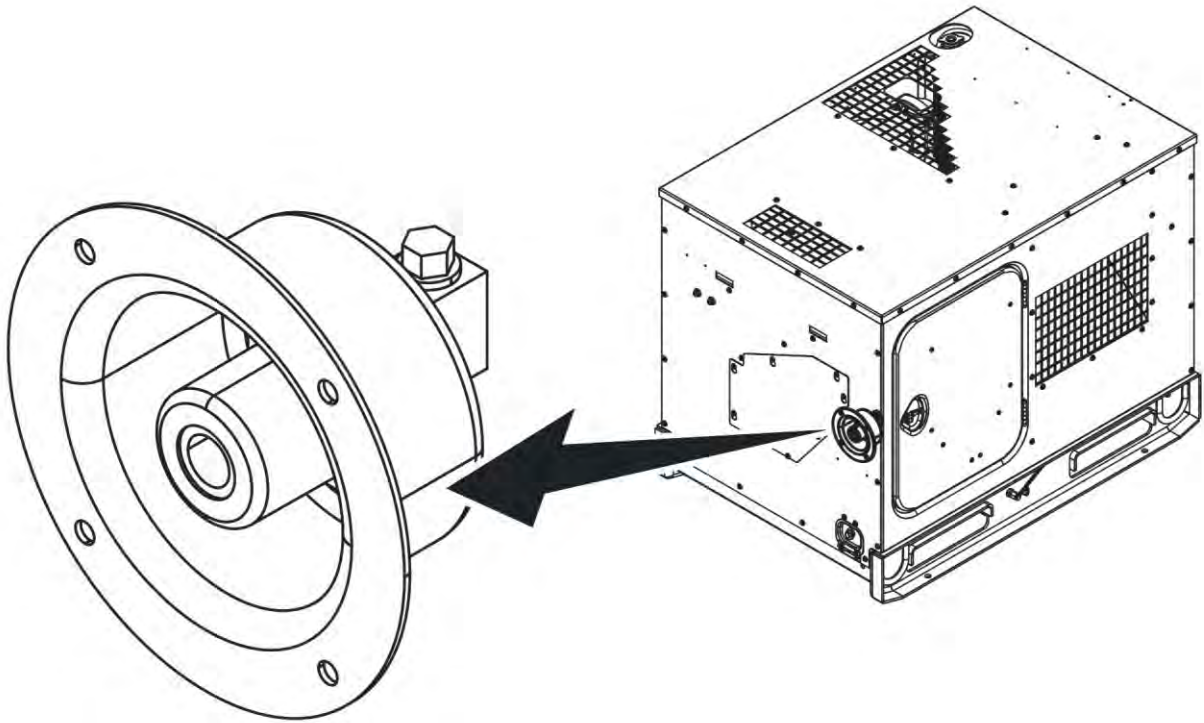


Figure 1. NATO Slave Receptacle — Location.

WARNING

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

Ensure equipment/vehicles being used to jump-start the generator set are not touching. Touching of metal surfaces can cause improper grounding. Do not allow the cable ends to touch each other or any part of the generator set/vehicle/equipment other than the NATO slave receptacle. May result in damage to the electrical system of the generator set/vehicle/equipment. Failure to comply may cause injury or death to personnel.

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

1. Move the vehicle/equipment being used to jump start close enough to the generator set that the cables reach.
2. Ensure the engine control switch on the generator set is OFF (TM 9-6115-749-10).
3. Ensure the vehicle/equipment being used to jump start is OFF.
4. Locate the NATO slave receptacle inside the left-side door (Figure 1).
5. Remove the NATO slave receptacle cover.
6. Ensure NATO slave cable ends are free of dirt and debris.
7. Ensure NATO slave receptacles are free of dirt and debris.

WARNING

Ensure equipment/vehicles being used to jump-start the generator set are not touching. Touching of metal surfaces can cause improper grounding. Do not allow the cable ends to touch each other or any part of the generator set/vehicle/equipment other than the NATO slave receptacle. May result in damage to the electrical system of the generator set/vehicle/equipment. Failure to comply may cause injury or death to personnel.

8. Connect the NATO slave cable to the generator set.
9. Turn on the vehicle/equipment being used to jump start the generator set.
10. Connect the other end of the NATO slave cable to the vehicle/equipment being used to jump start.
11. Allow the generator set to charge for 10 min.

CAUTION

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between attempted starts. Failure to comply may cause damage to equipment.

12. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
13. Start engine and check for proper operation.
14. Ensure proper operation of the generator set.
15. Remove the NATO slave cable from the vehicle/equipment being used to jump start.

16. Remove the NATO slave cable from the generator set.
17. Replace the cap on the NATO slave receptacle.

END OF TASK

Clean Battery Posts

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.

Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.

Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.

Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.

1. Remove battery cables from battery terminals (WP 0036, Remove/Install Batteries).
2. Apply a one-part sodium bicarbonate to two-parts water solution to terminals.
3. Let terminals stand in solution for 2 – 3 min.
4. Clean terminals with a wire brush.
5. Dry battery terminals with a wiping rag.
6. Install battery cables to battery terminals (WP 0036, Remove/Install Batteries).

END OF TASK

Repair Electrical Connectors

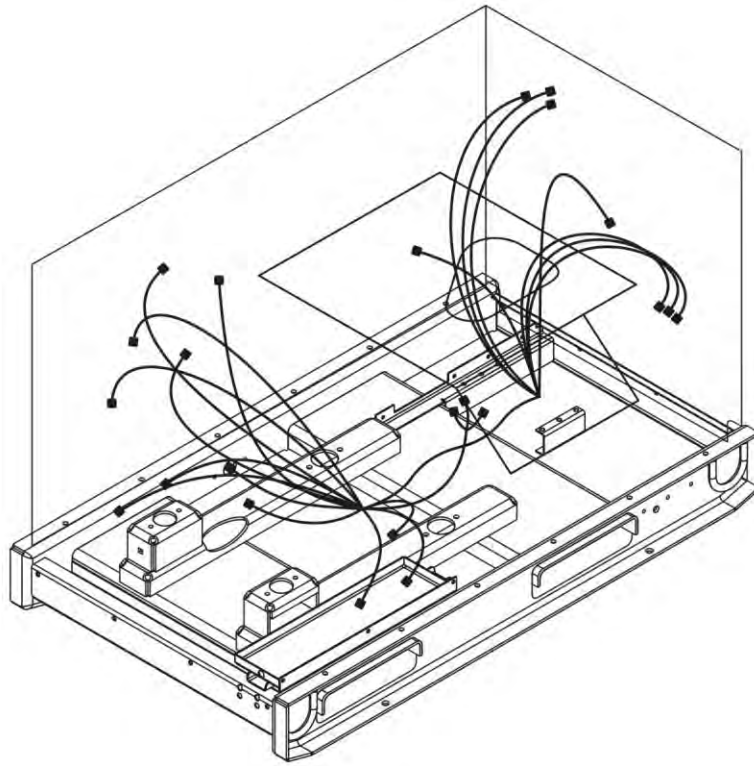


Figure 2. Wiring Harness — Location.

NOTE

Several types of connector are used on the AMMPS generator set wiring harness. Each type of electrical connector can be replaced without removing the entire wiring harness from the unit. Replacement steps for each type of electrical connector are given below. A table at the end of each repair step identifies the relevant electrical connector, contact type, and number of contacts required for each component connector type.

See the fold-out electrical wiring diagrams in the rear of this manual for locations of the various types of electrical connectors. Electrical connector numbers in the tables are keyed to the Engine Harness fold out diagram at the back of this manual.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate electrical connector or wiring harness (Figure 2) that requires repair.
3. Replace simple crimp-on connector (Table 2).

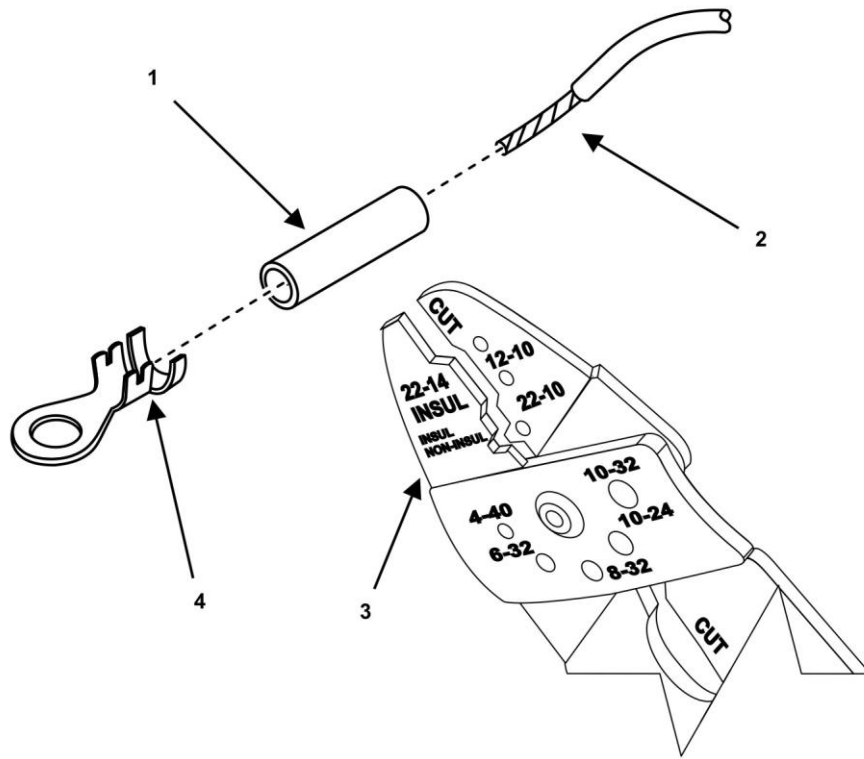


Figure 3. Simple Crimp-on Ring Connector.

- a. Identify failed electrical component connector (Figure 3, Item 4).
- b. Cut and discard old connector (Figure 3, Item 4) from wire lead (Figure 3, Item 2) at base of old connector (Figure 3, Item 4).
- c. Install a length of new shrink wrap (Figure 3, Item 1) long enough to cover the crimp area of new connector (Figure 3, Item 4) onto wire lead (Figure 3, Item 2).
- d. Strip insulation from wire lead (Figure 3, Item 2) equal to depth of new connector well.
- e. Place bare wire of wire lead (Figure 3, Item 2) into new connector (Figure 3, Item 4) well and crimp to secure connector (Figure 3, Item 4) to wire lead (Figure 3, Item 2) using a crimping tool (Figure 3, Item 3).
- f. Test new connector (Figure 3, Item 4) using a multimeter to verify continuity is present using wire diagram as a guide to identify the correct circuit.
- g. Slide shrink wrap (Figure 3, Item 1) over newly crimped connection and heat to form a tight seal.
- h. Install new connector (Figure 3, Item 4) to electrical component.
- i. Check operation of electrical component for proper operation. Repair as required.

Table 2. Crimp-On Ring Connector Repair.

WIRING HARNESS	ELECTRICAL COMPONENT	CONNECTOR TYPE	NO. CONTACTS
Engine Wiring Harness	DEAD CRANK SWITCH	Ring	3
Engine Wiring Harness	Battery-Charging Alternator	Terminal	1
Engine Wiring Harness	Starter Solenoid	Ring	1
Engine Wiring Harness	Glow Plugs	Ring	1
Power Wiring Harness	Battery-Charging Alternator (B+)	Ring	1
Power Wiring Harness	Battery-Charging Alternator (Ground)	Ring	1
Power Wiring Harness	Starter (B+)	Ring	1
Power Wiring Harness	Starter (B-)	Ring	2
Power Wiring Harness	Main DC Circuit Breaker (B+)	Ring	3

4. Repair multipin bulkhead-mounted connector (Table 3).

NOTE

This task contains typical repair instructions for the multipin connectors used on the 5 kW AMMPS DCS and engine speed sensor. There are four different connectors used on the generator set. Each one varies in the number of pins/sockets used in the connector. Repair of each connector uses the same procedure provided below. See Table 3 for the correct connector for your application.

- a. Disconnect cable connector from generator set component.
- b. Test wire/socket connections (Figure 4, Item 5) of electrical connector using a multimeter to determine failed socket(s) (Figure 4, Item 7) within the connector.
- c. Loosen two screws (Figure 4, Item 1) that secure strap of shell (Figure 4, Item 2) to cable (Figure 4, Item 8).
- d. Unscrew shell (Figure 4, Item 2) from connector housing (Figure 4, Item 4).
- e. Slide shell (Figure 4, Item 2) down cable (Figure 4, Item 8) to access back of connector housing (Figure 4, Item 4).
- f. Remove every wire/socket connection (Figure 4, Item 5) from rear of connector housing (Figure 4, Item 4) using extractor tool (Figure 4, Item 6).
- g. Inspect all individual wire/socket connections for signs of obvious damage. Replace all damaged sockets (Figure 4, Item 7) while accessible.
- h. Inspect cable (Figure 4, Item 8), shell (Figure 4, Item 2), and connector housing (Figure 4, Item 4) for signs of obvious damage. Replace all damaged components as required.

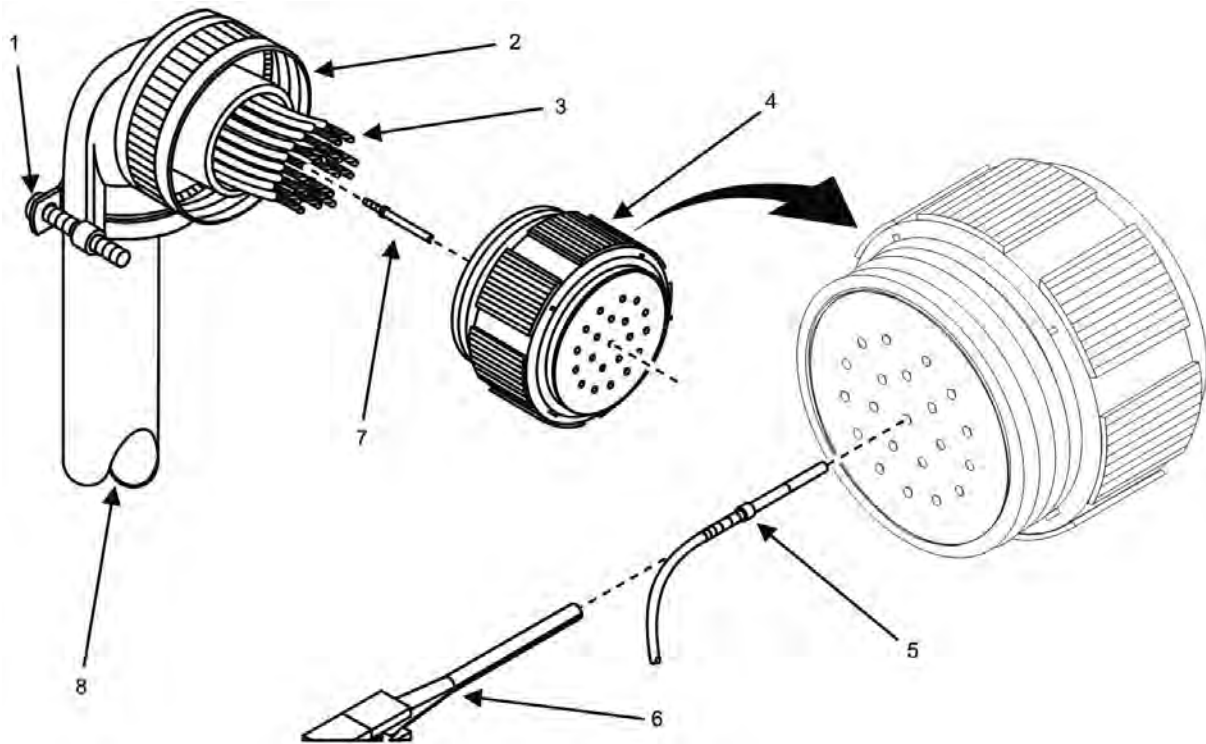


Figure 4. Multipin Connector Repair.

CAUTION

De-solder (see TB SIG 222) broken/damaged socket(s) (Figure 4, Item 7) and remove socket (Figure 4, Item 7) from cable wire (Figure 4, Item 3).

- i. Solder (see TB SIG 222) new socket(s) (Figure 4, Item 7) to cable wire (Figure 4, Item 3).
- j. Test new wire/socket connection(s) (Figure 4, Item 5) to ensure proper electrical flow.
- k. Insert all individual wire/socket connections (Figure 4, Item 5) into rear of connector housing (Figure 4, Item 4) using tags/markings applied during removal as a guide. Push wire/socket connections (Figure 4, Item 5) into connector housing (Figure 4, Item 4) locations by hand until each socket (Figure 4, Item 7) is fully seated and will not pull out.
- l. Slide shell (Figure 4, Item 2) over cable (Figure 4, Item 8) to its mounting location on connector housing (Figure 4, Item 4) and secure by screwing shell (Figure 4, Item 2) onto connector housing (Figure 4, Item 4).
- m. Tighten two screws (Figure 4, Item 1) to secure strap of shell (Figure 4, Item 2) to cable (Figure 4, Item 8) and relieve strain on cable (Figure 4, Item 8).

Table 3. Multipin Bulkhead-Mounted Connector Repair.

ELECTRICAL COMPONENT (CONNECTOR NUMBER)	CONTACT TYPE	NUMBER (NO.) CONTACTS
DCS (P1)	Socket	21
DCS (P2)	Socket	29
DCS (P3)	Socket	61
Engine Speed Sensor (P14)	Pin	2

5. Repair square type connector (Table 4).

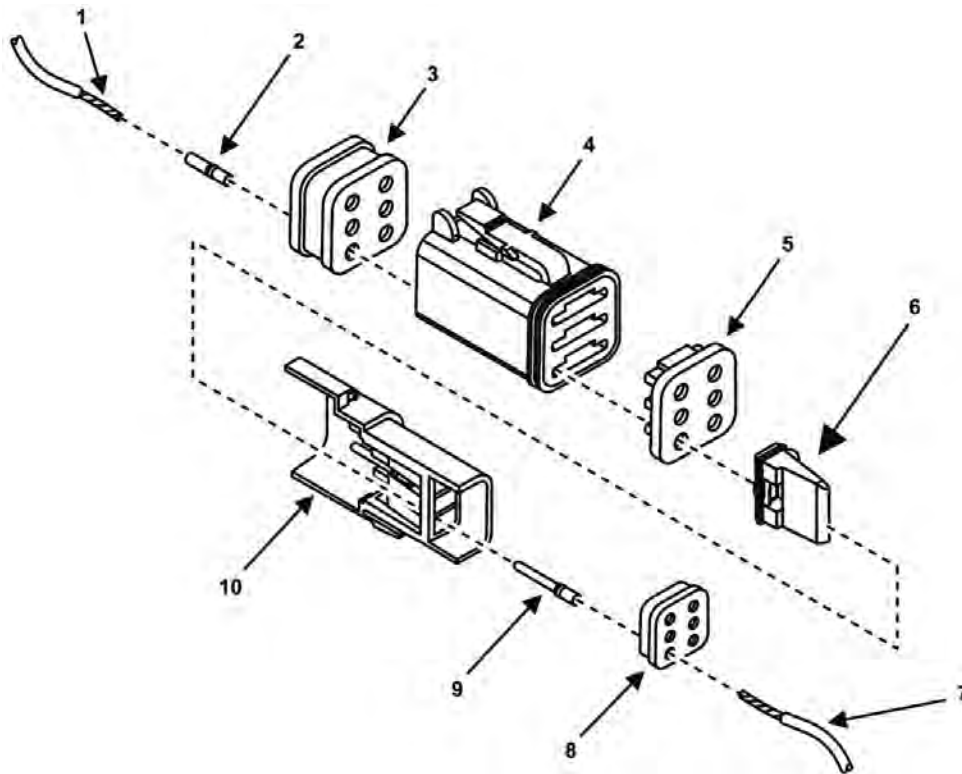


Figure 5. Square-Type Connector.

NOTE

Electrical connectors covered by this method may vary in design/shape but the procedure to repair them is the same.

- Identify electrical connector (Figure 5, Items 4 and 10) containing failed contact (Figure 5, Items 2 and 9).
- Disconnect connector (Figure 5, Items 4 and 10) from electrical component (Table 4).
- Test contact (Figure 5, Items 2 and 9) of electrical connector (Figure 5, Items 4 and 10) using a multimeter to determine failed contact (Figure 5, Items 2 and 9) within the connector (Figure 5, Items 4 and 10).
- Remove wedge lock (Figure 5, Item 6) or retainer lock (Figure 5, Item 5) from connector (Figure 5, Items 4 and 10) by pulling straight out using needle nose pliers.

- e. Remove failed contact (Figure 5, Item 2 and 9) by gently pulling wire (Figure 5, Items 1 and 7) attached to failed contact (Figure 5, Item 2 and 9) from connector (Figure 5, Items 4 and 10) while, at the same time, releasing the locking finger of failed contact (Figure 5, Items 2 and 9) using the proper contact removal tool.
- f. Hold seal (Figure 5, Items 3 and 8) in place using the removal tool as it may be displaced when pulling failed contact (Figure 5, Items 2 and 9) from rear of connector (Figure 5, Items 4 and 10) once failed contact (Figure 5, Items 2 and 9) is free from its locking finger.
- g. Cut failed contact (Figure 5, Items 2 and 9) from wire lead (Figure 5, Items 1 and 7) at base of failed contact (Figure 5, Items 2 and 9). Discard failed contact (Figure 5, Items 2 and 9).
- h. Strip insulation from wire lead (Figure 5, Items 1 and 7) to the length of new contact (Figure 5, Items 2 and 9) wire well.

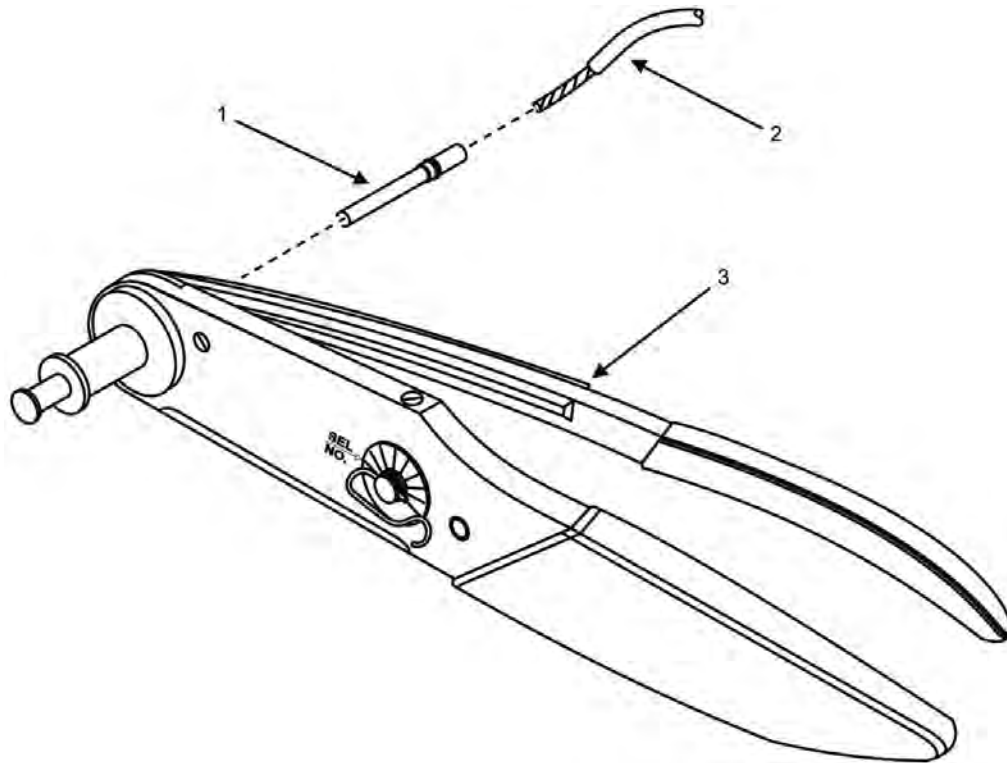


Figure 6. Square-Type Crimping Tool.

NOTE

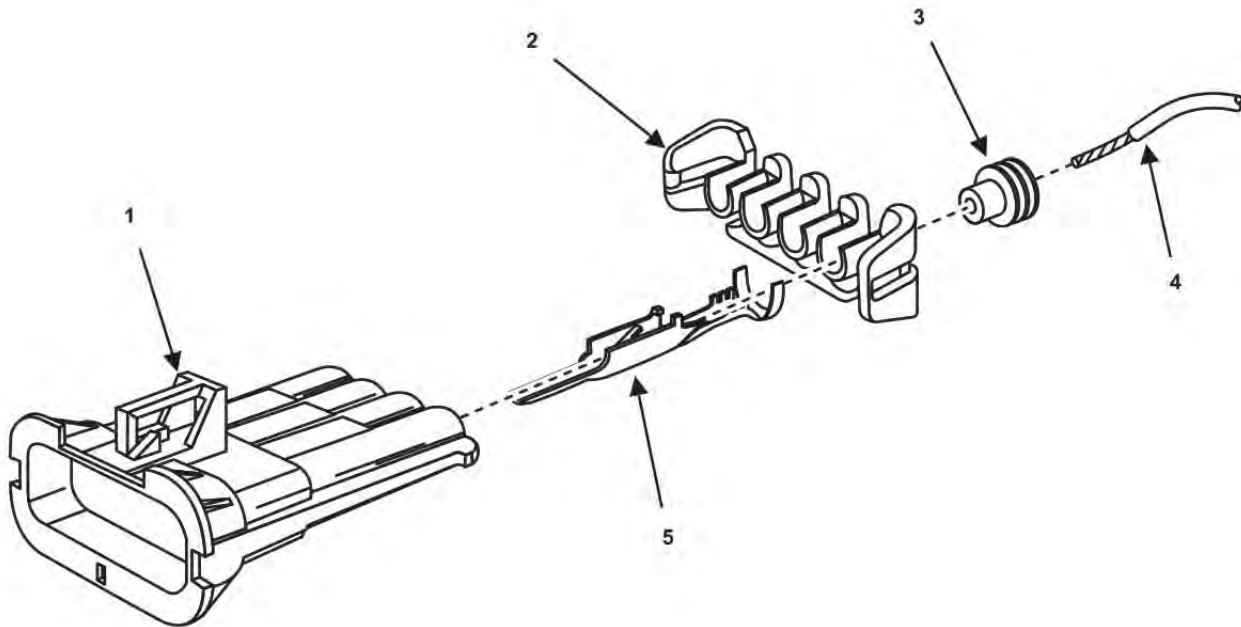
Crimping tool must be readjusted for each type/size of contact.

- i. Adjust crimping tool (Figure 6, Item 3) to the correct size of new contact (Figure 6, Item 1).
- j. Insert new contact (Figure 6, Item 1) into crimping tool (Figure 6, Item 3).
- k. Insert wire (Figure 6, Item 2) into contact (Figure 6, Item 1). Ensure all strands of wire are inside contact barrel. Contact (Figure 6, Item 1) must be centered between indicators of crimping tool (Figure 6, Item 3).
- l. Close handles of crimping tool (Figure 6, Item 3) until crimp cycle is completed.
- m. Release crimping tool handles and remove crimped contact (Figure 6, Item 1) from crimping tool (Figure 6, Item 3).
- n. Inspect crimped contact (Figure 6, Item 1) to ensure all strands of wire lead are inside contact barrel.

- o. Repeat substeps 5i – n if all wire strands were not captured inside contact (Figure 6, Item 1).
- p. Grasp wire lead (Figure 5, Items 1 and 7) approximately 1.0 in (25 mm) behind new contact (Figure 5, Items 2 and 9).
- q. Insert new contact (Figure 5, Items 2 and 9) straight into rear of seal (Figure 5, Items 3 and 8) until a click is felt.
- r. Pull gently on wire lead (Figure 5, Items 1 and 7) to verify contact (Figure 5, Items 2 and 9) is locked into connector (Figure 5, Items 4 and 10).
- s. Install wedge lock (Figure 5, Item 6) or retainer lock (Figure 5, Item 5) into connector (Figure 5, Items 4 and 10).
- t. Install repaired connector (Figure 5, Items 4 and 10) to electrical component.
- u. Check electrical component for proper operation. Repair as required.

Table 4. Square-Type Connector Repair.

ELECTRICAL COMPONENT (CONNECTOR NUMBER)	CONTACT TYPE	NO. CONTACTS
Winterization Kit (J20C)	Socket	3
Main Fuel Pump (P65)	Socket	2
Auxiliary Fuel Pump (P60)	Socket	2
Governor Actuator (P37)	Socket	2
G1 Field (P90)	Socket	2
Fuel Level Sensor (P70)	Socket	3
Spares (P75)	Socket	4
G1 Quad (P85)	Socket	2
Output Box (P500)	Socket	33

**Figure 7. Flat-type Pin Connector.**

NOTE

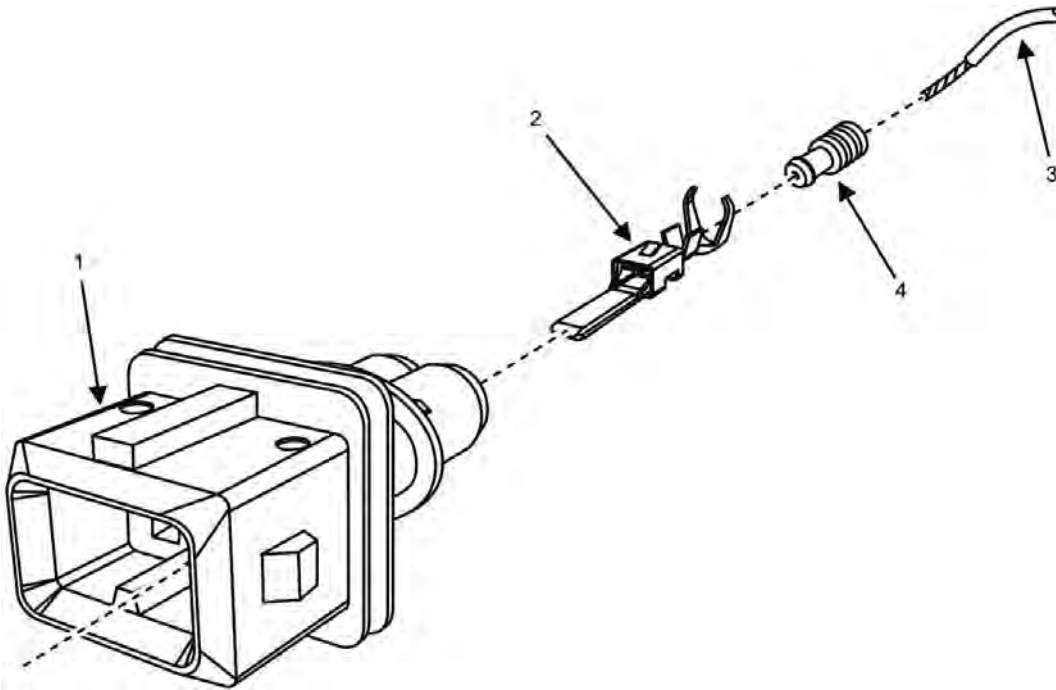
The flat-type electrical connectors used on the AMMPS 5 kW generator set wiring harness are all of the pin type. The mating connectors are integral parts of the electrical components to which they are attached. The female type connectors attached to various electrical components are not repairable and therefore not depicted.

6. Repair flat-type connector (Table 5).
 - a. Identify electrical connector containing failed contact.
 - b. Disconnect wiring harness from electrical component.
 - c. Test contacts (Figure 7, Item 5) of electrical connector using a multimeter to determine failed contact within the connector.
 - d. Pull connector lock (Figure 7, Item 2) from rear of electrical connector shell (Figure 7, Item 1).
 - e. Remove failed contact (Figure 7, Item 5) by gently pulling wire lead (Figure 7, Item 4) attached to failed contact (Figure 7, Item 5) from rear of connector shell (Figure 7, Item 1) while, at the same time, releasing contact (Figure 7, Item 5) from front of connector shell (Figure 7, Item 1) using the proper contact removal tool.
 - f. Remove and discard failed contact (Figure 7, Item 5) from wire lead (Figure 7, Item 4).
 - g. Remove and discard seal (Figure 7, Item 3) (where applicable) from wire lead (Figure 7, Item 4).
 - h. Strip insulation from wire lead (Figure 7, Item 4) to the length of new contact wire well.
 - i. Install new seal (Figure 7, Item 3) onto wire lead (Figure 7, Item 4).
 - j. Crimp new contact (Figure 7, Item 5) to wire lead (Figure 7, Item 4) using proper crimping tool.
 - k. Test new contact (Figure 7, Item 5) using a multimeter to verify continuity is present using wire diagram as a guide to identify the correct circuit.
 - l. Grasp wire lead (Figure 7, Item 4) approximately 1.0 in (25 mm) behind new contact (Figure 7, Item 5).
 - m. Insert new contact (Figure 7, Item 5) straight into rear of connector shell (Figure 7, Item 1) until a click is felt.
 - n. Pull gently on wire lead (Figure 7, Item 4) to verify contact (Figure 7, Item 5) is locked into connector shell (Figure 7, Item 1).
 - o. Install connector lock (Figure 7, Item 2) into rear of connector shell (Figure 7, Item 1).
 - p. Install seal (Figure 7, Item 3) into connector lock (Figure 7, Item 2) until outer surface of seal (Figure 7, Item 3) is flush with outer surface of connector lock (Figure 7, Item 2).
 - q. Install repaired connector (Figure 7, Item 1) to electrical component.
 - r. Check electrical component for proper operation. Repair as required.

Table 5. Flat-Type Connector Repair.

WIRING HARNESS	ELECTRICAL COMPONENT (#)	CONTACT TYPE	NO. CONTACTS
Engine Wiring Harness	Battery Sensor (P5)	Pin	3
Engine Wiring Harness	Coolant Temperature Sensor (P35)	Pin	2
Engine Wiring Harness	Oil Pressure Sensor (P40)	Pin	3
Engine Wiring Harness	Cooling Fan (P96)	Pin	4
Engine Wiring Harness	Relay Panel (P5A) (black)	Pin	2
Engine Wiring Harness	Relay Panel (P5B) (grey)	Pin	6
Engine Wiring Harness	Relay Panel (P5C) (blue)	Pin	4
Engine Wiring Harness	Relay Panel (P5D) (green)	Pin	7
Power Wiring Harness	Relay Panel (P11) (black)	Pin	1
Power Wiring Harness	Relay Panel (P10) (grey)	Pin	1

7. Repair winterization kit connector (Table 6).

**Figure 8. Winterization Kit Pin Connector.**

- Identify electrical connector containing failed contact.
- Disconnect wiring harness from electrical component.
- Test contacts of electrical connector using a multimeter to determine failed contact within the connector.
- Remove failed contact (Figure 8, Item 2) by inserting the extraction tool fully into the connector (Figure 8, Item 1) at the failed contact (Figure 8, Item 2). When the extraction tool reaches its full travel, the locking tabs on the failed contact (Figure 8, Item 2) are released.
- Pull wire lead (Figure 8, Item 3) connected to failed contact (Figure 8, Item 2) gently from the rear of connector (Figure 7, Item 1) to remove failed contact (Figure 8, Item 2).
- Remove failed contact (Figure 8, Item 2) from wire lead (Figure 8, Item 3). Discard failed contact (Figure 8, Item 2).
- Slide seal (Figure 8, Item 4) further on wire lead (Figure 8, Item 3).

- h. Strip insulation from wire lead (Figure 8, Item 3) to the length of new contact wire well.
- i. Crimp new contact (Figure 8, Item 2) to wire lead (Figure 8, Item 3) using proper crimping tool.
- j. Test new contact (Figure 8, Item 2) using a multimeter to verify continuity is present using wire diagram as a guide to identify the correct circuit.
- k. Grasp wire lead (Figure 8, Item 3) approximately 1.0 in (25 mm) behind new contact (Figure 8, Item 2).
- l. Insert new contact (Figure 8, Item 2) and wire lead (Figure 8, Item 3) straight into rear of connector (Figure 8, Item 1) until a click is felt.
- m. Pull gently on wire lead (Figure 8, Item 3) to verify contact (Figure 8, Item 2) is locked into connector (Figure 8, Item 1).
- n. Install seal (Figure 8, Item 4) into connector (Figure 8, Item 1) until outer surface of seal (Figure 8, Item 4) is flush with outer surface of connector (Figure 8, Item 1).
- o. Install repaired connector (Figure 8, Item 1) to electrical component.
- p. Check electrical component for proper operation. Repair as required.

Table 6. Winterization Kit Connector Repair.

ELECTRICAL COMPONENT (#)	CONTACT TYPE	NO. CONTACTS
Winterization Kit – Fuel Metering Pump (P21)	Pin	2

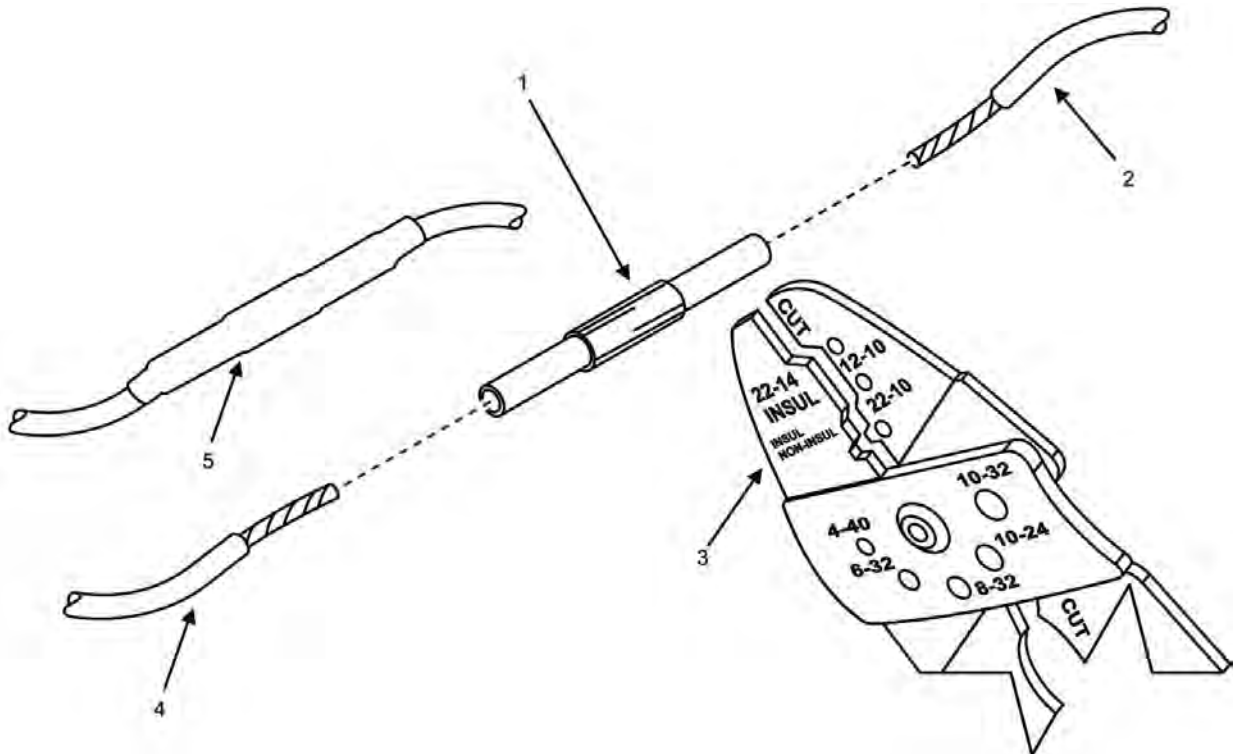


Figure 9. Butt Connector.

NOTE

Butt connectors are installed to repair (splice) in-line damage to an electrical wire. If damage to wire is longer than a replacement butt connector, use two butt connectors and a length of appropriate replacement wire to make a splice repair.

8. Install butt connector.
 - a. Locate in-line damage to electrical wire and determine size of wire and butt connector required.
 - b. Remove and discard damaged section of wire from wiring harness.
 - c. Remove the insulation from each end of the original wiring harness ends (Figure 9, Items 2 and 4).
 - d. Cut a piece of shrink wrap (Figure 9, Item 5) 1.0 in (25 mm) longer than the butt connector (Figure 9, Item 1) being used for the repair.
 - e. Slide shrink wrap (Figure 9, Item 5) over one end of the original wiring harness ends (Figure 9, Items 2 or 4).
 - f. Crimp both ends of original wiring harness (Figure 9, Items 2 and 4) into butt connector (Figure 9, Item 1) using a wire crimping tool (Figure 9, Item 3).
 - g. Slide shrink wrap (Figure 9, Item 5) over the installed butt connector (Figure 9, Item 1). Be sure entire butt connector (Figure 9, Item 1) is covered and shrink wrap (Figure 9, Item 5) is overlapping original wiring harness ends (Figure 9, Items 2 and 4).
 - h. Heat shrink wrap (Figure 9, Item 5) until it has tightly covered butt connector (Figure 9, Item 1).
 - i. Check electrical component for proper operation. Repair as required.

END OF TASK

Installing InPower AMMPS to a Compatible PC

1. Ensure compatible PC meets the following requirements:
 - a. Windows 2000, Windows XP, Windows Vista, or Windows 7 32-bit operating system. Installer will detect an unsupported system and abort the installation.
 - b. Internet Explorer 5.5 or above installed and running on the system. Installation cannot proceed if the Internet Explorer version is less than 5.5.
 - c. .Net Framework 2.0 or above for certain utilities and programs to work. Utilities will not work if version 2.0 or above is not available on the system, but installation will proceed.
 - d. A user login and administrative rights on compatible PC for installation. On Windows 7 and Vista operating systems, installation will fail without administrative rights. See administrator for administrative rights if installation fails.
 - e. Any previous version of InPower AMMPS removed from compatible PC IAW standard uninstall procedure.

NOTE

A CD with InPower AMMPS software is issued with each generator set. When using Windows 2000, the V2.0 InPower AMMPS CD folder must be manually opened from [My Computer]. When using Windows XP, the [Open folder to view files using Windows Explorer] option must be chosen from a dialog box that automatically displays. Windows Vista and 7 will automatically run the setup.exe without any prompt.

2. Run setup for InPower AMMPS V2.0.

CAUTION

Default path setting must be used as the destination folder. Restrictions are on a few folders for some operating systems. If restricted paths are selected, select an alternative path. Failure to comply may cause damage to equipment.

NOTE

Installer will check all prerequisites to perform installation. If any prerequisite is not met, then installer will inform user. If entire prerequisite is available, tool will check for previous versions of InPower AMMPS. Installer will not install InPower AMMPS if the same version or a newer version of InPower AMMPS is already installed on the PC.

3. Click [Next] and ensure step 1a – 1e conditions are met if an item is not checked during prerequisite check.

NOTE

Read each screen before making selection.

4. Make selections and click [Next] on the next four screens to install InPower AMMPS at default settings onto PC.

NOTE

Installer may run for several minutes depending on PC performance.

5. Select [Next] to finish installation and view [ReadMe] file.
6. Select [Next] once finished viewing [ReadMe] file.
7. Select [Finish] once setup has completed successfully.
8. Select and open InPower AMMPS icon from desktop or start menu to confirm proper operation.

END OF TASK

Using InPower AMMPS on a Compatible PC

NOTE

Figure 10 shows a remote cable (Figure 10, Item 4) and a local cable (Figure 10, Item 5). Both cables utilize a RS-485 to RS-232 converter (Figure 10, Item 6). The RS-485 side of the converter plugs into the cable. The RS-232 side plugs into the compatible PC COM Port 1.

The remote cable (Figure 10, Item 4) supports both remote operating software and InPower AMMPS use. The local cable (Figure 10, Item 5) with DISPLAY (Figure 10, Item 8) and MAIN (Figure 10, Item 7) adapters must be used when performing initial or update calibration functions and downloading log files with InPower AMMPS.

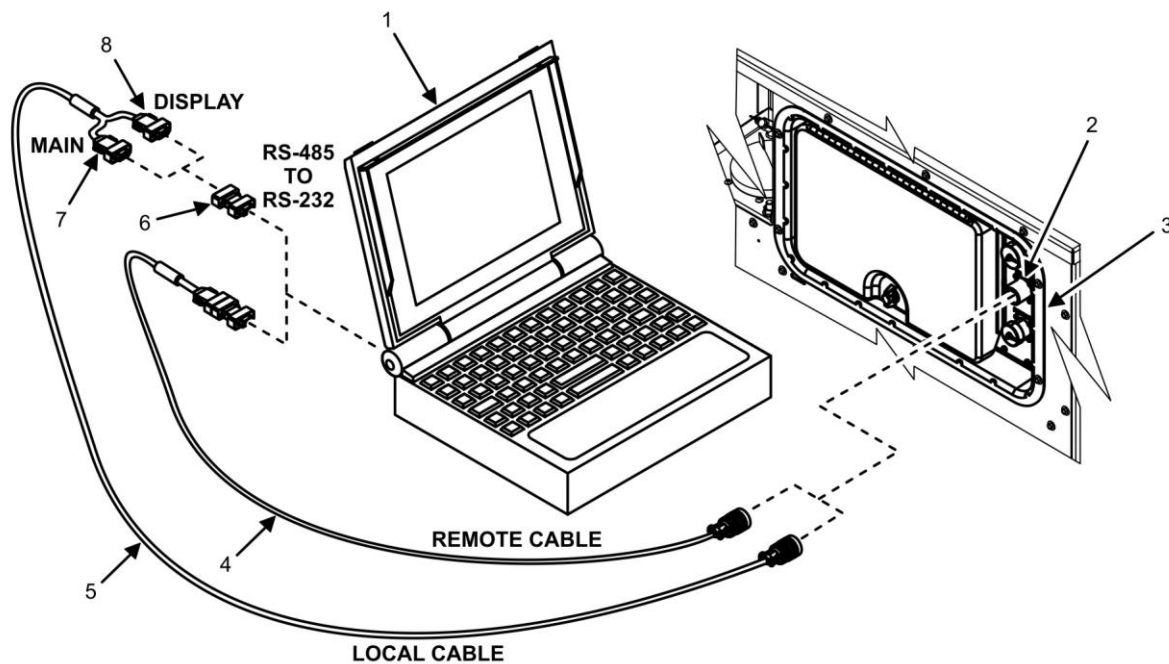


Figure 10. PC and DCS Connections.

1. Install battery ground cable (WP 0036, Remove/Install Batteries) and ensure battery power is supplied to the DCS (main DC circuit breaker ON (TM 9-6115-749-10)).

NOTE

DCS screen will activate upon connection of remote or local cable (Figure 10, Items 4 and 5).

2. Connect a remote cable (Figure 10, Item 4) or local cable (Figure 10, Item 5) to the DCS (Figure 10, Item 3) at REMOTE port (Figure 10, Item 2) and to a compatible PC (Figure 10, Item 1) using MAIN (Figure 10, Item 7) adapter and RS-485 to RS-232 converter (Figure 10, Item 6).
3. Select and open InPower AMMPS icon from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.

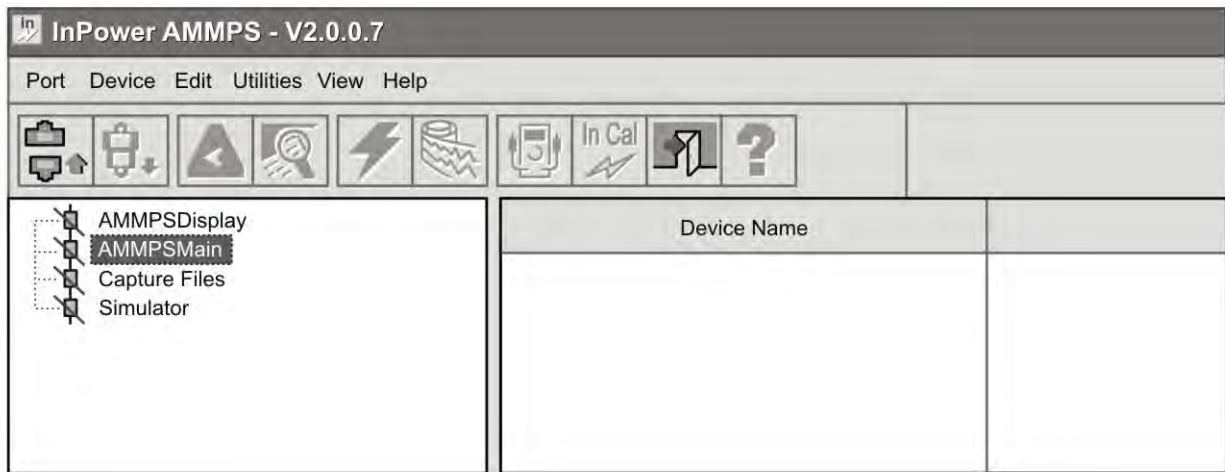


Figure 11. AMMPS Main.

4. Select [AMMPSMain] from left-side explorer pane (Figure 11).

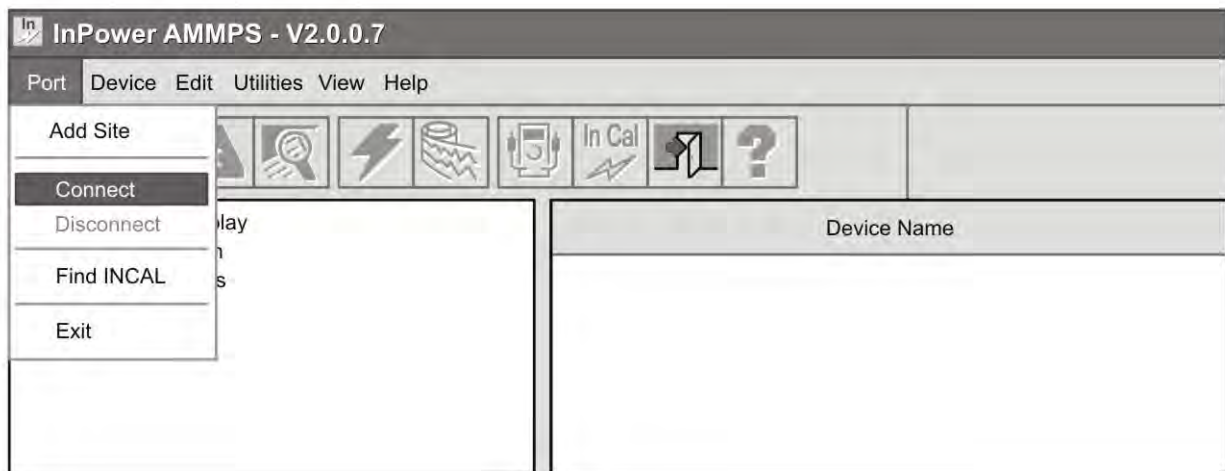


Figure 12. Port Connect.

5. Right-click on [AMMPSMain] or select [Port] from menu bar (Figure 12).
6. Select [Connect] from drop-down menu (Figure 12).
7. Check the following if InPower AMMPS fails to connect:
 - a. Ensure COM port for [AMMPSDisplay] or [AMMPSMain] is correct and not being used by another device or program. Access [Add Site] from [Port] drop-down menu to change COM port or add a different COM port site.
 - b. Ensure proper RS-485 adapter is being utilized and is installed correctly (Figure 10).
 - c. Ensure battery power is supplied to DCS and DCS is powered on (step 1).
 - d. Check all cables for proper installation and connections (step 2).

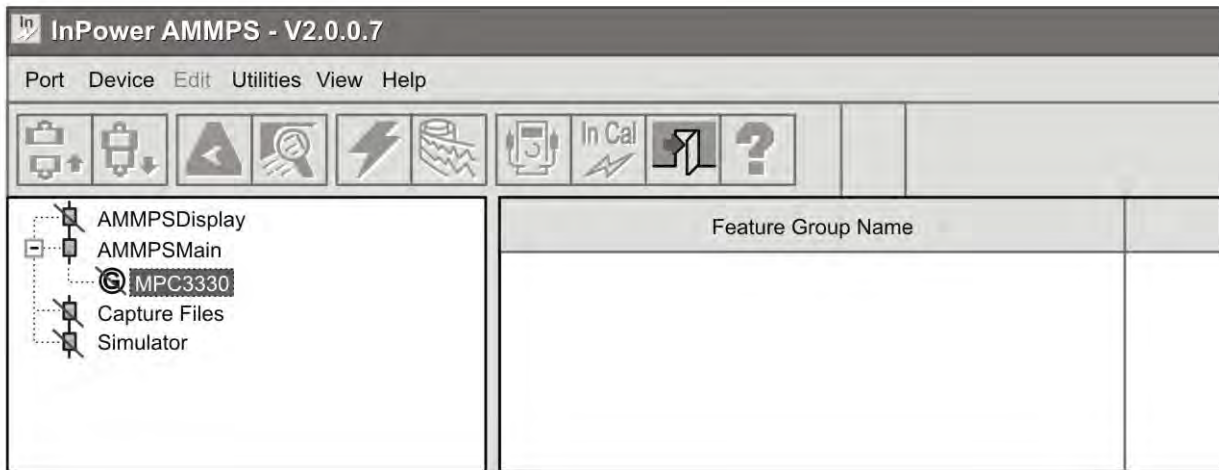


Figure 13. Device MPC3330.

8. Select device [MPC3330] once connected to [AMMPSTMain] (Figure 13).

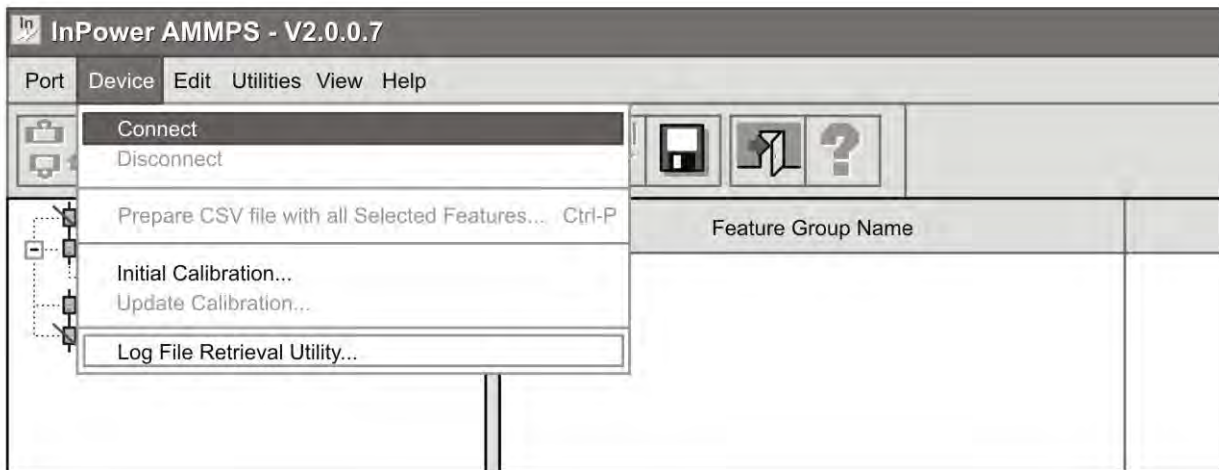


Figure 14. Device Connect.

9. Right-click on [MPC3330] or select [Device] from menu bar (Figure 14).
10. Select [Connect] from drop-down menu (Figure 14).

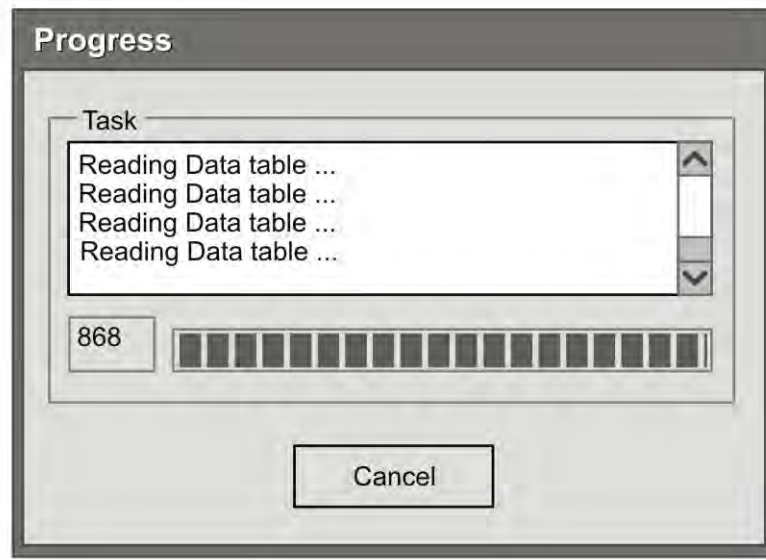


Figure 15. Data Table.

NOTE

Depending on performance of computer, DCS data may take several minutes to load.

11. View [Progress] dialog box as InPower AMMPS imports data from DCS (Figure 15).

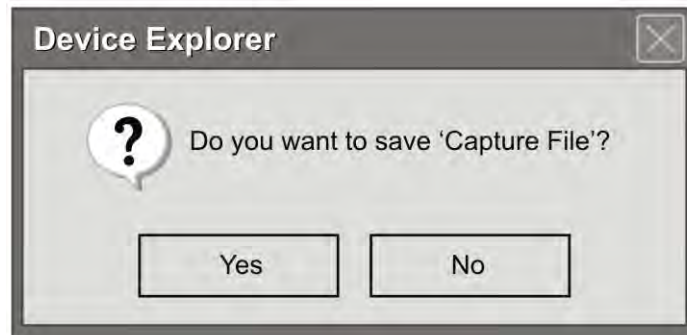


Figure 16. Capture File Yes or No.

NOTE

A capture file is required to perform Using a Capture File to Overlay Data task. Default location for capture file is shown in Figure 17.

12. Perform one of the following when dialog box displays (Figure 16):
 - a. Select [Yes] to save a capture file and:
 - (1) Use default name and default location (Figure 17).

NOTE

A progress bar will show the save process.

(2) Select [Save].

(3) Select [OK] once InPower AMMPS captures file successfully (Figure 17).

b. [No] if capture file will not be saved.

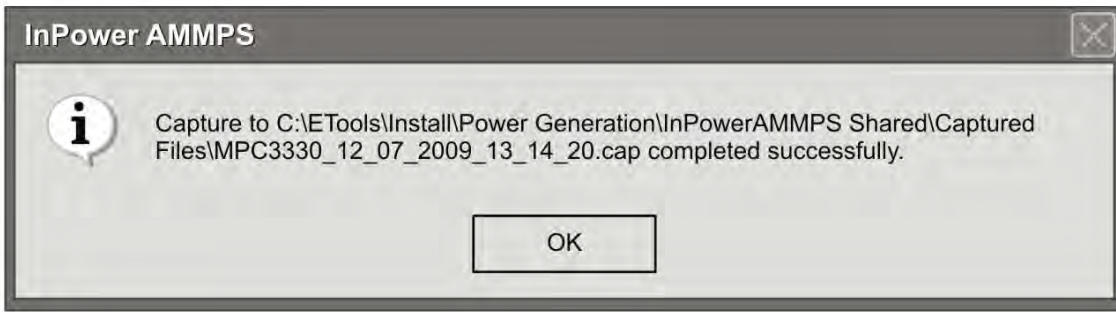


Figure 17. Capture File.

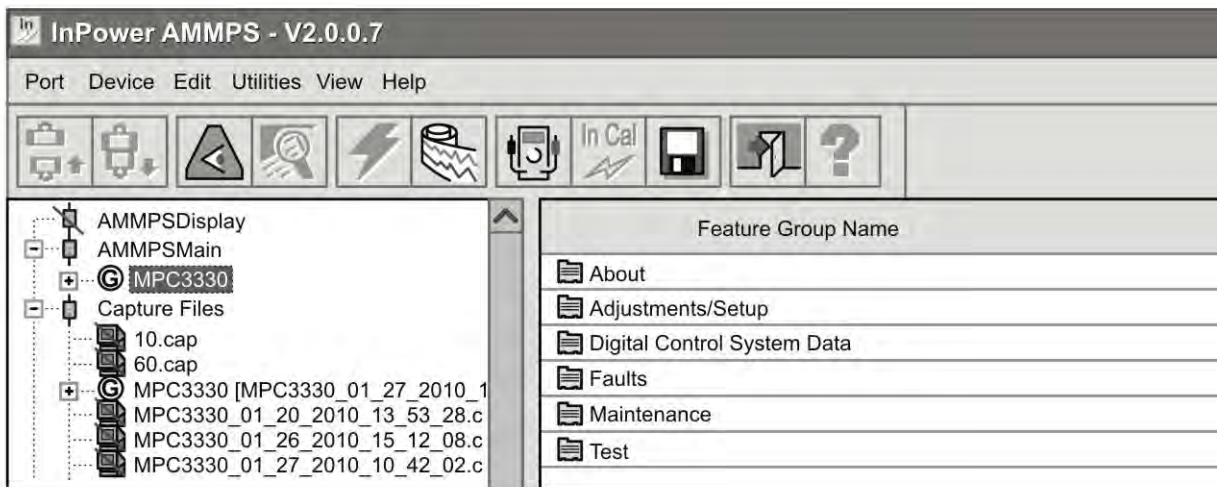


Figure 18. InPower AMMPS Maintenance.

13. Use InPower AMMPS for maintenance or troubleshooting as required (Figure 18).

END OF TASK

Downloading Log Files from DCS

NOTE

Log File Retrieval Utility can be accessed only after connecting to [AMMPSTDisplay] device through InPower AMMPS.

1. Ensure battery ground cable is installed (WP 0036, Remove/Install Batteries) and ensure battery power is supplied to the DCS (main DC circuit breaker ON (TM 9-6115-749-10)).

NOTE

Figure 10 shows a remote cable (Figure 10, Item 4) and a local cable (Figure 10, Item 5). Both cables utilize a RS-485 to RS-232 converter (Figure 10, Item 6). The RS-485 side of the converter plugs into the cable. The RS-232 side plugs into the compatible PC COM Port 1. DISPLAY (Figure 10, Item 8) adapter will be used for step 2.

2. Connect a local cable (Figure 10, Item 5) (with DISPLAY (Figure 10, Item 8) adapter) to the DCS (Figure 10, Item 3) and a compatible PC (Figure 10, Item 1).

NOTE

DCS screen will activate upon connection of cable.

3. Select and open InPower AMMPS icon from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.
4. Select [AMMPSTDisplay] from left-side explorer pane (Figure 19).
5. Double-click on [AMMPSTDisplay] (Figure 19) or select [Connect] from [Port] drop-down menu (Figure 20).

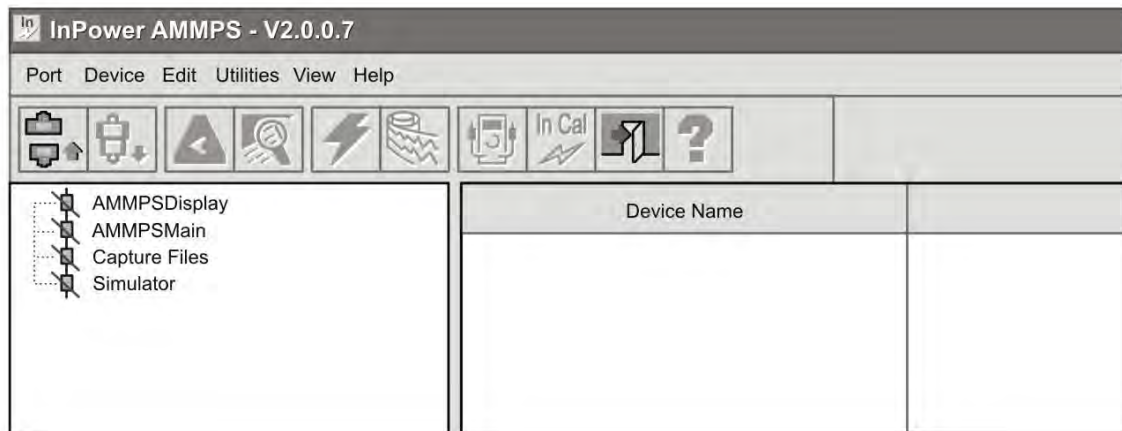


Figure 19. AMMPS Display.

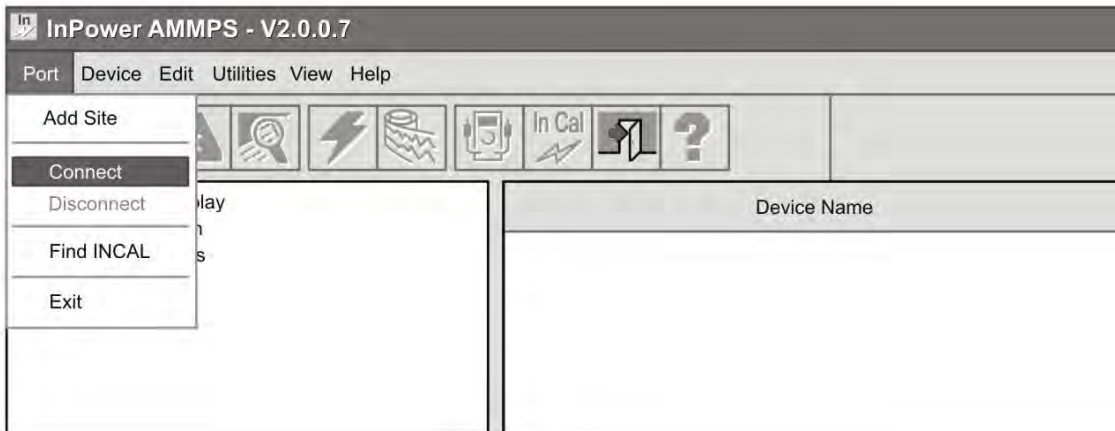


Figure 20. Port Connect for AMMPS Display.

6. Check the following if InPower fails to connect:
 - a. Ensure COM port for [AMMPSDisplay] is correct and not being used by another device or program. Access [Add Site] from [Port] drop-down menu to change COM port or add a different COM port site.
 - b. Ensure proper RS-485 adapter is being utilized and is installed correctly (Figure 10).
 - c. Ensure battery power is supplied to DCS and DCS is on (step 1).
 - d. Check all cables for proper installation and connections (step 2).

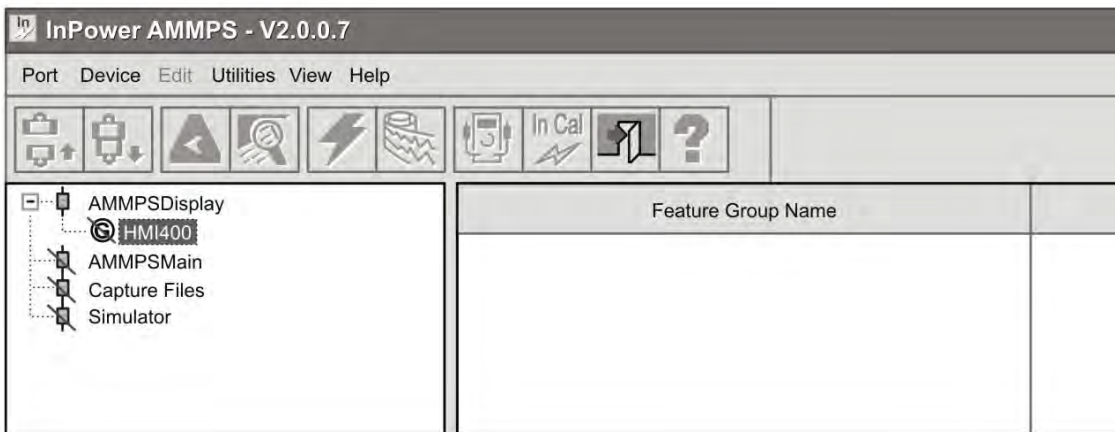


Figure 21. Device HMI400.

7. Select [HMI400] from left-side explorer pane (Figure 21).
8. Select [Connect] from [Device] drop-down menu (Figure 22).

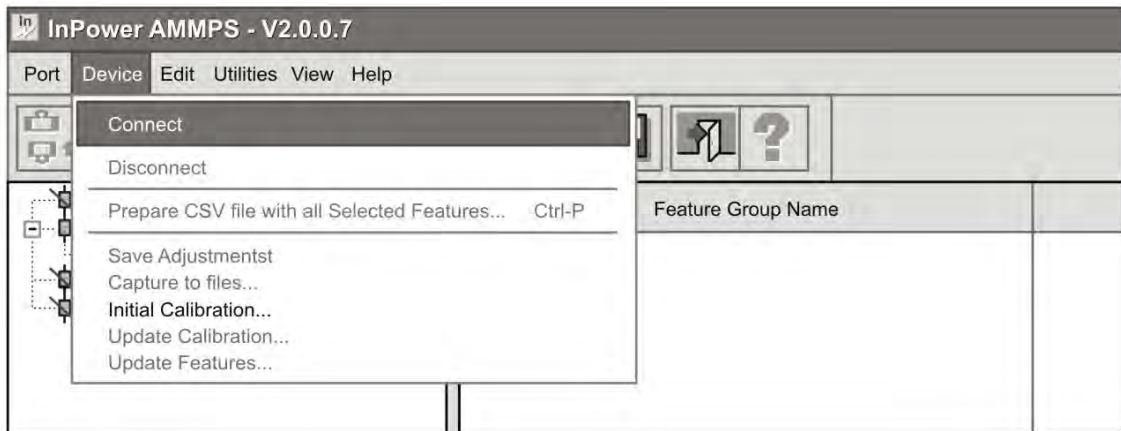


Figure 22. Device Connect for AMMPS Display.

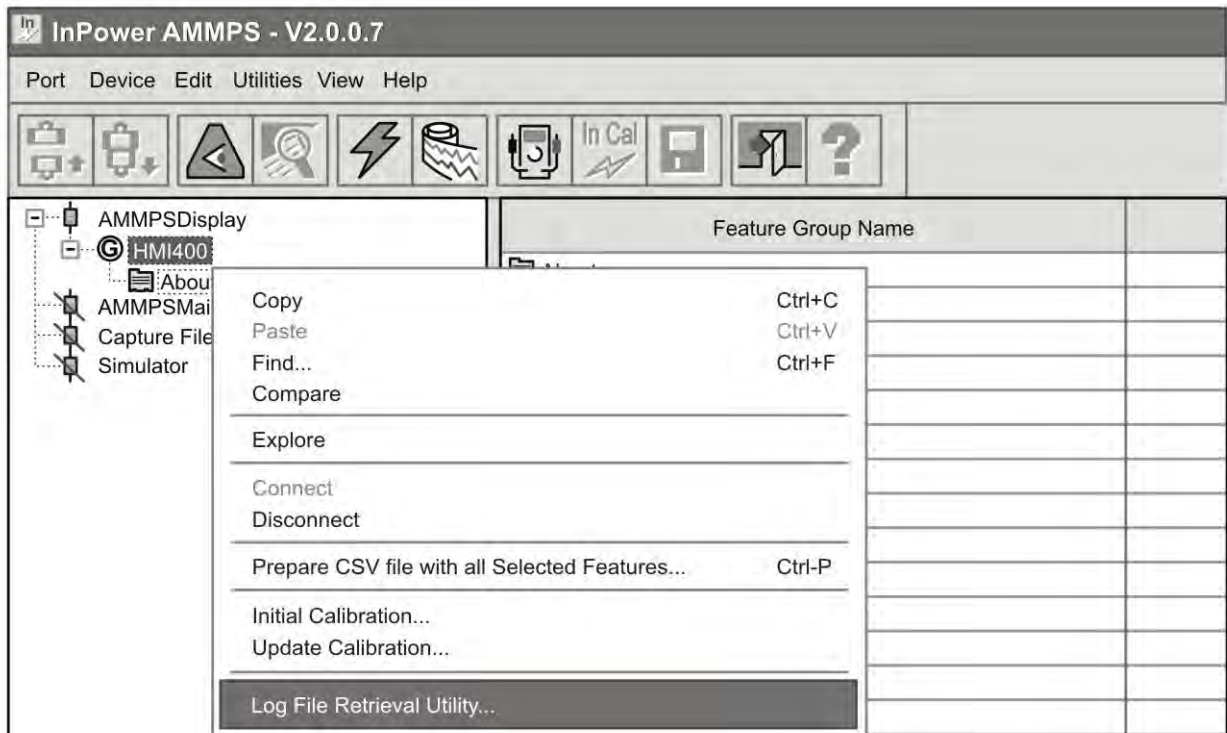


Figure 23. Log File Retrieval Utility.

NOTE

Log File Retrieval Utility can also be accessed through [Device] on menu bar.

9. Right-click [HMI400] from left-side explorer pane once connected (Figure 23) and select [Log File Retrieval Utility] to access dialog box (Figure 24).

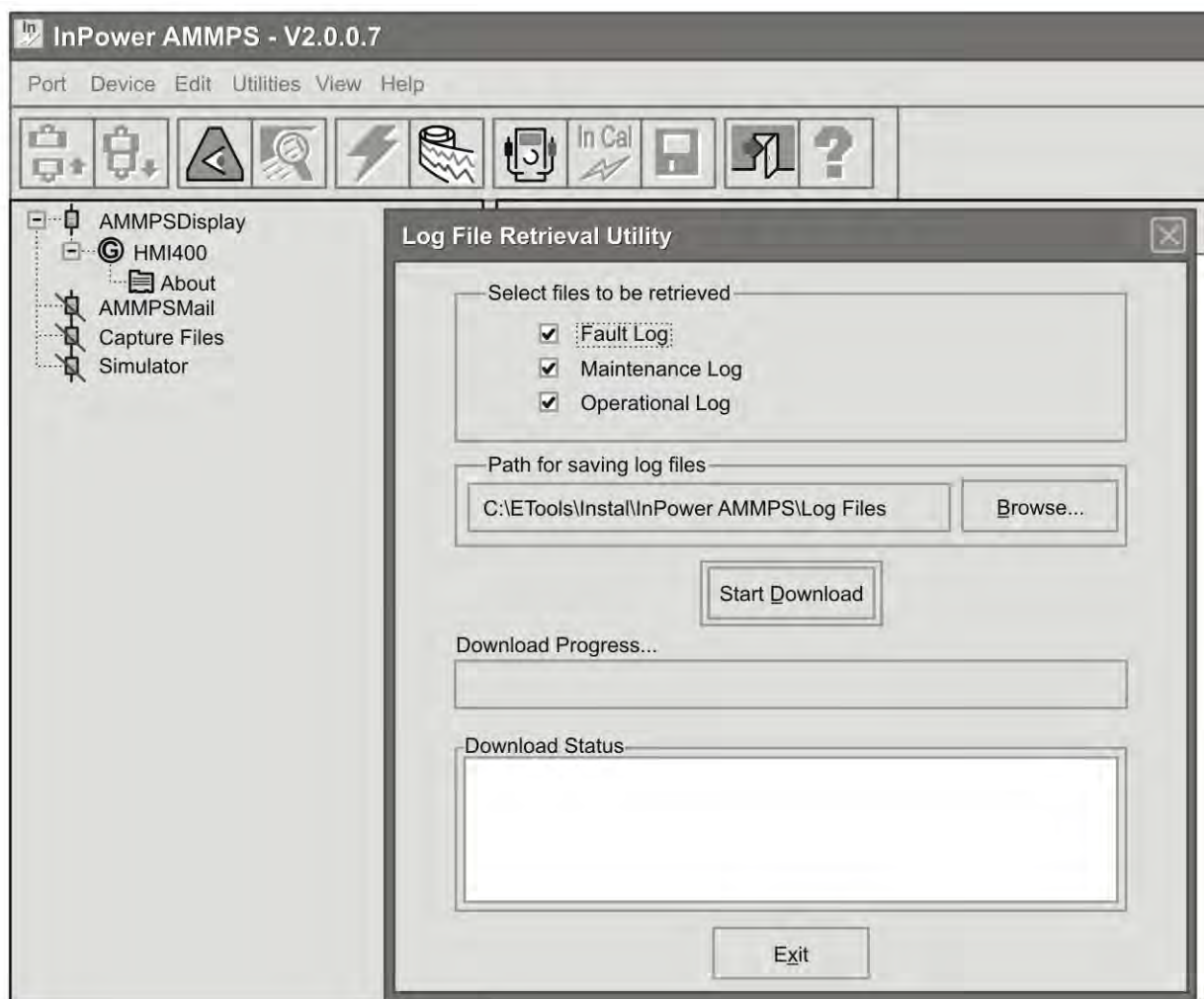


Figure 24. Log File Retrieval Utility Dialog Box.

10. Select/de-select any of the log files (Figure 24) for retrieval:

- a. [Fault Log].
- b. [Maintenance Log].
- c. [Operational Log].

NOTE

Default path for saving log files is C:\ETools\Instal\InPower AMMPS\Log Files.

11. Use [Browse] button (Figure 24) to change save location for log(s), if different location is desired.

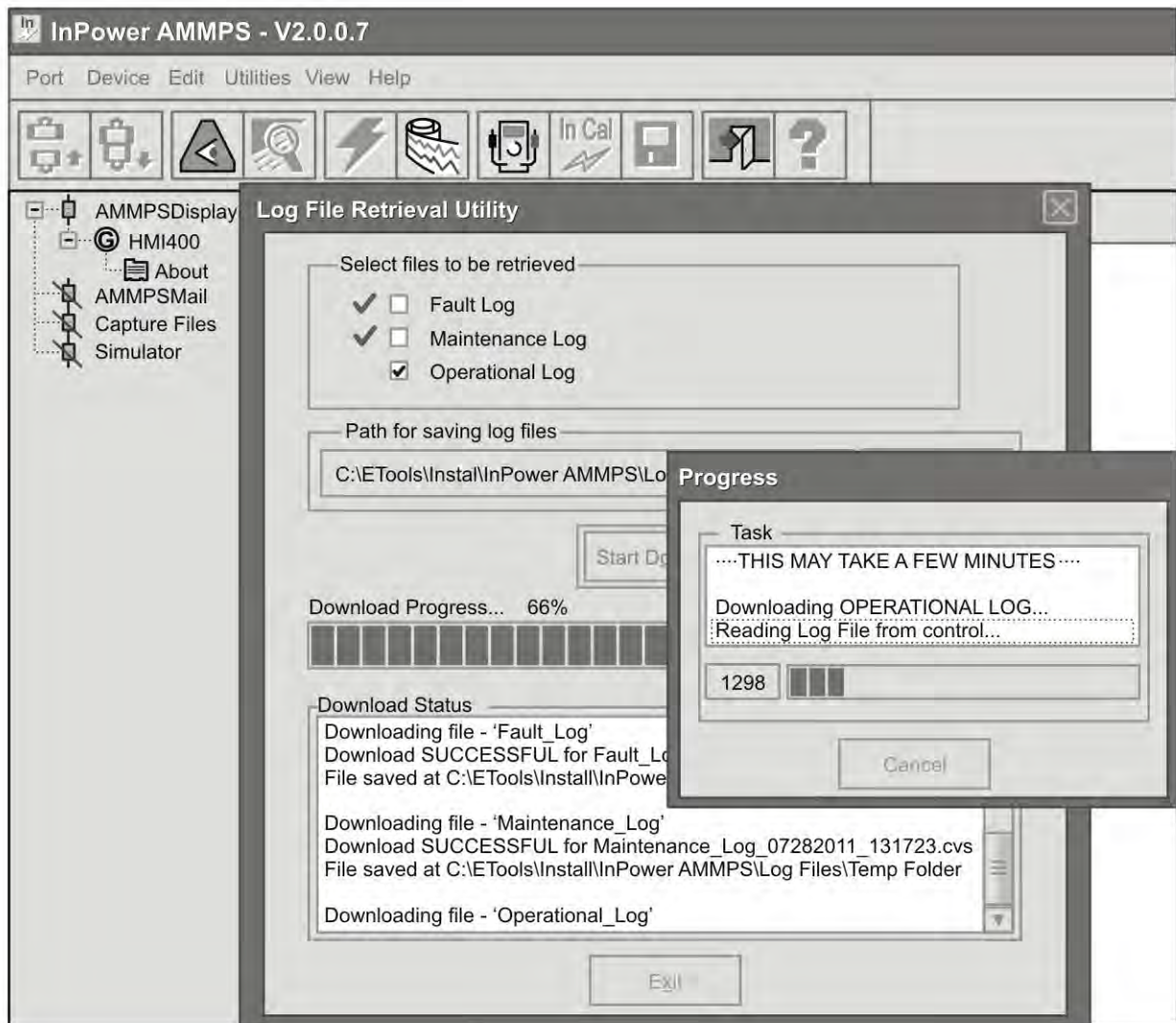


Figure 25. Log File Retrieval Utility Download.

NOTE

Download time (Figure 25) will vary depending on the size of the files within the control and the connection speed (baud rate).

12. Click [Start Download] button (Figure 24).

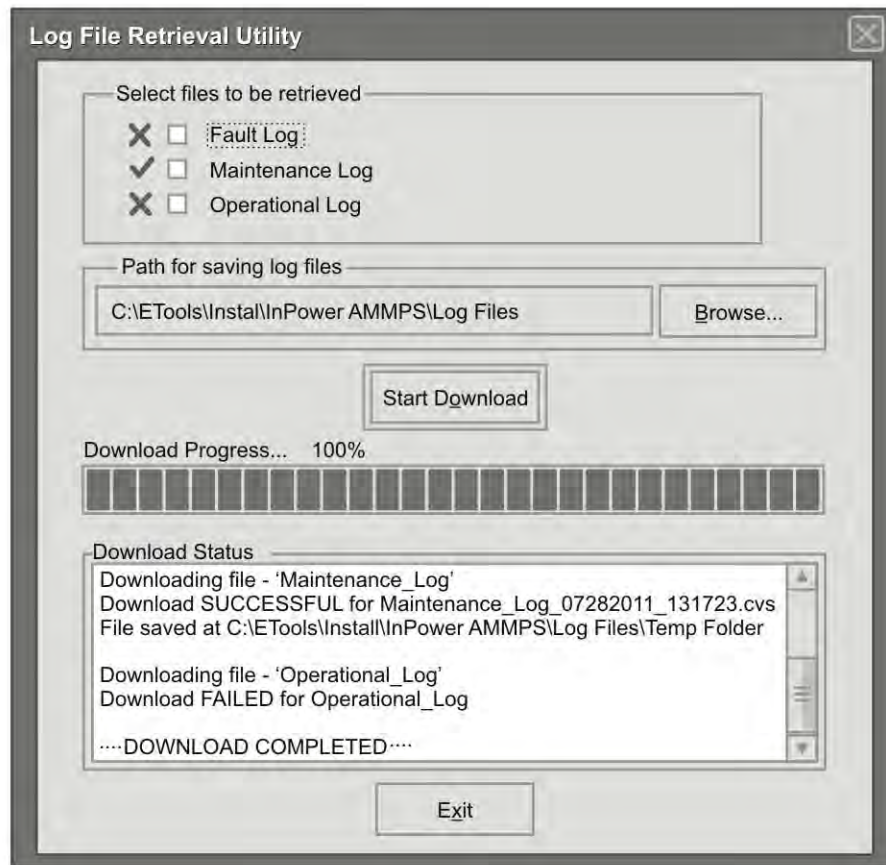


Figure 26. Log File Retrieval Utility Download Status.

NOTE

A green check mark (Figure 26) will appear next to the selected file(s) once file(s) is downloaded successfully. A red cross next to file(s) and indication DOWNLOAD FAILED in [Download Status] will appear for any file that fails to download. Figure 26 shows successful [Maintenance Log] download, failed [Fault Log] download, and failed [Operational Log] download.

13. Check [Download Status] message box (Figure 26) to ensure logs download properly.
14. Start a new download or click [Exit] (Figure 26) when all desired downloads are complete.

NOTE

Log files are Comma-Separated Values (CSV) files. A compatible program, such as Microsoft Excel, is required for viewing. Files can be copied and renamed onto a desktop without opening and viewing.

15. Open selected log from default path or saved location and review data in file.
16. Remove local cable (Figure 10, Item 5) (with DISPLAY (Figure 10, Item 8) adapter) from the DCS (Figure 10, Item 3) and compatible PC (Figure 10, Item 1).

END OF TASK

Using a Capture File to Overlay Data

CAUTION

It is important to save the latest capture file from DCS being replaced. Data can only be accessed using InPower AMMPS and a MSD hard drive (or compatible computer). If data is accessible, capture file can be used to overlay parameters and maintenance timers from the replaced DCS. If unable to access capture file data, maintenance timers will be reset and some parameters from replaced DCS will be lost. Use latest hard copy records to determine when maintenance actions are due. Failure to comply will cause damage to equipment.

It is important to save log data from DCS being replaced. The maintenance, operational, and fault logs should be downloaded from the DCS with InPower and saved to the hard drive of a MSD (or compatible computer). Maintenance, operational, and fault logs cannot be uploaded to the new DCS, but can be saved for reference. All logs will start over with a new DCS. If unable to access logs, use latest hard copy records to access operational, maintenance, and fault events. Failure to comply may cause damage to equipment.

NOTE

DCS that contains desired data will be referred to as DCS 1. DCS 2 is the destination DCS. DCS 2 can either be the same DCS after a calibration has been completed or a new DCS that is replacing a failed DCS.

Capture files can be stored in the [Captured Files] folder on the hard drive of a PC. They can also be removed and placed in an easy access location such as a desktop, CD, or memory drive. If a different PC will be used to upload capture file to DCS 2, capture file must be copied and pasted to PC that will be used.

1. Connect to [AMMPSMain] of DCS 1 and ensure capture file is saved. See Using InPower AMMPS on a Compatible PC task.
2. Use explorer pane of PC to access [C:\ETools\Install\Power Generation\InPowerAMMPS Shared\Captured Files] on the computer hard drive.

NOTE

Capture files can be renamed and stored in the [Captured Files] folder on the hard drive of a PC. They can also be removed and placed in an easy access location such as a desktop, CD, or memory drive. If a different PC will be used to upload capture file to DCS 2, capture file must be copied and pasted to PC that will be used.

3. Copy and paste desired (most recent) capture file to selected location and rename as DCS 1 or rename capture file as DCS 1 and leave in current location.
4. Disconnect InPower AMMPS from DCS.
5. Record engine hours of DCS 1 and save for use with DCS 2.
6. Disconnect from [AMMPSMain] and remove local cable (Figure 10, Item 5) (with MAIN (Figure 10, Item 7) adapter).
7. Paste capture file from DCS 1 into [C:\ETools\Install\Power Generation\InPowerAMMPS Shared\Captured Files] on the PC hard drive if moving capture file from one PC or location to another.
8. Connect to [AMMPSMain] of DCS 2. See Using InPower AMMPS on a Compatible PC task.

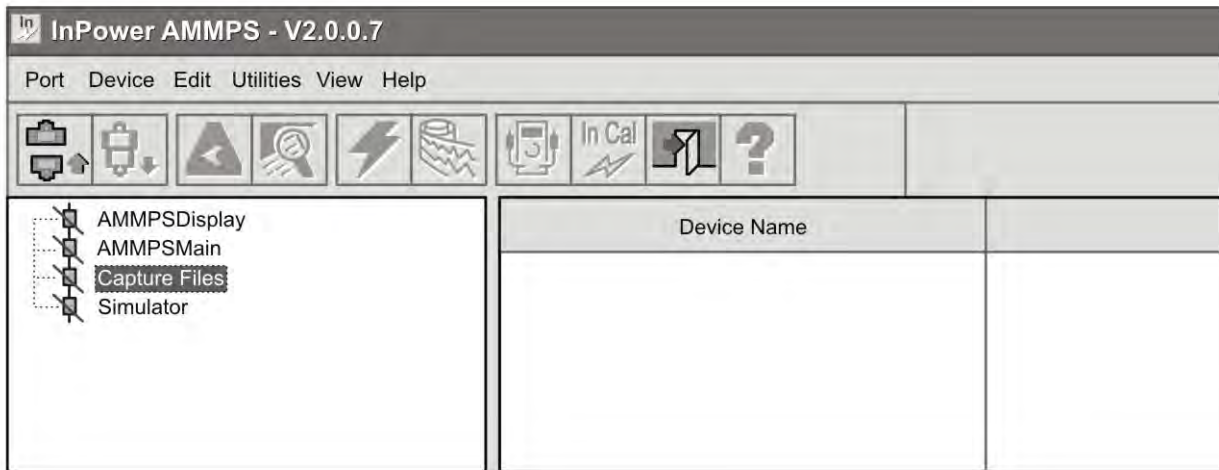


Figure 27. Capture File Explorer.

9. Select [Capture Files] from explorer pane (Figure 27).

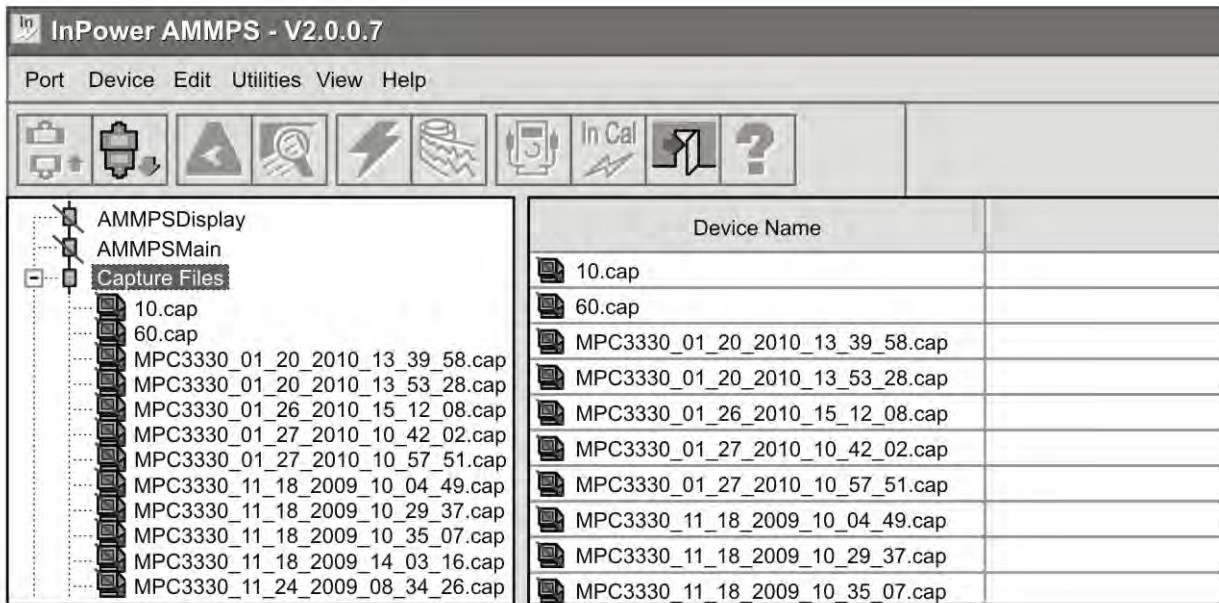


Figure 28. Open Capture Files Explorer.

10. Double-click on [Capture Files] to display available [Capture Files] (Figure 28).

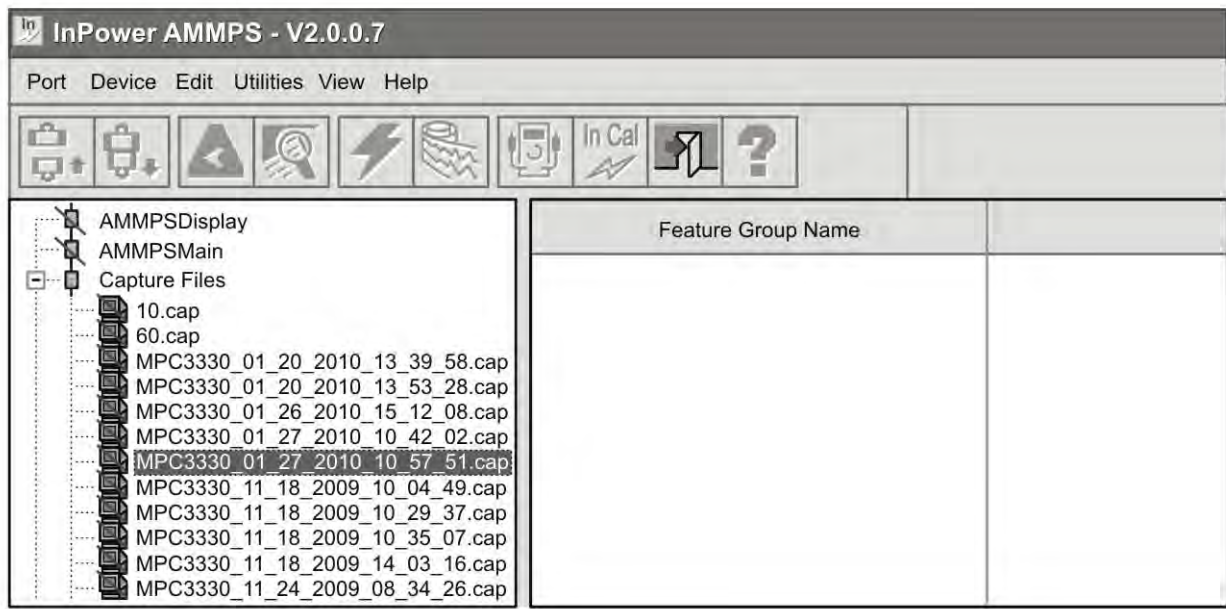


Figure 29. Select Capture File.

NOTE

Selected capture file shown in Figure 29 is an example. Any desired capture file can be selected and used as long as data required has been captured in file.

11. Select desired capture file from DCS 1 based on latest data captured or pasted to file (Figure 29).
12. Double-click selected capture file to connect and display capture file (Figure 29).

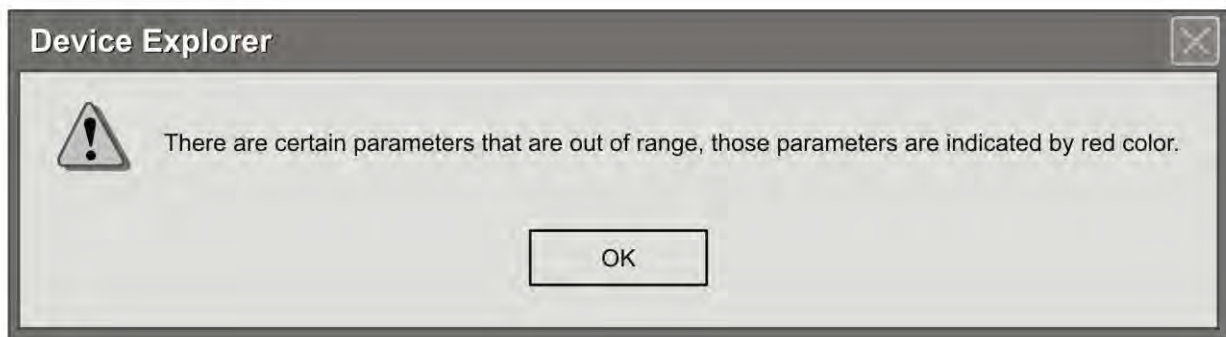


Figure 30. Parameters Dialog Box.

13. Choose [OK] when dialog box displays (Figure 30).

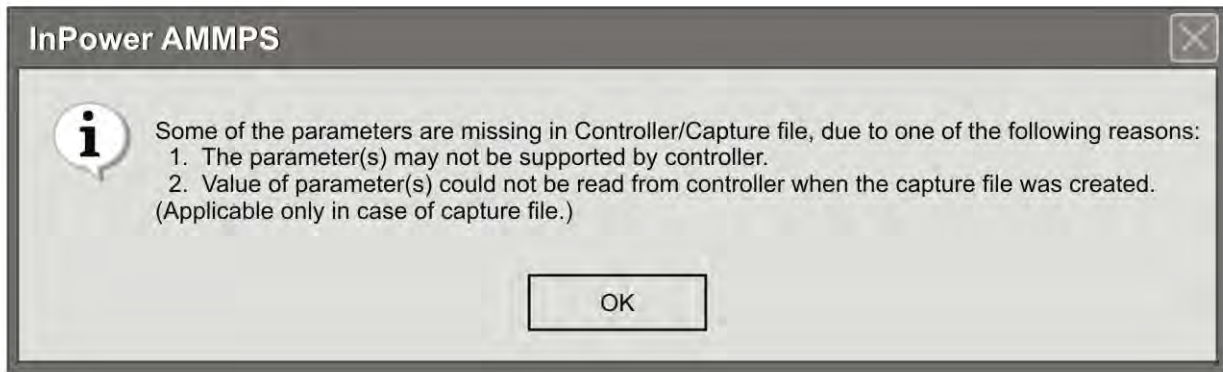


Figure 31. Parameters Missing.

NOTE

A dialog box indicating missing parameters (Figure 31) may display due to missing information (such as a model number) or a problem with the capture file. Depending on the condition of DCS 1, some data may not have been copied to capture file. Continue to overlay available data. Remaining data can be entered as required. See step 19.

14. Choose [OK] if second dialog box displays (Figure 31).
15. Connect InPower AMMPS to [AMMPSMain] and [MPC3330] of DCS 2. See Using InPower AMMPS on a Compatible PC task.

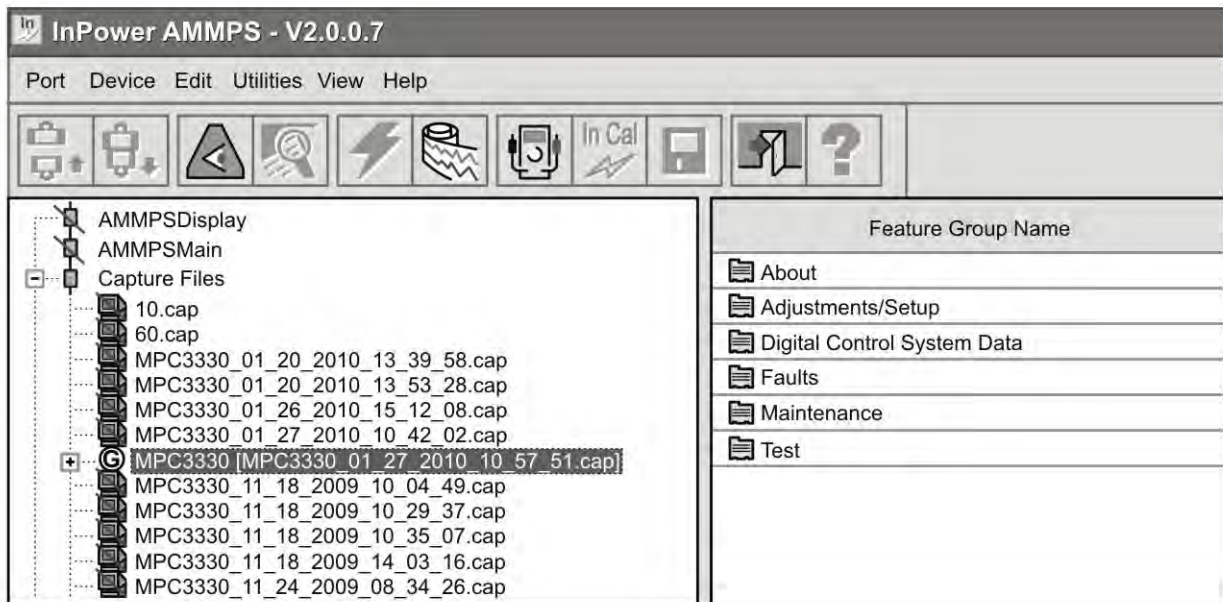


Figure 32. Drag Capture File.

NOTE

Before drag and drop, ensure InPower AMMPS is connected to [AMMPS Main] and [MPC3330] of DCS 2. Once selected, drag capture file from current location and drop to [AMMPSMain] to overlay file.

16. Select capture file (Figure 32) with mouse pointer and hold down left mouse button to drag and drop capture file to [AMMPSMain] device (Figure 33).

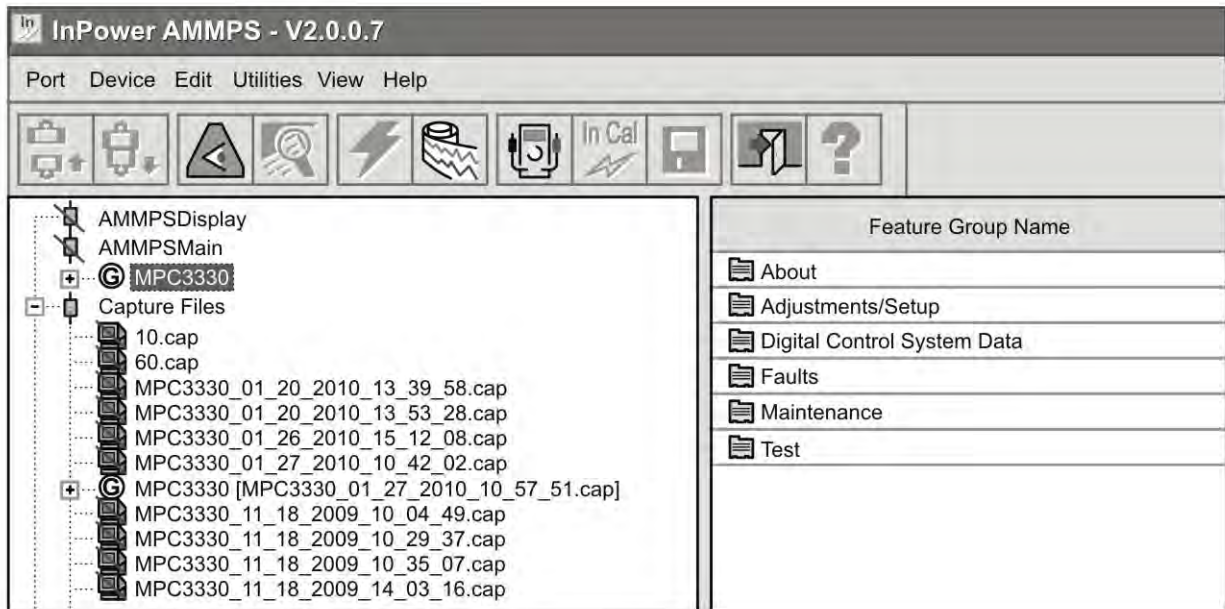


Figure 33. Drop Capture File.

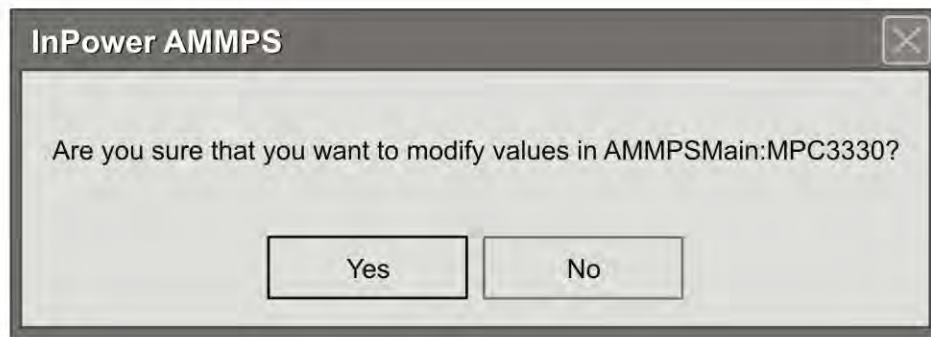


Figure 34. Modify Values.

17. Choose [Yes] when dialog box displays (Figure 34).

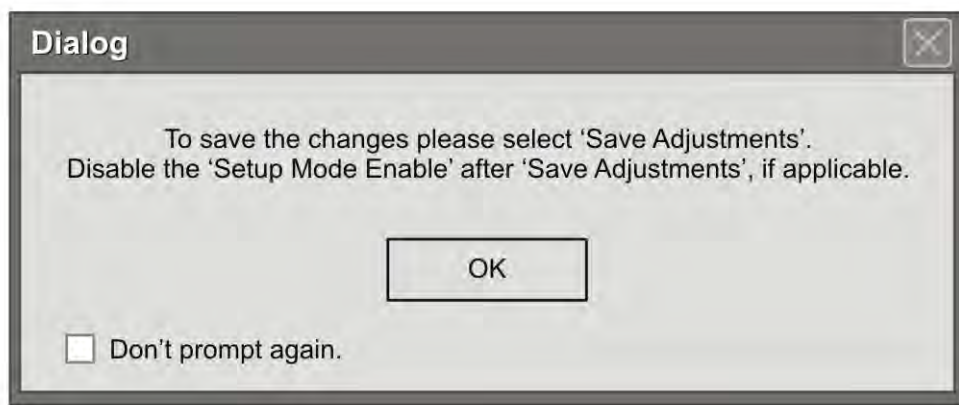


Figure 35. Save Adjustments.

18. Choose [OK] when dialog box displays (Figure 35).

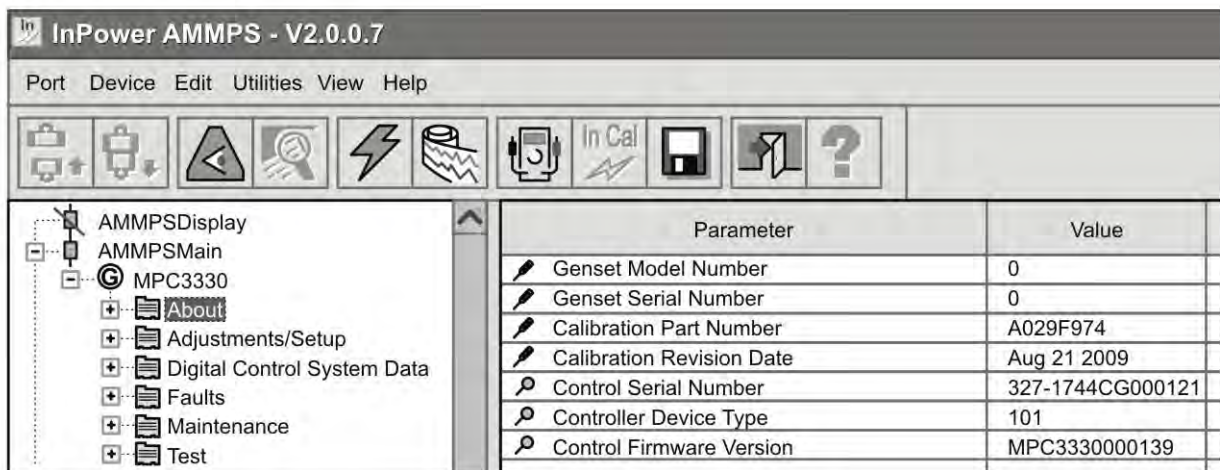


Figure 36. About Parameters.

NOTE

[About] is shown in Figure 36 as an example of an option available from the explorer pane. [Adjustments/Setup], [Digital Control System Data], [Faults], [Maintenance], and [Test] are also all available for viewing. Adjustments to the parameters are only required when a value is missing or a value is desired that currently is not saved to a parameter.

19. Select an option (e.g. [About]) from explorer pane under [MPC3330] device and modify parameters as required by double-clicking within [Value] and typing desired text (e.g. add model number to [Value] column of [Genset Model Number] Parameter) (Figure 36).

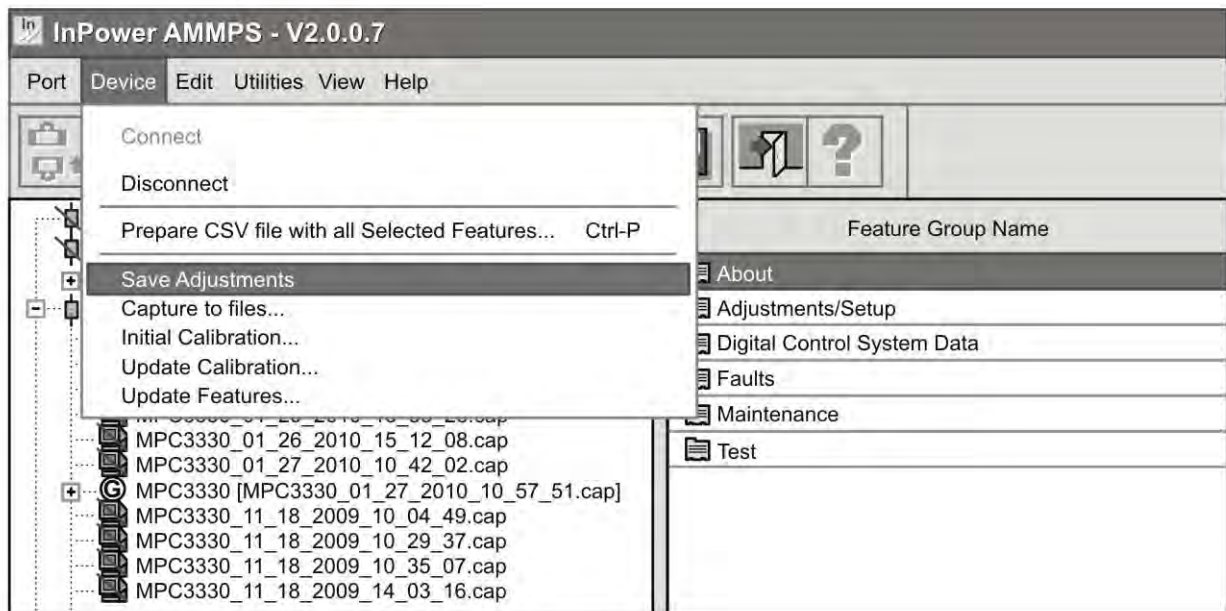


Figure 37. Save Adjustments from Drop-Down Menu.

20. Select [Save Adjustments] from [Device] drop-down menu (Figure 37) or select save icon shortcut (not shown).

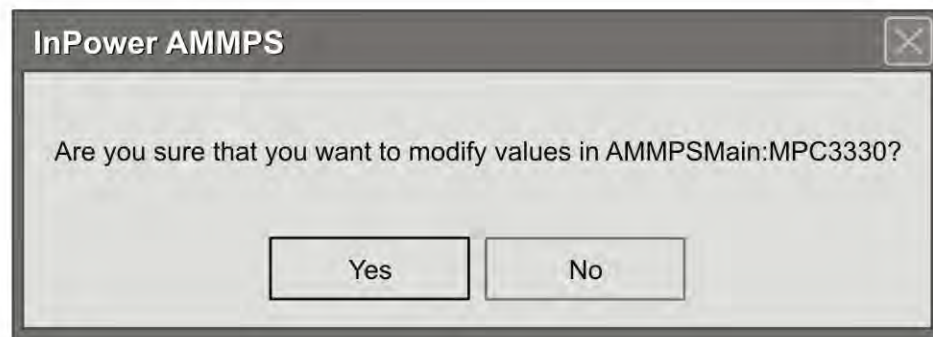


Figure 38. Confirm Modify Values.

21. Select [Yes] when dialog box displays (Figure 38).

Save Adjustments

Site ID: AMMPMain Device Name: MPC3330

Following parameter values have been changed. Do you want to permanently save the changes you have made?

Parameter Description	Old Value	New Value
Maintenance Item 5004 Countdown	700.20	750.06
Maintenance Item 5001 Countdown	0.15	250.02
Maintenance Item 5007 Countdown	1950.30	2000.16
Genset 3 Phase 400Hz Voltage Calibration	0.999	0.992
Calibration Revision Date	Nov 4 2009	Aug 21 2009
Maintenance Item 5017 Countdown	200.16	250.02
Maintenance Item 5014 Countdown	5.18	24.00
Maintenance Item 5011 Countdown	5.18	24.00
Maintenance Item 5006 Countdown	700.20	750.06
Maintenance Item 5003 Countdown	700.20	750.06
Genset 3 Phase 50/60Hz Voltage Calibration	0.996	0.988
Maintenance Item 5009 Countdown	450.18	500.04
Genset 240V Single Phase 50/60Hz Voltage Calibration	1.000	0.985
Genset 120V Single Phase 400Hz Voltage Calibration	1.001	0.978
Maintenance Item 5010 Countdown	1450.26	1500.12
Maintenance Item 5016 Countdown	200.16	250.02
Maintenance Item 5013 Countdown	2450.34	2500.20
Maintenance Item 5002 Countdown	700.20	750.06
Maintenance Item 5008 Countdown	1450.26	1500.12
Maintenance Item 5005 Countdown	1950.30	2000.16
Genset 120V Single Phase 50/60Hz Voltage Calibration	0.996	0.972
Genset 240V Single Phase 400Hz Voltage Calibration	1.005	0.991
Maintenance Item 5012 Countdown	4950.54	5000.40

Figure 39. Confirm Save Adjustments.

22. Review [Save Adjustments] dialog box for changes between [Old Value] column and [New Value] column (Figure 39).
23. Confirm parameters are the correct or desired changes for DCS 2 (Figure 39).
24. Compare hard copy records as required.
25. Double-click [New Value] column as required to adjust parameter values and click [Save] once adjustments are made (Figure 39).

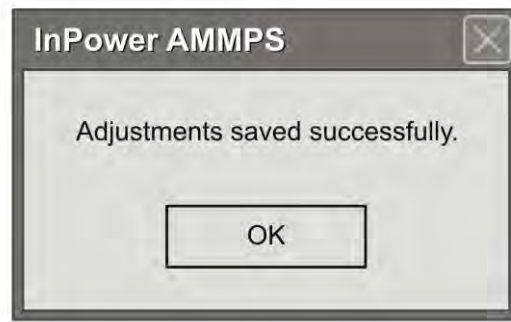


Figure 40. Saved.

26. Select [OK] when [Adjustments saved successfully] displays in dialog box (Figure 40).
27. Retry capture file procedure if adjustments are not saved successfully. See steps 1 through 26.
28. Update engine hours using adjustments screen 2 based on recorded value from DCS 1 (TM 9-6115-749-10).
29. Turn main DC circuit breaker OFF (TM 9-6115-749-10).
30. Turn main DC circuit breaker ON (TM 9-6115-749-10).
31. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
32. Start engine and check for proper operation (TM 9-6115-749-10).
33. Repair as required.

END OF TASK

Using Initial Calibration to Install Control Firmware Updates

1. Install battery ground cable (WP 0036, Remove/Install Batteries) and ensure battery power is supplied to the DCS (main DC circuit breaker ON (TM 9-6115-749-10)).

NOTE

Figure 10 shows a remote cable (Figure 10, Item 4) and a local cable (Figure 10, Item 5). Both cables utilize a RS-485 to RS-232 converter (Figure 10, Item 6). The RS-485 side of the converter plugs into the cable. The RS-232 side plugs into the compatible PC COM Port 1. MAIN (Figure 10, Item 7) adapter will be used for step 2.

2. Connect a local cable (Figure 10, Item 5) (with MAIN (Figure 10, Item 7) adapter) to the DCS (Figure 10, Item 3) and a compatible PC (Figure 10, Item 1).

NOTE

DCS screen will activate upon connection of cable.

3. Select and open InPower AMMPS icon from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.

NOTE

[Initial Calibration] feature is used to download a new firmware version calibration file into a replacement or current DCS.

4. Connect to [AMMPSMain]. See Using InPower AMMPS on a Compatible PC task.
5. Mark or save a capture file as required. See Using a Capture File to Overlay Data task.

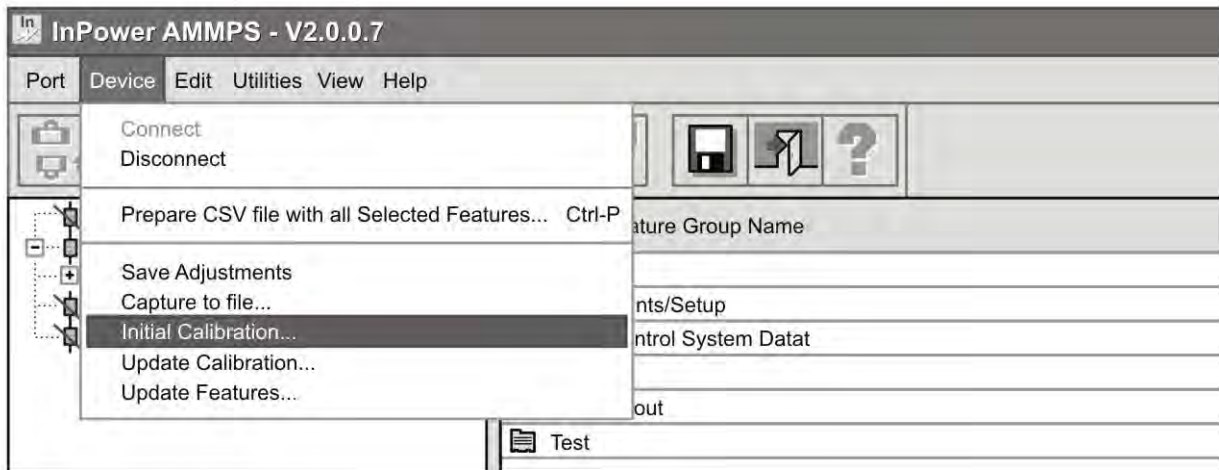


Figure 41. Initial Calibration.

CAUTION

Calibration steps must be followed in order presented. Failure to comply may cause damage to equipment.

NOTE

If a dialog box indicates that there is an error loading, the drive letter may not have been correctly specified during InPower AMMPS installation. The correct drive designation may need to be specified as required.

6. Click on the [Device] drop-down menu and select [Initial Calibration] (Figure 41).

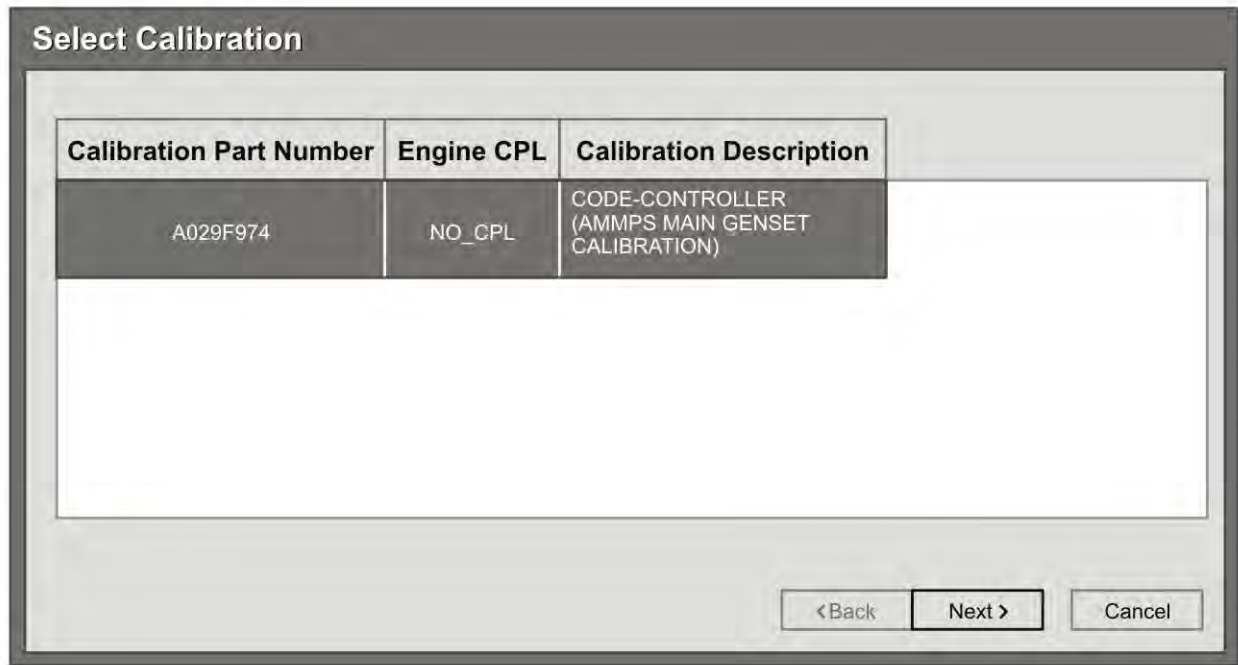


Figure 42. Select Calibration.

NOTE

Figure 42 is an example of a [Calibration Part Number]. [Calibration Part Number] may vary.

7. Select the appropriate [Calibration Part Number] and select [Next] (Figure 42).

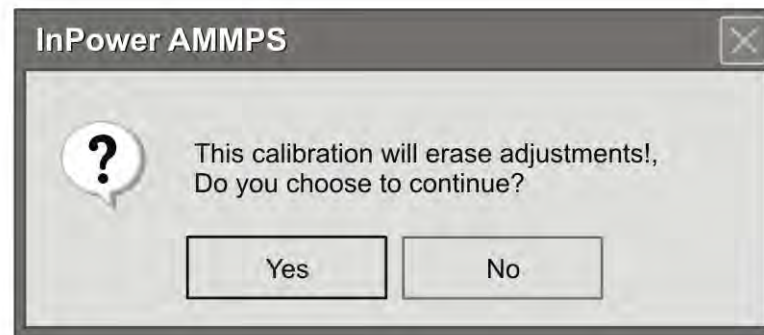


Figure 43. Calibration Erase.

8. Select [YES] if dialog box displays (Figure 43).

History

Calibration Part Number: A029F974 Current Calibration Revision:

Description: CODE-CONTROLLER (AMMPS MAIN GENSET CALIBRATION) CD Calibration Revision:

Revision History	Calibration File	Revision Description
14DEC2009	A029F974	History to be updated

Figure 44. History.

9. Choose [Next] if [History] displays the [Calibration File] selected in step 7 (Figure 44).
10. Choose [Back] to select the correct calibration file if [History] displays a calibration file that does not match the [Calibration File] selected in step 7 (Figure 44).

Save & Restore Parameters

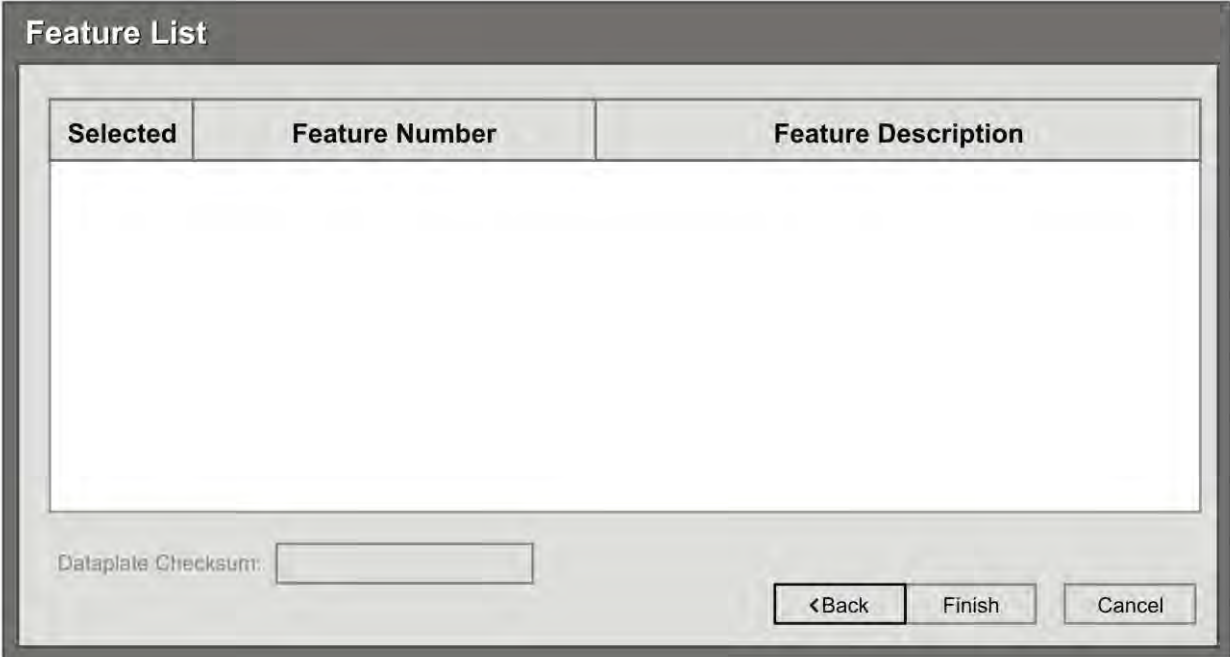
Parameters Loaded From: Connected Device

Parameter Description	Value	Units
Fault History Table	<Data Table>	
Faults Occurrence Table	<Data Table>	

☐ Overlay Capture File After Calibration

Figure 45. Save and Restore Parameters.

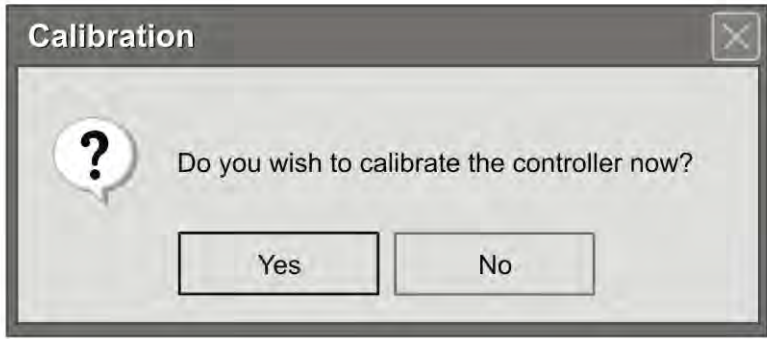
11. Select [Next] after confirming that the correct information is displayed in [Save & Restore Parameters] (Figure 45).



The 'Feature List' dialog box has a title bar with the text 'Feature List'. Below the title bar is a table with three columns: 'Selected', 'Feature Number', and 'Feature Description'. The table is currently empty. Below the table is a text field labeled 'Dataplate Checksum:'. At the bottom right of the dialog box are three buttons: '<Back', 'Finish', and 'Cancel'.

Figure 46. Feature List Finish.

12. Select [Finish] when [Feature List] dialog box displays (Figure 46).



The 'Calibration' dialog box has a title bar with the text 'Calibration' and a close button (X) in the top right corner. Below the title bar is a question mark icon in a speech bubble. To the right of the icon is the text 'Do you wish to calibrate the controller now?'. Below this text are two buttons: 'Yes' and 'No'.

Figure 47. Confirm Calibration.

13. Select [Yes] after confirming that DCS is ready for calibration (Figure 47).

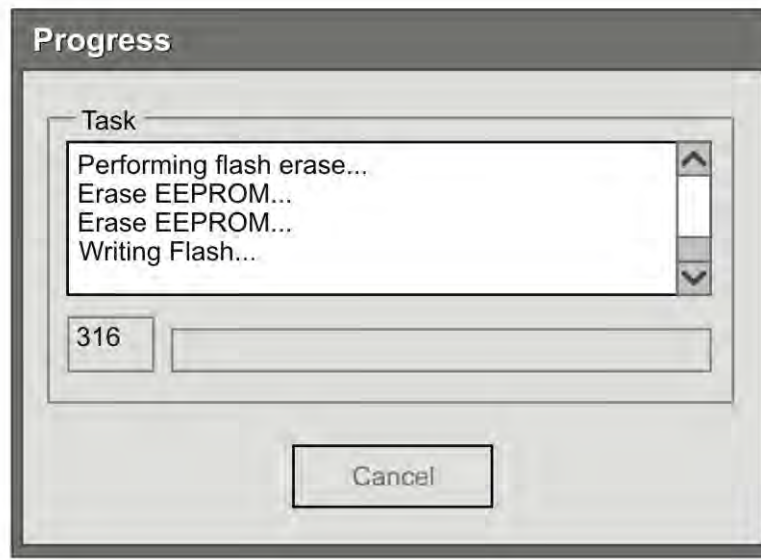


Figure 48. Calibration Progress.

NOTE

During the download, it is normal operation for the generator set control to display failure messages (e.g. [System Failure]) and DCS codes. Do not clear DCS codes or perform any other actions during the calibration file download or the download may be interrupted. When the download is complete, a final dialog box (Figure 49) informs the user the download completed successfully.

14. Monitor PC and DCS as calibration is downloaded (Figure 48) to ensure connections are not disturbed and power is not interrupted.

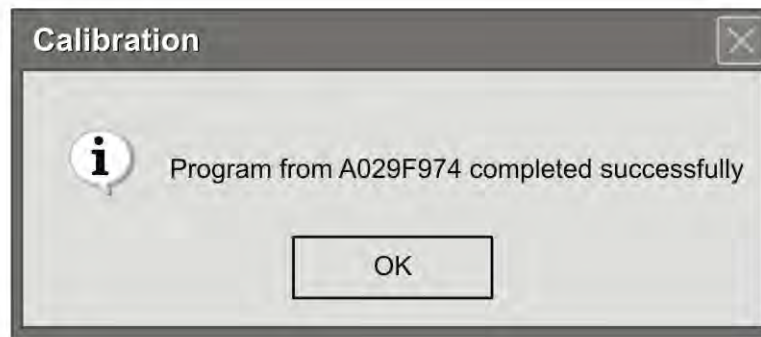


Figure 49. Calibration Completed Successfully.

NOTE

The calibration file download may take approximately 20 min, depending on PC performance and connection between DCS and PC. Calibration to the DCS may fail if battery is disconnected during the download process or if the cable drops off accidentally during the download. If DCS LED does not power on and will not power on after turning engine control switch to PRIME & RUN (TM 9-6115-749-10), proceed to Recovering AMMPS DCS if Initial or Update Calibration Fails task. PANEL LIGHTS will still work if calibration is interrupted. If PANEL LIGHTS do not work, proceed to electrical troubleshooting of DCS before attempting recovery of DCS (WP 0009, Electrical System Troubleshooting without a DCS Code).

15. Select [OK] when dialog box indicates [Calibration] has successfully completed (Figure 49).

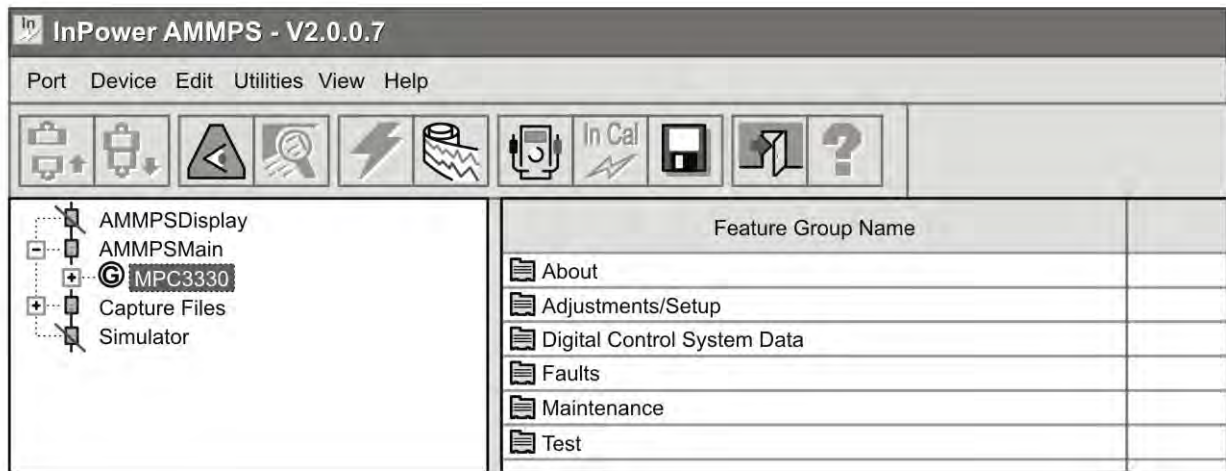


Figure 50. DCS Reconnect.

16. Observe PC screen to confirm InPower AMMPS automatically reconnected to [AMMPSMain] (Figure 50).
17. Overlay capture file and reset engine hours as required. See Using a Capture File to Overlay Data task.
18. Reset parameters as required if capture file is unavailable. See Using a Capture File to Overlay Data task, steps 19 through 26 and step 28.
19. Disconnect from [AMMPSMain] and remove local cable (Figure 10, Item 5) (with MAIN (Figure 10, Item 7) adapter).
20. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
21. Start engine and check for proper operation (TM 9-6115-749-10).
22. Repair as required.

END OF TASK

Using Update Calibration to Install Display Firmware Updates

1. Install battery ground cable (WP 0036, Remove/Install Batteries) and ensure battery power is supplied to the DCS (main DC circuit breaker ON (TM 9-6115-749-10)).

NOTE

Figure 10 shows a remote cable (Figure 10, Item 4) and a local cable (Figure 10, Item 5). Both cables utilize a RS-485 to RS-232 converter (Figure 10, Item 6). The RS-485 side of the converter plugs into the cable. The RS-232 side plugs into the compatible PC COM Port 1. DISPLAY (Figure 10, Item 8) adapter will be used for step 2.

2. Connect a local cable (Figure 10, Item 5) (with DISPLAY (Figure 10, Item 8) adapter) to the DCS (Figure 10, Item 3) and a compatible PC (Figure 10, Item 1).

NOTE

DCS screen will activate upon connection of remote operating cable.

3. Select and open InPower AMMPS icon from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.

NOTE

[Update Calibration] feature is used to download a new display firmware version calibration file into a replacement or current DCS.

4. Select [AMMPSTDisplay] from left-side explorer pane (Figure 51).

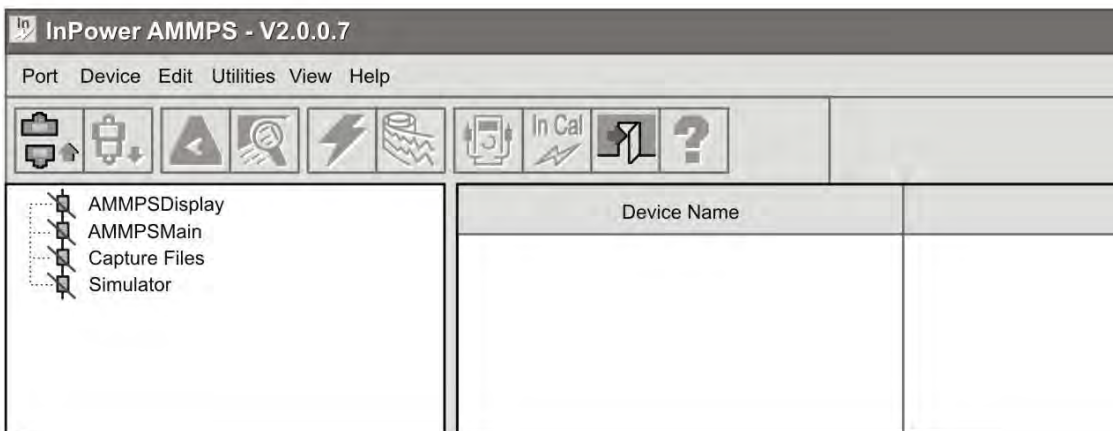


Figure 51. Connect to AMMPS Display.

5. Double-click on [AMMPSTDisplay] (Figure 51) or select [Connect] from [Port] drop-down menu (Figure 52).
6. Check the following if InPower fails to connect:
 - a. Ensure COM port for [AMMPSTDisplay] is correct and not being used by another device or program. Access [Add Site] from [Port] drop-down menu to change COM port or add a different COM port site.
 - b. Ensure proper RS-485 adapter is being utilized and is installed correctly (Figure 10).
 - c. Ensure battery power is supplied to DCS and DCS is on (step 1).
 - d. Check all cables for proper installation and connections (step 2).

7. Select [HMI400] from left-side explorer pane (Figure 53).
8. Select [Connect] from [Device] drop-down menu (Figure 54).



Figure 52. Port for AMMPS Display.

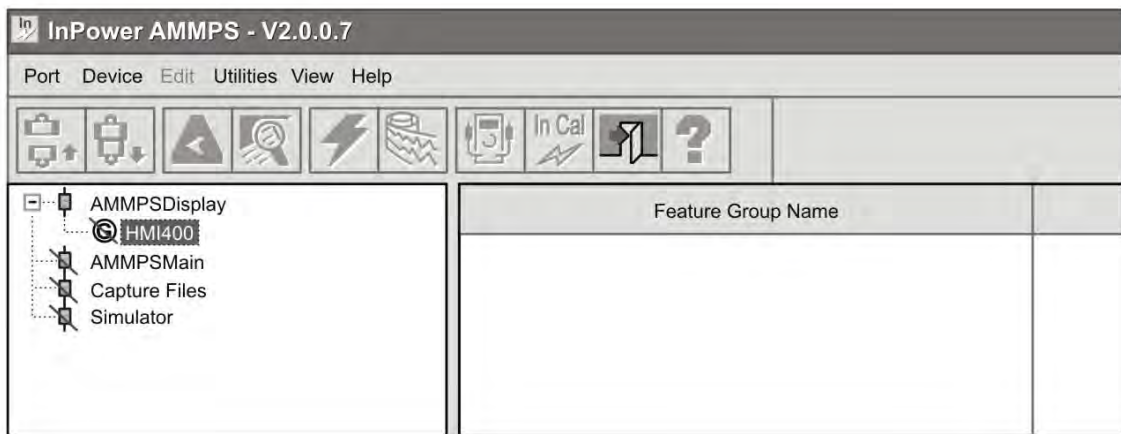


Figure 53. AMMPS Display Device HMI400.

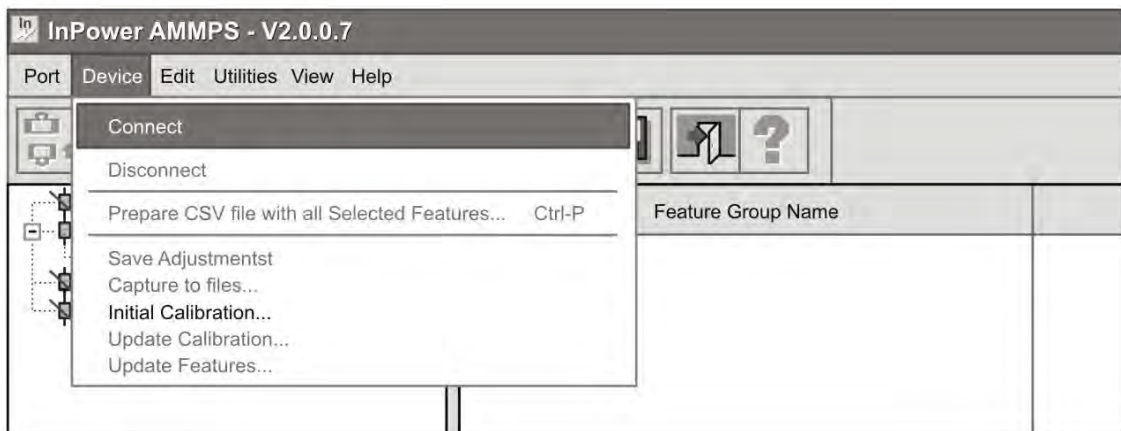


Figure 54. Device Connect Menu for AMMPS Display.

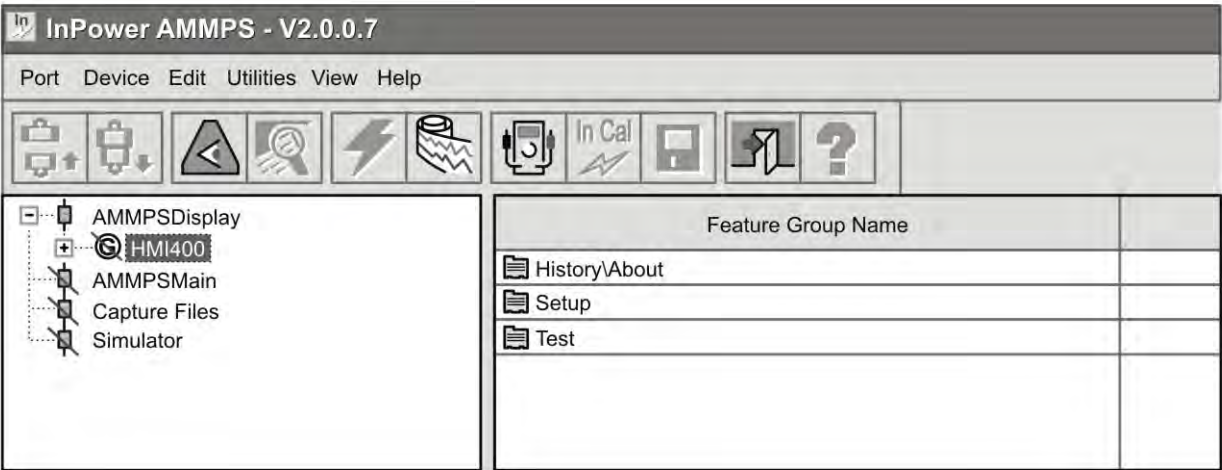


Figure 55. Highlight Display Device.

9. Select [HMI400] from left-side explorer pane once connected (Figure 55).

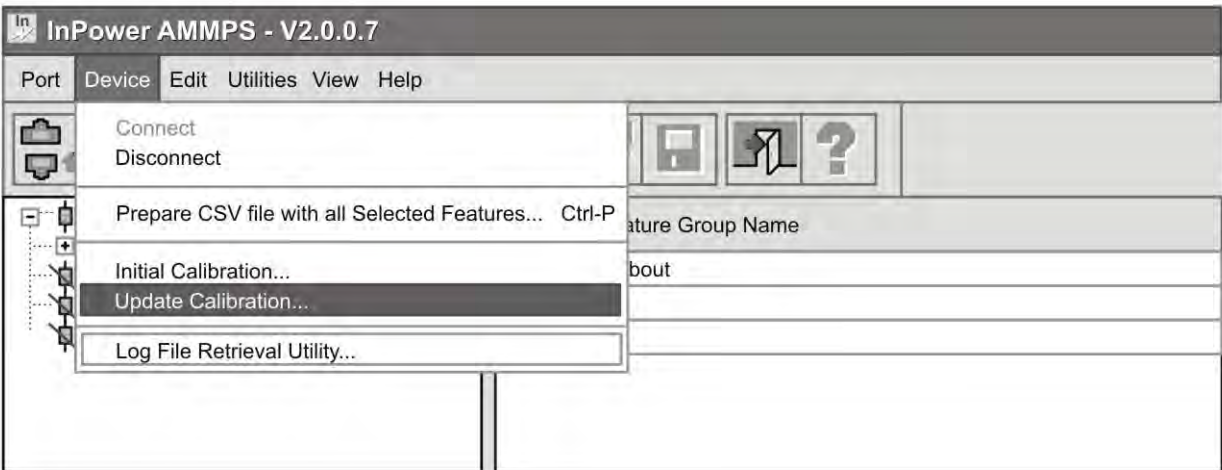


Figure 56. AMMPS Display Update Calibration.

10. Select [Update Calibration] from [Device] drop-down menu (Figure 56).
11. Select [Finish] on [History] dialog box (Figure 57).

History

Calibration Part Number: A029F972 Current Calibration Revision:

Description: CODE-HMI(AMMPS DISPLAY CALIBRATION) CD Calibration Revision:

Revision History	Calibration File	Revision Description
14DEC2009	A029F972	History to be updated

<Back Finish Cancel

Figure 57. AMMPS Display History.

12. Select [Yes] on [Calibration] dialog box (Figure 58).

Calibration

?

Do you wish to calibrate the controller now ?

Yes No

Figure 58. AMMPS Display Dialog Box.

13. Monitor PC and DCS as calibration is downloaded to ensure connections are not disturbed and power is not interrupted.

NOTE

PC will automatically disconnect from DCS when display firmware has been updated. InPower AMMPS will not need to be disconnected from DCS and can be closed.

14. Observe PC screen to confirm InPower AMMPS automatically disconnected from DCS.
15. Access DCS [About] screen to confirm display firmware has been updated (TM 9-6115-749-10).
16. Remove local cable (Figure 10, Item 5) (with DISPLAY (Figure 10, Item 8) adapter).

17. Turn engine control switch to PRIME & RUN (TM 9-6115-749-10).
18. Start engine and check for proper operation (TM 9-6115-749-10).
19. Repair as required.

END OF TASK

Recovering AMMPS DCS if Initial Calibration Fails

1. Attempt to connect to [AMMPSMain]. See Using InPower AMMPS on a Compatible PC task.

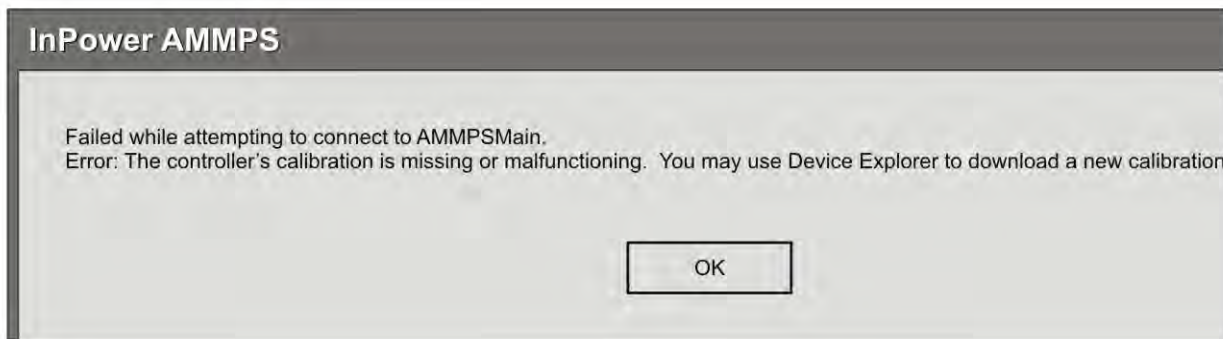


Figure 59. Failed Connection.

2. Check PC screen for dialog box indicating failed attempt (Figure 59).
3. Select [OK] and proceed to highlight [AMMPSMain] connection port (Figure 60).

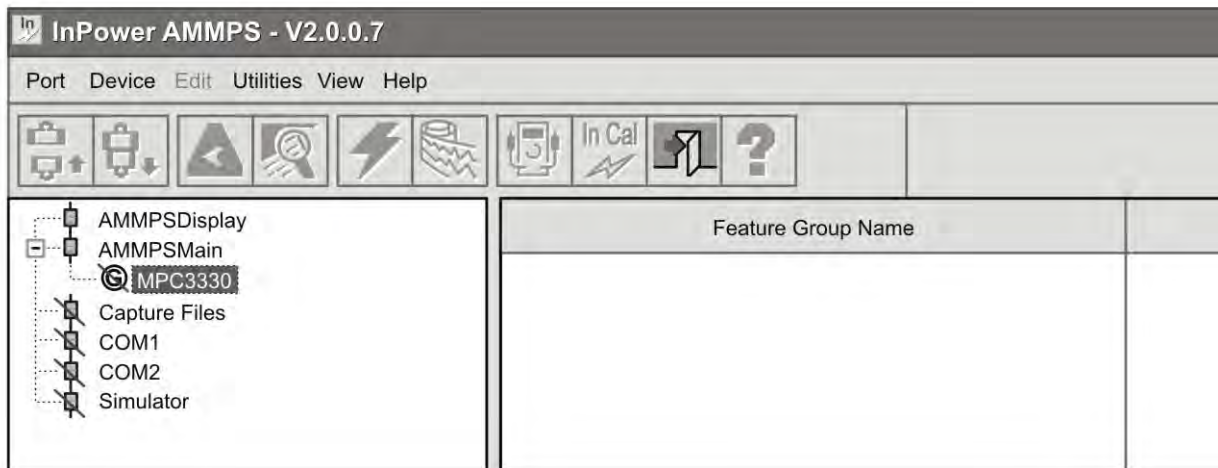


Figure 60. Highlight.

4. Proceed to Using Initial Calibration to Install Control Firmware Updates task and complete steps 5 through 22.
5. Test and replace DCS as required if symptom continues (WP 0017, Remove/Install DCS and WP 0018, Repair DCS).

END OF TASK

Preparation for Storage (Less Than Nine Months)**NOTE**

Steps 1 through 6 must be completed monthly.

1. Perform operator Before PMCS (TM 9-6115-749-10).
2. Start generator set (TM 9-6115-749-10).
3. Allow generator set to operate until coolant temperature reaches 185°F (85°C).
4. Turn engine control switch OFF (TM 9-6115-749-10).
5. Perform operator After PMCS (TM 9-6115-749-10).
6. Ensure scheduled field maintenance PMCS (WP 0016, Field PMCS) has been performed as required.

END OF TASK

Preparation for Storage (9 Months to 36 Months)**NOTE**

Read all storage and preservation steps that follow prior to performing them to avoid duplication of steps. Perform steps in order given.

1. Ensure AMMPS 5 kW generator set is fully functional.
 - a. Perform operator Before PMCS (TM 9-6115-749-10).
 - b. Operate generator set at 80% load for 1/2 hour (TM 9-6115-749-10).
 - c. Perform operator After PMCS (TM 9-6115-749-10).
 - d. Verify generator set is fully mission-capable.
 - (1) Repair or replace all defects found while performing PMCS (TM 9-6115-749-10).
 - (2) Repeat substeps 1 a – c.
2. Prepare cooling system for storage.
 - a. Start engine (TM 9-6115-749-10).
 - b. Operate generator set until [Coolant] reaches 180°F (85°C) if necessary.
 - c. Drain coolant (WP 0021, Service Cooling System).
 - d. Clean radiator interior (WP 0021, Service Cooling System).
 - e. Refill cooling system (WP 0021, Service Cooling System) with a mixture of 50% antifreeze and 50% distilled water (WP 0087, Lubrication Instructions).
3. Prepare fuel injection system for storage.
 - a. Fill a suitable 1 gal (4.55 L) or larger container with approved diesel fuel (WP 0087, Lubrication Instructions).
 - b. Fill a suitable 1 gal (4.55 L) or larger container with MIL-PRF-21260E, Grade PEI 0 preservative oil.
 - c. Obtain a suitable 1 gal (4.55 L) or larger empty container.
 - d. Place containers outside of rear door.
 - e. Disconnect the main fuel pump from the fuel manifold (WP 0041, Remove/Install Fuel Pump Main/Auxiliary).
 - f. Connect a suitable flexible fuel line to the main fuel pump.
 - g. Disconnect fuel return line and place into empty container (WP 0040, Remove/Install Fuel Manifold).
 - h. Insert flexible fuel line from substep 3f into container containing approved diesel fuel.
 - i. Start engine (TM 9-6115-749-10) and operate for 2 min.
 - j. Transfer flexible fuel line from substep 3f to container of MIL-PRF-21260E, Grade PEI 0 preservative oil.
 - k. Continue to operate engine until preservative oil flows from return line.
 - l. Turn engine control switch to OFF (TM 9-6115-749-10).
 - m. Replace fuel filter/water separator element (WP 0043, Replace Fuel Filter/Water Separator Element).
 - n. Install main fuel pump (WP 0041, Remove/Install Fuel Pump Main/Auxiliary).
4. Prepare valves, intake system, and cylinders for storage.
 - a. Remove air intake hose at intake manifold (WP 0019, Remove/Install Air Intake Hose Assemblies).
 - b. Fill an oil gun with MIL-PRF-21260E, Grade PEI 0 preservative lubricating oil.

- c. Spray oil into opening of intake manifold for 15 sec while cranking the engine using the DEAD CRANK SWITCH (TM 9-6115-749-10).

CAUTION

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between cranks. Failure to comply may cause damage to equipment.

- d. Repeat substep 4c for three additional periods of 15 sec each.
 - e. Install air intake hose removed in substep 4a.
5. Prepare lubrication system for storage.
- a. Drain engine oil (WP 0066, Service Lubrication System).
 - b. Replace oil filter (WP 0066, Service Lubrication System).
 - c. Fill engine crankcase (WP 0066, Service Lubrication System) with preservative lubricating oil conforming to grade 10, 30, or 15-40 of MIL-PRF 21260E.
 - d. Crank the engine for 15 sec using the DEAD CRANK SWITCH (TM 9-6115-749-10).

CAUTION

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between cranks. Failure to comply may cause damage to equipment.

- e. Repeat substep 5d for three additional periods of 15 sec each.
6. Prepare 24-V electrical system for storage.
- a. Clean dirt, acid, and other residues from top of batteries.
 - b. Remove batteries from generator set (WP 0036, Remove/Install Batteries).
 - c. Check voltage of the removed batteries (WP 0036, Remove/Install Batteries).

CAUTION

Charge AGM batteries only with a device with an AGM setting or that can regulate the voltage between 14.25 V and 14.75 V. Failure to comply will cause damage to equipment.

- d. Charge Absorbed Glass Mat (AGM) batteries as required.
 - (1) When charge level is less than 12.7 V.
 - (2) Charge every six months.
 - e. Charge flooded wet cell batteries as required.
 - (1) When charge level is less than 12.5 V.
 - (2) Charge every three months.
7. Prepare fuel system for storage.
- a. Drain fuel/preservative oil mixture from the fuel supply lines between the fuel filter/water separator and the fuel tank (WP 0039, Service Fuel System).
 - b. Drain fuel tank (WP 0039, Service Fuel System).
 - c. Clean fuel strainers (WP 0039, Service Fuel System).
8. Prepare AC generator for storage.
- a. Seal end bell vents with tape meeting SAE-AMS-T-22085 standard.

-
- b. Seal generator fan screen with tape meeting SAE-AMS-T-22085 standard.
 - c. Seal wire ports in generator housing with tape meeting SAE-AMS-T-22085 standard.
 9. Prepare diesel engine for storage.
 - a. Clean dip stick and dip stick tube of dirt and oil and then seal dip stick/dip stick tube junction with tape meeting SAE-AMS-T-22085 standard.
 - b. Clean oil fill of dirt and oil and then seal with tape meeting SAE-AMS-T-22085 standard.
 10. Lubricate all doors IAW WP 0087, Lubrication Instructions and close securely.
 11. Prepare three warning tags stating "THIS GENERATOR SET HAS BEEN PRESERVED. CHANGE FUEL FILTERS AND ENGINE OIL AND PERFORM PMCS" and attach to:
 - a. Dip stick
 - b. Oil filler cap.
 - c. Engine control switch.

CAUTION

Adequate air flow must be provided around generator set when stored under a tent or tarp. Failure to comply will cause damage to equipment.

NOTE

Store generator set inside an enclosed structure (preferred) or under roof when possible.

When storing generator set outside, cover with a tent or tarp. Allow at least 36 in (0.91 m) space between cover and generator set on all sides to ensure adequate air flow.

12. Move generator set into storage.

END OF TASK

Replace Freeze Plug

NOTE

Several freeze plugs of varying sizes are installed on the engine block. The procedure to replace each freeze plug is the same regardless of size or location.

It is not necessary to remove the engine assembly from the generator set to replace a freeze plug.

1. Drain cooling system (WP 0021, Service Cooling System).
2. Relocate or remove any engine components that restrict access the freeze plug to be replaced. Refer to the relevant WP for the proper procedure to relocate or remove the component.
3. Place wiping rags under freeze plug (Figure 61, Item 1) to absorb any residual coolant that may spill when freeze plug has been removed.

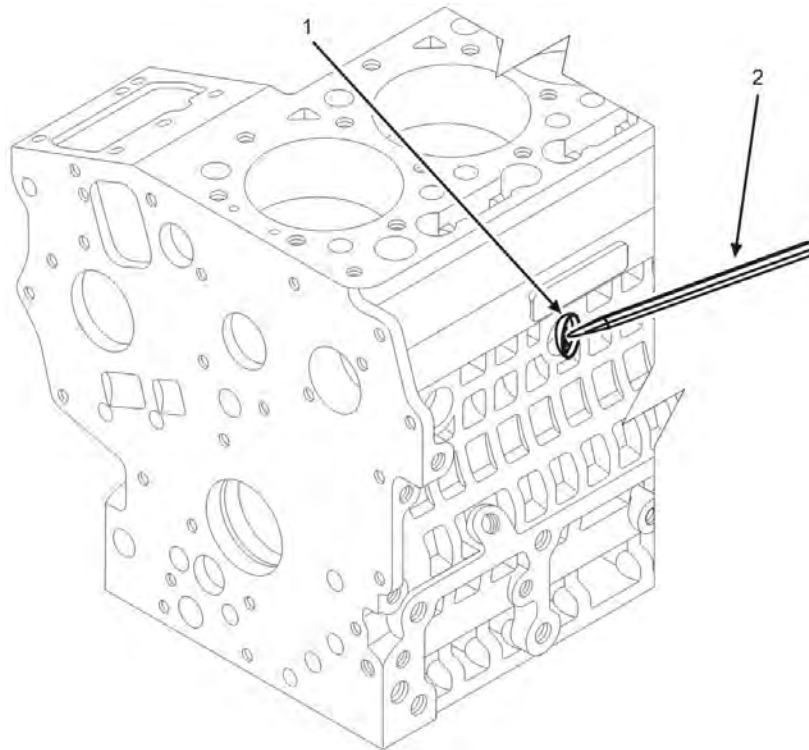


Figure 61. Remove Freeze Plug.

CAUTION

Use of excessive force with the hammer when removing freeze plug may cause freeze plug to be pushed inside engine block. Use care not to push freeze plug into engine block when removing it. Failure to comply may cause damage to equipment.

4. Remove freeze plug (Figure 61, Item 1) by tapping with a hammer and punch (Figure 61, Item 2) until freeze plug (Figure 61, Item 1) cocks in opening of engine block.
5. Remove and discard freeze plug (Figure 61, Item 1) from opening in engine block.
6. Remove dirt, debris, and oil from opening in engine block by wiping with a rag.

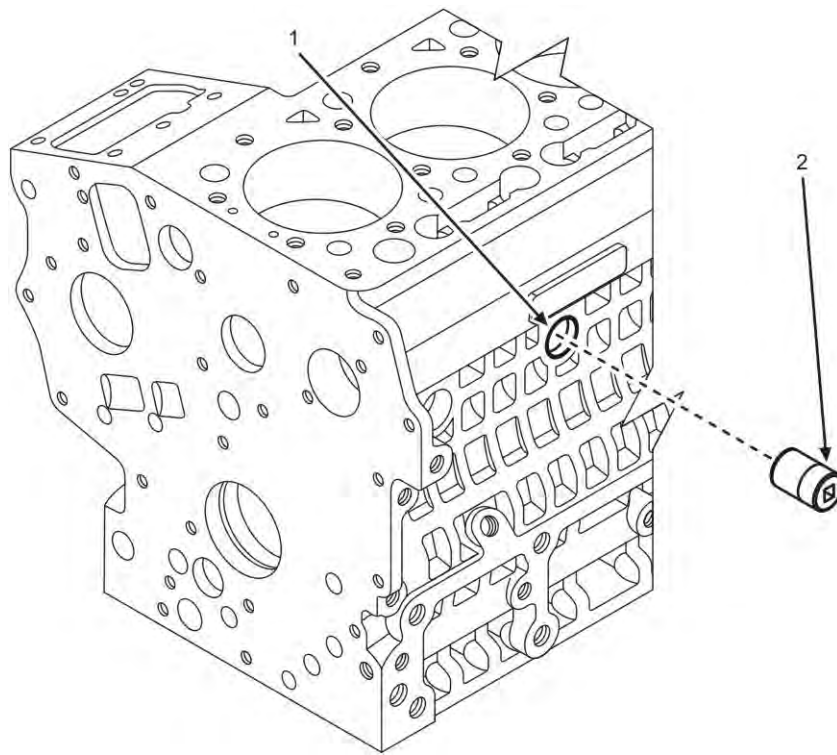


Figure 62. Install Freeze Plug.

7. Remove any burrs from opening using crocus cloth.
8. Position new freeze plug (Figure 62, Item 1) to opening in engine block.
9. Tap freeze plug (Figure 62, Item 1) into opening using a hammer and the proper size socket (Figure 62, Item 2) until freeze plug (Figure 62, Item 1) is fully seated into opening of engine block.
10. Replace any engine components previously removed or relocated.
11. Fill the cooling system (WP 0021, Service Cooling System).

WARNING

Starting engine when unit is partially disassembled is dangerous. Operate engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

12. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
13. Start engine and run for 5 min (TM 9-6115-749-10).
14. Inspect cooling system (WP 0021, Service Cooling System) for leaks. Repair as required.
15. Stop engine and let cool.
16. Check coolant level in recovery bottle (WP 0021, Service Cooling System) and add coolant as required to bring level of coolant in bottle to LOW marking line.
17. Dispose of spilled coolant and soiled rags IAW local SOP.

END OF TASK

Install Clinch Nut

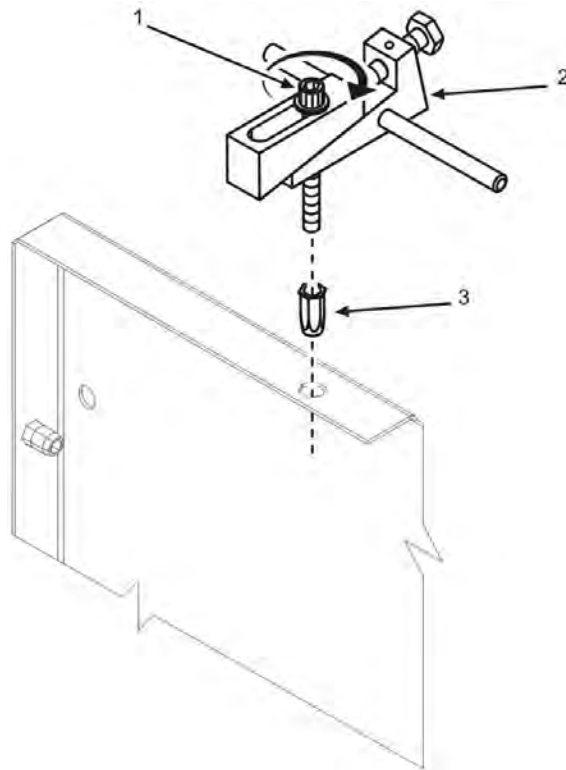


Figure 63. Clinch Nut to Rivet Tool.

1. Install new clinch nut (Figure 63, Item 3) to rivet nut tool (Figure 63, Item 2) by turning socket head screw (Figure 63, Item 1) clockwise until clinch nut (Figure 63, Item 3) is fully installed on tool.

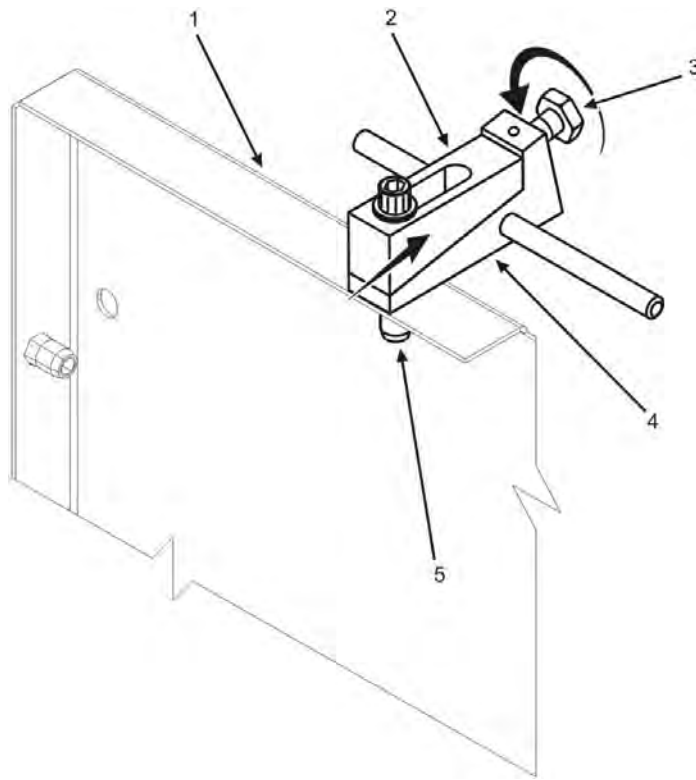


Figure 64. Install Clinch Nut to Panel.

CAUTION

Prior to tightening hex head screw (Figure 64, Item 3), position rivet nut tool (Figure 63, Item 2) flush with panel (Figure 64, Item 1) surface. Failure to comply may result in damage to equipment.

2. Install clinch nut (Figure 64, Item 5) into opening in panel (Figure 64, Item 1) with bottom surface of tool (Figure 64, Item 4) flush with panel (Figure 64, Item 1).
3. Turn hex head screw (Figure 64, Item 3) clockwise to draw top wedge (Figure 64, Item 2) of tool toward hex head screw (Figure 64, Item 3).
4. Continue to tighten hex head screw (Figure 64, Item 3) until top wedge (Figure 64, Item 2) is fully seated on bottom wedge (Figure 64, Item 4) of tool.

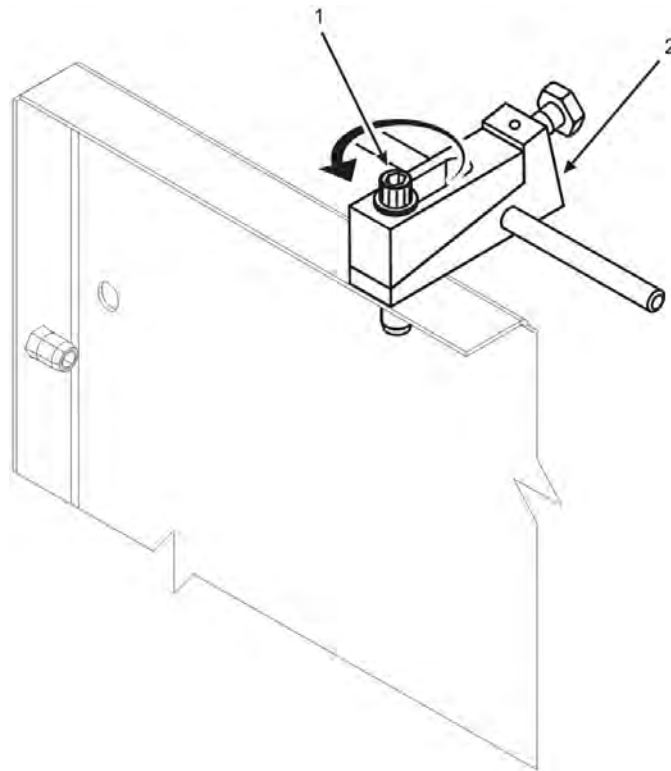


Figure 65. Remove Rivet Nut Tool.

5. Turn socket head screw (Figure 65, Item 1) counter-clockwise to remove tool (Figure 65, Item 2) from panel.

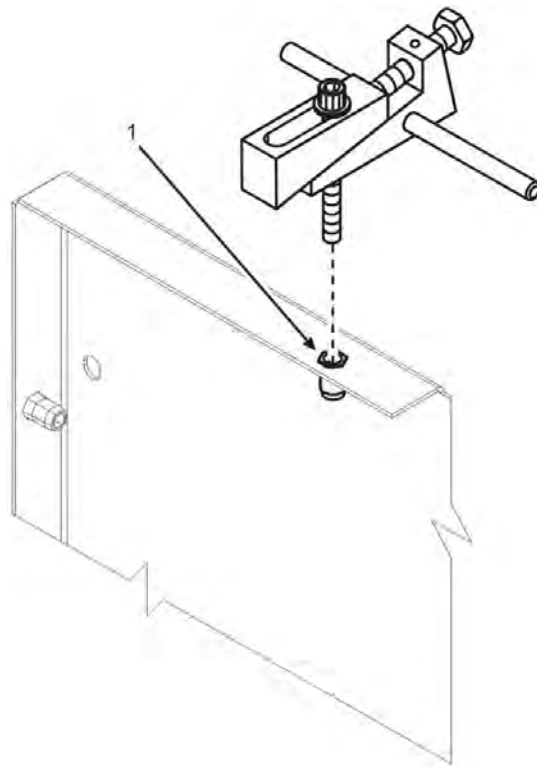


Figure 66. Installed Clinch Nut.

6. Use installed clinch nut (Figure 66, Item 1) to secure panel as required.

END OF TASK

END OF WORK PACKAGE

**SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL HARMONIC BALANCER**

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0162, Table 2, Item 42)

Materials/Parts

Pulley, fan drive (WP 0148, Repair Parts List, Figure 50, Item 1)
Lubricating oil, engine (WP 0163, Expendable and Durable Items List, Item 23)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
Engine cool
Front body panel removed (WP 0029, Remove/Install Front Body Panel)
Battery-charging alternator belt removed (WP 0076, Remove/Install Battery-Charging Alternator Belt)

REMOVE/INSTALL HARMONIC BALANCER**Remove Harmonic Balancer****NOTE**

It will be necessary to prevent the crankshaft (Figure 1, Item 3) from turning while loosening the harmonic balancer (Figure 1, Item 2) bolt (Figure 1, Item 1).

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove bolt (Figure 1, Item 1) securing harmonic balancer (Figure 1, Item 2) to crankshaft (Figure 1, Item 3).
3. Verify that alignment marks (Figure 1, Item 4) are clearly visible on harmonic balancer (Figure 1, Item 2) and crankshaft (Figure 1, Item 3).
4. Modify the alignment marks (Figure 1, Item 4) as required for clear visibility.
5. Remove harmonic balancer (Figure 1, Item 2) from crankshaft (Figure 1, Item 3) using a gear puller.
6. Place harmonic balancer (Figure 1, Item 2) on suitable work surface.

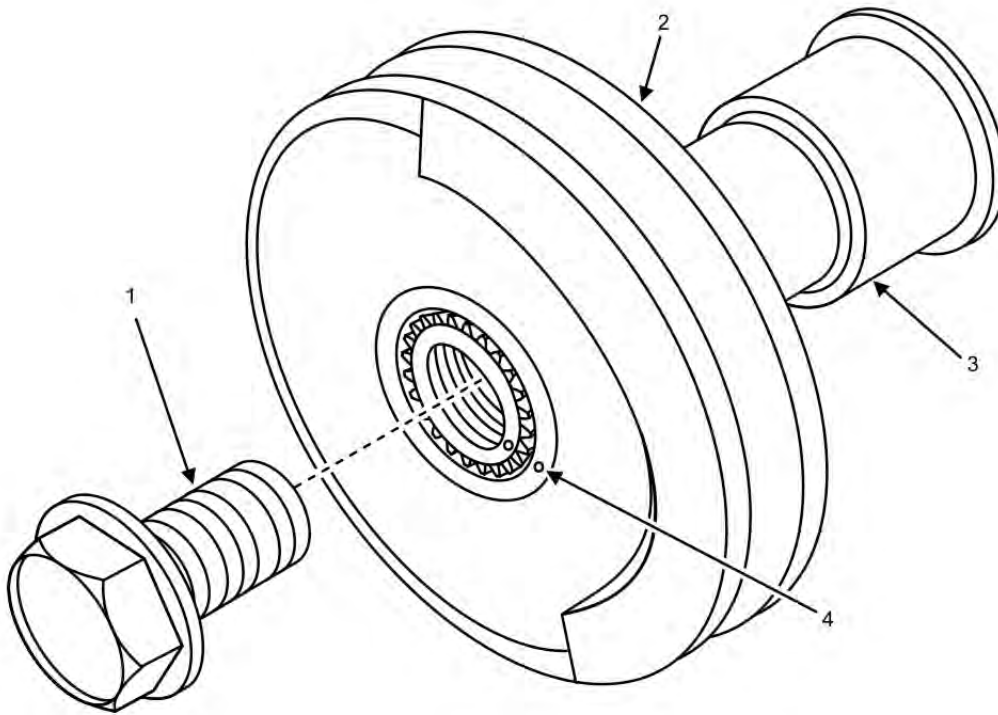


Figure 1. Harmonic Balancer — Removal.

END OF TASK

Inspect Harmonic Balancer

1. Inspect harmonic balancer (Figure 1, Item 2) for cracks, corrosion, or damage, and replace as required.
2. Inspect crankshaft (Figure 1, Item 3) end for cracks, corrosion, or damage. Notify local supervisor if replacement is required.

END OF TASK

Install Harmonic Balancer

CAUTION

Be sure to properly align alignment marks (Figure 1, Item 4) on crankshaft (Figure 1, Item 3) with timing marks on harmonic balancer (Figure 1, Item 2). Failure to comply may cause damage to equipment.

1. Install harmonic balancer (Figure 1, Item 2) to crankshaft (Figure 1, Item 3), aligning timing marks (Figure 1, Item 4) on each part as shown.

NOTE

It will be necessary to prevent crankshaft (Figure 1, Item 3) from turning while tightening bolt (Figure 1, Item 1).

2. Secure harmonic balancer (Figure 1, Item 2) to crankshaft (Figure 1, Item 3) by installing bolt (Figure 1, Item 1) finger-tight.
3. Secure bolt (Figure 1, Item 1) to a torque value of 87 – 94 ft/lb (118 – 125 Nm).
4. Install battery-charging alternator belt (WP 0076, Remove/Install Battery-Charging Alternator Belt).
5. Install front body panel (WP 0029, Remove/Install Front Body Panel).
6. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
7. Start engine and check for proper operation (TM 9-6115-749-10).
8. Repair as required.

END OF TASK

END OF WORK PACKAGE

SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
REMOVE/INSTALL GEAR CASE COVER

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Bolt (2) (WP 0128, Repair Parts List, Figure 30, Item 2)

Bolt, (22) (WP 0137, Repair Parts List, Figure 39, Item 2)

Bolt (1) (WP 0147, Repair Parts List, Figure 49, Item 11)

Bolt (2) (WP 0147, Figure 49, Item 13)

Bolt (9) (WP 0147, Figure 49, Item 14)

Bolt (2) (WP 0147, Figure 49, Item 15)

Bolt (1) (WP 0147, Figure 49, Item 16)

Bolt, machine (2) (WP 0128, Figure 30, Item 1)

Bolt, machine (5) (WP 0131, Repair Parts List, Figure 33, Item 1)

Comp, case gear (WP 0147, Figure 49, Item 1)

Gasket (WP 0131, Figure 33, Item 3)

Gasket (WP 0128, Figure 30, Item 15)

Gasket, gear case (WP 0147, Figure 49, Item 5)

Seal, oil (WP 0147, Figure 49, Item 12)

Gasket, actuator (WP 0134, Repair Parts List, Figure 36, Item 3)

Compound, sealing (WP 0163, Expendable and Durable items List, Item 15)

Materials/Parts

Lubricating oil, engine (WP 0163, Item 23)

Personnel Required

91D (1)

References

WP 0077, Remove/Install Starter

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)

Engine cool

Harmonic balancer removed (WP 0094, Remove/Install Harmonic Balancer)

Water pump and pulley removed (WP 0074, Remove/Install Water Pump)

Speed control plate removed and start spring disconnected (WP 0070, Remove/Install Speed Control Plate)

Governor actuator removed (WP 0078, Remove/Install Governor Actuator)

Oil pan removed (WP 0084, Remove/Install Oil Pan and Strainer)

Oil filter removed (WP 0068, Service Lubrication System)

REMOVE/INSTALL GEAR CASE COVER
Remove Gear Case Cover

1. Ensure equipment conditions are met in order presented in initial setup.

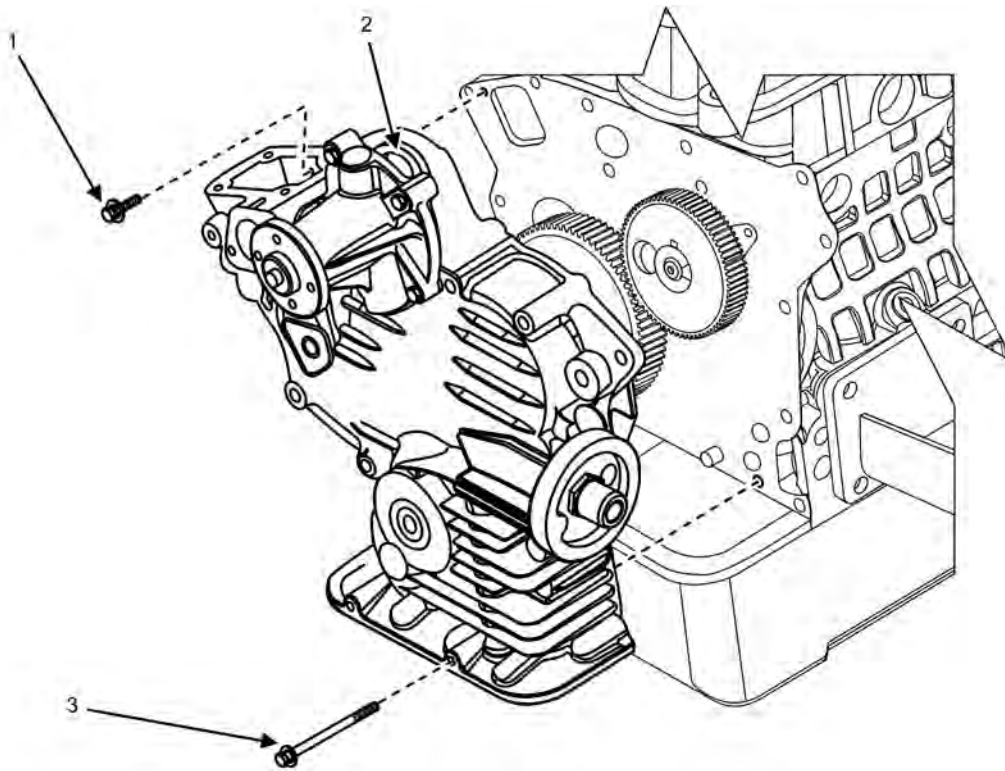


Figure 1. Gear Case Cover — Detail.

2. Remove starter mounting bolt from gear case cover (WP 0077, Remove/Install Starter).
3. Remove and discard gear case bolt with captive lock washer (Figure 1, Item 1) from beneath speed plate.
4. Loosen 13 bolts with captive lock washers (Figure 1, Item 3) on gear case cover (Figure 1, Item 2).
5. Remove and discard 13 bolts with captive lock washers (Figure 1, Item 3) from gear case cover (Figure 1, Item 2).

NOTE

It may be necessary to tap the gear case cover (Figure 1, Item 2) lightly with a rubber mallet to loosen.

6. Remove gear case cover (Figure 1, Item 2) and place on suitable work surface.

NOTE

The oil filter pipe joint (Figure 2, Item 5) and washer (Figure 2, Item 6) hold valve seat (Figure 2, Item 3), spring (Figure 2, Item 1), and ball (Figure 2, Item 2) in place. Care should be taken not to lose any of these parts when removing pipe joint and washer.

7. Remove oil filter pipe joint (Figure 2, Item 5) and washer (Figure 2, Item 6) from old gear case cover and set aside for reuse.

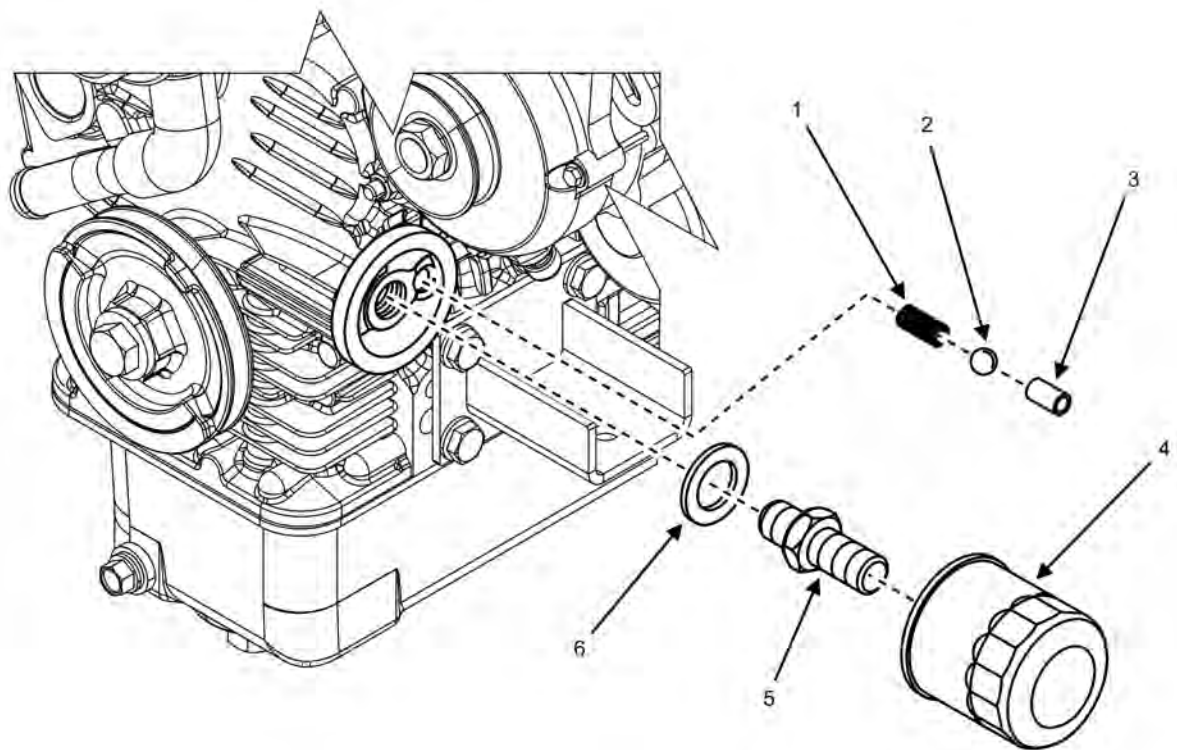


Figure 2. Remove Oil Filter and Mounting Hardware.

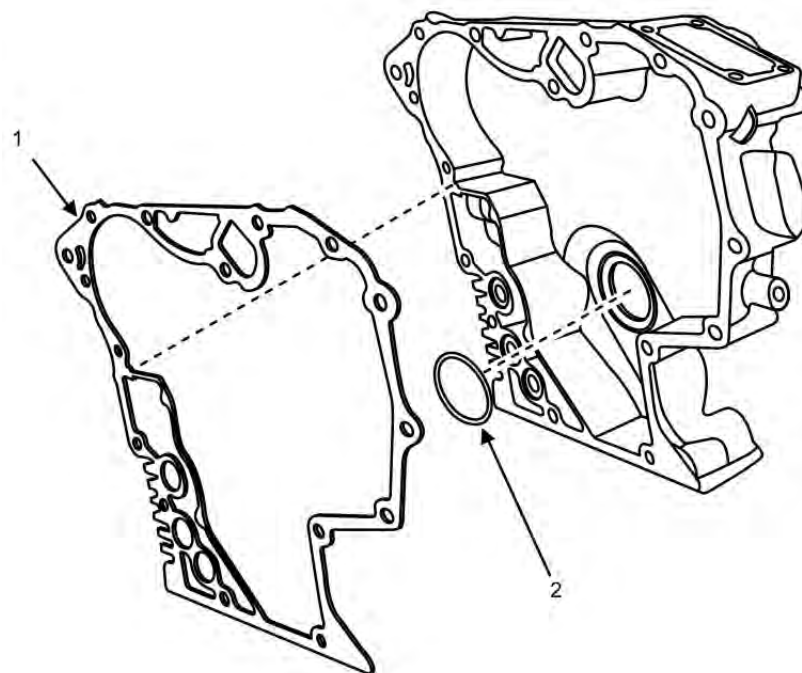


Figure 3. Gear Case Cover Detail — Rear.

8. Remove valve seat (Figure 2, Item 3), ball (Figure 2, Item 2), and spring (Figure 2, Item 1) from behind washer (Figure 2, Item 6) and set aside for reuse.
9. Remove and discard gear case cover gasket (Figure 3, Item 1).
10. Remove and discard oil seal (Figure 3, Item 2) from gear case cover (Figure 1, Item 2).

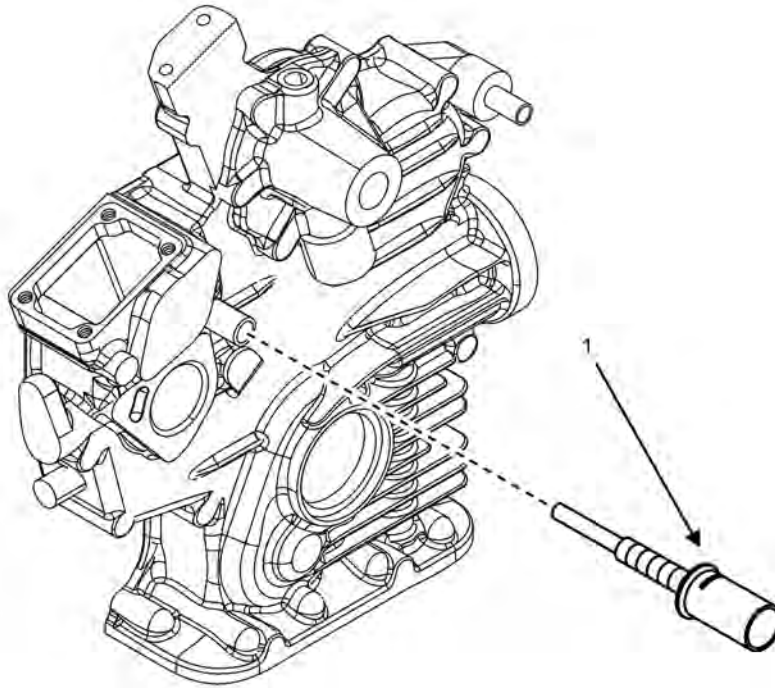


Figure 4. Remove Idle Apparatus.

11. Remove idle apparatus (Figure 4, Item 1) from gear case cover (Figure 1, Item 2) and set aside for reuse.

END OF TASK

Inspect Gear Case Cover

1. Inspect gear case cover (Figure 1, Item 2) for signs of obvious damage. Replace as required.
2. Remove stud holding metal water pipe to gear case cover (Figure 1, Item 2) if cover is being replaced and set aside for reuse.
3. Remove any dirt, debris, or residual gasket material from gear case cover (Figure 1, Item 2) mounting surface or on cylinder block.

END OF TASK

Install Gear Case Cover

1. Install idle apparatus (Figure 4, Items 1) to gear case cover.
2. Place valve seat (Figure 2, Item 3), ball (Figure 2, Item 2), and spring (Figure 2, Item 1) onto oil filter mounting location on gear case cover (Figure 1, Item 2).
3. Install washer (Figure 2, Item 6) and oil filter pipe joint (Figure 2, Item 5) onto new gear case cover (Figure 1, Item 2).
4. Install new oil seal (Figure 3, Item 2) into crankshaft opening of gear case cover (Figure 1, Item 2).

5. Apply liquid gasket to gear case cover (Figure 1, Item 2) mating surface.
6. Position gear case cover gasket (Figure 3, Item 1) to its mounting location on gear case.
7. Position gear case cover (Figure 1, Item 2) to its mounting location over gear case cover gasket (Figure 3, Item 1) on gear case.

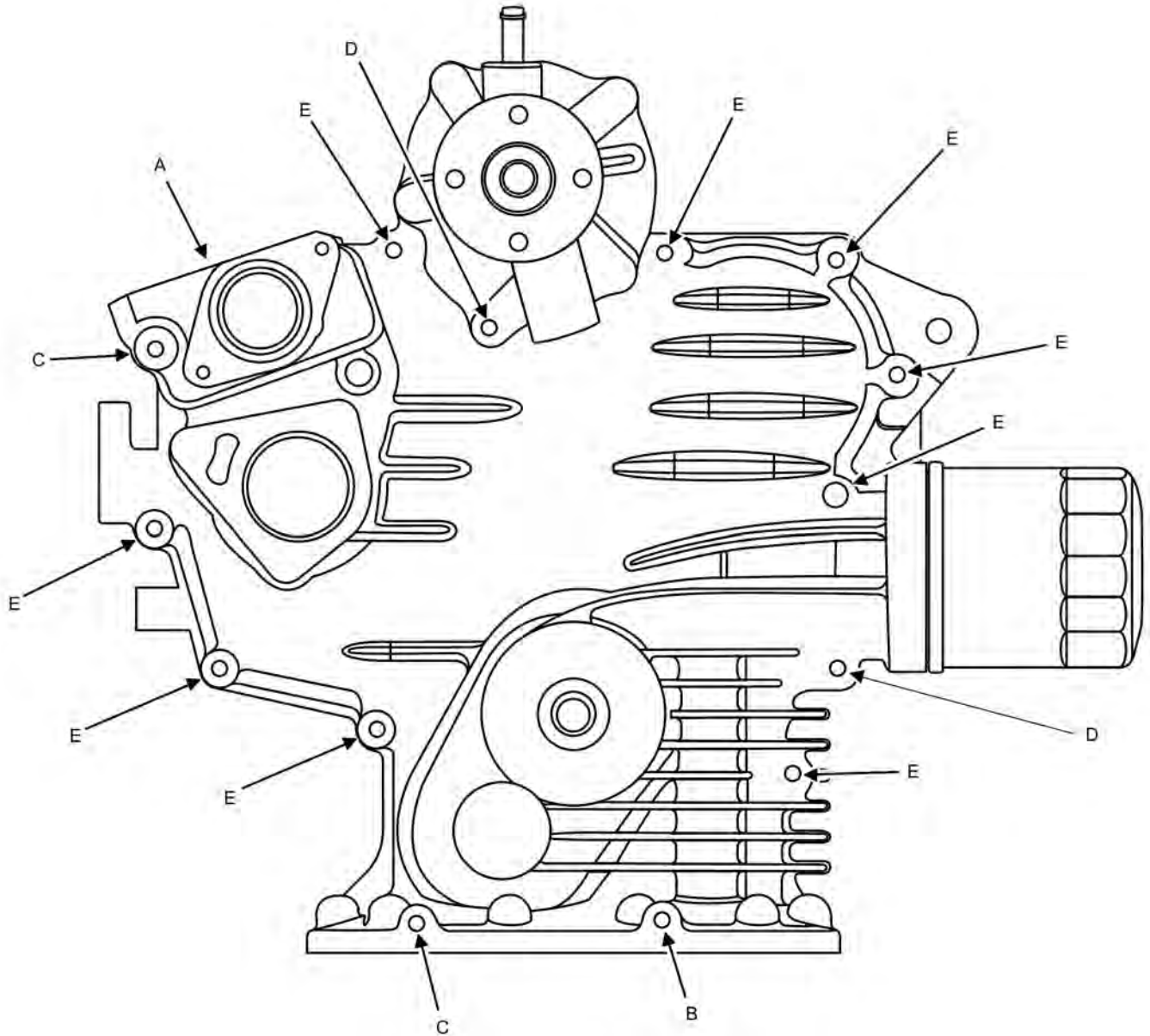


Figure 5. Mounting Bolts Location — Length Detail.

CAUTION

Be sure to install bolts into gear case according to lengths as shown in Figure 5 and the accompanying table. Failure to comply may cause damage to equipment.

8. Install gear case bolt with captive lock washer (Figure 5, Item A).

9. Install 13 bolts with captive lock washers (Figure 1, Item 3) according to location and length detailed in Figure 5 and Table 1. Tighten finger-tight.

Table 1. Mounting Bolt Length.

GROUP	LENGTH IN MM	LENGTH IN INCHES	QUANTITY
A	19.05 mm	0.75 in	1
B	88.90 mm	3.50 in	1
C	82.55 mm	3.25 in	2
D	63.50 mm	2.50 in	2
E	50.80 mm	2.00 in	9

10. Tighten all gear case cover bolts with captive lock washers (Figure 5, Items B through E) to a torque value of 7 – 8 ft/lb (10 – 11 Nm).
11. Install new oil filter (Figure 2, Item 4) (WP 0068, Service Lubrication System).
12. Install starter to gear case cover using mounting bolt (WP 0077, Remove/Install Starter).
13. Install oil pan (WP 0084, Remove/Install Oil Pan and Strainer).
14. Install governor actuator (WP 0078, Remove/Install Governor Actuator).
15. Install speed control plate (WP 0070, Remove/Install Speed Control Plate).
16. Install water pump and pulley (WP 0074, Remove/Install Water Pump).
17. Install harmonic balancer (WP 0094, Remove/Install Harmonic Balancer).
18. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
19. Start engine and check for proper operation (TM 9-6115-749-10).
20. Repair as required.

END OF TASK

END OF WORK PACKAGE

SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
REPLACE CYLINDER HEAD GASKET

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0162, Table 2, Item 32)

Materials/Parts

Assembly, cylinder head (1) (WP 0140, Repair Parts List, Figure 42, Item 1)
 Bolt (5) (WP 0135, Repair Parts List, Figure 37, Item 4)
 Bolt, cylinder head (14) (WP 0140, Figure 42, Item 8)
 Gasket (3) (WP 00127, Repair Parts List, Figure 29, Item 10)
 Gasket, cylinder head (1) (WP 0140, Figure 42, Item 10)
 Gasket, intake manifold (1) (WP 0135, Figure 37, Item 3)
 Gasket, valve cover (1) (WP 0141, Repair Parts List, Figure 43, Item 11)
 Grease, electrically conductive (WP 0163, Expendable and Durable Items List, Item 20)
 Lubricating oil, engine (WP 0163, Item 23)
 Pan, drain (WP 0163, Item 28)
 Penetrating oil (WP 0163, Item 29)
 Rag, wiping (WP 0163, Item 31)

Personnel Required

91D (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-749-10, WP 0005)
 Engine cool
 Battery-charging alternator assembly removed (WP 0075, Remove/Install Battery-Charging Alternator Assembly)
 Intake manifold removed (WP 0079, Remove/Install Intake Manifold)
 Exhaust manifold removed (WP 0080, Remove/Install Exhaust Manifold)
 Valve cover removed (WP 0082, Remove/Install Valve Cover)
 Fuel injectors and lines removed (WP 0069, Remove/Install Fuel Injector)
 Glow plug contact strip removed (WP 0068, Remove/Install Glow Plugs)
 Water pump hose removed (WP 0074, Remove/Install Water Pump)

REMOVE/INSTALL GEAR CASE COVER

Replace Cylinder Head Gasket

1. Ensure equipment conditions are met in order presented in initial setup.
2. Apply penetrating oil to all cylinder head bolts (Figure 2, Item 2).

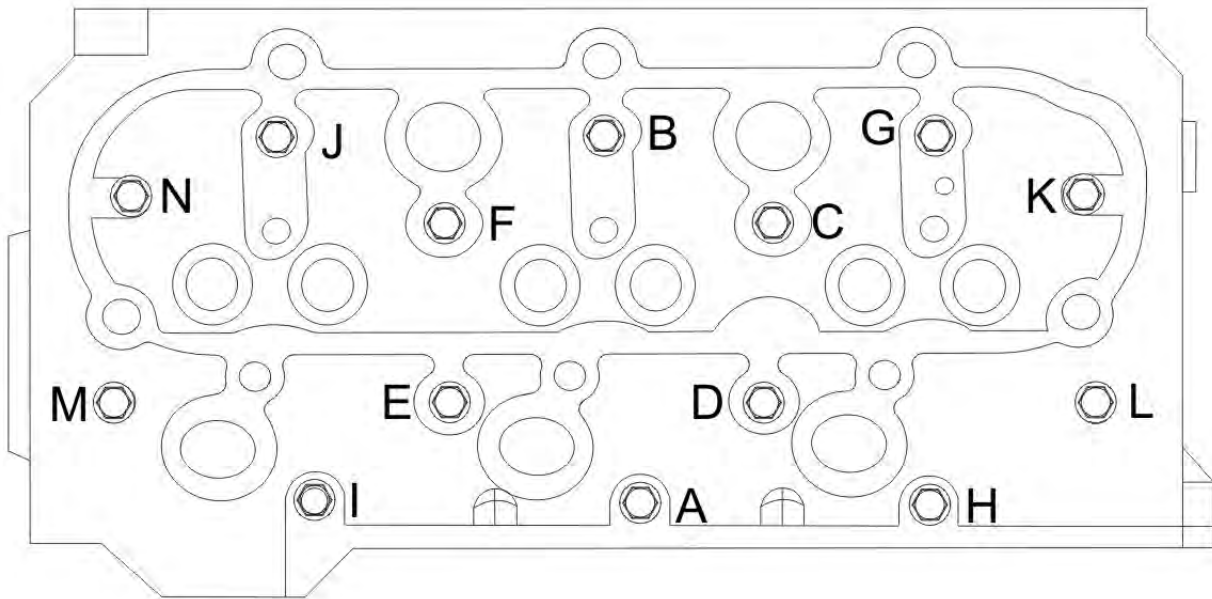


Figure 1. Cylinder Head Bolt Sequence.

CAUTION

To prevent warping of the cylinder head (Figure 2, Item 1), loosen cylinder head bolts (Figure 2, Item 2) in the specific order instructed in Figure 1. Failure to comply may cause damage to equipment.

The cylinder head bolts (Figure 2, Item 2) in locations H and L (Figure 1) are longer than the other cylinder head bolts (Figure 2, Item 2). These longer cylinder head bolts (Figure 2, Item 2) must be placed in locations H and L when installing the cylinder head (Figure 2, Item 1). Failure to comply may cause damage to equipment.

3. Loosen cylinder head bolts (Figure 2, Item 2) in reverse alphabetical order from N to A, as shown in Figure 1.

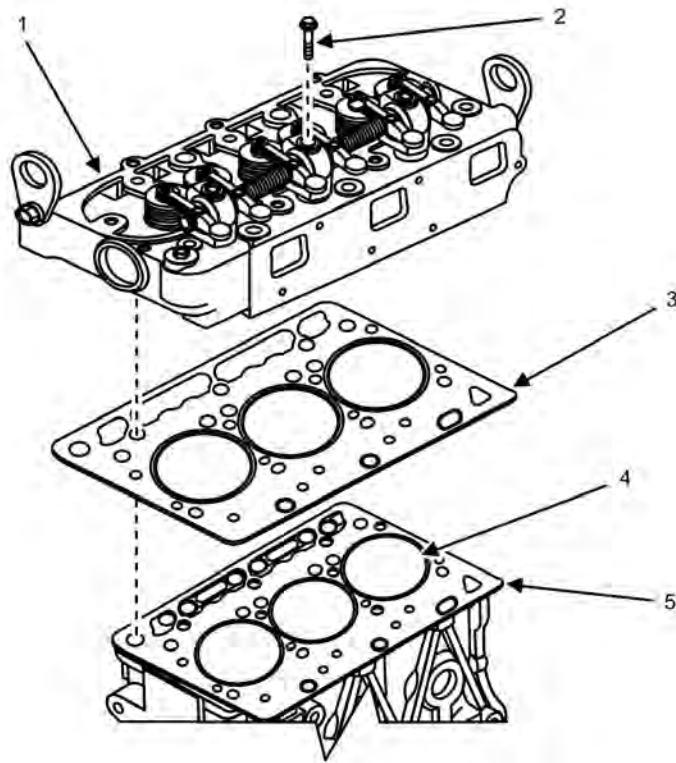


Figure 2. Remove/Install Cylinder Head — Detail.

4. Remove and discard cylinder head bolts (Figure 2, Item 2) from cylinder head (Figure 2, Item 1).

NOTE

It may be necessary to tap the cylinder head (Figure 2, Item 1) using a rubber mallet to loosen it from the engine block.

5. Remove cylinder head (Figure 2, Item 1) from engine block (Figure 2, Item 5).
6. Place cylinder head (Figure 2, Item 1) on a suitable work surface.
7. Cover cylinder bores (Figure 2, Item 4) to prevent dirt and debris from entering engine block (Figure 2, Item 5).
8. Remove and discard cylinder head gasket (Figure 2, Item 3).
9. Inspect cylinder head (Figure 2, Item 1) for cracks or damage.

NOTE

When replacing a cylinder head (Figure 2, Item 1) assembly, be sure to remove the lifting eyes and bolts from the damaged cylinder head assembly and install them on the new cylinder head assembly.

10. Notify local supervisor if replacement of cylinder head (Figure 2, Item 1) is necessary.

NOTE

When installing cylinder head gasket (Figure 2, Item 3), the metal flashing of the cylinder head gasket (Figure 2, Item 3) must face toward the cylinder head (Figure 2, Item 1).

11. Position new cylinder head gasket (Figure 2, Item 3) to its mounting location on engine block (Figure 2, Item 5) and align mounting holes.
12. Place cylinder head (Figure 2, Item 1) to its mounting location on new cylinder head gasket (Figure 2, Item 3).
13. Apply engine lubricating oil to new cylinder head bolts (Figure 2, Item 2) prior to installation.
14. Install new cylinder head bolts (Figure 2, Item 2) to positions A through N, as shown in Figure 1. Finger-tighten.

CAUTION

To prevent warping of the cylinder head (Figure 2, Item 1), install and torque the cylinder head bolts (Figure 2, Item 2) in the specific order instructed in Figure 1. Failure to comply may cause damage to equipment.

The cylinder head bolts (Figure 2, Item 2) in locations H and L (Figure 1) are longer than the other cylinder head bolts (Figure 2, Item 2). These longer cylinder head bolts (Figure 2, Item 2) must be used in locations H and L when installing the cylinder head (Figure 2, Item 1). Failure to comply may cause damage to equipment.

15. Secure cylinder head bolts (Figure 2, Item 2) to a torque value of 28 – 31 ft/lb (37 – 42 Nm) in alphabetical order from A to N, as shown in Figure 1.
16. Install water pump hose (WP 0074, Remove/Install Water Pump).
17. Install glow plug contact strip (WP 0068, Remove/Install Glow Plugs).
18. Install fuel injectors and lines (WP 0069, Remove/Install Fuel Injector).
19. Install valve cover (WP 0082, Remove/Install Valve Cover).
20. Install exhaust manifold (WP 0080, Remove/Install Exhaust Manifold).
21. Install intake manifold (WP 0079, Remove/Install Intake Manifold).
22. Install battery-charging alternator assembly (WP 0075, Remove/Install Battery-Charging Alternator).
23. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
24. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-749-10).
25. Repair as required.

END OF TASK

END OF WORK PACKAGE

**SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
WIRING DIAGRAMS**

INITIAL SETUP:**Personnel Required**

91D (1)

References

NMWR 9-6115-749

FO-1, Wiring Diagram

FO-2, Schematic Diagram

INTRODUCTION

All diagrams and essential wiring information are provided for all electrical circuits with the exception of the DCS. The wiring diagram for the DCS is provided in NMWR 9 6115-749.

WIRE IDENTIFICATION

Identification of wires is done in the FO-1, Wiring Diagram and FO-2, Schematic Diagram in the Rear Matter of this manual.

ABBREVIATIONS

Abbreviations in the wiring information conform to ASME Y14.38 unless the wires are marked as shown in the respective diagrams.

WIRING DIAGRAMS

Wiring schematics and diagrams are provided in FO-1, Wiring Diagram and FO-2, Schematic Diagram located in the Rear Matter of this manual.

END OF WORK PACKAGE

CHAPTER 6

PARTS INFORMATION

FOR

AMMPS 5KW GENERATOR SET

CHAPTER 6

PARTS INFORMATION

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
RPSTL INTRODUCTION	0098
GENERATOR SET REPAIR PARTS LIST	0099
DC ELECTRIC INSTALLATION REPAIR PARTS LIST	0100
RELAY PANEL ASSEMBLY REPAIR PARTS LIST	0101
HOUSING INSTALLATION REPAIR PARTS LIST	0102
DCS INSTALLATION REPAIR PARTS LIST	0103
DCS CONTROL PANEL ASSEMBLY REPAIR PARTS LIST	0104
DCS ENCLOSURE ASSEMBLY REPAIR PARTS LIST	0105
INTAKE AIR INSTALLATION REPAIR PARTS LIST	0106
EXHAUST INSTALLATION REPAIR PARTS LIST	0107
COOLING SYSTEM INSTALLATION REPAIR PARTS LIST	0108
FUEL SYSTEM INSTALLATION REPAIR PARTS LIST	0109
FUEL MANIFOLD ASSEMBLY REPAIR PARTS LIST	0110
FUEL FILTER/WATER SEPARATOR ASSEMBLY REPAIR PARTS LIST	0111
OUTPUT BOX INSTALLATION REPAIR PARTS LIST	0112
CONTACTOR REPAIR PARTS LIST	0113
OUTPUT TERMINAL BOARD REPAIR PARTS LIST	0114
VOLTAGE SELECTION SWITCH REPAIR PARTS LIST	0115
HOUR METER REPAIR PARTS LIST	0116
CONVENIENCE RECEPTACLE ASSEMBLY REPAIR PARTS LIST	0117
TRANSFORMERS REPAIR PARTS LIST	0118
PRINTED CIRCUIT BOARD MODULE REPAIR PARTS LIST	0119
POWER PLANT INSTALLATION REPAIR PARTS LIST	0120
AC GENERATOR ASSEMBLY, 50/60 HZ REPAIR PARTS LIST	0121
AC GENERATOR ASSEMBLY, 400 HZ REPAIR PARTS LIST	0122
ENGINE ASSEMBLY REPAIR PARTS LIST	0123
LUBRICATION SYSTEM REPAIR PARTS LIST	0124
ENGINE SPEED SENSOR REPAIR PARTS LIST	0125
GLOW PLUGS REPAIR PARTS LIST	0126
FUEL INJECTORS REPAIR PARTS LIST	0127
SPEED CONTROL PLATE REPAIR PARTS LIST	0128

<u>Title</u>	<u>WP Sequence No.</u>
FUEL INJECTION PUMP REPAIR PARTS LIST	0129
THERMOSTAT INSTALLATION REPAIR PARTS LIST	0130
WATER PUMP REPAIR PARTS LIST	0131
BATTERY-CHARGING ALTERNATOR AND BELT REPAIR PARTS LIST	0132
STARTER REPAIR PARTS LIST	0133
GOVERNOR ACTUATOR REPAIR PARTS LIST	0134
INTAKE MANIFOLD REPAIR PARTS LIST	0135
EXHAUST MANIFOLD REPAIR PARTS LIST	0136
OIL PAN AND STRAINER REPAIR PARTS LIST	0137
FLYWHEEL REPAIR PARTS LIST	0138
CRANKCASE REAR BEARING CASE COVER REPAIR PARTS LIST	0139
CYLINDER HEAD ASSEMBLY REPAIR PARTS LIST	0140
VALVE COVER REPAIR PARTS LIST	0141
ENGINE VALVES REPAIR PARTS LIST	0142
ROCKER ARMS AND PUSH RODS REPAIR PARTS LIST	0143
SHORT BLOCK ASSEMBLY REPAIR PARTS LIST	0144
CONNECTING RODS AND PISTONS REPAIR PARTS LIST	0145
CRANKSHAFT REPAIR PARTS LIST	0146
GEAR CASE COVER REPAIR PARTS LIST	0147
HARMONIC BALANCER REPAIR PARTS LIST	0148
CAMSHAFT AND GEAR REPAIR PARTS LIST	0149
IDLER GEAR REPAIR PARTS LIST	0150
FUEL CAMSHAFT AND FORK ASSEMBLY REPAIR PARTS LIST	0151
OIL PUMP AND GEAR REPAIR PARTS LIST	0152
ENGINE WIRING HARNESS REPAIR PARTS LIST	0153
POWER WIRING HARNESS REPAIR PARTS LIST	0154
WINTERIZATION KIT INSTALLATION REPAIR PARTS LIST	0155
BULK ITEM	0156
SPECIAL TOOLS LIST	0157
NATIONAL STOCK NUMBER (NSN) INDEX	0158
PART NUMBER INDEX	0159

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
RPSTL INTRODUCTION

INTRODUCTION

SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of operator and field maintenance of the AMMPS 5 kW generator set. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

GENERAL

In addition to the Introduction work package, this RPSTL is divided into the following work packages.

1. **Repair Parts List Work Packages.** Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and work package. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.
2. **Special Tools List Work Packages.** Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.
3. **Cross-Reference Indexes Work Packages.** There are two cross reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The National Stock Number (NSN) Index work package refers you to the figure and item number. The Part Number (P/N) Index work package refers you to the figure and item number.

EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIALTOOLS LIST WPS

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout. This entry may be subdivided into four subentries, one for each service.

Table 1. SMR Code Explanation.

Source Code <u>XX</u>	Maintenance Code <u>XX</u>	Recoverability Code <u>X</u>
1st two positions: How to get an item.	3rd position: Who can install, replace, or use the item.	4th position: Who can do complete repair* on the item.
		5th position: Who determines the disposition action on unserviceable items.

*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

<u>Source Code</u>	<u>Application/Explanation</u>
---------------------------	---------------------------------------

PA
PB
PC
PD
PE
PF
PG
PH
PR
PZ

NOTE

Items coded PC are subject to deterioration.

Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code.

KD
KF
KB

Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.

MF-Made at field level
MH-Made at below depot/sustainment level
ML-Made at SRA
MD-Made at depot
MG-Navy only

Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by P/N in the DESCRIPTION AND UOC column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the third position code of the SMR code, but the source indicates it is made at a higher level, order the item from the higher level of maintenance.

AF-Assembled by field level
AH-Assembled by below depot/sustainment level
AL-Assembled by SRA
AD-Assembled by depot
AG-Navy only

Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated in the source code. If the third position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.

XA

Do not requisition an "XA" coded item. Order the next higher assembly. (Refer to NOTE below.)

XB

If an item is not available from salvage, order it using the CAGEC and part number.

XC

Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's part number.

Source Code**Application/Explanation**

XD

Item is not stocked. Order an XD-coded item through local purchase or normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

Maintenance**Code****Application/Explanation**

C -

Crew

F -

Field maintenance can remove, replace, and use the item.

H -

Below Depot Sustainment maintenance can remove, replace, and use the item.

L -

Specialized repair activity can remove, replace, and use the item.

G -

Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only).

K -

Contractor facility can remove, replace, and use the item.

Z -

Item is not authorized to be removed, replaced, or used at any maintenance level.

D -

Depot can remove, replace, and use the item.

*NOTE - Army will use C in the third position. However, for joint service publications, other services may use O.

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

NOTE

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance**Code****Application/Explanation**

C -

Crew (operator) is the lowest class that can do complete repair.

F -

Field is the lowest level that can do complete repair of the item.

H -

Below Depot Sustainment is the lowest level that can do complete repair of the item.

L -

Specialized repair activity (*enter specialized repair activity or TASMG designator*) is the lowest level that can do complete repair of the item.

D -

Depot is the lowest level that can do complete repair of the item.

G -	Both afloat and ashore intermediate levels are capable of complete repair of item. (Navy only).
K -	Complete repair is done at contractor facility.
Z -	Nonreparable. No repair is authorized.
B -	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

Recoverability Code	Application/Explanation
Z -	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
F -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the field level.
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the below depot sustainment level.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L -	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A -	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G -	Field level reparable item. Condemn and dispose at either afloat or ashore intermediate levels. (Navy only).
K -	Reparable item. Condemnation and disposal to be performed at contractor facility.

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the number listed.

DESCRIPTION AND UOC (Column (6)). This column includes the following information:

1. The federal item name and, when required, a minimum description to identify the item.
2. Part numbers of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.

4. The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.

QTY (Column (7)). The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, sub-functional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES FORMAT AND COLUMNS

1. National Stock Number (NSN) Index Work Package. NSNs in this index are listed in National Item Identification Number (NIIN) sequence.

STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

For example, if the NSN is 5385-01-574-1476, the NIIN is 01-574-1476.

FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index work package. Part numbers in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. Indicates the part number assigned to the item.

FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

SPECIAL INFORMATION

UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC:..." in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the UOCs used in the RPSTL are:

<u>Code</u>	<u>Used On</u>
98E	Model MEP 1030
98F	Model MEP 1031

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in applicable TM.

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / Part Number (P/N) Index work packages and the bulk material list in the repair parts list work package.

HOW TO LOCATE REPAIR PARTS

1. When NSNs or Part Numbers Are Not Known.

First. Using the Table of Contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work package for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN Index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

3. When Part Number Is Known.

First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number index WP. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.

ABBREVIATIONS

Not applicable.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
GENERATOR SET REPAIR PARTS LIST

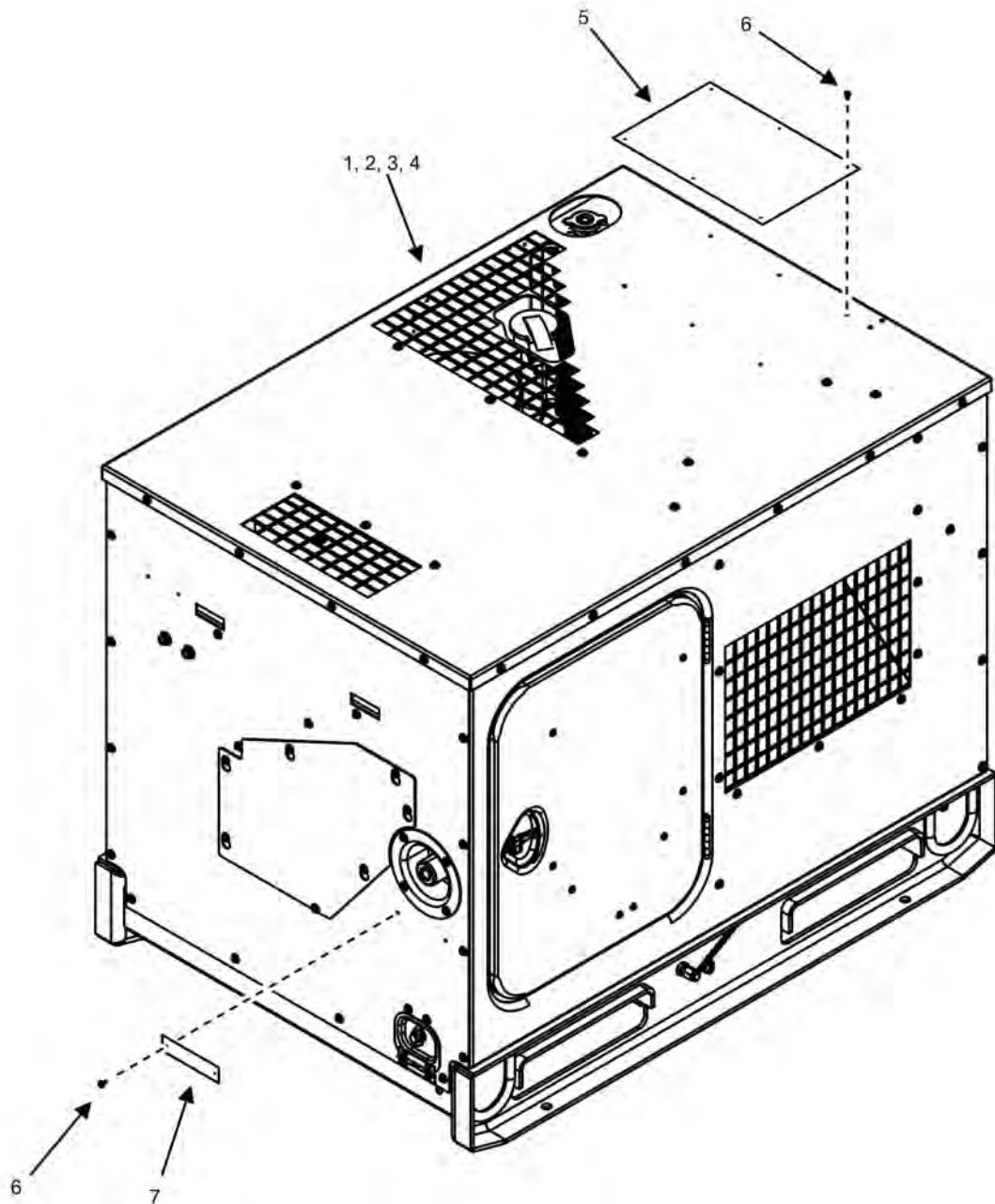


Figure 1. Generator Set (Sheet 1 of 6).

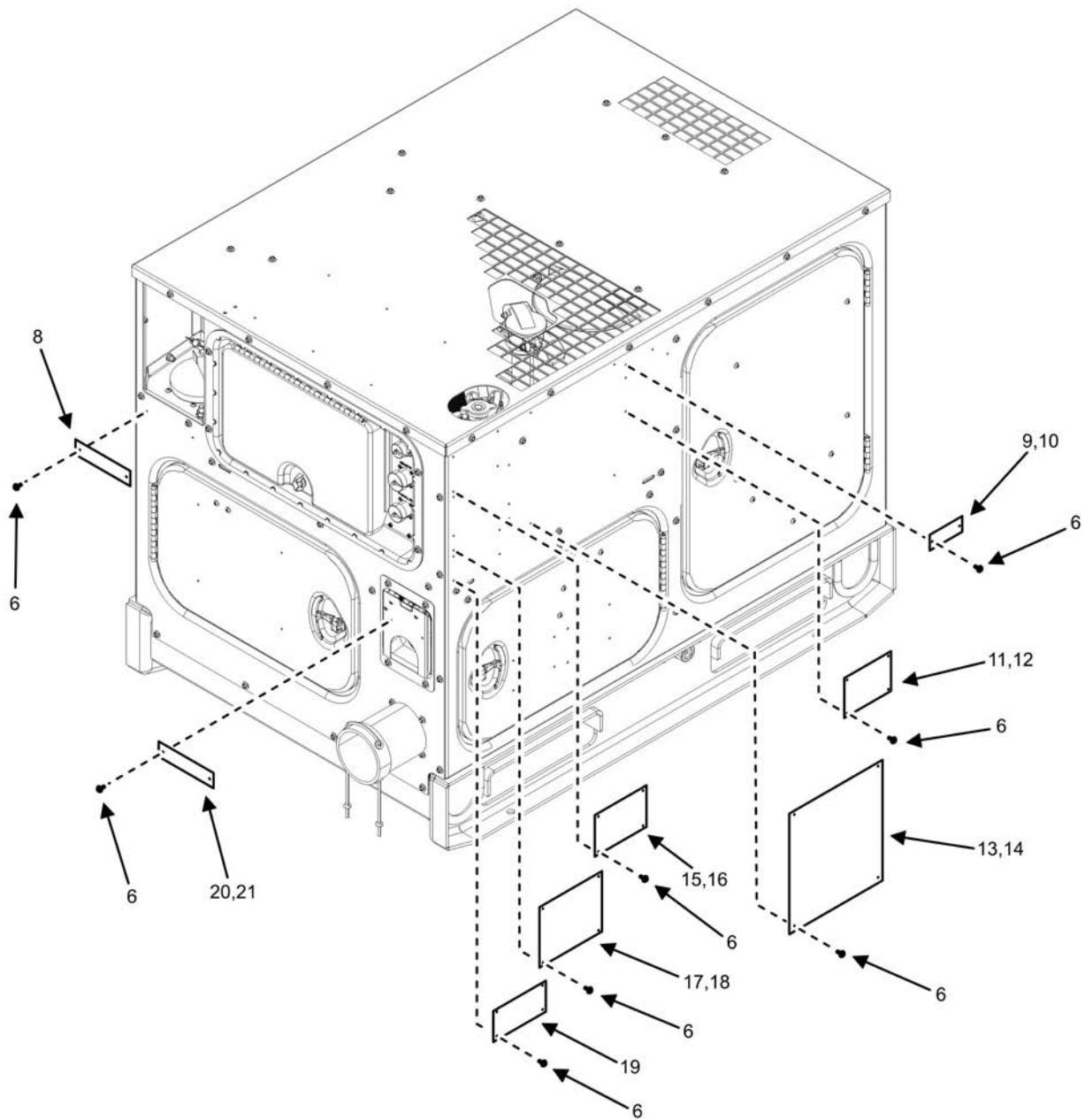


Figure 1. Generator Set (Sheet 2 of 6).

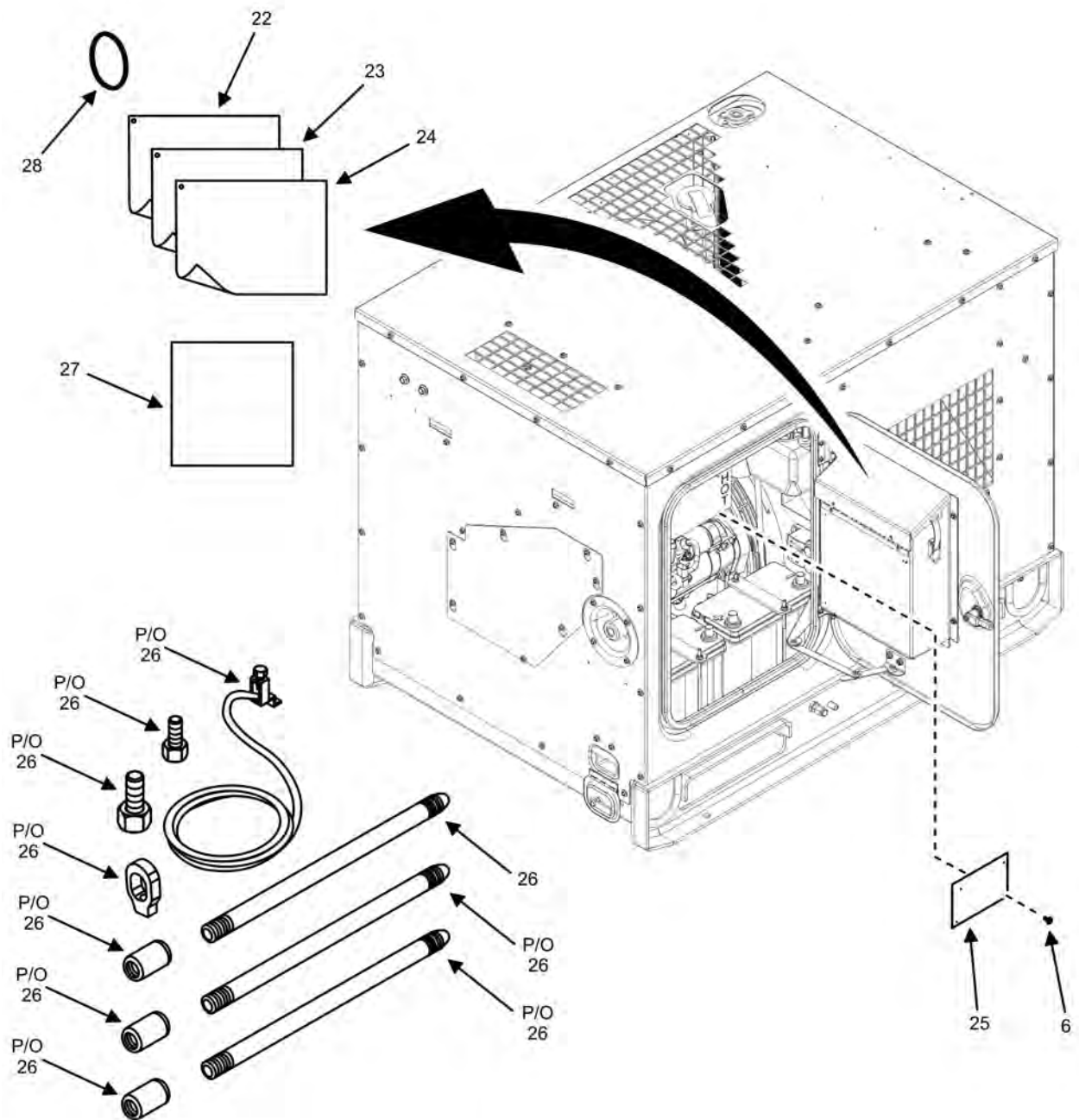


Figure 1. Generator Set (Sheet 3 of 6).

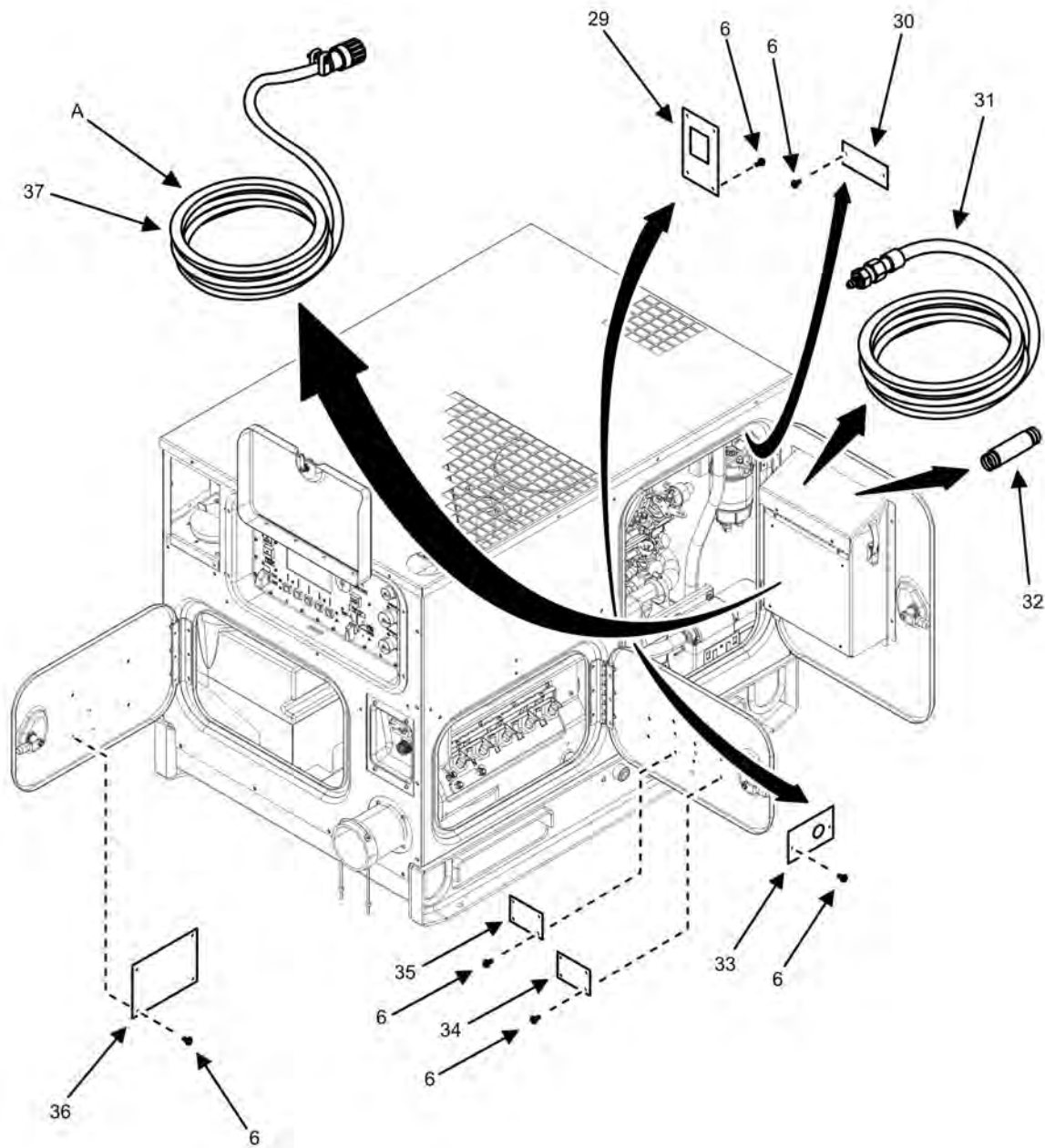


Figure 1. Generator Set (Sheet 4 of 6).

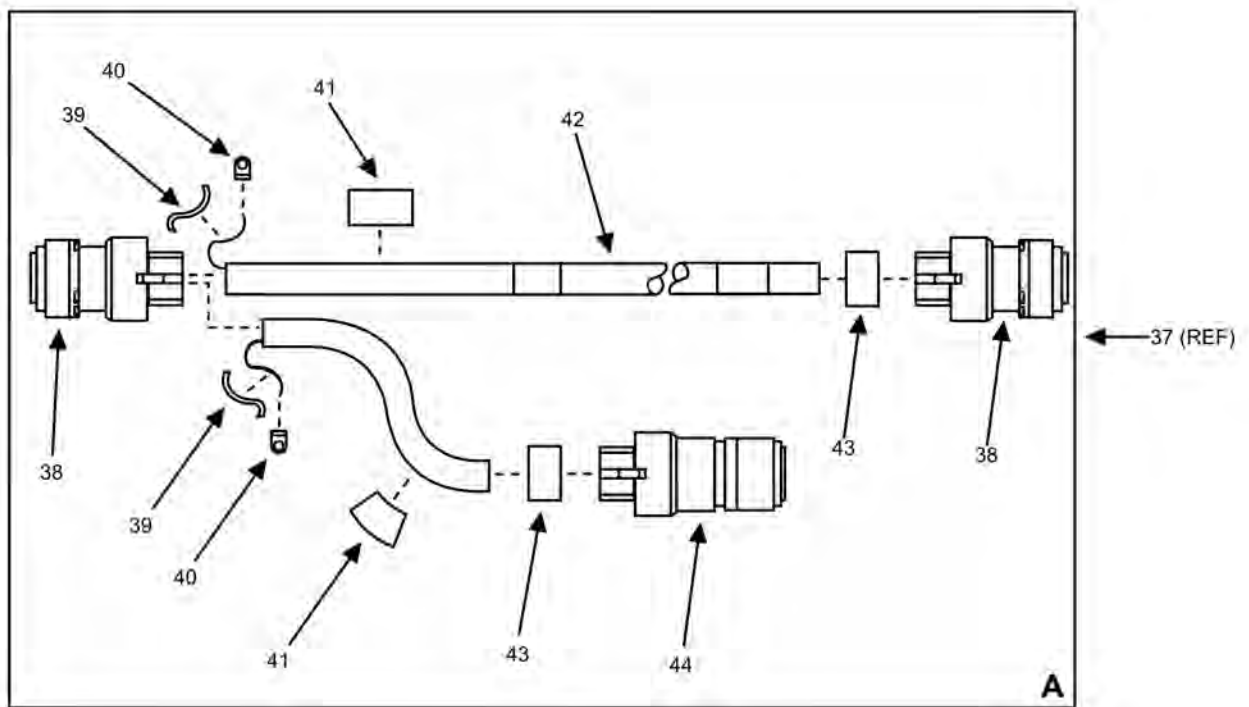


Figure 1. Generator Set (Sheet 5 of 6).

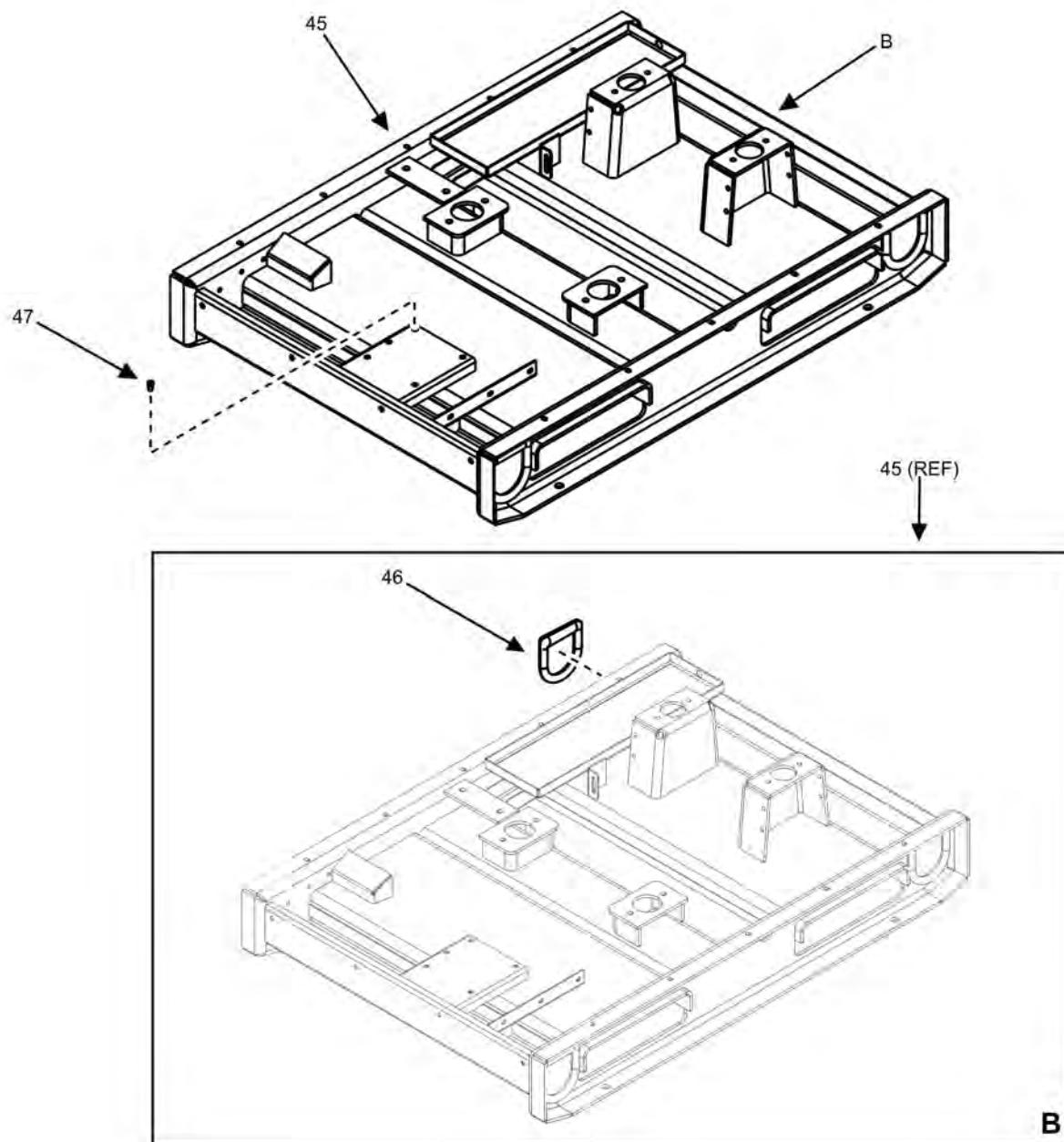


Figure 1. Generator Set (Sheet 6 of 6).

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 00	
								FIG. 1 GENERATOR SET	
1	PAFHH	PAFHH	PAFFF	PAFFF	6115015617329	30554	MEP-1030	GENERATOR SET, DIESEL UOC: 98E	1
2	PAFHH	PAFHH	PAFFF	PAFFF	6115015617438	30554	MEP-1031	GENERATOR SET, DIESEL UOC: 98F	1
3	XAFHH	XAFHH	XBFFF	XBFFF		30554	04-21130	.GENERATOR ASSEMBLY UOC: 98E	1
4	XAFHH	XAFHH	XBFFF	XBFFF		30554	04-21131	.GENERATOR ASSEMBLY UOC: 98F	1
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21026	.PLATE, OPERATING INSTRUCTIONS	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5320009321972	81349	M24243/6-A402H	.RIVET, BLIND	66
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20075	.PLATE, SLAVE, RECEPTACLE	
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21236	.PLATE, FUEL	1
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21078-1	.PLATE, UID IDENTIFICATION UOC: 98E	1
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21078-2	.PLATE, UID IDENTIFICATION UOC: 98F	1
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21077-1	.PLATE, IDENTIFICATION, GENERATOR SET UOC: 98E	1
12	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21077-2	.PLATE, IDENTIFICATION, GENERATOR SET UOC: 98F	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21023-1	.PLATE, LIFTING AND TIE DOWN UOC: 98E	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21023-2	.PLATE, LIFTING AND TIE DOWN UOC: 98F	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21024-1	.PLATE, IDENTIFICATION, OTAN UOC: 98E	1
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21024-2	.PLATE, IDENTIFICATION, OTAN UOC: 98F	1
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21022-1	.PLATE, SET RATING UOC: 98E	1
18	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21022-2	.PLATE, SET RATING UOC: 98F	1
19	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21011-1	.PLATE, SYSTEM CAPACITY	1
20	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21237	.PLATE, PARALLELING, RECEPTACLE UOC: 98E	1
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21240	.PLATE, PARALLELING, RECEPTACLE UOC: 98F	1
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20000-1	.LAMINATE, WIRING DIAGRAM 5KW, 50/60/400 HZ	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
23	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20000-2	.LAMINATE, WIRING DIAGRAM 5KW, 50/60/400 HZ	1
24	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20000-3	.LAMINATE, WIRING DIAGRAM 5KW, 50/60/400 HZ	1
25	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21025	.PLATE, BATTERY CONNECTION	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975008783791	58536	AA55804-3B 9FT	.ROD, GROUND	1
27	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21348	.PLATE, WIRING DIAGRAM	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	98-19694	.BOOK RING	1
29	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21106	.PLATE, INFORMATION	1
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21016	.PLATE, FIRST FUEL FILTER	1
31	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720000213320	01276	FA1493FFF3000	.HOSE ASSEMBLY, FUEL	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		39428	9176K155	.NIPPLE, PIPE	1
33	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-21776	.PLATE, DEAD CRANK	1
34	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20110	.PLATE, CAUTION, VOLTAGE	1
35	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21475-1	.PLATE, GROUNDING STUD	1
36	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21017-1	.PLATE, INFORMATION, FUEL	1
37	PAFFF	PAFFF	PAFFF	PAFFF	6150015860026	44940	04-21228	.HARNES, CONTROL	1
38	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0PCR1	CD3106E18-19P	..CONNECTOR, PLUG, ELECTRICAL	2
39	XBFZZ	XBFZZ	XBFZZ	XBFZZ		85901	ATUM 24/6-0	..SLEEVE, HEAT SHRINK (CUT TO LENGTH AS NEEDED FROM ATUM 24/6-0 ON BULK ITEMS LIST)	2
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940004640117	00779	36152	..TERMINAL, RING	2
41	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG3T3-100B	..LAMINATE, LABEL	4
42	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0PCR1	CD042256C	..CABLE, SHEILDED (CUT TO LENGTH AS NEEDED FROM 09130SWC8 ON BULK ITEMS LIST)	1
43	MFFZZ	MFFZZ	MFFZZ	MFFZZ		30554	88-20541-1	..INSULATION SLEEVING (CUT TO LENGTH AS NEEDED FROM 88- 20541-1 ON BULK ITEMS LIST)	2
44	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0PCR1	CD3101E18-19S	..CONNECTOR, PLUG, ELECTRICAL	1
45	XAFFF	XAFFF	XAFFF	XAFFF		44940	04-20538	.SKID ASSEMBLY	1
46	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20499	..EYE, LIFTING	4
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	.NUT, PLAIN, CLINCH	12
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
DC ELECTRIC INSTALLATION REPAIR PARTS LIST

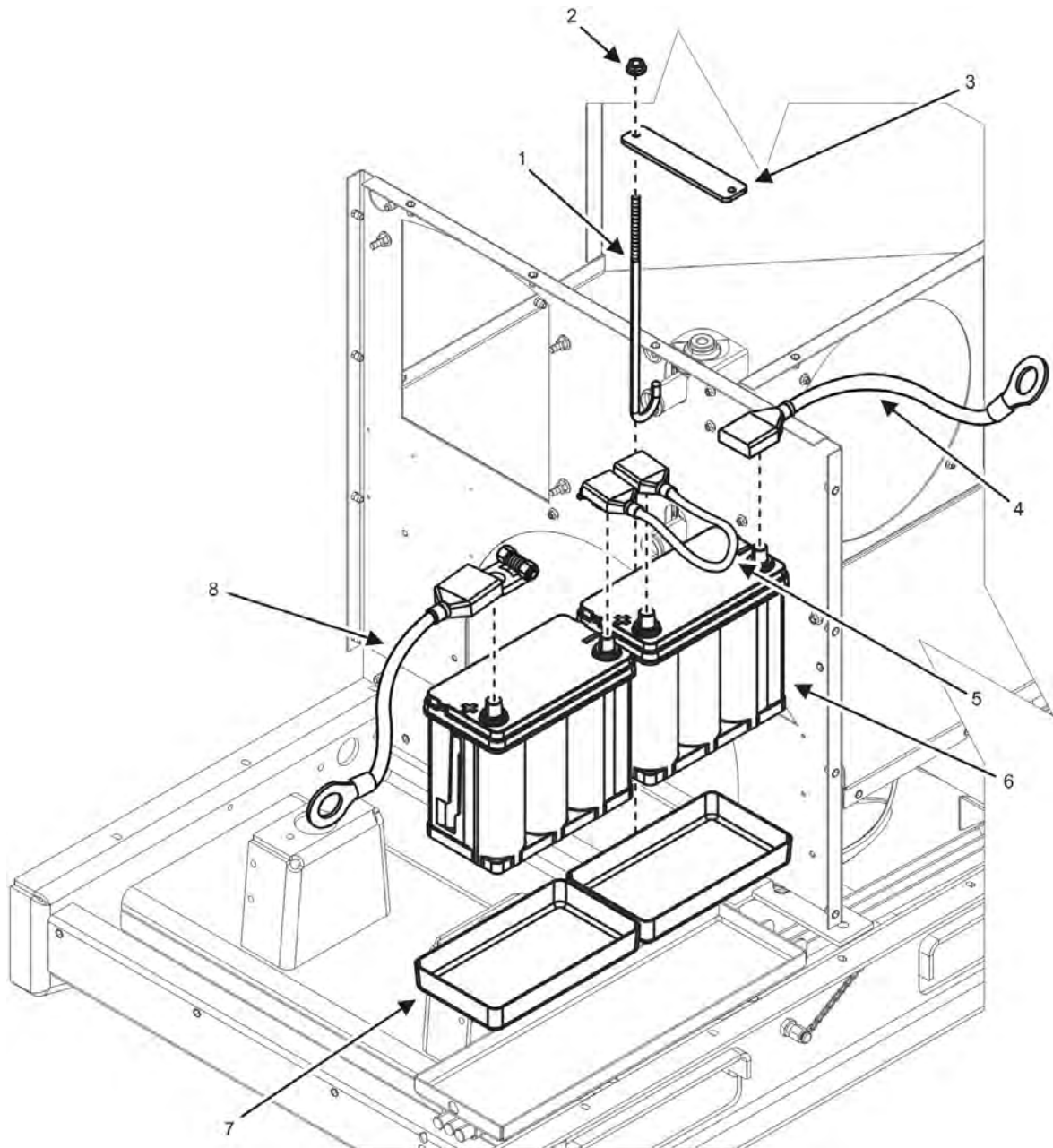


Figure 2. DC Electric Installation (Sheet 1 of 4).

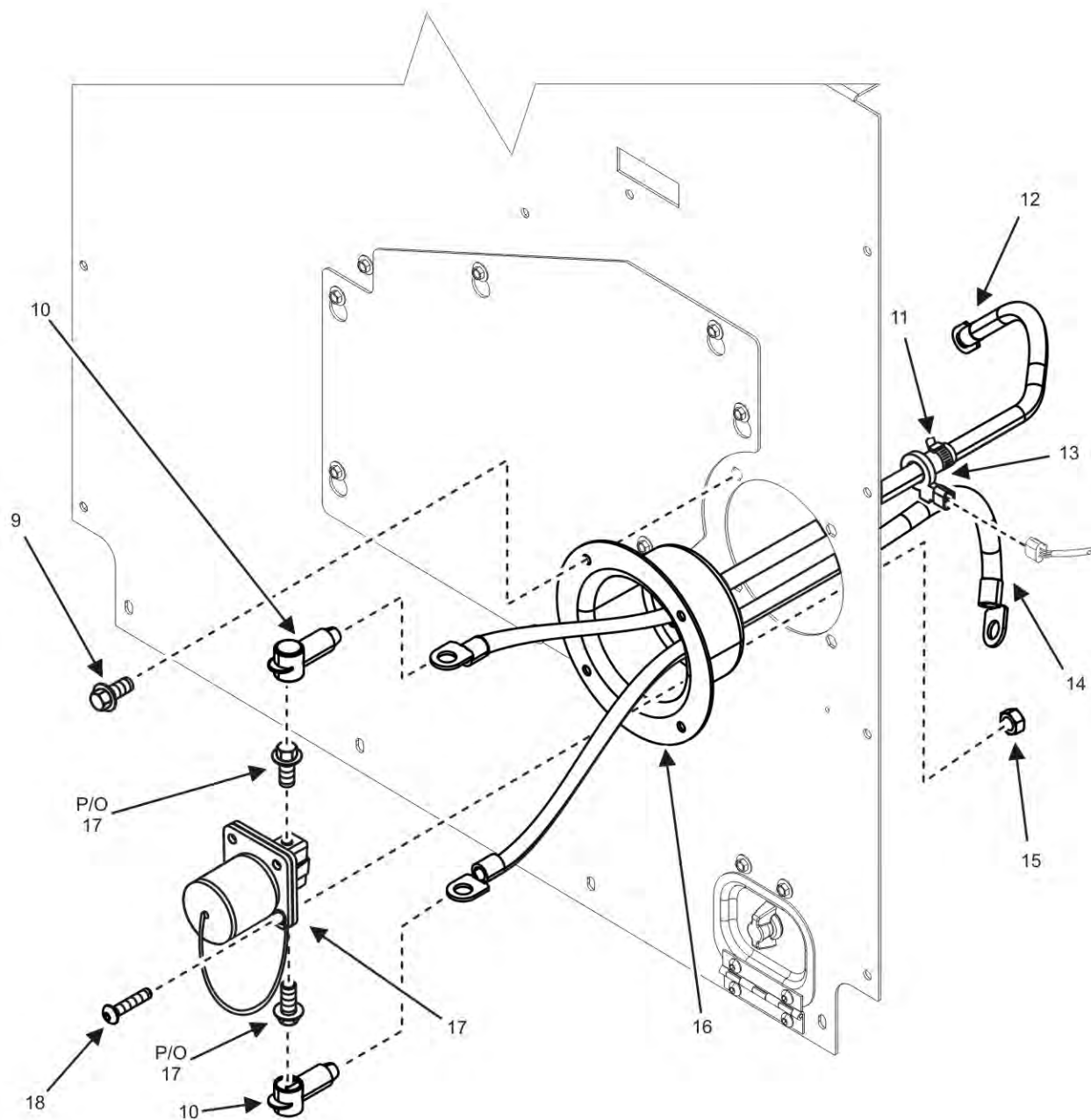


Figure 2. DC Electric Installation (Sheet 2 of 4).

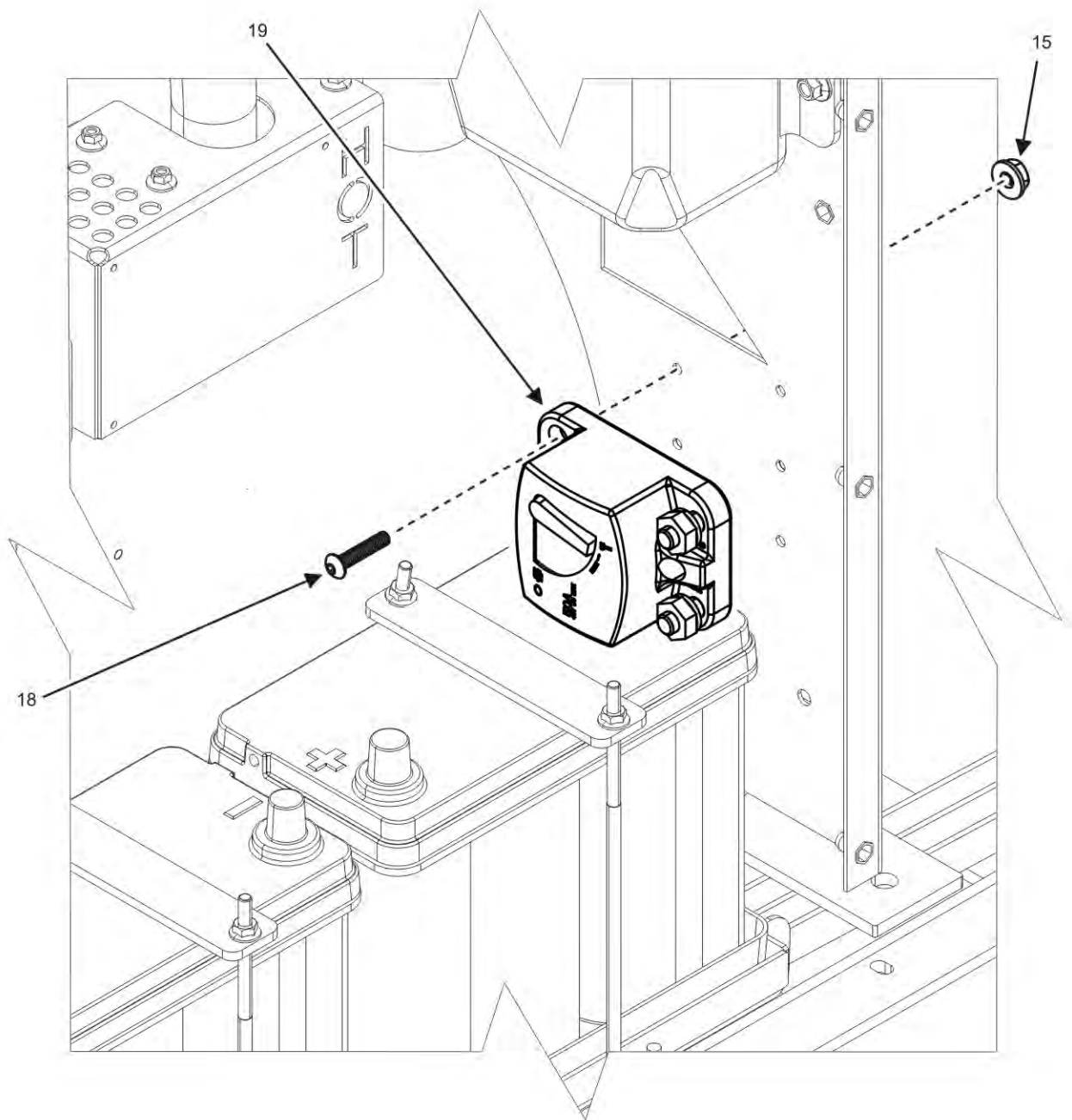


Figure 2. DC Electric Installation (Sheet 3 of 4).

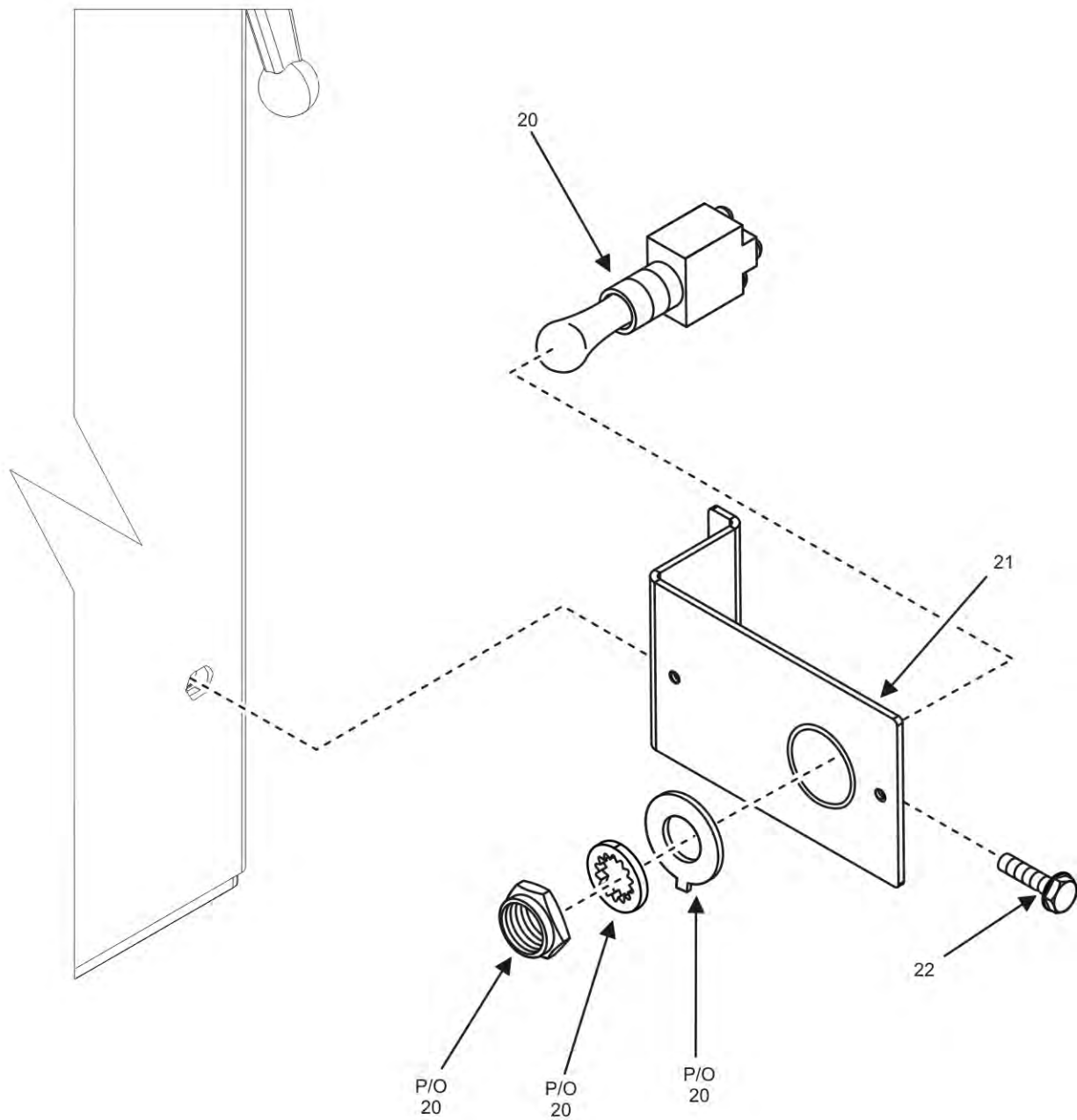


Figure 2. DC Electric Installation (Sheet 4 of 4).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
							GROUP 01	
							FIG. 2 DC ELECTRIC INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 04-21107	.RETAINER, BATTERY	4
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 DIN6923-M6	.NUT, PLAIN, EXTENDED	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 04-20849	.RETAINER, BATTERY, PLATE	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015926629	44940 04-20674-2	.LEAD, BATTERY, NEGATIVE	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015926626	44940 04-20673-1	.LEAD, ELECTRICAL, JUMPER	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554 88-22836	.BATTERY, STORAGE	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6160015926648	44940 04-20585	.TRAY, BATTERY	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 04-20674-1	.LEAD, BATTERY, POSITIVE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4M343 44832	.SCREW	4
10	PCFZZ	PCFZZ	PCFZZ	PCFZZ		1HDR0 222E3T02	.BOOT, DUST AND MOISTURE	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		06383 PLT4S-M30	.STRAP, TIEDOWN, ELECTRICAL	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015926743	44940 04-20675-1	.LEAD, ELECTRICAL, NATO SLAVE, POSITIVE	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6625015926232	0S2B6 HAB-80-S	.SENSOR, CURRENT	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015926746	44940 04-20675-2	.LEAD, ELECTRICAL, NATO SLAVE, NEGATIVE	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310011688140	D1FH08 DIN934M5	.NUT	7
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ	44940	04-20645	.TERMINAL BOX	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935010979974	19207 11674728	.CONNECTOR, RECEPTACLE	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 DIN7380A2-M5X25	.SCREW, CAP, SOCKET HEAD	7
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015876954	1UW16 187050F-03-1	.CIRCUIT BREAKER	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930006831625	96906 MS24523-31	.SWITCH, TOGGLE, DEAD CRANK	1
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940 04-21343	.BRACKET, DEAD CRANK SWITCH	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 AES10M06A016WB4K42	.SCREW, CAP, HEXAGON	1
							END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
RELAY PANEL ASSEMBLY REPAIR PARTS LIST

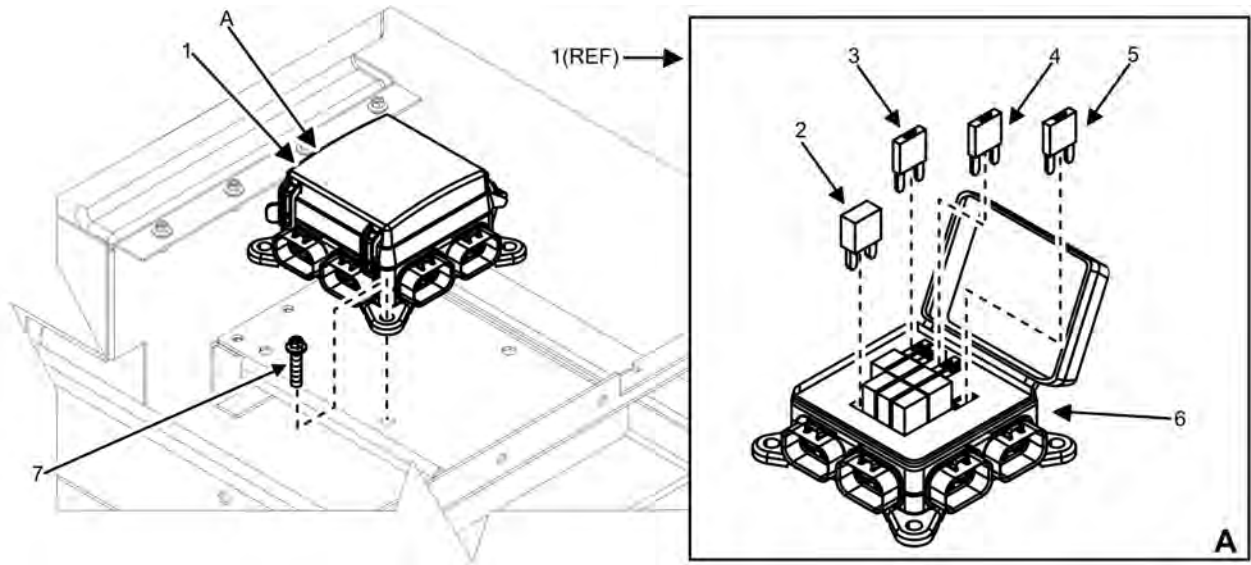


Figure 3. Relay Panel Assembly.

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 0101	
									FIG. 3 RELAY PANEL ASSEMBLY	
1	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20209		.PANEL, RELAY	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1UW16	B120-7032		..RELAY	8
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015694427	1UW16	22320-200		..CIRCUIT BREAKER	5
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015715799	1UW16	22330-200		..CIRCUIT BREAKER	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015696394	1UW16	22310-200		..CIRCUIT BREAKER	2
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		1UW16	31S-283-0U		..HOUSING, PANEL, RELAY	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K42		.SCREW, CAP, HEXAGON HEAD	4
									END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
HOUSING INSTALLATION REPAIR PARTS LIST**

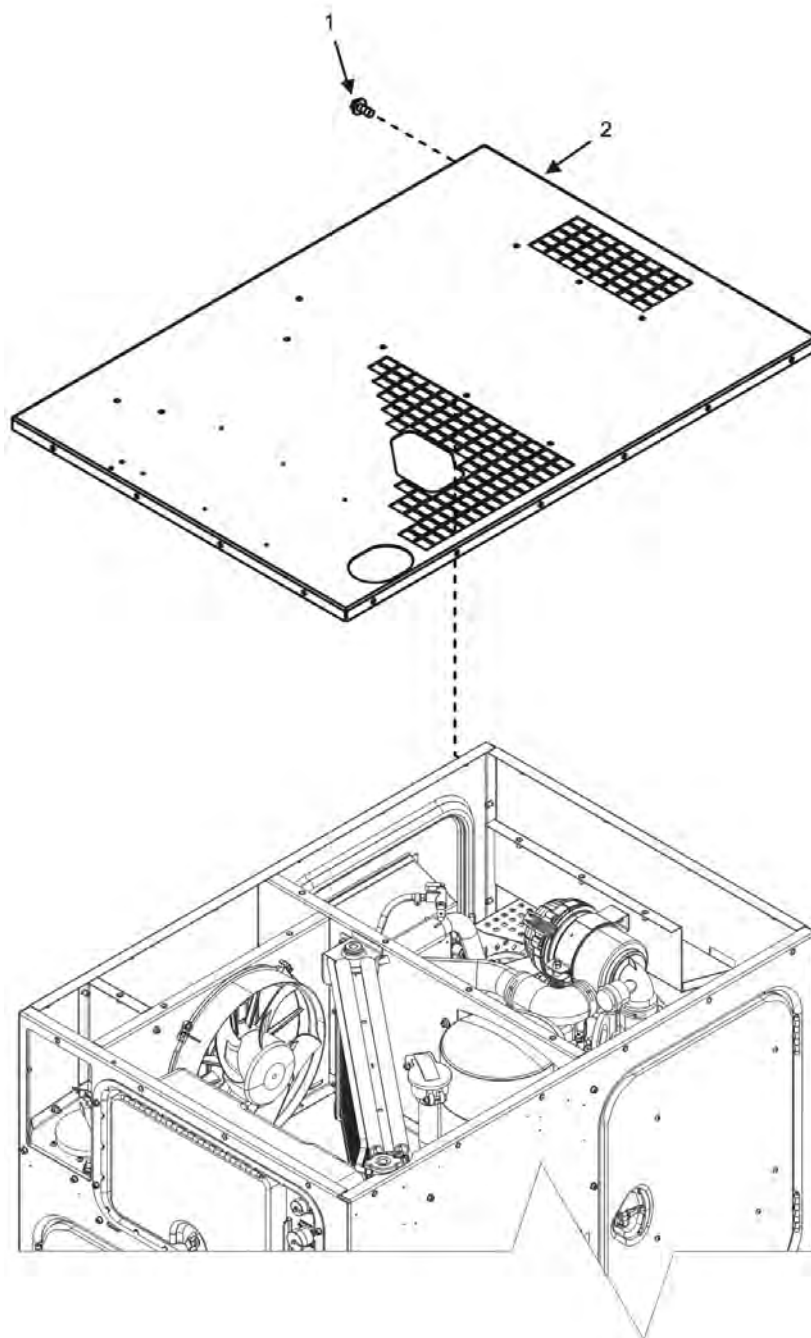


Figure 4. Housing Installation (Sheet 1 of 15).

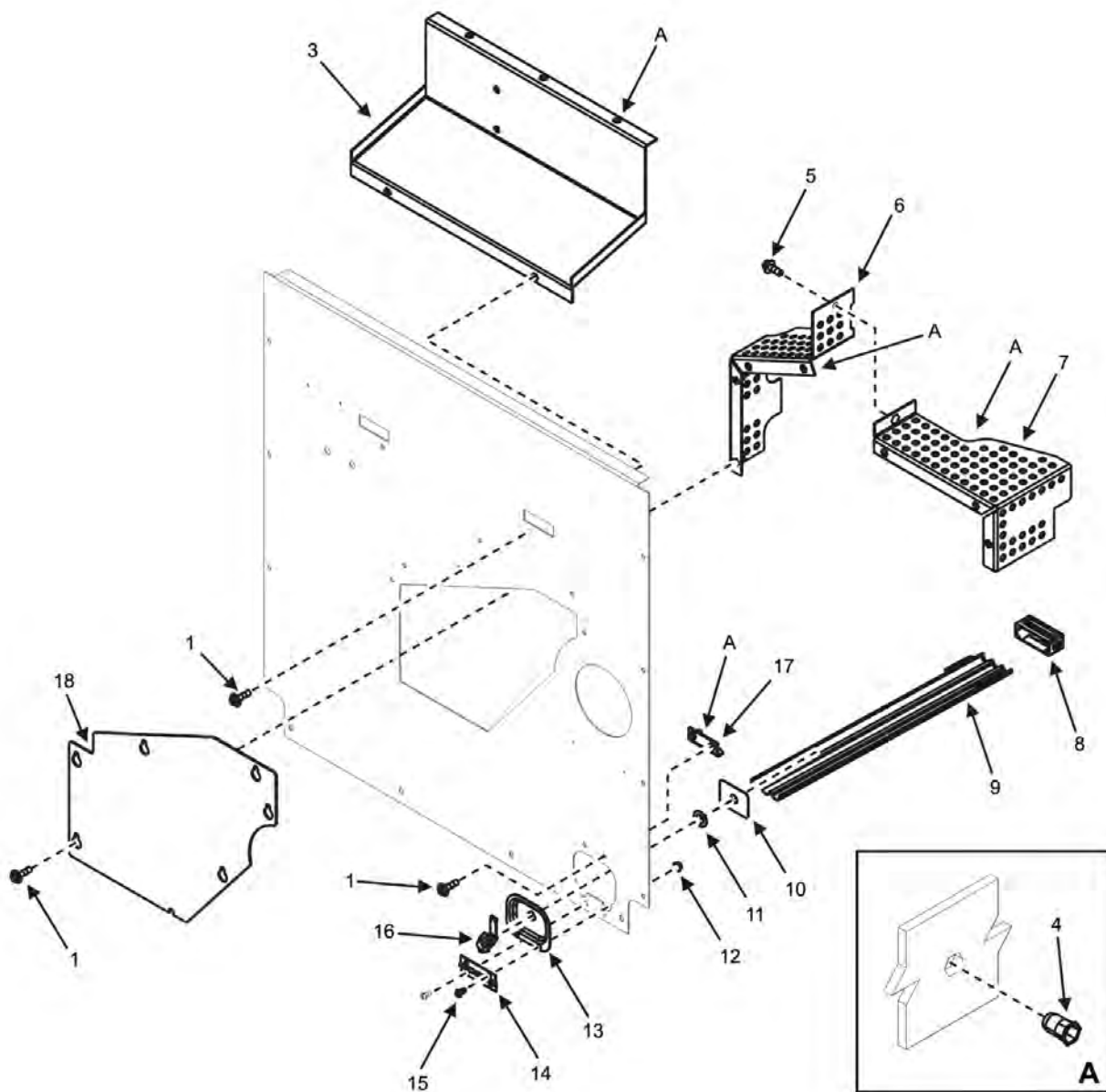


Figure 4. Housing Installation (Sheet 2 of 15).

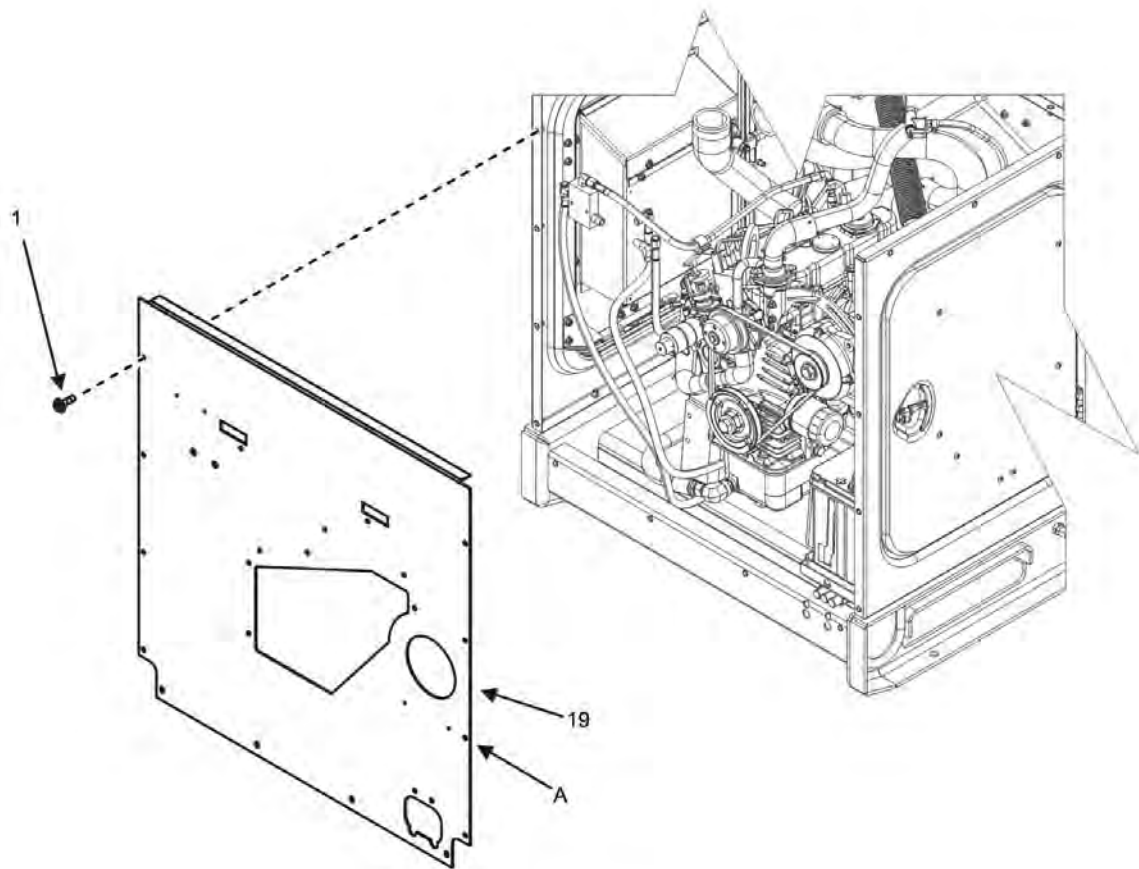


Figure 4. Housing Installation (Sheet 3 of 15).

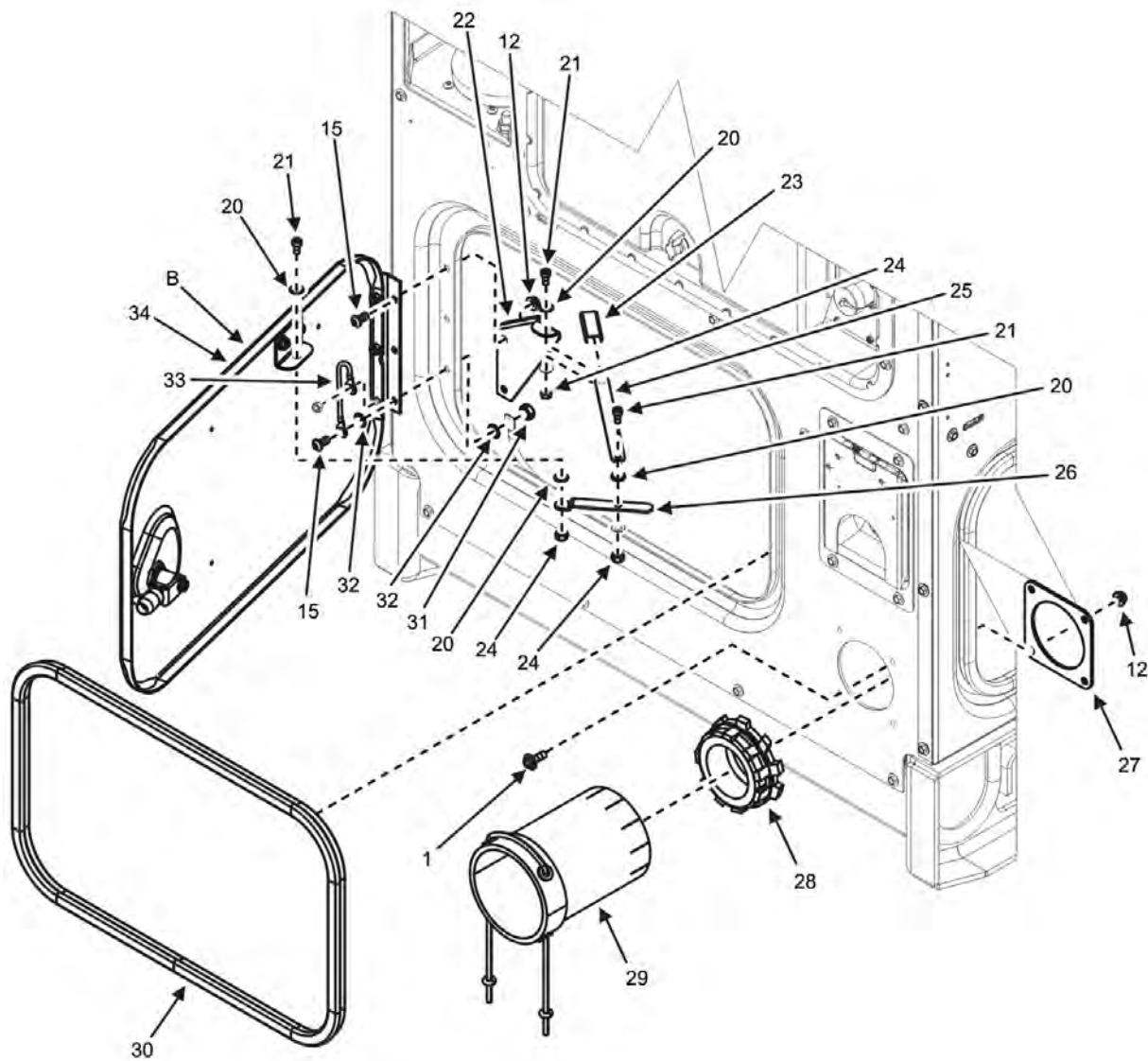


Figure 4. Housing Installation (Sheet 4 of 15).

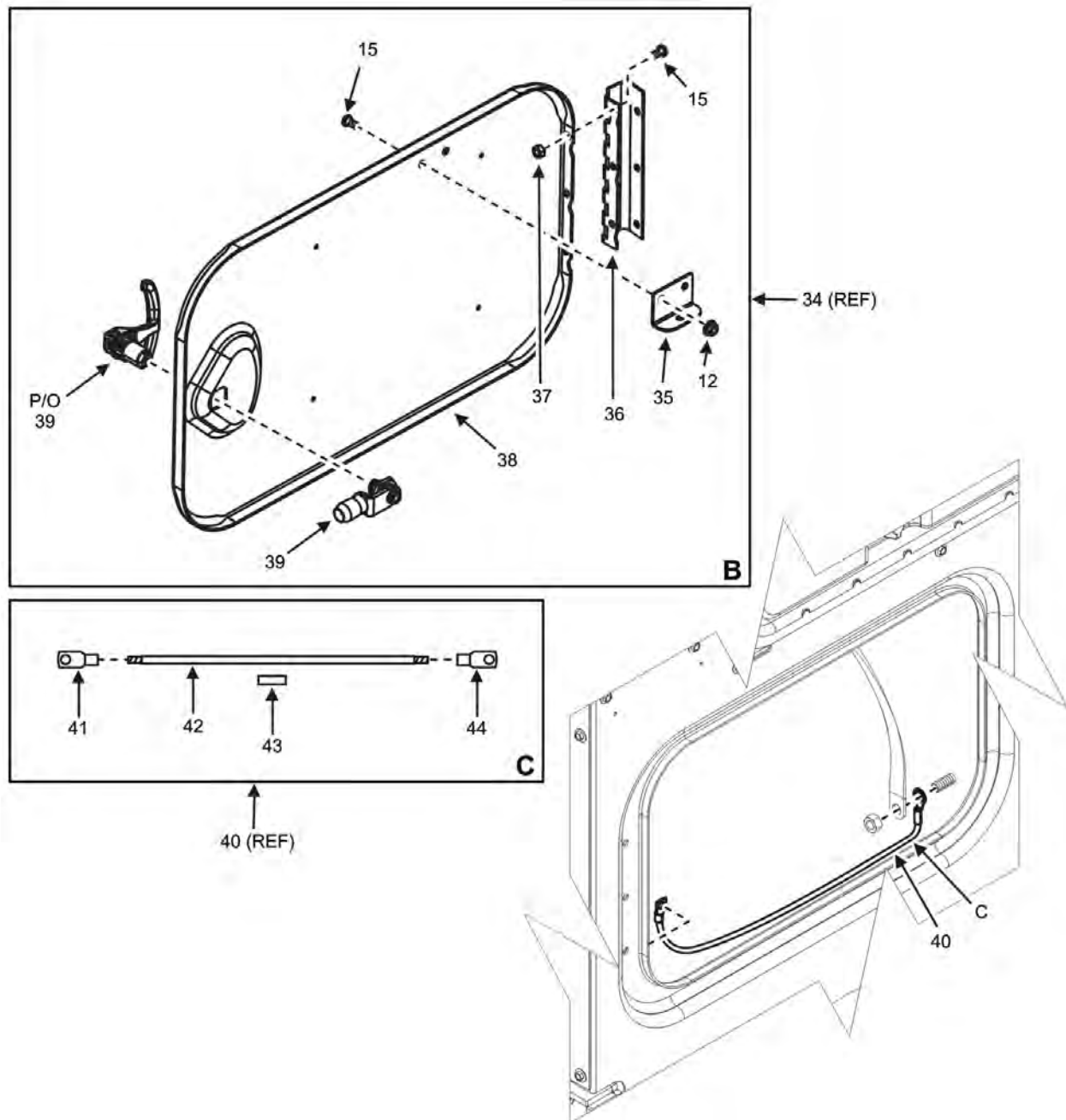


Figure 4. Housing Installation (Sheet 5 of 15).

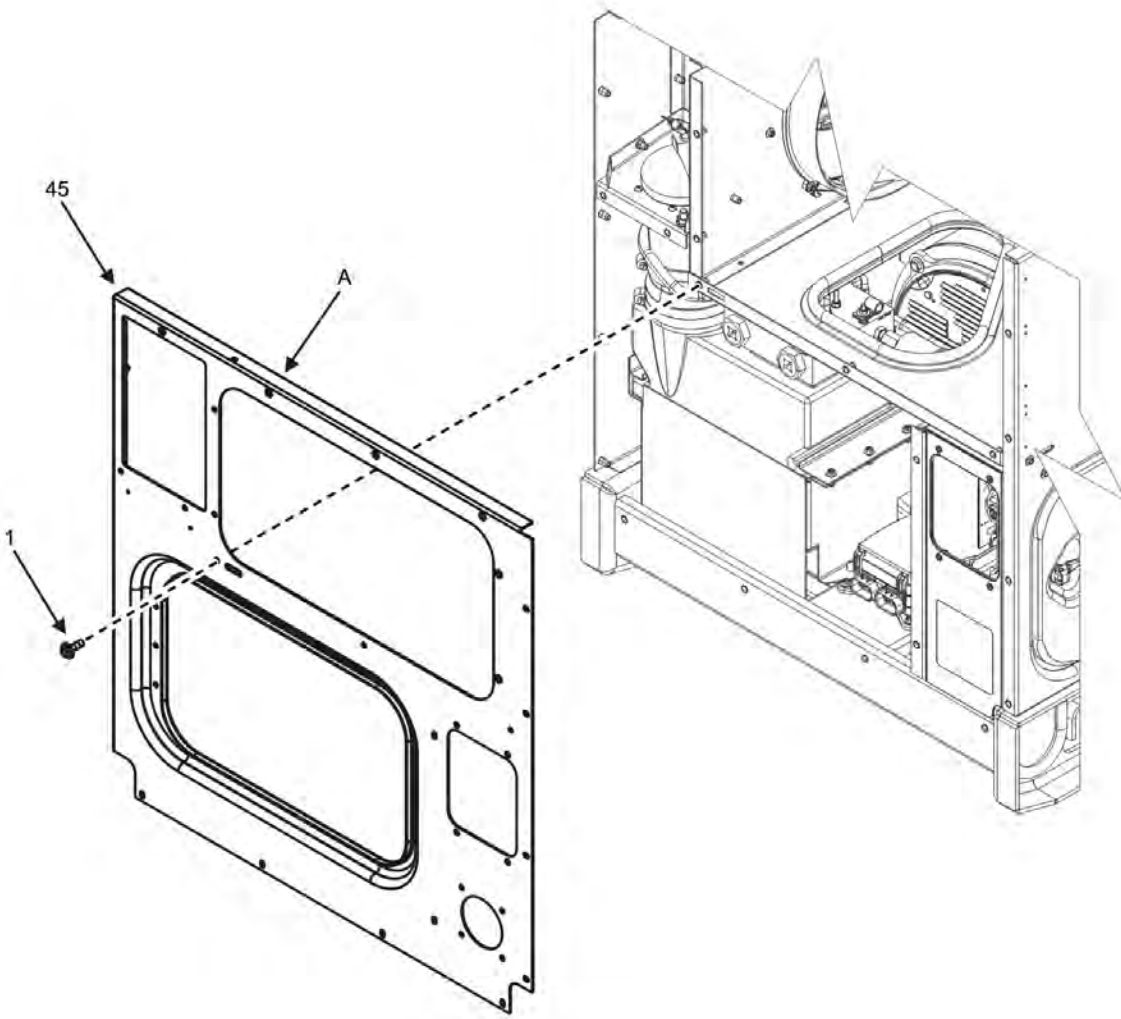


Figure 4. Housing Installation (Sheet 6 of 15).

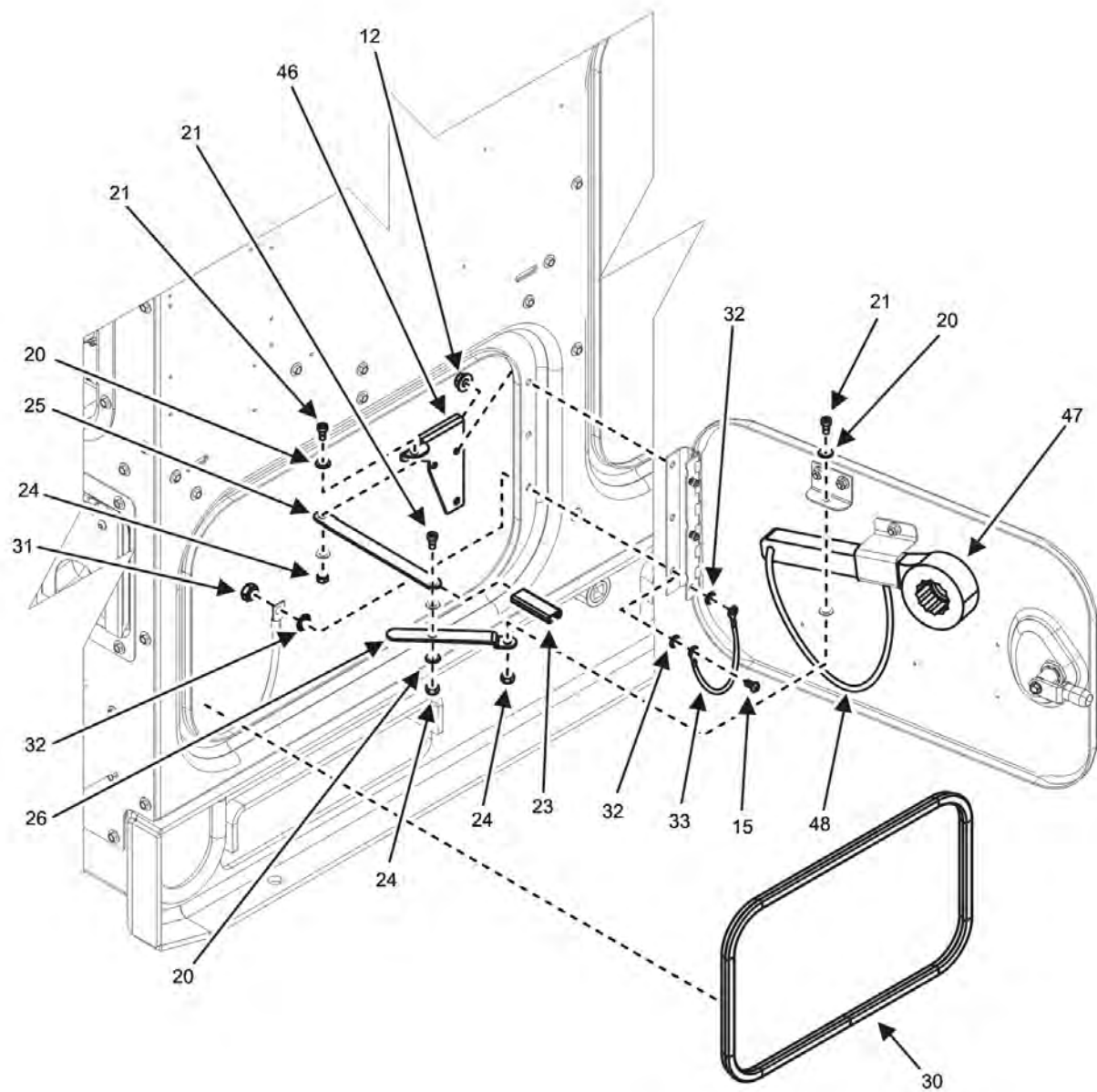


Figure 4. Housing Installation (Sheet 7 of 15).

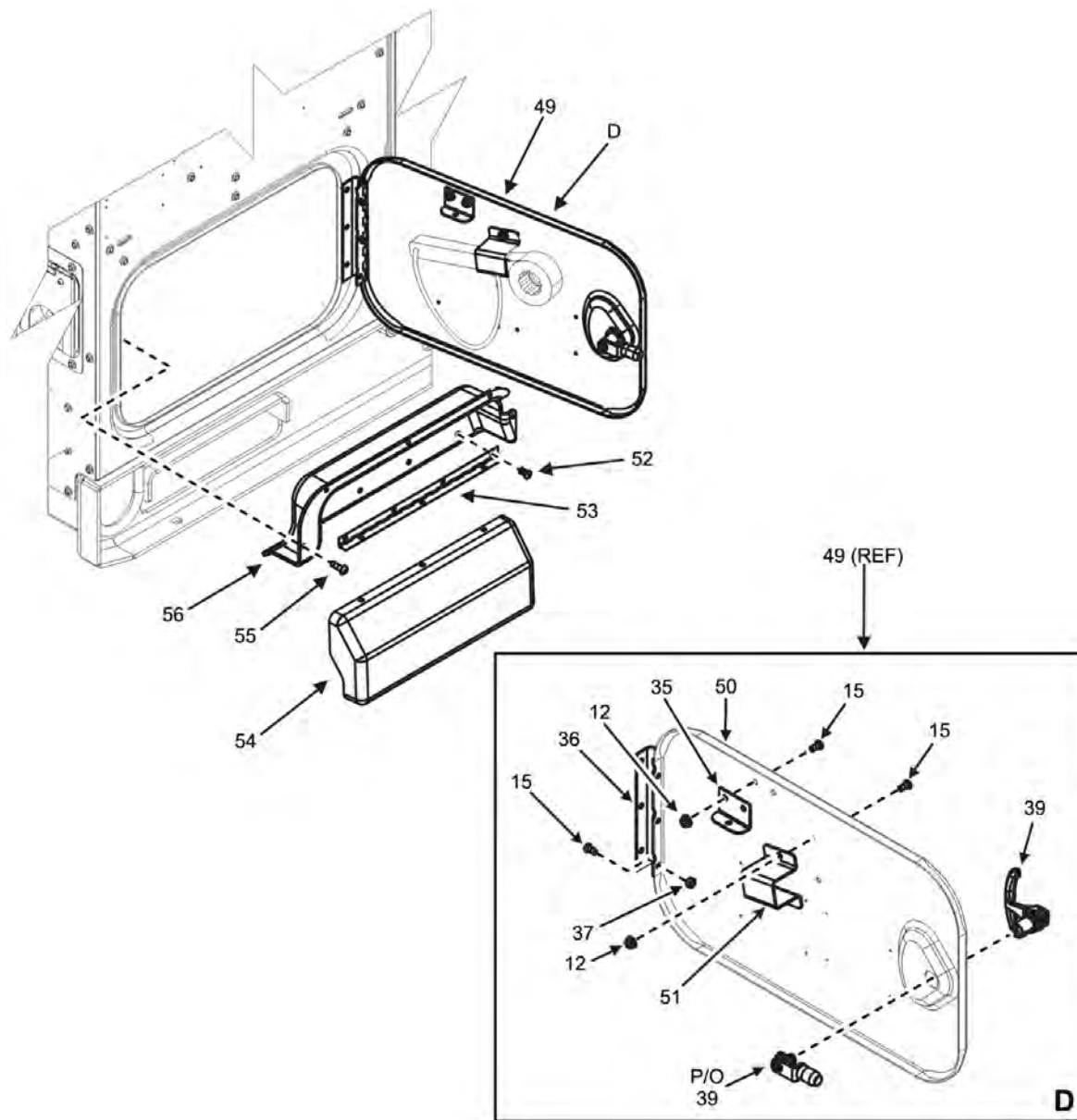


Figure 4. Housing Installation (Sheet 8 of 15).

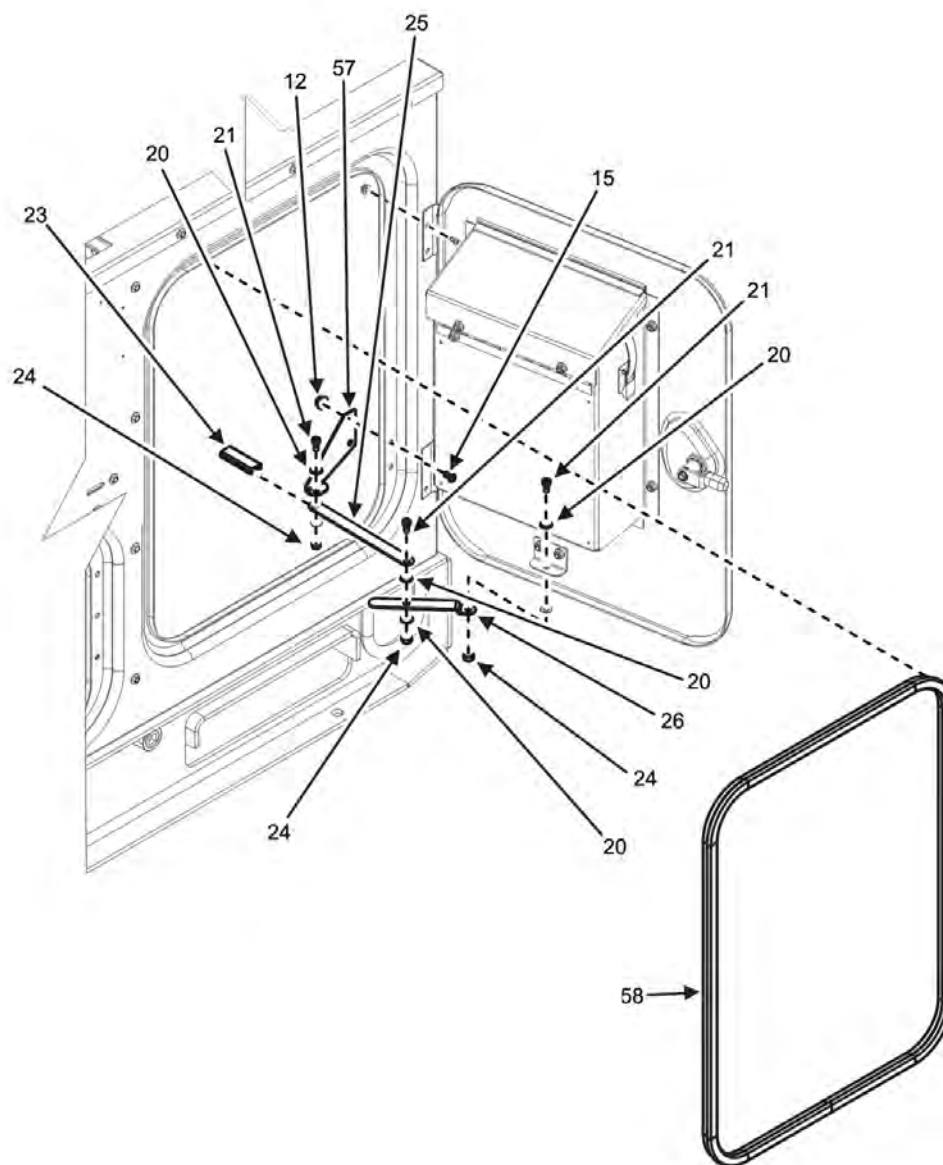


Figure 4. Housing Installation (Sheet 9 of 15).

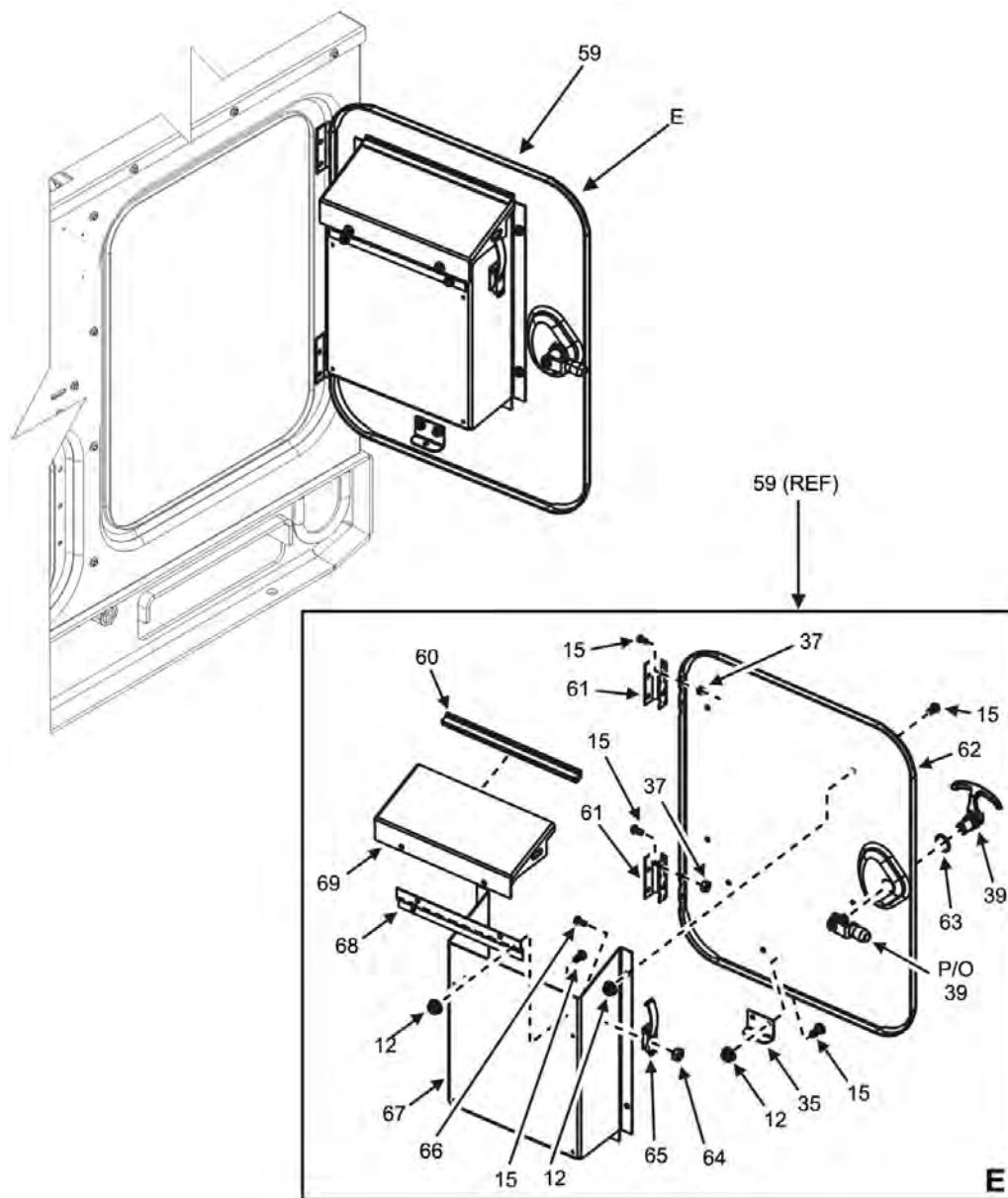


Figure 4. Housing Installation (Sheet 10 of 15).

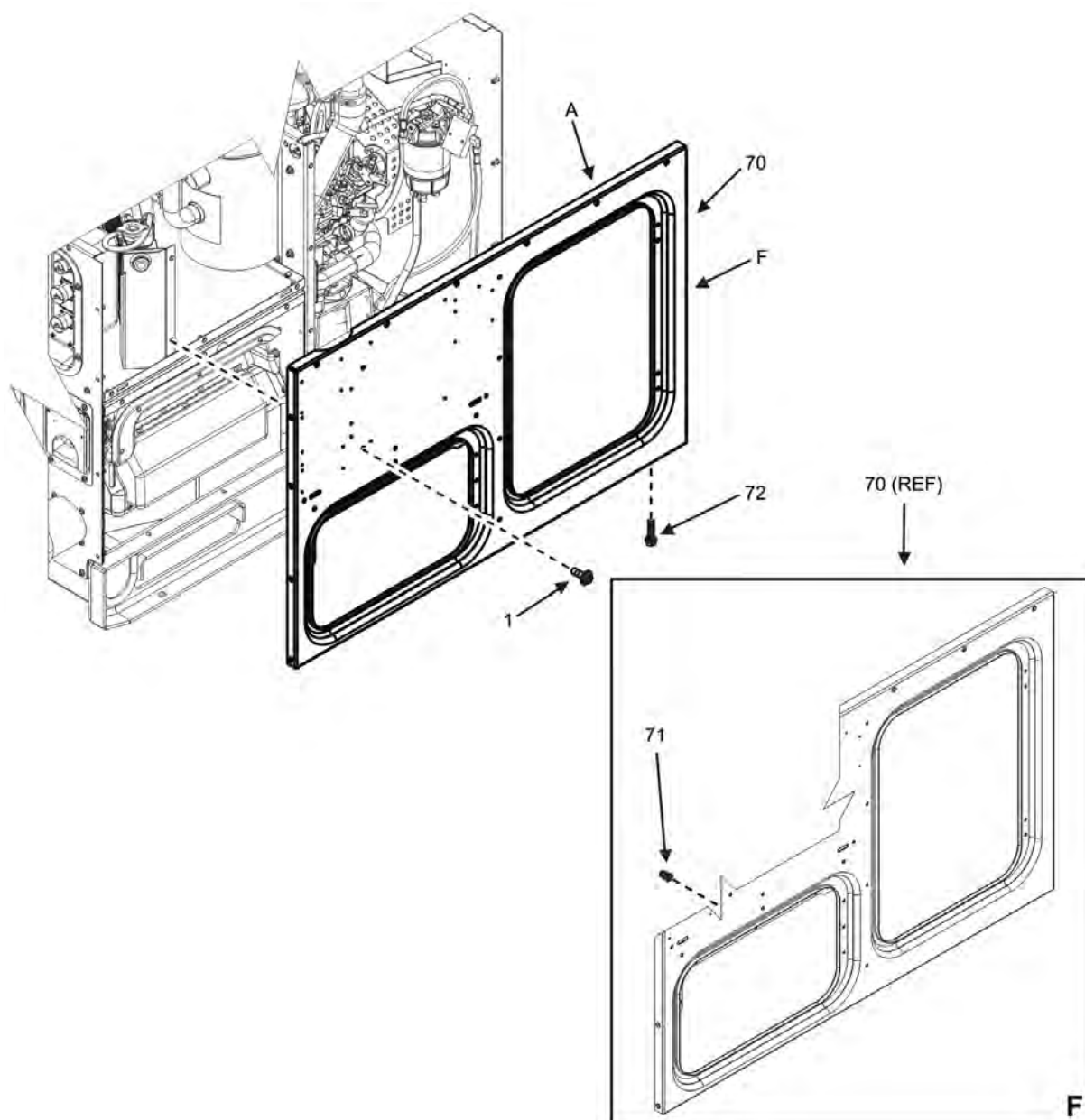


Figure 4. Housing Installation (Sheet 11 of 15).

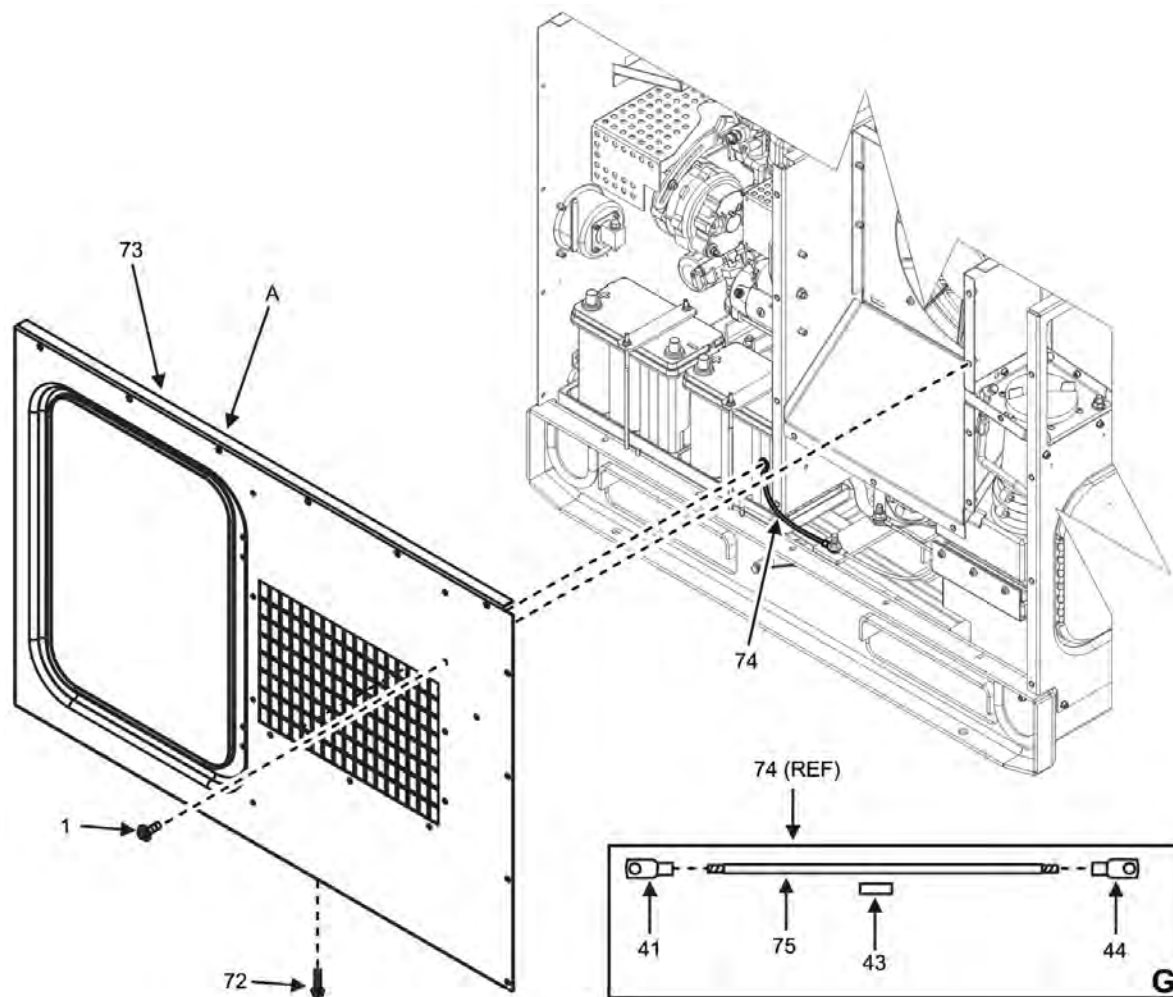


Figure 4. Housing Installation (Sheet 12 of 15).

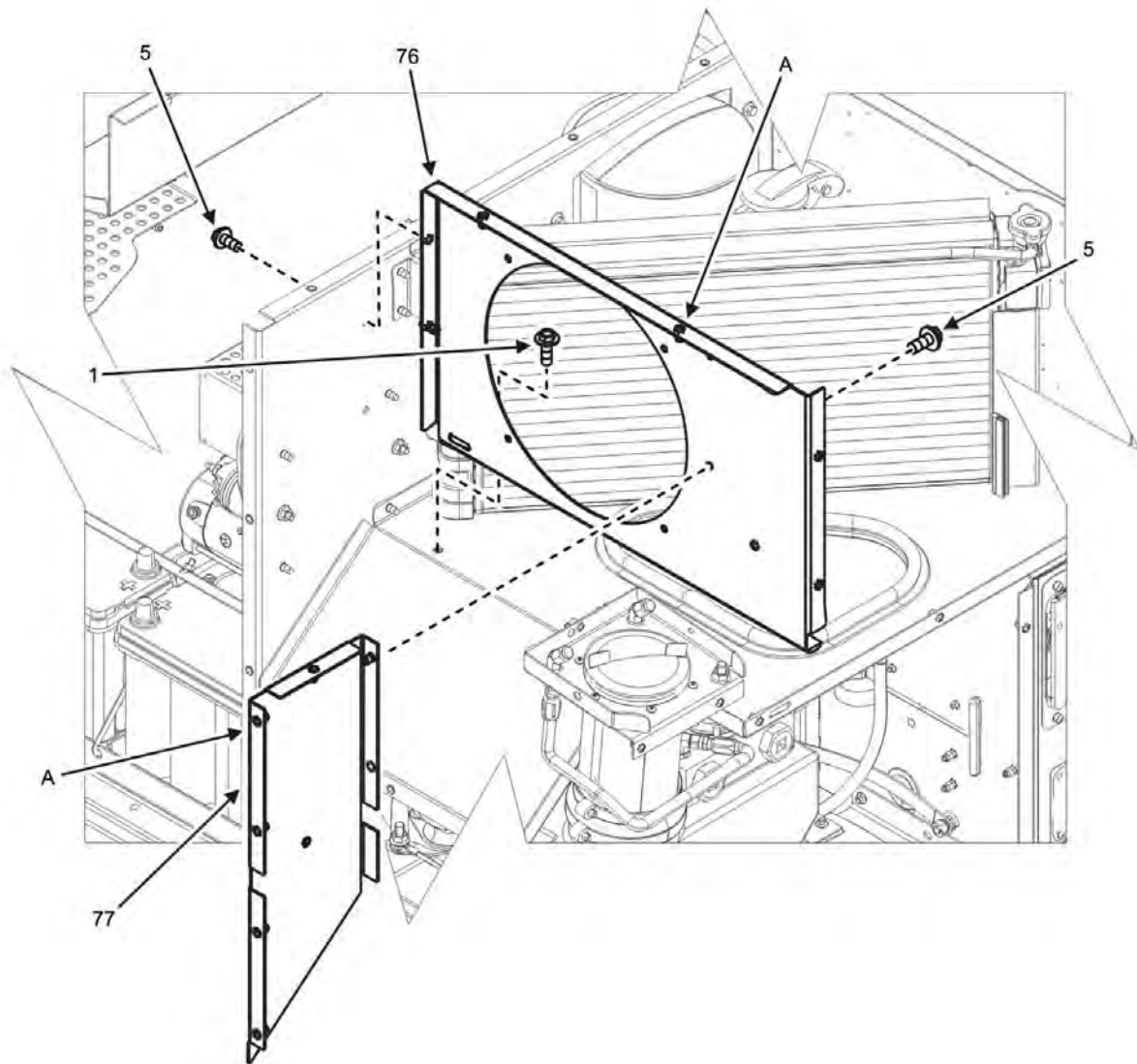


Figure 4. Housing Installation (Sheet 13 of 15).

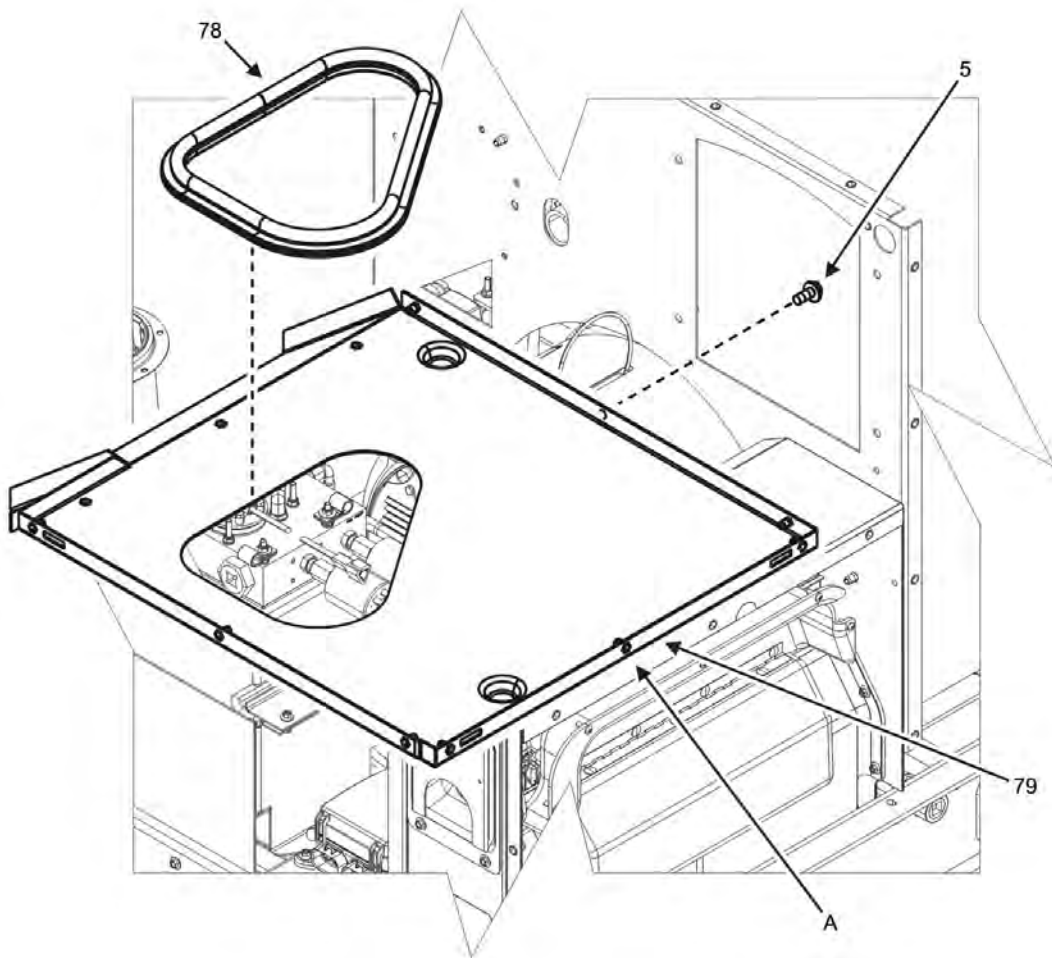


Figure 4. Housing Installation (Sheet 14 of 15).

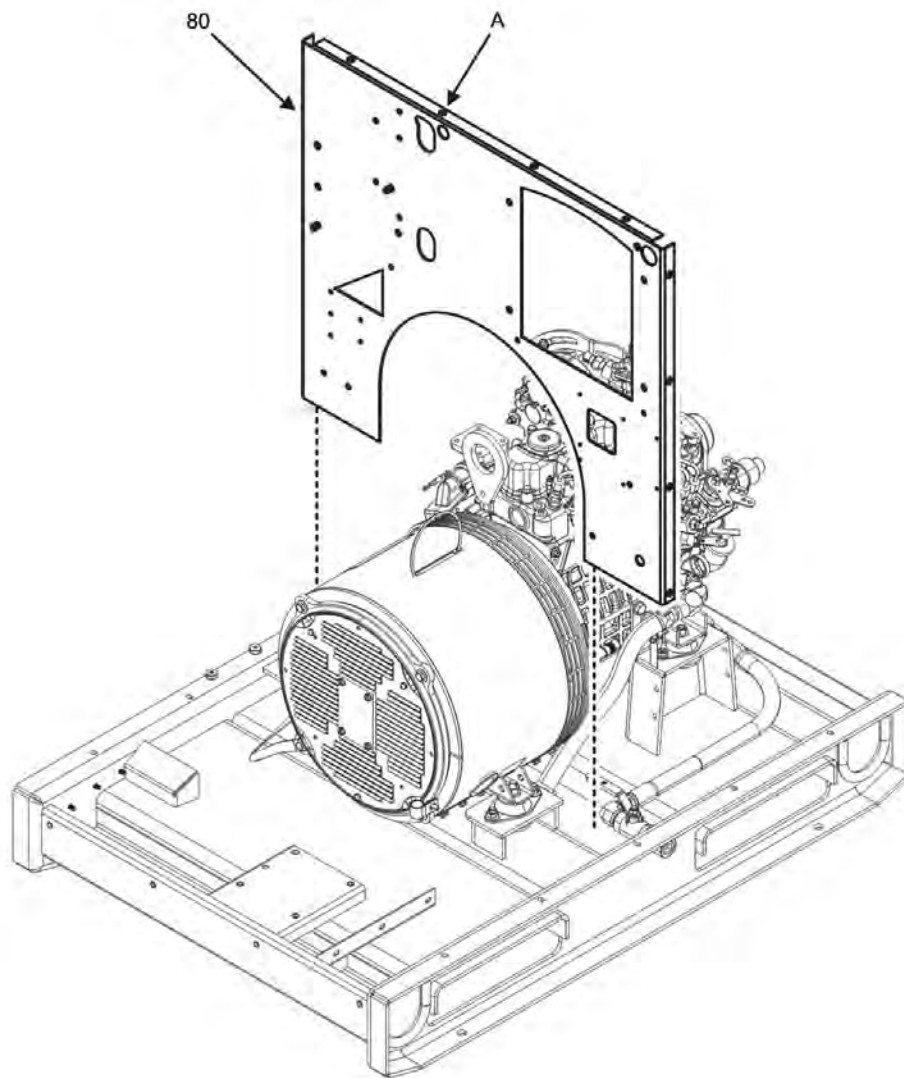


Figure 4. Housing Installation (Sheet 15 of 15).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 02									
FIG. 4 HOUSING INSTALLATION									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4M343	44832	.SCREW, FLANGE HEAD	112
2	XBFFZ	XBFFZ	XBFFZ	XBFFZ		44940	04-20992	.PANEL, TOP	1
3	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20940	.DUCT, AIR	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	.NUT, PLAIN, CLINCH	116
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K 42	.SCREW, CAP, HEXAGON. M6	7

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
6	PAFFF	PAFFF	PAFFF	PAFFF	5340015932741	44940	04-20986	.GUARD, BELT, RH	1
7	PAFFF	PAFFF	PAFFF	PAFFF	5340015932738	44940	04-20985	.GUARD, BELT, LH	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21725	.DAMPER, VIBRATION	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21723	.TRAY, CORRUGATED	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21724	.BUMPER	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21733	.WASHER, FLAT	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, PLAIN, EXTENDED	46
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5342015932754	44940	04-20747	.DOOR, ACCESS	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015936025	44940	04-20748	.HINGE	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	.SCREW, CAP, SOCKET HEAD	62
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015899988	S8812	8-325-88	.LATCH	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20944	.STRIKE, LATCH	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015932743	44940	04-21365	.PANEL, ACCESS	1
19	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20987	.PANEL, ENCLOSURE, FRONT	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW23X06R10MSE4A 31	.WASHER, FLAT	28
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015889321	3A054	90278A331	.SCREW, SHOULDER	12
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015932743	44940	04-21073	.BRACKET, DOOR	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21076	.LINK, DOOR	4
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN04M508000CX0 A36	.NUT,SELF- LOCKING,HEX	12
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4910015893803	44940	04-21074	.BRACE, DOOR STAY, TOP	4
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4910015893807	44940	04-21075	.BRACE, DOOR STAY, BOTTOM	4
27	XBFFZ	XBFFZ	XBFFZ	XBFFZ		44940	04-20282	.PLATE, RETAINER, MOUNTING	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015900371	30554	69-570-2	.BUSHING, SOCK	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2920013882776	30554	88-20218	.SLEEVE, TUBE	1
30	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-20872-1	.SEAL, EDGE (MAKE FROM A3921 ON BULK ITEM LIST, CUT TO LENGTH 1370MM +/-5)	4
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX, FLANGE M6 X 1	2
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A 21	.WASHER, LOCK	6
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015883447	44940	04-21318-2	.STRAP, GROUNDING	2
34	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21162	.DOOR, ASSEMBLY	1
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21072	.BRACKET, DOOR STAY	4
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015935979	44940	04-20630	.HINGE	2
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010800030	61080	2915011007	.NUT, PLAIN, HEXAGON	14
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5342015932753	44940	04-21159	.DOOR, ACCESS	1
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015900063	S8812	8-325-82	.LATCH	4
40	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-4	.LEAD,ELECTRICAL	2
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001139828	96906	MS25036-148	.TERMINAL, LUG, 12-10 AWG M6 RING	3
42	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65	.STRAND, WIRE (MAKE FROM 3271- 12-65 ON BULK ITEM LIST, CUT TO LENGTH 875 MM +/- 25 MM)	2

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
43	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	..LAMINATE, LABEL COVER	3
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	130207	..TERMINAL, LUG, 12-10 AWG M10 RING	3
45	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20334	..PANEL, REAR	1
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015932744	44940	04-21102	..BRACKET, OUTPUT BOX DOOR STAY	1
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5120013738976	30554	88-21146	..WRENCH, BOX	1
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4020014769072	30554	04-21322	..FIBER ROPE ASSEMBLY	1
49	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20400	..DOOR, OUTPUT BOX ASSEMBLY	1
50	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20332	..DOOR, OUTPUT BOX	1
51	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20285	..BRACKET, WRENCH MOUNTING	1
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ		09772	354-310102-00-5869	..CLIP	7
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20364	..HINGE, GUARD	1
54	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20369	..GUARD, PLASTIC, OUTPUT BOX	1
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES46M508016CH2A31	..SCREW, BUTTON HEAD SOCKET	5
56	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015932750	44940	04-21104	..GUARD, PLASTIC, MOUNT	1
57	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21081	..BRACKET, LEFT AND RIGHT DOOR STAY	2
58	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21748-1	..SEAL, EDGE (MAKE FROM A3921 ON BULK ITEM LIST, CUT TO LENGTH 1839MM +/-5)	2
59	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20649	..DOOR, ASSEMBLY, RIGHT AND LEFT	2
60	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21031-4	..SEAL, EDGE (MAKE FROM A1512 ON BULK ITEM LIST, CUT TO LENGTH 259MM +/-3)	2
61	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015935913	44940	04-20651	..HINGE	4
62	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20333	..DOOR, ENCLOSURE	2
63	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21766	..WASHER, FLAT	2
64	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015006541	3L891	40CNFHS	..NUT, PLAIN, HEXAGON	2
65	XBFFF	XBFFF	XBFFF	XBFFF	5340013960454	94222	97-50-170-11	..CATCH, CLAMPING	2
66	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015956003	1MMD1	C-04-21420	..SCREW, MACHINE	2
67	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21039	..BOX, TOOL	2
68	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21045	..HINGE, TOOL BOX	2
69	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21046	..COVER, BOX, TOOL	2
70	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20405	..PANEL, RIGHT	1
71	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893734	3A2G6	39101-75030	..NUT, PLAIN, CLINCH	4
72	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K42	..SCREW, HEX FLANGE HEAD M6 X 1 X 20	10

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
73	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20404		.PANEL, LEFT	1
74	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-6		.LEAD,ELECTRICAL	1
75	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65		..STRAND, WIRE (MAKE FROM 3271-12-65 ON BULK ITEM LIST, CUT TO LENGTH 216 MM +/- 25 MM)	1
76	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20883		.DUCT, AIR, FAN	1
77	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20941		.PANEL, SUPPORT	1
78	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21282-1		.SEAL, WEATHER (MAKE FROM A2539 ON BULK ITEM LIST, CUT TO LENGTH 920MM +/- 5)	1
79	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20909		.PANEL, RADIATOR	1
80	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20908		.CROSSMEMBER, ENCLOSURE	1
END OF FIGURE										

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
DCS INSTALLATION REPAIR PARTS LIST

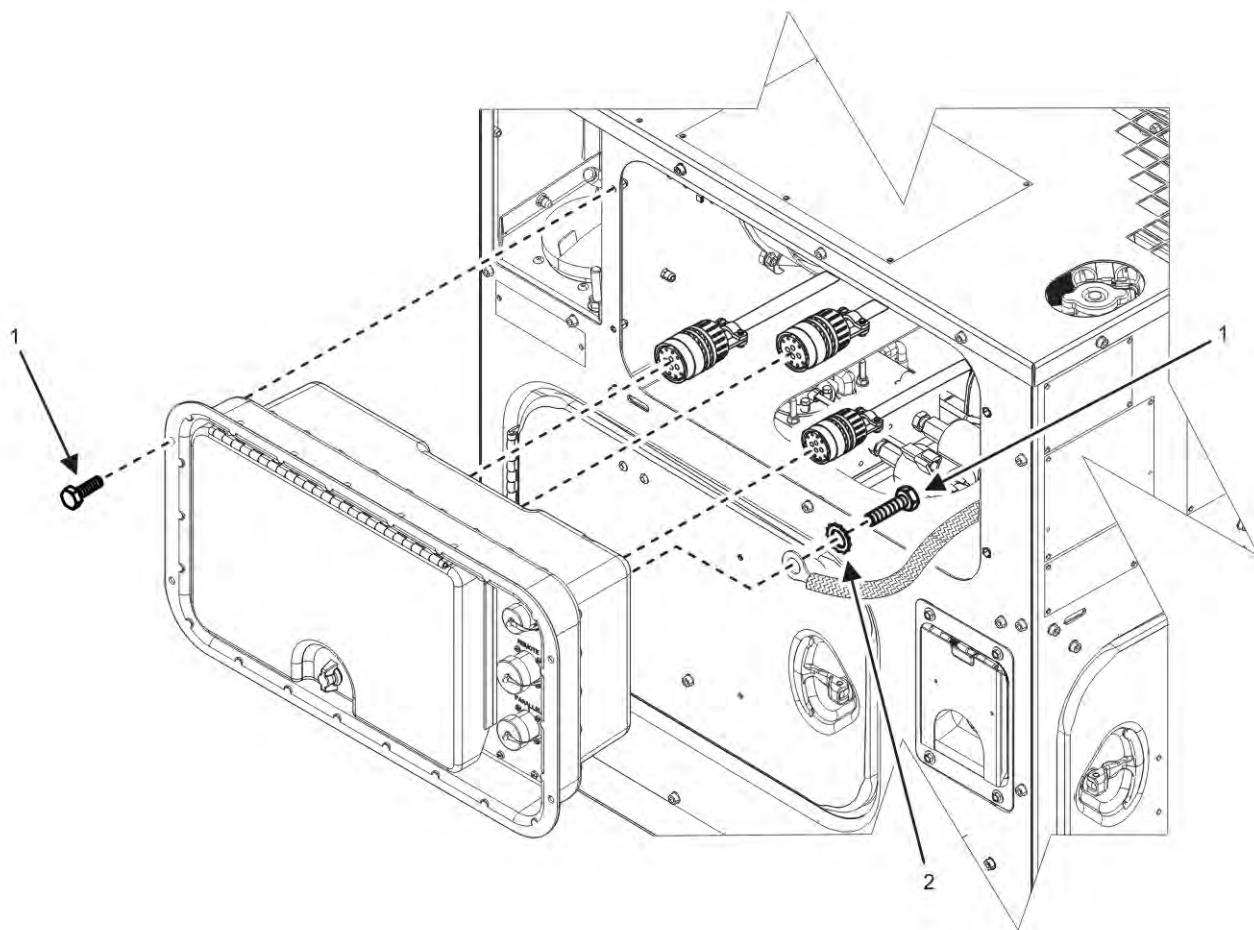


Figure 5. DCS Installation (Sheet 1 of 3).

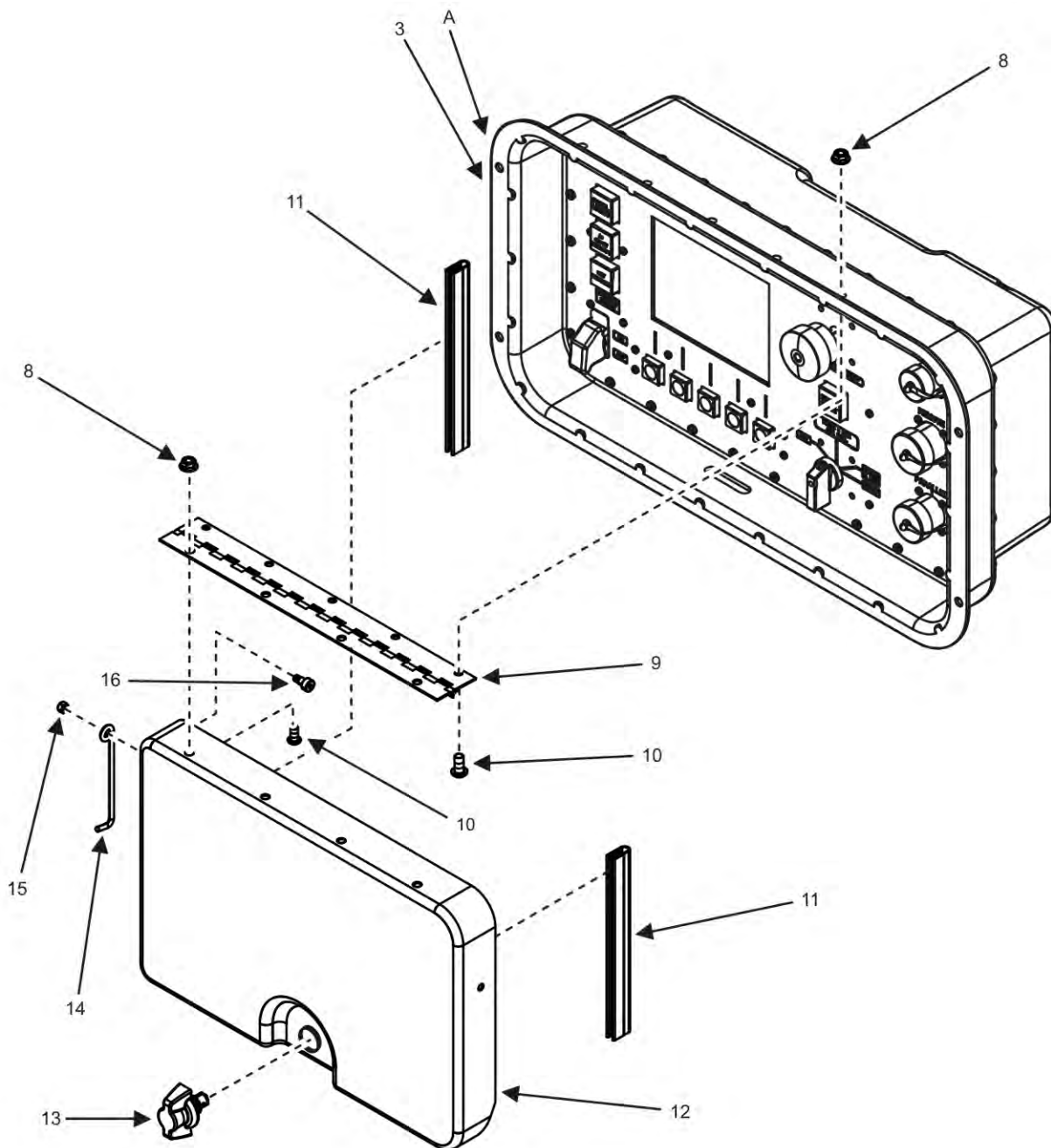


Figure 5. DCS Installation (Sheet 2 of 3).

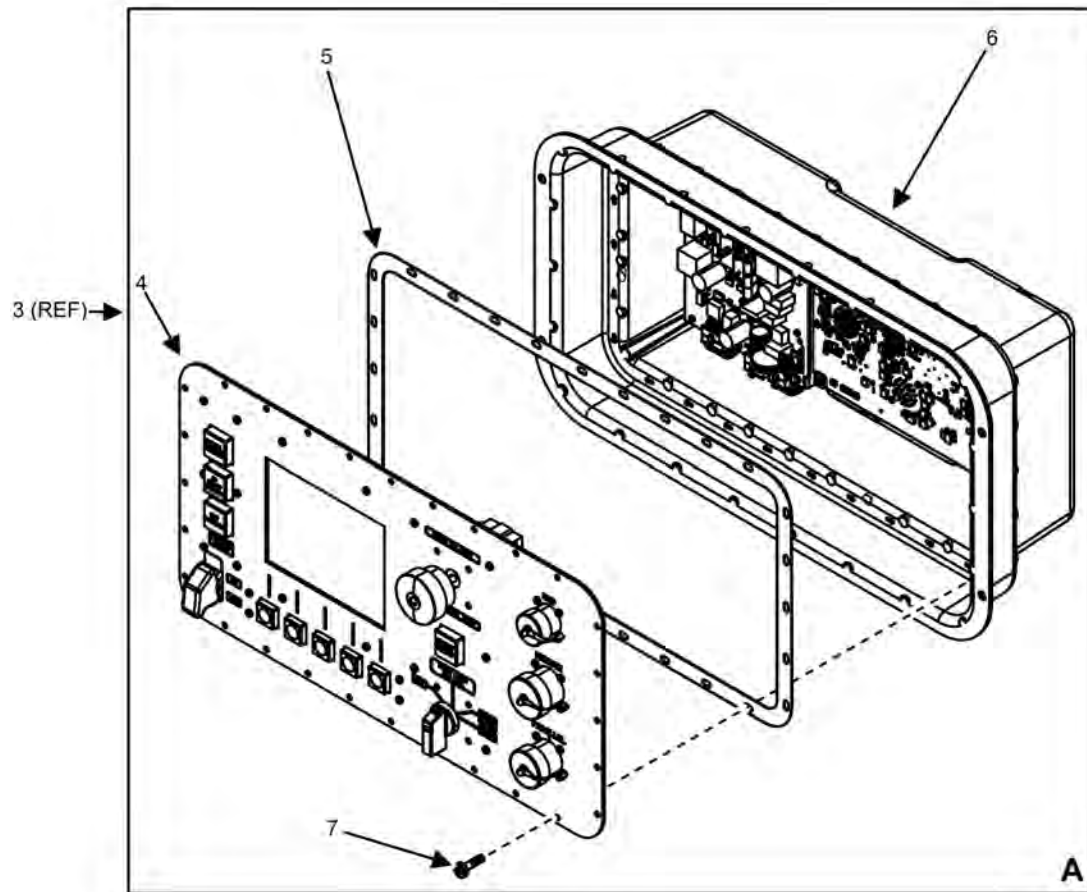


Figure 5. DCS Installation (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 03	
								FIG. 5 DCS INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A020WB4K42	.SCREW, FLANGE HEAD (M6 X 1.0 X 20)	5
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A21	.WASHER, LOCK	1
3	PAFHH	PAFHH	PAFFF	PAFFF	6115015884725	44940	04-20442	.CONTROL BOX ASSEMBLY	1
4	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20414	.PANEL ASSEMBLY, DCS CONTROL (SEE FIGURE 6 FOR PARTS BREAKDOWN)	1
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21569	.GASKET, CONTROL BOX	1

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
6	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20424		..ENCLOSURE ASSEMBLY, DCS (SEE FIGURE 7 FOR PARTS BREAKDOWN)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015956147	1MMD1	C-04-21421		..SCREW	28
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6		..NUT (M6 X 1)	9
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20399		..HINGE	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12		..SCREW (M6 X 12)	9
11	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21031-5		..SEAL, EDGE (MAKE FROM A1512 ON BULK ITEMS LIST)	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20313		..DOOR	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015899988	S8812	8-325-88		..LATCH	1
14	XBFFZ	XBFFZ	XBFFZ	XBFFZ		44940	04-20880		..BRACKET, SUPPORT	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN045M508000CX0A36		..NUT, LOCK	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015889321	3A054	90278A331		..SCREW, SHOULDER (M5 X 0.8 X 12)	1
END OF FIGURE										

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
DCS CONTROL PANEL ASSEMBLY REPAIR PARTS LIST

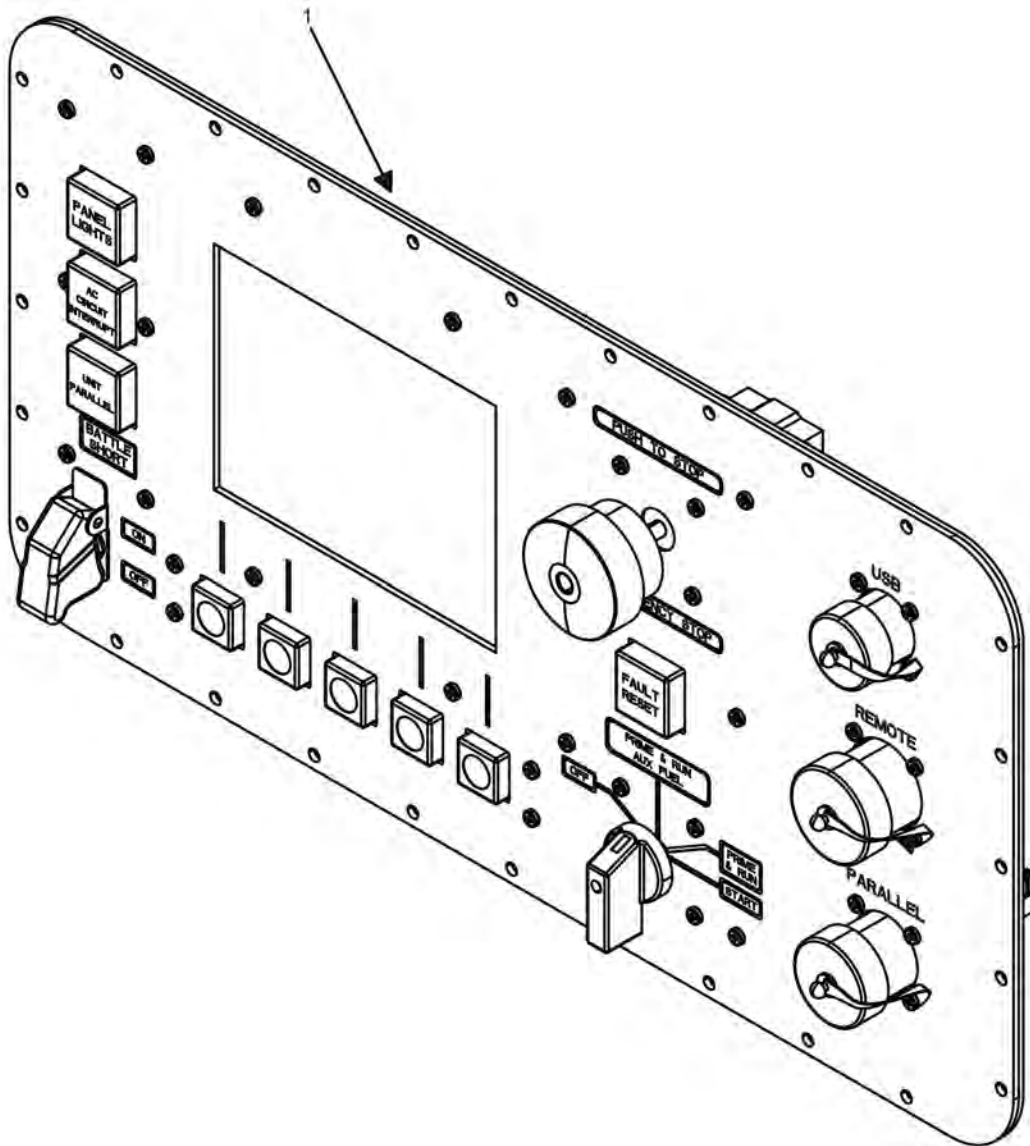


Figure 6. DCS Control Panel Assembly (Sheet 1 of 6).

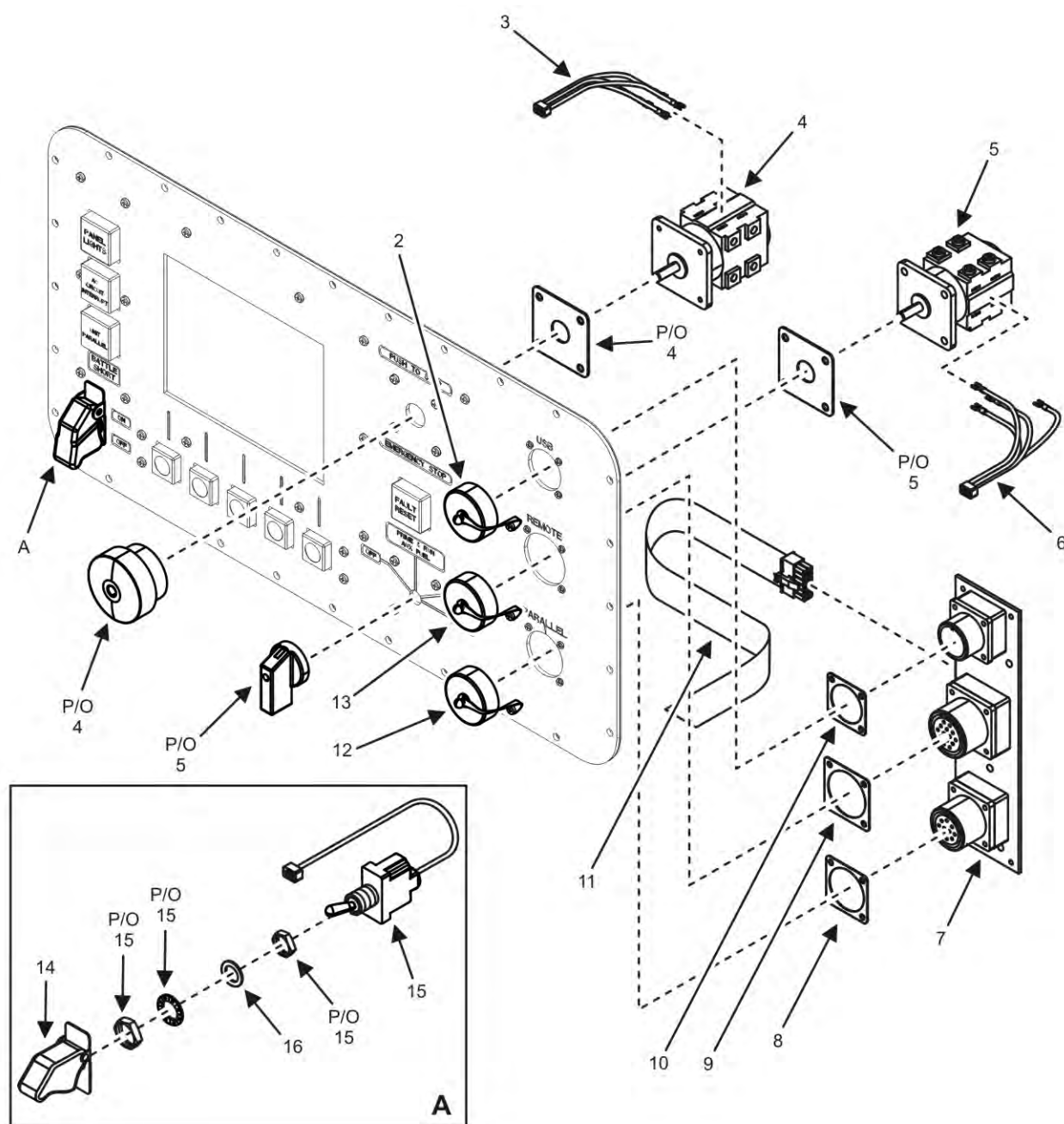


Figure 6. DCS Control Panel Assembly (Sheet 2 of 6).

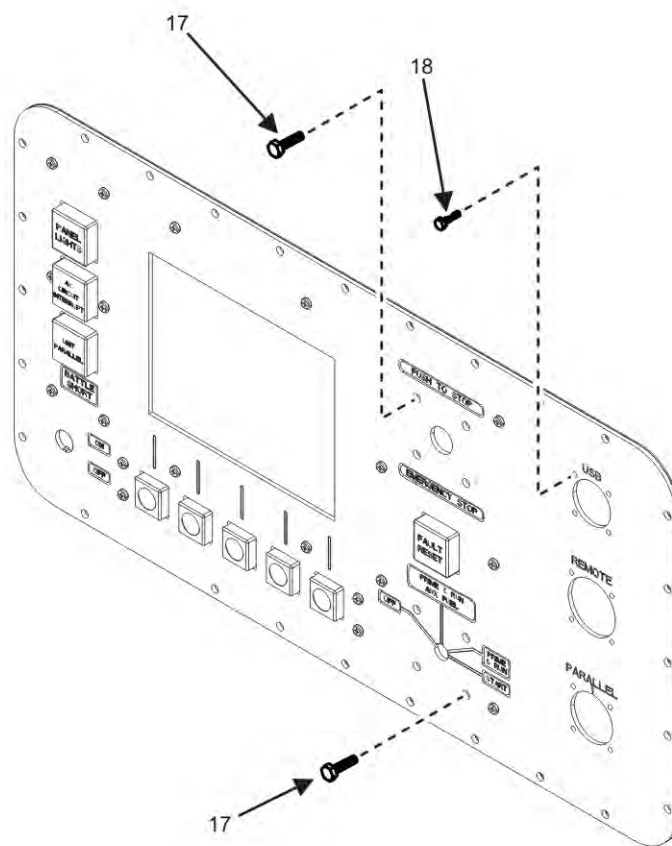


Figure 6. DCS Control Panel Assembly (Sheet 3 of 6).

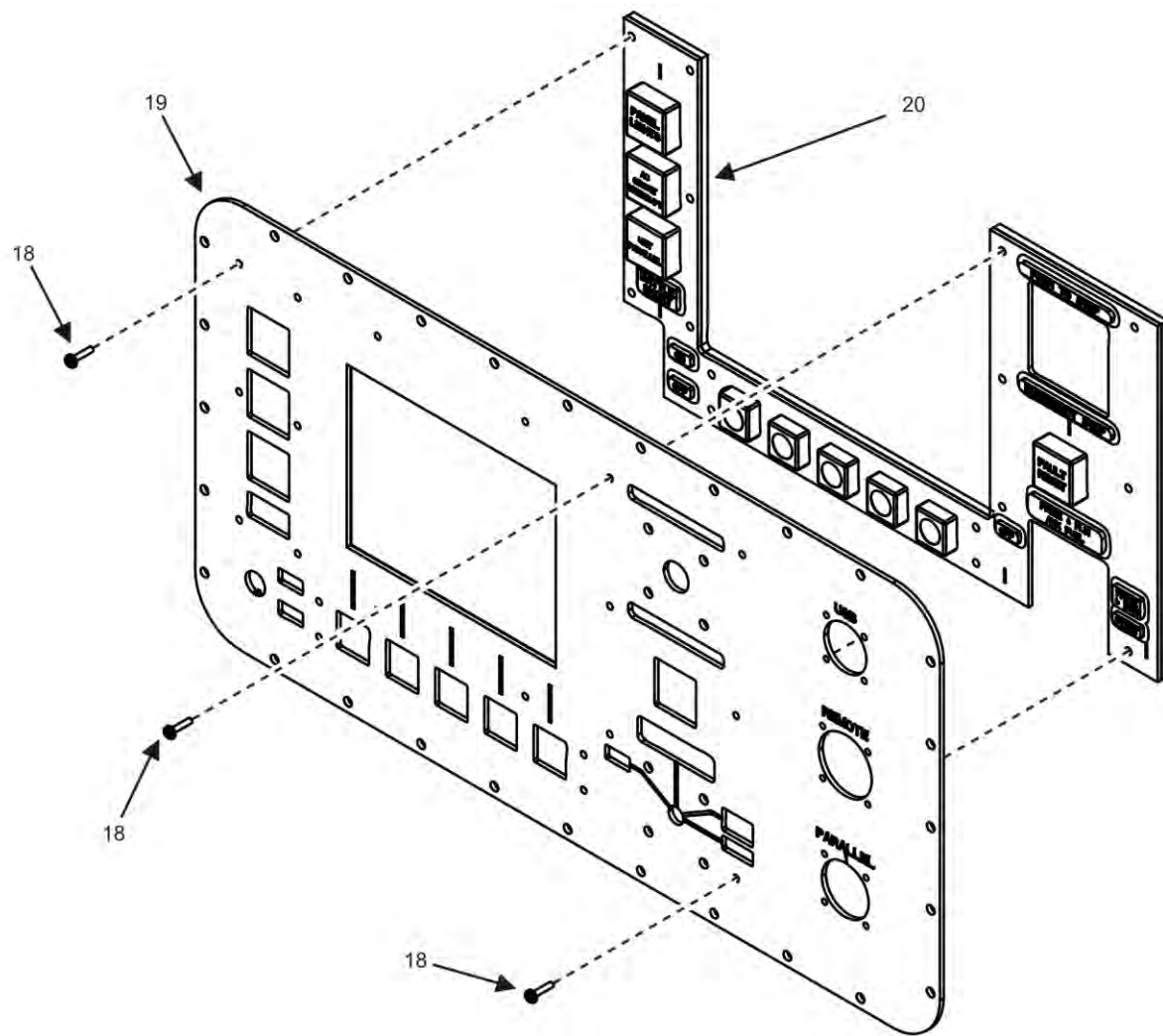


Figure 6. DCS Control Panel Assembly (Sheet 4 of 6)

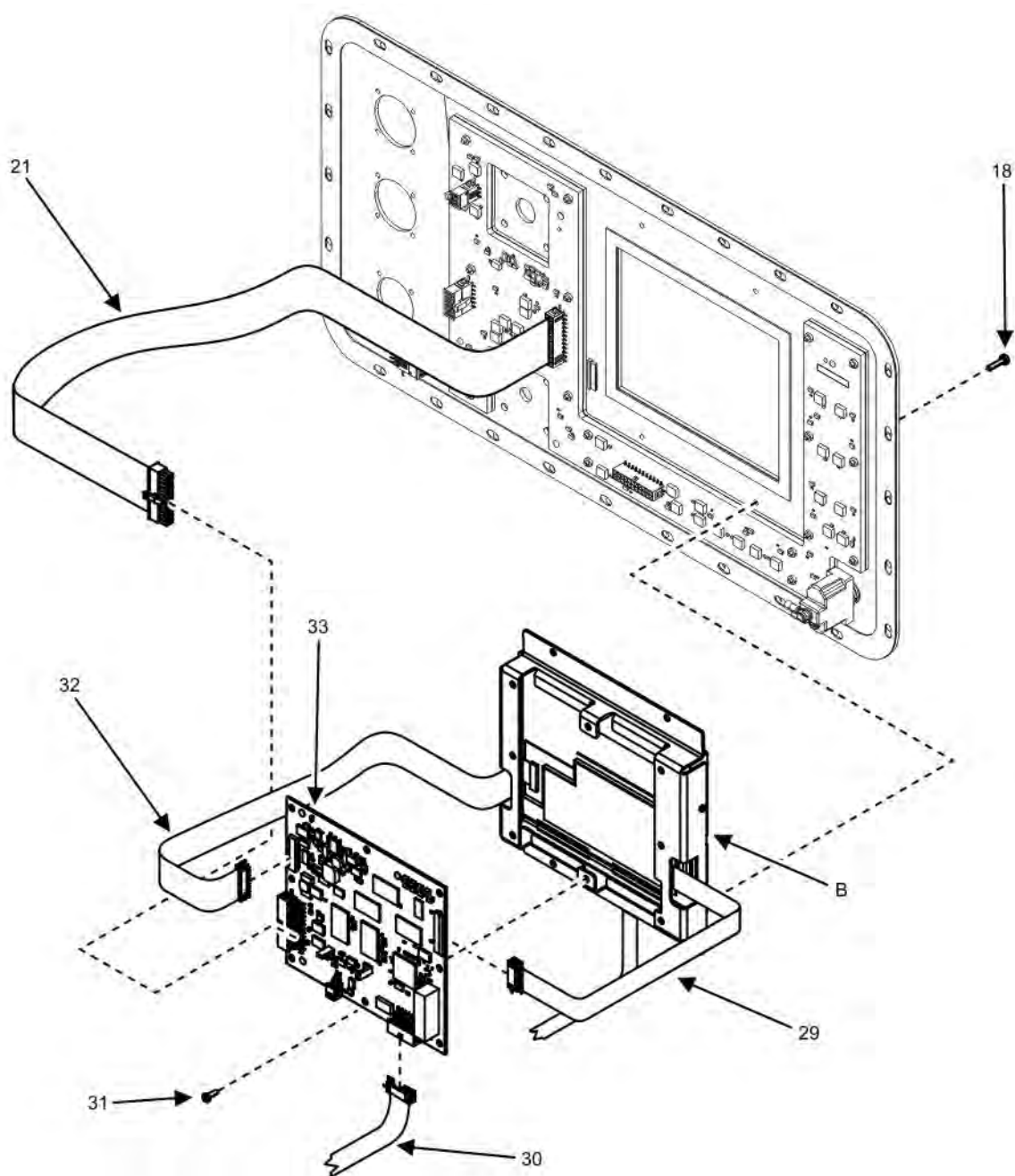


Figure 6. DCS Control Panel Assembly (Sheet 5 of 6).

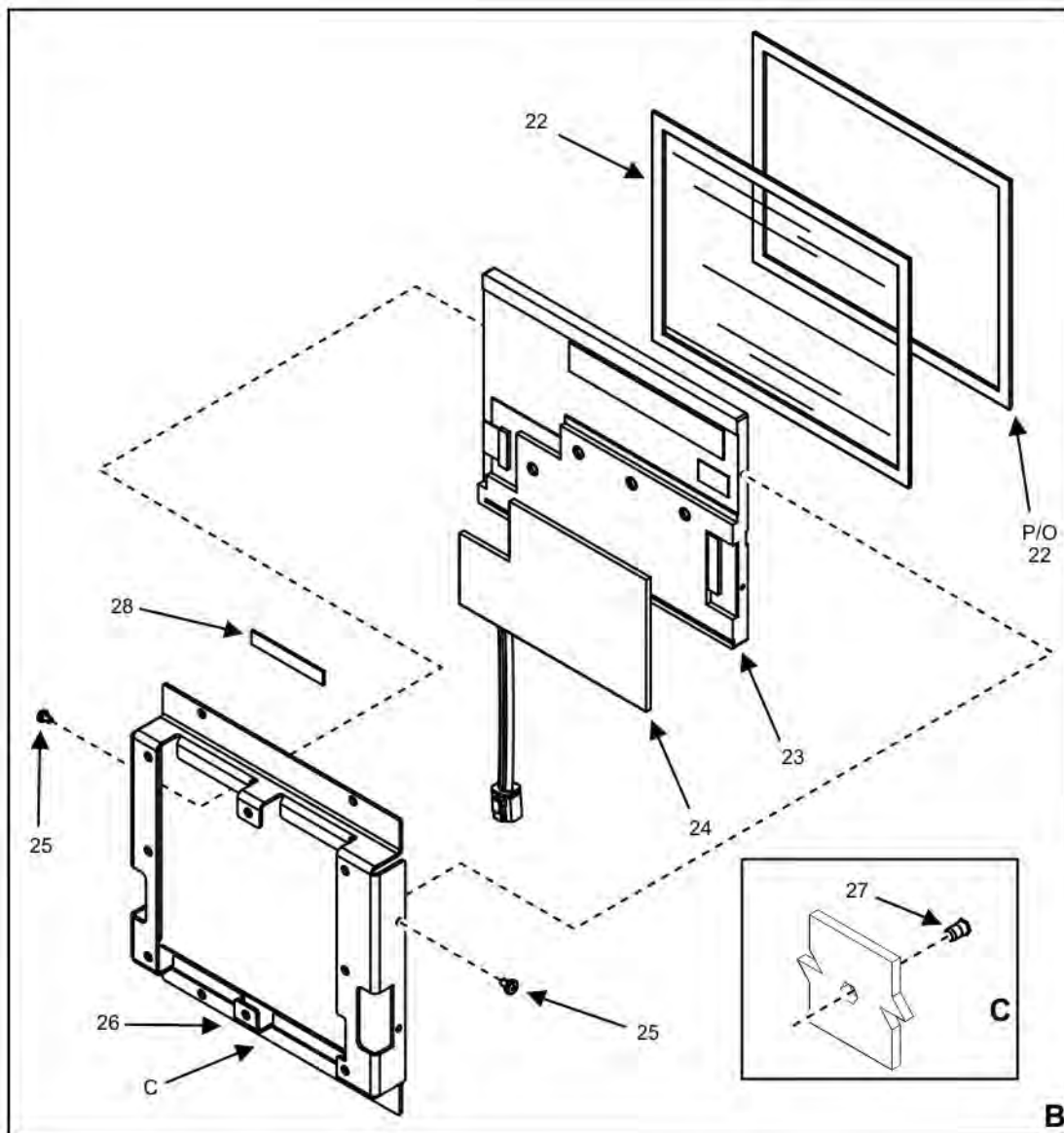


Figure 6. DCS Control Panel Assembly (Sheet 6 of 6).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0301	
								FIG. 6 DCS CONTROL PANEL ASSEMBLY	
1	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20414	..PANEL ASSEMBLY, DCS CONTROL	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	MS25043-16DA	..CAP	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015885621	44940	04-20422	..CABLE ASSEMBLY, EMERGENCY STOP SWITCH	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930015905539	10983	DKR12 US0094*02EA	..SWITCH, EMERGENCY STOP (INCLUDES GASKET, MOUNTING SCREWS, AND KNOB)	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930015875396	10983	DHR12 US9206*01EF1SWITCH, ENGINE CONTROL (INCLUDES GASKET, MOUNTING SCREWS, AND KNOB)	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015885606	44940	04-20421	..CABLE ASSEMBLY, ENGINE CONTROL SWITCH	1
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ		44940	A206D375	..CARD, CONTROL CONNECTOR	1
8	PAFZZ	PAFZZ	PAHZZ	PAHZZ	5330015956467	37GZ4	A026J180	..GASKET	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015894656	37GZ4	A026J182	..GASKET	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015956168	37GZ4	A026J177	..GASKET	1
11	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015886024	44940	04-20441	..CABLE ASSEMBLY (J203 TO J304)	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015901601	44940	MS25043-18DW	..CAP	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	MS25043-20DA	..CAP	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		96906	MS25224-1	..GUARD, SWITCH	1
15	PAFFF	PAFFF	PAFZZ	PAFZZ	5930015894070	44940	04-20385	..SWITCH, BATTLESORT	1
16	PAFZZ	PAFZZ	PAFFF	PAFFF	5310015935320	5P209	60225	..RING, SEALING	1
17	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5305015961447	44940	04-21701	..SCREW, THREAD- FORMING PANHEAD (10-16 TYPE B)	8
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21625	..SCREW, PAN HEAD (4-40 UNC X 0.5)	46
19	XBHZZ	XBHZZ	XBHZZ	XBHZZ		44940	04-20181	..PANEL, CONTROL	1
20	PAHZZ	PAHZZ	PAFZZ	PAFZZ		44940	04-21242	..MEMBRANE ASSEMBLY	1
21	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015885631	44940	04-21058	..CABLE ASSEMBLY (J201 TO J404)	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
22	PAHZZ	PAHZZ	PAHZZ	PAHZZ	6110015859960	3SZW3	A026F088	.PANEL, CONTROL, LCD GLASS (INCLUDES GASKET)	1
23	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5340015894472	SCR39	NL6448BC20-21C	.DISPLAY, LCD	1
24	PAHZZ	PAHZZ	PAHZZ	PAHZZ		79221	A026G053	.HEATER, PANEL (INCLUDES CABLE)	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7985-M2X3	.SCREW, PAN HEAD (M2 X 3.0)	4
26	XBHHH	XBHHH	XBFFF	XBFFF		44940	04-20969	.BRACKET, MOUNTING	1
27	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5310003382255	81349	M45938-1-4C	.NUT, PLAIN, CLINCH	12
28	PCFZZ	PCFZZ	PAHZZ	PAHZZ	5935015885541	44940	04-21204	.GASKET	4
29	PAHZZ		PAHZZ			44940	04-20411	.CABLE ASSEMBLY, DISPLAY COMMUNICATION (LCD DISPLAY TO J402)	1
30	PAHZZ		PAFZZ		6150015884000	44940	04-20437	.CABLE ASSEMBLY J104 TO J403	1
31	PAFZZ		PAHZZ		5935015885600	44940	AESF5C112312WA2A26	.SCREW, PAN HEAD (4-40 UNC X 0.31)	8
32	PAHZZ		PAFZZ			44940	04-20412	.CABLE, ASSEMBLY DISPLAY BACKLIGHT (LCD DISPLAY TO J401)	1
33	PAHZZ		PAHZZ		5998015887279	44940	A026D370	.CARD, CONTROL, DISPLAY	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
DCS ENCLOSURE ASSEMBLY REPAIR PARTS LIST

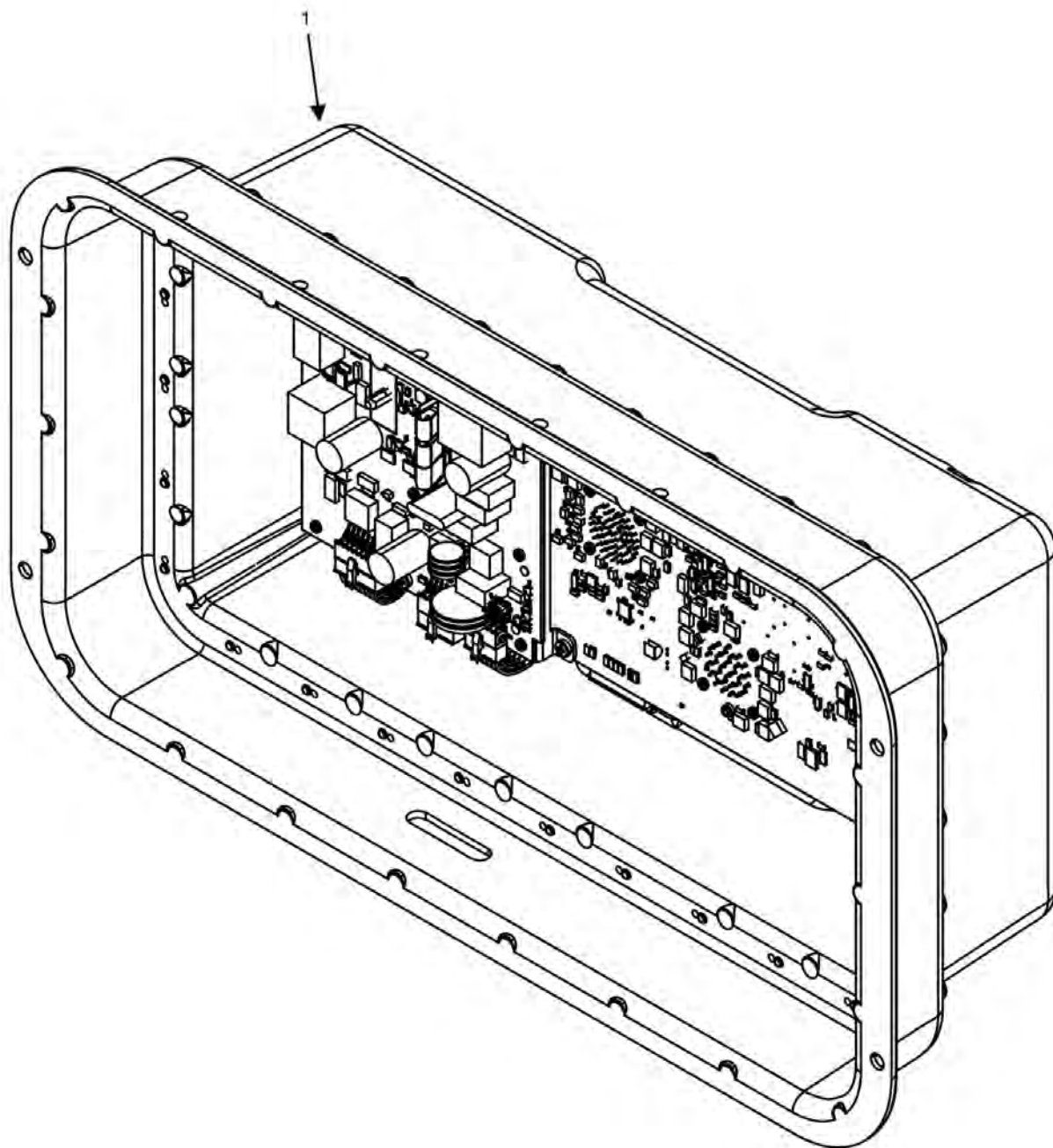


Figure 7. DCS Enclosure Assembly (Sheet 1 of 3).

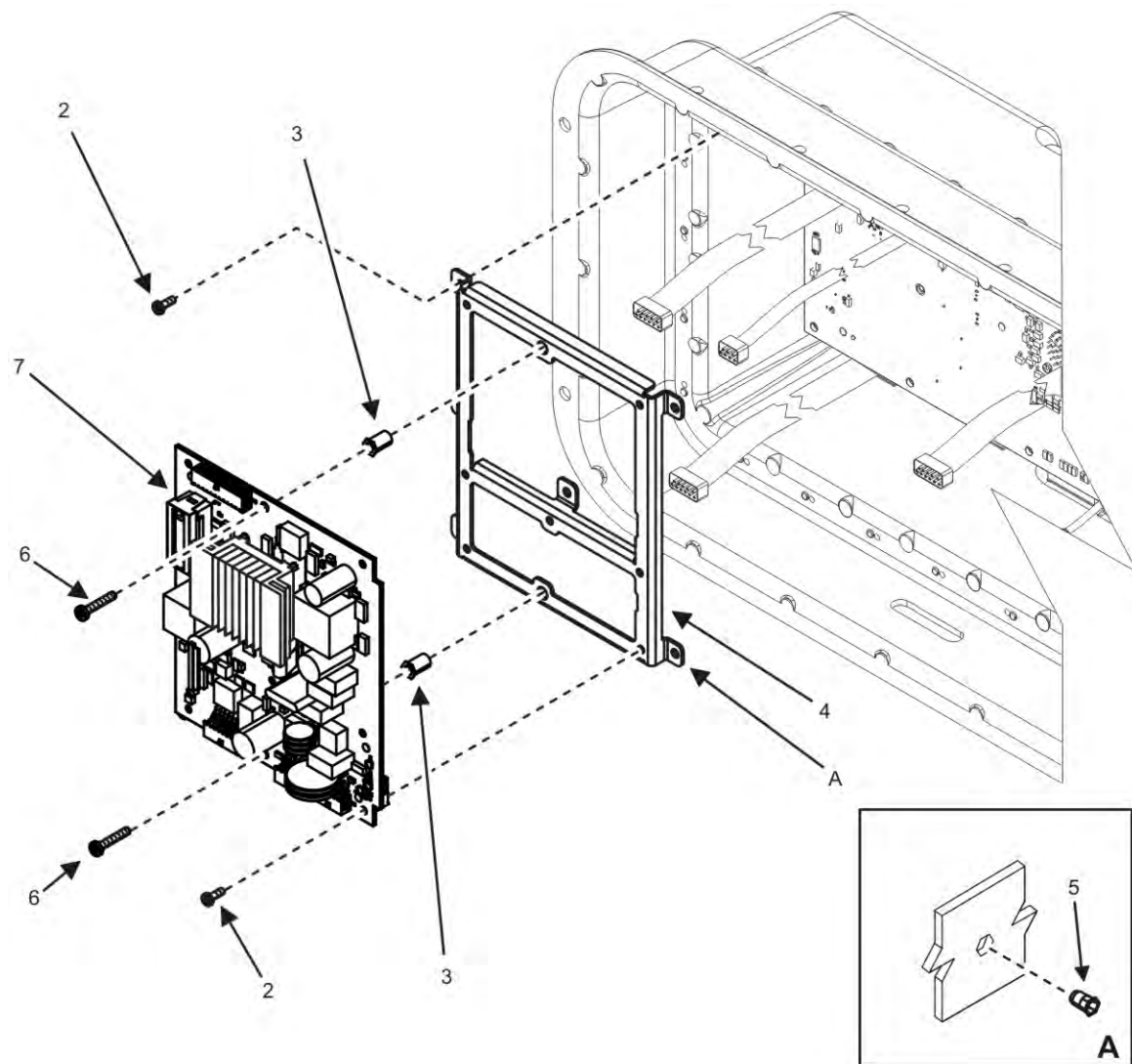


Figure 7. DCS Enclosure Assembly (Sheet 2 of 3).

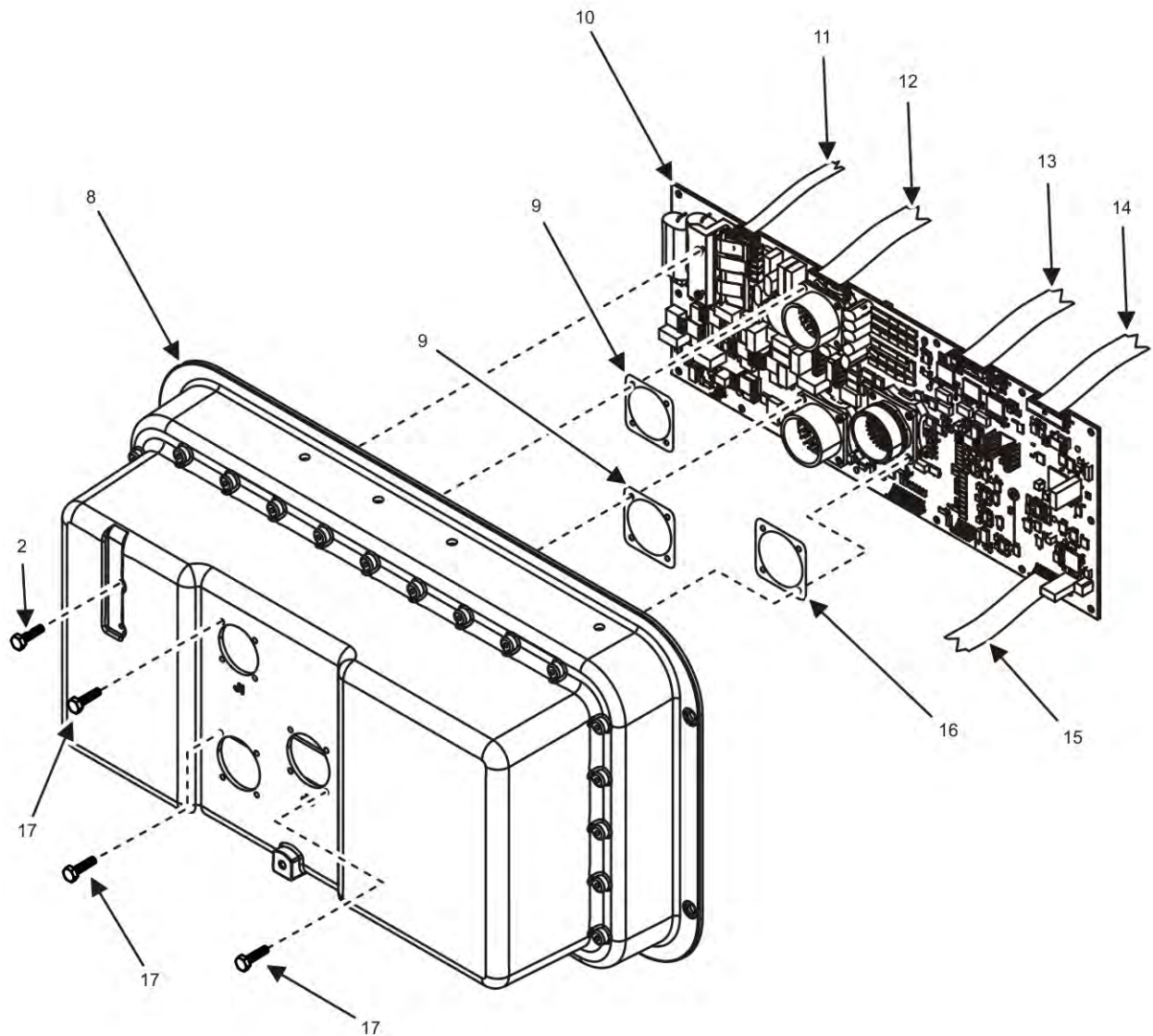


Figure 7. DCS Enclosure Assembly (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
		AIR FORCE	USMC	NAVY				GROUP 0302	
								FIG. 7 DCS ENCLOSURE ASSEMBLY	
1	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20424	.DCS ENCLOSURE ASSEMBLY	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		MMD1C	04-21420	..SCREW, LOCKING, PAN HEAD (M4 X 10)	12
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ		46384	SOS-85.1-12	..STAND OFF	2

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
4	XBHHH	XBHHH	XBFFF	XBFFF		44940	04-21402	..BRACKET	1
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5310003382255	81349	M45938-1-4C	...NUT, PLAIN, CLINCH	7
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5998015887145	44940	04-21422	..SCREW, PAN HEAD (M4 X 22)	2
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6130015887145	44940	A026D949	..CARD, CONTROL, POWER	1
8	XBHZZ	XBHZZ	XBFZZ	XBFZZ		44940	04-20650	..BOX, CONTROL	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015900070	37GZ4	A026E709	..GASKET	2
10	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5998015877618	44940	A026F215	..CARD, CONTROL, MAIN	1
11	PAHZZ	PAHZZ	PAHZZ	PAHZZ	6150015885253	44940	04-20439	..CABLE ASSEMBLY J17 TO J305	1
12	PAHZZ	PAHZZ	PAHZZ	PAHZZ	6150015855103	44940	04-20438	..CABLE ASSEMBLY J15 TO J202	1
13	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015883995	44940	04-20436	..CABLE, ASSEMBLY (J9 TO J101)	1
14	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015883992	44940	04-20434	..CABLE, ASSEMBLY (J13 TO J103)	1
15	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015883988	44940	04-20435	..CABLE, ASSEMBLY (J11 TO J102)	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015956135	37GZ4	A026E707	..GASKET	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21626	..SCREW (6-32)	12
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
INTAKE AIR INSTALLATION REPAIR PARTS LIST**

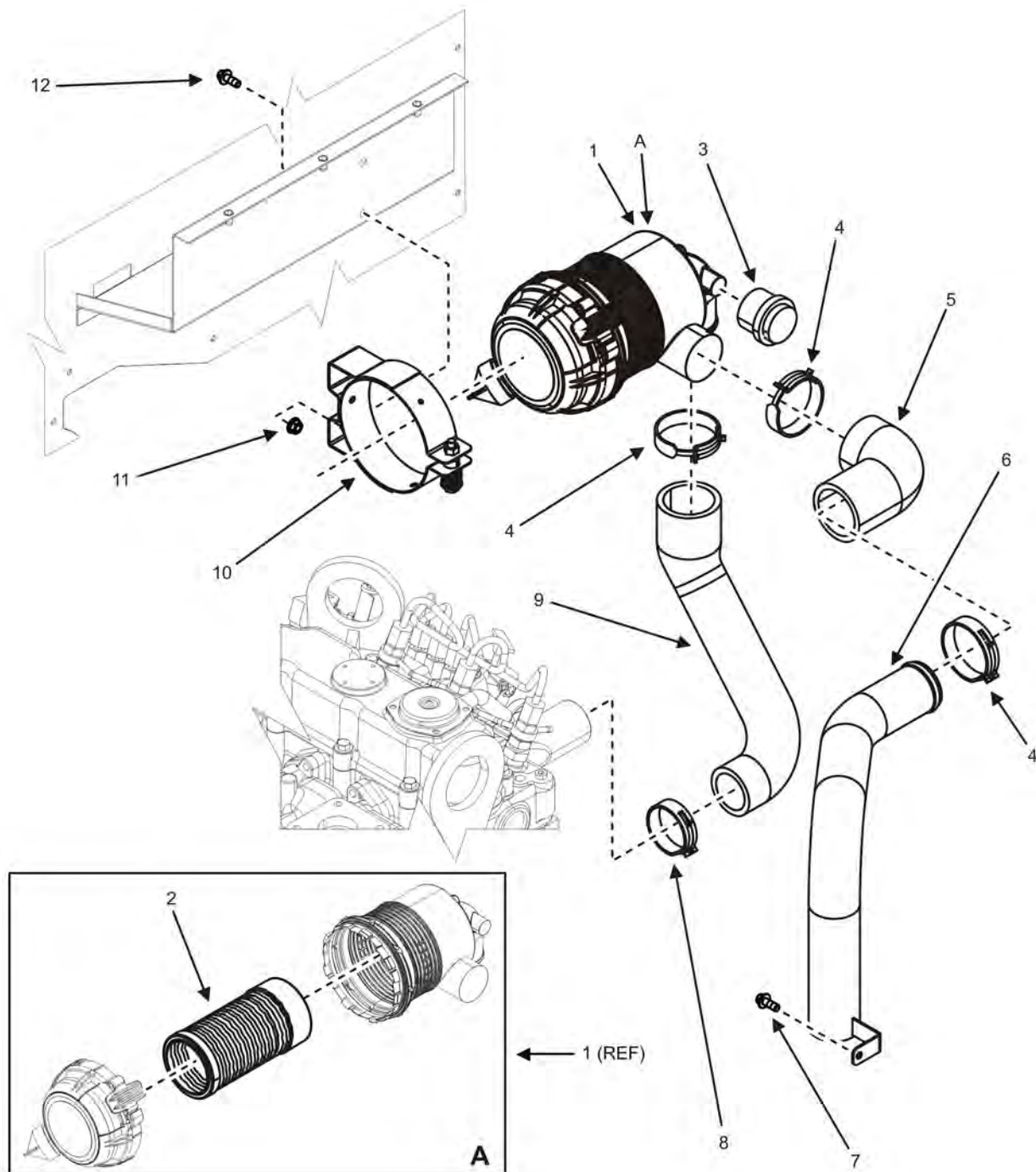


Figure 8. Intake Air Installation.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 04									
FIG. 8 INTAKE AIR INSTALLATION									
1	PBFFF	PBFFF	PBFFF	PBFFF	2940015883663	33457	AH1948500	.AIR CLEANER	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2940015883658	33457	AF26116	.ELEMENT, AIR FILTER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4330015923418	33457	Q06557A-10	.INDICATOR,SERVICE	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-67	.CLAMP	3
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20672	.ELBOW, HOSE	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20735	.TUBING, METALLIC	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	.SCREW, HEX FLANGEHEAD M6 X 1 X 16	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-58	.CLAMP	1
9	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20725	.TUBING NONMETALLIC	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015917301	33457	3918199S	.CLAMP, AIR CLEANER	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX FLANGE M6 X 1	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B020WB4K42	.SCREW, HEX FLANGE HEAD M8 X 1.25 X 20	2
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
EXHAUST INSTALLATION REPAIR PARTS LIST

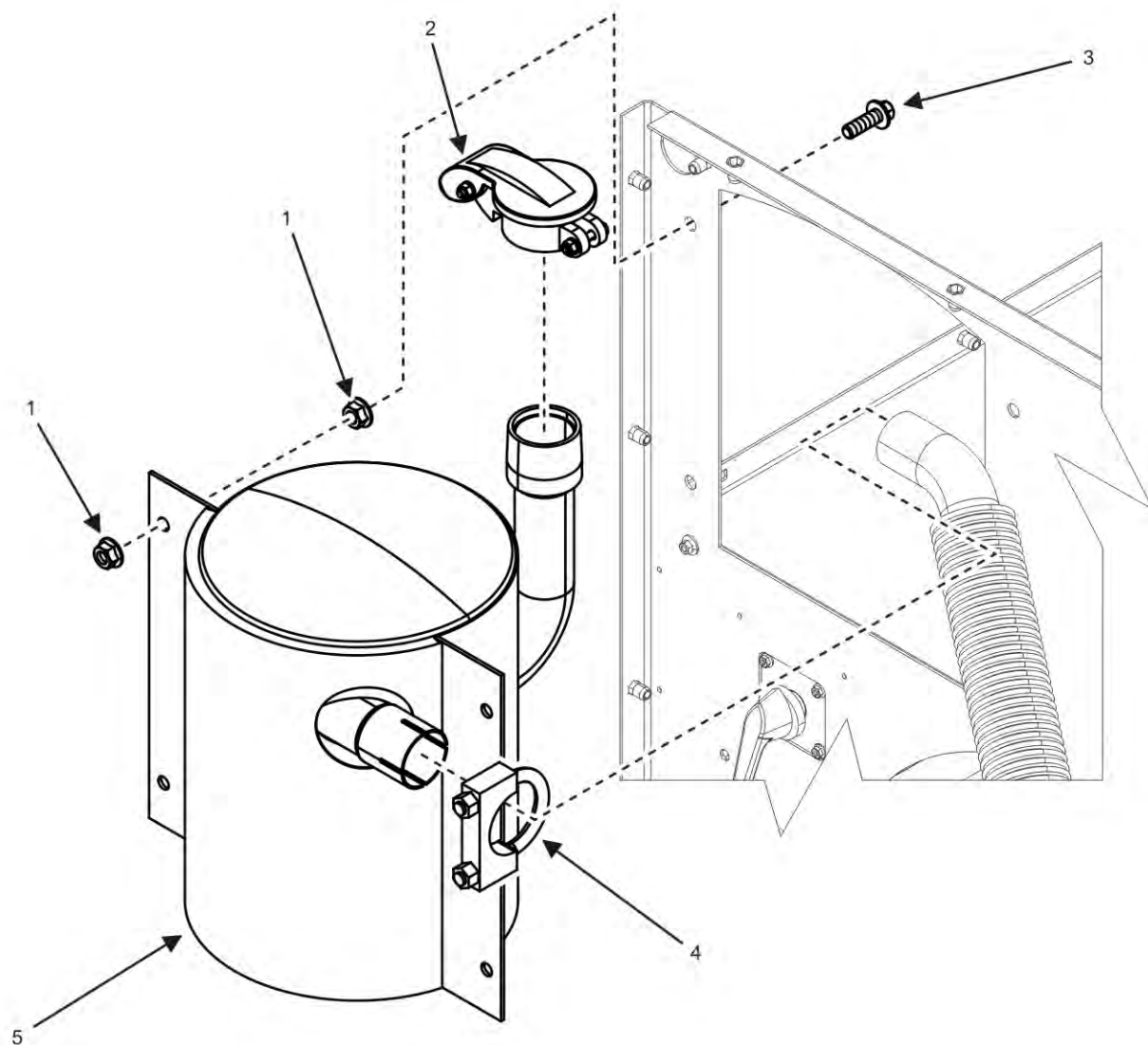


Figure 9. Exhaust Installation (Sheet 1 of 2).

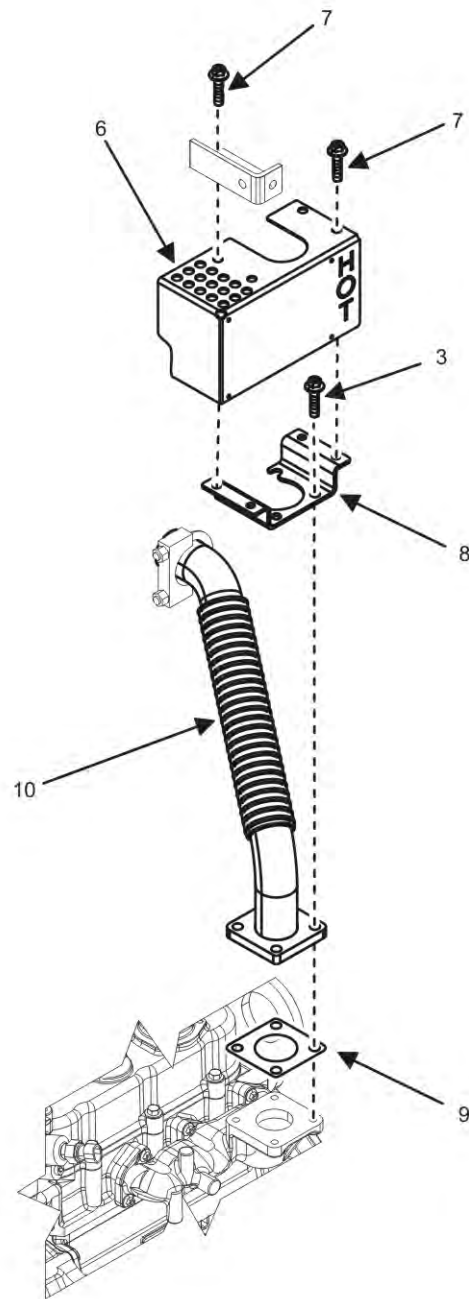


Figure 9. Exhaust Installation (Sheet 2 of 2).

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 05	
									FIG. 9 EXHAUST INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8		.NUT, HEX FLANGE (M8X1.25)	8
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015935321	4JTC3	55X		.CAP, RAIN EXHAUST	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B025WB4K42		.SCREW, HEX FLANGE HEAD (M8X1.25X25)	8
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		14934	PC150A1		.CLAMP, LOOP	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4NWX5	202229A		.MUFFLER	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21321		.SHIELD, HEAT	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42		.SCREW, HEX FLANGE HEAD (M6X1X16)	4
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21338		.BRACKET, SUPPORT	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014462136	0XWR1	15263-1237-0		.GASKET, EXHAUST	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20736		.PIPE, EXHAUST	1
									END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
COOLING SYSTEM INSTALLATION REPAIR PARTS LIST

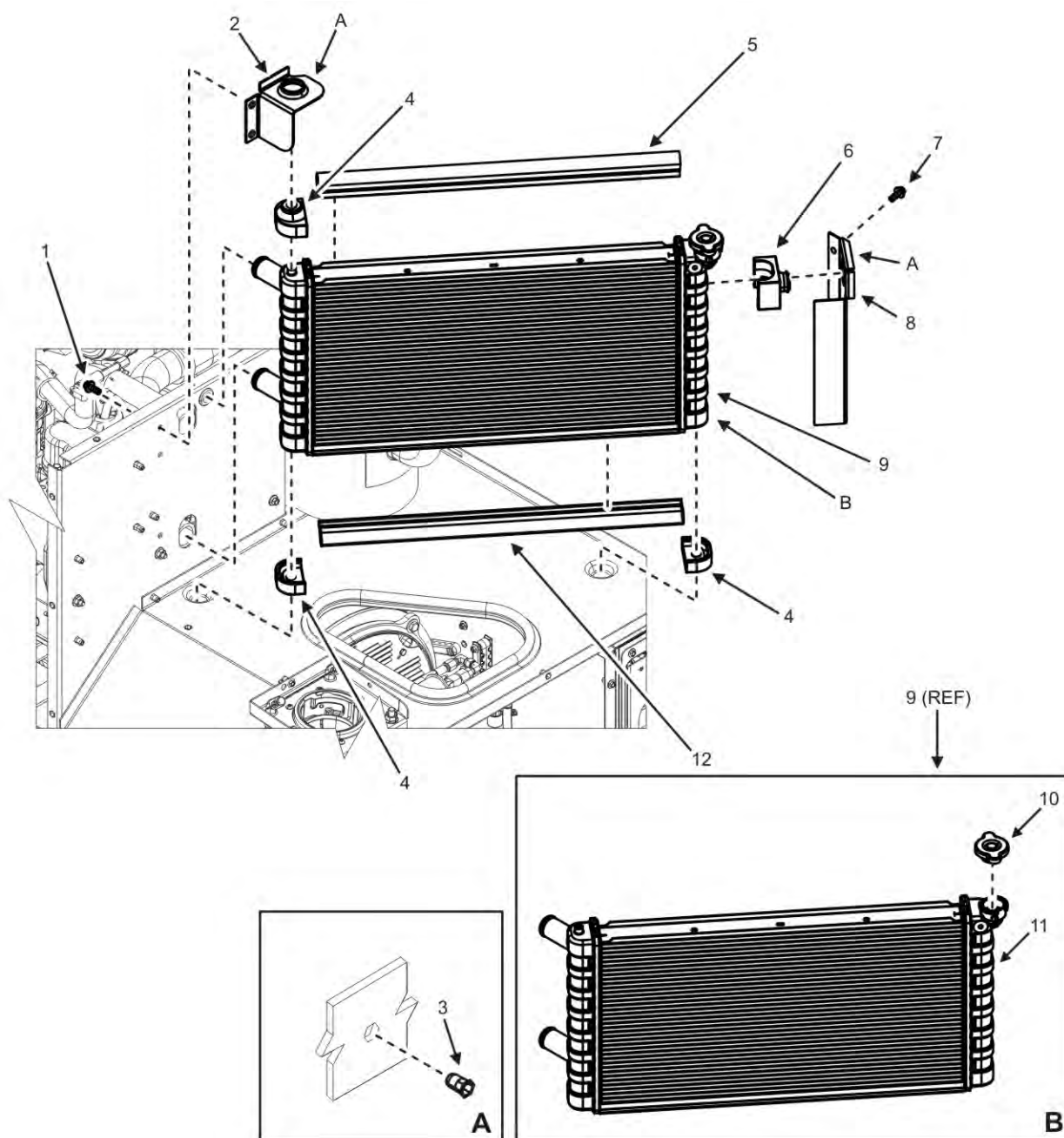


Figure 10. Cooling System Installation (Sheet 1 of 4).

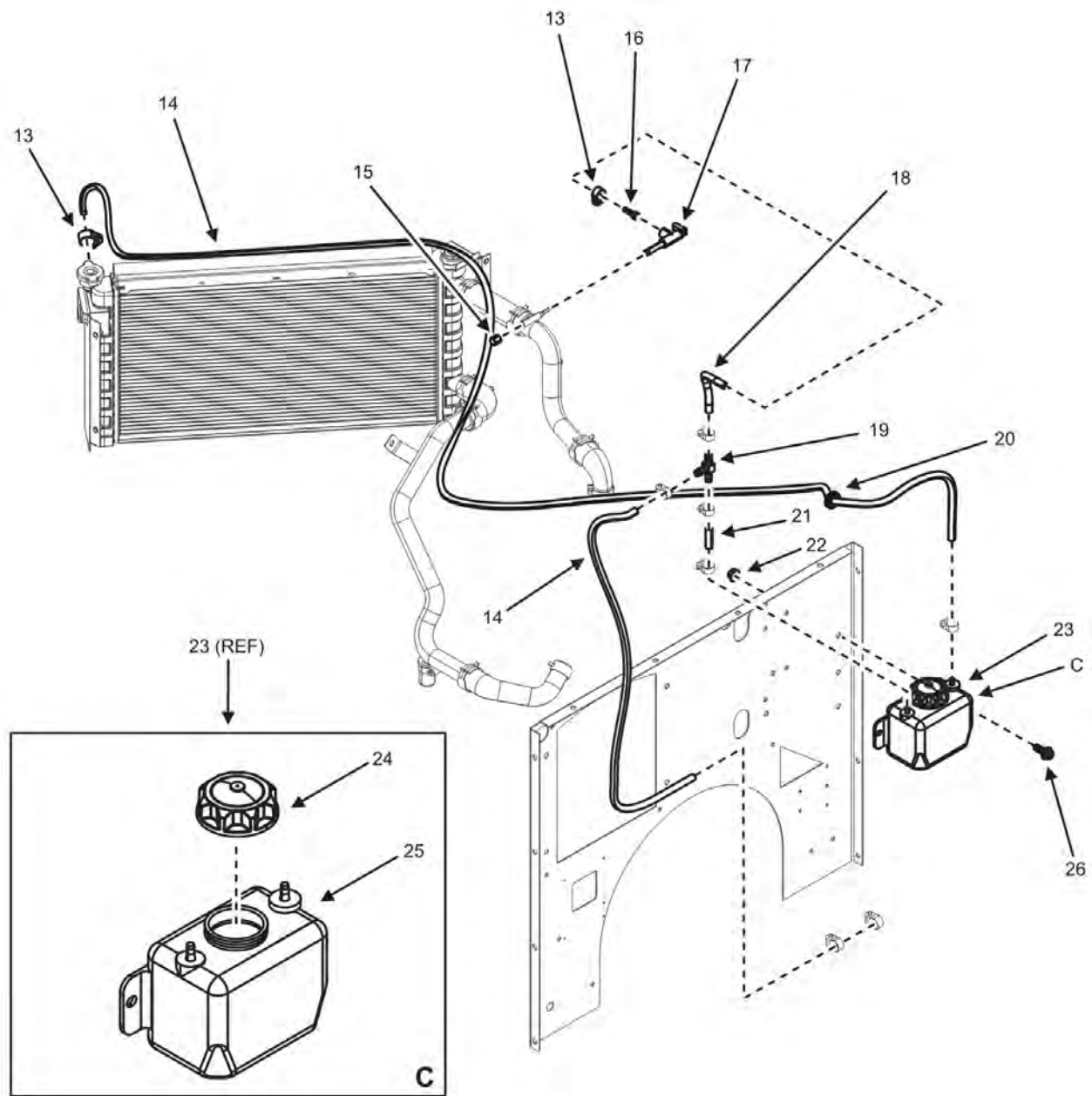


Figure 10. Cooling System Installation (Sheet 2 of 4).

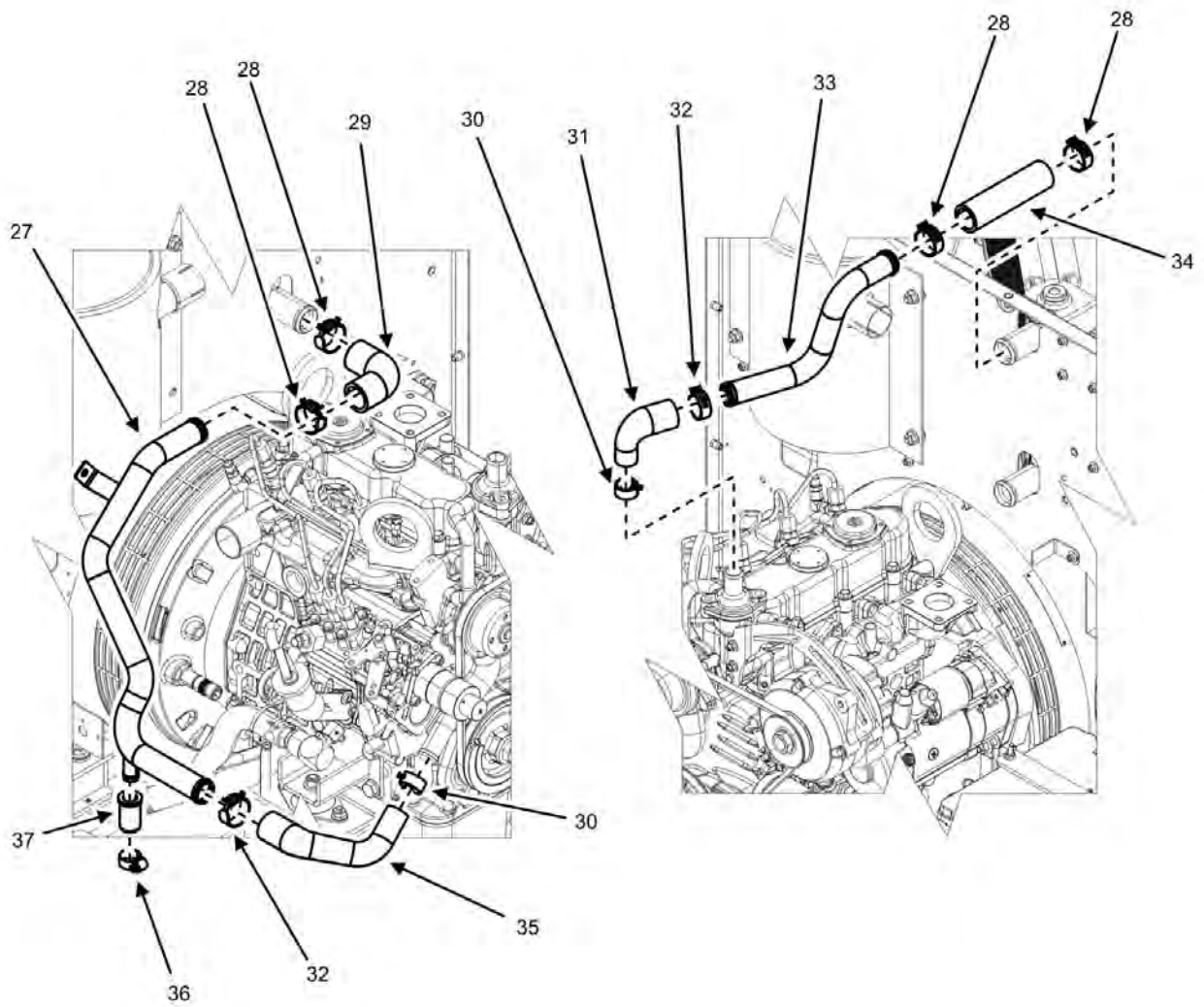


Figure 10. Cooling System Installation (Sheet 3 of 4).

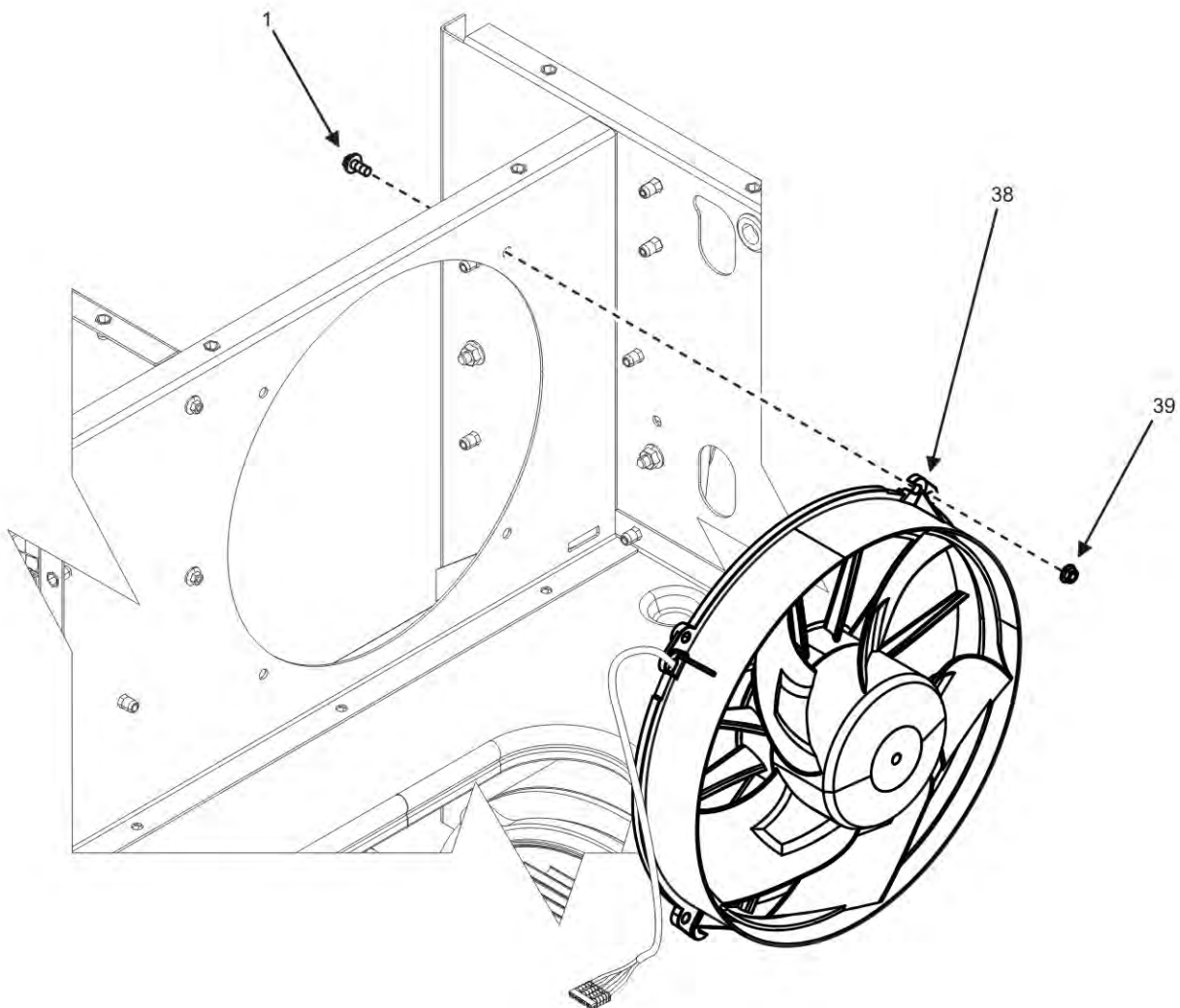


Figure 10. Cooling System Installation (Sheet 4 of 4).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 06	
								FIG. 10 COOLING SYSTEM INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	.SCREW, HEX FLANGE HEAD M6 X 1 X 16	6
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20997	.BRACKET, RADIATOR	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	.NUT, PLAIN, CLINCH	4
4	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015932746	44940	04-20832	.MOUNT, RADIATOR	3
5	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21030-1	.SEAL, EDGE (MAKE FROM A3709 ON BULK ITEMS LIST, CUT TO LENGTH 550MM+/-5)	2
6	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015932748	44940	04-20833	.MOUNT, RADIATOR	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4M343	44832	.SCREW, FLANGE HEAD M6 X 1.0 X 16	2
8	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20916	.BRACKET, RADIATOR	1
9	PAFFF	PAFFF	PAFFF	PAFFF	2930015908522	44940	A028X837	.RADIATOR ASSEMBLY	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	JSKG11	.CAP, FILLER, OPENING	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015959350	44940	0130-8255-2-010L	.RADIATOR	1
12	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21031-1	.SEAL, EDGE (MAKE FROM A1512 ON BULK ITEMS LIST, CUT TO LENGTH 550MM+/-5)	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730008716729	61424	6202	.CLAMP, HOSE	9
14	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21070-3	.HOSE, VENT RADIATOR (MAKE FROM 3058529 ON BULK ITEM LIST, CUT TO LENGTH 1050MM+/-10)	2
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015888328	3A054	9171K241	.CAP, PIPE	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730005951078	93061	125HBL-4-2	.FITTING, HOSE BARB	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820013671836	70411	SP2529VT	.VALVE, CHECK	1
18	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21070-4	.HOSE, VENT RADIATOR (MAKE FROM 3058529 ON BULK ITEMS LIST)	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015926772	44940	04-21502	.FITTING, TEE	1
20	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5325001850001	96906	MS35489-46	.GROMMET	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
21	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21070-5	.HOSE, VENT RADIATOR (MAKE FROM BULK ITEMS LIST 3058529, CUT TO LENGTH 50 MM +/- 10)	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8	.NUT, HEX FLANGE M8 X 1.25	2
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5430015955961	0E3E3	070506	.TANK, COOLANT ASSEMBLY	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015882852	0E3E3	080061BE	..CAP, COOLANT	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0E3E3	070313	..TANK, COOLANT	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B020WB4K42	.SCREW, HEX FLANGE HEAD M8 X 1.25 X 20	2
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20733	.TUBE, WATER LOWER	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-42	.CLAMP	4
29	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20724	.ELBOW, COOLANT HOSE	1
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-30	.CLAMP	2
31	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20726	.ELBOW, COOLANT HOSE	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-40	.CLAMP	2
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20734	.TUBE, WATER UPPER	1
34	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4720015942216	44940	04-20727	.HOSE, COOLANT (MAKE FROM 0503-2726 ON BULK ITEMS LIST, CUT TO LENGTH 153MM+/-3)	1
35	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20723	.ELBOW, COOLANT	1
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508F10	.CLAMP	1
37	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21393	.CAP, TUBE	1
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ		C0574	W3G300-ER38-47	.FAN, ENGINE COOLING	1
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX FLANGE M6 X 1	4
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
FUEL SYSTEM INSTALLATION REPAIR PARTS LIST

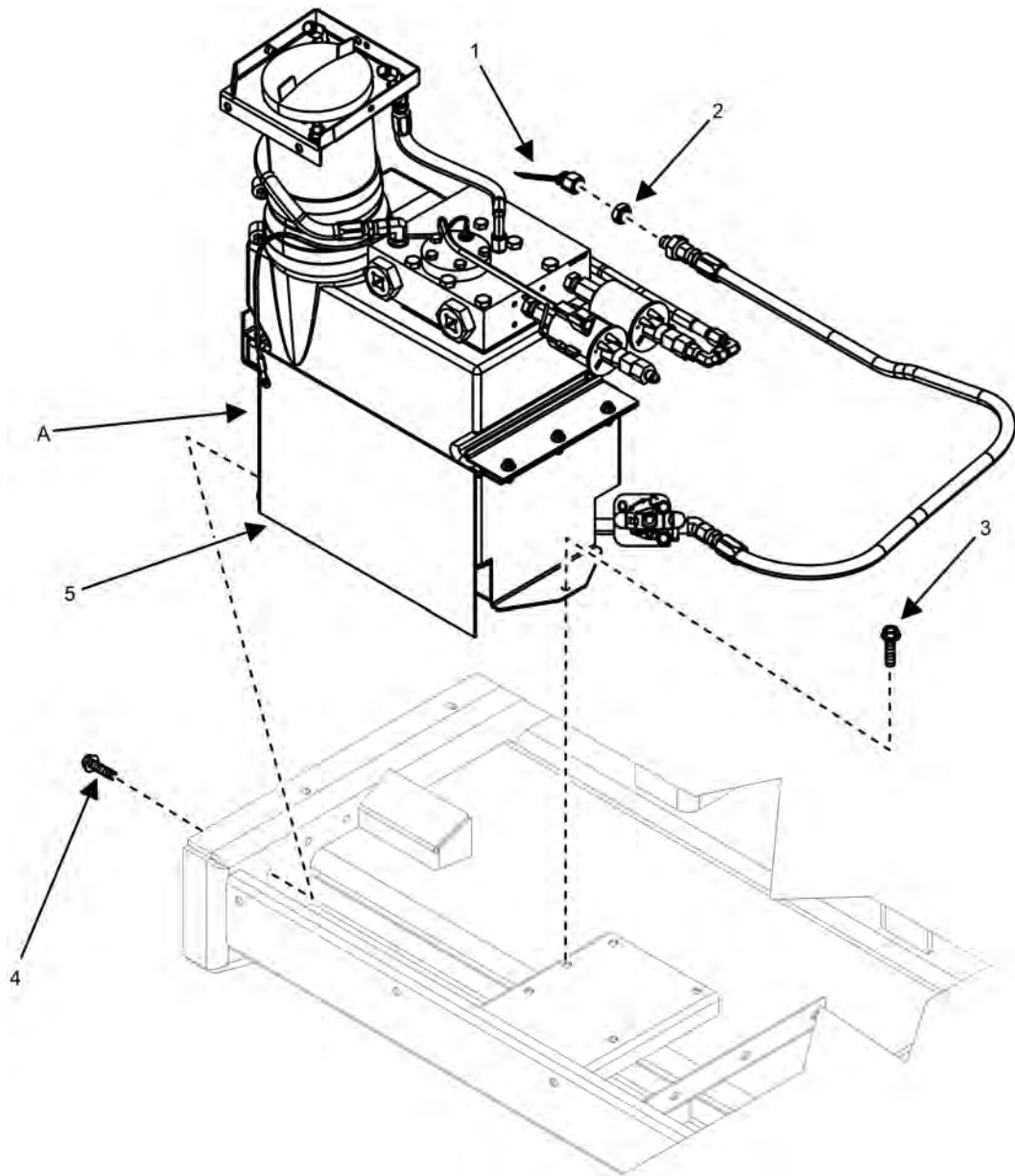


Figure 11. Fuel System Installation (Sheet 1 of 6).

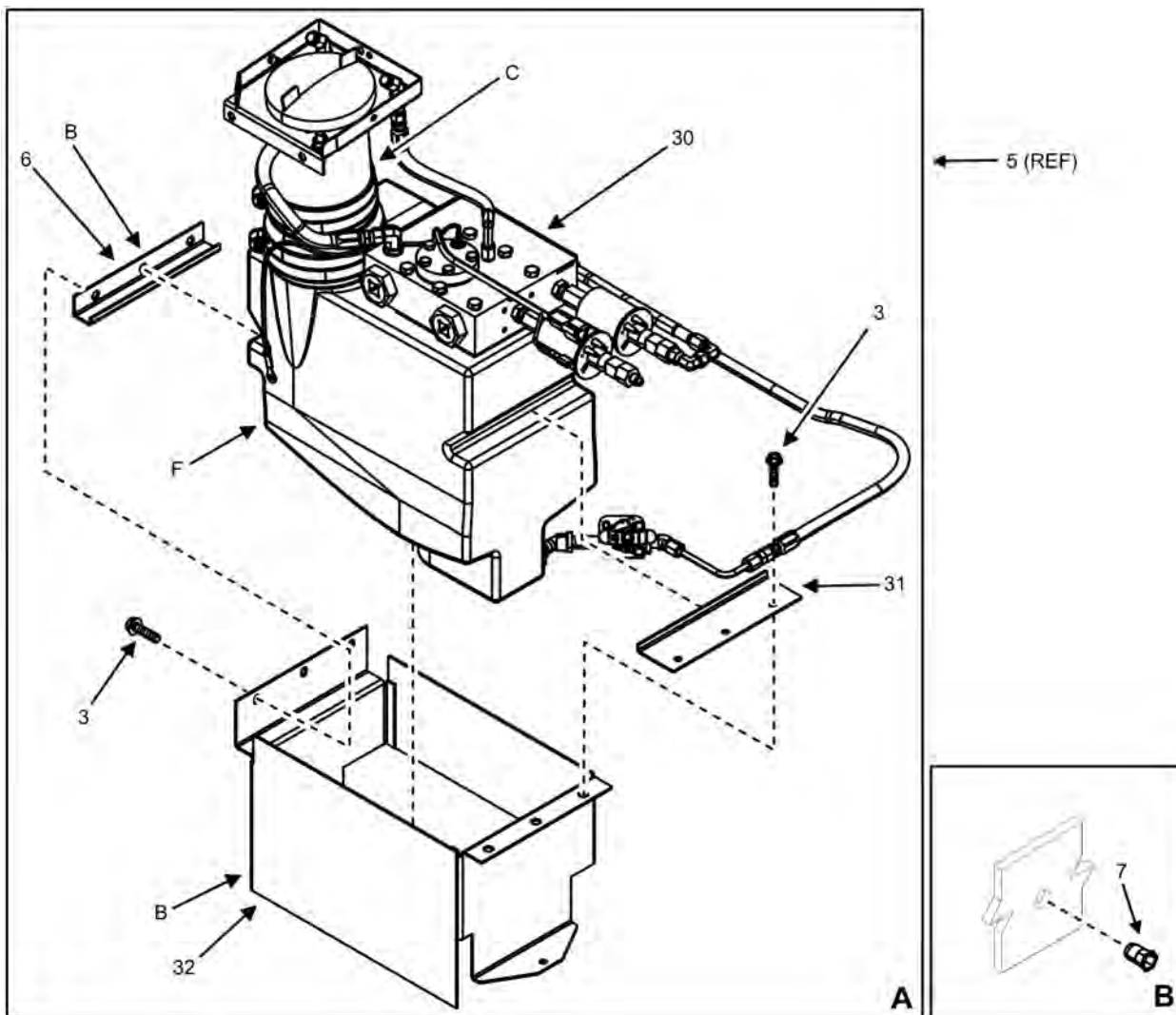


Figure 11. Fuel System Installation (Sheet 2 of 6).

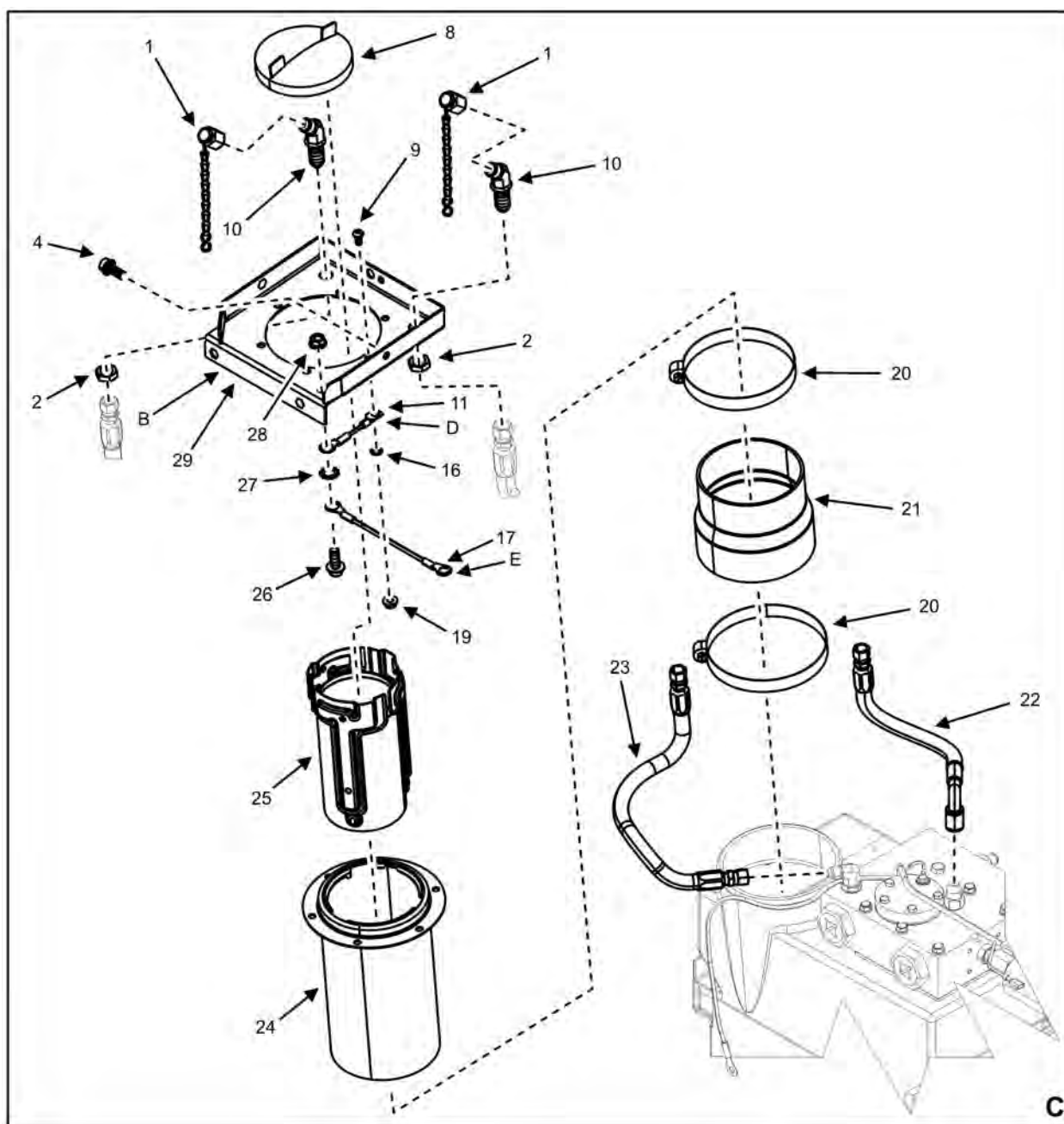


Figure 11. Fuel System Installation (Sheet 3 of 6).

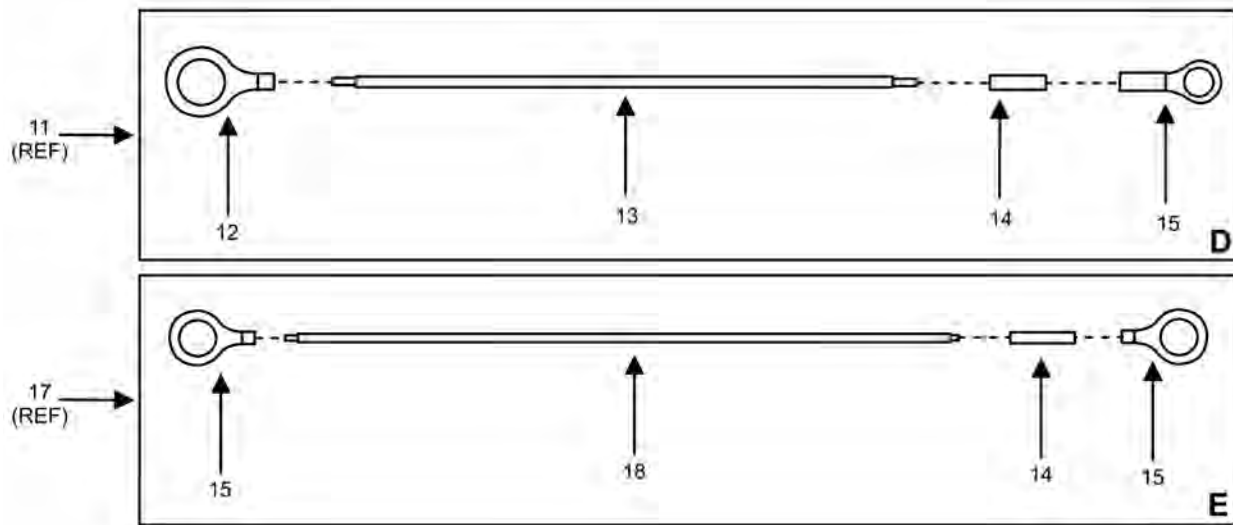


Figure 11. Fuel System Installation (Sheet 4 of 6).

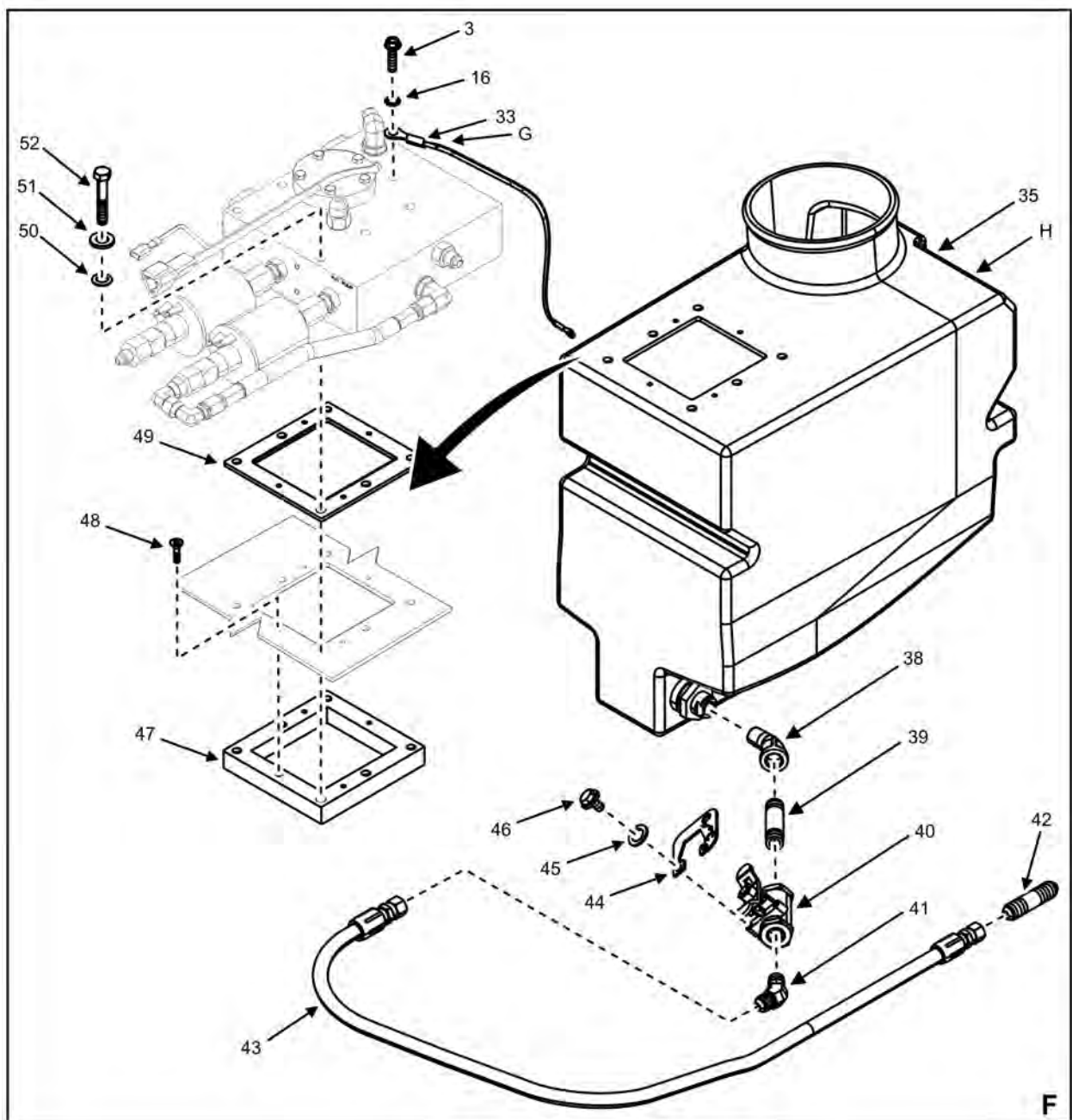


Figure 11. Fuel System Installation (Sheet 5 of 6).

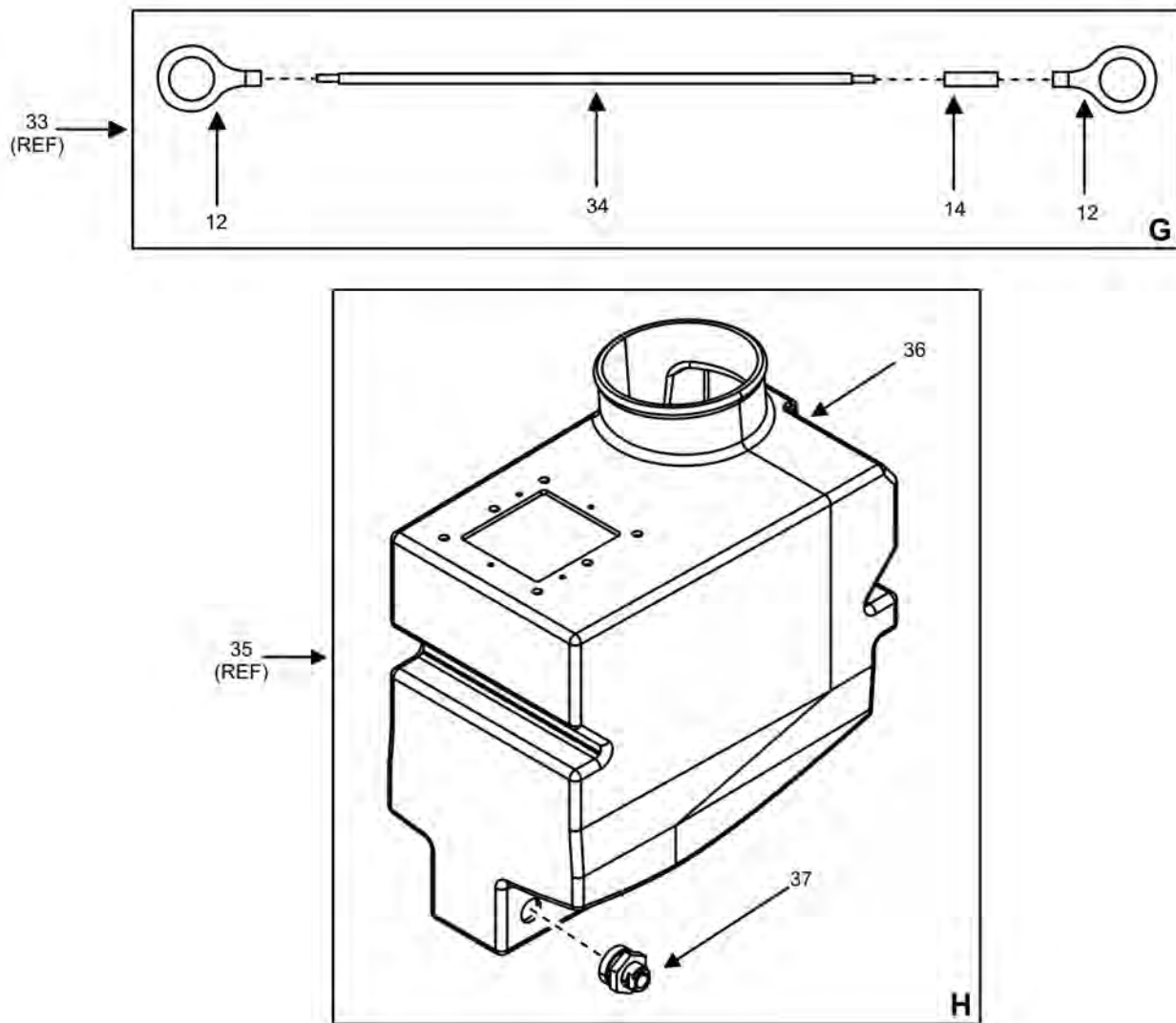


Figure 11. Fuel System Installation (Sheet 6 of 6).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 07	
								FIG. 11 FUEL SYSTEM INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015979059	44940	04-21043	.CAP, TUBE	3
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145070118C	.NUT, HEX JAM 1/2-20 INCH	3
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	.SCREW, HEX FLANGE HEAD M6 X 1 X 6	8
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4M343	44832	.SCREW	3
5	XCFFF	XCFFF	XCFFF	XCFFF		44940	04-20377	.FUEL SYSTEM ASSEMBLY 5KW	1
6	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20793	.BRACKET, FUEL SUPPORT SYSTEM	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	...NUT, CLINCH M6 X 1.0	9
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2590001419758	96906	MS35645-1	HEXSERT .CAP, FILLER OPENING	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	.SCREW, SOCKET HEAD BUTTON M6 X 1 X 12	6
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145070801B	..FITTING, TUBE ELBOW 45, 1/2- 20 INCH	2
11	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-1	..CABLE, ELECTRICAL GROUND	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001139828	96906	MS25036-148	...TERMINAL, RING M6, 12-10 AWG	3
13	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65	...WIRE, STRANDED 12 AWG (MAKE FROM 3271-12- 65 ON BULK ITEMS LIST CUT TO LENGTH 150MM +/- 25)	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	...LAMINATE, LABEL COVER	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	130207	...TERMINAL, RING M10, 12-10 AWG	3
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A21	..WASHER, LOCK 1/4 EXTERNAL TOOTH	2
17	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-3	..CABLE, ELECTRICAL GROUND	1
18	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65	...WIRE, STRANDED 12 AWG (MAKE FROM 3271-12- 65 ON BULK ITEMS LIST CUT TO LENGTH 1920MM +/- 25)	2

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6		..NUT, HEX	
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508F72		FLANGE M6 X 1	6
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015893753	44940	04-21352		..CLAMP	2
22	PAFZZ	PAFZZ	PCFZZ	PAFZZ		44940	04-20767-26		..COUPLING,	
23	PAFZZ	PAFZZ	PCFZZ	PAFZZ	4720015938806	44940	04-20767-25		HOSE	1
24	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20202		..LINE, FUEL	1
									..LINE, FUEL	1
									..MODULE,	
									FUEL FILLER	
									NECK	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015966464	44940	04-20203		..TUBE, FUEL	
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10C025CZ7A32		FILL	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW20M010000D88A31		..SCREW, H EX	
									FLANG HEAD	1
									M10 X 1.5 X 25	
									..WASHER,	
									LOCK M10	1
									EXTERNAL	
									TOOTH	
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN18M10C000DG8A31		..NUT, HEX	
									FLANGE HEAD	
									M10 X 1.5	1
									STAINLESS	
29	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20744		..BRACKET,	
30	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20615		FUEL SYSTEM	1
									..MODULE,	
									FUEL SYSTEM	
									(SEE FIGURE 12	
									FOR PARTS	1
									BREAKDOWN)	
31	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20792		..BRACKET,	
									FUEL SUPPORT	1
									SYSTEM	
32	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20829		..SUPPORT,	
									FUEL SYSTEM 5	1
									KW	
33	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-13		..CABLE,	
									ELECTRICAL	1
									GROUND	
34	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65		...WIRE,	
									STRANDED 12	
									AWG (MAKE	
									FROM 3271-12-	
									65 ON BULK	
									ITEMS LIST CUT	
									TO LENGTH	1
									225MM +/- 25)	
35	PAFFF	PAFFF	PAFFF	PAFFF	2910012751749	1DS87	84-13000		..TANK	
									ASSEMBLY,	1
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910015959558	44940	04-20501		FUEL 5 KW	
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015890851	1DS87	P35900661		...TANK, FUEL 5	1
									KW	
									...FITTING	
									BULKHEAD, 1/4-	1
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144-4140339C		18 NPT PORT	1
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20861		..ELBOW PIPE	
									..FITTING, PIPE	
									NIPPLE 1/4	
									INCH NPT X	1
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820015891015	93061	XV502P-4-04		50.8MM LONG	
									..VALVE, BALL	
									1/4 FEMALE	
									NPT	1
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145-4070302C		..FITTING, TUBE	
									ELBOW 1/4-NPT	1
									X 1/2-20	

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145070601B		..CONNECTOR, TUBE BULKHEAD, 1/2-20 INCH JIC FLARE	1
43	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015976349	44940	04-20767-29		..LINE, FUEL	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4310015975318	30554	04-21210		..PLATE, VALVE	1
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN127-M6		..WASHER, LOCK (M6)	2
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AESZAC190375WA1FY1		..SCREW HEX HEAD 10-24 INCH X 3/8 INCH	2
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015932769	44940	04-20535		..RETAINER, GASKET FUEL SYSTEM	1
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES47M407016DG6CP2		..SCREW, FLAT HEAD	2
49	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015971377	44940	04-20536		..GASKET, FUEL SYSTEM	1
50	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015960059	4JMM9	RS6220		..WASHER, SEALING	6
51	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW25X266062EA1AF1		..WASHER-FLAT 1/4	6
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M06A070WB4A A1		..SCREW-HHC M6 X 1 X 70	6
END OF FIGURE										

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
FUEL MANIFOLD ASSEMBLY REPAIR PARTS LIST**

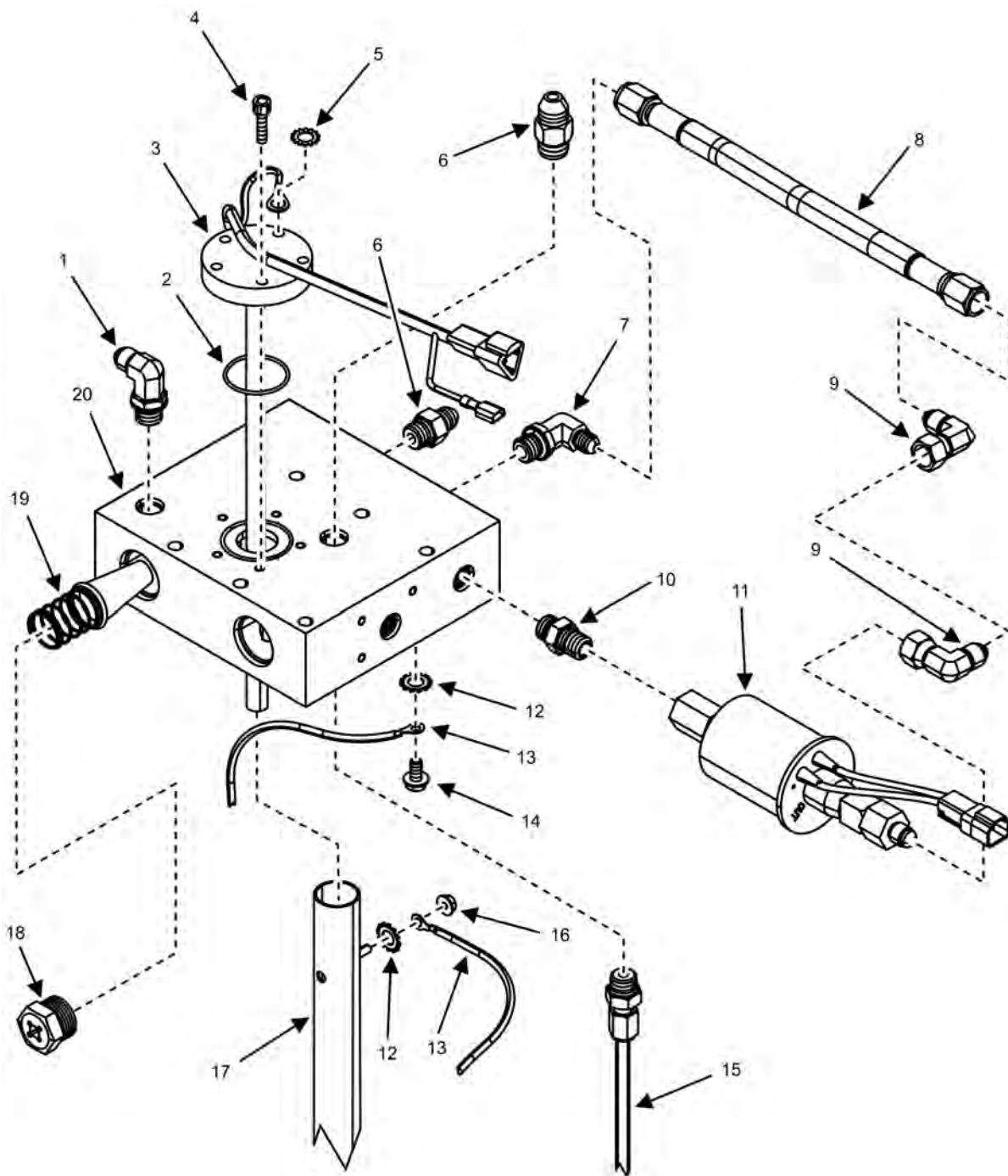


Figure 12. Fuel Manifold Assembly.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 0701	
								FIG. 12 FUEL MANIFOLD ASSEMBLY	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145-6070220C	.FITTING, TUBE ELBOW	1
2	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	J515CH29X0386H	.SEAL, O-RING	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910015881824	55752	FSCMN-03	.SENSOR, FUEL LEVEL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M5X30	.SCREW, HEX HEAD M5 X 0.8 X 30	5
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW22X190000EA1AA1	.WASHER, LOCK EIT #10	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730012089235	81343	SAE J514 5-6 070120C	.FITTING, CONNECTOR	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144-6070220C	.FITTING, TUBE ELBOW	1
8	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015966552	44940	04-20053	.LINE, FUEL	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975015906706	44940	SAEJ5144070221C	.FITTING, ELBOW	2
10	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	SAEJ5146-4080102C	.FITTING, CONNECTOR	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4320015870865	71425	0149-2769	.PUMP, FUEL, ELECTRIC	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13Z250000GD5A21	.WASHER, LOCK 1/4 EXT TOOTH	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015883447	44940	04-21318-2	.LEAD, ELECTRICAL GROUND	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963670	44940	AES10M06A016WB4K42	.SCREW, HEX FLANGE HEAD M6 X 1 X 16	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20623	.TUBE, FUEL	2
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX FLANGE M6X1	1
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20619	.PIPE, FUEL 5 KW	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015971376	44940	04-20406	.PLUG, THREADED	2
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015966452	44940	04-20618	.STRAINER, FUEL	2
20	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20534	.MANIFOLD, FUEL	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
FUEL FILTER/WATER SEPARATOR ASSEMBLY REPAIR PARTS LIST**

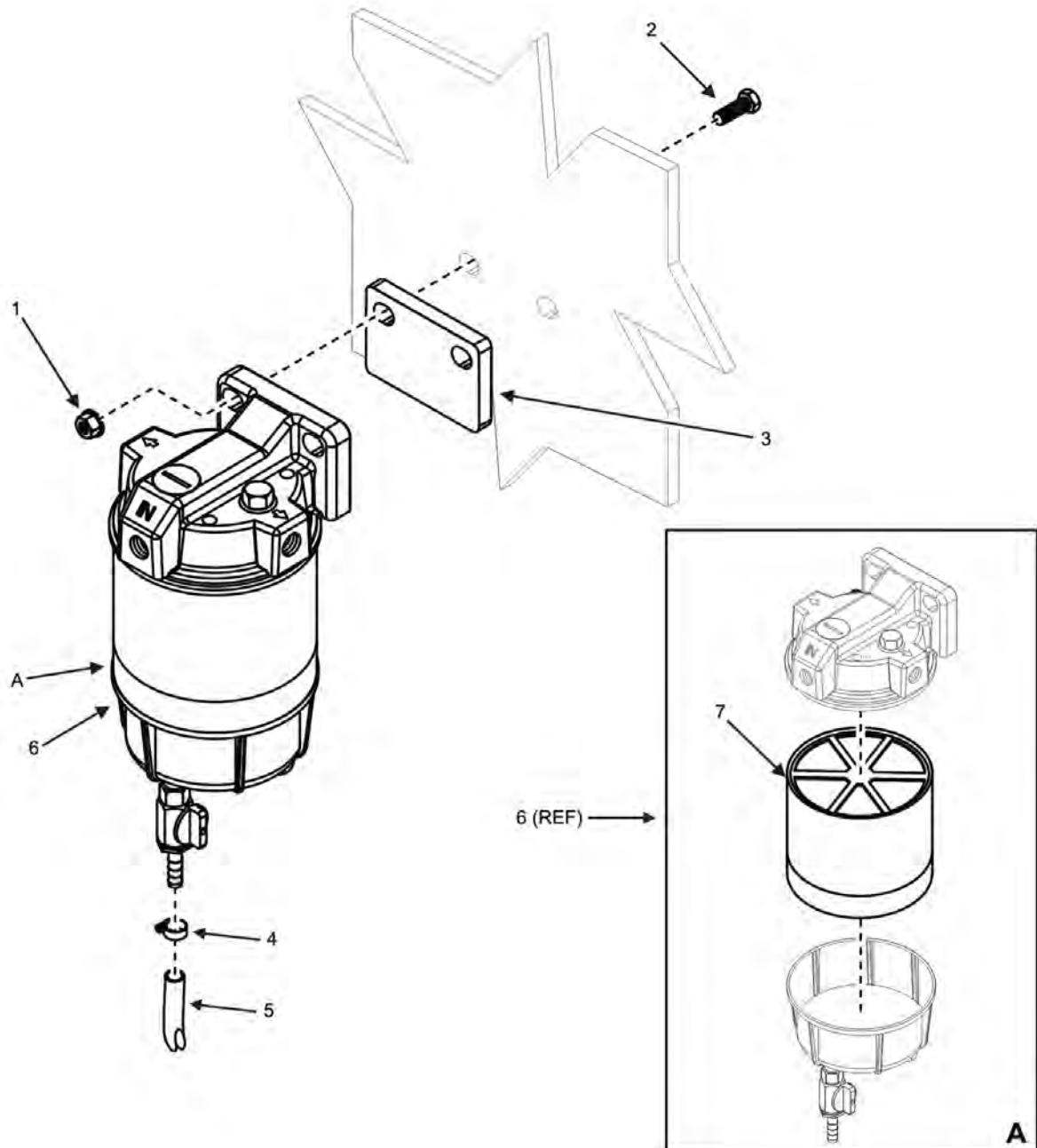


Figure 13. Fuel Filter/Water Separator Assembly (Sheet 1 of 3).

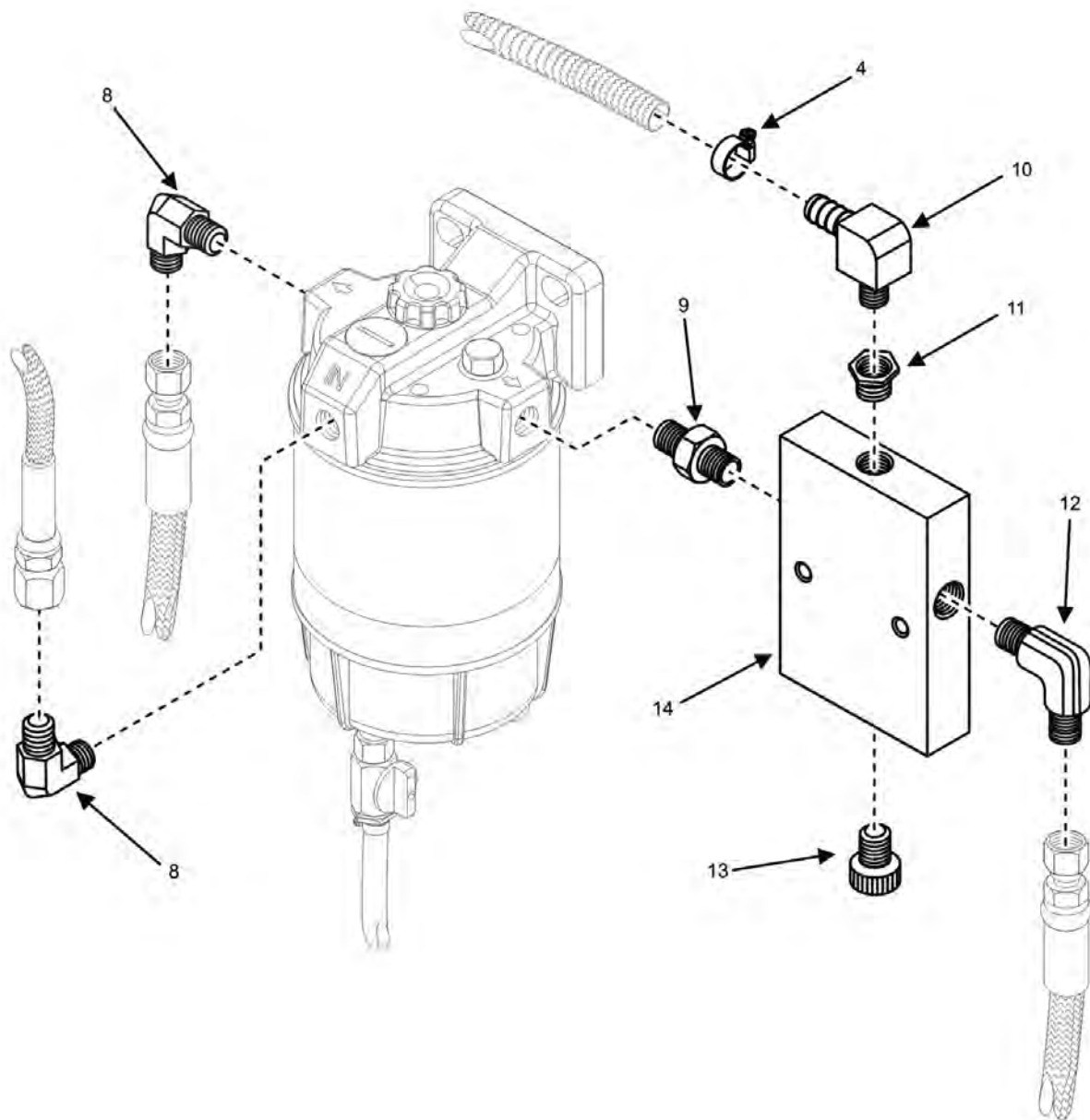


Figure 13. Fuel Filter/Water Separator Assembly (Sheet 2 of 3).

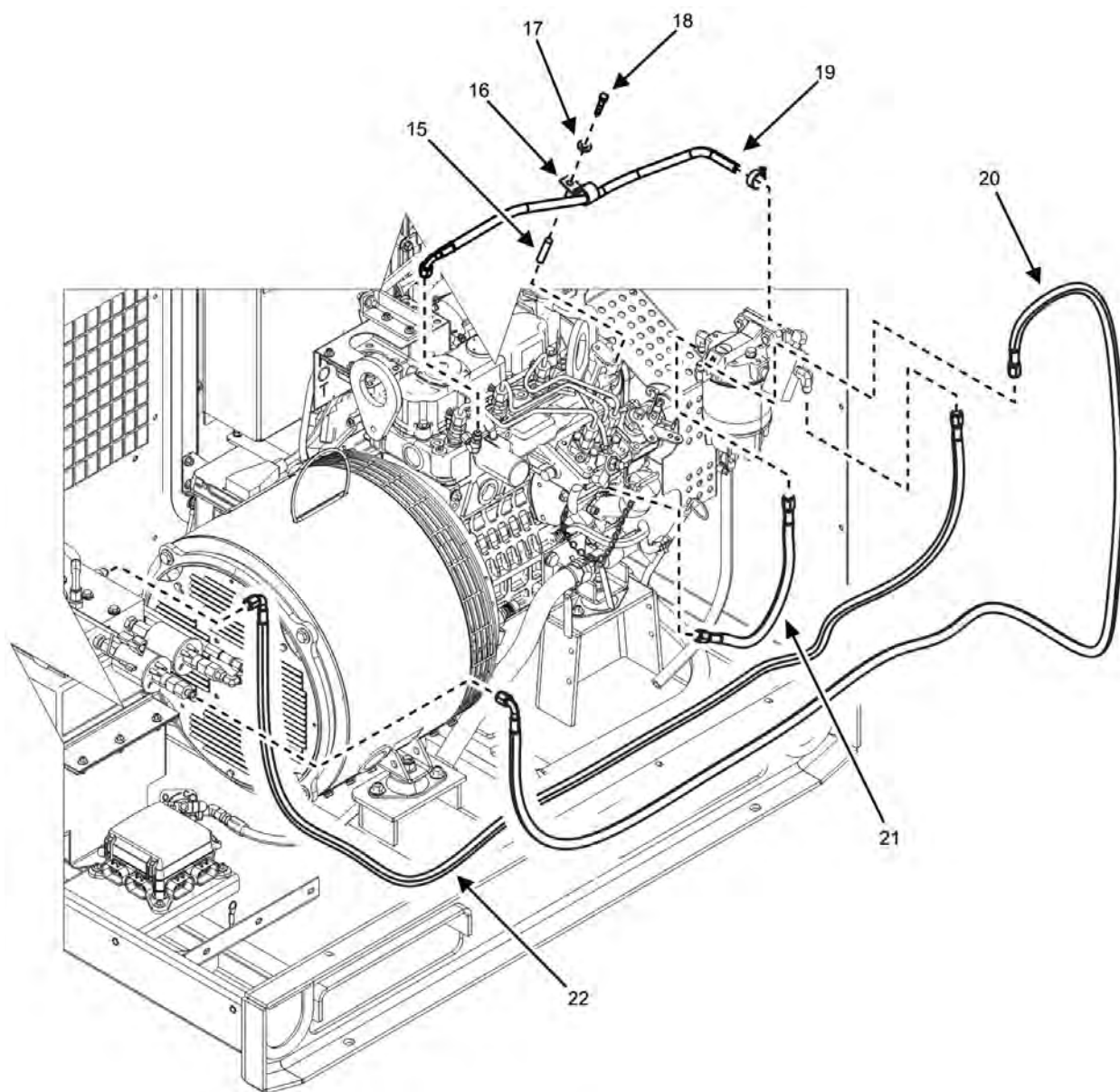


Figure 13. Fuel Filter/Water Separator Assembly (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0702	
								FIG. 13 FUEL FILTER/WATER SEPARATOR ASSEMBLY	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310012866304	S3151	93-193	.NUT, HEX M10 X 1.5	2
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015928054	05047	AES10M10C030WB4K42	.SCREW, HEX FLANGE HEAD M10 X 1.5 X 30	2
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21504	.SPACER	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730008716729	61424	6202	.CLAMP, HOSE	2
5	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4720015893798	44940	04-21485	.HOSE, FUEL (MAKE FROM 42190109 ON BULK ITEMS LIST CUT TO LENGTH 500 MM +/- 10)	1
6	PAFFF	PAFFF	PAFFF	PAFFF		4L990	215M-ONAN-01	.SEPARATOR, FUEL WATER	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2940015880924	55752	R15S	.FILTER, ELEMENT	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144-4070202C	.ADAPTOR, PIPE	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144-4140137C	.NIPPLE, PIPE	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ12312-34314608	.ELBOW, MALE ADAPTER	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ51442-140140B	.REDUCER	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975010963170	44940	SAEJ5145-4070202C	.FITTING, TUBE ELBOW	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144140109C	.PLUG, PIPE	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20884	.MANIFOLD, FUEL	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20581	.SPACER	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		75272	CJV-13	.CLAMP, J	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015626014	62319	DIN-9021-M6	.WASHER	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M06B045WB4A A1	.SCREW	1
19	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20767-4	.LINE, FUEL	1
20	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015976246	44940	04-20767-1	.LINE, FUEL	1
21	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015976254	44940	04-20767-12	.LINE, FUEL	1
22	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015976400	44940	04-20767-6	.LINE, FUEL	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
OUTPUT BOX INSTALLATION REPAIR PARTS LIST

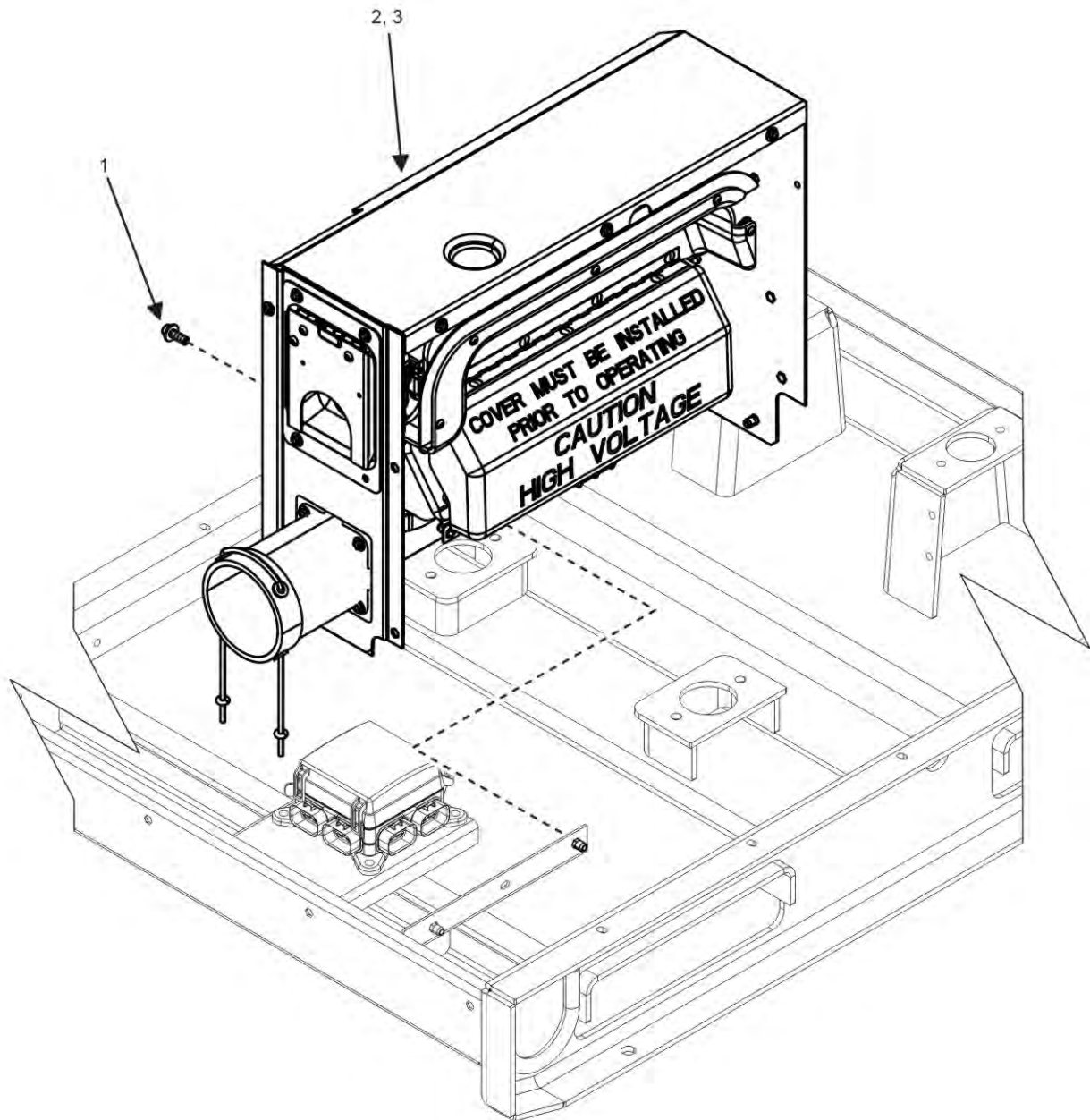


Figure 14. Output Box Installation (Sheet 1 of 2).

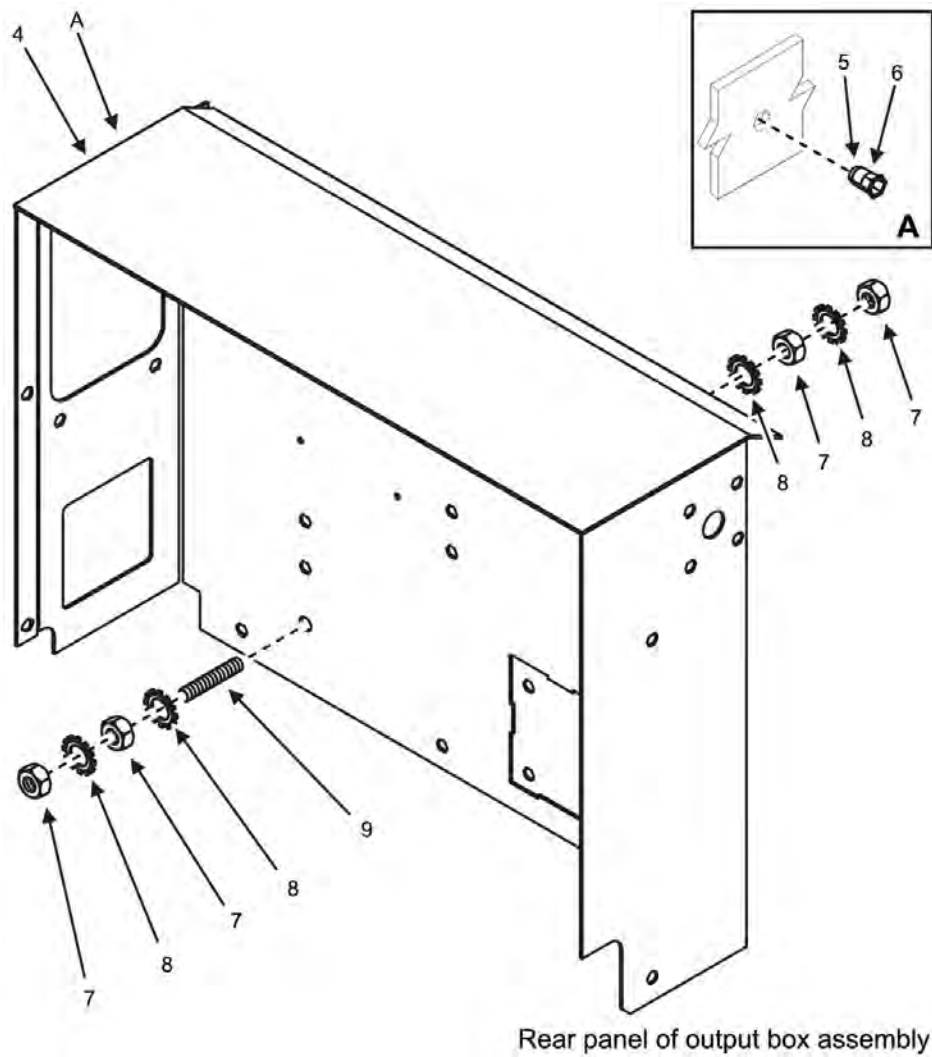


Figure 14. Output Box Installation (Sheet 2 of 2).

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR AIR FORCE	CODE USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 08	
									FIG. 14 OUTPUT BOX INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A020WB4K42		..SCREW, HEX FLANGE HEAD M6X1X20	2
2	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20454-3		..OUTPUT BOX ASSEMBLY	
3	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20454-4		UOC: 98E	1
4	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20407		..OUTPUT BOX ASSEMBLY	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030		UOC: 98F	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5325015893734	3A2G6	39101-75030		..PANEL, OUTPUT BOX	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN15M10C000WA2AA1		...NUT, PLAIN, CLINCH	30
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW20X010000BD8A21		...NUT, PLAIN, CLINCH	4
									..NUT, HEX (M10X1.5)	4
									..WASHER, LOCK M10	
									EXTERNAL STAR	4
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307015884044	44940	04-21292		..STUD, PLAIN (M10X1.5X55)	1
									END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
CONTACTOR REPAIR PARTS LIST

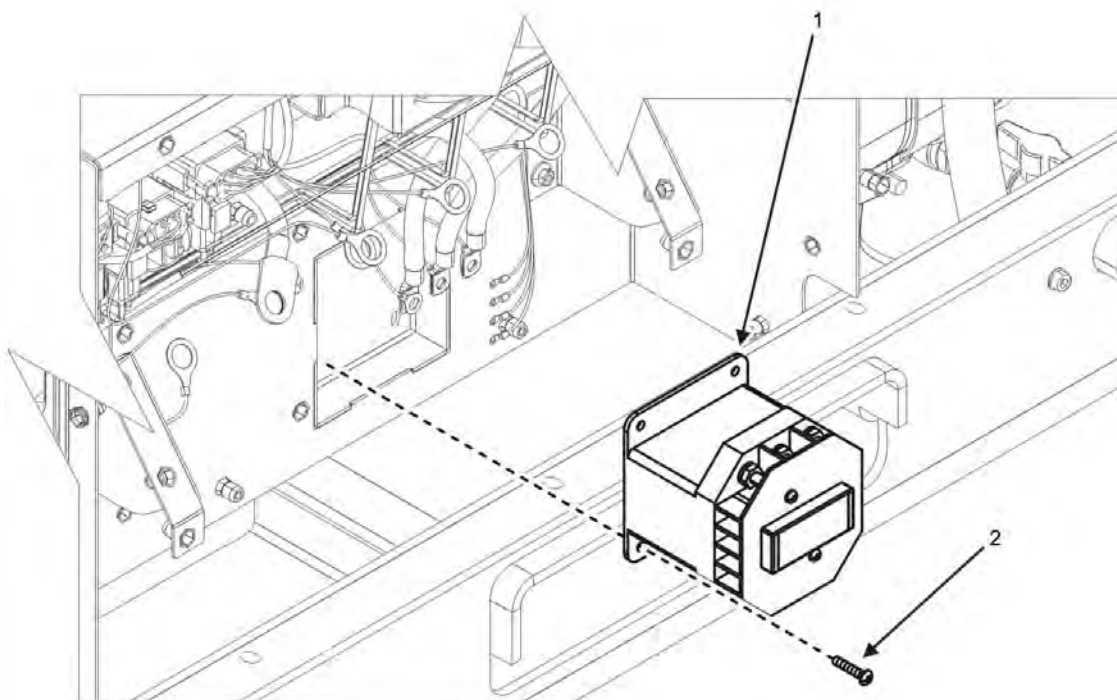


Figure 15. Contactor (Sheet 1 of 3).

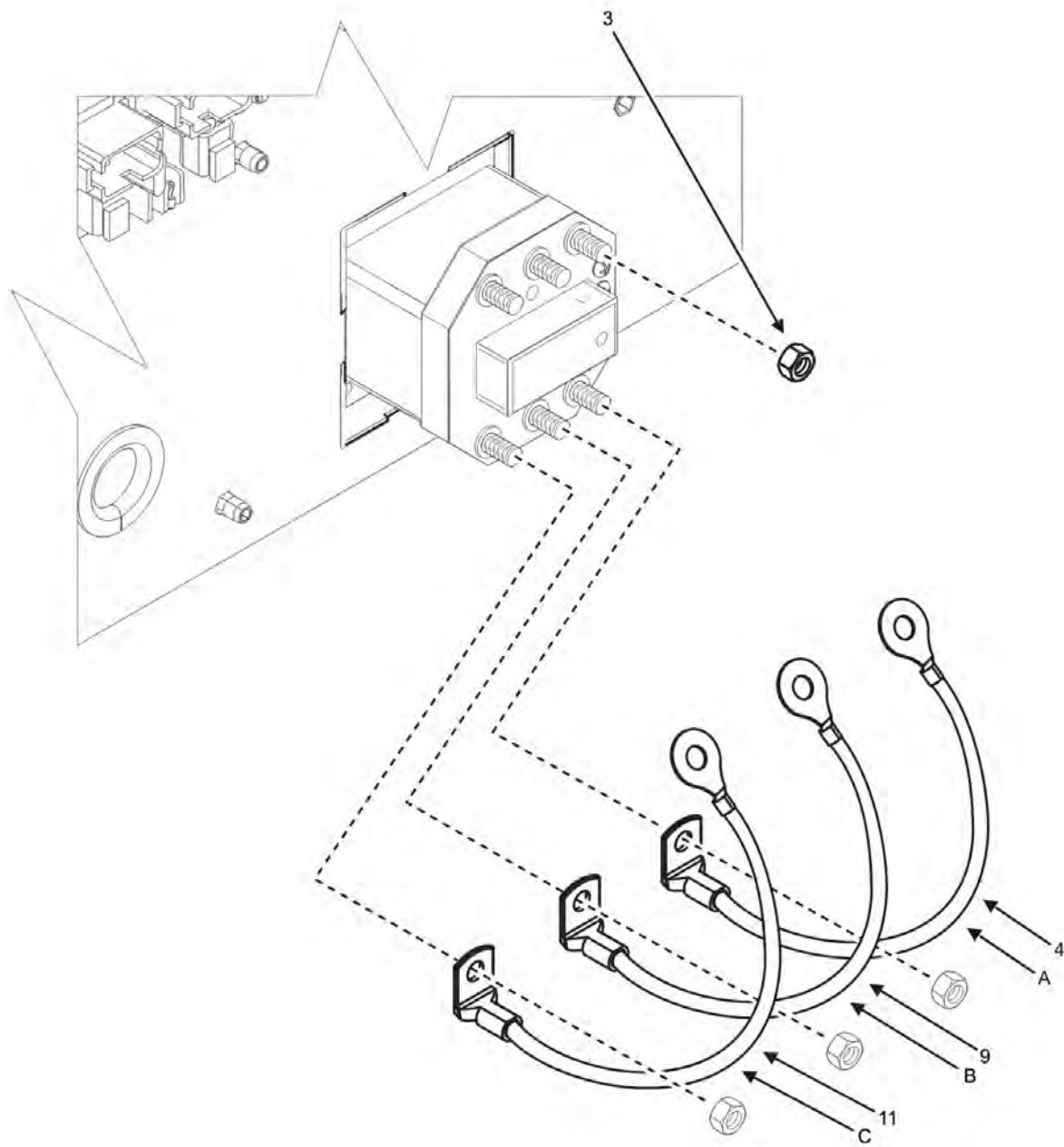


Figure 15. Contactor (Sheet 2 of 3).

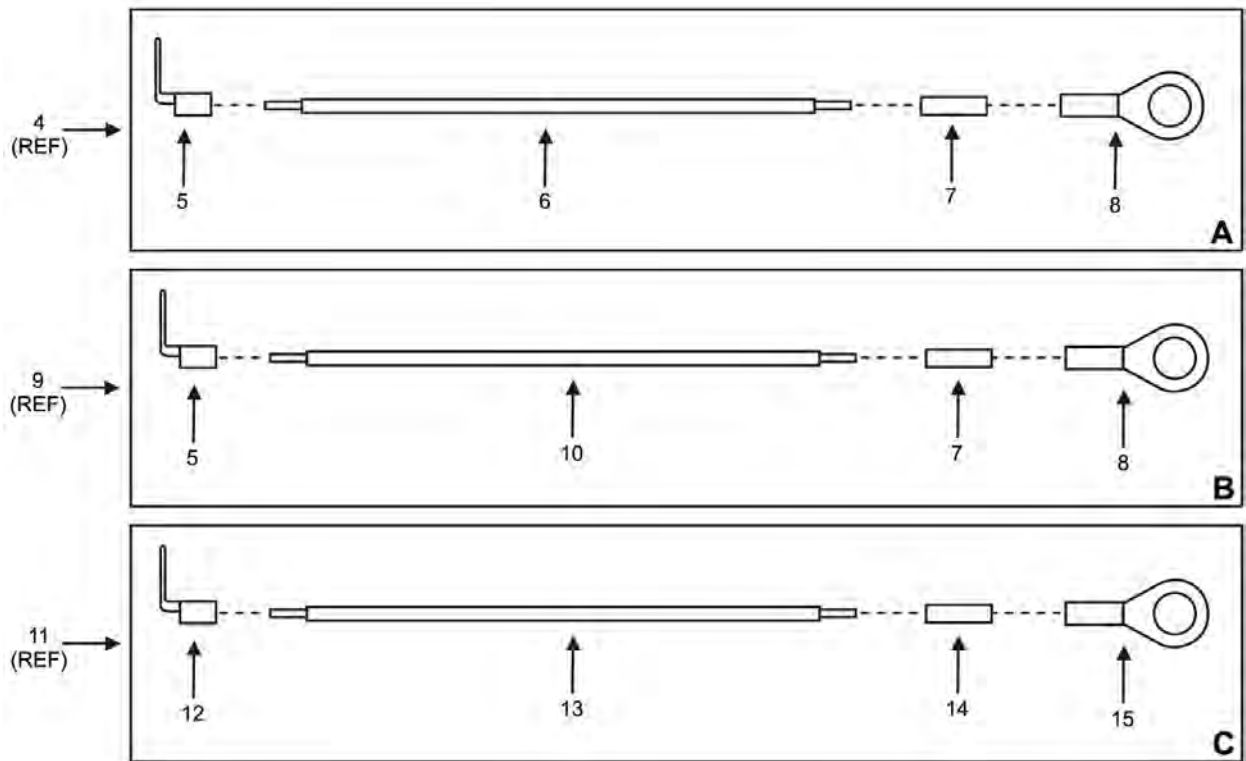


Figure 15. Contactor (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0801	
								FIG. 15 CONTACTOR	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6110015915195	01XD4	CT150E24E2S	.CONTACTOR, ELECTRICAL	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963600	05047	AES46M508016CH2A31	.SCREW, BUTTON HEAD SOCKET	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN12F250000CH2A31	M5X0.8X16 .NUT, HEX 1/4-28 UNF STAINLESS	6
4	PAFFF	PAFFF	PAFFF	PAFFF	6150015860317	44940	04-20261	.LEAD, ELECTRICAL K1- C2 TO TB501-L3	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860410	00779	35277	..TERMINAL, LUG	2
6	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-8-133	..STRAND, WIRE (MAKE FROM 3271-8-133 ON BULK ITEMS LIST CUT TO LENGTH 210 MM +/- 25)	2
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	..LAMINATE, LABEL	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001141315	96906	MS20659-12	..TERMINAL, RING	2
9	PAFFF	PAFFF	PAFFF	PAFFF	6150015860078	44940	04-20260	.LEAD, ELECTRICAL K1- B2 TO TB501-L2	1
10	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-8-133	..STRAND, WIRE (MAKE FROM 3271-8-133 ON BULK ITEMS LIST CUT TO LENGTH 205 MM +/- 25)	2
11	PAFFF	PAFFF	PAFFF	PAFFF	6150015861848	44940	04-20696	.LEAD, ELECTRICAL K1- A2 TO TB501-L1	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001435573	779	35678	..TERMINAL LUG	1
13	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133	..STRAND, WIRE (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 208MM + 25)	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG9T3-100B	...LAMINATE, LABEL	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940005045877	779	36808	..TERMINAL LUG	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
OUTPUT TERMINAL BOARD REPAIR PARTS LIST

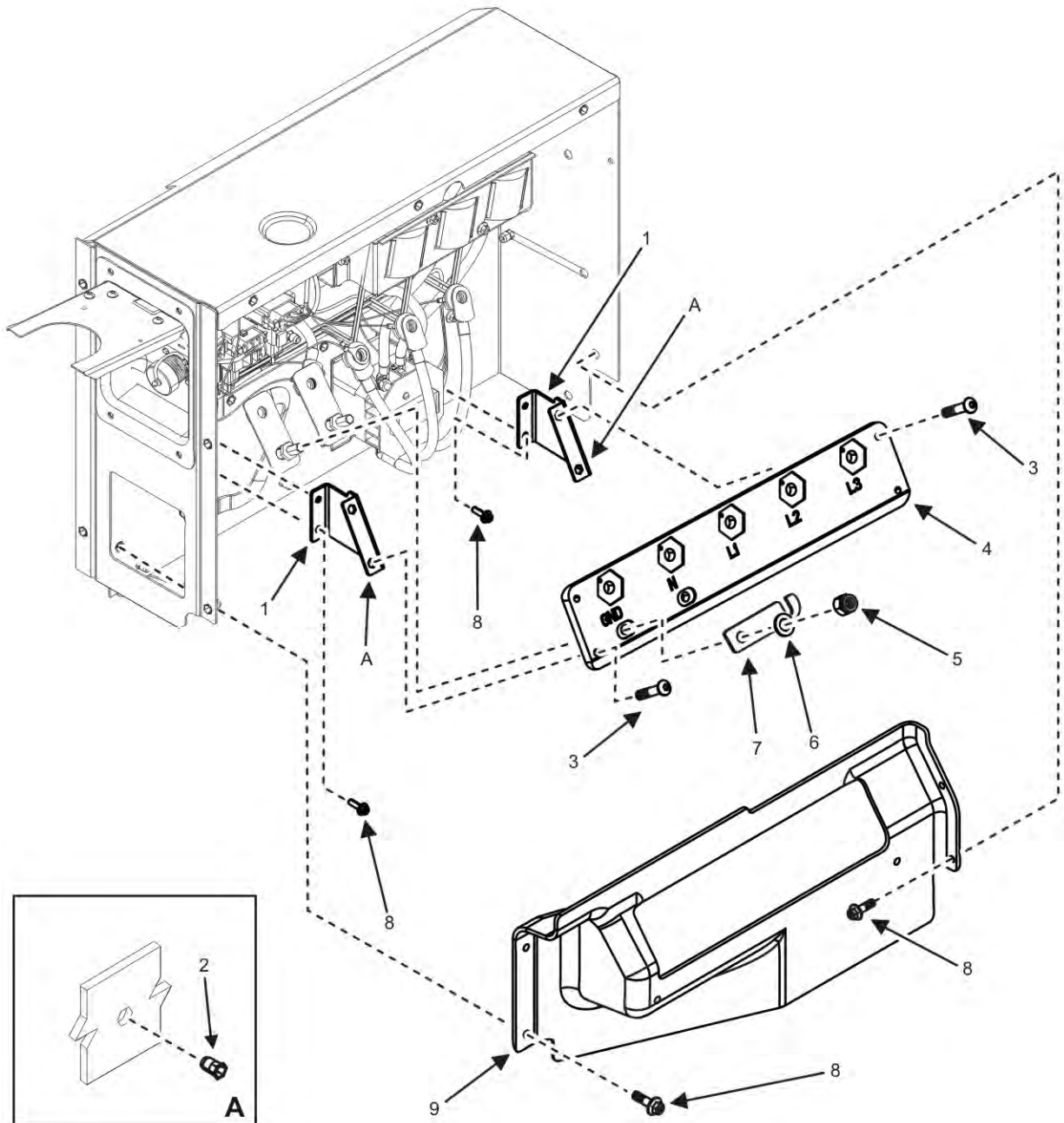


Figure 16. Output Terminal Board (Sheet 1 of 2).

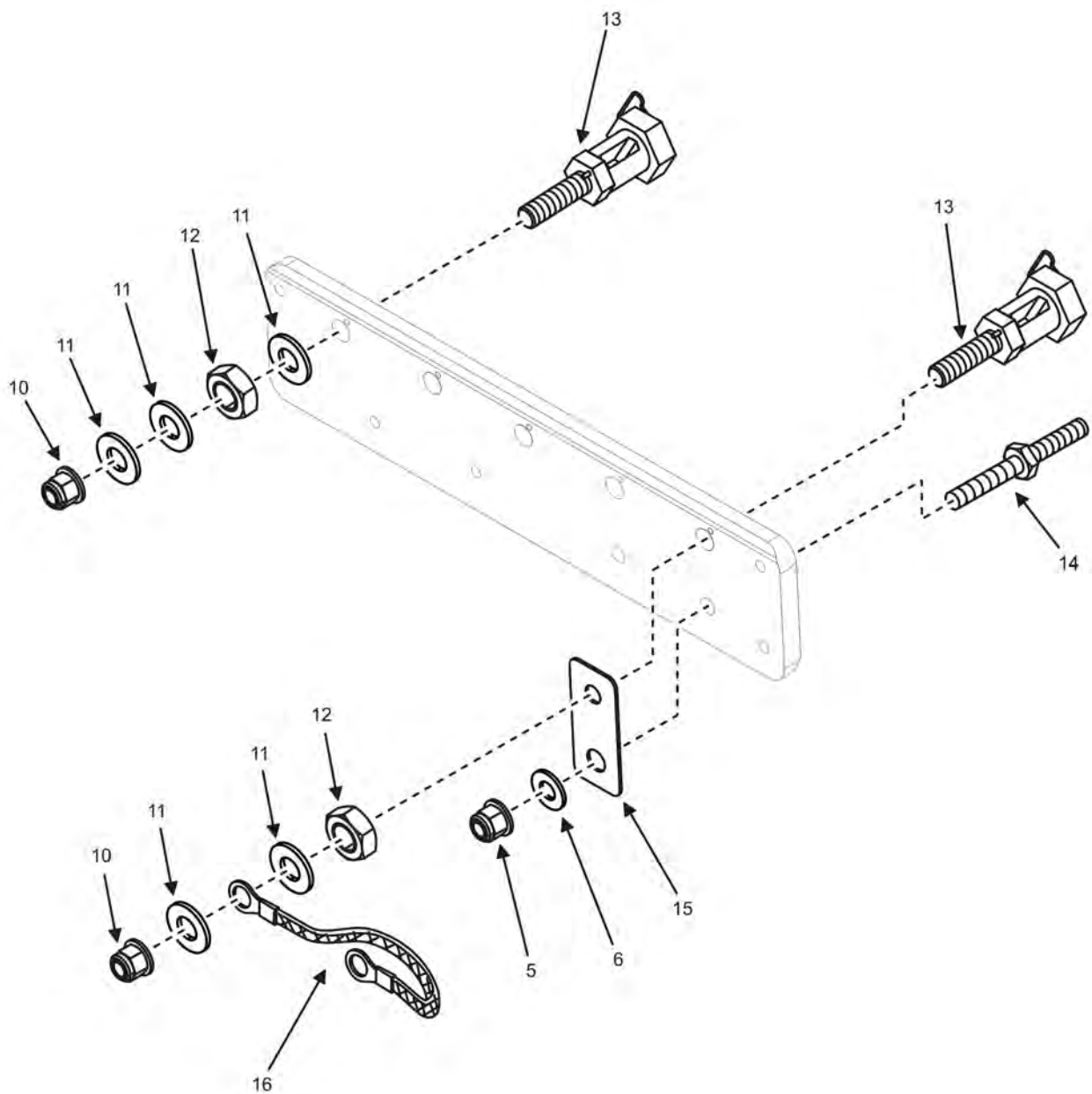


Figure 16. Output Terminal Board (Sheet 2 of 2).

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 0802	
									FIG. 16 OUTPUT TERMINAL BOARD	
1	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20759		.BRACKET, MOUNTING	2
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030		..NUT, CLINCH	6
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	B1834C06030N		.SCREW, SOCKET HEAD BUTTON M6 X 1 X 30	4
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20234		.BOARD, CONNECTION	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014702044	30554	8-820568-3		.NUT, LOCK 3/816 UNC28, BRASS	4
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014664926	81348	FFW92 TYPE A CLE GRI		.WASHER, FLAT	4
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	0420338		.BUSBAR, NEUTRAL	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K42		.SCREW, HEX FLANGE HEAD M6 X 1 X 20	8
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21103		.GUARD, CABLE ENTRY	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	M45913/38CS6N		.NUT, NYLON LOCK 1/213 STAINLESS STEEL	5
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015894140	3A054	95395A250		.WASHER, FLAT, 1/2 INCH, BRASS	13
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310001898467	30554	88-22336-1		.NUT, HEX JAM 1/213 UNC	5
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940009581214	82168	DG3M6F-S-RPC		.TERMINAL STUD, LOAD	5
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940010038579	30554	72-2236		.STUD, TERMINAL	2
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20335		.BUSBAR, GROUND	2
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886489	5T0Q1	EM4H710		.STRAP, GROUNDING	1
									END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
VOLTAGE SELECTION SWITCH REPAIR PARTS LIST

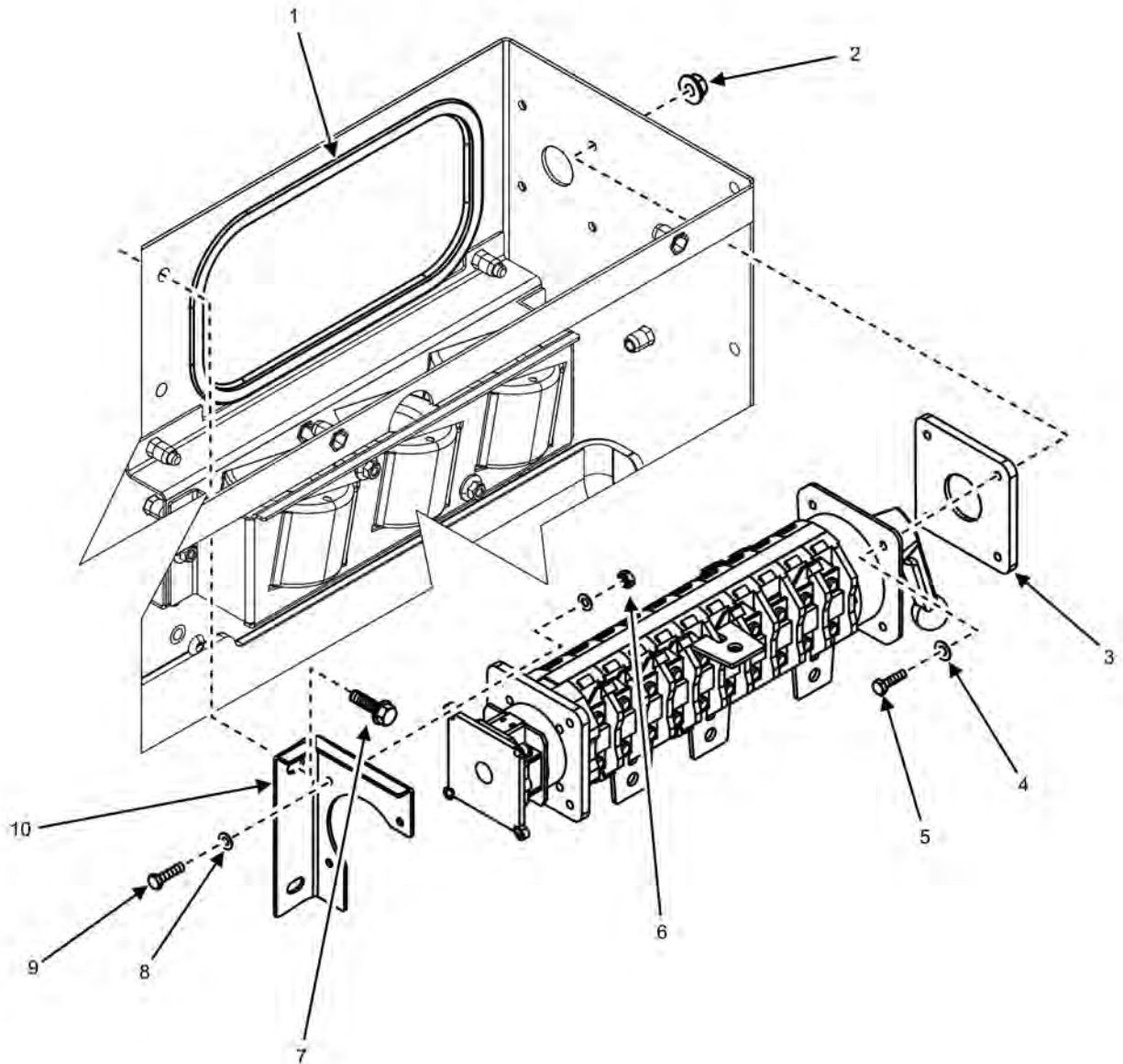


Figure 17. Voltage Selection Switch (Sheet 1 of 6).

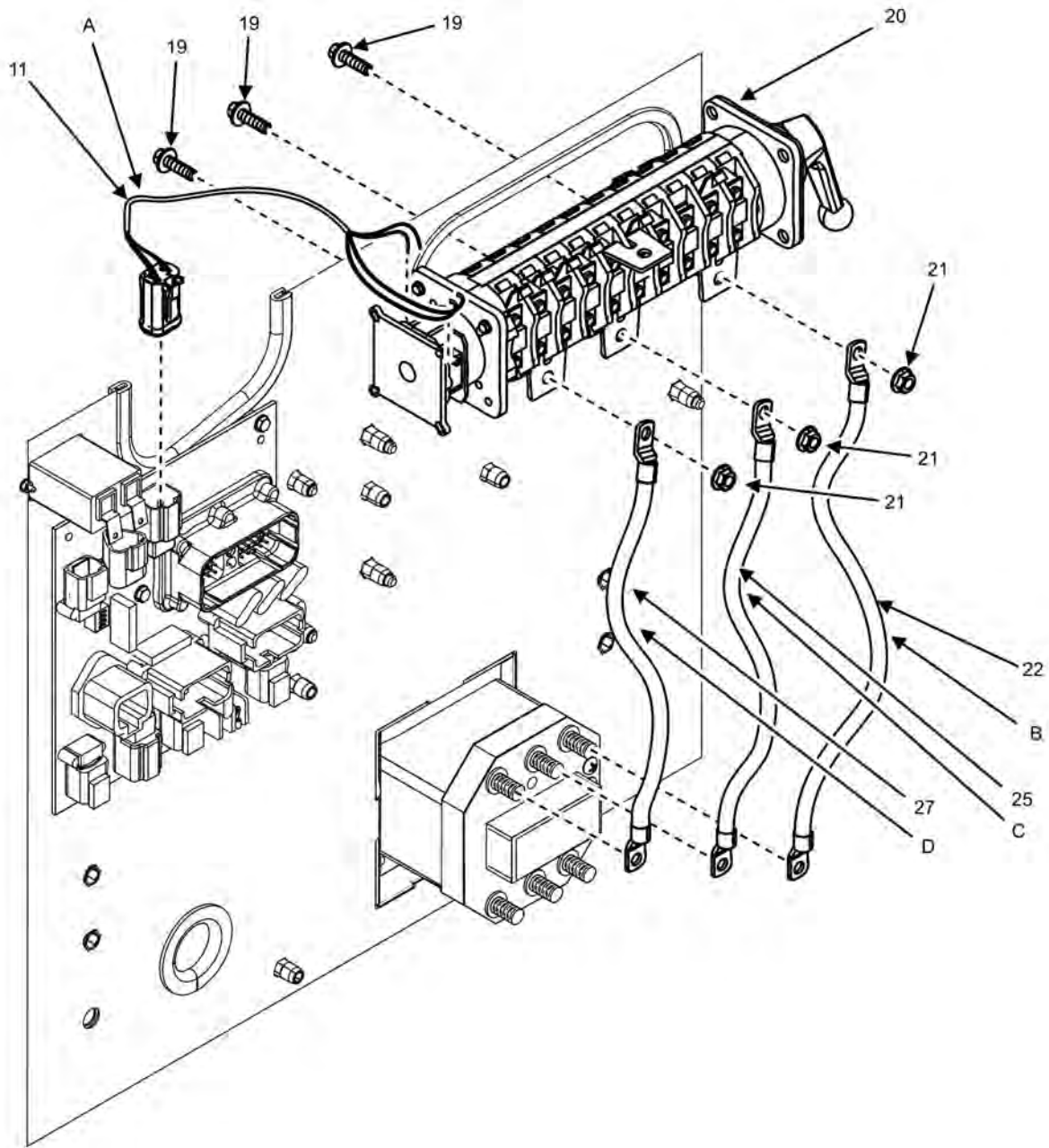


Figure 17. Voltage Selection Switch (Sheet 2 of 6).

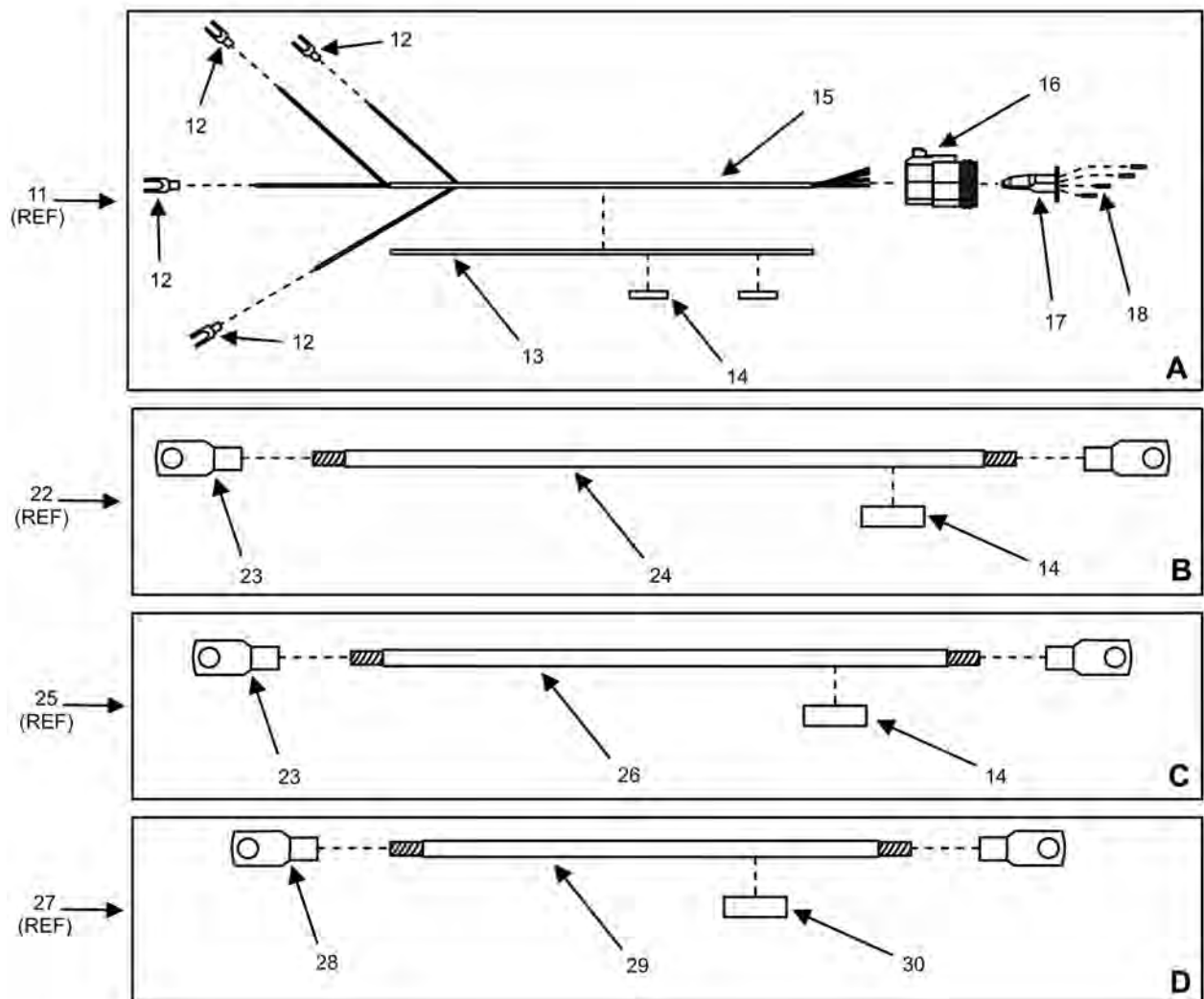


Figure 17. Voltage Selection Switch (Sheet 3 of 6).

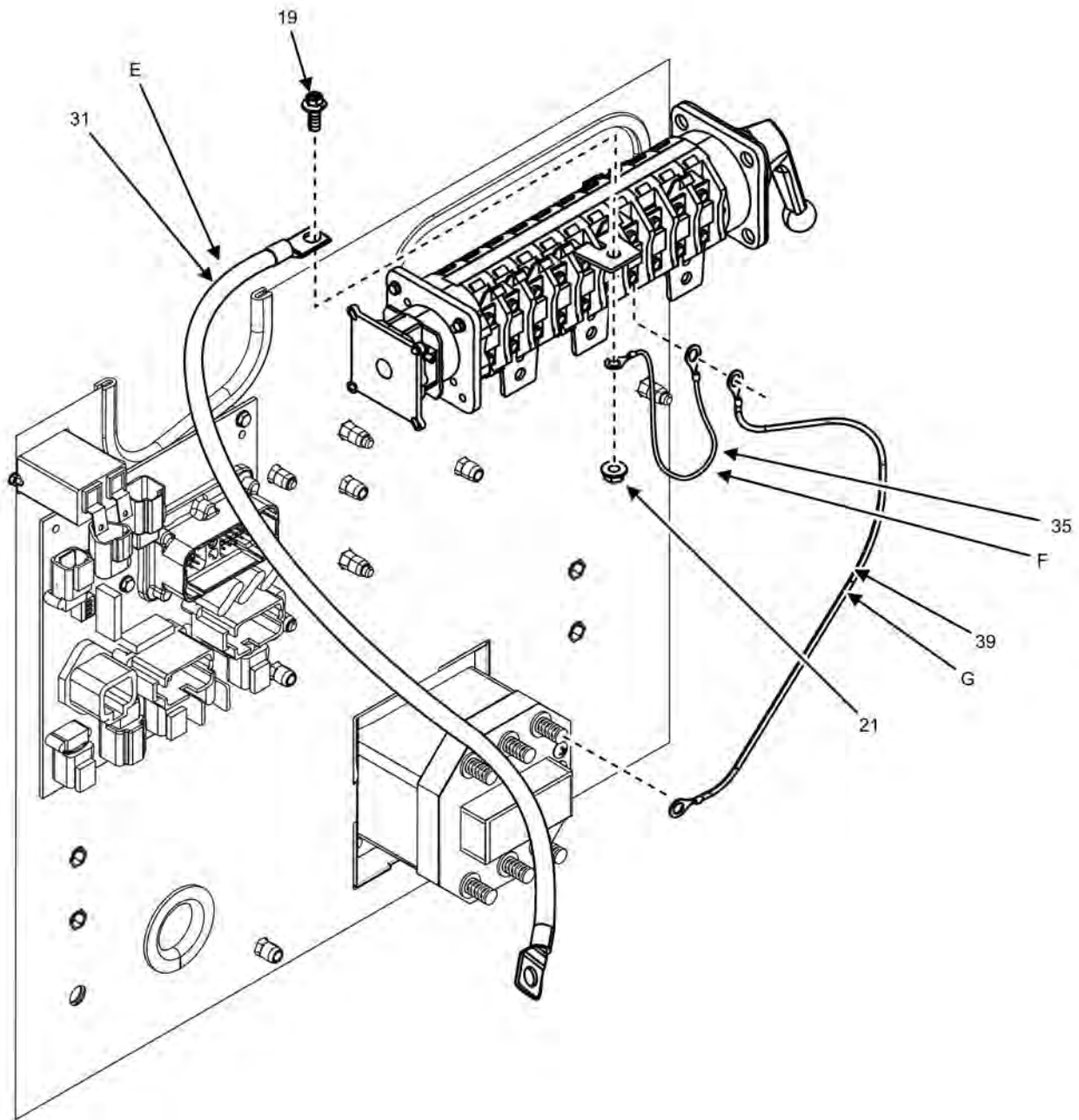


Figure 17. Voltage Selection Switch (Sheet 4 of 6).

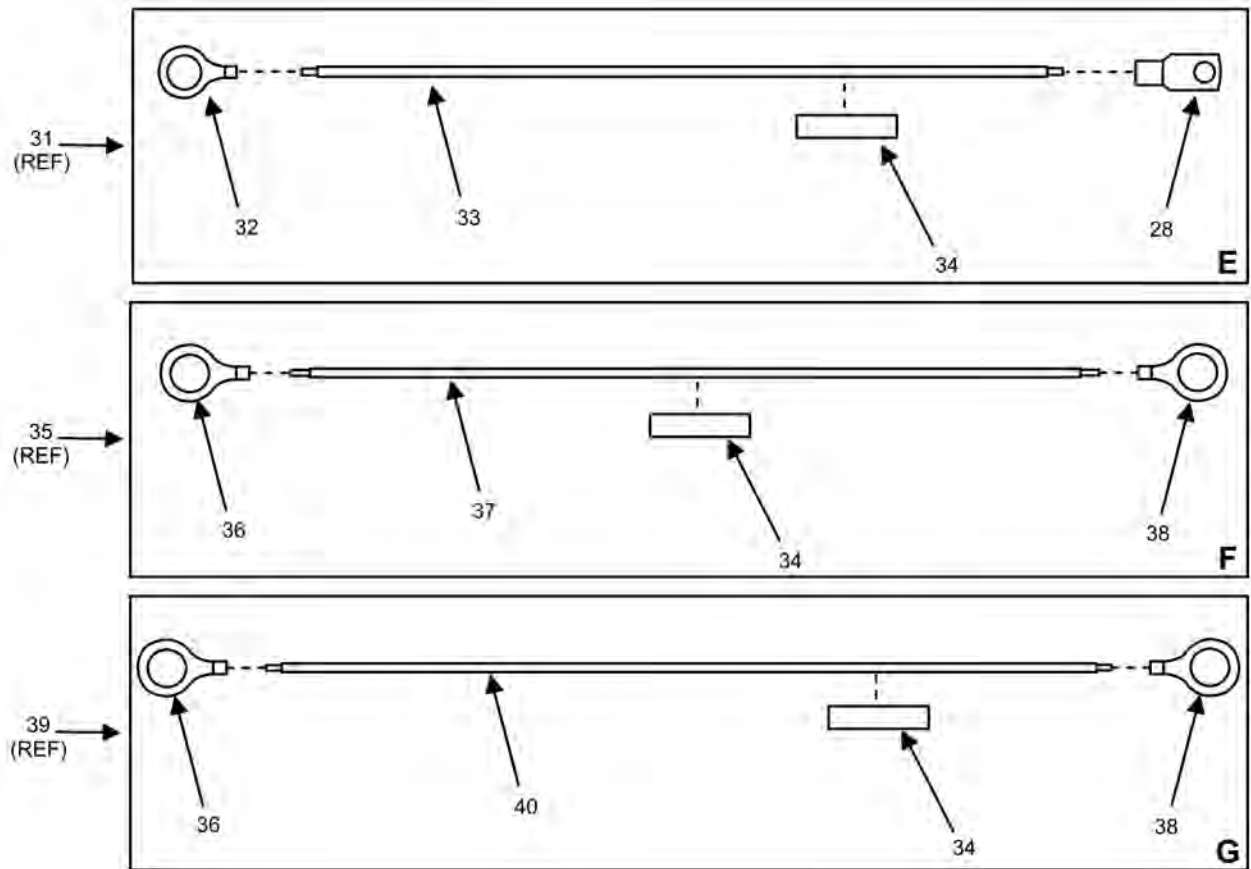


Figure 17. Voltage Selection Switch (Sheet 5 of 6).

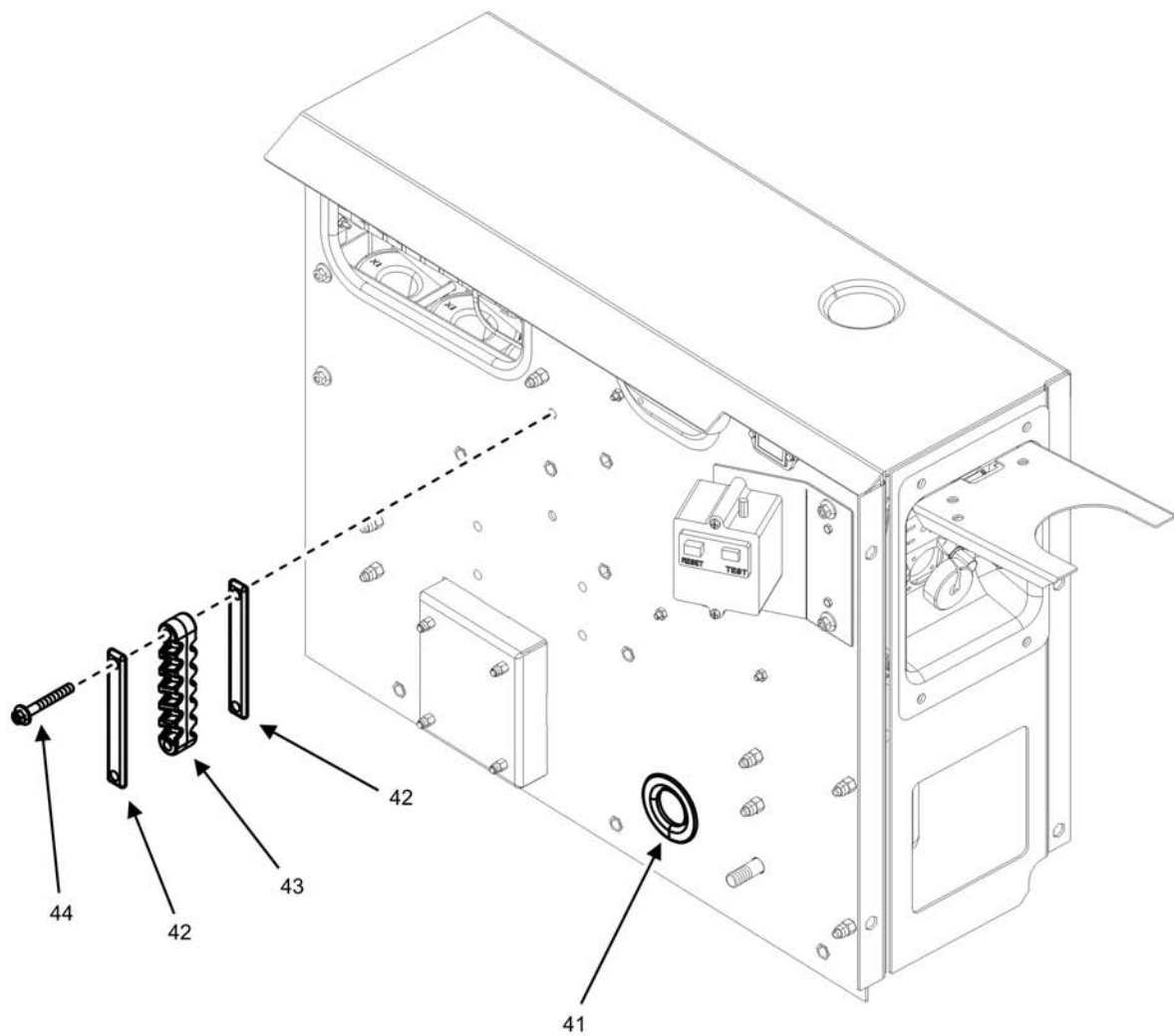


Figure 17. Voltage Selection Switch (Sheet 6 of 6).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0803	
								FIG. 17 VOLTAGE SELECTION SWITCH	
1	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-20902-1	.EDGING (MAKE FROM A3521ON BULK ITEMS LIST CUT TO LENGTH 504MM+/-5)	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M4	.NUT, HEX FLANGE M4 X 0.7	4
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21152	.PLATE, SWITCH MOUNTING	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014849183	1KWT0	085295	.WASHER, FLAT M4	4
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M4X16	.SCREW, HEX HEAD	4
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN934-M3	.NUT, HEX M3 X 0.5	3
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A020 WB4K 42	.SCREW, HEX FLANGE HEAD M6 X 1 X 20	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310993711050	KE489	DIN125M3	.WASHER, FLAT M3	6
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN933-M3X16	.SCREW, HEX HEAD M3 X 0/5 X 16	3
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20363	.BRACKET, MOUNTING	1
11	PAFFF	PAFFF	PAFFF	PAFFF	6150015860640	44940	04-20256	.WIRING HARNESS	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	55768-1	.TERMINAL, SPADE M4, 22-16 AWG	4
13	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	55PP028727576 40064	.INSULATION SLEEVEING (MAKE FROM 55PP02872757640 064 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	.LAMINANT, LABEL	4
15	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-20-10	.STRAND, WIRE (MAKE FROM 3271-20-10 ON BULK ITEMS LIST CUT TO LENGTH 334 MM + 25 AS NEEDED)	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		11139	DT06-45	.CONNECTOR, PLUG 4 PIN	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014830852	11139	W4S	.CONNECTOR, RECEPTACLE	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	.CONTACT, ELECTRICAL	4
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016 WB4K 42	.SCREW, HEX FLANGE HEAD M6 X 1 X 16	4
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930015860041	8T045	KW40-924C1-1	.SWITCH, ROTARY	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX FLANGE M6 X 1	4

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015860319	44940	04-20264	.LEAD, ELECTRICAL S501-M3 TO K1-C1	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006553318	96906	MS20659-41	..TERMINAL, RING M6, 8 AWG	4
24	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-8-133	..WIRE, STRANDED 8 AWG (MAKE FROM 3271-8-133 ON BULK ITEMS LIST CUT TO LENGTH 273 MM + 25)	1
25	PAFFF	PAFFF	PAFFF	PAFFF	6150015860351	44940	04-20263	.LEAD, ELECTRICAL S501-M2 TO K1-B1	1
26	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-8-133	.. WIRE, STRANDED 8 AWG (MAKE FROM 3271-8-133 ON BULK ITEMS LIST CUT TO LENGTH 244 MM + 25)	1
27	PAFFF	PAFFF	PAFFF	PAFFF	6150015860087	44940	04-20262	.LEAD, ELECTRICAL S501-M1 TO K1-A1	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940008990260	96906	MS20659-9	..TERMINAL, RING M6, 6 AWG	3
29	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133	..WIRE, STRANDED 6 AWG (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 249 MM + 25)	1
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG22T2-100B	..LAMINATE, LABEL	1
31	PAFFF	PAFFF	PAFFF	PAFFF	6150015861850	44940	04-20266	.LEAD, ELECTRICAL NEUTRAL	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940005045877	00779	36808	..TERMINAL, RING M12, 6 AWG	1
33	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133	..STRAND, WIRE (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 420 MM + 25)	1
34	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG9T3-100B	..LAMINATE, LABEL	3
35	PAFFF	PAFFF	PAFFF	PAFFF	6150015926637	44940	04-21614-1	.LEAD, ELECTRICAL JUMPER	1
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	55936-2	..TERMINAL, RING M6, 22-16 AWG	2
37	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	..STRAND, WIRE 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 140MM +/- 12)	1
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006172896	00779	36160	..TERMINAL, RING	2

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
39	PAFFF	PAFFF	PAFFF	PAFFF	6150015926641	44940	04-21614-2	.LEAD, ELECTRICAL JUMPER	1
40	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	..STRAND, WIRE 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH	1
41	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-20902-5	500MM +/- 12) .EDGING (MAKE FROM A3521 ON BULK ITEMS LIST CUT TO	1
42	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20174	110MM +/-3)	1
43	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20173	.RETAINER, WIRE	2
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A045 WB4K 42	.RETAINER, WIRE .SCREW, HEX FLANGE HEAD M6 X 1 X 45	1
									2
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
HOUR METER REPAIR PARTS LIST

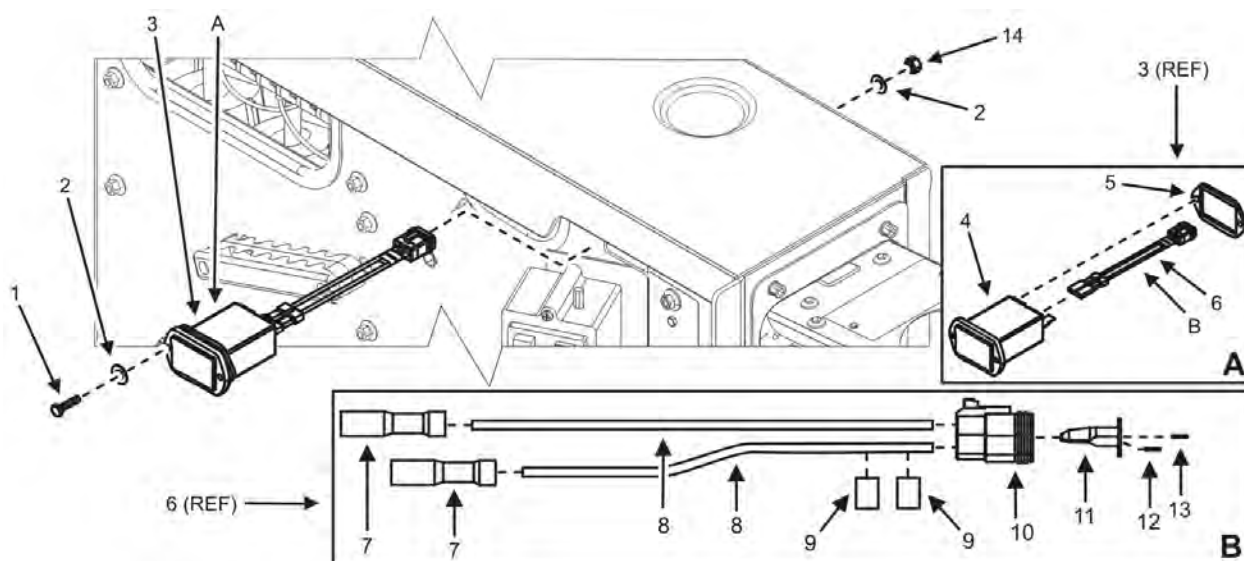


Figure 18. Hour Meter.

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 0804									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN933-M3X16	FIG. 18 HOUR METER ..SCREW, HEX HEAD M3 X 0.5	2
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310993711050	KE489	DIN125M3	..WASHER, FLAT M3	4
3	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20232	..HOUR METER ASSEMBLY	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6645013929615	74400	85094-12	..METER, TIME	1
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015894667	74400	81683	..GASKET	1
6	PAFFF	PAFFF	PAFFF	PAFFF	6150015860411	44940	04-20453	..WIRING HARNESS	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860213	30554	88-20275-3	...TERMINAL, DISCONNECT	2
8	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	...WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 172.3MM +/-3)	1
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	...LAMINATE, LABEL	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015238855	11139	DT06-3S	...CONNECTOR, PLUG 3 PIN	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	...PLUG, END SEAL, ELECTRICAL SIZE 12, 16	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	...CONTACT, ELECTRICAL, 22- 16 AWG	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014708342	11139	W3S	...POLORIZING KEY, ELECTRICAL	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN934-M3	..NUT, HEX M3 X 0.5	2
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
CONVENIENCE RECEPTACLE ASSEMBLY REPAIR PARTS LIST

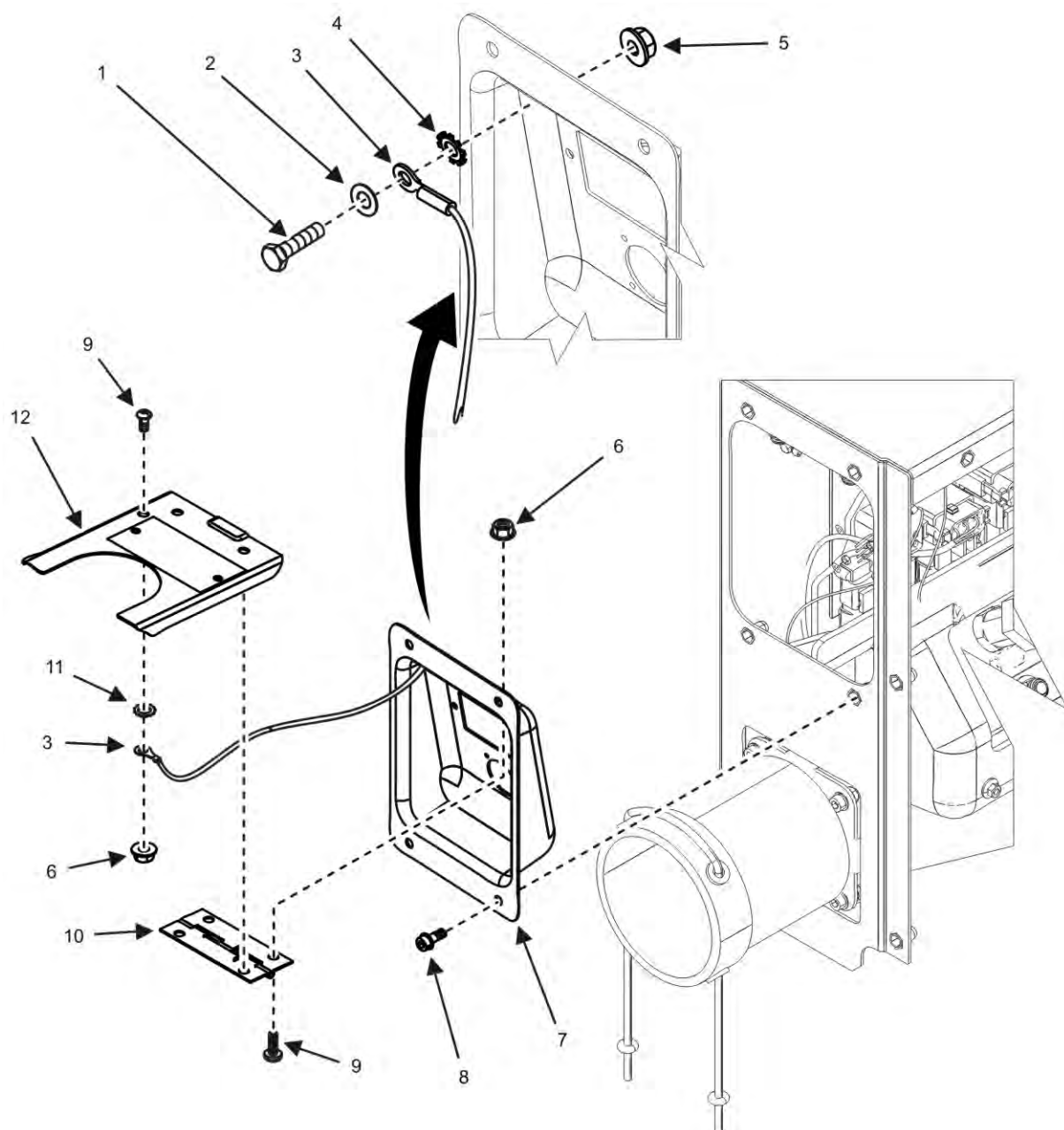


Figure 19. Convenience Receptacle Assembly (Sheet 1 of 5).

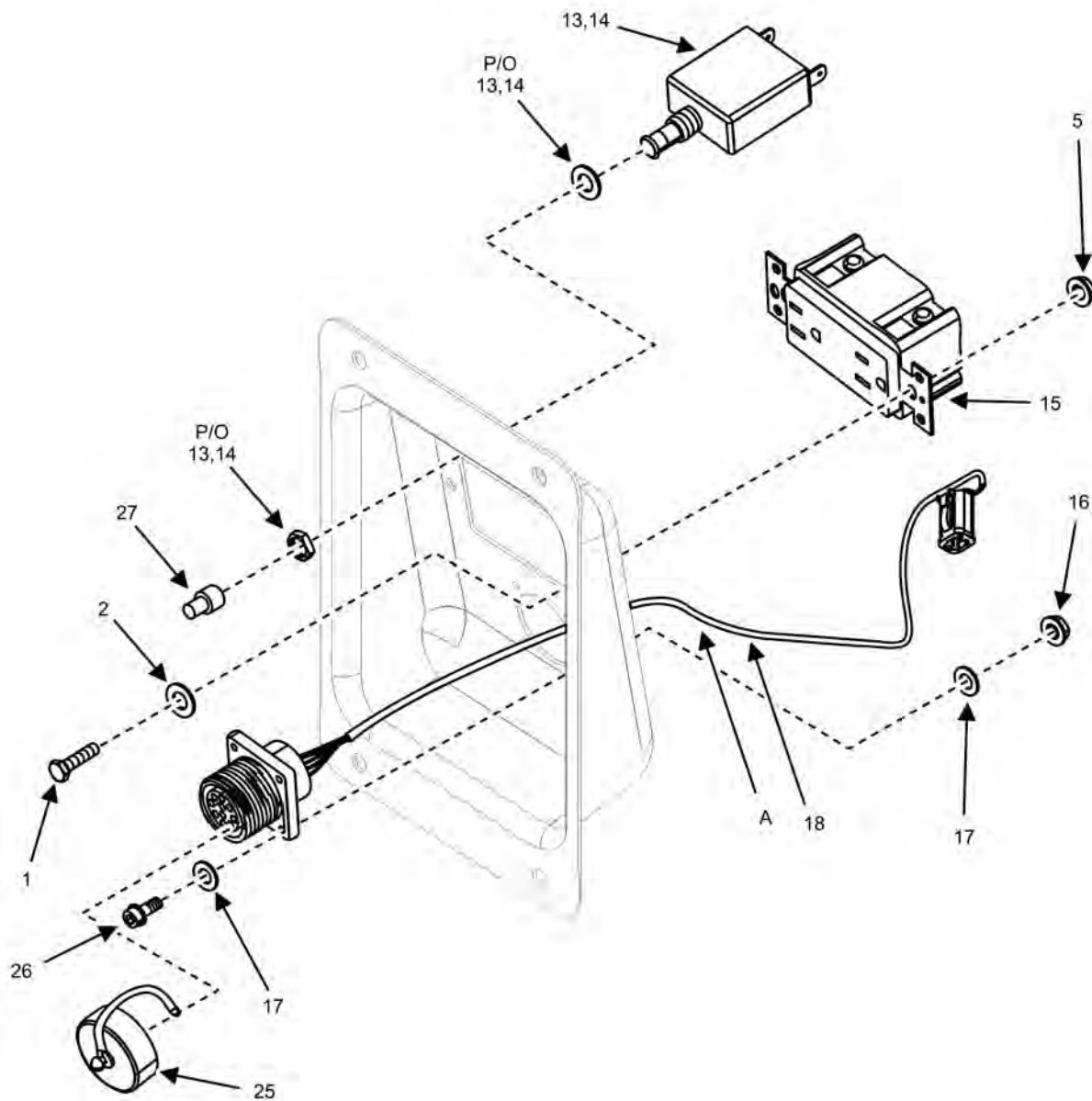


Figure 19. Convenience Receptacle Assembly (Sheet 2 of 5).

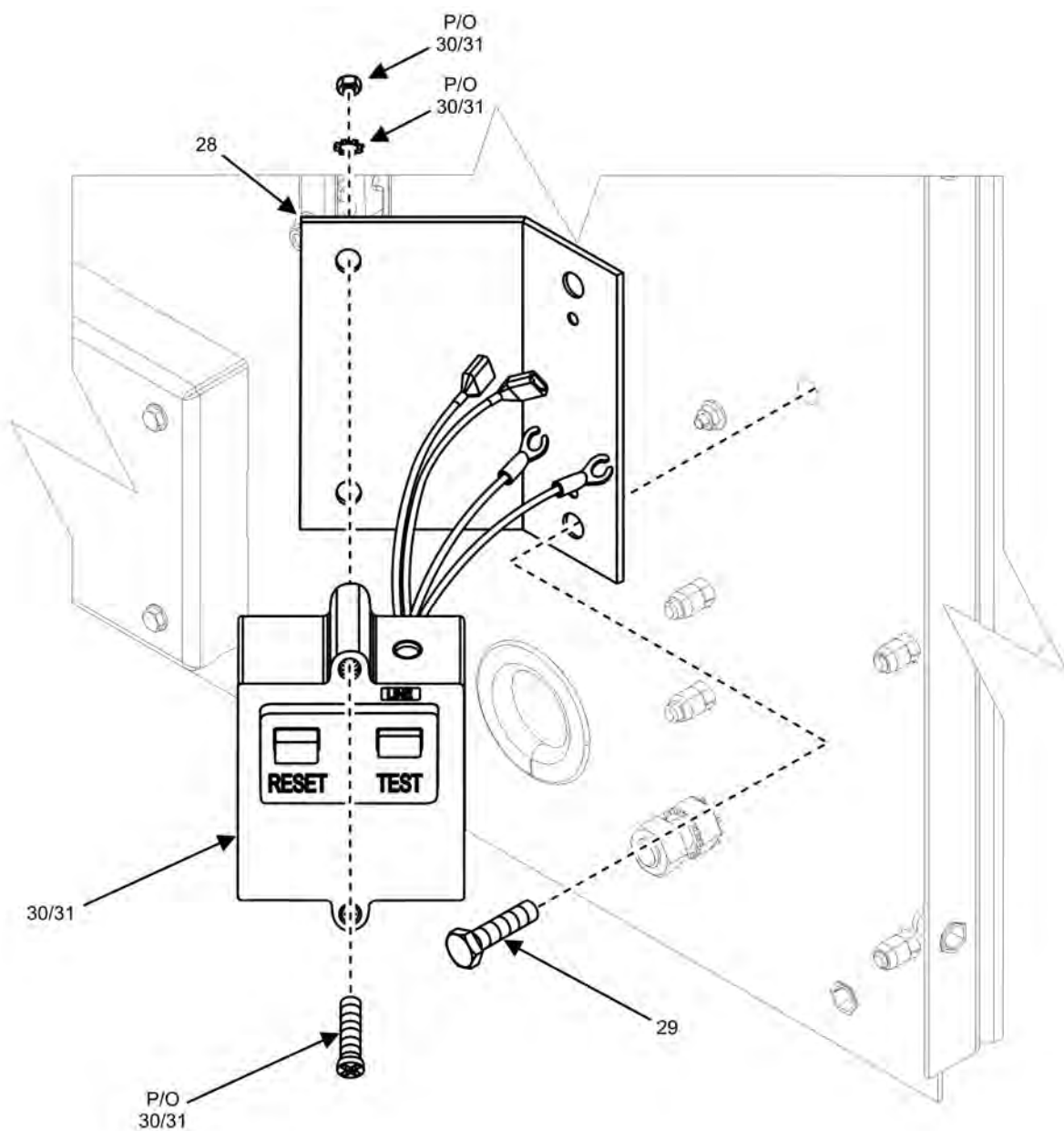


Figure 19. Convenience Receptacle Assembly (Sheet 3 of 5).

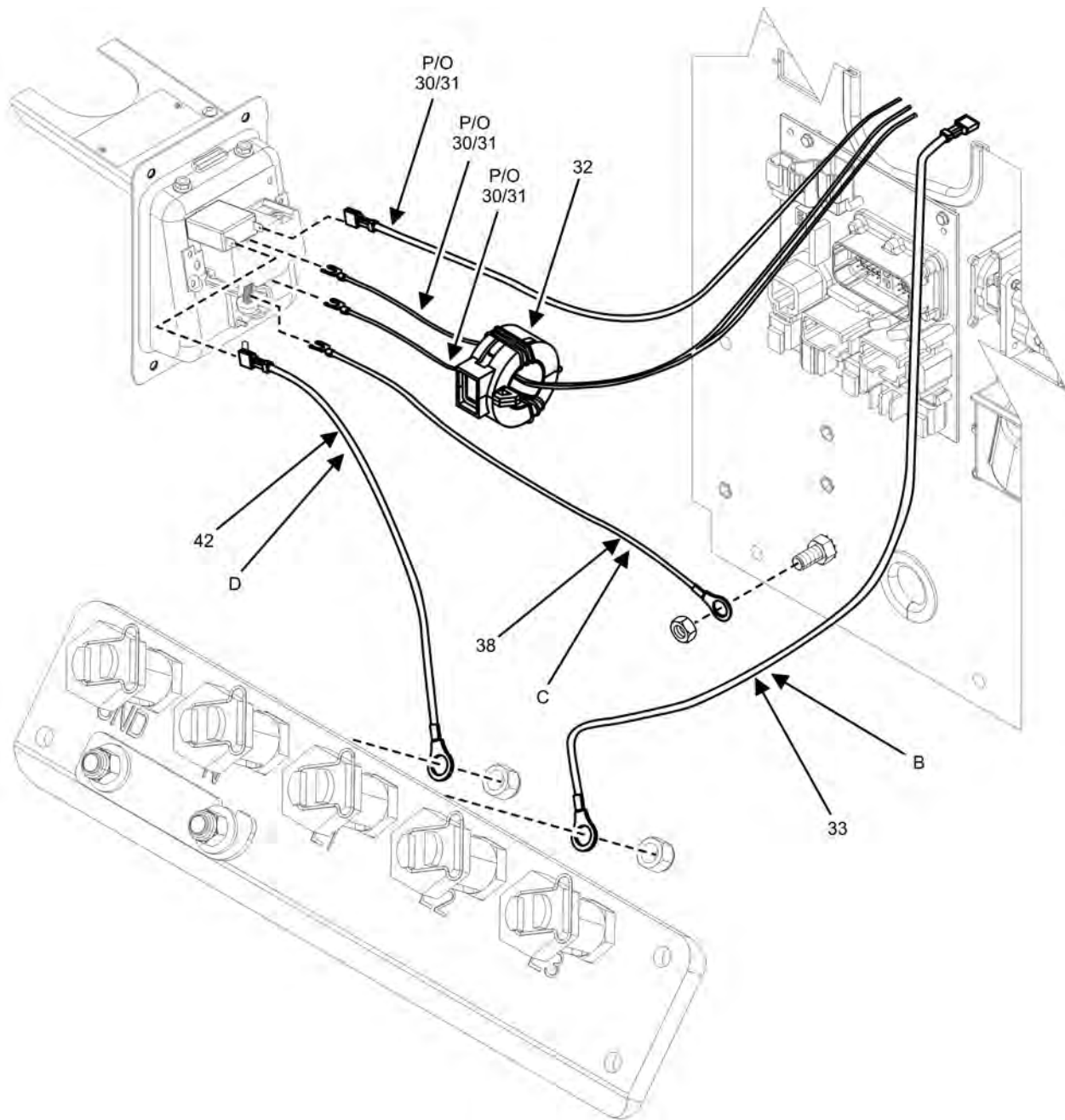


Figure 19. Convenience Receptacle Assembly (Sheet 4 of 5).

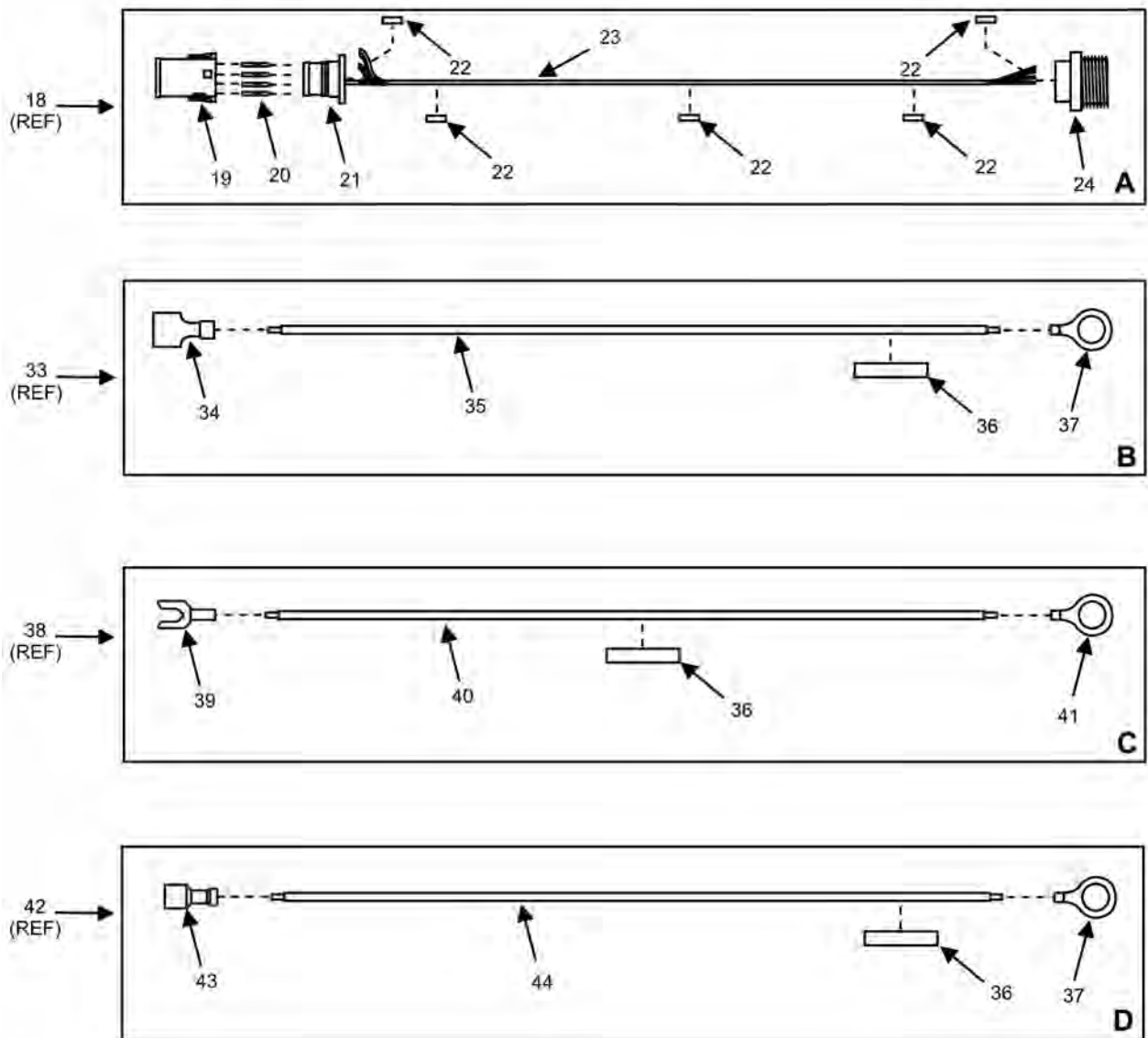


Figure 19. Convenience Receptacle Assembly (Sheet 5 of 5).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0805	
								FIG. 19 CONVENIENCE RECEPTACLE ASSEMBLY	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M4X16	.SCREW, HEX HEAD (M4X16)	3
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN125-M4	.WASHER, FLAT M4	3
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21318-1	.STRAP, ELECTRICAL GROUND	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X164000GD5A21	.WASHER, LOCK #8 EXT TOOTH	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M4	.NUT, HEX FLANGE (M4X0.7)	3
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX FLANGE (M6X1)	5
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20246	.HOUSING, RECEPTACLE GFI BOX	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4M343	44832	.SCREW, FLANGE HEAD	4
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	.SCREW, SOCKET HEAD BUTTON (M6X1X12)	5
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015933798	44940	04-20732	.HINGE, DOOR, SPRING LOADED CLOSED	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A21	.WASHER, LOCK 1/4 EXT TOOTH	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015878549	44940	04-20248	.PANEL, DOOR	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015860232	82647	PR11-62-15.0A-XX-V	.BREAKER, CIRCUIT 15A, 50/60HZ UOC: 98E	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015954319	82647	PR11-42-15.0A-XX-V	.BREAKER, CIRCUIT 15A, 400HZ UOC: 98F	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015956861	74545	DR20BLKWTR	.RECEPTACLE, DUPLEX	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN934-M3	.NUT, HEX (M3X0.5)	4
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310993711050	44940	DIN125-M3	.WASHER, FLAT M3	8
18	PAFFF	PAFFF	PAFFF	PAFFF	6150015860561	44940	04-20255	.CABLE ASSEMBLY (P502 TO J522)	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014846537	11139	DT06-4S	..CONNECTOR, PLUG (4 PIN)	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	..CONTACT, SOCKET, (22-16 AWG)	4
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014830852	11139	W4S	..WEDGE, PLUG (4 PIN)	1
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG26T6-100B	..LAMINATE, LABEL COVER	11
23	MFFZZ	MFFZZ	MFFZZ	MFFZZ	6145012521449	16428	89418	..CABLE, POWER, ELECTRICAL (MAKE FROM 89418 ON BULK ITEMS LIST CUT TO LENGTH 339MM +/- 25)	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015906702	44940	MS3102R18-19SN	..CONNECTOR, PLUG (MS3102R18-19S)	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015901601	44940	MS25043-18DW	..COVER, ELECTRICAL CONNECTOR MS25043-18DW	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN933-M3X16	..SCREW, HEX HEAD (M3X0.5X16)	4
27	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5930015900170	97539	1231/72	..BOOT, TERMINAL CIRCUIT BREAKER	1
28	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21674	..BRACKET, MOUNTING, RELAY	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	..SCREW, HEX FLANGE (M6X1X16) UOC: 98F	2
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ		60177	25960	..INTERRUPTER, GROUND FAULT 400HZ	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		60177	25970	UOC: 98F ..INTERRUPTER, GROUND FAULT 50/60HZ	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		2S894	240-2128-ND	UOC: 98E ..FILTER, CHOKE, GFI	1
33	PAFFF	PAFFF	PAFFF	PAFFF	6150015942384	44940	04-21704	..LEAD, ELECTRICAL RECEPTACLE NEUTRAL	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940011390853	30554	88-20275-4	..TERMINAL RECEPTACLE	1
35	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	..WIRE, STRANDED (16 AWG) (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 307 MM +/- 25)	1
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53421	TAG26T6-100B	..LAMINATE, LABEL COVER	3
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006603633	81343	MS25036-155	..TERMINAL, RING 1/2 INCH RING, 16 - 14 AWG	2
38	PAFFF	PAFFF	PAFFF	PAFFF	6150015860601	44940	04-20265	..LEAD, ELECTRICAL, J100 GND TO GND	1
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	52942-1	..TERMINAL, SPADE M4, 12-10 AWG	1
40	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65	..WIRE, STRANDED (12 AWG) (MAKE FROM 3271-12-65 ON BULK ITEMS LIST CUT TO LENGTH 390 MM +/- 25)	1
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	130207	..TERMINAL, RING M10, 12-10 AWG	1
42	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20712	..LEAD, ELECTRICAL CB501 TO TB501	1
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860213	30554	88-20275-3	..TERMINAL, DISCONNECT	1

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR AIR FORCE	CODE USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
44	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4110015906749	0X4C9	3271-16-26		..WIRE, STRANDED (16 AWG) (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 414 MM + 25) END OF FIGURE	1

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
TRANSFORMERS REPAIR PARTS LIST

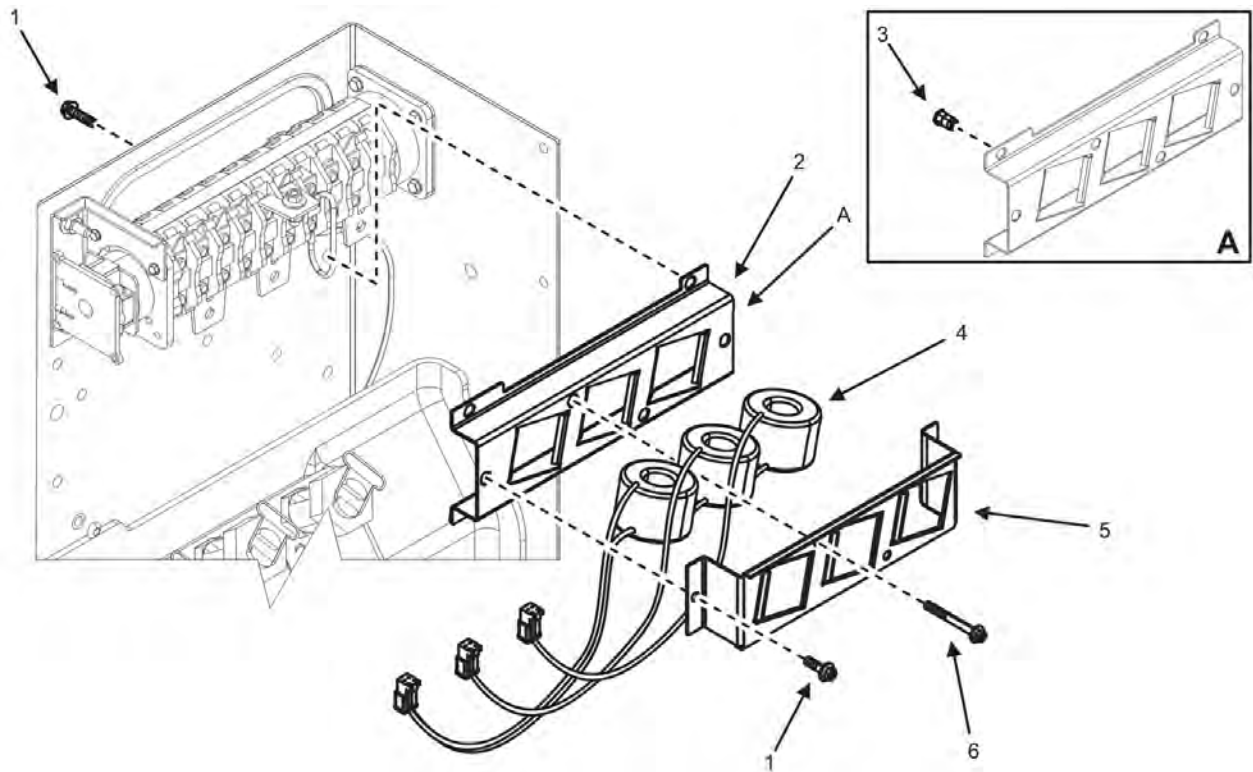


Figure 20. Transformers.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0806 FIG. 20 TRANSFORMERS	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A0 20WB4K42	.SCREW, HEX FLANGE HEAD M6 X 1 X 20	6
2	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20292	.BRACKET, MOUNTING, BOTTOM	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	..NUT, CLINCH	8
4	PBFZZ	PBFZZ	PBFZZ	PBFZZ		0SFN7	A026F118	.TRANSFORMER, CURRENT 105 AMP	3
5	XBZFZ	XBZFZ	XBFZZ	XBZFZ		44940	04-20293	.BRACKET, MOUNTING, TOP	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963678	05047	AES10M06A0 55WB4K42	.SCREW, HEX FLANGE HEAD M6 X 1 X 55	2
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
PRINTED CIRCUIT BOARD MODULE REPAIR PARTS LIST**

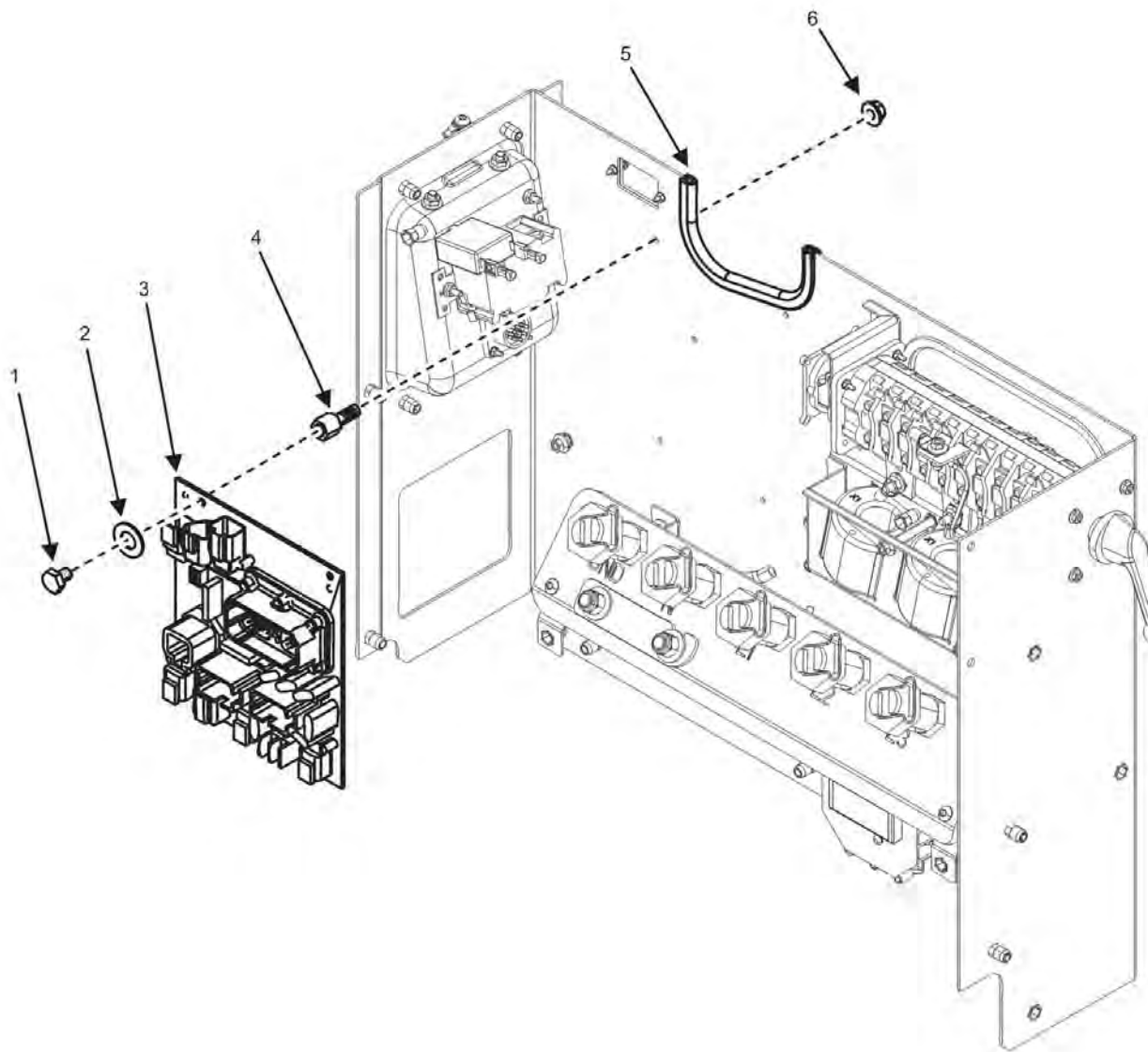


Figure 21. Printed Circuit Board Module (Sheet 1 of 3).

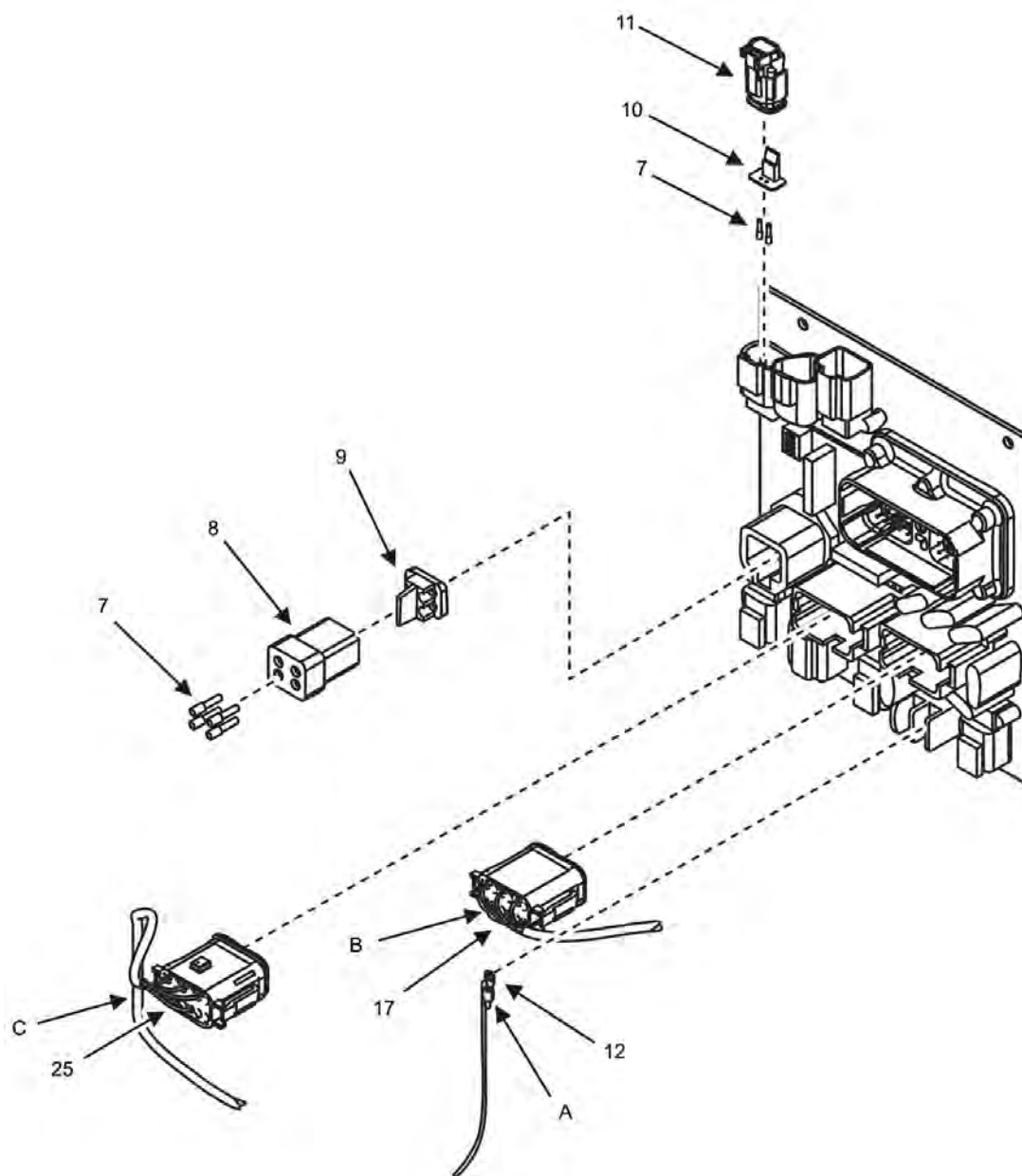


Figure 21. Printed Circuit Board Module (Sheet 2 of 3).

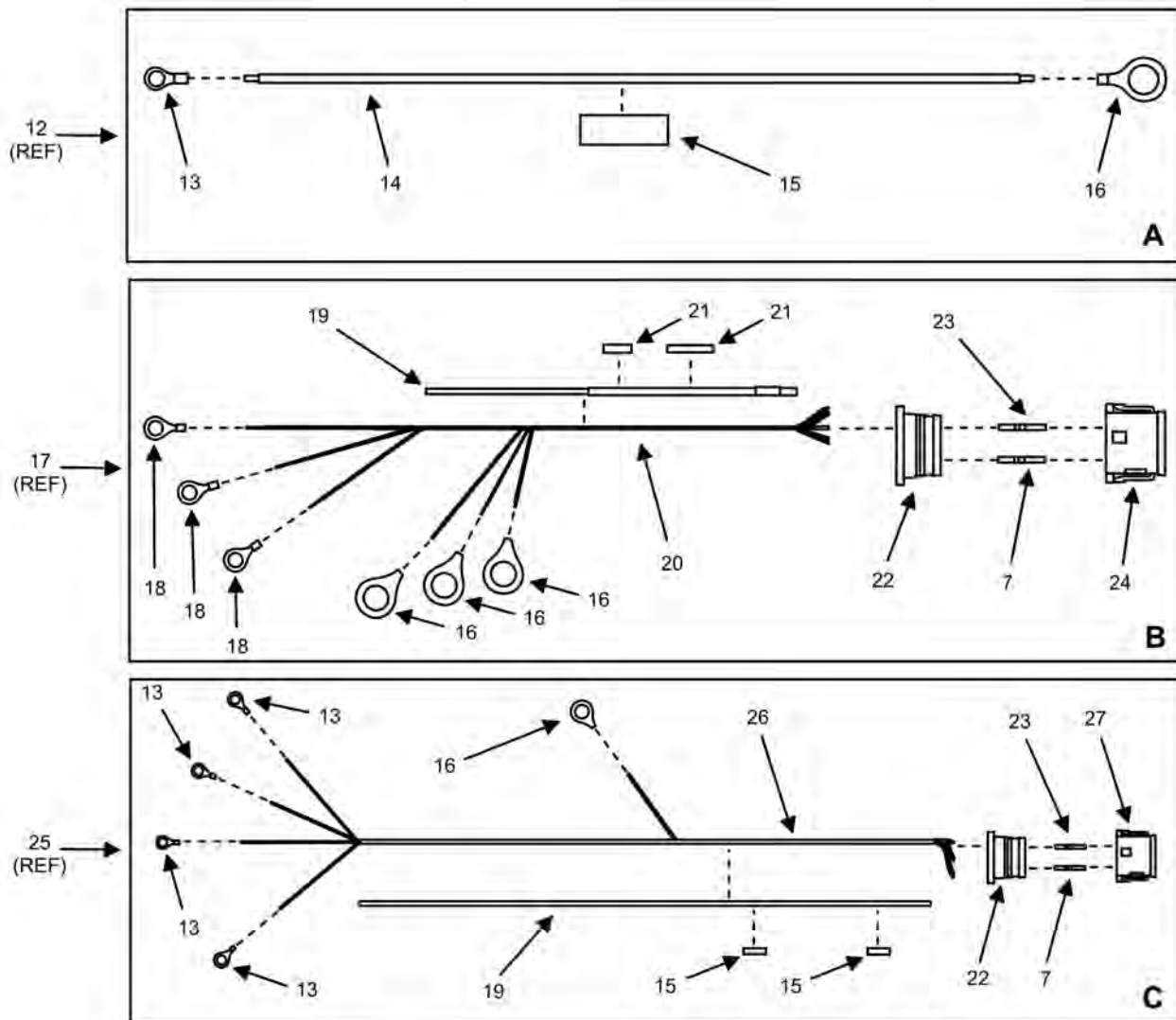


Figure 21. Printed Circuit Board Module (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0807	
								FIG. 21 PRINTED CIRCUIT BOARD MODULE	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M4X6	.SCREW, HEX HEAD	5
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014849183	1KWT0	085295	.WASHER, FLAT	5
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5998015860344	44940	A026K431	.MODULE, PRINTED CIRCUIT BOARD	1
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ	5365015908328	04729	MMF1203M06F 16M4	.SPACER, MOUNTING	5
5	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-20902-2	.EDGING (MAKE FROM A35210N BULK ITEMS LIST CUT TO LENGTH 197MM +/- 5)	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M4	.NUT, PLAIN, HEXAGON	5
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	.PLUG, END SEAL	19
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015224172	11139	DTP06-4S	.CONNECTOR, PLUG 4 PIN	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015121010	11139	WP-4S	.WEDGE, PLUG 4 PIN	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014468180	11139	W2S	.WEDGE, PLUG 2 PIN	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014475814	11139	DT06-2S	.CONNECTOR, PLUG 2 PIN	1
12	PAFFF	PAFFF	PAFFF	PAFFF	6150015860566	44940	04-20258	.LEAD, ELECTRICAL A2- TB511 TO GND	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940004640117	00779	36152	..TERMINAL, RING #6/M3.5, 22-16 AWG	5
14	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	..STRAND, WIRE (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 211 MM + 25)	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG26T6-100B	..LAMINATE, LABEL	3
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006603633	81314	MS25036-155	..TERMINAL, RING M12, 16-14 AWG	5
17	PAFFF	PAFFF	PAFFF	PAFFF	6150015860702	44940	04-20254	.HARNESS, WIRING J501 TO K1/TB501	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	55936-2	..TERMINAL, RING M6, 22-16 AWG	3
19	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	55PP028727576 40064	..INSULATION SLEEVING (MAKE FROM 55PP02872757640 064 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
20	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	..STRAND, WIRE (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 345 MM + 25 OR AS NEEDED)	1
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG9T3-100B	..LAMINATE, LABEL	2
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014541789	11139	W12S	..WEDGE, PLUG 12 PIN	2
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	599012036687	45152	0462-201-16141	..CONTACT, SOCKET, 22-16 AWG	11
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014953353	45152	7HA302	..CONNECTOR, PLUG 12 PIN	1
25	PAFFF	PAFFF	PAFFF	PAFFF	6150015862781	44940	04-20711	..HARNESS, WIRING J511 TO K1/TB501	1
26	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	..STRAND, WIRE (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 705 MM + 50 OR AS NEEDED)	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014953346	45152	8HA889	..CONNECTOR, PLUG 12 PIN	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
POWER PLANT INSTALLATION REPAIR PARTS LIST

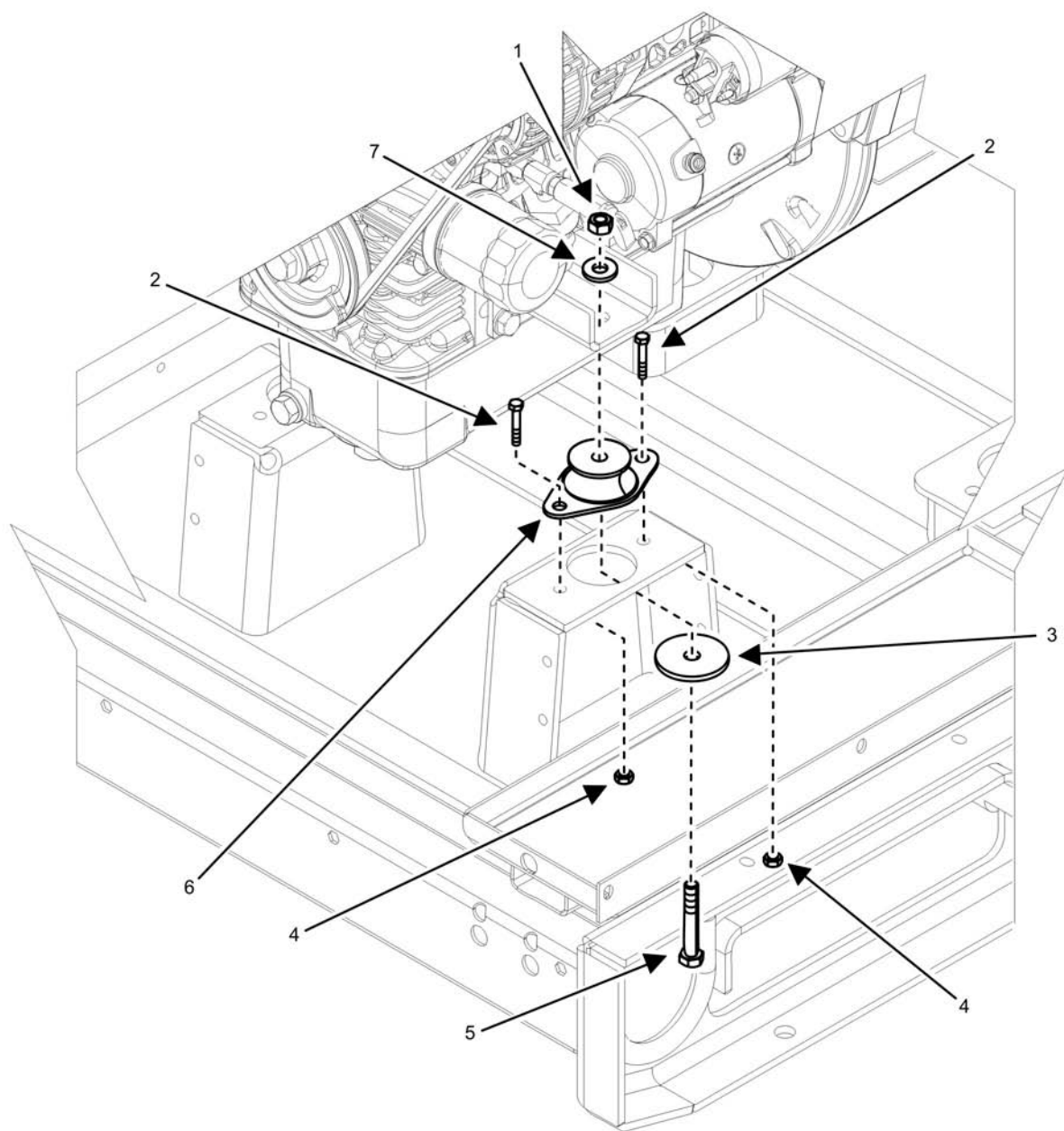


Figure 22. Power Plant Installation (Sheet 1 of 3).

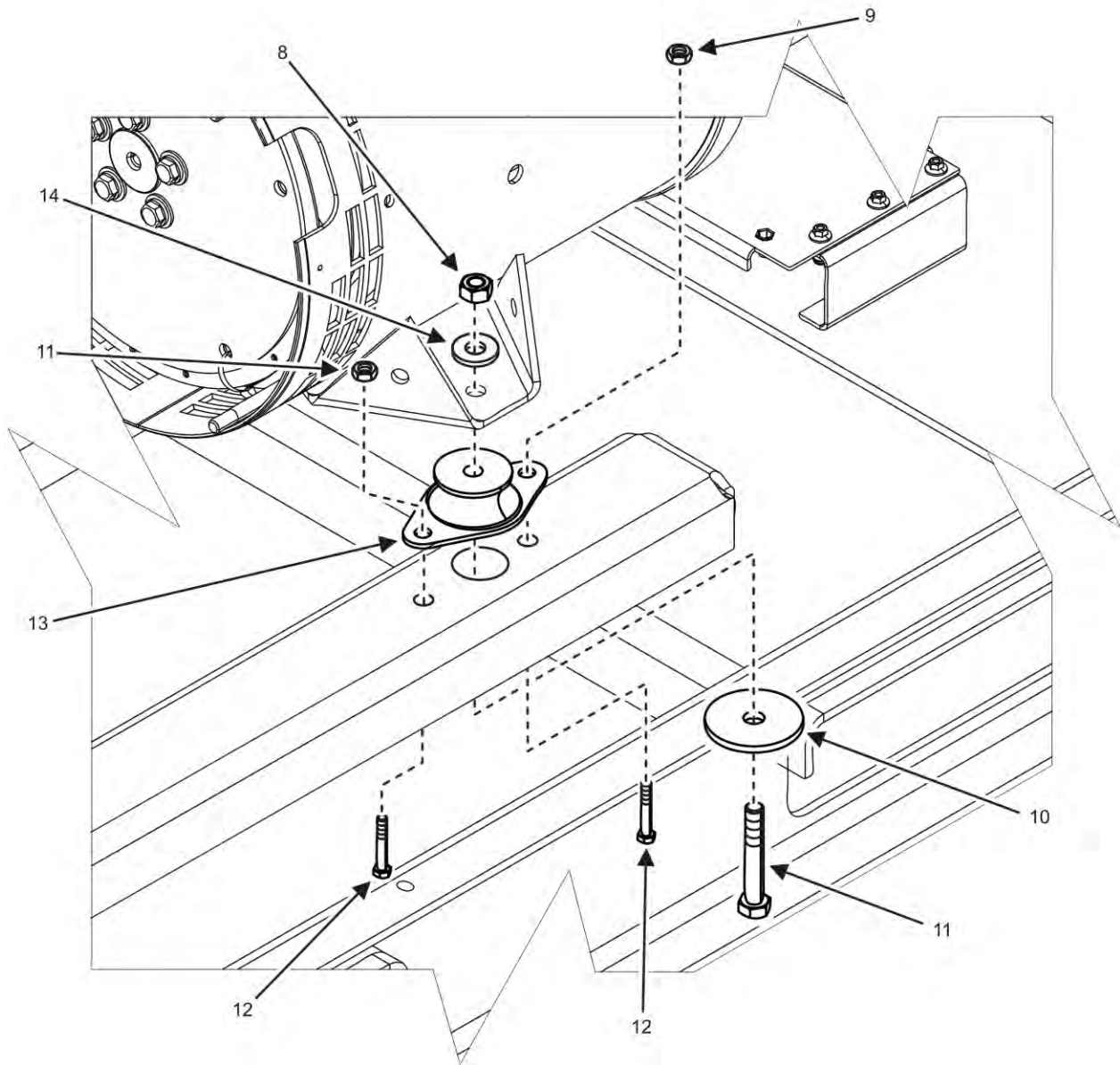


Figure 22. Power Plant Installation (Sheet 2 of 3).

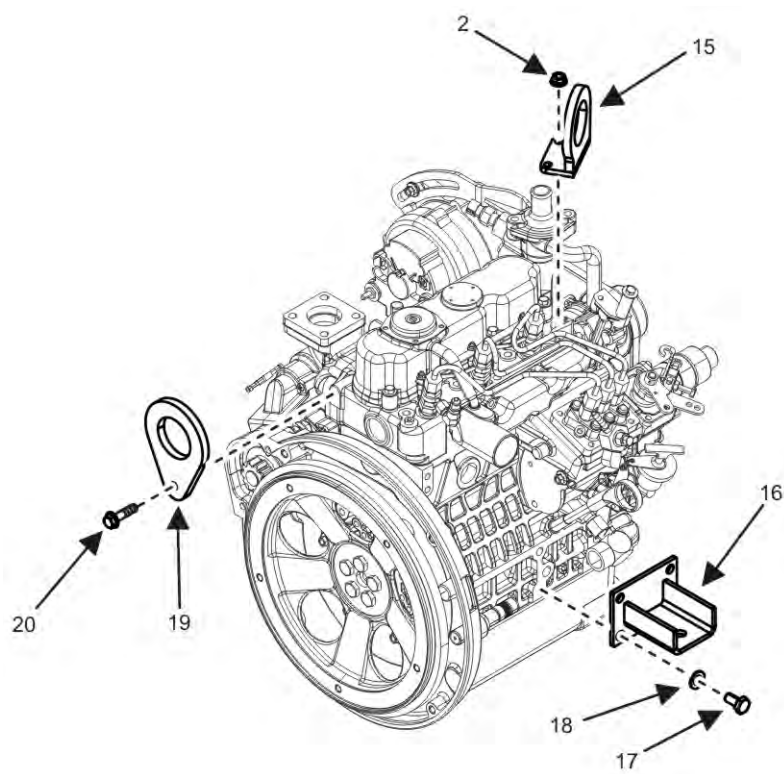


Figure 22. Power Plant Installation (Sheet 3 of 3).

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 09	
									FIG. 22 POWER PLANT INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310000874652	44940	M45913/1-6CGS5C		.NUT, HEX, SELF-LOCKING (3/8 – 16, GRADE 8)	2
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B025WB4K42		.SCREW, HEX FLANGE (M8 X 1.25 X 25)	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015973069	44940	04-20749-1		.WASHER, SNUBBING, HARDENED	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW31M08B000A6FL1		.NUT, HEX FLANGE (M8 X 1.25)	4
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEB02C375B50WA6FY1		.SCREW, HEX HEAD CAP (3/8 – 16 X 2.50 GRADE 8)	2
6	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340159003805	81860	28137-3		.ISOLATOR, VIBRATION, ENGINE MOUNT	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW01X375000BD6AQ1		.WASHER, FLAT (3/8 HARDENED)	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	13230E6382-8		.NUT, HEXAGON	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10N10C030WB4K42		...SCREW, HEX FLANGE (M10 X 1.5 X 30)	4
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015860557	44940	04-20749-2		.WASHER, SNUBBING, HARDENED	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES01C438B75WA6FY1		.BOLT, HEX HEAD (7/16 – 14, GRADE 8)	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		2V507	92461A500		.NUT, HEX FLANGE (M10 X 1.5)	4
13	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015903803	81860	29550-4		.ISOLATOR, VIBRATION, ALTERNATOR MOUNT	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW10X437000BD6AQ1		.WASHER, FLAT (7/16, HARDENED)	2
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20103		.BRACKET, ENGINE LIFTING	1
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20417		.BRACKET, ENGINE MOUNTING	2
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M10B020WB4K41		.SCREW, HEX HEAD (M10 X 1.25 X 20)	8
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN126-M10		.WASHER, FLAT (M10)	8
19	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20072		.BRACKET, ENGINE LIFTING	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015004266	0XWR1	01123-60816		.BOLT	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN18M08B000BA7H91		NUT, HEX, FLANGE (M8 X 1.25)	2
END OF FIGURE										

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
AC GENERATOR ASSEMBLY, 50/60 HZ REPAIR PARTS LIST

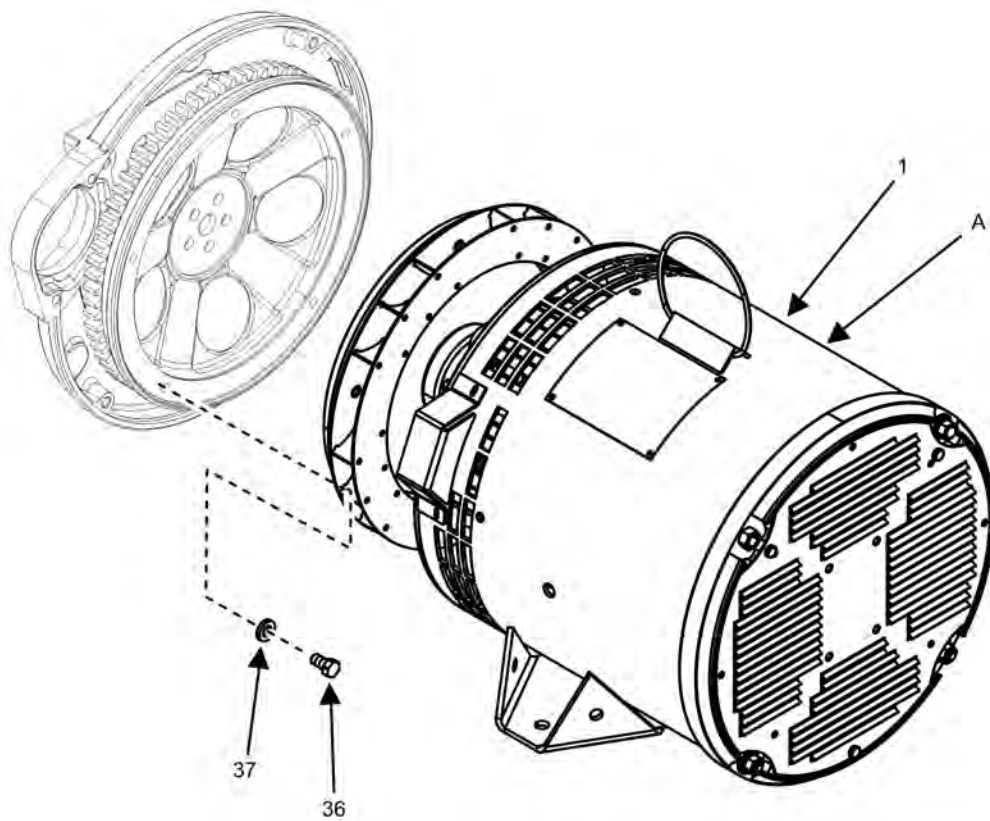


Figure 23. AC Generator Assembly, 50/60 Hz (Sheet 1 of 3).

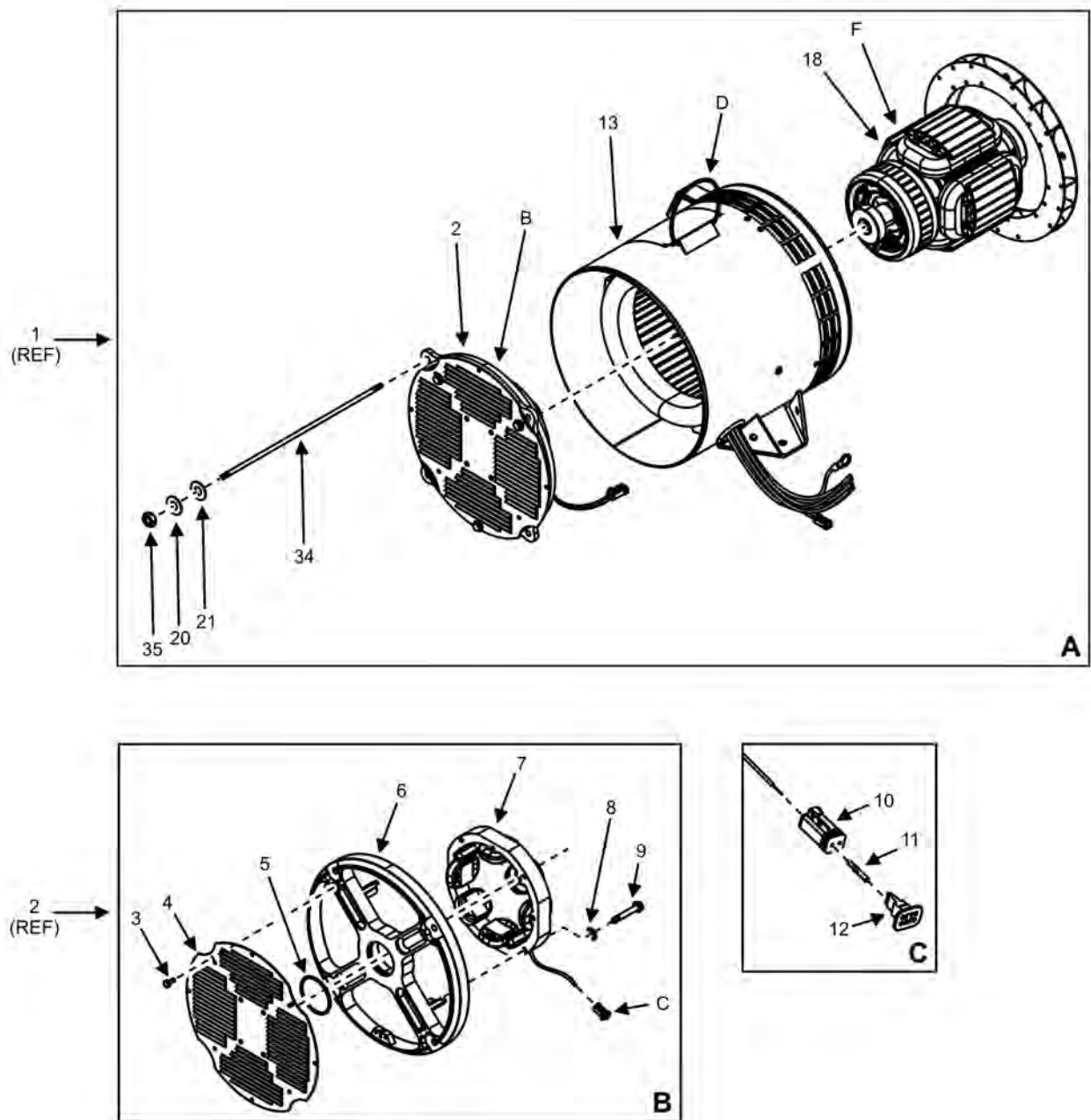


Figure 23. AC Generator Assembly, 50/60 Hz (Sheet 2 of 3).

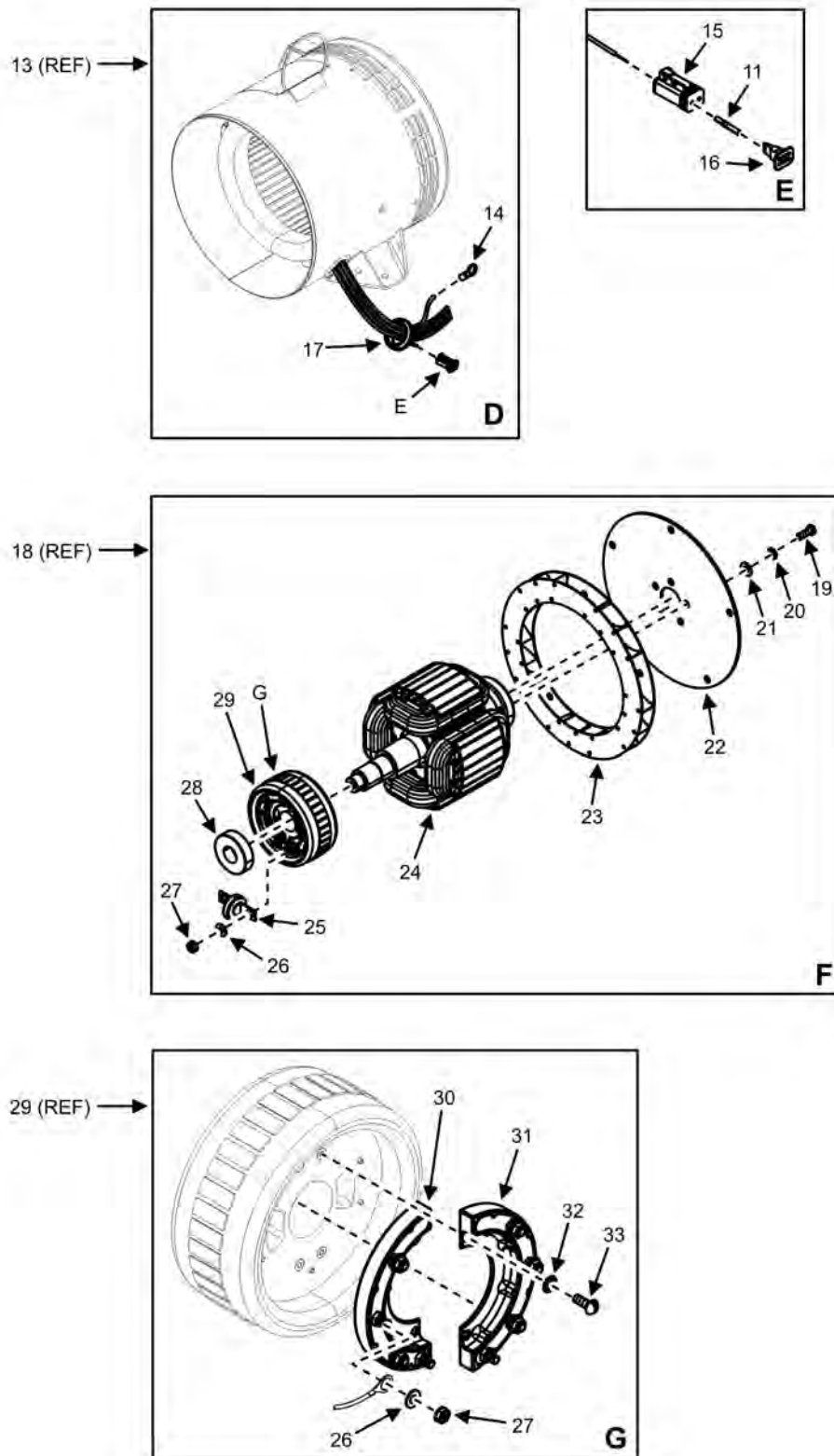


Figure 23. AC Generator Assembly, 50/60 Hz (Sheet 3 of 3).

(1)	(2)			(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 0901	
1	PAFHH	PAFHH	PAFDD	PAFDD		53YZ8	0200-3218-01	FIG. 23 AC GENERATOR ASSEMBLY, 50/60 HZ ..GENERATOR ASSEMBLY, 5 KW, 50/60 HZ UOC: 98E	1
2	PAFFF	PAFFF	PAFFF	PAFFF		53YZ8	A026F712	..ENDBELL ASSEMBLY UOC: 98E	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013390822	44940	815-0181	..SCREW, CAP, HEXAGON HEAD UOC: 98E	3
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20230	..COVER, INLET UOC: 98E	1
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5331009738598	44940	509-0094	..O-RING UOC: 98E	1
6	XAFZZ	XAFZZ	XAFZZ	XAFZZ		53YZ8	0211-0435	..ENDBELL UOC: 98E	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6115015887288	44940	A026F710	..STATOR, EXCITER UOC: 98E	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010779650	44940	853-0013	..WASHER, LOCK UOC: 98E	4
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013661153	44940	815-0774	..SCREW, TAPPING UOC: 98E	4
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015065555	11139	DT04-2P	..CONNECTOR, PLUG, RECEPTACLE UOC: 98E	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012163648	11139	0460-202-16141	..CONTACT, ELECTRICAL UOC: 98E	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015191808	11139	W2P	..RETAINER, ELECTRICAL, CONNECTOR UOC: 98E	1
13	PAFFF	PAFFF	PAFFF	PAFFF		53YZ8	A026E304	..STATOR, GENERATOR UOC: 98E	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006172896	00779	36160	..TERMINAL LUG UOC: 98E	12
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015860093	44940	0323-2538	..CONNECTOR, PLUG, ELECTRICAL UOC: 98E	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014468180	11139	W2S	..CONNECTOR BODY, PLUG, ELECTRICAL UOC: 98E	1
17	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4730011097901	44940	503-0183	..GROMMET UOC: 98E	1
18	PAFHH	PAFHH	PAFFF	PAFFF		53YZ8	0201-3649-01	..ROTOR, GENERATOR UOC: 98E	1
									1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305011742761	44940	0800-0050	..SCREW, CAP, HEXAGON HEAD UOC: 98E	5
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010609104	44940	0850-0050	..WASHER, LOCK UOC: 98E	9
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015878556	44940	0526-0390	..WASHER, FLAT UOC: 98E	9
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820015916101	30554	88-20225	..DISC, DRIVE UOC: 98E	1
23	XBHZZ	XBHZZ	XBHZZ	XBHZZ		53YZ8	A030S159	..FAN UOC: 98E	1
24	XAFZZ	XAFZZ	XAFZZ	XAFZZ		53YZ8	0201-3650-01	..ROTOR, ASSEMBLY, WOUND UOC: 98E	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5905013291699	44940	304-0807	..RESISTOR, VOLTAGE SENSITIVE UOC: 98E	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010518089	44940	526-0008	..WASHER, FLAT UOC: 98E	12
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010492745	44940	870-0131	..NUT, PLAIN, ASSEMBLED UOC: 98E	8
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3110011609663	44940	510-0112	..BEARING, ROTOR UOC: 98E	1
29	XAFFF	XAFFF	XAFFF	XAFFF	6115015877589	44940	A026J838	..EXCITER, ROTOR UOC: 98E	1
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A034L400	..RECTIFIER, POSITIVE UOC: 98E	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A032X895	..RECTIFIER, NEGATIVE UOC: 98E	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010607181	44940	853-0008	..WASHER, LOCK UOC: 98E	4
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305011904461	44940	813-0100	..SCREW UOC: 98E	4
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A026C355	..STUD UOC: 98E	4
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310004808509	44940	862-0003	..NUT, PLAIN, HEXAGON HEAD UOC: 98E	4
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015916658	44940	04-20769-1	..BOLT, MACHINE UOC: 98E	5
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW24X37N062BD6FY1	..WASHER, FLAT UOC: 98E	5
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
AC GENERATOR ASSEMBLY, 400 HZ REPAIR PARTS LIST

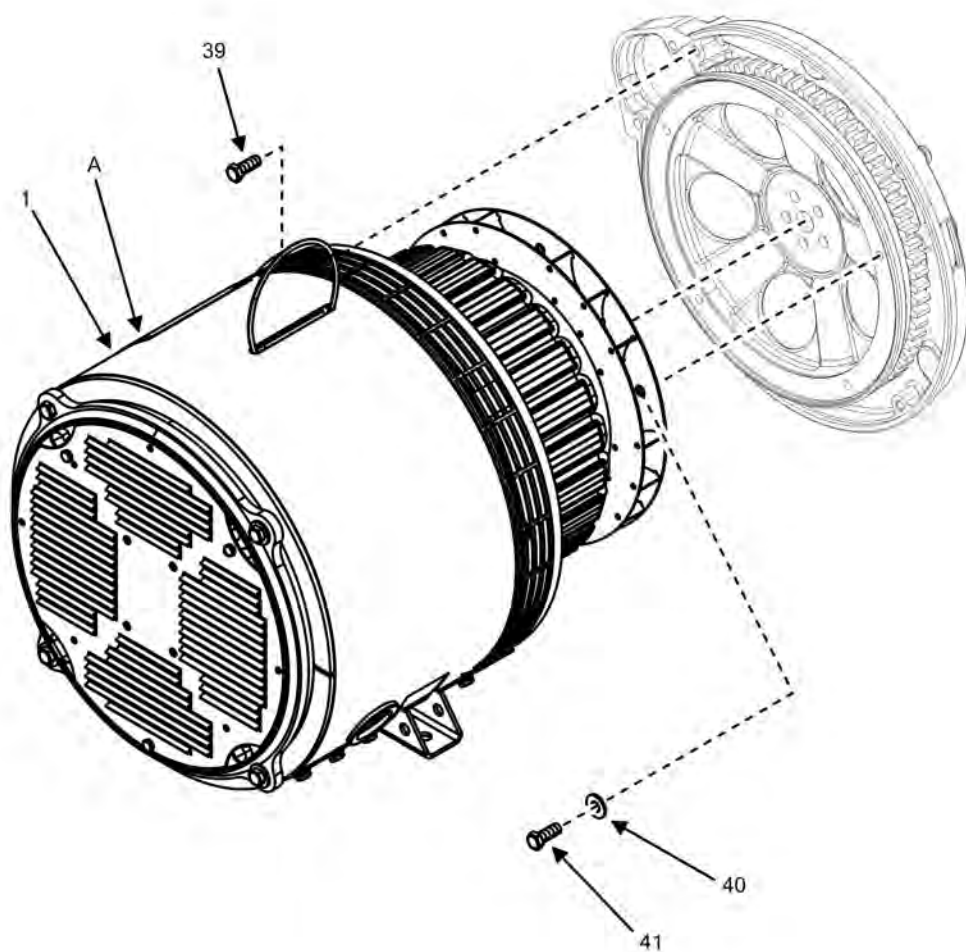


Figure 24. AC Generator Assembly, 400 Hz (Sheet 1 of 3).

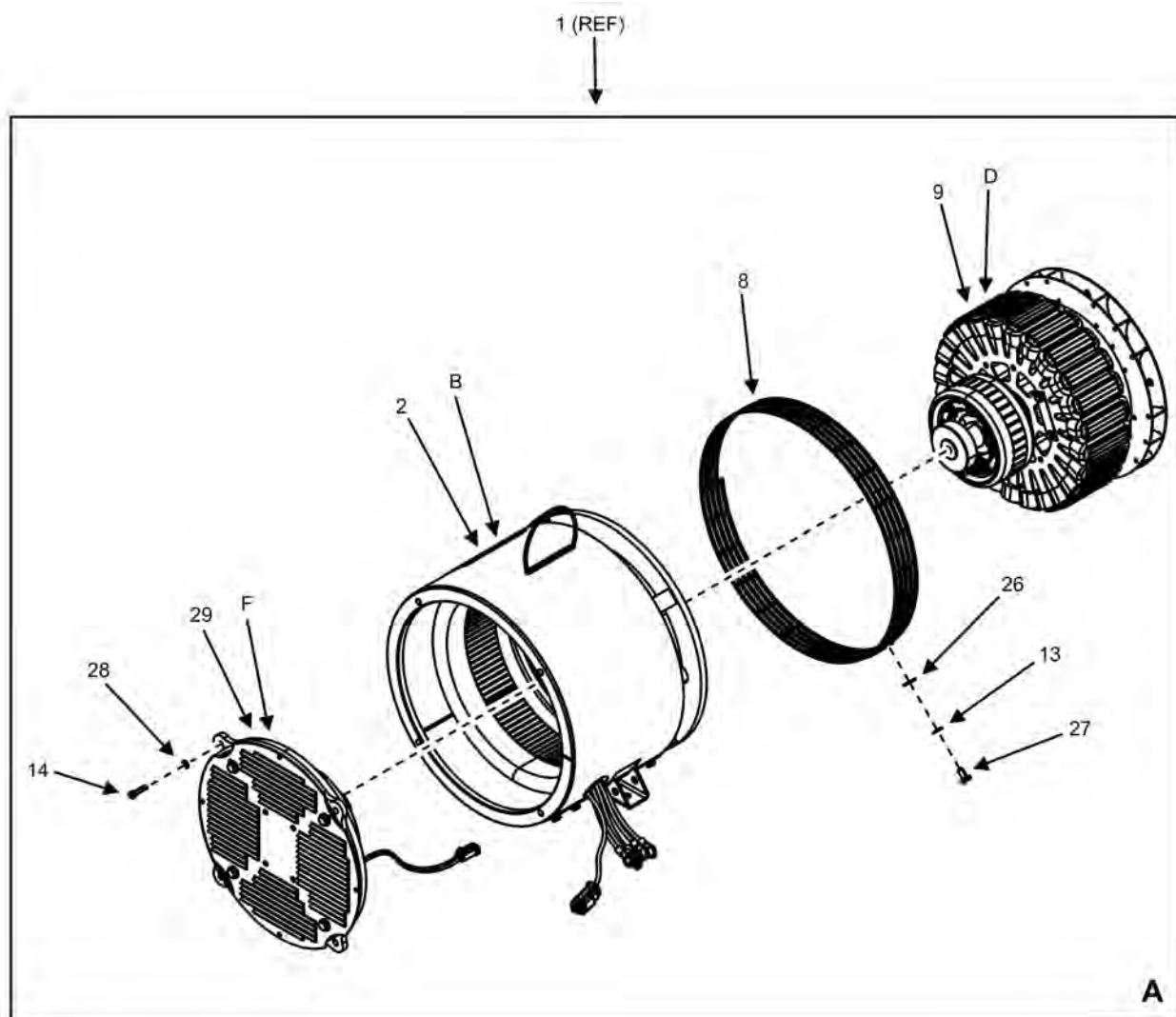


Figure 24. AC Generator Assembly, 400 Hz (Sheet 2 of 3).

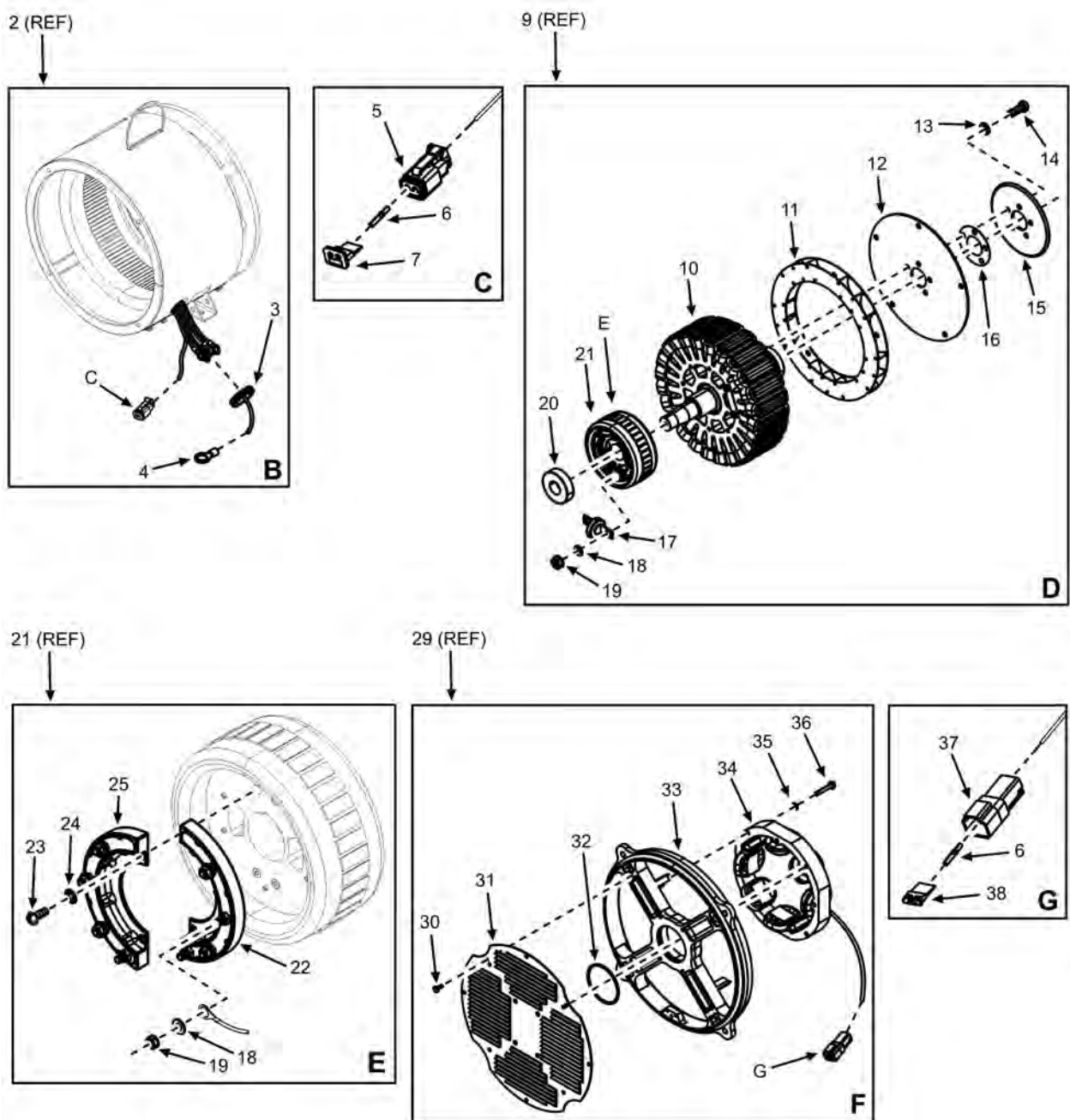


Figure 24. AC Generator Assembly, 400 Hz (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0901	
								FIG. 24 AC GENERATOR ASSEMBLY, 400 HZ	
1	PAFHH	PAFHH	PAFFF	PAFFF		53YZ8	0200-3219-01	.GENERATOR ASSEMBLY, 5 KW, 400 HZ UOC: 98F	1
2	XBFHH	XBFHH	XBFFF	XBFFF		53YZ8	A026E310	..STATOR, GENERATOR UOC: 98F	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	0508-0055	...GROMMET UOC: 98F	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006172896	00779	36160	...TERMINAL LUG UOC: 98F	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015860093	44940	0323-2538	..CONNECTOR, PLUG, ELECTRICAL UOC: 98F	12
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012163648	11139	0460-202-16141	..CONTACT, ELECTRICAL UOC: 98F	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014468180	11139	W2S	..CONNECTOR BODY, PLUG, ELECTRICAL UOC: 98F	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	0234-0895	..SCREEN ASSEMBLY UOC: 98F	1
9	XBFHH	XBFHH	XBFFF	XBFFF		53YZ8	A026H431	..ROTOR, GENERATOR UOC: 98F	1
10	XAFZZ	XAFZZ	XAFZZ	XAFZZ		53YZ8	A026G777	...ROTOR, ASSEMBLY, WOUND UOC: 98F	1
11	XBHZZ	XBHZZ	XBZZ	XBZZ		53YZ8	A030X159	...FAN UOC: 98F	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820015916101	30554	88-20225	...DISC, DRIVE UOC: 98F	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010096570	44940	0850-0040	...WASHER, LOCK UOC: 98F	5
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310011742761	44940	0800-0050	...SCREW, HEXAGON HEAD UOC: 98F	9
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015957518	30554	88-20227	...DISC, RETENTION UOC: 98F	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015957311	30554	88-20226	...SPACER, ROTOR RETAINER UOC: 98F	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5905013291699	44940	304-0807	...RESISTOR, VOLTAGE SENSITIVE UOC: 98F	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010518089	44940	526-0008	...WASHER, FLAT UOC: 98F	12

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010492745	44940	870-0131	...NUT, PLAIN, ASSEMBLED UOC: 98F	8
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	510-0102	...BEARING, ROTOR UOC: 98F	1
21	XAFFF	XAFFF	XAFFF	XAFFF	6115015877589	44940	A026J838	...EXCITER, ROTOR UOC: 98F	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A032X895	...RECTIFIER, NEGATIVE UOC: 98F	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305011904461	44940	813-0100	...SCREW UOC: 98F	4
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010607181	44940	853-0008	...WASHER, LOCK UOC: 98F	4
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A034L400	...RECTIFIER, POSITIVE UOC: 98F	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013700052	44940	0526-0015	...WASHER, FLAT UOC: 98F	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305010623344	44940	0800-0003	...SCREW UOC: 98F	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015878556	44940	0526-0390	...WASHER, FLAT UOC: 98F	4
29	XBFHH	XBFHH	XBFFF	XBFFF		53YZ8	A026F713	...ENDBELL ASSEMBLY UOC: 98F	1
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013390822	44940	815-0181	...SCREW, CAP, HEXAGON HEAD UOC: 98F	3
31	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20230	...COVER, INLET UOC: 98F	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	509-0099	...O-RING UOC: 98F	1
33	XAFZZ	XAFZZ	XAFZZ	XAFZZ		53YZ8	0211-0427	...ENDBELL UOC: 98F	1
34	XAHHZ	XAHHZ	XAFZZ	XAFZZ	6115015887288	44940	A026F710	...STATOR, EXCITER UOC: 98F	1
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010779650	44940	853-0013	...WASHER, LOCK UOC: 98F	4
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013661153	44940	815-0774	...SCREW, TAPPING UOC: 98F	4
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015065555	11139	DT04-2P	...CONNECTOR, PLUG, RECEPTACLE UOC: 98F	1
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015191808	11139	W2P	...RETAINER, ELECTRICAL, CONNECTOR UOC: 98F	1
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ58A574C3B08CY22	...SCREW, FLANGE HEAD UOC: 98F	4
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW24X37N062BD6FY1	...WASHER, FLAT UOC: 98F	5
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015916658	44940	04-20769-1	...BOLT, MACHINE UOC: 98F	5
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
ENGINE ASSEMBLY REPAIR PARTS LIST

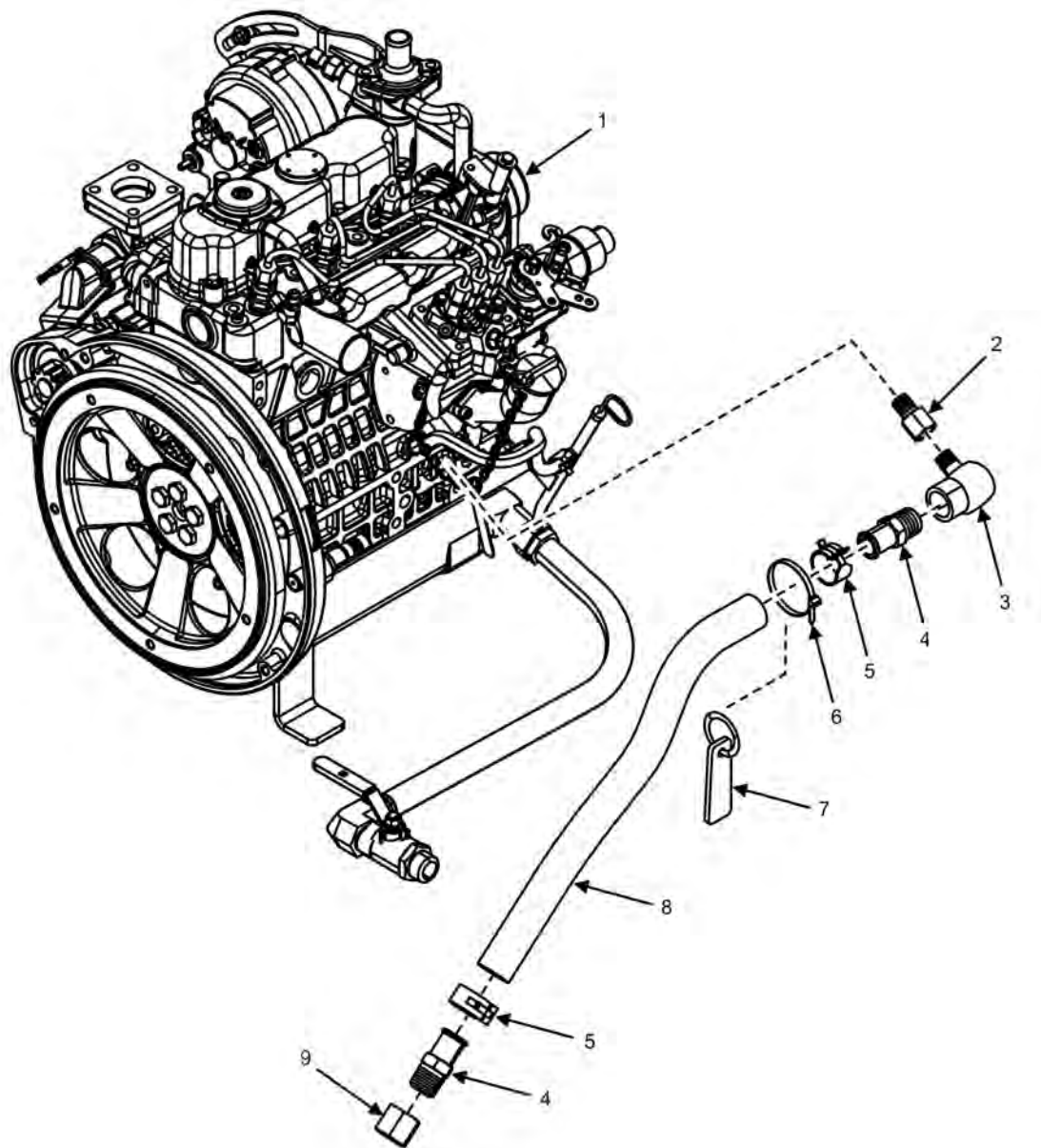


Figure 25. Engine Assembly (Sheet 1 of 2).

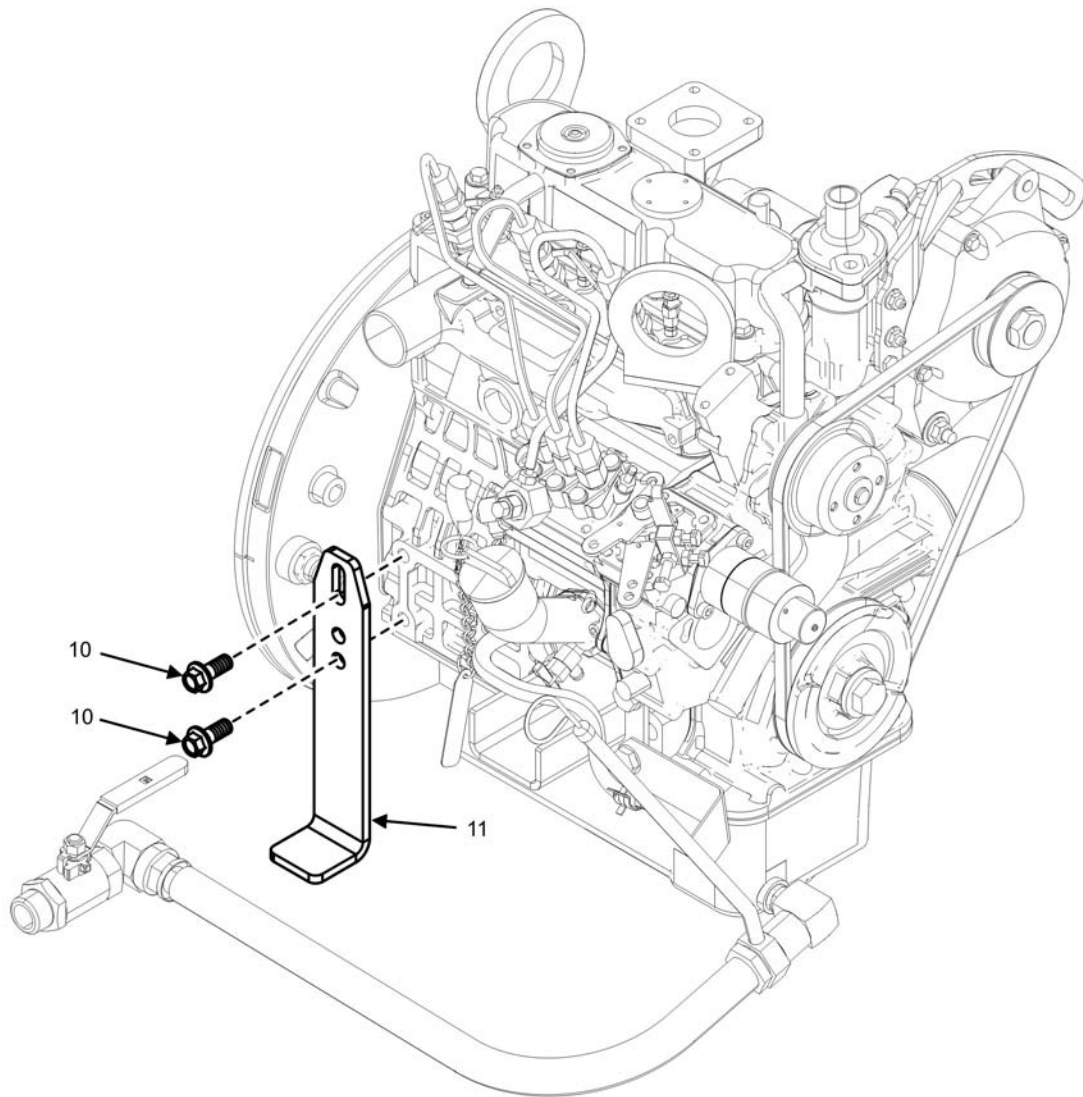


Figure 25. Engine Assembly (Sheet 2 of 2).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 0902	
								FIG. 25 ENGINE ASSEMBLY	
1	PAFHH	PAFHH	PAFDD	PAFDD	2815015975235	30554	04-20157	.ASSEMBLY, ENGINE (SEE FIGURES 26-42 AND 46 FOR PARTS BREAKDOWN)	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015901311	98441	1/4X1/4F3HG	.ADAPTER,STRAIGHT	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144-8140239C	.ELBOW, MALE	1
								FEMALE	
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ12318-12 430160B	.ADAPTER, TUBE	2
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-27	.CLAMP, TYPE CTB	2
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		06383	PLT4S-M30	.TIE, CABLE	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21599	.LABEL, INFORMATION COOLANT DRAIN HOSE	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21832-2	.HOSE, COOLANT, ENGINE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730014079298	93061	213P-8	.CAP, PIPE	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10N10C025WB4K42	.SCREW, HEX FLANGE HEAD	4
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21732	.SUPPORT, ENGINE 5KW	2
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
LUBRICATION SYSTEM REPAIR PARTS LIST

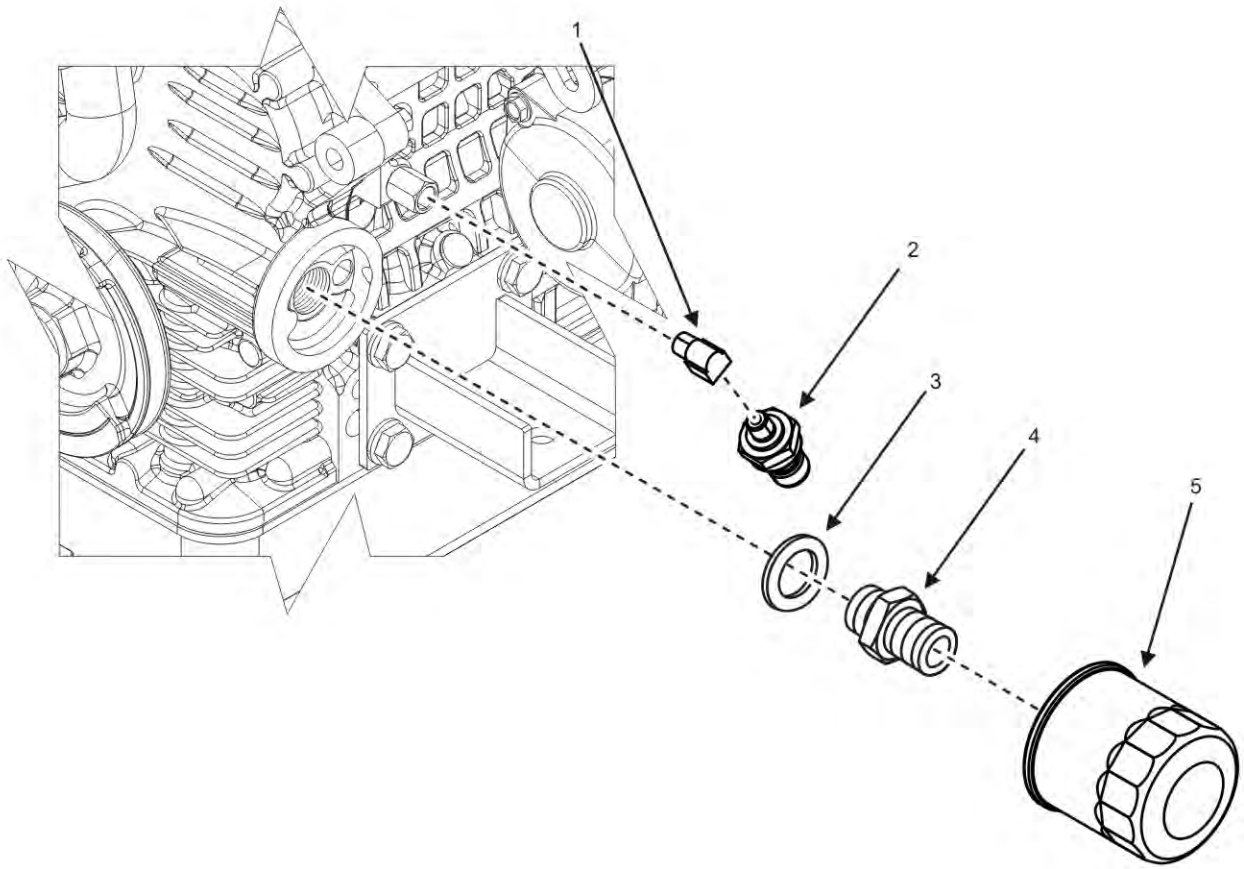


Figure 26. Lubrication System (Sheet 1 of 3).

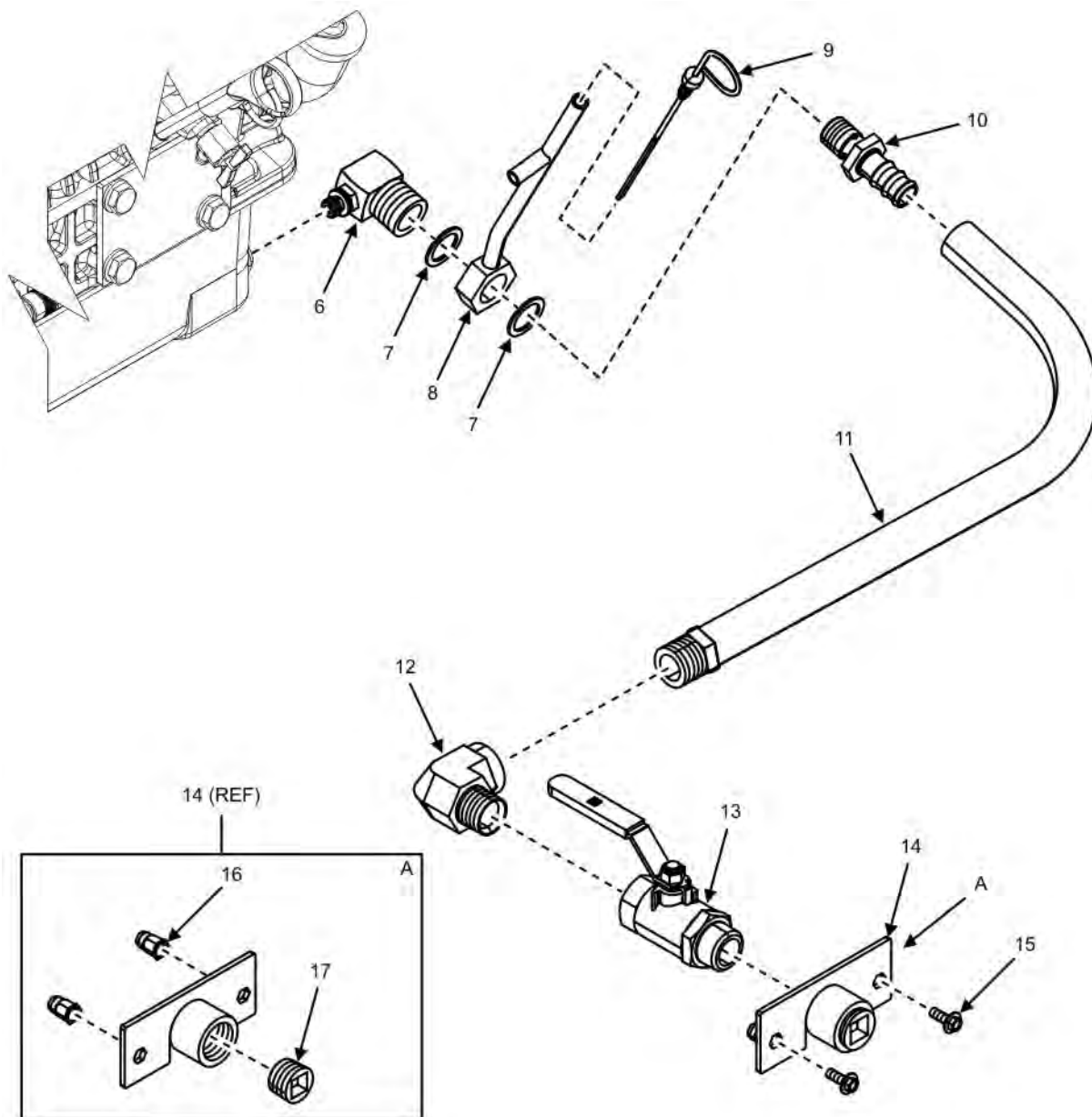


Figure 26. Lubrication System (Sheet 2 of 3).

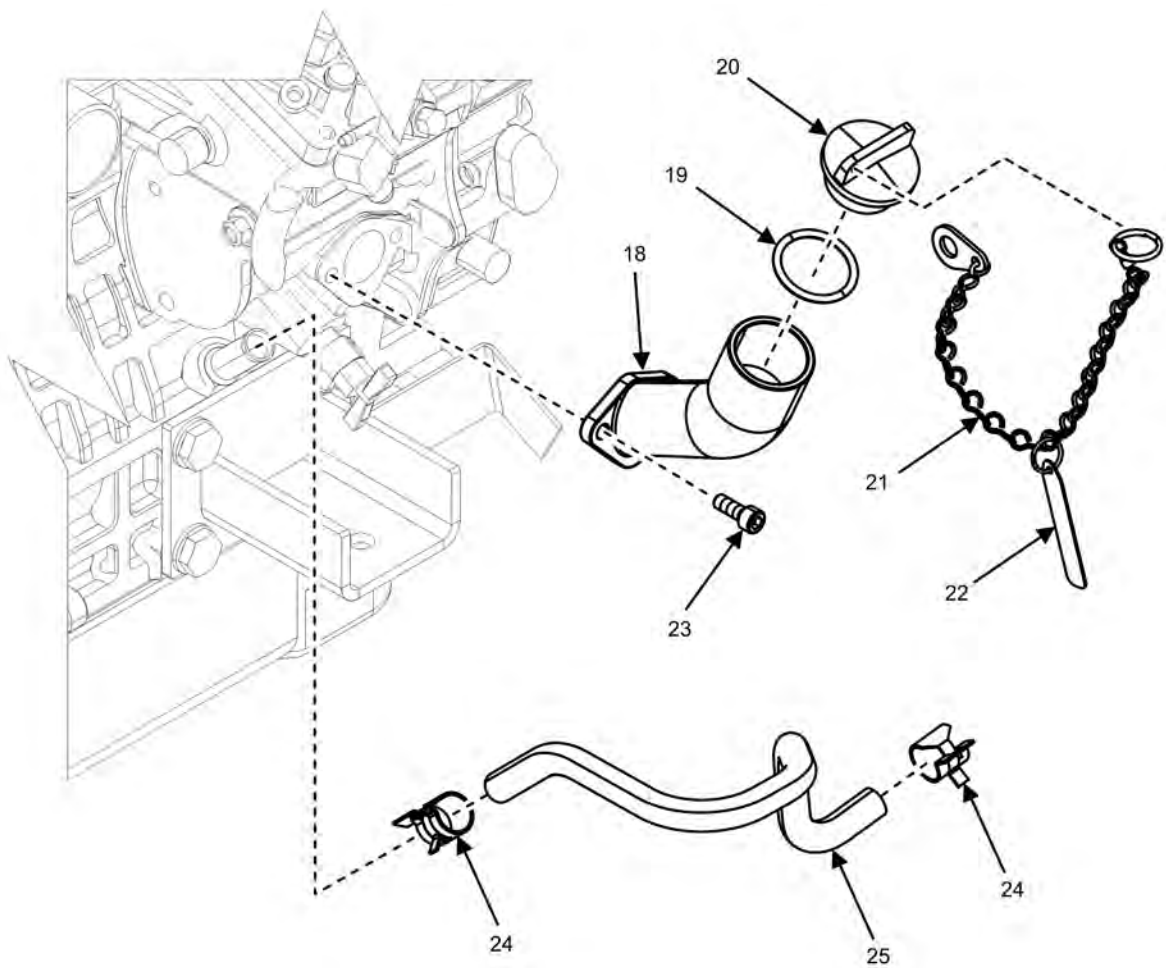


Figure 26. Lubrication System (Sheet 3 of 3).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090201									
FIG. 26 LUBRICATION SYSTEM									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5302-2130239B	.ELBOW, PIPE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6620015982271	22863	P4055-5001-1	.SENDER, OIL PRESSURE	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015370005	F0XWR1	15841-9401-0	.WASHER, PLAIN	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730013669017	30554	882307	.ADAPTER, STRAIGHT	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0XWR1	HH150-3243-0	.FILTER, ENGINE OIL	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44430	PS-PC1370-11	.ELBOW, 90 DEGREE	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015577264	0AK42	22190-220002	.WASHER, SEAL	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21763	.TUBE, DIPSTICK	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6680015957336	30554	04-21452	.DIPSTICK, ENGINE OIL	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21742	.ADAPTER, BANJO	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21529-1	.HOSE, OIL DRAIN	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		45X75	3/ 4 CD-S	.FITTING, ELBOW	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820015878062	93061	XV501P-12	.VALVE, STOP CHECK	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20162	.BULKHEAD, OIL DRAIN HOSE	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A020WB4K 42	.SCREW, CAP, HEXAGON HEAD	2
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		F3A26	639101-76030	..NUT, CLINCH	2
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015966482	44940	04-20166	.PLUG, PIPE	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015929384	44940	04-20367	.TUBING, METALLIC	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015468126	0AK42	24311-000320	.O-RING	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21815	.CAP, FILLER OPENING	1
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21295	.LANYARD, OIL FILL CAP	1
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21299	.PLATE, ENGINE OIL CHANGE	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN912-M6X16	.SCREW, SOCKET HEAD CAP (M6 X 1.0 X 16)	4
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-16	.CLAMP TYPE CTB	2
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21510-3	.HOSE, OIL	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
ENGINE SPEED SENSOR REPAIR PARTS LIST

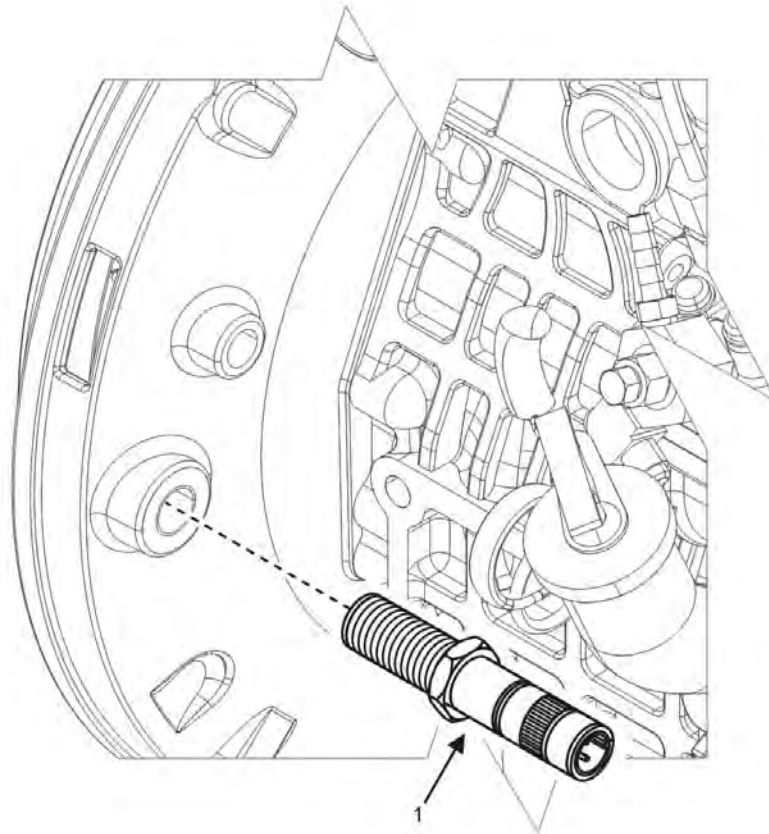


Figure 27. Engine Speed Sensor.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	A035B004	GROUP 090202 FIG. 27 ENGINE SPEED SENSOR .SENSOR, MAGNETIC SPEED END OF FIGURE	1

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
GLOW PLUGS REPAIR PARTS LIST

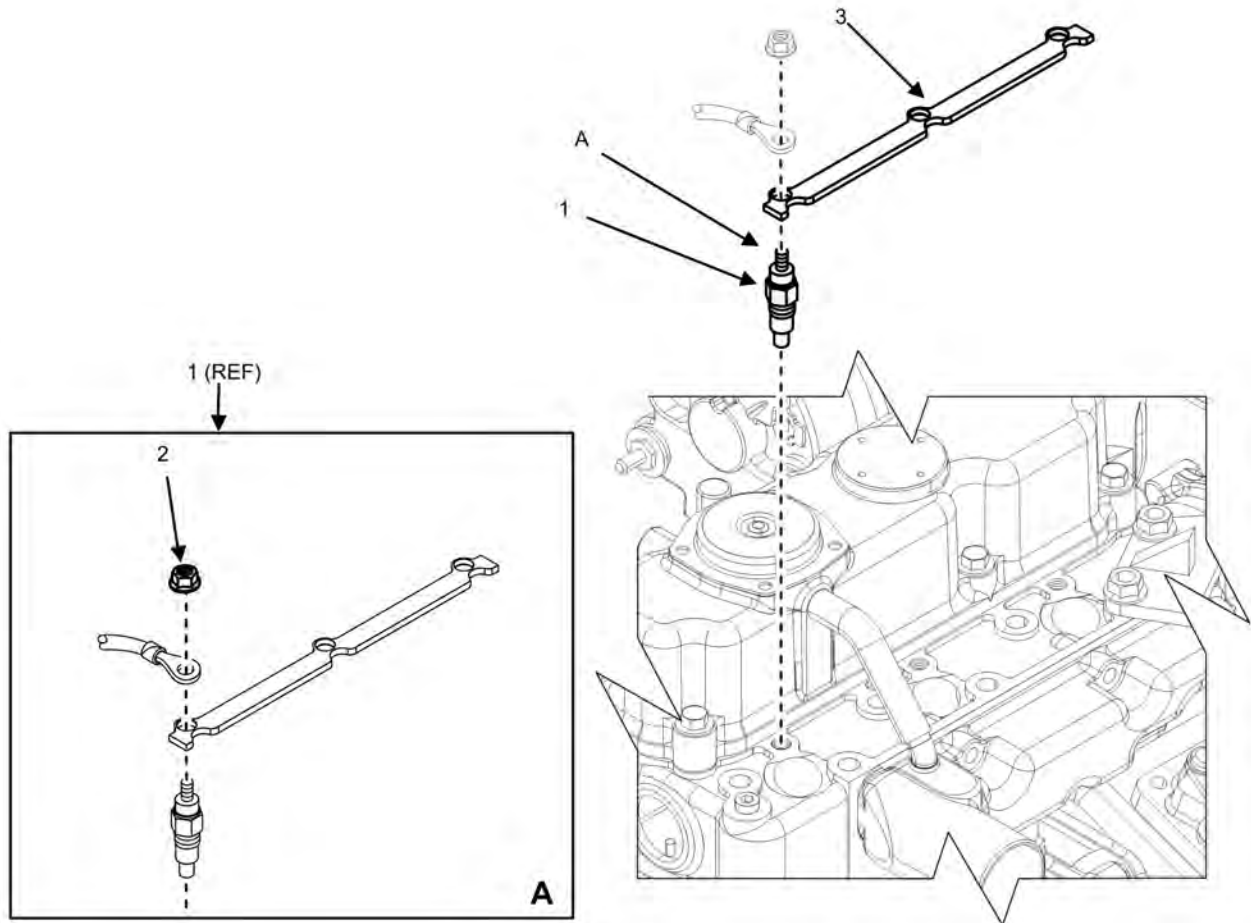


Figure 28. Glow Plugs.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090203									
FIG. 28 GLOW PLUGS									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2920014787511	OXWR1	16881-65512	.GLOW PLUG	3
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014406749	S4532	02761-5004-0	.NUT, SLEEVE	3
3	PAFFF	PAFFF	PAFFF	PAFFF	6145015886873	OXWR1	1G962-6556-0	.CORD, GLOW PLUG	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
FUEL INJECTORS REPAIR PARTS LIST**

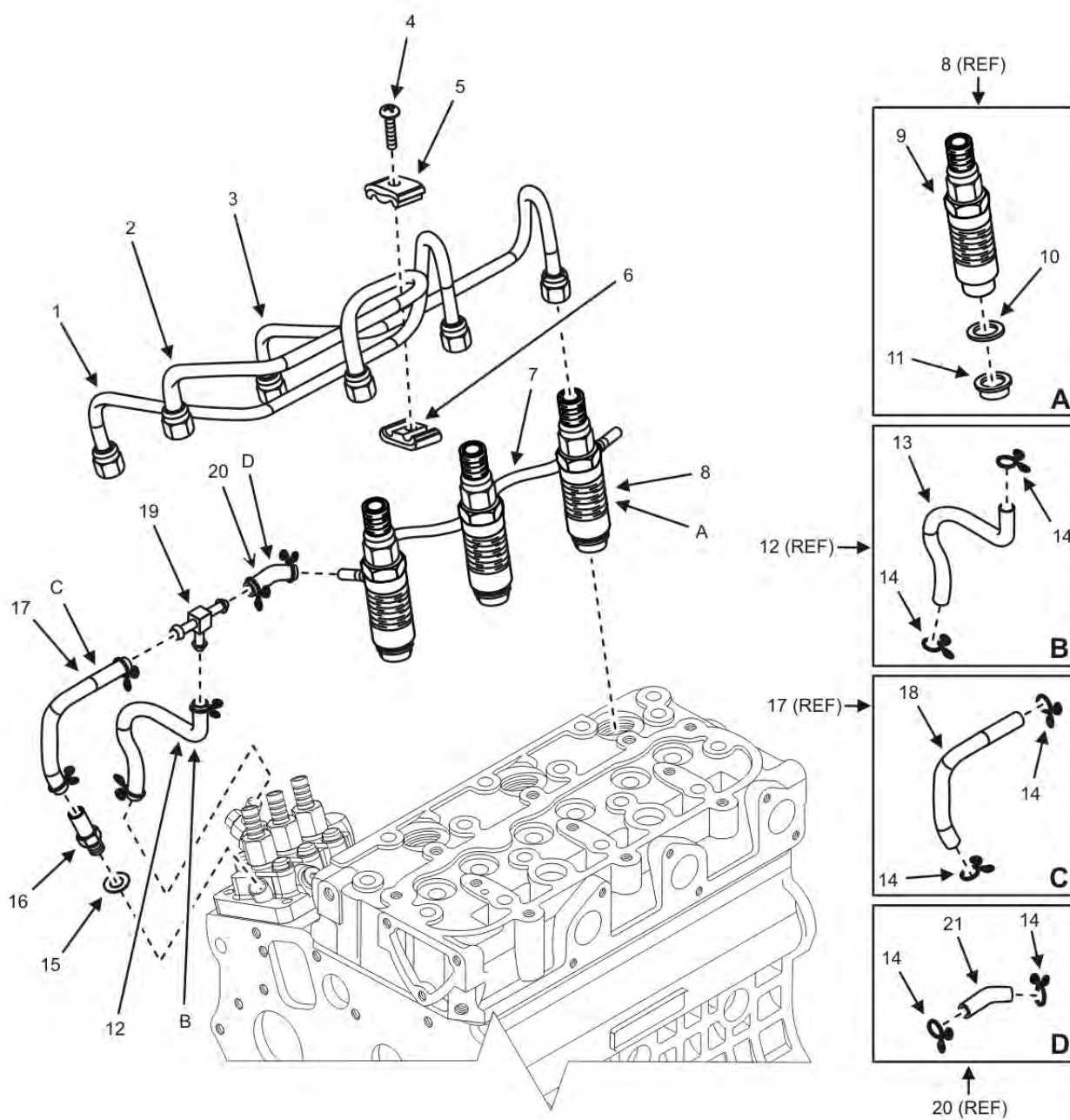


Figure 29. Fuel Injectors.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090204	
								FIG. 29 FUEL INJECTORS	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015976535	OXWR1	1G460-5371-2	.PIPE, INJECTION	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015976536	OXWR1	1G460-5372-3	.PIPE, INJECTION	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		OXWR1	1G460-5373-2	.PIPE, INJECTION	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015333695	1Q0C4	03024-50520	.SCREW, ASSEMBLED WASHER	2
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730014343361	67271	322136	.CLAMP, HOSE SPECIAL	2
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730014343360	67271	322135	.CLAMP, HOSE SPECIAL	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015976532	OXWR1	1G962-4250-0	.ASSEMBLY, PIPE, OVERFLOW	1
8	PAFFF	PAFFF	PAFFF	PAFFF	4730015869235	OXWR1	16001-5390-0	.ASSEMBLY, FUEL INJECTOR	3
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910015008991	OXWR1	16001-53000	..INJECTOR, FUEL	3
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015072967	5X475	15841-5362-2	..GASKET	3
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014313620	31013	19077-53650	..SEAL, PLAIN ENCASED	3
12	PAFFF	PAFFF	PAFFF	PAFFF	4710015870644	OXWR1	16809-4250-0	.ASSEMBLY, TUBE, FUEL	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		OXWR1	09661-40130	..TUBE, FUEL	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015339478	1Q0C4	14971-4275-0	..CLIP, PIPE	6
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014784911	OXWR1	15601-96650	.GASKET	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910014394915	67271	322123	.SCREW, AIR BLEEDER	1
17	PAFFF	PAFFF	PAFFF	PAFFF	4710015870639	OXWR1	16809-4203-0	.ASSEMBLY, TUBE, FUEL (INCLUDES ITEMS 16 AND ITEM 20)	1
18	XBFZZ	XBFZZ	XBFZZ	XBFZZ		OXWR1	09661-40085	..TUBE, FUEL	1
19	XBFZZ	XBFZZ	XBFZZ	XBFZZ		OXWR1	1G065-4236-0	.JOINT, T-PIPE	1
20	PAFFF	PAFFF	PAFFF	PAFFF	4710015870647	OXWR1	16809-4202-0	.ASSEMBLY, TUBE, FUEL (INCLUDES ITEMS 16 AND ITEM 23)	1
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		OXWR1	09661-40040	..TUBE, FUEL	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
SPEED CONTROL PLATE REPAIR PARTS LIST

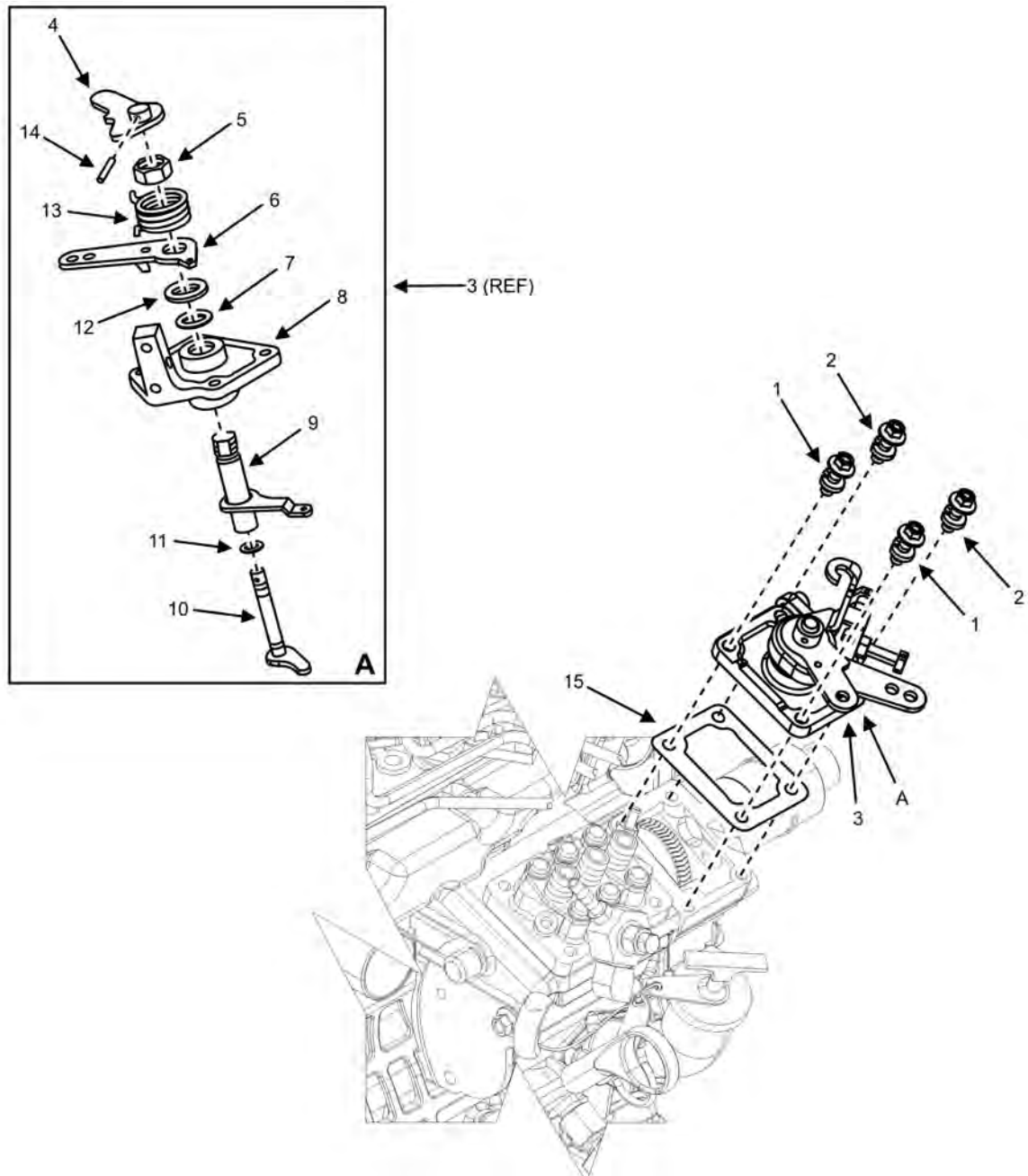


Figure 30. Speed Control Plate (Sheet 1 of 2).

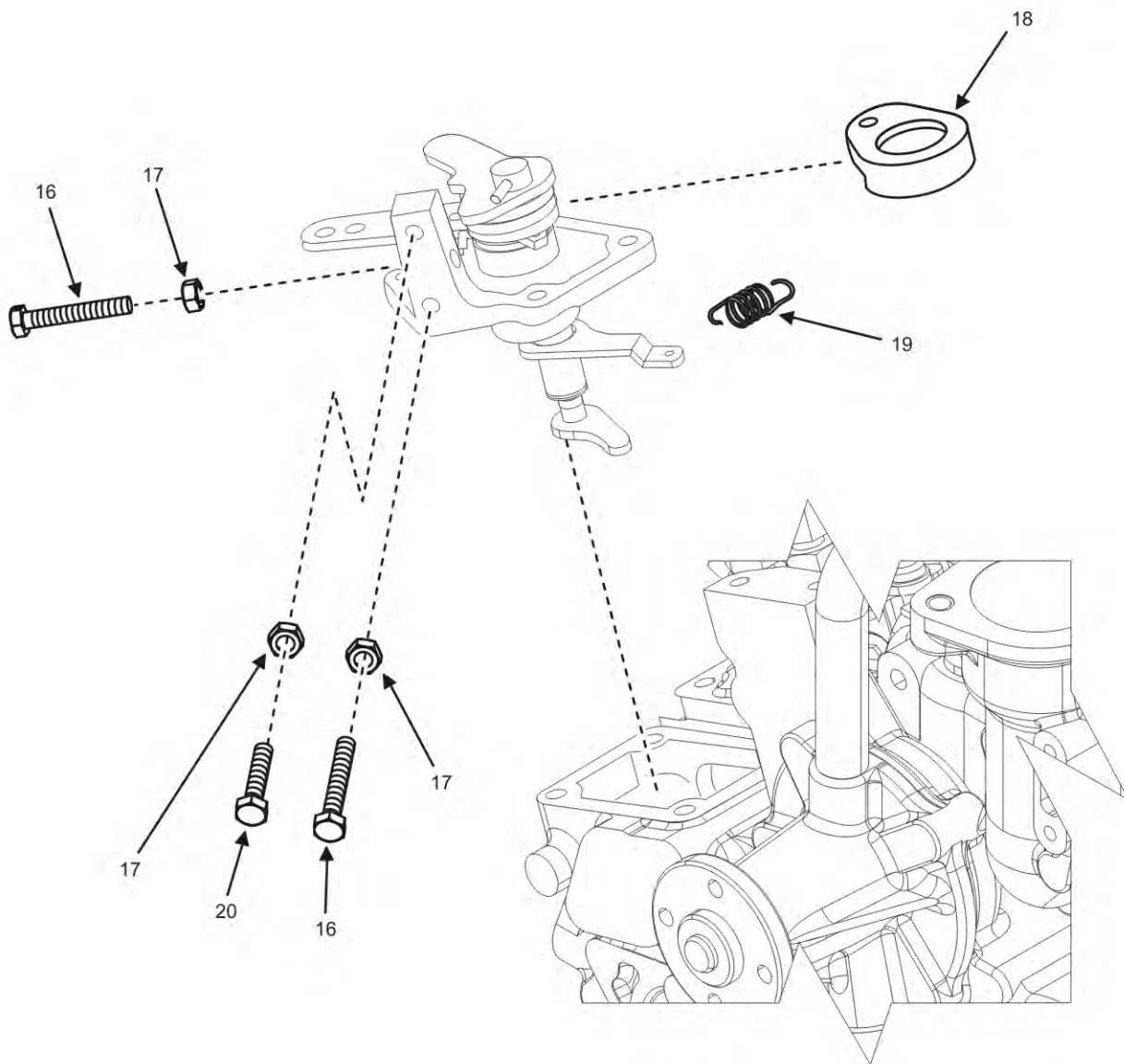


Figure 30. Speed Control Plate (Sheet 2 of 2).

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 090205	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015070141	5X475	01023-50618	FIG. 30 SPEED CONTROL PLATE	2
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015878726	0XWR1	16871-9105-0	.BOLT, MACHINE	2
3	PAFFF	PAFFF	PAFFF	PAFFF		0XWR1	1E110-5700-0	.BOLT	
								.ASSEMBLY, SPEED CONTROL PLATE	1
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0XWR1	19837-5772-3	..LEVER, ENGINE STOP	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015878685	0XWR1	16866-9201-0	..NUT, SPEED CONTROL	1
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0XWR1	1G639-5715-0	..LEVER, SPEED CONTROL	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015370010	0XWR1	04814-10160	..O-RING	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6505015859923	0XWR1	15841-5711-2	..PLATE, SPEED CONTROL	1
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0XWR1	1G820-5611-2	..LEVER, GOVERNOR	1
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0XWR1	1G820-5774-3	..SHAFT, LEVER	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015370007	0XWR1	04814-10070	..O-RING	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0XWR1	19280-5724-0	..COLLAR	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5360015372057	0XWR1	16878-5792-0	..SPRING, CONSTANT FORCE	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315015906563	0XWR1	05411-00314	..PIN, SPRING	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014785161	0XWR1	15841-57212	.GASKET	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014790352	0XWR1	19202-9101-0	.BOLT, MACHINE	2
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013207038	0XWR1	02056-50060	.NUT, PLAIN HEXAGON	3
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015879944	0XWR1	16866-5730-2	.CAP	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5360015878698	0XWR1	16851-5641-0	..SPRING, GOVERNOR	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014790365	0XWR1	15108-5728-00	.BOLT, MACHINE	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
FUEL INJECTION PUMP REPAIR PARTS LIST

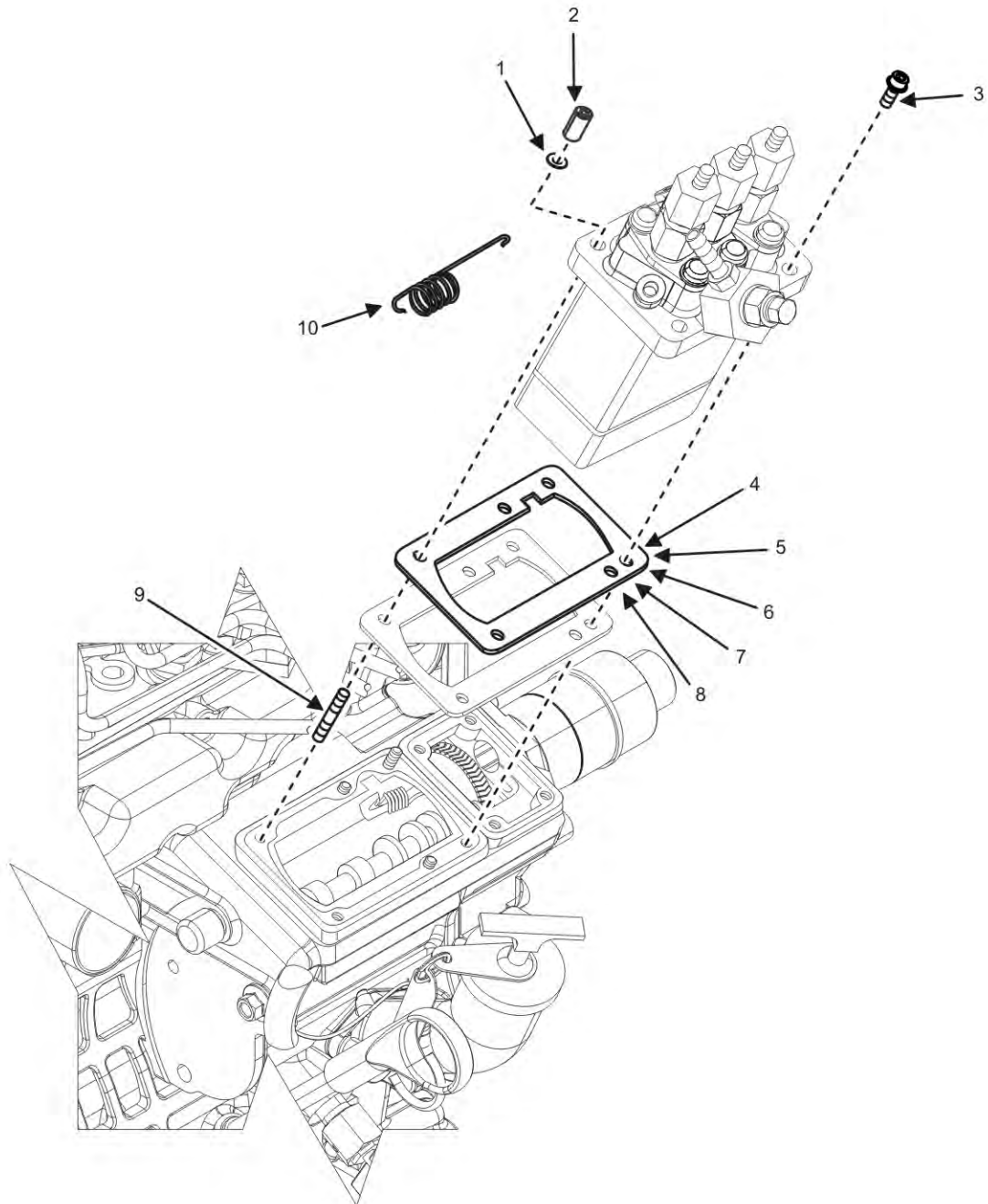


Figure 31. Fuel Injection Pump (Sheet 1 of 2).

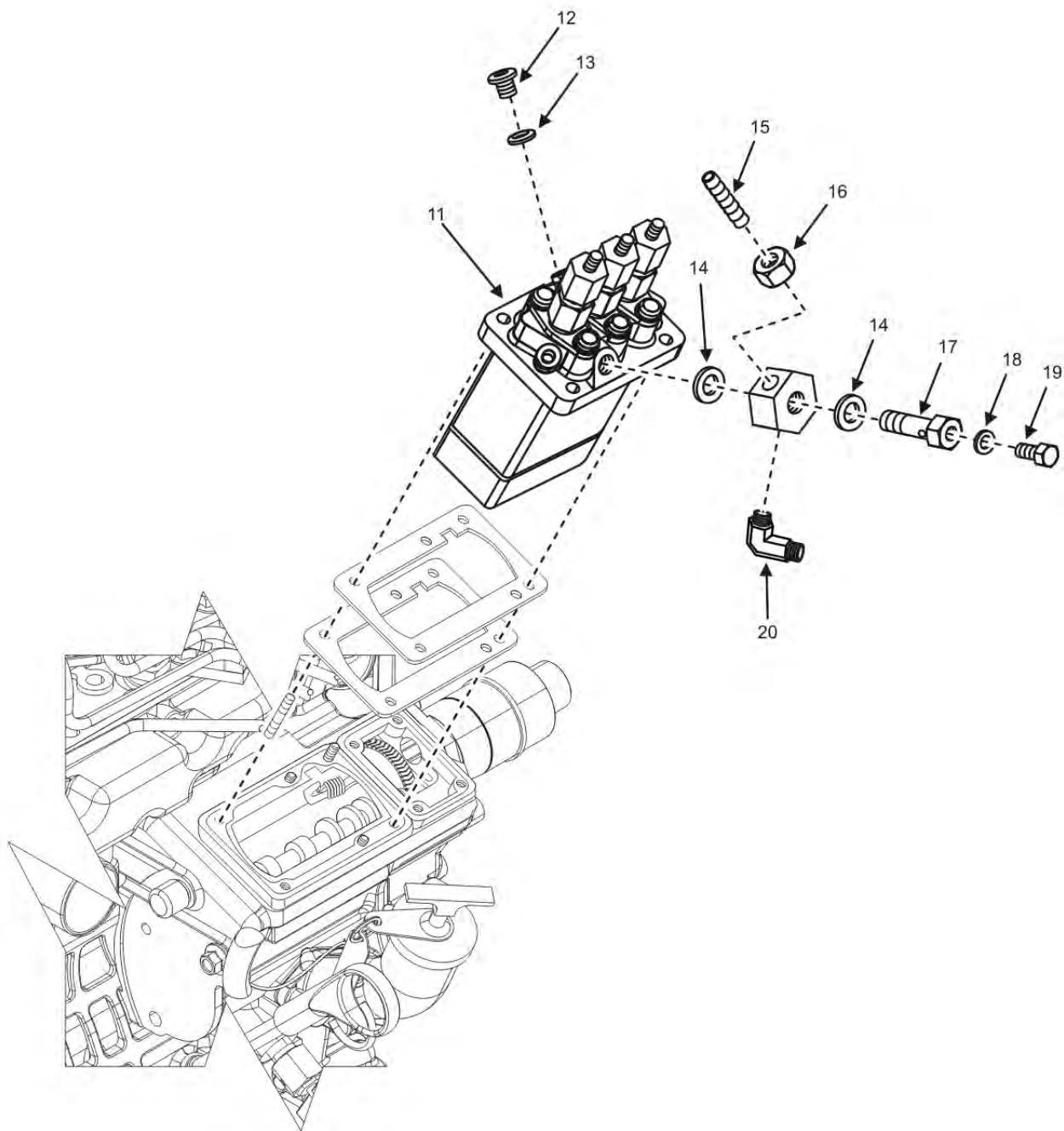


Figure 31. Fuel Injection Pump (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090206	
								FIG. 31 FUEL INJECTION PUMP	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013207100	0XWR1	04512-60060	.WASHER	2
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014785173	0XWR1	15841-92320	.NUT	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015878754	0XWR1	16871-9106-0	.BOLT, HEX HEAD	
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015912541	0XWR1	1G700-5220-0	SOCKET	2
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365014371065	0XWR1	16006-52092	.SHIM (0.175MM)	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365014371064	0XWR1	16006-52112	.SHIM (0.200MM)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015003332	0XWR1	16006-52112	.SHIM (0.250MM)	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015894782	0XWR1	16006-52122	.SHIM (0.300MM)	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015894782	0XWR1	1G700-5216-0	.SHIM (0.350MM)	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307014772256	1Q0C4	15841-91500	.STUD	2
11	PAFFF	PAFFF	PAFFF	PAFFF	5360015878665	0XWR1	1G820-5648-2	.SPRING, START	1
						0XWR1	1G820-5101-0	.PUMP	
								ASSEMBLY, FUEL INJECTION	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015072201	5X475	16030-9601-0	.PLUG	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014784851	0XWR1	15841-96650	.GASKET	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015370001	0XWR1	15861-9665-0	.GASKET	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730010175119	29510	343544R91	.JOINT	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21771	.FITTING, BANJO	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730014863490	S4532	15841-51320	.BOLT, FLUID	
								PASSAGE	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014784849	0XWR1	15841-96660	.GASKET	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305014801127	0XWR1	15841-51350	.SCREW, CAP	
								SOCKET HEAD	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAE J514 4-4 070202C	.ELBOW, MALE ADAPTER	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
THERMOSTAT INSTALLATION REPAIR PARTS LIST**

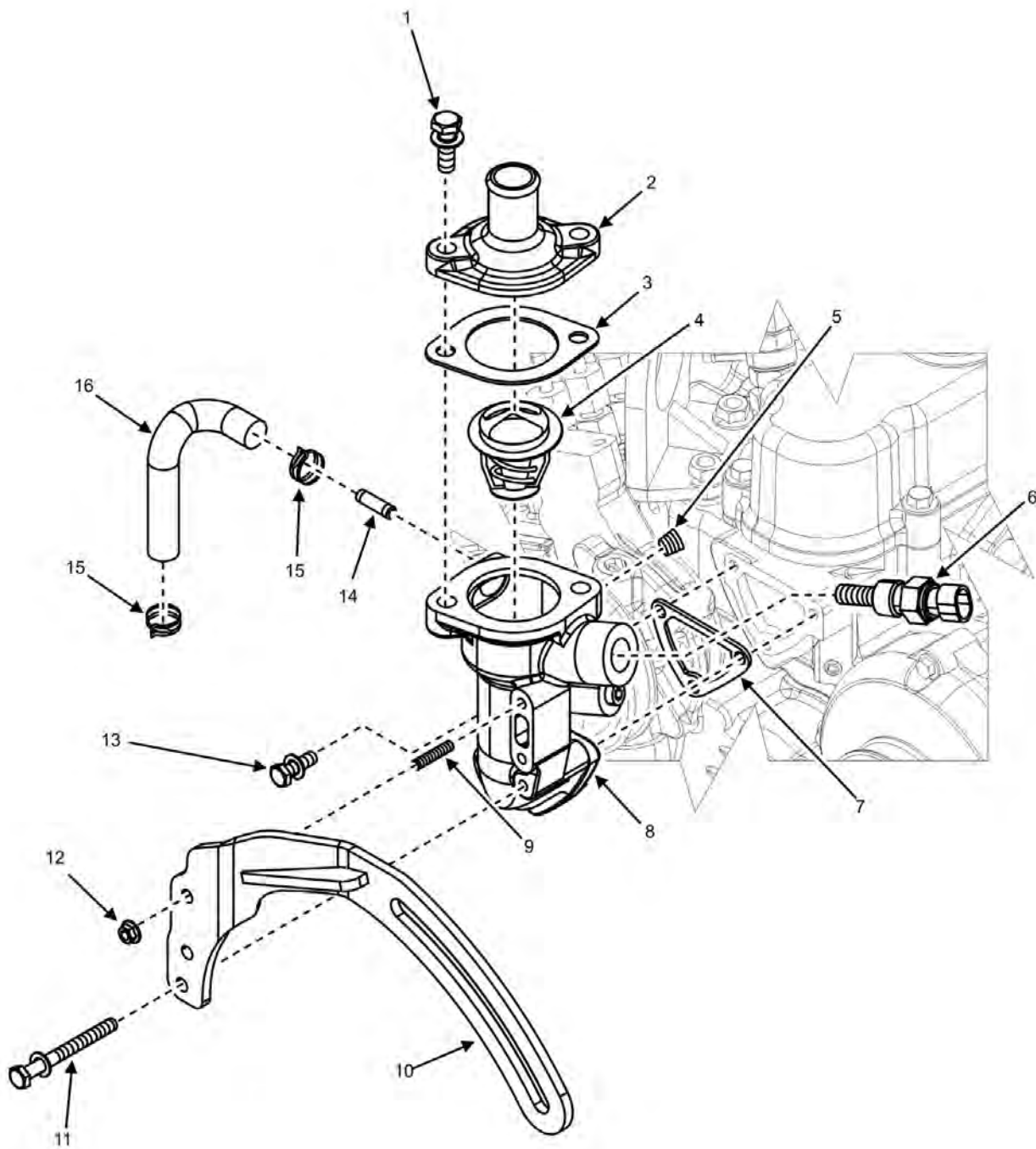


Figure 32. Thermostat Installation.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 090207	
								FIG. 32 THERMOSTAT INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015004271	OXWR1	01123-50825	.BOLT, MACHINE	2
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		OXWR1	1E051-7326-0	.COVER, THERMOSTAT	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015075010	5X475	16221-7327-0	.GASKET	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6685-01-525-5884	44940	1E051-7326-0	.THERMOSTAT, FLOW CONTROL	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3431015068134	5X475	15841-9602-0	.PLUG	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6685015860032	82647	5024-0250	.SENSOR, TEMPERATURE	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015869080	OXWR1	15841-7292-3	.GASKET	1
8	XBFFF	XBFFF	XBFFF	XBFFF		OXWR1	1E132-7270-0	.HOUSING, THERMOSTAT	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20950	.STUD	2
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ	5307015878555	44940	04-20860	.BRACKET, MOUNTING	1
11	PFFZZ	PFFZZ	PFFZZ	PFFZZ	5306015008701	OXWR1	01023-60650	.BOLT, MACHINE	1
12	PAFFF	PAFFF	PAFFF	PAFFF		44940	DIN6923-M6	.NUT, PLAIN EXTENDED	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015069038	5X475	01023-50616	.BOLT, MACHINE	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015074421	5X475	16241-7337-0	.PIPE, METALLIC	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730014787130	OXWR1	16241-73360	.CLAMP, HOSE	2
16	PCFZZ	PCFZZ	PCFZZ	PCFZZ		OXWR1	1E132-7335-0	.HOSE, NON- METALLIC	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
WATER PUMP REPAIR PARTS LIST

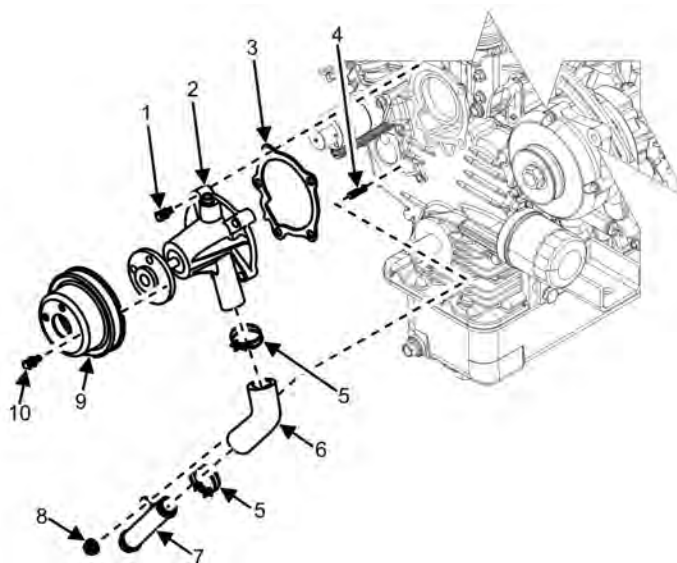


Figure 33. Water Pump.

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090208									
FIG. 33 WATER PUMP									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306013213372	S4532	01023-50622	.BOLT, MACHINE	5
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015976224	0XWR1	1G820-7303-0	.PUMP, WATER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015878688	0XWR1	16851-7343-0	.GASKET	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307014966030	S4532	15841-9151-0	.STUD, PLAIN	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730014966572	S4532	15841-7296-0	.CLAMP, HOSE	2
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930982059103	S4532	15841-7286-0	.PIPE, WATER	1
7	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720014966578	S4532	15841-7287-0	.HOSE, PRE-FORMED	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015002374	0XWR1	02751-50060	.NUT, PLAIN PLATED	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3020015370881	0XWR1	15841-7425-0	.PULLEY, FAN	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2990999175958	S8029	01754-50610	.BOLT, FLANGE	4
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
BATTERY-CHARGING ALTERNATOR AND BELT REPAIR PARTS LIST**

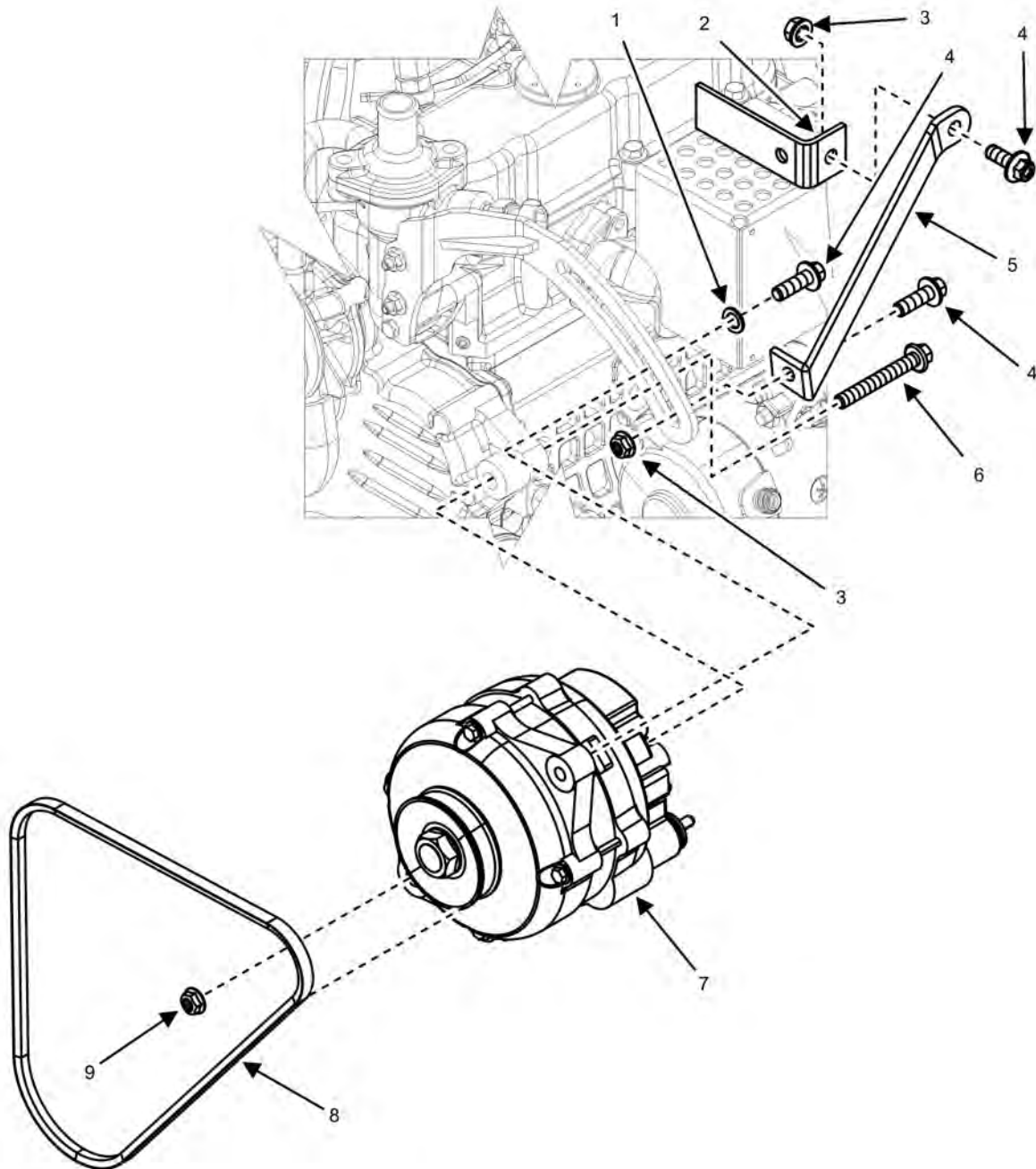


Figure 34. Battery-Charging Alternator and Belt.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090209	
								FIG. 34 BATTERY- CHARGING ALTERNATOR AND BELT	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN126-M8	.WASHER, FLAT (M8)	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21684	BRACE, REAR	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8	.NUT, HEX FLANGE (M8X1.25)	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B025WB4K42	.SCREW, HEX FLANGE (M8X1.25X25)	3
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21683	.BRACKET, ALTERNATOR	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B060CH1K42	.SCREW, CAP HEX FLANGE (M8X1.25X60)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2920015890612	47KE9	A002TA9071	.ALTERNATOR, BATTERY- CHARGING	1
8	PCFZZ	PCFZZ	PCFZZ	PCFZZ	3030015880982	47WU2	XPZ887 9426-10887	.BELT, V	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN18M08B000BB1K42	.NUT, HEX FLANGE (M8X1 .25)	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
STARTER REPAIR PARTS LIST

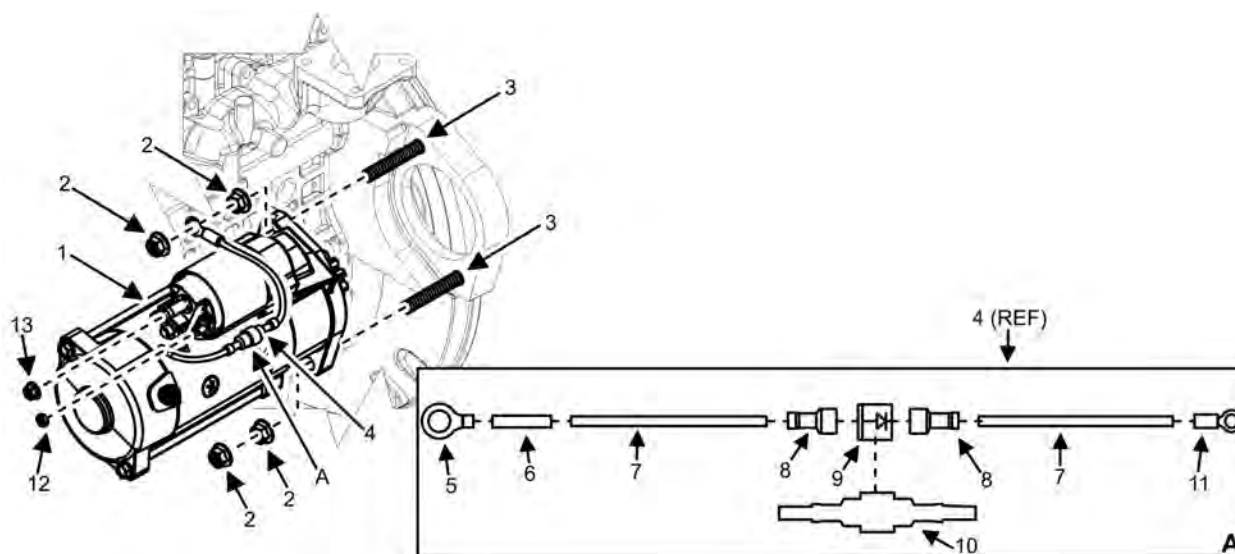


Figure 35. Starter.

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 090210	
								FIG. 35 STARTER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6110015958949	10360	11.131.457	.MOTOR, STARTER, 24 VOLT	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M10	.NUT, HEX FLANGE (M10 X 1.5)	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20771	.STUD (M10 X 1.5 X 60)	2
4	PAFFF	PAFFF	PAFFF	PAFFF	6150015860281	44940	04-21425	.LEAD, ELECTRICAL	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860272	00779	2-36160-1	..TERMINAL, LUG	1
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	..LAMINATE, LABEL COVER	1
7	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	..STRAND, WIRE	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860213	30554	88-20275-3	..TERMINAL, DISCONNECT	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5961015860276	3EUR0	GH60-04G-B- LF	..SEMICONDUCTOR DEVICE	1
10	MFFZZ	MFFZZ	MFFZZ	MFFZZ		30554	88-20541-15	..SLEEVING, INSULATING (MAKE FROM 88-20541-15 ON BULK ITEMS LIST CUT TO LENGTH 25MM BEYOND CRIMPED ENDS)	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015859905	00779	160140	..TERMINAL, LUG	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN943-M5	.NUT, HEX (M5 X 0.8)	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8	.NUT, HEX FLANGE (M8 X 1.25)	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
GOVERNOR ACTUATOR REPAIR PARTS LIST

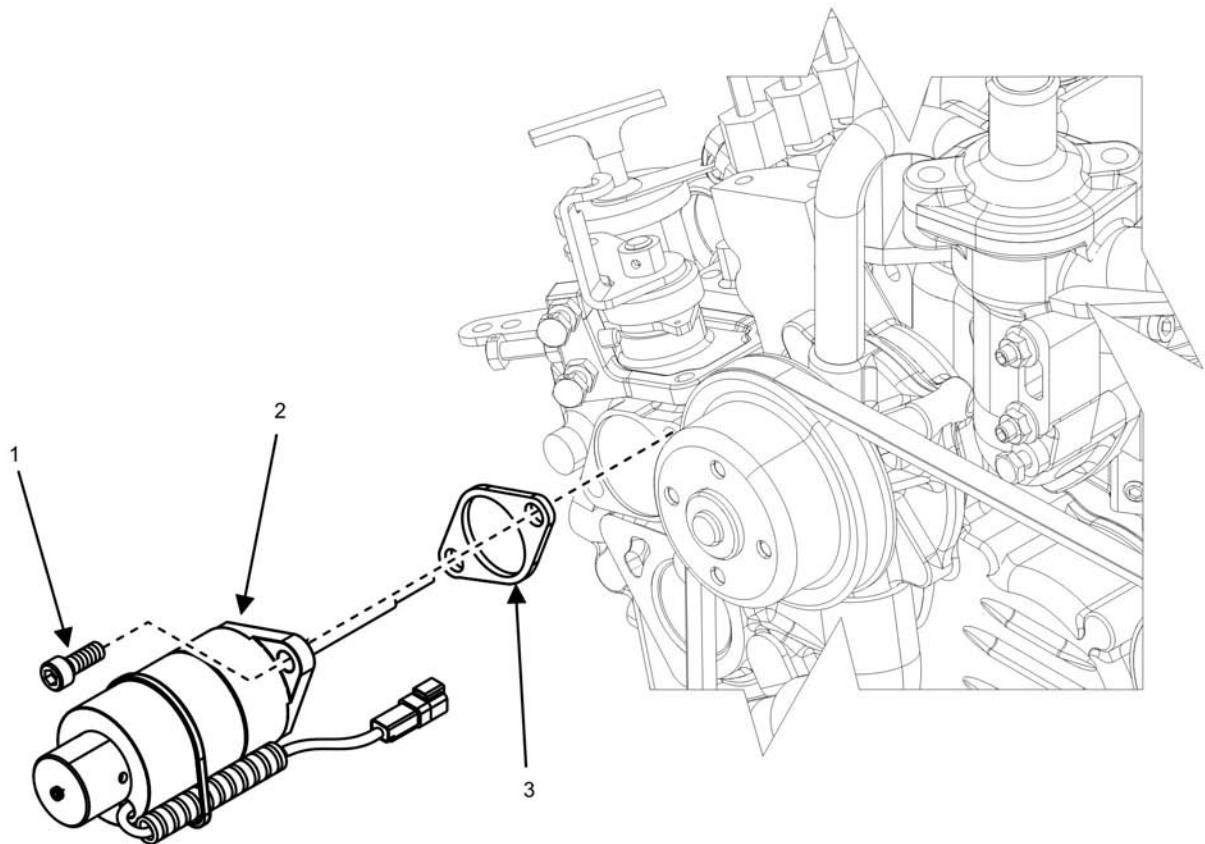


Figure 36. Governor Actuator.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090211									
FIG. 36 GOVERNOR ACTUATOR									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN912-M6X16	.SCREW, CAP SOCKET HEAD (M6X1X16)	2
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		5DR61	9269	.GOVERNOR ACTUATOR	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014371063	1Q0C4	16299-6015-0	.GASKET, ACTUATOR	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
INTAKE MANIFOLD REPAIR PARTS LIST

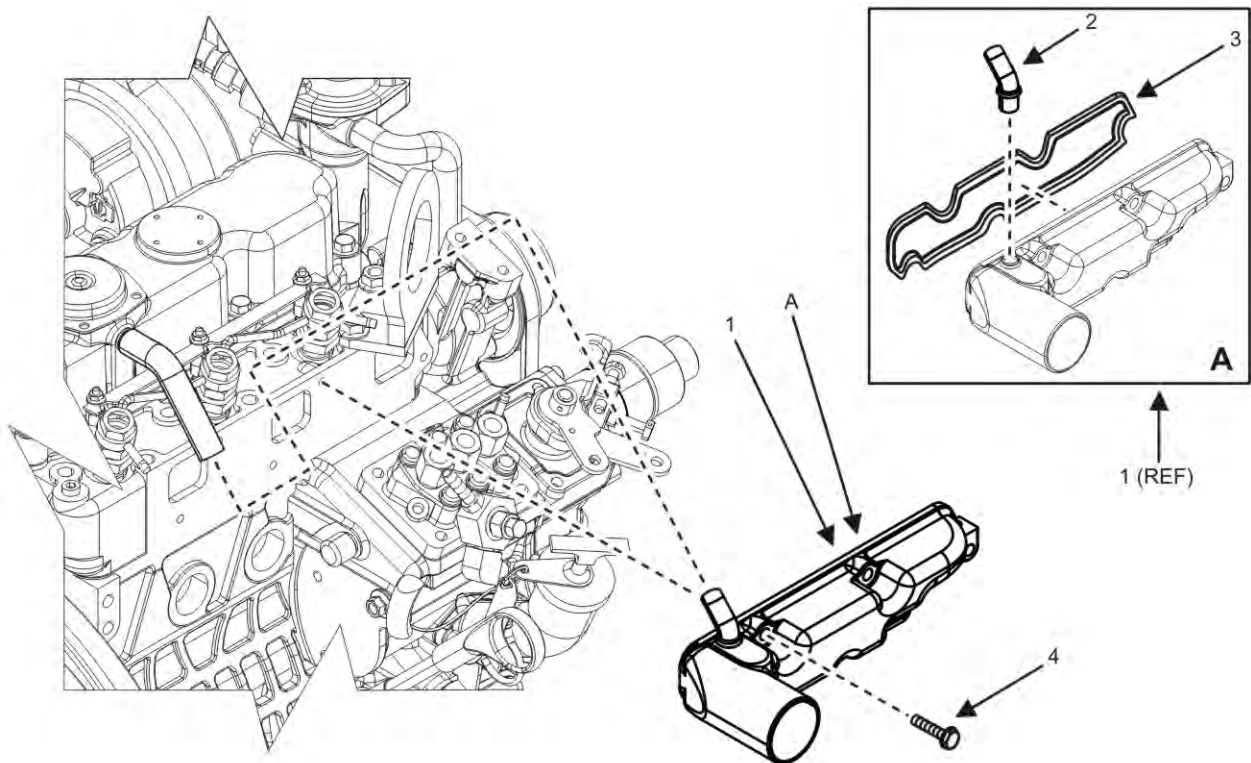


Figure 37. Intake Manifold.

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090212									
FIG. 37 INTAKE MANIFOLD									
1	XBFFF	XBFFF	XBFFF	XBFFF		0XWR1	1G960-1177-0	.ASSEMBLY, INTAKE MANIFOLD	1
2	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4710015869233	0XWR1	1G960-0555-0	..PIPE, BREATHER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015878670	0XWR1	1G962-1182-0	..GASKET, INTAKE MANIFOLD	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	0185-2391	.BOLT	5
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
EXHAUST MANIFOLD REPAIR PARTS LIST

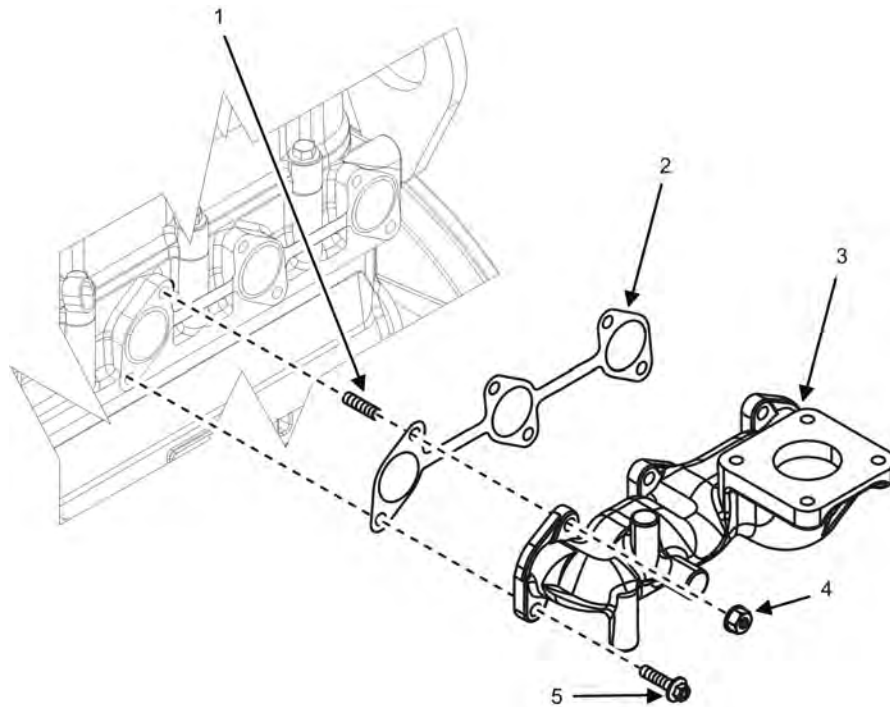


Figure 38. Exhaust Manifold.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090213	
								FIG. 38 EXHAUST MANIFOLD	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307014966035	S4532	01513-50618	.STUD	3
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015878541	0XWR1	1G962-1235-0	.GASKET, EXHAUST	
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015874306	0XWR1	1E121-1231-0	MANIFOLD, EXHAUST	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014785187	0XWR1	02756-50060	.NUT, UBS	3
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014966045	S4532	01759-50161	.BOLT, UBS	3
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
OIL PAN AND STRAINER REPAIR PARTS LIST

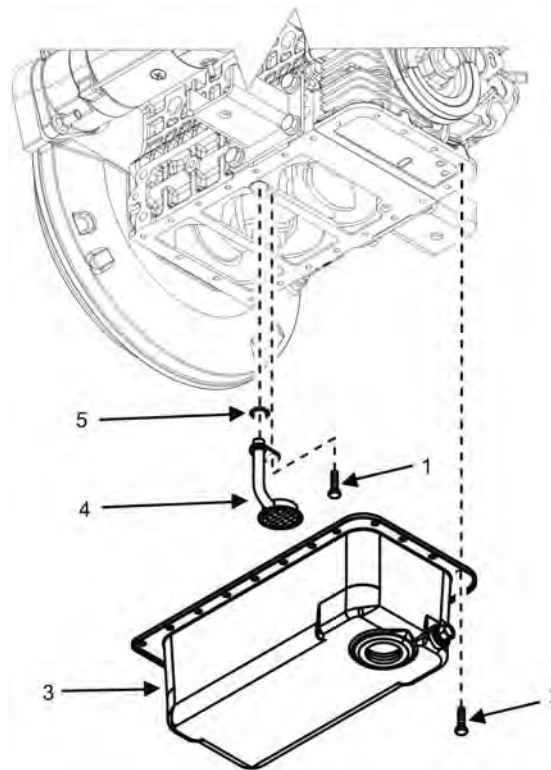


Figure 39. Oil Pan and Strainer.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090214									
FIG. 39 OIL PAN AND STRAINER									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015004262	OZWR1	01123-60814	.BOLT	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306013207024	S4532	01023-50614	.BOLT	22
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015875954	OZWR1	1G962-0150-2	.PAN, OIL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2940015876850	OZWR1	16851-3211-0	.STRAINER	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3430015065021	5X475	04814-00160	.O-RING	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
FLYWHEEL REPAIR PARTS LIST

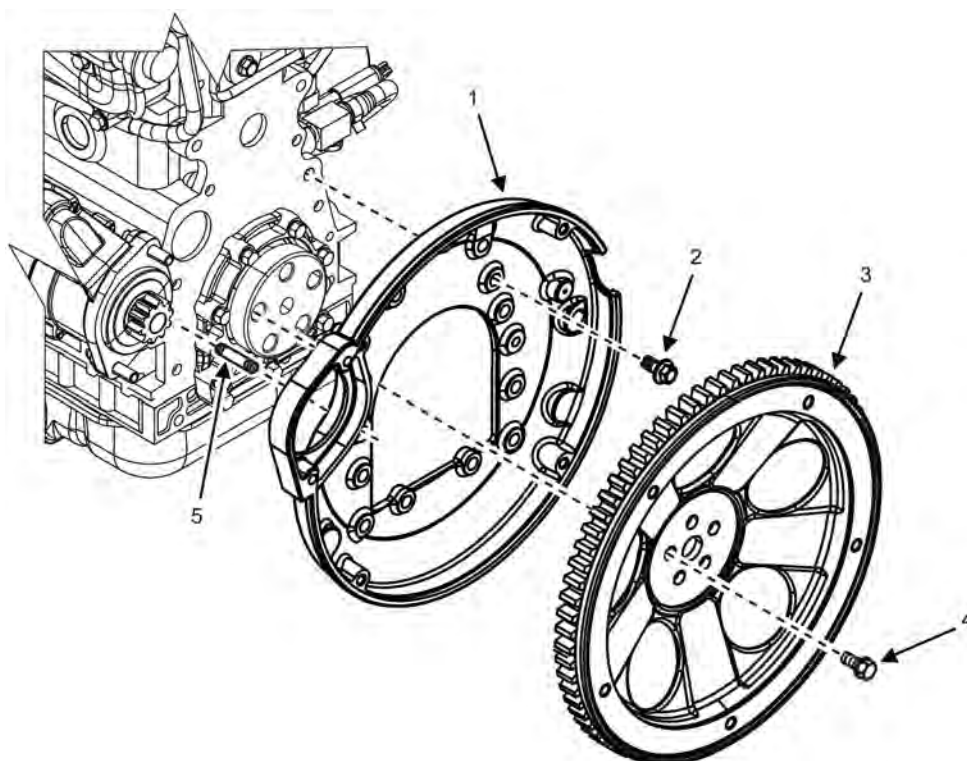


Figure 40. Flywheel.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC NAVY			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090215	
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20153	FIG. 40 FLYWHEEL .ADAPTER, ALTERNATOR, MACHINED	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B025WB4K42	.SCREW, HEX FLANGE HEAD (M8 X 1.25 X 25)	9
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015957312	44940	04-20141	.FLYWHEEL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M10B020WB4K41	.SCREW, HEX HEAD (M10 X 1.25 X 20)	5
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN1481-M3X40	.PIN, SPRING	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
CRANKCASE REAR BEARING CASE COVER REPAIR PARTS LIST

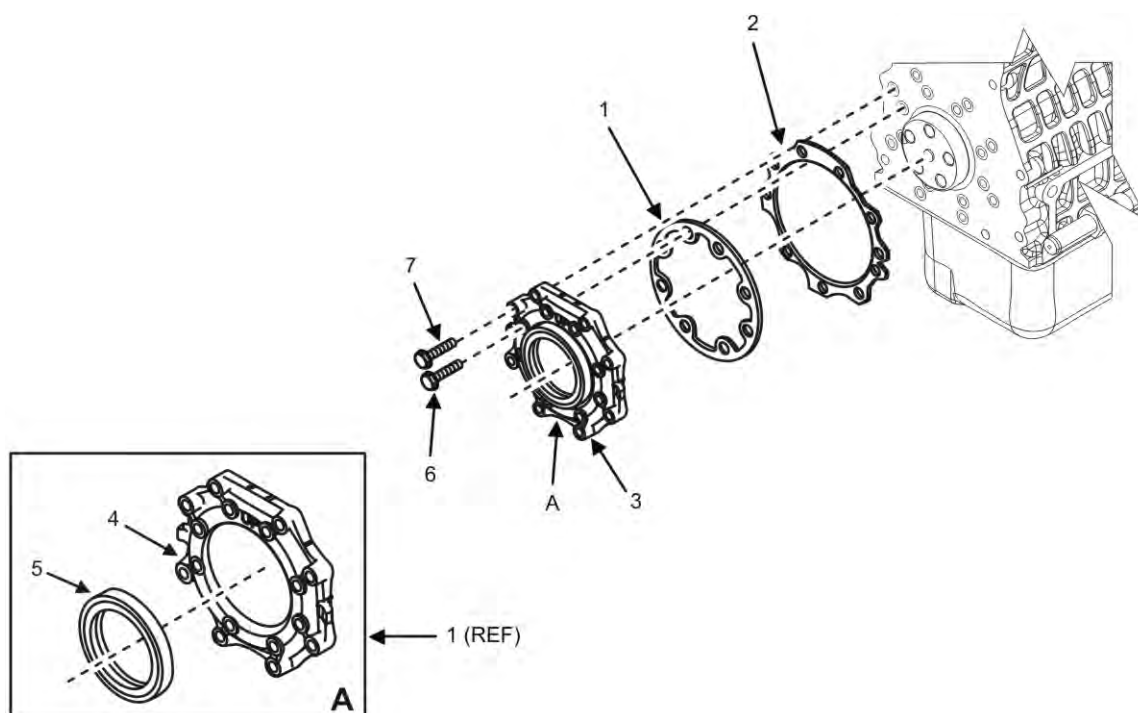


Figure 41. Crankcase Rear Bearing Case Cover.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090216									
FIG. 41 CRANKCASE REAR BEARING CASE COVER									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015869086	0XWR1	1G960-0436-0	.GASKET, BEARING CASE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015878678	0XWR1	15841-0482-3	.GASKET, CASE COVER	1
3	XBFHH	XBFHH	XBFZZ	XBFZZ		0XWR1	15841-0480-3	.COVER ASSEMBLY, BEARING CASE	1
4	XBFHH	XBFHH	XBFZZ	XBFZZ		0XWR1	15841-0481-5	..COVER, BEARING CASE	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014786004	0XWR1	19215-9916-0	..SEAL, OIL	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306013213375	S4532	01023-50620	.BOLT	8
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306013213372	S4532	01023-50622	.BOLT	8
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
CYLINDER HEAD ASSEMBLY REPAIR PARTS LIST**

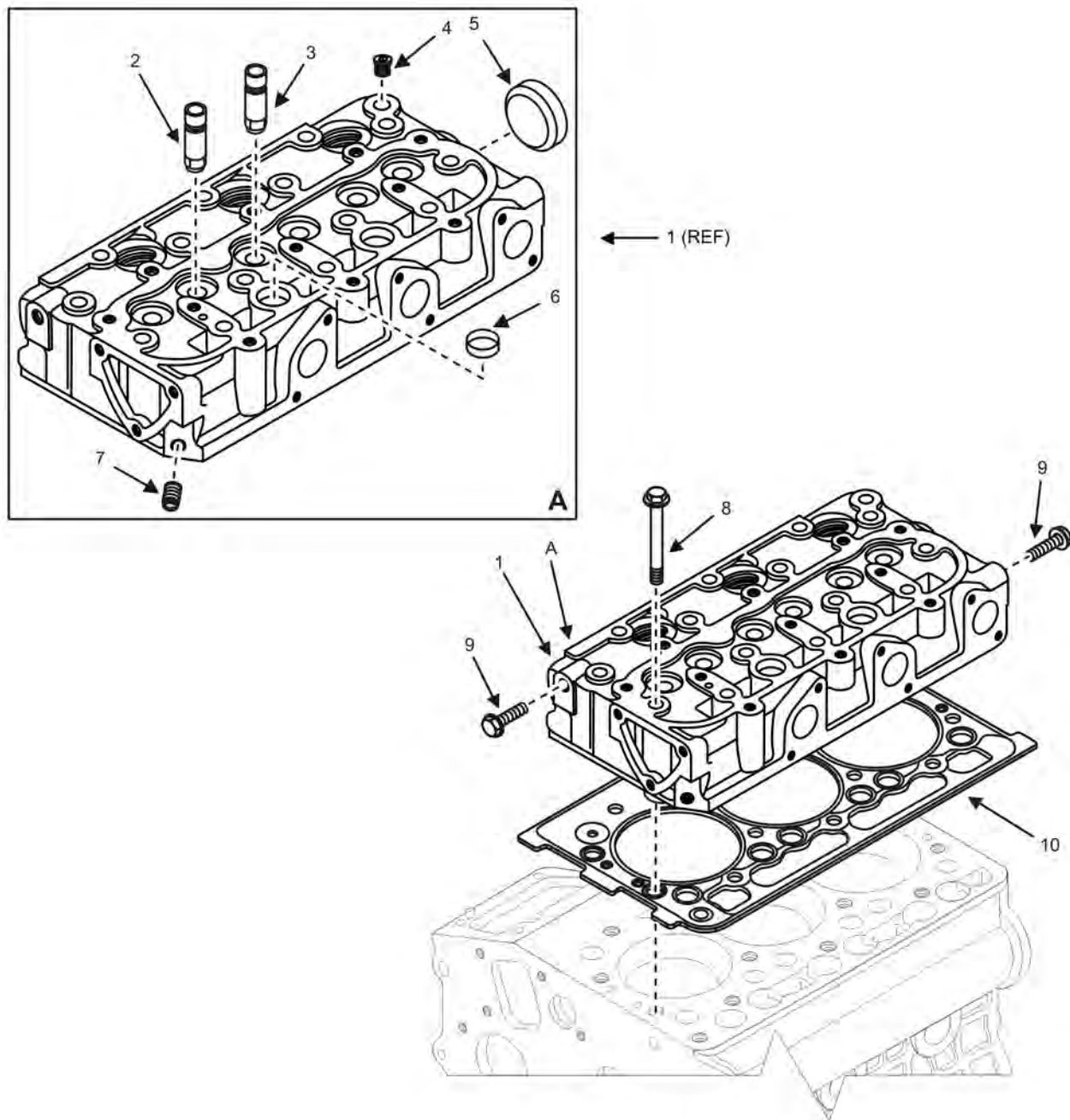


Figure 42. Cylinder Head Assembly.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090217									
FIG. 42 CYLINDER HEAD ASSEMBLY									
1	PAFHH	PAFHH	PAFFF	PAFFF	4310015908438	0XWR1	1G962-0304-5	.ASSEMBLY, CYLINDER HEAD	1
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	15841-1354-0	..GUIDE, INLET VALVE	3
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	15841-1356-0	..GUIDE, EXHAUST VALVE	3
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3431015068134	5X475	15841-9602-0	..PLUG	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3431015068102	5X475	15321-9626-0	..CAP, SEALING	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015333731	1Q0C4	15261-0337-0	..CAP, SEALING	2
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5365015064655	5X475	15261-9601-0	..PLUG	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015368998	0XWR1	14601-0345-0	.BOLT, CYLINDER HEAD	14
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015004266	0XWR1	01123-60816	.BOLT	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015880723	0XWR1	1G962-0331-3	.GASKET, CYLINDER HEAD	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
VALVE COVER REPAIR PARTS LIST**

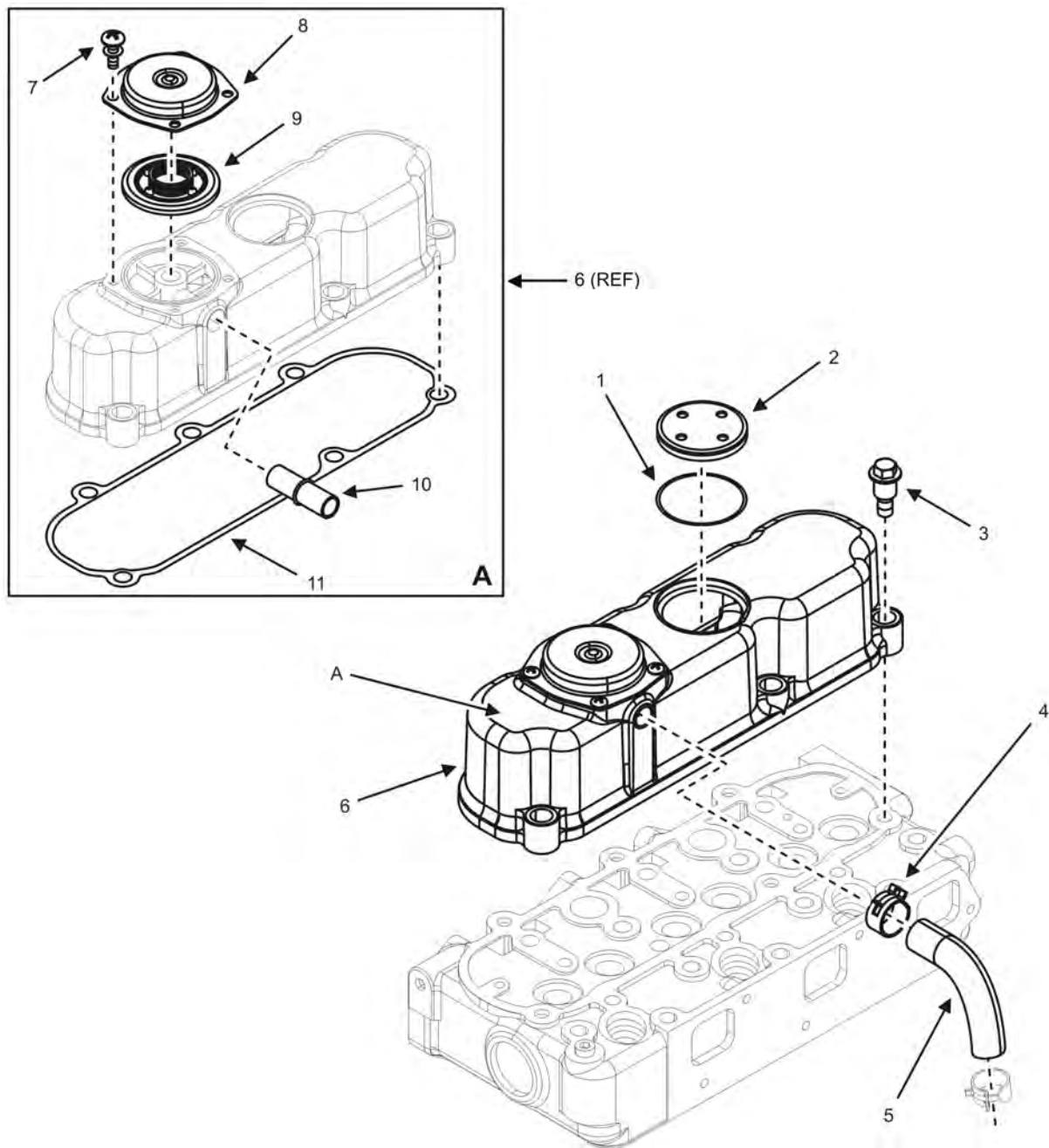


Figure 43. Valve Cover.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 09021701									
FIG. 43 VALVE COVER									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3431015068286	44940	04814-50300	.O-RING	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015426383	44940	E9151-33140	.PLUG, OIL FILLER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015905676	44940	1G911-9102-2	.BOLT	4
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	09318-88125	.CLAMP, HOSE	2
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	1G960-0551-2	.TUBE,BREATHER	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015895756	44940	1G960-1450-5	.ASSEMBLY, VALVE COVER	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014790358	44940	03024-50510	..SCREW WITH WASHER	4
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015426396	44940	1G801-05120	..COVER, BREATHER	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015426394	5X475	1G911-05203	.. VALVE, BREATHER	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015074421	5X475	16241-7337-0	..PIPE, WATER RETURN	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015880728	0XWR1	1G962-1452-2	..GASKET, VALVE COVER	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
ENGINE VALVES REPAIR PARTS LIST**

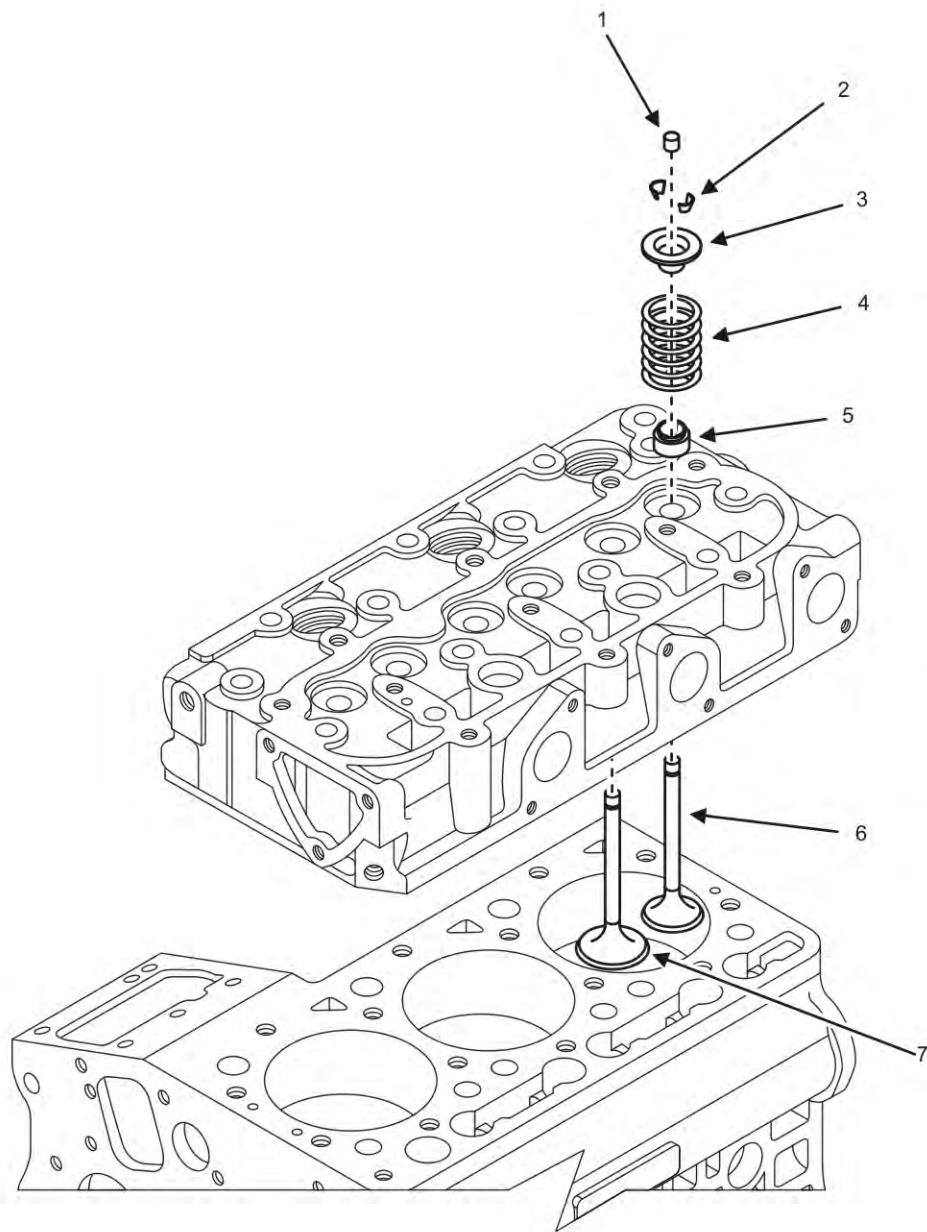


Figure 44. Engine Valves.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 09021702	
								FIG. 44 ENGINE VALVES	
1	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015006972	0XWR1	16851-13280	.CAP, VALVE	6
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815996104361	S8029	14601-1336-0	.COLLET, VALVE SPRING	6
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340992354309	S8029	14601-1333-0	.RETAINER, SPRING	6
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5360999115629	S8029	14601-1324-0	.SPRING, VALVE	6
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5330014786002	0XWR1	11420-13150	.SEAL, VALVE STEM	6
6	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	1G687-1312-0	.VALVE, EXHAUST	3
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	1G687-1311-0	.VALVE, INLET	3
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
ROCKER ARMS AND PUSH RODS REPAIR PARTS LIST**

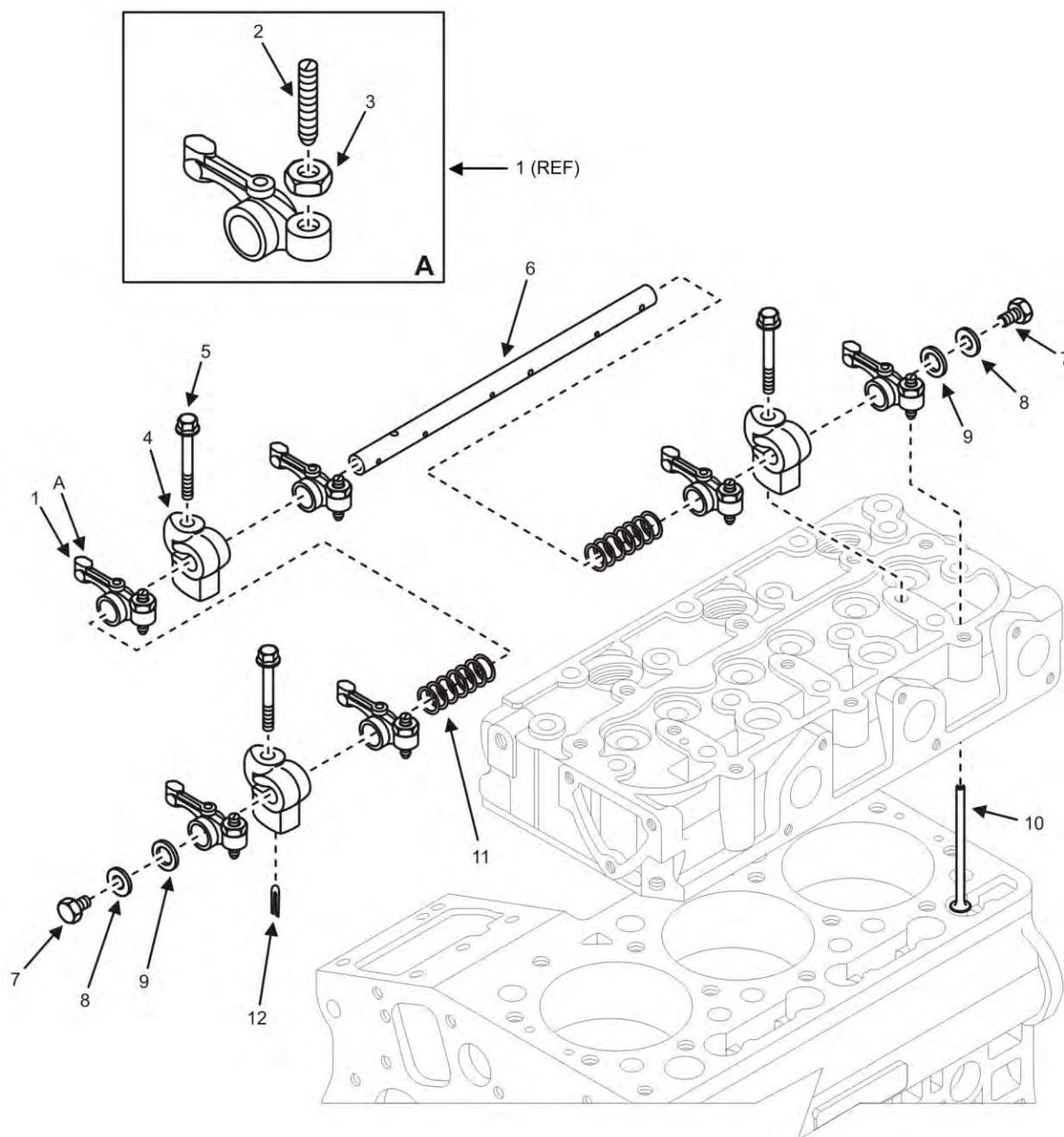


Figure 45. Rocker Arms and Push Rods.

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 09021731									
FIG. 45 ROCKER ARMS AND PUSHRODS									
1	PAFFF	PAFFF	PAFFF	PAFFF	2815014787538	0XWR1	15841-1403-0	.ASSEMBLY, ROCKER ARM	6
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015371683	0XWR1	15841-1423-0	..SCREW, ADJUSTING	6
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0XWR1	14601-1424-0	..NUT	6
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0XWR1	1G460-1435-0	.BRACKET, ROCKER ARM	3
5	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5306221271431	0XWR1	01754-50640	.BOLT, FLANGE	3
6	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2895015876016	0XWR1	1G962-1426-2	.SHAFT, ROCKER ARM	1
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5306013934861	31013	01023-50610	.BOLT	2
8	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	15842-9402-2	.WASHER, PLAIN	2
9	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5365015003268	0XWR1	16871-1443-0	.WASHER	2
10	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815014787489	0XWR1	16851-1511-0	.PUSH ROD	6
11	PHHZZ	PHHZZ	PHHZZ	PHHZZ	5340015880263	0XWR1	1G460-1431-2	.SPRING, ROCKER ARM	2
12	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015000653	0XWR1	05411-00420	.PIN, SPRING	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
SHORT BLOCK ASSEMBLY REPAIR PARTS LIST

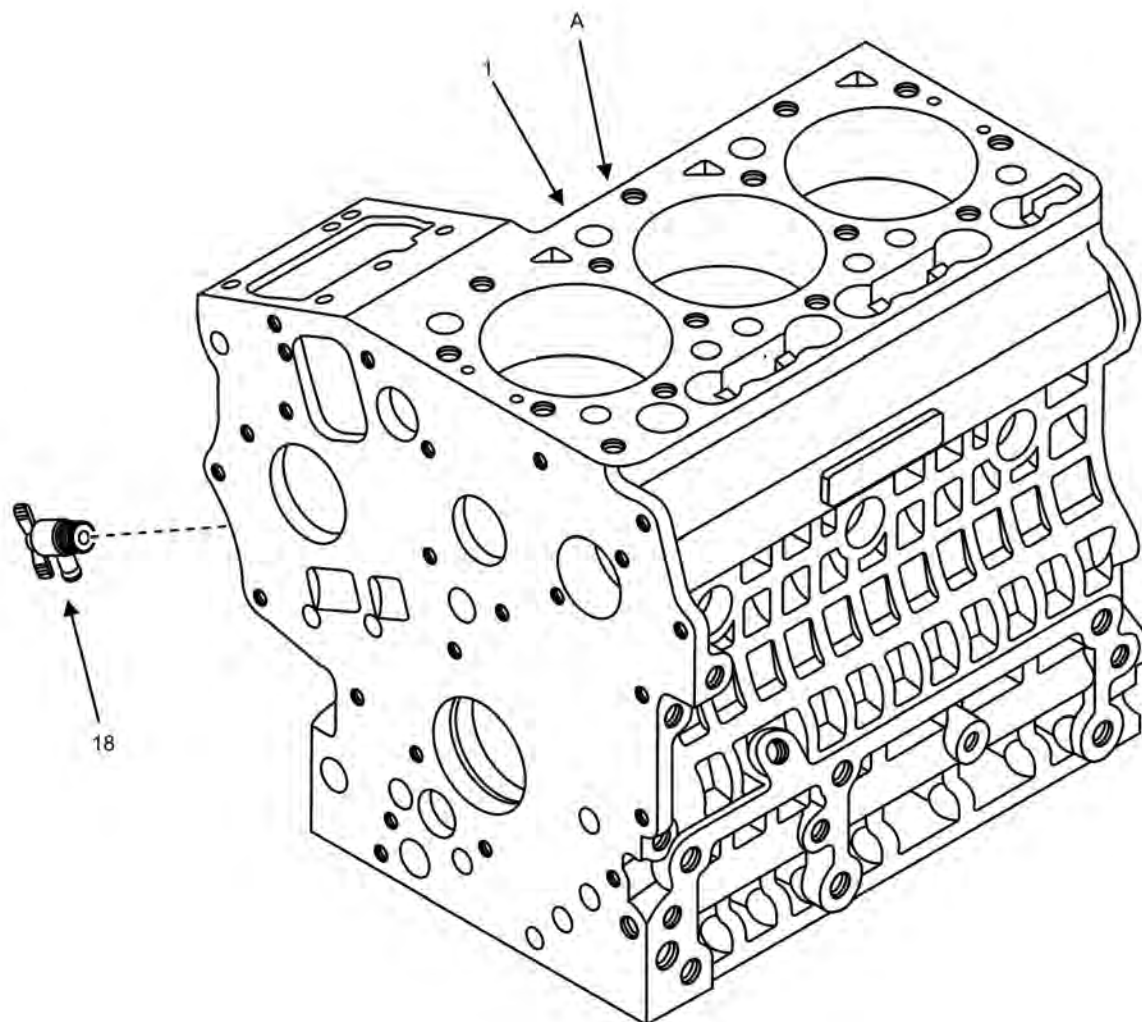


Figure 46. Short Block Assembly (Sheet 1 of 2).

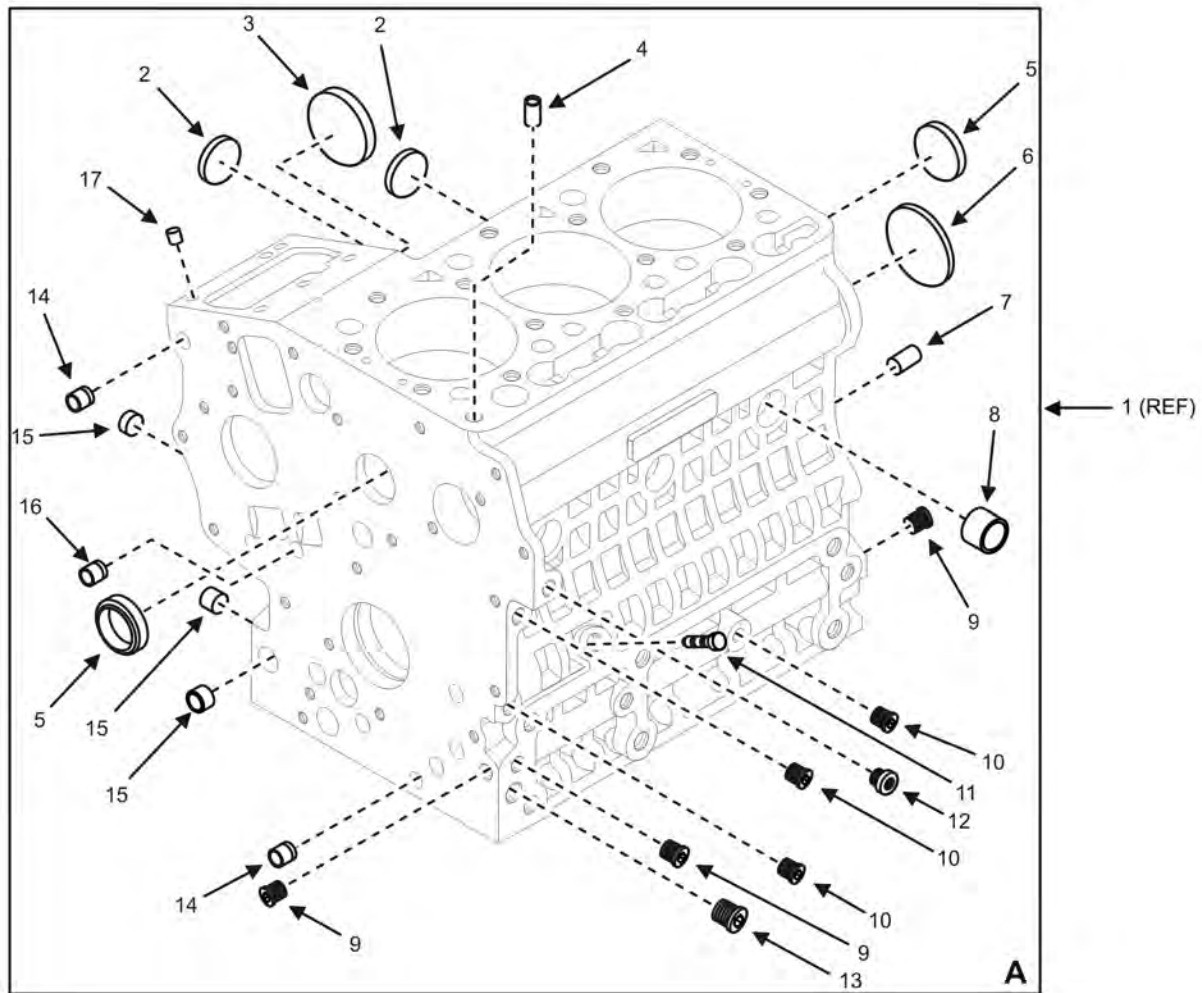


Figure 46. Short Block Assembly (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090218	
								FIG. 46 SHORT BLOCK ASSEMBLY	
1	PAHHH	PAHHH	PAFFF	PAFFF	2815015879098	0XWR1	1G952-0101-9	..SHORT BLOCK ASSEMBLY	1
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	06311-85025	..CAP, SEALING	2
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015371201	0XWR1	16851-1621-2	..COVER, FUEL CAMSHAFT	1
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015141178	44940	0185-2094	..PIN, PIPE	1
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3431015064642	5X475	15451-9627-0	..CAP, SEALING	2
6	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5365015369631	0XWR1	15261-9616-0	..PLUG, EXPANSION	1
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015369062	0XWR1	05012-00814	..PIN, STRAIGHT	2
8	PAHZZ	PAHZZ	PAFZZ	PAFZZ	4320015372098	0XWR1	16851-9627-0	..CAP, SEALING	3
9	PAHZZ	PAHZZ	PAFZZ	PAFZZ	4730015334181	1Q0C4	15521-9602-0	..PLUG	3
10	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5365015064655	5X475	15261-9601-0	..PLUG	5
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0XWR1	1G513-3655-0	..PLUG, OIL GAUGE	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015372064	0XWR1	34150-2758-0	..PLUG	1
13	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5365015369631	0XWR1	15521-9603-0	..PLUG	1
14	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015063293	5X475	15321-3396-0	..PIN, PIPE	2
15	PAHZZ	PAHZZ	PAFZZ	PAFZZ	4320015372149	0XWR1	16851-9626-0	..CAP, SEALING	3
16	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015371192	0XWR1	17331-5919-0	..PIN, PIPE	2
17	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015369063	0XWR1	05012-00508	..PIN, STRAIGHT	2
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820014790226	0XWR1	15841-7302-0	..ASSEMBLY COCK, DRAIN	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
CONNECTING RODS AND PISTONS REPAIR PARTS LIST**

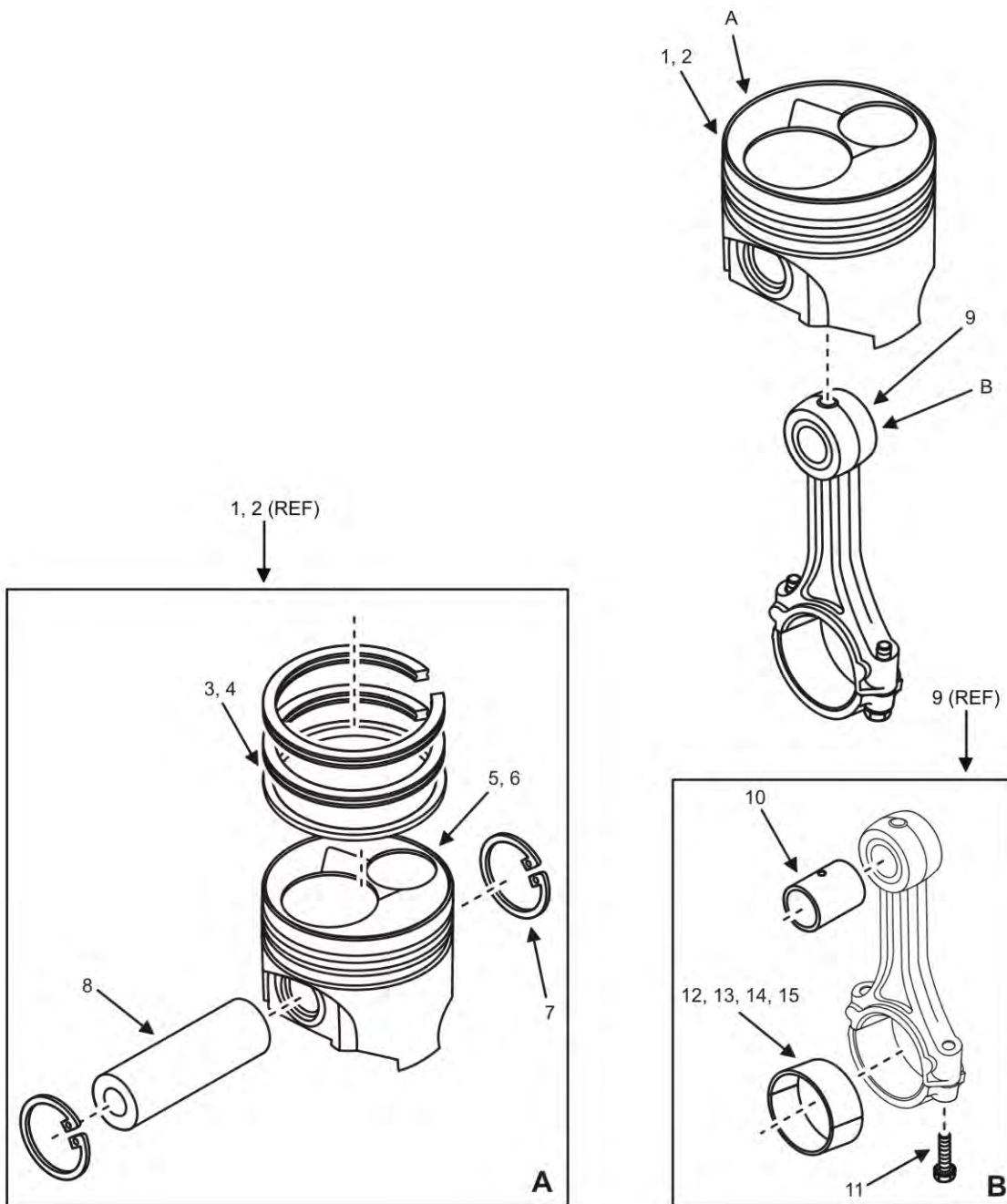


Figure 47. Connecting Rods and Pistons.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021801	
								FIG. 47 CONNECTING RODS AND PISTONS	
1	KFFFF	KFFFF	KFFFF	KFFFF		0XWR1	1G687-2177-0	..ASSEMBLY, PISTON (STD) (INCLUDES ITEMS 3,5,7, 8, AND 10)	3
2	KFFFF	KFFFF	KFFFF	KFFFF		0XWR1	1G687-2178-0	..ASSEMBLY, PISTON (+0.25MM) (INCLUDES ITEMS 4,6,7, 8, AND 10)	3
3	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015879127	0XWR1	1G960-2105-0	..ASSY, PISTON RING (STD)	3
4	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015879131	0XWR1	1G960-2109-0	..ASSY, PISTON RING (+0.25MM)	3
5	PAHZZ	PAHZZ	PAHZZ	PAHZZ		0XWR1	1G687-2111-3	..PISTON (STD)	3
6	PAHZZ	PAHZZ	PAHZZ	PAHZZ		0XWR1	1G687-2190-3	..PISTON (+0.25MM)	3
7	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5325013213445	0XWR1	15261-2133-0	..RING, RETAINING, PISTON PIN	6
8	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815014787493	0XWR1	16871-2131-0	..PIN, PISTON	3
9	PAHHH	PAHHH	PAHHH	PAHHH	2815015875949	0XWR1	16851-2201-5	..ASSEMBLY, CONNECTING ROD	3
10	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015953866	0XWR1	16851-2198-2	..BUSH, PISTON PIN	3
11	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5306014790361	0XWR1	1685122140	..BOLT, CONNECTING ROD	6
12	PAHZZ	PAHZZ	PAHZZ	PAHZZ	3120014786137	31013	16851-22320	..BEARING, SLEEVE M (STD)	3
13	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5340015878376	0XWR1	16851-2233-0	..BEARING, SLEEVE L (STD)	3
14	PAHZZ	PAHZZ	PAHZZ	PAHZZ	3120014786135	31013	15861-22970	..BEARING, SLEEVE (-0.20MM)	3
15	PAHZZ	PAHZZ	PAHZZ	PAHZZ	3120014786132	31013	15861-22980	..BEARING, SLEEVE (-0.40MM)	3
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
CRANKSHAFT REPAIR PARTS LIST

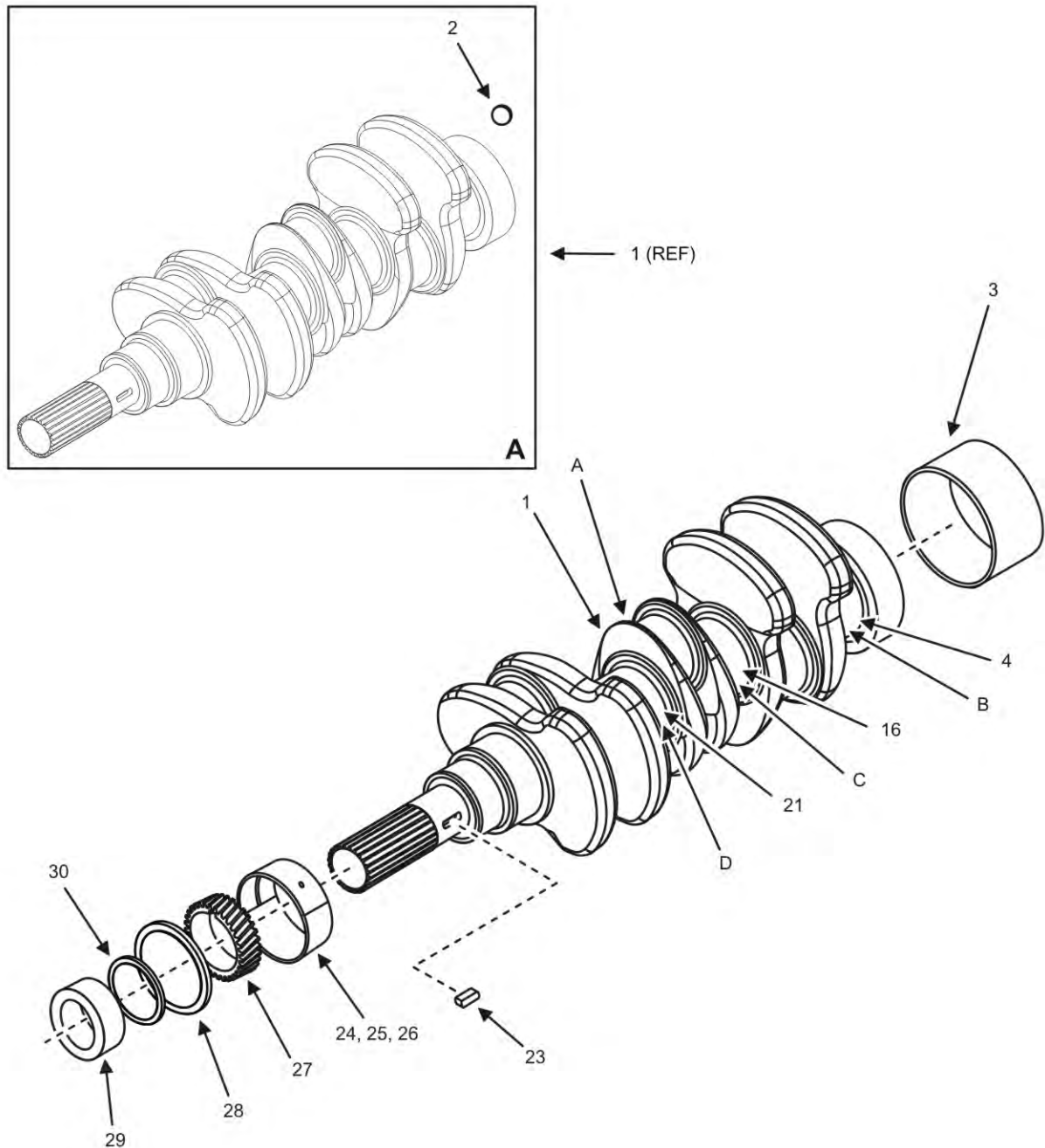


Figure 48. Crankshaft (Sheet 1 of 2).

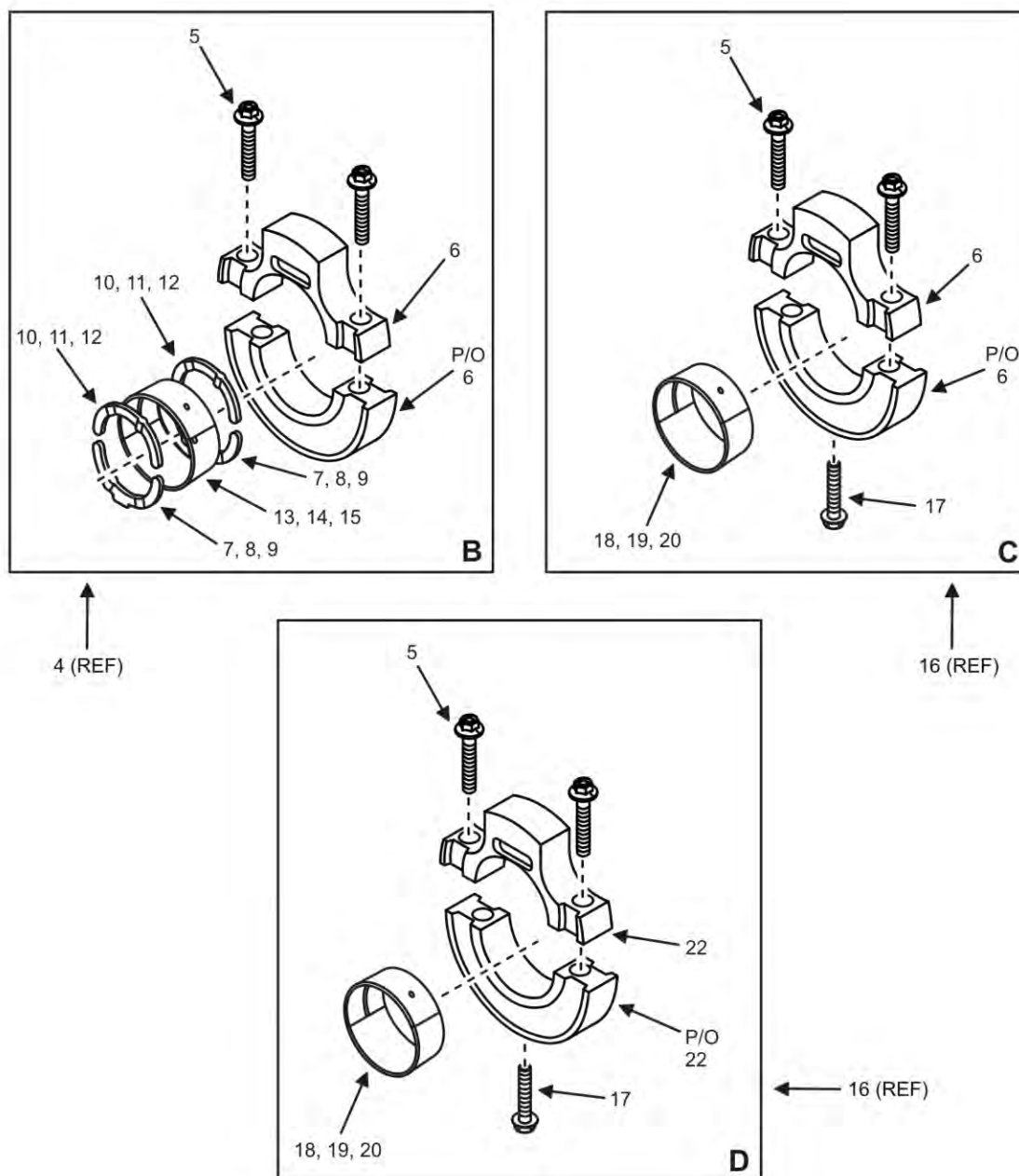


Figure 48. Crankshaft (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021802	
								FIG. 48 CRANKSHAFT	
1	PAHHH	PAHHH	PAHHH	PAHHH	4310015908447	0XWR1	1G962-2301-2	..COMP. CRANKSHAFT	1
2	XBHZZ	XBHZZ	XBFX	XBFX		0XWR1	07715-03207	..BALL (INCL IN COMP. CRANKSHAFT P/N 1G962-2301- 2)	3
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015876917	0XWR1	19215-2328-0	..SLEEVE, CRANKSHAFT	1
4	PAHHH	PAHHH	PAFFF	PAFFF	5340015880262	0XWR1	1G460-0709-0	..ASSY BRG. CASE, (FLYWHEEL)	1
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5306015880255	0XWR1	1G460-0454-0	..BOLT, BEARING CASE	6
6	XBHZZ	XBHZZ	XBFZZ	XBFZZ		0XWR1	1G460-0409-0	..ASSY CASE, MAIN BRG. (FLYWHEEL)	1
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340015878720	0XWR1	15261-2354-3	..BEARING, THRUST (STD)	2
8	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340015878744	0XWR1	15261-2397-3	..BEARING, THRUST (+0.20MM)	2
9	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340014786107	0XWR1	15261-2398-3	..BEARING, THRUST (+0.40MM)	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3120014786117	0XWR1	15261-23530	..BEARING, THRUST(STD)	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3120014786114	0XWR1	15261-2395-0	..BEARING, THRUST (+0.20MM)	2
12	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3120014786113	0XWR1	15261-23960	..BEARING, THRUST (+0.40MM)	2
13	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3110015876857	31013	1G460-2382-0	..BEARING, SLEEVE (STD SET)	1
14	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3110015876944	44940	1G460-2393-0	..BEARING, SLEEVE (-0.20MM SET)	1
15	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3110015876935	0XWR1	1G460-2395-0	..BEARING, SLEEVE (-0.40MM SET)	1
16	PAHHH	PAHHH	PAFFF	PAFFF	2990015879135	0XWR1	1G962-0705-0	..ASSY BRG. CASE, MAIN (MIDDLE	1
17	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5306014790360	0XWR1	15841-04562	..BOLT, BEARING CASE	2
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3110015876968	0XWR1	1G460-2383-0	..BEARING, SLEEVE (STD SET)	2
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3110015876924	0XWR1	1G460-2394-0	..BEARING, SLEEVE (-0.20MM SET)	2
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3110015876956	0XWR1	1G460-2396-0	..BEARING, SLEEVE (-0.40MM SET)	2
21	PAHHH	PAHHH	PAFFF	PAFFF	5340015880260	0XWR1	1G460-0704-0	..ASSY BRG. CASE, MAIN (FRONT)	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
22	XBHZZ	XBHZZ	XBFZZ	XBFZZ		0XWR1	1G460-0404-0	..ASSY CASE, MAIN BRG. (FRONT)	1
23	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315013212001	0XWR1	05712-00515	..KEY, SHAFT	1
24	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015875843	0XWR1	1G460-2347-0	..BEARING, SLEEVE (STD)	1
25	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2895015875845	0XWR1	1G460-2391-0	..BEARING, SLEEVE (-0.20MM)	1
26	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2895015875851	0XWR1	1G460-2392-0	..BEARING, SLEEVE (-0.40MM)	1
27	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3020014790690	0XWR1	15841-2411-0	..GEAR, CRANK	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815014790929	0XWR1	15881-2331-0	..SLINGER, OIL	1
29	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3110014786106	31013	15841-23250	..COLLAR, CRANKSHAFT	1
30	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5331015894780	0XWR1	04814-16220	..O-RING	1
31	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	1G962-2375-2	..SET, BEARING, ENGINE COMPLETE (STD) (NOT SHOWN) (INCLUDES ITEMS 7, 10, 13, 18, 24 PLUS ITEMS 12 AND 13 FROM FIGURE 47)	1
32	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	1G962-2376-2	..SET, BEARING, ENGINE COMPLETE (- 0.20MM/+0.20MM) (NOT SHOWN) (INCLUDES ITEMS 8, 11, 14, 19, 25 PLUS ITEM 14 FROM FIGURE 47)	1
33	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	1G962-2377-2	..SET, BEARING, ENGINE COMPLETE (- 0.40MM/+0.40MM) (NOT SHOWN) (INCLUDES ITEMS 9, 12, 15, 20, 26 PLUS ITEM 15 FROM FIGURE 47)	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
GEAR CASE COVER REPAIR PARTS LIST**

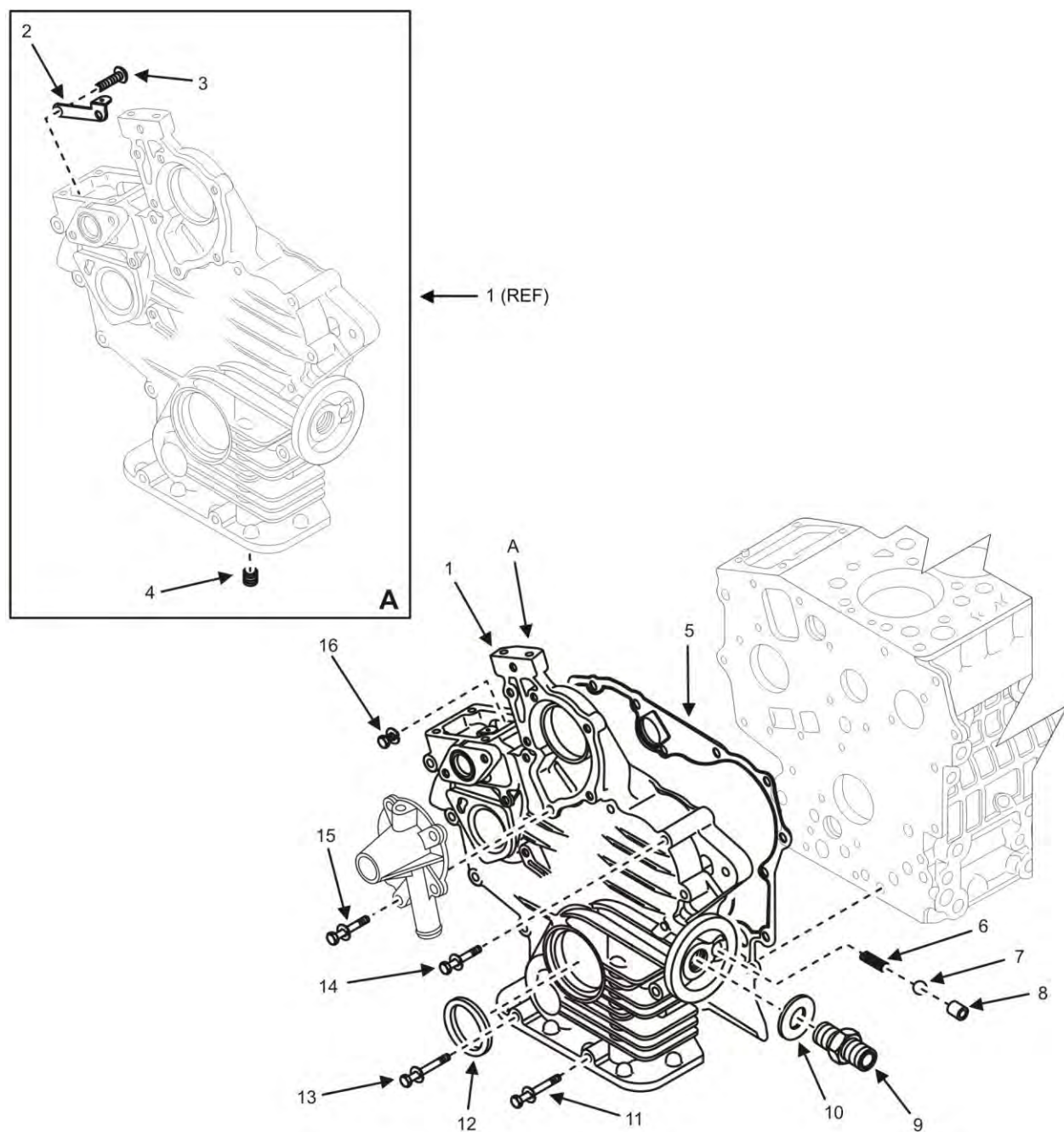


Figure 49. Gear Case Cover.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 09021803	
								FIG. 49 GEAR CASE COVER	
1	XBFHH	XBFHH	XBFHH	XBFHH		44940	16825-0402-4	.COMP. CASE GEAR	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015895760	44940	1G820-5628-2	..STAY, START	
								SPRING	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015008690	44940	16861-93310	..SCREW	1
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5365015369631	44940	15521-9603-0	..PLUG	2
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015895764	44940	1G820-0413-0	.GASKET, GEAR CASE	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340982059079	44940	16851-3695-0	.SPRING	1
7	PAFZZ	PAFZZ	PAFFF	PAFFF	4820014781226	48200	07715-03211	.BALL	1
8	PAFZZ	PAFZZ	PAFFF	PAFFF	2815014787478	44940	15841-3693-0	.SEAT, VALVE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	15241-3229-0	.JOINT, PIPE	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015370005	44940	15481-9401-0	.WASHER, PLAIN	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015008701	44940	01023-50690	.BOLT	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014784887	44940	15877-04140	.SEAL, OIL	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014358407	44940	01023-50680	.BOLT	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015008701	44940	01023-60650	.BOLT	9
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014790355	44940	15841-91010	.BOLT	2
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015070141	44940	01023-50618	.BOLT	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
HARMONIC BALANCER REPAIR PARTS LIST

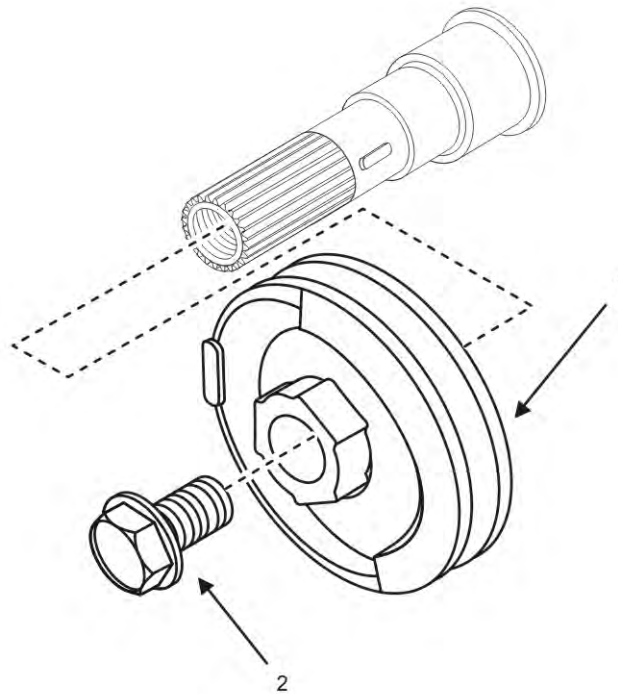


Figure 50. Harmonic Balancer.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021804	
								FIG. 50 HARMONIC BALANCER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3020015899931	0XWR1	1G962-7428-0	.PULLEY, FAN DRIVE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014790367	0XWR1	15881-91030	.BOLT	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
CAMSHAFT AND GEAR REPAIR PARTS LIST

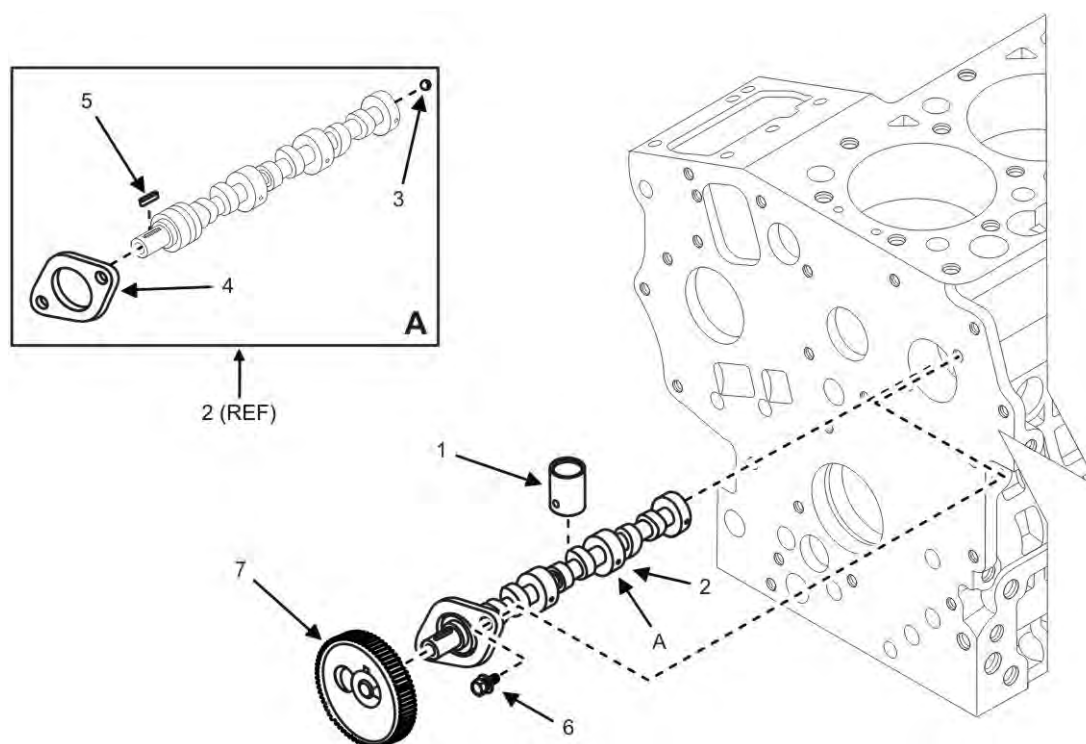


Figure 51. Camshaft and Gear.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 09021805									
FIG. 51 CAMSHAFT AND GEAR									
1	PAHZZ	PAHZZ	PAFZZ	PAFZZ	4810015869239	0XWR1	16851-1555-2	.TAPPET	6
2	PAHHH	PAHHH	PAFFF	PAFFF	2895015876053	0XWR1	1G962-1601-5	.ASSEMBLY, CAMSHAFT	1
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015360903	1Q0C4	07715-00401	.BALL	1
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340015369608	0XWR1	15841-1627-0	.STOP, MECHANICAL	1
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315013210400	0XWR1	05712-00518	.KEY, MACHINE	1
6	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5306013213371	S4532	01023-50612	.BOLT	2
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3020015372137	0XWR1	16864-1651-0	.GEAR, CAMSHAFT	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
IDLER GEAR REPAIR PARTS LIST

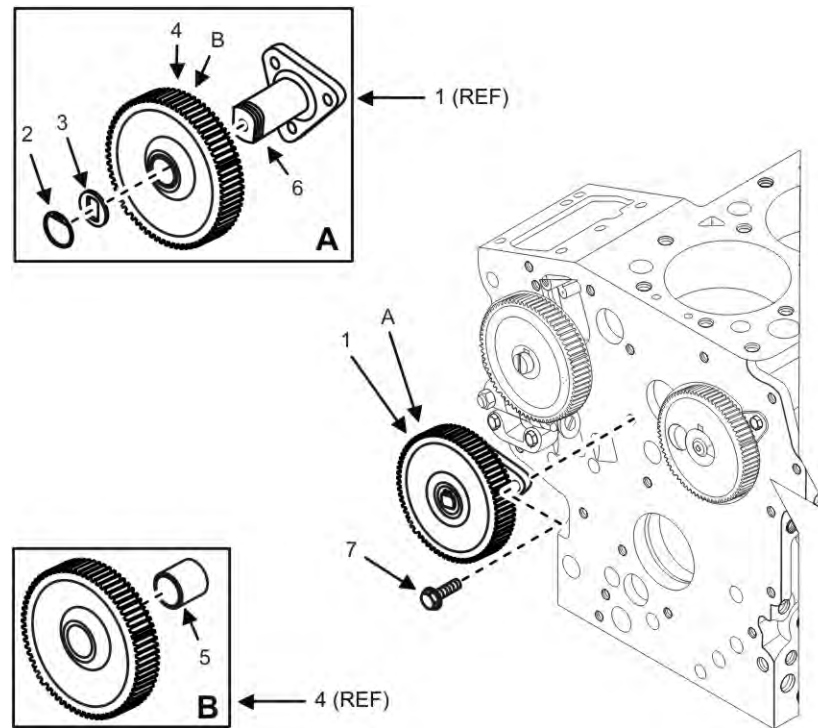


Figure 52. Idler Gear.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM	ARMY	SMR CODE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
NO.		AIR							
		FORCE							
GROUP 09021806									
FIG. 52 IDLER GEAR									
1	PAHHH	PAHHH	PAFFF	PAFFF	3020015371182	0XWR1	15875-9934-0	..ASSEMBLY, IDLER GEAR	1
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5325014786921	0XWR1	15875-24320	..RING, SNAP	1
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3040015371181	0XWR1	15785-2437-0	..COLLAR, IDLER GEAR	1
4	PAHHH	PAHHH	PAFFF	PAFFF	3020014867673	0XWR1	15875-24013	..GEAR, IDLER	1
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3120015371179	0XWR1	15875-2428-2	..BUSHING	1
6	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3040015371790	0XWR1	15875-2425-0	..SHAFT, IDLER GEAR	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306013207024	S4532	01023-50614	..BOLT	3
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
FUEL CAMSHAFT AND FORK ASSEMBLY REPAIR PARTS LIST

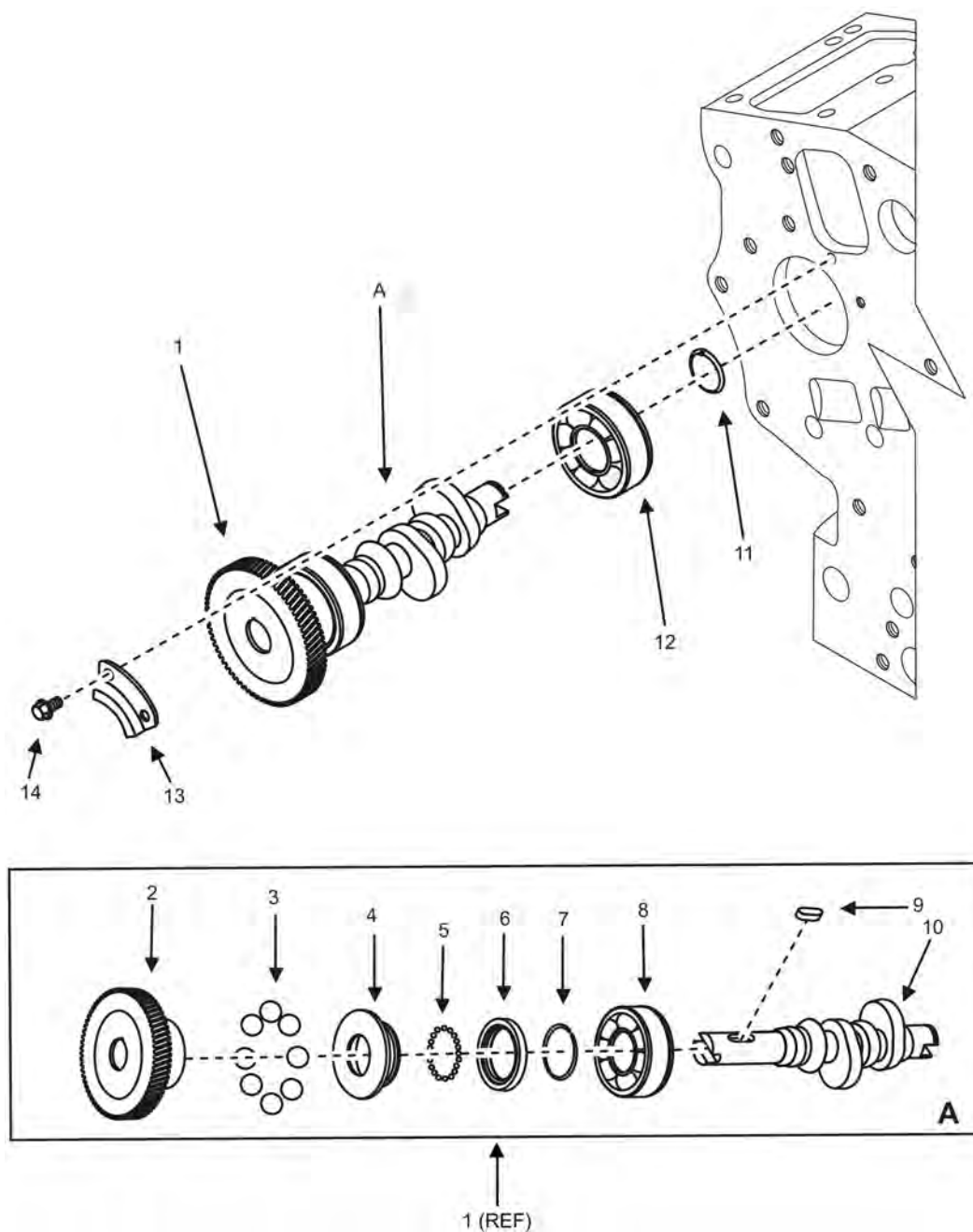


Figure 53. Fuel Camshaft and Fork Assembly (Sheet 1 of 2).

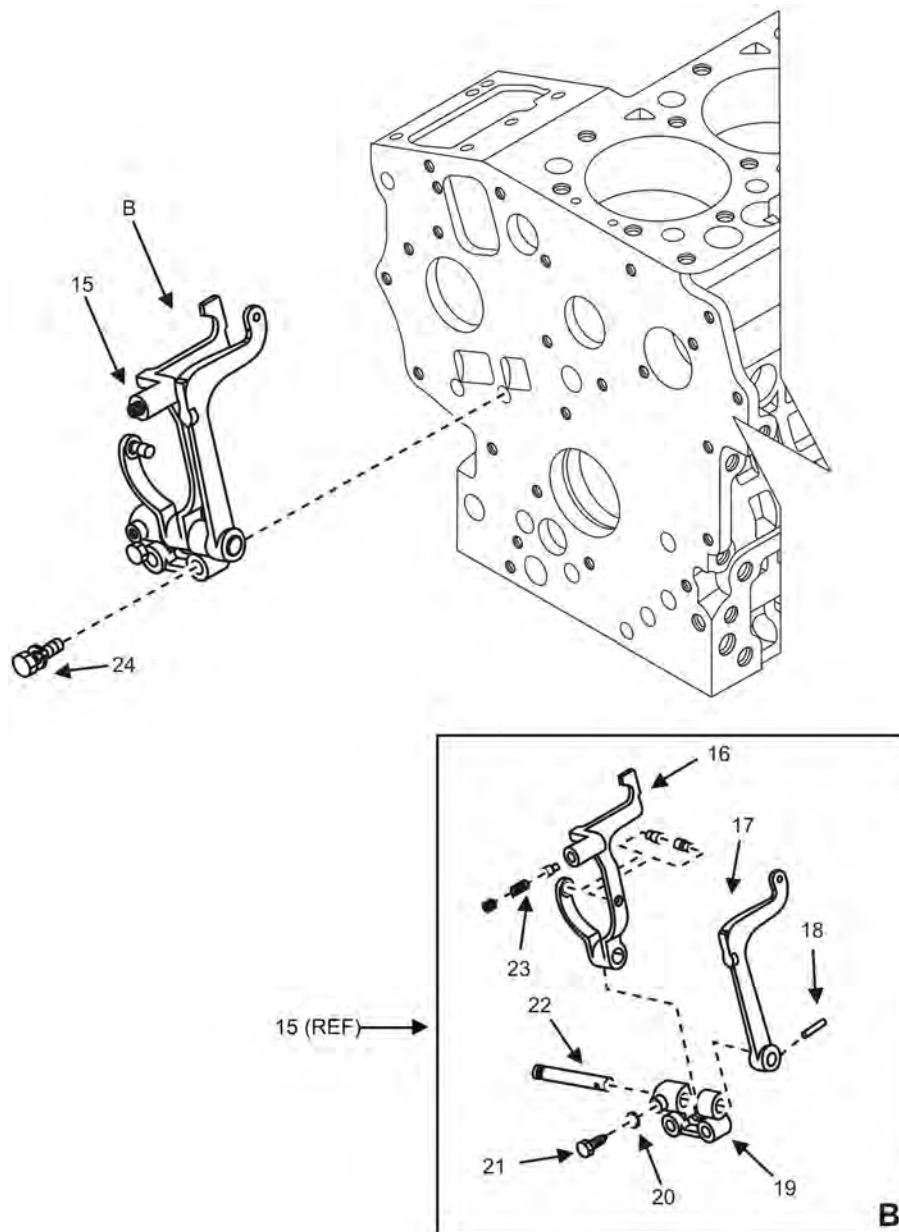


Figure 53. Fuel Camshaft and Fork Assembly (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021807	
								FIG. 53 FUEL CAMSHAFT AND FORK ASSEMBLY	
1	PAHHH	PAHHH	PAFFF	PAFFF	2815015875938	0XWR1	16861-1602-4	.ASSEMBLY, CAMSHAFT FUEL	1
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3020015371183	0XWR1	16851-5115-0	..GEAR, INJECTION PUMP	1
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015875919	0XWR1	07715-03217	..BALL	8
4	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015875862	0XWR1	15841-5545-2	..SLEEVE, GOVERNOR	1
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3110015369064	0XWR1	07715-00801	..BALL	32
6	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3110015370879	0XWR1	15841-5569-0	..CASE, GOVERNOR BALL	1
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340145141736	0XWR1	15261-5547-0	..CIR-CLIP, GOVERNOR SLEEVE	1
8	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3110015368999	0XWR1	08153-06203	..BEARING, BALL	1
9	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5315013212001	0XWR1	05712-00515	..KEY	1
10	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2895015873807	0XWR1	15875-1617-3	..CAMSHAFT FUEL	1
11	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5325014863846	0XWR1	04612-00170	..CIR-CLIP	1
12	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3110015862415	0XWR1	16871-9730-0	..BEARING, BALL	1
13	XBHZZ	XBHZZ	XBHZZ	XBHZZ		0XWR1	15841-1632-0	STOPPER, FUEL CAMSHAFT	1
14	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5306013213371	S4532	01023-50612	..BOLT, MACHINE	2
15	PAFFF	PAFFF	PAFFF	PAFFF	5340015906569	0XWR1	1E152-5605-0	..ASSEMBLY LEVER, FORK	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5360015869113	0XWR1	16000-5423-0	..SPRING	1
17	PAFFF	PAFFF	PAFFF	PAFFF	5340015369610	0XWR1	15841-5606-0	..CLEVIS, ROD END	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015369609	0XWR1	15841-5613-0	...LEVER, FORK	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015369611	0XWR1	15841-5615-0	...SHAFT, FORK LEVER	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315014786939	31013	05411-00318	...PIN, SPRING	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015370876	0XWR1	15261-6641-0	..BOLT, MACHINE	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015369994	0XWR1	04512-60050	..WASHER, SPRING	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015371710	0XWR1	15841-5623-0	..HOLDER, FORK LEVER	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014790363	0XWR1	01023-50635	..BOLT, MACHINE	2
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
OIL PUMP AND GEAR REPAIR PARTS LIST

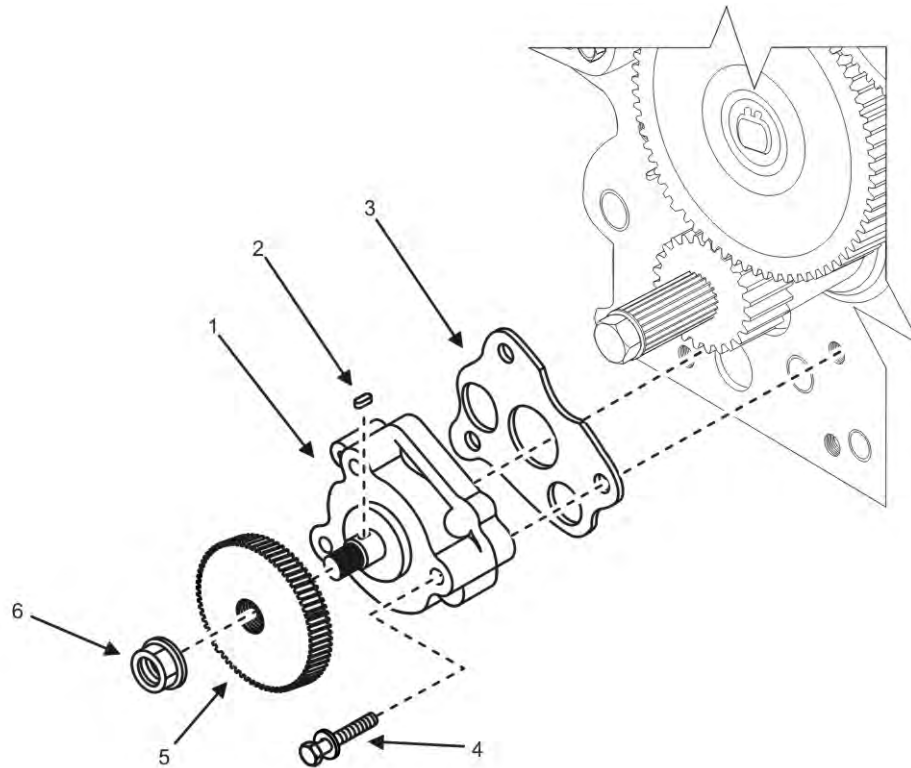


Figure 54. Oil Pump and Gear.

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 09021808									
FIG. 54 OIL PUMP AND GEAR									
1	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0XWR1	16851-3501-2	.OIL PUMP	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315014861942	0XWR1	05712-00408	.KEY	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014786354	0XWR1	16851-35152	.GASKET, OIL PUMP	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014790327	0XWR1	15841-9105-0	.BOLT	3
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3010014867671	0XWR1	15841-35660	.GEAR, OIL PUMP DRIVE	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014785170	0XWR1	02783-50100	.NUT, FLANGE	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
ENGINE WIRING HARNESS REPAIR PARTS LIST

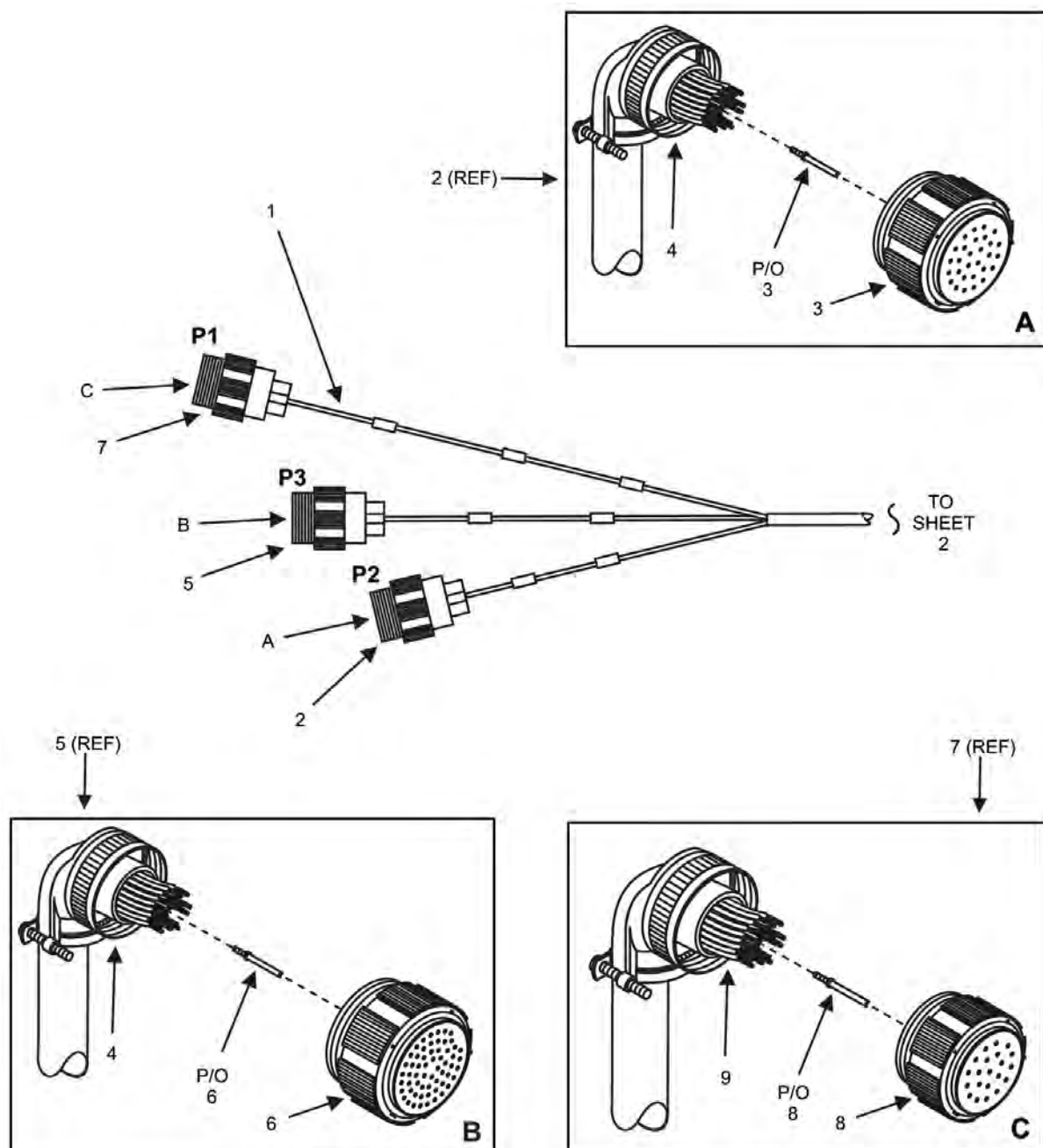


Figure 55. Engine Wiring Harness (Sheet 1 of 16).

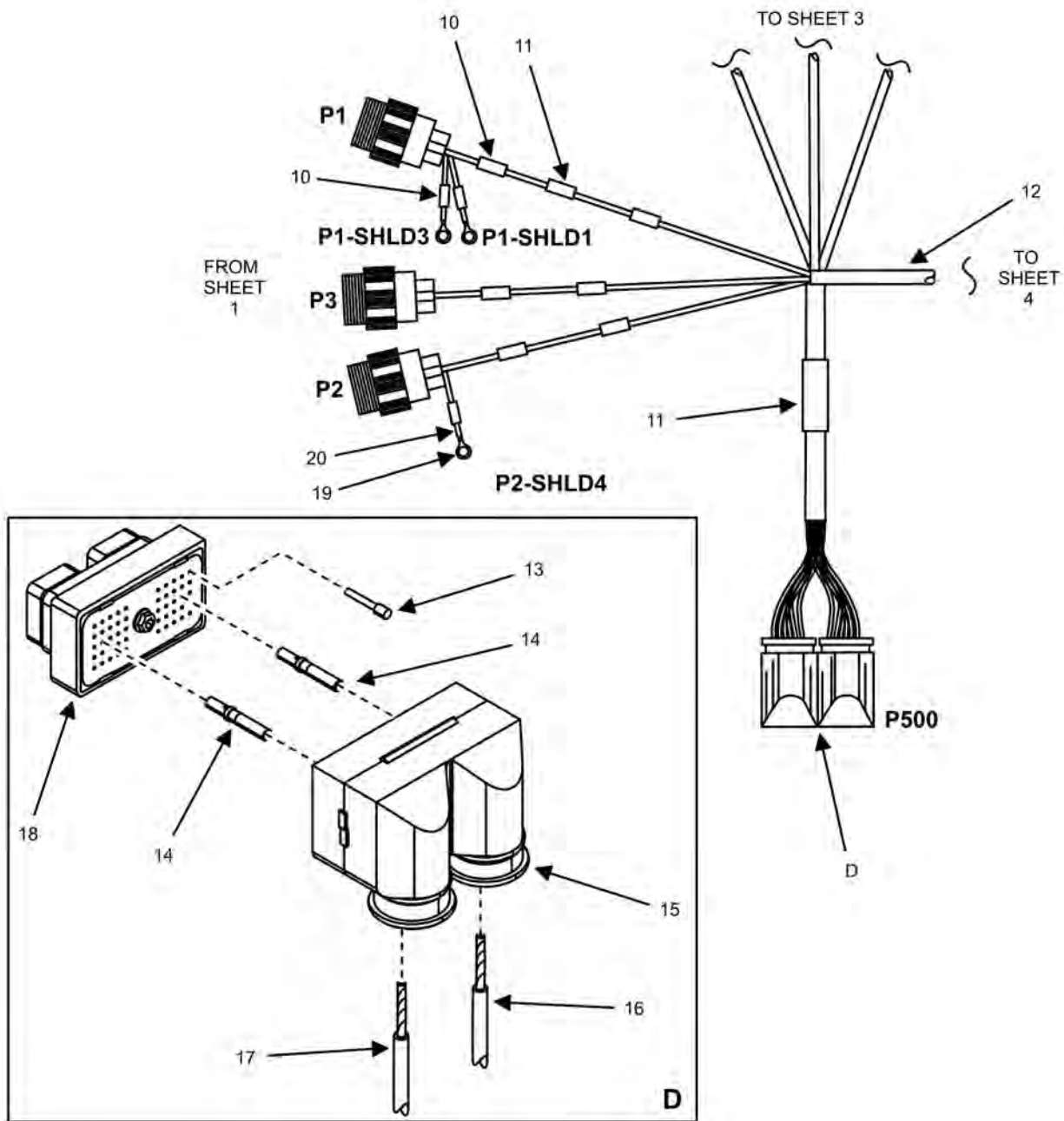


Figure 55. Engine Wiring Harness (Sheet 2 of 16).

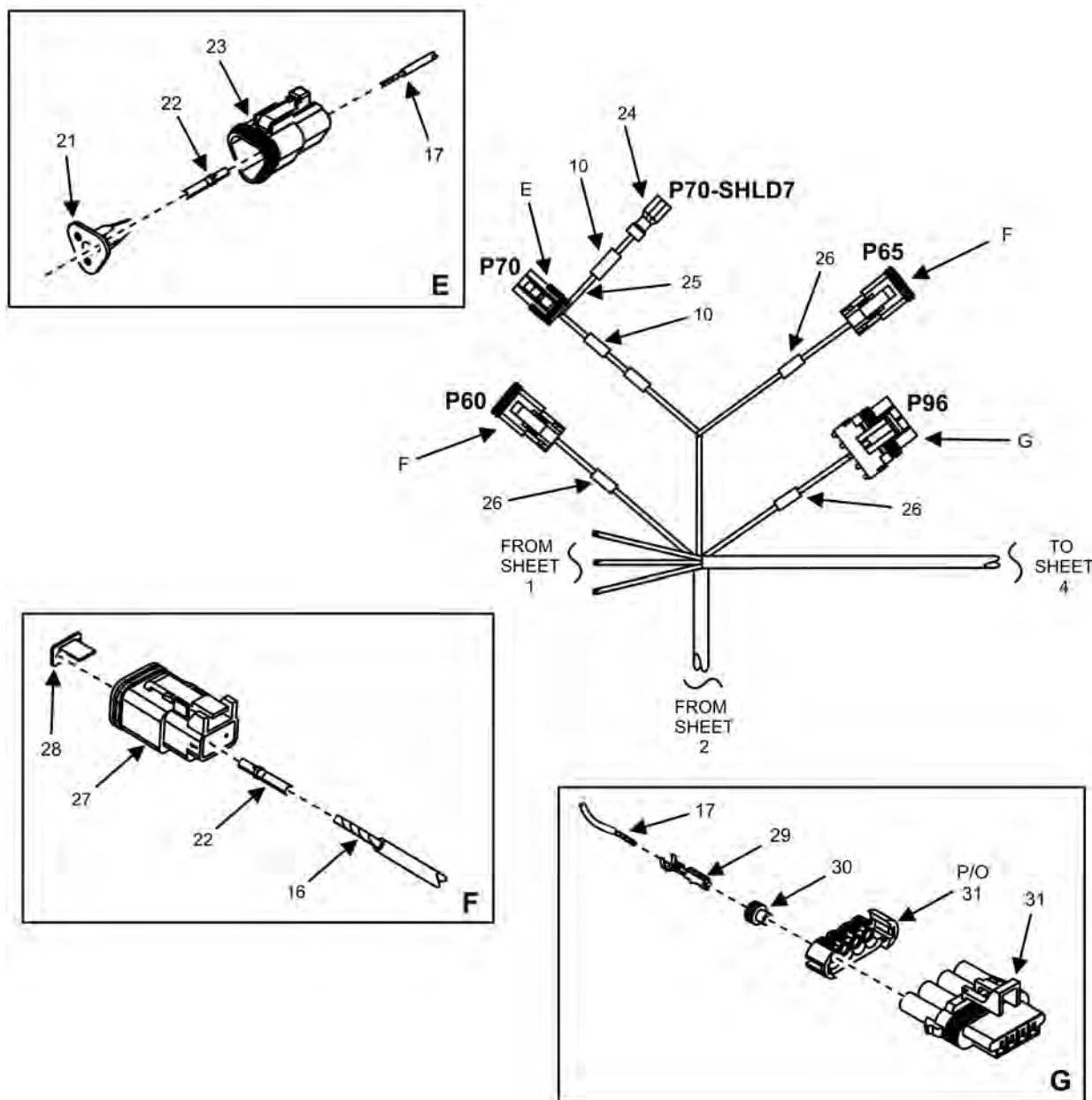


Figure 55. Engine Wiring Harness (Sheet 3 of 16).

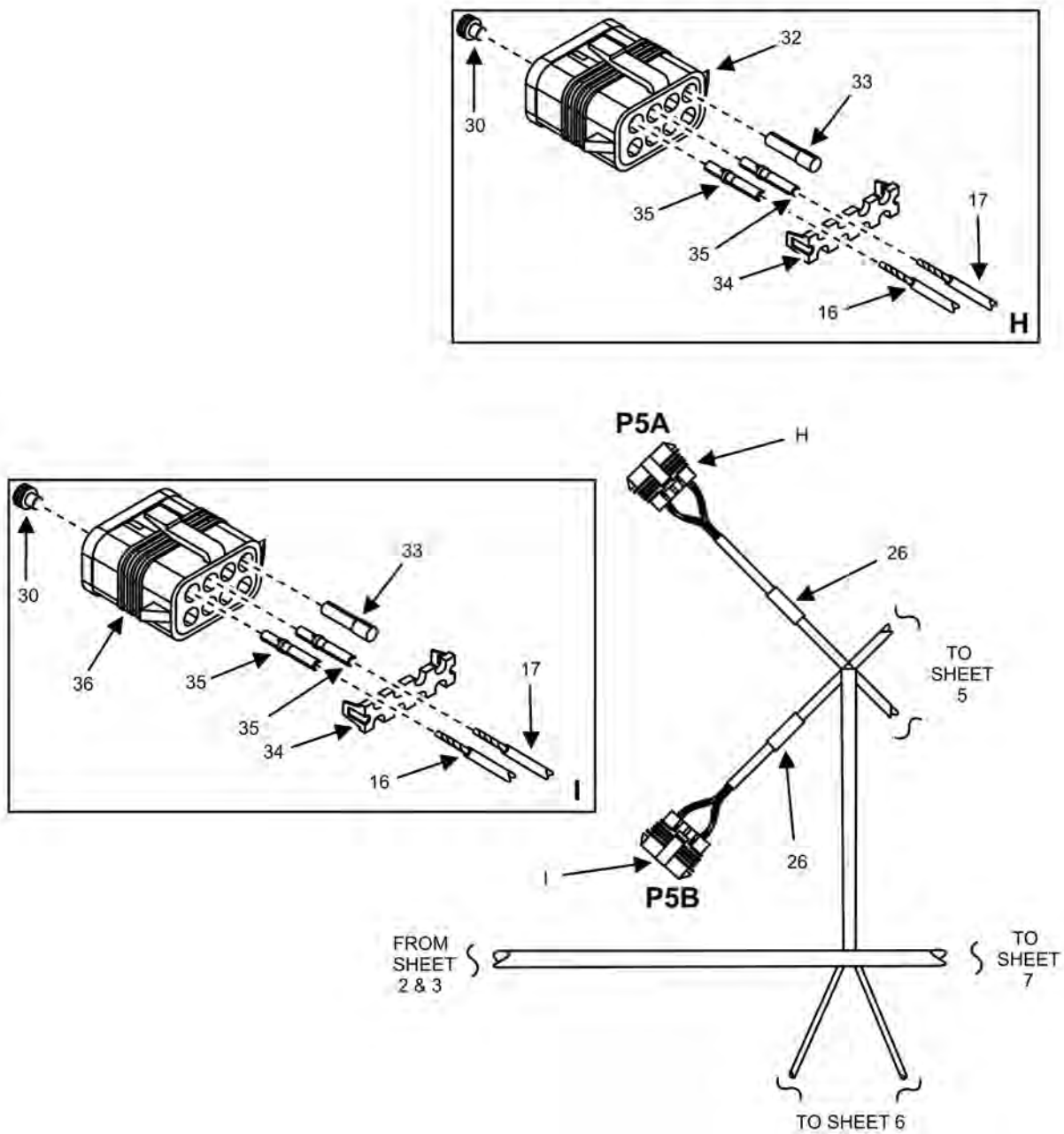


Figure 55. Engine Wiring Harness (Sheet 4 of 16).

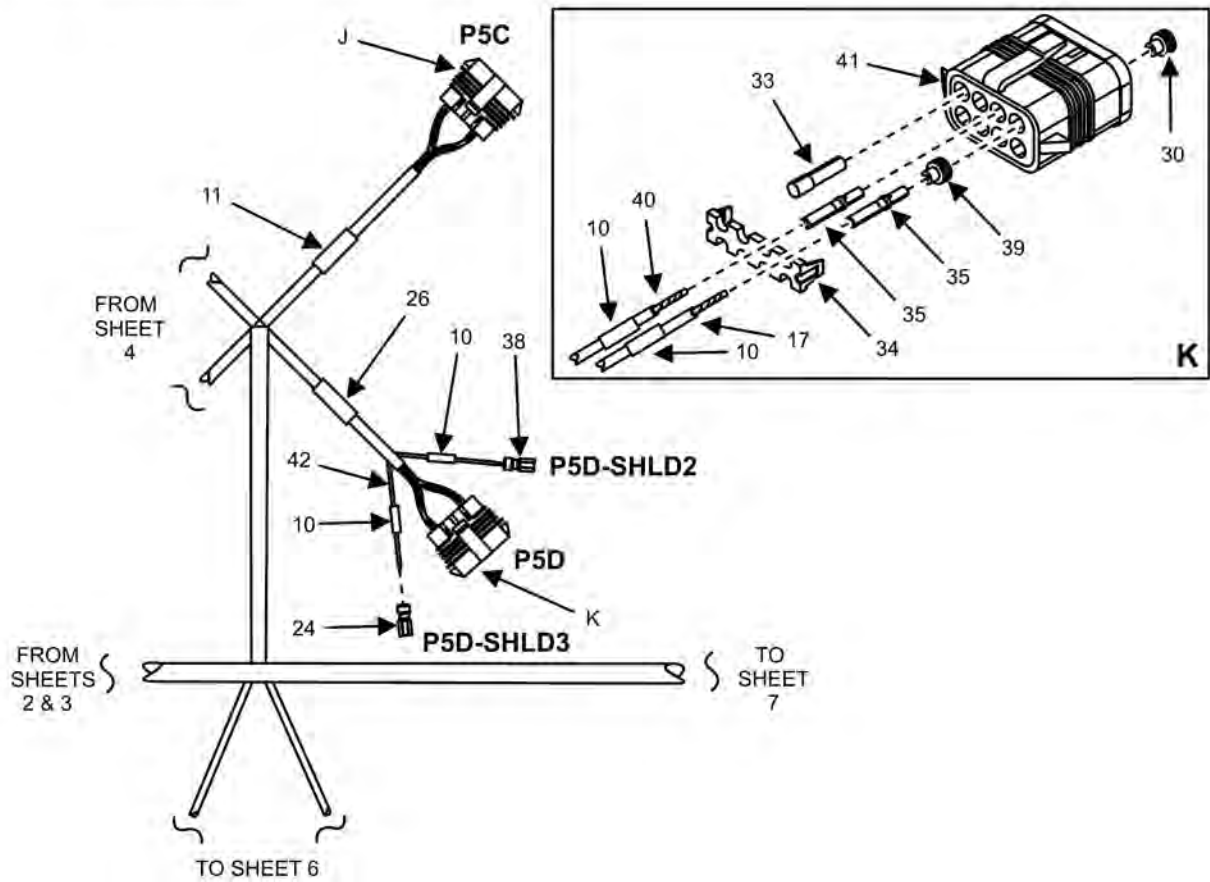
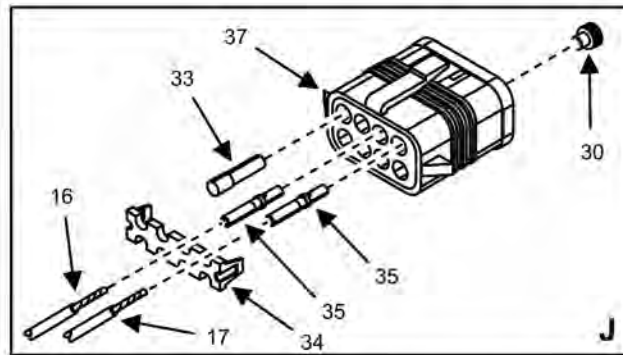


Figure 55. Engine Wiring Harness (Sheet 5 of 16).

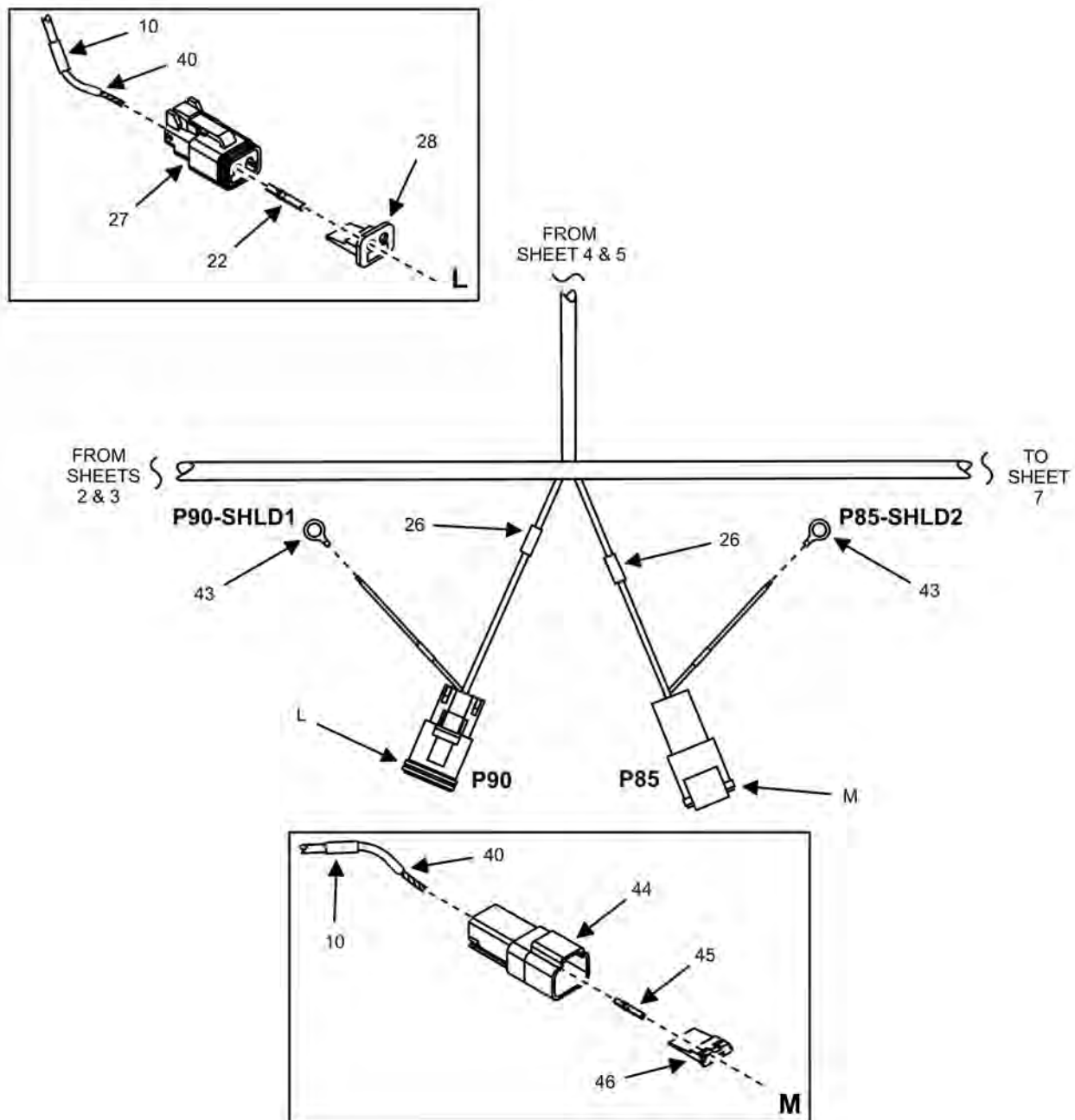


Figure 55. Engine Wiring Harness (Sheet 6 of 16).

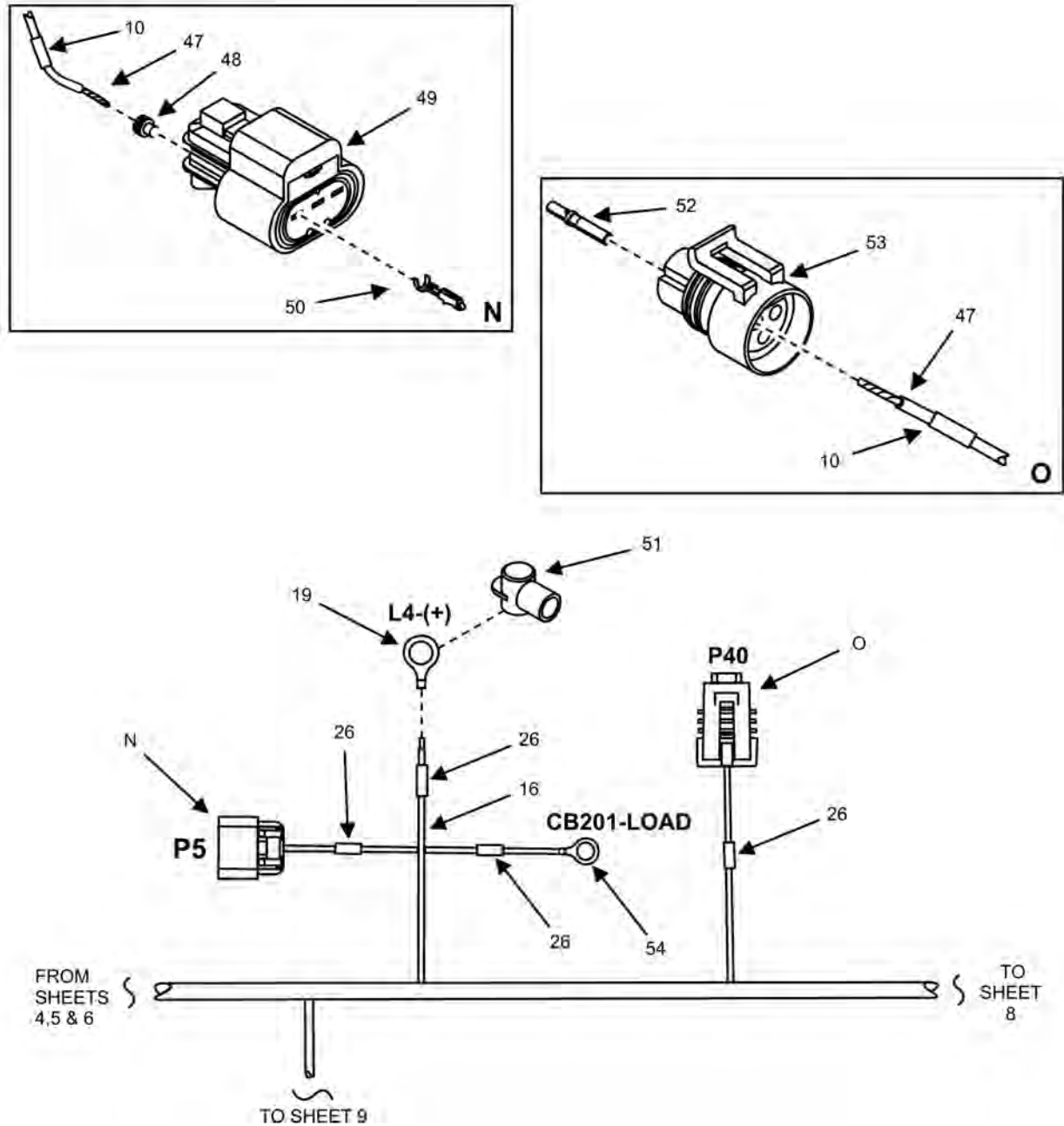


Figure 55. Engine Wiring Harness (Sheet 7 of 16).

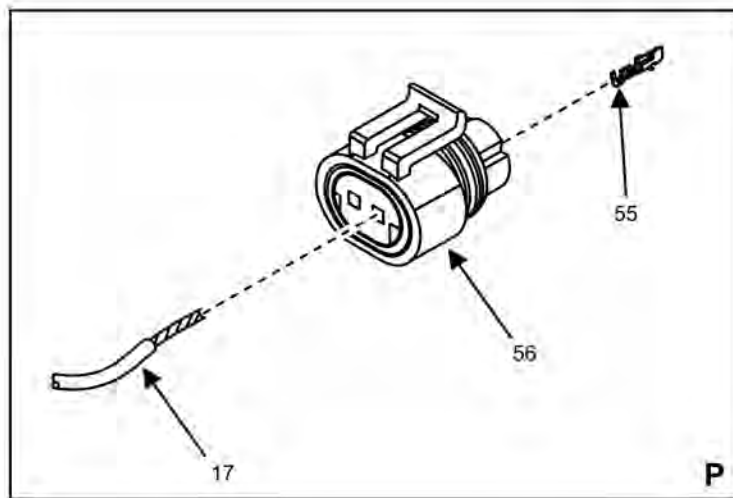
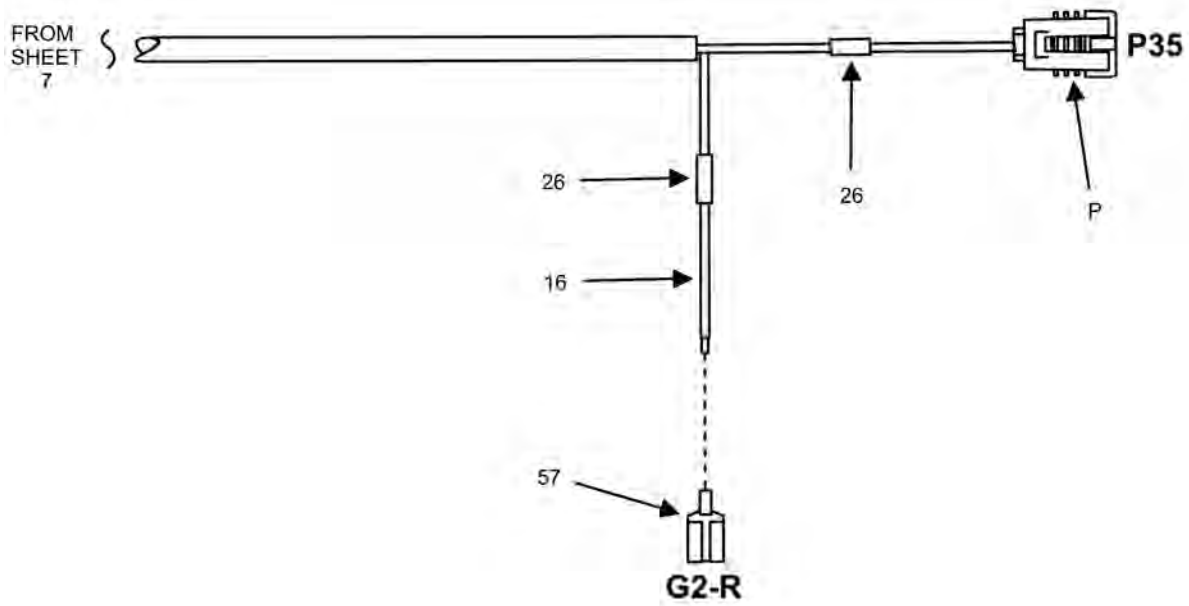


Figure 55. Engine Wiring Harness (Sheet 8 of 16).

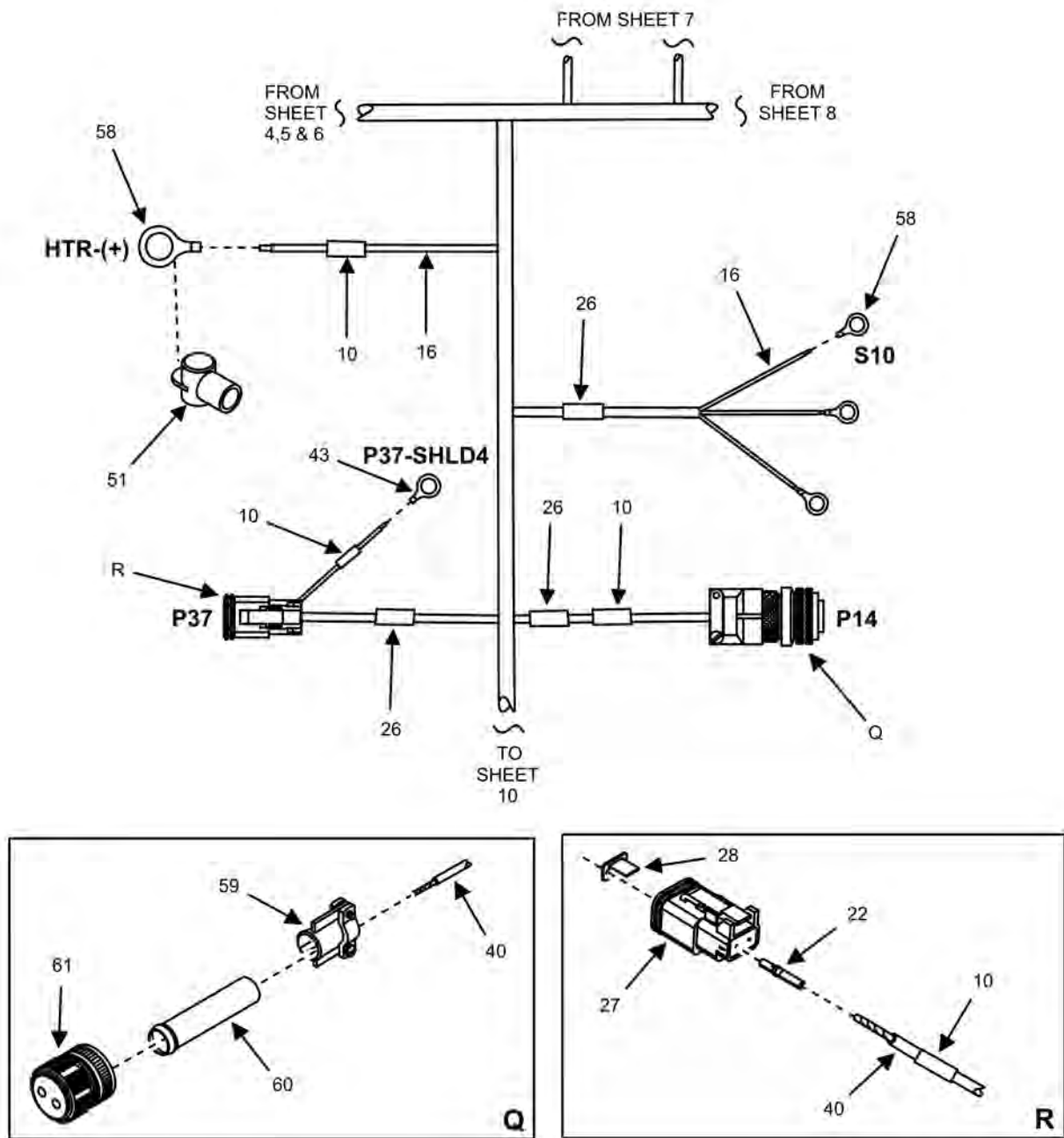


Figure 55. Engine Wiring Harness (Sheet 9 of 16).

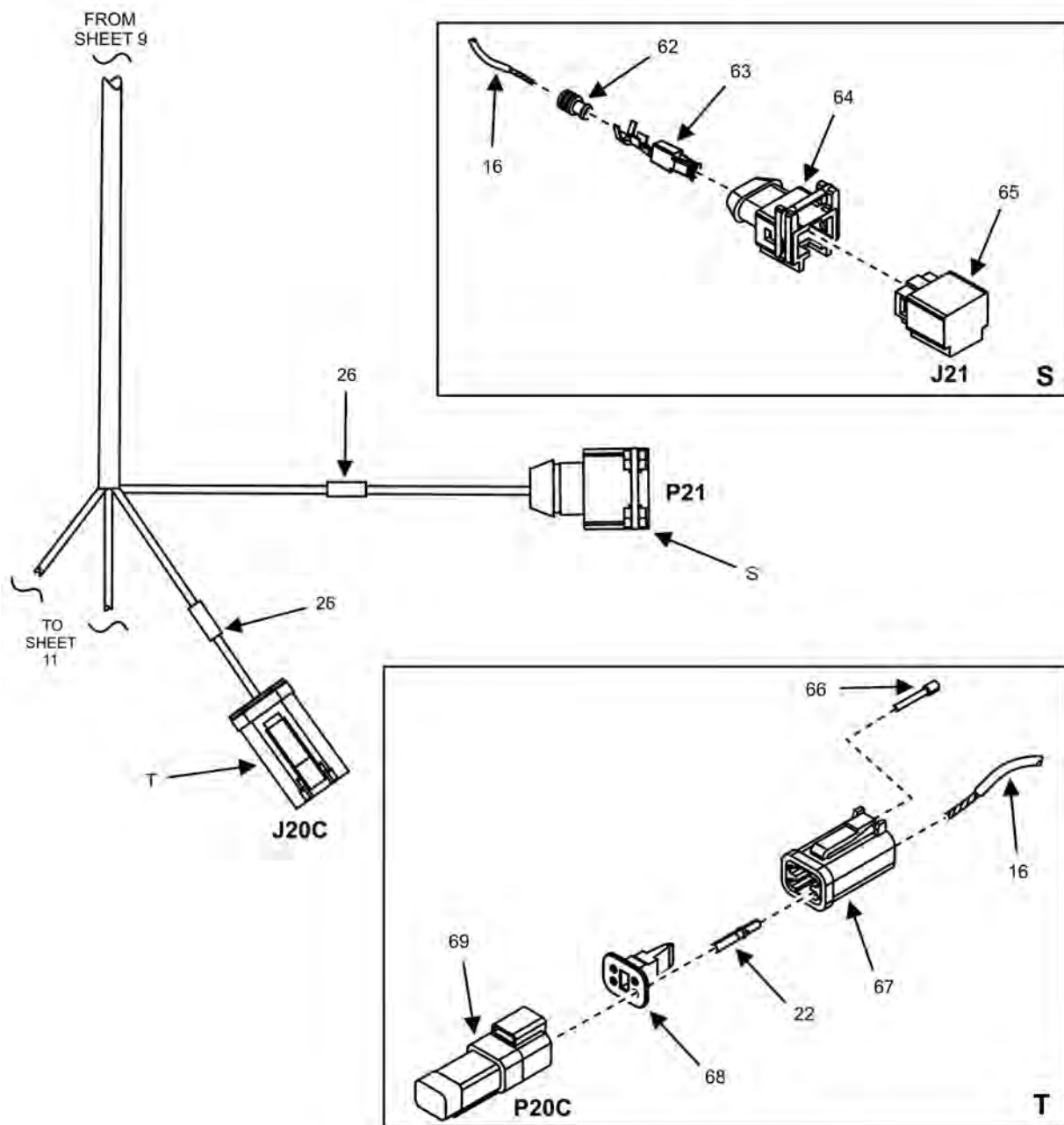


Figure 55. Engine Wiring Harness (Sheet 10 of 16).

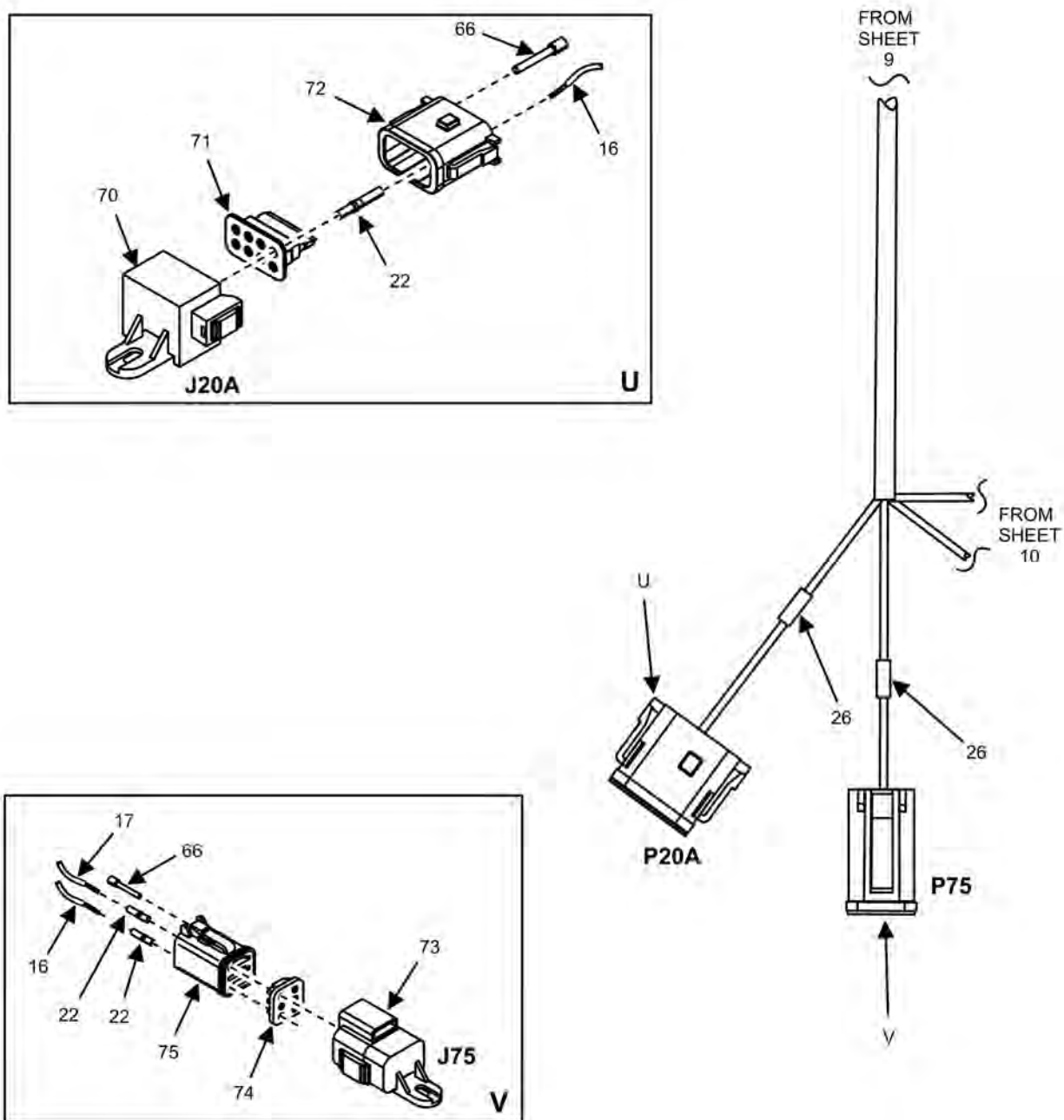


Figure 55. Engine Wiring Harness (Sheet 11 of 16).

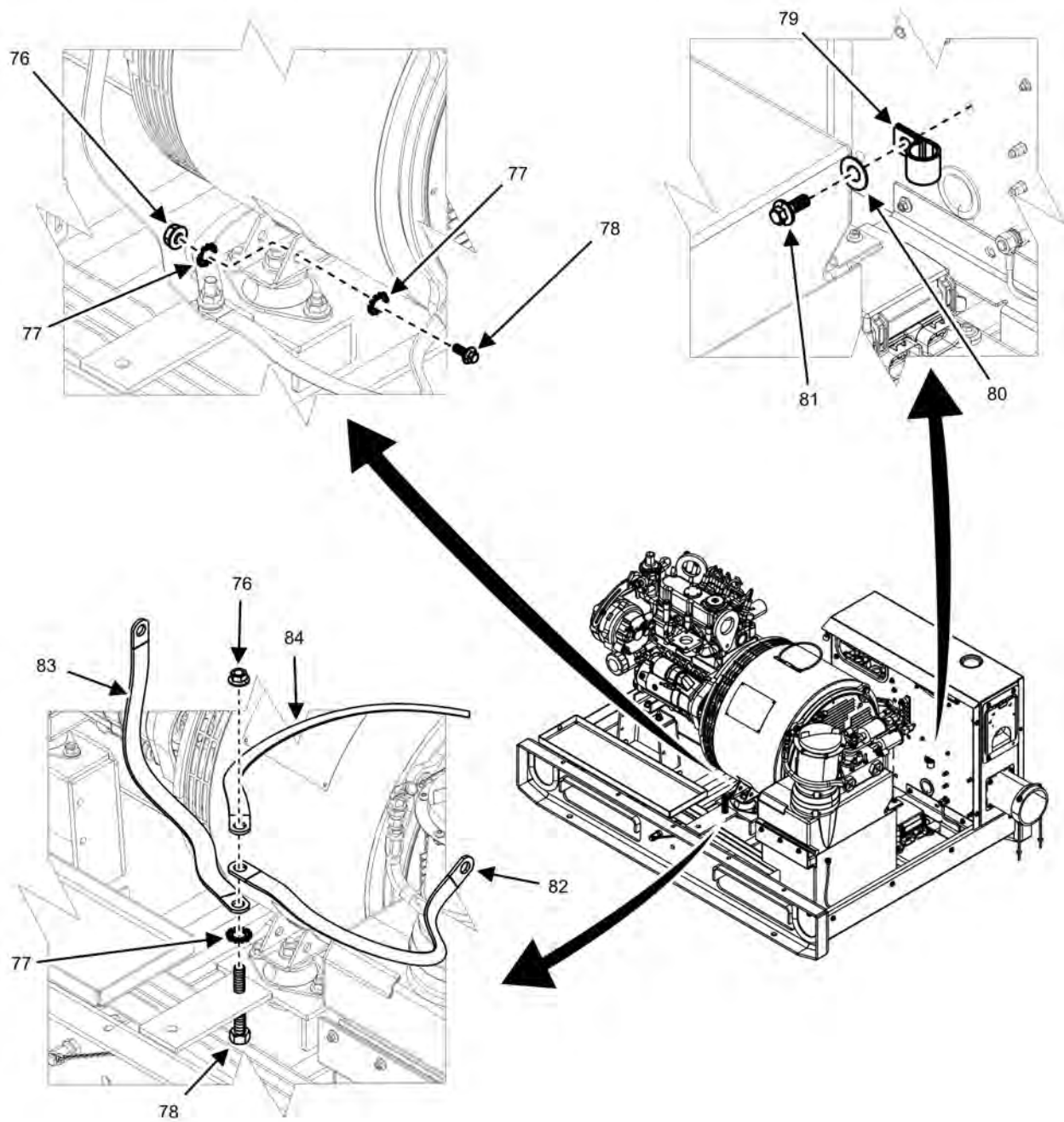


Figure 55. Engine Wiring Harness (Sheet 12 of 16).

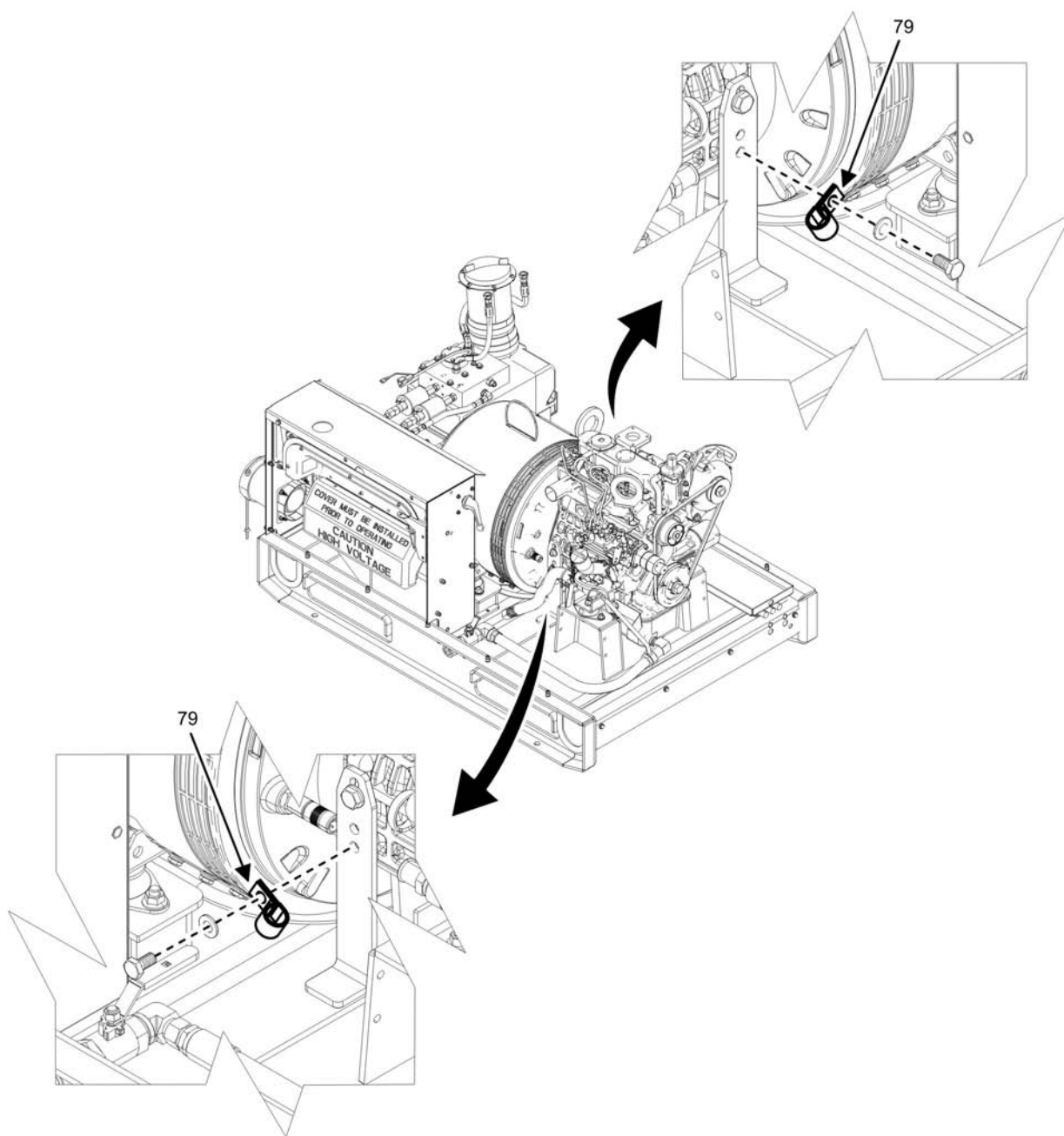


Figure 55. Engine Wiring Harness (Sheet 13 of 16).

WIRE LABEL	FROM	TO
P1-A/P500-25	P1-A	P500-25
P1-C/500-5	P1-C	P500-5
P1-D/P500-43	P1-D	P500-43
P1-E/P500-3	P1-E	P500-3
P1-G/P500-41	P1-G	P500-41
P1-J/P90-1	P1-J	P90-1
P1-K/P90-2	P1-K	P90-2
P1-L/P5D-A	P1-L	P5D-A
P5D-B/P85-1	P5D-B	P85-1
P5D-G/P85-2	P5D-G	P85-2
P1-M/P5D-H	P1-M	P5D-H
P1-R/P500-21	P1-R	P500-21
P1-S/P500-23	P1-S	P500-23
P1-T/P500-1	P1-T	P500-1
P2-A/P5D-D	P2-A	P5D-D
P2-B/P5D-C	P2-B	P5D-C
P2-C/P5D-F	P2-C	P5D-F
CB201-LOAD/P20A-1	CB201-LOAD	P20A-1
P5B-F/HTR-(+)	P5B-F	HTR-(+)
P2-F/P500-36	P2-F	P500-36
P2-G/P75-1	P2-G	P75-1
P2-H/P60-2	P2-H	P60-2
P2-J/P37-2	P2-J	P37-2
P2-K/P500-6	P2-K	P500-6
P2-L/P5B-G	P2-L	P5B-G
P2-M/P37-1	P2-M	P37-1
P2-N/P65-2	P2-N	P65-2
P2-P/G2-R	P2-P	G2-R
P2-R/P20A-7	P2-R	P20A-7
P2-S/P500-30	P2-S	P500-30
P2-T/P500-37	P2-T	P500-37
P2-U/J20C-1	P2-U	J20C-1

Figure 55. Engine Wiring Harness (Sheet 14 of 16).

WIRE LABEL	FROM	TO
P2-V/P65-1	P2-V	P65-1
P2-W/P500-18	P20-W	P500-18
P2-Y/P75-2	P2-Y	P75-2
P2-Z/P60-1	P2-Z	P60-1
P2-a/P500-46	P2-a	P500-46
P2-d/P5B-H	P2-d	P5B-H
P2-e/P5B-A	P2-e	P5B-A
P2-f/P5B-B	P2-f	P5B-B
P20A-4/P21-1	P20A-4	P21-1
J20C-2/P21-2	J20C-2	P21-2
P20A-2/J20C-4	P20A-2	J20C-4
P3-A/P500-10	P3-A	P500-10
P3-B/P500-8	P3-B	P500-8
P3-C/P500-45	P3-C	P500-45
P3-E/P5-A	P3-E	P5-A
P3-F/P70-A	P3-F	P70-A
P3-G/P70-B	P3-G	P70-B
P3-H/P500-19	P3-H	P500-19
P3-J/P5-C	P3-J	P5-C
P3-M/P500-16	P3-M	P500-16
P3-N/P14-A	P3-N	P14-A
P3-P/P14-B	P3-P	P14-B
P3-R/P14-SHLD	P3-R	P14-SHLD
P3-V/P5A-E	P3-V	P5A-E
P3-X/P5B-E	P3-X	P5B-E
P3-Y/P5C-B	P3-Y	P5C-B
P3-b/P500-9	P3-b	P500-9
P3-c/P500-17	P3-c	P500-17
P3-d/P500-29	P3-d	P500-29
P3-f/P40-B	P3-f	P40-B
P3-g/P40-C	P3-g	P40-C
P3-h/P35-A	P3-h	P35-A

Figure 55. Engine Wiring Harness (Sheet 15 of 16).

WIRE LABEL	FROM	TO
P3-k/P40-A	P3-k	P40-A
P3-m/P500-50	P3-m	P500-50
P3-n/P500-20	P3-n	P500-20
P3-p/P75-4	P3-p	P75-4
P3-q/P35-B	P3-q	P35-B
P3-r/P5-B	P3-r	P5-B
P3-s/P500-40	P3-s	P500-40
P3-u/P75-3	P3-u	P75-3
P3-v/P96-C	P3-v	P96-C
P3-x/P96-B	P3-x	P96-B
P3-AA/P500-26	P3-AA	P500-26
P3-BB/P500-7	P3-BB	P500-7
P3-CC/P500-49	P3-CC	P500-49
P3-DD/P500-34	P3-DD	P500-34
P3-EE/P500-27	P3-EE	P500-27
P3-GG/P500-39	P3-GG	P500-39
P3-LL/P500-38	P3-LL	P500-38
P3-MM/P500-28	P3-MM	P500-28
P5A-F/P96-A	P5A-F	P96-A
P5C-G/P96-D	P5C-G	P96-D
S10-1/P5C-C	S10-1	P5C-C
S10-2/L4-(+)	S10-2	L4-(+)
S10-3/P5C-A	S10-3	P5C-A
P1-SHLD1/P90-SHLD1	P1	P90
P5D-SHLD2/P85-SHLD2	P5D	P85
P1-SHLD3/P5D-SHLD3	P1	P5D
P2-SHLD4/P37-SHLD4	P2	P37
NONE	P3	P40
NONE	P3	P5
NONE/P70-SHLD7	P3	P70

Figure 55. Engine Wiring Harness (Sheet 16 of 16).

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 10	
									FIG. 55 ENGINE WIRING HARNESS	
1	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20010		..WIRING HARNESS	1
2	XCFFF	XCFFF	XCFFF	XCFFF		OPCRI	CD389/26WJ29SN-BS25		..CONNECTOR, 29 PIN	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935012502524	81349	D38999/26WJ29SN		...CONNECTOR, PLUG, ELECTRICAL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013897312	81349	M85049/39-25W		...CLAMP, CABLE, ELECTRICAL	2
5	XCFFF	XCFFF	XCFFF	XCFFF		OPCRI	CD389/26WJ61SN-BS25		..CONNECTOR, 61 PIN	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011862240	81349	D38999/26WJ61SN		...CONNECTOR, PLUG, ELECTRICAL	1
7	XCFFF	XCFFF	XCFFF	XCFFF		OPCRI	CD389/26WH21SN-BS23		..CONNECTOR, 21 PIN	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013250384	81349	D38999/26WH21SN		...CONNECTOR, PLUG, ELECTRICAL	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014142582	81349	M85049/39-23W		...BACKSHELL, ELECTRICAL	1
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B		..LAMINATE, LABEL, COVER	48
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG3T3-100B		..LAMINATE, LABEL, COVER	5
12	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	55PP02872757640064		..INSULATION SLEEVING (MAKE FROM 55PP02872757640064 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014791823	45152	6HB683		..PLUG, END SEAL, ELECTRICAL	17
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015722092	11139	1062-20-0122		..CONTACT, ELECTRICAL, 22-16 AWG	33
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015885256	11139	0528-001-5005		..CONNECTOR, PLUG, HOUSING, 50 PIN	1
16	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26		..STRAND, WIRE, 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
17	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-20-10		..STRAND, WIRE, 20 AWG (MAKE FROM 3271-20-10 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015877612	11139	DRC26-50S04		..CONNECTOR, PLUG, ELECTRICAL, 50 PIN	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434771	81343	MS25036-103		..TERMINAL, LUG, 16-14 AWG	4

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
20	MFFZZ	MFFZZ	MFFZZ	MFFZZ	5970013261733	92194	TFT-250-16		..INSULATION SLEEVING, ELECTRICAL (MAKE FROM TFT-250-16 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014708342	11139	W3S		..POLARIZING KEY, ELECTRICAL	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654		..CONTACT, ELECTRICAL, 22-16 AWG	22
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015238855	11139	DT06-3S		..CONNECTOR, PLUG, ELECTRICAL, 3 PIN	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940011129746	30554	88-20275-1		..TERMINAL, DISCONNECT	2
25	MFFZZ	MFFZZ	MFFZZ	MFFZZ	5970014701630	28105	ST-301-3/16BLAC		..INSULATION SLEEVING, ELECTRICAL (MAKE FROM ST-301-3/16BLAC ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
26	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG9T3-100B		..LAMINATE, LABEL COVER	24
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014475814	11139	DT06-2S		..CONNECTOR, BODY, PLUG, 2 PIN	4
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014468180	11139	W2S		..CONNECTOR, BODY, PLUG, WEDGE 2 PIN	4
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999013234929	77060	12089188		..CONTACT, ELECTRICAL, 18-20 AWG	4
30	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015868449	77060	15324982		..BOOT, DUST AND MOISTURE	19
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013088599	45152	1788880		..CONNECTOR, BODY, PLUG, 4 PIN	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699460	71400	32006-A22		..CONNECTOR, PLUG, BLACK ELECTRICAL	1
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013399574	77060	12010300		..PLUG, END SEAL, ELECTRICAL	13
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015704538	71400	32006-TP2		..CONNECTOR BODY, MODULAR	4
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015273588	77060	12077411		..TERMINAL, QUICK DISCONNECT	19
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015885261	1UW16	32006-B22		..CONNECTOR, PLUG, GREY ELECTRICAL	1
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699470	71400	32006-D22		..CONNECTOR, PLUG, BLUE ELECTRICAL	1
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ		56501	RA25177M		..TERMINAL, DISCONNECT	1
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975013604293	77060	12015899		..SEAL	4
40	MFFZZ	MFFZZ	MFFZZ	MFFZZ		4AJA4	EF20C0028722		..CABLE, SPECIAL PURPOSE, 18 AWG (MAKE FROM EF20C0028722 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR AIR FORCE	CODE USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699542	71400	32006-C22	..CONNECTOR, PLUG, GREEN ELECTRICAL	1
42	MFFZZ	MFFZZ	MFFZZ	MFFZZ		30554	88-20541-11	..INSULATION, SLEEVING (MAKE FROM 88-20541-11 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434773	81343	MS25036-105	..TERMINAL, LUG, RING, 22 - 18 AWG	3
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015065555	0FW39	12422624	..CONNECTOR, PLUG, ELECTRICAL	1
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012163648	11139	0460-202-16141	..CONTACT, ELECTRICAL, 16-20 AWG	2
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015191808	11139	W2P	..RETAINER, ELECTRICAL	1
47	MFFZZ	MFFZZ	MFFZZ	MFFZZ		4AJA4	EF20C0038722	..CABLE, ELECTRICAL, 18 AWG (MAKE FROM EF20C0038722 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
48	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015891081	1V6F3	15366021	..SEAL	3
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015859802	1V6F3	15326808	..CONNECTOR, RECEPTACLE	1
50	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1V6F3	12191818	..CONTACT, PIN, 16-18 AWG	3
51	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5930015876626	58961	218N1F02	..BOOT, DUST AND MOISTURE	2
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015821957	77060	12089290	..TERMINAL, QUICK DISCONNECT	3
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015033305	77060	12065287	..CONNECTOR BODY, PLUG	1
54	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002835281	81343	MS25036-109	..TERMINAL, LUG	1
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015885530	IV6F3	12124076	..CONTACT, SOCKET	2
56	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014660260	77060	12162193	..CONNECTOR, PLUG, ELECTRICAL	1
57	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860213	30554	88-20275-3	..TERMINAL, DISCONNECT	1
58	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940004640117	00779	36152	..TERMINAL, LUG	4
59	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	M85049/38C-4A	..CLAMP	1
60	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5365005985282	96906	MS3420-4	..BUSHING, RUBBER	1
61	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015905546	77820	97-3106A-10SL-4S(624)	..CONNECTOR, ELECTRICAL	1
62	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015408655	45152	2KP504	MAGNETIC SENSOR	1
63	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015600703	00779	929939-1	..SEAL, PLAIN	2
64	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015716514	00779	963040-3	..TERMINAL, LUG, 16-20 AWG	2
65	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015886862	37GZ4	20593C400	..CONNECTOR BODY, PLUG	1
66	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	..CAP, CONNECTOR	1
67	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014846537	11139	DT06-4S	..CONNECTOR, PLUG, ELECTRICAL	7
68	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014830852	11139	W4S	..CONNECTOR, RECEPTACLE	1
69	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015235410	11139	DT04-4P-EP13	..CONNECTOR, PLUG, ELECTRICAL	1
70	PAFZZ	PAFZZ	PAFZZ	PAFZZ		11139	1011-348-0805	..CONNECTOR, RECEPTACLE	1
71	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015231411	11139	W8S	..RETAINER, ELECTRICAL	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
72	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015877601	11139	DT06-08SA	..CONNECTOR, PLUG, ELECTRICAL	1
73	PAFZZ	PAFZZ	PAFZZ	PAFZZ		11139	1011-347-0605	..CONNECTOR, RECEPTACLE	1
74	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015152283	19207	12485651-125	..SECONDARY LOCKNUT	1
75	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015399272	45152	2HB188	..CONNECTOR, PLUG, ELECTRICAL	1
76	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M10	.NUT, PLAIN, EXTENDED	2
77	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X375000GD5A21	.WASHER, 3/8, EXT TOOTH	3
78	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015928054	05047	AES10M10C030WB4K42	.SCREW, HEX HEAD, M10	2
79	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340000538994	80205	MS21333-126	.CLAMP, LOOP	3
80	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015626014	62319	DIN-9021-M6	.WASHER, FLAT, M6	1
81	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A020WB4K42	.SCREW, CAP, HEX, M6	1
82	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886588	5T0Q1	EM4E393	.STRAP, GROUNDING	1
83	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886398	5T0Q1	EM4A080	.STRAP, GROUNDING	1
84	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886563	5T0Q1	EM4D147	.STRAP, GROUNDING	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
POWER WIRING HARNESS REPAIR PARTS LIST

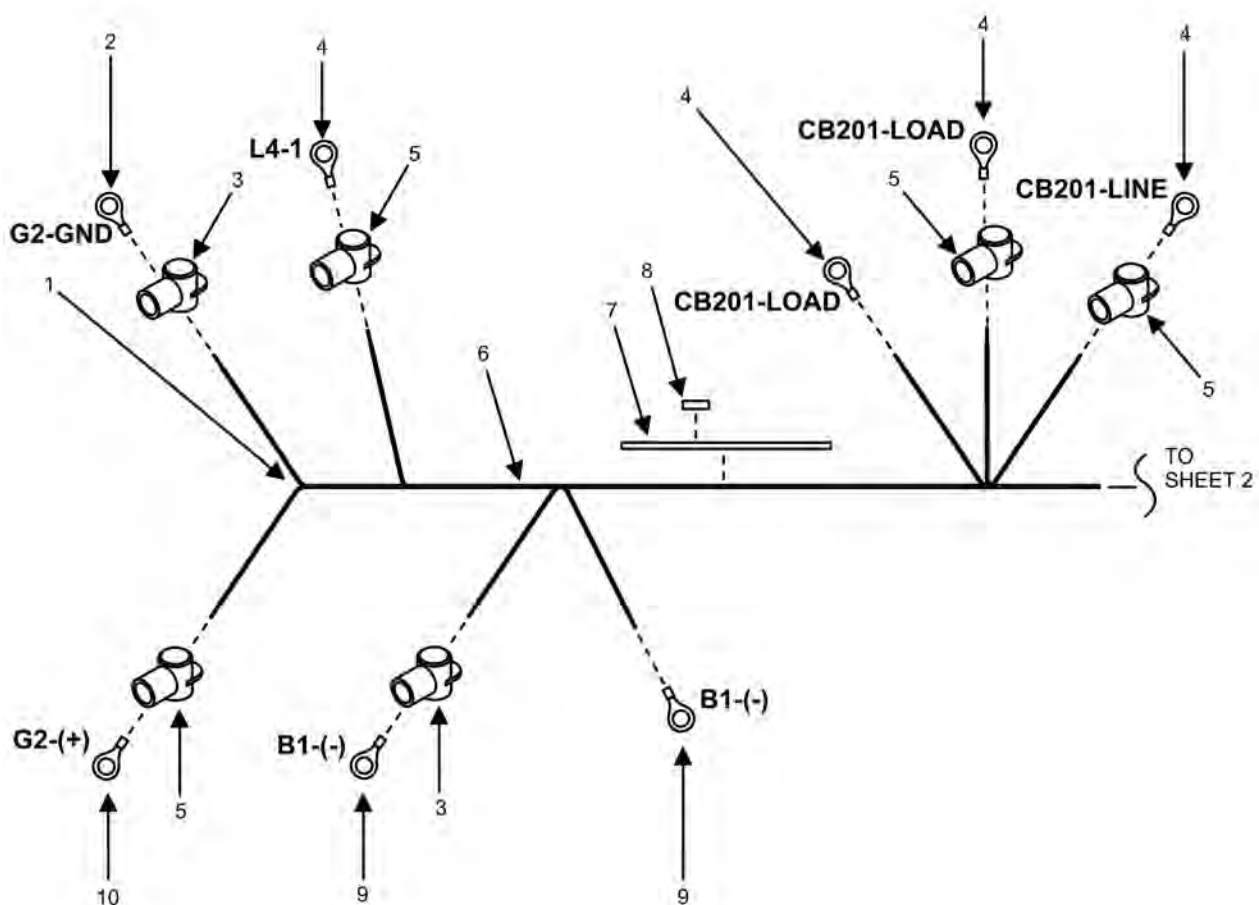
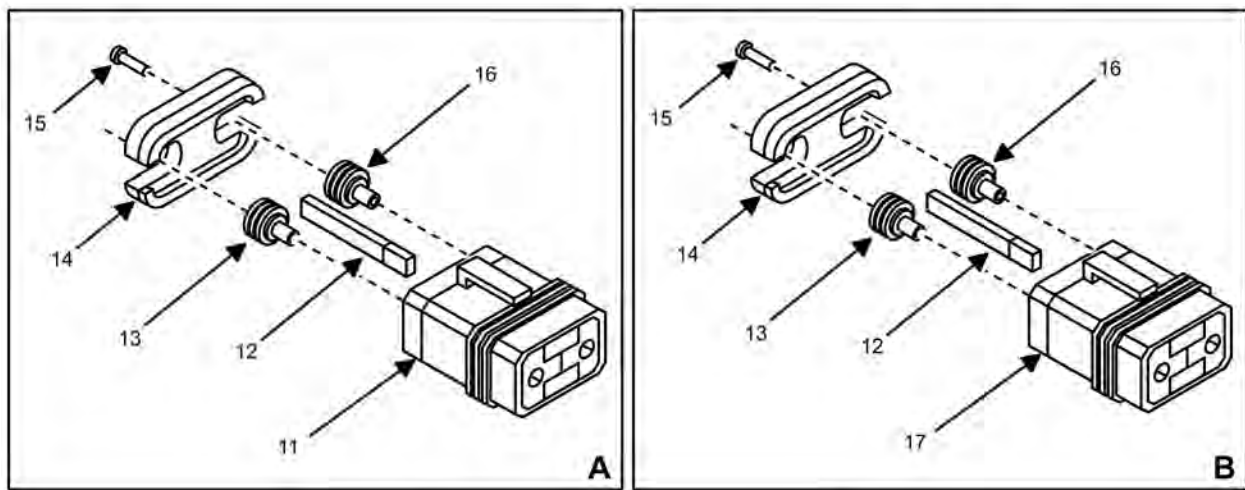
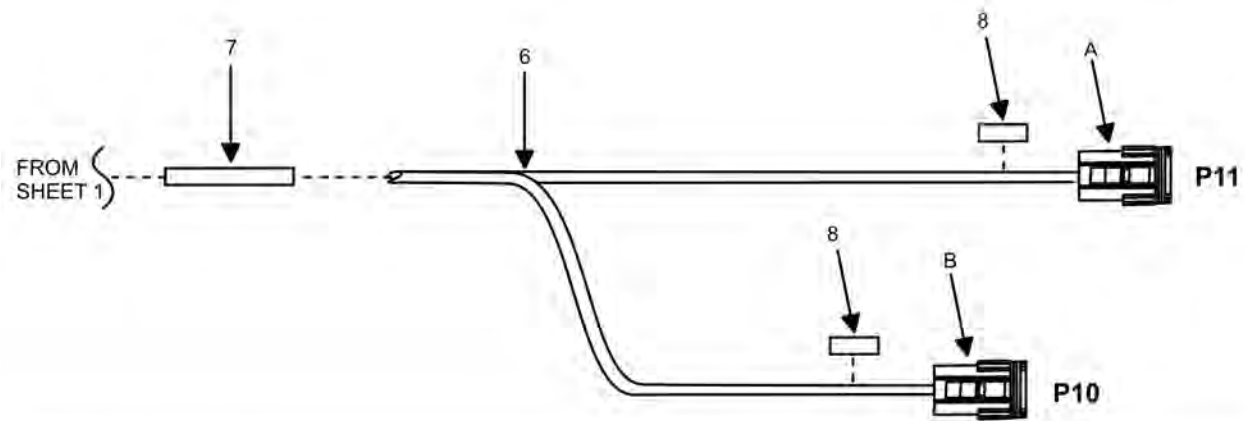


Figure 56. Power Wiring Harness (Sheet 1 of 2).



WIRE LABEL	FROM	TO
P10-1/CB201-LOAD	P10-1	CB201-LOAD
P11-1/B1-(-)	P11-1	B1-(-)
CB201-LINE/L4-1	CB201-LINE	L4-1
G2-(-)/CB201-LOAD	G2-(-)	CB201-LOAD
B1-(-)/G2-GND	B1-(-)	G2-GND

Figure 56. Power Wiring Harness (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 11	
								FIG. 56 POWER WIRING HARNESS	
1	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21080	..WIRING HARNESS, POWER	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434794	81343	MS25036-112	..TERMINAL, LUG, RING	1
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	218N1T14	..BOOT, DUST AND MOISTURE (BLACK)	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940007189913	00779	35111	..TERMINAL, LUG, RING, M8, 12-10 AWG	4
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	218N1T02	..BOOT, DUST AND MOISTURE (RED)	4
6	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-10-105	..STRAND, WIRE, 10 AWG (MAKE FROM 3271-10-105 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
7	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	55PP02872757640064	..INSULATION SLEEVING (MAKE FROM 55PP02872757640064 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
8	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG2T5-100B	..LAMINATE, LABEL COVER	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940008231581	00779	35112	..TERMINAL, LUG, RING, 3/8 IN, 12-10 AWG	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434777	81343	AS25036-157	..TERMINAL, LUG, RING	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699506	71400	32004-A2	..CONNECTOR, PLUG, ELECTRICAL (BLACK)	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015700849	45152	17KP739	..TERMINAL, TAPER, RECEPTACLE	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		IV6F3	12129381	..BOOT, DUST AND MOISTURE SEAL	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015704557	71400	32004-TP2	..CONNECTOR BODY, RECEPTACLE COVER	2
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340011917772	11139	114018	..PLUG, PROTECTIVE, DUST AND MOISTURE SEAL	2
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015703453	71400	15336703	..SEAL	2
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015928518	1UW16	32004-B2	..CONNECTOR, PLUG, ELECTRICAL (GRAY)	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
WINTERIZATION KIT INSTALLATION REPAIR PARTS LIST

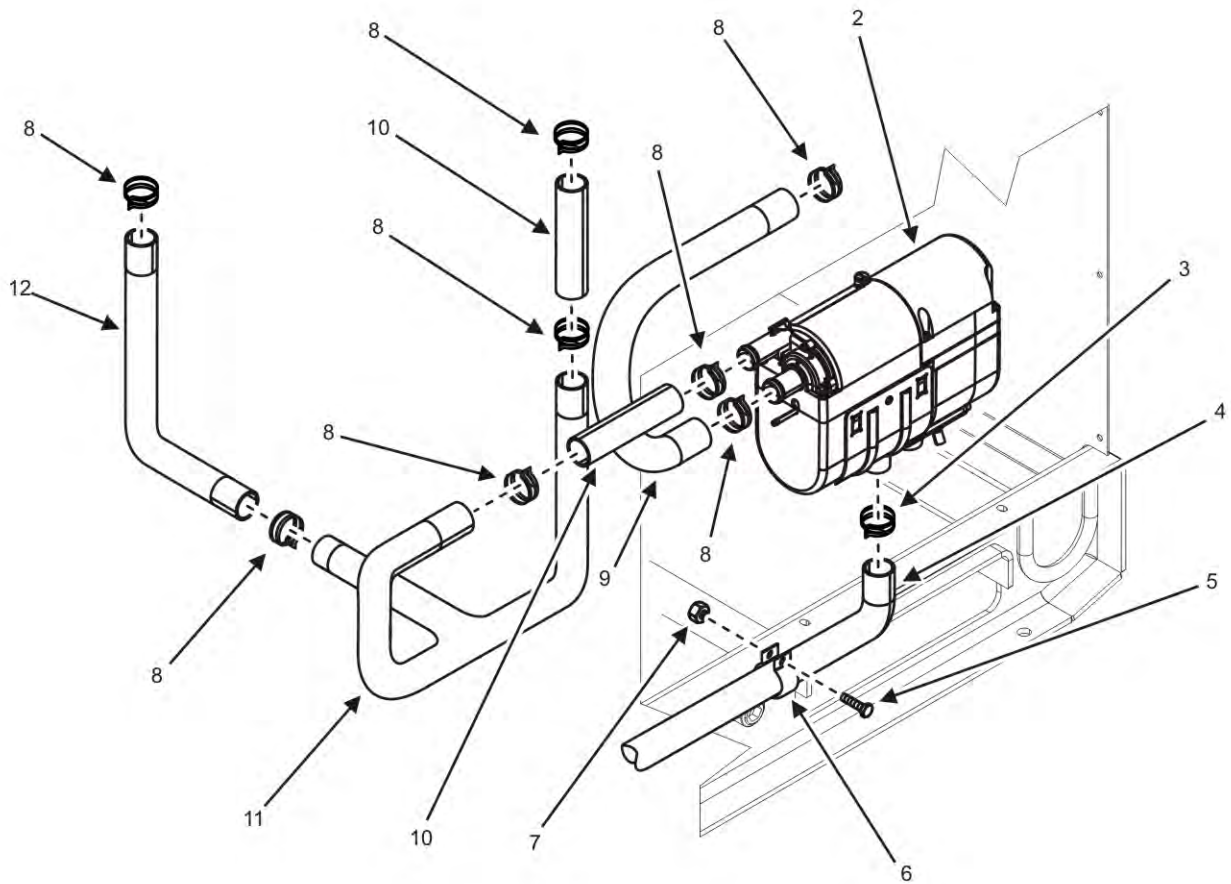


Figure 57. Winterization Kit Installation (Sheet 1 of 4).

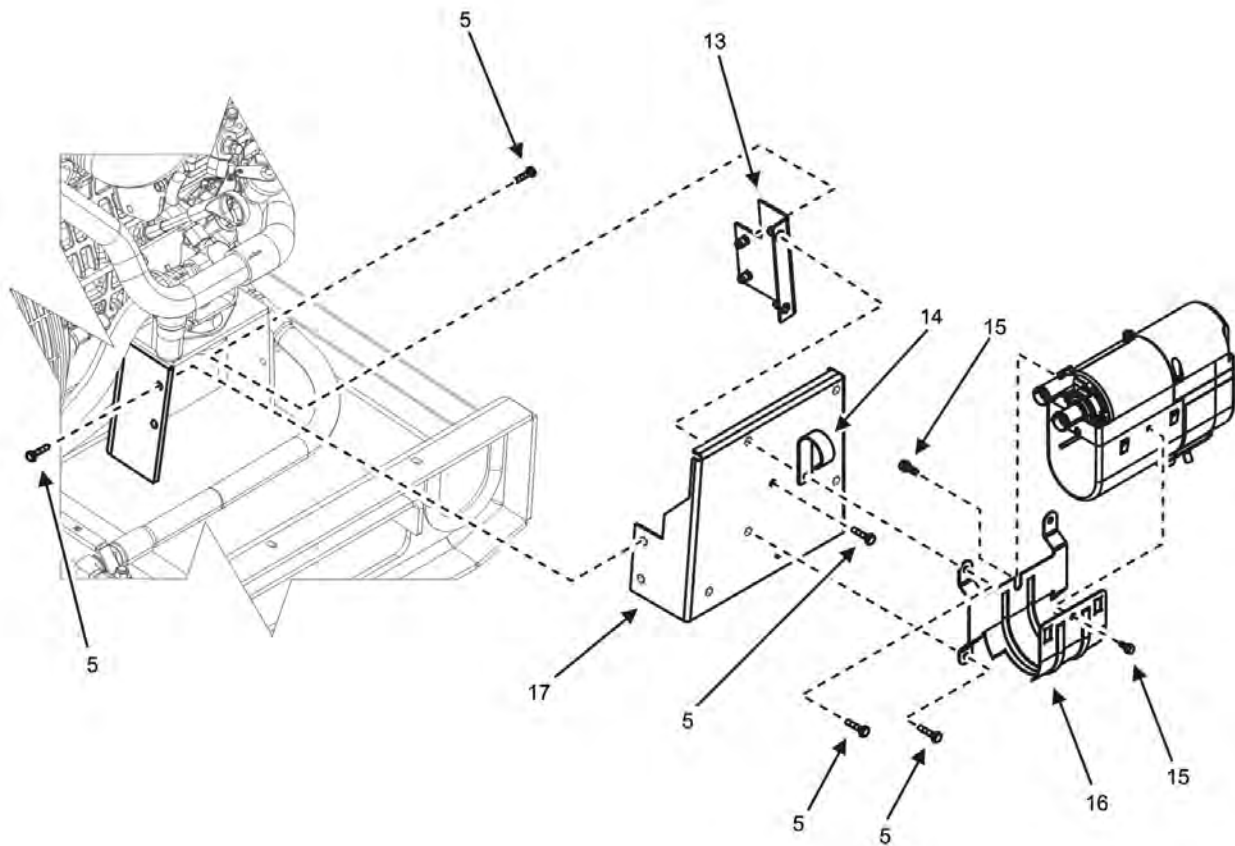


Figure 57. Winterization Kit Installation (Sheet 2 of 4).

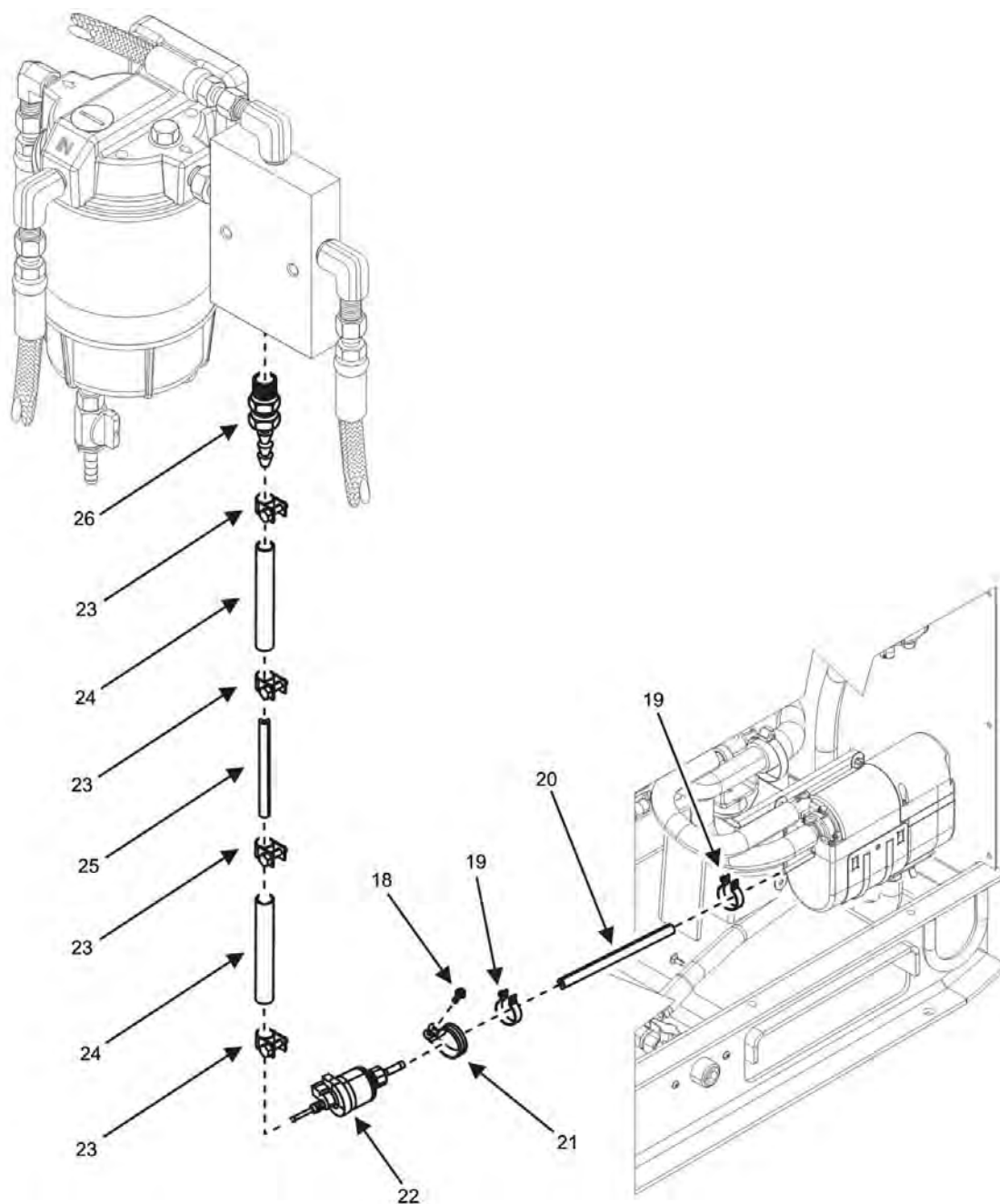


Figure 57. Winterization Kit Installation (Sheet 3 of 4).

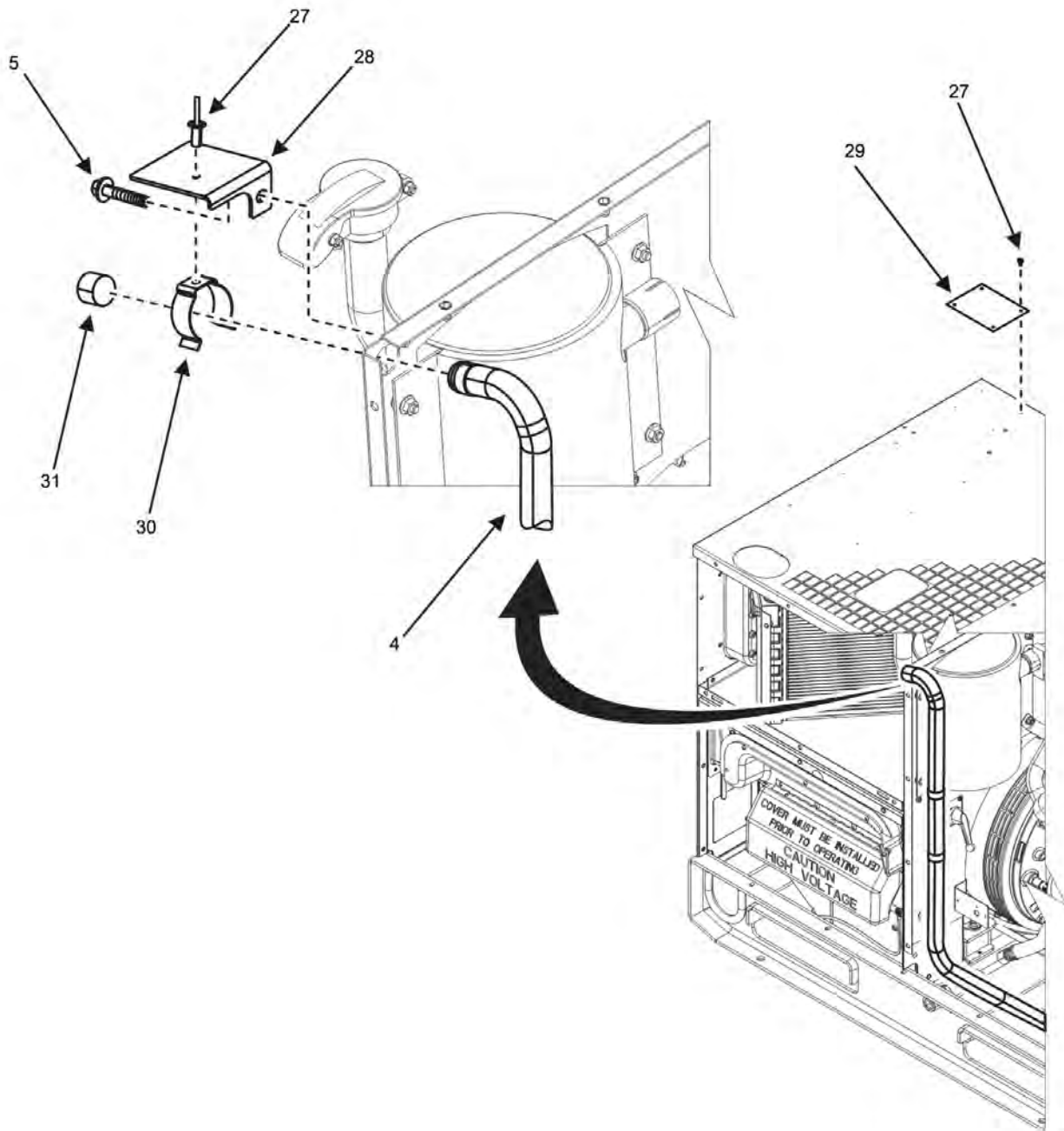


Figure 57. Winterization Kit Installation (Sheet 4 of 4).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
							GROUP 12	
							FIG. 57 WINTERIZATION KIT INSTALLATION	
1	KFFFF	KFFFF	KFFFF		44940	04-20775	.KIT, WINTERIZATION (NOT SHOWN)	1
2	PAFZZ	PAFZZ	PAFZZ		38453	99-20-0019	..HEATER	1
3	PAFZZ	PAFZZ	PAFZZ		38453	50-40-0018	..CLAMP, TUBE 30MM ID	1
4	XBFZZ	XBFZZ	XBFZZ		44940	04-21551-4	..TUBE, FLEXIBLE EXHAUST	1
5	PAFZZ	PAFZZ	PAFZZ		44940	AES10M6A016WB4K42	..SCREW, HEX FLANGE HEAD M6X1X16	11
6	PAFZZ	PAFZZ	PAFZZ	5340005505943	18076	MS 122916	..CLAMP, TUBE	2
7	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	..NUT, HEX FLANGE M6X1	1
8	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-29	..CLAMP TYPE CBT	8
9	PCFZZ	PCFZZ	PCFZZ		44940	04-21175	..HOSE, COOLANT	1
10	MFFZZ	MFFZZ	MFFZZ		44940	04-2108-3	..HOSE, NONMETALLIC 3/4 INCH ID (MAKE FROM 30-10-0003 ON BULK ITEMS LIST CUT TO LENGTH 85 MM +/-10)	2
11	PAFZZ	PAFZZ	PAFZZ		44940	04-21386	..TUBE, HEATER 5KW	1
12	MFFZZ	MFFZZ	MFFZZ		44940	04-21208-4	..HOSE, NONMETALLIC 3/4 INCH ID (MAKE FROM 30-10-0003 ON BULK ITEMS LIST CUT TO LENGTH 353 MM +/-10)	1
13	XBFZZ	XBFZZ	XBFZZ		44940	04-20844	..BRACKET, HEATER SUPPORT 5KW	1
14	PAFZZ	PAFZZ	PAFZZ		75272	CJV-1709	..CLAMP, J	1
15	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A012WB4K42	..SCREW, HEX FLANGE HEAD M6X1X12	2
16	XBFZZ	XBFZZ	XBFZZ		38453	50-60-0045	..BRACKET, HEATER	1
17	XBFZZ	XBFZZ	XBFZZ		44940	04-20774	..BRACKET, HEATER 5KW	1
18	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A030B4K42	..SCREW, HEX FLANGE HEAD M6X1X30	1
19	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508D9	..CLAMP, HOSE	2
20	MFFZZ	MFFZZ	MFFZZ		44940	04-20852-1	..HOSE, FUEL 5/32 INCH ID (MAKE FROM 40-10-0016 ON BULK ITEMS LIST CUT TO LENGTH 290MM +/-10)	1
21	PAFZZ	PAFZZ	PAFZZ		38453	50-60-0028	..CLAMP, LOOP	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910200027185	1C645	25-1942-45-00-00	..PUMP,FUEL, WINTERIZATION KIT	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508D11	..CLAMP, HOSE	4
24	PCFZZ	PCFZZ	PCFZZ	PCFZZ		38453	40-10-0017	..HOSE, FUEL, 5MM ID	2
25	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21547-3	..TUBE, FLEXIBLE (MAKE FROM 40-10- 0005 ON BULK ITEMS LIST CUT TO LENGTH 950 MM +/-10)	1
26	XBFZZ	XBFZZ	XBFZZ	XBFZZ	4730014491233	9C664	125HB-3-4	..ADAPTER, HOSE, .25 INCH NPT MALE TO BARB	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5320009321972	81349	M24243/6-A402H	..RIVET, BLIND	5
28	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21503	..BRACKET, EXHAUST TUBE	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21676	..PLATE, OPERATING INSTRUCTIONS	1
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015883558	78553	C22275-020-4	..CLIP	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		38453	60-30-0025	..CAP, TUBE	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE

AMMPS 5KW GENERATOR SET

BULK ITEM

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 99 BULK MATERIAL						
FIG. BULK						
1	PAFZZ	6145015886850	4AJA4	EF20C0038722	CABLE, ELECTRICAL	1
2	PAFZZ	6145012521449	16428	89418	CABLE, POWER, ELECTRICAL	1
3	PAFZZ		16428	9514	CABLE, SHIELDED	1
4	PAFZZ		16428	9512	CABLE, SHIELDED	1
5	PAFZZ		44940	09130SWC8	CABLE, SHIELDED	1
6	PAFZZ		4AJA4	EF20C0028722	CABLE, SPECIAL, PURPOSE	1
7	PAFZZ	9150200044776	I3160	846-1p	COATING	1
8	PCFZZ	5330015896527	C4643	A2539	EDGING	1
9	PCFZZ	5330015896559	C4643	A3521	EDGING	1
10	PCFZZ		24161	4219-0109	HOSE, FUEL	1
11	PCFZZ	4720014792748	45152	3058529	HOSE, NONMETALLIC	1
12	PCFZZ	4720015942216	24161	0503-2726	HOSE, NONMETALLIC	1
13	PCFZZ	4720200060172	38453	30-10-0003	HOSE, NONMETALLIC	1
14	PCFZZ	4720200061632	38453	40-10-0005	HOSE, NONMETALLIC	1
15	PCFZZ	4720200059980	38453	40-10-0016	HOSE, NONMETALLIC	1
16	PAFZZ	5970015315648	30554	88-20541-1	INSULATION SLEEVING	1
17	PAFZZ		28105	ST-301-3/16BLAC	INSULATION SLEEVING	1
18	PAFZZ		30554	88-20541-11	INSULATION SLEEVING	1
19	PAFZZ	5970015315648	30554	88-20541-14	INSULATION SLEEVING	1
20	PAFZZ		3SXL3	55PP02872757640064	INSULATION SLEEVING	1
21	PAFZZ	5970013261733	92194	TFT-250-16	INSULATION SLEEVING, ELECTRICAL	1
22	PAFZZ	4720012085869	24161	4230-0134	HOSE, NONMETALLIC	1
23	PAFZZ	8030000822508	81346	ASTM D5363	PRIMER, SEALING, COMPOUND	1
24	PCFZZ	9390123827191	C4643	A1512	SEAL, EDGE	1
25	PCFZZ	5330123826622	C4643	A3709	SEAL, EDGE	1
26	PCFZZ	5330123826625	C4643	A3921	SEAL, EDGE, BULB	1
27	PCFZZ		44940	04-20868	SEAL, EDGE	1
28	PAFZZ	8030014790487	05972	56541	SEALING COMPOUND	1
29	PAFZZ	8030013963362	05972	68035	SEALING COMPOUND	1
30	PAFZZ		44940	MIL-S-46163A	SEALING COMPOUND	1
31	PCFZZ	5970015942369	85901	ATUM 24/6-0	SLEEVE, HEAT SHRINK	1
32	PCFZZ		30554	88-20541-15	SLEEVING, INSULATION	1
33	PAFZZ	4010015928570	0X4C9	3271-12-65	STRAND, WIRE	1
34	PAFZZ	4010015942186	0X4C9	3271-14-41	STRAND, WIRE	1
35	PAFZZ	4010015906749	0X4C9	3271-16-26	STRAND, WIRE	1
36	PAFZZ	4010015928567	0X4C9	3271-20-10	STRAND, WIRE	1
37	PAFZZ	4010015960040	0X4C9	3271-6-133	STRAND, WIRE	1
38	PAFZZ	4010015934805	0X4C9	3271-8-133	STRAND, WIRE	1
39	PAFZZ	4010015965308	0X4C9	3271-10-105	STRAND, WIRE	1
40	PAFZZ	6154015964356	44940	13230E6651-24	WIRE, BRAIDED	1
END OF FIGURE						

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
SPECIAL TOOLS LIST

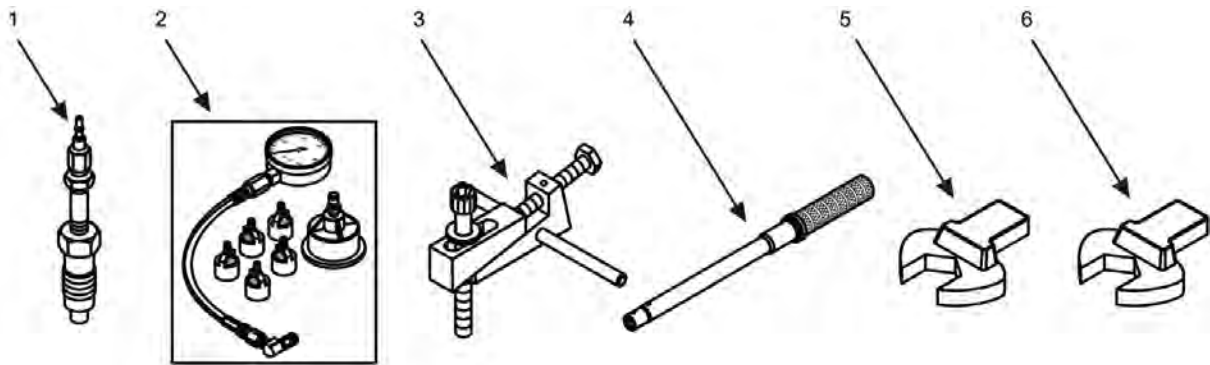


Figure 58. Special Tools List.

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) CAGEC	(5) PART NUMBER (P/N)	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
SPECIAL TOOLS FIG. 58						
1	PAFZZ KFFZZ KFFZZ		0J1H4 0J1H4 0J1H4	KUB5ENGCOMAD 5-10-15STTEKIT 5-60STTEKIT	ADAPTER, COMPRESSION TEST KIT, AMMPS 5, 10, 15 KW STTE (NOT SHOWN) KIT, AMMPS COMMON STTE (NOT SHOWN)	
2	PAFZZ		47M91	3289	TEST SET, OIL SYSTEMS PRESSURE	
3	PAFZZ		0J1H4	01METRIC	TOOL, RIVET NUT	
4	PAFZZ		636D0	64-154	TORQUE TUBE, 5-75 FT-LB	
5	PAFZZ		636D0	64-309	TORQUE WRENCH HEAD END, 1/4" X 3/8" DRIVE, 5/8"	
6	PAFZZ		636D0	64-308	TORQUE WRENCH HEAD END, 1/4" X 3/8" DRIVE, 9/16"	
END OF FIGURE						

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
NATIONAL STOCK NUMBER (NSN) INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4720000213320	1	31	5940010038579	16	14
5340000538994	55	79	5310010096570	24	13
8030000822508	BULK	24	4730010175119	31	15
5310000874652	22	1	5310010492745	23	27
5940001139828	4	41		24	19
	11	12	5310010518089	23	26
5940001141315	15	8		24	18
2590001419758	11	8	5310010607181	23	32
5940001434771	55	19		24	24
5940001434773	55	43	5310010609104	23	20
5940001434777	56	10	5305010623344	24	27
5940001434794	56	2	5310010779650	23	8
5940001435573	15	12		24	35
5325001850001	10	20	5310010800030	4	37
5310001898467	16	12	5975010963170	13	12
5940002835281	55	54	5935010979974	2	17
5310003382255	6	27	4730011097901	23	17
	7	5	5940011129746	55	24
5940004640117	1	40	5940011390853	19	34
	21	13	3110011609663	23	28
	55	58	5310011688140	2	15
5310004808509	23	35	5935011741235	18	11
5940005045877	15	15		21	7
	17	32		55	66
5340005505943	57	6	5305011742761	23	19
4730005951078	10	16	5310011742761	24	14
5365005985282	55	60	5935011862240	55	6
5940006172896	17	38	5305011904461	23	33
	23	14		24	23
	24	4	5340011917772	56	15
5940006553318	17	23	5999012036687	17	18
5940006603633	19	37		18	12
	21	16		19	20
5930006831625	2	20	5999012036687	21	23
5940007189913	56	4	5999012036687	55	22
5940008231581	56	9	4720012085869	BULK	23
4730008716729	10	13	4730012089235	12	6
	13	4	5999012163648	23	11
5975008783791	1	26		24	6
5940008990260	17	28		55	45
5320009321972	1	6	5935012502524	55	3
	57	27	6145012521449	19	23
5940009581214	16	13		BULK	2
5331009738598	23	5	2910012751749	11	35

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310012866304	13	1	5935014468180	21	10
5935013088599	55	31		23	16
5306013207024	39	2		24	7
	52	7		55	28
5310013207038	30	17	5935014475814	21	11
5310013207100	31	1		55	27
5315013210400	51	5	4730014491233	57	26
5315013212001	48	23	5935014541789	21	22
	53	9	5935014660260	55	56
5306013213371	51	6	5310014664926	16	6
	53	14	5970014701630	55	25
5306013213372	33	1	5310014702044	16	5
	41	7	5935014708342	18	13
5306013213375	41	6		55	21
5325013213445	47	7	4020014769072	4	48
5999013234929	55	29	5307014772256	31	9
5935013250384	55	8	4820014781226	49	7
5970013261733	55	20	5330014784849	31	18
	BULK	22	5330014784851	31	13
5905013291699	23	25	5330014784887	49	12
	24	17	5330014784911	29	15
5305013390822	23	3	5330014785161	30	15
	24	30	5310014785170	54	6
5935013399574	55	33	5310014785173	31	2
5975013604293	55	39	5310014785187	38	4
5305013661153	23	9	5330014786002	44	5
	24	36	5330014786004	41	5
4730013669017	26	4	3110014786106	48	29
4820013671836	10	17	5340014786107	48	9
5310013700052	24	26	3120014786113	48	12
5120013738976	4	47	3120014786114	48	11
2920013882776	4	29	3120014786117	48	10
5935013897312	55	4	3120014786132	47	15
6645013929615	18	4	3120014786135	47	14
5306013934861	45	7	3120014786137	47	12
5340013960454	4	65	5330014786354	54	3
8030013963362	BULK	30	5325014786921	52	2
4730014079298	25	9	5315014786939	53	20
5935014142582	55	9	4730014787130	32	15
5330014313620	29	11	2815014787478	49	8
4730014343360	29	6	2815014787489	45	10
4730014343361	29	5	2815014787493	47	8
5306014358407	49	13	2920014787511	28	1
5330014371063	36	3	2815014787538	45	1
5365014371064	31	6	4820014790226	46	18
5365014371065	31	5	5306014790327	54	4
2910014394915	29	16	5306014790352	30	16
5310014406749	28	2	5306014790355	49	15
5330014462136	9	9	5306014790358	43	7

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5306014790360	48	17		46	10
5306014790361	47	11	3430015065021	39	5
5306014790363	53	24	5935015065555	23	10
5306014790365	30	20		24	37
5306014790367	50	2		55	44
8030014790487	BULK	29	3431015068102	42	5
3020014790690	48	27	3431015068134	32	5
2815014790929	48	28		42	4
5935014791823	55	13	3431015068286	43	1
4720014792748	BULK	11	5306015069038	32	13
5305014801127	31	19	5306015070141	30	1
5935014830852	17	17		49	16
	19	21	5365015072201	31	12
	55	68	5330015072967	29	10
5935014846537	19	19	4710015074421	32	14
	55	67		43	10
5310014849183	17	4	5330015075010	32	3
	21	2	5935015121010	21	9
5315014861942	54	2	5315015141178	46	4
4730014863490	31	17	5310015152283	55	74
5325014863846	53	11	5935015191808	23	12
3010014867671	54	5		24	38
3020014867673	52	4	5935015191808	55	46
5935014953346	21	27	5935015224172	21	8
5935014953353	21	24	5935015231411	55	71
5307014966030	33	4	5935015235410	55	69
5307014966035	38	1	5935015238855	18	10
5306014966045	38	5		55	23
4730014966572	33	5	6685015255884	32	4
4720014966578	33	7	5940015273588	55	35
5315015000653	45	12	5970015315648	BULK	17
5310015002374	33	8		BULK	20
5365015003268	45	9	5305015333695	29	4
5365015003332	31	7	4730015333731	42	6
5306015004262	39	1	4730015334181	46	9
5306015004266	22	20	5305015339478	29	14
	42	9	2815015360903	51	3
5306015004271	32	1	5306015368998	42	8
5310015006541	4	64	3110015368999	53	8
2815015006972	44	1	5315015369062	46	7
5305015008690	49	3	5315015369063	46	17
5306015008701	32	11	3110015369064	53	5
	49	11	5340015369608	51	4
	49	14	5340015369609	53	18
2910015008991	29	9	5340015369610	53	17
5935015033305	55	53	5340015369611	53	19
5315015063293	46	14	5365015369631	46	6
3431015064642	46	5		46	13
5365015064655	42	7		49	4

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310015369994	53	22	6150015855103	7	12
5330015370001	31	14	5935015859802	55	49
5310015370005	26	3	5940015859905	35	11
	49	10	6505015859923	30	8
5331015370007	30	11	6110015859960	6	22
5331015370010	30	7	6150015860026	1	37
5306015370876	53	21	6685015860032	32	6
3110015370879	53	6	5930015860041	17	20
3020015370881	33	9	6150015860078	15	9
3120015371179	52	5	6150015860087	17	27
3040015371181	52	3	5935015860093	23	15
3020015371182	52	1		24	5
3020015371183	53	2	5940015860213	18	7
5315015371192	46	16		19	43
2815015371201	46	3		35	8
5305015371683	45	2		55	57
5340015371710	53	23	5925015860232	19	13
3040015371790	52	6	5940015860272	35	5
5360015372057	30	13	5961015860276	35	9
5935015372064	46	12	6150015860281	35	4
4320015372098	46	8	6150015860317	15	4
3020015372137	51	7	6150015860319	17	22
4320015372149	46	15	5998015860344	21	3
5935015399272	55	75	6150015860351	17	25
5340015408655	55	62	5940015860410	15	5
5365015426383	43	2	6150015860411	18	6
2815015426394	43	9	5935015860557	22	10
5340015426396	43	8	6150015860561	19	18
5331015468126	26	19	6150015860566	21	12
5310015577264	26	7	6150015860601	19	38
5940015600703	55	63	6150015860640	17	11
6115015617329	1	1	6150015860702	21	17
6115015617438	1	2	6150015861848	15	11
5310015626014	13	17	6150015861850	17	31
	55	80	3110015862415	53	12
5925015694427	3	3	6150015862781	21	25
5925015696394	3	5	5340015868449	55	30
5935015699460	55	32	5330015869080	32	7
5935015699470	55	37	5330015869086	41	1
5935015699506	56	11	5360015869113	53	16
5935015699542	55	41	4710015869233	37	2
5940015700849	56	12	4730015869235	29	8
5935015703453	56	16	4810015869239	51	1
5935015704538	55	34	4710015870639	29	17
5935015704557	56	14	4710015870644	29	12
5925015715799	3	4	4710015870647	29	20
5935015716514	55	64	4320015870865	12	11
5999015722092	55	14	2895015873807	53	10
5999015821957	55	52	2815015874306	38	3

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5930015875396	6	5	5340015880260	48	21
2815015875843	48	24	5340015880262	48	4
2895015875845	48	25	5340015880263	45	11
2895015875851	48	26	5330015880723	42	10
2815015875862	53	4	5330015880728	43	11
2815015875919	53	3	2940015880924	13	7
2815015875938	53	1	3030015880982	34	8
2815015875949	47	9	2910015881824	12	3
2815015875954	39	3	2930015882852	10	24
2895015876016	45	6	6145015883447	4	33
2895015876053	51	2	5999015883447	12	13
5930015876626	55	51	5340015883558	57	30
2940015876850	39	4	2940015883658	8	2
3110015876857	48	13	2940015883663	8	1
2815015876917	48	3	6150015883988	7	15
3110015876924	48	19	6150015883992	7	14
3110015876935	48	15	6150015883995	7	13
3110015876944	48	14	6150015884000	6	30
5925015876954	2	19	5307015884044	14	9
3110015876956	48	20	6115015884725	5	3
3110015876968	48	18	6150015885253	7	11
6115015877589	23	29	5935015885256	55	15
	24	21	5935015885261	55	36
5935015877601	55	72	5999015885530	55	55
5935015877612	55	18	5935015885541	6	29
5998015877618	7	10	5935015885600	6	32
4820015878062	26	13	6150015885606	6	6
5340015878376	47	13	6150015885621	6	3
5330015878541	38	2	6150015885631	6	21
5340015878549	19	12	6150015886024	6	11
5307015878555	32	10	6145015886398	55	83
5310015878556	23	21	6145015886489	16	16
	24	28	6145015886563	55	84
5360015878665	31	10	6145015886588	55	82
5330015878670	37	3	6145015886850	BULK	1
5330015878678	41	2	5935015886862	55	65
5310015878685	30	5	6145015886873	28	3
5330015878688	33	3	5998015887145	7	6
5360015878698	30	19	6130015887145	7	7
5340015878720	48	7	5998015887279	6	33
5306015878726	30	2	6115015887288	23	7
5340015878744	48	8		24	34
5306015878754	31	3	5340015888328	10	15
2815015879098	46	1	5305015889321	4	21
2815015879127	47	3		5	16
2815015879131	47	4	2920015890612	34	7
2990015879135	48	16	4730015890851	11	37
5340015879944	30	18	4820015891015	11	40
5306015880255	48	5	5340015891081	55	48

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310015893727	1	47		21	26
	4	4		35	7
	10	3		55	16
	11	7		BULK	36
	14	5	5365015908328	21	4
	16	2	4310015908438	42	1
	20	3	4310015908447	48	1
5310015893734	4	71	2930015908522	10	9
5325015893734	14	6	5365015912541	31	4
4730015893753	11	21	6110015915195	15	1
4720015893798	13	5	4820015916101	23	22
4910015893803	4	25		24	12
4910015893807	4	26	5306015916658	23	36
5930015894070	6	15		24	41
5310015894140	16	11	5340015917301	8	10
5340015894472	6	24	5305015921168	14	1
5330015894656	6	9		17	7
5330015894667	18	5		20	1
5331015894780	48	30		26	15
5365015894782	31	8		55	81
5340015895756	43	6	4330015923418	8	3
5340015895760	49	2	6625015926232	2	13
5330015895764	49	5	6150015926626	2	5
5330015896527	BULK	8	6150015926629	2	4
5330015896559	BULK	9	6150015926637	17	35
3020015899931	50	1	6150015926641	17	39
5340015899988	4	16	6160015926648	2	7
	5	13	6150015926743	2	12
5340015900063	4	39	6150015926746	2	14
5330015900070	7	9	4730015926772	10	19
5930015900170	19	27	5305015928054	13	2
5365015900371	4	28		55	78
4730015901311	25	2	5935015928518	56	17
5935015901601	6	12	4010015928567	BULK	37
5340015901601	19	25	4010015928570	BULK	34
5340015903803	22	13	4710015929384	26	18
5930015905539	6	4	5340015932738	4	7
5935015905546	55	61	5340015932741	4	6
5306015905676	43	3	5340015932743	4	18
5315015906563	30	14		4	22
5340015906569	53	15	5340015932744	4	46
5935015906702	19	24	5340015932746	10	4
5975015906706	12	9	5340015932748	10	6
4010015906749	17	37	5340015932750	4	56
	18	8	5342015932753	4	38
	19	35	5342015932754	4	13
4110015906749	19	44	5330015932769	11	47
4010015906749	21	14	5340015933798	19	10
	21	20	4010015934805	BULK	39

STOCK NUMBER	FIG.	ITEM
5310015935320	6	16
5340015935321	9	2
5340015935913	4	61
5340015935979	4	36
5340015936025	4	14
4720015938806	11	23
4010015942186	BULK	35
4720015942216	10	34
	BULK	12
5970015942369	BULK	32
6150015942384	19	33
2815015953866	47	10
5925015954319	19	14
5430015955961	10	23
5305015956003	4	66
5305015956135	7	16
5330015956147	5	7
5330015956168	6	10
5330015956467	6	8
5935015956861	19	15
2815015957311	24	16
2815015957312	40	3
6680015957336	26	9
2815015957518	24	15
6110015958949	35	1
2930015959350	10	11
2910015959558	11	36
4010015960040	BULK	38
5310015960059	11	50
5305015961447	6	17
5305015963600	15	2
5305015963670	12	14
5305015963678	20	6
6154015964356	BULK	41
4010015965308	BULK	40
4730015966452	12	19
4710015966464	11	25
4730015966482	26	17
4720015966552	12	8
5365015971376	12	18
5330015971377	11	49

STOCK NUMBER	FIG.	ITEM
5310015973069	22	3
2815015975235	25	1
4310015975318	11	44
2930015976224	33	2
4720015976246	13	20
4720015976254	13	21
4720015976349	11	43
4720015976400	13	22
4710015976532	29	7
2815015976535	29	1
2815015976536	29	2
4730015979059	11	1
6620015982271	26	2
4010015906749	17	40
5330123826622	BULK	26
5330123826625	BULK	27
9390123827191	BULK	25
5340145141736	53	7
5340159003805	22	6
2910200027185	57	22
9150200044776	BULK	7
4720200059980	BULK	15
4720200060172	BULK	13
4720200061632	BULK	14
5306221271431	45	5
5340982059079	49	6
2930982059103	33	6
5340992354309	44	3
5310993711050	17	8
	18	2
	19	17
2815996104361	44	2
5360999115629	44	4
2990999175958	33	10

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
PART NUMBER INDEX

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
A002TA9071	34	7	AEN12F250000CH2A31	15	3
A026C355	23	34	AEN15M10C000WA2AA1	14	7
A026D370	6	33	AEN18M08B000BA7H91	22	21
A026D949	7	7	AEN18M08B000BB1K42	34	9
A026E304	23	13	AEN18M10C000DG8A31	11	28
A026E310	24	2	AES01C438B75WA6FY1	22	11
A026E707	7	16	AES07M06A070WB4AA1	11	52
A026E709	7	9	AES07M06B045WB4AA1	13	18
A026F088	6	22	AES07M10B020WB4K41	22	17
A026F118	20	4		40	4
A026F215	7	10	AES10C025CZ7A32	11	26
A026F710	23	7	AES10M06A012WB4K42	57	15
	24	34	AES10M06A016WB4K42	2	22
A026F712	23	2		4	5
A026F713	24	29		8	7
A026G053	6	24		9	7
A026G777	24	10		10	1
A026H431	24	9		11	3
A026J177	6	10		12	14
A026J180	6	8		17	19
A026J182	6	9		19	29
A026J838	23	29	AES10M06A020WB4K42	3	7
	24	21		4	72
A026K431	21	3		5	1
A028X837	10	9		14	1
A030S159	23	23		16	8
A030X159	24	11		17	7
A032X895	23	31		20	1
	24	22		26	15
A034L400	23	30		55	81
	24	25	AES10M06A030B4K42	57	18
A035B004	27	1	AES10M06A045WB4K42	17	44
A1512	BULK	25	AES10M06A055WB4K42	20	6
A206D375	6	7	AES10M08B020WB4K42	8	12
A2539	BULK	8		10	26
A3521	BULK	9	AES10M08B025WB4K42	9	3
A3709	BULK	26		22	2
A3921	BULK	27		34	4
AA55804-3B 9FT	1	26		40	2
AEB02C375B50WA6FY1	22	5	AES10M08B060CH1K42	34	6
AEN045M508000CX0A36	5	15	AES10M10C030WB4K42	13	2
AEN04M508000CX0A36	4	24		55	78

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
AES10M6A016WB4K42	57	5	DHR12US9206*01EF1	6	5
AES10N10C025WB4K42	25	10	DIN 125 M3	17	8
AES10N10C030WB4K42	22	9		18	2
AES46M508016CH2A31	4	55		19	17
	15	2	DIN125-M4	19	2
AES47M407016DG6CP2	11	48	DIN126-M8	34	1
AESF5C112312WA2A26	6	31	DIN126-M10	22	18
AESZAC190375WA1FY1	11	46	DIN127-M6	11	45
AEW01X375000BD6AQ1	22	7	DIN1481-M3X40	40	5
AEW10X437000BD6AQ1	22	14	DIN6923-M10	35	2
AEW13X164000GD5A21	19	4		55	76
AEW13X250000GD5A21	4	32	DIN6923-M4	17	2
	5	2		19	5
	11	16		21	6
	19	11	DIN6923-M6	2	2
AEW13X375000GD5A21	55	77		4	12
AEW13Z250000GD5A21	12	12		4	31
AEW20M010000D88A31	11	27		5	8
AEW20X010000BD8A21	14	8		8	11
AEW22X190000EA1AA1	12	5		10	39
AEW23X06R10MSE4A31	4	20		11	19
AEW24X37N062BD6FY1	23	37		12	16
	24	40		17	21
AEW25X266062EA1AF1	11	51		19	6
AEW31M08B000A6FL1	22	4		32	12
AF26116	8	2		57	7
AH1948500	8	1	DIN6923-M8	9	1
AS25036-157	56	10		10	22
ASTM D5363	BULK	24		34	3
ATUM 24/6-0	1	39		35	13
	BULK	32	DIN7380A2-M5X25	2	18
B120-7032	3	2	DIN7380A2-M6X12	4	15
B1834C06030N	16	3		5	10
C-04-21420	4	66		11	9
C-04-21421	5	7		19	9
C22275-020-4	57	30	DIN7985-M2X3	6	25
CD042256C	1	42	DIN-9021-M6	13	17
CD3101E18-19S	1	44		55	80
CD3106E18-19P	1	38	DIN912-M6X16	26	23
CD389/26WH21SN-BS23	55	7		36	1
CD389/26WJ29SN-BS25	55	2	DIN931-M4X16	17	5
CD389/26WJ61SN-BS25	55	5		19	1
CJV-13	13	16	DIN931-M4X6	21	1
CJV-1709	57	14	DIN931-M5X30	12	4
CT150E24E2S	15	1	DIN933-M3X16	17	9
D38999/26WH21SN	55	8		18	1
D38999/26WJ29SN	55	3		19	26
D38999/26WJ61SN	55	6	DIN934-M3	17	6
DG3M6F-S-RPC	16	13		18	14

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
	19	16	MS 122916	57	6
DIN934-M5	2	15	MS20659-12	15	8
	35	12	MS20659-41	17	23
DKR12US0094*02EA	6	4	MS20659-9	17	28
DR20BLKWRTR	19	15	MS21333-126	55	79
DRC26-50S04	55	18	MS24523-31	2	20
DT04-2P	23	10	MS25036-103	55	19
	24	37	MS25036-105	55	43
DT04-4P-EP13	55	69	MS25036-109	55	54
DT06-08SA	55	72	MS25036-112	56	2
DT06-2S	21	11	MS25036-148	4	41
	55	27		11	12
DT06-3S	18	10	MS25036-155	19	37
	55	23		21	16
DT06-45	17	16	MS25043-16DA	6	2
DT06-4S	19	19	MS25043-18DW	6	12
	55	67		19	25
DTP06-4S	21	8	MS25043-20DA	6	13
E9151-33140	43	2	MS25224-1	6	14
EF20C0028722	55	40	MS3102R18-19SN	19	24
	BULK	6	MS3420-4	55	60
EF20C0038722	55	47	MS35489-46	10	20
	BULK	1	MS35645-1	11	8
EM4A080	55	83	NL6448BC20-21C	6	23
EM4D147	55	84	P35900661	11	37
EM4E393	55	82	P4055-5001-1	26	2
EM4H710	16	16	PC150A1	9	4
FA1493FFF3000	1	31	PLT4S-M30	25	6
FFW92 TYPE A CLE GRI	16	6	PLT4S-M30	2	11
FSCMN-03	12	3	PR11-42-15.0A-XX-V	19	14
GH60-04G-B-LF	35	9	PR11-62-15.0A-XX-V	19	13
GH120-10	BULK	16	PS-PC1370-11	26	6
HAB-80-S	2	13	Q06557A-10	8	3
HH150-3243-0	26	5	R15S	13	7
J515CH29X0386H	12	2	RA25177M	55	38
JSKG11	10	10	RS6220	11	50
KW40-924C1-1	17	20	SAEJ12318-12430160B	25	4
M24243/6-A402H	1	6	SAEJ1508CTB-16	26	24
	57	27	SAEJ1508CTB-27	25	5
M45913/1-6CGS5C	22	1	SAEJ1508CTB-29	57	8
M45913/38CS6N	16	10	SAEJ1508D11	57	23
M45938-1-4C	6	27	SAEJ1508D9	57	19
	7	5	SAEJ5144-4070202C	31	20
M85049/38C-4A	55	59	SAEJ5144-8140239C	25	3
M85049/39-23W	55	9	SAEJ5145-6070120C	12	6
M85049/39-25W	55	4	SAEJ5302-2130239B	26	1
MEP-1030	1	1	SAEJ12312-34314608	13	10
MEP-1031	1	2	SAEJ1508CTB-30	10	30
MIL-S-46163A	BULK	31	SAEJ1508CTB-40	10	32
MMF1203M06F16M4	21	4	SAEJ1508CTB-42	10	28

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
SAEJ1508CTB-58	8	8		55	28
SAEJ1508CTB-67	8	4	W3G300-ER38-47	10	38
SAEJ1508F10	10	36	W3S	18	13
SAEJ1508F72	11	20		55	21
SAEJ5144070221C	12	9	W4S	17	17
SAEJ5144140109C	13	13		19	21
SAEJ51442-140140B	13	11		55	68
SAEJ5144-4070202C	13	8	W8S	55	71
SAEJ5144-4140137C	13	9	WP-4S	21	9
SAEJ5144-4140339C	11	38	XPZ8879426-10887	34	8
SAEJ5144-6070220C	12	7	XV501P-12	26	13
SAEJ5145070118C	11	2	XV502P-4-04	11	40
SAEJ5145070601B	11	42	6202	10	13
SAEJ5145070801B	11	10		13	4
SAEJ5145-4070202C	13	12	9269	36	2
SAEJ5145-4070302C	11	41	9512	BULK	4
SAEJ5145-6070220C	12	1	9514	BULK	3
SAEJ5146-4080102C	12	10	25960	19	30
SAEJ58A574C3B08CY22	24	39	25970	19	31
SOS-85.1-12	7	3	35111	56	4
SP2529VT	10	17	35112	56	9
ST-301-3/16BLAC	55	25	35277	15	5
	BULK	18	35678	15	12
TAG22T2-100B	17	30	36152	1	40
TAG26T6-100B	19	22		55	58
	19	36	36160	17	38
	21	15		23	14
TAG2T5-100B	4	43		24	4
	11	14	36808	15	15
	15	7		17	32
	17	14	44832	2	9
	18	9		4	1
	35	6		10	7
	55	10		19	8
	56	8	56541	BULK	29
TAG3T3-100B	55	11	60225	6	16
TAG3T3-100B	1	41	68035	BULK	30
TAG9T3-100B	15	14	70313	10	25
	17	34	70506	10	23
	21	21	81683	18	5
	55	26	85295	17	4
TFT-250-16	55	20		21	2
	BULK	22	89418	19	23
W12S	21	22	89418	BULK	2
W2P	23	12	114017	18	11
	24	38		21	7
	55	46		55	66
W2S	21	10	114018	56	15
	23	16	130207	4	44
	24	7		11	15

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
	19	41	01754-50610	33	10
160140	35	11	01754-50640	45	5
322123	29	16	01759-50161	38	5
322135	29	6	0185-2094	46	4
322136	29	5	0185-2391	37	4
420338	16	7	0200-3218-01	23	1
882307	26	4	0200-3219-01	24	1
1788880	55	31	0201-3649-01	23	18
3058529	BULK	11	0201-3650-01	23	24
11674728	2	17	02056-50060	30	17
12010300	55	33	0211-0427	24	33
12015899	55	39	0211-0435	23	6
12065287	55	53	0234-0895	24	8
12077411	55	35	02751-50060	33	8
12089188	55	29	02756-50060	38	4
12089290	55	52	02761-5004-0	28	2
12124076	55	55	02783-50100	54	6
12129381	56	13	03024-50510	43	7
12162193	55	56	03024-50520	29	4
12191818	55	50	0323-2538	23	15
12422624	55	44		24	5
15324982	55	30	04-20000-1	1	22
15326808	55	49	04-20000-2	1	23
15336703	56	16	04-20000-3	1	24
15366021	55	48	04-20010	55	1
1685122140	47	11	04-20053	12	8
2915011007	4	37	04-20072	22	19
01023-50610	45	7	04-20103	22	15
01023-50612	51	6	04-20141	40	3
	53	14	04-20153	40	1
01023-50614	39	2	04-20157	25	1
	52	7	04-20162	26	14
01023-50616	32	13	04-20166	26	17
01023-50618	30	1	04-20173	17	43
	49	16	04-20174	17	42
01023-50620	41	6	04-20181	6	19
01023-50622	33	1	04-20202	11	24
	41	7	04-20203	11	25
01023-50635	53	24	04-20209	3	1
01023-50680	49	13	04-20232	18	3
01023-50690	49	11	04-20234	16	4
01023-60650	32	11	04-20246	19	7
	49	14	04-20248	19	12
01123-50825	32	1	04-20254	21	17
01123-60814	39	1	04-20255	19	18
01123-60816	22	20	04-20256	17	11
	42	9	04-20258	21	12
0130-8255-2-010L	10	11	04-20260	15	9
0149-2769	12	11	04-20261	15	4
01513-50618	38	1	04-20262	17	27

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
04-20263	17	25	04-20538	1	45
04-20264	17	22	04-20581	13	15
04-20265	19	38	04-20585	2	7
04-20266	17	31	04-20615	11	30
04-20282	4	27	04-20618	12	19
04-20285	4	51	04-20619	12	17
04-20292	20	2	04-20623	12	15
04-20293	20	5	04-20630	4	36
04-20313	5	12	04-20645	2	16
04-20332	4	50	04-20649	4	59
04-20333	4	62	04-20650	7	8
04-20334	4	45	04-20651	4	61
04-20335	16	15	04-20672	8	5
04-20363	17	10	04-20673-1	2	5
04-20364	4	53	04-20674-1	2	8
04-20367	26	18	04-20674-2	2	4
04-20369	4	54	04-20675-1	2	12
04-20377	11	5	04-20675-2	2	14
04-20385	6	15	04-20696	15	11
04-20399	5	9	04-20711	21	25
04-20400	4	49	04-20712	19	42
04-20404	4	73	04-20723	10	35
04-20405	4	70	04-20724	10	29
04-20406	12	18	04-20725	8	9
04-20407	14	4	04-20726	10	31
04-20411	6	29	04-20727	10	34
04-20412	6	32	04-20732	19	10
04-20414	5	4	04-20733	10	27
	6	1	04-20734	10	33
04-20417	22	16	04-20735	8	6
04-20421	6	6	04-20736	9	10
04-20422	6	3	04-20744	11	29
04-20424	5	6	04-20747	4	13
	7	1	04-20748	4	14
04-20434	7	14	04-20749-1	22	3
04-20435	7	15	04-20749-2	22	10
04-20436	7	13	04-20759	16	1
04-20437	6	30	04-20767-1	13	20
04-20438	7	12	04-20767-12	13	21
04-20439	7	11	04-20767-25	11	23
04-20441	6	11	04-20767-26	11	22
04-20442	5	3	04-20767-29	11	43
04-20453	18	6	04-20767-4	13	19
04-20454-3	14	2	04-20767-6	13	22
04-20454-4	14	3	04-20769-1	23	36
04-20499	1	46		24	41
04-20501	11	36	04-20771	35	3
04-20534	12	20	04-20774	57	17
04-20535	11	47	04-20775	57	1
04-20536	11	49	04-20792	11	31

PART NUMBER	FIG.	ITEM
04-20793	11	6
04-20829	11	32
04-20832	10	4
04-20833	10	6
04-20844	57	13
04-20849	2	3
04-20852-1	57	20
04-20860	32	10
04-20861	11	39
04-20868	BULK	28
04-20872-1	4	30
04-20880	5	14
04-20883	4	76
04-20884	13	14
04-20902-1	17	1
04-20902-2	21	5
04-20902-5	17	41
04-20908	4	80
04-20909	4	79
04-20916	10	8
04-20940	4	3
04-20941	4	77
04-20944	4	17
04-20950	32	9
04-20969	6	26
04-20985	4	7
04-20986	4	6
04-20987	4	19
04-20992	4	2
04-20997	10	2
04-21011-1	1	19
04-21016	1	30
04-21017-1	1	36
04-21022-1	1	17
04-21022-2	1	18
04-21023-1	1	13
04-21023-2	1	14
04-21024-1	1	15
04-21024-2	1	16
04-21025	1	25
04-21026	1	5
04-21030-1	10	5
04-21031-1	10	12
04-21031-4	4	60
04-21031-5	5	11
04-21039	4	67
04-21043	11	1
04-21045	4	68
04-21046	4	69
04-21058	6	21

PART NUMBER	FIG.	ITEM
04-21070-3	10	14
04-21070-4	10	18
04-21070-5	10	21
04-21072	4	35
04-21073	4	22
04-21074	4	25
04-21075	4	26
04-21076	4	23
04-21077-1	1	11
04-21077-2	1	12
04-21078-1	1	9
04-21078-2	1	10
04-21080	56	1
04-21081	4	57
04-2108-3	57	10
04-21102	4	46
04-21103	16	9
04-21104	4	56
04-21106	1	29
04-21107	2	1
04-21130	1	3
04-21131	1	4
04-21152	17	3
04-21153-1	11	11
04-21153-13	11	33
04-21153-3	11	17
04-21153-4	4	40
04-21153-6	4	74
04-21159	4	38
04-21162	4	34
04-21175	57	9
04-21204	6	28
04-21208-4	57	12
04-21210	11	44
04-21228	1	37
04-21236	1	8
04-21237	1	20
04-21240	1	21
04-21242	6	20
04-21282-1	4	78
04-21292	14	9
04-21295	26	21
04-21299	26	22
04-21318-02	4	33
04-21318-1	19	3
04-21318-2	12	13
04-21321	9	6
04-21322	4	48
04-21338	9	8
04-21343	2	21

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
04-21348	1	27	04814-00160	39	5
04-21352	11	21	04814-10070	30	11
04-21365	4	18	04814-10160	30	7
04-21386	57	11	04814-16220	48	30
04-21393	10	37	04814-50300	43	1
04-21402	7	4	05012-00508	46	17
04-21420	7	2	05012-00814	46	7
04-21422	7	6	0503-2726	BULK	12
04-21425	35	4	0508-0055	24	3
04-21452	26	9	0526-0015	24	26
04-21475-1	1	35	0526-0390	23	21
04-21485	13	5		24	28
04-21502	10	19	0528-001-5005	55	15
04-21503	57	28	05411-00314	30	14
04-21504	13	3	05411-00318	53	20
04-21510-3	26	25	05411-00420	45	12
04-21529-1	26	11	05712-00408	54	2
04-21547-3	57	25	05712-00515	48	23
04-21551-4	57	4		53	9
04-21569	5	5	05712-00518	51	5
04-21599	25	7	06311-85025	46	2
04-21614-1	17	35	07715-00401	51	3
04-21614-2	17	39	07715-00801	53	5
04-21625	6	18	07715-03207	48	2
04-21626	7	17	07715-03211	49	7
04-21674	19	28	07715-03217	53	3
04-21676	57	29	0800-0003	24	27
04-21683	34	5	0800-0050	23	19
04-21684	34	2		24	14
04-21701	6	17	080061BE	10	24
04-21704	19	33	08153-06203	53	8
04-21723	4	9	0850-0040	24	13
04-21724	4	10	0850-0050	23	20
04-21725	4	8	09130SWC8	BULK	5
04-21732	25	11	09318-88125	43	4
04-21733	4	11	09661-40040	29	21
04-21742	26	10	09661-40085	29	18
04-21748-1	4	58	09661-40130	29	13
04-21763	26	8	1/4X1/4F3HG	25	2
04-21766	4	63	1011-347-0605	55	73
04-21771	31	16	1011-348-0805	55	70
04-21815	26	20	1062-20-0122	55	14
04-21832-2	25	8	11.131.457	35	1
04512-60050	53	22	11420-13150	44	5
04512-60060	31	1	1231/72	19	27
0460-202-16141	23	11	12485651-125	55	74
	24	6	125HB-3-4	57	26
	55	45	125HBL-4-2	10	16
04612-00170	53	11	13230E6382-8	22	8
0462-201-16141	21	23	13230E6651-24	BULK	41

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
14601-0345-0	42	8	15841-5606-0	53	17
14601-1324-0	44	4	15841-5613-0	53	18
14601-1333-0	44	3	15841-5615-0	53	19
14601-1336-0	44	2	15841-5623-0	53	23
14601-1424-0	45	3	15841-5711-2	30	8
14971-4275-0	29	14	15841-57212	30	15
15108-5728-00	30	20	15841-7286-0	33	6
15241-3229-0	49	9	15841-7287-0	33	7
15261-0337-0	42	6	15841-7292-3	32	7
15261-2133-0	47	7	15841-7296-0	33	5
15261-23530	48	10	15841-7302-0	46	18
15261-2354-3	48	7	15841-7425-0	33	9
15261-2395-0	48	11	15841-91010	49	15
15261-23960	48	12	15841-9105-0	54	4
15261-2397-3	48	8	15841-91500	31	9
15261-2398-3	48	9	15841-9151-0	33	4
15261-5547-0	53	7	15841-92320	31	2
15261-6641-0	53	21	15841-9401-0	26	3
15261-9601-0	42	7	15841-9602-0	32	5
	46	10		42	4
15261-9616-0	46	6	15841-96650	31	13
15263-1237-0	9	9	15841-96660	31	18
15321-3396-0	46	14	15842-9402-2	45	8
15321-9626-0	42	5	15861-22970	47	14
15451-9627-0	46	5	15861-22980	47	15
15481-9401-0	49	10	15861-9665-0	31	14
15521-9602-0	46	9	15875-1617-3	53	10
15521-9603-0	46	13	15875-24013	52	4
	49	4	15875-2425-0	52	6
15601-96650	29	15	15875-2428-2	52	5
15785-2437-0	52	3	15875-24320	52	2
15841-04562	48	17	15875-9934-0	52	1
15841-0480-3	41	3	15877-04140	49	12
15841-0481-5	41	4	15881-2331-0	48	28
15841-0482-3	41	2	15881-91030	50	2
15841-1354-0	42	2	16000-5423-0	53	16
15841-1356-0	42	3	16001-53000	29	9
15841-1403-0	45	1	16001-5390-0	29	8
15841-1423-0	45	2	16006-52092	31	5
15841-1627-0	51	4	16006-52112	31	6
15841-1632-0	53	13	16006-52122	31	7
15841-23250	48	29	16030-9601-0	31	12
15841-2411-0	48	27	16221-7327-0	32	3
15841-35660	54	5	16241-73360	32	15
15841-3693-0	49	8	16241-7337-0	32	14
15841-51320	31	17		43	10
15841-51350	31	19	16299-6015-0	36	3
15841-5362-2	29	10	16809-4202-0	29	20
15841-5545-2	53	4	16809-4203-0	29	17
15841-5569-0	53	6	16809-4250-0	29	12

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
16825-0402-4	49	1	1G460-0704-0	48	21
16851-13280	44	1	1G460-0709-0	48	4
16851-1511-0	45	10	1G460-1431-2	45	11
16851-1555-2	51	1	1G460-1435-0	45	4
16851-1621-2	46	3	1G460-2347-0	48	24
16851-2198-2	47	10	1G460-2382-0	48	13
16851-2201-5	47	9	1G460-2383-0	48	18
16851-22320	47	12	1G460-2391-0	48	25
16851-2233-0	47	13	1G460-2392-0	48	26
16851-3211-0	39	4	1G460-2393-0	48	14
16851-3501-2	54	1	1G460-2394-0	48	19
16851-35152	54	3	1G460-2395-0	48	15
16851-3695-0	49	6	1G460-2396-0	48	20
16851-5115-0	53	2	1G460-5371-2	29	1
16851-5641-0	30	19	1G460-5372-3	29	2
16851-7343-0	33	3	1G460-5373-2	29	3
16851-9626-0	46	15	1G513-3655-0	46	11
16851-9627-0	46	8	1G639-5715-0	30	6
16861-1602-4	53	1	1G687-1311-0	44	7
16861-93310	49	3	1G687-1312-0	44	6
16864-1651-0	51	7	1G687-2111-3	47	5
16866-5730-2	30	18	1G687-2177-0	47	1
16866-9201-0	30	5	1G687-2178-0	47	2
16871-1443-0	45	9	1G687-2190-3	47	6
16871-2131-0	47	8	1G700-5216-0	31	8
16871-9105-0	30	2	1G700-5220-0	31	4
16871-9106-0	31	3	1G801-05120	43	8
16871-9730-0	53	12	1G820-0413-0	49	5
16878-5792-0	30	13	1G820-5101-0	31	11
16881-65512	28	1	1G820-5611-2	30	9
17331-5919-0	46	16	1G820-5628-2	49	2
17KP739	56	12	1G820-5648-2	31	10
187050F-03-1	2	19	1G820-5774-3	30	10
19077-53650	29	11	1G820-7303-0	33	2
19202-9101-0	30	16	1G911-05203	43	9
19215-2328-0	48	3	1G911-9102-2	43	3
19215-9916-0	41	5	1G952-0101-9	46	1
19280-5724-0	30	12	1G960-0436-0	41	1
19837-5772-3	30	4	1G960-0551-2	43	5
1E051-7326-0	32	2	1G960-0555-0	37	2
	32	4	1G960-1177-0	37	1
1E110-5700-0	30	3	1G960-1450-5	43	6
1E121-1231-0	38	3	1G960-2105-0	47	3
1E132-7270-0	32	8	1G960-2109-0	47	4
1E132-7335-0	32	16	1G962-0150-2	39	3
1E152-5605-0	53	15	1G962-0304-5	42	1
1G065-4236-0	29	19	1G962-0331-3	42	10
1G460-0404-0	48	22	1G962-0705-0	48	16
1G460-0409-0	48	6	1G962-1182-0	37	3
1G460-0454-0	48	5	1G962-1235-0	38	2

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
1G962-1426-2	45	6		4	75
1G962-1452-2	43	11		11	13
1G962-1601-5	51	2		11	18
1G962-2301-2	48	1		11	34
1G962-2375-2	48	31		19	40
1G962-2376-2	48	32		BULK	34
1G962-2377-2	48	33	3271-14-41	BULK	35
1G962-4250-0	29	7	3271-16-26	17	37
1G962-6556-0	28	3		17	40
1G962-7428-0	50	1		18	8
202229A	9	5		19	35
20593C400	55	65		19	44
213P-8	25	9		21	14
215M-ONAN-01	13	6		21	20
218N1F02	55	51		21	26
218N1T02	56	5		35	7
218N1T14	56	3		55	16
22190-220002	26	7		BULK	36
222E3T02	2	10	3271-20-10	17	15
22310-200	3	5		55	17
22320-200	3	3		BULK	37
22330-200	3	4	3271-6-133	15	13
2-36160-1	35	5		17	29
240-2128-ND	19	32		17	33
24311-000320	26	19		BULK	38
25-1942-45-00-00	57	22	3271-8-133	15	6
28137-3	22	6		15	10
29550-4	22	13		17	24
2ER654	17	18		17	26
	18	12		BULK	39
	19	20	34150-2758-0	46	12
	55	22	343544R91	31	15
2HB188	55	75	354-310102-00-5869	4	52
2KP504	55	62	36152	21	13
3/ 4 CD-S	26	12	39101-75030	4	71
30-10-0003	BULK	13		14	6
304-0807	23	25	39101-76030	1	47
	24	17		4	4
31S-283-0U	3	6		10	3
32004-A2	56	11		11	7
32004-B2	56	17		14	5
32004-TP2	56	14		16	2
32006-A22	55	32		20	3
32006-B22	55	36	3918199S	8	10
32006-C22	55	41	40-10-0005	BULK	14
32006-D22	55	37	40-10-0016	BULK	15
32006-TP2	55	34	40-10-0017	57	24
3271-10-105	56	6	40CNFHS	4	64
	BULK	40	4219-0109	BULK	10
3271-12-65	4	42	4230-0134	BULK	23

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
44832	11	4	88-20075	1	7
5024-0250	32	6	88-20110	1	34
503-0183	23	17	88-20218	4	29
50-40-0018	57	3	88-20225	23	22
50-60-0028	57	21		24	12
50-60-0045	57	16	88-20226	24	16
509-0094	23	5	88-20227	24	15
509-0099	24	32	88-20230	23	4
510-0102	24	20		24	31
510-0112	23	28	88-20275-1	55	24
526-0008	23	26	88-20275-3	18	7
	24	18		19	43
52942-1	19	39		35	8
55768-1	17	12		55	57
55936-2	17	36	88-20275-4	19	34
	21	18	88-20541-1	1	43
55PP02872757640064	17	13		BULK	17
	21	19	88-20541-11	55	42
	55	12		BULK	19
	56	7	88-20541-14	BULK	20
	BULK	21	88-20541-15	35	10
55X	9	2		BULK	33
60-30-0025	57	31	8-820568-3	16	5
639101-76030	26	16	88-21146	4	47
69-570-2	4	28	88-21776	1	33
6HB683	55	13	88-22336-1	16	12
72-2236	16	14	88-22836	2	6
7HA302	21	24	8HA889	21	27
813-0100	23	33	90278A331	4	21
	24	23		5	16
815-0181	23	3	9171K241	10	15
	24	30	9176K155	1	32
815-0774	23	9	92461A500	22	12
	24	36	929939-1	55	63
8-325-82	4	39	93-193	13	1
8-325-88	4	16	95395A250	16	11
	5	13	963040-3	55	64
84-13000	11	35	97-3106A-10SL-4S(624)	55	61
846-1p	BULK	7	97-50-170-11	4	65
85094-12	18	4	98-19694	1	28
853-0008	23	32	99-20-0019	57	2
	24	24			
853-0013	23	8			
	24	35			
862-0003	23	35			
870-0131	23	27			
	24	19			

END OF WORK PACKAGE

CHAPTER 7

SUPPORTING INFORMATION

FOR

AMMPS 5KW GENERATOR SET

CHAPTER 7
SUPPORTING INFORMATION

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
REFERENCES.....	0160
MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION	0161
MAINTENANCE ALLOCATION CHART (MAC)	0162
EXPENDABLE AND DURABLE ITEMS LIST	0163
MAINTENANCE AND DEFERRED MAINTENANCE ITEMS LIST	0164

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
REFERENCES

SCOPE

This WP lists all the field manuals, forms, technical manuals, and miscellaneous publications referenced in this TM.

FIELD MANUALS

FM 4-25.11	First Aid
FM 5-424	Theater of Operations Electrical Systems

FORMS

AFI 21-101	Aircraft and Equipment Maintenance Management
AFI 33-201	Air Force Instruction, Communications Security
AFR 900-4	Product Quality Deficiency Report (PQDR)
Air Force Technical Order (AFTO) Form 22	Technical Manual (TM) Change Recommendation and Reply
AR 25-30	The Army Publishing Program
AR 700-138	Army Logistics Readiness and Sustainability
CTA 8-10	Army Medical Department Expendable/Durable Items
CTA 50-909	Field and Garrison Furnishings and Equipment
CTA 50-970	Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)
DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2258	Depreservation Guide for Vehicles and Equipment
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 5988E	Equipment Inspection and Maintenance Worksheet (electronic version)
DA PAM 738-751	Functional Users Manual for The Army Maintenance Management System – Aviation (TAMMS-A)
DA PAM 750-8	TAMMS Users Manual
MCO P4855.10	Product Quality Deficiency Report (PQDR)
SF 361	Transportation Discrepancy Report (TDR)
SF 368	Product Quality Deficiency Report (PQDR)

TECHNICAL MANUALS

NMWR 9-6115-749	National Maintenance Work Requirement (NMWR) for Generator Set, Skid Mounted 5 kW Advanced Medium Mobile Power Sources (AMMPS)
TM 1-1500-344-23	Aircraft Weapon Systems Cleaning and Corrosion Control
TM 4700-15/1	Tactical Equipment Records Procedures
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command)
TM 9-6115-749-10	Operator's Manual For Generator Set, Skid Mounted 5 kW Advanced Medium Mobile Power Sources (AMMPS)
TM 9-6115-755-13&P	Operator and Field Maintenance Manual Including Repair Parts and Special Tools List For Generator Set, Trailer Mounted 5 kW Advanced Medium Mobile Power Sources (AMMPS)
TO 00-20	Series of Technical Orders

MISCELLANEOUS DOCUMENTS

A-A-52557A	Fuel Oil, Diesel; for Posts, Camps and Stations
A-A-52624A	Commercial Item Description: Antifreeze, Multi-engine Type
MIL-A-53009A	Military Specification, Additive, Antifreeze Extender, Liquid Cooling Systems
MIL-C-0010597F(ME)	Military Specification, Cleaning Compound with Conditioner for Engine Cooling Systems
MIL-DLT-83133G	Turbine Fuel, Aviation, Kerosene Type, JP-8 (NATO F-34), NATO F-35, and JP-8+100 (NATO F-37)
MIL-L-46152E	Military Specification, Lubricating Oil, Internal Combustion Engine, Administrative Service
MIL-PRF-2104H	Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service
MIL-PRF-21260E	Performance Specification, Lubrication Oil, Internal Combustion Engine, Preservative Break-in
MIL-PRF-22191F	Performance Specification, Barrier Materials, Transparent, Flexible, Heat-Sealable
MIL-PRF-46167D	Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic
MIL-STD-129	Military Marking Practices for Shipment and Storage
SAE-AMS-T-22085	Tapes, Pressure-Sensitive, Adhesive, Preservation and Sealing
TB-43-0211	Army Oil Analysis Program (AOAP) Guide for Leaders and Users
TB 750-651	Use of Antifreeze Solutions, Antifreeze Extender, Cleaning Compounds, and Test Kit in Engine Cooling Systems

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

This MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field – includes two subcolumns, Crew (C) and Maintainer (F).

Sustainment – includes two subcolumns, Below Depot (H) and Depot (D).

The maintenance to be performed at field and sustainment levels is described as follows:

1. Crew maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "C" in the third position of the SMR code. A "C" appearing in the fourth position of the SMR code indicates complete repair is possible at the crew maintenance level.
2. Maintainer maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "F" appearing in the third position of the SMR code. An "F" appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to use after maintenance is performed at this level.
3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "H" appearing in the third position of the SMR code. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.
4. Depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "D" or "K" appearing in the third position of the SMR code. Depot sustainment maintenance can be performed by either depot personnel or contractor personnel. A "D" or "K" appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply systems after maintenance is performed at this level.

The tools and test equipment requirements table (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks table (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

Maintenance Functions

Maintenance functions are limited to and defined as follows:

1. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gaugings and evaluation of cannon tubes.
2. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. **Service.** Operations required periodically to keep an item in proper operating condition, e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
 - a. **Unpack.** To remove from the packing box for service or when required for the performance of maintenance operations.
 - b. **Repack.** To return item to the packing box after service and other maintenance operations.
 - c. **Clean.** To rid the item of contamination.
 - d. **Touch up.** To spot paint scratched or blistered surfaces.
 - e. **Mark.** To restore obliterated identification.
4. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position or by setting the operating characteristics to specified parameters.
5. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.
6. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
7. **Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
8. **Paint (ammunition only).** To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
9. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC, and the assigned maintenance level is shown as the third position code of the Source, Maintenance, and Recoverability (SMR) code.
10. **Repair.** The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the “repair” maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunction; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component that is assigned a SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.
12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance-significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions, refer to “Maintenance Functions” outlined above.)

Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3) by indicating work time required (expressed as man hours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

- C Crew maintenance
- F Maintainer maintenance

Sustainment:

- L Specialized Repair Activity (SRA)
- H Below depot maintenance
- D Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks, and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement, and Diagnostic Equipment (TMDE), and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) Nomenclature. Name or identification of the tool or test equipment.

Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) Tool Number. The manufacturer's part number.

Explanation of Columns in the Remarks

Column (1) Remarks Code. The code recorded in column (6) of the MAC.

Column (2) Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

END OF WORK PACKAGE

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
MAINTENANCE ALLOCATION CHART (MAC)**

Table 1. MAC for AMMPS 5 kW Generator Set.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
00	GENERATOR SET	Inspect	0.6	0.3				A
		Service		0.1			31	A
		Repair		0.2			31	B
01	DC ELECTRICAL INSTALLATION	Inspect	0.1	0.2				A
		Remove/Install		1.1			31	
		Repair		0.3			3,8,9,20,31	C
0101	RELAY PANEL ASSEMBLY	Test		0.1			31	D
		Inspect	0.1					A
		Remove/Install		0.2			31	
02	HOUSING INSTALLATION	Repair		0.1			31	E
		Test		0.1			31	F
		Replace		0.2			31	
03	DIGITAL CONTROL SYSTEM (DCS) INSTALLATION	Inspect	0.1					A
		Remove/Install		4.2			14,31	
		Repair		0.2			31,33	G
0301	CONTROL PANEL ASSEMBLY	Inspect	0.1	0.1				A
		Remove/Install		0.3			31	
		Repair		0.3	0.5		31	H
		Test		0.2				
		Replace		0.2			31	
		Inspect	0.1	0.1				
		Remove/Install		0.4			31	
		Repair		0.3	0.8		23, 31	I
		Test		0.1			31	J

Table 1. MAC for AMMPS 5 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
0302	DCS ENCLOSURE ASSEMBLY	Replace		0.1			31	
		Inspect		0.1				
		Remove/Install		0.4			31	
		Repair			1.0		23, 31	K
		Test			0.5		31	L
04	INTAKE AIR INSTALLATION	Replace		0.2			31	
		Inspect	0.1	0.1				A
		Service		0.2				A
		Remove/Install		1.0			31	
		Replace		0.3			31	
05	EXHAUST INSTALLATION	Inspect	0.1					A
		Remove/Install		0.9			31	
		Replace		0.3			31	
06	COOLING SYSTEM INSTALLATION	Inspect	0.1	0.3				
		Service		0.5			31	
		Remove/Install		4.7			31	
		Repair		0.5			31	N
		Test		0.2			24	
07	FUEL SYSTEM INSTALLATION	Replace		0.7			31	
		Inspect	0.1					A
		Service	0.7	1.2			11,13,3 1.39,40	A
		Remove/Install		1.8			11,13,3 1.39,40	
		Repair		0.3			11,13,3 1.39,40	O
0701	FUEL MANIFOLD ASSEMBLY	Inspect	0.1	0.2				A
		Remove/Install		4.5			11,31,3 4,35,39, 40,41	
		Repair		0.7			11,31,3 4,35,39, 40,41	
		Test		0.5			31	

Table 1. MAC for AMMPS 5 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
0702	FUELFILTER/WATER SEPARATOR INSTALLATION	Replace		0.4			11,31,3 4,35,39, 40,41	
		Inspect	0.1	0.1				A
		Service	0.1	0.4			37	A
		Remove/Install		2.1			31	
		Repair		0.4			31	
		Replace		2.1			31	
08	OUTPUT BOX INSTALLATION	Inspect	0.1	0.2				A
		Remove/Install		1.0			31	
		Repair		0.4			31,33	
0801	CONTACTOR	Inspect		0.5				
		Remove/Install		3.7			31,39	
		Repair		0.5			8,9,20,3 1,39	P
		Test		0.1			31	
		Replace		1.8			31,39	
0802	OUTPUT TERMINAL BOARD	Inspect	0.1					A
		Remove/Install		0.7			31,39,4 0,41	
		Repair		0.2			31,39,4 0,41	
0803	VOLTAGE SELECTION SWITCH	Inspect		0.1				
		Remove/Install		1.0			31,38,3 9	
		Repair		0.2			8,9,20,3 1,38,39	Q
		Test		0.2				
		Replace		0.5			31,38,3 9	
0804	HOUR METER	Inspect	0.1					A
		Remove/Install		0.5			31,38	
		Repair		0.2			8,9,20,3 1,38	R
		Test		0.1			31,38	
		Replace		0.3			31,38	

Table 1. MAC for AMMPS 5 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
0805	CONVENIENCE RECEPTACLE	Inspect	0.1					A
		Remove/Install		0.6			21,31,3 8,39	
		Repair		0.2			21,31,3 8,39	S
		Test	0.1	0.1			31	
		Replace		0.3			21,31,3 8,39	
0806	TRANSFORMERS	Inspect		0.1				
		Remove/Install		0.7			31,38,3 9	
		Repair		0.1			31,33,3 8,39	T
		Test		0.1			31	
		Replace		0.2			31,38,3 9	
0807	PRINTED CIRCUIT BOARD MODULE	Inspect		0.1				A
		Remove/Install		0.6			23,31,3 8,40	
		Repair		0.1			8,9,20,2 3,31,38, 40	U
		Test		0.2			23,31	
		Replace		0.3			23,31,3 8,40	
09	POWER PLANT INSTALLATION	Inspect	0.1	0.1				A
		Remove/Install		2.6			31,39	
		Repair		0.3			31,39	V
		Replace		4.0			31,39	
0901	AC GENERATOR ASSEMBLY	Inspect	0.1	1.0				A
		Remove/Install		4.7			19,31,3 4,36,39	
		Repair		1.5	12.0		8,9,19,2 0, 31,34,3 6,39	W
		Test		1.0			19,31,3 9	

Table 1. MAC for AMMPS 5 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
0902	ENGINE ASSEMBLY	Replace		2.0			19,31,3 4,36,39	A
		Inspect	0.2	0.4				
		Service	0.1	0.3				
		Remove/Install		4.0			31,39,4 1	
090201	LUBRICATION SYSTEM	Repair		1.3	3.5			A A X
		Test		1.0				
		Adjust		1.0				
		Replace		2.2				
		Overhaul			11.0			
		Inspect	0.1	0.1				
		Service		0.3			31,37	
		Remove/Install		1.2			31,37	
		Repair		0.4			31,37	
		Test		0.1			31	
090202	ENGINE SPEED SENSOR	Replace		0.6			31,33,3 7	X
		Inspect	0.1	0.1				
		Remove/Install		0.9			31	
		Adjust		0.4			31	
090203	GLOW PLUGS	Replace		0.1			31	
		Inspect		0.1				
		Remove/Install		0.8			22,31,3 9	
		Test		0.3			31	
090204	FUEL INJECTOR	Replace		0.5			22,31,3 9	Y
		Inspect	0.1	0.2				
		Remove/Install		2.5			11,31,4 0	
		Repair		0.3			11,31,4 0	
		Test		0.4			15,28	
090205	SPEED CONTROL PLATE	Replace		1.1			11,31,4 0	
		Inspect	0.1					
		Remove/Install		0.7			17,31	
		Adjust		0.3			31	

Table 1. MAC for AMMPS 5 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
090206	FUEL INJECTION PUMP	Replace		0.6			17,31	
		Inspect						A
		Remove/Install		6.3			13,18,3 1	
		Repair		0.2			13,18,3 1	Z
		Test		0.5			31	
		Adjust		0.3			31	
		Replace		3.4			13,18,3 1	
090207	THERMOSTAT	Inspect		0.2				
		Remove/Install		1.2			31	
		Repair		0.2			31	AA
		Test		0.5			31	
		Replace		0.5			31	
		Inspect	0.1	0.2				A
090208	WATER PUMP	Remove/Install		1.5			13,31	
		Repair		0.2			13,31	BB
		Replace		1.3			13,31	
		Inspect	0.1	0.1				A
090209	BATTERY-CHARGING ALTERNATOR AND BELT	Service		0.2			31,40	A
		Remove/Install		0.9			31,40	
		Adjust		0.2			31,40	
		Test		0.5			31	
		Replace		0.9			31,40	
		Inspect		0.1				A
		Remove/Install		0.7			31	
090210	STARTER	Repair		0.2			8,9,20,3 1	CC
		Test		0.2			31	
		Replace		0.5			31	
		Inspect		0.1			31	A
090211	GOVERNOR ACTUATOR	Remove/Install		0.7			31	
		Test		0.1			31	
		Replace		0.4			31	
		Inspect		0.1			31	A
		Remove/Install		0.7			31	
		Test		0.1			31	
090212	INTAKE MANIFOLD	Replace		0.4			31	
		Inspect	0.1	0.1				A

Table 1. MAC for AMMPS 5 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
090213	EXHAUST MANIFOLD	Remove/Install		1.0			13,31,4 0	A
		Replace		0.5			13,31,4 0	
		Inspect	0.1	0.1				
		Remove/Install		2.0			31	
090214	OIL PAN AND STRAINER	Replace		1.4			31	A
		Inspect	0.1	0.1				
		Remove/Install		4.5			13,31	
		Replace		0.7			13,31	
090215	FLYWHEEL	Inspect		0.4				A
		Remove/Install		16.3			31,40	
		Replace		0.4			31,40	
		Inspect		0.1				
090216	CRANKCASE REAR BEARING CASE COVER	Remove/Install		17.5			31	A
		Repair		0.5			31	
		Replace		0.7			31	
		Inspect		0.2				
090217	CYLINDER HEAD ASSEMBLY	Remove/Install		4.5			31	A
		Repair		0.5	4.2		31	
		Test		2.1	1.1		1,27,31, 40	
		Replace		1.1			31	
09021701	VALVE COVER	Inspect	0.1	0.1				A
		Remove/Install		1.5			31,39	
		Repair		0.2			31,39	
		Replace		0.6			31,39	
09021702	ENGINE VALVES	Inspect		0.1	0.3			A
		Remove/Install			0.9		31	
		Adjust		0.8			31	
		Replace			0.9		31	
09021703	ROCKER ARMS AND PUSH RODS	Inspect			0.1			EE
		Remove/Install			1.8		31,40	
		Repair			1.8		31,40	
		Adjust			1.0			

Table 1. MAC for AMMPS 5 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
090218	SHORT BLOCK ASSEMBLY	Replace			1.8		31,40	
		Inspect						A
		Remove/Install			5.0		31,40	
		Repair		0.7	10.0		31,40	
		Replace			6.0		31,40	
09021801	CONNECTING RODS AND PISTONS	Inspect			0.2			
		Remove/Install			7.0		31,40	
		Repair			8.0		31,40	FF
		Test			0.5		31	
		Replace			7.0		31,40	
09021802	CRANKSHAFT	Inspect			0.2			
		Remove/Install			8.0		31,40	
		Repair			9.0		31,40	GG
		Test			0.5			
		Replace			8.0		31,40	
09021803	GEAR CASE COVER	Inspect		0.1				A
		Remove/Install		2.0			31	
		Repair		0.5			31	
		Replace		2.0			31	
09021804	HARMONIC BALANCER	Inspect		0.1				
		Remove/Install		0.6			31	
		Replace		0.5			31	
09021805	CAMSHAFT AND GEAR	Inspect			0.2			
		Remove/Install			1.5		31,40	
		Repair			1.0		31,40	
		Test			0.5			
		Adjust			0.5			
		Replace			1.5		31,40	
09021806	IDLER GEAR	Inspect			0.2			
		Remove/Install			1.5		31,40	
		Repair			1.0		31,40	
		Replace			1.5		31,40	
09021807	FUEL CAMSHAFT AND FORK ASSEMBLY	Inspect			0.3			
		Remove/Install			0.8		31,40	

Table 1. MAC for AMMPS 5 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
09021808	OIL PUMP AND GEAR	Repair			0.4		31,40	
		Replace			0.8		31,40	
		Inspect			0.1			
		Remove/Install			1.5		31,39	
		Test			0.5		26,31,39	
10	ENGINE (MAIN) WIRING HARNESS INSTALLATION	Replace			1.5		31,39	
		Inspect	0.1	0.1				A
		Remove/Install		3.5			31	
		Repair		0.5			33,31	HH
		Test		0.2			31	
11	POWER WIRING HARNESS INSTALLATION	Replace		1.3			31	
		Inspect	0.1	0.2				A
		Remove/Install		1.0			31	
		Repair		0.5			8,9,20,31	II
		Test		0.1			31	
12	WINTERIZATION KIT INSTALLATION	Replace		0.9			31	
		Inspect	0.1	0.1				A
		Remove/Install		2.0			31	
		Repair		0.5			31,33	
		Test		0.3			2,31	
		Replace		1.0			31	

Table 2. Tools and Test Equipment for AMMPS 5 kW Generator Set.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
1	F	Adapter, Compression Test		KUB5ENGCOMAD
2		Bank, Load	G76852	
3	F	Beaker, Laboratory	6640009575578	1080-500
4	O,F	Cable, Auxiliary with NATO Plug	6520014993317	4202042
5	F	Cable, Local Control		04-21226
6	F	Cable, Remote Control		04-21227
7	F	Caliper, Vernier, 0-6 Inch		KTC S0999
8	F	Clamp, Vise-Grip, 11" Swivel Pad, Weld Type	5120013367977	11SP
9	F	Crimping, Tool, Terminal		KTC S0159
10	F	Crimping, Tool, Terminal, Hand	5120013748936	J-38852
11	F	Crowfoot Attachment Set, Socket Wrench, Flare Nut, Metric		KTC S0170
12	F	Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard		KTC S0161
13	F	Forward Repair System	4940015331621	SC 4940-95-E42
14	F	Hammer, Hand, Soft Face, Dead Blow		KTC S0221
15	F	Hex Key 5.0mm		KTC S6328
16	F	Kit, Nozzle	4730015619098	DT-6022
17	F	Oiler, Hand		50-573
18	F	Pick, Dental	6520013539942	H-10401
19	F	Pick, Miniature	5120014287836	SG4ASHBR
20	F	Puller Set, Mechanical		KTC S0221
21	F	Remover, Electrical Contact	5120011584707	114010

Table 2. Tools and Test Equipment for AMMPS 5 kW Generator Set — Continued.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
22	F	Screwdriver, Torx, T20, 3" Long		KTC S0342
23	F	Socket, Impact Wrench, 3/8" Dr, 6Pt, Deep, 10mm		KTC S0892
24	F	Strap, Wrist, Electrostatic Discharge	5920014913509	4720
25	F	Test Kit, Radiator Pressure		KTC S0698
26	F	Test Set, Electronic Systems	6625014938968	13580880
17	F	Test Set, Oil Systems Pressure		3289
28	F	Tester, Cylinder Compression	4910015624340	MT33C
29	F	Tester, Diesel Fuel Injector Nozzle	4910009106666	DT1300
30	F	Thermometer, Self- Indicating	6685002422184	ASTM 10F
31	F	Tool Kit, Blind, Fastener, Installation		KTC S0700
32	F	Tool Kit, General Mechanic's (GMTK)	5180015487634	SC 5180-95-B48
33	F	Tool Set, SATS, Base	4910014906453	SC 4910-95-A81
34	F	Tool, Rivet Nut		01METRIC
35	F	Torque Tube, 5-75 FT-LB		64-154
36	F	Torque Wrench Head End, 1/4" X 3/8" Drive, 5/8"		64-309
37	F	Torque Wrench Head End, 1/4" X 3/8" Drive, 9/16"		64-308
38	F	Wrench, Oil Filter, Strap		KTC S0982
39	F	Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB		KTC S0986

Table 2. Tools and Test Equipment for AMMPS 5 kW Generator Set — Continued.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
40	F	Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB		KTC S0987
41	F	Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB		KTC S0989
42	F	Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB		KTC S0991

Table 3. Remarks for the AMMPS 5 kW Generator Set.

REMARKS CODE	REMARKS
A	Preventive Maintenance Checks and Services (PMCS)
B	Generator Set repair includes replacement of identification plates, lifting eyes, clinch nuts, and repair of Control Harness.
C	DC Electric Installation repair includes the replacement of batteries, battery cables, NATO slave receptacle, main DC circuit breaker, and DEAD CRANK SWITCH.
D	DC Electric Installation test includes testing of batteries, main DC circuit breaker, and DEAD CRANK SWITCH.
E	Relay Panel Assembly repair includes replacement of circuit breakers and relays.
F	Relay Panel Assembly test includes testing of circuit breakers and relays.
G	Housing Installation repair includes the replacement of access doors, panels, door latches, hinges, brackets, access covers, clinch nuts, and repair of electrical leads.
H	DCS Installation repair includes replacement of the control box assembly, control box gasket, DCS enclosure assembly, and DCS control panel assembly.
I	DCS Control Panel Assembly repair includes replacement of cable assemblies, switches, control panel, membrane assembly, gaskets, LCD display, panel heater, and circuit card assemblies.
J	DCS Control Panel Assembly test includes testing of switches and circuit card assemblies.
K	DCS Enclosure Assembly repair includes replacement of cable assemblies, gaskets, and circuit card assemblies.
L	DCS Enclosure Assembly test includes testing of circuit card assemblies.
M	Intake Air and Installation Inspect and service functions include the inspection and servicing of the service indicator, hose assemblies, and filter element.
N	Cooling System Installation repair includes the replacement of the radiator assembly, coolant tank assembly, and cooling fan.

Table 3. Remarks for the AMMPS 5 kW Generator Set — Continued.

REMARKS CODE	REMARKS
O	Fuel System Installation repair function includes the replacement of the tank assembly and fuel system module.
P	Contactor repair includes the replacement and repair of electrical leads.
Q	Voltage Selection Switch repair includes the replacement and repair of electrical leads.
R	Hour Meter repair includes the replacement and repair of the wiring harness.
S	Convenience Receptacle Assembly repair includes replacement and repair of the cable assemblies.
T	Transformers repair includes replacement of clinch nuts.
U	Printed Circuit Board Module repair includes the replacement and repair of electrical leads and wiring harnesses.
V	Power Plant Installation repair includes the replacement of the engine assembly and AC generator assembly.
W	AC Generator Assembly repair includes the replacement and repair of the end bell assembly, stator assembly, rotor assembly, and exciter rotor assembly.
X	Lubrication System repair includes replacement and repair of the oil drain hose bulkhead assembly and dipstick tube assembly.
Y	Fuel Injector repair includes the replacement of the fuel injector assembly and hose assemblies.
Z	Fuel Injection Pump repair includes the replacement of shims.
AA	Thermostat Installation repair includes the replacement of the thermostat and temperature sensor.
BB	Water Pump repair includes the replacement of the fan pulley.
CC	Starter repair includes the replacement and repair of the electrical lead.
DD	Valve Cover repair includes the replacement and repair of the cylinder head assembly cover.
EE	Rocker Arms and Push Rods repair includes the replacement and repair of the rocker assembly.
FF	Connecting Rods and Pistons repair includes the replacement and repair of the piston assembly and connecting rod assembly.
GG	Crankshaft repair includes the replacement and repair of the crankshaft, bearing case assembly, bearing assemblies, and oil slinger assembly.
HH	Engine Wiring Harness repair includes the replacement and repair of connector assemblies.

Table 3. Remarks for the AMMPS 5 kW Generator Set — Continued.

REMARKS CODE	REMARKS
II	Power Wiring Harness repair includes the replacement and repair of connector assemblies.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

Scope

This work package lists expendable and durable items that you will need to operate and maintain the AMMPS 5 kW generator set. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment, or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanation of Columns in the Expendable/Durable Items List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid (WP 0098, Item 5)).

Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item (C=Crew, F=Field/ASB, H=Below Depot).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) U/I. Unit of Issue (U/I) code shows the physical measure or count of an item, such as gallon, dozen, gross, etc.

Table 1. Expendable and Durable Items.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
1	F	6810-00-201-0906	Alcohol, denatured, 16 oz, 837015 (19203)	BT
2	C	6850-00-664-1403	Antifreeze, ethylene glycol, 1 gal, A-A-52624 (58536)	GL
3	F	8145-01-440-3417	Bag, barrier, 11509521 (18876)	EA
4	H	8950-01-407-9105	Baking soda, 01900 (90038)	EA
5	F	7920-00-514-2417	Brush, acid swabbing, 803-12 (7S147)	GR
6	F	5120-01-371-9268	Brush, battery terminal, BTC3A (55719)	EA
7	C	7920-01-127-4376	Brush, wire, scratch, brass wire, 71966 (76169)	EA
8	C	5340-00-450-5718	Cap set, protective, dust and moisture seal, 10935405 (19207)	EA
9	H	6850-01-053-2540	Cleaning compound, engine cooling system, MACS SUPER FAST FLUSH 1500 (72527)	BT
10	F	6850-01-474-2317	Cleaning compound, solvent, BT05 (0K209)	CO

Table 1. Expendable and Durable Items — Continued.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
11	C	5350-00-221-0872	Cloth, abrasive, crocus, ANSI B74.18 (80204)	PG
12	C	7920-01-482-6042	Cloth, cleaning, electronics, 792000NIB0395 (1A920)	BX
13	F	8030-00-105-0270	Compound, antiseize, 1 lb can with brush top, NSBT-16N (5W425)	CN
14	F	8030-01-396-3362	Compound, sealing, 50 mL bottle, 68035 (05972)	BT
15	C	8030-01-508-9181	Compound, sealing, 5699 (05972)	TU
16	F	7930-00-068-1669	Detergent, general purpose P-D-1747 (81348)	BX
17	C	6810-00-107-1510	Distilled water, ACS, O-C-265 (81348)	DR
18	C	9140-00-286-5286	Fuel, diesel, DF-1, AA52557-1 (58536)	GL
19	C	9140-00-286-5294	Fuel, diesel, DF-2, AA52557-2 (58536)	GL
20	C	9150-01-179-1589	Grease, electrically conductive, BEMS 15030 (59364)	CA
21	C	9150-00-929-7946	Grease, general purpose, G-60/EPV (76736)	CA
22	F	6850-01-160-3868	Inhibitor, corrosion, liquid cooling system, MIL-A-53009 (81349)	QT
23	C	9150-01-518-9477	Lubricating oil, engine, 1 qt MIL-PRF-2104H OE/HDO-15/40, MIL-PRF-2104 (81349)	QT
24	C	9150-00-189-6727	Lubricating oil, engine, 1 qt MIL-PRF-2104H OE/HDO-10, 10W/QT/CN/2104 (13873)	QT
25	C	9150-00-402-2372	Lubricating oil, engine, arctic 5 gal, -65°F (-54°C), MIL-PRF-46167 (81349)	CN
26	H	9150-00-111-3199	Lubricating oil, engine, preservation 5 gal, MIL-PRF-21260 (81349)	CN
27	H	7920-01-430-5028	Pad, scouring, 048011-04028 gray 6" X 9" (27293)	EA
28	H	4910-01-490-6453	Pan, drain, KTC S0255 (00NS2)	EA
29	H	9150-00-261-7899	Penetrating oil, VV-P-216 (81348)	PT
30	H	8030-00-082-2508	Primer, sealing compound, 74755 (05972)	BT
31	C	7920-00-205-3571	Rag, wiping, DDD-R-0030 (81348)	BX
32	F	8030-01-465-1390	Sealant, 56507 (05972)	EA
33	C	8520-01-133-8099	Soap, ivory, 7385T11 (39428)	EA
34	H	5975-00-074-2072	Strap, tie-down, electrical components, PLT2SC (06383)	HD
35	C	9905-00-537-8954	Tag, marker, 50 each bundle, 9905-00-537-8954 (64067)	BD
36	C	7510-00-117-5520	Tape, pressure sensitive, black conforming to SAE-AMS-T-22085, 481 (52152)	RO
37	C	8135-01-054-0738	Wire, tie, TIEWIRE16GA3-1/2LB (56319)	CL

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 5KW GENERATOR SET
MAINTENANCE AND DEFERRED MAINTENANCE ITEMS LIST

GENERAL INFORMATION

This WP lists all maintenance items, as well as deferred maintenance items, displayed by the DCS and their corresponding maintenance prompt and interval. The interval displayed on the DCS refers to operating hours remaining until the corresponding maintenance prompt is due for maintenance. The interval in Table 1 represents the total time interval in operating hours for a maintenance item. When a maintenance prompt is deferred, a deferred maintenance item code appears within the operating hours interval given in Table 2. Maintenance items provide operator feedback in conjunction with fault and warning codes (WP 0006, Warning and Fault Codes).

Table 1. Maintenance Item Codes and Prompts.

CODE	INTERVAL (HR OR CALENDAR)	MAINTENANCE PROMPT
5001	50.0	[First change engine oil and filter]
5002	500.0 or 6 months	[Change engine oil and filter]
5003	500.0 or 6 months	[Change fuel filter/water separator]
5004	500.0 or 6 months	[Replace air filter]
5005	1500.0 or 1 year	[Drain coolant and flush system]
5006	500.0 or 6 months	[Inspect Aux Fuel Filter]
5007	1500.0 or 2 years	[Engine Valve check/adjust]
5008	1500.0	[Engine fuel injection nozzles check]
5009	500.0 or 6 months	[Inspect radiator cap for damage]
5010	500.0	[Replace drive belts]
5011	24.0	[Perform Daily Preventative Maintenance]
5014	1 year	[Inspect and Test Winterization Kit]
5015	500.0 or 6 months	[Check Voltage Selector Switch Operation]
5016	250.0 or 3 months	[Test and Reset GFI Receptacle]
5017	250.0 or 3 months	[Clean Radiator, Breather, Chrg Air/Fuel Coolers]

Table 2. Deferred Maintenance Item Codes and Prompts.

CODE	INTERVAL (HR)	MAINTENANCE PROMPT
6001	24.0	[First change engine oil and filter]
6002	48.0	[Change engine oil and filter]
6003	48.0	[Change fuel filter/water separator]
6004	48.0	[Replace air filter]
6005	72.0	[Drain coolant and flush system]
6006	48.0	[Inspect Aux Fuel Filter]
6007	72.0	[Engine Valve check/adjust]
6008	72.0	[Engine fuel injection nozzles check]
6009	48.0	[Inspect radiator cap for damage]
6010	72.0	[Replace drive belts]
6011	12.0	[Perform Daily Preventative Maintenance]
6014	72.0	[Inspect and Test Winterization Kit]
6015	48.0	[Check Voltage Selector Switch Operation]
6016	24.0	[Test and Reset GFI Receptacle]
6017	24.0	[Clean Radiator, Breather, Chrg Air/Fuel Coolers]

END OF WORK PACKAGE

GLOSSARY

SCOPE

This WP defines all of the terms used in the AMMPS 5 kW generator set TM.

TERM	DEFINITION
12 VDC electrical system	A system used to create and maintain 12 VDC to power the generator set. The system includes two 12-V batteries, a battery-charging alternator rotated by an engine driven V-belt, and the required wiring and support components.
AC electrical system	This is the system that supplies AC from the generator set to the Load. The power is generated by the AC generator and transferred to the Load via the output box.
AC CIRCUIT INTERRUPT switch	This switch controls the operation of the AC contactor, which allows the generator set to be connected or disconnected to the load or switch box.
Automatic Voltage Regulator (AVR)	Electrical regulator designed to automatically maintain a constant voltage level. Important component in synchronous generators, it controls the output voltage of the generator by controlling its excitation.
AMMPS	Newest generation of battlefield electric power supply.
Battery-charging alternator	A small, engine-mounted power generator that creates 12 VDC when rotated by an engine-driven belt.
Battery-charging alternator belt	The engine-driven belt that rotates the battery-charging alternator.
Battleshort	A condition in which some military equipment can be placed so it does not shut down when circumstances would be damaging to the equipment or personnel.
BATTLESHORT switch	This switch is placed in the ON position during situations when constant power is required without disruption; it allows the system to override faults/warnings that would normally shutdown the generator set. In normal operation, the BATTLESHORT switch will be in the OFF position to protect the generator set.
CAUTION	A notation in the manual that informs the reader that possible damage to the machine may occur if conditions listed are not met.
CARC	The CARC paint is used on the housing assembly for the generator set to protect it from the environment.
Convenience receptacle	A plug-in 110 V electrical outlet mounted at the rear of the generator set similar to the one used in a typical American home.
DCS	The DCS, which is located at the rear of the generator set, is a microprocessor-based control that allows the operator and maintainer to start/stop the generator set, operate the contactor, adjust voltage and frequency, clear/reset generator faults, and perform other necessary functions to provide power. Contains three components: control box, control board assembly, and front panel assembly.
DCS screen	LCD with a menu-driven display format to control generator set operations.
Engine control switch	This switch provides the local control for the generator set. The engine control switch has four positions: OFF, PRIME & RUN AUX FUEL, PRIME & RUN, and RUN.
Exhaust side	The side of the engine where the exhaust manifold is mounted.
External fuel system	The system that allows fuel to be pumped from a holding device not attached to the generator set into the generator set fuel tank.
Fault code	A message displayed on the DCS when a mechanical fault is detected. The code is displayed as a number followed by a short descriptive message.

TERM	DEFINITION
Flywheel end	The end of the engine where the flywheel is mounted.
Front	When used to describe a direction in relation to the generator set, the front is the end of the generator set opposite of the DCS.
Fuel pump, auxiliary	Fuel pump used to pump fuel from an external source to the internal fuel tank of the generator set.
Fuel pump, main	Fuel pump used to pump fuel from the internal fuel tank of the generator set to the engine.
Inspect	A method (usually visual) used to determine damage to a component.
Intake air heater	A 24-V electric heater mounted to the engine intake manifold used to heat incoming air to reduce start-up time in cold weather.
Intake air heater relay	The electrical switch that controls the operation of the intake air heater.
Intake side	The side of the engine where the intake manifold is mounted.
Internal fuel system	The system housed within the generator set to fuel the engine. This includes the fuel tank, main fuel pump, fuel/water separator, and the required lines, fittings, and other components.
Left side	The side of the machine that houses the intake air grille and a forward door. As the operator stands directly facing the DCS looking out, over the generator set, the side of the machine to his left is the left side.
Mode I	Mode I refers to the output of the generator set expressed in cycles per seconds (Hz). Mode I is a 50/60 Hz machine.
Mode II	Mode II refers to the output of the generator set expressed in cycles per seconds (Hz). Mode II is a 400 Hz machine.
NOTE	A notation in the manual that informs the reader helpful information that will assist in the completion of a maintenance task.
Ohm	The Ohm is a unit of electrical resistance. One V will cause a current of 1 Amp to flow through a resistance of 1 Ohm.
Phase	Phase refers to the windings of an AC generator.
Power Plant (PP)	This is two AMMPS generator sets hooked up in parallel with the use of a switch box.
Power Unit (PU)	This is a single AMMPS generator set.
Rear	The end of the machine where the DCS is mounted.
Remove	A maintenance task to remove a component from the generator set.
Repair	A maintenance task to restore a component to operational condition, usually by disassembly, parts replacement, and re-assembly of the component.
Replace	A maintenance task to remove a component from the generator set with no intent to re-install the same component. The original component is to be disposed of and replaced with new component.
Right Side	The side of the machine that houses the output box and a forward door. As the operator stands directly facing the DCS looking out, over the generator set, the side of the machine to his right is the right side.
Service	A maintenance task performed, usually on a scheduled basis, to restore or replenish items consumed during normal operation.
Soft key buttons	The soft button keys are located below the display panel on the DCS. The function of each button varies with the soft key function on the display panel.

TERM	DEFINITION
Test	A maintenance task to determine if a component is performing correctly or to specification.
Volt	A unit of electrical potential. A potential of 1 V will cause a current of 1 Amp to flow through a resistance of 1 Ohm.
Water pump end	The end of the engine where the water pump is mounted.
WARNING	A notation in the manual that informs the reader that possible personal injury or death may occur if conditions listed are not met.
Warning code	A message displayed on the DCS when a mechanical fault is detected that, if the cause is left untreated, will cause damage to the equipment. The code is displayed as a number followed by a short descriptive message.
Watt	A unit of electrical power. In DC circuits, wattage equals voltage multiplied by amperage. In AC circuits, wattage equals effective voltage multiplied by effective amperage multiplied by power factor multiplied by a constant dependent on the number of phases. 1,000 W are equal to 1 kW.
Winterization kit	The winterization kit, located on the inside of the right-side panel, is a fuel-fired coolant heater providing the ability to heat the coolant in extreme cold conditions.

END OF WORK PACKAGE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE 06 01 09
TO (Forward to proponent of publication or form) (Include ZIP Code) Commander: US Army CECOM LCMC ATTN: AMSEL-LC-LEO-E-CM Fort Monmouth, NJ 07703-5006						FROM (Activity and location) (Include ZIP Code) Jane Q. Doe, SFC 1234 Any Street Anytown, AL 34565	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 11-1234-567-14						DATE 06 01 09	TITLE Operator, Field and Sustainment Support Maintenance Manual for Radio, AN/ABC-123
ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
1	WP 0005 PG 3		2			Test or Corrective Action column should identify a different WP number.	
* Reference to line numbers within the paragraph or subparagraph.							
TYPED NAME, GRADE OR TITLE Jane Q. Doe, SPC					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 123-4567		SIGNATURE

TO (Forward direct to addressee listed in publication)				FROM (Activity and location) (Include ZIP Code)				DATE	
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS									
PUBLICATION NUMBER TB 9-2590-528-13&P				DATE			TITLE INTERROGATION ARM ASSEMBLY (IAA)		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
PART III – REMARKS (Any general remarks, recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)									
TYPED NAME, GRADE OR TITLE Jane Q. Doe, SPC				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 123-4567			SIGNATURE		

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO (Forward to proponent of publication or form) (Include ZIP Code)						FROM (Activity and location) (Include ZIP Code)	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER						DATE	TITLE
ITEM	PAGE	PARA- GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
<i>* Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

TO (Forward direct to addressee listed in publication)				FROM (Activity and location) (Include ZIP Code)			DATE	
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS								
PUBLICATION NUMBER				DATE		TITLE		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
PART III – REMARKS (Any general remarks, recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)								
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE		

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO (Forward to proponent of publication or form) (Include ZIP Code)						FROM (Activity and location) (Include ZIP Code)	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER						DATE	TITLE
ITEM	PAGE	PARA- GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
<i>* Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

TO (Forward direct to addressee listed in publication)				FROM (Activity and location) (Include ZIP Code)			DATE	
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS								
PUBLICATION NUMBER				DATE		TITLE		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
PART III – REMARKS (Any general remarks, recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)								
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE		

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO (Forward to proponent of publication or form) (Include ZIP Code)						FROM (Activity and location) (Include ZIP Code)	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER						DATE	TITLE
ITEM	PAGE	PARA- GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
<i>* Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

TO (Forward direct to addressee listed in publication)				FROM (Activity and location) (Include ZIP Code)			DATE	
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS								
PUBLICATION NUMBER				DATE		TITLE		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
PART III – REMARKS (Any general remarks, recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)								
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE		

By Order of the Secretary of the Army:

RAYMOND T. ODIERNO
General, United States Army
Chief of Staff

Official:



JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
1125615

By Order of the Secretary of the Air Force:

NORTON A. SCHWARTZ
General, USAF
Chief of Staff, USAF

Official:

DONALD J. HOFFMAN
General, USAF
Commander, AFMC

By Order of the Marine Corps:

J.E. CAVE
Product Group Director, PG-15
Ground Transportation Engineer Systems
Marine Corps Systems Command

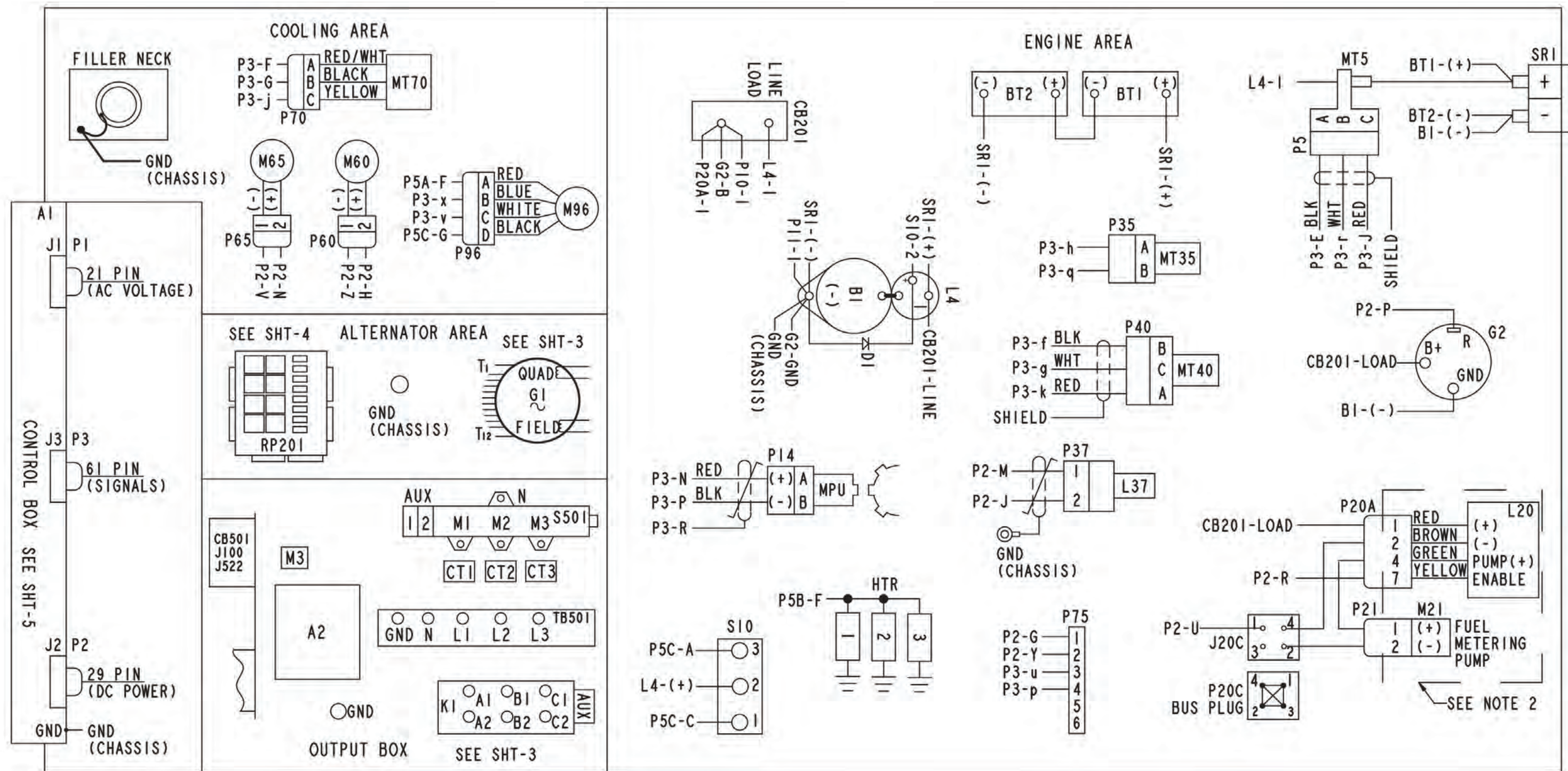
By Order of the Secretary of the Navy:

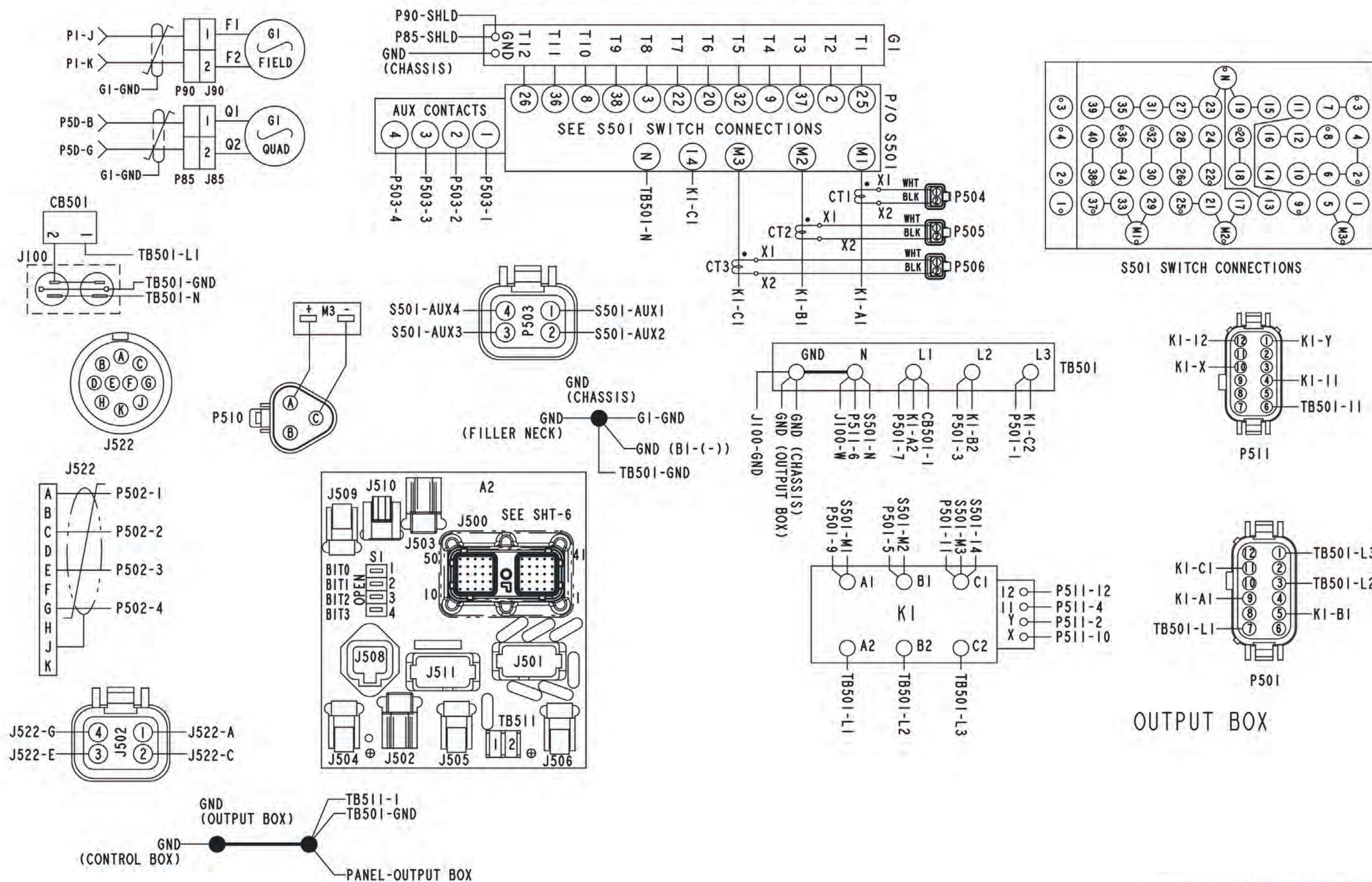
**NAVAL FACILITIES ENGINEERING
COMMAND (NAVFAC)**

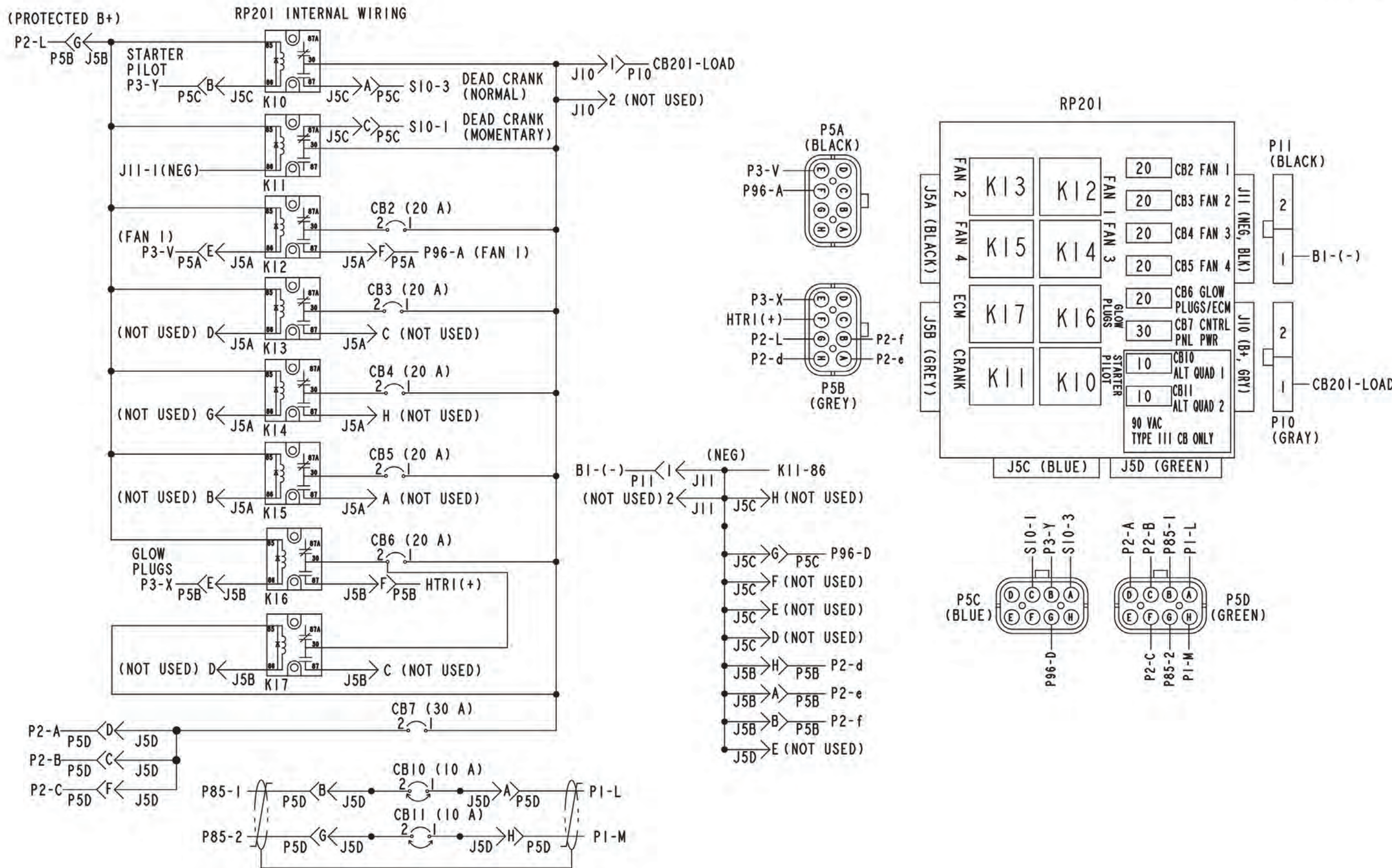
**NAVAL FACILITIES EXPEDITIONARY
LOGISTICS CENTER (NFELC)
CODE EXP 21**

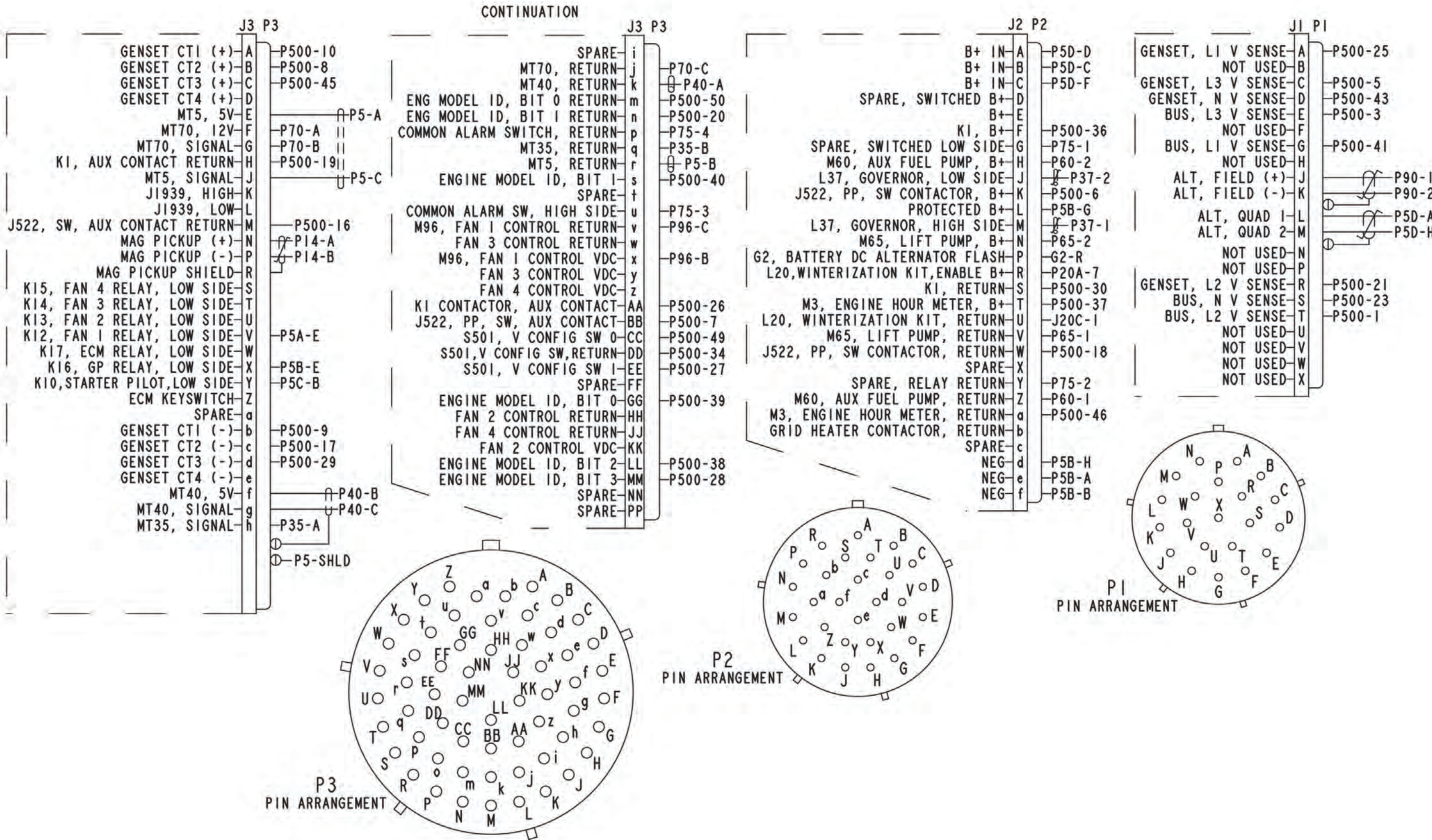
Army Distribution: To be distributed IAW the Initial Distribution Number (IDN) 257870 requirements for TM 9-6115-749-24&P.

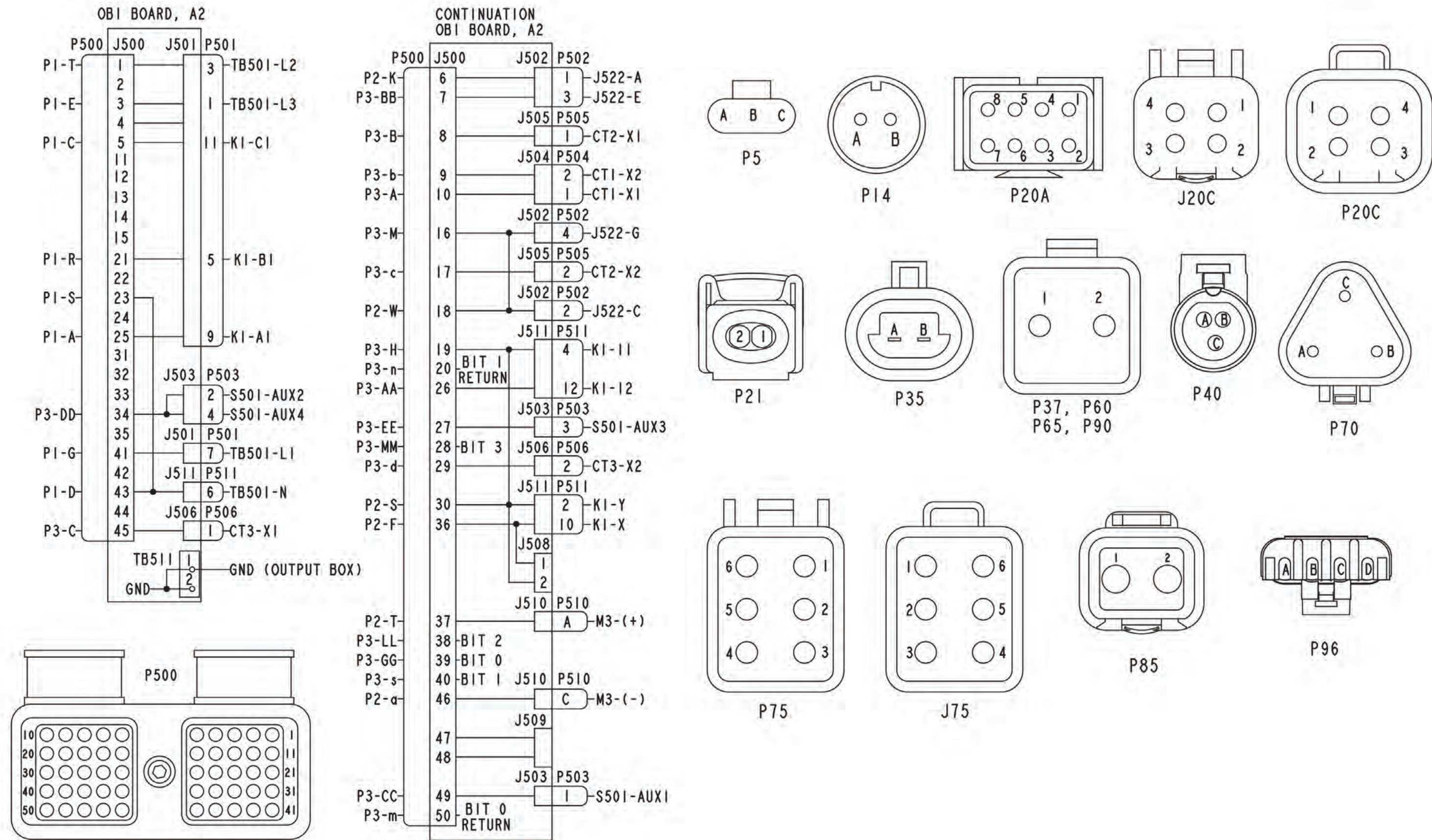
Marine Corps Distribution: To be distributed IAW PCN 184 092921 00.







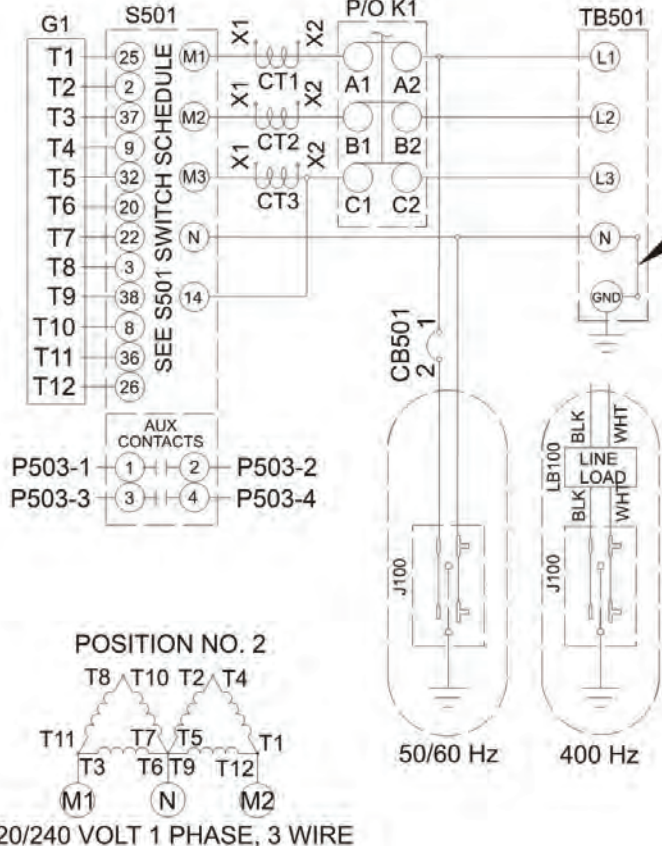
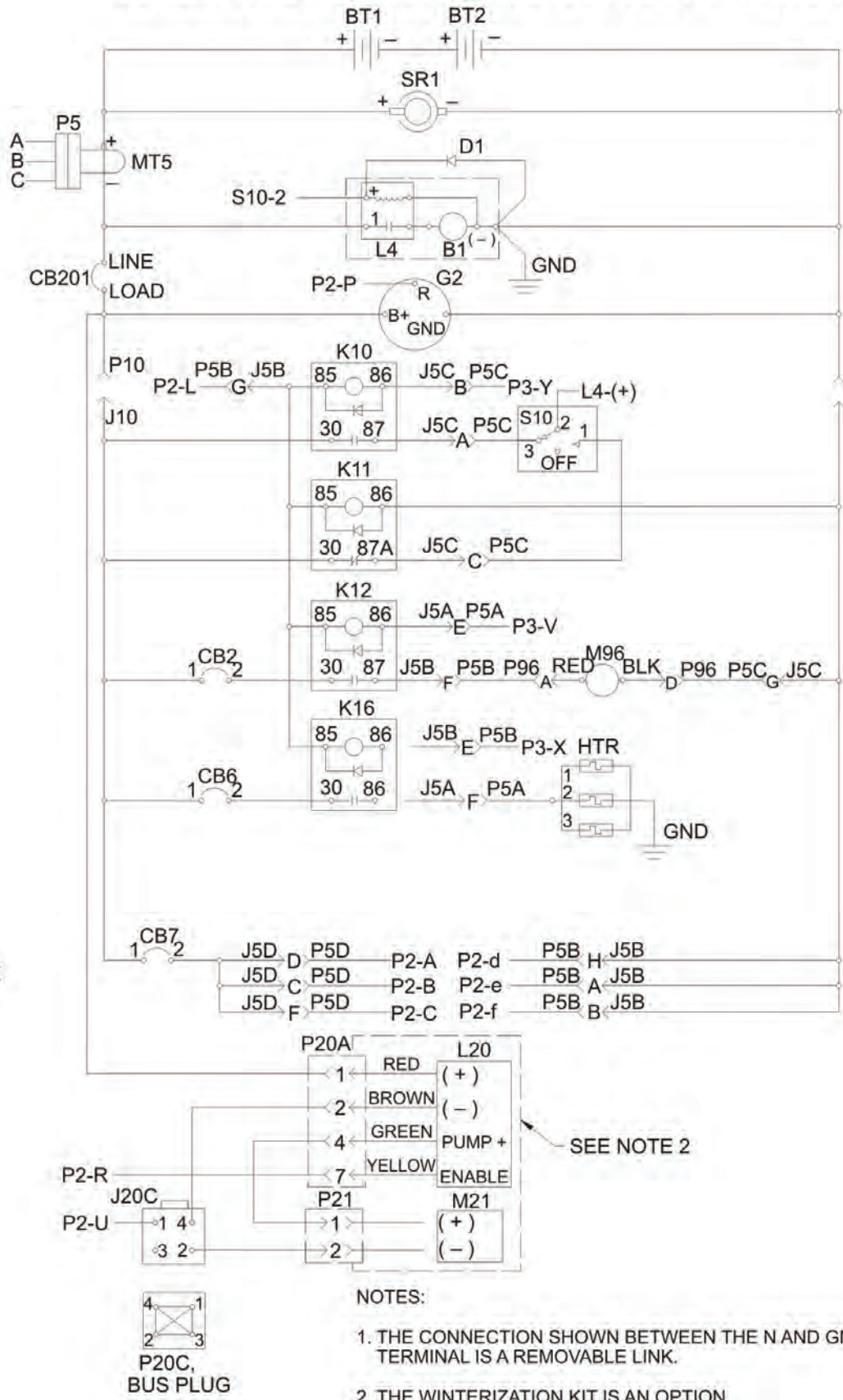
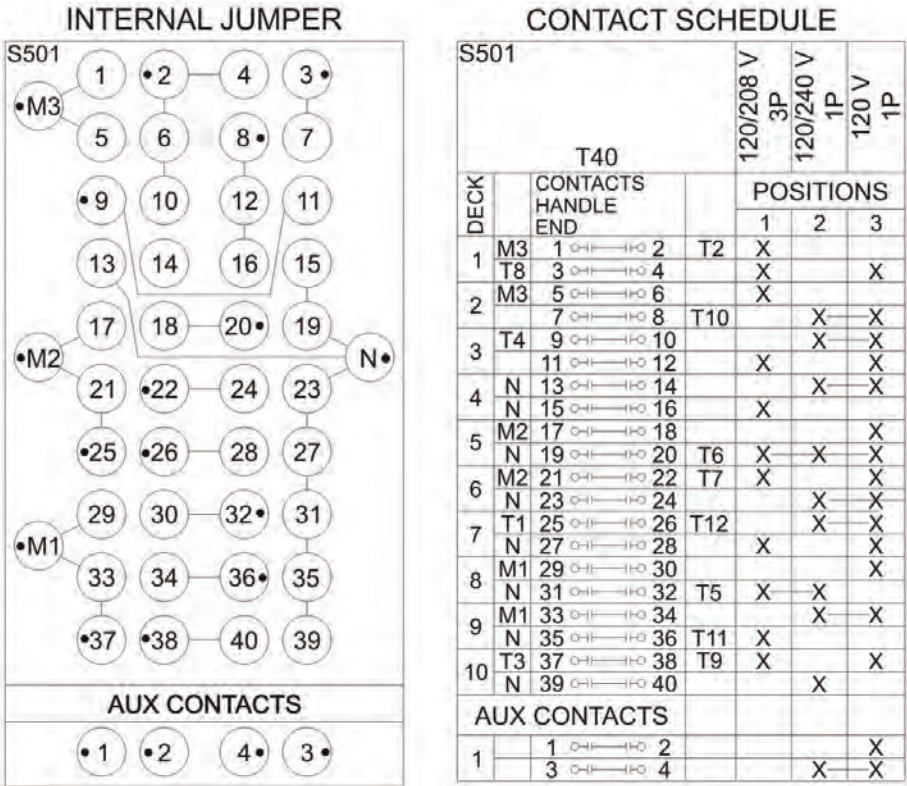




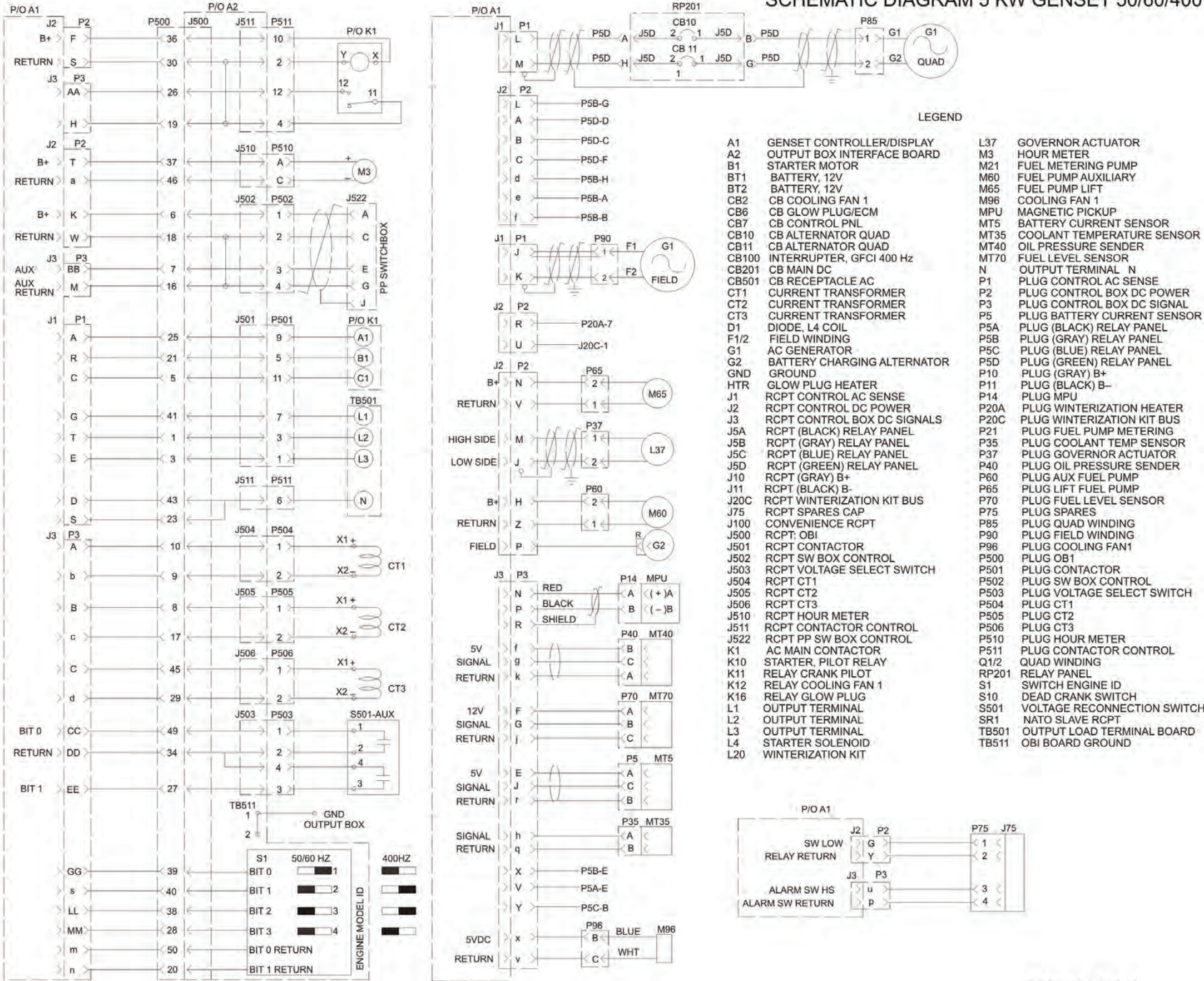
LEGEND

A1	GENSET CONTROLLER/DISPLAY	J509	RECEPTACLE CT4	P37	PLUG GOVERNOR ACTUATOR
A2	OUTPUT BOX INTERFACE BOARD	J510	RECEPTACLE HOUR METER	P40	PLUG OIL PRESSURE SENDER
B1	STARTER MOTOR	J511	RECEPTACLE CONTACTOR CONTROL	P60	PLUG AUX FUEL PUMP
BT1	BATTERY, 12V	J522	RECEPTACLE PP SW BOX CONTROL	P65	PLUG LIFT FUEL PUMP
BT2	BATTERY, 12V	K1	AC MAIN CONTACTOR	P70	PLUG FUEL LEVEL SENSOR
CB2	CIRCUIT BREAKER COOLING FAN 1	K10	STARTER, PILOT RELAY	P75	PLUG SPARES
CB3	CIRCUIT BREAKER	K11	RELAY CRANK PILOT	P85	PLUG QUAD WINDING
CB4	CIRCUIT BREAKER	K12	RELAY COOLING FAN1	P90	PLUG FIELD WINDING
CB5	CIRCUIT BREAKER	K13	RELAY	P96	PLUG COOLING FAN1
CB6	CIRCUIT BREAKER GLOW PLUG/ECM	K14	RELAY } NOT USED	P500	PLUG OBI
CB7	CIRCUIT BREAKER CONTROL PNL	K15	RELAY }	P501	PLUG CONTACTOR
CB10	CIRCUIT BREAKER ALTERNATOR QUAD	K16	RELAY GLOW PLUG	P502	PLUG SW BOX CONTROL
CB11	CIRCUIT BREAKER ALTERNATOR QUAD	K17	RELAY ECM	P503	PLUG VOLTAGE SELECT SWITCH
CB201	CIRCUIT BREAKER MAIN DC	L1	OUTPUT TERMINAL	P504	PLUG CT1
CB501	CIRCUIT BREAKER RECEPTACLE AC	L2	OUTPUT TERMINAL	P505	PLUG CT2
CT1	CURRENT TRANSFORMER	L3	OUTPUT TERMINAL	P506	PLUG CT3
CT2	CURRENT TRANSFORMER	L4	STARTER SOLENOID	P510	PLUG HOUR METER
CT3	CURRENT TRANSFORMER	L20	WINTERIZATION KIT	P511	PLUG CONTACTOR CONTROL
D1	DIODE, L4 COIL	L37	GOVERNOR ACTUATOR	Q1/2	QUAD WINDING
F1/2	FIELD WINDING	M3	HOUR METER	RP201	RELAY PANEL
G1	AC GENERATOR	M21	FUEL METERING PUMP	S1	SWITCH ENGINE ID
G2	BATTERY CHARGING ALTERNATOR	M60	FUEL PUMP AUXILIARY	S10	DEAD CRANK SWITCH
GND	GROUND	M65	FUEL PUMP LIFT	S501	VOLTAGE RECONNECTION SWITCH
HTR	GLOW PLUG HEATER	M96	COOLING FAN 1	SRI	NATO SLAVE RECEPTACLE
J1	RECEPTACLE CONTROL AC SENSE	MPU	MAGNETIC PICKUP	TB501	OUTPUT LOAD TERMINAL BOARD
J2	RECEPTACLE CONTROL DC POWER	MT5	BATTERY CURRENT SENSOR	TB511	OBI BOARD GROUND
J3	RECEPTACLE CONTROL BOX DC SIGNALS	MT35	COOLANT TEMPERATURE SENSOR		
J5A	RECEPTACLE (BLACK) RELAY PANEL	MT40	OIL PRESSURE SENDER		
J5B	RECEPTACLE (GRAY) RELAY PANEL	MT70	FUEL LEVEL SENSOR		
J5C	RECEPTACLE (BLUE) RELAY PANEL	N	OUTPUT TERMINAL N		
J5D	RECEPTACLE (GREEN) RELAY PANEL	P1	PLUG CONTROL AC SENSE		
J10	RECEPTACLE (GRAY) B+	P2	PLUG CONTROL BOX DC POWER		
J11	RECEPTACLE (BLACK) B-	P3	PLUG CONTROL BOX DC SIGNAL		
J20C	RECEPTACLE WINTERIZATION KIT BUS	P5	PLUG BATTERY CURRENT SENSOR		
J85	RECEPTACLE QUAD WINDING	P5A	PLUG (BLACK) RELAY PANEL		
J90	RECEPTACLE FIELD WINDING	P5B	PLUG (GRAY) RELAY PANEL		
J100	RECEPTACLE GFI CONVENIENCE	P5C	PLUG (BLUE) RELAY PANEL		
J500	RECEPTACLE OBI	P5D	PLUG (GREEN) RELAY PANEL		
J501	RECEPTACLE CONTACTOR	P10	PLUG (GRAY) B+		
J502	RECEPTACLE SW BOX CONTROL	P11	PLUG (BLACK) B-		
J503	RECEPTACLE VOLTAGE SELECT SWITCH	P14	PLUG MPU		
J504	RECEPTACLE CT1	P20A	PLUG WINTERIZATION HEATER		
J505	RECEPTACLE CT2	P20C	PLUG WINTERIZATION KIT BUS		
J506	RECEPTACLE CT3	P21	PLUG FUEL PUMP METERING		
J508	RECEPTACLE AC RELAY	P35	PLUG COOLANT TEMP SENSOR		

SCHEMATIC DIAGRAM 5 KW GENSET 50/60/400 HZ SHT 1 OF 2



SCHEMATIC DIAGRAM 5 KW GENSET 50/60/400 HZ SHT 2 OF 2



30554-04-21348

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 Lb.
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
 1 Sq. Kilometer = 1,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

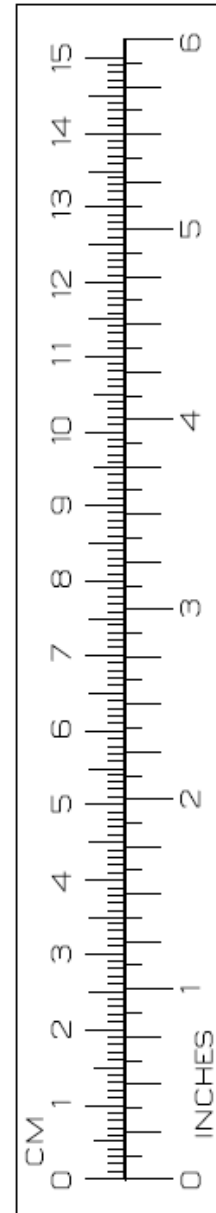
TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 (^{\circ}\text{C} + 32) = ^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet.....	Square Meters.....	0.093
Square Yards.....	Square Meters.....	0.836
Square Miles.....	Square Kilometers.....	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters.....	29.573
Pints.....	Liters.....	0.473
Quarts.....	Liters.....	0.946
Gallons	Liters.....	3.785
Ounces	Grams.....	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet.....	Newton-Meters	1.356
Pounds per Square Inch.....	Kilopascals	6.895
Miles per Gallon.....	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches.....	0.394
Meters.....	Feet	3.280
Meters.....	Yards	1.094
Kilometers.....	Miles.....	0.621
Square Centimeters.....	Square Inches	0.155
Square Meters	Square Feet.....	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers.....	Acres	2.471
Cubic Meters	Cubic Feet.....	35.315
Cubic Meters	Cubic Yards.....	1.308
Milliliters.....	Fluid Ounces	0.034
Liters.....	Pints	2.113
Liters.....	Quarts.....	1.057
Liters.....	Gallons	0.264
Grams.....	Ounces	0.035
Kilograms.....	Pounds	2.205
Metric Tons.....	Short Tons.....	1.102
Newton-Meters	Pound-Feet.....	0.738
Kilopascals	Pounds per Square Inch.....	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour.....	Miles per Hour	0.621



PIN: 086804-000