

INCH-POUND

MIL-F-62668(AT)
~~22 December 1989~~
SUPERSEDING
(see 6.6)

MILITARY SPECIFICATION

FIGHTING VEHICLE, INFANTRY, M2, M2A1, M2A2, AND FIGHTING VEHICLE, CAVALRY, M3, M3A1, M3A2: PROCESSING FOR STORAGE AND SHIPMENT OF

This specification is approved for use by U.S. Army Tank-Automotive Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the processing for storage and shipment of the M2, M2A1 and M2A2 Fighting Vehicle, Infantry and M3, M3A1 and M3A2 Fighting Vehicle, Cavalry (see 1.2 and 6.1).

1.2 Classification. Processing shall be one of the following levels, as specified (see 6.2).

Level A - Maximum military protection. Level A is the processing required for the protection of vehicle during shipment, handling, and storage exceeding 90 days from date of actual processing. This level does not provide for driveaway capability. It does provide for domestic or overseas shipment, including open deck loading.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US Army Tank-Automotive Command, ATTN: AMSTA-GDS, Warren, MI 48397-5000, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

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Level B - Minimum military protection. Level B is the limited processing required for the protection of vehicle during shipment, handling, and storage not to exceed 90 days from date of actual processing. This level provides for driveaway capability, when specified, and domestic or overseas shipment, (excluding open deck loading).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following specifications, standards and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

A-A-208	- Ink, Marking, Stencil, Opaque (Porous and Non-Porous Surfaces.
A-A-883	- Tape, Pressure Sensitive Adhesive, Masking.
O-E-576	- Sodium Bicarbonate, Technical.
O-S-801	- Sulfuric Acid, Electrolyte; for Storage Batteries.
P-D-220	- Detergent, General Purpose.
QQ-S-781	- Strapping, Steel and Seals.
TT-E-529	- Enamel, Aklyd, Semi-gloss, Low Voc Content.
TT-V-121	- Varnish, Spar, Water-Resisting.
UU-P-268	- Paper, Kraft, Wrapping.
UU-T-81	- Tags, Shipping and Stock.
VV-L-800	- Lubricating Oil, General Purpose, Preservative (Water-Displacing, Low Temperature).
ZZ-T-416	- Tire, Pneumatic: Retread and Repair Materials.
LLL-B-810	- Building Board (Hardboard), Hard Pressed, Vegetable Fiber.
MMM-A-179B	- Adhesive: Paper Label.
NNN-P-40	- Paper, Lens.
PPP-B-601	- Boxes, Wood, Cleated-Plywood.
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner.
PPP-B-636	- Boxes, Shipping, Fiberboard.
PPP-S-760	- Strapping, Nonmetallic (and Connectors).
PPP-T-60	- Tape, Packaging, Waterproof.
PPP-T-97	- Tape, Packaging/Industrial, Filament Reinforced.

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- MIL-P-116 - Preservation, Methods of.
- MIL-B-117 - Bags, Sleeves and Tubing.
- MIL-C-450 - Coating Compound, Bituminous Solvent Type, Black (for Ammunition).
- MIL-C-5501 - Caps and Plugs, Protective, Dust and Moisture Seal.
- MIL-B-11188 - Batteries, Storage: Lead-Acid.
- MIL-A-11755 - Antifreeze, Arctic Type.
- MIL-B-12841 - Basic Issue Items for Military Vehicles, Carriages and Equipment; Preparation for Shipment and Storage of.
- MIL-C-16173 - Corrosion Preventive Compound, Solvent Outback, Cold Application.
- MIL-D-16791 - Detergents, General Purpose (Liquid, Nonionic).
- MIL-L-21260 - Lubricating Oil, Internal Combustion Engine, Preservative and Break-In.
- MIL-T-22085 - Tapes, Pressure-Sensitive Adhesive, Preservation and Sealing.
- MIL-B-22191 - Barrier Materials, Transparent, Flexible, Heat Sealable.
- MIL-T-37402 - Tester, Antifreeze Solutions.
- MIL-P-46002 - Preservative Oil, Contact and Volatile, Corrosion-Inhibited.
- MIL-A-46153 - Antifreeze, Ethylene Glycol, Inhibited, Heavy Duty, Single Package.
- MIL-H-46170 - Hydraulic Fluid, Rust Inhibited, Fire Resistant Synthetic Hydrocarbon Base.
- MIL-T-50036 - Talc, Technical T1 and T3.
- MIL-A-53009 - Additive, Antifreeze Extender, Liquid Cooling System.
- MIL-T-60394 - Tape-Pressure-Sensitive Adhesive Film Foam Double-Coated (For Use with Ammunition).
- MIL-D-81298 - Dye, Liquid for the Detection of Leaks in Aircraft Fuel Systems.

STANDARDS

MILITARY

- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-2073-1 - DOD Materiel, Procedures for Development and Application of Packaging Requirements.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099).

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2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DOCUMENTS

DEPARTMENT OF TRANSPORTATION

Federal Motor Carrier Safety Regulations

(Application for copies should be addressed to the Department of Transportation, Bureau of Motor Carrier Safety, Washington, DC 20590.)

Hazardous Materials Regulations

(Application for copies should be addressed to the Department of Transportation, Hazardous Materials Regulations Board, Washington, D.C. 20590.)

DRAWING

ARMY

12349601 - Vehicle Protective Closure Kit.

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

ASSOCIATION OF AMERICAN RAILROADS PUBLICATIONS.

Section No. 1 - General Rules Governing Loading of Commodities on 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, IL 60605.)

(Non-Government publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

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2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS.

3.1 Level A.

3.1.1 First article. Unless otherwise specified (see 6.2), 1 of the first 10 production processed vehicles shall be subjected to the first article inspection specified in 4.2. Approval of this vehicle shall not relieve the contractor of his obligation to process all vehicles in accordance with this specification. Unless otherwise specified by the acquisition activity, any change to materials or design after approval shall require additional vehicles be inspected as specified in 4.2. The Government representative shall select the vehicle to be inspected.

3.1.2 Government furnished equipment (GFE). Unless previously accomplished, GFE (other than installed) shall be packaged, packed, and marked in accordance with the individual document for the specific item. GFE shall be stowed with basic issue items (BII).

3.1.3 Preservatives and atomized spray equipment. When atomized spraying of preservative oils is specified, compressed air supply lines shall be equipped with moisture separators every 50 feet or fraction thereof.

3.1.4 Processing records. Records of vehicle processing shall be maintained and shall be readily available for review by Government representatives.

3.1.5 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. Bare metal surfaces of removed parts shall be preserved, packaged, packed in accordance with MIL-STD-2073-1, identified and stowed securely within the vehicle.

3.1.5.1 Matchmarking. Parts removed from the 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, or on metal tags using waterproof ink or paint, and attached to mating parts. The marked cloth shipping tags shall be waterproofed with varnish conforming to TT-V-121 or adhesive conforming to MMM-A-179B.

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3.1.6 Record forms. Two copies of DD Form 2258 shall be completed with information that includes preservation accomplished and de preservation instructions. The Equipment Log Book Binder and one copy of DD Form 2258 (see 6.4) shall be placed in a bag conforming to type I, class B, style 2, 6 mil of MIL-E-117; the bag shall be closed by heat sealing and securely attached in the driver's compartment of vehicle. The other copy of DD Form 2258 shall be waterproofed with adhesive conforming to MMM-A-179B, or sealed in a plastic bag, and securely attached in a conspicuous location on the exterior of the vehicle.

3.1.7 Cleaning and drying (see 4.5.2.1).

3.1.7.1 Interior of vehicle. Interior surfaces of vehicle shall be cleaned with solution of detergent conforming to P-D-220, or type I of MIL-D-16791, and water. Solution temperature shall not exceed 210 degrees Fahrenheit (°F), and pressure shall not exceed 5 pounds per square inch (psi) measured 4 inches from the nozzle. After cleaning, cleaned surfaces shall be rinsed with clean water and dried. Care shall be taken during cleaning and rinsing operations to assure that no solution or water enters instruments, connections, or other components susceptible to water damage. Solutions or water shall not accumulate and remain in cavities that cannot be drained. Vehicles with decals, markers, straps, and floor plates installed shall only be hand cleaned with solution of P-D-220, or type I of MIL-D-16791, and water to prevent damage to these components. Cleaned surfaces shall be hand rinsed and dried.

3.1.7.1.1 Cleaning and drying of battery supports and retainers.

Battery supports and retainers shall be cleaned with a solution of one-half pound of sodium bicarbonate conforming to O-S-576 per gallon of water. After cleaning, cleaned surfaces shall be flushed with clean water, then thoroughly dried. Dried surfaces shall then be preserved in accordance with 3.1.8.2.

3.1.7.1.2 cleaning and drying of backrests and seats. The backrest and seat cushions shall be cleaned with a solution of detergent conforming to P-D-220, or type I of MIL-D-16791, in warm water. After cleaning, the cushions shall be wiped with cloths and saturated with clean water to remove the cleaning solution. Care shall be taken not to saturate the cushions with cleaning solution or water. After rinsing, the cushions shall be dried, then protected in accordance with 3.1.9.3.

3.1.7.2 Exterior of vehicle and weapon station. Exterior of vehicle and weapon station shall be cleaned with a solution of detergent conforming to P-D-220, or type I of MIL-D-16791, in warm water or steam. Cleaning shall remove all foreign matter. After cleaning, surfaces shall be rinsed with clean water or steam and thoroughly dried. Care shall be taken to avoid entry of water or steam into driver's compartment, engine compartment or weapon system openings. Care shall be taken in the cleaning of the Integrated Sight Unit (ISU). Steam or high pressure water spray shall not be sprayed directly on any of the lenses. All exposed lenses shall be wiped clean and dry using lens tissue conforming to NNN-P-40, type I, class 4.

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3.1.8 Preservation.

3.1.8.1 Relubrication. If the vehicle has been operated more than 75 miles since lubrication, or after the vehicle has been cleaned in accordance with 3.1.7.2, the vehicle shall be relubricated using materials conforming to drawings, specifications, or lubrication order applicable to the vehicle. All exposed oil can points such as, but not limited to, levers, locking levers, locking bars, locking pins, pintle pins, hinge pins, hinges, strikers, wing nuts, door locks, hand-operated locking knobs, latches, linkage, and threaded ends of yokes and related clevis pins, shall be coated with lubricant conforming to VV-L-800. Excess lubricant shall be removed after coating.

3.1.8.2 Preservation of battery supports and retainers. Top battery supports and retainers shall be preserved with compound conforming to MIL-C-450.

3.1.8.3 Transmission and final drives. Final drives shall contain lubricating oil conforming to specification MIL-L-21260, Grade 30, and be at operating level. Transmission shall be drained of oil and refilled to operating level with lubrication oil conforming to specification MIL-L-21260, Grade 10. Start engine, and after initial warm-up, drive vehicle until engine is at normal operating temperature (165°F, 195°F); then ensure the following operations are executed two (2) times minimum:

- a. Operate vehicle in 3rd range at 30 MPH minimum.
- b. Execute full left turn and full right turn (pivot).
- c. Reverse.
- d. Application of service brakes.

Recheck oil and fill to operating level. DD Form 2258 shall be annotated with the grade of preservation oil used.

3.1.8.4 Cooling system. The cooling system shall be protected by one of the following procedures (see 6.2):

- a. For shipments to, and storage in, areas where the temperature drops below minus 40°F, systems shall be protected as specified in 3.1.8.4.3.
- b. For shipment and storage within the bounds of 30 degrees north latitude and 20 degrees south latitude, except continental United States, systems shall be protected as specified in 3.1.8.4.2.
- c. For all other shipments, cooling systems shall be protected as specified in 3.1.8.4.1.

NOTE: DD Form 2258 (see 3.1.6) shall be completed to indicate coolant used.

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3.1.8.4.1 Water and antifreeze procedure. The cooling system shall be filled to operating level with a clean solution consisting of equal parts by volume of antifreeze (ethylene glycol) conforming to MIL-A-46153, and water. The engine shall be operated until a temperature has been reached that causes the thermostat to open, to assure complete mixing and distribution of 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 the surge tank filler neck.

3.1.8.4.2 Water and corrosion inhibitor procedure. The cooling system shall be filled with clean water up to the "ADD" mark in the surge tank. A corrosion inhibitor conforming to MIL-A-53009 shall be added in the proportion of five ounces of the inhibitor for each ten quarts of water. The inhibitor shall be dissolved in two quarts of warm water and poured into the surge tank while the engine is idling. More water shall be added, if necessary, to fill the cooling system 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 surge tank filler neck.

3.1.8.4.3 Antifreeze compound procedure. The cooling system shall be filled to operating level with antifreeze compound conforming to MIL-A-11755. The compound shall be used without dilution. A warning tag, bearing the information "COOLING SYSTEM FILLED WITH ANTIFREEZE (ARCTIC TYPE) - DO NOT DRAIN", shall be securely attached to the surge tank filler neck.

3.1.8.5 Engine crankcase preservation. The crankcase 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 2258 shall be annotated with the type and grade of lubricant used.

3.1.8.6 Compression ignition engine. Compression ignition engine preservation shall be in accordance with 3.1.8.6.1 through 3.1.8.6.4 in an uninterrupted sequence.

3.1.8.6.1 Initial conditions. Prior to processing, engine shall be cooled to assure that the 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 currents, circulation of engine coolant, or by waiting the period of time required to arrive at the above specified temperature. When the ambient temperature exceeds 100°F, the engine shall be cooled to ambient temperature.

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3.1.8.6.2 Fuel system and combustion chamber preservation. A portable auxiliary container with a filtering device and regulator valve shall be filled with preservative oil conforming to grade 1 if 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. Position container to allow gravity feed to the engine. Disconnect the fuel line between the primary fuel filter and the fuel pump at the filter end. Connect this line to the auxiliary container containing preservative oil. Disconnect vehicle fuel return line at quick disconnect coupling. Connect a transparent plastic fuel line to the end of the disconnected fuel return line. Place the other end of transparent fuel line into a recovery container to collect the return oil.

Remove air duct at the intake air filter outlet and the turbocharger inlet. An air restrictor plug shall be installed into the air duct at the air filter end (see Figure 1) and secured in position with the existing clamp. Return duct to its original position and secure it to the turbocharger and clamp. do not reconnect duct to air filter outlet. The plug shall remain in place for processing, shipment and storage. A warning tag, bearing the information, "AIR INTAKE SYSTEM DISCONNECTED AND PLUGGED - REMOVE PLUG AND RECONNECT DUCT PRIOR TO STARTING," shall be prepared and secured in a conspicuous location within the driver's area.

Place the engine fuel control to the "ON" position. Open the regulator valve on the auxiliary container. Crank the engine with the starter (NOTE: Engine may fire for approximately 5 seconds) for not less than 30 seconds and not greater than 45 seconds. If the red-colored preservative oil is not observed within the 30- to 45-second period, rest the starter for a period of 3 minutes and repeat the cranking procedure.

CAUTION: Special precautions shall be taken to assure that the time limits specified are not exceeded. Damage to the starter solenoid or hydrostatic lock may result.

Close the regulator valve on the auxiliary container and disconnect it from the fuel pump supply line and reconnect the fuel pump supply line to the primary filter. Remove the transparent fuel line, and reconnect the vehicle fuel return line at the quick disconnect coupling. Turn on the vehicle fuel supply system (see 4.5.2.4).

3.1.8.6.3 Preservation through exhaust system and air intake of turbocharger. Atomize 1 ounce of preservative oil conforming to grade 1 of MIL-P-46002 into the external exhaust opening. Seal the opening with tape conforming to type IV of MIL-T-22085. Remove the exhaust tube between the turbocharger and left exhaust manifold. Atomize 1 ounce of preservative oil conforming to grade 1 of MIL-P-46002 into the left exhaust manifold, then atomize 2 ounces of grade 1 of grade 1 of MIL-P-46002 into the right exhaust manifold, and turbocharger, replace the left exhaust tube. Remove air duct at the intake air filter outlet and the turbocharger inlet. Atomize 1 ounce of preservative oil conforming to grade 1 of MIL-P-46002 into the air inlet (toward engine) of the turbocharger. Reconnect air duct to turbocharger and secure with the clamp.

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3.1.8.6.4 Preservation through oil level gage rod opening. Remove the oil level gage rod and atomize 6 ounces of preservative oil conforming to grade 1 of MIL-P-46002 into the crankcase through the gage rod opening. An extension of sufficient length to permit the nozzle to be within the crankcase (but not submerged in the crankcase oil) shall be used. Reinstall the gage rod.

All openings to engine interior, including oil level gage rod opening and the oil filler cap shall be sealed with tape conforming to type IV of MIL-T-22085.

WARNING TAG:

A red warning tag, bearing the information "ENGINE PRESERVED WITH VCI - DO NOT CRANK" and "BEFORE CRANKING, REMOVE TAPE FROM ALL SEALED AREAS (EXHAUST, OIL GAGE ROD AND OIL FILLER CAP)", shall be placed in a conspicuous location within the driver's compartment.

3.1.8.7 Personnel heater and lines. Personnel heater shall have the fuel supply shut off valve turned to the off position. (The turret must be rotated to gain access to the valve.) The main fuel line supplying fuel to the heater shall be disconnected at a point closest to shut off valve. Fuel from the fuel line shall be allowed to drain. Seal ends of disconnected fuel line and shut off valve with plastic plugs/caps conforming to MIL-C-5501, with tape conforming to type II of MIL-T-22085.

Two warning tags, each bearing the information "HEATER FUEL LINES DISCONNECTED AND SEALED. PRIOR TO PLACING PERSONNEL HEATER IN OPERATION, REMOVE PLUGS/CAPS OR TAPE FROM FUEL LINE, AND SHUT OFF VALVE. OPERATE HEATER FUEL PUMP AND DRAIN A MINIMUM AMOUNT OF FUEL THROUGH THE FUEL LINE INTO A PORTABLE CONTAINER. RECONNECT HEATER FUEL LINE", shall be prepared. One tag each shall be secured to the personnel operating switch and one to the personnel heater.

3.1.8.8 Fuel tank preservation. Using the vehicle fuel pump, fuel tank shall be drained to the maximum extent possible. (Disconnect fuel line from the fuel pump to the fuel filter at the filter. Pump fuel into a recovery container). The fuel tank cap and filler screen shall be removed and coated with lubricating oil conforming to type 1, grade 30 of MIL-L-21260. Three (3) quarts of lubricating oil conforming to type 1, grade 10 of MIL-L-21260 shall be added to residual fuel. The tank cap and filler screen shall be reinstalled (see 4.5.2.2).

CAUTION: Special precaution shall be taken to assure pump is turned off as soon as fuel stops flowing into recovery container.

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3.1.8.8.1 Fuel tank security. After processing the fuel tank as specified in 3.1.8.8. The fuel cap cover shall be closed, then from inside of vehicle the combat lock shall be pulled to the lock position.

3.1.8.9 Ramp lift assembly. All unpainted metal surfaces of the ramp lift assembly, excluding cylinder rod, shall be coated with preservative conforming to grade 4 of MIL-C-16173.

3.1.8.9.1 Ramp hydraulic reservoir. The ramp hydraulic reservoir shall be filled with hydraulic fluid conforming to type I of MIL-H-46170.

3.1.8.10 Hatches, doors, and firing ports. Rubber seals around hatches and doors shall be coated with powdered talc conforming to type IV, class C of ZZ-T-416 or talc, technical, MIL-T-50036. Firing ports (M2, M2A1 and M2A2) shall have their plugs installed. For shipment, hatches and doors shall be closed and locked from the inside, except the driver's hatch. The driver's hatch shall be closed and secured from the outside with a bolt having a nut drawn up tight and exposed threads peened over to prevent easy removal, or a bolt having a nut drawn up tight with the nut tack welded to the bolt, or with a Government-issued padlock. For storage, hatches and doors shall be locked from the inside, except that the ramp door shall be secured in the open position for ventilation.

3.1.8.11 Turret position and travel lock. The turret and tow missile launcher shall be in their travel positions. The turret travel lock shall be engaged (locked position), securing the turret from rotating.

3.1.8.12 Ventilation.

3.1.8.12.1 Drain plugs. Drain plugs shall be in the open position. Drains are located on the left front and right rear of vehicle. A warning tag bearing the information "DRAIN PLUGS OPEN: PRIOR TO OPERATION, CLOSE PLUGS", shall be secured within the driver's compartment.

3.1.8.12.2 Engine access compartment panel. One engine compartment access panel shall be removed and stowed securely in crew compartment. A warning tag, bearing the information "ENGINE COMPARTMENT PANEL REMOVED: LOWER RAMP OR OPEN HATCHES WHEN OPERATING ENGINE", shall be attached in a conspicuous location within the driver's compartment.

3.1.8.13 Miscellaneous preservation. Except as otherwise specified herein, all exposed, unpainted metal surfaces on the exterior of the vehicle, except the track shoes, shall be coated with compound conforming to Grade 1 of MIL-C-16173. All exposed, unpainted, unplated metal surfaces on the interior of the vehicle shall be coated with compound conforming to grade 4 of MIL-C-16173.

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3.1.9 Packaging.

3.1.9.1 Dry charged batteries and cables. Vehicle dry charged batteries and turret dry charged batteries shall be installed and secured in their battery carriers. Battery cables shall be secured to battery carrier with 3/4-inch tape conforming to type IV of PPP-T-97. Battery filler cap openings shall be sealed by placing a 2-inch square X 3 mil thick piece of film conforming to type II of MIL-B-22191 over each filler cap opening with cap removed. The sheet shall be of sufficient length to allow it to be depressed into the opening to the same depth as the filler plug. Filler caps shall be screwed or inserted into openings to form a complete seal without damaging the sheet. If batteries have been processed in accordance with MIL-B-11188, they need not be reprocessed as above.

3.1.9.2 Electrolyte. Electrolyte shall be packaged and packed in accordance with O-S-801, except that the exterior container shall conform to PPP-B-621, class 2, or PPP-B-601, overseas type. Marking shall conform to O-S-801. The packed electrolyte shall be stowed on the same location as the BII and secured independently to permit separate removal.

3.1.9.3 Packaging of backrests and seats. Cushions of backrests and seats (see 3.1.7.1.2) shall be covered with paper conforming to grade B of UU-P-268 with a basis weight of not less than 60 pounds. The paper shall be secured with tape conforming to type I of A-A-883.

3.1.9.3.1 Seat and backrest positioning. Seats and backrests shall be placed in their stowed position. The rear center squad seat and pedestal on the M3 vehicle shall be removed and securely stowed within the crew compartment. Both of the rear center squad seats in the M2 vehicle shall be removed and securely stowed within the crew compartment.

3.1.9.4 Periscopes. Periscopes shall be left in place. Place tape conforming to MIL-T-60394, type I, on corners of glass surface (see figure 2). Over tape, place a piece of hardboard conforming to LLL-B-810, type II, surface II, finish D, design A, 1/8-inch thick size 2 3/4-inch X 7 3/4 inches.

3.1.9.5 Fire extinguishers. Fire extinguishers shall contain 90 percent of rated full charge. All seals shall be intact. DA Form 253 shall be completed and attached securely to each extinguisher (see 6.3).

3.1.9.6 Secondary gun sight. Remove secondary sight, clean and package in a type CF, class Weather-Resistant box conforming to PPP-B-636. Container shall be closed with tape conforming to type III, class 1, of PPP-T-60, identified as to contents, and securely stowed within the crew compartment.

3.1.9.7 TOW launcher. TOW launcher to be lowered to stowed position.

3.1.9.7.1 TOW launcher cover. The canvas cover on the rear of the launcher shall be in place and secured in position (see figure 3) with non-metallic strapping conforming to PPP-S-760, type II, 5/8 wide.

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3.1.9.8 Integrated sight unit (ISU). Doors on ISU cover shall be closed and latched from inside.

3.1.9.8.1 Flag holder. Remove flag holder from rear of Integrated Sight Unit cover. Reinstall mounting bolts and washers. Clean and package in a type CF, Class Water Resistant box conforming to PPP-B-636. Box shall be closed with tape conforming to type III, class 1, of PPP-T-60, identified as to contents, and securely stowed within crew compartment.

3.1.9.9 Backup sight. Backup sight shall be left in place. Place tape conforming to MIL-T-60394, type I, glass surface as shown in figure 4. Over tape, place a piece of hardboard conforming to LLL-B-810, type II, surface II, finish D, design A, 1/8 inch thick as shown in figure 4. Eye piece latch shall be in a locked position (eyepiece should not be allowed to traverse).

3.1.9.10 Grenade launcher openings. Seal grenade launcher openings with tape conforming to type IV of MIL-T-22085.

3.1.9.11 BII. Unless otherwise specified (see 6.2), BII shall be processed, packaged, and packed in accordance with MIL-B-12841. BII shall be stowed and secured in accordance with 3.1.9.11.1.

3.1.9.11.1 Stowage and securement of BII. BII and items removed for shipment shall be identified to the pertinent vehicle by serial number. (NOTE: BII and items removed for shipment shall not be identified to the pertinent vehicle by serial number if vehicle has been rebuilt or revised at depot). BII shall be stored inside buildings, except during shipment. Packed BII, receiver and feeder containers shall be placed inside the vehicle as shown in figure 6 and secured in place with 1-1/4-inch wide strapping conforming to the type I, class 1, finish A or QQ-S-781. (NOTE: If BII and other containers are packed in fiberboard containers and it has been determined 1-1/4-inch wide strapping will cause damage to containers, strapping width shall be reduced to 3/4-inch wide). Strapping shall be secured to holding devices within crew compartment. Additional strapping may be required if 3/4-inch wide strapping is used. BII, receiver, feeder, impact tool kit, and removed item boxes shall be secured in such a manner as to prevent any movement during transit and to prevent damage to containers or vehicle interiors. Corner protectors shall be used under all strapping.

3.1.9.12 25mm barrel support and 7.62mm machine gun barrel support. The 25mm barrel support and the 7.62mm machine gun barrel support shall be covered (see figure 5) with barrier material conforming to MIL-B-117, style 1, type I, class E. The bags shall be secured to supports with tape conforming to type IV of MIL-T-22085.

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3.1.10 Vehicle closure.

3.1.10.1 Closure kit. Unless otherwise specified (see 6.2), each vehicle shall be provided with a vehicle protective closure kit. The closure kit shall be fabricated, assembled, and installed in accordance with Drawing 12349601.

3.1.10.1.1 Antenna guard. Remove antenna guard from turret. Reinstall mounting bolts and washers. Clean and package in a type CF, class Weather Resistant box conforming to PPP-B-636. Box shall be closed with tape conforming to type III, class 1, of PPP-T-60, identified as to contents, and securely stowed within crew compartment.

3.1.10.2 Depot BII box marking. The information "DO NOT DESTROY - USE FOR RETURN SHIPMENT OF VEHICLE CLOSURE KIT" shall be stenciled on the depot BII box in lettering no less than 3/4 inch high with a contrasting color of enamel conforming to TT-E-529. Do not mark BII box if it is ascertained the container will not accommodate the closure kit.

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 and final drives. Transmission and final drives shall contain operational lubricant as specified on applicable drawings, specifications, or lubrication orders, filled to operating level. If however, these units contain lubricating oil conforming to type I, grade 10 or 30 of MIL-L-21260, an additional amount of the same oil shall be added to attain operating level. Operating lubricants shall not be mixed with MIL-L-21260 except in an emergency. DD Form 2258 shall be annotated to indicate grade of lubricant or preservative oil used.

3.2.2 Engine crankcase. The engine crankcase shall contain normal operational lubricant as specified in lubrication order, filled to operational level. DD Form 2258 shall be annotated to indicate grade of lubricant used.

3.2.3 Engine preservation. The engine shall require no preservation for level B shipment and storage.

3.2.4 Personnel heater and fuel pump. The personnel heater and fuel pump shall be in ready-to-use condition.

3.2.5 Residual fuel. Unless otherwise specified (see 6.2), the vehicle shall be shipped without draining residual fuel from the fuel tank.

3.2.6 Backrests and seats. Cushions of backrests and seats shall not be covered. If cushions are received packaged, they shall be stowed as received in the crew compartment.

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3.2.7 Engine compartment access panels. Engine compartment access panels in the crew compartment shall not be removed.

3.2.8 Antenna guard. The antenna guard shall not be removed for Level B shipment and storage.

3.2.9 Vehicle closure. Vehicle closure kits shall not be provided for level B shipment and storage.

3.3 Materials. Materials shall be as specified herein and in referenced specifications and drawings. Material shall be free from all defects and imperfections that might affect the serviceability and appearance of the finished product (see 4.5.1).

3.3.1 Recycled, virgin and reclaimed materials. There are no requirements for the exclusive use of virgin materials. The use of recycled or reclaimed (recovered) materials is acceptable provided that all other requirements of this specification are met (see 4.5.1).

3.4 Loading.

3.4.1 Loading flat cars. Loading of vehicles on open top railroad cars shall be in accordance with the applicable requirements of section I, General Rules Governing the Loading of Commodities on Open Top Cars, and figure 79, section 6, Rules governing the Loading of Department of Defense Material on Open Top Cars, publication of the Association of American Railroads.

3.4.2 Highway shipment. Loading of vehicles for shipment by haulaway and rules for shipment by driveaway or towaway shall be in accordance with Interstate Commerce Commission publication "Federal Motor Carrier Safety Regulations", and applicable military publications.

3.4.3 Reprocessing engine after loading.

3.4.3.1 Level A. If the engine is operated in connection with the moving of vehicle to the loading area or during the loading itself, the engine shall be reprocessed as specified in 3.1.8.6 through 3.1.8.6.4. The vehicle cover shall be rolled clear of the engine intake and exhaust to provide air circulation and to prevent damage to the cover. After reprocessing of engine, the vehicle cover shall be replaced in its original position.

3.4.3.2 Level B. If engine is operated in connection with the movement of vehicle for loading or unloading, there shall be no additional processing of engine.

3.5 Marking. In addition to any special marking required in the contract (see 6.2), the vehicle shall be marked in accordance with MIL-STD-129.

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3.5.1 Lifting points. The information "LIFT HERE" with an arrow pointing to the lifting eye shall be stenciled adjacent to each lifting eye using black ink conforming to A-A-208.

3.6 Drive on/drive off capability. When the vehicle is to be operated for loading or unloading (see 6.2), the following provisions shall apply:

3.6.1 Additional fuel. When specified (see 6.2), additional fuel shall be added, as required, to accomplish movement of vehicle.

3.6.2 Batteries and electrolyte. Batteries shall be filled with electrolyte, fully charged, and battery cables connected. After vehicle self-movement for loading or placement in storage. The vehicle negative ground cable shall be removed from the sponson behind and to the lower left of the driver's seat. Return bolt and washers to sponson. Wrap end of ground cable with tape conforming to type IV, class 1 of PPP-T-60, to protect against metal to metal contact. Secure loose cable to sponson with tape conforming to type IV, class 1 of PPP-T-60. A tag bearing the information, "VEHICLE PRESERVED FOR DRIVEAWAY CONDITION. BEFORE CRANKING, CONNECT NEGATIVE GROUND CABLE TO SPONSON BEHIND DRIVER'S SEAT. ENGINE AND FUEL TANKS NOT PRESERVED.", shall be attached in a conspicuous location within the driver's compartment.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order (see 6.2), the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, 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 or witness 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 Responsibility for compliance. All items must meet all requirements of section 3. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

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

4.2 First article inspection. Unless otherwise specified (see 6.2), 1 of the first 10 production processed vehicles (see 3.1.1) shall be subjected to the inspections specified in 4.5.

4.3 Production processed vehicles. Unless otherwise specified (see 6.2), all production processed vehicles shall be subjected to the inspections specified in 4.5.2 through 4.5.2.3.

4.4 Failure. Failure of the first article, 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 contractor has corrected the condition causing the failure has been provided to the Government.

4.5 Quality conformance inspection.

4.5.1 Materials. Except for the materials that have been inspected by the Government at the source, all materials to be used in processing of vehicles shall be inspected in accordance with the material specifications; or certified inspection and laboratory test reports shall be provided which show that furnished materials conform to the applicable material specification (see 6.5.1). When materials are listed on a Qualified Products List, they shall be obtained from one of the approved sources indicated.

4.5.2 Processing. Except as otherwise specified herein, vehicle processing shall be inspected to determine conformance to this specification. Inspection of processing shall include all items specified in table I and 4.5.2.1 through 4.5.2.4.

TABLE I. Processing inspection.
(See indicated paragraphs for Level A, B requirements)

Component	Cleaning	Preservation		Packaging/Stowage	
	Levels A & B	Level A	Level B	Level A	Level B
Processing records				3.1.4	3.1.4
Disassembly				3.1.5	3.1.5
Matchmarking				3.1.5.1	3.1.5.1
Interior of vehicle	3.1.7.1				
Battery supports & retainers	3.1.7.1.1	3.1.8.2	3.1.8.2		
Backrests & seats	3.1.7.1.2			3.1.9.3	3.2.6
Exterior of vehicle & weapon station	3.1.7.2				
Relubrication		3.1.8.1	3.1.8.1		

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TABLE I. Processing inspection - Continued.
 (See indicated paragraphs for Level A, B requirements)

Component	Cleaning	Preservation		Packaging/Stowage	
	Levels A & B	Level A	Level B	Level A	Level B
Transmission and final drives 1/		3.1.8.3	3.2.1		
Cooling system 1/		3.1.8.4	3.1.8.4		
Water and antifreeze procedures		3.1.8.4.1	3.1.8.4.1		
Water & corrosion inhibitor procedure		3.1.8.4.2	3.1.8.4.2		
Arctic antifreeze procedure		3.1.8.4.3	3.1.8.4.3		
Engine crankcase 1/		3.1.8.5	3.2.2		
Compression ignition engine		3.1.8.6	3.2.3		
Preservation thru fuel system and combustion chamber		3.1.8.6.2	3.2.3		
Preservation thru air intake and exhaust system		3.1.8.6.3	3.2.3	3.1.8.6.3	
Preservation thru oil level gage red opening 1/		3.1.8.6.4	3.2.3	3.1.8.6.4	
Personnel heater & lines		3.1.8.7	3.2.4		
Fuel tank		3.1.8.8	3.2.5		
Ramp lift assembly		3.1.8.9	3.1.8.9		
Ramp hydraulic reservoir		3.1.8.9.1	3.1.8.9.1		
Hatches & doors		3.1.8.10	3.1.8.10	3.1.8.10	
Turret position and travel lock		3.1.8.11	3.1.8.11		
Drain plugs				3.1.8.12.1	3.1.8.12.1
Engine compartment access panel				3.1.8.12.2	3.2.7
Miscellaneous preservation		3.1.8.13	3.1.8.13		
Dry charged batteries & cables		3.1.9.1	3.1.9.1	3.1.9.1	3.1.9.1
Electrolyte				3.1.9.2	3.1.9.2
Periscopes				3.1.9.4	3.1.9.4
Fire extinguishers				3.1.9.5	3.1.9.5
Record forms				3.1.6	3.1.6
Secondary gun sight				3.1.9.6	3.1.9.6
TOW launcher				3.1.9.7	3.1.9.7

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TABLE I. Processing inspection - Continued.
 (See indicated paragraphs for Level A, B requirements)

Component	Cleaning	Preservation		Packaging/Stowage	
	Levels A & B	Level A	Level B	Level A	Level B
TOW launcher cover				3.1.9.7.1	3.1.9.7.1
Integrated sight unit				3.1.9.8	3.1.9.8
Flag holder				3.1.9.8.1	3.1.9.8.1
Backup sight				3.1.9.9	3.1.9.9
Grenade launcher				3.1.9.10	3.1.9.10
Basic issue items (BII)				3.1.9.11	3.1.9.11
Stowage and securement of (BII)				3.1.9.11.1	3.1.9.11.1
25MM barrel support and 7.62mm machine gun barrel support				3.1.9.12	3.1.9.12
Vehicle closure kit				3.1.10.1	3.2.9
Antenna guards				3.1.10.1.1	3.2.8
Depot BII box marking				3.1.10.2	
Loading on flat cars				3.4.1	3.4.1
Highway shipment				3.4.2	3.4.2
Reprocessing engine after loading				3.4.3.1	3.4.3.2
Marking				3.5	3.5
Lifting points				3.5.1	3.5.1

1/ Inspect DD Form 2258.

4.5.2.1 Cleaning. To determine conformance to 3.1.7.1, the interior of vehicle shall be examined for cleanliness. One vehicle each day shall be tested for cleanliness in accordance with the applicable provisions of MIL-P-116. To determine conformance to 3.1.7.2, the exterior of vehicle shall be examined for cleanliness. Surfaces on which tape is to be applied shall be examined for cleanliness before application.

4.5.2.2 Fuel tanks. To determine conformance to 3.1.8.8, visual inspection of preservative application shall be accomplished to assure addition of the correct amount of oil, based upon a known amount of residual fuel.

4.5.2.3 Cooling system. To determine conformance to 3.1.8.4, one processed vehicle shall be selected at random from each day's production. The engine coolant shall be tested using a hydrometer-thermometer type tester, with a range of minus 60 to plus 160°F, conforming to MIL-T-37402.

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4.5.2.4 Engine. To determine conformance to 3.1.8.6.1 through 3.1.8.6.3, the interior of engine from 1 of the first 10 production processed vehicles shall be examined for surface coverage. The engine shall be disassembled to the extent necessary to permit visual examination of all surfaces within the combustion chamber. The combustion chamber is all surfaces within the cylinder from and including the surface of the head within the cylinder. All surfaces within the combustion chamber shall have a "wet" coating of preservative oil such as is obtained when an item is dipped or flushed with the oil.

5. PACKAGING

This section is not applicable to this specification.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Vehicle processing covered by this specification is intended to protect the vehicles for storage outside of buildings, for immediate use shipment, and for domestic or overseas shipment, including carloading.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Applicable level of processing (see 1.2).
- c. If first article inspection is not required (see 3.1.1).
- d. Applicable procedure for protection of cooling system (see 3.1.8.4).
- e. If BII should be processed, packed, or stored other than as specified (see 3.1.9.11).
- f. If vehicle closure kit is not required (see 3.1.10.1).
- g. If residual fuel shall be drained from the fuel tank prior to shipping (see 3.2.5).
- h. If special marking is required (see 3.5).
- i. If vehicle drive-on and drive-off capability is required (see 3.6).
- j. If additional fuel shall be supplied (see 3.6.1).
- k. If responsibility for inspection shall be other than as specified (see 4.1).
- l. If first article sample size shall be other than as specified (see 4.2).
- m. If production processed vehicles shall be subjected to inspections other than as specified (see 4.3).

6.3 Safety precautions. Caution should be exercised in handling carbon dioxide (CO₂) fire extinguisher cylinders. Cylinder should not be dropped, permitted to strike each other, or handled roughly. Extreme care should be exercised during the reinstallation operation to avoid tripping the fire extinguisher control system (see 3.1.9.5).

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6.4 Forms. A copy of the "Equipment Log Book" and all required forms (see 3.1.6) will be furnished to the contractor by the Government at least 30 days before shipment of the equipment as required by the contract delivery schedule.

6.5 Definitions.

6.5.1 Recovered materials. "Recovered materials" means materials that have been collected or recovered from solid waste (see 6.5.2).

6.5.2 Solid waste. "Solid waste" means (a) any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility; and (b) other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. It does not include solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Clean Water Act, (33 U.S.C. 1342 et seq.), or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) (Source: Federal Acquisition Regulations, section 23.402).

6.6 Supersession data. This military specification supersedes FMC corporation drawing number 12328552, revision G, dated 23 April 1987.

6.7 Government furnished equipment. Unless previously accomplished, government furnished equipment (GFE) (other than installed) shall be packaged, packed and marked in accordance with the individual document for the specific item. GFE shall be stowed with basic issue items (BII).

6.8 Subject term (key word) listing.

Cooling system
 Disassembly
 Engine
 Matchmarking
 Materials
 Miscellaneous preservation
 Processing
 Processing record
 Record forms
 Relubrication
 Tow launcher

6.9 AMC policy on AQLs/LTPDs. This specification is certified to be in compliance with current Army Materiel Command (AMC) policy for the elimination of AQLs/LTPDs (Acceptable Quality Levels/Lot Tolerance Percent Defectives) from military specifications.

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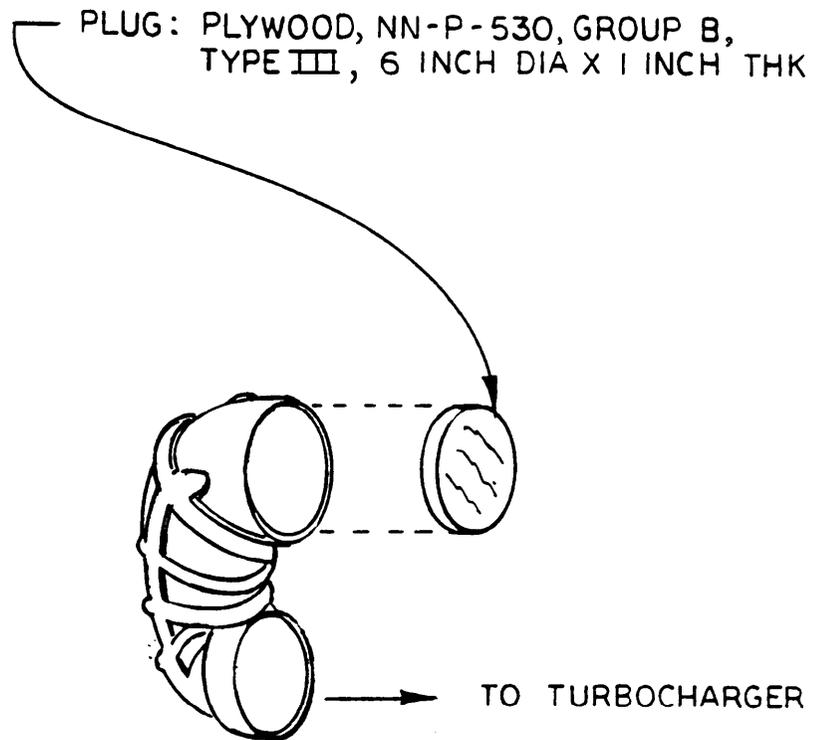


FIGURE 1. Air Restrictor Plug.

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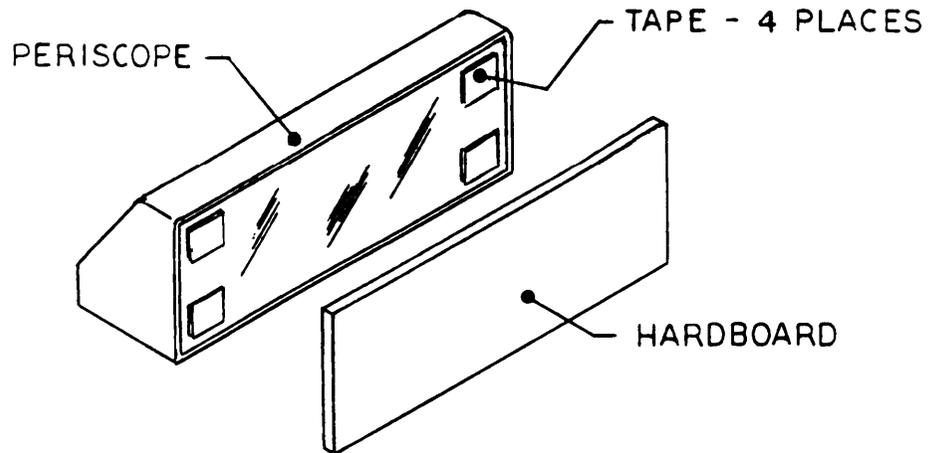


FIGURE 2. Periscope Protector.

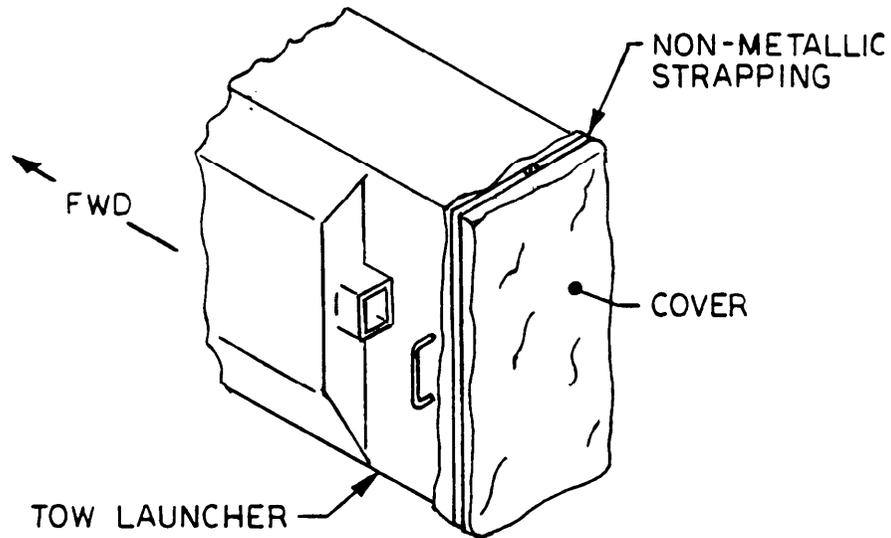


FIGURE 3. Launcher Cover.

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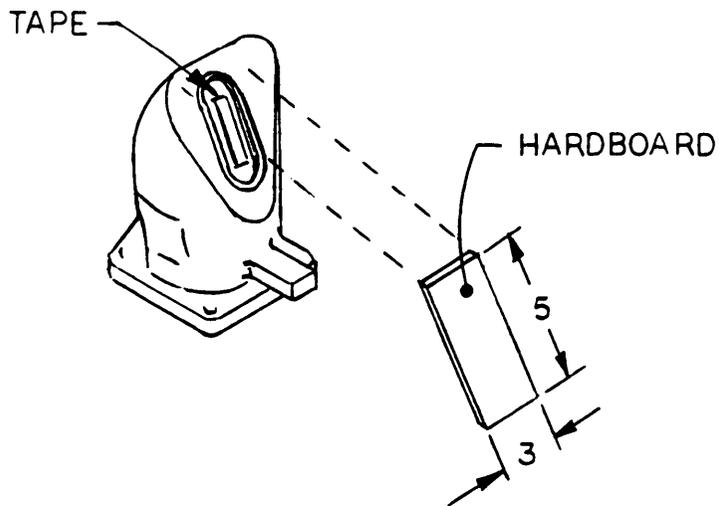


FIGURE 4. Backup Sight Protector.

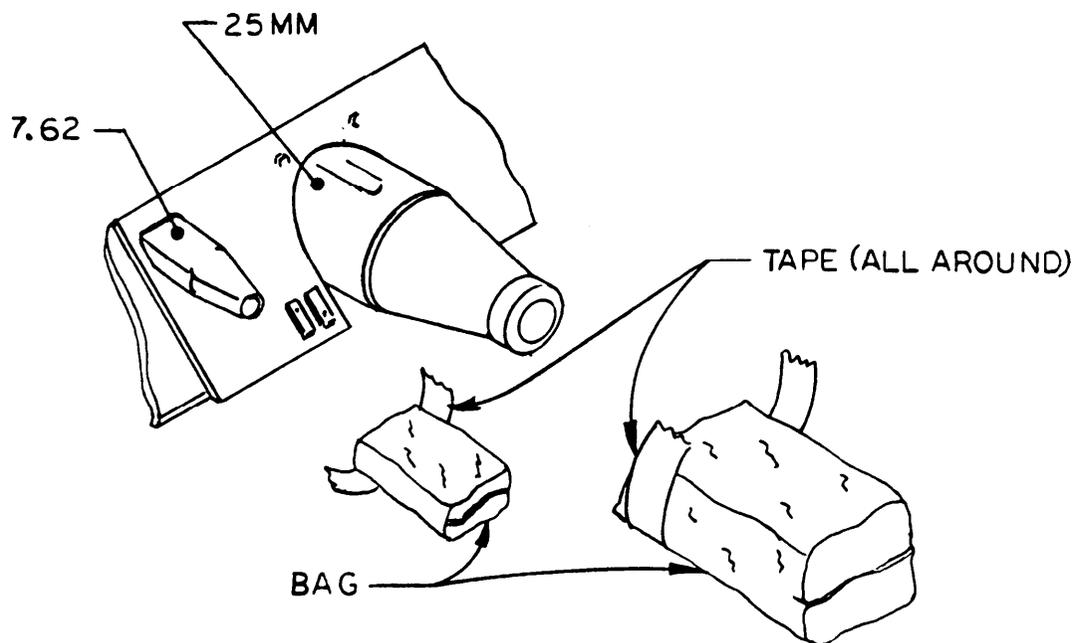


FIGURE 5. Barrel Support Closure.

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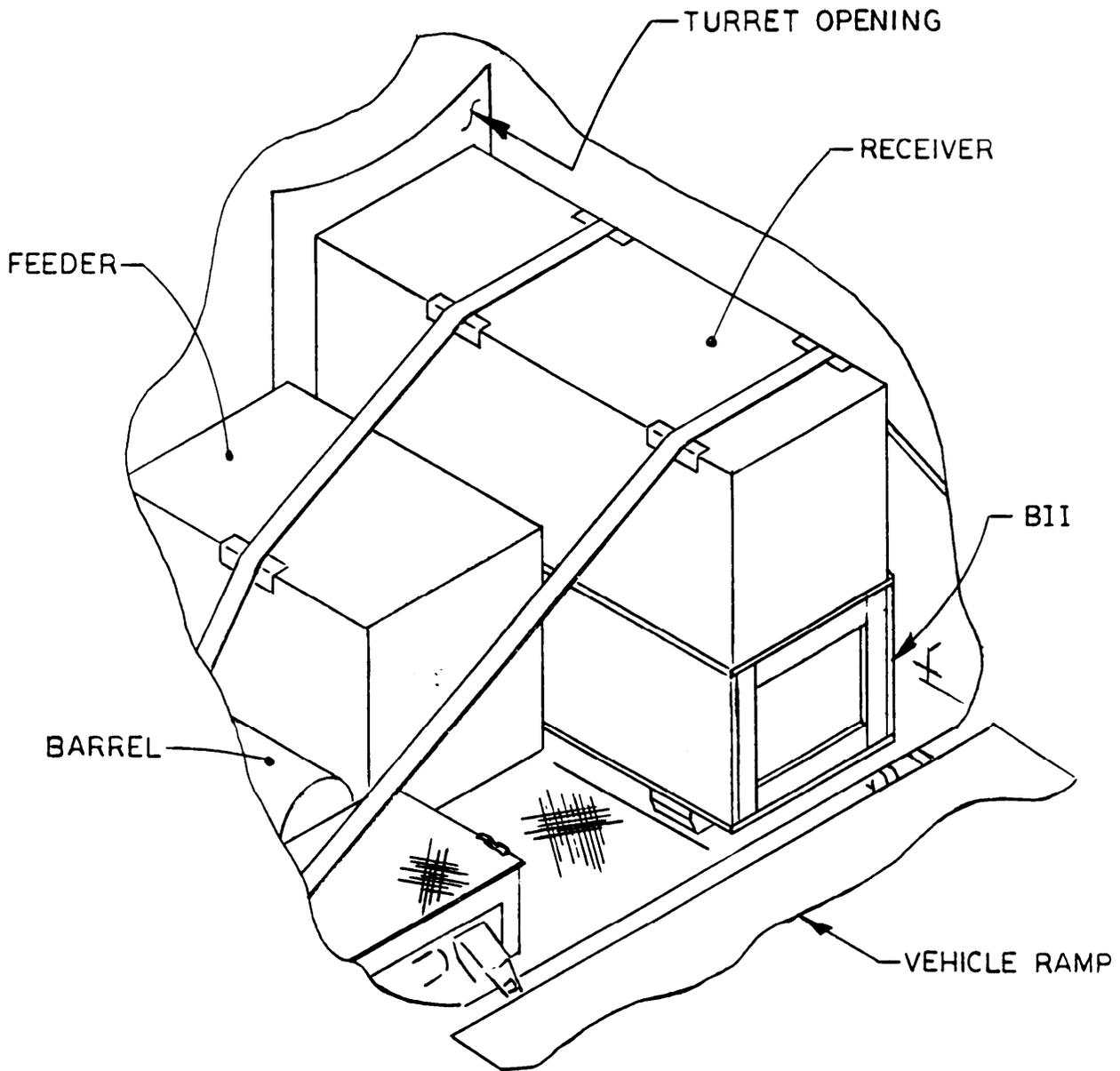


FIGURE 6. Interior Stowage.

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Custodian:
Army - AT

Preparing activity:
Army - AT

Review Activity:
Army - SM

(Project PACK-A345)

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