**DEPARTMENT OF THE ARMY TECHNICAL MANUAL**

# INSPECTION, CARE, AND PRESERVATION OF AIR DEFENSE ARTILLERY AND TOWED WEAPON MATERIEL (LESS GUIDED MISSILE) DURING STORAGE

Headquarters, Department of the Army, Washington, D. C.
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## SECTION I.

## GENERAL

**1. Purpose**

The purpose of this manual is to provide instruction on the procedures for inspection, care, and preservation of air defense artillery and towed weapon materiel (less guided missiles) during storage.

**2. Scope**

*a.* This manual provides minimum requirements and material applications to be used to achieve the necessary degree of protection for air defense artillery and towed weapon materiel (less guided missiles) in all classes of dormant and active storage for periods in excess of 90 days. Motorized artillery (self-propelled weapons) and truck-mounted rocket launchers are covered in TB 9-300-1/1 (Combat Vehicles: Inspection, Care, and Preservation During Storage).

*b.* The appendix contains a list of current references, including supply and technical manuals, forms, and other available publications applicable to air defense artillery and towed weapon materiel (less guided missiles) during storage.

**3. Forms, Records, and Reports**

*a. General.* Responsibility for the proper execution of forms, records, and reports rests with the commander of units operating equipment for which he is responsible. The value of accurate records must be appreciated by responsible personnel. Forms, records, and reports are used to indicate the type, quantity, condition, and disposition of materiel to be inspected, repaired, or used in repair. Properly executed forms convey authorization; they are used in connection with repair and replacement for materiel in the hands of troops and for delivery for repair to field and depot shops; they show work required, progress of work, and status on completion of repair.

*b. Authorized Forms.* The forms generally applicable to units operating this materiel are listed in the appendix. For instructions in the use of these forms, refer to TM 38-750. For listing of all forms, refer to DA Pam 310-2.

*c. Field Report of Accidents.* The reports necessary to comply with the Army safety program are prescribed in AR 385-40. These reports are required whenever accidents involving injury to personnel or damage to materiel occur.

*d. Equipment Improvement Recommendations.* Deficiencies detected in the equipment or materials should be reported using the Equipment Recommendation section of DA Form 2407.

**4. Requisitioning**

*a.* For requisitioning supplies, use the information in Department of the Army supply manual (for the appropriate FSC group) of the Department of Defense Section of the Federal Supply Catalog. For numerical designations of particular groups of supplies, refer to SB 708-21 (H2-1).

*b.* Distribution of Department of the Army supply manuals and changes thereto are made in accordance with procedures outlined in AR 310-1.

*c.* For information on procuring and requisitioning preservation materials, packaging and packing materials, and related supplies and equipment used by the Army, refer to SB 38-100.

**5. References**

*a.* Frequently used references are: TM 9-200, TM 9-208-1, TM 9-208-2, TM 9-247, AR 725-50, and MIL-STD-129. For complete list of references, refer to the appendix.

*b.* Specifications and Standards used by the Department of the Army are listed in the Department of Defense Index of Specifications and Standards, which consist of three separate parts-

Part I--Straight Alphabetical Listing
Part II--Numerical Listing, and
Part III--Federal Supply Classification Listing

Copies of specifications and standards may be requisitioned in accordance with the provisions of that index. As only basic specifications and

standards are referred in this manual, use must be made of that index to determine the latest revision.

**6. Safety Precautions**

*Note. 1.* If solvents are used on insulation and insulated wires of any electrical items, extreme care must be exercised. Even the vapors of solvents could be harmful in such instances by causing dimensional changes in delicate equipment. Avoid inhalation of a solvent vapors.

*2.* TB ORD 350 should be followed after cleaning operations to provide for fungus proofing.

*a.* Observe safe operating procedures at all times, especially when handling cleaning materials.

*b.* Gasoline and similar hydrocarbons are dangerous and will not be used for cleaning purposes. Adequate cleaning materials described in TM 9-247 are available through regular supply channels.

*c.* Avoid skin contact with cleaning solvents. Use synthetic rubber gloves.

*d.* Observe fire regulations when using paint and lacquer thinners as they are highly flammable.

*e.* Hydrocarbon solvents are destructive to natural rubber and must not be used on such parts. Hydrocarbon solvents are petroleum products such as gasoline, benzene, kerosene, drycleaning (Stoddard) solvents, and drycleaning agents (naphthas).

*f.* Fire protection equipment must be adequately distributed throughout work areas.

*g.* Protective equipment must be worn during operations involving abrasive blasting, grinding, buffing, or where compressed air is being used.

*h.* Do not use carbon tetrachloride as its vapor is dangerous to health.

**7. Definitions**

The following definitions apply to terms used in this manual and pertinent terms used in referenced publications:

*a. Accounts.* A classification of stock balances according to the purpose for which the stocks are held or according to the ownership of the stocks.

*b. Account Code.* A two-digit number designating an account. These numbers are so assigned that major groupings of assets may be obtained by use of the first digit of the code which designates broader categories of purpose or ownership of stocks.

*c. Adjustments.* Transactions which reflect changes in stock balances as a result of inventory discrepancies, catalog changes, in-transit gains or losses, changes of balances between codes, and the like.

*d. Administrative Storage.* If it happens that there is a shortage of maintenance personnel or a temporary excess of vehicles, organizational vehicles can be put into storage when authorized by the major commander concerned.

*e. Analysis.* The process of segregating broad categories of information into component elements of data.

*f. Analysis Code.* A numerical code used in conjunction with the transaction codes further to segregate accounting transactions. These codes will provide sufficient detail for the analysis of shipments, receipts, and adjustments to meet all accounting and reporting requirements.

*g. Condition Reservation.* A segregation of stock balances according to the physical condition of stock or the limitation of use subject to further processing, repair, maintenance, or assembly.

*h. Condition-Reservation Code.* A one-digit number designating a condition-reservation.

*i. Deprocessing.* Deprocessing is the removal of closures, barrier materials, tapes, and all other material utilized for sealing external openings of the weapon, the reverse of processing (r below).

*j. Due-In.* Quantities of supplies scheduled to be received from vendors, repair facilities, assembly operations, other commands, inter-depot transfers, and other sources.

*k. Due-Out.* That portion of stock (requisitioned or required) which was not immediately available for issue or shipment but which is recorded as a commitment for future use.

*l. Exercising Materiel.* This is the activity which is performed for the purpose of distributing preservatives or lubricants over critical surfaces that normally would be accomplished by operation of the materiel.

*m. Issue.* Quantity of supplies shipped to using agency.

*n. Level of Protection*. The extent of preservation, packaging, and packing required to protect an item of supply against specific hazards of storage, shipment, and handling. The levels of protection are: Level A, Military Protection; Level B, Limited Military Protection; and Level C, Minimum Military Protection. For further information on levels of protection, refer to TM 9-200.

*o. On-Hand Balance*. Quantity of supplies of a command supply system the accountability for which is maintained on the command's stock records.

*p. Packing*. Application or use of exterior shipping containers and assembling of packaged items (or items not requiring packaging) therein, together with necessary blocking, bracing or cushioning, weatherproofing, exterior strapping, and marking of the shipping containers.

*q. Preservation and Packaging*. Application or use of adequate protective measures including, as applicable, the use of appropriate preservatives, protective wrappings, cushioning, interior containers, and complete identification marking, up to but not including the exterior shipping container.

*r. Processing*. Treatment of materiel or equipment by cleaning, drying, painting, applying preservative compounds, sealing, packaging, and packing, to prevent its deterioration.

*s. Procurement Direction*. Authority (within limitation of approved programs or as otherwise directed by higher authority) to require procurement to be accomplished. Refer to AR 700-5.

*t. Receipt*. Quantities of supplies picked up on US Army Supply and Maintenance Command stock records.

*u. Reprocessing*. Renewing and/or replacing the original treatment (n above) which has deteriorated or lost its protective effectiveness in storage due to the passage of time or any harsh condition that may have developed.

*v. Surveillance*. Observation, inspection, investigation, test, study, and classification of Army ordnance materiel in movement, storage, and use with respect to degree of serviceability and rate of deterioration.

*w. Transaction Code*. A one-digit number identifying an accounting transaction and its effect on the stock records.

*x. Command Supply Manager*. The head of a command or an individual responsible to such head for the overall direction, coordination, and supervision of the activities of the national inventory control points and related procurement, distribution, and maintenance activities within the command. Refer to AR 700-5.

**8. Responsibility**

During the period of storage, it shall be the commanding officer's responsibility to ascertain that the materiel is not deteriorating and to institute corrective action as soon as it is required. Essentially, all materiel in storage will require a visual surveillance and the selected percentages for inspection will require inspection by component disassembly.

**9. Comments or Suggestions**

This first edition is being published in advance of complete technical review. Any errors or omissions will be forwarded on DA Form 2028 direct to the Commanding Officer, Raritan Arsenal, Metuchen, N.J., ATTN: SSMRA-PRA.

## SECTION II

## STORAGE CLASSIFICATION

**10. Class A, Dormant Storage (With Required Processing)**

*a. General*. Dormant storage includes all processed weapons in storage that have been provided with protection against the entry of snow or rain by means of sealing, covering, or storing in either dehumidified or nondehumidified shelters or buildings. Weapons in dormant storage must not be operated or exercised between specified processing cycles. For complete information on processing of self-propelled and towed class II Ordnance general supplies, refer to TB 9-299/1.

*b. Class A1, Outside of Building Storage*. Weapons in class AT, outside of building storage, are protected by taping, sealing, and/or spraying with strippable plastic coating compound (TB 9-299/1), and affixing closures.

*c. Class A2, Sheltered Storage*. Weapons in class A2, sheltered storage, are protected by buildings (nondehumidified), shelters, weapon-affixed devices, or closures of structural characteristics designed to afford protection from the elements.

*d. Class A3, Dehumidified Structural Storage*. Weapons in class A3, dehumidified structural storage, are protected by structures in which the atmosphere is maintained at a relative humidity of 40 percent or less by means of mechanical dehumidifying devices. Periodic check of humidity is required in accordance with prescribed inspection schedules (par. 13).

*e. Class A4, Dehumidified Nonstructural Storage*. Weapons in class A4, dehumidified nonstructural storage, are protected by complete or partial sealing of the weapon, and by means of mechanical or static dehumidification of each weapon, singly or in series, maintaining a controlled atmosphere within weapon interior areas not exceeding 40-percent relative humidity.

**11. Class B, Active Storage (Periodic Exercising Required)**

*a. General*. Active storage includes all weapons that have been provided with protection against the entry or snow or rain by means of sealing, covering, or storing in shelters or buildings (dehumidified and nondehumidified), and for which certain processing requirements are replaced or supplemented by specified periodic exercising (par. 23).

*b. Class B1, Outside of Building Storage*. Weapons in class B1, outside of building storage, are protected as specified in paragraph 10b, except that specified weapon components are exercised as indicated in paragraph 23.

*c. Class B2, Sheltered Storage*. Weapons in class B2, sheltered storage, are protected as specified in paragraph 10c, except that specified weapon components are exercised as indicated in paragraph 23.

*d. Class B3, Dehumidified Structural Storage*. Weapons in class B3, dehumidified structural storage, are protected as specified in paragraph 10d, except that specified weapon components are exercised as indicated in paragraph 23.

*e. Class B4, Dehumidified Nonstructural Storage*. Weapons in class B4, dehumidified nonstructural storage, are protected as specified in paragraph 10e except that specified weapon components are exercised as indicated in paragraph 23.

## SECTION III

## INSPECTION

**12. General**

The two general types of weapon inspection are the visual type and the component disassembly type:

*a. Visual Type*. Visual inspection will consist of a general surveillance of the weapons. Special attention will be given to any unusual conditions such as damage to, or deterioration of, weapon or weapon processing, corrosion, accumulation of water, or pilferage and leakage of lubricants. Visual inspection will be accomplished as outlined in paragraph 15.

*b. Component Disassembly Type*. A percentage of items in storage will be selected at set intervals (par. 14b) for inspection by component disassembly as outlined in paragraph 16.

**13. Surveillance Inspection Schedule**

*a. General*. Conduct surveillance inspection where applicable as prescribed in b and c below. Damage to weapons or deterioration of weapon or weapon processing will be recorded by the inspector and reported in writing to the responsible officer within 1 working day.

*b. Class A, Dormant Storage (With Required Processing).*

(1) *Class A1, outside of building storage*. Perform visual, external inspection of weapons at intervals not to exceed 30 days or immediately following abnormal weather conditions, such as high winds (gale proportions 50 mph or greater), floods, or any storm conditions which might adversely affect weapon protection. Surveillance inspection will consist of, but not be limited to, an examination of weapon sealing and materials to assure continued protection to all visible portions of the processing.

(2) *Class A2, sheltered storage*. Visually inspect weapons at intervals not to exceed 180 days. Check for evidence of corrosion, leakage of lubricants or coolant, and preservative failure. Inspect weapons protected with shrouds or closures for evidence of damage immediately after abnormal weather conditions.

(3) *Class A3, dehumidified structural storage*. Review dehumidification records at intervals of not more than 30 days to determine average humidity. When records in any dehumidified structure indicate that the accumulative, average relative humidity is greater than 50 percent for the 30-day period, the weapons in that structure will be inspected as prescribed for class A2, sheltered storage ((2) above).

(4) *Class A4, dehumidified nonstructural storage*. Perform surveillance inspection of weapon exteriors at intervals prescribed for class Al, outside of building storage ((1) above). Review of dehumidification records and action thereon will be as prescribed for class A3, dehumidified structural storage ((3) above).

c. *Class B, Active Storage (Periodic Exercising Required)*. Class B1, outside of building storage; class B2, sheltered storage; class B3, dehumidified structural storage; and class B4, dehumidified nonstructural storage, will be inspected in the same manner as prescribed for the corresponding class A series dormant storage in b above, and in addition, any malfunctions or deficiencies noted in either the weapon or the weapon components during exercising will be recorded and brought to the attention of the responsible officer within 1 working day.

**14. Care and Preservation Inspection Schedule**

*a. Inspection Schedule*. Conduct internal and external weapon and component inspection (pars. 15 and 16) at intervals prescribed in table I.

*Table I. Inspection Schedule*

| Class of storage | Surveillance inspection | Component inspection | Dehumidification record check | Exercising check |
|---|---|---|---|---|
| A1 | 30 days | 180 days | Not applicable | Each exercising period |
| A2 | 180 days | 180 days | Not applicable | Each exercising period |
| A3 | 180 days | 360 days | Daily | Each exercising period |
| A4 | 30 days | 360 days | Daily | Each exercising period |
| BE | 30 days | Method I-180 days | Not applicable | Each exercising period |
| | | Method 11-360 days | Not applicable | Each exercising period |
| B2 | 180 days | Method I-180 days | Not applicable | Each exercising period |
| | | Method II-360 days | Not applicable | Each exercising period |
| B3 | 180 days | 360 days | Daily | Each exercising period |
| B4 | 30 days | 360 days | Daily | Each exercising period |

*b. Interval and percentages.*

(1) *Normal inspection.*

*(a) Visual inspection*. All materiel requiring exercising (par. 23) will be inspected at the time of exercising and all materiel not requiring exercising will be inspected semiannually.

(b) *Component disassembly inspection.* Inspect 5 percent of all materiel in storage annually.

(2) *Additional inspection.* In the event deterioration is present, disassemble the affected assemblies as necessary to determine accurately the extent of deterioration. Inspect an additional 10 percent of the lot by component disassembly and submit a report to the responsible office, showing the extent of the deterioration and the corrective action taken. If additional processing or corrective action appears necessary because of deterioration, the entire lot will be inspected. Record all pertinent inspection data on the processing record tag (DA Form 9-14) or processing record sheet (DA Form 9-15).

*c. Care and Preservation Inspection.* Selection of weapons for weapon and component inspection will be as prescribed in table II. Do not select any weapon for subsequent reinspection until all weapons in the lot have been inspected. Assembly all weapons following care and preservation inspection.

*Table II. Care and Preservation Inspection*

| Weapon lot size[1] | Weapon inspection[2] | Component inspection |
|---|---|---|
| 1-100--------- | 10 percent--------- | 2 weapons |
| 101-250------ | 10 weapons, plus 8 percent of all over 100. | 3 weapons |
| 251-500------ | 22 weapons, plus 6 percent of all over 250. | 4 weapons |
| 501-1,000---- | 37 weapons, plus 5 percent of all over 500. | 6 weapons |
| Over 1,000--- | 62 weapons, plus 1 percent of all over 1,000. | 6 weapons, plus 1 weapons for each 250 weapons or major portion thereof of all over 1,000. |

[1]A lot is composed of one type of weapon taken from one class of storage within one processing period of 30 days.

[2] In computing the number of weapons required for inspection, all fractions will be ignored.

*d. Selection of Items for Inspection.* All items in storage shall be visually inspected. The items for the percentage inspection will be selected at random from all types of storage and on a rotational basis so that an item will not be reinspected until all the materiel of that type has been inspected.

**15. Weapon Visual Inspection**

*a.* Weapons selected for inspection will be deprocessed to the extent necessary to permit unrestricted visual inspection (par. 12a) of all external surfaces on and within the weapon. Deprocessing will include removal of on-equipment material, barrier-materials, tapes, and all other material utilized for sealing external openings of the weapon.

*b.* Examine weapon for deterioration of all surfaces, for condition of preservatives and painted surfaces, and to determine the extent of any corrosion or moisture. Partial internal inspection may be performed with the aid of proboscopes, boroscopes, telescope, portable light, or other similar inspection devices and by removal of access plates and covers. Exterior compartments will be inspected for presence of moisture.

**16. Weapon Component Disassembly Inspection**

*a.* Remove all of the rust-preventive compounds, overwrappings, and lubricants.

*b.* Disassemble the materiel sufficiently to permit visual inspection of all operating surfaces.

*c.* Inspect the parts and determine the location and extent of any existing corrosion or deterioration (table III).

*d.* Inspect recoil mechanisms as follows:

Note. Disassembly of hydropneumatic recoil mechanisms is limited to the extent shown in the applicable equipment technical manual.

(1) Disassemble hydropneumatic recoils sufficiently to permit visual inspection of external operating surfaces.

(2) At time of exercising, inspect for oil leakage in accordance with TB ORD 606.

(3) Inspect fluid in hydropneumatic recoil mechanisms in accordance with TB ORD 605.

*e.* Immediately following the operation of the oil gears or hydraulic units during inspection, inspect a sample of the fluid from the reservoir of each of the mechanisms tested.

*f.* Remove gun mount; then remove gun from mount. Disconnect counterbalance assembly. Disassemble the breech mechanism, including the breechblock assembly, and remove preservatives to permit proper inspection. Clean and visually examine the obturator gas-check pad, obturator rings, disk, and internal breech surfaces and threaded portions for powder fouling. Clean and inspect all exposed unpainted surfaces of the mount, trunnion caps, and bearings.

*Table III. Stages of Corrosion and Corrective Action*

| Stages of corrosion | Description | Collective Action | | | Remarks |
|---|---|---|---|---|---|
| | | 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 any immediate corrective action. | This condition does not require any immediate action other than processing as necessary. | This condition does not require any immediate action other than processing as necessary. | Use as is, except in the case of recoil surfaces, equilibrator, and elevating cylinders, subjected to functional wiping action. Remove corrosion by use of crocus cloth. |
| Stage 2 | Loose rust, black, red, or white. Corrosion accompanied by minor etching and pitting of surface affected. No scale or tight rust. | Clean by any practical method. Touch up with paint as originally applied. | Clean, exercise, and reprocess. | Exercise and reprocess | In the case of recoil surfaces, equilibrator, and elevating cylinders subjected to functional wiping action. Remove corrosion by use of crocus cloth. |
| Stage 3 | Rust, black, red, or white. Corrosion accompanied singly or in combination with etching, pitting, or more extensive surface damage. Loose or granular condition. | Same as stage 2 | Clean, exercise, and reprocess. | Exercise and reprocess | This condition would have a minor effect on fit or wear of part or cornponent, but would permit use of part without reprocess. Does not apply to items such as instruments, electrical or manual, and critical surfaces which are necessary to effect a seal against pressurized liquid. |
| Stage 4 | Rust, black, red, or white. Corrosion progressed to the point where fit, wear, function, or life of the item has been affected. Powdered or scaly condition, with pits or irregular areas of material removed from surface of item. | Same as stage 2 | Replace or reprocess parts and components involved. | Replace or reprocess parts and components involved. | Requires action as indicated. |

*Note*. Disassembly of hydropneumatic recoil mechanism will be limited to the extent indicated in applicable equipment technical manuals.

(1) *Recoil mechanism*. Disassemble, clean, and inspect hydrospring, variable and hydropneumatic recoil mechanism, cylinders, and replenishers.

(2) *Equilibrator and recuperator cylinders*. Disassemble, clean, and inspect equilibrator gas- and oil-operated cylinders.

(3) *Elevating mechanism and cylinders*. Disassemble, clean, and inspect hydraulic elevating mechanisms.

*g.* Disassemble switch boxes, relays, control boxes, junction boxes, and all other functional components to the extent necessary to deter- mine evidence of corrosion.

*h.* Drain reservoirs remove covers and plugs, and inspect interiors.

*i.* Remove hydraulic components such as pumps, motors, valves, pistons, and connections to facilitate examination of interior surfaces. Perform further disassembly when removed components reveal evidence of corrosion.

*j.* In addition to disassembly prescribed in a through i above, remove covers, caps, and inspection plates as necessary to facilitate thorough inspection of weapons.

**17. Fire-Control Items Inspection**

*a*. Inspect on-equipment materiel (OEM), fire control, and communication equipment packages.

*Note*. OEM, and fire-control and communication equipment that is stored with the OEM, will not be deprocessed unless the exterior package shows evidence of deterioration.

*b*. Inspect fire-control and communication equipment that is processed and stored on carriage as follows:

(1) Check completeness and general appearance.

(2) Remove all corrosion preventives with approved solvents (as prescribed in TM 9-247 and TM 9-208-1) from machined and unpainted surfaces and inspect for corrosion.

(3) Check rubber eyeshields, canvas covers, and cover assembly gaskets for deterioration, cuts, or tears.

(4) Inspect power distribution boxes, electrical connections, and cables for deterioration and corrosion and for broken or frayed connections. Check wiring for evidence of fungus growth. Check tropicalization treatment in accordance with TB ORD 350.

(5) Inspect scales, numbers, and indexes for clarity.

(6) Check level vials for cracks, breaks, or looseness.

(7) Turn all worm knobs slowly. The movement shall be smooth and even over their entire ranges. Upon reversal of the movements, there shall be no undue movement of the knobs without corresponding movement of the driven members.

(8) Inspect all optical instruments for objectional dirt smears, scratches, digs, condensate, fungus growth, chips, fractures, or cement separations.

(9) Check that meters, switches, handwheel controls, and variable resistors (potentiometers) operate in all positions without sticking or looseness, and the plugs and receptacles mate securely.

(10) Check that hydraulic oil is at the proper level. Check elevation and azimuth data converters for leakage and internal pressure.

(11) Check drive cables and clutches for proper operation.

(12) Check magnetrons for mechanical, electrical, and air connections. functional tests as shown in the pertinent technical manuals.

(13) Conduct electrical and mechanical functional tests as shown in the pertinent technical manuals.

(14) Operate all computing sight controls to maximum limits to determine whether there are any malfunctions due to corrosion or other causes. Remove inspection covers and plugs to permit inspection of gears, drive band, and bearings. Completely disassemble only when examination indicates the presence of internal corrosion.

(15) Remove covers from fire-control items indicated in (*a*) through (*g*) below, to permit examination.

*(a)* Slip-ring assembly-perform complete disassembly only when visual examination indicates the presence of corrosion.
*(b)* Distribution box.
*(c)* Inverter box.
*(d)* Interlock micro switches.
*(e)* Control selector box.
*(f)* Elevation switch assembly.
*(g)* Lighting device.

(16) Inspect indicating disiccators for effectiveness of desiccant.

(17) Inspect all controls for freedom of movement. Inspect control locks to assure that movements are secured when control locks are applied.

**18. Evaluation Inspection**

*a*. The extent of corrosion, deterioration, or damage must be included in the inspection report (par. 20). This information will also provide a basis for determining disposition of weapons in accordance with instructions prescribed in paragraph 21.

*b*. Determine stages of corrosion from table III, with considerations towards the relationship to the affected area. Consider only corrosion which may be found on functional or mating surfaces as sufficient basis for rejection or reprocessing of the component. Consider corrosion found on other surfaces as sufficient basis for additional cleaning and reprocessing.

*c*. During evaluation, note the condition and presence of preservative compounds and coatings. In order to provide a basis for determining the continuation or extension of reprocessing and inspection intervals, the inspection report must include information that preservatives or other protective materials and processes are or are not in a satisfactory condition. Report appearance of preservative films as applicable, as prescribed in (1) and (2) below.

(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).

**19. Processing Inspection**

Conduct reprocessing inspections during and after reprocessing of weapon to assure compliance with the following processing requirements:

*a*. Weapons will be reprocessed as required based on the evaluation inspection prescribed in paragraph 18. All weapons will be exercised at the time of reprocessing. See paragraph 26*c* for reprocessing intervals.

*b*. Reprocessing of weapons during storage will be in accordance with TB 9-299/1.

*c*. Ventilation of weapons in sheltered and dehumidified storage will be as follows:

(1) *General*. Do not seal weapons in class A2, sheltered storage; class A3, dehumidified structural storage; class B2, sheltered storage; and class B3, dehumidified structural storage, during periods of storage. Provide all weapons with maximum possible ventilation, except as prescribed in (2) *(b)* and *(c)* below.

(2) *Ventilation for weapons in class A1 and B1, outside of building storage.*
*(a)* To permit more adequate weapon ventilation, remove inspection plates, access plates, and gaskets from under side of weapon only.
*(b)* Leave drain valves in open position.
*(c)* Package removed items and stow in a secure location on the weapon.
*(d)* Cover openings, resulting from the removal of plates, with metal screening having 1/4-inch maximum mesh.

(3) *Ventilation for weapons in class A4 and B4, dehumidified nonstructural storage*. Provisions for ventilation are not required for weapons in classes A4 and B4, dehumidified nonstructural storage.

**20. Inspection Reports**

*a*. Process DD Form 1397 for each weapon inspected to indicate results of each care and preservation inspection (par. 14).

*b*. Record both positive and negative results to provide a basis for evaluating reprocessing and inspection schedules.

*c*. Maintain accurate records so that they will be available for review at each storage location during the period that the weapon is in storage.

**21. Disposition of Weapons**

*a. Deteriorated Weapons.*

(1) When inspection and evaluation (par. 18) establishes the presence of corrosion, take corrective action as indicated in table III.

(2) When stage 4 corrosion (table III) is present, disposition of corrective action of components must be based on evaluation of functional tests and operational test results. Perform such tests on the items in an "as found" condition and in accordance with applicable technical manuals.

(3) When results of functional and operational tests disclose malfunction and further evaluation assures that malfunction is the result of corrosion which cannot be corrected by normal care and preservation action, a request for disposition, accompanied with complete details, must be forwarded to the officer in charge assigned the maintenance function for the combat weapon involved.

*b. Nondeteriorated Weapons*. When, as a result of inspection and evaluation (par. 18), it is found that corrosion is not present and all protective coatings, materials, and devices are satisfactory for continued protection, the officer in charge may extend the reprocessing cycle as prescribed in (1) through (7) below.

(1) Each extension will be limited to 3-month consecutive increments until the limit of processing effectiveness has been reached.

(2) When reprocessing cycles have been extended at the installation, forward a complete report to the responsible officer in charge.

(3) For confirmation of processes, stamp or initial and date DD Form 1397.

(4) Accompany all reports with a statement to the effect that processing cycle has been extended.

(5) Do not make initial or repetitive processing extensions unless based upon actual inspection in accordance with the procedures and schedules prescribed herein.

(6) When it is determined that the limit of processing effectiveness has been reached, the interval covered between initial processing and subsequent reprocessing will be established as the continuing cycle for that installation.

(7) The care and preservation cycle must not exceed a 12-month interval.

## SECTION IV

## CARE

**22. Corrective Action**

*a*. Remove all forms of corrosion and perform other required actions on disassembled materiel (table III).

*b*. Take necessary action to prevent accumulation of water, leakage of lubricants, and pilferage.

*c*. If the fluid in oil gears or hydraulic units is contaminated, the fluid will be drained, the unit flushed with drycleaning solvent and filled with a proper preservative fluid. The source of contamination will be eliminated.

*d*. Correct operation defects.

*e*. If required, reestablish tropicalization treatment on fire-control materiel in accordance with TB ORD 350.

**23. Exercising**

*a. Purpose*. Exercising is performed for the purpose of distributing preservatives or lubricants over critical surfaces that normally would be accomplished by weapon operation; critical surfaces or highly finished interior surfaces of weapons and their components are subject to deterioration when mechanisms are not in use. To insure that weapon components in storage remain in a serviceable condition, it is necessary that exercising be accomplished after inspections are completed and immediately prior to reprocessing.

*b. Methods.*

(1) *Method I, unit exercising*. Unit exercising is accomplished by operation of

the main unit of a weapon system with power supplied to components by and through the system's own power source. Consistent with the type and equipment of the weapon, method I exercising includes operation of auxiliaries, elevation of the weapon tube, movement of the weapon tube in and out of battery and functioning of all powered components not disassembled for storage.

(2) Method II, external power exercising. External power exercising is by remote or external power source not requiring operation of the weapon power plant. Operation of controls and application of power is usually accomplished from a location outside of the weapon system. Method II exercising includes operation of a weapon elevating system where applicable.

*Note.* Prior to processing a recoil mechanism and when it has not been exercised, proof-fired, overhauled, or manufactured within 4 months prior to preparation for storage, it will be exercised for a minimum of 3 extensions of recoil piston, each extension to be a minimum of 6 inches. Replenisher end equilibrator assemblies will be exercised concurrently with recoil mechanisms.

*c. Frequency.* Frequency of exercising will be determined in accordance with time intervals established in table IV. Inspect continuously during exercising to assure conformance with proper exercising methods. For complete information on exercising, refer to TB ORD 303.

*Table IV. Exercising Intervals*

| Method of Exercising | Storage class | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 |
| Method I_ | 180 days_ | 180 days_ | 180 days_ | 180 days_ | 180 days_ | 15 days_ | 180 days_ | 180 days |
| | Not applicable. | Not applicable. | Not applicable. | Not applicable. | 7 days_ | 7 days_ | 7 days_ | 7 days |
| Method II | | | | | | | | |

## SECTION V

## PRESERVATION

### 24. Reprocessing After Visual Inspection and Exercising

The materiel will be reprocessed to the extent necessary to provide adequate protection and to approximate the conditions of materiel processed in accordance with TB 9-299/1, and applicable packaging and processing specifications and instructions.

### 25. Reprocessing After Component Disassembly Inspection

The materiel will be processed in accordance with TB 9-299/1.

### 26. Reprocessing During Storage

a. Weapons will be reprocessed as required, based on evaluation of inspection as prescribed in paragraph 18. All weapons will be exercised at the time of reprocessing. Reprocessing intervals are given in c below.

b. Reprocessing of weapons during storage will be in accordance with TB 9-299/1.

c. Reprocessing intervals will be conducted at 180-day intervals for all classes of storage.

*Note.* Exercising frequency at intervals not exceeding 180 days is necessary to assure weapon and component readiness with the minimum delay. Improper functioning of a weapon and its components may require extensive disassembly, rebuild, and replacement of parts, thereby delaying shipments and increasing expenditures.

### 27. Ventilation of Weapons in Sheltered and Dehumidified Storage

Refer to paragraph 19c.

## SECTION VI

## MARKING AND RECORDING

**28. Marking**
Dates of inspection and exercising will be stenciled on the gun tube, launching rail, or other conspicuous place in letters at least three- fourths of an inch in height.

**29. Recording**
Inspection will be recorded in DA Form 2408-4 (Weapon Record Data).

**30. Serviceability Classification**
Changes of serviceability classification necessitated during inspection, care and preservation will be reflected in the status reports that are used to establish availability of materiel.

## APPENDIX

## REFERENCES

**1. Publication Indexes**
The following indexes should be consulted frequently for the latest changes or revisions of references given in this appendix and for new publications relating to materiel covered in this manual:--

Index of Army Motion Pictures, and Film Strips, Slides, and Phono-Recordings. ---------- DA Pam 108-1
Military Publications:
General Policies ---------- AR 310-1
Index of Administrative Publications ---------- DA Pam 310-1
Index of Blank Forms ---------- DA Pam 310-2
Index of Graphic Training Aids and Devices ---------- DA Pam 310-5
Index of Supply Manuals--Ordnance Corps ---------- DA Pam 310-29
Index of Tables of Organization and Equipment, Type Tables of Distribution, and Tables of Allowances. ---------- DA Pam 310-7
Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders. ---------- DA Pam 310-4
Index of Training Publications ---------- DA Pam 310-3

**2. Forms**
The following forms pertain to this materiel.

DA Form 9-1, Materiel Inspection Tag.
DA Form 9-14, Processing Record for Shipment and Storage of Field and AA Artillery and Equipment.
DA Form 9-15, Processing Record for Shipment and Storage of Gun, Anti-aircraft, 75-mm, Weapon System, Towed, M51.
DA Form 253, Fire Extinguisher Record Tag.
DD Form 1397, Processing and Deprocessing Record for Shipment and Storage Vehicles and Spare Engines.
DA Form 2028, Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9 (cut sheet).
DA Form 2404, Equipment Inspection and Maintenance Worksheet.
DA Form 2407, Maintenance Request.

DA Form 2408-1, Equipment Daily or Monthly Log.
DA Form 2408-4, Weapon Record Data.

**3. Other Publications**
The following explanatory publications contain information pertinent to this material and associated equipment.

*a. General.*

Cooling Systems: Vehicles and Powered Ground Equipment ---------- TM 9-2858
Dictionary of United States Army Terms ---------- AR 320-5
Federal Supply Classification; Part I: Groups and classes (Cataloging Handbook H2-1). ---------- SB 708-21
Military Publications, General Policies ---------- AR 310-1
Military Symbols ---------- FM 21-30
Military Terms, Abbreviations, and Symbols: Authorized Abbreviations and Brevity Code. ---------- AR 320-50
Military Training ---------- FM 21-5
Ordnance Major Items and Major Combinations and Pertinent Publications ---------- SB 9-1
Organization, Policies, and Responsibilities for Maintenance Operations ---------- AR 750-5
Organization and Operation of Inventory Control Points ---------- AR 700-5
Property Accountability: Code Pattern for Accounting and Reporting ---------- AR 735-15
Safety: Accident Reporting and Records ---------- AR 385-40
Techniques of Military Instructions ---------- FM 21-6
The Army Equipment Record System and Procedures ---------- TM 38-750

*b. Maintenance.*

Cleaning of Ordnance Materiel ---------- TM 9-208-1
Cleaning, Drying, and Abrading Equipment for Cleaning Ordnance Materiel ---------- TM 9-208-2
Inspection, Care, and Maintenance of Antifriction Bearings ---------- TM 9-214
Instructions for Exercising All Types of Recoil Mechanisms, Replenishers, and Equilibrators. ---------- TB ORD 303
Ordnance Maintenance: Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel; and Related Materials Including Chemicals. ---------- TM 9-247
Painting Instructions and Field Use ---------- TM 9-213
Preservation, Packaging, and Packing of Military Supplies and Equipment ---------- TM 38-230
Processing of Unboxed Self-Propelled and Towed Class II Ordnance General Supplies and Related Materiel for Shipment and Storage. ---------- TB 9-299/1

*c. Storage and Shipment.*

Cleaning, Drying, and Abrading Equipment for Cleaning Ordnance Material. ---------- TM 9-208-2
Cleaning of Ordnance Materiel ---------- TM 9-208-1
Combat Vehicles: Inspection, Care, and Preservation During Storage ---------- TB 9-300-1/1
General Packaging Instructions for Ordnance General Supplies ---------- TM 9-200
Hydropneumatic Recoil Mechanisms and Equilibrators for Antiaircraft Artillery: Instructions for Inspecting Recoil Mechanisms, Checking and Correcting Nitrogen Pressure, and Adding Recoil Reserve oil. ---------- TB ORD 606
Hydropneumatic Recoil Mechanisms of Field, Combat Vehicle, and AA Artillery Materiel: Inspection Procedure to Determine Serviceability of Mechanisms Containing Emulsified Oil. ---------- TB ORD 605

Logistics (General): Preservation, Packaging, and Packing---------- AR 700-15
Issue of Supplies and Equipment: Requisitioning, Receipt, and Issue System----------AR 725-50
Marking for Shipment and Storage----------MISTD-129
Storage and Materials Handling----------TM 743-200-1
Storage of Army Supplies and Equipment in Shed and Open Storage----------SB 388-1
Strippable Plastic Coating Compound; Description, Equipment Used, Method of Application, Inspection, and Maintenance. TB ORD 574
Supply Procedures: List of Standard Lubricants, Hydraulic Fluids, Liquid Fuels, and Preservative Material Used by the Army. SM 3-6800-ML
Supply Procedures: Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army. SB 38-100

**By Order of the Secretary of the Army:**

**EARLE G. WHEELER,**
***General, United States Army,***
***Chief of Staff.***

**Official:**

**J. C. LAMBERT,**
***Major General, United States Army,***
***The Adjutant General.***

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*NG:* State AG (3); units same as Active Army except allowance is one copy to each unit.
*USAR:* None.
For explanation of abbreviations used, see AR 320-50.

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