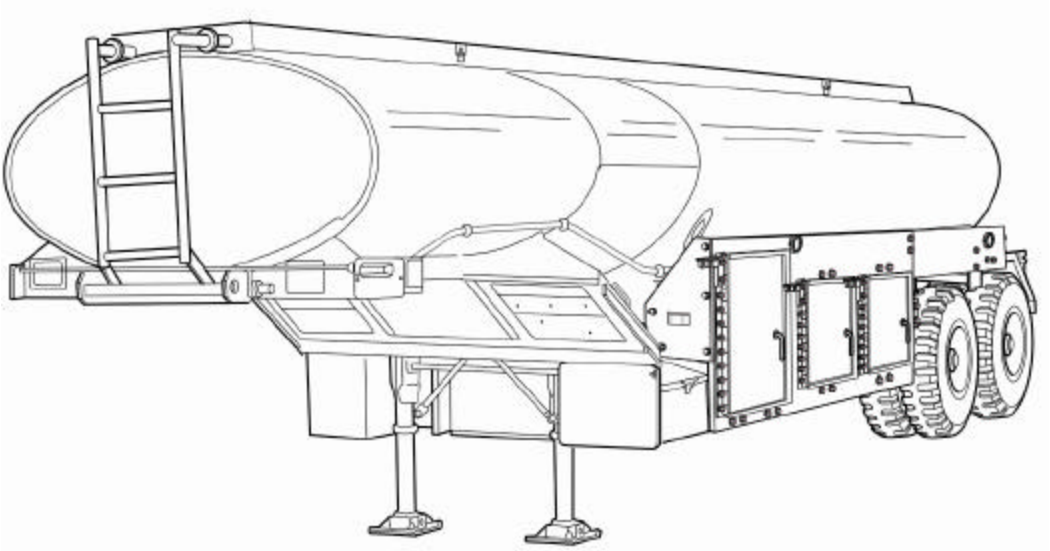
DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

TECHNICAL BULLETIN

FOR

SEMITRAILER, TANK, 5000-GALLON
M969 (NSN 2330-01-050-5634)
M969A1 (NSN 2330-01-155-0048)
M969A2 (NSN 2330-01-377-9337)

TANKER BALLISTIC PROTECTION SYSTEMS (TBPS/AOA/FTSS)



Headquarters, Department of the Army, Washington, DC

FEBRUARY 2006

WARNING

Use caution when lifting the left front frame plate. A shifting load may cause injury to personnel.

WARNING

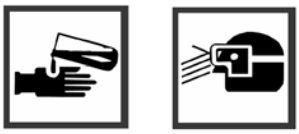
Use caution when lifting the right front frame plate. A shifting load may cause injury to personnel.

WARNING

Use caution when lifting the left supplemental armor. A shifting load may cause injury to personnel.

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death, post signs that read NO SMOKING WITHIN 50 FEET OF VEHICLE when working with fuel tanker.



WARNING

Eye and hand protection must be worn at all times when applying FTSS Patch Kit. Failure to do so may result in injury to personnel.

b

TB 9-2330-336-14

LIST OF EFFECTIVE PAGES/WORK PACKAGES

Date of issue for original pages/work packages is:

28 February 2006

NOTE: The portion of text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands.

Dates of issue for original and changed pages are:

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TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 34 AND TOTAL NUMBER OF PAGES IS 80 CONSISTING OF THE FOLLOWING:

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A/(B Blank)	0
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i thru iv	0
1-1 thru 1-2	0
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4-1 thru 4-32	0
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6-1/(6-2 Blank)	0
7-1 thru 7-4	0

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 28 February 2006

TECHNICAL BULLETIN

FOR

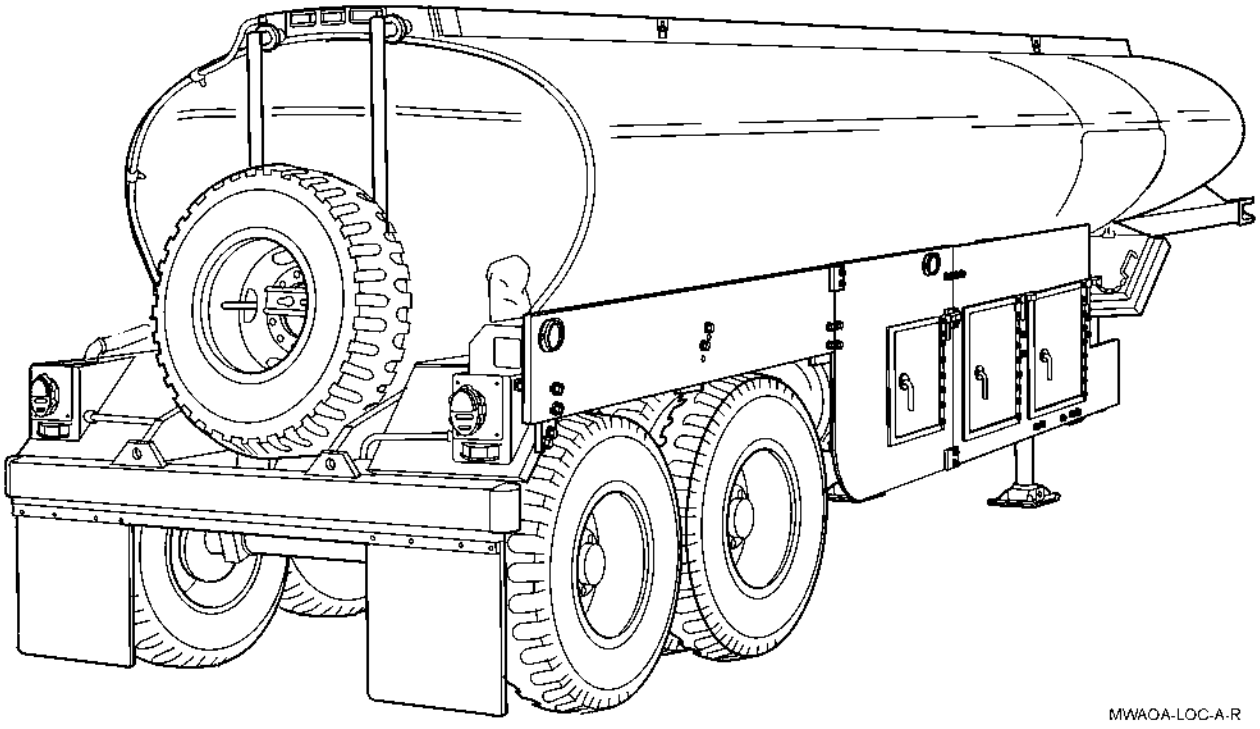
SEMITRAILER, TANK, 5000-GALLON
M969 (NSN 2330-01-050-5634)
M969A1 (NSN 2330-01-155-0048)
M969A2 (NSN 2330-01-377-9337)

TANKER BALLISTIC PROTECTION SYSTEM
(TBPS/AOA/FTSS)

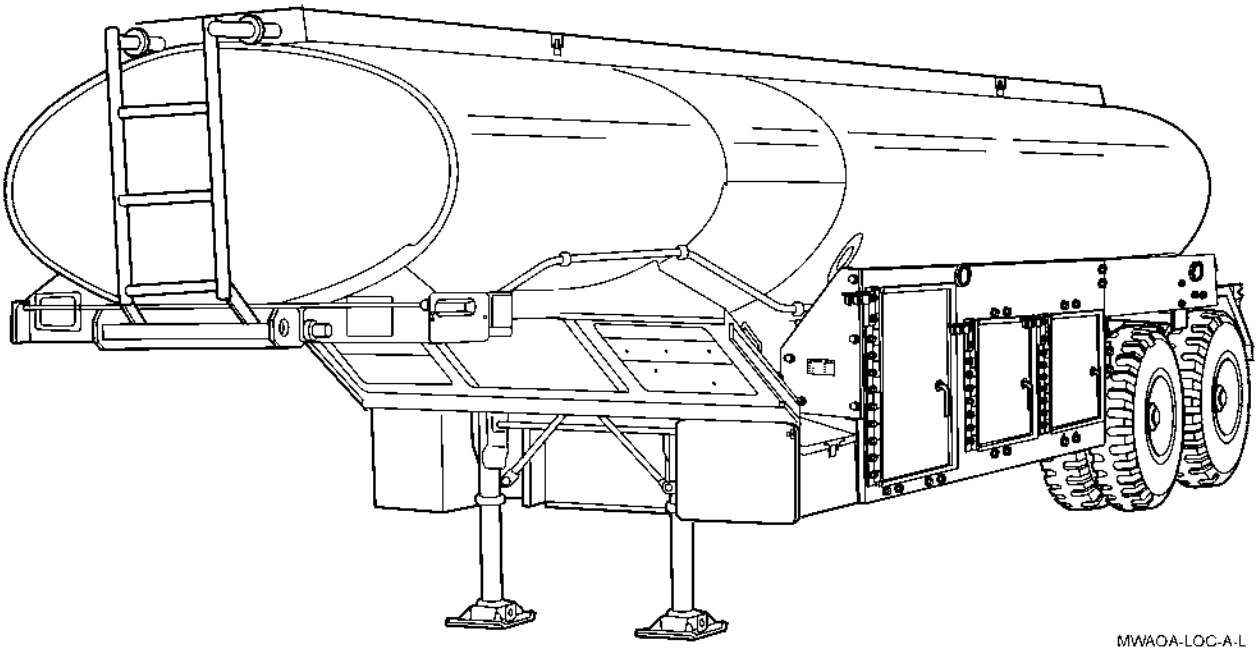
REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028-2 (Recommended Changes to Equipment Technical Publications) through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on ACCESS REQUEST FORM. The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond more quickly to your comments and better manage the DA Form 2028 program. You may also mail, fax, or e-mail your letter, DA Form 2028, or DA Form 2028-2 directly to Technical Publication Information Office, TACOM-R1, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The e-mail address is tacom-tech-pubs@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726. A reply will be furnished to you.

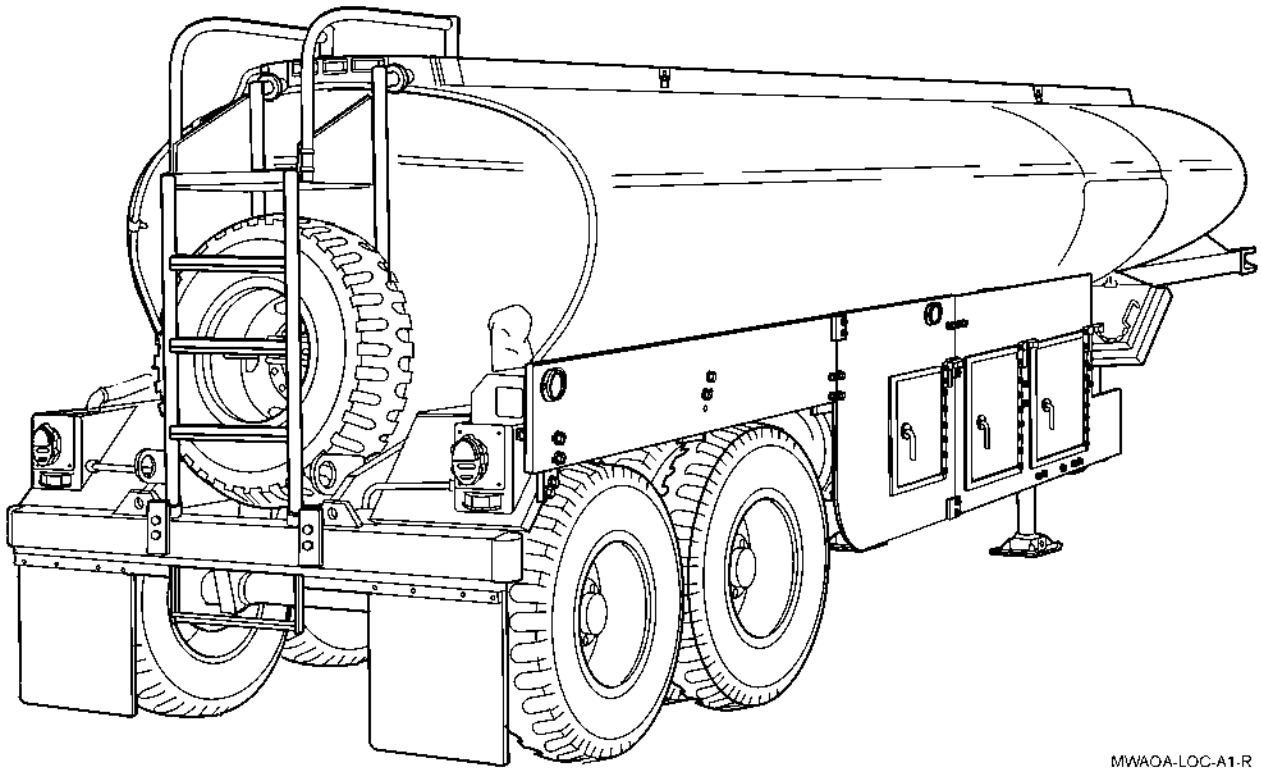
TABLE OF CONTENTS



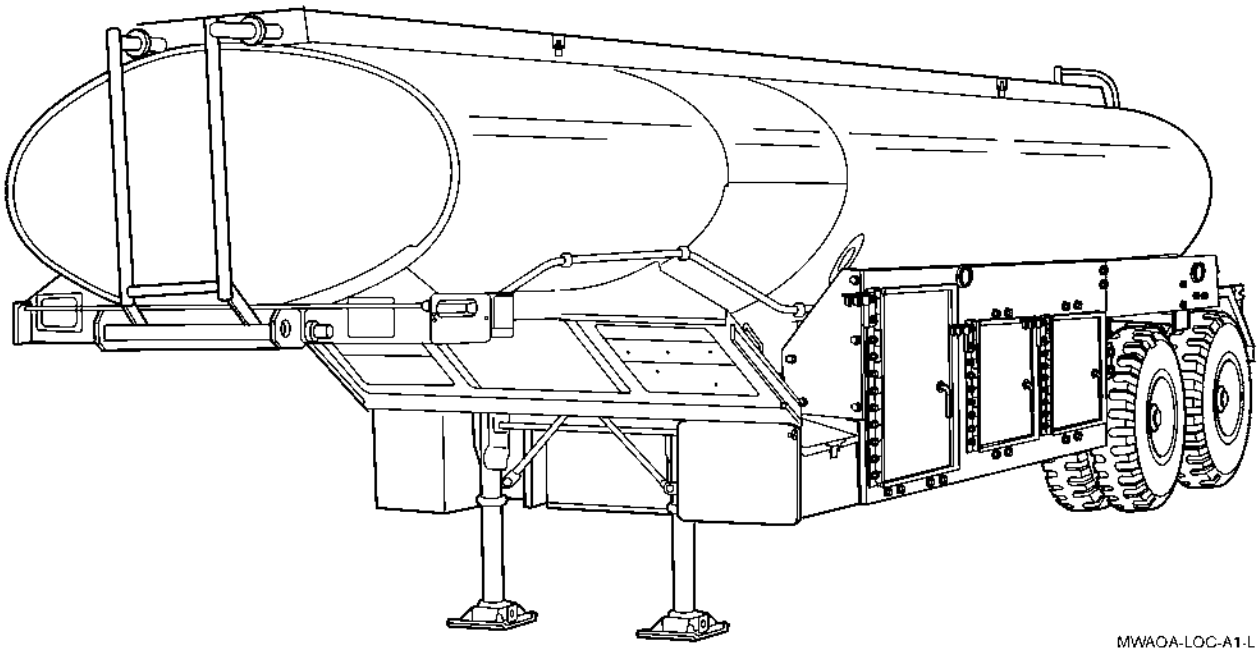
M969 RIGHT SIDE



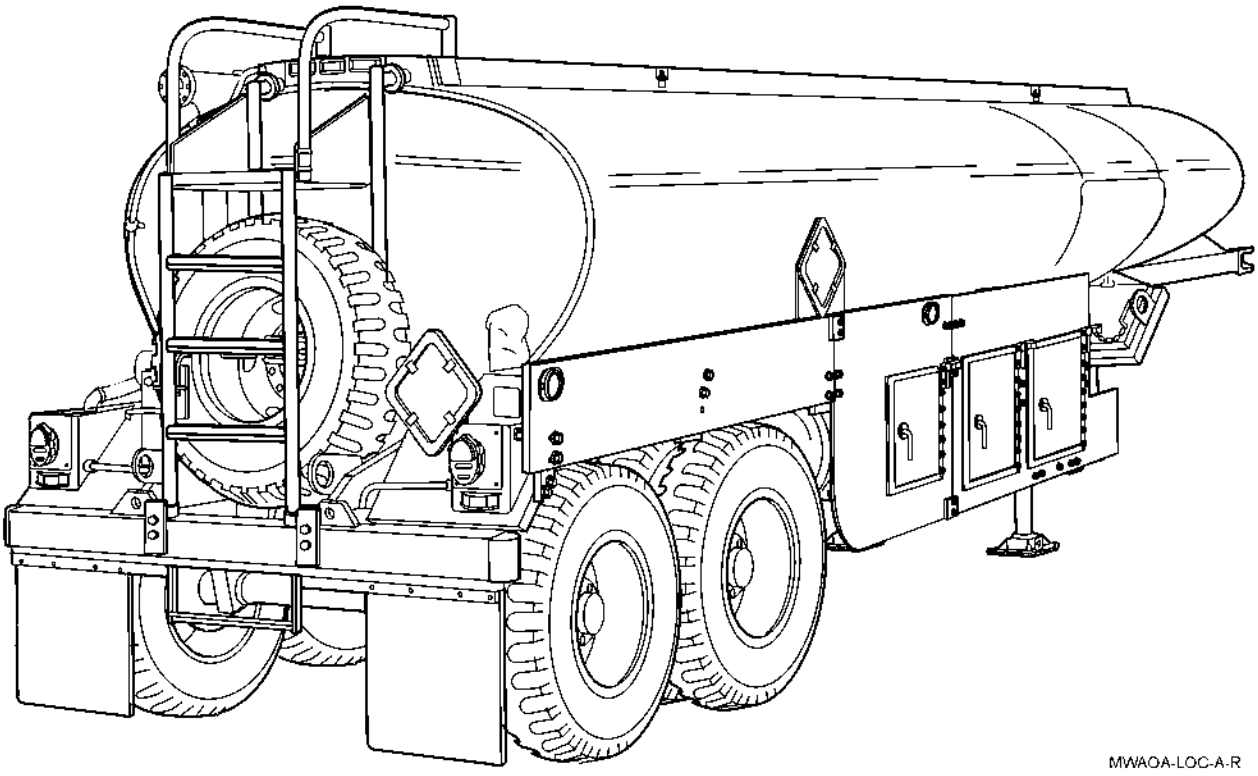
M969 LEFT SIDE



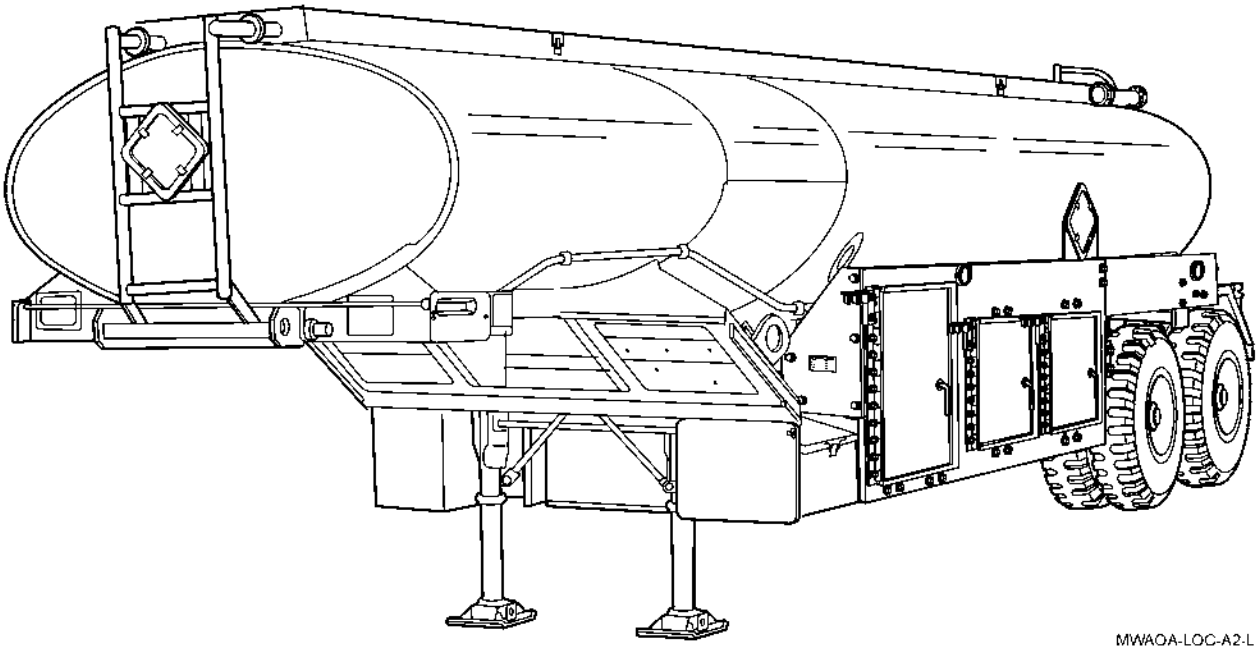
M969A1 RIGHT SIDE



M969A1 LEFT SIDE



M969A2 RIGHT SIDE



M969A2 LEFT SIDE

CHAPTER 1
GENERAL MAINTENANCE PROCEDURES

SCOPE

The purpose of this Technical Bulletin (TB) is to provide the instructions for applying the Tanker Ballistic Protection Systems (TBPS/AOA/FTSS) on M969/A1/A2 series, 5000-gallon, fuel tankers. The TBPS consists of the Fuel Tank Self-Sealing (FTSS) System, Add-On-Armor (AOA) Kit, and FTSS Repair Kit, which all work in conjunction to provide the fuel tanker with ballistic protection against small arms fire.

The TBPS kit is applicable to the following end items:

Nomenclature	National Stock Number	Part Number
M969	2330-01-050-5634	8750004
M969A1	2330-01-155-0048	8750126
M969A2	2330-01-377-9337	8750324

When completed, the vehicle NSN and part number will change for the end item as follows:

Nomenclature	National Stock Number	Part Number
M969P1	2330-01-527-4878	12500823-1
M969A1P1	2330-01-527-4879	12500823-2
M969A2P1	2330-01-527-4880	12500823-3

ARMY KNOWLEDGE ONLINE (AKO) WEBSITE

Refer to the AKO website at https://www.us.army.mil/suite/login/welcome.html for the most recent updates to the kits and TB installation instructions.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, Functional Users Manual for The Army Maintenance Management Systems (TAMMS).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)

If your M969/A1/A2 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. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/PQDR, Warren, MI 48397-5000. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

1. CPC of Army materiel is a continuing concern. Any corrosion problems with this item should be reported so that they can be corrected and improvements made to prevent the problem in future items.

2. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

CORROSION PREVENTION AND CONTROL (CPC) (continued)

3. If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will ensure that the information is identified as a CPC problem.

4. The form should be submitted to the address specified in DA PAM 738-750, Functional Users Manual for The Army Maintenance Management System (TAMMS).

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Refer to TM 750-244-6 for procedures on destruction of military vehicles.

PREPARATION FOR STORAGE OR SHIPMENT

Refer to TM 38-470, Storage and Maintenance of Army Prepositioned Stock Material, for preservation, packaging, marking, and preparation for storage or shipment of M969/A1/A2 series fuel tankers.

LIST OF ABBREVIATIONS AND ACRONYMS

AKO	Army Knowledge Online
AOA	Add-On-Armor
CPC	Corrosion Prevention and Control
DA PAM	Department of the Army Pamphlet
DOT	Department of Transportation
EIR	Equipment Improvement Recommendations
FRP	Field Repair Patch
FTSS	Fuel Tank Self-Sealing
TAMMS	The Army Maintenance Management System
TB	Technical Bulletin
TBPS	Tanker Ballistic Protection System
TM	Technical Manual

CHAPTER 2
PRECONDITIONS

VEHICLE PREPARATION

1. Ensure the fuel tanker has been emptied in accordance with appropriate Operator's Manual, Technical Bulletin and Field Manual Procedures. The fuel tanker does not require purging or sniff testing prior to modification.

2. Ensure the fuel tanker is properly grounded and all vessel openings have been properly and completely secured.

3. Remove the front and rear side reflectors from the left and right side of vehicle (TM 9-2330-356-14/ TM 9-2330-398-24). Discard mounting hardware. Set aside reflectors for reinstallation.

4. Remove trough covers and hose assemblies from left and right side of vehicle (TM 9-2330-356-14/ TM 9-2330-398-24). Retain hoses, hose trough covers, and hardware for reinstallation.

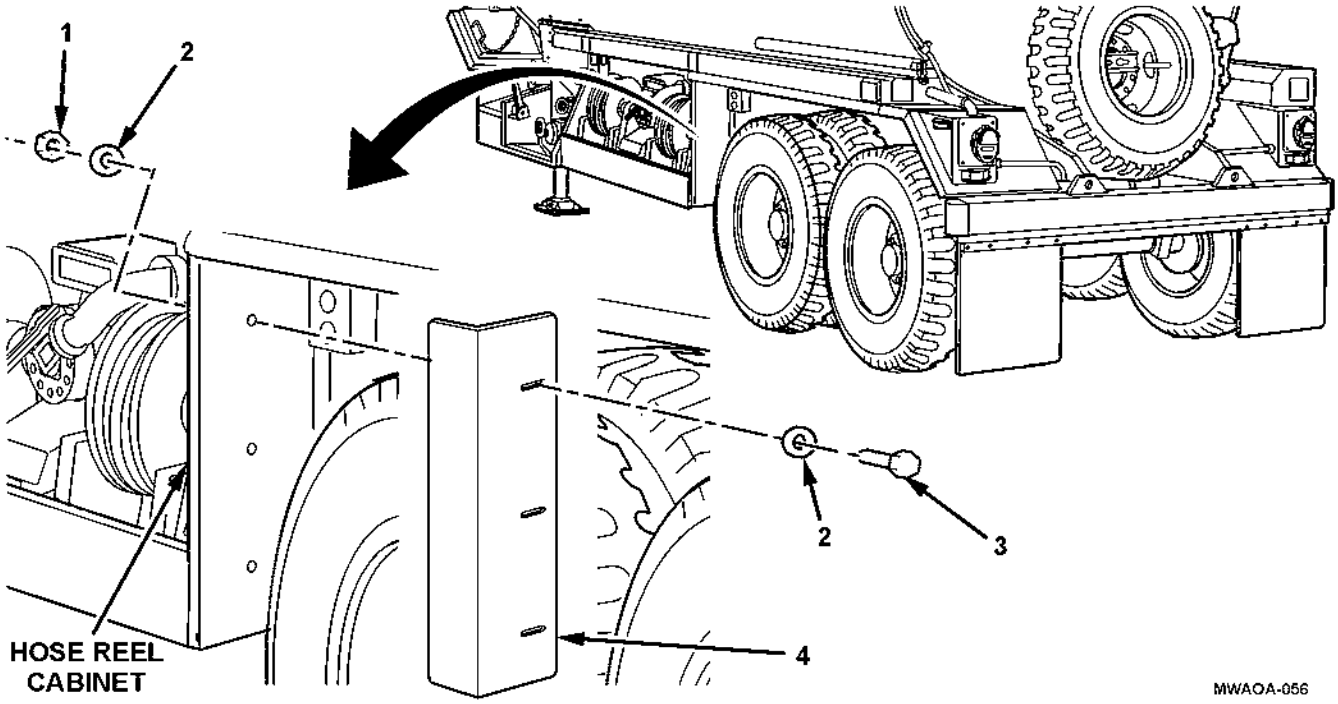
NOTE

On early model M969 tankers, and those converted from M967, a dust shield panel can be found on the right side of the hose reel cabinet. Do not remove or discard this panel when the hose reel cabinet door assembly is removed. During the installation of the Add-On-Armor (AOA) Kit, a hose reel frame cover bracket, P/N 12500865, will be installed to reinforce the dust shield panel and provided added protection from contamination to the hose reel housing.

5. Remove hose reel cabinet door assembly from vehicle (TM 9-2330-356-14/ TM 9-2330-398-24). Discard mounting hardware. Set aside hose reel cabinet door assembly for disposition.

VEHICLE PREPARATION (continued)

6. Position hose reel frame cover bracket (4) (kit 57K4784) on hose reel cabinet and install with six flat washers (2), three hexagon head capscrews (3), and self-locking nuts (1). Adjust hose reel frame cover bracket (4) flush with hose reel cabinet and tighten mounting hardware.



NOTE

Perform Step 7 for fuel tankers equipped with the Lombardini engine kit modification.

7. Remove engine compartment cover, if so equipped, from right side of vehicle (TM 9-2330-356-14/TM 9-2330-398-24). Set engine compartment cover and mounting hardware inside for disposition.

8. For vehicle preparation and application of the FTSS system, refer to Chapter 3 of this TB.

NOTE

Check assembly areas for any items that could interfere with the installation of the AOA kits, should any items be in the way; use a Plasma Cutter and/or Hand Grinder to remove those items. Finish all exposed metal areas using a rust inhibitor primer and paint as specified in Table 7-4, Materials and Parts. Allow for the appropriate time for prime and paint to cure.

CHAPTER 3
FUEL TANK SELF-SEALING (FTSS) SYSTEM

SCOPE

This section provides the instructions for applying the FTSS System to M969/A1/A2 fuel tankers. The FTSS System is a coating applied to the exterior surface of the fuel tank vessel that will seal a leak caused by small arms fire within twenty minutes of impact. Once sealed, the fuel tanker may continue operating under normal conditions. In the event the FTSS System does not seal a leak within twenty minutes, a repair kit is provided to patch the affected area. Refer to Chapter 5, FTSS Repair Kit, for instructions on applying the field patch assemblies.

VEHICLE PREPARATION

The following list details the locations and components that must be removed to allow access to restricted areas of the fuel tanker before the FTSS System coating is applied. Once the coating has been applied, dried, and inspected, some of the components may be reinstalled. For component replacement instructions, spare, and mandatory replacement parts, refer to TM 9-2330-356-14 and TM 9-2330-356-24P (M969/M969A1) or TM 9-2330-398-24 and TM 9-2330-398-24P M969A2).

Front Bulkhead:

1. Remove drain tubes (M969A1 only).
2. Remove electrical conduit.
3. Remove electrical access cover.
4. Remove right and left maker lights and lead assemblies.
5. Remove service air glad-hand cover.
6. Remove emergency air glad-hand cover.

Curbside:

1. Remove air cleaner.
2. Remove battery cover.
3. Remove front and rear reflectors.
4. Remove curbside clearance light and lead assembly.

Rear Bulkhead:

1. Remove ladder assembly.
2. Remove drain tubes (M969 only).
3. Remove spare tire and spare tire carrier.
4. Remove license plate and frame (as applicable).
5. Remove electrical conduit.
6. Remove triple warning lights and lead assembly.
7. Remove fire extinguisher and mounting bracket.
8. Remove gas can and mounting bracket.
9. Remove right composite light and lead assembly.
10. Remove left composite light and lead assembly.
11. Remove DOT placard (as applicable).

VEHICLE PREPARATION (continued)

Roadside:

1. Remove electrical conduit.
2. Remove fire extinguisher and mount.
3. Remove roadside clearance light and lead assembly.

FTSS SYSTEM PROCEDURE

The source and application of the FTSS System is proprietary. For vehicle preparation, applications, and reapplication of the FTSS System, contact VSE Corporation, 2550 Huntington Avenue, Alexandria, VA 31902. Or you may submit your request by phone (800) 455-4873 or fax (703) 960-2688.

FOLLOW-ON TASK

The following is a list of components that are reinstalled after the FTSS coating has been applied, dried, and inspected. For component installation instructions, spare, and mandatory replacement parts, refer to TM 9-2330-356-14 and TM 9-2330-356-24P (M969/M969A1) or TM 9-2330-398-24 and TM 9-2330-398-24P (M969A2).

Front Bulkhead:

1. Install drain tubes (M969A1 only).
2. Install electrical conduit.
3. Install electrical access cover.
4. Install right and left maker lights and lead assemblies.
5. Install service air glad-hand cover.
6. Install emergency air glad-hand cover.

Curbside:

1. Install air cleaner.
2. Install battery cover.
3. Install front and rear reflectors.
4. Install curbside clearance light and lead assembly.

Rear Bulkhead:

1. Install ladder assembly.
2. Install drain tubes (M969 only).
3. Install spare tire and spare tire carrier.
4. Install license plate and frame (as applicable).
5. Install electrical conduit.
6. Install triple warning lights and lead assembly.
7. Install fire extinguisher and mounting bracket.
8. Install gas can and mounting bracket.
9. Install right composite light and lead assembly.
10. Install left composite light and lead assembly.
11. Install DOT placard (as applicable).

Roadside:

1. Install electrical conduit.
2. Install fire extinguisher and mount.
3. Install roadside clearance light and lead assembly.

CHAPTER 4
ADD-ON-ARMOR (AOA) KIT

SCOPE

This chapter provides the parts list and installation instructions for the AOA kit.

TOOLS AND SPECIAL TOOLS

For a list of tools and special tools needed to install the AOA kit, refer to Chapter 7, Table 7-2.

NOTE

All lifting devices, lifting slings, and hydraulic jack, must have the capability to support 500 pounds (227 kg) when used to install the AOA kit.

KIT PARTS AND THEIR DISPOSITION

The following lists the kit components of the AOA kit. This list can be used to inventory the kit for completeness.

NOTE

Refer to the AKO website at https://www.us.army.mil/suite/login/welcome.html for the most recent updates to the contents of the AOA kit.

NOTE

Items 1, 5, 31, and 34 are assembled during the installation of the AOA kit.

Table 4-1. AOA Kit Contents List

Item No.	Nomenclature	National Stock Number	Part Number	CAGEC	QTY
	Assembly Drawing		12500826	19207	1
	Small Shim 0.1046 Thick		12500845-1	19207	6
	Small Shim 0.125 Thick		12500845-2	19207	6
	Small Shim 0.375 Thick		12500845-3	19207	6
	Large Shim 0.1046 Thick		12500846-1	19207	8
	Large Shim 0.125 Thick		12500846-2	19207	8
	Large Shim 0.375 Thick		12500846-3	19207	8
2	Bracket, A, Support, Rear		12500851	19207	1
3	Bracket, Support, Slider		12500852	19207	4
4	Bracket, B, Support, Rear	2540-01-532-8980	12500850	19207	1
6	Bracket, F, Support, Rear		12500856	19207	2
7	Bracket, E, Support, Rear		12500855	19207	2
8	Washer, Flat 1/2	5310-00-809-5997	MS27183-17	96906	162
9	Nut, Hexagon, Self-Locking, 1/2-13	5305-01-411-4385	MS17830-8C	96906	54
10	Washer, Lock 1/2	5310-00-933-8778	MS35338-143	80205	79

KIT PARTS AND THEIR DISPOSITION (continued)

NOTE

Item numbers 1, 5, 31, and 34 are assembled during the installation of the AOA kit.

Table 4-1. AOA Kit Contents List (continued)

Item No.	Nomenclature	National Stock Number	Part Number	CAGEC	QTY
11	Screw, Cap, Hexagon, Head 1/2-13x2.00	5305-00-071-2071	B1821BH050C200N	80204	33
12	Frame Front, Roadside	2540-01-532-8984	12500841	19207	1
14	Bracket, Support, Roadside	2540-01-532-8977	12500839	19207	1
15	Screw, Cap, Hexagon, Head 1/2-13x3.00	5305-00-071-2075	B1821BH050C300N	80204	37
16	Screw, Cap, Hexagon, Head 1/2-13x6.00	5305-01-032-2312	B1821BH050C600N	80204	9
17	Washer, Flat 1/2 x 1-1/4 O.D.	5310-01-147-5859	10910174-40	19207	4
18	Plate, Shield, Rear, Roadside	2540-01-532-8976	12500843	19207	1
19	Screw, Machine 10-32 x 7/16	5305-00-059-3658	MS51958-62	80205	8
20	Washer, Flat #10	5310-00-619-1148	MS15795-808	80205	8
21	Washer, Lock #10	5310-00-933-8120	MS35338-138	80205	8
22	Door, Assembly B, Roadside	2540-01-532-8982	12500830	19207	2
23	Latch, Safety		12500887-1	19207	3
24	Washer, Flat 3/8	5310-01-312-4960	MS27183-55	96906	57
25	Washer, Lock 3/8	5310-00-984-7042	MS35338-141	96906	57
26	Screw, Cap, Hexagon, Head 3/8-16x2.00	5305-00-782-9489	B1821BH038C200N	80204	12
27	Screw, Cap, Hexagon, Head 3/8-16x1.00	5305-00-068-0510	B1821BH038C100N	80204	55
28	Door, Assembly A, Roadside	2540-01-532-8983	12500829	19207	1
29	Shield, Dust Cover		12500871	19207	1
30	Screw, Self-Drilling		91324A580		4
32	Bracket, D, Support, Front, Curbside		12500854	19207	1
33	Bracket, C, Support, Rear	2590-01-533-9803	12500853	19207	1
35	Frame Front, Curbside	2510-01-532-3324	12500842-2	19207	1
36	Mid-Plate, Filter, Curbside	2590-01-532-3291	12500834	19207	1
37	Shield, Rear, Curbside	2590-01-532-3301	12500838	19207	1
38	Bracket, Rear Shield, Curbside	2590-01-532-3273	12500840-1	19207	1
39	Bracket, Rear Shield, Curbside	2590-01-532-3570	12500840-2	19207	1
40	Screw, Cap, Hexagon, Head 3/8-16x1.50	5305-00-725-2315	B1821BH038C150N	80204	2
41	Washer, Flat 3/8 x 0.132 Thick (spacers)	5310-00-728-9957	10910174-22	19207	8
42	Nut, Hexagon, Nylon Lock (spacer) 3/8-16	5305-00-050-6646	MS17830-6C	96906	2
43	Latch, Safety		12500887-2	19207	3
44	Door, Assembly E, Curbside		12500833	19207	1
45	Door, Assembly C, Curbside	2510-01-532-3315	12500831	19207	1
46	Door, Assembly D, Curbside	2540-01-532-3415	12500832	19207	1

KIT PARTS AND THEIR DISPOSITION (continued)

Table 4-2. Hose Reel Cabinet Dust Cover

Item No.	Nomenclature	National Stock Number	Part Number	CAGEC	QTY
1	Nut, Self-Locking	5310-00-241-6604	MS17830-4C	96906	3
2	Washer, Flat	5310-00-880-5977	MS15795-811	96906	6
3	Screw, Cap, Hexagon Head	5305-00-207-8253	MS35307-308	96906	3
4	Cover Bracket		12500865	19207	1

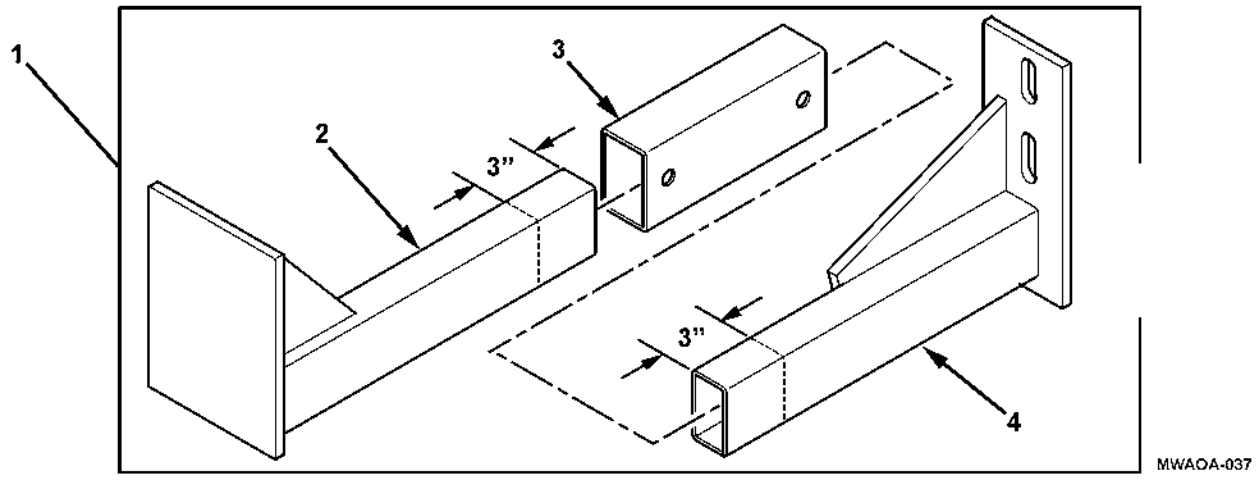
NOTE

On early model M969 tankers, and those converted from M967, a dust shield panel can be found on the right side of the hose reel cabinet. Do not remove or discard this panel when the hose reel cabinet door assembly is removed. During the installation of the AOA Kit, a hose reel frame cover bracket, P/N 12500865, will be installed to reinforce the dust shield panel and provided added protection from contamination to the hose reel housing.

INSTALLATION

1. Scribe a locating mark 3 inches (8 cm) from end of support bracket (2) and support bracket (4), as shown. These marks will be used to position the slider support bracket (3).

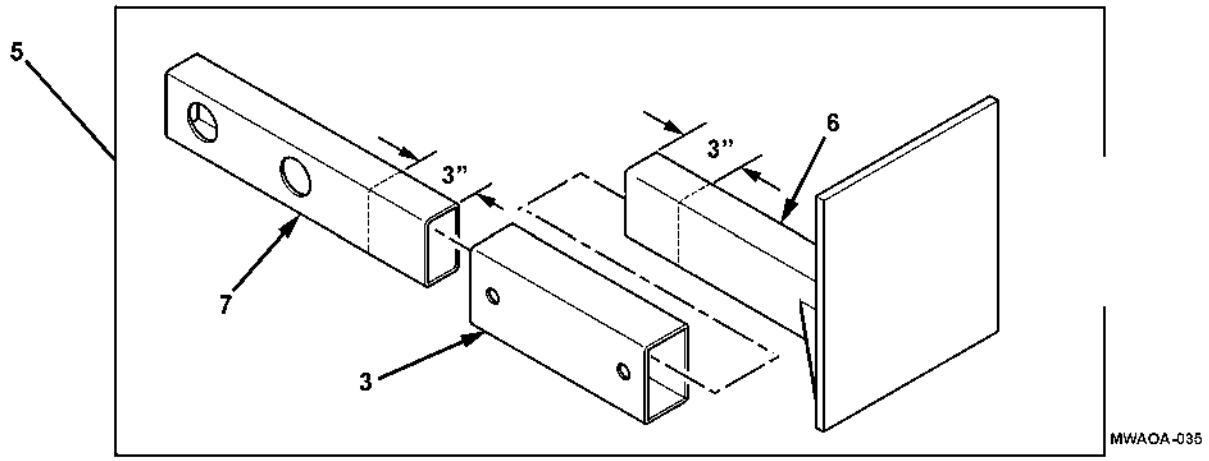
2. Assemble left front bracket assembly (1) using support bracket (2), support bracket (4), and slider support bracket (3), as shown.



INSTALLATION (continued)

3. Scribe a locating mark 3 inches (8 cm) from end of support bracket (7) and support bracket (6), as shown. These marks will be used to position the slider support bracket (3).

4. Assemble left rear bracket assembly (5) using support bracket (7), support bracket (6), and slider support bracket (3), as shown.

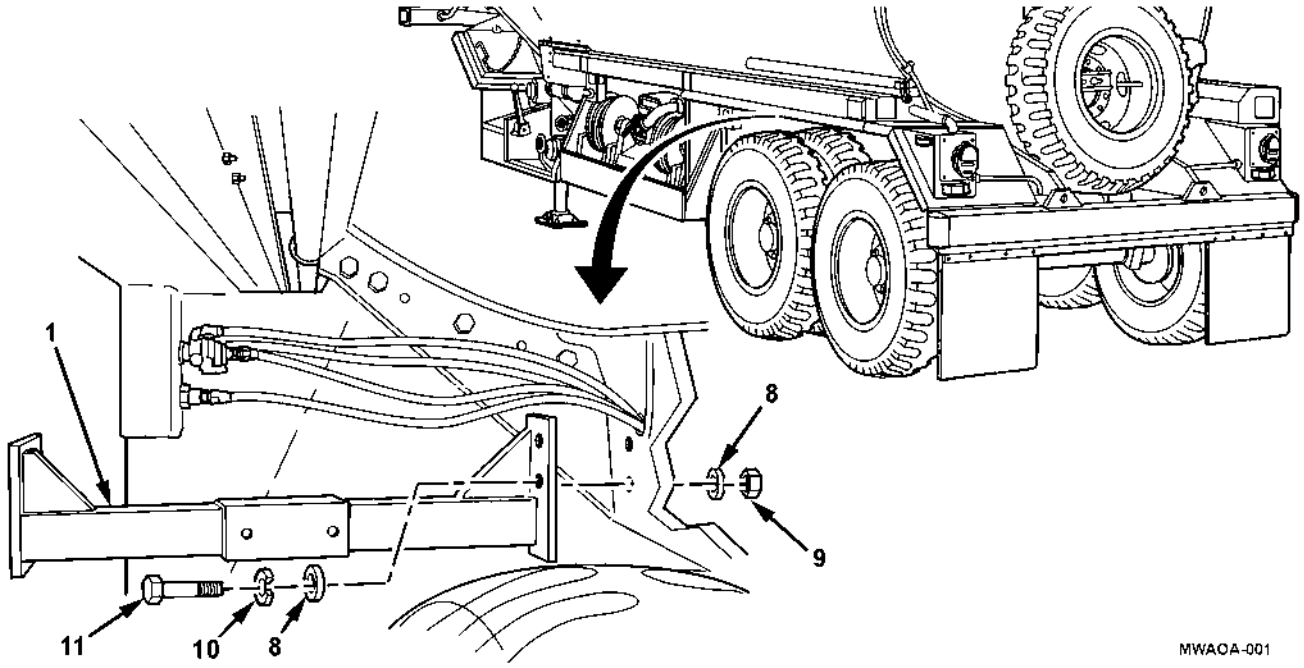


NOTE

If the through holes are not found on vehicle frame, use the left front bracket (1) as a template and drill using a 19/32-inch drill bit.

5. Locate two existing holes through vehicle frame as shown.

6. Install left front bracket assembly (1) on vehicle frame with four flat washers (8), two hexagon head capscrews (11), lockwashers (10), and self-locking nuts (9), as shown. Torque self-locking nuts to 55-65 lb-ft (75-81 N•m).



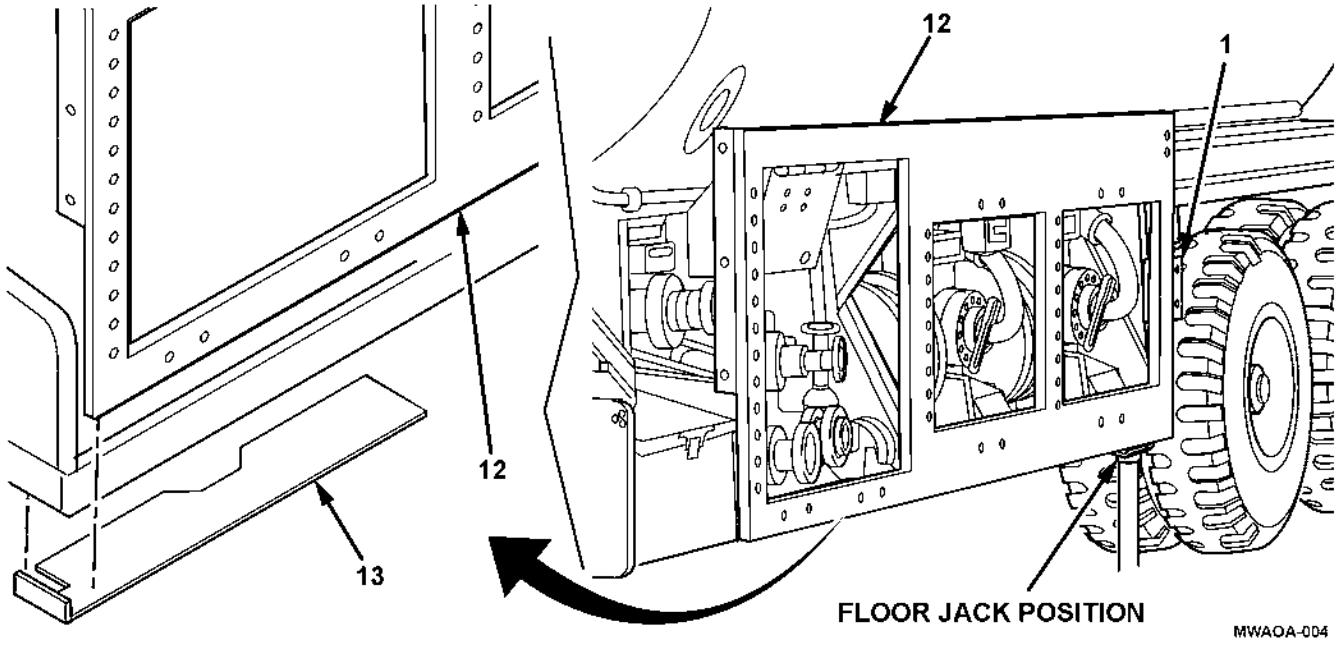
INSTALLATION (continued)

7. Position locating guide template (13) (Table 7-3) on hose reel cabinet and clamp in place. Ensure template (13) is flush and even with the bottom and front side of the hose reel hose reel cabinet, as shown.

WARNING

Use caution when lifting the supplemental armor. A swinging or shifting load may cause injury to personnel.

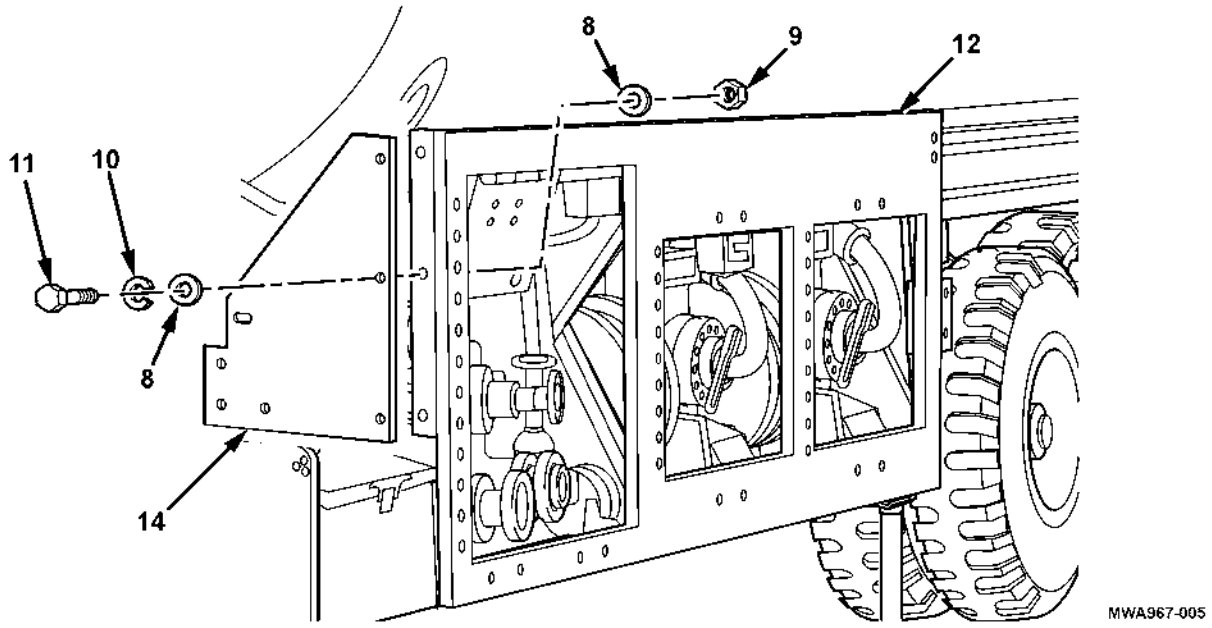
8. Using dawg grips (Table 7-2), a suitable lifting sling, and lifting device, raise and position frame plate (12) against hose reel cabinet. Ensure frame plate (12) seats square in template (13). Clamp frame plate (12) in place on hose reel cabinet and left front bracket assembly (1). Use a hydraulic jack to lift frame plate into position.



INSTALLATION (continued)

9. Install left support bracket (14) on frame plate (12) with six flat washers (8), three hexagon head capscrews (11), lockwashers (10), and self-locking nuts (9). Torque self-locking nuts to 55-65 lb-ft (75-81 N•m).

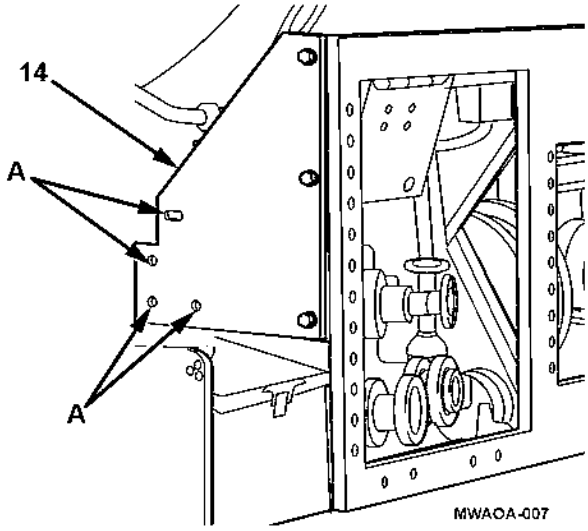
10. Clamp support bracket (14) against hose reel cabinet.



CAUTION

When drilling through hole in upper slot of mounting plate, use caution not to drill through welded angle bracket.

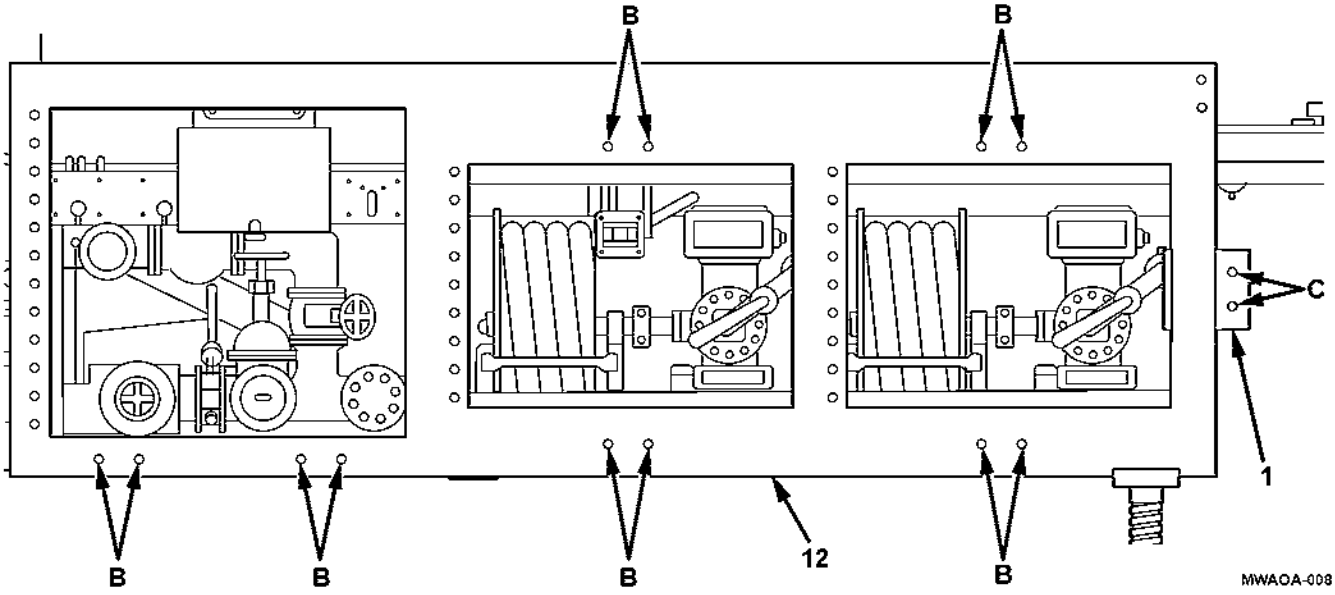
11. Using a 19/32-inch drill bit and support bracket (14) as a template, drill four holes, marked A, through hose reel cabinet, as shown. Insert pry bar through slotted hole of support bracket to hold in place.



INSTALLATION (continued)

12. Using a 19/32-inch drill bit and frame plate (12) as a template, drill twelve holes, marked B, through hose reel cabinet, as shown.

13. Using a 19/32-inch drill bit and frame plate (12) as a template, drill two holes, marked C, through hose reel cabinet and left front bracket assembly (1), as shown.



INSTALLATION (continued)

14. Install left support bracket (14) on hose reel cabinet with eight flat washers (8), four hexagon head capscrews (11), lockwashers (10), and self-locking nuts (9). Hand tighten self-locking nuts.

NOTE

Install small shims 12500845-1 through -3 as required to ensure the frame plate is straight and even with the hose reel cabinet.

15. Check the straightness of the frame plate (12) against the hose reel cabinet at door opening. Shim gap using small shims as required.

16. Install frame plate (12) on hose reel cabinet with eight flat washers (8), four hexagon head capscrews (16), lockwashers (10), and self-locking nuts (9). Hand tighten self-locking nuts.

NOTE

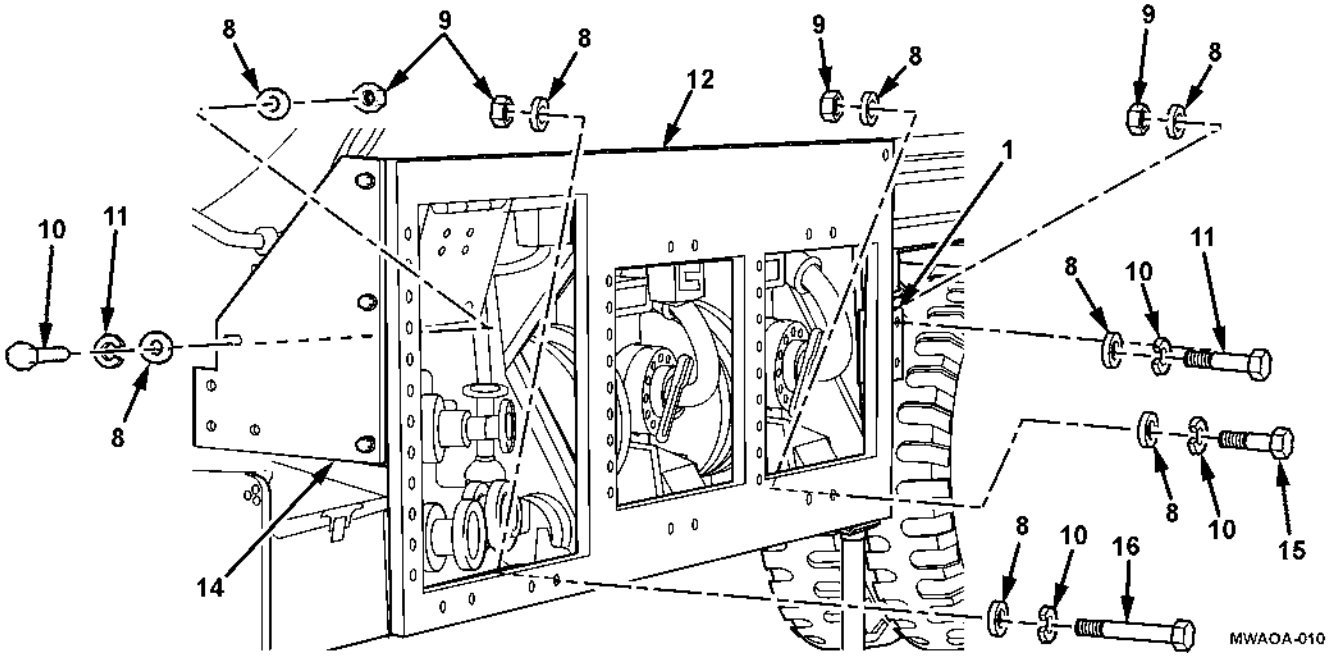
Install large shims 12500846-1 through -3, as needed, to ensure the frame plate is straight and even with the hose reel cabinet. Do not shim the area between the center support bracket and left front bracket assemblies.

17. Check the straightness of the frame plate (12) against the hose reel cabinet and fender of vehicle. Shim gap using large shims as required.

18. Install frame plate (12) on hose reel cabinet with eight flat washers (8), four hexagon head capscrews (15), lockwashers (10), and self-locking nuts (9). Hand tighten self-locking nuts.

19. Install frame plate (12) on left front bracket assembly (1) with four flat washers (8), two hexagon head capscrews (10), lockwashers (10), and self-locking nuts (9). Hand tighten self-locking nuts.

20. Torque support bracket and frame plate hardware to 55-65 lb-ft (75-81 N•m).



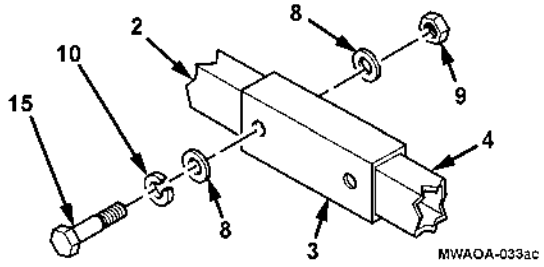
INSTALLATION (continued)

21. Align slider support bracket (3) with scribed mark on rear support bracket (2) or rear support bracket (4). Clamp slider support (3) in place.

22. Using a 19/32-inch drill bit and slider support bracket (3) as a template, drill holes through on center cross brace (2) and support bracket (4).

23. Install four flat washers (8), two hexagon head capscrews (15), lockwashers (10), and self-locking nuts (9) through on center cross brace (2), support bracket (4), and slider support bracket (3), as shown.

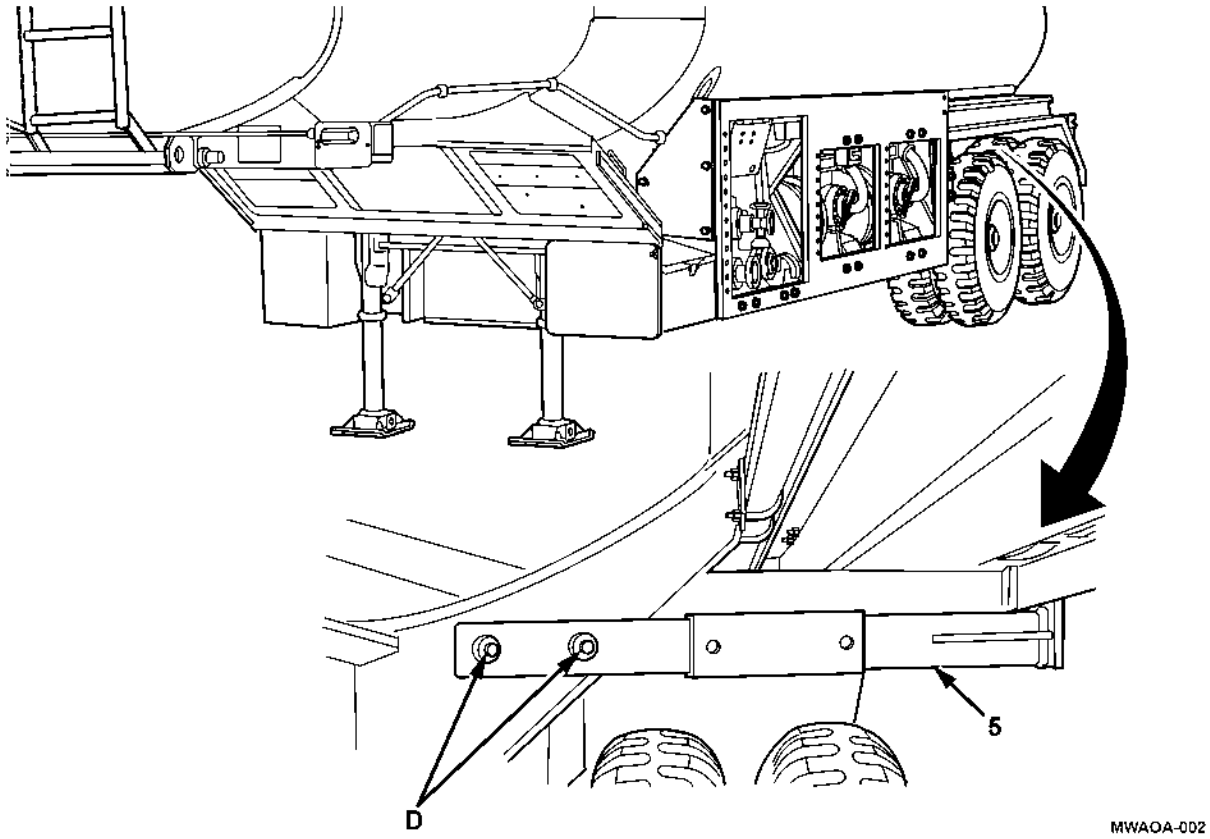
24. Repeat Steps 21 through 24 for left front bracket assembly.



25. Position left rear bracket assembly (5) on vehicle frame member and clamp in place, as shown.

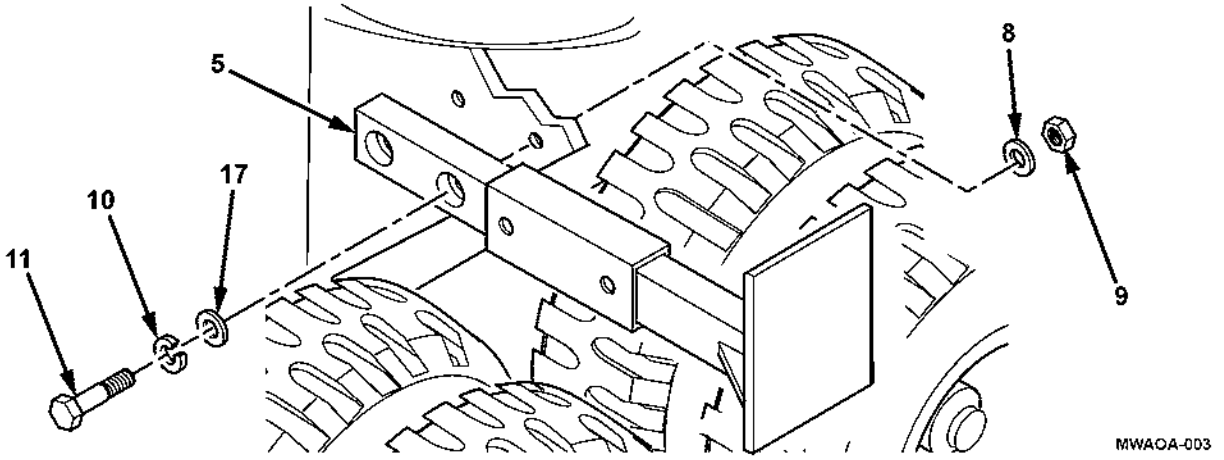
26. Using a 19/32-inch drill bit, drill two holes, marked D, through vehicle frame member at pilot hole locations, as shown.

27. Remove all burrs and sharp edges. Finish all exposed metal areas using a rust inhibitor primer and paint as specified in Table 7-4, Materials and Parts. Allow for the appropriate time for prime and paint to cure.



INSTALLATION (continued)

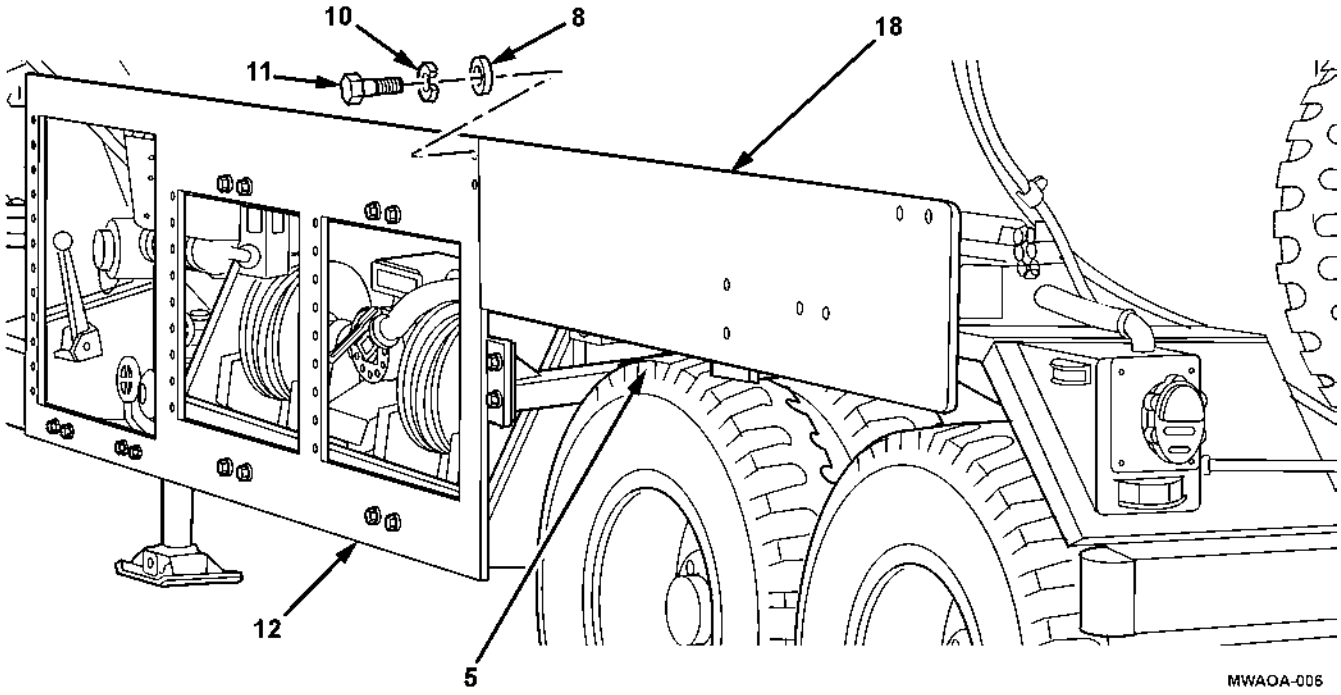
28. Install left rear bracket assembly (5) on vehicle frame member with two hexagon head capscrews (11), lockwashers (10), flat washers (17), flat washers (8), and self-locking nuts (9). Torque self-locking nuts to 55-65 lb-ft (75-81 N•m).



WARNING

Use caution when lifting the supplemental armor. A swinging or shifting load may cause injury to personnel.

29. Using dawg grips (Table 7-2), a suitable lifting sling, and lifting device raise and position rear shield plate (18) on vehicle. Position the two alignment holes of frame plate (12) over threaded holes of rear shield plate (18) and install with two hexagon head capscrews (11), lockwashers (10), and flat washers (8), as shown. Clamp rear shield plate (18) on vehicle and left rear bracket assembly (5).

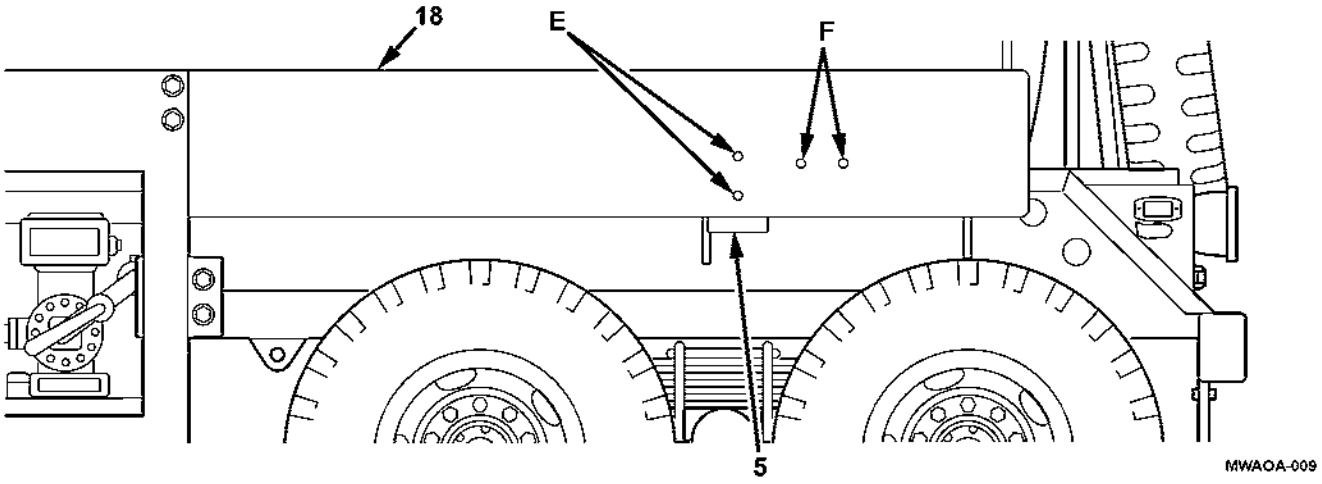


INSTALLATION (continued)

30. Using a 19/32-inch drill bit and rear shield plate (18) as a template, drill two holes, marked F, through vehicle and fender (5), as shown.

31. Using a 27/64-inch drill bit and rear shield plate (18) as a template, drill two holes, marked E, through left rear bracket assembly (5), as shown. Use a 1/2-13 tap to thread through holes E in left rear bracket assembly (5).

32. Remove all burrs and sharp edges. Finish all exposed metal areas using a rust inhibitor primer and paint as specified in Table 7-4, Materials and Parts. Allow for the appropriate time for prime and paint to cure.



INSTALLATION (continued)

NOTE

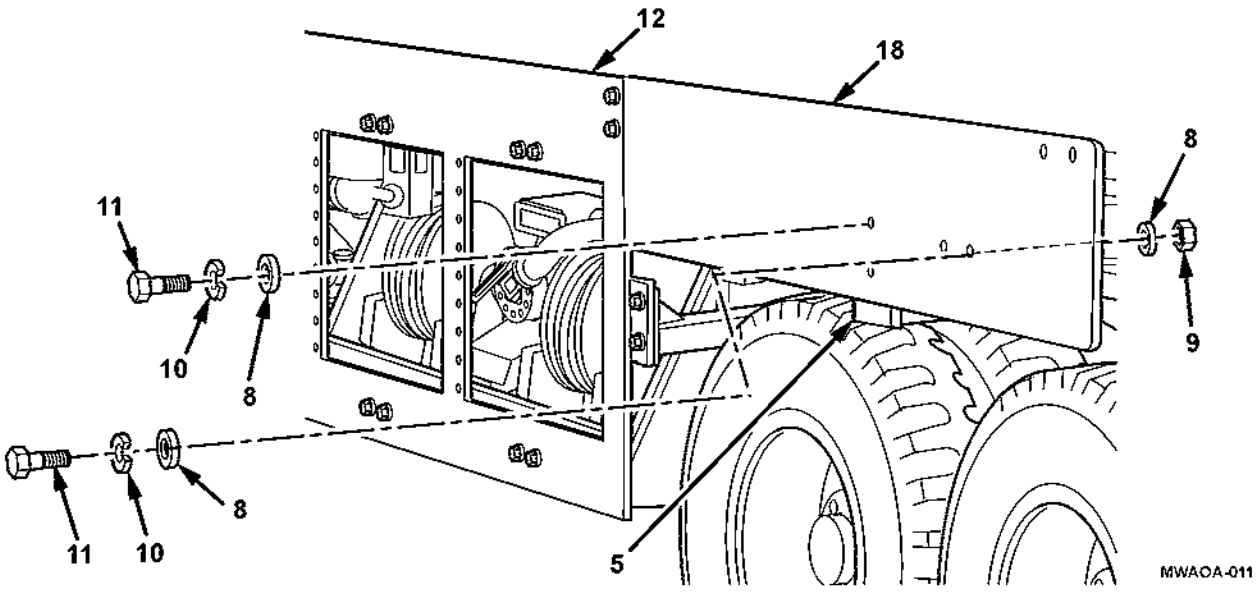
Install large shims 12500846-1 through -3, as needed, to ensure rear shield plate is straight and even with the vehicle. Do not shim the area between the rear shield plate and left rear bracket.

33. Check the straightness of the rear shield plate against the fender of vehicle. Shim using large shims as required.

34. Install rear shield plate (18) on left rear bracket assembly (5) with two hexagon head capscrews (11), lockwashers (10), and flat washers (8). Hand tighten self-locking nuts.

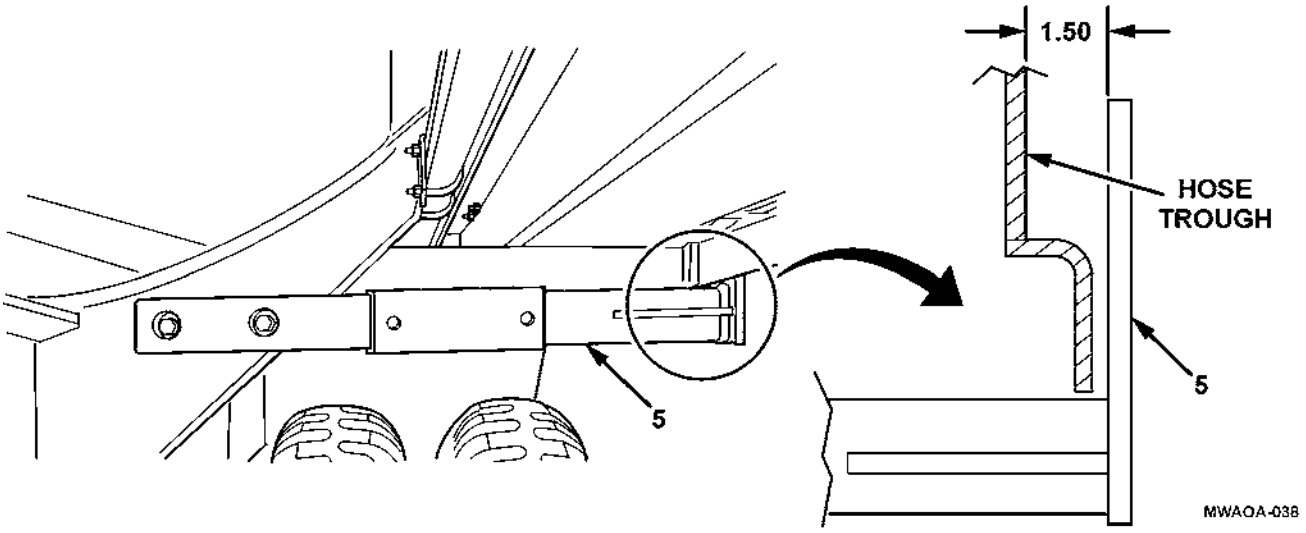
35. Install rear shield plate (18) on vehicle with four flat washers (8), two hexagon head capscrews (11), lockwashers (10), and self-locking nuts (9). Hand tighten self-locking nuts.

36. Torque all rear shield plate hardware to 55-65 lb-ft (75-81 N•m).



INSTALLATION (continued)

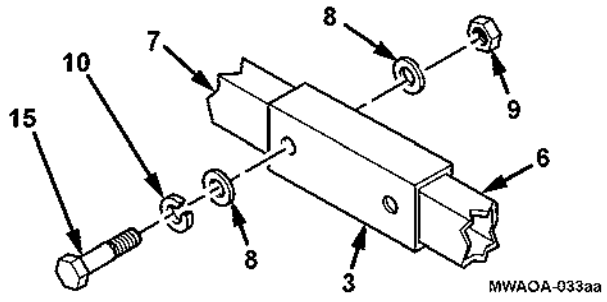
37. Adjust left rear bracket assembly (5) to ensure there is a 1.50-inch (38 mm) clearance between foot of bracket and hose trough and clamp in place securely.



38. Align slider support bracket (3) with scribed mark on rear support bracket (6) or rear support bracket (7) and clamp in place securely.

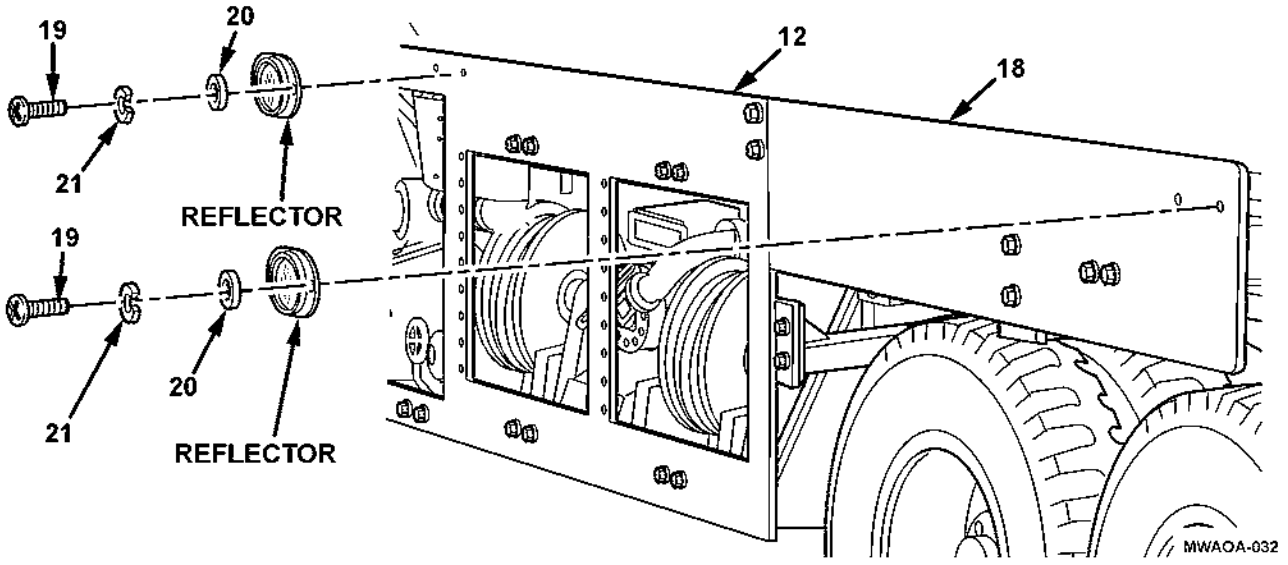
39. Using a 19/32-inch drill bit and slider support bracket (3) as a template, drill holes through rear support bracket (6) and rear support bracket (7)

40. Install four flat washers (8), two hexagon head capscrews (15), lockwashers (10), and self-locking nuts (9) through slider support bracket (3), rear support bracket (6), and rear support bracket (7), as shown.



INSTALLATION (continued)

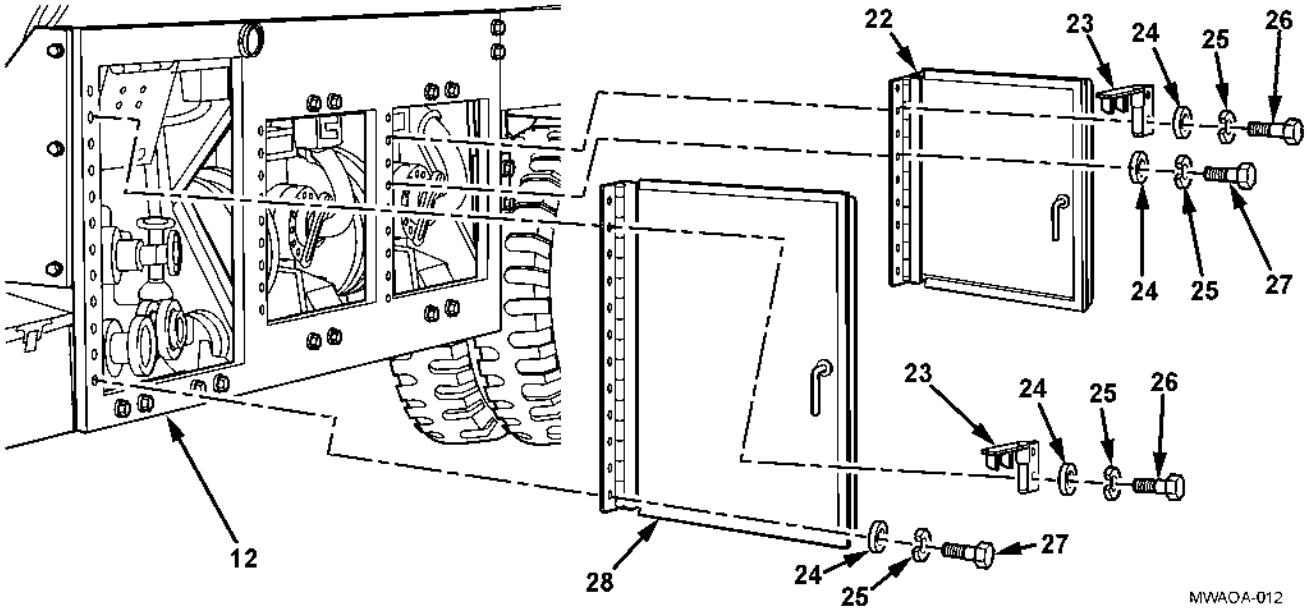
41. Position reflectors, previously removed, on frame plate (12) and rear shield plate (18) and install with two machine screws (19), lockwashers (21), and flat washers (20).



42. Install door assembly (28) on frame plate (12) with twelve flat washers (24), lockwashers (25), and hexagon head capscrews (27). Tighten door assembly hardware to 30-35 lb-ft (41-48 N•m).

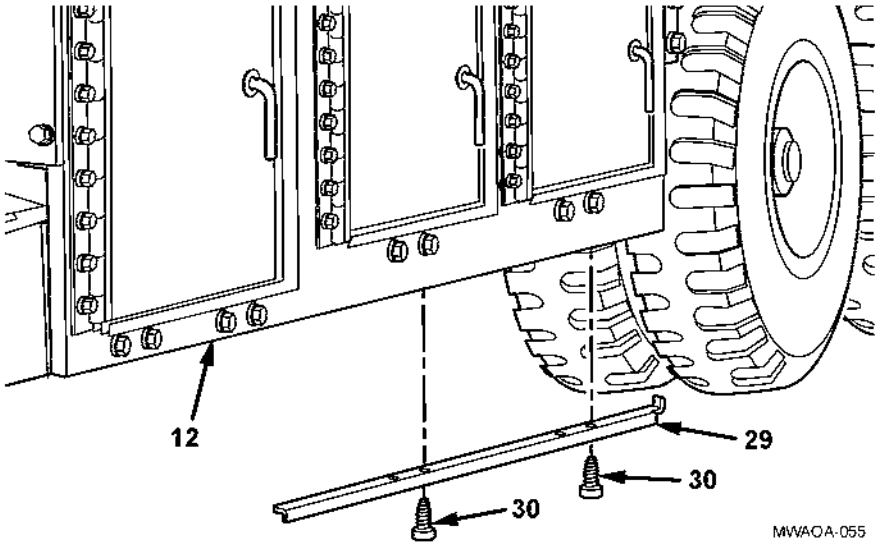
43. Install two door assemblies (22) on frame plate (12) with eighteen flat washers (24), lockwashers (25), and hexagon head capscrews (27). Tighten all door assembly hardware to 30-35 lb-ft (41-48 N•m).

44. Install safety latch (23) on door assemblies (22 and 28) with two flat washers (24), lockwashers (25), and hexagon head capscrews (26). Tighten safety latch hardware to 30-35 lb-ft (41-48 N•m).



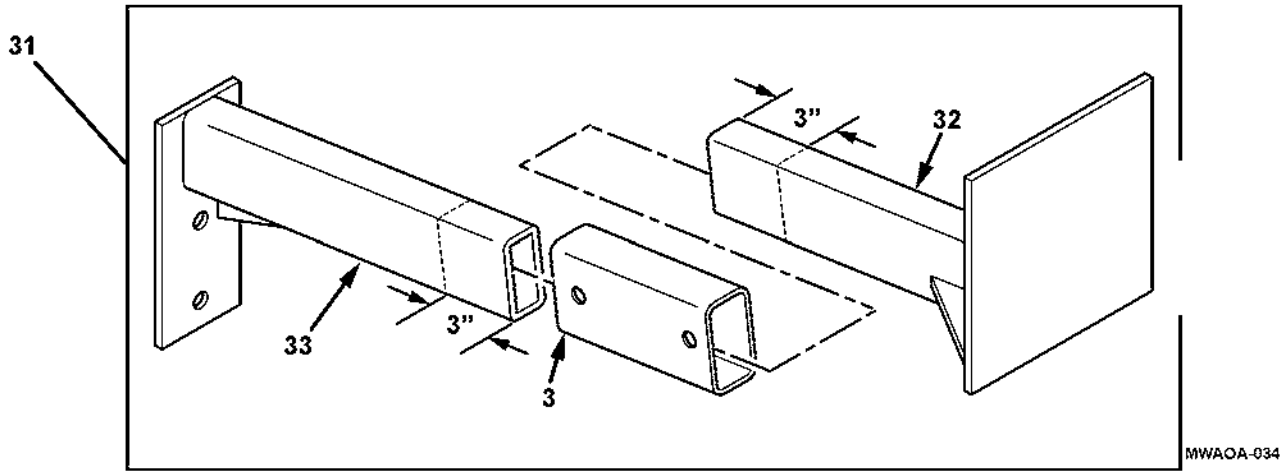
INSTALLATION (continued)

45. Position dust cover shield (29) on trust of frame plate (12) and install with four self-drilling screws (30).



46. Scribe a locating mark 3-inches (8 cm) from end of support bracket (33) and support bracket (32), as shown. These marks will be used to position the slider support bracket (3).

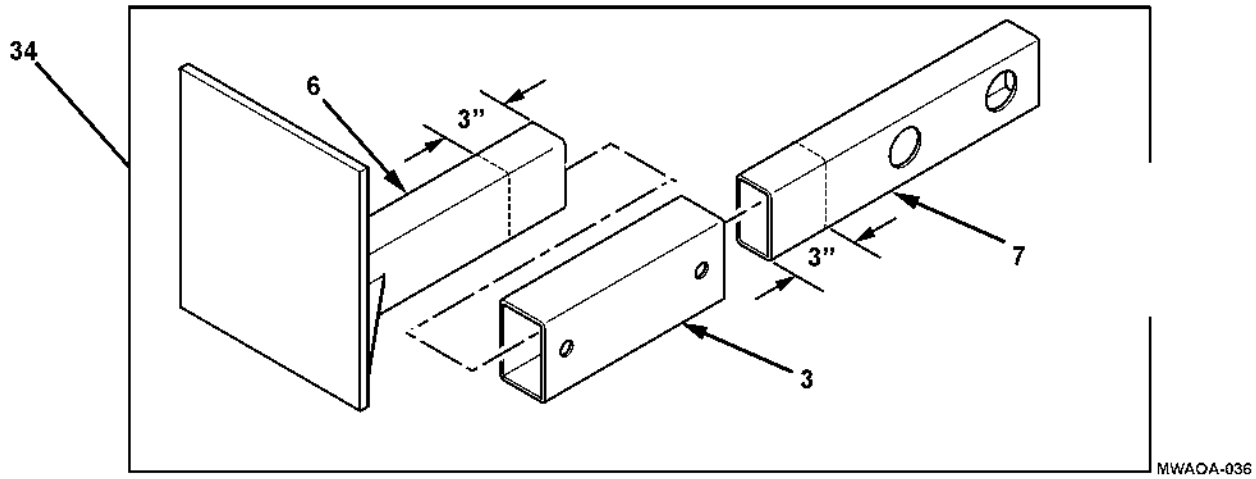
47. Assemble support bracket (33) and support bracket (32) to form right front bracket assembly (31), as shown.



INSTALLATION (continued)

48. Scribe a locating mark 3-inches (8 cm) from end of support bracket (7) and support bracket (6), as shown. These marks will be used to position the slider support bracket (3).

49. Install support bracket (7) and support bracket (6) on slider support bracket (3) to form right rear bracket assembly (34), as shown.

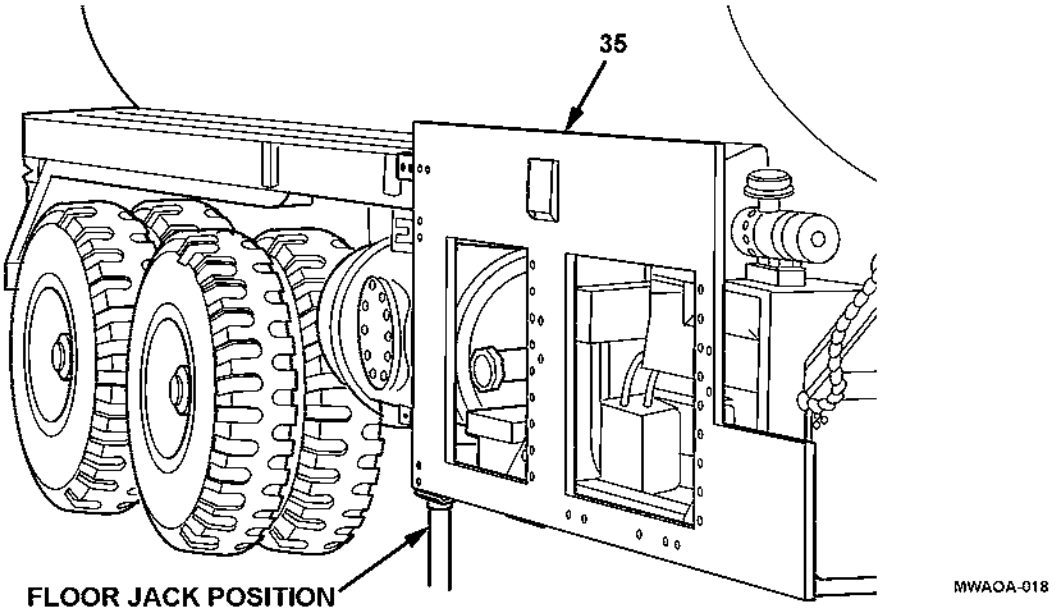


WARNING

Use caution when lifting the supplemental armor. A swinging or shifting load my cause injury to personnel.

50. Using dawg grips (Table 7-2), a suitable lifting sling, and lifting device, raise and position frame plate (35) against engine and pump frame.

51. Place a floor jack at the rear of frame plate (35), as shown, to lift and hold the plate level and flush with the bottom of the engine and pump frame. Clamp frame plate (35) in place on engine and pump frame.

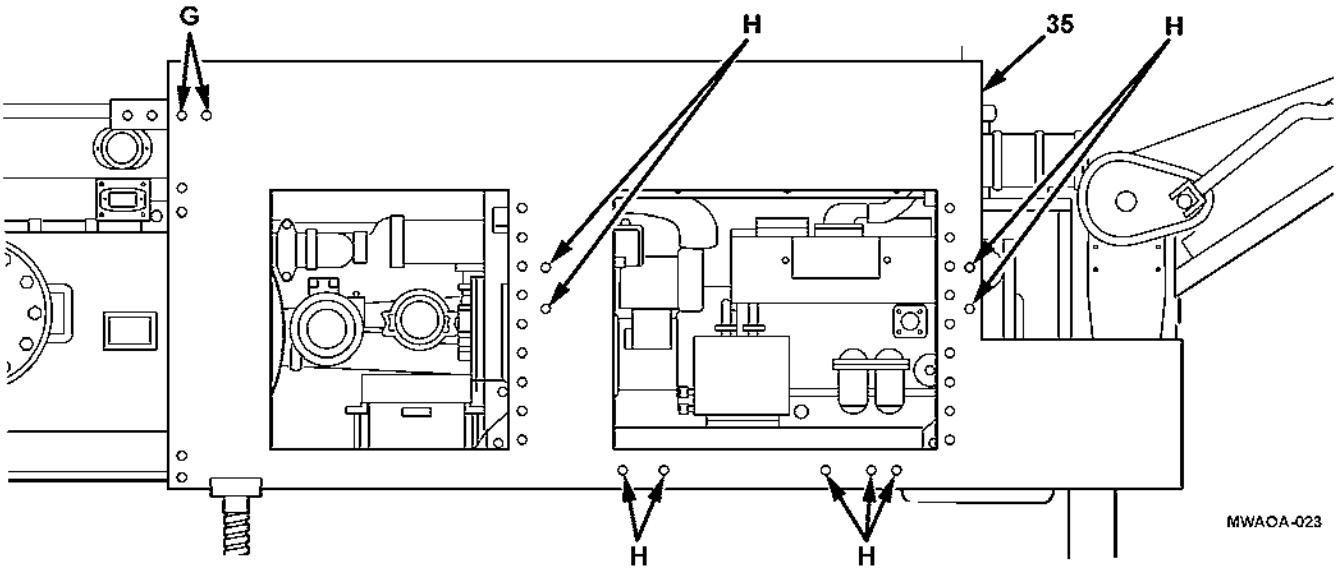


INSTALLATION (continued)

52. Using a 19/32-inch drill bit and frame plate (35) as a template, drill nine holes, marked H, through engine and pump frame, as shown.

53. Using a 19/32-inch drill bit and frame plate (35) as a template, drill two holes, marked G, through hose trough, as shown.

54. Remove all burrs and sharp edges. Finish all exposed metal areas using a rust inhibitor primer and paint as specified in Table 7-4, Materials and Parts. Allow for the appropriate time for primer and paint to cure.



INSTALLATION (continued)

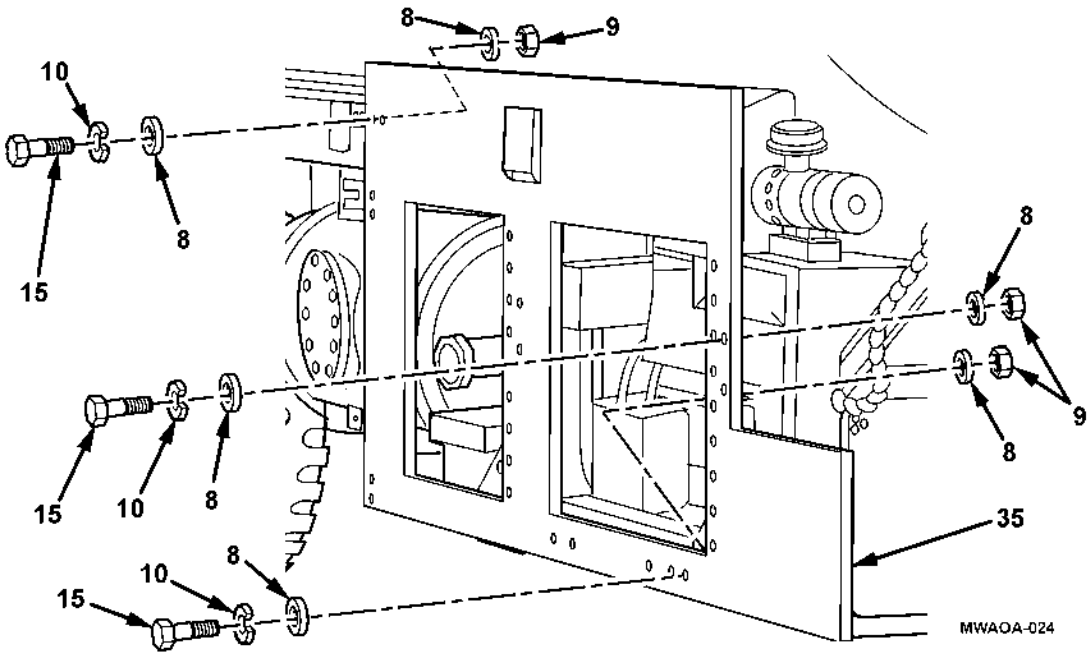
NOTE

Install large shims 12500846-1 through -3, as needed, to ensure a snug and secure fit of frame plate on the engine and pump frame.

55. Install frame plate (35) on engine and pump frame with eight flat washers (8), four hexagon head capscrews (15), lockwashers (10), and self-locking nuts (9). Hand tighten self-locking nuts.

56. Install frame plate (35) on vehicle with four flat washers (8), two hexagon head capscrews (15), lockwashers (10), and self-locking nuts (9). Hand tighten self-locking nuts.

57. Torque all frame plate hardware to 55-65 lb-ft (75-81 N•m).



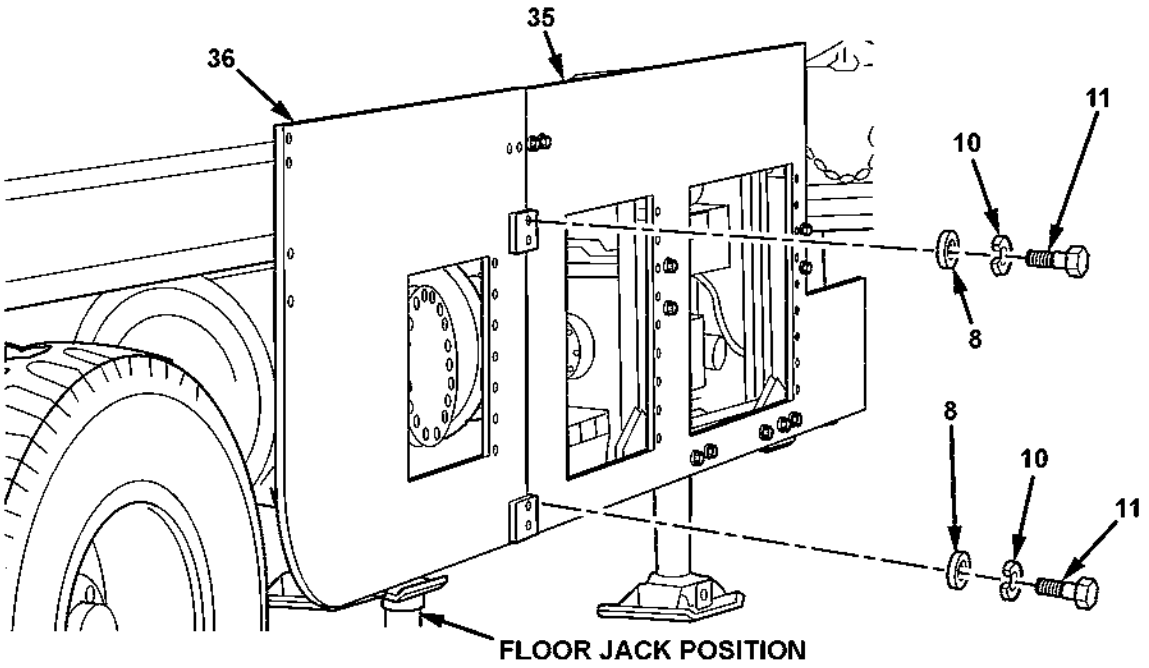
INSTALLATION (continued)

WARNING

Use caution when lifting the supplemental armor. A swinging or shifting load my cause injury to personnel.

58. Using dawg grips (Table 7-2), a suitable lifting sling, and lifting device, raise and position filter mid-plate (36) against engine and pump frame, as shown. Use a floor jack to level and support the filter mid-plate (36) on the engine and pump frame, as shown.

59. Align four holes in filter mid-plate (36) with threaded holes of frame plate (35) and install with four flat washers (8), lockwashers (10), and hexagon head capscrews (11). Clamp filter mid-plate (31) in place on engine and pump frame.



INSTALLATION (continued)

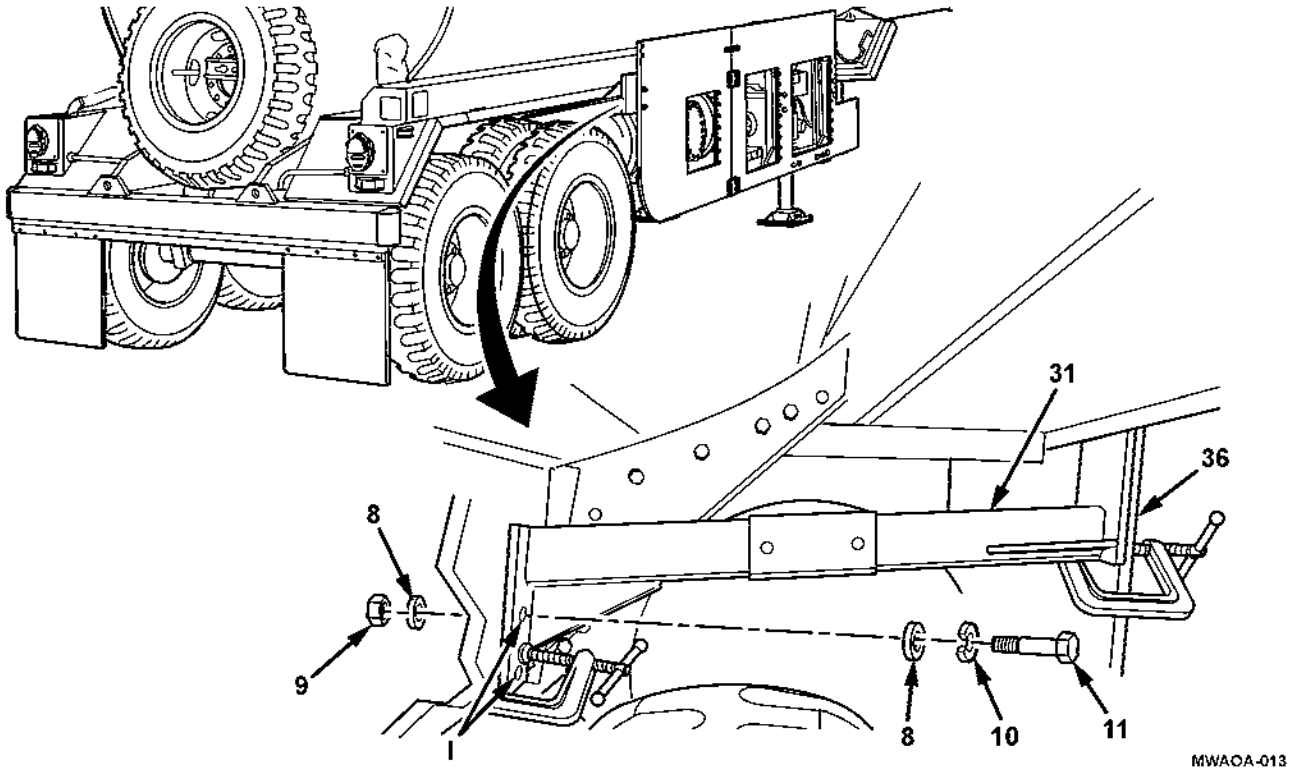
60. Position right front bracket assembly (31) under fender on vehicle frame and filter mid-plate (36). Align bottom of right front bracket assembly (31) flush with bottom of vehicle frame. Clamp bracket in place on vehicle frame and filter mid-plate (36).

61. Extend right front bracket assembly (31) to vehicle frame. Align pad of right front bracket assembly (31) flush with the bottom of the vehicle frame and clamp in place as shown.

62. Using a 19/32–inch drill bit and right front bracket assembly (31) as a template, drill two holes, marked I, through vehicle frame, as shown.

63. Remove all burrs and sharp edges. Finish all exposed metal areas using a rust inhibitor primer and paint as specified in Table 7-4, Materials and Parts. Allow for the appropriate time for primer and paint to cure.

64. Install right front bracket assembly (31) on vehicle frame with four flat washers (8), two hexagon head capscrews (11), lockwashers (10), and self-locking nuts (9). Torque self-locking nuts to 55-65 lb-ft (75-81 N•m).



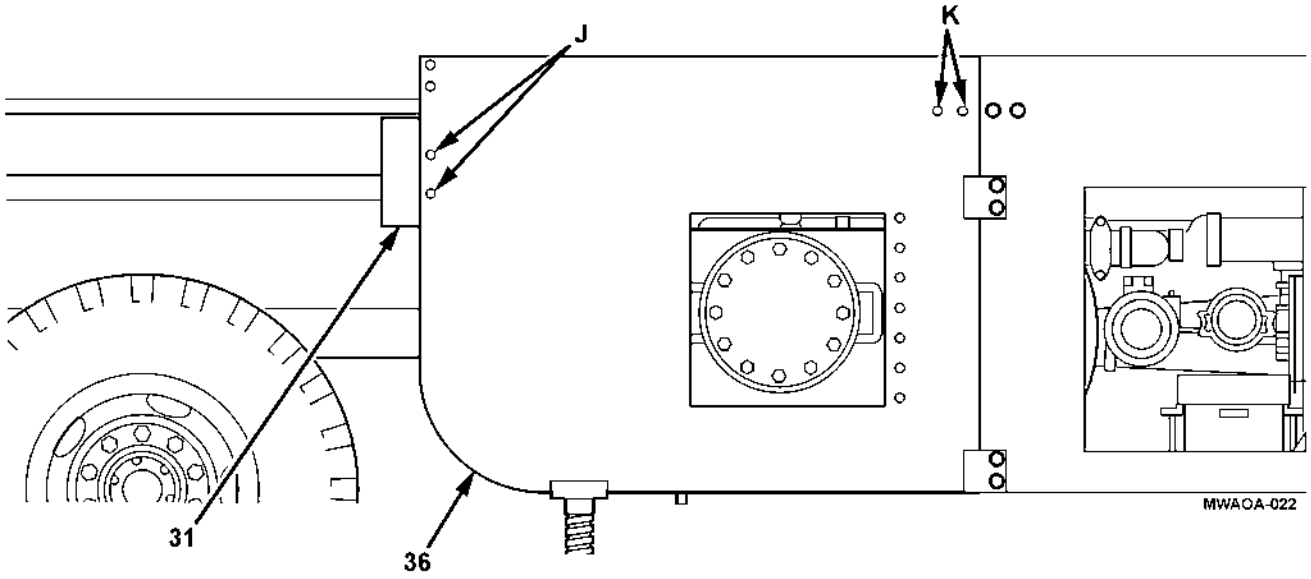
INSTALLATION (continued)

65. Using a 19/62-inch drill bit and filter mid-plate (36) as a template, drill two holes, marked K, through engine and pump frame, as shown.

66. Using a 27/64-inch drill bit and filter mid-plate (36) as a template, drill two holes, marked J, through right front bracket assembly (31), as shown.

67. Use a 1/2-13 tap to thread through holes J in right front bracket assembly (31), as shown.

68. Remove all burrs and sharp edges. Finish all exposed metal areas using a rust inhibitor primer and paint as specified in Table 7-4, Materials and Parts. Allow for the appropriate time for primer and paint to cure.



INSTALLATION (continued)

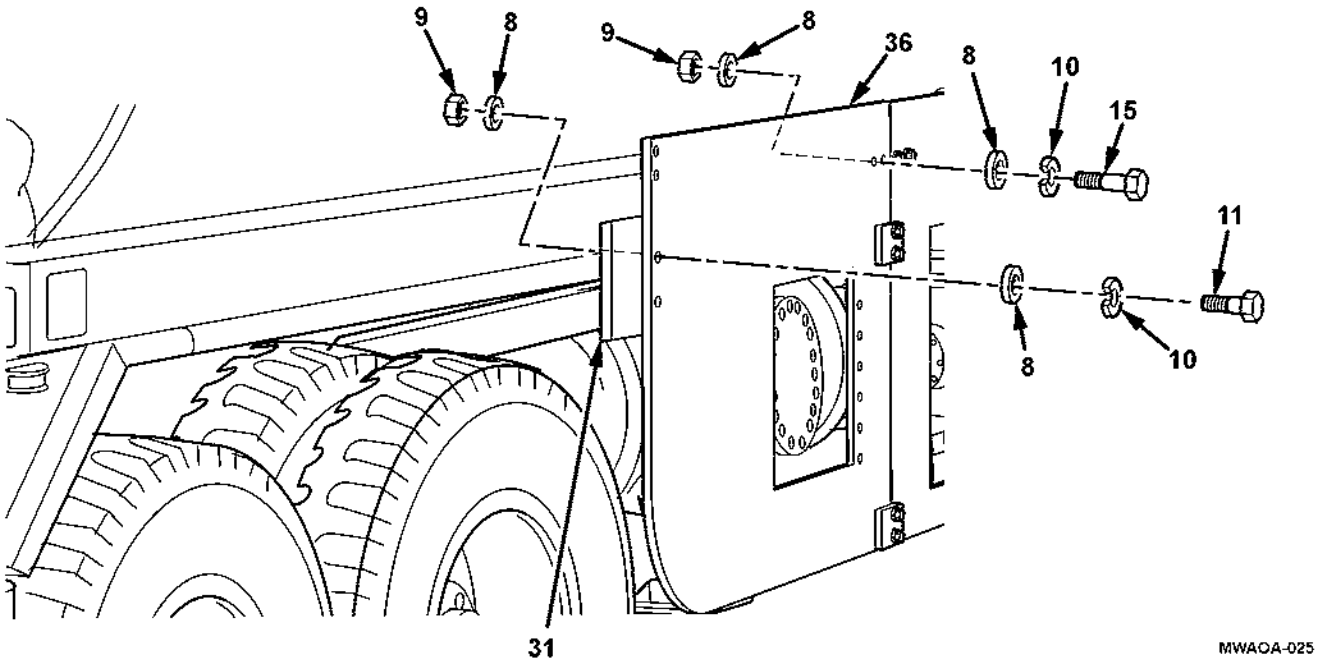
NOTE

Install large shims 12500846-1 through -3, as needed, to ensure a snug and secure fit of the filter and rear shield frame plates of the vehicle. Do not shim the area between the frame plates, front, rear brackets.

69. Install filter mid-plate (36) on right front bracket assembly (31) with two flat washers (8), lockwashers (10), and hexagon head capscrews (11). Hand tighten capscrews.

70. Install filter mid-plate (36) on engine and pump frame with four flat washers (8), two hexagon head capscrews (15), lockwashers (10), and self-locking nuts (9). Hand tighten self-locking nuts.

71. Torque filter mid-plate (36) hardware to 55-65 lb-ft (75-81 N•m).

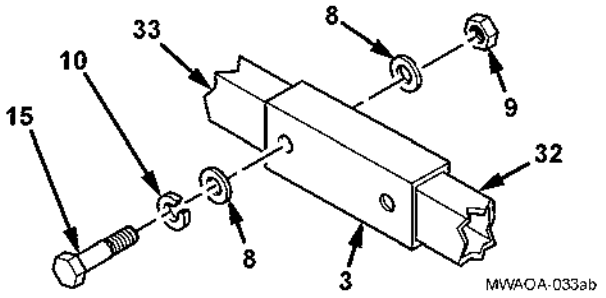


INSTALLATION (continued)

72. Align slider support bracket (3) with scribed mark on support bracket (33) or front support bracket (32) and clamp in place securely.

73. Using a 19/32-inch drill bit and slider support bracket (3) as a template, drill holes through rear support bracket (33) and rear support bracket (32).

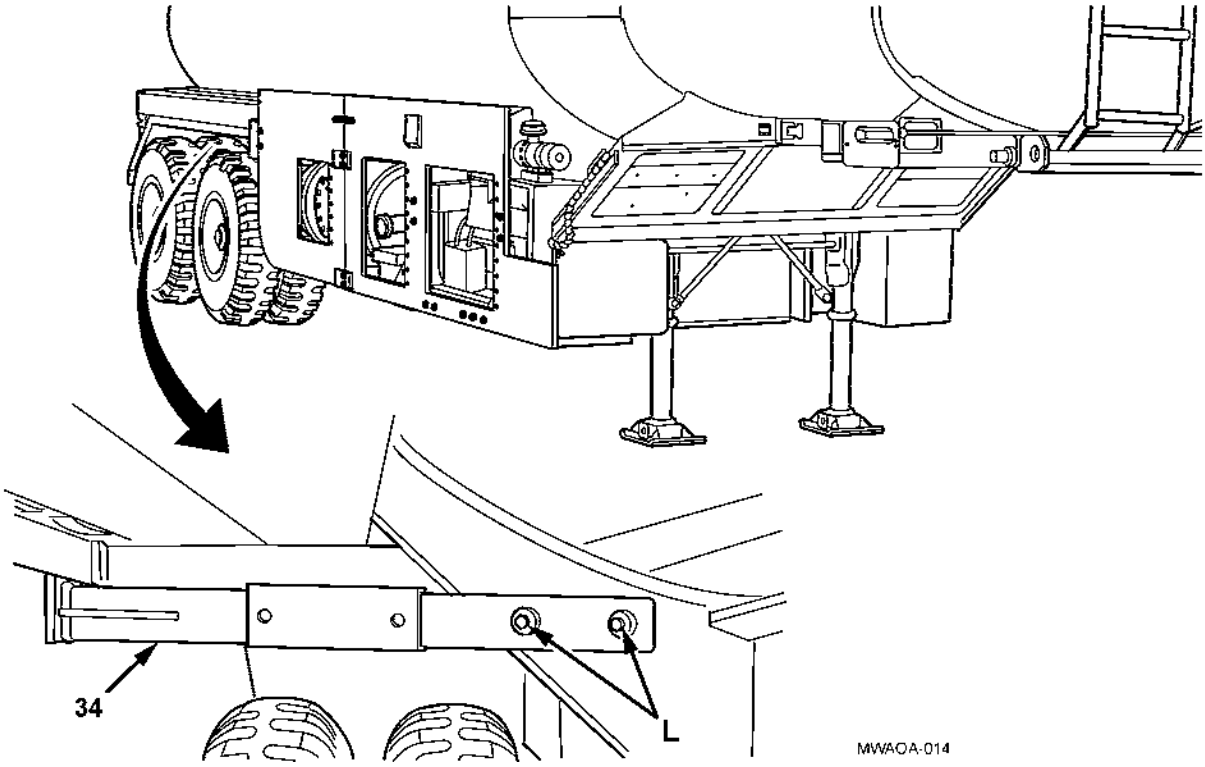
74. Install four flat washers (8), two hexagon head capscrews (15), lockwashers (10), and self-locking nuts (9) through slider support bracket (3), support bracket (32), or front support bracket (33), as shown.



75. Position right rear bracket assembly (34) on vehicle frame and clamp in place.

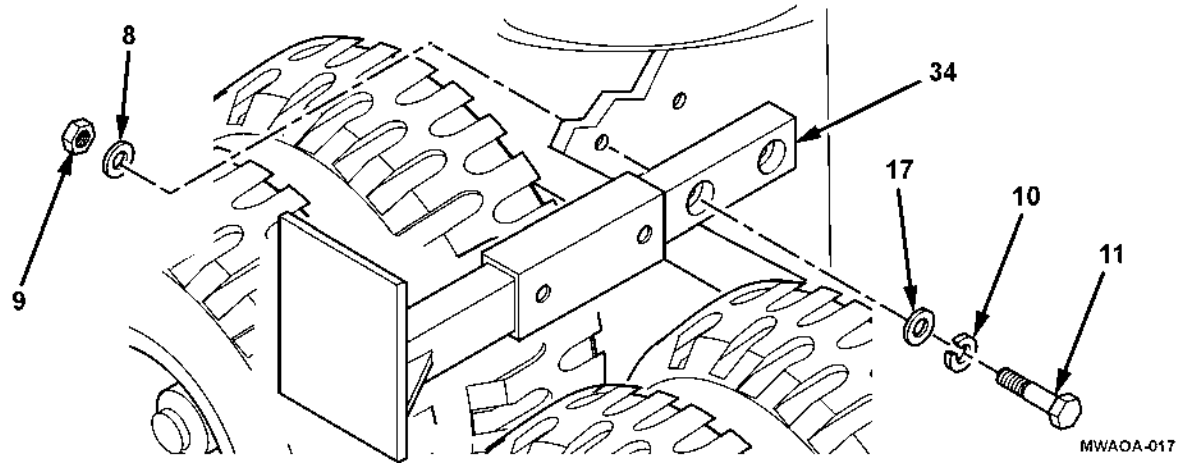
76. Using a 19/32-inch drill bit and right rear bracket assembly (34) as a template, drill two holes, marked L, through vehicle frame member.

77. Remove all burrs and sharp edges. Finish all exposed metal areas using a rust inhibitor primer and paint as specified in Table 7-4, Materials and Parts. Allow for the appropriate time for primer and paint to cure.



INSTALLATION (continued)

78. Install right rear bracket assembly (34) on vehicle frame member with two flat washers (17), flat washers (8), hexagon head capscrews (11), lockwashers (10), and self-locking nuts (9). Torque self-locking nuts to 55-65 lb-ft (75-81 N•m).



INSTALLATION (continued)

79. Using dawg grips (Table 7-2), a suitable lifting sling, and lifting device, raise and position rear shield (37) against vehicle fender, as shown.

80. Align two holes in rear shield (37) with threaded holes of filter mid-plate (36) and install with two flat washers (8), lockwashers (10), and hexagon head capscrews (11). Clamp rear shield (37) in place on vehicle, right front (31) and right rear (34) brackets.

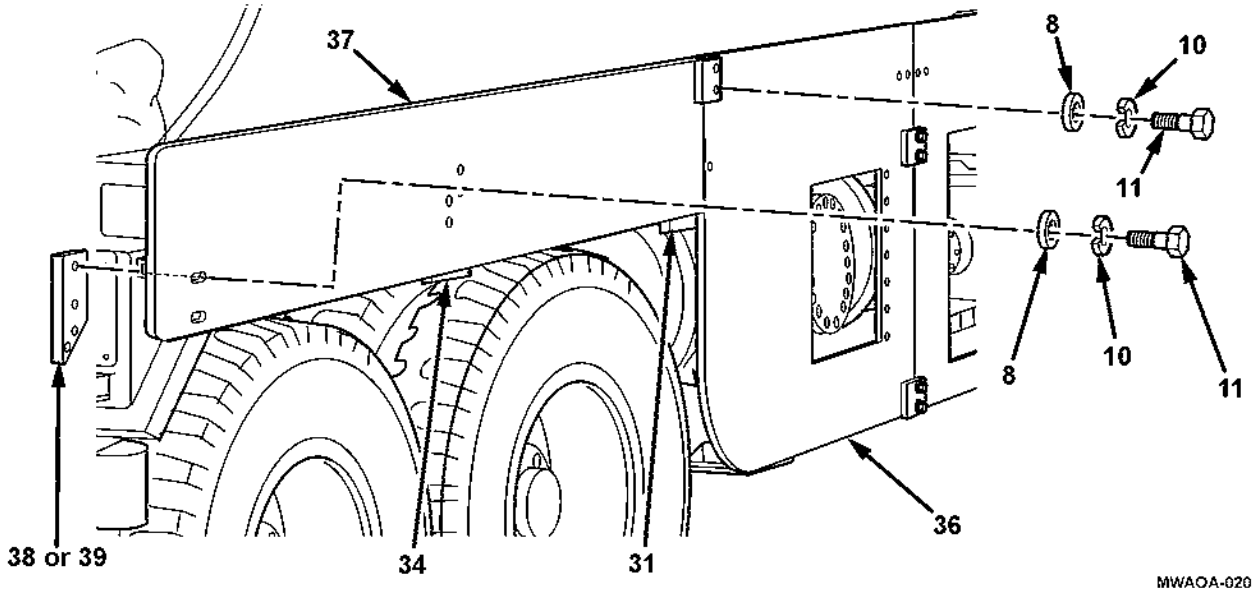
WARNING

Use caution when lifting the supplemental armor. A swinging or shifting load my cause injury to personnel.

NOTE

Rear shield brackets 12500840-1 and 12500840-2 are match fit. Select the bracket which is appropriate for the vehicle. When installing shield bracket 12500840-2, replace hexagon head capscrew B1821BH038C100N with B1821BH038C150N.

81. Install rear shield bracket (38 or 39) on rear shield (37) with two flat washers (8), lockwashers (10), and hexagon head capscrews (11).



INSTALLATION (continued)

82. Align rear shield bracket (38 or 39) to fender of vehicle. Using a 3/8-drill bit, center and drill two through holes marked O, as shown.

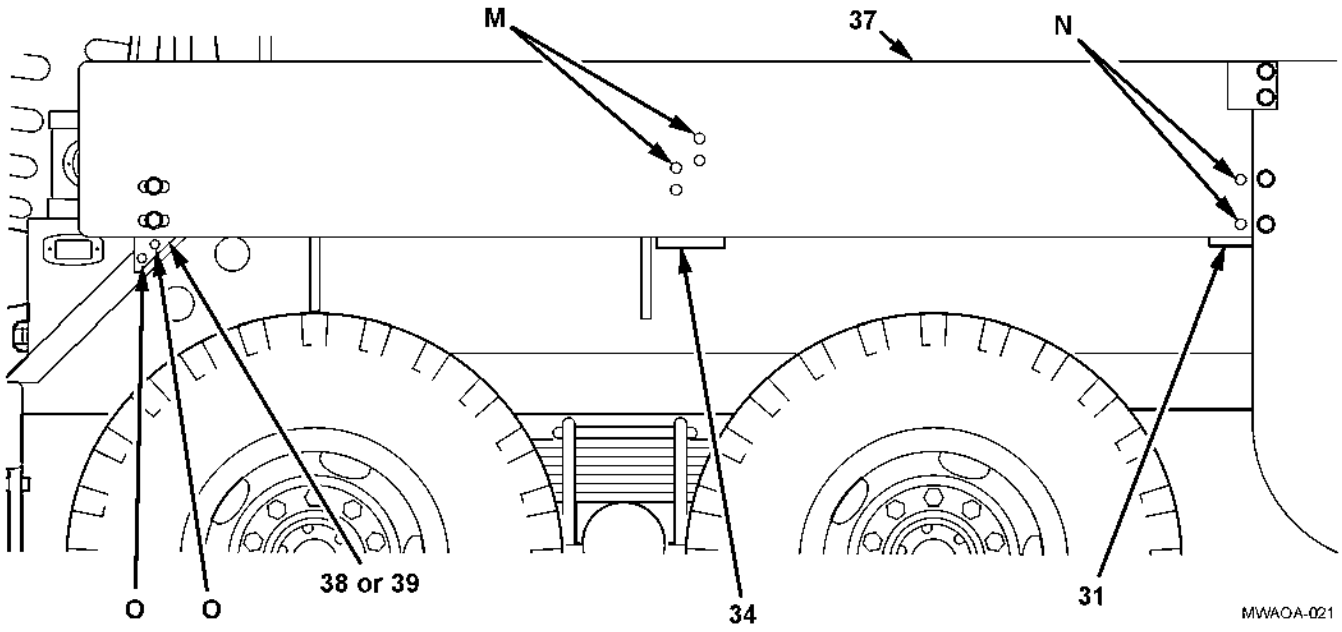
NOTE

When installing the rear shield plate, use the upper set of holes, marked M, as shown.

83. Using a 27/64-inch drill bit and rear shield (37) as a template, drill two through holes, marked M and N, through right front (31) and rear (34) bracket, as shown.

84. Use 1/2-13 tap to thread through holes M and N in right front (31) and rear (34) bracket as shown.

85. Remove all burrs and sharp edges. Finish all exposed metal areas using a rust inhibitor primer and paint as specified in Table 7-4, Materials and Parts. Allow for the appropriate time for primer and paint to cure.

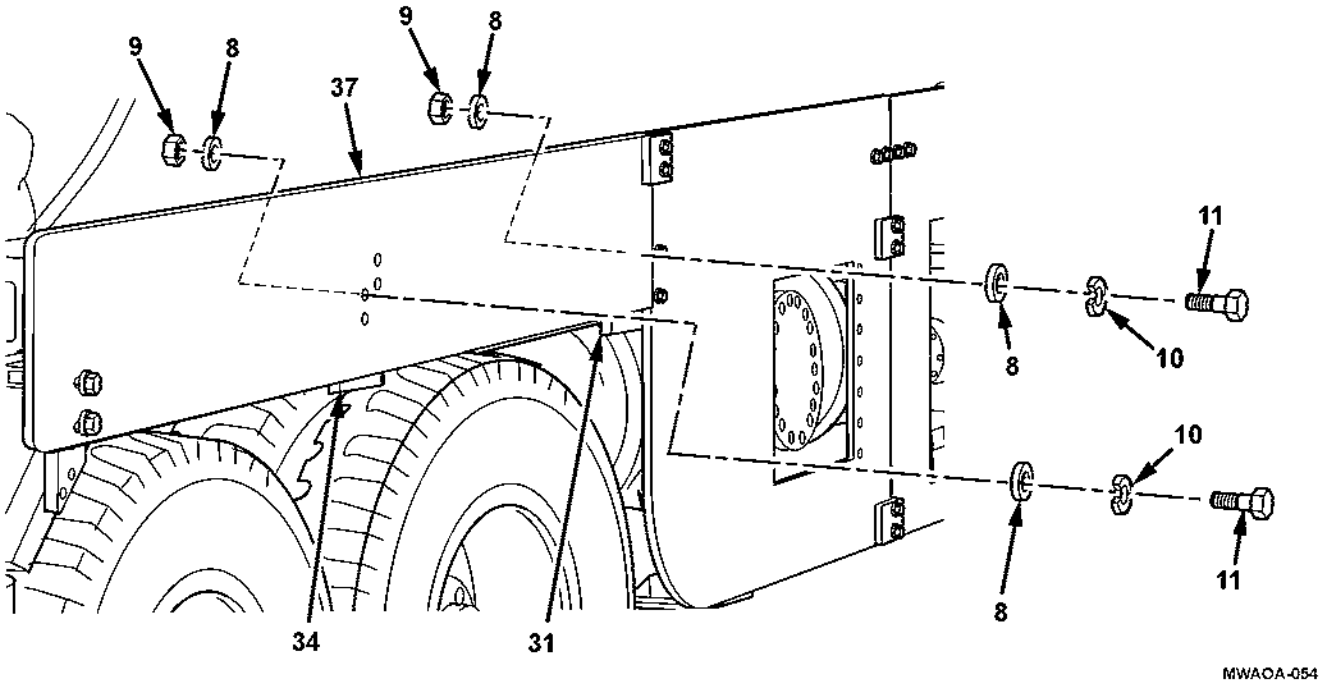


INSTALLATION (continued)

86. Install rear shield (37) on right rear bracket (34) with two lockwashers (10), flat washers (8), and hexagon head capscrews (11). Hand tighten rear shield plate hardware.

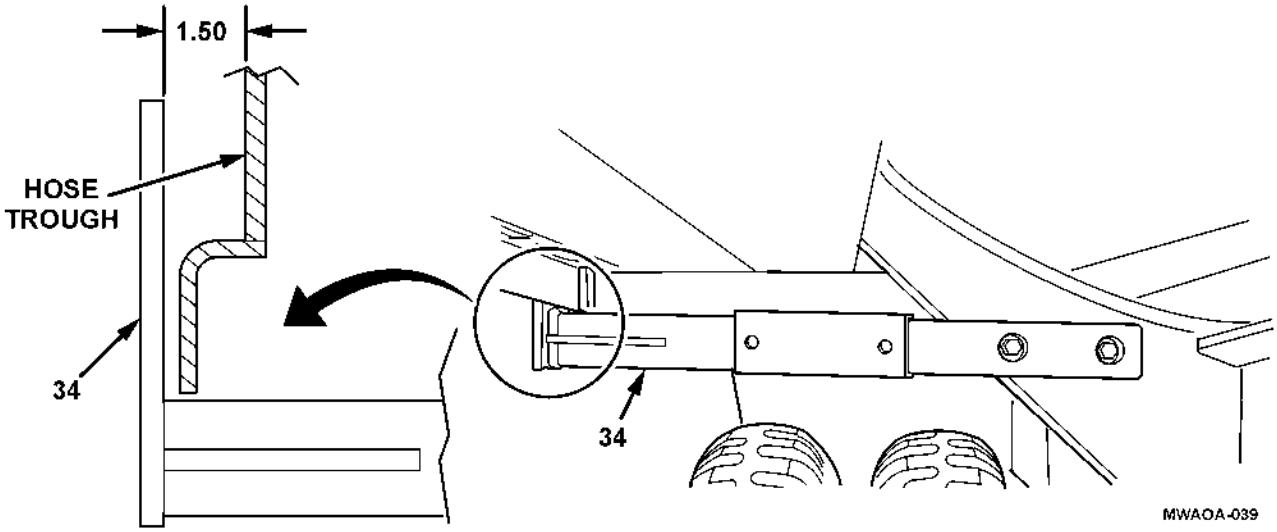
87. Install rear shield (37) on right front bracket assembly (31) with two flat washers (8), lockwashers (10), and hexagon head capscrews (11). Hand tighten rear shield plate hardware.

88. Torque all rear shield plate hardware to 55-65 lb-ft (75-81 N•m).



INSTALLATION (continued)

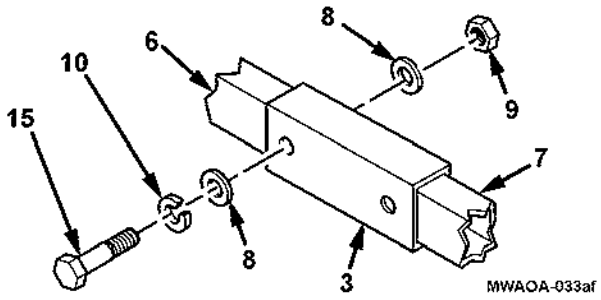
89. Adjust right rear bracket assembly (34) to ensure there is a 1.50-inch (38.1 mm) clearance between foot of bracket and hose trough and clamp in place securely.



90. Align slider support bracket (3) with scribed mark on rear support bracket (7) or rear support bracket (6) and clamp in place securely.

91. Using a 19/32-inch drill bit and slider support bracket (3) as a template, drill through holes through rear support bracket (7) and rear support bracket (6).

92. Install four flat washers (8), two hexagon head capscrews (15), lockwashers (10), and self-locking nuts (9) through slider support bracket (3), rear support bracket (7), and rear support bracket (6), as shown.

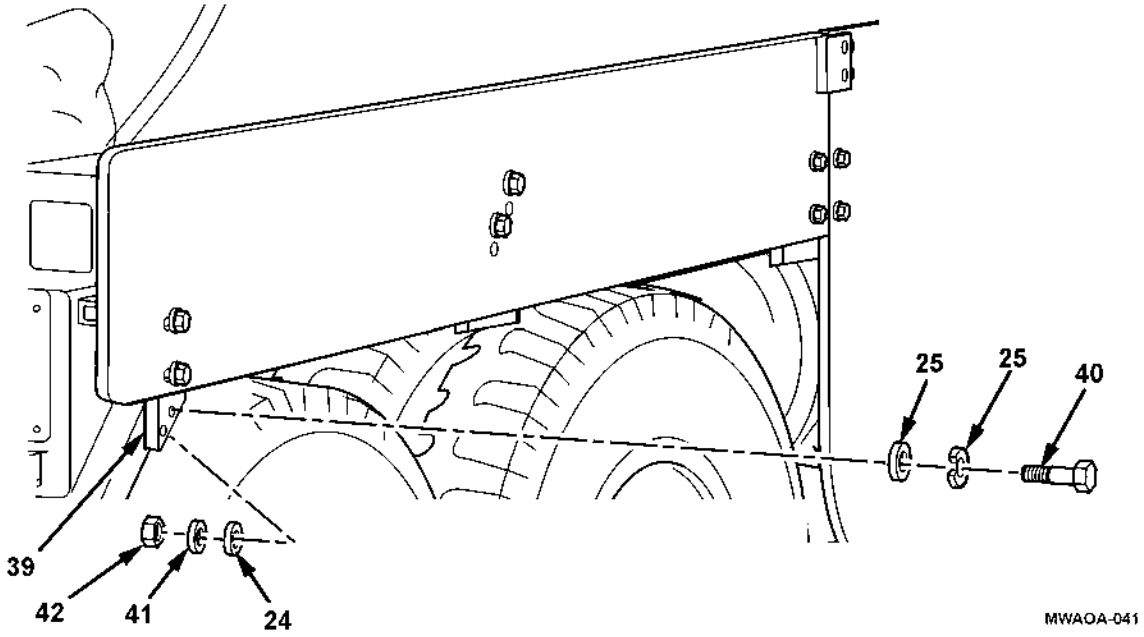


INSTALLATION (continued)

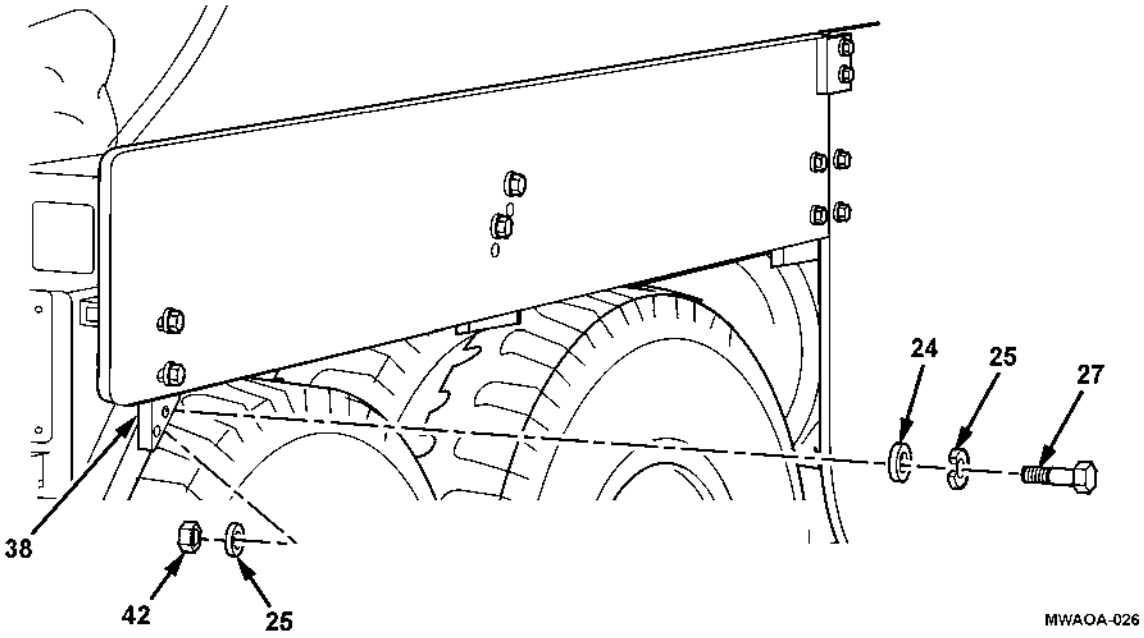
NOTE

Perform Step 93 if installing with optional rear shield bracket 12500840-2.

93. Install rear shield bracket (39) to fender with four flatwashers (24), two hexagon head capscrews (40), two lockwashers (25), spacers (41) (as required), and self-locking nuts (42).

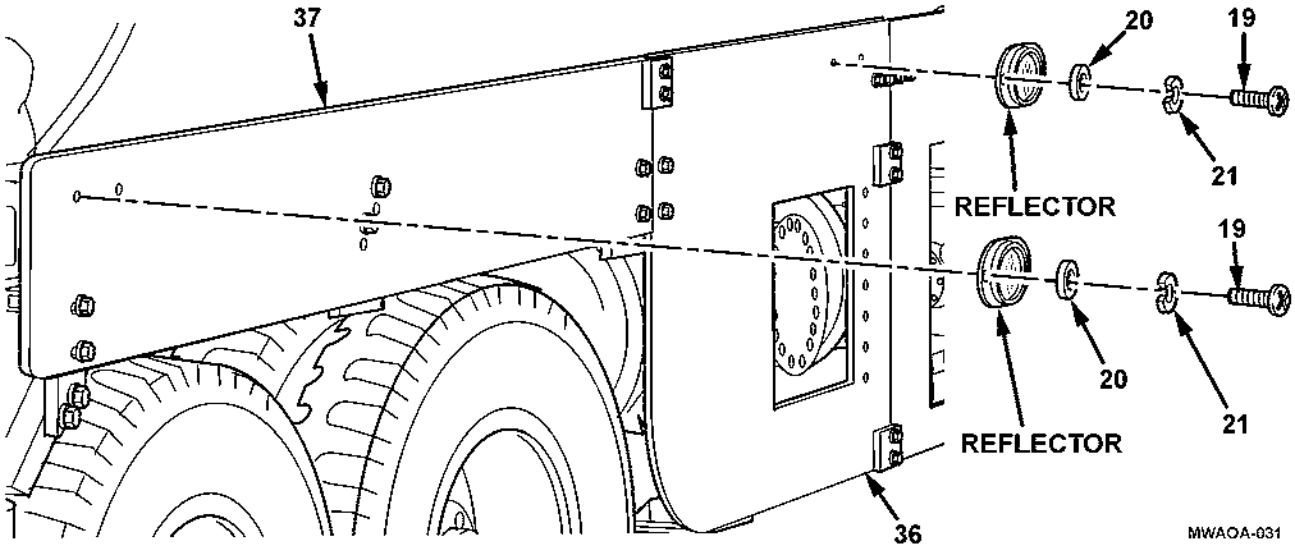


94. Install rear shield bracket (38) to fender with four flatwashers (24), two hexagon head capscrews (27), lockwashers (25), and self-locking nuts (42).



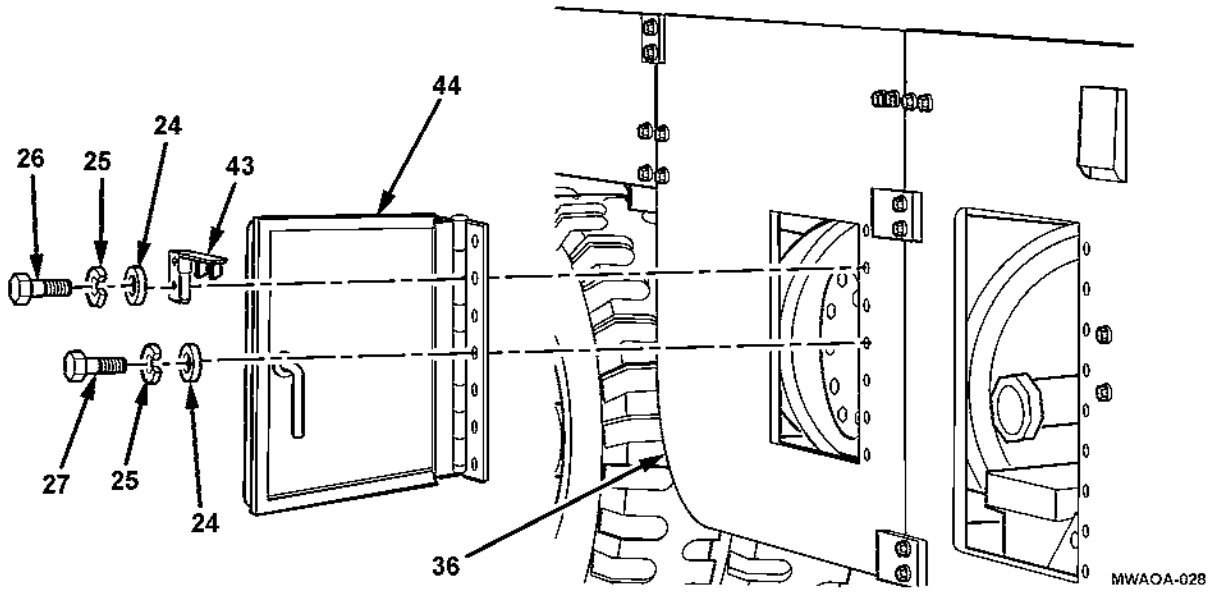
INSTALLATION (continued)

95. Position reflectors, previously removed, on filter mid-plate (36) and rear shield (37) and install with two machine screws (19), lockwashers (21), and flat washers (20).



96. Install door assembly (44) on filter mid-plate (36) with seven flat washers (24), lockwashers (25), and hexagon head capscrews (27). Torque hexagon head capscrews to 30-35 lb-ft (41-48 N•m).

97. Install safety latch (43) on door assembly (44) with two hexagon head capscrews (26), lockwashers (25), and flat washers (24). Torque hexagon head capscrews to 30-35 lb-ft (41-48 N•m).

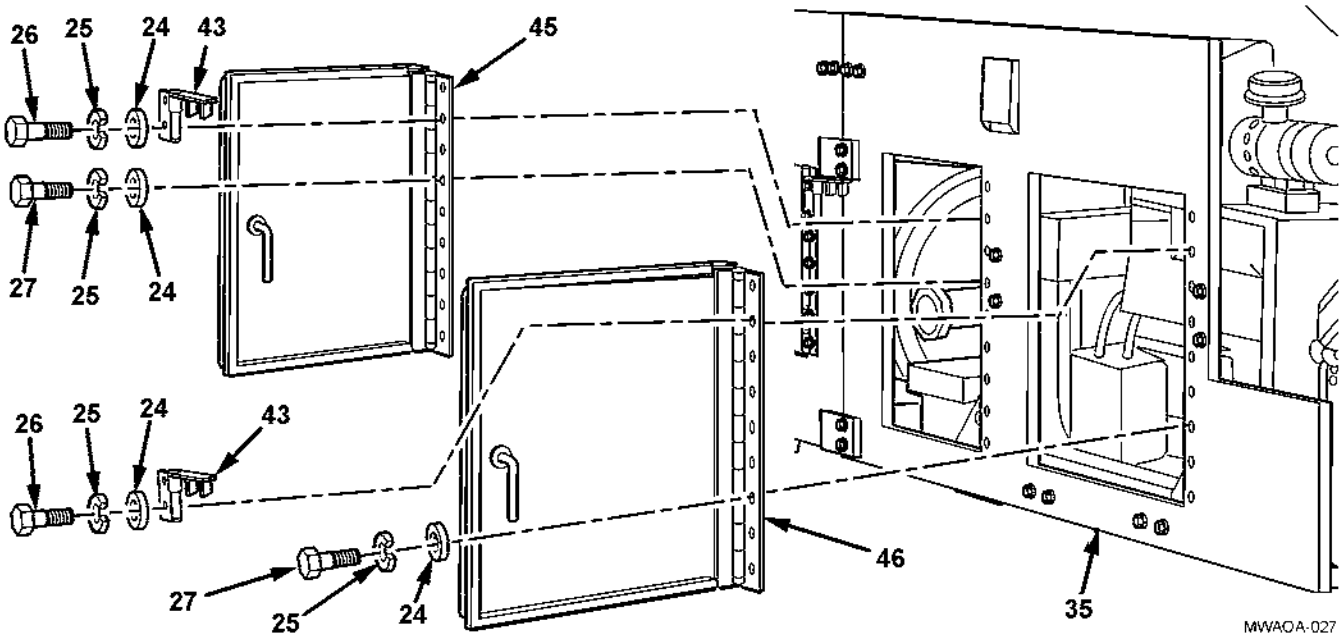


INSTALLATION (continued)

98. Install door assembly (46) on frame plate (35) with nine flat washers (24), lockwashers (25), and hexagon head capscrews (27). Torque all hexagon head capscrews to 30-35 lb-ft (41-48 N•m).

99. Install door assembly (45) on frame plate (35) with nine flat washers (24), lockwashers (25), and hexagon head capscrews (27). Torque all hexagon head capscrews to 30-35 lb-ft (41-48 N•m).

100. Install safety latch (43) on door assembly (45) and (46) with two hexagon head capscrews (26), lockwashers (25), and flat washers (24). Torque safety latch hardware to 30-35 lb-ft (41-48 N•m).



FOLLOW-ON TASK

1. Install hose assemblies and hose trough covers on vehicle (TM 9-2330-356-14/TM 9-2330-398-24) using retained hardware.

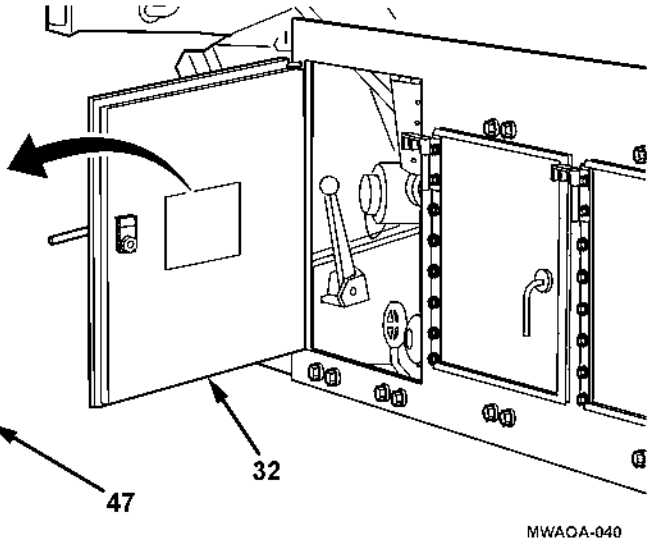
NOTE

Perform Step 2 only if door assembly 12500829 did not come with load data plate 12500857 installed previously.

2. Using spray adhesive Table 7-4, Materials and Parts, install load data plate (47) top center of door assembly (32), as shown.

Tankers With Tanker Ballistic Protection System (TBPS) Installed			
Prime Mover	Maximum Fuel Load	Terrain	Maximum Allowable Speed
M915, M931, M932* Series	4,500 Gallons	Hard Surfaces, Gravel, and Dirt Roads	40 mph
M915, M931, M932* Series	2,500 Gallons	Cross-Country	35 mph
M52 Series	2,500 Gallons	All	IAW Applicable TM
M915A5 Series	5,000 Gallons	All	IAW Applicable TM
M915 Series	5,000 Gallons	All	IAW Applicable TM
All Tractors	As Listed Above	Sand/Snow/Mud	25 mph
		Ice	12 mph
*Tire Pressure on rear tires of M931A1R2 and M932A1A2 must be increased to 70 psi. Tractors equipped with Central Tire Inflation Systems (CTIS) must have the CTIS system disabled IAW applicable vehicle Technical Manual.			

Tankers WITHOUT Tanker Ballistic Protection System (TBPS) Installed			
Prime Mover	Maximum Fuel Load	Terrain	Maximum Allowable Speed
M915, M931, M932* Series	5,000 Gallons	Hard Surfaces, Gravel, and Dirt Roads	40 mph
M915, M931, M932* Series	3,000 Gallons	Cross-Country	35 mph
M52 Series	3,000 Gallons	All	IAW Applicable TM
M915A5 Series	5,000 Gallons	All	IAW Applicable TM
M915 Series	5,000 Gallons	All	IAW Applicable TM
All Tractors	As Listed Above	Sand/Snow/Mud	25 mph
		Ice	12 mph
*Tire Pressure on rear tires of M931A1R2 and M932A1A2 must be increased to 70 psi. Tractors equipped with Central Tire Inflation Systems (CTIS) must have the CTIS system disabled IAW applicable vehicle Technical Manual.			



CHAPTER 5
FUEL TANK SELF-SEALING (FTSS) REPAIR KIT

SCOPE

This chapter provides the kit contents and instructions for repairing a fuel tanker that has been coated with the Fuel Tank Self-Sealing (FTSS) System. The FTSS Repair Kit is used to close punctures in the tanker wall that the FTSS System does not fully seal after being ruptured. Each of the 3 and 5-inch diameter Field Repair Patch (FRP) assemblies contain an absorbent packet that will activate a gelatin process, which converts the leaking fuel into a semi-solid. The combination of the semi-solid and mechanical rubber seal of the patch form a blockage of the leaking fuel from the tanker.

FTSS REPAIR KIT

The FTSS Repair Kit consists of the following items listed in Table 5-1.

Table 5-1. FTSS Repair Parts Kit, 57K4786, List

Nomenclature	NSN	Part Number	CAGE	QTY
3-inch Patch, Spill Control	TBD	12500860	19207	15 each
5-inch Patch, Spill Control	TBD	12500859	19207	5 each
Bag, Tool	TBD	12500890	19207	1 each
Battery, Non-Rechargeable, AA 4-Pack	6135-01-447-0950	115A	80204	1 pkg.
Blade, Knife	5110-00-293-2865	PD5110-00-293-2865	80244	1 pkg.
Caulking Compound, 3 oz Tube	8030-01-293-8513	1708	4U870	2 each
Cloth, Cleaning 80 Count Alcohol Saturated	7920-01-036-4464	TX1301	21994	1 box
Extension, Socket Wrench 20-inch Extension 1/2-inch Drive	5120-00-240-8705	516059-6	80020	1 each
Flashlight, AA Battery	6230-00-635-4998	Z21P	77542	1 each
Gloves, Disposable, XL 100 Count Box	8415-01-492-0180	8415-01-492-0180	80244	1 box
Goggles, Industrial	4240-00-052-3776	3336841	45152	2 pair
Handle, Socket Wrench, 18-inch, 1/2-inch Drive	5120-00-249-1071	B107.10M TY1CL3ST1	05047	1 each
Knife, Craftsman's	5110-00-892-5071	PD5110-00-892-5071	80244	1 each
Laminated Instruction Sheet	TBD	12500872	19207	1 each
Laminated Parts List	TBD	12500888	19207	1 each
Socket, Magnet 3/4-inch, 1/2-inch Drive	TBD	12500858	19207	1 each

REPAIR PROCEDURES

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open flame or any spark (ignition source). Keep at least a B-C fire extinguisher nearby when working with fuel of fuel system.

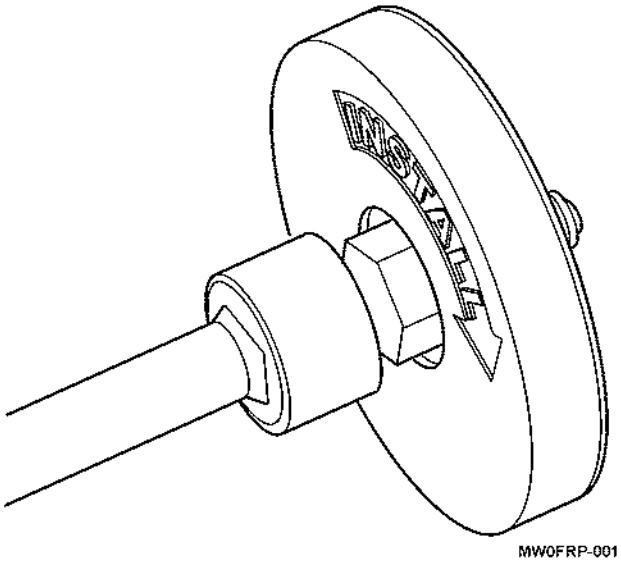
WARNING

Eye and hand protection must be worn at all times when applying FTSS Patch Kit. Failure to do so may result in injury to personnel.

1. Place the bolt head of the FRP assembly into the magnetic socket.

2. Position the FRP assembly within 1/2-inch (12.7 mm) of the leak by "stabbing" the patch assembly directly into the FTSS System liner.

3. Using the socket wrench handle and extension, tighten the FRP assembly screw until secure.



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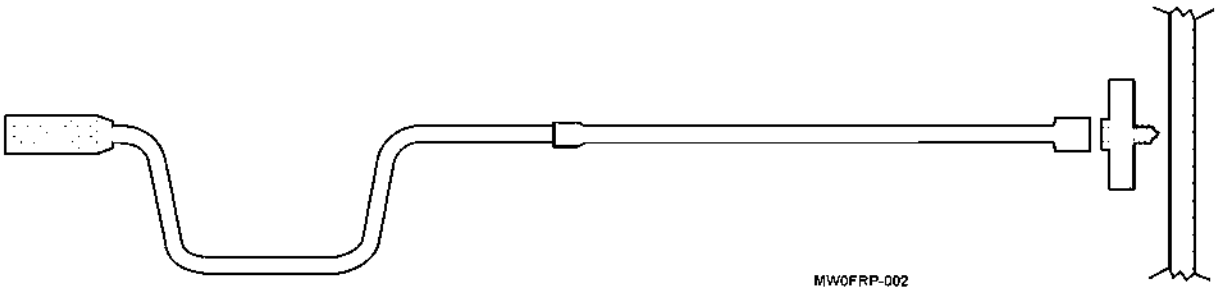

MWOFRP-002

4. Observe the fuel flow. Leakage should begin to slow and noticeably stop within a few seconds. If the leak continues, remove the patch, and relocate to a different position.

5. After leak has stopped, wipe any excess fuel from repaired area with a clean rag. Clean repaired area with alcohol wipes. Apply caulking compound to the base of the FRP assembly to permanently seal the patch in place.

6. Report all fuel tanker vessel damage to immediate supervisor for proper repair.

CHAPTER 6
QUALITY ASSURANCE AND FINAL INSPECTION

QUALITY ASSURANCE REQUIREMENTS

The installer is responsible for compliance with quality assurance requirements specified herein. The installer is responsible for observing all quality and safety standards. These requirements and the installer's plan of inspection, or quality assurance program, constitute the minimum examinations and tests necessary to assure compliance with established requirements. The installer is responsible for following the instructions contained in this Technical Bulletin (TB) for installing the TBPS kit. Report and record the modification of this TB in accordance with DA PAM 738-750 and DA PAM 738-751.

FINAL PAINT

1. Ensure all exposed metal surfaces have been thoroughly cleaned by an approved chemical or mechanical method.

2. Finish all exposed metal plates, brackets, and shields using rust inhibitor primer and paint as specified in Table 7-4, Materials and Parts, in accordance with TM 43-0139, Painting Instructions for Army Materiel. Allow for the appropriate time for the primer and paint to cure.

3. Ensure all surfaces have been pretreated as soon as possible after cleaning by an approved spray or brush method.

FINAL INSPECTION REQUIREMENTS

1. Check all armor panels, braces, brackets, and doors are properly installed and secure.

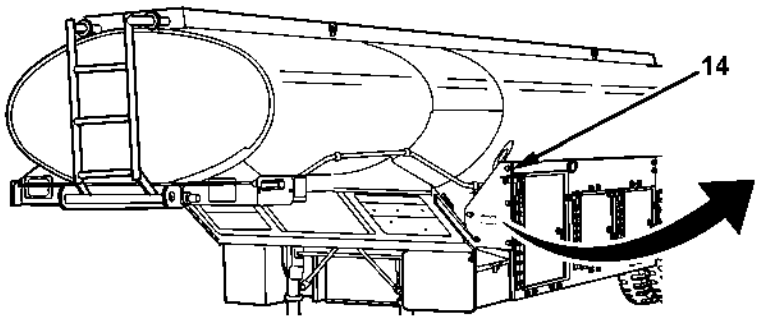
2. Check the operation of all access doors. Ensure access door do not bind when opening and closing.

3. Ensure door latches do not bind and hold access doors securely in place.

4. Apply lubricating oil (Item 9, Table 7-4) to all door hinges and safety latches.

MARKING EQUIPMENT

After the TBPS has been installed, apply the new data plate on left support bracket (14), as shown.



UP-ARMORED VEHICLE	
MODEL :	FIELD A :
NSN :	FIELD B :
NEW LIN :	FIELD C :
OLD LIN :	FIELD D :

MWAOA-053

CHAPTER 7
SUPPORT DATA

REFERENCES

This section contains a list of all the publications referenced in and/or applicable to this TB.

DA PAM 738-750	Functional Users Manual for The Army Maintenance Management System (TAMMS)
DA PAM 738-751	Functional Users Manual for The Army Maintenance Management System (TAMMS)
DA Form 2028-2	Recommended Changes to Equipment Technical Publications
SF 368	Product Quality Deficiency Report
TM 9-2330-356-14	Operators, Unit, Direct Support, and General Support Maintenance Manual for Semitrailer, Tank, 5000 Gallon (M969/M969A1)
TM 9-2330-356-24P	Unit, Direct Support, and General Support Maintenance Repair Parts and Special Tools List for Semitrailer, Tank, 5000-Gallon (M969/M969A1)
TM 9-2330-398-24	Unit, Direct Support, and General Support Maintenance Manual for Semitrailer, Tank, 5000-Gallon (M969A2)
TM 9-2330-398-24P	Unit, Direct Support, and General Support Maintenance Repair Parts and Special Tools List for Semitrailer, Tank, 5000-Gallon (M969A2)
TM 38-470	Storage and Maintenance of Army Prepositioned Stock Material
TM 43-0139	Painting Instructions for Army Materiel
TM 750-244-6	Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use

SPECIAL TOOLS; TOOL KITS; TEMPLATES; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND FIXTURES REQUIRED

The following list contains the equipment and tools suggested/recommended to install the AOA kit:

Table 7-1. Hand Tools

Nomenclature	National Stock Number	CAGEC	Part Number	QTY
Tool Kit, General Mechanics	5180-00-177-7033 or Commercial Equivalent	19204	SC5180-90-CL-N26	1
Variable Speed Magnetic Base Drill	Milwaukee or Commercial Equivalent	40898	CAT 4202 40917, Model 8373877778 42010	1
Hand Grinder	Dewalt or Commercial Equivalent		DW818	1
C Clamps, 8-inch	5120-00-203-6436	2V507	5027A16	3
C Clamps, 12-inch			5027A25	2
Vise Grip Clamps, 8-inch			5105A17	4
Vise Grip Clamps, 4-1/2-inch			5105A23	4
Pads, Grinding 4-inch		2V507	4655A5	2
Grinding Discs 4-1/2-inch (Package of 25)		2V507	4732A12	2
Ratchet, Air 3/8-inch			84967504	2
Air Drill 1/2-inch Drive			48438022	1
Wrench, Torque 1/2-inch Drive	5120-00-640-6364	05047	B107.14MTY1CLBS11	1

SPECIAL TOOLS; TOOL KITS; TEMPLATES; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND FIXTURES REQUIRED (continued)

Table 7-2. Common and Special Tools

Nomenclature	National Stock Number	CAGEC	Part Number	QTY
Drill Bits, 19/32 (.5938) Diameter Ex Gold Cobalt, Split Point		4J007	78581055	6
Drill Bits, 7/32 (.2188) Cobalt, Split Point		4J007	78561891	
Drill Bits, .375 Diameter, Cobalt		4J007	78530573	10
Drill Bits, 1/4 (.2500) Cobalt		4J007	64183890	
Tap 1/2-13		4J007	01791516	
Handle, Tap (1/4 – 1/2)-12"		4J007	88435284	
Air Line Dryer			159672-1405	4
Air Line Coupler Kit, 3/8, Male Plug			155231-1405	2
Air Line Coupler Kit, 3/8, Female Plug			155232-1405	2
Air Line Coupler Kit, 3/8, Male			155233-1405	4
Air Line Coupler Kit, 3/8, Female			155234-1405	4
5-in-1 Air Line Manifold, 3/8			159133-1405	2
Work Lights			160923-1405	2
Electrical Extension Lines, 50-Foot			162439-1405	4
Rigging, 2 Leg, add 2 Ft, 40-Ft legs, SS Type 2		2V507	33675T16	2
Rigging, Material Dawg/Grippers		2V507	8845T74	2
Respirator, Air	4240-00-022-2524 or Commercial Equivalent	81348	GGG-M-125/6	4
Gloves, Work, Leather		2V507	52835T41	8
Floor Jack, 3.5-Ton			144885-1405	2
Engine Hoist			145503-1405	2
3/8 Air Hose, 65-Feet			1586652-1405	4

Table 7-3. Templates

Item No.	Nomenclature	National Stock Number	CAGEC	Part Number	QTY
13	Locating Guide Template*		31902	12500847	1

1 Template is not supplied with every kit. If needed, template can be fabricated in accordance with drawing 12500847.

MATERIALS AND EXPENDABLES

The following list the bulk and expendable materials needed to apply the TB.

Table 7-4. Materials and Parts

ITEM	Nomenclature	National Stock Number	Part Number	CAGEC	QTY
1	Primer, Coating (Rust Inhibitor)	8010-00-687-8191 or Commercial Equivalent	TT-P-662	81348	1 GL
2	Rag, Wiping White	7920-00-205-3571 or Commercial Equivalent	DDD-R-0030	81348	50 LB
3	Cutting Fluid	9150-01-373-5788 or Commercial Equivalent	TAPMAGIC EP-XTRA	17781	1 PT
4	Cleaning Compound, Solvent	7930-00-177-5217 or Commercial Equivalent	7930-00-177-5217	80244	5 GL
5	Detergent, General Purpose	7930-00-985-6945 or Commercial Equivalent	7930-00-985-6945	83421	1 GL
6	Coating, Water Dispersible Aliphatic Polyurethane, Chemical Agent Resistant (Desert Tan 686A)	8010-01-519-6769 or Commercial Equivalent	M64159-2-003G-33446	81349	3 GL
7	Carbide Cutter Lubricant	Commercial Equivalent	TP00234-0		1 GL
8	Adhesive, Spray	8040-00-938-6860 or Commercial Equivalent	MMM-A-1058	81348	1 CN
9	Oil, Lubricating	9150-00-178-4726	MIL-PRF-2104	81349	1 QT

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is US Army Adjutant General Center.	Use Part II *(reverse)* for Repair Parts and Special Tools Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM)	DATE (Date You Will Fill Out This Form)
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PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION FORM NUMBER	DATE	TITLE
TB 9-2330-336-14		Technical Bulletin for M969/A1/A2 Fuel Tankers

ITEM	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Exact wording of recommended changes must be given)*
	0004 00-3					Callouts on art are numbered incorrectly. Callouts 3, 4, and 5 should be 6, 7, and 8.

** Reference to line numbers within the paragraph or sub paragraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
John Doe SSG	XXX-XXXX	John Doe

DA FORM 1 FEB 74 **2028** REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED

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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

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PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

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Secretary of the Army

0535703

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inch
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Mile

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inch
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Mile

WEIGHTS

1 Gram = 0.001 Kilogram = 1000 Milligrams = 0.035 Ounce
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inch
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liter = 0.0338 Fluid Ounce
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

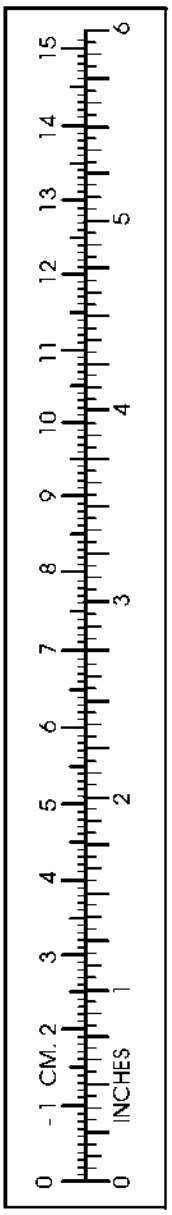
TEMPERATURE

5/9 (°F – 32) = °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 (°C + 32) = °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 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



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