MILITARY STANDARD

AUTOMOBILES, TRUCKS, TRUCK TRACTORS, TRAILERS AND TRAILER DOLLIES; PRESERVATION AND PACKAGING OF

TO ALL HOLDERS OF MIL-STD-281A

1. MIL-STD-281A, 23 November 1965, is changed as follows:

2. Holders of MIL-STD-281A will verify that paragraph changes and additions indicated have been entered. This page will be retained as a check sheet. This change notice is a separate publication. Each notice is to be retained by stocking points until the Military Standard is completely revised or canceled.

FSC PACK

FOREWORD

(Superseded)

The purpose of this standard is to establish minimum preservation, packaging, and packing requirements for levels to be used for shipment and storage of wheeled vehicles in a mobile condition, boxed, and skidded.

Fundamentally, the vehicle processing procedures, methods, and materials contained in this standard are intended for use by all Department of Defense services when specifying requirements for preparation and preservation of vehicles for shipment and storage. This standard will be implemented by means of departmental documents (manuals, technical orders, supply bulletins, publications, limited coordination specifications, vehicle preparation for shipment and storage data sheets etc.,) to specify the requirements of this standard which apply to the specific vehicle or vehicles, as well as to provide coverage for installed equipment and peculiar parts and components not provided for in this standard.

The degree of protection provided in 5.1 is level A (mobile) preservation and packaging.

The degree of protection provided in 5.2 is level B (mobile) preservation and packaging required for the specific shipping, handling, and storage conditions stated therein. It is recognized that occasions will arise, such as favorable climatic conditions at the storage site that may justify modification of the level B requirements. Level B is designed for flexibility in that it permits the application of varying degrees of protection to fit the specific conditions. Only those minimum requirements necessary to protect the vehicle under specific conditions would be specified by the using service.

The degree of protection provided in 5.3 is level C (mobile) preservation and packaging.

The degree of protection provided in 5.4 is level A (boxed or skidded) preservation, packaging, and packing.

The degree of protection provided in 5.5 is level B (boxed or skidded) preservation, packaging, and packing.

The degree of protection provided in 5.6 is level C (boxed or skidded) preservation, packaging, and packing.

Requirements for quality assurance provisions are provided in section 6.

This revision A supersedes Standard MIL-STD-281, 25 April 1956, and the following specifications: MIL-T-3435A, 8 April 1959; MIL-T-3345A, 8 April 1959; MIL-P-10039B, 4 May 1955; MIL-P-10040B, 21 February 1955; and MIL-P-13784 (Ord), 12 November 1954.

2.1 (Superseded) The issues of the following documents in effect on the date of invitation for bids form a part of this standard to the extent specified herein.

SPECIFICATIONS

FEDERAL

C-N-200 — Neat's-Foot Oil.

L-P-378 — Plastic Film (Polyethylene Thin Gage).

O-A-548 — Antifreeze, Ethylene Glycol, Inhibited.

O-I-490 — Inhibitor, Corrosion, Liquid Cooling System.

T-R-571 — Rope; Cotton.

FF-N-105 — Nails, Wire, Brads, and Staples.

NN-P-515 — Plywood, Container Grade.

QQ-S-781 — Steel, Strapping, Flat.

UU-P-271 — Paper, Wrapping, Waterproofed Kraft.

UU-T-81 — Tags, Shipping and Stock.

VV-F-800 — Fuel Oil, Diesel.

VV-L-800 — Lubrication Oil, General Purpose, Preservative, (Water-Displacing, Low Temperature).

JJJ-C-86 — Castor Oil, Technical.

PPP-B-601 — Boxes, Wood, Cleated-Plywood.

PPP-B-621 — Boxes, Wood, Nailed and Lock-Corner.

PPP-B-636 — Box, Fiberboard.

PPP-B-640 — Boxes, Fiberboard, Corrugated, Triple-Wall.

PPP-T-60 — Tape: Pressure-Sensitive Adhesive, Waterproof, for Packaging.

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MIL-C-104 — Crates, Wood; Lumber and Plywood Sheathed, Nailed and Bolted.

MIL-P-116 — Preservation, Methods of.

MIL-B-117 — Bags and Sleeves, Interior Packaging.

MIL-B-121 — Barrier Material, Greaseproofed, Waterproofed, Flexible.

MIL-P-130 — Paper, Wrapping, Laminated and Creped.

MIL-S-207 — Sulfuric Acid, Electrolyte: Packaging, Packing, and Marking for Shipment and Storage of.

MIL-B-208 — Battery, Storage, Lead Acid, Automotive and Navy Portable (Except

Aircraft), Packaging and Packing of.

MIL-L-2104 — Lubricating Oil, Internal Combustion Engine (Heavy Duty).

MIL-L-2105 — Lubricating Oil, Gear, Multipurpose.

MIL-G-6711 — Graphite, Lubricating.

MIL-G-10924 — Grease, Automotive and Artillery.

MIL-C-11755 — Compound, Antifreeze, Arctic-Type.

MIL-P-12841 — On Vehicle Equipment (OVE) for Military Vehicles, Packaging of.

MIL-P-14105 — Paint, Heat Resisting, Olive Drab (for Steel Surfaces).

MIL-C-16555 — Coating Compound, Strippable, Sprayable.

MIL-L-21260 — Lubricating Oil, Internal-Combustion Engine, Preservative.

MIL-P-46046 — Preservative Fluid, Automotive Brake System and Components.

MIL-P-46093 — Primer Coating, Synthetic (for Brake Drums).

MIL-T-50036 — Talc, Technical, T1.

STANDARDS

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MIL-STD-105 — Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-109 — Quality Assurance Terms and Definitions.

MIL-STD-129 — Marking for Shipment and Storage.

MIL-STD-162 — Materials Handling Equipment, Self-Propelled: Preparation for Delivery and Storage.

PUBLICATIONS

ARMY

TM 38-750 — Army Equipment Record Procedures.

(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. (Superseded) The *following documents form a part of this standard.* Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

INTERSTATE COMMERCE COMMISSION

Motor Carrier Safety Regulations.

(Application for copies should be addressed to the Interstate Commerce Commission, Bureau of Motor Carriers, Washington, D.C.)

ASSOCIATION OF AMERICAN RAILROADS

Rules Governing the Loading of Commodities on Open Top Cars.

(Application for copies should be addressed to the Association of American Railroads, 59 East Van Buren, Chicago 5, Ill.)

CONSOLIDATED CLASSIFICATION COMMITTEE
Official Classification Committee
Uniform Freight Classification Rules.

(Application for copies should be addressed to the Official Classification Committee, 1 Park Avenue at 33rd Street, New York, N.Y. 10016)

AMERICAN TRUCKING ASSOCIATIONS, INC.
National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Associations Inc., 1616 P Street, N.W., Washington, D.C. 20036)

4.3 Disassembly. (Superseded) Maximum practicable reduction in cube shall be effected for all oversea shipments. Parts vulnerable to damage and pilferage; and projecting parts whose removal will accomplish the desired reduction in cube, such as soft top cabs, cargo body covers (if applicable), bows, gear shift knobs, windshield wiper arms and blades, and side view mirrors shall be removed. Related vehicular components and above items shall be preserved, packaged, packed (separate from OVE) and stowed on the vehicle in accordance with the level of protection to which the vehicle is being preserved, packaged and packed, and the applicable specifications. The packed parts shall be placed in a protected location on the vehicle and secured in a manner to prevent movement and damage during shipment and storage. Removed bolts and nuts, screws, pins, and washers shall be placed in one of the mating parts and secured to prevent their loss. The wheels shall be removed for boxed preparation of truck chassis; and parts such as wheels, axles, bearings, drawbars, and lamps shall be removed, if necessary, for boxed and skidded preparation of trailers.

4.6 Record forms. (Superseded) Record forms designated by the agency concerned shall be furnished and completed with each vehicle. For Army use, one copy of the "Equipment Log Book" or "Equipment Maintenance Log, Consolidated" and forms required in TM 38-750 and two copies of "Processing and Deprocessing Record for Shipment, Storage and Issue of Vehicles and Spare Engines," DD Form 1397, shall be furnished and completed with each vehicle. Information on forms shall include preservation accomplished and depreservation instructions. Log book or equipment maintenance log consolidated, with required forms, and one copy of DD Form 1397 shall be placed in a bag conforming to type II, class B or C of MIL-B-117. The bag shall be sealed and placed in dash compartment or lubrication order holder; or securely attached in a conspicuous location near identification or data plate.

4.7 On vehicle equipment. (Superseded) On vehicle equipment shall be preserved, packaged, packed and stowed in accordance with MIL-P-12841, or other specification designated by the agency concerned, at the level specified (see 7.1 and 7.3). All miscellaneous tools and equipment shall be considered as OVE. Unless previously accomplished, Government furnished equipment (GFE) other than installed components, shall be packed in an exterior container conforming to class as specified (see 7.1), style 4 of PPP-B-621, separate from OVE. The GFE placed in the container shall be that equipment specified for each vehicle. Container shall be marked in accordance with MIL-STD-129, stowed with OVE and secured independently to facilitate separate removal. All containers shall be secured with strapping conforming to type I, class B of QQ-S-781.

4.7.1 *Tarpaulins.* (Superseded) Except when otherwise specified, tarpaulins and other loose canvas items not otherwise provided for herein shall be thoroughly dried, folded, or rolled in a manner to avoid creas-

ing of plastic windows, packaged in accordance with method III of MIL-P-116, and packed in accordance with MIL-P-12841. Boxes shall be marked to indicate the contents and stowed in a protected location on the vehicle.

4.8 Intervehicular (jumper) cable, air lines and safety chains. (Superseded) Intervehicular (jumper) cable shall be secured to vehicle with tape conforming to class 1 of PPP-T-60. Connectors at end of air lines shall be secured in the dummy couplings. Safety chains and loose portions of air lines shall be secured to vehicle draw bar in the same manner as the cable. Cables and airlines shall not have a bend of less than 12 inch radius when taping to the vehicle.

4.9 Marking. (Superseded) In addition to specified special marking, vehicles shall be marked in accordance with the applicable requirements of MIL-STD-129.

4.10 Loading. (Superseded)

4.10.1 *Rail shipment.* (Added) Loading of vehicles on open-top cars for shipment by rail shall be in accordance with the applicable requirements of Association of American Railroads, "Rules Governing the Loading of Commodities on Open-Top Cars."

4.10.2 *Highway shipment.* (Added) Loading of vehicles for shipment by haulaway, and rules for shipment by driveway or towaway shall be in accordance with Interstate Commerce Commission Publication, "Motor Carrier Safety Regulations" and applicable Military regulations.

4.11 Implementation of requirements. (Superseeded) For U.S. Army Tank-Automotive Center's use, requirements of this standard will be implemented by completion of Vehicle Preservation Data Sheet, OTA Forms 4497 and 4497A. Referenced forms will be used to implement specific preservation requirements for each item and will be used as the contract instrument (see figure 1).

5.1.8 *Air compressor.* (Superseded) Where the lubricating system is separate from the associated power unit, air compressor crankcase shall contain type P-10 preservative oil only, grade 1 or 2 as applicable, filled to operating level. Compressor air cleaner shall be removed and air intake and outlet disconnected. Prior to or while engine is being operated during preservation (see 5.1.7.1 or 5.1.7.2 as applicable), type P-10, grade 2 preservative oil shall be sprayed into compressor air intake until oil appears at outlet, then air intake and outlet shall be reconnected. Compressor air cleaner (oil-bath type) shall be preserved as specified in 5.1.5 and reinstalled.

5.1.9 *Batteries and cables.* (Superseded) Cables shall be secured to battery support with tape conforming to class 1 of PPP-T-60. Retainers and related hardware shall be grouped together and secured to battery support with the same class tape. When specified (see 7.1), batteries shall be secured in place in vehicle battery carrier. The vent holes in the filler caps of dry charged batteries shall be plugged or sealed. Unless otherwise specified (see 7.1), dry charged batteries shall be packaged in accordance with the oversea requirements of MIL-B-208.

5.1.9.1 *Electrolyte (crate-type pack).* (Added) Unless otherwise specified (see 7.1), electrolyte shall be packaged and marked in accordance with the requirements prescribed for type IV, class 1 or 2 unit, as applicable of MIL-S-207. The required number of unit packages of electrolyte shall be packed in separate crate type structures. Crates shall have solid ends of nominal one inch lumber. Four slats of moisture resistant plywood conforming to type II of NN-P-515, having a length to fit, 4 inches wide

by ¼ inch thick, shall form the sides. One slat is required for each side. Each slat shall be secured to the approximate center of the crate ends with two 3d, sinker or cooler cement coated nails, conforming to FF–N–105. Nails shall be placed one inch from the slat side, two inches on center. Crate shall be banded with ¾ inch strapping conforming to type I, class B of QQ–S–781. Strapping shall run lengthwise, with the straps placed at the approximate center of slats, and criss-crossed at right angles over the solid ends. Corner protectors shall be used under strapping. If markings on electrolyte unit packages is obscured by the crate, the same marking information shall be applied on the exterior surfaces of the crate. Arrows shall be applied to each crate to indicate correct stacking. Crates shall be stowed with OVE and secured independently in a manner to prevent movement and damage in transit and facilitate easy removal at ports when special stowing is required by maritime regulations.

5.1.9.2 *Electrolyte (exterior container pack, MIL–S–207).* (Added) When specified (see 7.1), electrolyte shall be packaged, packed, and marked in accordance with the requirements prescribed for type IV, class 1 or 2 unit, as applicable of MIL–S–207, and stowed and secured with the OVE.

5.1.10 *Drive belts.* (Superseded) Tension of all drive belts shall be released. Unpainted surfaces of pulley groove shall be coated with primer conforming to MIL–P–46093. A warning tag, bearing the information "BELT TENSION RELEASED; ADJUST BEFORE STARTING ENGINE," shall be securely attached in a conspicuous location within driver's compartment.

5.1.11 *Exhaust system.* (Superseded) Unpainted surfaces of exhaust system, except manifold, shall be coated with type P–1 preservative or paint conforming to MIL–P–14105. When required for reduction in cube, upper section of vertical tailpipe shall be removed, coated with type P–1 preservative, and stowed with other OVE. Opening of vertical tailpipes or opening left by disassembly, shall be sealed with tape conforming to class 1 of PPP–T–60.

5.1.12.1 *Fill and drain method.* (Superseded) Unless otherwise specified (see 7.1), fuel tanks shall be completely drained of fuel, filled with type P–10, grade 2 preservative oil, and again drained. Tank shall be allowed to stand with drain plug removed until oil flow ceases. Plug and tank filler cap shall be coated with the type P–10, grade 2 preservative oil and reinstalled. In some cases it may be necessary to provide venting by removing the screw from the sending unit or by some other means so that an air lock at the top of the tank will not develop, preventing coating of the upper interior surfaces. Drained preservative oil may be reused for processing of other gasoline fuel tanks provided not more than 10 percent of the resultant fluid is gasoline when tested as specified in 6.13.1.

5.1.13 *Disc-type clutch.* (Superseded) Clutch pedal, with gear shift in "NEUTRAL" position, shall be depressed a distance sufficient to remove free play, and then depressed 1 to 1½ inches more. Pedal shall be secured in depressed position by wiring to floorboard plates; or by wiring a woodblock to pedal shaft beneath floorboard. Flywheel housing drain plug shall be removed and coated with type P–19 preservative. Drain plug, together with a warning tag bearing the information "FLYWHEEL HOUSING DRAIN PLUG REMOVED; REINSTALL BEFORE PLACING VEHICLE IN SERVICE," shall be securely attached in a conspicuous location within driver's compartment. When a threaded boss is provided in flywheel housing adjacent to drain hole, removed drain plug shall be installed in threaded boss. A warning tag, bearing the informa-

tion "FLYWHEEL HOUSING DRAIN PLUG REMOVED AND INSTALLED ADJACENT TO DRAIN HOLE; REINSTALL IN DRAIN HOLE BEFORE PLACING VEHICLE IN SERVICE," shall be securely attached in a conspicuous location within driver's compartment.

5.1.13.1 *Clutch disassembly.* (Superseded) When specified (see 7.1), in addition to 5.1.13 clutch shall be disassembled and metal surfaces of operating parts, including clutch collars, linkage, pins, and flywheel ring gear and starter drive shall be coated with a thin film of primer conforming to MIL-P-46093.

5.1.13.2 *Clutch plate removal.* (Superseded) When specified (see 7.1), in addition to 5.1.13 clutch cover plates shall be removed and, with the clutch engaged, all accessible metal surfaces within the housing shall be sprayed with a thin film of primer conforming to MIL-P-46093.

5.1.14.1 *Interior surfaces of brakedrum.* (Superseded) When specified (see 7.1), interior surfaces enclosed within breakdrum, such as brake cams, anchor pins, adjusting screws, and braking surfaces of face of the brakedrum shall be coated with a thin film of primer conforming to MIL-P-46093. Care shall be exercised to prevent primer from contacting brake lining and rubber impregnated parts. A warning tag, bearing the information "BRAKEDRUMS PRESERVED; DO NOT APPLY BRAKES WHEN VEHICLE IS BEING MOVED," shall be securely attached in a conspicuous location or within driver's compartment. Towing shall be with a rigid tow bar or similar arrangement.

5.1.14.3 *Hydraulic brakes.* (Superseded) Brake system shall be filled with operational hydraulic brake fluid in accordance with applicable drawings, specifications, lubrication orders or instructions of using services. When specified (see 7.1), brake system shall be purged of the operational hydraulic brake fluid and filled with non-petroleum base preservative and limited operational hydraulic fluid conforming to MIL-P-46046. A tag shall be attached to the steering wheel with the following warning. "BRAKE SYSTEM FILLED WITH PRESERVATIVE BRAKE FLUID. REPLACE WITH OPERATIONAL BRAKE FLUID BEFORE PLACING VEHICLE IN SERVICE."

5.1.15.1 *Hard-top cab.* (Superseded) Door hinges, latches, and operating mechanisms shall be lubricated with type P-9 preservative oil. Locks shall be lubricated with graphite conforming to MIL-G-6711. Inspection access plates shall be removed and all interior surfaces of doors including inner surfaces of access plates, if unpainted, shall be coated with type P-1 preservative, and access plates reinstalled. Care shall be exercised to assure that door drain holes remain open. Windows shall be open ½ inch for ventilation and, when applicable, cab air vents shall be left in open position. All rubber molding around doors, windows, and vents shall be dusted with talc conforming to MIL-T-50036. Windshield wiper arms and blades shall be removed and, together with keys, placed in a waterproof bag conforming to type I class B or C of MIL-B-117, then stowed in dash compartment, or securely attached to steering column.

5.1.15.2 *Soft-top and open-type cabs.* (Superseded) Except when removal of top is required for shipment and storage, cab shall be processed in accordance with 5.1.15.1. Soft-top cabs shall be removed for oversea shipment when removal will effect reduction in cube. Removed top shall be thoroughly dried, folded, or rolled in a manner to avoid creasing of plastic windows, packaged in accordance with method III of MIL-P-116, and packed in accordance with MIL-P-12841. Boxes shall be marked to indicate the contents and stowed in a protected location on the vehicle. Windshield wiper arms

and blades shall be removed and, together with keys, stowed in dash compartment, and windshield secured in folded-down position. When dash compartment is not provided, wiper arms and blades, together with keys, shall be placed in a bag conforming to type I, class B or C of MIL-B-117 and securely attached to steering column. Seat backs and cushions shall be removed and fabric surfaces covered with barrier material conforming to class L-4 of UU-P-271 and secured with rope conforming to class 2, 3/8 inch circumference, of T-R-571; or covered with black, 6 Mil thick polyethylene conforming to L-P-378 and secured with tape conforming to class 1 of PPP-T-60. Horn backs and cushions shall be reinstalled. Dash panel, including defroster vents, shall be covered with barrier material conforming to class L-4 of UU-P-271 or black, 6 mil thick polyethylene conforming to L-P-378 and secured, except at bottom, with tape conforming to class 1 of PPP-T-60. Horn button shall be covered with the same type of material, of a size to completely cover opening around horn button, and secured in the same manner as specified and dash panel. Floor mat shall be removed, rolled, tied, and stowed on the vehicle. Doors including hinges, latches, seals, locks, operating mechanisms, access plates, and interior surfaces of doors accessible through inspection openings shall be processed in accordance with applicable requirements of 5.1.15.1. Door glass shall be rolled down to the maximum extent and door glass slit sealed with tape conforming to class 1 of PPP-T-60. When top is removed from vehicles equipped with automatic transmissions only, gear shift lever shall be placed in neutral position and exposed machined surfaces shall be coated with grease conforming to MIL-G-10924. Openings in top of shift towers shall be covered with tape conforming to class 1 of PPP-T-60.

5.1.16.1 *Cargo and command bodies.* (Superseded) Cover shall be removed, leather straps coated with neat's foot oil conforming to C-N-200, and cover, including end curtains, shall be thoroughly dried, folded, or rolled, packaged in accordance with method III of MIL-P-116, and packed in accordance with MIL-P-12841. Boxes shall be marked to indicate the contents and stowed in a protected location on the vehicle. Top bows shall be removed. Unpainted metal surfaces of bows, stake pockets, and removed hardware shall be coated with type P-1 preservative, and hardware, when dry, shall be reinstalled into one of the mating parts. Bows shall be banded together with strapping conforming to type I, class B of QQ-S-781 and secured to floor of cargo compartment. Openings afforded by removal of bows, and stake pockets that are not provided with drain holes to permit draining, shall be covered with tape conforming to class 1 of PPP-T-60. When required for reduction in cube, troop seats and side racks shall be removed, banded together with the same class strapping, and secured to floor of cargo compartment. Boxed cover shall be stowed and secured with other OVE. Body drains shall be opened to prevent accumulation of water.

5.1.16.2 *Dump body.* (Superseded) Unpainted metal surfaces of body, roller arms and ramps, uncovered tailgate chains, locking devices, control levers, and related linkage shall be coated with type P-1 preservative. Hydraulic system shall be filled to operating level with operational hydraulic fluid. Removed hardware and unpainted surfaces exposed by disassembly shall be coated with type P-1 preservative, and hardware reinstalled into one of the mating parts. All exposed, unpainted machined surfaces of the hydraulic ram, when the dump body is fully retracted shall be coated with type P-11 preservative, wrapped with barrier conforming to type II, grade A, class 2 of MIL-B-121 and secured with tape conforming to class 1 of PPP-T-60.

5.1.16.3 *Van, ambulance, panel utility, and maintenance truck bodies.* (Superseded) Body drains and ventilators shall be placed in open position to provide all possible ventilation. Door hinges, latches, and operating mechanisms shall be lubricated with type P–9 preservative oil. Special equipment, when furnished with body, such as shop cabinets, tools and benches, electronic equipment, air compressors, generators, and refrigeration air conditioning (see 5.1.16.3.1), and heater units shall be preserved packaged and packed in accordance with requirements of existing applicable specifications; or as specified by the procuring activity (see 7.1). Doors shall be closed and secured to prevent pilferage or damage.

5.1.16.3.1 *Refrigeration air conditioning units.* (added) Packed refrigeration air conditioning units (see 5.1.16.3) shall be blocked, braced and anchored inside the van body in a manner to prevent damage in transit. Opening in van body, resulting from removal of the unit, shall be covered with a sheet of fiberboard conforming to type CF, grade V3c or type SF, grade V3s of PPP–B–636. Fiberboard shall be secured and sealed in place with tape conforming to class 1 of PPP–T–60. Tape shall be a minimum of 6 inches in width. Three inches of the tape shall be placed on fiberboard and the other 3 inches onto vehicle surface. Fiberboard and tape shall be coated with coating compound conforming to MIL–C–16555. Thickness of coating shall be such as to result in a maximum thickness of 0.040 inches, measured after 4 hours of drying. Specified thickness shall extend not less than 2 inches beyond tape onto vehicle surface.

5.1.16.4 *Utility truck body.* (Superseded) Top shall be removed, thoroughly dried, folded, or rolled in a manner to avoid creasing of plastic windows, packaged in accordance with method III of MIL–P–116, and packed in accordance with MIL–P–12841. Boxes shall be marked to indicate the contents and stowed in a protected location on the vehicle. Windshield wiper arms and blades shall be removed and, together with keys, stowed in dash compartment, and windshield secured in folded-down position. When dash compartment is not provided, wiper arms and blades, together with key, shall be placed in a bag conforming to type optional, class B or C of MIL–B–117, and securely attached to steering column. Seat backs and cushions shall be removed and fabric surfaces covered with barrier material conforming to class L–4 of UU–P–271 and secured with rope conforming to class 2, $\frac{3}{8}$ inch circumference, of T–R–571; or covered with black, 6 mil thick polyethylene conforming to L–P–378 and secured with tape conforming to class 1 of PPP–T–60. Seat backs and cushions shall be reinstalled. Dash panel, including defroster vents, shall be covered with barrier material conforming to class L–4 of UU–P–271 or black, 6 mil thick polyethylene conforming to L–P–378 and secured, except at bottom, with tape conforming to class 1 of PPP–T–60. Horn button shall be covered with the same type of material, of a size to completely cover opening around horn button, and secured in the same manner as specified for dash panel.

5.1.16.5 *Fuel tank body.* (Superseded) Unless otherwise specified (see 7.1), all interior surfaces of fuel compartments of steel tanks except stainless steel surfaces and surfaces having protective coatings shall be coated with type P–10, grade 2 preservative oil. The underside of hatches shall be considered an interior surface. All tank emergency valves and gate valves shall be left in open position. All valves left open to atmosphere shall be covered with screen or dust cap. Rubber seals of hatches shall be coated with talc conforming to MIL–T–50036, and hatches shall be closed and secured. Exterior unpainted metal surfaces of hose couplings, valves, and pump shall be coated with type P–1 preservative. Equipment

compartment drains shall be secured in open position. When applicable, the keys to vehicle stowage cabinet shall be identified and secured in a conspicuous location adjacent to engine instruments inside stowage cabinet. Door hinges and latches shall be lubricated with type P-9 preservative oil and doors closed and secured to prevent pilferage or damage. When equipped with CO_2 fire extinguishers, the exterior portable CO_2 fire extinguisher shall be packed in a fiberboard container, identified and secured in the stowage cabinet. When the tank has a liquid separator, the liquid separator filter shall be processed in accordance with the following procedure. The coupling at the top of the separator shall be disconnected and the pump shut-off valve closed. The separator shall then be filled with oil conforming to VV-L-800 and then drained by opening the water drain valve. After the separator has drained the water drain valve shall be closed. When specified (see 7.1), in lieu of coating of interior of tanks with preservative, a dehumidification method or a volatile corrosion inhibitor method shall be used.

5.1.16.5.1 *Fuel pumping system.* (Superseded) All interior surfaces of fuel transfer pump shall be sprayed with type P-10, grade 2 preservative oil. Manifold valves shall be placed in open position. Pump and sump drain plugs shall be removed, coated with type P-10, grade 2 preservative oil and placed in a bag conforming to type I, class C of MIL-B-117 and contents identified. A warning tag, bearing the information "PUMP AND SUMP DRAIN PLUGS REMOVED; REPLACE BEFORE OPERATING ENGINE AND PUMP," shall be securely attached, together with bag, in a conspicuous location on the pump.

5.1.16.5.2 *Auxiliary engine.* (Added) For vehicles equipped with auxiliary type engines such as generator and fuel servicing vehicles the engine shall be preserved in accordance with 5.1.7 as applicable. Components of auxiliary engines shall be preserved in accordance with applicable paragraph of this standard for the level required.

5.1.16.6 *Water tank body.* (Superseded) Water tank body shall be cleaned in accordance with process C-14, using a nontoxic cleaning compound and dried by procedure D-1 of MIL-P-116. After cleaning, drains and lower outlets shall be left in open position and openings covered with filter paper or fine mesh aluminum or plastic screen, secured in place with tape conforming to class 1 of PPP-T-60. Removed drain plugs shall be coated with type P-14 preservative, and placed in a bag conforming to type II, class C of MIL-B-117. The bag shall be marked to indicate the contents, sealed, and securely attached to one of the faucets; or in a conspicuous location within equipment compartment. Valves, faucets, and forward outlet shall be coated with type P-14 preservative. Rubber seals of hatches and top openings shall be coated with talc conforming to MIL-T-50036, and forward outlet, hatches, and top openings shall be closed and secured. Equipment compartment drains shall be secured in open position and compartment doors closed and secured to prevent pilferage or damage. For steel tanks (other than stainless or precoated) all interior tank surfaces shall be coated with type P-14 preservative.

5.1.17 *Inverted trailers.* (Superseded) When cargo or other type trailers are to be inverted for shipment, filler plug and vent assembly shall be removed from hydraulic brake master cylinder and solid plug installed, using two compression-type copper gaskets, to prevent loss of brake fluid. Filler plug and vent assembly shall be coated with method IC-1 of MIL-P-116, and secured to master cylinder. A warning tag, bearing the information "MASTER CYLIN-

DER FILLER PLUG AND VENT ASSEMBLY SECURED TO MASTER CYLINDER; REINSTALL BEFORE PLACING VEHICLE IN SERVICE," shall be securely attached to trailer-to-vehicle brake line connection. Exposed ends of airplane type shock absorbers shall be covered with tape conforming to class 1 of PPP-T-60. When required for shipment, wheels of inverted trailer shall be removed and secured to trailer bed. Removal of racks is required when applicable, for all shipments, and removal of wheels is required for all oversea shipments, when their removal will effect cost savings.

5.1.18 *Miscellaneous preservation.* (Superseded) All exterior, unpainted surfaces such as steering assemblies, frames, tie rods, adjusting rods, springs, pintle assemblies, fifth wheels, upper fifth wheel plates and kingpins, trailer landing gear, stabilizing jacks, electrical, electronic and hydraulic outlets and connections, and surfaces exposed by disassembly shall be coated with type P-1 preservative. Exposed, unpainted, machined-metal surfaces, and threaded surfaces that require occasional turning in normal operation of the unit shall be coated with type P-19 preservative. Padlocks shall be lubricated with graphite conforming to MIL-G-6711. External unpainted surfaces of engine shall not be processed with contact preservatives.

5.1.19 *Winch and derrick assemblies.* (Superseded) Winch gear case and other gear driven units shall contain gear lubricant conforming to requirements of applicable lubrication order, filled to operating level. Unless otherwise specified (see 7.1), wire cable shall be unreeled and all surfaces shall be coated with type P-1 preservative. While cable is being rewound, any damage to applied preservative coating shall be repaired by application of additional type P-1 preservative to damaged areas. When specified (see 7.1), wire cable shall be unreeled and all surfaces shall be coated with a suitable preservative grease or a hard film preservative compound. While cable is being rewound, any damage to applied preservative coating shall be repaired by application of additional preservative to damaged areas. The wire cable shall be free of any corrosion before preservative is applied. All exposed, unpainted metal surfaces of cable drums, sheaves, snatch blocks, boom block, A-frame, crane, or derrick boom, controls, and linkage shall be coated with type P-1 preservative. The winch automatic brake assembly cover, brake band, brake spring adjusting pin, and brake spring shall be removed. All exterior surfaces of the brake disk and brake band shall be coated with primer conforming to MIL-P-46093. Exterior surfaces of brake spring adjusting pin, brake spring, and all related hardware, shall be coated with grease conforming to MIL-G-10924. All removed items and brake assembly cover shall be reinstalled. All moving, mating parts shall be coated with grease conforming to MIL-G-10924. Hydraulic system shall contain operational hydraulic fluid, filled to operating level. When operating surfaces of hydraulic piston are exposed, piston shall be coated with grease conforming to MIL-G-10924, and overwrapped with barrier material conforming to type I, grade A, class 1 of MIL-B-121, and secured with tape conforming to class 1 of PPP-T-60. When hydraulic piston is retracted, exposed surfaces of piston shall be coated with type P-11 preservative, wrapped with barrier conforming to type I, grade A, class 1 of MIL-B-121, and secured with tape conforming to class 1 of PPP-T-60. Hydraulic controls shall be secured in neutral position.

5.1.20 *Repair Parts.* (Superseded) Repair parts shall be preserved and packaged as specified by the procuring activity (see 7.1), and packed in a minimum number of nailed wood boxes conforming to class 2, style optional, of PPP-B-621; wood cleated-plywood boxes conforming to oversea type,

style optional, of PPP-B-601; or fiberboard boxes conforming to class weather resistant, grade optional, of PPP-B-636; or class 2, style optional, of PPP-B-640. The number, size and weight of the boxes shall be determined by the available space and convenience for packing on the truck chassis and trailer. Boxes shall be strapped in accordance with the appendix to the applicable box specification. Boxes shall be positioned on the vehicle so as not to increase cubage or to interfere with lifting or towing the vehicle.

5.1.21 *Tools.* (Superseded) Tools shall be preserved and packaged as specified by the procuring activity (see 7.1). Unless otherwise specified (see 7.1), tools shall be placed in the toolbox on the equipment. The lid of the toolbox shall be closed and secured. Lid joints shal be sealed with tape conforming to class 1 of PPP-T-60.

5.1.23 *Technical publications.* (Superseded) Technical publications for each vehicle shall be packaged in accordance with method IC-1 of MIL-P-116. Unless otherwise specified (see 7.1), technical publications shall be placed in the toolbox or in the lubrication order holder on the equipment.

5.2.1.2 *Automatic drive.* (Superseded) Transmission shall contain lubricant conforming to requirements of applicable drawing, specification, or lubrication order, filled to operating level. Transmission shall be operated through all ranges for a minimum of 1 minute at a sufficient engine speed to assure lubricant coverage of all interior parts and surfaces.

5.2.3.4 *Preservative and drain procedure (see 7.2).* (Superseded) Cooling system shall be filled with type P-3, or P-9 preservative prior to engine preservation. After engine preservation, cooling systems shall be drained and drain cocks left in open position. A warning tag, bearing the information "CLOSE DRAIN COCKS AND FILL COOLING SYSTEM BEFORE OPERATING ENGINE," shall be securely attached in a conspicuous location within driver's compartment.

5.2.5 *Engine crankcase.* (Superseded) Engine crankcase shall contain lubricating oil in accordance with the applicable drawing, specification or lubrication order, or type P-10 preservative oil, grade 1 or 2 as applicable, filled to operating level. Operating level shall be attained by addition of the same type and grade of oil contained in the crankcase. Operating lubricant and preservative oil shall not be mixed.

5.2.6.1 *Gasoline engine.* (Superseded) When specified (see 7.1), gasoline engine shall be preserved in accordance with 5.1.7.1.

5.2.6.2 *Diesel engines.* (Superseded) When specified (see 7.1), diesel engines shall be preserved in accordance with 5.1.7.2, as applicable.

5.2.7 *Air compressor.* (Superseded) Air compressor crankcase shall contain lubricating oil in accordance with the applicable drawing, specification, or lubrication order, or type P-10 preservative oil, grade 1 or 2 as applicable, filled to operating level. Operating level shall be attained by addition of the same type and grade of oil contained in the crankcase. Operating lubricant and preservative oil shall not be mixed.

5.2.8 *Batteries and cables.* (Superseded) Batteries and cables shall be processed in accordance with 5.1.9.

5.2.8.1 *Electrolyte.* (Added) Electrolyte shall be processed in accordance with 5.1.9.1 or 5.1.9.2.

5.2.12.2 *Soft-top and open-type cabs.* (Superseded) Soft-top and open-type cabs shall be processed in accordance with 5.1.15.2.

5.2.13.4 *Utility truck body.* (Superseded) When required for reduction in cube, top, end curtains, and windshield wiper arms and blades shall be removed and packaged in accordance with 5.1.16.4, except that seat backs and cushions, dash panel, including defroster vents, and horn button shall not be preserved.

5.2.13.5.1 *Fuel pumping system.* (Superseded) Fuel pumping system shall be preserved in accordance with 5.1.16.5.1.

5.2.13.5.2 *Auxiliary engine.* (Added) Engine crankcase shall contain lubricating oil conforming to the requirements of the applicable drawing, specification, or lubrication order, or type P-10 preservative oil, grade 1 or 2 as applicable, filled to operating level. Operating level shall be attained by addition of the same type and grade of oil contained in the crankcase. Operating lubricant and preservative oil shall not be mixed. When specified (see 7.1), the auxiliary engine shall be preserved in accordance with 5.1.16.5.2, except that the engine crankcase shall contain lubricating oil as specified above.

5.2.17 *Rubber tires.* (Added) Rubber tires shall be inflated as specified in 5.1.22.

5.2.18 *Repair parts.* (Added) Repair parts shall be processed in accordance with 5.1.20.

5.2.19 *Tools.* (Added) Tools shall be processed in accordance with 5.1.21.

5.2.20 *Technical publications.* (Added) Technical publications shall be processed in accordance with 5.1.23.

5.3.1 *Cooling system.* (Superseded) When specified (see 7.1), the cooling system shall be protected in accordance with 5.2.3.

5.3.2 *Batteries and cables.* (Superseded) Batteries and cables shall be processed in accordance with 5.1.9.

5.3.2.1 *Electrolyte.* (Added) Electrolyte shall be processed in accordance with 5.1.9.1 or 5.1.9.2.

5.3.4 *Cargo, command, van, ambulance, panel utility, and maintenance truck bodies.* (Superseded) Body drains and ventilators shall be placed in open position to prevent accumulation of water, and to provide all possible ventilation. Processing shall be in accordance with 5.1.16.3, except that the refrigeration air conditioning units shall remain installed.

5.3.8 *Winch and derrick assemblies.* (Added) Wire cable shall be preserved as specified in 5.1.19.

5.3.9 *Rubber tires.* (Added) Tires shall be inflated as specified in 5.1.22.

5.4.1.1 *Cooling systems.* (Superseded) Cooling systems shall be processed in accordance with 5.2.3.4.

5.4.1.3 *Batteries and cables.* (Superseded) Batteries and cables shall be processed in accordance with 5.1.9.

5.4.1.3.1 *Electrolyte.* (Added) Electrolyte shall be processed in accordance with 5.1.9.1 or 5.1.9.2.

5.4.1.6 *Lamps.* (Superseded) Lamps and reflector lenses removed from the vehicle shall be packaged in a fiberboard box conforming to classs weather-resistant, grade optional, of PPP-B-636 and closed with two strips of tape conforming to PPP-T-60.

5.4.1.7.1 *Parts removed by disassembly.* (Superseded) Unit packages and unpackaged parts removed by disassembly and accessories such as lamps, bearings, and re-

pair parts shall be intermediate packaged in nailed wood boxes conforming to class 2, style optional, of PPP-B-621, wood cleated-plywood boxes conforming to oversea type, style optional, of PPP-B-601, or fiberboard boxes conforming to class weather-resistant, grade optional, of PPP-B-636, or class 2, style optional, of PPP-B-640. The boxes for skidded preparation shall be strapped in accordance with the appendix to the applicable box specification. Strapping shall conform to type I, class B of QQ-S-781. The boxes for boxed preparation shall not require strapping.

6.10 Prepreservation inspection. (Superseded) Unless otherwise specified (see 7.1), all vehicles, prior to application of preservations, shall be visually examined to determine conformance to cleaning and drying (see 4.1), presence of record forms (see 4.6), and presence of markings (see 4.9).

6.13.1 *Fuel and oil mixture test.* (Superseded) The drained preservative oil from the fuel tanks of one out of every five vehicles shall be tested to determine conformance to 5.1.12.1. An American Petroleum Institute (API) hydrometer with thermometer, plus correction values for the temperature differential above or below the established base temperature, shall be used to measure dilution of preservative oil with fuel. Mixture shall be tested as follows:

(a) A test specimen consisting of one gallon of clean, unused preservative oil conforming to grade 2 of MIL-L-21260 shall be used as a standard for measuring the degree of dilution of preservative oil with fuel. The clean, unused preservative oil shall be identified with a purity point of 0.0 percent dilution. A test specimen of one gallon of the drained preservative oil shall be tested with the hydrometer for a comparison of the purity points.

(b) The drained preservative oil shall not be reused when the test shows a contamination of 10 percent or greater. A 10 percent contamination is indicated when the difference in purity points tested at the same temperature exceeds the following degrees API:

1.0° API — For diesel fuel

3.4° API — For gasoline

7.1 Ordering data. (Superseded) Procurement documents should specify the following:

(a) Title, number, and date of this standard.

(b) Selection of applicable level of preservation, packaging and packing (see 1.1).

(c) Selection of mobile, boxed, or skidded condition of preparation for shipment and storage (see 1.3).

(d) Selection of applicable level of preservation, packaging, packing and stowing of OVE (see 4.7 and 7.3).

(e) Selection of applicable class of PPP-B-621 container (see 4.7).

(f) If transmission should contain type P-10 preservative oil (see 5.1.1.2.1).

(g) Selection of applicable procedure of protection of cooling systems (see 5.1.4 and 5.2.3).

(h) If packaging of dry charged batteries other than in accordance with MIL-B-208 is required (see 5.1.9).

(i) If dry charged batteries are to be secured in place in the vehicle battery carrier (see 5.1.9).

(j) If packaging and marking of electrolyte other than as prescribed is required (see 5.1.9.1).

(k) If packaging, packing, and marking of electrolyte in accordance with MIL-S-207 is required (see 5.1.9.2).

(l) If preservation of fuel tank other than fill and drain method is required (see 5.1.12.1).

(m) If preservation of fuel tank in accordance with drain and spray method is required (see 5.1.12.2).

(n) If disassembly of the clutch and coating of metal surfaces of operating parts with primer is required (see 5.1.13.1).

(o) If removal of clutch cover plates and spraying of accessible metal surfaces within the housing with primer is required (see 5.1.13.2).

(p) If coating of interior surfaces enclosed within brakedrums and face of the brake drum with primer is required (see 5.1.14.1 and 5.1.14.6).

(q) If preservation of working surfaces covered by piston dust shield is required (see 5.1.14.2).

(r) If purging of hydraulic brake system and filling with MIL-P-46046 preservative is required (see 5.1.14.3).

(s) If removal of plugs and hose from housings and connectors and preservation of interior surfaces of the vacuum booster is required (see 5.1.14.5.1).

(t) If preservation and packaging of special equipment other than in accordance with applicable specifications is required (see 5.1.16.3).

(u) If preservation of fuel tank body other than as prescribed is required (see 5.1.16.5).

(v) If preservation of interior of fuel tank body with a dehumidification or volatile corrosion inhibitor is required (see 5.1.16.5).

(w) If preservation of wire cable other than with P-1 preservative is required (see 5.1.19).

(x) If preservation of wire cable as prescribed is required (see 5.1.19).

(y) Selection of applicable method of preservation and packaging of repair parts (see 5.1.20).

(z) Selection of applicable method of preservation and packaging of tools (see 5.1.21).

(aa) If preservation and packaging of tools other than as prescribed is required (see 5.1.21).

(bb) If packaging of technical publications other than as prescribed is required (see 5.1.23).

(cc) Selection of applicable procedure of protection of cooling systems (see 5.2.3).

(dd) If preservation of gasoline engines in accordance with level A re-

quirements is required (see 5.2.6.1).

(ee) If preservation of diesel engines in accordance with level A requirements is required (see 5.2.6.2).

(ff) If preservation of auxiliary engines in accordance with level A requirements is required (see 5.2.13.5.2).

(gg) If protection of cooling system with water and antifreeze is required (see 5.3.1).

(hh) If preservation inspection other than as prescribed is required (see 6.10).

7.2 **Preservative and drain procedure.** (Superseded) Protection of cooling systems using type P-3 preservative (see 5.2.3.4) is not being specified for Army use.

7.3 **On vehicle equipment (OVE).** (Superseded) The level of preservation and packaging and of packing of OVE see (4.7) and (7.1) may or may not be the same as that specified for the vehicle it accompanies. It depends on the knowledge of handling, shipment storage, and use at time of procurement. For example, for a vehicle preserved level B (mobile) the OVE should be preserved level A if the shipment involves an overseas destination, immediate vehicle use, but where weather conditions are very unfavorable. When a vehicle is preserved level B or C and destined for shipment to a Military activity for further processing and domestic storage, the OVE should be preserved and packed level A.

Notice. Rescinded.

Notice of availability. (Superseded) The title and identifying symbol number should be stipulated when requesting copies of Military standards. Copies of this Military standard may be obtained as follows:

Copies of this standard for military use may be obtained as indicated in the General Provisions of the Department of Defense Index of Specifications and Standards (DODISS).

Copies of this standard may be obtained for other than official use by individuals, firms, and contractors from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Custodians:

Army—MO

Navy—YD

Air Force—84

Review interest:

Army—MO, MI, GL, SM, WC

Navy—MC

User interest:

Navy—WP

Preparing activity:

Army—MO

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