

**NORMAL**

**MWO effective date 1 August 1987 and completion date 30 September 1991**

**MWO 9-2320-218-34**

**DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER**

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**INSTALLATION OF  
ROLLOVER PROTECTION SYSTEM  
(1/4-TON VEHICLE M151A2)**

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**HEADQUARTERS, DEPARTMENT OF THE ARMY, WASHINGTON, D.C.  
1 AUGUST 1987**

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**REPORTING OF 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. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank-Automotive Command, Attn: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

## 1. PURPOSE OF MODIFICATION.

The purpose of this modification is to provide vehicle with a roll bar and occupant restraint system to minimize occupant injury during vehicle rollover and collision.

## 2. VEHICLE INSPECTION.

a. Vehicles to be modified will be at 10/20 standards and will meet the minimum criteria for installation of the ROPS. No body or frame repair is authorized by the installation team at the time of MWO 9-2320-218-34 applications.

b. Vehicles will be inspected for any condition that may prevent the proper installation of the Rollover Protection System (ROPS) in accordance with this MWO such as:

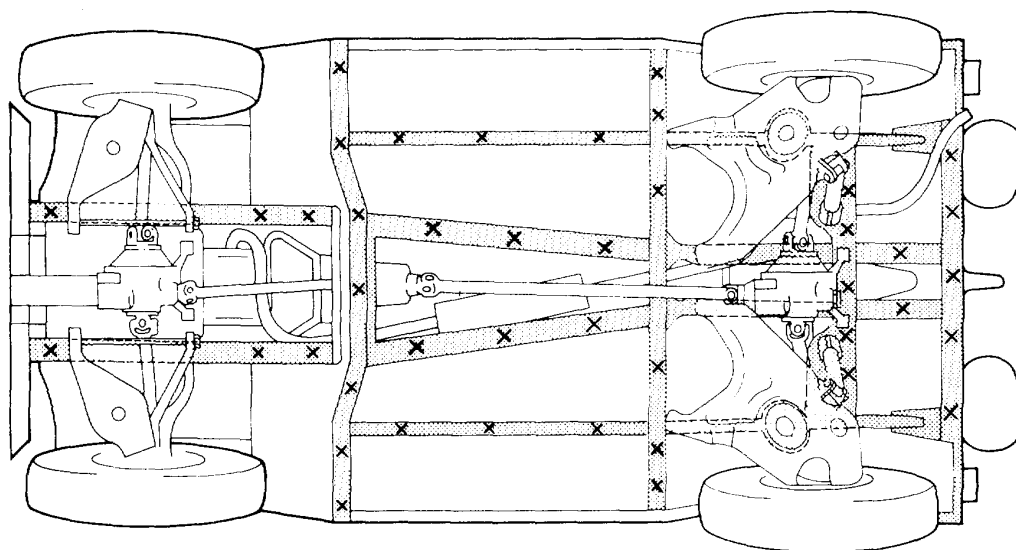
(1) Rust/Corrosion/Damage (illustrated below): Probe the underside of the entire vehicle with a punch 3/8" diameter flat point, NSN 5720-00-273-0001 and a hammer inserted NSN 5120-00-903-8553 with the medium plastic face NSN 5120-00-585-8202 installed or a 24 ounce rubber mallet NSN 5120-00-293-3399. To identify non-repairable metal, strike suspected metal surface every ten inches with the punch and mallet. Good metal will remain intact or dent slightly, corroded areas will punch through or crumble. Pay particular attention to those high load structural frame members in and around the rear differential and suspension mounts for cracks or damage.

(2) Kits, Modifications, Repairs, or Other Damage: Inspect entire vehicle for any kit, modification, repair, or other damage located in those areas illustrated on page 2. For example, kits other than those addressed by the MWO, welded or bolted reinforcement plates, body parts and brackets, holes, body filler materials, damage or any condition that may cause interference during the installation of the MWO. Inspection may require the use of probes, hammers/mallets, punches, or any other common tools as determined necessary.

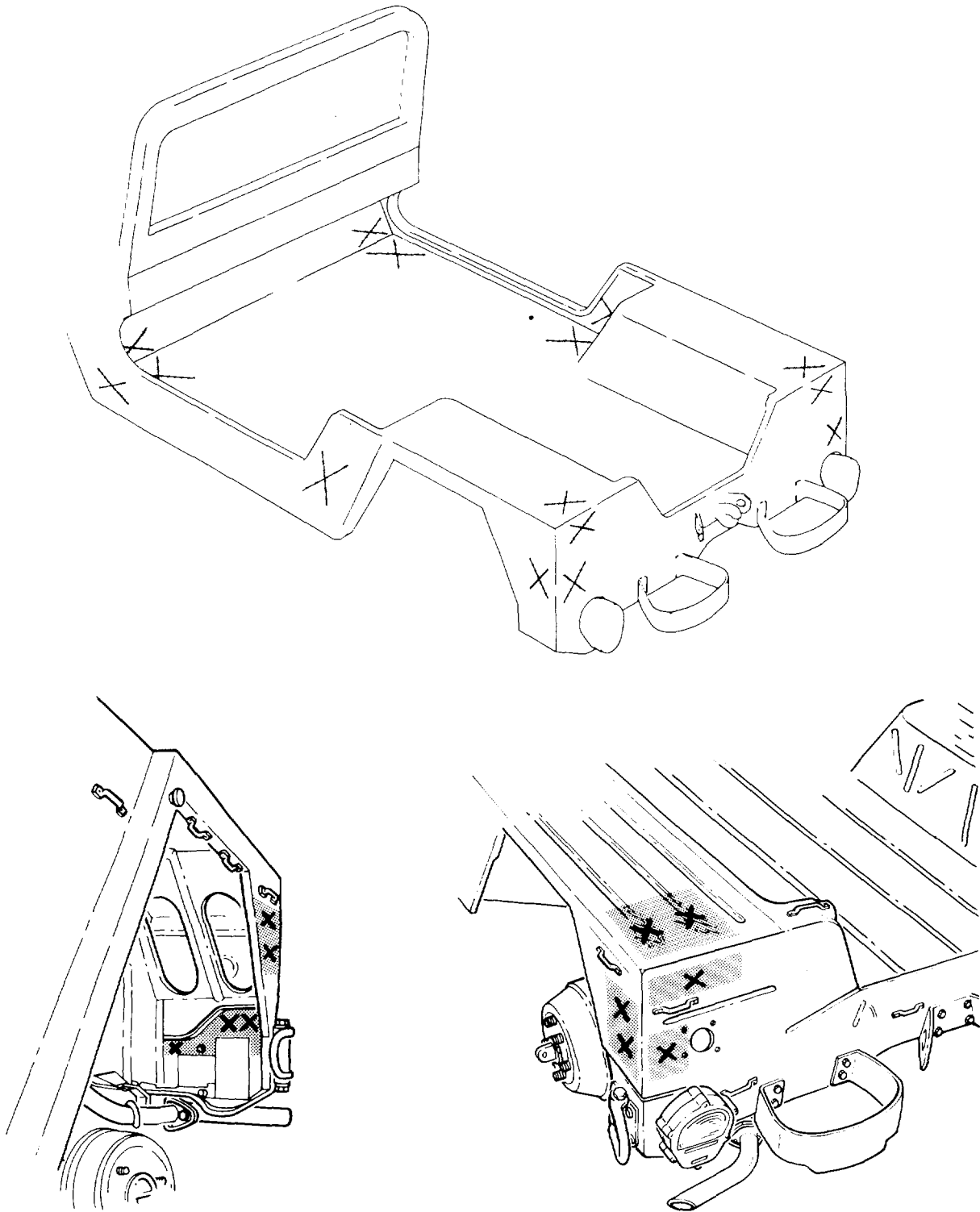
c. Any vehicle condition, identified during this inspection, that will prevent the proper installation of ROPS, as specified by this MWO, is justification for denial of application. Vehicles failing this inspection and identified as none repairable will be identified with the following statement on DA Form 2407 "Unsafe for Operation" - "Vehicle to be Deadlined". At the discretion of the installation team, those vehicles determined to be acceptable after repair will be identified as such, and returned to the unit for repair.

d. Required Criteria.

(1) Vehicle must be rejected for MWO application if any condition described in paragraph b is evident in areas marked (X).



- (X). (2) Vehicle must be rejected for MWO application if damage or corrosion is evident in areas marked



**3. PRIORITY CLASSIFICATION.**

This modification is classified as normal.

a. **VEHICLES IN USE** (including vehicles in supply or maintenance activities below depot level and vehicles in administrative storage): Vehicles in use will be modified as soon as feasible, but no later than the scheduled completion date.

b. Vehicles not modified after expiration MWO completion date will be reported as NORM/NOT READY in accordance with applicable Army regulations.

**4. END ITEM OR SYSTEM TO BE MODIFIED.**

a. **TRUCK, UTILITY:** 1/4-ton, 4x4, M151A2 (2320-00-177-9258)  
**SERIAL NO. RANGE:** All

b. Vehicle National Stock Number (NSN) will be changed to 2320-01-264-4819 as indicated on new data plate supplied with the MWO.

**5. MODULES (COMPONENTS, ASSEMBLIES, SUBASSEMBLIES, BOARDS, AND CARDS) TO BE MODIFIED.**

<b>HARD TOP KIT INSTALLED</b>		
<b>NOMENCLATURE</b>	<b>NSN</b>	<b>PART NO.</b>
Door Hard Top, Right	2510-00-470-1569	7345392
Door Hard Top, Left	2510-00-177-7777	7345391

**6. PART(S) TO BE MODIFIED.**

<b>DEEP WATER FORDING KIT INSTALLED</b>			
<b>NOMENCLATURE</b>	<b>NSN</b>	<b>PART NO.</b>	<b>PARA. NO.</b>
Support, Exhaust Pipe	N/A	11660430	11.b.

**7. APPLICATION.**

a. **TIME COMPLIANCE SCHEDULE.** MWO effective date 1 August 1987 and completion date 30 September 1991.

b. **LEVEL OF MAINTENANCE.** Intermediate forward (Direct Support).

c. **APPLIED BY.** Two persons with the following specialty are required to install MWO kits: wheeled vehicle repairman (MOS-63W) or equivalent civilian mechanic.

d. **TIME REQUIRED** (time for completion of MWO application to one end item).

(1) Total of 40.0 man-hours using 2 men.

(2) Total of 20.0 hours downtime for one end item.

e. **ADDITIONAL INFORMATION.**

(1) Refer to MWO fielding plan.

(2) Approval authority for alterations/modifications to equipment, or any deviation from the procedures specified by this publication will be coordinated through the Depot Maintenance Division Product Improvement Management Branch (AMSTA-MRP), U.S. Army Tank-Automotive Command (TACOM), Warren, MI 48397-5000.

**8. TECHNICAL PUBLICATIONS AFFECTED/CHANGED AS A RESULT OF THIS MWO.**

- TB 9-2320-218-10-1
- TM 9-2320-218-10
- TM 9-2320-218-20-1-1
- TM 9-2320-218-20-1-2
- TM 9-2320-218-20P
- TM 9-2320-218-34-1
- TM 9-2320-218-34P
- LO 9-2320-218-12
- TM 9-2320-218-10 HR

**9. SUPPLY KITS, PARTS, AND DISPOSITION.****a. KIT/PARTS REQUIRED TO ACCOMPLISH MWO.**

(1) KITS. The following kit is required to accomplish this modification and must be checked for completeness before starting the job.

**MODIFICATION KIT 12301498**

ITEM NAME	PART NO.	QTY.	FIGURE AND ITEM NO.
Reflector	11663067-1	1	2-9
Anchor	12301256	2	2-3
Bracket	12301273	2	2-8
Tape, Pressure Sensitive	12302504	1	2-1()
Rollbar, Front, L.H.	12356641-1	1	1-4
Rollbar, Front, R.H.	12356641-2	1	1-1
Rollbar, Intermediate, R.H.	12356642	1	1-2
Rollbar, Rear, R.H.	12356643	1	1-3
Crossbar, Front	12356644-1	2	1-8
Crossbar, Rear	12356644-2	2	1-7
Bracket, Rollbar Front, R.H.	12356647-1	1	1-14
Bracket, Rollbar Front, L.H.	12356647-2	1	1-11
Bracket, Rollbar Intermediate, L.H.	12356648-1	1	1-10
Bracket, Rollbar Intermediate, R.H.	12356648-2	1	1-13
Bracket, Rollbar Rear, L.H.	12356649-1	1	1-12
Bracket, Rollbar Rear, R.H.	12356649-2	1	1-9
Reinforcement, Light Switch	12356F650	2	3-5
Reinforcement, Trailer Socket	12356651	1	3-2
Handle, Door, L.H.	12356652-1	1	3-10
Handle, Door, R.H.	12356652-2	1	3-10
Rollbar, Intermediate, L.H.	12356653	1	1-5
Rollbar, Rear, L.H.	12356654	1	1-6
Clamp, Rollbar to Air Intake	12356658	1	3-13

Brace, Rollbar to Air Intake	12356659	1	3-14
Bracket, Seat Belt Anchor	12356660	2	2-4
Bracket, Seat Belt, Rear	12356663	1	3-6
Belt Assembly, Front	12356667	2	2-1
Belt Assembly, Rear	12356668	2	2-7
Padding, Impact	12356670	4	4-5
Restraint, Front, R.H.	12356671-1	1	4-1
Restraint, Front, L.H.	12356671-2	1	4-1
Restraint, Rear, L.H.	12356672-1	1	4-4
Restraint, Rear, R.H.	12356672-2	1	4-4
Plate, Data	12356673	1	3-4
Label	12356763	1	2-12
Bracket, Retractor R.H.	12368351	1	2-13
Bracket, Retractor L.H.	12368352	1	2-13
Bracket	12368353	2	1-15
Plate, Data	12368354	1	3-23
Nut, 1/4-28 UTNJB-38	MS21042-4	1	3-7
Nut, .1900-32 UNJB-38	MS21044-N3	6	3-7
Nut, 5/16-24 UNJB-38	MS21044-N5	2	3-16
Cotter Pin	MS24665-287	2	3-11
Washer, 11/32 Inside Dia.	MS27183-12	2	3-17
Washer, 15/32 Inside Dia.	MS27183-16	6	2-11
Washer, 17/32 Inside Dia.	MS27183-18	12	3-8/2-5/4-3
Screw, 1/4-20 UNC-2A, 3/4 in. long	MS35206-281	1	3-3
Screw, #10-32 UNF-2A, 5/8 in. long	MS35207-264	6	3-20
Washer, Lock, #10 Internal Tooth	MS35333-39	12	3-19
Washer, Lock, 5/16 Internal Tooth	MS35333-41	3	3-19
Washer, Lock, 1/2 Internal Tooth	MS35333-44	5	3-19
Washer, Lock, 1/4 Internal Tooth	MS35334-19	4	3-19
Washer, Lock, 1/4 External Tooth	MS35335-33	11	3-19
Washer, Lock, #8 Hel, Spring	MS35338-42	1	3-19
Washer, Lock, 5/16 Hel, Spring	MS35338-45	14	3-19
Washer, Lock, 1/2 Hel, Spring	MS35338-48	2	3-12

Screw, Tapping, 1/4-20, 1 in. long	MS51851-88	6	3-22
Screw, Tapping, Cross Head, 0.190 Dia. 16 Tri, 3/8 in. long	MS51861-44	8	3-21
Nut, Lock, 1/4-28 UNF	MS51922-5	11	3-7
Nut, 3/8-24 UNF-3B	MS51943-36	42	3-7
Nut, 1/4-20 UNC 2B	MS51967-2	2	3-7
Nut, Locking, 5/16 Hex, Flanged	MS51988-6	4	3-9
Nut, Flanged, 7/16 -20 UNF-2B	MS51988-10	6	3-9
Nut, Flanged, 1/2-20 UNF	MS51988-12	10	3-9/2-2/4-2
Screw, 5/16-24 UNF-2A, grade 5, 1 in. long	MS90726-34	2	3-3
Screw, 5/16-24 UNF-2A, grade 8, 1/2 in. long	MS90727-29L	4	3-15
Screw, 5/16-24 UNF-2A, grade 8, 5/8 in. long	MS90727-31L	4	3-15
Screw, 5/16-24 UNF-2A, grade 8, 7/8 in. long	MS90727-33	4	3-15
Screw, 3/8-24 UNF-2A, grade 8, 3/4 in. long	MS90727-58	4	3-15
Screw, 3/8-24 UNF-2A, grade 8, 1 in. long	MS90727-60	20	3-15
Screw, 3/8-24 UNF-2A, grade 8, 1-1/4 in. long	MS90727-62	18	3-15
Screw, 7/16-20 UNF-2A, grade 8, 1-1/8 in. long	MS90727-86	6	3-15
Screw, 1/2-20 UNF-2A, grade 8, 1-1/8 in. long	MS90727-110	4	3-15/2-6
Screw, 1/2-20 UNF-2A, grade 8, 1-3/8 in. long	MS90727-112	4	3-15
Screw, 1/2-20 UNF-2A, grade 8, 2-3/4 in. long	MS90727-118	2	3-15
Screw, 1/2-20 UNF-2A, grade 8, 3-1/2 in. long	MS90727-121	2	3-15
Plug	NAS 451-17	2	3-18
Washer, 3/8 in. Inside Diameter	24617-9428848	42	3-8
Tape, 2 in. x 60 yd roll, Type IV, Class I, Color Olive Drab x 34087	PPP-T-60	2	4-6

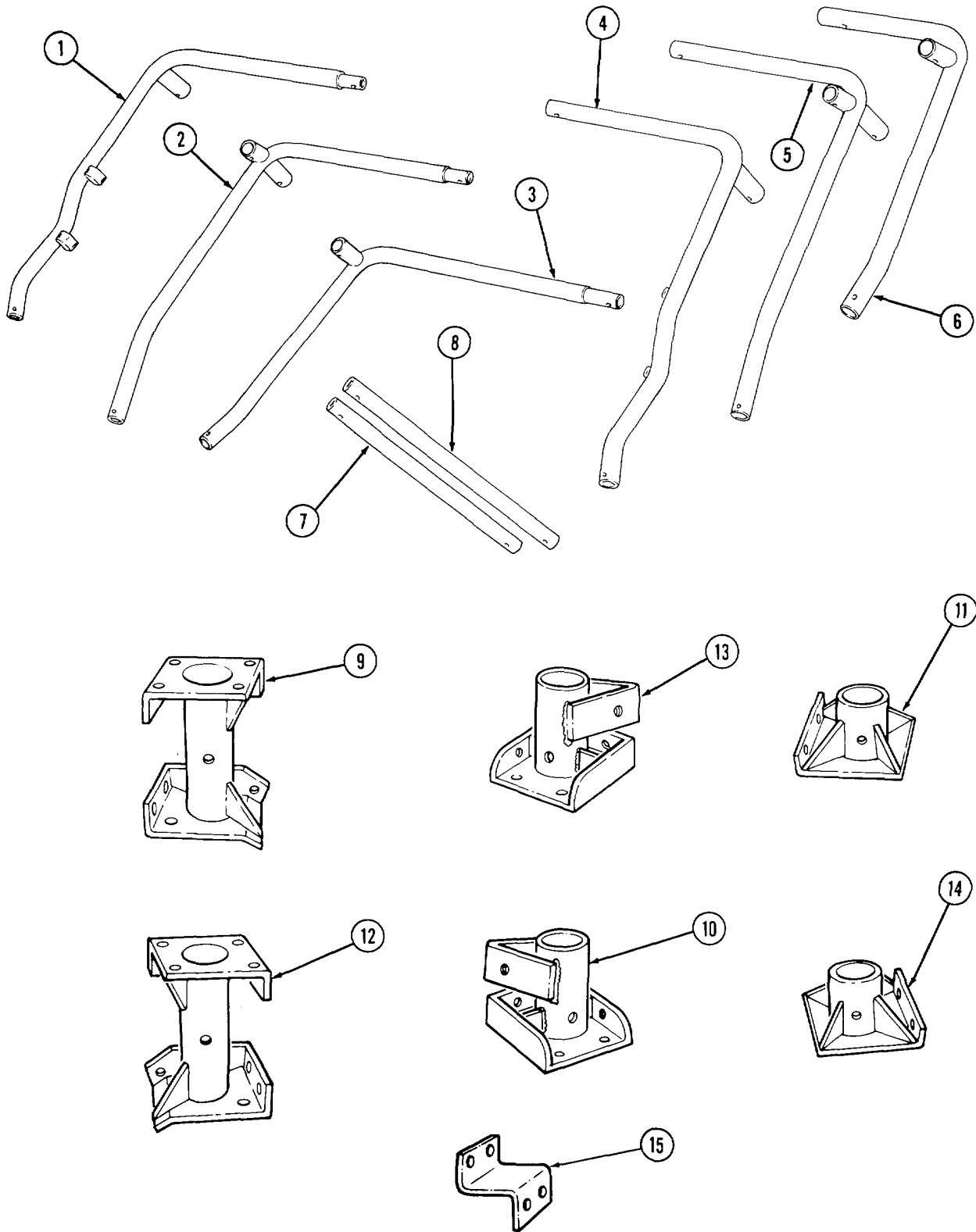


Figure 1. Modification Kit 12301498.



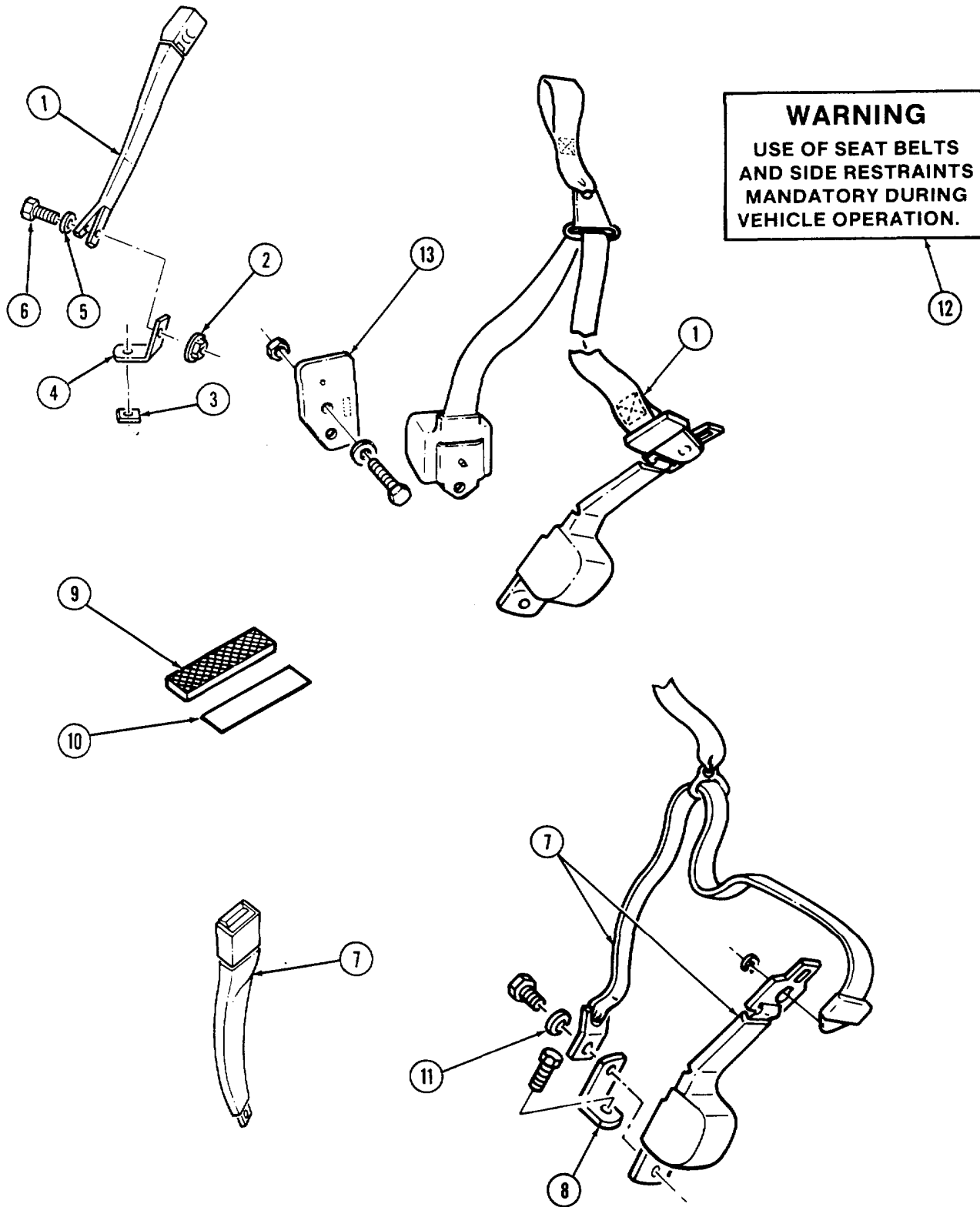


Figure 2. Modification Kit 12301498.

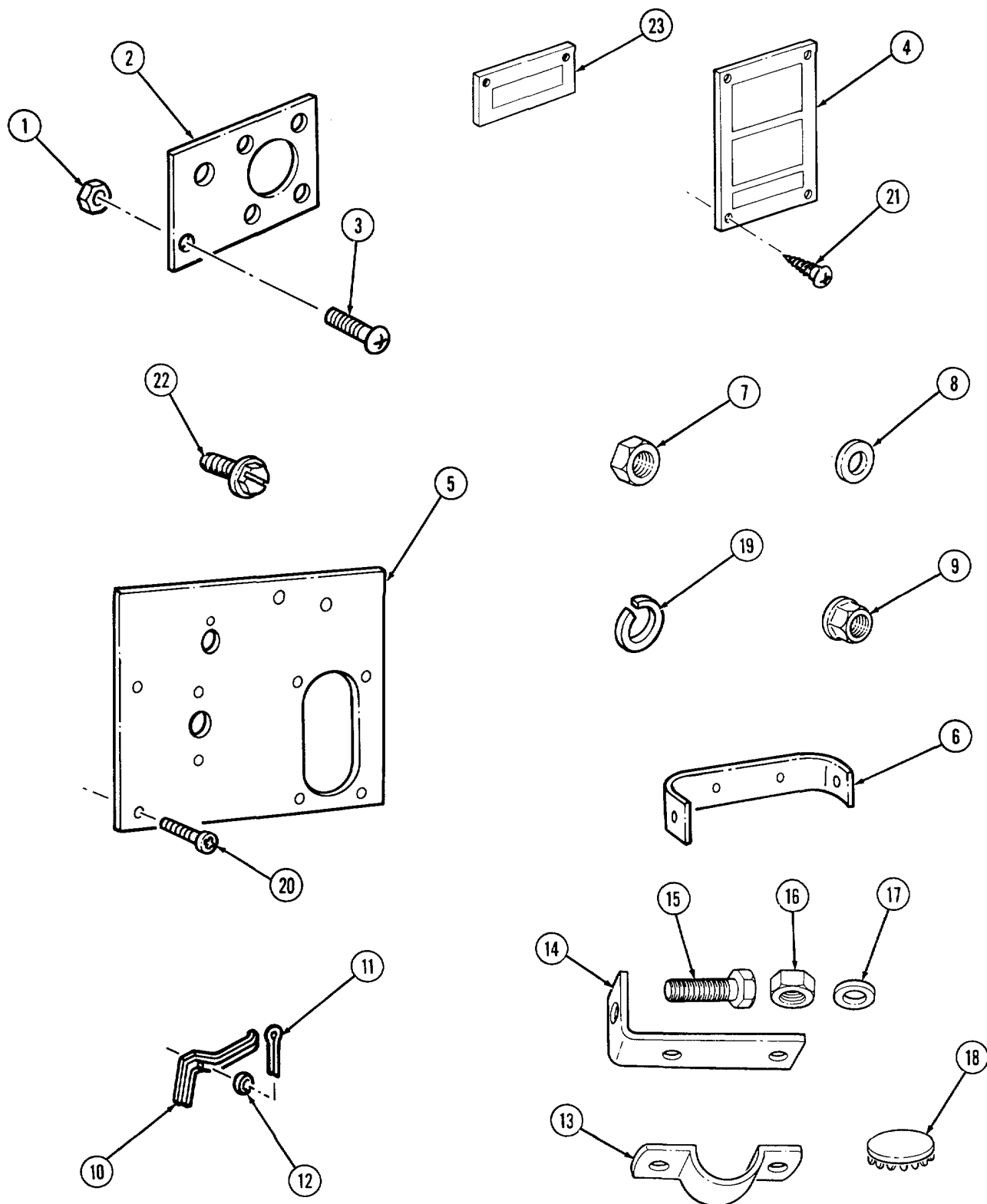


Figure 3. Modification Kit 12301498.

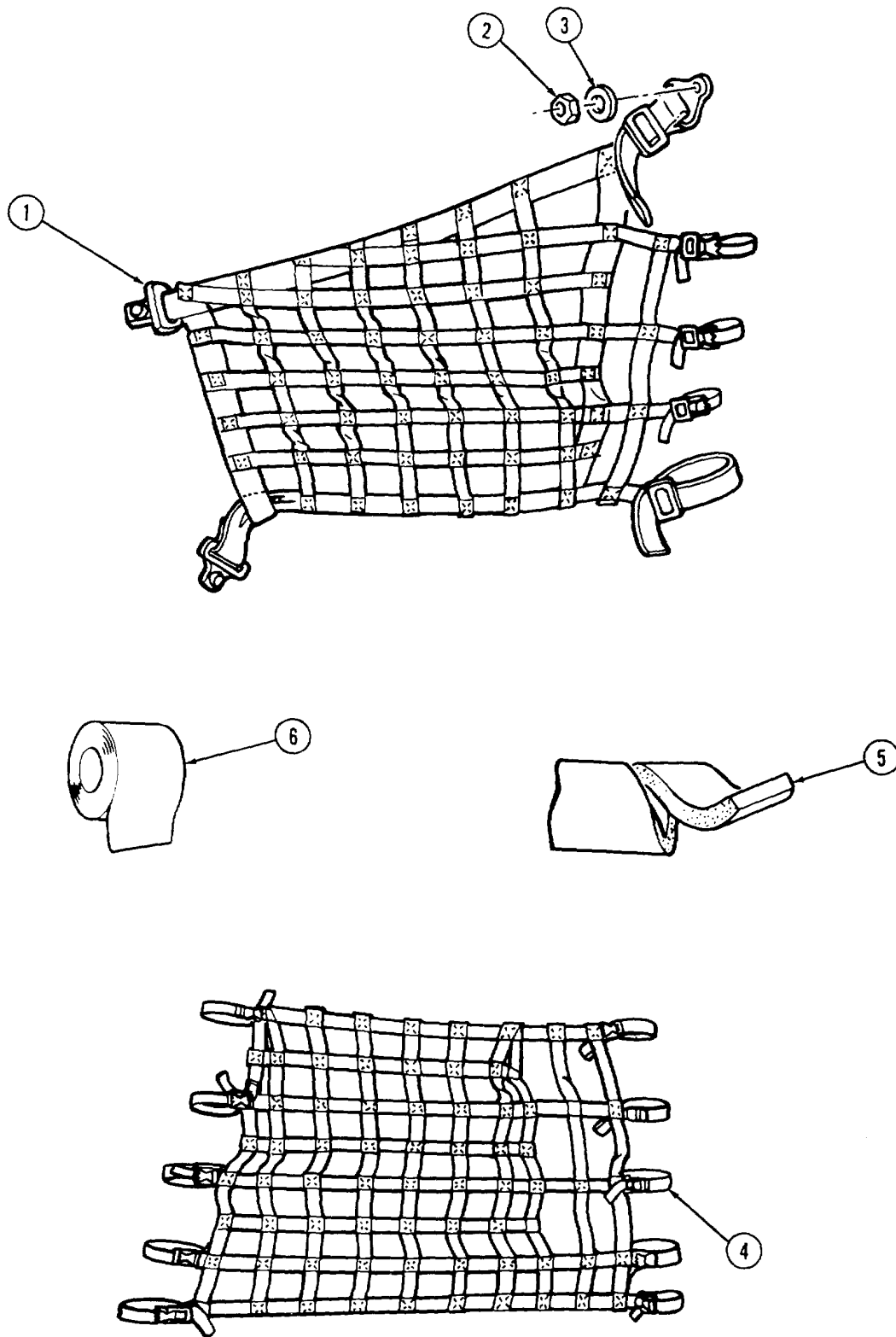


Figure 4. Modification Kit 12301498.

(2) PARTS. The following parts are required to complete this modification for vehicles equipped with deepwater fording kit, and must be requisitioned from supply.

NSN	ITEM NAME AND PART NUMBER	QUANTITY REQUIRED PER END ITEM
	Washer, Lock, 1/4 Dia. Internal Tooth	MS35335-33 10
	Washer, Lock, 5/16 Dia.	MS35338-45 1
	Nut, Lock, 3/8-24 UNF-2B	MS51922-21 2
	Nut, Lock, 5/16-18 UNC	MS51988-5 17
	Gasket	7331368 1

b. KITS. The modification kit 12301498 weighs 347 lbs., measures 5 ft. x 3.33 ft. x 1.27 ft., and the volume is 21.145 cubic feet.

c. DISTRIBUTION AND ISSUE INSTRUCTIONS.

(1) U.S. FORCES. Do not requisition kits. They will be shipped automatically as detailed in the Memorandum of Understanding (MOU).

(2) U.S. ARMY DEPOTS. Requisition required kits through supply channels.

(3) MULTISERVICE. Special instructions will be provided for multipurpose MWO's.

(4) MAP/MAS COUNTRIES. Special shipping instructions will be provided for MAP/MAS countries.

d. All material removed and not reused during installation will be returned to stock for disposition in accordance with AR 725-50.

e. BULK AND CONSUMABLE MATERIALS.

**NOTE**

Refer to TB 43-0209 for painting materials.

NSN	NOMENCLATURE	QUANTITIES
8030-01-134-6513	Rustproofing Compound	1 CN

**10. SPECIAL TOOLS; JIGS; TEST MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE): AND FIXTURES REQUIRED.**

Hole saw, 2.25 inch dia.

Hole saw, 2.50 inch dia.

**11. MODIFICATION PROCEDURES.**

a. VEHICLE PREPARATION.

(1) Remove front seats (refer to TM 9-2320-218-20-1-2).

(2) Remove rear seat (refer to TM 9-2320-218-20-1-2).

## NOTE

- Perform steps (3) and (4) if deep water fording kit is installed.
- Perform step (5) if soft top is installed.
- Perform steps (6) to (11) if hard top is installed.
- Left side and right side doors are removed the same. These procedures cover the left side door.

(3) Remove air intake extension hose and tube (refer to TM 9-2320-218-34-1).

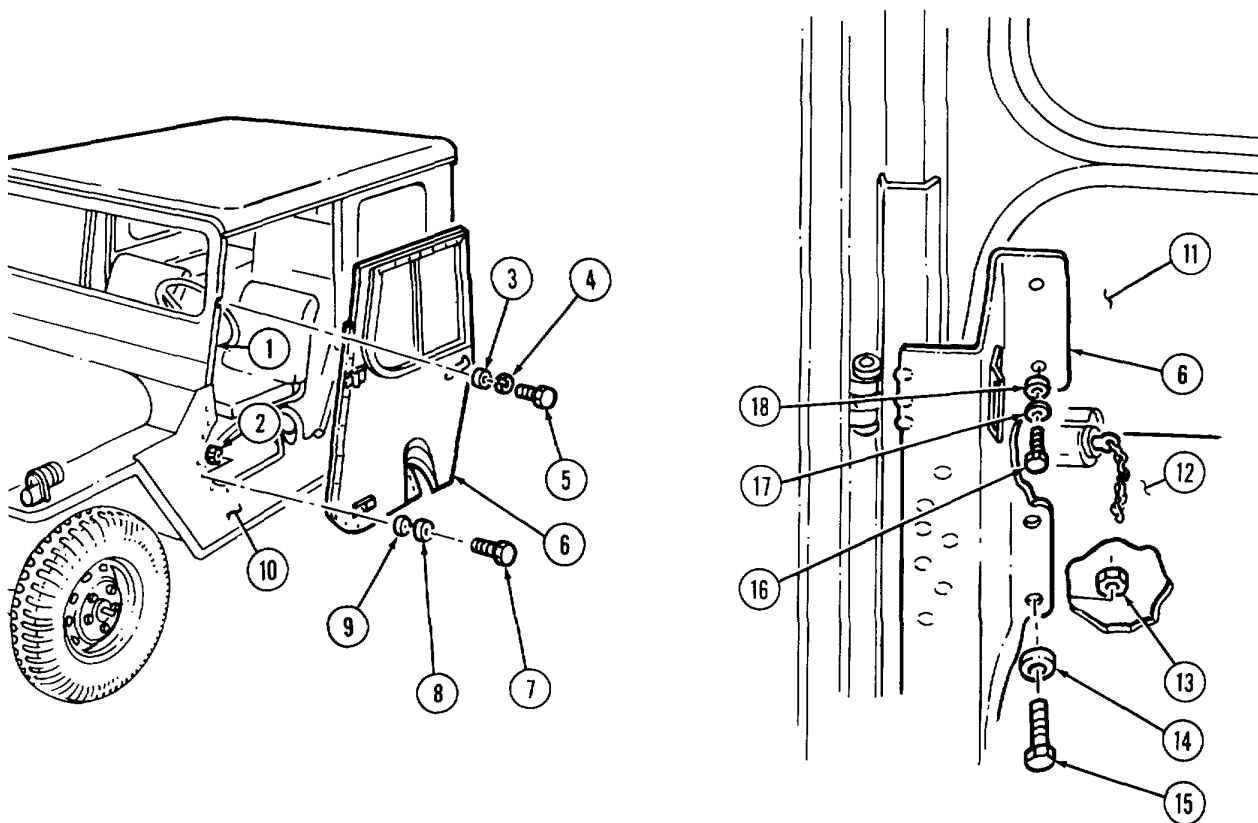
(4) Remove exhaust pipe extension (refer to TM 9-2320-218-34-1).

(5) Remove doors, side curtains and soft top (refer to TM 9-2320-218-10).

(6) Remove two screws (5), lockwashers (4), and washers (3) securing door and pillar assembly (6) to windshield frame (1).

(7) Remove two nuts (13), screws (15), and washers (14) securing door and pillar assembly (6) to dash panel (12). Remove two screws (16), lockwashers (17), and washers (18) securing door and pillar assembly (6) to windshield assembly (11).

(8) Remove six nuts (2), screws (7), lockwashers (8), and washers (9) securing door and pillar assembly (6) to body side panel (10). Remove door and pillar assembly (6) from body side panel (10).



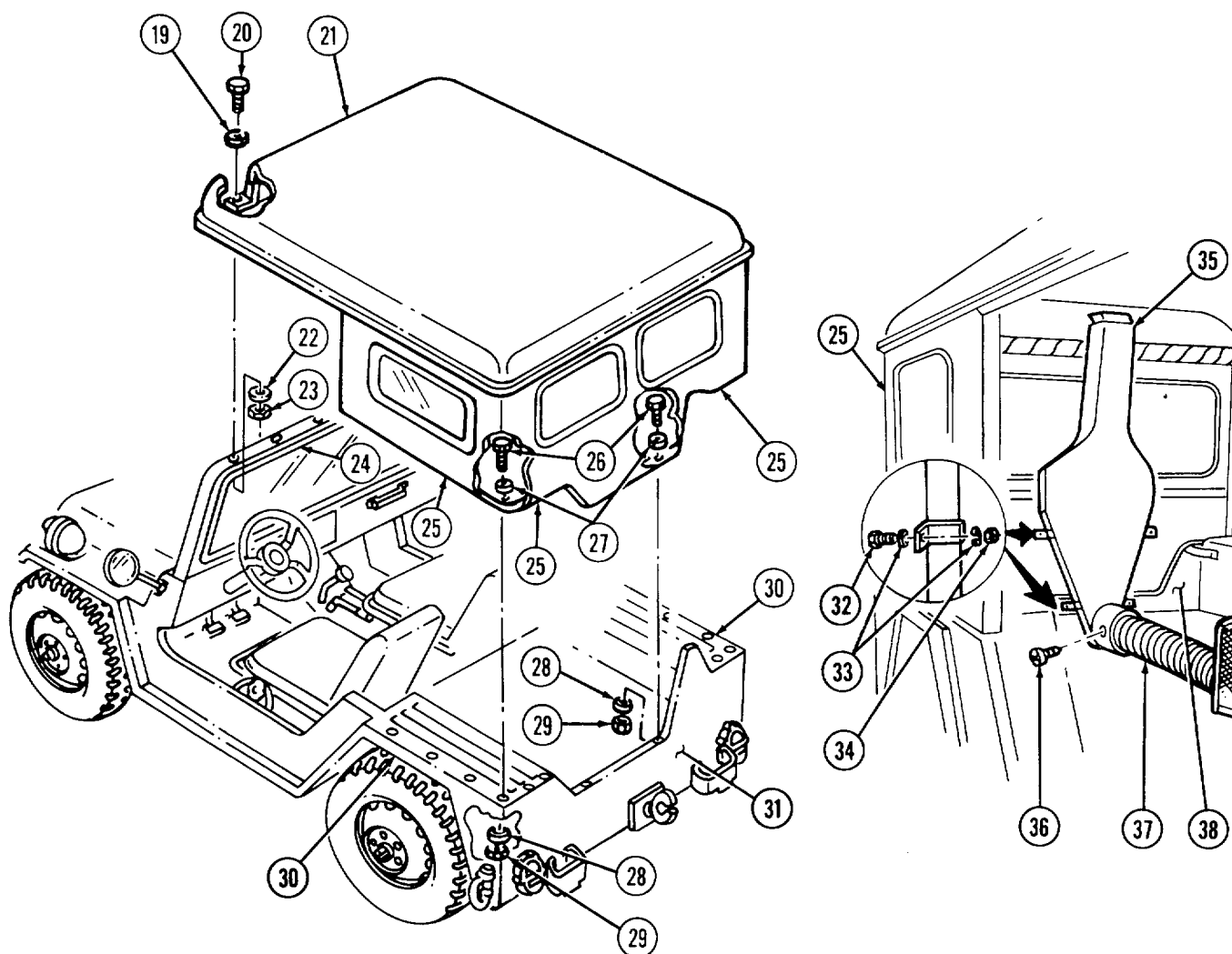
(9) Remove screw (36) securing duct assembly (35) to air intake pipe (37). Remove nuts (34), washers (33), and screws (32) securing duct assembly (35) to vehicle body (38) and hard top rear panel (25). Remove duct assembly (35).

(10) Remove four nuts (23), lockwashers (22), screws (20), and washers (19) securing hard top roof panel (21) to vehicle windshield frame (24). Discard lockwashers.

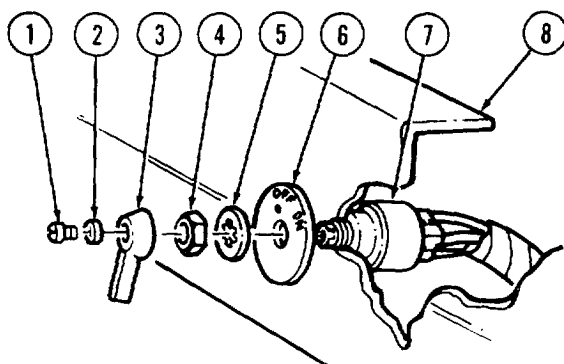
(11) Remove sixteen nuts (29), lockwashers (28), thirty-two flat washers (27), and sixteen screws (26) securing hard top rear panel (25) to vehicle rear (31) and side panels (30). Discard lockwashers (28). Remove hard top assembly.

(12) Remove windshield (refer to TM 9-2320-218-20-1-2).

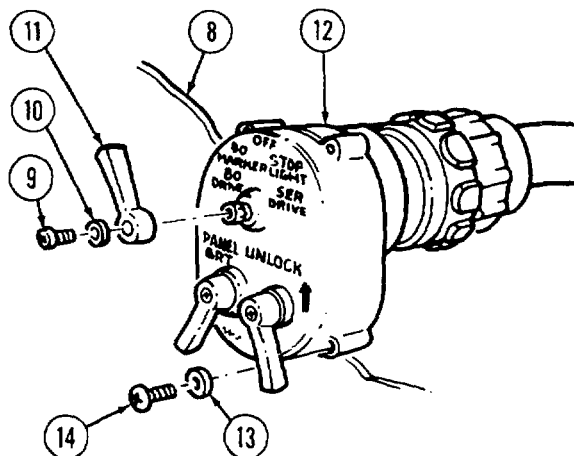
(13) Disconnect battery ground cable and reinstall battery box cover (refer to TM 9-2320-218-20-1-1).



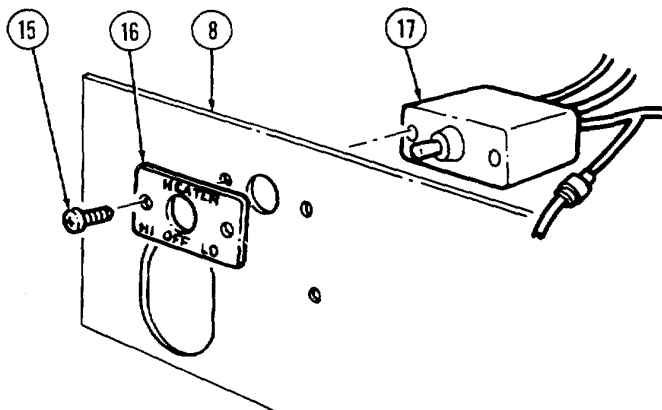
(14) Remove screw (1), lockwasher (2), lever (3), nut (4), lockwasher (5), and instruction plate (6) securing ignition switch (7) to dash panel (8). Pull ignition switch (7) from behind dash panel (8). Discard lockwashers (2) and (5).



(15) Remove screw (9), washer (10), lever (11), four screws (14), and lockwashers (13) securing main light switch (12) to dash panel (8). Pull main light switch (12) from behind dash panel (8). Discard lockwashers (13).



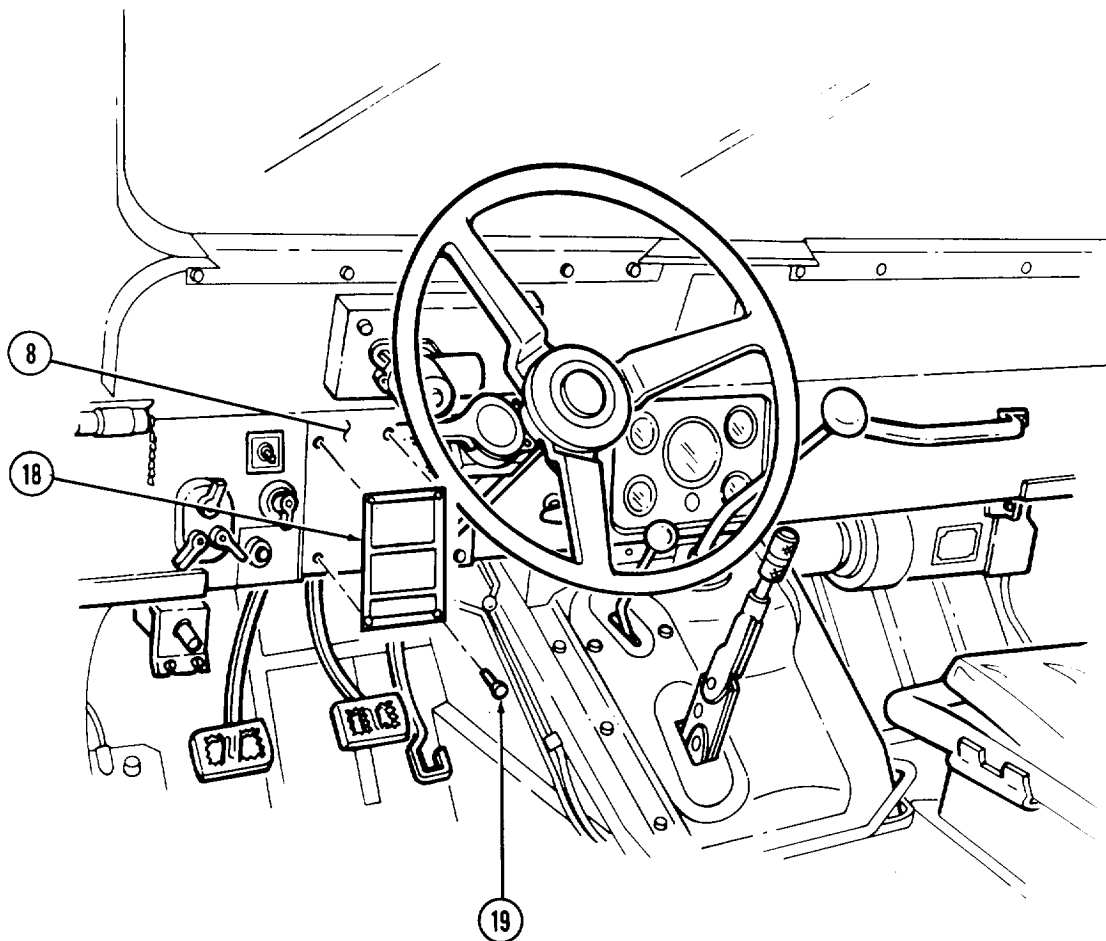
(16) Remove two screws (15) securing instruction plate (16) and heater switch (17) to dash panel (8). Pull heater switch (17) from behind dash panel (8).



**NOTE**

**Perform steps (17) and (18) if M16 rifle mounting kit is installed.**

- (17) Remove hot water heater if installed (refer to TM 9-2320-218-20-1-2).
- (18) Remove left side and right side rifle mounting catch and floor bracket (refer to TM 9-2320-218-20-1-2).
- (19) Remove four rivets (19) securing data plate (18) to vehicle dash panel (8). Remove data plate (18).



- (20) Remove rear wheels (refer to TM 9-2320-218-20-1-2).
- (21) Remove left rear red reflector (refer to TM 9-2320-218-20-1-2).

**NOTE**

**Prior to removal, tag leads for installation.**

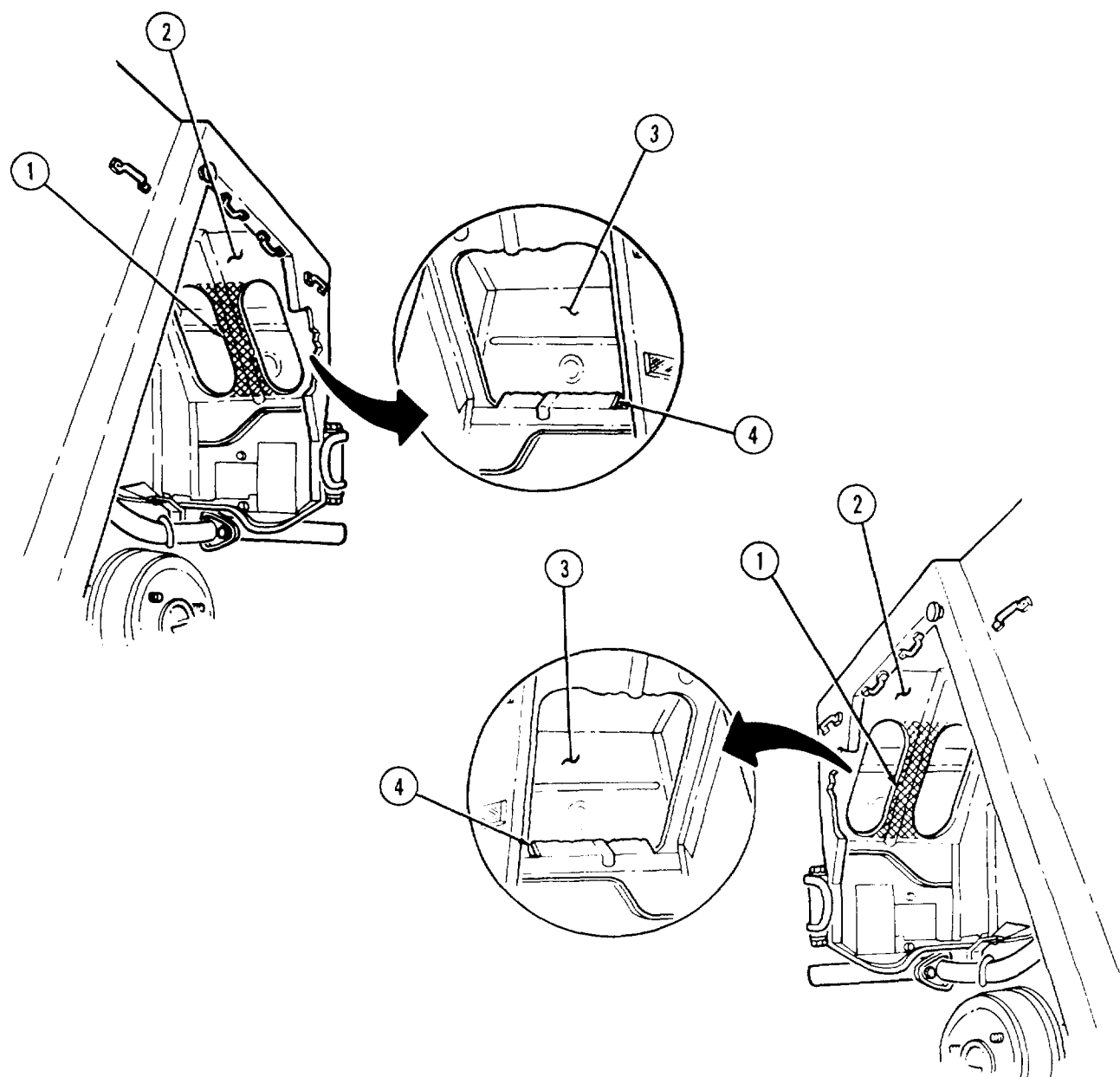
- (22) Remove trailer receptacle (refer to TM 9-2320-218-20-1-1).



**WARNING**

- Remove flammable materials, such as spilled fuel, oil, or rust-proofing from immediate area. Place wet rags or nonflammable cloth around area being cut.
- Use effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.) during cutting operations. Failure to do so could result in personal injury.

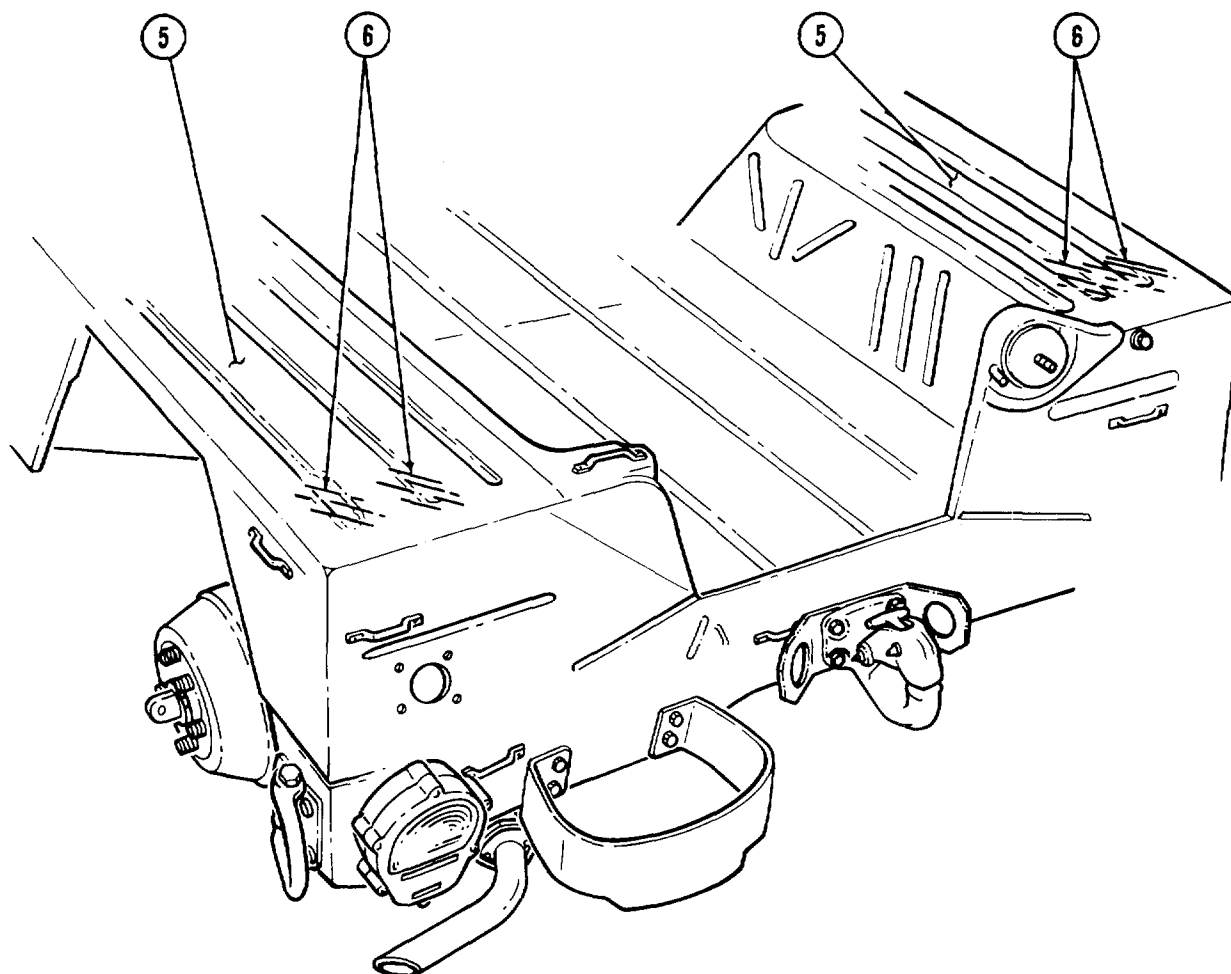
(23) Using a cutting torch (or air chisel, if available) cut and remove center sections (1) from under wheelhousing supports (2). Bend bottom flanges (4) toward rear of wheelhousing (3). If a torch is used, make certain the WARNING regarding flammable materials is followed prior to use of the torch.



**WARNING**

- Remove flammable materials, such as spilled fuel, oil, or rust-proofing from immediate area. Place wet rags or nonflammable cloth around area to be flattened.
- Use effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.) during heating operations. Failure to do so could result in personal injury.

(24) Use heat, dolly block, and hammer to flatten two creases (6) on top of wheel housings (5), to allow access for rear rollbar bracket and to allow as much contact as possible between the bracket to be installed and body.



## b. 12356649-1 LEFT SIDE REAR ROLLBAR BRACKET INSTALLATION PROCEDURES.

**NOTE**

- Perform step 1 only for vehicles equipped with antenna mounting bracket.
- Perform steps 2 and 3 only for vehicles equipped with deep water fording kit.

(1) Remove four nuts (2) and screws (1) from corner of antenna mounting bracket (3).

(2) Remove three nuts (7) and screws (5) from exhaust mounting support assembly (6).

(3) Cut and remove lower mounting tab (8) from support assembly (6).

(4) Position rollbar bracket ( 11) between wheelhousing (9) and rear body panel flange (12).

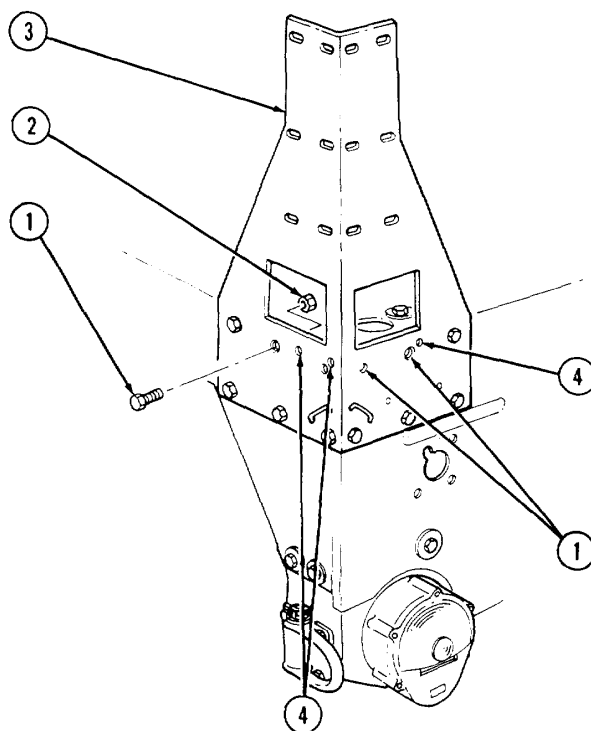
(5) Using rollbar bracket (11) as template, locate and mark seven 0.406-inch diameter holes (10) in wheelhousing (9) and two 0.406-inch diameter holes (13) in rear body panel flange (12).

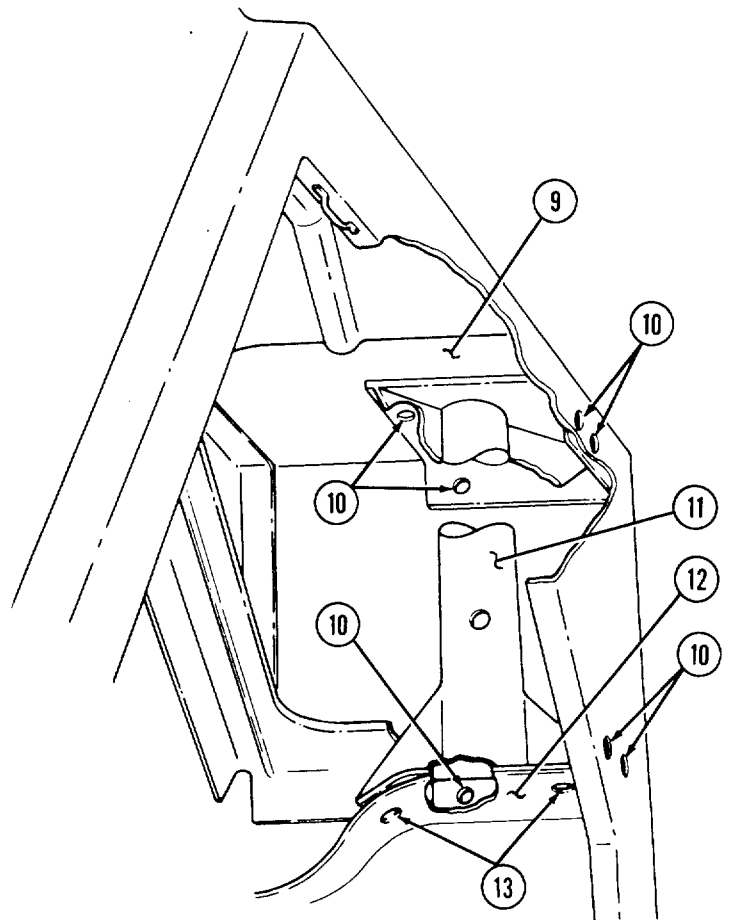
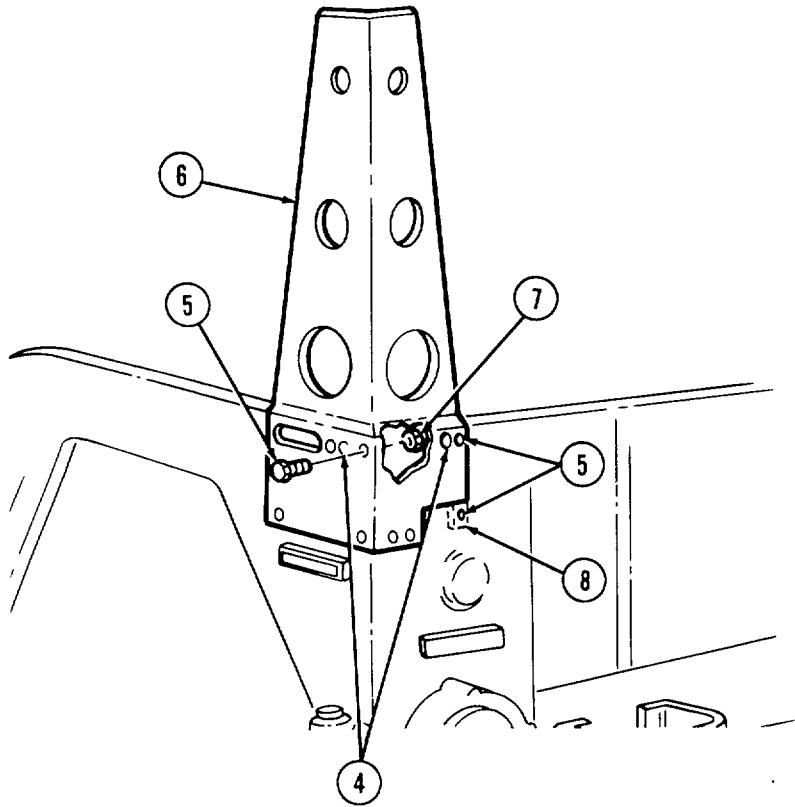
(6) Remove rollbar bracket (11) from wheelhousing (9).

**NOTE**

**If antenna mounting bracket or exhaust mounting support assembly is installed, drill through as marked in step 5.**

(7) Drill nine 0.125-inch diameter pilot holes from underside of wheelhousing and enlarge nine pilot holes with 0.406-inch diameter drill from outside of wheelhousing (9), and antenna mounting bracket holes (4) or exhaust mounting support assembly holes (4).





(8) Position and secure rollbar bracket (4) to wheelhousing (5) with six MS90727-60 screws (3), three MS90727-62 screws (9), nine 24617-9428848 washers (2), and MS51943-36 nuts (1). Tighten nuts (1) to 15 lb-ft (20 N-m).

(9) Using pin hole (13) at top of rollbar bracket (4) as template, drill 0.50-inch diameter hole (12) through rear body panel (14). Enlarge hole (12) to 0.750-inch diameter.

(10) Tap at top of wheelhousing (5) with hammer to form an outline (8) of opening at top of rollbar bracket (4).

#### NOTE

**Perform step 11 only for vehicles equipped with hard top kit.**

(11) Using hard top mounting holes (6) on top of wheelhousing (5) as a template, drill three 0.228-inch diameter holes (7) through rear rollbar bracket (4).

(12) Remove nine nuts (1), washers (2), and screws (3) and (9) securing rollbar bracket (4) to remove wheelhousing (5) and rollbar bracket (4).

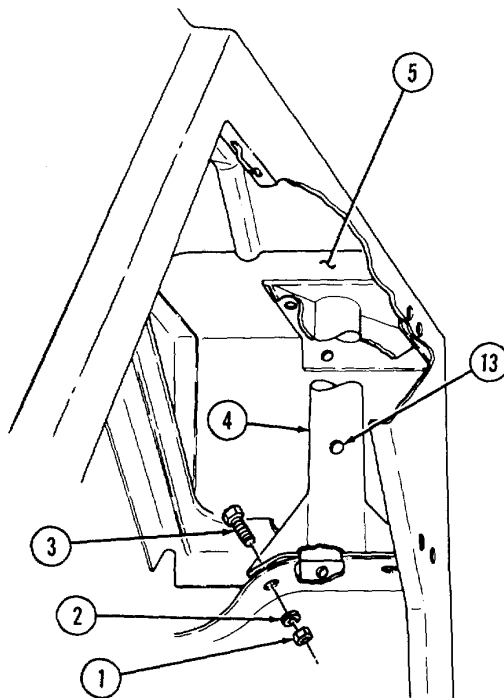
(13) Following outline (8) formed on top of wheelhousing (5) in step 10, use hole saw to cut out 2.250-inch diameter hole (15).

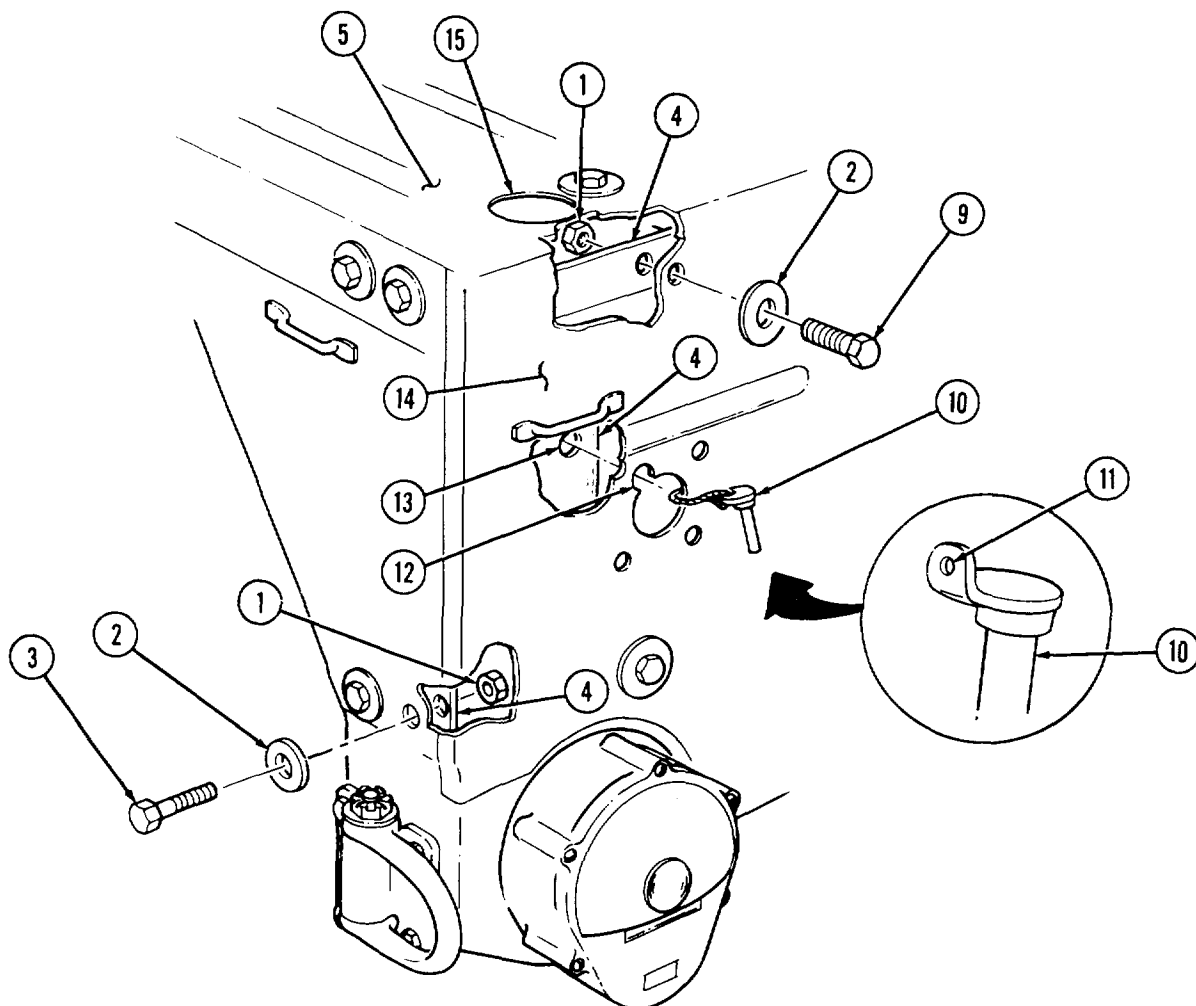
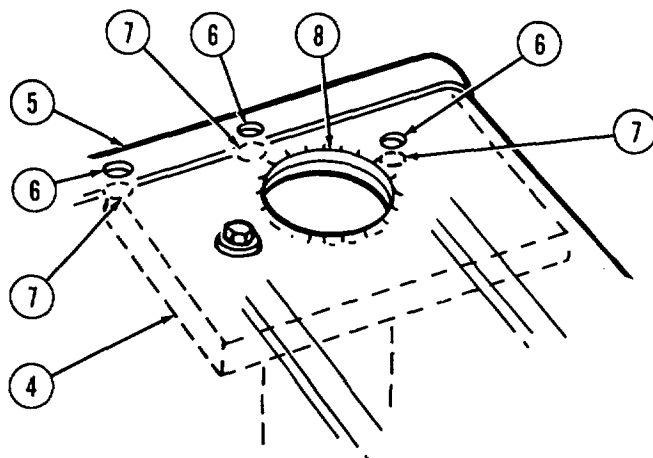
#### NOTE

**It may be necessary to bend pin head tabs (11) to clear hole (12) in body panel (14).**

(14) Position rollbar bracket (4) to wheelhousing (5) with pin (10) through hole (12) in body panel (14).

(15) Secure rollbar bracket (4) to wheelhousing (5) with six MS90727-60 screws (3), three MS90727-62 screws (9), nine 24617-9428848 washers (2), and MS51943-36 nuts (1). Tighten nuts (1) finger tight.





- c. 12356649-2 RIGHT SIDE REAR ROLLBAR BRACKET INSTALLATION PROCEDURES.

**NOTE**

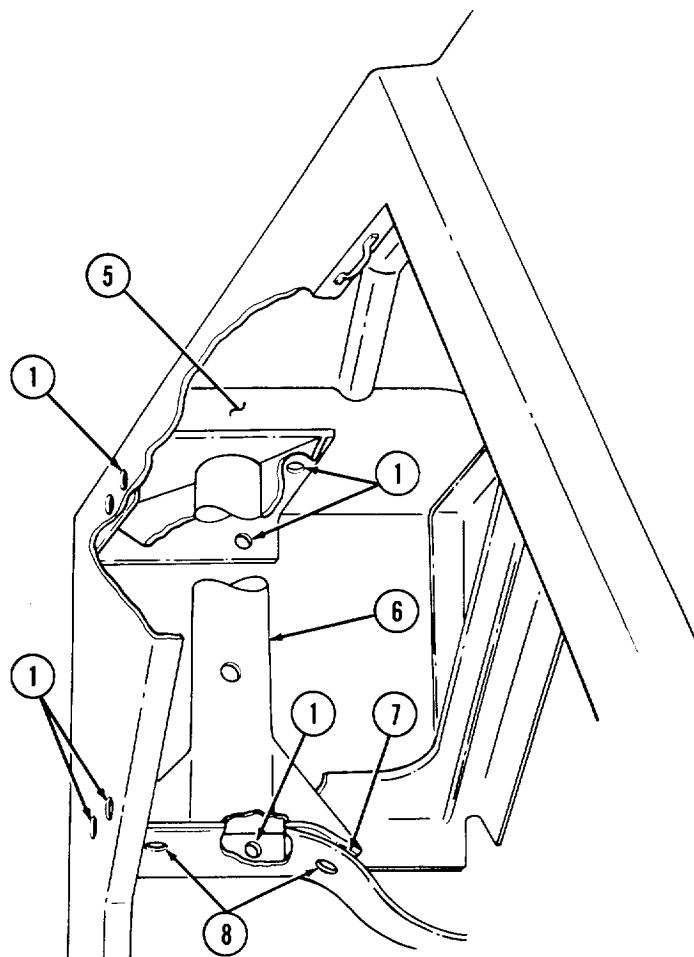
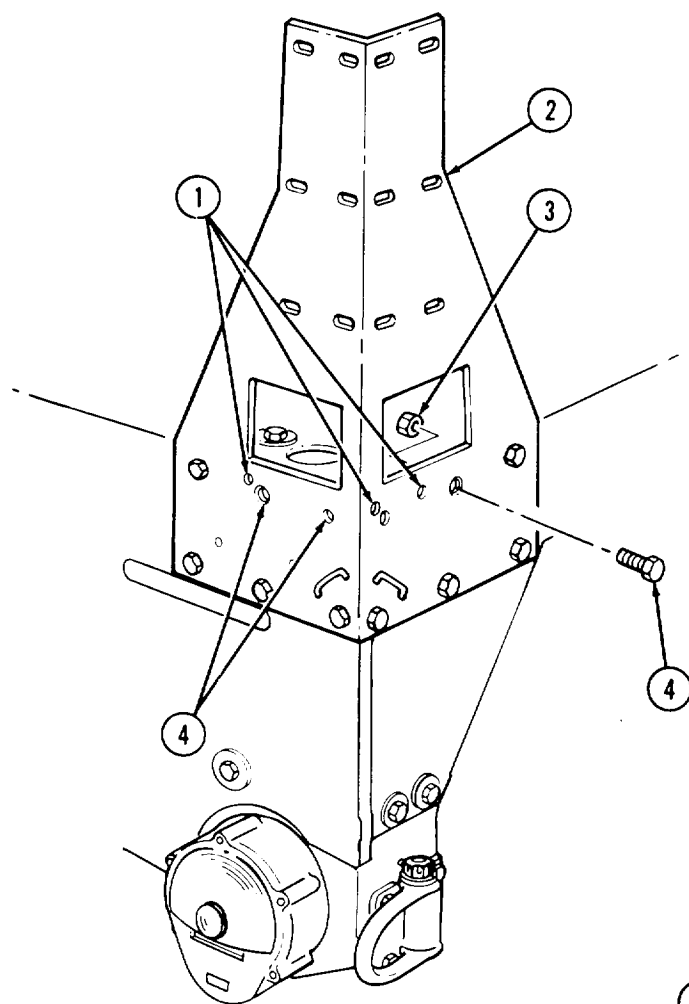
**Perform step 1 only for vehicles equipped with antenna mounting bracket.**

- (1) Remove four nuts (3) and screws (4) from corner of antenna mounting bracket (2).
- (2) Position rollbar bracket (6) between wheelhousing (5) and rear body panel flange (7).
- (3) Using rollbar bracket (6) as template, locate and mark seven 0.406-inch diameter holes (1) in wheelhousing (5) and two 0.406-inch diameter holes (8) in rear body panel flange (7).
- (4) Remove rollbar bracket (6) from wheelhousing (5).

**NOTE**

**If antenna mounting bracket is installed, drill through as marked in step 3.**

- (5) Drill nine 0.125-inch diameter pilot holes (1) and (8) from underside of wheelhousing (5) and enlarge nine pilot holes (1) and (8) with 0.406-inch diameter drill from outside of wheelhousing (5) and antenna mounting bracket (2).





(6) Position and secure rollbar bracket (2) to wheelhousing (1) with six MS90727-60 screws (3), three MS90727-62 screws (9), nine 24617-9428848 washers (4), and MS51943-36 nuts (5). Tighten nuts (5) to 15 lb-ft (20 N-m).

(7) Using pin hole (11) at top of rollbar bracket (2) as template, drill 0.50-inch diameter hole (12) through rear body panel (14). Enlarge hole (12) to 0.750-inch diameter.

(8) Tap at top of wheelhousing (1) with hammer to form an outline (8) of opening at top of rollbar bracket (2).

**NOTE**

**Perform step 9 only for vehicles equipped with hard top kit.**

(9) Using hard top mounting holes (7) on top of wheelhousing (1) as template, drill 0.228-inch diameter holes (6) through rear rollbar bracket (2).

(10) Remove nine nuts (5), washers (4), and screws (3) and (9) securing rollbar bracket (2) to wheelhousing (1) and remove rollbar bracket (2).

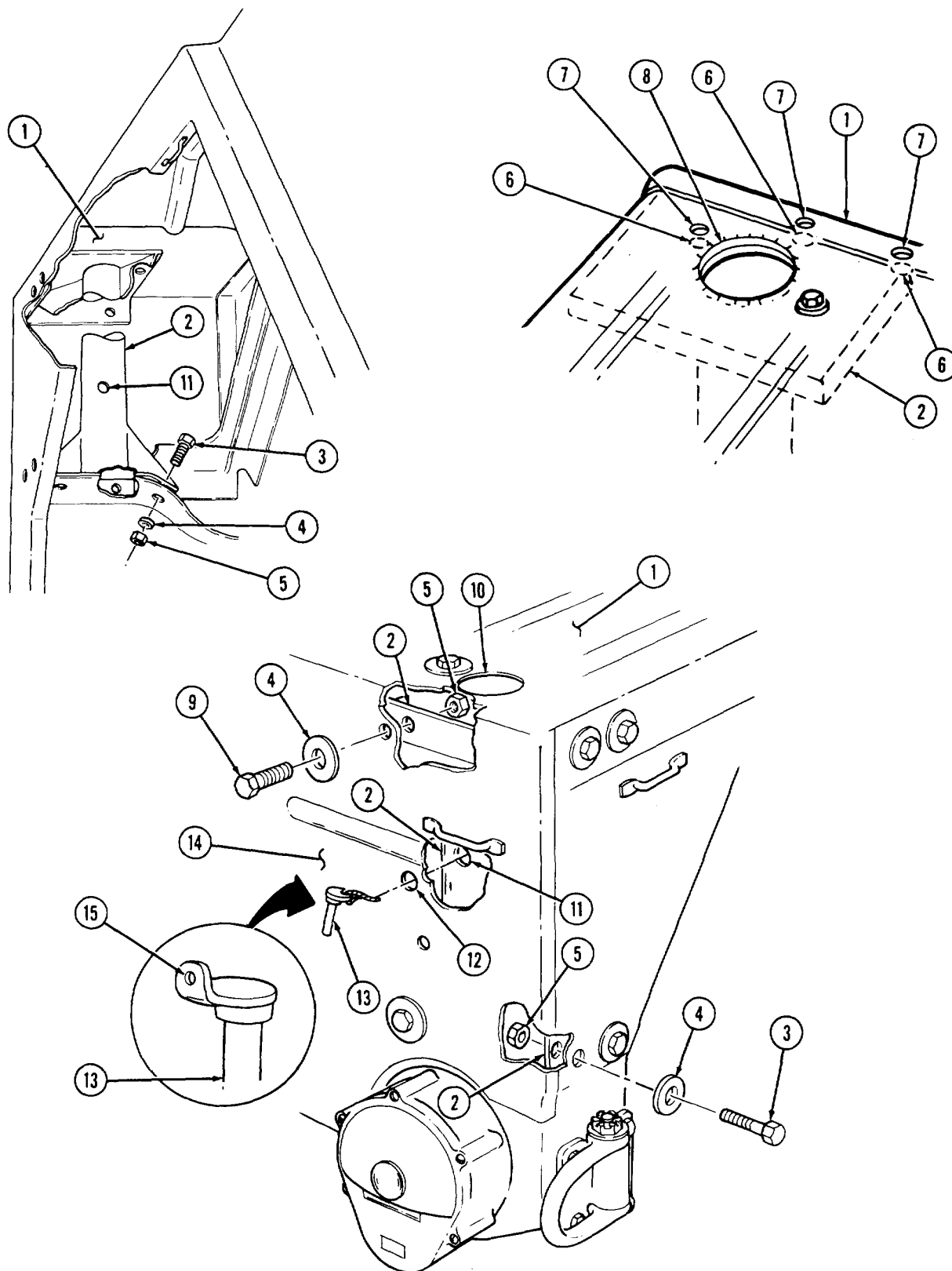
(11) Following outline (8) formed on top of wheelhousing (1) in step 8, use hole saw to cut out 2.250-inch diameter hole (10).

**NOTE**

**It may be necessary to bend pin head tab (15) to clear hole (12) in body panel (14).**

(12) Position rollbar bracket (2) to wheelhousing (1) with pin (13) through hole (12) in body panel (14).

(13) Secure rollbar bracket (2) to wheelhousing (1) with six MS90727-60 screws (3), three MS90727-62 screws (9), nine 24617-9428848 washers (4), and MS51943-36 nuts (5). Tighten nuts (5) finger tight.



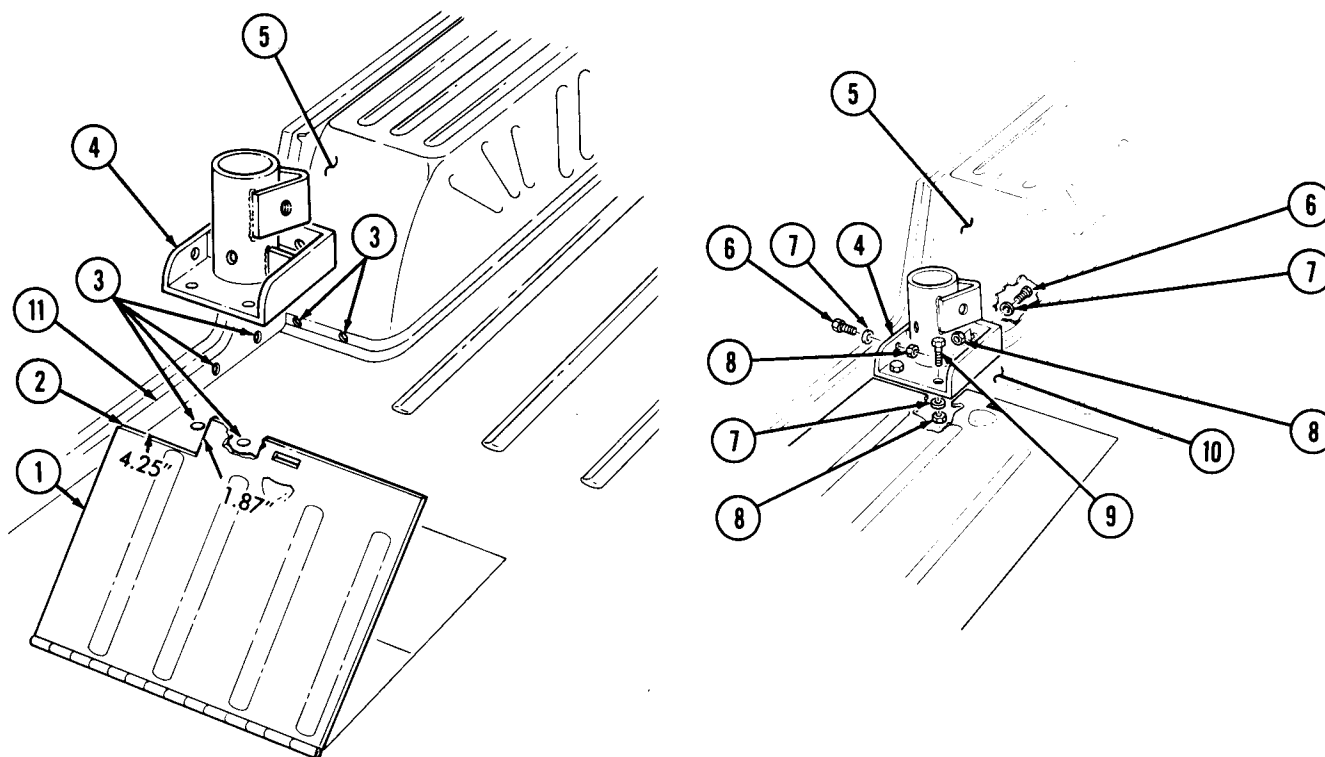
## d. RIGHT-HAND 12356648-2 INTERMEDIATE BRACKET INSTALLATION PROCEDURES.

- (1) Raise stowage box cover (1) to OPEN position.

**NOTE**

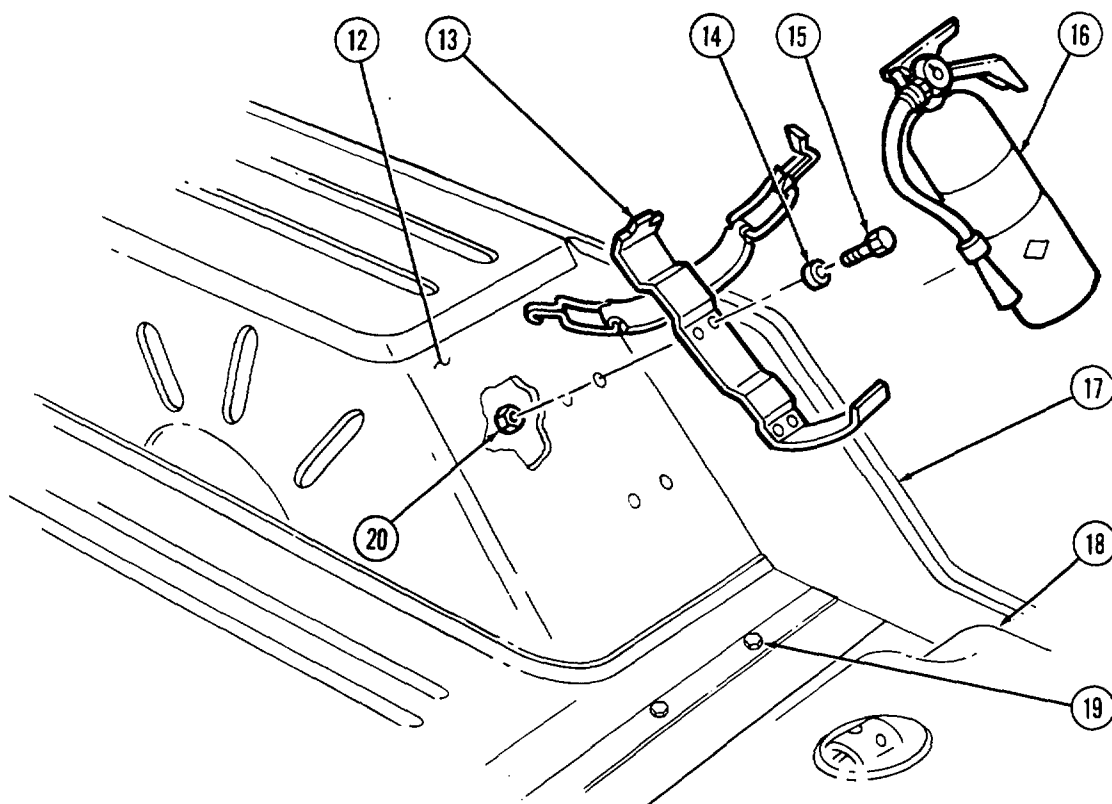
**For vehicles with arctic insulation installed, use intermediate brackets as template to locate, mark, and cut away insulation from bracket mounting surface.**

- (2) Position intermediate bracket (4) to front of wheelhousing (5) and body side panel (11).
- (3) Using intermediate bracket (4) as a template, locate and mark six 0.406-inch diameter holes (3).
- (4) Remove intermediate bracket (4).
- (5) Drill six 0.406-inch diameter holes (3).
- (6) Position and secure intermediate bracket (4) to body (10) with four MS90727-62 screws (6), two MS90727-60 screws (9), six 24617-9428848 washers (7), and six MS51943-36 nuts (8). Tighten nuts (8) finger tight.
- (7) Cut a 1.87-inch x 4.25-inch square slot (2) in stowage box cover (1). Remove sharp edges and burrs.



## e. LEFT-HAND 12356648-1 INTERMEDIATE BRACKET INSTALLATION PROCEDURES.

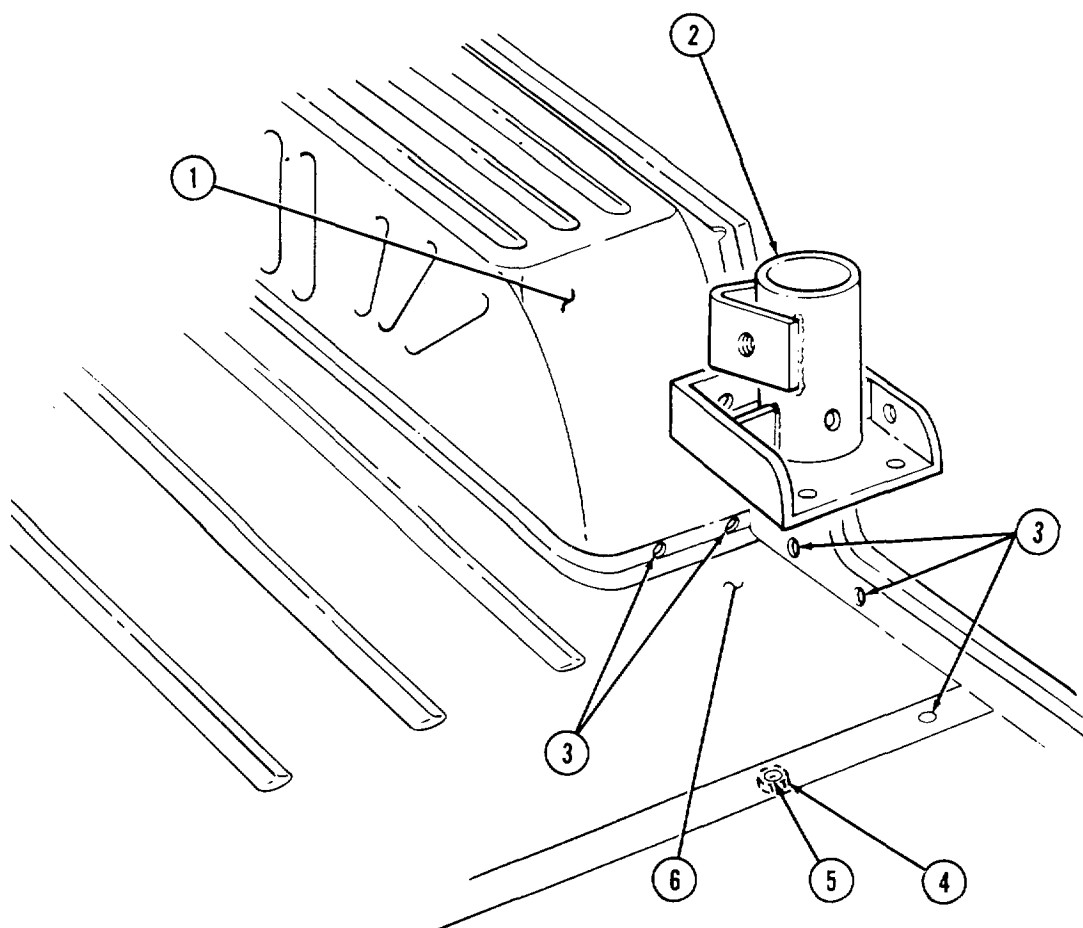
- (1) Remove screw (19) securing fuel tank (18) to body (17).
- (2) Remove fire extinguisher (16) from mounting bracket (13).
- (3) Remove four nuts (20), washers (14), and screws (15) securing mounting bracket (13) to wheelhousing (12). Remove mounting bracket (13).

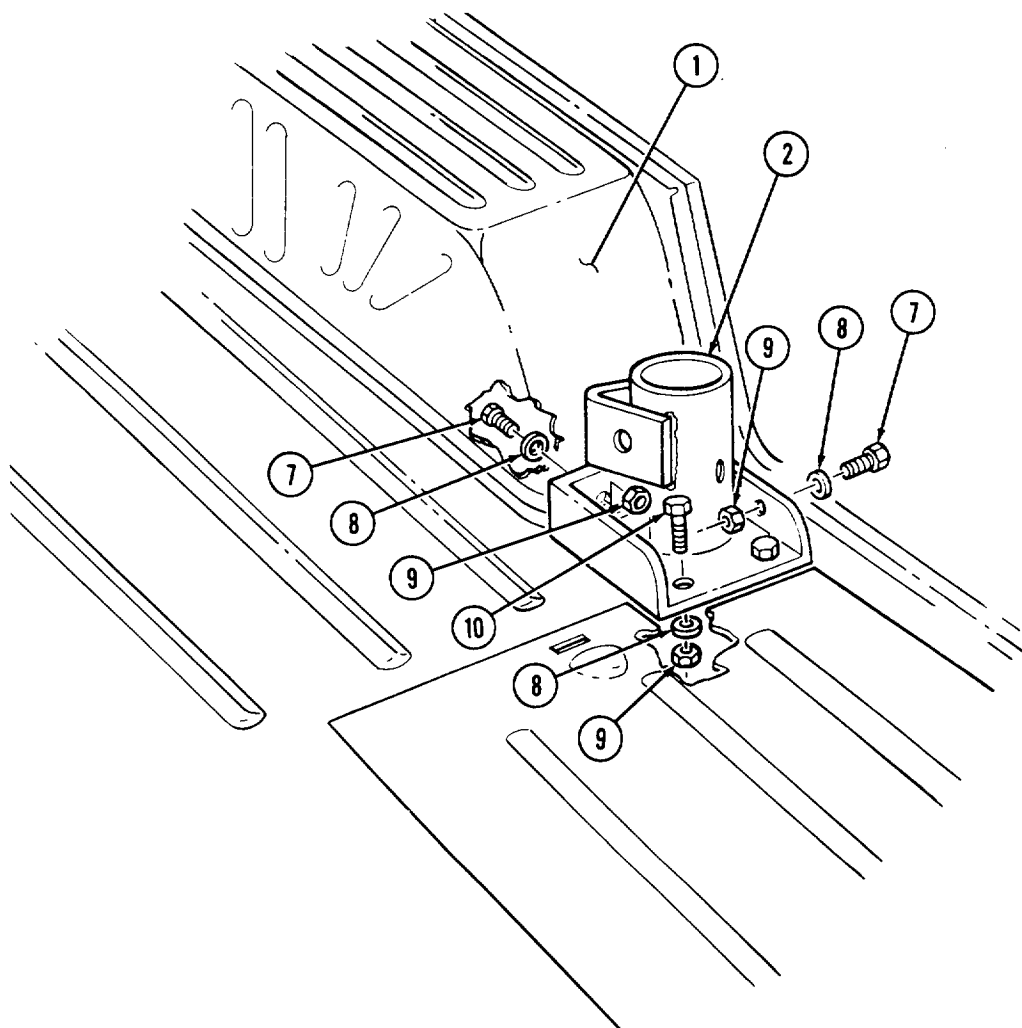


## NOTE

**For vehicles with arctic insulation installed, use intermediate bracket as template to locate, mark, and cut away insulation from bracket mounting surface.**

- (4) Position intermediate bracket (2) to front of wheelhousing (1) and body side panel (6).
- (5) Using intermediate bracket (2) as a template, locate and mark five 0.406-inch diameter holes (3).
- (6) Remove intermediate bracket (2).
- (7) Drill five 0.406-inch diameter holes (3) in body (6) and one 0.406-inch diameter hole (5) through fuel tank mounting weld nut (4).
- (8) Position and secure intermediate bracket (2) to body (6) with four MS90727-62 screws (7), two MS90727-60 screws (10), six 24617-9428848 washers (8), and six MS51943-36 nuts (9). Tighten nuts (9) finger tight.





## f. FRONT ROLLBAR BRACKETS INSTALLATION PROCEDURES.

**NOTE**

- **Left-hand 12356647-2 and right-hand 12356647-1 rollbar brackets are installed the same. This procedure covers the left-hand rollbar bracket.**
- **For vehicles with arctic insulation installed, use rollbar bracket as template to locate, mark, and cut away insulation from bracket mounting surface.**

(1) Position rollbar bracket (5) against front floor panel (3) and body side panel (1).

(2) Using rollbar bracket (5) as template, locate and mark four 0.406-inch diameter holes in floor panels (14) and (3) and two 0.406-inch diameter holes (2) in body side panel (1).

(3) Remove rollbar bracket (5) and drill six 0.125-inch diameter pilot holes (2) and (4) as marked in step 2.

**NOTE**

**Make sure two pilot holes (7) are centered on underbody crossmember (6) flange. If not centered, reposition rollbar bracket (5), remark and drill new pilot holes.**

(4) Enlarge six pilot holes (2) and (4) with 0.406-inch diameter drill.

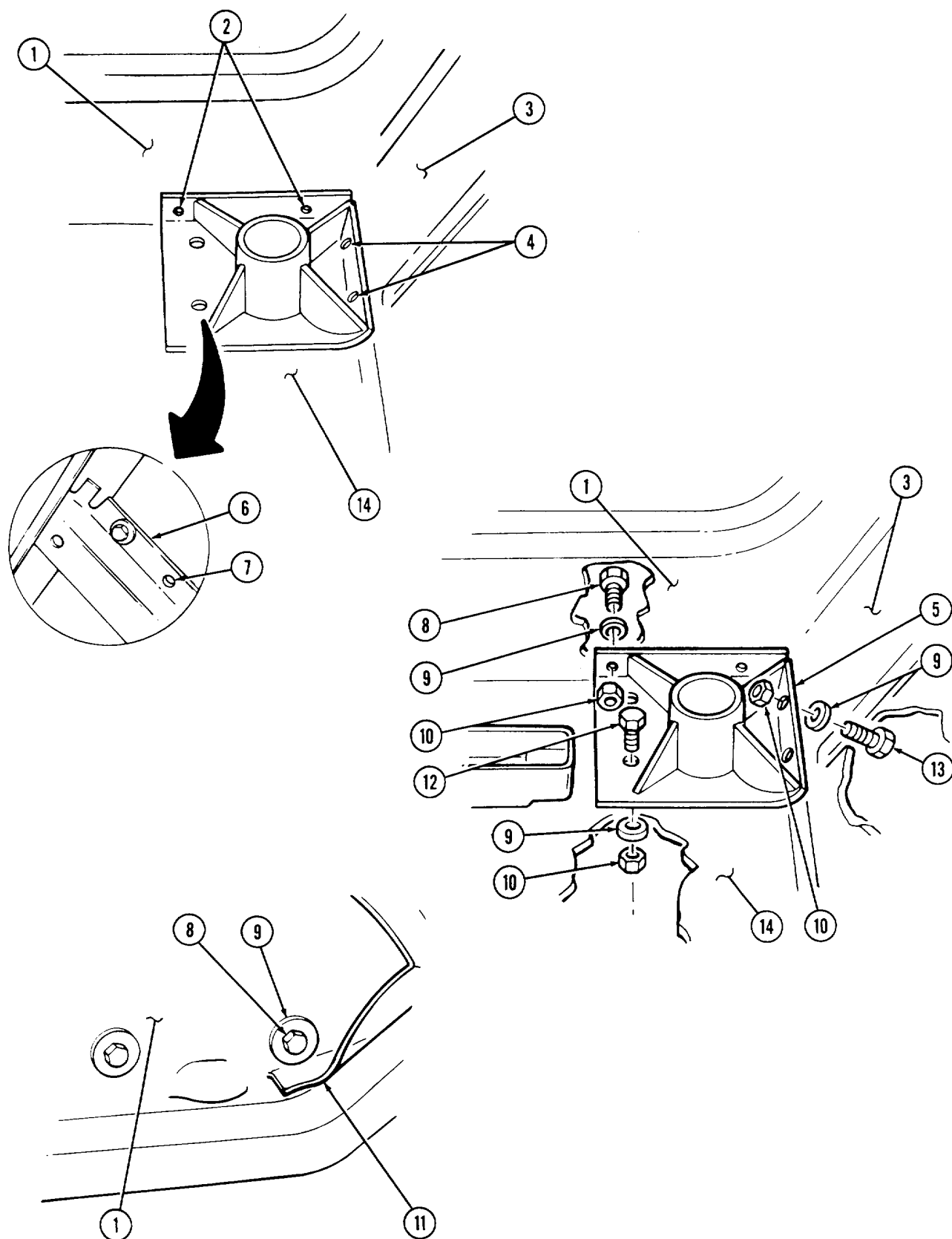
(5) Install and secure rollbar bracket (5) to front floor panel (3) with two MS90727-60 screws (1:3), 24617-9428848 washers (9), and MS51943-36 nuts (10). Tighten nuts finger tight.

**NOTE**

**It may be necessary to reform bottom of shovel support ( 11) to allow access for mounting hardware.**

(6) Secure rollbar bracket (5) to body side panel (1) with two MS90727-58 screws (8), 24617-9428848 washers (9), and MS51943-36 nuts (10). Tighten nuts finger tight.

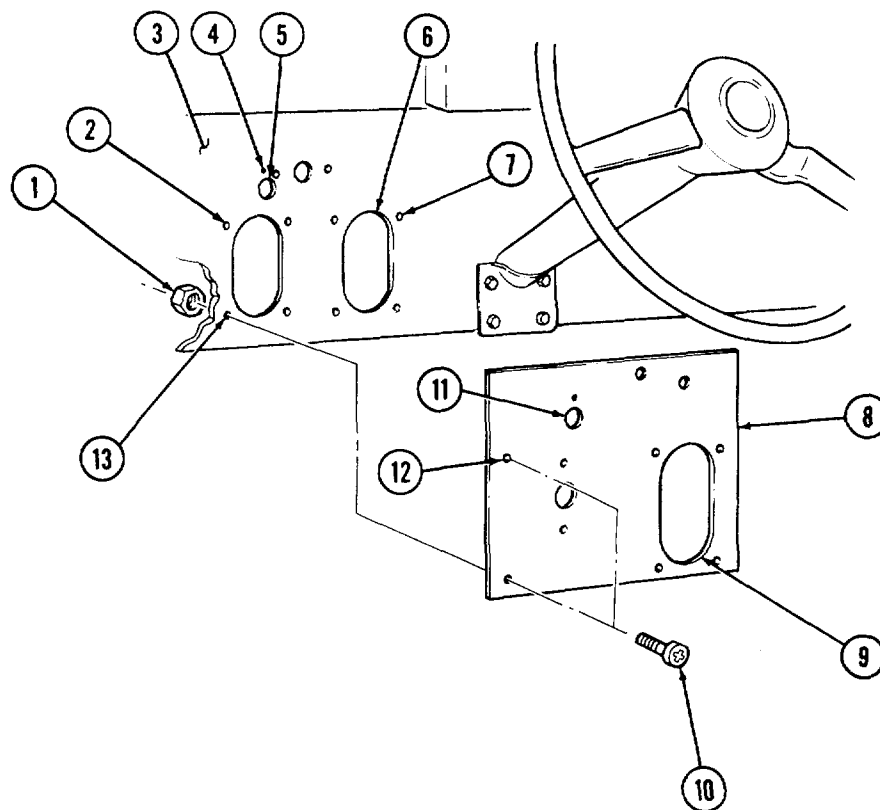
(7) Secure rollbar bracket (5) to floor (14) with two MS90727-62 screws (12), 24617-9428848 washers (9), and MS51943-36 nuts (10). Tighten nuts finger tight.





## g. LIGHT SWITCH REINFORCEMENT INSTALLATION PROCEDURES.

- (1) Using 12356650 reinforcement (8) as template, locate and align the two holes (12) on left side of reinforcement (8) with the left two existing light switch mounting holes (2) and (13) on dash panel (3).
- (2) Locate and mark light switch opening (9) and main power switch holes (11) on dash panel (3).
- (3) Remove reinforcement (8) and drill the following holes in dash panel (3).
  - (a) One 0.128-inch diameter hole (4).
  - (b) One 0.562-inch diameter hole (5).
  - (c) Four 0.228-inch diameter holes (7).
  - (d) Cut out light switch opening (6) using 2.50-inch diameter hole saw.
- (4) Install reinforcement (8) to dash panel (3) and secure with two MS35207-264 screws (10) and MS21044-N3 nuts (1).

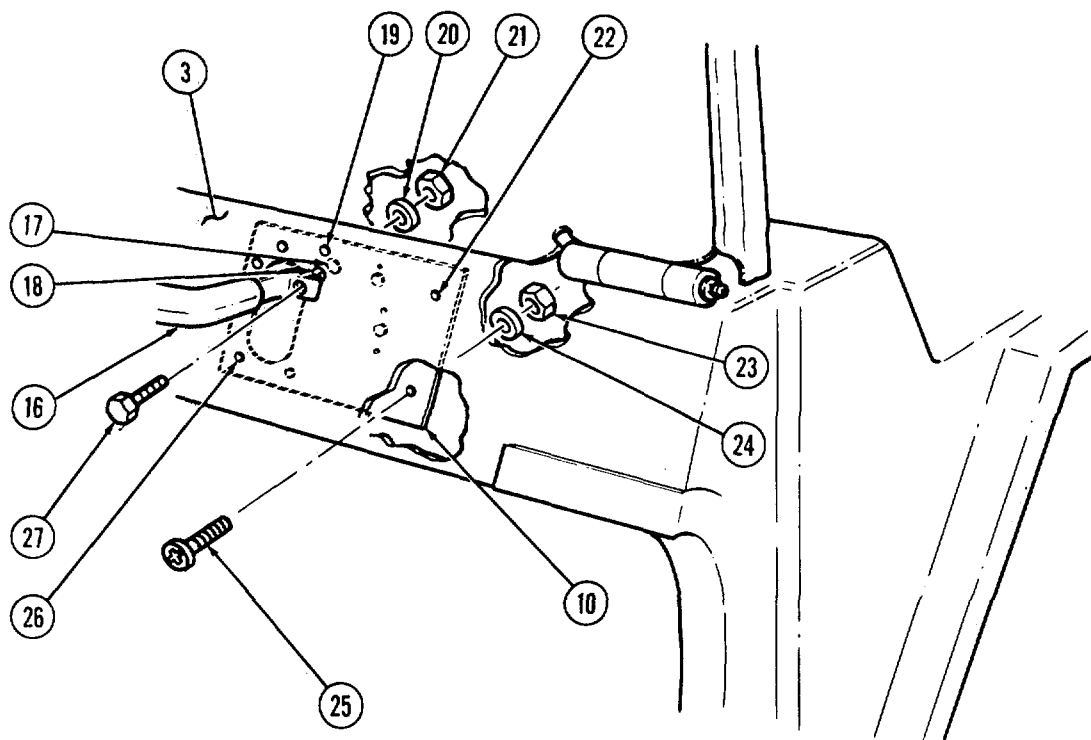


## h. RIGHT SIDE REINFORCEMENT INSTALLATION.

**NOTE**

**Perform steps (1) through (5) if M16 rifle mounting brackets are installed.**

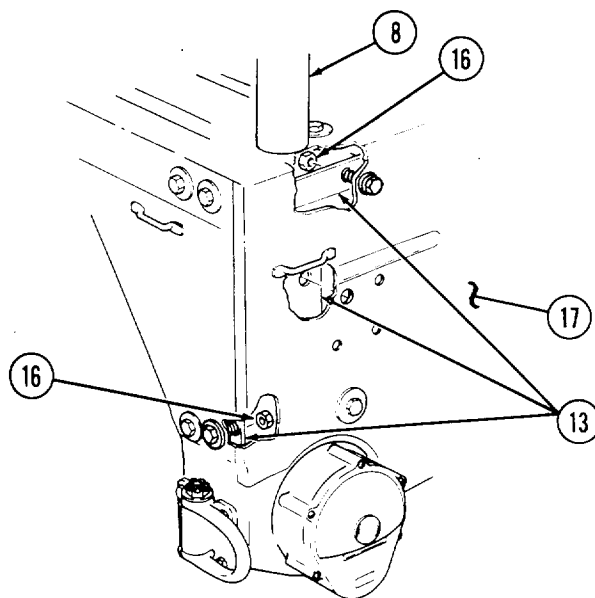
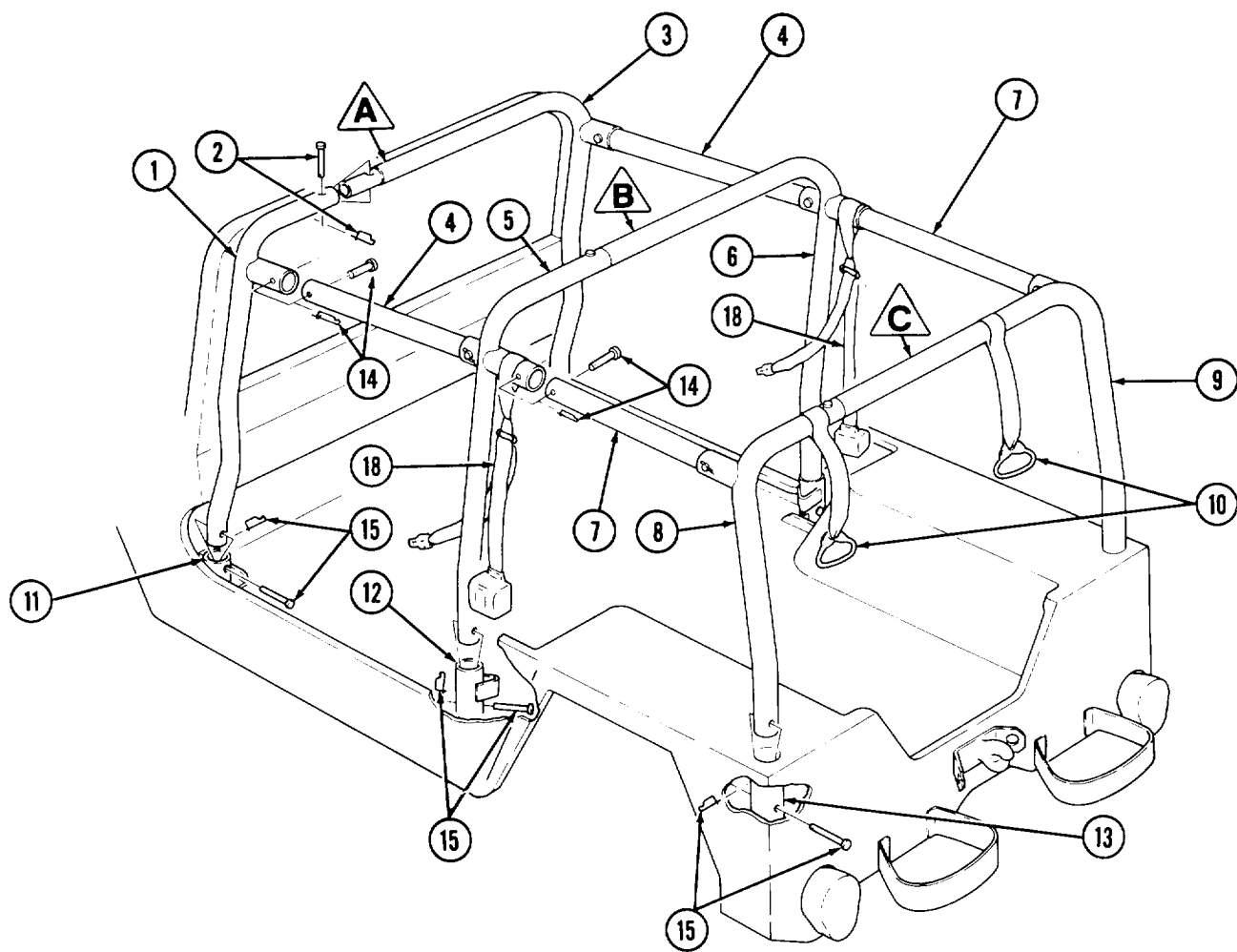
- (1) Remove nut (21), washer (20), and screw (27) securing passenger grab handle (16) to vehicle dash panel (3).
- (2) Using 12356650 reinforcement (10) as a template, align hole (17) with hole (18) in dash panel (3).
- (3) Locate, mark, and drill two 0.348-inch diameter holes (19) and four 0.228-inch diameter holes (22) in dash panel (3).
- (4) Install and secure reinforcement (10) to dash panel (3) with four MS35207-264 screws (25), MS35335-33 washers (24), and MS21044-N3 nuts (23).
- (5) Secure passenger grab handle (16) to vehicle dash (3) and reinforcement (10) with existing screw (27), washer (20), and MS21042-4 nut (21).



## i. ROLLBAR ASSEMBLY INSTALLATION.

**NOTE****Note direction of pin assemblies.**

- (1) Attach 12356641-1 rollbar (1) to 12356644-2 rollbar (3) and secure with pin assembly (2).
- (2) Attach 12356653 rollbar (5) to 12356642 rollbar (6) and secure with pin assembly (2).
- (3) Slide two shoulder strap assemblies (10) onto 12356654 rollbar (8) and 12356643 rollbar (9), and attach rollbars together and secure with pin assembly (2).
- (4) Install front rollbar assembly (A) into front mounting brackets (11).
- (5) Insert two 12356644-1 crossbars (4) into rollbar (A) assembled in step (1).
- (6) Install intermediate rollbar assembly (B) into intermediate brackets (12).
- (7) Install two 12356667 front seat belt assemblies (18) on intermediate rollbar (B).
- (8) Insert two 12356641-2 crossbars (7) into rollbar (B) assembled in step (2).
- (9) Install rear rollbar assembly (C) into rear brackets (13).
- (10) Install crossbars (4) and (7) and secure with eight pin assemblies (14).
- (11) Secure front (A), intermediate (B), and rear (C) rollbar assemblies to brackets with pin assemblies (15).
- (12) Tighten all mounting hardware nuts (16) securing front (11), intermediate (12), and rear (15) rollbar brackets to vehicle (17). Tighten nuts (16) to 30-40 lb-ft (41-54 N-m)



## j. FRONT SEAT BELT ASSEMBLY INSTALLATION.

**NOTE**

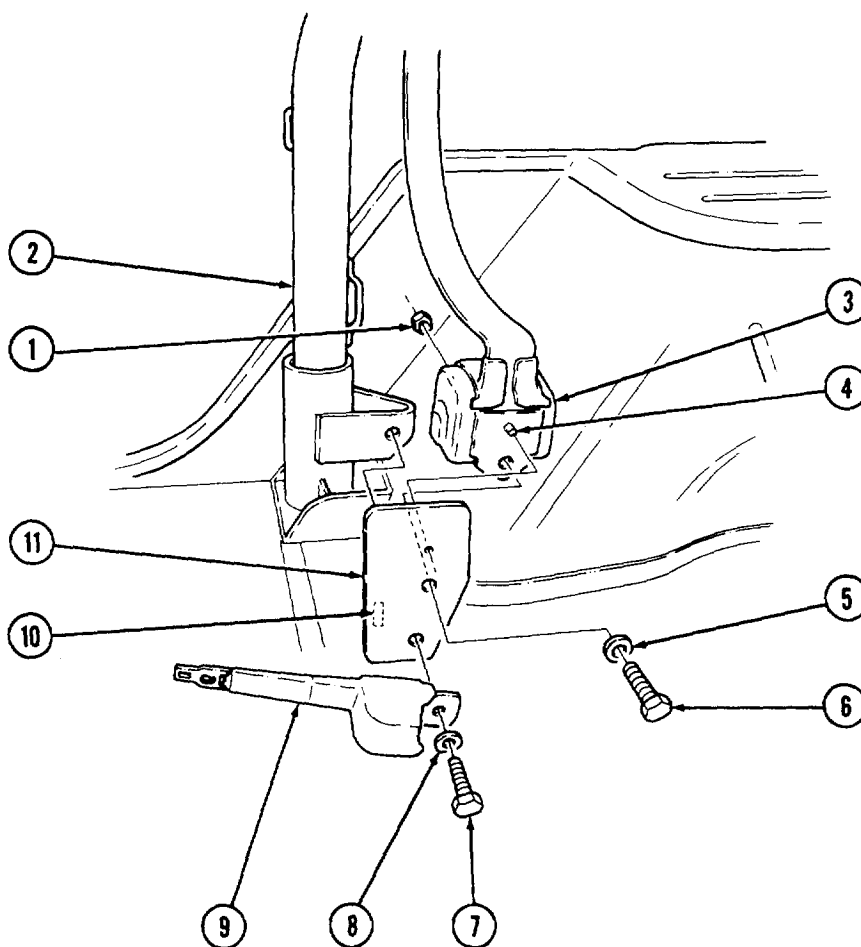
- Left and right-hand seat belts are installed the same. This procedure covers the right-hand belt assembly.
- Note position of stop block (10) on left-hand bracket (11).
- Note position of pin (4) on shoulder belt retractor (3).

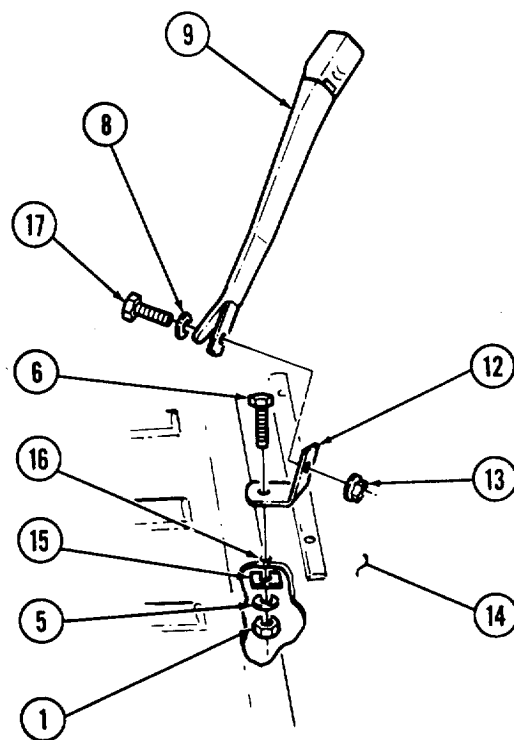
(1) Install and secure shoulder belt retractor (3) to 12368352 bracket (11) with MS90727-86 screw (6), MS27183-16 washer (5), and MS51988-10 nut (1). Tighten nut (1) 60 lb-ft (81 N-m).

(2) Secure bracket (11) and front belt retractor (9) to intermediate rollbar (2) with MS90727-112 screw (7) and MS27183-18 washer (8). Tighten screw (7) to 60 lb-ft (81 N-m).

(3) Install and secure 12356660 anchor (12) to existing holes (16) in vehicle floor (14) with MS90727-86 screw (6), 12301256 anchor (15), MS27183-16 washer (5), and MS51988-10 nut (1). Tighten nut (1) to 60 lb-ft (81 N-m).

(4) Install and secure seat belt assembly half with buckle (9) to floor anchor bracket (12) with MS90727-110 screw (17), MS27183-18 washer (8), and MS51988-12 nut (13). Tighten nut (13) to 90 lb-ft (122 N-m).





## k. REAR SEAT BELT ASSEMBLY INSTALLATION.

**NOTE**

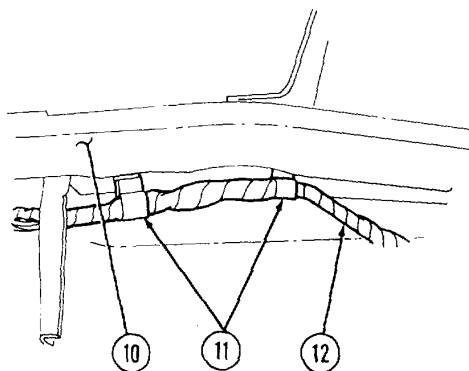
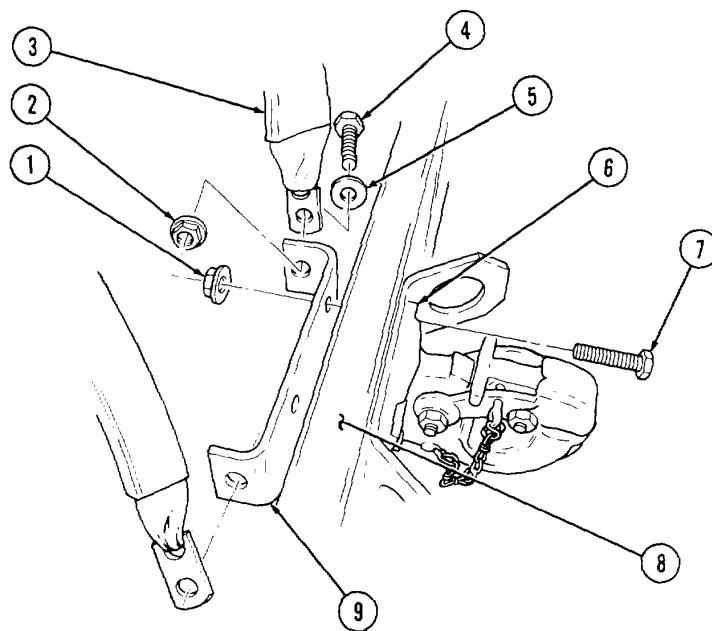
- Left and right-hand seat belts are installed the same. This procedure covers the left-hand seat belt assembly.
- Perform steps 4 and 9 only for left-hand seat belt installation.

(1) Remove and discard two top nuts (1), existing washers, and screws (7) securing pintle assembly (6) to vehicle body (8).

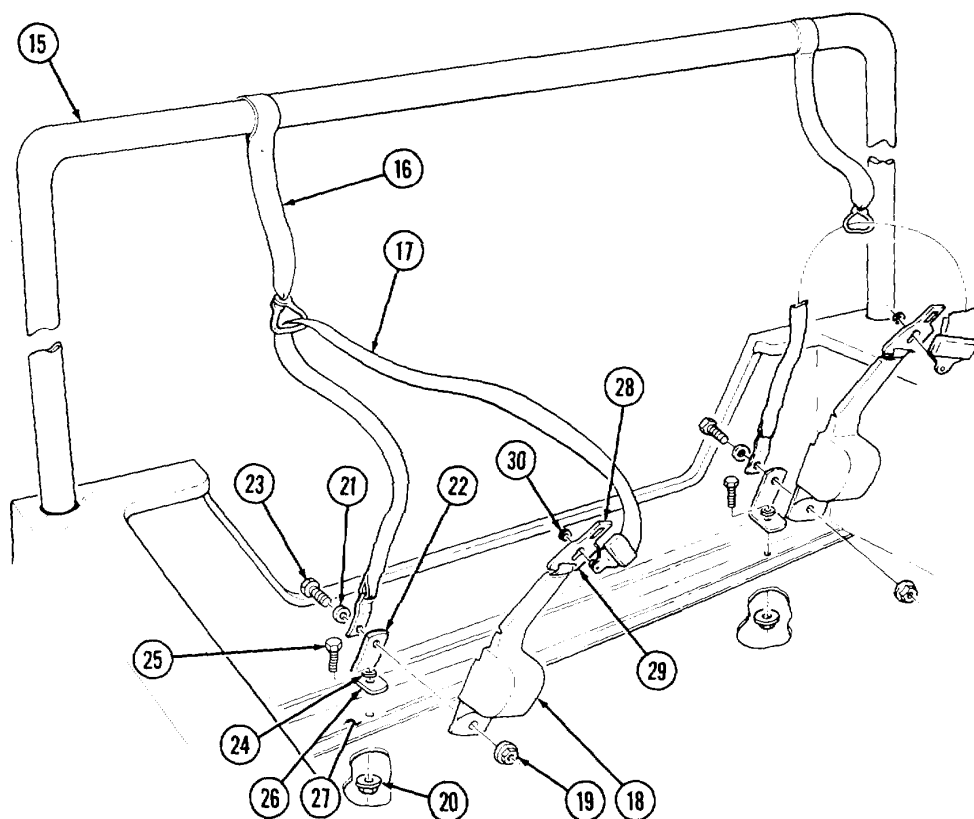
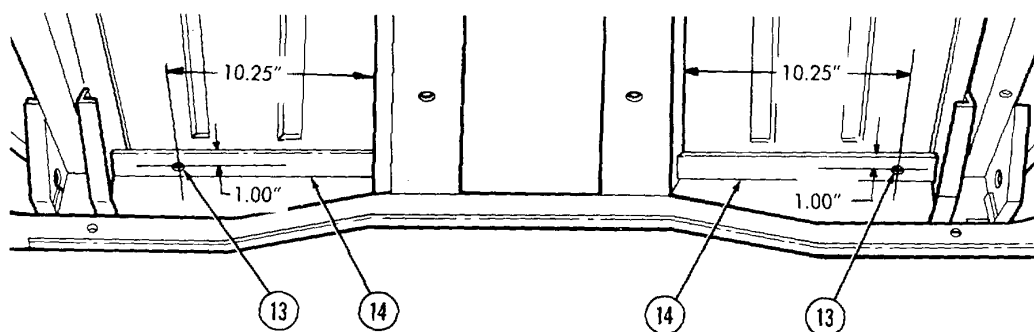
(2) Install and secure 12356663 bracket (9) to vehicle body (8) and pintle assembly (6) with two MS90727-118 screws (7) and MS51988-12 nuts (1). Tighten nuts (1) to 30-40 lb-ft (41-54 N-m).

(3) Secure 12356668 belt assembly half with buckle (3) to bracket (9) with MS90727-1 10 screw (4), MS27183-18 washer (5), and MS51988-12 nut (2). Tighten nut (2) to 30-40 lb-ft (41-54 N-m).

(4) Pull harness (12) away from two clips (11) under rear body (10).



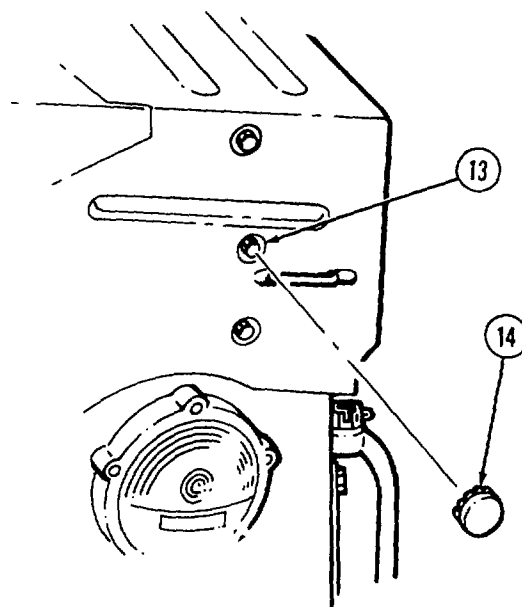
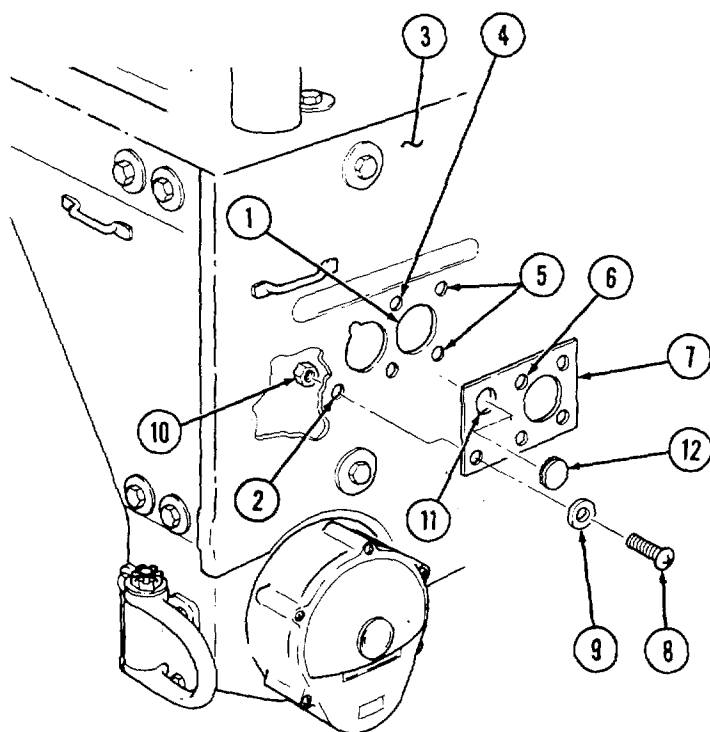
- (5) Locate, mark, and drill two 0.468-inch diameter holes (13) in body flange (14).
- (6) Install MS27183-16 washer (24) and MS90727-86 screw (25) to short leg (26) of 12301273 bracket (22).
- (7) Attach shoulder strap (17) to belt assembly (16) attached to rear rollbar assembly (15). Install and secure belt assembly half with retractor (18), and shoulder strap (17) to bracket (22) with MS27183-18 washer (21), MS90727-112 screw (23), and MS51988-12 nut (19). Tighten nut (19) to 30-40 lb-ft (41-54 N-m).
- (8) Install and secure bracket (22) to vehicle body (27) with MS51988-10 nut (20). Tighten nut (20) to 30-40 lb-ft (41-54 N-m).
- (9) Secure harness (12) to rear underbody (10) with two existing clips (11).
- (10) Secure shoulder belt buckles (28) to seat belt buckles (29) with existing locking rings (30).





## I. TRAILER RECEPTACLE REINFORCEMENT INSTALLATION.

- (1) Using 12356651 reinforcement (7) as a template, align two holes (6) in reinforcement (7) with two holes (4) in rear body panel (3).
- (2) Locate, mark, and drill three 0.281-inch diameter holes (5) and (2) in rear body panel (3).
- (3) Locate, mark, and cut one 2.25-inch diameter hole (1) in rear body panel (3).
- (4) Secure reinforcement (7) to rear body panel (3) with MS35206-281 screw (8), MS35335-33 washer (9), and MS51967-2 nut (10).
- (5) Install NAS451-17 plug (12) in left-hand pin assembly hole (11).
- (6) Install NAS451-17 plug (14) in right-hand pin assembly hole (13).



## m. FRONT RESTRAINT INSTALLATION.

**NOTE**

**Left and right-hand restraints are installed the same. This procedure covers the left-hand restraint.**

(1) Install and secure 12356671-2 restraint (18) top mounting strap with buckle (21) to intermediate rollbar (22) with MS90727-121 screw (23), two MS27183-18 washers (20), and MS51988-12 nut (19). Tighten nut (19) to 90 lb-ft (122 N-m).

(2) Install and secure 12368353 bracket (28) to lower part of front rollbar (17) with two MS90727-31L screws (29). Tighten screws (29) to 24 lb-ft (32 N-m).

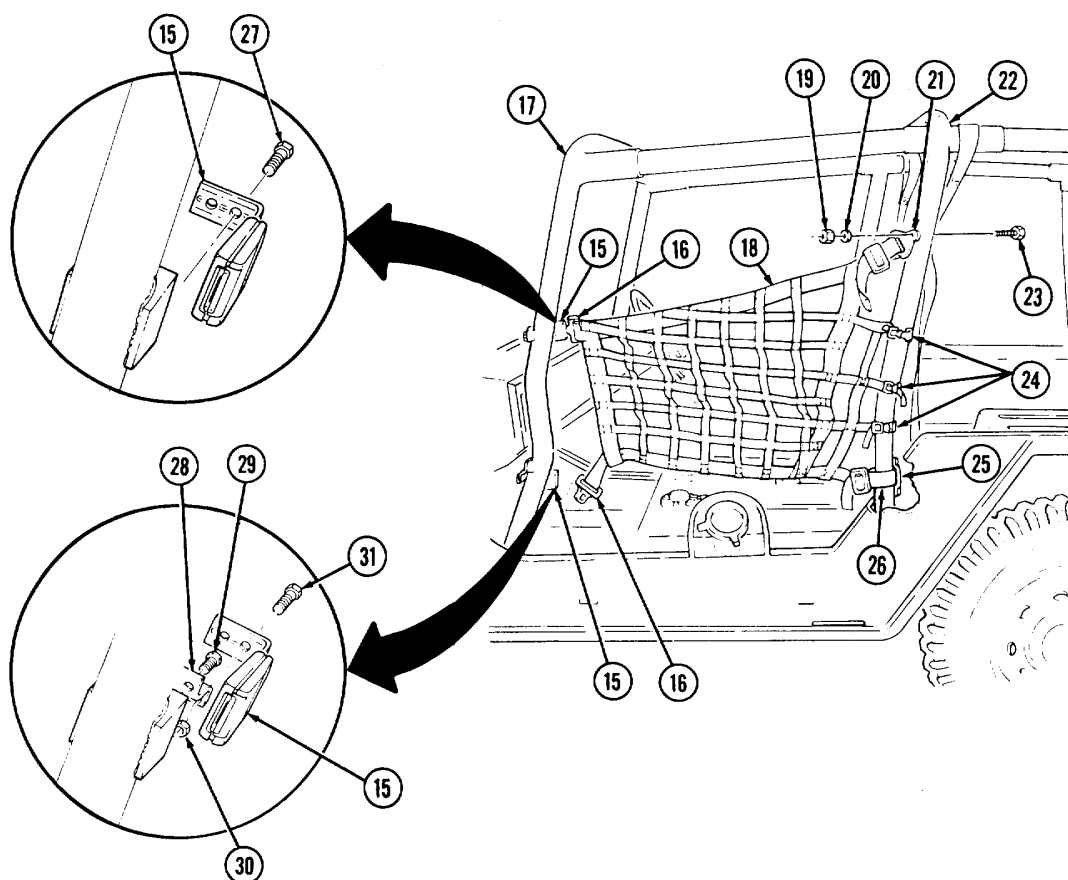
(3) Remove two latches (15) from restraint (18) and secure upper latch (15) to front rollbar (17) with two MS90727-29L screws (27). Tighten screws (27) to 24 lb-ft (32 N-m).

(4) Secure lower latch (15) to bracket (28) with two MS90727-33 screws (31) and MS51988-6 nuts (30). Tighten nuts (30) to 24 lb-ft (32 N-m)

(5) Secure front restraint, top and bottom straps (16) to latches (15) on front rollbar (17).

(6) Secure three remaining straps (24) to intermediate rollbar (22).

(7) Secure bottom strap (26) through footman loop (25) on intermediate rollbar (22).



## n. ROLLBAR PADDING INSTALLATION.

**NOTE**

- Use drycleaning solvent to clean rollbar surface before installing padding.
- Trim starting end of 12356670 padding at 45° for square fit before wrapping rollbars.

(1) Position and secure 212-inch roll of padding (1) to rear rollbar (8) by starting at point (A) and wrapping rollbar with padding (1) toward point (B). Use additional padding (6) until point (B) is reached. Trim end of padding (1) for square fit.

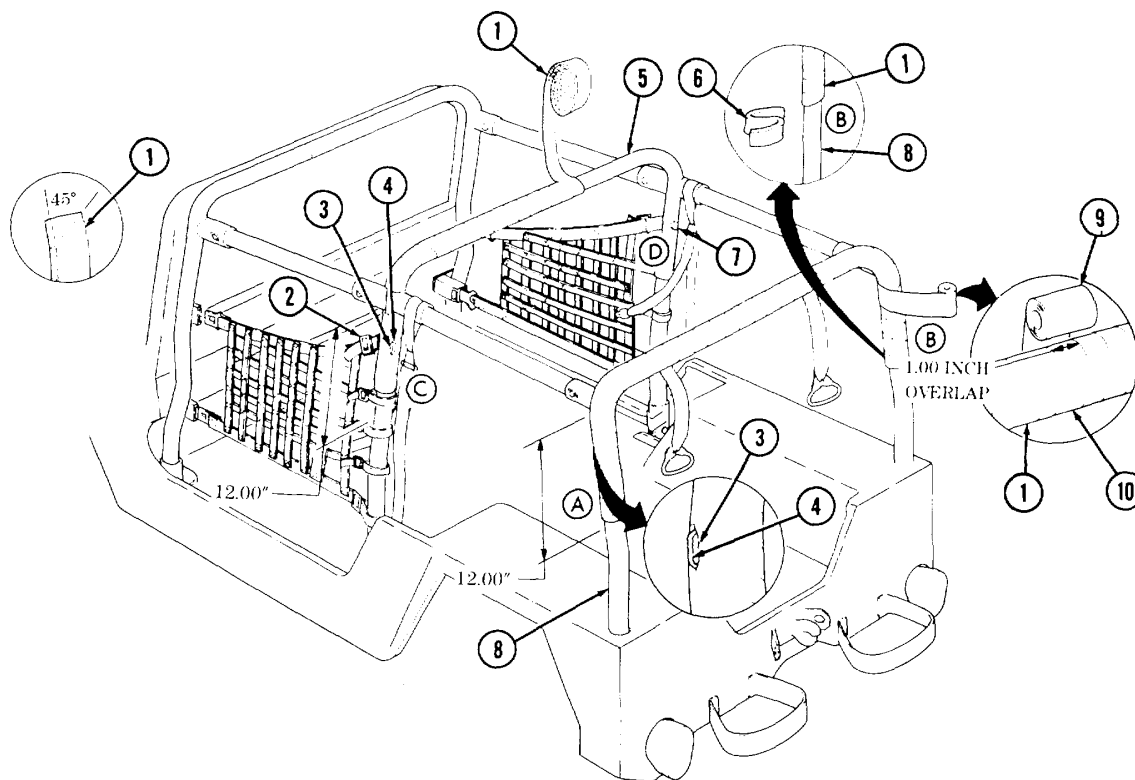
(2) Cover all padding (1) with PPP-T-60 tape (9) spiral wrapped at right angles to padding (1) with 1.00-inch overlap (10) starting at point (B).

(3) Cut and remove padding ( 1 ) from outside rollbar areas (3) to allow access to footman loops (4) for rear restraint installation.

(4) Position and secure 212-inch roll of padding (1) to intermediate rollbar (5) by starting at point (C) and wrapping rollbar with padding (1 ) until point (D) is reached. Trim end of padding (1) for square fit. Use additional padding (1 ) around front restraint buckle (2) and screw head (7) if required.

(5) Cover all padding (1) with PPP-T-60 tape (9) spiral wrapped at right angles to padding (1) with 1.00-inch overlap (10) starting at point (D).

(6) Cut and remove padding ( 1 ) from outside rollbar areas (3) to allow access to footman loops (4) for rear restraint installation.



**NOTE**

**For the following steps, cut two 212-inch rolls of padding in half.**

(7) Position and secure 106-inch roll of padding (11) to front left crossbar (12) by starting at point (E) and wrapping bar with padding (11) until point (F) is reached. Trim end of padding (11).

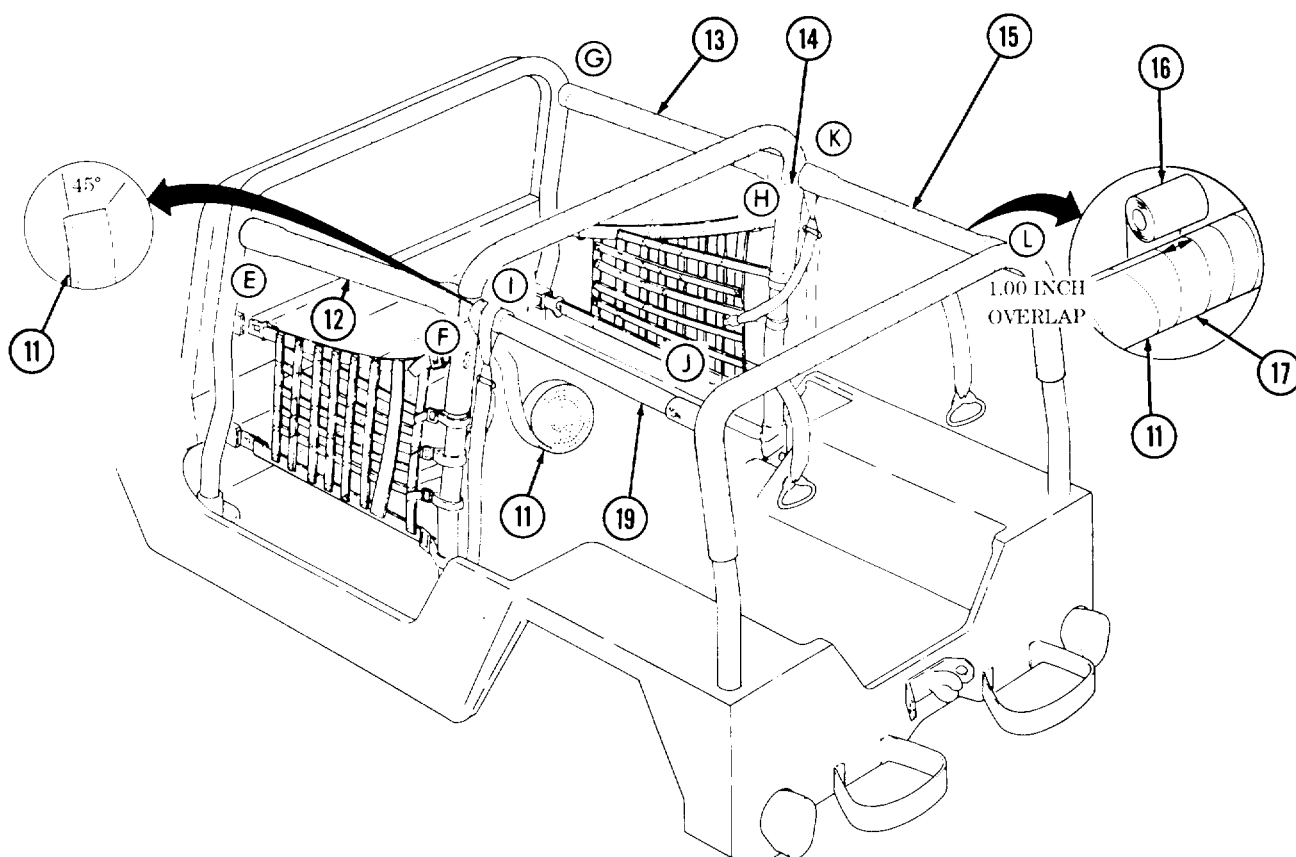
(8) Position and secure 106-inch roll of padding (11) to front right crossbar (13) by starting at point (G) and wrapping bar (13) with padding (11) until point (H) is reached. Trim end of padding (11) for square fit.

(9) Position and secure 106-inch roll of padding (11) to rear left crossbar (19) by starting at point (I) and wrapping bar (19) with padding (11) until point (J) is reached. Trim end of padding (11) for square fit.

(10) Position and secure 106-inch roll of padding (11) to rear right crossbar (15) by starting at point (K) and wrapping bar (15) with padding (11) until point (L) is reached. Trim end of padding (11) for square fit.

(11) Use additional padding (11) around inside of rollbar areas (14) if required.

(12) Cover all padding (11) with PPP-T-60 tape (16) spiral wrapped at right angles to padding (11) with 1.00-inch overlap (17).

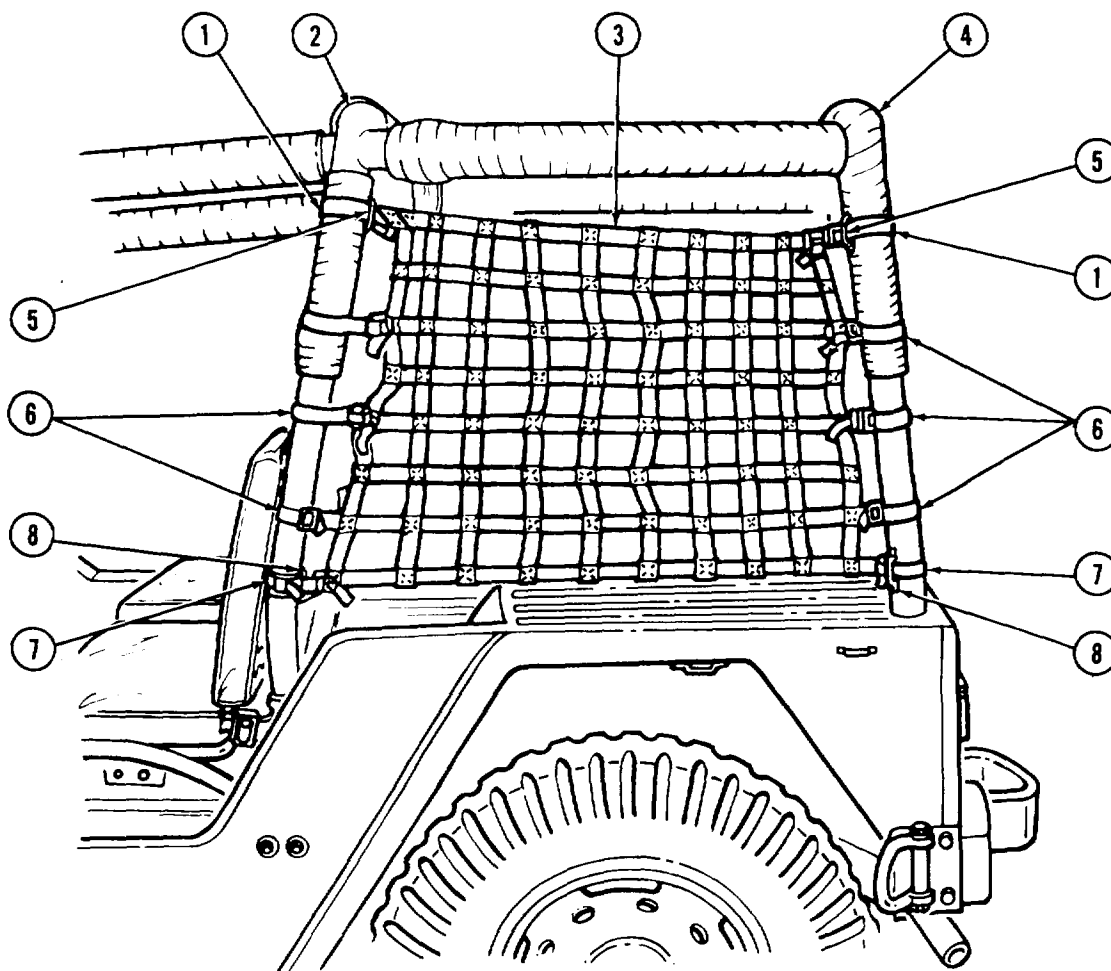


## o. REAR RESTRAINT INSTALLATION.

**NOTE**

**Left and right-hand restraints are installed the same. This procedure covers the left-hand restraint.**

- (1) Install and secure 12356672-1 restraint (3) upper straps (1) to footman loops (5) on intermediate (2) and rear (4) rollbars.
- (2) Install and secure restraint (3) lower straps (7) to footman loops (8) on intermediate (2) and rear (4) rollbars.
- (3) Secure remaining straps (6) to intermediate (2) and rear (4) rollbars.



## p. HARD TOP DOOR HANDLE INSTALLATION.

**NOTE**

- Perform this procedure only if hard top kit is installed on vehicle.
- Left and right door handles are installed the same. Procedure covers the left door handle.

(1) Remove cotter pin (8), slotted nut (4), and lockwasher (3) securing inner door handle (2) to door (1). Discard cotter pin (8).

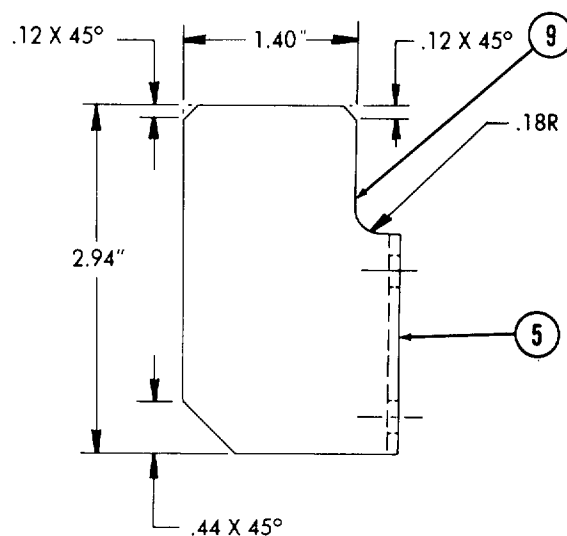
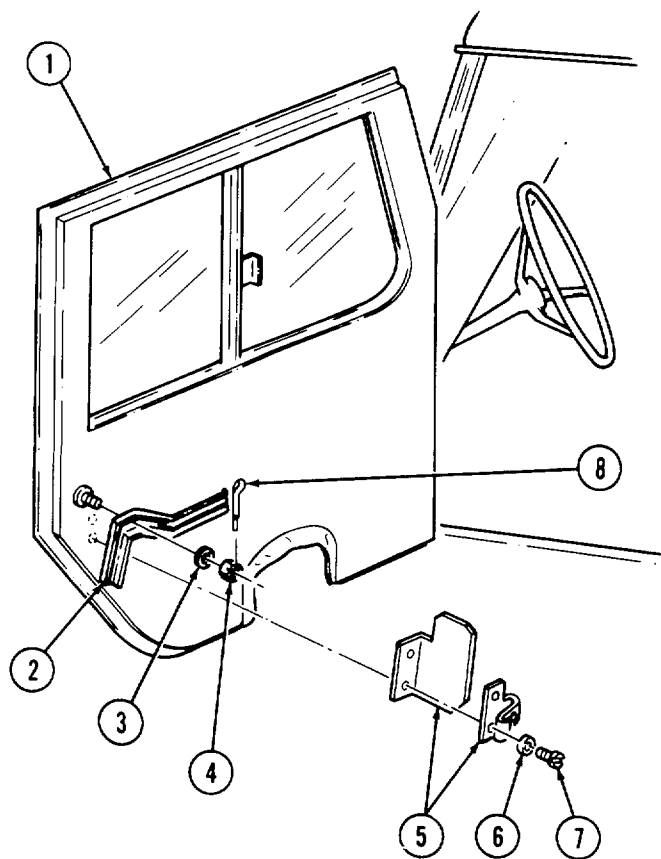
(2) Remove and discard door handle (2).

(3) Install and secure 12356652-1 handle (2) to door (1) with MS35338-48 washer (3), existing slotted nut (4), and MS24665-287 cotter pin (8).

(4) Remove two screws (7) and washers (6) securing door handle stop (5) to door (1). Remove door stop (5).

(5) Cut and form inside edge (9) of door handle stop (5).

(6) Install and secure door handle stop (5) to door (1) with two existing screws (7) and washers (6).



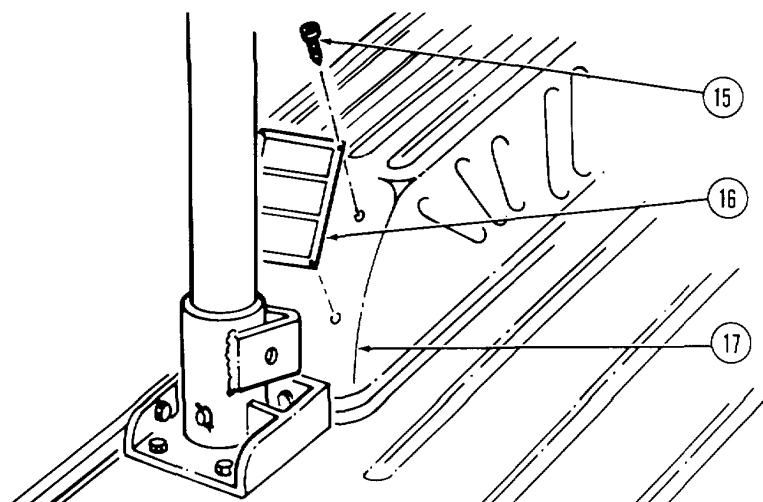
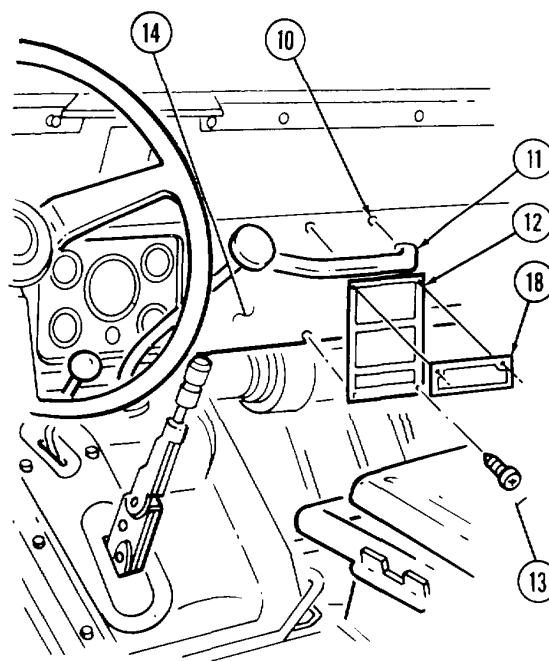
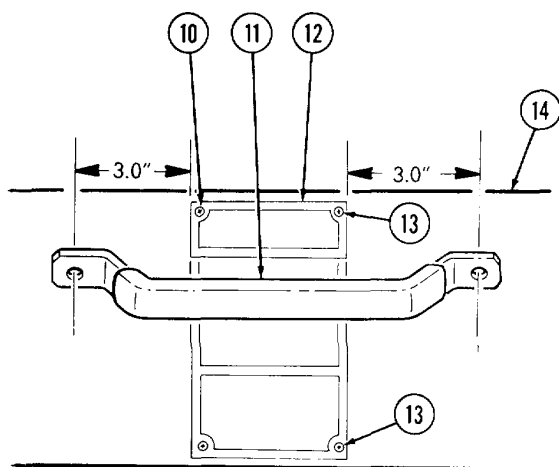
## q. DATA PLATE INSTALLATION.

(1) Using existing data plate (12) as template, locate, mark, and drill four 0.125-inch diameter holes (10) in dash panel (14) behind passenger grab handle (11).

(2) Install and secure existing data plate (12) to dash panel (14) with two lower MS51861-44 screws (13). Install 12368354 data plate (18) over existing data plate (12) and secure with two upper MS51861-44 screws (13).

(3) Remove four screws (15) securing data plate (16) to right side front wheelhousing (17). Remove and discard data plate (16) and four screws (15).

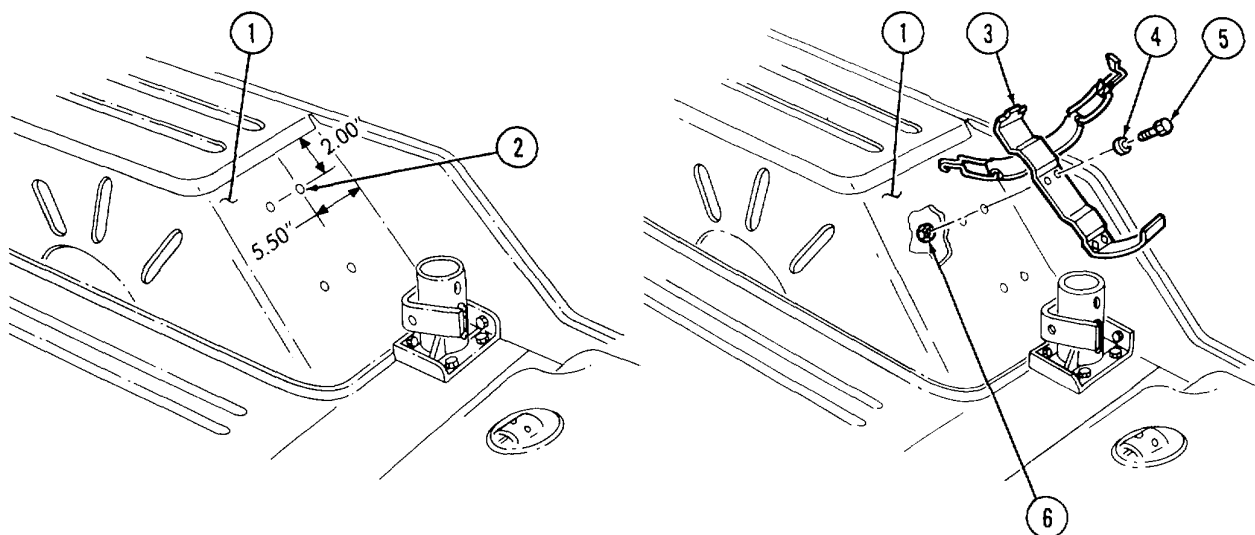
(4) Install 12356673 data plate (16) to right side front wheelhousing (17) and secure with four MS51861-44 screws (15).



## r. FIRE EXTINGUISHER INSTALLATION.

(1) Using fire extinguisher mounting bracket (3) as template, locate, mark, and drill four 0.312-inch diameter holes (2) in wheelhousing (1).

(2) Install and secure mounting bracket (3) to wheelhousing (1) with four existing screws (5), washers (4), and nuts (6).

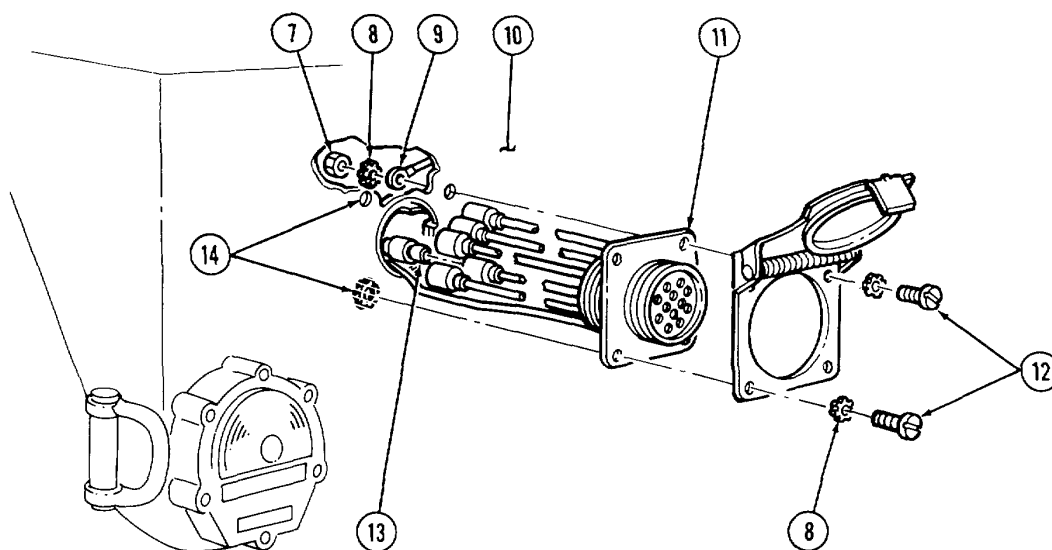


## s. TRAILER RECEPTACLE INSTALLATION.

(1) Connect harness leads (13) to trailer receptacle (11).

(2) Secure trailer receptacle (11) to body weld nuts (14) with two existing screws (12) and MS35335-33 lockwashers (8).

(3) Secure trailer receptacle (11) and ground lead (9) to body (10) with two existing screws (12), MS35335-33 lockwashers (8), and two MS51967-2 nuts (7).



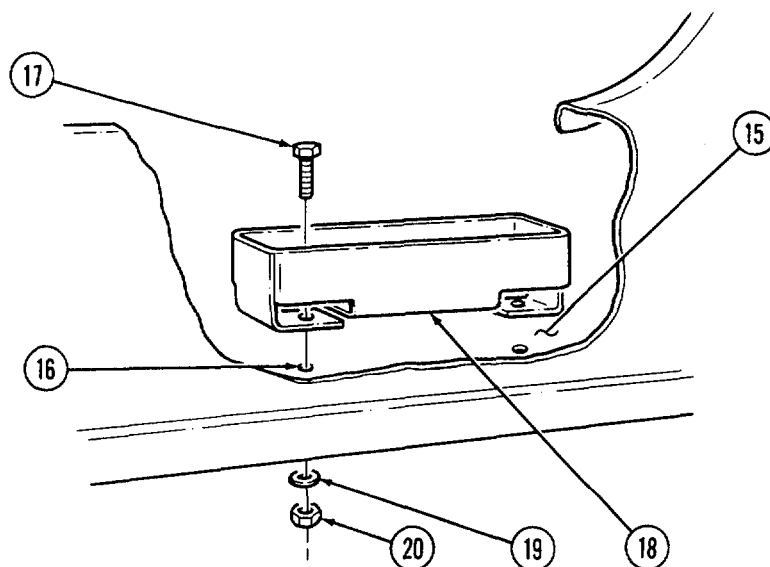
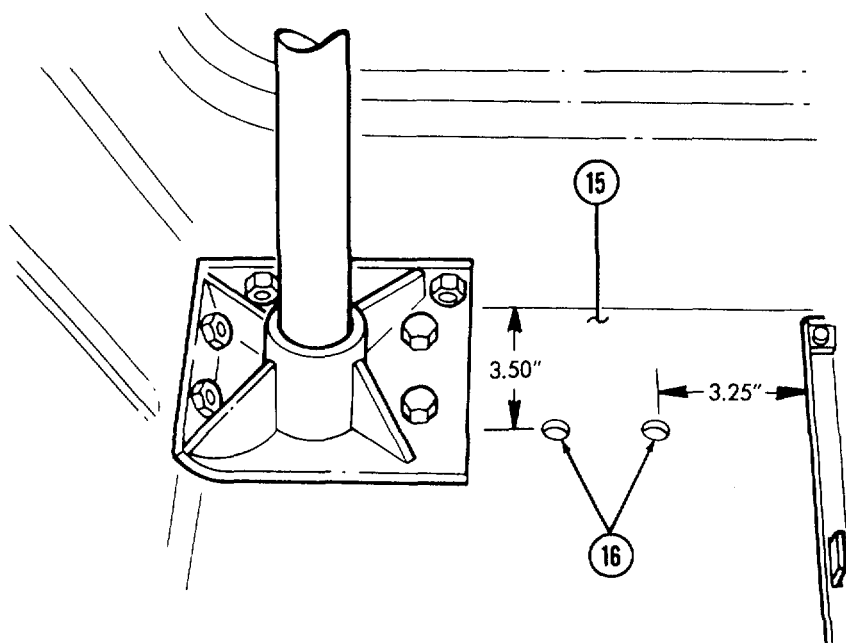


## t. M16 RIGHT SIDE RIFLE FLOOR MOUNTING BRACKET INSTALLATION.

**NOTE**

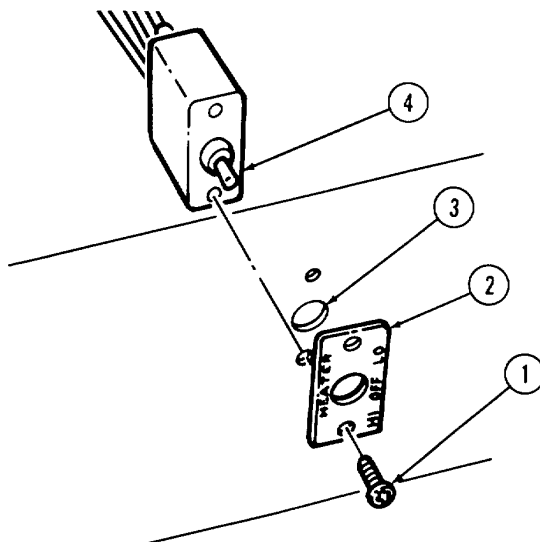
**This procedure covers the right side bracket. Left side bracket is not installed with rollbars.**

- (1) Using bracket (18) as template, locate, mark, and drill two 0.316-inch diameter holes (16) in floor panel (15).
- (2) Secure bracket (18) to floor panel (15) with two existing screws (17), MS35335-33 washers (19), and nuts (20).

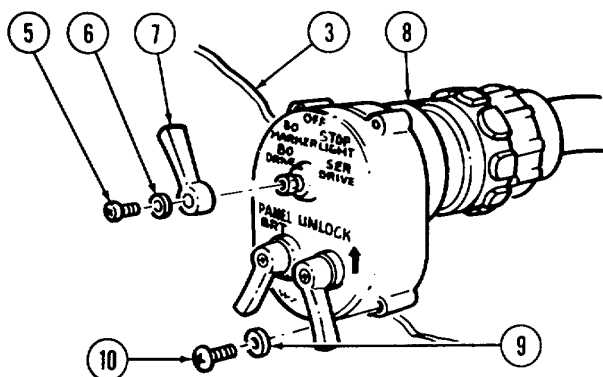


## u. ELECTRICAL SWITCHES INSTALLATION.

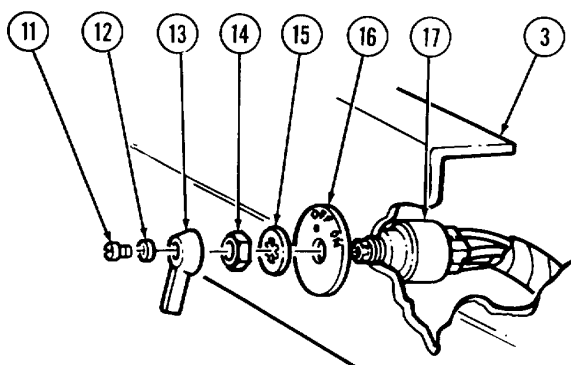
- (1) Secure heater switch (4) and identification plate (2) to dash panel (3) with two existing screws (1).



- (2) Secure main light switch (8) to dash panel (3) with four MS35333-39 washers (9) and existing screws (10), and secure lever (7) to switch (8) with existing washer (6) and screw (5).



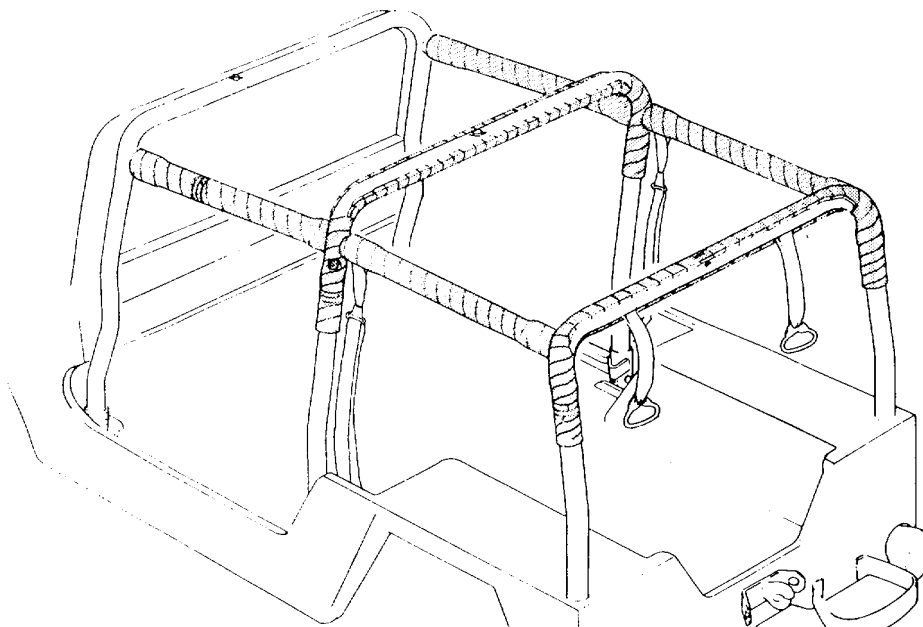
- (3) Secure ignition switch (17) and identification plate (16) to dash panel (3) with MS35333-44 washer (15), and existing nut (14), and secure lever (13) to switch (17) with MS35338-42 washer (12) and existing screw (11).



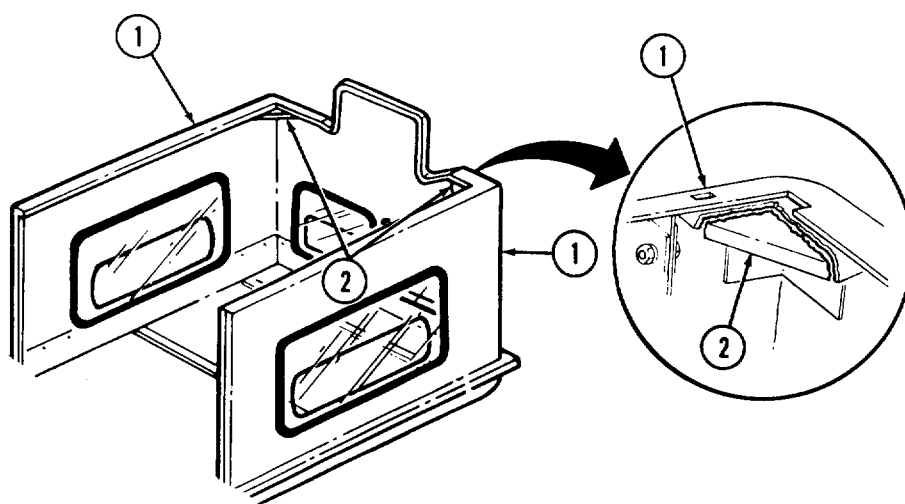
- v. INSTALL WINDSHIELD (refer to TM 9-2320-218-20-1-1).
- w. HARD TOP KIT INSTALLATION.

**NOTE**

- Perform this procedure only for vehicles equipped with hard top kit.
- It may be necessary to cut and remove padding from intermediate and rear rollbars to allow hard top to clear rollbars.



(1) Cut and remove part of triangular gusset (2) from lower left and right sides of hard top (1). Remove sharp edges and burrs.



(2) Position hard top (1) over vehicle body (10) and windshield (5).

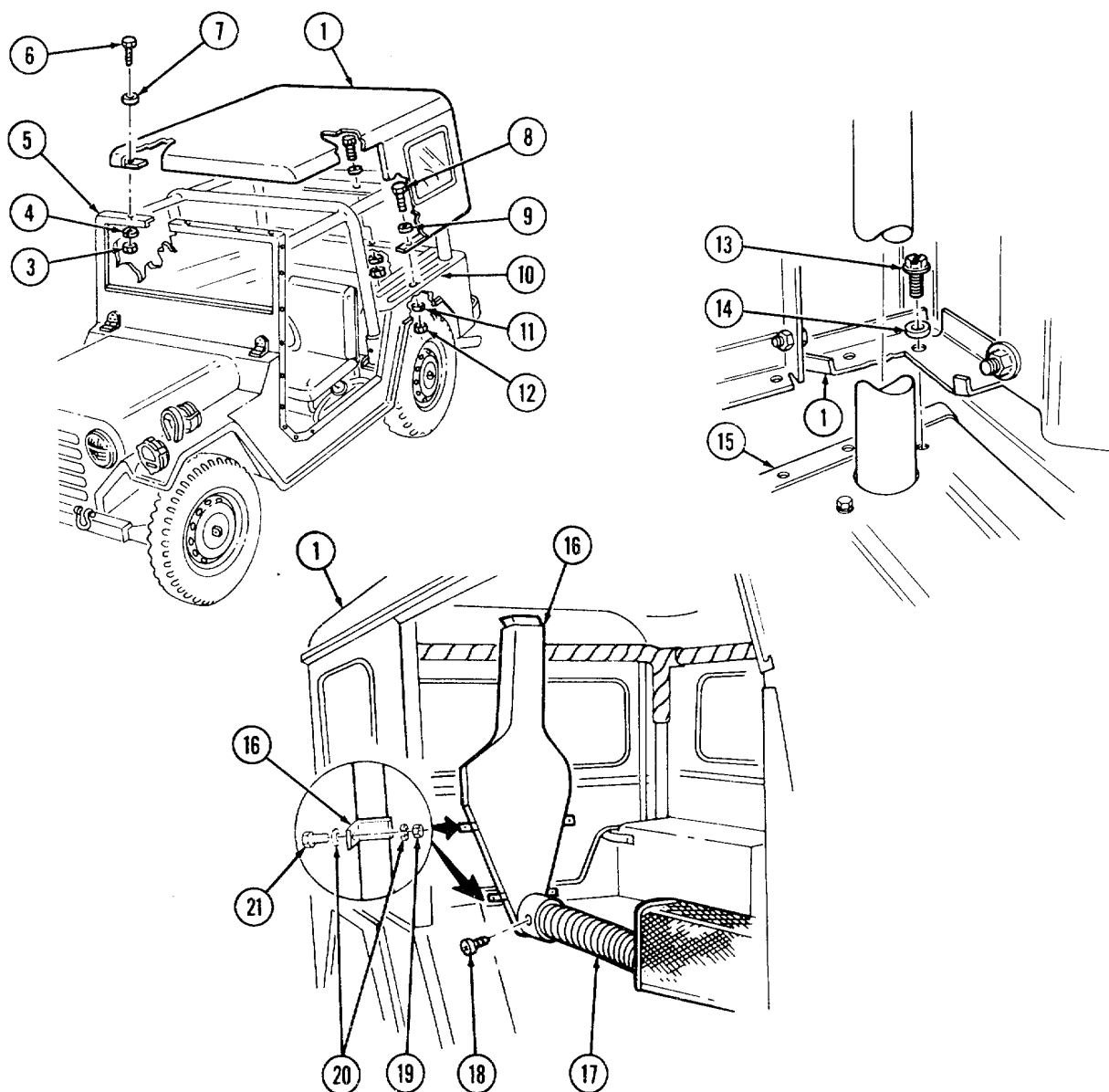
(3) Secure hard top (1) to windshield frame (5) with four existing screws (6), washers (7), nuts (3), and MS35338-45 lockwashers (4).

(4) Secure hard top (1) to vehicle body (10) with ten existing screws (8), washers (9), nuts (12), and MS35338-45 lockwashers (11).

(5) Secure hard top (1) to wheel housings (15) with six MS51851-88 screws (13) and existing washers (14).

(6) Install and secure duct assembly (16) to hard top (1) and vehicle body (10) with four existing screws (21), nuts (19), and eight washers (20).

(7) Secure air intake pipe (17) to duct assembly (16) with existing screw (18).



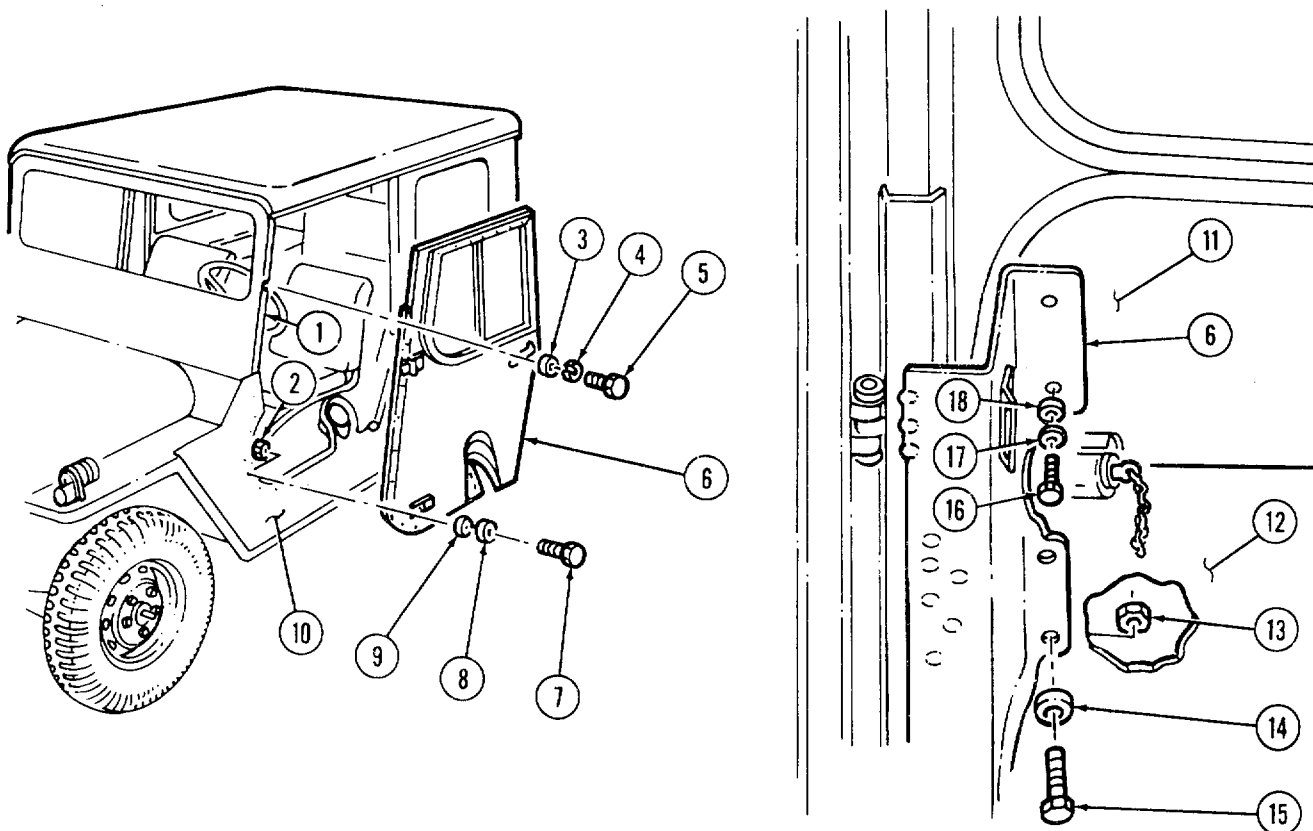
## NOTE

**Left and right side door and pillar assemblies are installed the same. These procedures cover the left side door and pillar assembly.**

(8) Install and secure door and pillar assembly (6) to body side panel (10) with six existing screws (7), washers (9), lockwashers (8), and nuts (2).

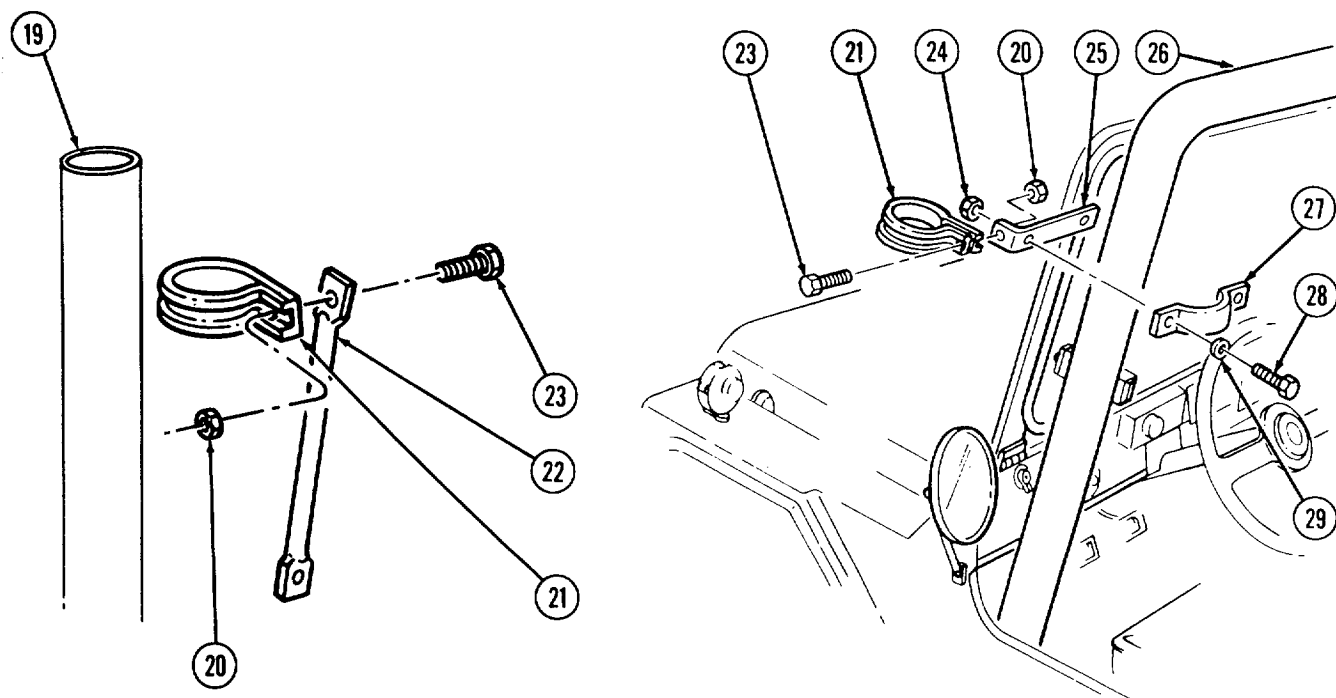
(9) Secure door and pillar assembly (6) to (lash panel (12) and windshield panel (11) with two existing screws (15), washers (14), and nuts (13), and two existing screws (16), washers (18), and lockwashers (17).

(10) Secure door and pillar assembly (6) to windshield frame (1) with two existing screws (5), washers (3), and lockwashers (4).



## x. DEEP WATER FORDING KIT MODIFICATION.

- (1) Install and secure 12356658 clamp (27), and 12356659 brace (25) to rollbar (26) with two MS90726-34 screws (28), MS27183-12 washers (29), and MS21044-N5 nuts (24).
- (2) Install air intake extension hose and tube (19) (refer to TM 9-2320-218-34-1).
- (3) Discard existing support (22) and secure air intake clamp (21) to brace (25) with existing screw (23) and nut (20).



## y. VEHICLE FINAL PREPARATION.

- (1) Prime and paint exposed metal surfaces as required (refer to TB 43-0209 and TM 43-0039).
- (2) Apply rustproofing as required (refer to TB 43-0213).
- (3) Install left rear red reflector (refer to TM 9-2320-218-20-1-2).
- (4) Install rear wheels (refer to TM 9-2320-218-20-1-2).

**NOTE**

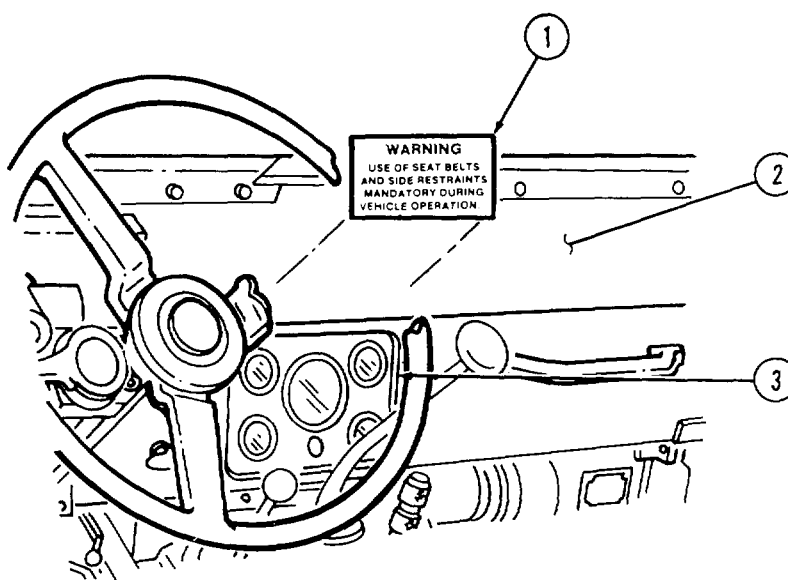
**Perform steps (5) and (6) if M16 mounting catches were removed.**

- (5) Install left and right side rifle mounting catch (refer to TM 9-2320-218-1-2).
- (6) Install hot water heater if removed (refer to TM 9-2320-218-1-2).
- (7) Connect battery ground cable (refer to TM 9-2320-218-20-1-1).
- (8) Install rear seat (refer to TM 9-2320-218-20-1-2).
- (9) Install front seats (refer to TM 9-2320-218-20-1-2).
- (10) Install soft top, side curtains, and doors, if removed (refer to TM 9-2320-218-10).
- (11) Adjust front seat belts with retractor to desired position and tighten screws securing front seat belts with retractor to intermediate rollbar to 60 lb-ft (81 N-m).

**NOTE**

**Use drycleaning solvent to clean windshield surface before applying warning label.**

- (12) Apply 1235676.3 warning label (1) to lower windshield frame (2), centered over instrument panel (3).



## t. M16 RIGHT SIDE RIFLE FLOOR MOUNTING BRACKET INSTALLATION.

**NOTE**

**This procedure covers the right side bracket. Left side bracket is not installed with rollbars.**

- (1) Using bracket (18) as template, locate, mark, and drill two 0.316-inch diameter holes (16) in floor panel (15).
- (2) Secure bracket (18) to floor panel (15) with two existing screws (17), MS35335-33 washers (19), and nuts (20).

**14. QUALITY ASSURANCE REQUIREMENTS.**

a. **GENERAL.** The following information is supplied to ensure the proper application of this modification and provide clarification in regard to the adequacy of installer's inspection methods and procedures applicable to quality assurance contract data. The provisions include, but are not limited to, installer responsibilities, Government verification, in-process inspection and workmanship inspection. Inspection shall be in accordance with TM 750-245-4.

b. **INSTALLER RESPONSIBILITIES.** The installer is responsible for compliance with quality assurance requirements specified herein. These requirements, the installer's plan of inspection, or quality program, constitute the minimum examinations and tests necessary to assure compliance with established requirements. Requirements contained in this MWO shall be included in the installer's inspection plan or quality program. These requirements shall not be construed as eliminating the installer's responsibility from complete compliance with all the provisions of the contract and submitting to the Government, material that meets all requirements of the contract.

c. **GOVERNMENT VERIFICATION.** All quality assurance operations performed by the installer shall be subject to Government verification at unscheduled intervals. Verification will consist of (A) surveillance of the operations to determine that practices, methods and procedures of the written inspection plan are being properly applied, and (B) Government product inspection to measure quality of product offered for acceptance deviation from prescribed or agreed-upon procedures or instances of practices which might have an adverse effect upon the quality of the product, will immediately be called to the attention of the installer. Failure of the installer to promptly correct deficiencies noted shall be cause for suspension of acceptance until corrective action has been made, or until conformance of product to prescribed criteria has been demonstrated.

d. **IN-PROCESS INSPECTION.** During normal assembly operations torque procedures used in production shall be visually observed and readings recorded to determine conformity of the torque requirements contained in this MWO. The recorded torque readings shall be submitted to the Government as certification of the torque requirements. A minimum of (4) individual torque performances for each torque requirement shall be observed at random intervals during each identified production shift to assure that torque procedure is adequate to attain torque as specified.

e. **WORKMANSHIP INSPECTION.** Inspect components that were replaced or installed during the modification for security of mounting. Inspect painted areas of ROPS kit and reworked components for missing, cracked, or chipped paint. Prime (MIL-P-52192, MIL-P-53022 or MIL-P-53030) and paint (MIL-C-46168) as required. Inspect cable and lead assemblies for proper and secure routing. Inspect for frays, cracks, splits, or bare wires. Correct if necessary. Inspect metal surfaces for burrs or sharp edges. Remove, if present. Inspect for deformations or other indications of poor workmanship and completeness of assembly. Correct, if necessary.



**15. RECORDING AND REPORTING OF THE MODIFICATION.**

- a. Records and report forms (refer to DA PAM 738-750).
- b. Loss and gain form 2408-9 will be initiated to report change of end item NSN.

**16. PRODUCT IMPROVEMENT PROPOSAL (PIP) NUMBER**

1-85-06-4052

## **APPENDIX**

This appendix gives examples of the forms required to be completed upon completion of the MWO.

MAINTENANCE REQUEST				PAGE NO.	NO. OF PAGES	REQUIREMENT CONTROL SYMBOL	
For use of this form, see TM 38-750; the proponent agency is DCSLOG.						CSGLD-1047(R1)	
<b>SECTION I - EQUIPMENT DATA</b>							
<b>CONTROL NUMBER</b> 334095		<b>WORK ORDER NUMBER</b> W31398-010		<b>WESDC</b> 3C	<b>ORG PD</b> 05	<b>PD AUTHENTICATION</b> J. BEND. CPT	
<input type="checkbox"/> WORK REQUEST <input checked="" type="checkbox"/> MWO <input type="checkbox"/> WARRANTY CLAIM		<b>1a. ORGANIZATION</b> 782 <sup>ND</sup> ORD DET			<b>b. LOCATION</b> APO N.Y. 09165		<b>c. UNIT IDENT CODE</b> WE5F92
<b>2. SERIAL NO.</b> 4700		<b>3. NOUN NOMENCLATURE</b> TRUCK, UTILITY		<b>4. LINE NO.</b>	<b>5. MODEL</b> M151A2		<b>6. NATIONAL STOCK NUMBER</b> 2320-00-177-9258
<b>7. MAINTENANCE ACTIVITY</b> 71 <sup>ST</sup> MAINT CO(DS)		<b>8. LEVEL</b> F	<b>8. UTILIZATION CODE</b> ON	<b>9. MCSR ITEM</b> Y	<b>a. ERC</b> A	<b>b. PACING ITEM</b>	<b>10. HOURS</b> 10,500 M
<b>14. FAILURE DETECTED DURING (Select one - use ✓ or X)</b> <input checked="" type="checkbox"/> A Scheduled Maintenance <input type="checkbox"/> C Test <input type="checkbox"/> E Storage <input type="checkbox"/> G Flight <input type="checkbox"/> B Handling <input type="checkbox"/> D Normal Op <input type="checkbox"/> F Inspection <input type="checkbox"/> H Other				<b>15. FIRST INDICATION OF TROUBLE (Select one - use ✓ or X)</b> <input checked="" type="checkbox"/> 068 Inoperative <input type="checkbox"/> 258 Overheating <input type="checkbox"/> 790 Out of Adjustment <input type="checkbox"/> 008 Noisy <input type="checkbox"/> 387 Low Performance <input type="checkbox"/> Other			
<b>16. DESCRIBE DEFICIENCIES OR SYMPTOMS ON THE BASIS OF COMPLETE CHECKOUT AND DIAGNOSTIC PROCEDURE IN EQUIPMENT TM (Do not prescribe repairs)</b> APPLY MWO 9-2320-218-34							
PIP-1-85-06-4052							
<b>16a. REMARKS</b>							
<div style="text-align: center;"> <b>PREPARATION INSTRUCTIONS</b>  <i>(Prior to using this form, read TM 38-750 for detailed preparation instructions)</i> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>(1) Place a "✓" or an "X" in the box for the type action required.</p> <p>(2) Enter the WESDC if the item is Materiel Condition Status Reportable.</p> <p>(3) Enter the priority designator as determined from the urgency of need and force activity designator.</p> <p>(4) The Unit Commander, Chief of TDA activity or their designated representative will authenticate, by signature, a priority of 01 through 08.</p> <p>(5) Block 1a. Enter the name of the organization submitting the request.</p> <p>(6) Block 1b. Enter the unit submitting the request; units overseas enter APO only.</p> <p>(7) Block 1c. Enter the unit identification code of the unit in block 1a.</p> <p>(8) Block 2. Enter the equipment serial no. For ammunition, enter the lot number. For administrative use vehicles enter the USA registration number.</p> <p>(9) Block 3. Enter the noun abbreviation of the item.</p> <p>(10) Block 4. Enter the item line number if applicable.</p> <p>(11) Block 5. Enter the model number.</p> <p>(12) Block 6. Enter the national stock number of the item listed in block 3.</p> </div> <div style="width: 48%;"> <p>(13) Block 7. Enter the name of the support activity.</p> <p>(14) Block 7a. Enter the symbol of the maintenance category (O, F, H, D or L).</p> <p>(15) Block 8. Enter the utilization code.</p> <p>(16) Block 9. Enter the word "yes" if the item is Materiel Condition Status Reportable.</p> <p>(17) Block 9a. Enter the equipment readiness code, if applicable.</p> <p>(18) Block 9b. Enter the word "yes" if the item is a pacing item.</p> <p>(19) Block 10. Enter the hour reading if applicable.</p> <p>(20) Block 11. Enter the mileage from the odometer if applicable.</p> <p>(21) Block 12. Enter the total rounds fired if applicable.</p> <p>(22) Block 13. For turbine engines, enter the number of hot starts.</p> <p>(23) Block 14. Enter a "✓" or "X" in the proper block.</p> <p>(24) Block 15. Enter a "✓" or "X" in the proper block.</p> <p>(25) Block 16. Describe briefly the fault or symptoms needing correction.</p> </div> </div>							
<b>23. SUBMITTED BY</b> H. Weiss		<b>24. RECEIVED BY</b>					
<b>JULIAN DATE</b> 6029		<b>JULIAN DATE</b>					

DA FORM 2407  
MAY 81

EDITION OF JUL 79 IS OBSOLETE.

RECEIPT COPY 1

MAINTENANCE REQUEST					PAGE NO.	NO. OF PAGES	REQUIREMENT CONTROL SYMBOL	
For use of this form, see TM 38-750; the proponent agency is DCSLOG.							CSGLD-1047(R1)	
SECTION I - EQUIPMENT DATA								
CONTROL NUMBER 334095		WORK ORDER NUMBER W 31398-010		WESDC 3C	ORG PD Ø5	PD AUTHENTICATION J. BEND, CPT		
<input type="checkbox"/> WORK REQUEST <input checked="" type="checkbox"/> MWO <input type="checkbox"/> WARRANTY CLAIM		1a. ORGANIZATION 782 <del>NO</del> ORD DET			b. LOCATION APO N.Y. 09165		c. UNIT IDENT CODE WE5F92	
2. SERIAL NO. 4700		3. NOUN NOMENCLATURE TRUCK, UTILITY		4. LINE NO.	5. MODEL M151A2		6. NATIONAL STOCK NUMBER 2320-00-177-9258	
7. MAINTENANCE ACTIVITY 71ST MAINT CO.(DS)		a. LEVEL F	8. UTILIZATION CODE ON	9. MCSR ITEM Y	a. ERC A	b. PACING ITEM	10. HOURS	11. MILES 10,500M
14. FAILURE DETECTED DURING (Select one - use ✓ or X) <input checked="" type="checkbox"/> A Scheduled Maintenance <input type="checkbox"/> C Test <input type="checkbox"/> E Storage <input type="checkbox"/> G Flight <input type="checkbox"/> B Handling <input type="checkbox"/> D Normal Op <input type="checkbox"/> F Inspection <input type="checkbox"/> H Other				15. FIRST INDICATION OF TROUBLE (Select one - use ✓ or X) <input checked="" type="checkbox"/> 068 Inoperative <input type="checkbox"/> 258 Overheating <input type="checkbox"/> 790 Out of Adjustment <input type="checkbox"/> 1008 Noisy <input type="checkbox"/> 397 Low Performance <input type="checkbox"/> Other				
16. DESCRIBE DEFICIENCIES OR SYMPTOMS ON THE BASIS OF COMPLETE CHECKOUT AND DIAGNOSTIC PROCEDURE IN EQUIPMENT TM (Do not prescribe repairs) APPLY MWO 9-2320-218-34								
PIP-1-85-06-4052								
16a. REMARKS								
SECTION II - WORK ACCOMPLISHED								
17a. REPAIR ORGANIZATION/ACTIVITY 31ST MAINT CO (DS)				c. UNIT IDENT CODE WK5DSC		18. TYPE ORGANIZATION/ACTIVITY AC- COMPLISHING WORK (Select one - use ✓ or X) <input checked="" type="checkbox"/> 1 TOE <input type="checkbox"/> 2 TD <input type="checkbox"/> 3 CONTRACTOR		19. AMS ACCOUNT CODE
b. LOCATION		c. COMPONENT/PART NOUN, SVC, OR MWO NO.		MANHOURS (Hrs & tenths)	NATIONAL STOCK NUMBER		PART SOURCE CODE	QTY
20a. ACT CODE		d. CB CODE	e. REF DESIGNATOR	f. MFR CODE	h		i	j
k		l		m		n		o
p		q		r		s		t
u		v		w		x		y
z		aa		ab		ac		ad
ae		af		ag		ah		ai
aj		ak		al		am		an
ao		ap		aq		ar		as
at		au		av		aw		ax
ay		az		ba		bb		bc
bd		be		bf		bg		bh
bi		bj		bk		bl		bm
bn		bo		bp		bq		br
bs		bt		bu		bv		bw
bx		by		bz		ca		cb
cc		cd		ce		cf		cg
ch		ci		cj		ck		cl
cm		cn		co		cp		cq
cr		cs		ct		cu		cv
cw		cx		cy		cz		da
db		dc		dd		de		df
dg		dh		di		dj		dk
dl		dm		dn		do		dp
dq		dr		ds		dt		du
dv		dw		dx		dy		dz
ea		eb		ec		ed		ee
ef		eg		eh		ei		ej
ek		el		em		en		eo
ep		eq		er		es		et
eu		ev		ew		ex		ey
ez		fa		fb		fc		fd
fe		ff		fg		fh		fi
fj		fk		fl		fm		fn
fo		fp		fq		fr		fs
ft		fu		fv		fw		fx
fy		fz		ga		gb		gc
gd		ge		gf		gg		gh
gi		gj		gk		gl		gm
gn		go		gp		gq		gr
gs		gt		gu		gv		gw
gx		gy		gz		ha		hb
hc		hd		he		hf		hg
hh		hi		hj		hk		hl
hm		hn		ho		hp		hq
hr		hs		ht		hu		hv
hw		hx		hy		hz		ia
ib		ic		id		ie		if
ig		ih		ii		ij		ik
il		im		in		io		ip
iq		ir		is		it		iu
iv		iw		ix		iy		iz
ja		jb		jc		jd		je
jf		jg		jh		ji		jj
jk		jl		jm		jn		jo
jp		jq		jr		js		jt
ju		jv		jw		jx		jy
jz		ka		kb		kc		kd
ke		kf		kg		kh		ki
kj		kk		kl		km		kn
ko		kp		kq		kr		ks
kt		ku		kv		kw		kx
ky		kz		la		lb		lc
ld		le		lf		lg		lh
li		lj		lk		ll		lm
ln		lo						

CONTROL NO. <b>X 67538</b>	1. ORGANIZATION <b>782ND ORD DET</b>	2. LOCATION <b>APO N.Y. 09165</b>	3. UNIT IDENT CODE <b>WE5F92</b>	4. UTILIZATION CODE <b>ON</b>	5. VEHICLE USE CODE <b>A</b>
6. NOMENCLATURE <b>TRUCK, UTILITY</b>	7. MODEL <b>M151A2</b>	8. NATIONAL STOCK NO. <b>2320-01-264-4819</b>	9. SERIAL NO. <b>4700</b>	10. REGISTRATION NO. <b>4A215</b>	
11. YEAR OF MFG <b>M74</b>	12. MANUFACTURER (MFG Code)	13. CONTRACT NO.	14. PURCHASE ORDER NO.	15. WARRANTY PERIOD	
16. TYPE REPORT		17. REPORT CODE	18. USAGE	19. SHIPPED TO a. ORGANIZATION	
a. ACCEPTANCE AND REGISTRATION			a. HOURS	20. RECEIVED FROM a. ORGANIZATION	
b. USAGE					
c. TRANSFER			b. MILES		
d. LOSS					
e. GAIN		<b>S</b>	c. ROUNDS	b. RECEIVED FROM UIC	
f. OTHER					
21. REMARKS					

OLD NSN: 2320-00-177-9258

"PERMANENT LOGBOOK COPY"

22. INSPECTOR'S SIGNATURE	23. JULIAN DATE <b>7287</b>
EQUIPMENT CONTROL RECORD	
For use of this form, see TM 38-750; the proponent agency is the Office of the Deputy Chief of Staff for Logistics.	
DA FORM 2408-9 1 OCT 72	REPLACES DA FORMS 2408-7, 1 JAN 64, AND 2408-8, 1 JAN 64, WHICH ARE OBSOLETE.
NMP COPY 1	

## GAIN REPORT SAMPLE

CONTROL NO. <b>X 64304</b>	1. ORGANIZATION <b>782ND ORD DET</b>	2. LOCATION <b>APO N.Y. 09165</b>	3. UNIT IDENT CODE <b>WE5F92</b>	4. UTILIZATION CODE <b>ON</b>	5. VEHICLE USE CODE <b>A</b>
6. NOMENCLATURE <b>TRUCK, UTILITY</b>	7. MODEL <b>M151A2</b>	8. NATIONAL STOCK NO. <b>2320-00-177-9258</b>	9. SERIAL NO. <b>4700</b>	10. REGISTRATION NO. <b>4A215</b>	
11. YEAR OF MFG	12. MANUFACTURER (MFG Code)	13. CONTRACT NO.	14. PURCHASE ORDER NO.	15. WARRANTY PERIOD	
16. TYPE REPORT		17. REPORT CODE	18. USAGE	19. SHIPPED TO a. ORGANIZATION	
a. ACCEPTANCE AND REGISTRATION			a. HOURS	20. RECEIVED FROM a. ORGANIZATION	
b. USAGE					
c. TRANSFER			b. MILES		
d. LOSS		<b>N</b>			
e. GAIN			c. ROUNDS	b. RECEIVED FROM UIC	
f. OTHER					
21. REMARKS					

22. INSPECTOR'S SIGNATURE	23. JULIAN DATE <b>7287</b>
EQUIPMENT CONTROL RECORD	
For use of this form, see TM 38-750; the proponent agency is the Office of the Deputy Chief of Staff for Logistics.	
DA FORM 2408-9 1 OCT 72	REPLACES DA FORMS 2408-7, 1 JAN 64, AND 2408-8, 1 JAN 64, WHICH ARE OBSOLETE.
NMP COPY 1	

## LOSS REPORT SAMPLE

**HEADQUARTERS**  
**U.S. ARMY TANK-AUTOMOTIVE COMMAND**  
**WARREN, MICHIGAN 48397-5000**

This publication has been prepared under the supervision and control of the Commander, U.S. Army Tank-Automotive Command, Warren, Michigan, by the Maintenance Directorate, National Maintenance Point (NMP) and is published for the information and guidance of all concerned.


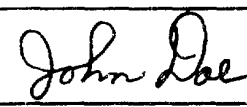
FOR THE COMMANDER:

OFFICIAL:

JAMES G. EDGE  
Colonel, GS  
Chief of Staff

BRENDA M. STENERSON  
1LT, GS  
Adjutant

DISTRIBUTION:  
Special

 <div style="border: 1px solid black; padding: 5px; margin-top: 10px; font-size: small;">             THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL!           </div>		SOMETHING WRONG		WITH THIS PUBLICATION?	
		FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)			
		YOUR MAILING ADDRESS			
		DATE SENT		DATE YOU FILL OUT THIS FORM	
PUBLICATION NUMBER			PUBLICATION DATE		PUBLICATION TITLE
MWO 9-2320-218-34			1 Aug 1987		ROLLOVER PROTECTION SYSTEM (4-TON VEHICLE M151A2)
BE EXACT... PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:	
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	<div style="font-size: large; font-weight: bold; transform: rotate(-15deg); opacity: 0.5; position: absolute; bottom: 10px; right: 10px;">SAMPLE</div>	
9		3			
22	C-3				
52	8				
				ITEM 19. FLAT WASHER INSTEAD OF LOCK WASHER.  0.406 - INCH DIAMETER HOLES SHOULD BE 0.421 - INCH DIAMETER HOLES.  ITEM 9. AMOUNT OF WASHERS SHOULD BE 12.	
PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBERS				SIGN HERE:	
JOHN DOE, WO/2, 602-234-5789					

**SAMPLE**

FILL IN YOUR  
UNIT'S ADDRESS



FOLD BACK

DEPARTMENT OF THE ARMY

POSTAGE AND FEES PAID  
DEPARTMENT OF THE ARMY  
DOD 314



TEAR ALONG PERFORATED LINE

OFFICIAL BUSINESS  
PENALTY FOR PRIVATE USE \$300

COMMANDER  
U.S. ARMY TANK-AUTOMOTIVE COMMAND  
ATTN: AMSTA-MB  
WARREN, MI 48397-5000





# SOMETHING WRONG

WITH THIS PUBLICATION?

THEN... JOT DOWN THE  
DOPE ABOUT IT ON THIS  
FORM. CAREFULLY TEAR IT  
OUT. FOLD IT AND DROP IT  
IN THE MAIL!

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

MWO 9-2320-218-34

PUBLICATION DATE

1 Aug 1987

PUBLICATION TITLE

Rollover Protection System  
( $\frac{1}{4}$ -Ton Vehicle M151A2)

BE EXACT... PIN-POINT WHERE IT IS

IN THIS SPACE TELL WHAT IS WRONG  
AND WHAT SHOULD BE DONE ABOUT IT:PAGE  
NO.PARA-  
GRAPHFIGURE  
NO.TABLE  
NO.

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBERS

SIGN HERE:

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TEAR ALONG PERFORATED LINE

## 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 =

### LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces  
 320 Fahrenheit is equivalent to 0° Celsius

### 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 = 1,000,000 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  
 1 Megagram = 1.1 Short Tons

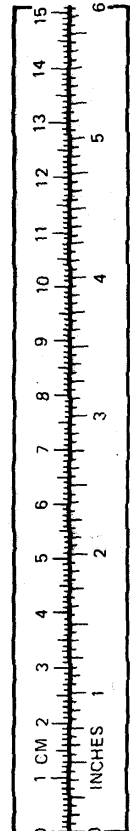
### TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 $9/5 (^{\circ}\text{C} + 32) = ^{\circ}\text{F}$

## 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
Quarts .....	Liters .....	0.946
Gallons .....	Liters .....	3.785
Ounces .....	Grams .....	28.349
Pounds .....	Kilograms .....	0.45
Short Tons .....	Metric Tons .....	0.0907
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
Meters .....	Yards .....	1.094
Kilometers .....	Miles .....	0.621
Square Centimeters .....	Square Inches .....	0.155
Square Meters .....	Square Feet .....	10.764
Square Meters .....	Square Yards .....	1.195
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



TA08991

