

PRESERVATION, PACKAGING AND PACKING OF ANTI-FRICTION BEARINGS

(This EO replaces EO 75-10-17 dated 14 Jun 55) ✓

PURPOSE

1 The objective of this Engineering Order is to set forth standards of preservation, packaging, and packing that will ensure and provide adequate protection for all anti-friction bearings and bearing parts other than those used in instruments and bombsights. Preservation of bearings as outlined is only to be undertaken by those formations operating properly equipped and staffed packaging sections at RDs and SDs .

GENERAL

2 The preservation of bearings generally is divided into four steps and concerns itself with corrosion control measures to prevent deterioration resulting from exposure to atmospheric conditions during storage and shipment. These measures are:-

- (a) Cleaning, including fingerprint removal.
- (b) Drying .
- (c) Application of the corrosion - preventive compound or lubricant .
- (d) Packaging .

NOTE

Carry out the procedures connected with corrosion control in one continuous operation from start to finish. Undue delay between operations may result in contamination of the bearings by dirt or dust either prior to, or subsequent to, application of the preservative, or may permit corrosion of clean bearings before the preservative is applied .

3 Properly preserved and stored bearings are those which have been thoroughly cleaned, fingerprints removed, dried and coated with the approved corrosive preventive compound or lubricant, then protected by an approved preservation wrapping method .

4 The complete execution and the sequence of procedures for preservation or re-preservation of bearings will prevent any possibility of corrosive action. However, deterioration of preservative compounds, aging characteristics of packing materials must be considered on stored items, therefore, EO 00-35-1 will apply on re-preservation of packaged bearings.

5 The handling of bearings should be kept to a minimum during or after cleaning and preservation. Never handle bearings with bare hands as the perspiration residue will tend to start corrosive action. If rubber gloves are not available, handle the bearings with barrier material, grease resistant, which is acid-free and non-corrosive, RCAF Sec/Ref. 40D/681 .

6 Thoroughly clean the bearings and bearing parts to remove all dirt, grease and fingerprints. The use of trichlorethylene to Specification C-28-2 RCAF Ref. 33C/163 in a vapour degreaser unit, or, by a cleaner fluid to Specification 3-GP-8, RCAF Sec/Ref. 33C/182, is approved.

CAUTION

Cleaner fluid is flammable and trichlorethylene is highly toxic. Handle these solvents in safety tanks and provide accessible fire extinguishers. Ensure covers are replaced when the solvents are not in use. These solvents are toxic to the same extent as gasoline and paint solvents.

However, they may be safely used if the area is properly ventilated and exhausted. Where the solvent is used in large tanks, a two percent by volume contamination by sludge is grounds for filtering or removal of the contents. A cloudy appearance of the fluid indicates the presence of sludge.

7 Immediately after the cleaning operation treat the surfaces of bearings with fingerprint remover to Spec. MIL-C-15074A to remove all perspiration residue from the bearing and bearing parts. During the processing, handle the bearings on hooks, racks or baskets suitable for the purpose and for adequate drainage. Application of fingerprint remover is to be followed by a rinse in cleaner fluid Spec. 3-GP-8 to remove any film left by the fingerprint remover.

NOTE

All bearings and bearing parts shall be moisture-free before preservatives are applied. Failure to remove moisture or solvents will seriously affect the preservative film and will cause it to fail.

8 Drying will consist of drainage of the cleaner fluid, application of controlled heat, if available, or alternately using dehydrated compressed air drying. The normal time required for drying is two minutes or more with the temperature controlled from a minimum of 54°C (130°F) to a maximum of 71°C (160°F). The maximum temperature requires cooling of the bearings prior to the application of the preservative, to attain a uniform coating of the preservative coating. The minimum temperature assures removal of all moisture from the bearing and precludes condensation.

NOTE

If controlled heat is not available, use controlled compressed air as a method of drying the bearings. Prepared compressed air must be dry and free of all oil and dirt. The presence of moisture in compressed air may be readily detected by permitting the air to blow on a polished

piece of metal at room temperature, and by observing for condensation. Pressure of the air may vary with the capacity of available equipment, but need not be above 90 psi.



When drying bearings with compressed air, do not allow the bearing parts to spin freely. A freely spinning bearing is easily damaged.

PACKAGING METHODS

9 Bearings are to be packaged in accordance with Specification Pack 2-1, utilizing the following methods:-

- (a) 1A-1 Conforming wrap, dip-coat sealed.
- (b) 1A-5 Rigid metal container sealed.
- (c) 1A-8 Grease resistant, waterproof, water-vapourproof bag, sealed.
- (d) 1B-2 Aluminum foil wrap, strippable compound.

NOTE

Method 1A-1 or 1B-2 to be used for bearings over five pounds.

IDENTIFICATION

10 Identification will in all instances appear on the outside container, and in addition to the regular identification an additional label is to be affixed containing the following.

WARNING

Preserved with (Specification No.) clean and lubricate prior to use if necessary.

TYPES OF BEARINGS

11 Bearings other than instrument and bomb-sight will be classified as aircraft control type bearings or wheel bearings, and will be relubricated after cleaning, and inspection as follows:-

- (a) All control type bearings, enclosed or open, are to be re-lubricated with grease, Spec. 3-GP-683a (RCAF Ref. 34A/192).
- (b) All wheel bearings, enclosed or open, are to be re-lubricated with grease, Spec. 3-GP-690 (RCAF Ref. 34A/122).

EQUIPMENT REQUIRED

12 The following is a list of the RCAF stocked materiel and the required procedure for the cleaning and relubrication of wheel and control type bearings:-

- (a) 2T/130 tank parts cleaner each 2. These tanks to be used for working the bearings in cleaner fluid Spec. 3-GP-8 to remove the old lubricant.
- (b) 2T/808 air compressor each 1. The air compressor is required to provide air for the operation of the cleaner fluid spray guns and the air blow guns.
- (c) 2T/51 spray guns (varsol type) each 2. The spray guns are required to concentrate a spray of cleaner fluid (Spec. 3-GP-8) through the bearings between the races of ball and roller open type bearings and to provide agitation of the cleaner fluid for the enclosed type bearings.
- (d) 2T/41 guns, air blow each 2. These air guns are required for drying the bearings.
- (e) 2T/19 vapour degreaser (trichlorethylene) each 1. The use of this machine will depend upon results of the previous cleaning methods. It may be necessary to use this machine to ensure complete removal of the old lubricant and to free the bearings of oil films which may be deposited on the bearings from contaminated cleaner fluid.
- (f) 4H/228 guns power lubricating each 2. The power grease guns will ensure a sufficient volume of grease at the bearing lubricator to provide good results with a minimum of manual effort. Two guns will be required to obviate the necessity of recharging the grease reservoirs with different types of grease for the style of bearings being processed.
- (g) 1T/1425 lubricators for enclosed bearings each 2. These lubricators are designed for the greasing of enclosed (sealed) bearings.
- (h) 1T/1426 lubricators for open type bearings each 2. These lubricators are designed for the greasing of open type ball and roller bearings.
- (j) Synthetic rubber gloves and rubber aprons to be worn by the operators at all times to ensure adequate protection of clothing to prevent dermatitis and to protect the bearings from contamination with body acids (fingerprints etc.) which cause rapid corrosion of the parts affected.
- (k) Grease, Spec. 3-GP-683a (RCAF Ref. 34A/192) for all control type bearings, enclosed or open.
- (l) Grease, Spec. 3-GP-690 for all wheel bearings of the enclosed or open type (34A/122).
- (m) Cleaner fluid, Spec. 3-GP-8 (33C/182).
- (n) Trichlorethylene, Spec. C-28-2 (33C/163).
- (p) Fingerprint remover, Spec. MIL-C-15074A.
- (q) Hose, Spec. MIL-H-6000 (for suction on varsol guns) size to be specified to fit suction tubes.
- (r) Hose, air, Spec. ZZ-H-461b or ZZ-N-496a size to be specified to fit compressor, varsol guns and air guns.
- (s) Metal containers, slip cover type, of various sizes.

ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF

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