

MIL-G-46723C(AT)

20 November 1981

SUPERSEDING

MIL-G-46723B(AT)

23 January 1975

## MILITARY SPECIFICATION

GUN, SELF-PROPELLED, FULL-TRACKED, 175MM, M107

AND HOWITZER, SELF-PROPELLED, FULL-TRACKED,

8-18-INCH; M110, M110A1 and M110A2, PROCESSING FOR

STORAGE AND SHIPMENT OF

### 1. SCOPE

1.1 Scope. This specification covers processing of the M107 Full Tracked, Self-Propelled Gun and M110, M110A1 and M110A2 Full Tracked, Self-Propelled Howitzer for storage outside of buildings, for immediate use shipment; and for domestic or overseas shipment, including car-loading; meeting the requirements of levels A and B processing.

1.2 Classification. Processing shall be of the following levels as specified (see 6.1):

#### Level A -

Maximum Military Protection. This is the level to be specified for protection of vehicles during shipment, handling, and storage exceeding 90 days from date of actual processing at the production facility. This level is suitable for domestic or overseas shipment including open deck loading.

#### Level B -

Minimum Military Protection. This is the level to be specified for protection of vehicles during shipment handling, and storage not to exceed 90 days from date of processing at the production facility. Level B is suitable for domestic or overseas shipment excluding open deck loading.

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## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

## SPECIFICATIONS

## FEDERAL

L-P-378	- Plastic Sheet and Strip Thin Gauge, Polyolefin.
O-E-760	- Ethyl Alcohol (Ethanol), Denatured Alcohol, and Propriety Solvent.
O-I-490	- Inhibitor, Corrosion, Liquid Cooling System.
O-S-576	- Sodium Bicarbonate, Technical Grade.
O-S-801	- Sulfuric Acid, Electrolyte, for storage batteries.
P-D-220	- Detergent, General Purpose.
GG-T-250	- Tester, Antifreeze Solutions.
NN-P-530	- Plywood, Flat Panel.
QQ-S-781	- Strapping, Steel and Seals.
RR-W-360	- Wire Fabric, Industrial.
TT-E-529	- Enamel, Alkyd, Semi-Gloss
UU-P-268	- Paper, Kraft, Wrapping.
UU-T-81	- Tag Shipping and Stock.
VV-F-800	- Fuel Oil, Diesel.
VV-L-800	- Lubricating Oil, General Purpose Preservative. (Water-Displacing, Low Temperature).
ZZ-H-601	- Hose and Hose assemblies, Rubber (Wrapped Braided) Water Service.
MMM-A-178	- Adhesive, Paper Label, Water-resistant.
MMM-A-260	- Adhesive, Water-resistant (For sealing waterproofed paper
NNN-P-40	- Paper, Lens.
PPP-B-601	- Boxes, wood, cleated plywood.
PPP-B-621	- Box, wood, nailed and locked corner.
PPP-B-636	- Box, shipping, fiberboard.
PPP-C-843	- Cushioning Material, Cellulosic.
PPP-T-42	- Tape, Packaging, masking, paper.
PPP-T-60	- Tape, Packaging, Waterproof.
PPP-T-97	- Tape, Pressure-Sensitive Adhesive, Filament, Reinforced.

## MILITARY

MIL-P-116	- Preservation, Packaging Methods of.
MIL-B-117	- Bags, Sleeves and Tubing, Interior Packaging.
MIL-B-121	- Barrier Material, Greaseproofed, Waterproofed, Flexible.

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MIL-C-450	- Coating compound, Bituminous Solvent Type, Black (for Ammunition).
MIL-P-3420	- Packaging Material, Volatile, Corrosion Inhibitor, Treated Opaque.
MIL-C-5501	- Cap and Plug, Protective, Dust and Moisture Seal.
MIL-H-6083	- Hydraulic Fluid, Petroleum Base, for Preservation and Operation.
MIL-I-8574	- Inhibitors, Corrosion, Volatile, Utilization of.
MIL-G-10924	- Grease, Automotive and Artillery.
MIL-B-11188	- Battery, Storage, Lead-acid.
MIL-C-11755	- Compound, Antifreeze, Arctic-type.
MIL-P-12841	- Basic Issue Items for Military Vehicles Carriages and equipment, Preparation for Shipment and Storage of.
MIL-P-13983	- Paint, Temporary, Lusterless, Gasoline Removable.
MIL-P-14232	- Parts, Equipment and Tools for Army Materiel, Packaging and Packing of.
MIL-C-16173	- Corrosion Preventive Compound, Solvent Cutback, Cold-application.
MIL-C-16555	- Coating Compound, Strippable, Sprayable.
MIL-D-16791	- Detergent, General Purpose (Liquid, Nonionic).
MIL-L-21260	- Lubricating Oil, Internal Combustion Engine, Preservative and Break-in.
MIL-T-22085	- Tape, Pressure-sensitive, Adhesive, Preservation and Sealing.
MIL-B-22191	- Barrier Material, Transparent, Flexible, Heat Sealable.
MIL-P-46002	- Preservative Oil, Contact and Volatile Corrosion-inhibited.
MIL-A-46153	- Antifreeze, Ethylene Glycol, Inhibited, Heavy Duty, Single Package.
MIL-L-46167	- Lubricating Oil, Internal Combustion Engine, Arctic.
MIL-T-50036	- Talc, Technical, T1 and T3.
MIL-D-81298	- Dye, Liquid, for the Detection of Leaks in Aircraft Fuel Systems.

## STANDARDS

## MILITARY

STD-129	- Marking for Shipment Storage.
STD-647	- Packaging Standards, Preparation and Use of.
STD-731	- Quality of Wood Members for Containers and Pallets.
MS-15795	- Washer, Flat Metal, Round, General Purpose.

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

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## DEPARTMENT OF TRANSPORTATION (DOT)

## Hazardous Materials Regulations

## DRAWINGS

## ARMY

10908900	- Closure Kit, Vehicle Protective - M107 and M110/M110A1/M110A2.
11642872	- BII Rack, M107/M110/M110A1/M110A2.
10914887	- Cover, Closed Kit
10919932	- Bracket
10919933	- Bracket
10919967	- Stringer, OEV Rack
10919968	- Support
10919969	- End, OVE Rack Stringer
10919973	- Strut
10919974	- Bracket, OVE Rack
10919987	- Remover, Valve Guide
10956686	- Door, Access
10956695	- Bracket
11631439	- Strut, OVE Rack

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity, or as directed by the contracting officer.)

**2.2 Other publications.** The following document(s) form a part of this specification to the extent specified herein. The issue of the documents which are indicated as DOD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

## ASSOCIATION OF AMERICAN RAILROADS PUBLICATION

Section No. 1	- General Rules Governing Loading of Commodities on Open Top Cars.
Section No. 6	- Rules Governing the Loading of Department of Defense Material on Open Top Cars.

(Application for copies should be addressed to the Association of American Railroads, 59 East Van Buren, Chicago, Illinois, 60605).

**2.3 Order of precedence.** In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

**3. REQUIREMENTS****3.1 Level A**

**3.1.1 First production processed vehicle.** Unless otherwise specified (see 6.1), the first production production processed vehicle shall be subjected to the inspection specified in 4.2. Approval of the first production processed vehicle shall not relieve the contractor of his obligation to process all vehicles.

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in accordance with this specification. Except as otherwise specified by the procuring activity, and change to materials, design, or processing procedures after approval of the first production processed vehicle shall require that an additional production processed vehicle be inspected as specified in 4.2.

3.1.2 Optional materials. Where tape conforming to type IV, class 1 of PPP-T-60 is cited, tape conforming to type II of MIL-T-22085 may be substituted.

3.1.3 Stock Numbers. Materials to be obtained through Government supply channels shall be ordered by stock numbers or specifications.

3.1.4 Preparation prior to processing. Except as otherwise specified herein, and to the maximum extent consistent with production efficiency, economy, and safe storage and shipment, vehicle shall be prepared for storage and shipment in a completely assembled condition after test runs, and completion and approval of all necessary repairs. Specified equipment shall be installed and all adjustments made so that vehicle may be operated, shipped, and placed into service with a minimum of delay.

3.1.4.1 Processing records. Records of vehicle processing shall be maintained and readily available for review by the Government representative.

3.1.4.2 Disassembly. Projecting parts whose removal will accomplish desired cube reduction, and parts susceptible to damage and pilferage, shall be removed from the vehicle. Removed bolts, nuts, screws, pins, and washers shall be placed in one of the mating parts and secured. Removed parts shall be preserved, packed, identified, and stowed securely on or inside of vehicle.

3.1.4.3 Matchmarking. Parts removed from vehicle shall be matchmarked when necessary to facilitate reassembly. Matchmarking information shall be put on cloth shipping tags conforming to type A of UU-T-81 and attached to mating parts. The marked cloth shipping tags shall be waterproofed with adhesive conforming to MM-A-178.

### 3.1.5 Cleaning and drying.

3.1.5.1 Interior of vehicle. Interior surfaces of vehicle shall be cleaned with a solution of detergent conforming to P-D-220 or type 1 of MIL-D-16791 and warm water. Water or other liquid under pressure, or steam cleaning shall not be used. After cleaning, surfaces shall be rinsed with clean water and dried. Care shall be taken during cleaning and rinsing to assure that no liquids enter instruments, connections, or other components susceptible to water damage, and that water does not accumulate in areas where it cannot drain from or be dried.

3.1.5.1.1 Battery supports and retainers. Battery supports and retainers shall be cleaned with a solution of  $\frac{1}{2}$  pound of sodium bicarbonate conforming to O-S-576, per gallon of water. Cleaned surfaces shall be flushed with clean water, then thoroughly dried. Dried surfaces shall be preserved in accordance with 3.1.12.1.

3.1.5.1.2 Backrests, seats, and crashpads. Cushion components shall be cleaned with a solution of detergent conforming to P-D-220, or type 1 of MIL-D-16791, in warm water. After cleaning, cushions shall be wiped with cloths saturated with clean water to remove cleaning solution. Care shall be taken not to saturate the cushions with cleaning solution or water. After rinsing, cushions shall be dried, then protected in accordance with 3.1.16.

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**3.1.5.1.3 Fire control items.** Exposed optical glass components of fire control items, shall be cleaned by blowing exposed optical glass surfaces with air from a hand syringe, or by use of clean camel-hair brush, followed by the use of ethyl alcohol conforming to O-E-760. In case of contamination not removed by alcohol, cleaning shall be accomplished by use of a solution consisting of two ounces of detergent conforming to type 1 of MIL-D-16791,  $\frac{1}{2}$  gallon of alcohol conforming to O-E-760, and one gallon distilled water. Using a swab made of paper conforming to type 1 of NNN-P-40, optical glass surfaces shall be washed with the cleaning agent. Washing shall be repeated, using a clean swab each time, until no dirt or other foreign matter remains on the surface. Cleaning shall be accomplished with a minimum of pressure and rubbing, and without use of cloth or rubbing materials. Immediately after cleaning, the optics shall be covered or wrapped with lens tissue conforming to NNN-P-40, and secured with tape conforming to PPP-T-42.

**3.1.5.2 Exterior of vehicle.** Using a solution of detergent conforming to P-D-220, or type 1 of MIL-D-16791, and water or steam, vehicle exterior surfaces shall be cleaned in a manner which will assure removal of all foreign matter. After cleaning, surfaces shall be rinsed with water and thoroughly dried. Exterior of vehicle shall be cleaned without permitting entry of steam or water into driver's or engine compartments.

**3.1.5.2.1 Cannon.** When inspection indicated the need for reprocessing (see 4.5.2.2), cannon shall be cleaned in accordance with process C-3 and thoroughly dried in accordance with procedure D-4 of MIL-P-116.

**3.1.6 Relubrication.** When vehicle has been operated in excess of 50 miles since previous lubrication, or after vehicle has been cleaned in accordance with 3.1.5, the vehicle shall be relubricated. Materials conforming to drawings, specifications, or lubrication order applicable to the vehicle shall be used. All exposed oil can points, such as, but not limited to; levers, locking bars, strikers, hinges, hinge pins, locking pins, pintle pins, locking levers, wing nuts, latches, door locks, hand-operated locking knobs, linkage, and threaded ends of yokes and related clevis pins, shall be lubricated with oil conforming to VV-L-800. Excess lubricant shall be removed.

**3.1.7 Transmission, auxiliary drive and final drives.** Transmission shall contain lubricating oil conforming to grade 10 of MIL-L-21260, filled to operating level. Auxiliary drive gearbox and final drives shall contain lubricating oil conforming to MIL-L-21260, grade 10 to 30 as applicable, filled to operating level. Auxiliary drive clutch housing shall be filled to operating level with oil conforming to MIL-L-46167. DD Form 1397 shall be annotated with grade of lubricant used (see 3.1.20).

**3.1.8 Engine crankcase.** Crankcase of engine shall be filled to operating level with lubricating oil conforming to MIL-L-21260, of the seasonal grade specified in the applicable drawing, specification, or lubrication order. DD Form 1397 shall be annotated with grade of lubricant used (see 3.1.20).

**3.1.9 Engine preservation.** Engine preservation shall be in accordance with 3.1.9.1 through 3.1.9.4 without interruption, except for the cooling specified in 3.1.9.1.



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3.1.9.1 Fuel system and combustion chamber. Prior to processing engine, the engine shall be cooled to assure that cylinder head temperature, measured at the injector nozzle flange surface of all cylinders, is not more than 100°F. Cooling shall be accomplished by induced air current, circulation of engine coolant, or by waiting the period of time required to arrive at the specified temperature. When ambient temperature exceeds 100°F, engine shall be cooled to a temperature equivalent to the ambient.

3.1.9.1.1 Auxiliary fuel container. After engine has been cooled, the fuel supply system from the fuel tank shall be shut off. A portable container with two compartments shall be positioned to provide gravity feed to the engine. One compartment shall be filled with preservative oil conforming to grade 1 of MIL-P-46002, to which has been added an oil soluble red dye conforming to MIL-D-81298, in a concentration sufficient to impart a marked coloring to the oil. The second compartment shall be filled with diesel fuel conforming to VV-F-800.

3.1.9.1.2 Auxiliary fuel container connection. Connect fuel line from auxiliary fuel container to fuel pump supply line. Disconnect lines to secondary fuel filter, and connect to slave filter assembly. Disconnect residual vehicle fuel return line at quick disconnect coupling. Connect a transparent plastic fuel line to the engine end of the disconnected fuel return line. Insert the other end of the plastic fuel line into a recovery container to collect the residual return oil.

3.1.9.1.3 Combustion chamber preservation. Disconnect air cleaner hose from engine air box blower. An air restrictor boot, or an air restrictor fabricated in accordance with figure 2, shall be installed on the engine air box blower and secured to assure that air to engine is completely shut off. The fuel valve on the auxiliary fuel tank shall be turned to the lubricating oil position (grade 1, MIL-P-46002). Place engine fuel control in run position. Crank engine with starter (NOTE: Engine may fire for several seconds) for a minimum of 30 seconds and not exceeding a maximum of 45 seconds. The fuel valve on the auxiliary fuel container shall be turned to the off position.

**CAUTION:**

SPECIAL PRECAUTIONS SHALL BE TAKEN TO ASSURE THAT TIME LIMITS SPECIFIED SHALL NOT BE EXCEEDED OR THE ENGINE STARTER OR STARTER SOLENOID MAY BE DAMAGED.

3.1.9.2 Engine purging. Purge fuel return lines of all preservative oil by turning the auxiliary fuel tank valve to the diesel fuel position and close engine fuel control shut-off. Crank engine with starter for a period of time to remove all traces of red colored lubricating oil from plastic return line (CAUTION: Do not operate starter for a period exceeding 45 seconds.) If preservative oil has not been purged, rest starter for three minutes and repeat purge operation. Turn the auxiliary fuel tank valve to the OFF position. Remove fuel line, and slave filter and reconnect. Turn on vehicle fuel supply system. Remove air restrictor. Disconnect plastic fuel return line and reconnect the residual fuel return at the quick disconnect coupling.

3.1.9.3 Preservation through air intake and exhaust system. After preservation in accordance with 3.1.9.1 through 3.1.9.2, one ounce of preservative oil conforming to grade 1 of MIL-P-46002 shall be atomized into exhaust opening. Opening shall be sealed with tape conforming to type IV, class 1 of PPP-T-60. The hose shall be disconnected at the air intake, and one ounce of preservative oil conforming to grade 1 MIL-P-46002, shall be atomized into the air intake opening. The air intake opening and the engine crankcase breathers shall be sealed with plastic plugs conforming to MIL-C-5501 or with tape conforming to type IV, class 1 of PPP-T-60. A red warning

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tag bearing the information "ENGINE PRESERVED WITH VCI - DO NOT CRANK. BEFORE CRANKING, REMOVE CAPS, TAPE, OR PLUGS, AND REINSTALL HOSE", shall be placed in a conspicuous location with driver's compartment. DD Form 1397 shall be annotated to show engine is preserved with VCI and oil. (See 3.1.20).

3.1.9.4 Preservation through oil level gage rod opening. After preservation in accordance with 3.1.9.1 through 3.1.9.2, the oil level gage rod shall be removed and six ounces of preservative oil conforming to grade 1 of MIL-P-46002 shall be atomized into the crankcase through the oil level gage rod opening. An extension of sufficient length to permit the spray nozzle to be within the crankcase shall be used. Spray nozzle shall not be submerged in the crankcase oil. After spraying has been accomplished, oil level gage rod shall be reinstalled. All opening to the engine interior, including oil level gage rod opening, and oil filler cap, shall be sealed with tape conforming to type IV class 1 of PPP-T-60.

3.1.10 Fuel tanks and fuel cells. Process vehicles with metal fuel tanks as specified in 3.1.10.1 Process vehicles with coated fabric fuel cells as specified in 3.1.10.2.

3.1.10.1 Fuel tanks. Fuel tank shall be drained to the maximum extent possible. Fuel tank cap and filler screen shall be removed and coated with lubricating oil conforming to grade 30 of MIL-L-21260. One quart of lubricating oil conforming to grade 10 of MIL-L-21260 shall be added to each five gallons or portion thereof of residual fuel that remains after draining tank. Tank cap and filler screen shall be reinstalled.

3.1.10.2 Fuel cells (coated fabric). Remove fuel cell drain access plugs located on bottom of hull. (Note: Remove fuel cell drains plugs and drain fuel cells to the maximum extent possible Overnight draining is recommended if time is available). Reinstall drain plugs and access covers. Add one quart of lubricating oil conforming to grade 10 of MIL-L-21260 through the fuel cell filler opening. Fuel tank cap and filler screen shall be removed and coated with lubricating oil conforming to grade 30 of MIL-L-21260, then reinstalled.

### 3.1.11 Cooling system.

3.1.11.1 Cooling system. Unless otherwise specified (see 6.1), prior to, or concurrently with the other preservation requiring engine operation, cooling system shall be protected by the following procedure: Cooling system shall contain a clean solution consisting of equal parts by volume of antifreeze (ethylene glycol) conforming to MIL-A-46153 and water, filled to capacity. Engine shall be operated until temperature has been reached that causes thermostat to open, and assure complete mixing and even distribution of the antifreeze solution. A warning tag, bearing the information "COOLING SYSTEM FILLED WITH WATER AND ANTIFREEZE SOLUTION (ETHYLENE GLYCOL) IN EQUAL PARTS BY VOLUME - DO NOT DRAIN", shall be securely attached to radiator filler neck. Coolant shall show protection to minus 40°F. DD Form 1397 shall be marked to indicate coolant and degree of protection sued.

3.1.11.2 Arctic antifreeze compound procedure. For shipment and storage in areas where the temperature drops below minus 40°F, cooling system shall be filled with antifreeze compound conforming to MIL-C-11755. The compound shall be used without dilution. A warning tag, bearing the information "COOLING SYSTEM FILLED WITH ANTIFREEZE (ARCTIC-TYPE)- DO NOT DRAIN OR DILUTE", shall be securely attached.



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to radiator filler neck.

**3.1.11.3 Water and corrosion inhibitor procedure.** For shipment and storage within the bounds of 30° north latitude and 30° south latitude, except Continental United States, cooling system shall be preserved as follows: Cooling system shall be filled with clear water up to, but not including, the radiator upper tank. A corrosion inhibitor conforming to O-I-490 shall be added in the proportion of 5 ounces of the inhibitor for each 10 quarts of water. The inhibitor shall be dissolved in 2 quarts of warm water and poured into the radiator while the engine is idling. More water shall be added, if necessary, to fill the radiator to operating level. A warning tag, bearing the information "COOLING SYSTEM DOES NOT CONTAIN ANTIFREEZE-FILLED WITH WATER AND INHIBITOR", shall be securely attached to radiator filler neck.

**3.1.12 Batteries, cables, battery supports and electrolyte.**

**3.1.12.1 Battery supports and retainers.** Battery supports and retainers shall be preserved with compound conforming to MIL-C-450.

**3.1.12.2 Dry charged batteries and cables.** Dry charged batteries shall be installed in the vehicle battery carrier. Filler cap opening shall be sealed by placing a 2-inch wide by 3-mil thick piece of film conforming to type II of MIL-F-22191 over all filler cap openings, with caps removed. The film shall be sufficient length to allow the film to be depressed into the filler cap opening to the same depth as the filler cap. Filler caps shall be screwed into the filler openings to form a complete seal without damaging plastic film. If batteries have been processed in accordance with MIL-B-11188, they need not be reprocessed as above. Wrap POS battery terminal of bulkhead disconnect lead (circuit 81) and the circuit breaker lead (circuit 459B), with a double layer of tape conforming to type IV, class 1 of PPP-T-60, to prevent arcing when vehicle is operated with internal battery pack disconnected. Battery cables shall be secured to battery carrier with 3/4 inch wide tape conforming to type IV of PPP-T-97.

**3.1.12.3 Electrolyte.** Electrolyte shall be preserved, packed, and marked in accordance with O-S-801, except that exterior container shall be in accordance with PPP-B-601 or PPP-B-621. The packed electrolyte shall be stowed with the basic issue items (BII), and secured independently with 3/4 X .020 strapping, conforming to type 1, class 1, finish A of QQ-S-781.

**3.1.13 Sighting and fire control items.**

**3.1.13.1 Periscopes, telescopes, quadrants, and removable mounts.** If installed, all periscopes, telescopes, quadrants, and removable mounts (such as telescope mount M138), shall be removed from the vehicle and preserved and packed in accordance with level A of MIL-P-14232 and applicable packaging data sheets, then stowed with EII. After the mounts have been removed from the trunnions, the bolts and washers that retained the mounts to the trunnions, shall be coated with grease conforming to MIL-G-10924, then seated firmly (approx 10 pound feet torque) into their holes. All level vial covers shall be positioned over the vials.

**3.1.13.2 Mounting surfaces for fire control items.** Exposed, unpainted metal mounting surfaces for fire control items, shall be coated with grease conforming to MIL-G-10924.

**3.1.13.3 Instrument light (dry-cell powered).** If installed, the instrument

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light shall be removed, dry cells removed, and the light preserved in accordance with level A of MIL-P-14232 and the applicable packaging data sheet, then stowed with BII.

### 3.1.14 Cannon and mount.

3.1.14.1 Bore and chamber preservation. Immediately after cleaning (see 3.1.5.2.1), bore and chamber of the cannon shall be coated with preservative oil conforming to VV-L-800. Excess preservative shall be allowed to drain from coated surfaces. A strip of volatile corrosion inhibitor (VCI) treated barrier material conforming to type 1, class 3 style A of MIL-I-3420, shall be cut and rolled into a tube with the VCI treated surface on the outside. The barrier material shall be of a size that will provide a continuous contact with the bore and chamber surfaces. The rolled barrier material shall be inserted into the cannon so that it extends the entire length of the bore and chamber. The VCI barrier tube shall not be forced or kinked in a manner which would obstruct the chamber.

3.1.14.2 Closure of muzzle opening. The tampon portion of a plug conforming to figure 3, shall be driven securely into the muzzle opening. The muzzle plug shall be secured with tape conforming to type IV, class 1 of PPP-T-60, 2 inches (minimum) wide. For tubes without a muzzle brake, two pieces of tape shall be applied across the center of the plug. The strips shall be perpendicular to each other and extend 4 inches onto the surface of the gun tube. The tape shall be reinforced by applying a strip of tape circumferentially around the joint between the plug and the tube, and then applying 3 additional turns of tape around the tube, extending from the muzzle to 4 inches behind the muzzle. For tubes with a muzzle brake, 3 strips of tape shall extend across the muzzle plug, through the muzzle brake openings, and back onto the sides of the muzzle brake for 4 inches. The tape shall be reinforced with a circumferential wrap of tape applied a minimum of 3 full turns over the muzzle brake surfaces. All exposed surfaces of the tape, muzzle plug, adjacent surfaces of the tube, and, if applicable, the muzzle brake, shall be coated with a watertight layer of strippable coating compound, conforming to MIL-C-16555. Cover the muzzle and (if applicable) muzzle brake with a polyethylene bag .006 thick, conforming to type 1, class 1, grade A, finish 1 of L-P-378. The bag shall be of sufficient length to extend a minimum of 10 inches onto the gun tube. Secure the bag with strips of 1 X 12 inch tape conforming to type IV, class 1 of PPP-T-60. Run the tape lengthwise on the top, bottom and sides of the cannon, so that approximately half of each strip is on the bag, and half on the painted surface of the cannon. Apply additional tape (6 inch width) of the same material around the circumference of the tube to form a continuous seal, extending from the lip of the bag, 3 inches onto the gun tube, and 3 inches onto the bag. Two additional strips of tape (1 inch minimum width) shall be applied around the circumference of the bag in a manner that divides the bag into three approximate equal length areas and provides additional securement of bag to cannon.

3.1.14.3 Breech mechanism. The obturator spindle group shall be disassembled then it and the other components of the breech mechanism shall be cleaned in accordance with method c-1 of MIL-P-116 and dried. (Note: Use soap and water to clean non-metallic components of this group.) All unpainted metal surfaces, including phosphated surfaces of the breech block, breech operating mechanism, firing mechanism and obturator spindle shall be coated with grease conforming to MIL-G-10924. The obturator spindle group shall be reinstalled in the breech block and the breech closed.

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3.1.14.4 Exercising of recoil mechanism. Prior to processing as specified in 3.1.14.4.1, and when the recoil mechanism has not been exercised, proof fired, overhauled, or manufactured within 4 months prior to preparation for storage or shipment, the recoil mechanism shall be exercised a minimum of three extensions of the recoil piston. Extension shall be a minimum of 6 inches. Record of exercising shall be entered on DA Form 2408-4 "Weapon Record Data", and proof testing of the weapon shall be entered on DA Form 2408-9 "Proof Acceptance Record" (see 3.1.20).

3.1.14.4.1 Processing of recoil mechanism after exercising. Accessible machined metal surfaces of the cannon immediately forward of the recoil mechanism, shall be coated with grease conforming to MIL-G-10924. Inaccessible machined metal surfaces shall be fogged with lubricating oil conforming to grade 10 of MIL-L-21260. Processing shall be accomplished by removing cover of the cannon shield. The surface of the recoil mechanism immediately forward of breech ring collar shall be coated with grease conforming to MIL-G-10924. Application of grease shall be made while cannon is out of the battery during exercising and upon last extension prior to return to battery.

3.1.14.5 Exercising of replenisher. Replenisher assemblies shall be exercised concurrently with the recoil mechanism (see 3.1.14.4).

3.1.14.5.1 Processing of replenisher after exercising. Replenisher shall be filled to bleed position with hydraulic fluid conforming to MIL-H-6083, then drained to operating level.

3.1.14.6 Elevating mechanism. Exposed unpainted surfaces of elevating pinion and rack and elevating hand crankshaft shall be coated with grease conforming to MIL-G-10924.

3.1.14.7 Traversing mechanism. Exposed, unpainted surfaces of traversing gear pinion, and traversing hand crankshaft, shall be coated with grease conforming to MIL-G-10924.

#### 3.1.14.8 Cannon mounts.

3.1.14.8.1 Travel locks. The shorter of the two wedge type travel locks shall be engaged and locked (to provide 3.5 inches separation between the bottom of the cradle and the top of deck at the travel lock location).

#### 3.1.14.8.2 Tube position (In battery/out of battery).

3.1.14.8.2.1 M107 tube position. The M107 cannon tube shall be retracted 54 inches out of battery.

3.1.14.8.2.2 M110, M110A1 and M110A2 tube position. Except for shipment by air transport, cannon tubes of the M110, M110A1 and M110A2 vehicles shall be in battery for shipment and storage. For air shipment, cannon tubes shall be retracted 54 inches out of battery.

3.1.14.8.3 Tube restraints (for transportation). Cannon tubes of the M107, M110A1 and M110A2 vehicles (but not the M110), shall be secured to the front lifting eyes with two 5/8 inch by 16 foot long steel cables as follows: Place a 3/4 inch ID by 36 inch long piece of hose conforming to ZZ-H-601 over each cable.

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Pass one end of each cable over the gun tube and the other end through a front lifting-eye. Overlap the loose ends of each cable and secure the overlapped ends loosely with four 5/8 inch cable clamps per cable, spaced 4 inches apart, centered between the loose ends. (Note: Two of the clamps shall face one way, and two shall face the other way, on each cable.) Position the hoses to prevent chaffing of the gun tube. While using a cable tightener to remove visible slack, torque the clamp nuts to 50 pound feet. Secure each loose cable end to the cable with five layers of tape conforming to type IV, class 1 of PPP-T-60 to protect the closure cover.

**3.1.14.8.4 Gun mount preservation.** Exposed unpainted surfaces of the recoil rod, counter recoil rod, variable orifice control rod, cannon tube, and machined surfaces of the mount shall be coated with grease conforming to MIL-G-10924. The recoil, counter recoil, and variable orifice rods shall be overwrapped with two layers of barrier materials conforming to type II, grade A of MIL-B-121, with the seams at the bottom. Barrier shall be secured in place with tape conforming to type IV, class 1 of PPP-T-60.

**3.1.14.8.5 Retracting control valve handle.** The retracting control valve handle shall be secured in the "NORMAL AND HOLD" position with wire or other equally effective means.

**3.1.14.9 Rammer.** Rammer shall be rotated to ramming position. Rammer chain extension rack roller, pinion, and drive gears shall be coated with preservative oil conforming to VV-L-800. Ramming chain shall be extended to full ram position, then coated completely by spraying or swabbing with lubricating oil. Exposed, unpainted surfaces of rammer cylinder piston rod shall be coated with grease conforming to MIL-G-10924 then wrapped with two layers of barrier material conforming to type II, grade A of MIL-B-121. Barrier material shall be secured in place with tape conforming to type IV, class 1 of PPP-T-60. Rammer shall be secured in stowed position with 3/4 inch strapping conforming to type 1, finish A of QQ-S-781.

**3.1.14.10 Hydraulic systems.** Hydraulic systems shall be filled to operating level with hydraulic fluid conforming to MIL-H-6083.

**3.1.15 Spade.** Spade shall be extended from retracted position. Approximately one inch of exposed surface of the hydraulic piston rods shall be coated with grease conforming to MIL-G-10924. Spade shall be returned slowly to full retracted position.

**3.1.16 Backrests, seats, and crash pads.** Immediately after drying (see 3.1.5.1.2), cushioned components of backrests, seats, and crash pads shall be covered with paper having a minimum basis weight of 60 pounds, conforming to grade B of UU-P-268. Paper shall be secured in place with tape conforming to type 1 of PPP-T-42.

**3.1.17 Hatches and doors.** Rubber seals shall be coated with powdered talc conforming to MIL-T-50036. Mica of suitable particle size may be substituted for talc. Turret well cleanout cover shall be closed and latched. Driver's hatch shall be secured in the closed and latched position, by passing a suitable bolt through the locking lugs; securing the bolt with a nut; then deforming the bolt threads to prevent easy removal (see 3.3.2).

**3.1.18 Miscellaneous preservation.** Except as otherwise specified, all exposed, unpainted machined metal surfaces on the interior of the vehicle shall be coated with preservative grade 4 of MIL-C-16173. All exposed, unpainted machined metal surfaces on the exterior of the vehicle, except tracks, shall be coated with preservative



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conforming to grade 1 of MIL-C-16173.

3.1.19 Air cleaners. Air cleaners shall be dry and free of heavy dirt deposits. Air cleaners shall be installed in their housings and the air cleaner doors closed and latched.

3.1.20 Record forms. A copy of the Equipment Log Book, consisting of two copies of DD Form 1397 and single copies of DA Form 2408-4 and DA Form 2408-9 shall be furnished with and completed for each vehicle (see 6.3). Instructions for preparation and attachment or location of the Equipment Log Book shall be supplied by the Government representative. One copy of DD Form 1397 shall be placed in a bag conforming to style 2, type 1, class B of MIL-B-117. Bag shall be folded over twice and stapled or taped and secured to headlamp with tape conforming to type IV, class 1 of PPP-T-60. The duplicate copy of Form 1397 shall be placed with the log book.

3.1.21 Vehicle closure. Vehicle shall be provided with a "covered wagon-style" closure in accordance with drawing F10908900. Closure shall be fabricated, assembled, and installed in accordance with the appendix and referenced drawings. All sharp corners of framework and bows, where cloth cover will make contact, such as corners on base of the frame, shall be cushioned with a 3/4 inch minimum thickness of cushioning material conforming to PPP-C-843, secured in place with tape conforming to type IV, class 1 of PPP-T-60. To lift vehicle for loading, cover shall be rolled away from front and rear bows to expose vehicle lifting eyes.

3.1.21.1 Ventilation. Transmission and radiator drain (left side) access plates and gaskets on underside of vehicle shall be removed for ventilation. Un-painted metal surfaces, and surfaces exposed by removal of these items, shall be coated with preservative conforming to grade 1 of MIL-C-16173. Plates and gaskets shall be placed in a box conforming to PPP-B-636, closed with PPP-T-60 tape, identified and stowed within vehicle in a manner to prevent movement during shipment. The following information shall be stenciled on the exterior of vehicle: "REMOVE SCREENS, INSTALL ACCESS PLATES AND GASKETS, BEFORE VEHICLE OPERATION." Stenciling color shall be white or yellow, using paint conforming to MIL-P-13983. Stenciling shall be in characters a minimum of 3/4-inch high.

3.1.21.1.1 Screens. Screens (see Figures 4 and 5) constructed of galvanized wire fabric, 4 by 4 mesh, conforming to type 1, class 1 of RR-W-360 shall be installed in transmission and radiator drains access plate openings.

3.1.22 Fire Extinguisher. Fire extinguisher shall have a minimum of 90 percent of the rated full charge. All seals shall be intact. DA Form 253 shall be completed and securely attached to each extinguisher (see 6.2). Fire extinguisher bracket latch shall be secured to deter pilferage of portable extinguisher.

3.1.23 Basic Issue Items. Unless otherwise specified (see 6.1), all spare parts, tools and equipment shall be preserved and packed in accordance with requirements of MIL-P-12841. Pack shall be identified to pertinent vehicle by serial number. When vehicles are equipped with closure covers BII need not be removed to sheltered storage.

3.1.23.1 BII Rack. Vehicle shall be provided with a BII rack constructed in accordance with Drawing D11642872. The BII rack shall be installed as follows:

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- (a) Attach struts (10919973-1 and 11631439) to hull using screws and lockwashers.
- (b) Attach brackets (10919974 and 10956695) to hull using screws and lockwashers and spacer 10956696.
- (c) Fit ends (10919969) over ends of stringers (10919967) using lag bolts.
- (d) Attach supports (10919968) to stringers (10919967) using bolts, washers, and nuts.
- (e) Secure assembled rack to bracket (10919974) and struts (10919973-1 and 11631439) using bolts, washers, and nuts.

3.1.23.2 Securement of BII Containers. BII containers shall be placed on the BII/OVE rack in a position which will not increase the overall cube of the vehicle or interfere with closure cover or lifting of vehicle. Each large wood box shall be secured to the rack with a minimum of two 1-1/4 X .031 or .035 inch straps placed across the box and spaced to provide adequate securement. Smaller BII boxes shall be secured to larger BII boxes, or to BII rack with 3/4 X .020 inch strapping. Strapping shall conform to type 1, finish A of QQ-S-781. Corner protectors shall be used under strapping.

3.1.24 Tow hooks. Tow hooks and related hardware shall be removed for shipment, placed in a box conforming to PPP-B-636, closed with tape conforming to PPP-T-60, identified and securely stowed within vehicle to prevent movement in transit.

3.2 Level B. Vehicles shall be processed in the same manner as specified for Level A, with the following exceptions:

3.2.1 Transmission, auxiliary drive and final drives. Transmission, auxiliary drives and final drives shall contain normal operational lubricant as specified on lubrication order, filled to operating level. DD Form 1397 shall be annotated to indicate grade of lubricant used.

3.2.2 Engine crankcase. Engine crankcase shall contain normal operational lubricant as specified on lubrication order, filled to operational level. DD Form 1397 shall be annotated to indicate grade of lubrication used.

3.2.3 Engine preservation. Engine shall not be preserved for Level B shipment and storage.

3.2.4 Fuel tanks. Unless otherwise specified (see 6.1), vehicles shall be shipped without draining residual fuel from the fuel tanks.

3.2.5 Drive on - drive off capability. When vehicles are to be operated for loading or unloading, the following provisions apply (see 6.1):

3.2.5.1 Fuel tanks. Additional fuel shall be added, as required, to accomplish movements of vehicle.

3.2.5.2 Batteries and electrolyte. New batteries with electrolyte added and fully charged shall be installed in the vehicle and battery cables properly connected.

### 3.3 All levels.

3.3.1 Loading of flat cars. Loading of vehicles on open top railcars shall be in accordance with applicable requirements of Section 1, Association of American Railroads (AAR) Manual, "Loading of Commodities on Open Top Cars", and Figure Number 79 or 80 of Section 6 of the AAR rules, "Loading of Department of Defense Material



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on Open Top Cars". The type of railcar and the applicable transportation data shall be as authorized by the responsible Government transportation office. (Note: Transmission shall be in Neutral and brakes shall not be set).

3.3.2 Driver's hatch securement. When drive on - drive off capability is specified (see 6.1), the driver's hatch securement specified in 3.1.17, shall not be applied until vehicle has been loaded.

3.3.3 Engine preservation and closure cover procedures for drive on-drive off operations..

3.3.3.1 Level A. If engine is operated in connection with movement of vehicle to loading area, or during the loading or unloading itself, the engine shall be reprocessed as specified in 3.1.9 through 3.1.9.4. An auxiliary fuel tank shall be used, or 1 quart of oil per grade 10 of MIL-L-21260 shall be added to each 5 gallons of fuel to be added to vehicle fuel tanks/fuel cells. Prior to engine operation, the vehicle cover shall be rolled clear of the engine intake and exhaust to provide air circulation and to prevent damage to cover (sec 3.3.3.3). After reprocessing, vehicle closure cover shall be placed in its original position.

3.3.3.2 Level B. If engine is operated in connection with movement of vehicle for loading or unloading, the vehicle cover shall be rolled clear and replaced as for level A above. Engine reprocessing is NOT required.

3.3.3.3 Instructions for rolling cover back. Vehicle cover shall be rolled back as follows:

- (a) Unfasten apron of cover from brackets (10919932 and 10919933) back to third bow of frame from front.
- (b) Open clamps attached to those brackets from which cover apron has been unfastened and remove freed tie-rods.
- (c) Open sliding fastener at front of cover and roll cover back to second rod.
- (d) Tuck cover apron between frame and deck on right side to clear exhaust openings.

3.3.4 Marking. In addition to any special marking required in the contract or order, vehicles shall be marked in accordance with MIL-STD-129. BII removed from vehicle for shipment shall be identified to pertinent vehicle by serial number.

3.3.4.1 Lifting points. The information "LIFT HERE" shall be stenciled adjacent to lifting eyes with arrows pointing to the lifting eyes, using white enamel conforming to TT-E-529. Stenciling shall be in characters a minimum of 1/2 inch high.

3.3.4.2 Closure marking. The information "TO LIFT VEHICLE FOR LOADING, UNFASTEN AND ROLL COVER FROM FRONT AND REAR BOWS EXPOSING LIFTING EYES," shall be stenciled in a conspicuous location on the front and rear of vehicle closure, using white enamel conforming to TT-E-529. Stenciling shall be in characters a minimum of 3/4 inch high. Closure cover (P/N 10914887) shall be stenciled with the following: "CLOSURE KIT, VEHICLE PROTECTIVE-4107-DO NOT DESTROY-REINSTALL FOR SHIPMENT OR STORAGE OR SHIP WITH BII". Closure cover (P/N 10914887-1) shall be stenciled with the following: "CLOSURE KIT, VEHICLE PROTECTIVE-4107, M110, M110A1 and M110A2 - DO NOT DESTROY - REINSTALL FOR SHIPMENT OR STORAGE OR SHIP WITH BII". The stencils shall be in a conspicuous location on one end and one side of the closure cover. The characters shall be a minimum of 2 inches high using white enamel conforming to TT-E-529.

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## 4. - QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Inspection of materials and components. The contractor is responsible for insuring that materials and components used were manufactured and inspected in accordance with requirements of referenced subsidiary specifications and standards to the extent specified herein, or if none, in accordance with the requirements of this specification.

4.1.2 Inspection records. Contractor shall maintain records of all inspections performed and such records shall be readily available for review by the Government representative.

4.2 First production processed vehicle. The first production vehicle (see 3.1.1) shall be subjected to the inspections and tests specified in 4.5.2.1 through 4.5.2.4 and 4.6.1.

4.3 Production processed vehicles. Unless otherwise specified (see 6.1) all production processed vehicles shall be subjected to the inspections and tests specified in 4.5.2.1 through 4.5.2.4 and 4.6.1.

4.4 Rejection. Failure of the first production or any production processed vehicle to conform to the applicable requirements of this specification shall be cause for rejection of the vehicles by the Government. No vehicles shall be accepted until objective evidence that the supplier has corrected the condition causing the rejection has been provided to the Government.

4.5 Quality conformance inspection.

4.5.1 Materials. Except for materials which have been inspected by the Government at source, all materials to be used in processing of vehicles shall be inspected in accordance with the material specification; or certified inspection and laboratory test reports shall be provided which show that furnished materials conform to the detailed specifications. When materials are listed on a Qualified Products List, they shall be obtained from one of the approved sources indicated.

4.5.2 Processing. All vehicle processing shall be inspected to determine conformance to this specification. Inspection of processing shall include all items specified in Table 1, and 4.5.2.1 through 4.5.2.4 and 4.6.1.

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Table I - Processing Inspection  
(See indicated paragraphs for Level A and Level B requirements)

Component/ Process	Cleaning		Preservation		Processing	
	Levels A and B	Level A	Level B	Levels A and B		
Preparation Prior to Processing				3.1.4		
Processing Records				3.1.4.1		
Disassembly		3.1.4.2	3.1.4.2	3.1.4.2		
Matchmarking				3.1.4.3		
Interior of Vehicle	3.1.5.1					
Battery Supports and Retainers	3.1.5.1.1	3.1.12.1	3.1.12.1	3.1.16		
Backrests, Seats and Crash Pads	3.1.5.1.2			3.1.5.1.3		
Fire Control Items	3.1.5.1.3	3.1.5.1.3	3.1.5.1.3			
Exterior of Vehicle	3.1.5.2					
1/Relubrication		3.1.6	3.1.6			
1/Transmission, Auxiliary and Final Drives		3.1.7	3.2.1			
1/Engine Crankcase		3.1.8	3.2.2			
Engine Preservation		3.1.9	3.2.3			
Fuel System and Combustion Chamber		3.1.9.1				
Auxiliary Fuel Container		3.1.9.1.1				
Auxiliary Fuel Container Connection		3.1.9.1.2				
Combustion Chamber Preservation		3.1.9.1.3				
Engine Purging		3.1.9.2				
Preservation Through Air Intake & Exhaust System		3.1.9.3				
Preservation Through Oil Level Gage Rod Opening-		3.1.9.4				
1/Fuel Tanks/Fuel Cells (As Appropriate)		3.1.10	3.2.4			
Cooling System (As Appropriate--Sec Para 6.1)		3.1.11	3.1.11			
Dry Charge Batteries and Cables		3.1.12.2	3.1.12.2			
Electrolyte				3.1.12.3		
Periscopes, Telescopes, Quadrants and Mounts		3.1.13.1	3.1.13.1	3.1.13.1		
Mounting Surfaces for Fire Control Items		3.1.13.2	3.1.13.2			
Instrument Light		3.1.13.3	3.1.13.3	3.1.13.3		
Bore and Chamber Preservation	3.1.5.2.1	3.1.14.1	3.1.14.1			
Closure of Muzzle Opening		3.1.14.2	3.1.14.2	3.1.14.2		
Breech Mechanism	3.1.14.3	3.1.14.3	3.1.14.3	3.1.14.3		
2/Exercising of Recoil Mechanism				3.1.14.4		
Processing of Recoil Mechanism After Exercising		3.1.14.4.1	3.1.14.4.1			

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Table 1 - Processing Inspection (Continued)

Component/ Process	Cleaning		Preservation		Processing	
	Levels A and B	Level A	Level B	Level B	Levels A and B	
Exercising of Replenisher		3.1.14.5	3.1.14.5			
Processing of Replenisher After Exercising		3.1.14.5.1	3.1.14.5.1			
Elevating Mechanism		3.1.14.6	3.1.14.6			
Traversing Mechanism		3.1.14.7	3.1.14.7			
Travel Locks						3.1.14.8.1
Cannon Tube Position (M107)						3.1.14.8.2.1
Cannon Tube Position (M10, M10A1 & M10A2)						3.1.14.8.2.2
Cannon Tube Restraints (M107, M10A1 & M10A2)						3.1.14.8.3
Gun Mount Preservation						
Retracting Control Valve Handle		3.1.14.8.4	3.1.14.8.4			3.1.14.8.5
Rammer		3.1.14.9	3.1.14.9			
Hydraulic Systems		3.1.14.10	3.1.14.10			
Spade		3.1.15	3.1.15			
Hatches and Doors		3.1.17	3.1.17			
Miscellaneous Preservation		3.1.18	3.1.18			
Air Cleaners						
Record Forms						3.1.19.1
Vehicle Closure						3.1.20
Ventilation						3.1.21
Screens						3.1.21.1
Fire Extinguisher						3.1.21.1.1
Basic Issue Items						3.1.22
Basic Issue Item Rack (OVE Rack)				3.1.23		3.1.23
Securement of Basic Issue Item Containers		3.1.23	3.1.23			3.1.23.1
Tow Hooks						3.1.23.2
Fuel Tanks (For Drive On-Drive Off)						3.1.24
Batteries/Electrolyte (For Drive On-Drive Off)						3.2.5.1
Loading						3.2.5.2
Reprocessing After Loading						3.3.1
Marking		3.3.3.1	3.3.3.2			
Lifting Points						3.3.4
Closure Marking						3.3.4.1
						3.3.4.2 & 30.3

1/Inspect DD Form 1397

2/Inspect DA Form 2408-4 and DA Form 2408-9

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4.5.2.1 Cleaning. To determine conformance to 3.1.5.1, interior of vehicles shall be examined for cleanliness, and one vehicle each day shall be tested for cleanliness in accordance with the applicable provisions of MIL-P-116. To determine conformance to 3.1.5.2, exterior of vehicle shall be examined for cleanliness. Surfaces to which tape is to be applied shall be examined for cleanliness before applying tape.

4.5.2.2 Fuel tank. To determine conformance to 3.1.10 interior of fuel tank shall be examined and visual inspection shall assure that complete processing, as specified, has been accomplished.

4.5.2.3 Cannon. Cannon shall be examined to determine condition and effectiveness of processing in conformance to requirements of 3.1.14. If reprocessing has been accomplished, cannon shall be examined to determine conformance to requirements of 3.1.5.2.1 and 3.1.14.

4.5.2.4 Engine. To determine conformance to 3.1.9, interior of engine from the first production processed vehicle shall be examined for surface coverage. Engine shall be disassembled to extent necessary to permit visual examination of all surfaces within the combustion chamber. (NOTE: The combustion chamber shall be considered as all surfaces within the cylinder, from and including the crown of the piston, to and including the surface of the head within the cylinder.) All surfaces within the combustion chamber shall have a "wet" coating of the preservative oil such as obtained when the item is dipped or flushed with the preservative oil. The processing method of the approved preserved engine shall be submitted in writing for production on all subsequent engines.

#### 4.6 Tests.

4.6.1 Cooling system. To determine conformance to 3.1.11, one vehicle from each day's production shall be selected at random and engine coolant tested using an antifreeze tester conforming to GG-T-250, with a range of minus 60° to 160°F.

#### 5 Packaging.

This section is not applicable to this specification.

#### 6. NOTES

6.1 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Level(s) of processing required (see 1.2).
- c. If inspection of the first production processed vehicle is not required (see 3.1.1).
- d. If cooling system processing is other than as specified in 3.1.11.1.
- e. If level B shipment involves maritime shipment regulation for fuel tank drainage.
- f. If drive on - drive off capability is required and additional fuel required (see 3.2.5).
- g. If BII item processing other than that specified in 3.1.23 is required. (One possible alternative is to process BII per packaging data sheets developed specifically for these vehicles.)
- h. If production processed vehicle inspection is other than specified (see 4.3).

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6.2 Safety precautions. Caution should be exercised in handling fire extinguisher cylinders. Cylinders should not be dropped, permitted to strike each other, or be handled roughly. Extreme care should be exercised during the reinstallation operation to avoid tripping fire extinguisher control system (see 3.1.22).

6.3 Forms. Copies of the Equipment Log Book and all required forms will be furnished the contractor by the Government at least 30 days before shipment of the equipment as required by the contract delivery schedule (see 3.1.20 and 3.1.22).

6.4 Change from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

## Custodian:

Army - AT

## Preparing activity:

Army - AT

## Review activities:

Army - AR, SM

Navy - MC

(Project No. PACK -A229)



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## APPENDIX

REQUIREMENTS FOR ASSEMBLY, INSTALLATION, REMOVAL, DISASSEMBLY, AND PACKAGING  
OF VEHICLE CLOSURE FOR M107, M110, M110A1 and M110A2 VEHICLES10 SCOPE.

This appendix covers requirements for assembly, installation, removal, and disassembly of the vehicle closure (sec 3.1.21), and packing of the disassembled vehicle closure. This appendix is a mandatory part of the specification. The information contained herein is intended for compliance.

## 20 Applicable documents.

20.1 Government documents. The following documents form a part of this appendix to the extent specified herein.

20.1.1 Specifications, standards, and handbooks.

## STANDARDS

## MILITARY

MS21083

- Nut, self-locking, hexagon, non-metallic insert, low height, 250 Deg. F.

20.1.2 Drawings and publications.

## Drawings

## Army

8712249  
10908548  
10908550  
10908551  
10908552  
10908553  
10908555  
10908556  
10908557  
10908558  
10908559  
10908561  
10908828  
10908829  
10908830  
10908831  
10908834  
10908835  
10908836  
10908837  
10908839

- Fastener, stud blackout curtain.  
- Washer  
- Post, closure kit base frame.  
- Angle, closure kit frame.  
- Angle  
- Rod, closure kit cover.  
- Rod  
- Angle, closure frame connector  
- Link, closure frame  
- Link, frame  
- Link  
- Angle  
- Tube, closure kit frame  
- Bow  
- Angle  
- Strut, base frame, front  
- Strut  
- Bracc  
- Bracket  
- Bracket, closure kit cover  
- Tube, closure kit frame

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10908840	- Brace
10908845	- Channel, closure kit frame
10908848	- Tube
10908850	- Installation, closure kit frame
10908851	- Angle
10908853	- Bow, Side (Brazed)
10908855	- Bow, top (Brazed)
10908900	- Closure kit, vehicle protective - M107 and M110/M110A1/M110A2
10914841	- Bow, closure kit, base frame, rear
10914842	- Bow, top, rear
10914844	- Bow, top, rear
10914865	- Tube
10914887	- Cover, closure kit
10914998	- Bracket
10919924	- Bracket, closure kit cover
10919932	- Bracket
10919933	- Bracket
10919946	- Spacer
10922144	- Fastener, closure frame

## 30. REQUIREMENTS.

30.1 Assembly and installation of closure. The vehicle closure shall consist of a frame assembly (see Drawing F10908900) and a cover assembly (see Drawing F10914887). The cover shall be attached after the frame assembly has been installed on the vehicle. NOTE: Due to the increased diameter of the M110A1 and M110A2 cannon tubes, and because of the requirement that the M110, M110A1 and M110A2 be shipped with gun tubes in battery, closure kit (10908900) and closure cover (10914887) shall be applied only to the M107 vehicle. Closure kit (10908900-1) and closure cover (10914887-1) may be used on all of these vehicles, the M107, M110, M110A1 and M110A2.

30.1.1 Frame assembly installation. The closure frame shall be assembled and installed in accordance with the following instructions:

- a. Attach struts (10908831 and 10908834) to hull using screws and lockwashers.
- b. Attach brackets (10908836, 10908837-1 and 10908837-2) to hull using screws and lockwashers.
- c. Attach brackets (10919924-1 and 10919924-2) to hull using screws and nuts.
- d. Attach channels (10908845-1 and 10908845-2) to spade using screws and nuts. Fasten channels together using angle (10908556), screws and nuts.
- e. Fasten base frame angles (10908551 and 10908552) to struts using washers (10908548), screws and nuts.
- f. Fasten base frame angles (10908551, 10908552, 10908561, 10908851-1, and 10908851-2) to brackets and to each other using angles (10908556), screws and nuts.
- g. Fasten base frame angles (10908830-1 and 10908830-2) together and to strut using angle (10908556) screws and nuts. Fasten these angles to side angles to form corner joints using screws and nuts.

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- h. Using 7/8 nuts and lockwashers, install brackets (10914998) and posts (10908550) on base frame angles. Install outer brackets (10914998) at front and rear of base frame using 7/8 screws and lockwashers.
- i. Place bows (10908853) over posts (10908550) along each side of base frame. Slip tubes (10908828-1) onto connectors of tube (10908848) and place this assembly over posts at front.
- j. Place links (10908557, 10908558 and 10908559) over connectors of bows (10908853). Slip bows (10908829 and 10908855) over connectors of bows (10908853). Place remaining links (10908557, 10908558 and 10908559) over connectors of bows (10908855). Slip plate of tube (10914865) over connector of rearmost bow (10908855). Slip plate of tube (10908848) over connector of foremost bow (10908855). Insert connectors of bows (10908855) into opposing bows (10908829). Install braces (10908835) using washers (10908548), screws, nuts, and clamps.
- k. Slip tubes (10908839-1 and 10908839-2) onto connectors of tube (10914865) and fasten lower ends of tube to channels (10908845-1 and 10908845-2) using screws and nuts. Insert connector of bow (10914842) through plate of tube (10914865) and into opposing tube (10914844). Slip bows (10914841-1 and 10914841-2) over connectors of bows (10914842 and 10914844) and fasten lower ends of bows (10914841-1 and 10914841-2) to channels (10908845-1 and 10908845-2). Install brace (10908840) using clamps. Install remainder of clamps.
- l. Remove metal boxes from spade and secure on right hand turret deck using 3/4 inch X .020 strapping conforming to type 1, finish A of QQ-S-781. Use wood blocking as necessary to protect boxes.
- m. Raise the lower portion of the personnel seat (located at right rear of vehicle) and secure it against seat back by pulling chain tight through chain retainer, then engage chain in chain retainer slot.

30.1.2 Installation of cover. The vehicle cover shall be installed over the closure frame in accordance with the following instructions:

- a. Drape cover over frame (10908850).
- b. Slip rods (10908553 and 10908555) through loops in cover.
- c. Attach fasteners (8712249) to brackets (10919932 and 10919933) with nuts (MS21083H3).
- d. Attach clamps (10922144) and brackets (10919933) to brackets (10914998) at front of frame using screws, nuts, and washers. Attach clamps (10922144) and bracket (10919932) to brackets (10914998) at side of frame using screws, nuts, and washers. Attach clamps (10922144) to channels at rear using spacers (10919946) screws, nuts, and washers. Attach remaining clamps (10922144) to brackets (10914998) using spacers (10919946), screws, nuts, and washers.
- e. Position clamps to obtain good fit of cover by means of slotted holes in brackets (10914998). Secure rods (10908553 and 10908555) to brackets (10914998) with clamps.
- f. Close both ends of cover with sliding fasteners. Secure fasteners with cotter pins.
- g. Secure apron of cover to brackets (10919932 and 10919933) using turn-button fasteners.
- h. Lace up rear corners of cover beneath spade with rope (provided) and tie.

## APPENDIX

- i. Close fastener of gun tube collar as far as possible and tie ropes. Secure fastener with cotter pin.

30.2 Removal of vehicle closure. The vehicle cover assembly and frame assembly shall be removed from the vehicle in a step by step procedure that is the reverse of the installation procedure (see 30.1.1 and 30.1.2).

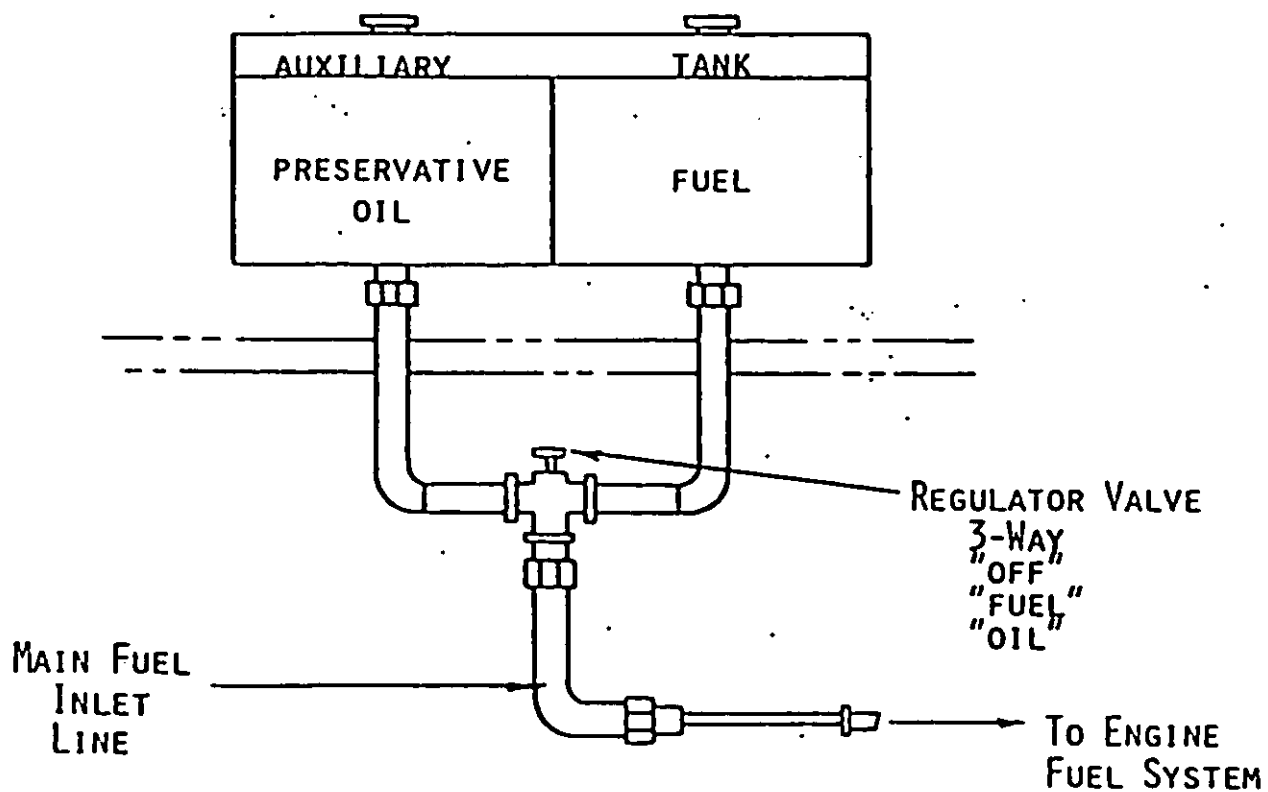
30.3 Vehicle closure disposition marking. The following information shall be stenciled on the outside front and outside rear of the cover: "REUSABLE CLOSURE (COVER AND FRAMEWORK) - DO NOT DESTROY - WHEN REMOVED AND NO LONGER REQUIRED FOR PROTECTION, PACKAGE AND SHIP PER INSTRUCTIONS ON INSIDE OF COVER". The following information shall be stenciled in a conspicuous location on the inside front and inside rear of the cover:

### PACKAGING AND SHIPPING INSTRUCTIONS

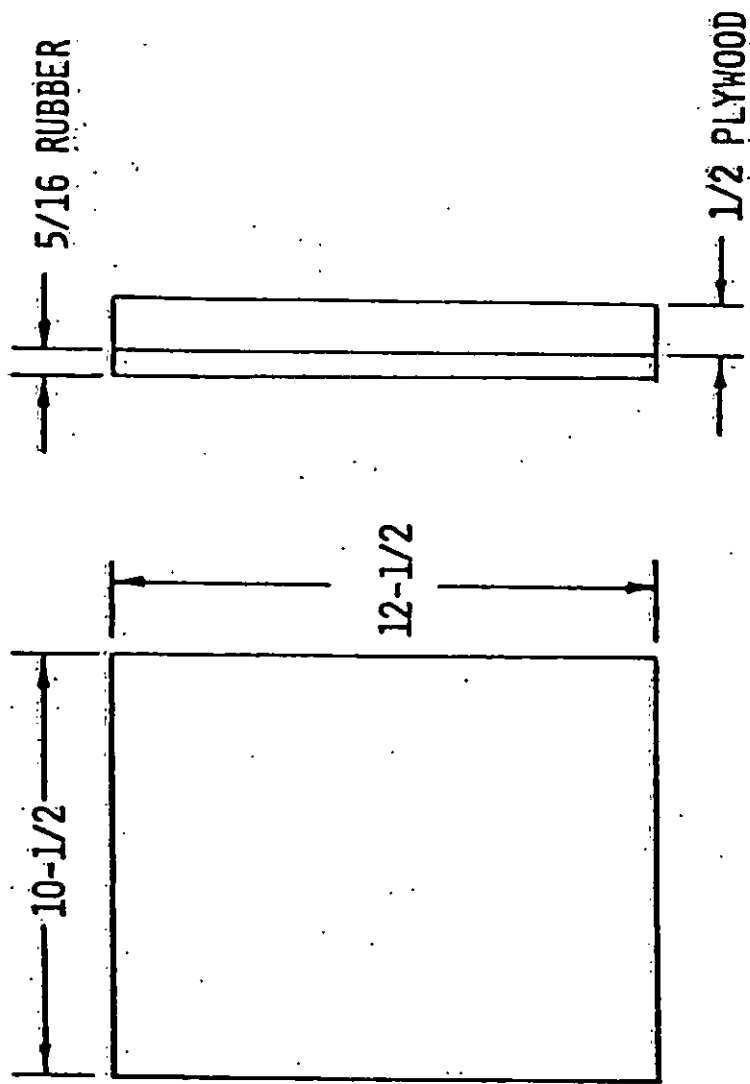
1. A LARGE BII CONTAINER MAY BE USED AS SHIPPING BOX
2. SECURELY BUNDLE LIKE ITEMS
3. PACKAGE HARDWARE IN CLOTH BAGS OR REUSE BAGS FROM BII
4. GROUP LARGEST, HEAVIEST ITEMS IN BOTTOM OF BOX
5. PLACE OTHER ITEMS IN VOID BETWEEN ABOVE ITEMS
6. FOLD COVER - PLACE ON TOP OF ABOVE ITEMS - PROTECT FROM SHARP POINTS OR EDGES
7. IMMOBILIZE ALL ITEMS AND SECURE BOX COVER ON BOX
8. SHIP TO (address to be furnished by contracting officer)

All stenciled characters to be a minimum of 3/4 inches high using white enamel conforming to TT-E-529.

30.4 BII box marking. The information "DO NOT DESTROY - USE FOR RETURN SHIPMENT OF VEHICLE CLOSURE KIT" shall be stenciled on BII box in lettering a minimum of 3/4 inches high with a contrasting color of enamel conforming to TT-E-529.



AUXILIARY FUEL CONTAINER  
FIGURE - 1



SIZE SHOWN FOR  
REFERENCE PURPOSES  
ONLY

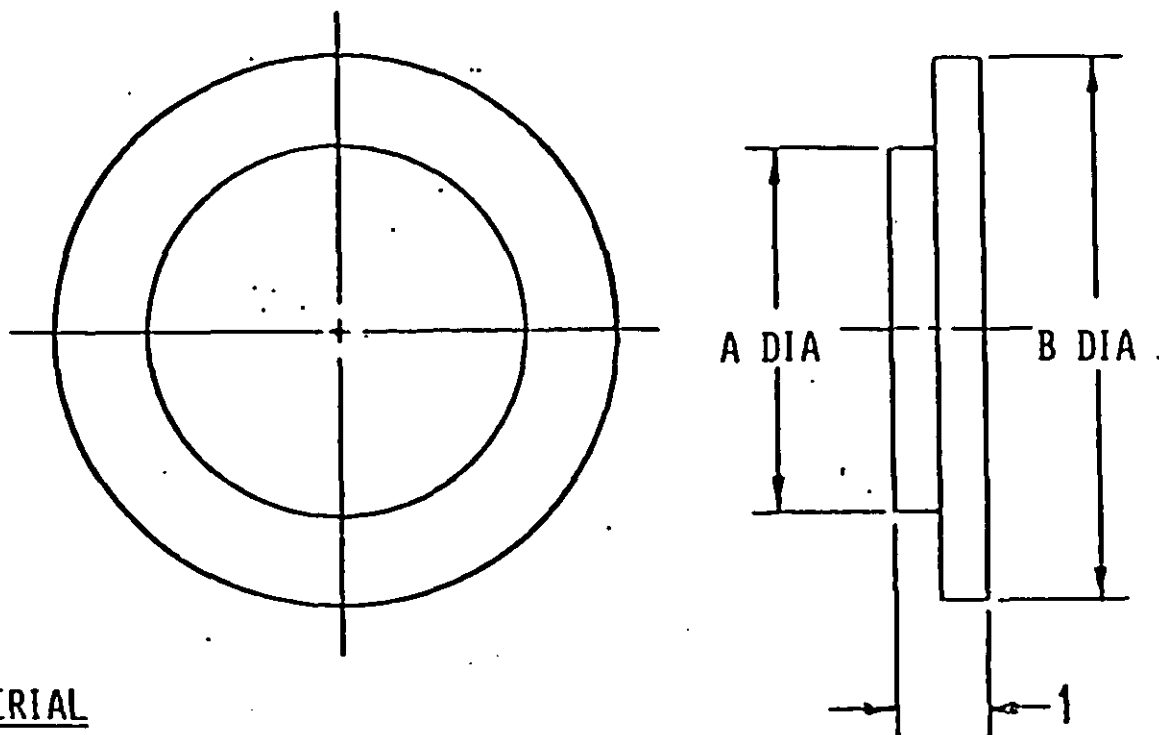
MATERIAL NOTE:  
RUBBER  
TENSILE STRENGTH  
1500-1800 LBS ± 5  
DUROMETER 55 ± 5  
PLYWOOD  
COMMERCIAL GRADE

NOTE:  
CEMENT RUBBER TO  
PLYWOOD WITH  
MMM-A-260.

AIR RESTRICTOR PLATE

FIGURE - 2



MATERIAL

PLYWOOD, FLAT PANEL  
EXTERIOR TYPE  
SPEC NN-P-530  
1/2 THICK

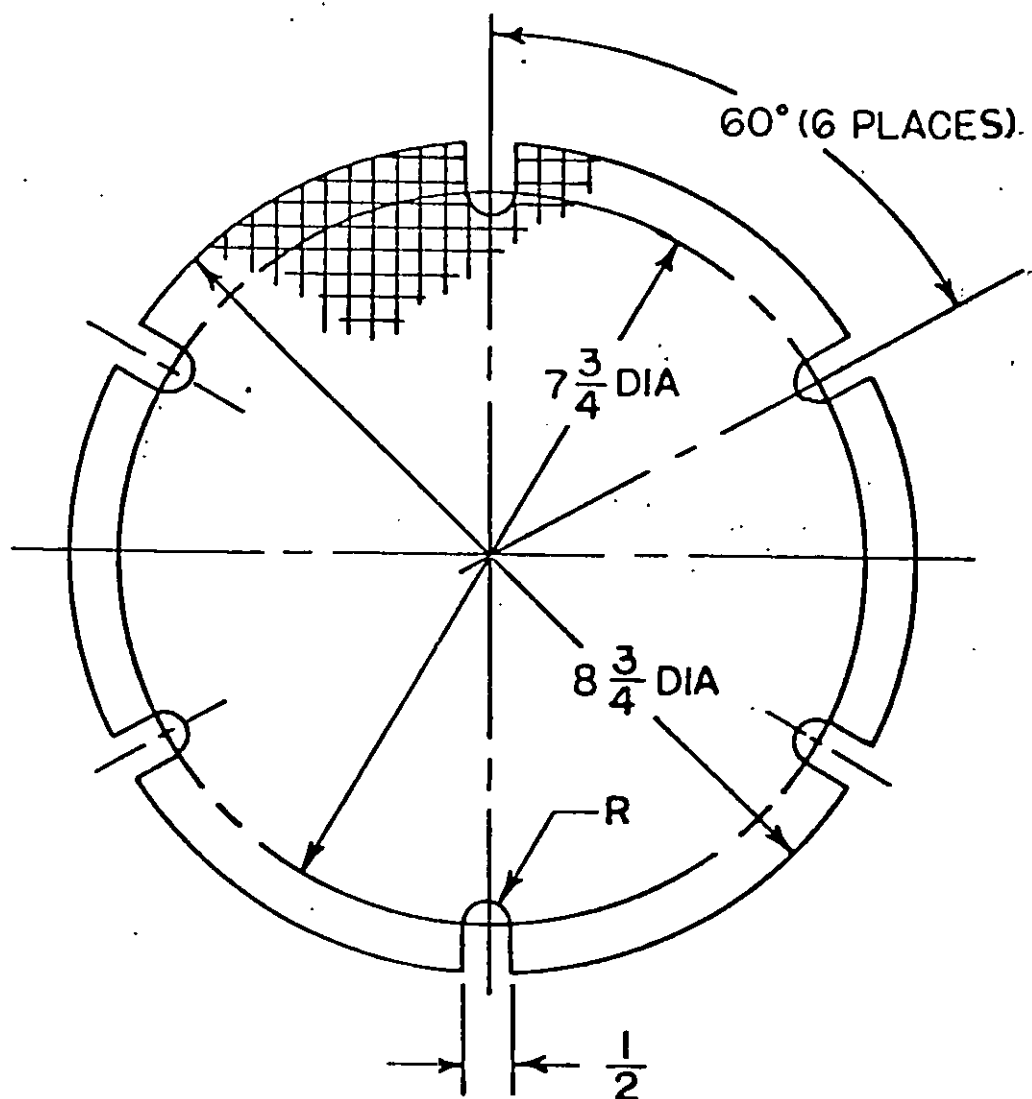
PROTECTIVE FINISH

BARRIER MATERIAL  
SPEC. MIL-C-16555  
.040 THICK AFTER  
4 HOURS...  
DRYING

VEHICLE	CANNON	A DIA	B DIA
M107	175MM, M113 M113A1	$6\frac{15}{16}$	$9\frac{3}{4}$
M110	8 IN., M2A1 M2A2	$8\frac{1}{8}$	$12\frac{1}{8}$
M110A1	8 IN., M201	$8\frac{1}{8}$	10
M110A2	8 IN. M201A2	$8\frac{1}{8}$	$8\frac{7}{8}$

PLUG, MUZZLE

FIGURE - 3

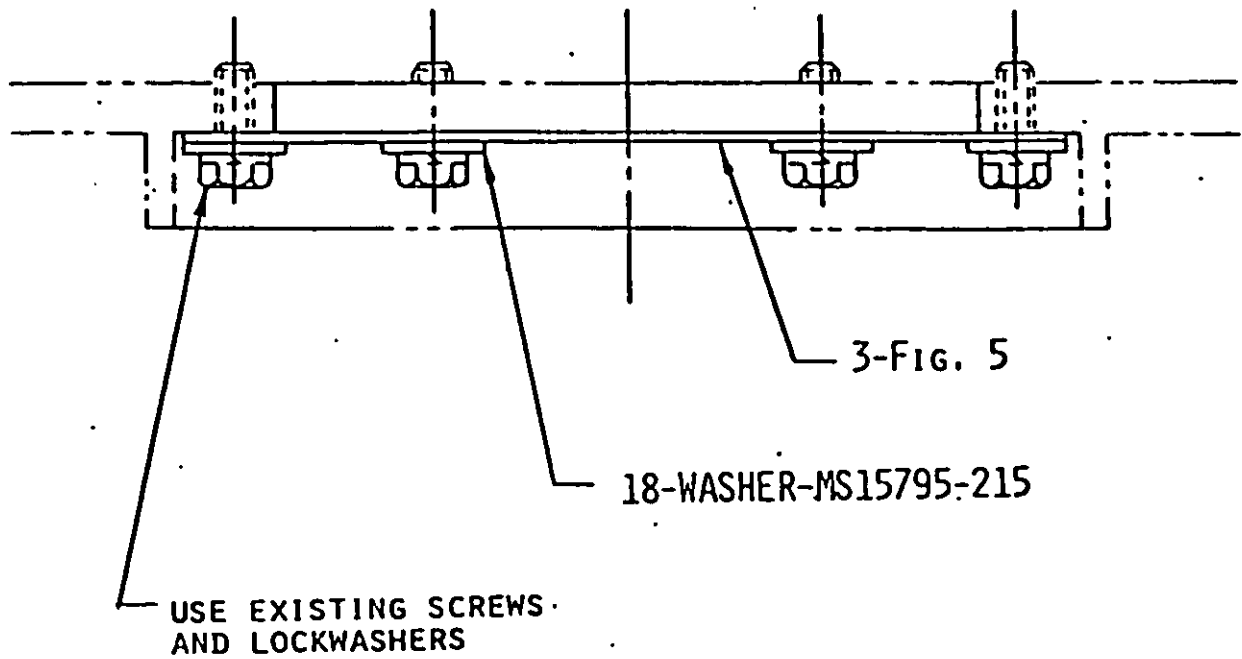


MATERIAL

WIRE FABRIC, GALVANIZED  
TYPE I, CLASS 1  
RR-W-360, 4X4 MESH

TOLERANCE:  $\pm \frac{1}{16}$

SCREEN  
FIG. 4



INSTALLATION, SCREEN

FIG. 5.

5/N 0102-014-1802