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SUPERSEDING

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MILITARY STANDARD

COMBAT VEHICLES AND EQUIPMENT;  
INSPECTION, CARE, AND PRESERVATION  
DURING STORAGE OF



FSC-PACK

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DEPARTMENT OF THE ARMY  
WASHINGTON, D. C.

Combat Vehicles and Equipment;  
Inspection, Care, and Preservation  
During Storage of

MIL-STD-634A(AT)

1. This Military Standard has been approved by the Department of the Army and is published to provide Inspection, Care, and Preservation Requirements for Combat Vehicles During Storage.

2. Recommended corrections, additions, or deletions should be addressed to Commanding General, U.S. Army Tank-Automotive Command, Warren, Michigan 48090.

## FOREWORD

The purpose of this standard is to provide minimum requirements for inspection, care, and preservation of combat vehicles in all classes of storage. These requirements apply subsequent to the application of the initial preservation.

Specific represervation requirements for inspection, care, and preservation of combat vehicles during storage are provided in detailed combat vehicle preparation for shipment and storage specifications which cover a particular vehicle or associated series of vehicles.

Results of inspection of combat vehicles as specified by this standard shall be annotated on the Inspection Check List (see figure 4).

This standard is intended for use in the inspection, care, and preservation of combat vehicles stored at Government activities and contractor facilities.

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**SECTION 1. SCOPE**

**1.1 Coverage.** This standard prescribes inspection, care and preservation requirements for maintaining combat vehicles and equipment during storage at contractor facilities and Government activities.

**1.1.1 Government activities.** This standard applies to combat vehicles stored at Government activities as follows:

(a) Condition codes A, B, D, E, and G - all applicable provisions of this standard.

(b) Condition codes F, and materiel for code H - only those provisions which are necessary to minimize deterioration prior to disposal action.

**1.1.2 Contractor facilities.** The contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the contractor may utilize his own facilities or any commercial laboratory acceptable to the Government.

The Government reserves the right to perform any of the inspections set forth in this standard where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

**1.2 Classification.** Care and preservation shall be accomplished for the following classes of storage (see 6.1).

## Classes of Storage

**Class A – Dormant (with required preservation).**

Class A1 – Outside of buildings or shelters.

Class A2 – Sheltered.

Class A3 – Dehumidified (structural).

Class A4 – Dehumidified (nonstructural).

**Class B – Active (periodic exercising required).**

Class B1 – Outside of buildings - with method I or method II exercising.

Class B2 – Sheltered - with method I or II exercising.

Class B3 – Dehumidified (structural) - with method I or II exercising.

Class B4 – Dehumidified (nonstructural) - with method I or II exercising.

Methods of exercising.

Method I – Vehicle exercised by means of operating vehicle power plant.

Method II – Vehicle components exercised by remote source power.

**SECTION 2. REFERENCED DOCUMENTS**

**2.1** 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**

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

**SECTION 3. DEFINITIONS****3.1 Classes of storage.**

**3.1.1 Class A, dormant storage.** Dormant storage includes all preserved vehicles placed and retained under conditions described in 3.1.1.1 through 3.1.1.4 and are not operated between specified exercising and preservation cycles. Extent of preservation required for the various classes of storage is mainly dependent upon the effect of the environmental conditions. Maximum preservation protection (level A) is required for the items subjected to the direct action of the elements, as in outside storage, and lesser preservation is needed as environmental conditions become less deleterious to the stored materiel.

**3.1.1.1 Class A1.** Vehicles placed and retained under conditions as follows shall be considered falling within class A1 storage category.

(a) Outside of buildings, sheds or shelters.

(b) Inside or under sheds or shelters that are open on one or more sides to the elements.

**3.1.1.2 Class A2.** Vehicles placed and retained inside completely closed warehouses, sheds, and

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shelters shall be considered falling within class A2 storage. Vehicles in this class of storage require the same preservation as for class A1 storage, except the protection against entry of snow and rain shall be excluded.

**3.1.1.3 Class A3.** Vehicles placed and retained within warehouses, sheds and other buildings where the atmosphere is controlled at 40 percent maximum relative humidity (rh) shall be considered as class A3 storage.

**3.1.1.4 Class A4.** Vehicles that are placed and sealed singly, or in multiples, within or are encapsulated in a flexible bag, barrier or cover, and wherein a maximum 40 percent relative humidity (rh) is maintained by either static or dynamic dehumidification, shall be considered class A4 storage.

**3.1.2 Class B, active storage.** Active storage includes all vehicles that have been placed and retained under storage conditions described in 3.1.1 and are periodically exercised (see 3.2).

**3.1.2.1 Class B1.** Vehicles stored as described in 3.1.1.1 and exercised by method I or II.

**3.1.2.2 Class B2.** Vehicles stored as described in 3.1.1.2 and exercised by method I or II.

**3.1.2.3 Class B3.** Vehicles stored as described in 3.1.1.3 and exercised by method I or II.

**3.1.2.4 Class B4.** Vehicles stored as described in 3.1.1.4 and exercised by method I or II.

**3.2 Exercising.** Exercising of vehicles includes the operation of all functional mechanisms for the purpose of effective preservation through distribution of lubricants or preservatives over surfaces lubricated by normal operation.

**3.2.1 Method I.** Method I exercising necessitates operation of vehicle engines with power supplied to components by and through the vehicle power system. Auxiliary fuel tank shall be used for exercising vehicle engines to avoid the necessity of re-preserving fuel tanks.

**3.2.2 Method II.** Method II includes the exercising of any or all specified vehicle components

and shall be accomplished without engine combustion. This method utilizes a remote or external power source introduced through the starter or starters, electrical system, or by addition of powered units to specific components. Operation of controls and application of power is usually accomplished from a position outside of the vehicle.

**3.3 Care and preservation (cyclic) inspection.** Care and preservation inspection encompasses three separate inspection functions. These inspections, namely, surveillance (external), vehicle inspection, and component (internal), vary in purpose, degree and time interval, but in common, reveal and expose evidence of corrosion, deterioration, and failure or deficiencies of the preservation.

**3.3.1 Surveillance (external) inspection.** Surveillance inspection covers the visual examination of the external portions, and the applied processing for evidence of rust, corrosion and deterioration. Thorough examination for evidence of leakage of coolants and lubricants, loose tape and barrier materials, is required.

**3.3.2 Vehicle inspection.** Vehicle inspection requires the removal of preservatives, tapes, and barriers to permit unrestricted visual inspection of all external surfaces on and within the vehicle. Examination of metallic and non-metallic surfaces for condition of preservatives and painted portions to determine presence and extent of corrosion, deterioration and moisture. Partial internal inspections of engine, power train components, cannon, and fire control items shall be accomplished by removal of access plates and covers and by use of telescopes, borescopes or other similar inspection devices (see figure 1).

**3.3.3 Component (internal) inspection.** Component inspection requires the disassembly of the vehicles, cannon and mount, and fire control items to the extent required to permit examination of the internal components to determine evidence and extent of corrosion and deterioration. When contamination, corrosion or deterioration is found, disassembly shall be extended to determine the further effects of the condition. Oils and preservatives shall be examined for presence of moisture, discoloration, microbial activity or any foreign matter.

**3.4 Abnormal weather conditions.** The abnormal weather conditions referred to in this standard include high winds (gale proportions 50 miles per hour, or greater), floods, or any storm condition which may adversely affect vehicle protection.

**3.5 Vehicle sealing.** Vehicle sealing pertains to the utilization of barrier materials, tape, plastic caps and plugs, sprayable compounds or other means applied directly to components and exterior surfaces of the vehicle for the purpose of excluding dust, sand, snow, rain, and other forms of moisture from entering the interior components of the vehicle.

**3.6 Vehicle protective closure.** A vehicle protective closure is a device affixed to a vehicle which is designated to provide protection against entry of snow and rain, and constructed to permit maximum ventilation of vehicle interior. Such devices may be fabricated of metal, fabric, wood, plastic, or any other specified material. Closures are usually constructed over a metal or wood framework.

## SECTION 4. GENERAL REQUIREMENTS

### 4.1 Inspection.

#### 4.1.1 *Inspection responsibilities.*

**4.1.1.1 Contractor inspection.** When care and preservation is accomplished by a contractor, the contractor shall conduct all inspection specified herein. Records of care and preservation shall be maintained in the Equipment Log Book and DD Form 1397, Processing and Deprocessing Record for Shipment, Storage, and Issue of Vehicles and Spare Engines, initialed and dated to indicate confirmation of preservation. Records shall be readily available for review by the Government inspector.

**4.1.1.2 Government inspection.** The Government inspector shall witness contractor inspection, to the extent necessary to assure conformance with this standard. When care and preservation is accomplished by a Government activity, all inspection shall be conducted by the Government inspector. Results of the inspection shall be recorded in the Equipment Log Book, and DD Form 1397, Processing and Deprocessing Record for Shipment, Storage and Issue of Vehicles and Spare Engines,

initialed and dated to indicate confirmation of preservation.

### 4.2 Inspection schedules.

**4.2.1 Inspection cycles.** Inspection time intervals for surveillance, vehicle, and component inspections shall be as specified in table I.

**4.2.2 Vehicle quantities subject to inspection cycles.** Quantities and percentages of lot quantities for vehicle and component inspection shall be as specified in table II. Vehicles shall be subjected to 100 percent surveillance inspection.

**4.3 Surveillance inspection.** Surveillance inspection shall be conducted as specified for the various classes of storage prescribed in 4.3.1 through 4.3.5 and to the extent specified in (3.3.1). Deficiencies noted during the inspection shall be recorded on Inspection Check List (see figure 4) and action taken to correct all deficiencies.

**4.3.1 Class A1 storage.** Vehicles shall be subjected to surveillance inspection at intervals specified in table I and immediately following abnormal weather conditions (see 3.4).

**4.3.2 Class A2 storage.** Vehicles shall be subjected to surveillance inspection at intervals specified in table I for evidence of corrosion, leakage of lubricant, coolant, or preservative failure.

**4.3.3 Class A3 storage.** Controlled humidity conditions shall be checked daily and reviewed at intervals of not more than 30 days to determine average humidity. When records in any controlled humidity structure reveal an accumulative average rh, of greater than 40 percent for the period, vehicle inspection shall be accomplished on the quantity of units specified in table II for component inspection. When humidity conditions are maintained at 40 percent maximum relative humidity (rh), surveillance inspection shall be accomplished at intervals specified in table I.

**4.3.4 Class A4 storage.** Surveillance of controlled humidity records shall be as specified for class A3 storage (see 4.3.3). When controlled humidity records indicate relative humidity (rh) average above 40 percent, vehicles shall be inspected as specified

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TABLE I. *Inspection cycles*

Class of Storage	Surveillance Inspection	Vehicle Inspection <sup>1</sup>	Component Inspection	Controlled Humidity Record Check	Exercising Check
A1	1 Mo. <sup>2</sup>	6 Mo.	See Paragraph 4.5	*	*
A2	3 Mo.	12 Mo.		*	*
A3	6 Mo. <sup>2</sup>	18 Mo.		Daily	*
A4	3 Mo. <sup>2</sup>	18 Mo.		Daily	*
B1	1 Mo. <sup>2</sup>	6 Mo.		*	Each Exercising Period
B2	3 Mo.	12 Mo.		*	Each Exercising Period
B3	3 Mo. <sup>2</sup>	18 Mo.		Daily	Each Exercising Period
B4	1 Mo. <sup>2</sup>	18 Mo.		Daily	Each Exercising Period

<sup>1</sup>Extend inspection cycles in accordance with conditions established in paragraph 4.6.1.1.

<sup>2</sup>Immediately following adverse weather conditions, vehicles in Class A1, A4, B1, and B4 storage shall be surveillance inspected. Immediately following power failure, controlled humidity units for Class A3, A4, B3, and B4 storage shall be inspected to assure proper operation.

\*Controlled humidity record check not applicable.

TABLE II. *Care and preservation inspection*

Lot Size*	Surveillance Inspection	Vehicle Inspection**	Component Inspection
1-100	100 Percent	10 Percent	3 Vehicles
101-250	100 Percent	10 Vehicles Plus 8 Percent of all over 100.	3 Vehicles
251-500	100 Percent	22 Vehicles Plus 6 Percent of all over 100.	4 Vehicles
501-1000	100 Percent	37 Vehicles Plus 5 Percent of all over 500.	6 Vehicles
Over 1000	100 Percent	62 Vehicles Plus 1 Percent of all over 1000.	6 Vehicles, plus 1 Vehicle for each 250 vehicles of major portion thereof, in excess of 1000.

\*A lot of vehicles shall be composed of one type of vehicle from one class of storage.

\*\*In computing number of vehicles, all fractions shall be ignored.

for class A3 (see 4.3.3) and the barrier examined for leaks.

**4.3.5 Class B1 and B2 storage.** Vehicles shall be subjected to surveillance inspection at intervals specified in table I. Any malfunction or deficiency noted shall be recorded on the inspection check list (see figure 4), and brought to the attention of the responsible authority.

**4.4 Vehicle inspection.** Vehicles selected for inspection shall not be operated prior to accomplishment of inspection. The quantity of vehicles selected for inspection shall be as specified in table II, and shall be accomplished at time intervals

specified in table I. No vehicle shall be selected for subsequent reinspection until all vehicles in the lot have been inspected. Inspection shall encompass the degree and extent of examination specified in 3.3.2.

**4.5 Component inspection.** Component inspection shall be accomplished immediately after vehicle inspection (see 4.4) when stages of corrosion 2, 3, or 4 (see table III) are found on internal parts of the components. Samples for component inspection shall be in the quantities specified in table II and shall be representative of the greater degree of corrosion. Component inspection shall consist of the examination specified in 3.3.3 and 4.5.1 through 4.5.1.22.



TABLE III. Definitions, terminology, stages of corrosion and action required

Stages of Corrosion	Corrective Action					Remarks
	Description	Painted Surfaces	External Machined Surfaces (Functional and Nonfunctional)	Internal Machined Surfaces (Functional and Nonfunctional)		
Stage 1	Discoloration, staining. No direct visual evidence of pitting, etching or other surface damage.	This condition does not require immediate corrective action.	This condition does not require immediate corrective action other than reprocessing as necessary.	This condition does not require immediate corrective action other than reprocessing as necessary.	Use as is, except in the case of cylinders subjected to functional wiping action. Remove corrosion by use of crocus cloth.	
Stage 2	Loose rust, black or white corrosion accompanied by minor etching and pitting of surface. No scale or tight rust.	Clean by any applicable process. Touch up with paint as originally applied.	Clean, exercise and reprocess.	Exercise, drain lubricants or preservatives, flush and refill to operation level.	In the case of cylinders subjected to functional wiping action, remove corrosion by use of crocus cloth.	
Stage 3	Rust, black or white corrosion accompanied singly or in combination with etching, pitting or more extensive surface damage. Loose or granular condition.	Clean by any applicable process. Touch up with paint as originally applied.	Clean, exercise and reprocess.	Exercise, drain lubricants or preservatives, flush and refill to operation level.	This condition would have minor effect on fit or wear of part or component, but would permit use without reprocess. Does not apply to such items as instruments, electrical or manual, and critical surfaces that are necessary to effect a seal against pressurized liquids.	
Stage 4	Rust, black or white corrosion progressed to the point where fit, wear function or life of the item has been affected. Powered or scaly condition, with pits or irregular areas of material removed from surface of item.	Clean by any applicable process. Touch up with paint as originally applied.	Replace or reprocess parts and components involved.	Replace or reprocess parts and components involved.	This condition will require action as indicated.	

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**4.5.1 Disassembly for component inspection.** No vehicle shall be selected for disassembly (see 3.3.3) which has been operated subsequent to last preservation. Disassembly shall be as specified in 4.5.1.1 through 4.5.1.23.3, and as necessary to determine the extent of deterioration and presence of corrosion. Deprocessing and cleaning shall be limited to the extent necessary to permit examination of all critical areas of the parts being inspected. Evidence of corrosion in the form of deposits, discoloration, etching, and pitting shall not be removed until inspection and evaluation is completed and disposition determined. Thorough examination shall be made of all drained oils and preservatives for the presence of water, biological, microbial or organic activity. When contamination is found, disassembly shall be extended, as necessary, to determine the effects of such contamination.

**4.5.1.1 Engines.** Engines shall be disassembled to permit examination of cylinder walls, pistons, valves, valve springs, rocker arms, camshafts, camshaft journals, connecting rods, gears, governors, manifolds and water pump.

**4.5.1.2 Fuel system.** Fuel injector system, fuel pumps, carburetor, and filters shall be examined for biological, microbial, or organic activity. Any contamination found shall be flushed and cleaned to remove all evidence of corrosion or contamination.

**4.5.1.3 Auxiliary engine.** Auxiliary engines shall be disassembled to permit examination of components specified in 4.5.1.1.

**4.5.1.4 Transmissions.** Transmission covers and plates shall be removed, and visual examination made of gears, shafts, collars, bearings, etc., to determine presence of corrosion. Complete disassembly shall be accomplished when examination indicates presence of internal corrosion.

**4.5.1.5 Differentials.** Differentials shall be drained and all access plates removed for examination of interior. Evidence of internal corrosion shall require further disassembly to determine extent and degree of corrosion.

**4.5.1.6 Final drives and axle housing.** One final drive and one axle housing from each vehicle shall

be disassembled to the extent necessary to examine gear, shaft, and bearing surfaces.

**4.5.1.7 Road wheels and support rollers.** One road wheel and one support roller shall be removed from each vehicle. When visual examination indicates the presence of internal corrosion, complete disassembly shall be accomplished to facilitate thorough inspection of all components.

**4.5.1.8 Turret races.** Prior to removal of turret from the vehicle, turret shall be rotated in each direction and hand effort checks recorded at 90°, 180°, 270°, and 360°; or at maximum distances characteristic to the design of the vehicle, as applicable, to determine any malfunction which might be due to corrosion. Partial internal inspection can be made by removal of access plugs. Turrets shall be removed from vehicle and races examined. Complete disassembly shall be accomplished when examination indicates the presence of corrosion.

**4.5.1.9 Winch assemblies, gear cases and chain drives.** Covers, access plates of gear cases, chain drives and winch assemblies shall be removed to facilitate examination of components. Evidence of corrosion shall require further disassembly to determine extent and degree of corrosion.

**4.5.1.10 Air compressors.** Except where the air compressor lubricating system is integral with the engine lubricating system the compressors shall be drained, and oil examined. When examination indicates the presence of water, biological, microbial, or organic activity, disassembly shall be extended, as necessary, to determine effects of such contamination.

**4.5.1.11 Fuel tanks, vehicle.** Interior of fuel tank shall be examined to determine evidence of corrosion, with particular attention given to weld, and adjacent areas. Equipment shown in figure 1, or similar inspection devices may be used for this examination. Residual fuel or fuel preservative mixture shall be examined for evidence of moisture, gumming, biological, microbial, or organic activity.

**4.5.1.12 Cooling systems.** Liquid cooling systems, including radiator cores, hot water heaters, water reservoirs, and related connecting tubes,

rubber hose, and pumps, shall be examined for leaks and inspected internally to the extent possible for corrosion and evidence of pollution with engine oils or lubricants. Rubber components shall be examined for ozone deterioration.

**4.5.1.13 Electrical systems.** Switch boxes, relays, control boxes, junction boxes, and all other functional electrical components shall be disassembled to the extent necessary to determine the presence and extent of corrosion and deterioration.

**4.5.1.14 Ignition system.** Ammeter, starting switch, coil, distributor and distributor shaft shall be inspected, or disassembled to the extent necessary to determine the presence of corrosion. Wires shall be examined for checks, cracks, broken or frayed loom.

**4.5.1.15 Hydraulic systems.** Hydraulic components such as pumps, motors, valves, pistons, and connections shall be removed from vehicle to facilitate examination of interior surfaces. When removal of hydraulic components indicates the presence of corrosion, further disassembly shall be conducted to determine extent of corrosion. Hydraulic fluids shall be examined for moisture, discoloration, gelling, and foreign contaminants.

**4.5.1.16 Cannon and mount.** Cannon mount shall be removed from the turret, and cannon from the mount. Counterbalance assembly shall be disconnected. The breech mechanism and percussion and firing mechanism shall be disassembled and cleaned for inspection. Obturator gas-check pad, obturator rings, and disk shall be cleaned for inspection and assembly shall be visually examined for the presence of powder fouling at interrupted threads. All exposed unpainted surfaces of the mount, trunnion caps, and bearings shall be cleaned for inspection.

**4.5.1.17 Recoil mechanism.** Hydro-spring recoil mechanism or cylinders and replenishers shall be disassembled.

**4.5.1.18 Equilibrator cylinders.** Equilibrator gas and oil operated cylinders shall be disassembled and cleaned for inspection.

**4.5.1.19 Elevating mechanism and cylinders.**

Manual and manual electric, or hydraulic mechanisms shall be disassembled and cleaned for inspection. Elevating cylinders shall be disassembled and cleaned for inspection.

**4.5.1.20 Cupolas.** Cupolas shall be removed from vehicle and cupola race disassembled.

**4.5.1.21 Fire extinguishers.** Fire extinguishers shall be removed and inspected for corrosion, damaged controls and broken seals. Inspection shall also be made to assure that fire extinguishers have a minimum of 90 percent of the rated charge.

**4.5.1.22 Miscellaneous disassembly.** In addition to disassembly specified in 4.5.1 through 4.5.1.23.9, covers, caps, and inspection plates shall be removed to facilitate and accomplish thorough inspection of other suspect areas of the vehicle components not otherwise specifically covered in this standard.

**4.5.1.23 Fire control items.**

**4.5.1.23.1 Computing sights.** All controls of computing sights shall be operated to maximum limits to discover any malfunction which might be due to corrosion. Inspection covers and plugs shall be removed to examine gears, drive band, and bearings. Complete disassembly shall be accomplished only when examination indicates the presence of internal corrosion.

**4.5.1.23.2 Oil gears.** Oil gears shall be removed from vehicle. Oil shall be drained and covers removed for examination. Complete disassembly shall be accomplished only when examination indicates the presence of internal corrosion.

**4.5.1.23.3 Drive controller.** Drive controller shall be removed from vehicle, and cover shall be removed to permit examination of interior.

**4.5.1.23.4 Desiccators.** Indicating desiccators shall be examined for effectiveness of desiccant.

**4.5.1.23.5 Ballistic computer.** Ballistic computer shall be examined for broken windows. Controls shall be operated to maximum limits. Ammunition selector handle and superelevation hand crank shall return to original position when released. Top cover shall be removed and interior examined.

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**4.5.1.23.6 Azimuth indicator.** Azimuth indicator shall be examined for broken windows and corrosion. Both pointers shall be placed in coincidence, and resetter knob depressed. When knob is rotated, pointers shall move together. When knob is released it shall return from depressed position.

**4.5.1.23.7 Telescope mounts.** All controls shall be inspected for freedom of movement. Control locks shall be inspected to determine that movements are secured when control locks are applied.

**4.5.1.23.8 Ballistic drive and elevation quadrant.** Ballistic drive and elevation quadrant shall be inspected for corrosion or failure of optical components.

**4.5.1.23.9 Range finder.** Range finder shall be inspected as follows: observe the sky separately through the right and left eyepiece. Examine for existence of foreign matter, or any condition which obscures or detracts from the field of vision. Do not backsight or shadow. Haze on filters, or a yellowish tinge in the field of vision of the right or left eyepiece will not be cause for rejection. Examine for illumination of sighting reticle scales and stereoscopic patterns. Operating knobs shall be rotated to determine that movements are smooth and even, and traverse the full range as indicated by observing readings on the corresponding graduated scales. When faulty operation or deterioration of electrical, optical, or mechanical systems is determined, range finder shall be removed from vehicle. Top cover shall be removed from range finder and inspected for additional deterioration. Main and auxiliary boresight assemblies shall be removed, and the springs inspected for corrosion.

**4.6 Evaluation of inspection.** A determination of the extent of corrosion, deterioration and damage shall be made and included in the inspection report, to provide a basis for determining disposition (see 4.6.1). Stages of corrosion (see table III) shall be determined with relation to the area affected. Only that corrosion which is found on functional or mating surfaces shall be considered as a basis for rejection or rework of the component. Corrosion found on other surfaces shall be considered as a basis for additional cleaning and reprocessing. During evaluation, condition and presence of preservative compounds and coatings shall be noted. To

provide a basis for determining extension of inspection intervals, inspection report shall include information to indicate whether preservative, and other protective materials and processes are in satisfactory or unsatisfactory condition. Condition of preservative films as indicated below, shall be entered on inspection report:

1. Condition good, no contamination, remaining film thickness - (as applied) (reduced).
2. Condition failing, contaminated with moisture or dirt, remaining film thickness - (as applied) (reduced) (depleted).

#### 4.6.1 Disposition of vehicles.

1. When inspection reveals the presence of corrosion, evaluation of the stage of corrosion and corrective action shall be taken as indicated in 4.6 and table III.

2. When stage 4 corrosion (see table III) is present, disposition or corrective action shall be based on evaluation of function tests, such as engine stall and similar test and operational test results. Such tests shall be performed on the items in an "as found" condition, and in accordance with applicable technical manuals.

3. When results of functional and operation tests disclose malfunction, and further evaluation assures that malfunction is the result of corrosion that cannot be corrected by normal care and preservation action, a request for disposition, accompanied with complete details, shall be forwarded to the activity responsible for the vehicle.

**4.6.1.1 Nondeteriorated vehicles.** When, as a result of vehicle inspection, it is found that corrosion is not present and all preservative materials are satisfactory for continued protection, exercising and representation of vehicles in class A (dormant) storage shall be waived. Vehicles shall be reinspected at three month intervals until it is determined that the limit of preservation effectiveness has been reached. Inspection cycles (see table I), shall be extended to correspond to the results of vehicle's inspection. Extended cycles shall apply only when storage conditions remain unchanged. No vehicle shall be selected for subsequent reinspection until

all vehicles in the lot have been inspected. When it is determined that the limit of preservation effectiveness has been reached, the interval covered between initial preservation and subsequent re-preservation shall be established as the continuing exercising and re-preservation cycle for that installation. Exercising and re-preservation cycles shall be reported to the responsible officer in charge. All reports shall cite the established exercising and reprocessing cycle.

#### 4.6.2 *Preoiling of engines.*

4.6.2.1 *Spark ignition.* When inspection specified in 4.4 indicates the presence of dry cylinder walls, or stage 2 or 3 corrosion (see table III), engines shall be preoiled before normal re-preservation operation. Spark plugs shall be removed and two ounces of lubricating oil, conforming to VV-L-800, shall be atomized sprayed into each cylinder. Equipment shown in figures 2 and 3 has proved satisfactory for this operation. After interval of 15 minutes, engine shall be rotated with starter for 30 seconds. Spark plugs shall then be reinstalled.

4.6.2.2 *Compression ignition.* Preoiling of compression ignition engines shall be accomplished as specified for spark ignition engines, (see 4.6.2.1), except that application of preservative oil shall be accomplished through injector ports, or by direct application to top of piston perimeters and upper surfaces of cylinder walls when disassembled.

4.6.3 *Hydraulic systems.* When inspection specified in 4.5.1.15 indicates contaminated or discolored hydraulic fluid, and indication of various stages of corrosion or deterioration of component parts, standard and corroded metallic and non-metallic parts shall be thoroughly cleaned. Components corroded or deteriorated to the extent that would affect the operational ability shall be replaced. Hydraulic system shall be completely purged and flushed with operational fluid.

4.6.4 *Fuel tanks.* When inspection specified in 4.5.1.11 indicates contamination of residual fuel or preservative, caused by biological, microbial or organic activity, the tank shall be completely drained, flushed and cleaned to remove all evidence of corrosion or contamination. When protective

interior coating of steel tank has been damaged, the damaged coating shall be restored to meet original specification requirements.

4.6.5 *Winch assemblies and related components.* When winch components are inspected as specified in 4.5.1.9, and indicate evidence of corrosion, the affected components shall be disassembled to the extent necessary, and thoroughly cleaned and inspected to determine if functional capabilities are impaired, requiring replacement. The winch and associated parts shall be reassembled, lubricated and functionally tested to assure operational capabilities prior to re-preservation.

4.6.6 *Transmissions, differentials, final drives and axle housings.* When inspection specified in 4.5.1.4, 4.5.1.5, and 4.5.1.6 denotes a degree of corrosion on the internal functional parts, that upon removal will not impair the operational capabilities of the assembly, the following remedial action shall be accomplished:

(a) Completely drain oils and lubricants from assembly.

(b) Thoroughly clean and flush contaminants from cases and housings.

(c) Remove rust and corrosion from affected parts. Disassemble as necessary to accomplish rust and corrosion removal.

(d) Inspect rehabilitated components to re-affirm usability and upon reassembly fill with operational oils and functional test to acceptance specification requirements.

Components classified as deteriorated to a stage 4 corrosion condition (see table III), and after functional testing reveal the assembly to be functionally inoperable, shall be listed rework. Pertinent detailed information explaining condition shall accompany request for disposition to appropriate authorities.

4.6.7 *Natural and synthetic rubber components.* Rubber components such as boots, air tubes, hose and seals shall be examined for deterioration that would impair its intended operational capabilities. Rubber components classified unserviceable shall be replaced.



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**4.6.8 Turret and cupolas races.** When inspection specified in 4.5.1.8 and 4.5.1.20 indicate various stages of corrosion, races and bearings shall be thoroughly cleaned and inspected to determine if functional capabilities are impaired. Corroded races and bearings shall be repaired or replaced.

**4.6.9 Cannon and mount, recoil mechanism, equilibrators cylinders, elevating mechanism and cylinders.** When inspection in 4.5.1.16, 4.5.1.17, 4.5.1.18, and 4.5.1.19 indicate various stages of corrosion or deterioration of component parts, corroded parts shall be thoroughly cleaned. Components corroded or deteriorated to the extent that would affect the operational ability shall be replaced. When inspection indicates contaminated or discolored hydraulic fluid, hydraulic units shall be completely purged and flushed with operational fluid.

**4.6.10 Fire control items.** When inspection in 4.5.1.23.1 through 4.5.1.23.9 indicate various stages of corrosion of component parts, corroded parts shall be thoroughly cleaned. Components corroded to the extent that would affect the operational ability shall be replaced.

**4.7 Represervation inspection.** Represervation inspection shall be conducted during and after represervation of vehicles, cannon and mount, and fire control items. Inspection shall consist of all examinations and tests specified in the military specification specific to the vehicle.

**4.8 Material inspection.** Except for materials which have been Government inspected at the source, all materials to be used in reserving vehicles shall be inspected in accordance with the material specification; or certified inspection and laboratory test reports shall be furnished which show that material, as furnished, conforms to the detailed specification.

**4.8.1 Exercising.** Vehicles in class A (dormant) storage shall be exercised in accordance with method I (see 4.8.1.1) at time of represervation. Vehicles in class B (active) storage shall be exercised in accordance with method I or II (see 4.8.1.2) at intervals shown in table IV.

**4.8.1.1 Method I.** Except as otherwise specified herein, exercising shall consist of operation of the engine and when applicable auxiliary engine, and functioning of all powered components not disassembled for storage, traversing of the turret, elevation and movement of the cannon tube in and out of battery, and movement of the vehicle under its own power through all gears and ranges. When vehicles are stored on jacks, blocks, or other means which allow free movement of tracks, exercising as specified above shall be accomplished without moving the vehicle. Auxiliary fuel tanks shall be used for vehicle exercising to avoid the necessity of reserving fuel tanks.

**4.8.1.2 Method II.** Exercising shall be accomplished by means of power being applied from a source separate from the vehicle to the component being exercised, or by means not requiring operation of the vehicle power plant. Exercising shall consist of rotating engine crankshaft, for not less than 30 seconds, at a speed which will assure distribution of lubricants to all lubrication points which would normally be affected through engine operation. When design permits, transmission shall be placed in drive gear, or other means of effecting transmission lockup shall be utilized to exercise transmission, final drive track, and road wheels. Exercising of vehicles shall be accomplished while vehicle is on jacks, or blocks, or stored in any manner which will permit free movement of tracks.

TABLE IV. Frequency of exercising

Class of storage	Exercising method	Frequency intervals
B1	I - .....	30 Days
	II - .....	7 Days
B2	I - .....	30 Days
	II - .....	7 Days
B3	I - .....	180 Days
	II - .....	30 Days
B4	I - .....	N/A
	II - .....	30 Days

**4.8.2 Represervation.** Represervation of vehicle, cannon and mount, and fire control items in class A (dormant) storage shall be accomplished as required by inspection and after exercising.

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**SECTION 5. DETAILED REQUIREMENTS**

**5.1 Application.** The detailed requirements of this standard pertain to the inspection, care and preservation of specific vehicles for all classes of storage. Detailed storage requirements for a specific vehicle are provided in the individual preparation for shipment and storage specifications which cover a particular vehicle or associated series of vehicles.

**Custodian:**  
Army - AT

**Review activities:**  
Army - SM, WC

**SECTION 6. NOTES**

**6.1 Ordering data.** Procurement document should specify the following:

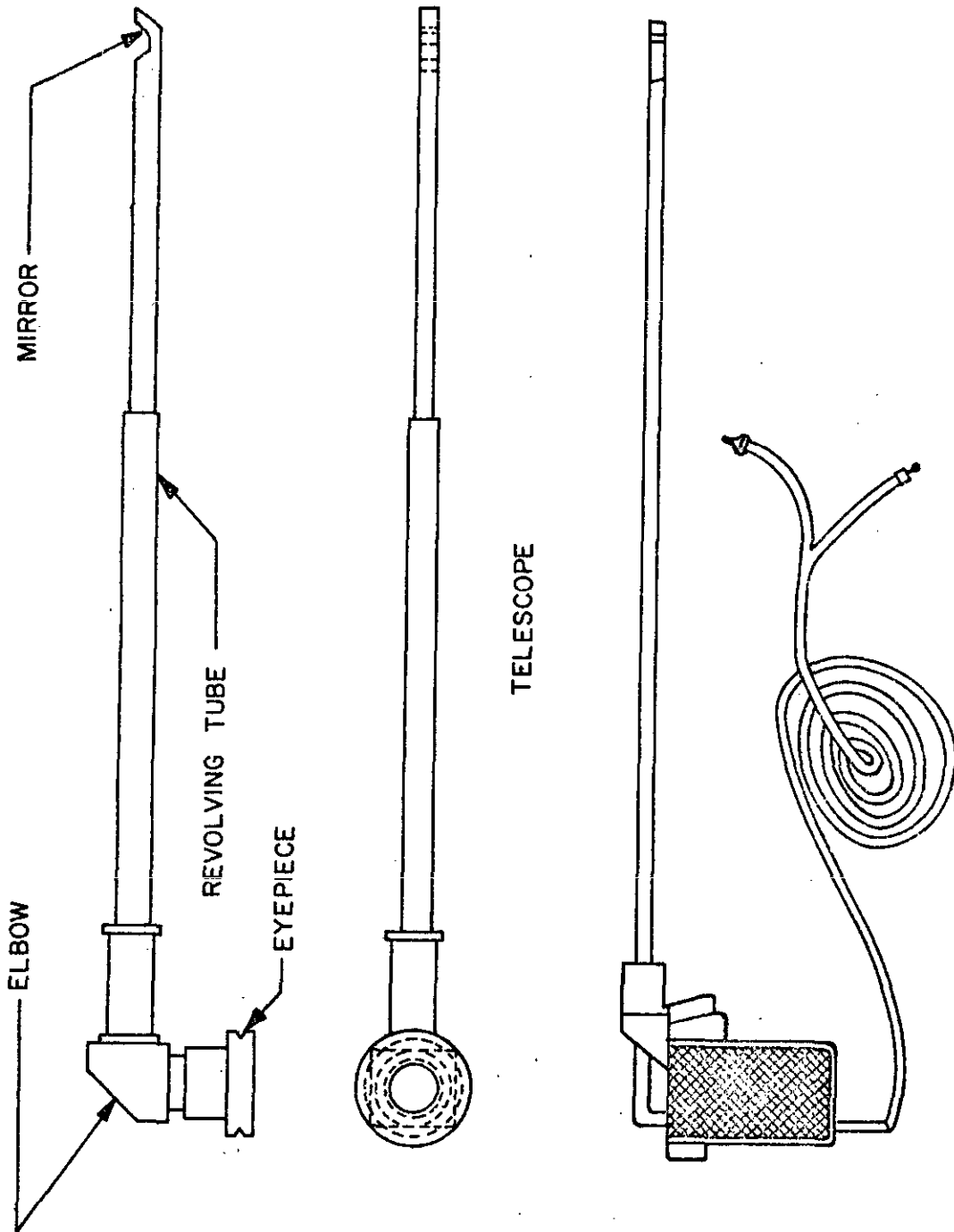
(a) Title, number, and date of this standard.

(b) Class of storage and method of exercising required (see 1.2).

**Preparing activity:**  
Army - AT

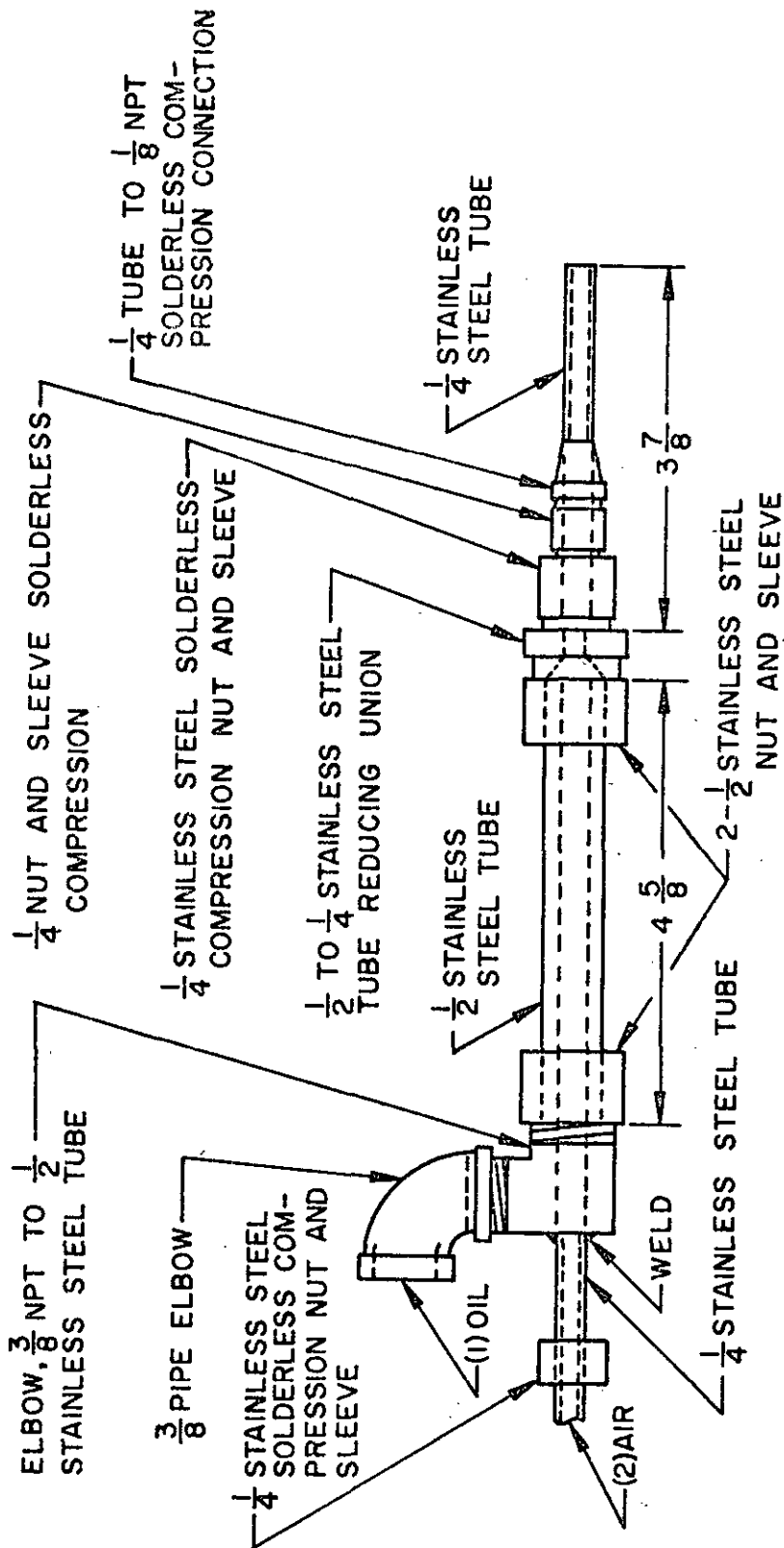
**Project No.** PACK-A020

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PORTABLE LIGHT  
TELESCOPE  
FIGURE 1. INSPECTION DEVICES



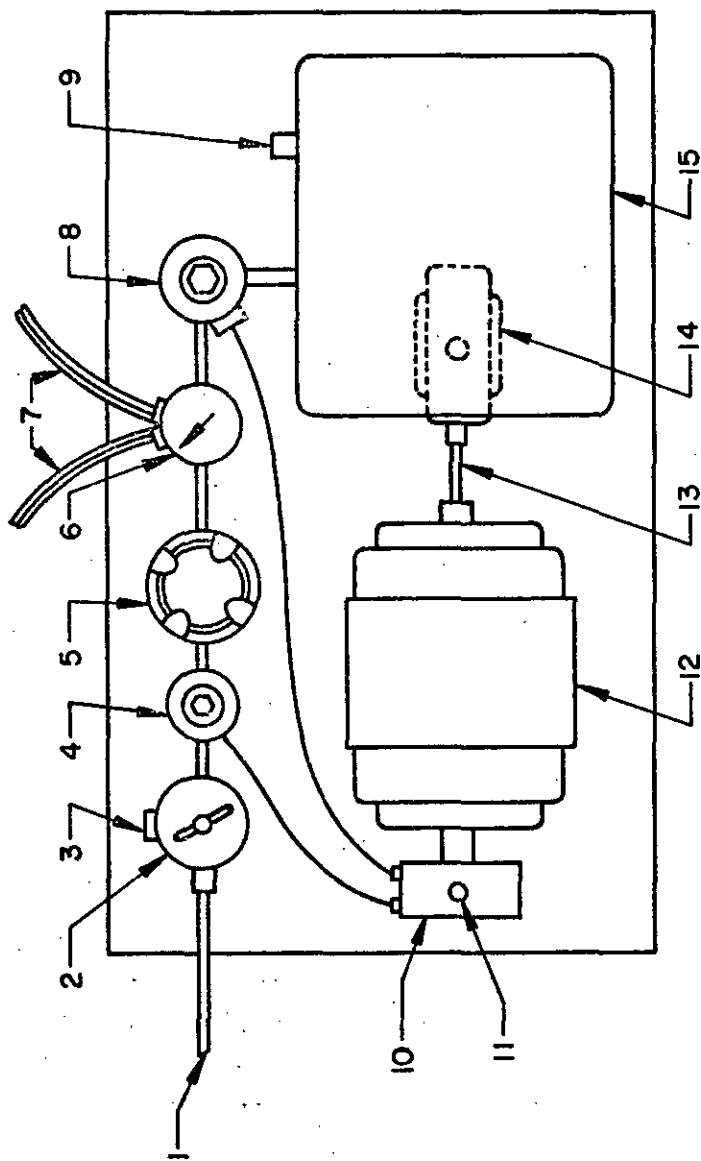


NOTE:  
(1) AND (2) CONNECT TO CORRESPONDING LINES ON FIGURE 3.

NOTE:  
THIS EQUIPMENT HAS PROVEN SATISFACTORY FOR PROCESSING ENGINE THRU SPARK PLUG OPENING.

INJECTION DEVICE  
FIGURE 2

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- |                           |                           |                                    |
|---------------------------|---------------------------|------------------------------------|
| 1. AIR LINE               | 7. TWO DOUBLE TAPED LINE  | 13. SHAFT                          |
| 2. AIR PRESSURE REGULATOR | 8. SOLENOID VALVE         | 14. POSITIVE DISPLACEMENT OIL PUMP |
| 3. AIR PRESSURE GAGE      | 9. OIL TANK LEVEL GAGE    | 15. OIL TANK                       |
| 4. SOLENOID VALVE         | 10. ELECTRIC JUNCTION BOX |                                    |
| 5. MOISTURE SEPARATOR     | 11. ELECTRIC LINE         |                                    |
| 6. OIL PRESSURE GAGE      | 12. MOTOR, 1/4 HP         |                                    |

NOTE:  
THIS EQUIPMENT HAS PROVEN SATISFACTORY FOR PROCESSING ENGINE THRU SPARK  
PLUG OPENINGS IN CONJUNCTION WITH FIGURE 2.

### PRESSURE PUMP

FIGURE 3



FIGURE 4. INSPECTION CHECK LIST (CONT)

ITEM	REFERENCE	SURV. EQUIPMENT			VEHICLE AND EQUIPMENT			COMPO-NENT			REMARKS
		SATISFACTORY	OTHER	SATISFACTORY	REPROCESS	STAGE OF CORROSION	OTHER	SATISFACTORY	REBUILD	STAGE OF CORROSION	
HYDRAULIC SYST	4.5.1.15										
CANNON & MOUNT	4.5.1.16										
RECOIL MECHANISM	4.5.1.17										
EQUILIBRATOR CYL	4.5.1.18										
ELEVATING MECH	4.5.1.19										
CUPOLAS	4.5.1.20										
FIRE EXTINGUISHER	4.5.1.21										
FIRE CONTROL ITEMS	4.5.1.23										
COMPUTING SIGHTS	4.5.1.23.1										
OIL GEARS	4.5.1.23.2										
DRIVE CONTROLLER	4.5.1.23.3										
DESTICATORS	4.5.1.23.4										
BALLISTIC COMPUTER	4.5.1.23.5										
AZIMUTH INDICATOR	4.5.1.23.6										
TELESCOPE MOUNTS	4.5.1.23.7										
BALLISTIC DRIVE & ELEVATION QUADRANT	4.5.1.23.8										
RANGE FINDER	4.5.1.23.9										