LIST OF EFFECTIVE PAGES

CHAPTER SECTION	PAGE	DATE
LEP	1	Dec 02/2005
	2 blank	Dec 02/2005
Contents	1	Dec 02/2005
	2	Dec 02/2005
72-10-00	1	Feb 11/2000
Description and	2	Feb 11/2000
Operation	3	Feb 11/2000
	4	Feb 11/2000
	5	Feb 11/2000
	6 blank	Feb 11/2000
72-10-00	201	Dec 02/2005
Maintenance	202	Dec 06/2001
Practices	203	Dec 06/2001
	204	Dec 06/2001
	205	Dec 06/2001
	206	Dec 06/2001
	207	Dec 06/2001
	208	Dec 06/2001
	209	Dec 06/2001
	210	Dec 06/2001
	211	Dec 06/2001
	212	Dec 06/2001
	213	Dec 06/2001
	214	Dec 06/2001
	215	Dec 06/2001
	216	Dec 06/2001
	217	Dec 06/2001
	218	Dec 02/2005
	219	Dec 06/2001
	220 blank	Dec 06/2001

TABLE OF CONTENTS

TABLE OF CONTENTS

REDUCTION GEARBOX - DESCRIPTION AND OPERATION

1. Description and Operation (Ref. Fig. 1)

   A. General

      The engine models included in this manual are equipped with one of two propeller reduction gear and shaft sections, that differ primarily in pitch of first-stage reduction gears.

      Both sections have a nominal output shaft speed of 2200 rpm at takeoff power; one is fitted with coarse first-stage gear teeth and the other with fine first-stage gear teeth for increased torque.

      The reduction gear and propeller shaft, located at the front of the engine, is housed in two magnesium alloy castings, the front and rear cases of which are bolted together at flange A of the exhaust duct (Ref. 72-50-05).

      The gearbox contains a two-stage planetary geartrain, accessory drives, torquemeter and propeller shaft. The first-stage reduction gear and torquemeter are contained in the rear case, while the second-stage reduction gear, accessory drives and propeller shaft are in the front case. Torque from the power turbine section is transmitted through the power turbine shaft and turbine coupling to the first-stage sungear.

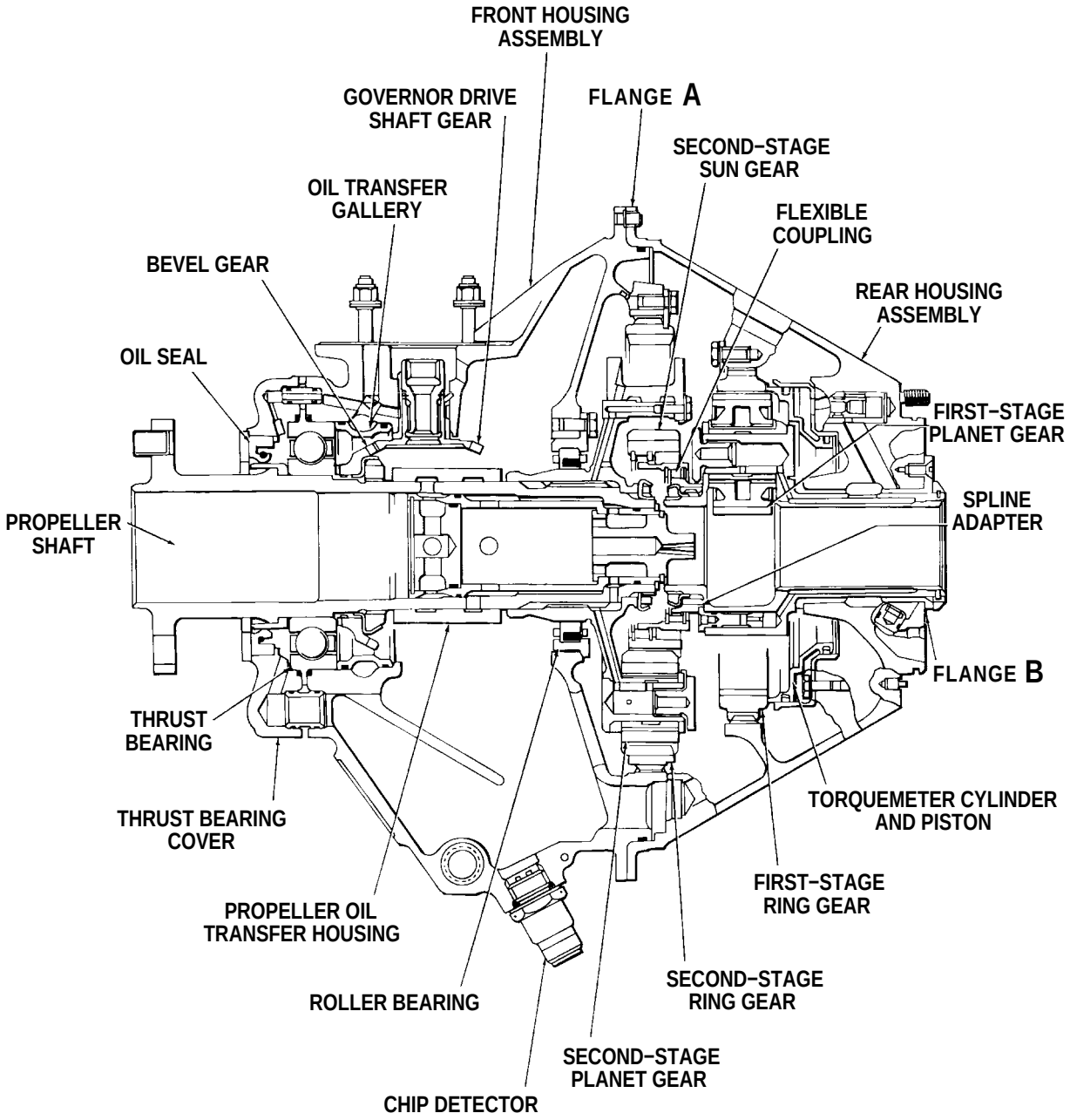
      The first-stage sungear consists of a short hollow steel shaft which has an integral spur gear at the front end and an external spline on the rear end. The external splines engage with the internal splines of the turbine coupling on the power turbine shaft and is secured within the coupling by two retaining rings.

      The first-stage ring gear is located in helical splines provided in the rear case of the reduction gearbox. The torque developed by the power turbine is transmitted through the sungear and planet gears to the ring gear which is opposed by the helical splines. This opposition causes the planet gear carrier to rotate. The ring gear, although secured by the helical splines, is allowed to move axially between the case and five retaining plates secured to the case. The axial movement is used in the torquemeter application.

      The second-stage of reduction is housed in the front case of the reduction gearbox. The first-stage planet carrier is attached to the second-stage sungear by a flexible coupling which also acts to dampen any vibrations between the two rotating masses.

      The second-stage sungear drives five planet gears mounted in the second-stage carrier. A second-stage ring gear is located by splines in the front case of the reduction gearbox by retaining plates. The second-stage carrier is in turn splined to the propeller shaft and held by a keywasher and nut. A flanged roller bearing supports the second-stage carrier and the rear of the propeller shaft. The inner race of the bearing is located on the machined circumference of the second-stage carrier extension, while the flanged outer race is bolted to a web in the front case.

      A propeller oil transfer tube adapter and a nozzle assembly are coupled together by a retaining ring and located within the centerbore of the propeller shaft. The adapter provides the necessary separation of pressure oil for propeller actuation, and pressure oil for lubrication of propeller thrust and gearbox front roller bearings. The nozzle assembly and transfer tube conduct pressure oil for lubrication of the No. 4 bearing area, second-stage



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Reduction Gearbox Assembly - Cross-section
Figure 1

planetary gears and sungear coupling. Pressure oil is supplied to the oil transfer tube via oil transfer sleeve installed on the OD of the propeller shaft. The sleeve is supplied by two independent oil sources via two transfer tubes. Engine oil is supplied to the rear section of the sleeve for direction to the centerbore transfer tube adapter. Propeller governor oil is supplied to the front section of the sleeve to provide hydraulic pressure for the propeller pitch servo system (Ref. 76-10-00).

The accessories located on the front reduction gearbox are driven by a bevel drive gear mounted at the rear of the propeller shaft thrust bearing assembly. Drive shafts from the bevel drive gear transmit rotational power to the three pads on the front case of the reduction gearbox. The pads are located at the 12 o'clock, and approximately the 3 and 9 o'clock positions.

Propeller thrust loads are absorbed by the ball bearing assembly located on the front section of the propeller shaft, the outer flange of which is secured to the front case of the gearbox. The bevel drive gear adjusting spacer, thrust and roller bearings and seal runner are stacked and secured to the propeller shaft by a keywasher and spanner nut.

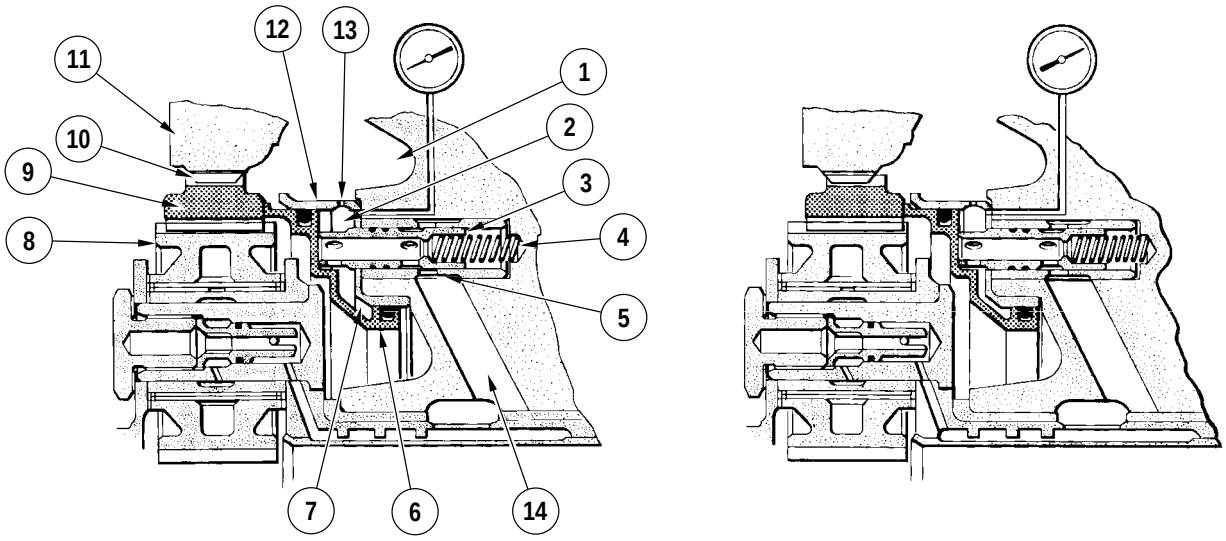
A thrust bearing cover assembly is secured by bolts at the front flange of the reduction gearbox front case. The cover assembly incorporates an oil seal retaining ring plate which facilitates replacement of the oil seal and two oil transfer tubes. The tubes allow pressure oil in the reduction gearbox to be applied to the front face of the thrust bearing and scavenge oil to return to the gearbox via cored passages in the cover assembly.

The torquemeter (Ref. Fig. 2) is a hydro-mechanical torque-sensing device, installed at the rear of the first-stage reduction gear in the rear case of the reduction gearbox. The torquemeter provides an accurate indication of engine power output and consists of a cylinder, piston, seal rings, valve plunger and spring.

Rotation of the ring gear is resisted by the helical splines, which impart an axial movement to the ring gear and to the torquemeter piston. Movement of the piston moves a valve plunger against the spring, opening a metering orifice and allowing an increased flow of pressure oil into the torquemeter chamber. Piston movement continues until oil pressure in the torquemeter chamber is proportional to torque being absorbed by the ring gear. Any change in engine power recycles the sequence until a state of equilibrium is again reached.

Hydraulic locks are prevented by allowing oil to bleed continuously from the torquemeter chamber into the reduction gear sump through a small bleed orifice at the top of the torquemeter cylinder.

Because the external ambient pressure and the pressure within the reduction gear may vary and affect the total pressure on the torquemeter piston, internal pressure is measured. The difference between the torquemeter pressure and reduction gear internal pressure accurately indicates the torque being produced. The two pressures are internally routed to bosses at the top of the reduction gear front case where connections can be made to suit individual airframe instrumentation requirements.



CONSTANT POWER **POWER INCREASED**

C351A

Torquemeter - Schematic (Typical)
Figure 2

Key to Figure 2

1. Gearbox Oil Pressure
2. Torquemeter Pressure
3. Valve Plunger
4. Spring
5. Metering Orifice
6. Torquemeter Piston
7. Torquemeter Chamber
8. First-stage Planet Gear
9. First-stage Ring Gear
10. Helical Splines
11. Rear Case
12. Torquemeter Cylinder
13. Bleed Orifice
14. Engine Oil Pressure

A chip detector is installed at the 6 o'clock position on the reduction gearbox. The chip detector provides an indication of the presence of ferrous particles in the lubrication system when a continuity check is done. Connection provisions exist for airframe wiring to provide in-flight indication of contamination (Ref. Aircraft Maintenance Manual).Inspection paint stripes on detector housing permit visual indication of defects of swaging at the electrical connector.

REDUCTION GEARBOX - MAINTENANCE PRACTICES

1. General

   A. Maintenance personnel should make reference to the INTRODUCTION section and Chapter 70-00-00 STANDARD PRACTICES of this manual to familiarize themselves with general procedures.

   B. Install suitable protective caps/covers over all disconnected tubes/lines and component openings.

   C. Lockwire used, shall unless otherwise specified, comply with specification AMS 5687, heat and corrosion resistant steel wire MS9226-03, which is 0.025 inch diameter, and will not be specified in instructions.

2. Consumable Materials

   The consumable materials listed below are used in the following procedures.

Item No.	Name
PWC03-001	Oil, Engine Lubricating
PWC05-037	Enamel, Aluminum Epoxy
PWC05-061	Cloth, Abrasive
PWC05-101	Cloth, Abrasive
PWC05-270	Paper, Abrasive
PWC07-023	Coating, Aluminum and Zinc
PWC08-002	Adhesive, Fluorosilicone
PWC09-001	Sealant, Silicone Rubber
PWC11-014	Alcohol, Isopropyl
PWC11-016	(Use PWC11-014)
PWC11-027	Solvent, Petroleum
PWC11-031	Cleaner, Engine
PWC13-001	Primer, Epoxy
PWC13-003	Primer, Coating

3. Special Tools

   The special tools listed below are used in the following procedures.

Tool No.	Name
PWC32072	Puller

4. Fixtures, Equipment and Supplier Tools

   Not Applicable

5. Removal/Installation

A. Removal of Propeller Shaft Oil Seal - Pre-SB1227, Post-SB1377 and Post-SB1381 (Ref. Fig. 201)

(1) Remove the propeller (Ref. Aircraft Maintenance Manual).

(2) Remove eight bolts (6, Fig. 201) and washers (7) securing the oil seal retaining ring halves (1, Pre-SB1227), (2, Post-SB1377) or (8, Post-SB1381) to the propeller thrust bearing cover (4). Remove the ring halves.

(3) If installed, remove the gasket (3, Post-SB1377) and discard.

(4) Work out the seal (5) from the cavity, taking care not to damage the bore of the thrust bearing cover assembly or the surface of the oil seal runner (10).

(5) Remove the garter spring from the inside diameter rear face of the seal (5). Unwind the spring and remove from the propeller shaft. Remove the seal by stretching over the retaining ring and propeller shaft flange.

NOTE: The seal may be cut in order to remove it. When cutting, protect the surface of the propeller shaft from possible nicks or scratches caused by the cutting instrument.

(6) Clean the gasket residue from the retaining ring halves and thrust bearing cover mating surfaces using a suitable non-metallic scraper.

B. Removal of Propeller Shaft Oil Seal - Post-SB1227, Pre-SB1390 and Post-SB1390 (Ref. Fig. 202)

(1) Remove the propeller (Ref. Aircraft Maintenance Manual).

(2) Place a suitable container under the front end of the reduction gearbox and disconnect the airframe drain line from the nipple at the bottom of the thrust bearing cover (5, Fig. 202). Allow any residual oil to drain into the container.

(3) Remove the bolts (8), washers (7) and oil seal retaining ring (1) from the thrust bearing cover. Move the retaining ring (1) forward to be flush against the flange of the propeller shaft. Remove the gasket (6) and discard.

(4) If Post-SB1390 oil seal support ring halves (2) are fitted, note the split line location, identify the top and bottom segments, and remove from the propeller shaft.

(5) Work the seal element (3) from the cavity, taking care not to damage the bore of the thrust bearing cover assembly or the surface of the oil seal runner (4).

(6) Remove the garter spring from the inside diameter rear face of the seal. Unwind the spring and remove from the propeller shaft. Remove the seal by stretching the seal over the retaining ring and propeller shaft flange.

NOTE: The seal may be cut to facilitate removal. When cutting the seal, protect the surface of the propeller shaft from possible nicks or scratches caused by the cutting instrument.

(7) Clean the gasket mating surfaces using a suitable non-metallic scraper.

C. Removal of Reduction Gearbox Oil Strainer (Ref. Fig. 203)

(1) Remove the bolt (2, Fig. 203) and washer (3) securing the scavenge oil strainer plug (4) to the reduction gearbox (1). Withdraw the strainer plug with puller (PWC32072) and remove the preformed packing (5).

(2) Remove the scavenge oil strainer assembly (6) from the cored passage in the gearbox.

D. Removal of Magnetic Chip Detector - Post-SB1217 (Ref. Fig. 204)

NOTE: On Pre-SB1217 engines, a drain plug was fitted in lieu of a chip detector.

(1) Remove the cover (5, Fig. 204), or disconnect the airframe cable, from the chip detector (1) at the 6 o'clock position on the reduction gearbox. If the cover is removed, discard the preformed packing (4) if the inspection shows deterioration or damage to the packing.

(2) Provide a suitable drip pan under the reduction gearbox to collect any residual oil.

(3) Remove the chip detector (1) from the reduction gearbox and discard the preformed packing (3).

E. Installation of Propeller Shaft Oil Seal - Pre-SB1227, Post-SB1377 and Post-SB1381 (Ref. Figs. 201 and 205)

CAUTION: HANDLE THE SEAL WITH CARE TO PREVENT DAMAGE. AVOID APPLYING LOADS LOCALLY TO THE LIP OF THE SEAL, AS THE SEAL IS SOFT AND HAS LOW TEAR RESISTANCE.

(1) Remove the garter spring from the new seal (5, Fig. 201).

(2) Tape a strip of plastic material (polyethylene sheet) over the flange of the propeller shaft and apply a liberal layer of engine oil (PWC03-001). This will let the seal slip over the flange without undue stress.

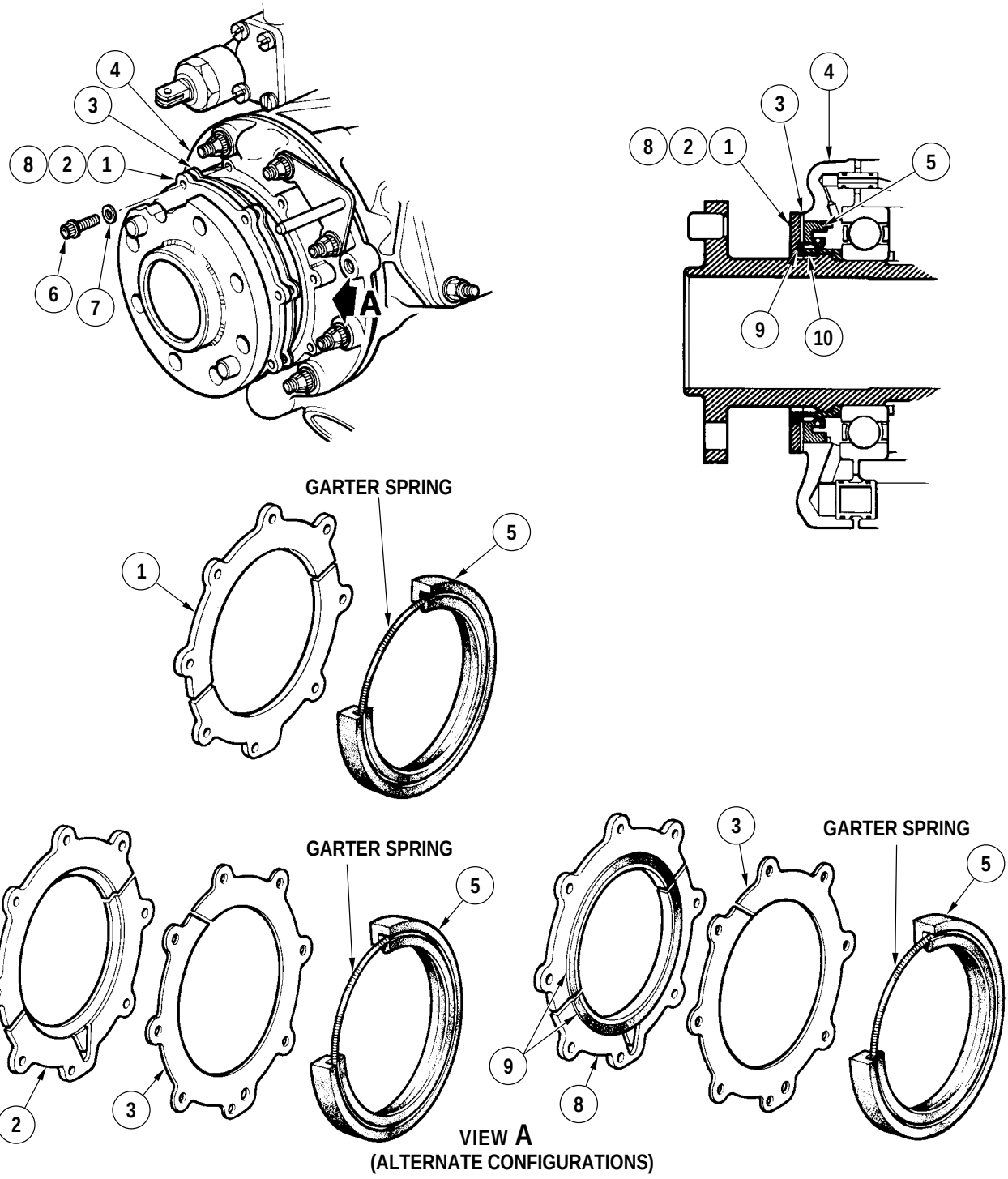
(3) Preheat the seal to a maximum of 93°C (200°F) for 20 minutes.

(4) Moisten seal (5, Fig. 201) in engine oil (PWC03-001) and install over propeller mounting flange of the propeller shaft with the V-side of the seal facing the thrust bearing cover (4).

(5) Install the garter spring in the V-section of the seal (Ref. Fig. 205).

(6) Gently press the seal and garter spring into the cavity formed by the bore of the thrust bearing cover (4, Fig. 201) and oil seal runner (10). Work the seal into the cavity with thumbs until the seal is correctly seated in the cavity.

(7) Remove the plastic sheet from the propeller shaft and wipe propeller shaft dry of all residual oil. Install the oil seal retaining ring halves (1, Pre-SB1227), (2, Post-SB1377) or (8, Post-SB1381) as follows:



Pre-SB1227, Post-SB1377 and Post-SB1381 C43104

Removal/Installation of Propeller Shaft Oil Seal
Figure 201

Key to Figure 201

1. Oil Seal Retaining Ring Halves (Pre-SB1227)
2. Oil Seal Retaining Ring Halves (Post-SB1377)
3. Gasket (Post-SB1377)
4. Thrust Bearing Cover
5. Seal and Garter Spring
6. Bolt
7. Washer
8. Oil Seal Retaining Ring Half (Post-SB1381)
9. Felt Strip Insert (Post-SB1381)
10. Seal Runner

CAUTION: MAKE SURE THE REAR FACE OF THE RETAINING RING HALVES ARE CLEAN AND THE SURFACE IS FREE OF ABRASIONS, NICKS, PITTING AND SCORING.

(a) Install Pre-SB1227 retaining ring halves (1) over the oil seal (5) making sure the gap between the two halves is approximately horizontal and the bolt holes are aligned with those on the thrust bearing cover (4).

(b) For Post-SB1381 engine, moisten the felt strip inserts (9) on the oil seal retaining ring halves (8) with engine oil (PWC03-001).

CAUTION: THE OIL SEAL SUPPORT GASKET IS VERY BRITTLE; DO NOT OVERSTRESS DURING INSTALLATION.

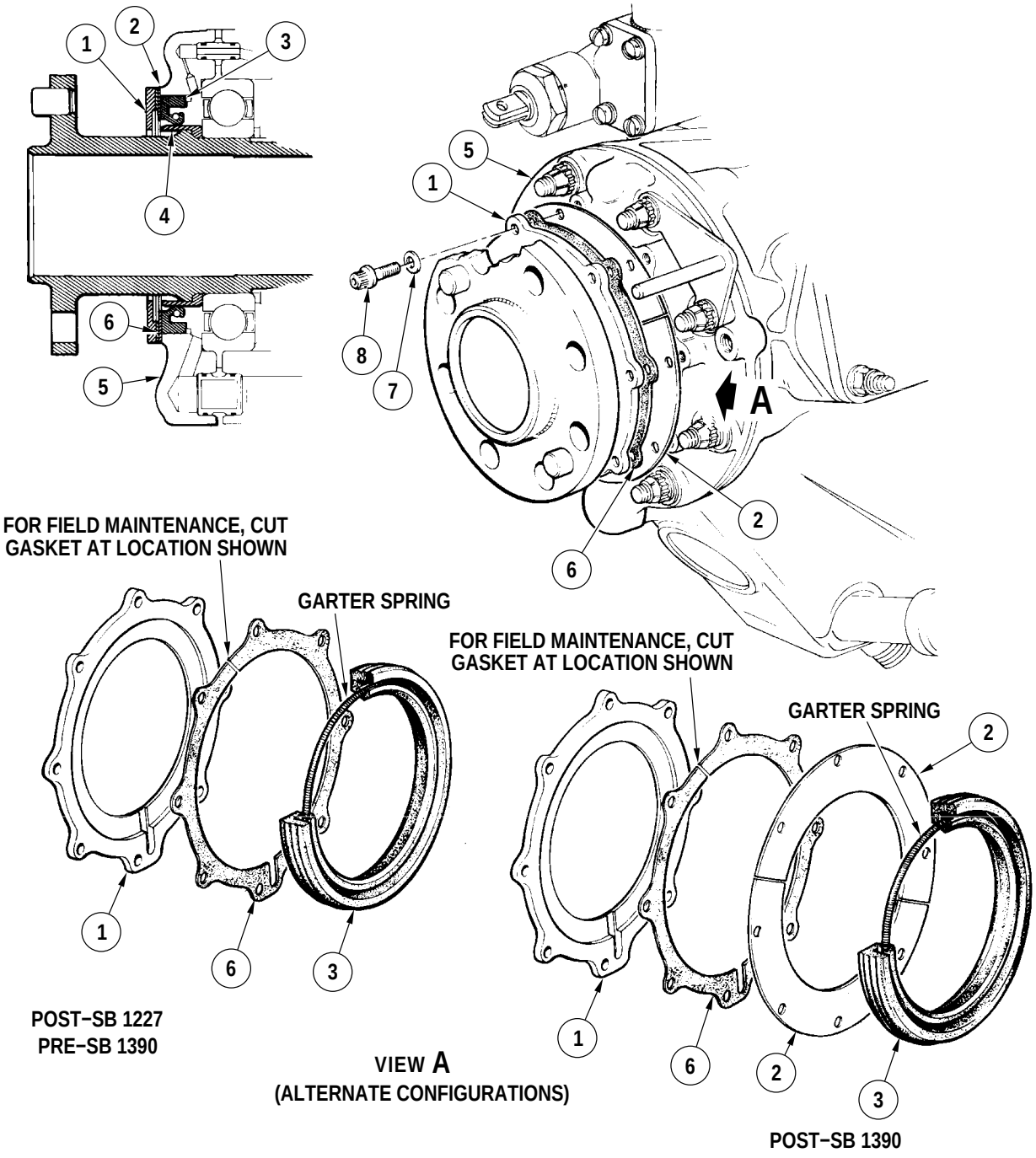
(c) When installing the Post-SB1377 or Post-SB1381 oil seal assembly, place the pre-split support gasket (3) carefully over the propeller shaft with the split at the one o'clock position and the drain port at bottom centerline. Install the retaining ring halves (2 or 8) so the lower half ring oil drain channel aligns with the cut-out in the gasket and drain spigot. Align the bolt holes of both ring halves with the holes in the thrust bearing cover (4), making sure the joints are at the four and ten o'clock positions (all references looking rearward).

(d) Make sure the Post-SB1381 felt strip inserts (9) engage the lip of the seal runner (10).

(8) Maintain the bolt hole and joint alignment; secure the retaining ring halves (1,2 or 8, as applicable) with washers (7) and bolts (6). Tighten the bolts in diametric sequence, 24 to 36 lb.in., and lockwire in pairs.

(9) Install the propeller (Ref. Aircraft Maintenance Manual).

NOTE: The use of Post-SB1377 configuration is an option to Post-SB1390 configuration, not a replacement.



Post-SB1227, Pre-SB1390 and Post-SB1390 C13433A

Removal/Installation of Propeller Shaft Oil Seal
Figure 202

Key to Figure 202

1. Oil Seal Retaining Ring
2. Oil Seal Support Ring Halves (Post-SB1390)
3. Seal Element
4. Seal Runner
5. Thrust Bearing Cover
6. Gasket
7. Washer
8. Bolt

F. Installation of Propeller Shaft Oil Seal - Post-SB1227, Pre-SB1390 and Post-SB1390 (Ref. Figs. 205)

CAUTION: HANDLE THE SEAL WITH CARE TO PREVENT DAMAGE. AVOID APPLYING LOADS LOCALLY TO THE LIP OF THE SEAL, AS THE SEAL IS SOFT AND HAS LOW TEAR RESISTANCE.

(1) Remove the garter spring from the new seal (3, Fig. 202).

(2) Tape a strip of plastic material (polyethylene sheet) over the flange of the propeller shaft and apply a liberal layer of engine oil (PWC03-001). This will let the seal slip over the flange without undue stress.

(3) Preheat the seal to a maximum of 93°C (200°F) for 20 minutes.

(4) Moisten seal (3, Fig. 202) in engine oil (PWC03-001) and install over propeller mounting flange of the propeller shaft with the V-side of the seal facing the thrust bearing cover (5).

(5) Install the garter spring in the V-section of the seal (Ref. Fig. 205).

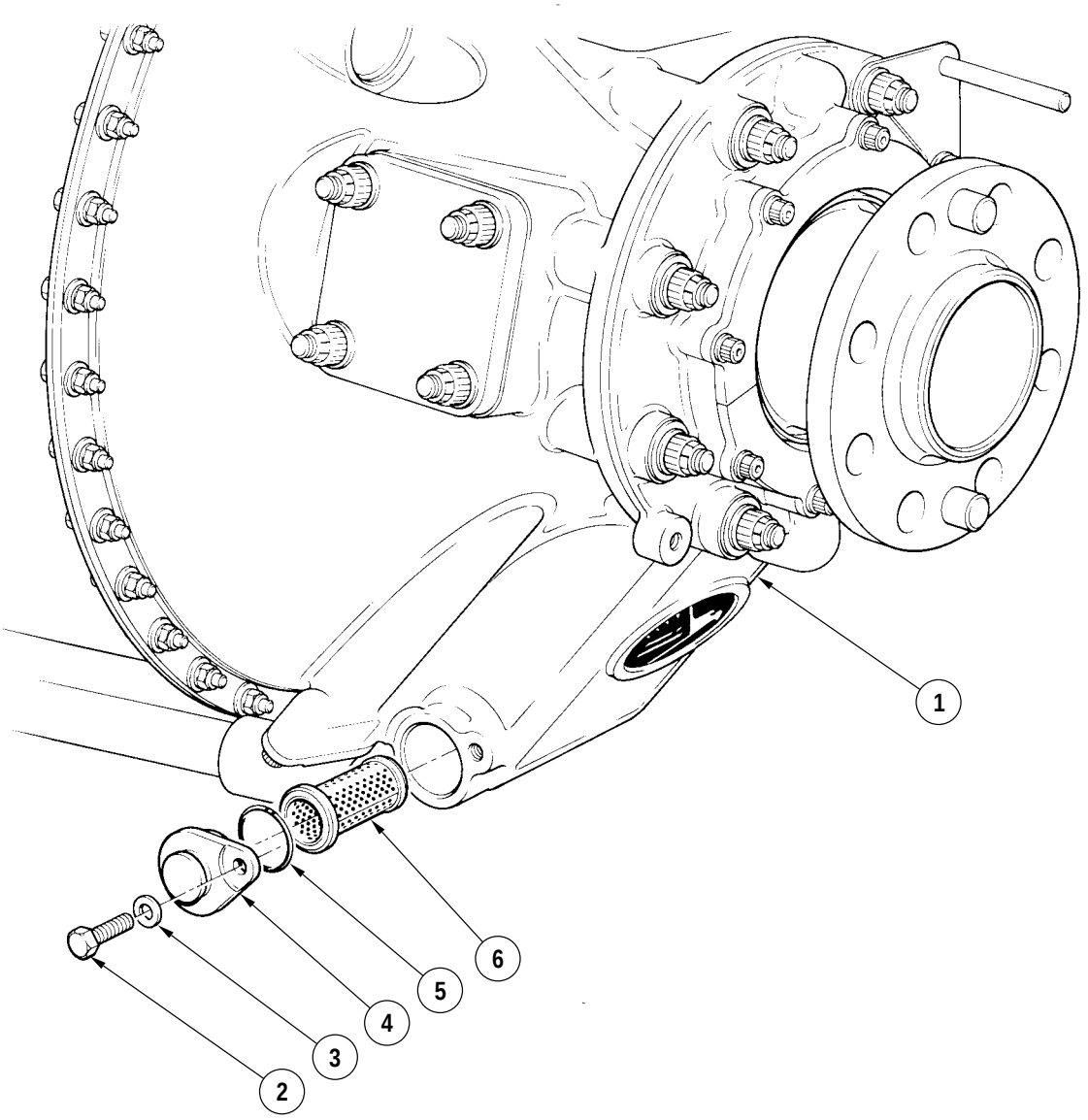
(6) Gently press the seal and garter spring into the cavity formed by the bore of the thrust bearing cover (5, Fig. 202) and oil seal runner (4). Work the seal into the cavity with thumbs until the seal is correctly seated in the cavity.

(7) Remove the plastic sheet from the propeller shaft and wipe propeller shaft dry of all residual oil.

(8) If the Post-SB1390 oil seal support ring halves (2) are to be installed, position the segments with the split line as noted at disassembly, and with the top and bottom halves properly located against the seal (3).

CAUTION: THE OIL SEAL SUPPORT GASKET IS VERY BRITTLE; DO NOT OVERSTRESS DURING INSTALLATION.

(9) Cut (slit) the new gasket (6) midway between the two holes at a right angle to the vertical centerline, then carefully install on the propeller shaft.



C352B

Removal/Installation of Scavenge Oil Strainer
Figure 203

Key to Figure 203

1. Reduction Gearbox
2. Bolt
3. Washer
4. Scavenge Oil Strainer Plug
5. Preformed Packing
6. Scavenge Oil Strainer Assembly

(10) Align the groove in the retaining ring (1) and corresponding cut-out in the gasket with the drain spigot in the thrust bearing cover. Secure the retaining ring with eight bolts (8) and washers (7). Tighten the bolts in diametric sequence, 24 to 36 lb.in., and lockwire in pairs.

(11) Install the propeller (Ref. Aircraft Maintenance Manual).

(12) Connect the airframe drain line to the nipple at the bottom of the thrust bearing cover (Ref. Aircraft Maintenance Manual).

G. Installation of Reduction Gearbox Oil Strainer (Ref. Fig. 203)

(1) Locate the strainer (6) in cored passage at the front of the reduction gearbox (1). Make sure that the strainer is pressed fully home.

(2) Moisten the preformed packing (5) with engine oil (PWC03-001) and install in the recess on the boss of the strainer plug (4).

(3) Install the strainer plug on the reduction gearbox and secure with the bolt (2) and washer (3). Tighten the bolt 36 to 40 lb.in., and fasten with lockwire.

H. Installation of Magnetic Chip Detector - Post-SB1217 (Ref. Fig. 204)

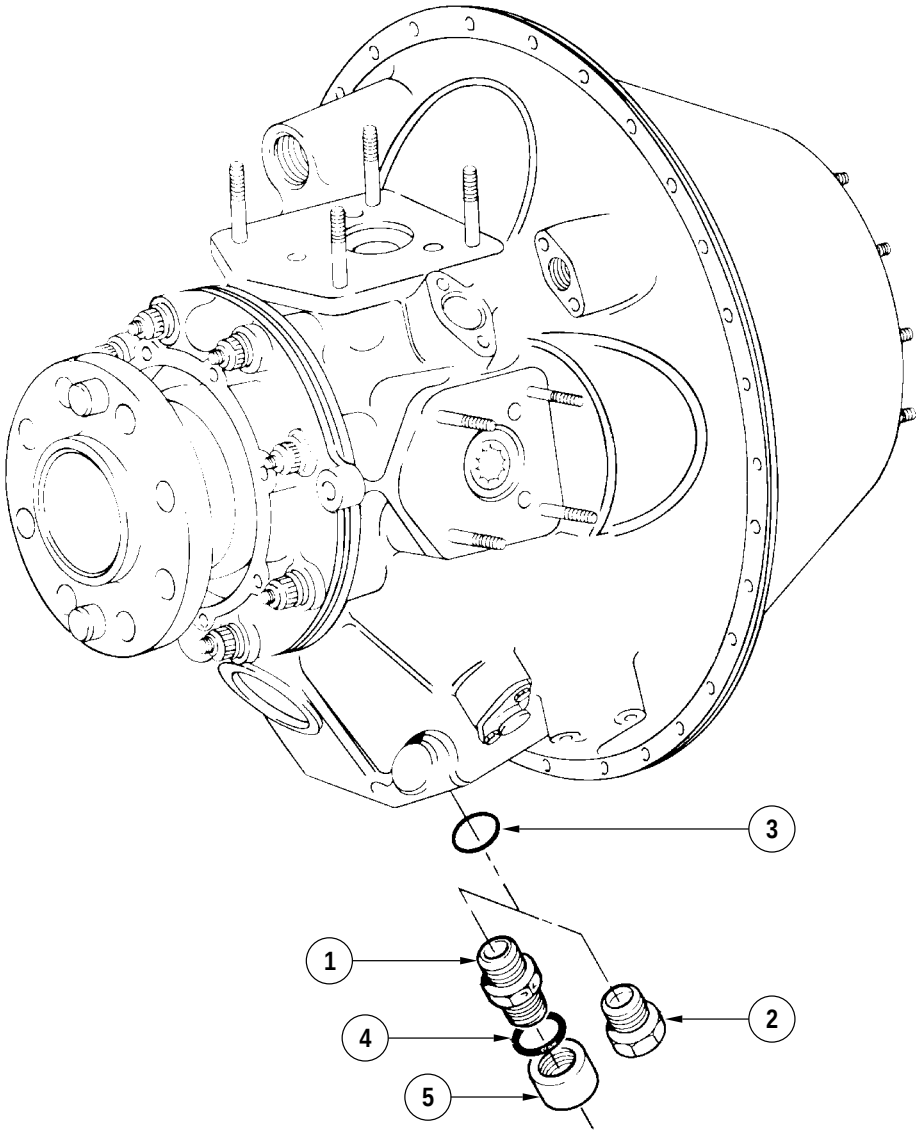
NOTE: On Pre-SB1217 engines, a drain plug was fitted in lieu of a chip detector.

(1) Install a new preformed packing (3, Fig. 204) on the chip detector (1).

CAUTION: THE CHIP DETECTOR CAN BE QUITE EASILY OVERTIGHTENED BY MODERATE HAND PRESSURE. USE OF A TORQUE WRENCH IS THEREFORE IMPORTANT TO AVOID OVERTORQUING WHICH COULD RESULT IN FRACTURE OF THE CHIP DETECTOR BODY.

(2) Install the chip detector in the boss at the 6 o'clock position in the reduction gearbox. Tighten 45 to 55 lb.in.

(3) If necessary, install a new preformed packing (4) in the cover (5).



C7054

Magnetic Chip Detector
Figure 204

Key to Figure 204

1. Chip Detector (Post-SB1217)
2. Plug (Pre-SB1217)
3. Preformed Packing
4. Preformed Packing (Post-SB1217)
5. Cover (Post-SB1217)

(4) Install the cover on the chip detector, or reconnect the airframe cable, as applicable. If the cover was reinstalled, tighten fingertight only; do not use tools. Lockwire the cover and/or chip detector.

NOTE: On field-modified engines, a circular knurled cover (MS25043-120), with integral gasket and chain, may be fitted in lieu of a drilled hexagon cover. This cover should be reinstalled on the chip detector fingertight only, and the chain suitably fastened with lockwire to the chip detector.

6. Cleaning/Painting

A. Scavenge Oil Strainer Assembly

(1) Soak scavenge oil strainer assembly in clean solvent (PWC11-027) or (PWC11-031). Remove oil sludge and examine for evidence of metallic particles. Open up blocked holes using non-metallic scraper.

(2) Wipe clean with lint-free cloth and dry with clean, dry compressed air.

B. Magnetic Chip Detector

CAUTION: DO NOT SOAK DETECTOR IN SOLVENT.

(1) Seal electrical receptacle.

(2) Use a medium stiff-bristle brush or spray to clean with solvent (PWC11-027) or (PWC11-031).

(3) Make sure detector is free of metal particles. Dry with clean, dry compressed air.

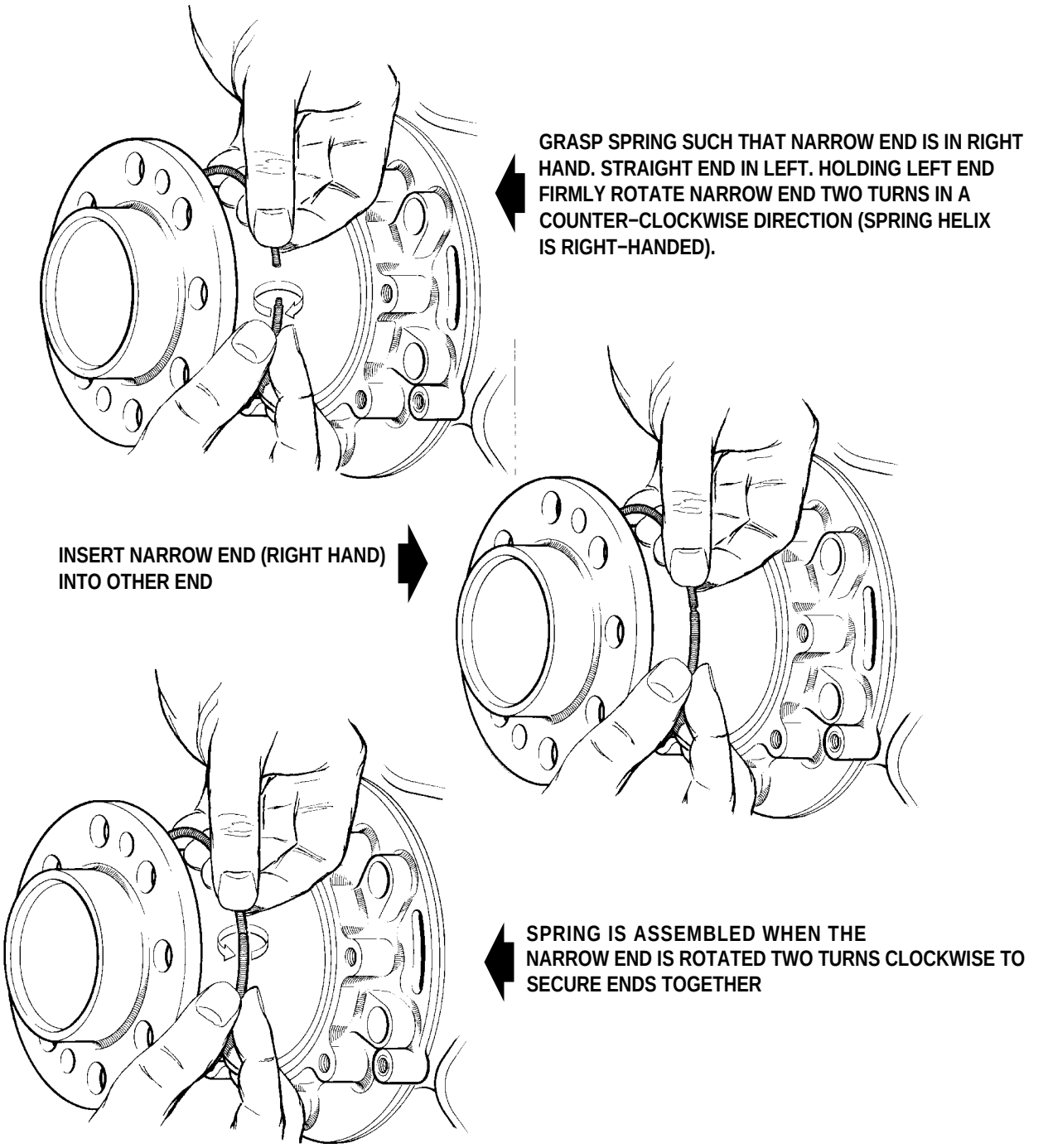
(4) If not required for immediate installation, store chip detector in clean polyethylene bag.

C. Reduction Gearbox Rear Housing (Heavy Maintenance Only)

(1) Use petroleum solvent (PWC11-027) or (PWC11-031) to remove any residue from reduction gearbox rear case.

(2) Wipe case clean with a lint-free cloth and dry with clean, dry compressed air.

(3) If the base metal is exposed, touch-up as required with primer (PWC13-003).



C950A

Installation of Propeller Shaft Oil Seal Garter Spring
Figure 205

7. Inspection/Check

A. Inspection of Propeller Thrust Bearing Cover Assembly

(1) Examine thrust bearing cover seal cavity for burrs, nicks and other surface damage. Light stoning of damaged surfaces is acceptable. Corrosion may be removed (Ref. Para. 8.).

B. Inspection of Oil Seal Retaining Ring or Ring Halves

(1) Examine oil seal retaining ring or ring halves for nicks, burrs and surface damage. Light stoning of damaged surfaces is acceptable.

(2) Check integrity of felt strip inserts in oil seal retaining ring halves Post-SB1381. If worn or damaged, retaining ring halves must be shipped to an approved overhaul facility for felt strip insert replacement.

C. Inspection of Oil Seal Runner

(1) Examine visible area of seal runner for nicks, burrs and other surface damage caused by tools during removal of seal. No repair is acceptable. Ship power output section of engine to an approved overhaul facility for replacement of defective seal runner.

NOTE: If applicable, check the integrity of the sealant (PWC09-001) between the forward lip of the oil seal runner and propeller shaft. Replace if necessary.

(2) Examine the propeller shaft oil seal contact area on seal runner for wear (grooving). If concentrated wear is present, installation of an alternate offset propeller shaft oil seal should be considered. This offset seal will contact the runner at a different location (Ref. IPC).

D. Inspection of Scavenge Oil Strainer Assembly

(1) Examine strainer element for blocked passages and for leakage between element (6, Fig. 203) and plug (4). Clean as necessary (Ref. Para. 6.A.).

(2) Remove plug (4) and preformed packing (5); check condition of preformed packing, then discard.

(3) Examine strainer element seating surfaces for nicks, burrs and other surface damage caused during removal and installation. Light stoning of damaged surfaces is acceptable.

(4) Replace strainer element assembly if cracks are detected.

(5) Examine threads of bolt and, if plug is removed, internal threads for deformation. Chase threads using suitable die or tap as appropriate. Remove all metal chips.

E. Inspection of Magnetic Chip Detector

NOTE: Whenever a reduction gearbox chip detector is inspected, the main oil filter should also be inspected. Any foreign material found on the chip detector or in the main oil filter should be identified before further inspection/operation. For detailed debris analysis refer to Chapter 70-00-00, MAINTENANCE PRACTICES.

CAUTION: WHEN AN ENGINE IS REMOVED DUE TO METAL CONTAMINATION OF THE OIL SYSTEM AND TO AVOID CONTAMINATION OF A NEWLY INSTALLED ENGINE, ALL AIRFRAME COMPONENTS ASSOCIATED WITH THE ENGINE OIL SYSTEM - INCLUDING PROPELLER, PROPELLER GOVERNORS, TUBES AND HOSES - SHOULD BE FLUSHED ACCORDING TO AIRCRAFT MAINTENANCE MANUAL. AIRFRAME OIL COOLERS SHOULD BE REPLACED WITH NEW COMPONENTS. ORIGINAL ENGINE EQUIPMENT SUCH AS OIL-TO-FUEL HEATERS AND GOVERNORS SHOULD BE RETURNED WITH THE ENGINE.

(1) Remove chip detector (Ref. Para.).

NOTE: Every time a chip detector is removed for inspection, the oil filter element should also be inspected (Ref. 79-20-02 Inspection/Check).

(2) If only a single chain of magnetic particles, consisting of slivers or fuzz type material or non-magnetic material, bridges the gap between poles of the chip detector, clean the chip detector and continue operation. Recheck both chip detector and oil filter within the next 15 flight hours.

NOTE: Clean poles on chip detector by wiping with a lint-free cloth; discard cloth after cleaning.

(3) When more than 10 small, nugget shaped, magnetic pieces are found, the engine should be returned to an approved overhaul facility for inspection.

(4) When a small amount of fuzz made up of powdered material is evident, clean detector, reinstall and recheck for electrical continuity after 10 hours.

(5) When powdered fuzz is evident a second time, but the quantity has not increased, clean detector, reinstall and recheck after a further 10 hours.

(6) When powdered fuzz is evident a third time in similar or greater quantities, the engine should be returned to an approved overhaul facility for inspection.

(7) Detailed Inspection:

(a) Examine threads for damage. Chase threads as required. Replace detector if threads are badly damaged or crossed.

(b) Examine witness stripes on the detector housing and electrical connector. Movement of the connector relative to the housing may short the circuit's internal connections and give false indications. This condition is cause for rejection of the detector.

NOTE: Certain chip detectors incorporate a splined locking arrangement which prevents movement, therefore do not require witness stripe identification.

(c) Connect the ohmmeter across the detector output terminals and place a suitable steel bar across the magnet poles. Circuit continuity must exist.

(d) Check the output terminal pins and the condition of the potting compound. If the pins are loose or if the compound is cracked, reject the detector.

F. Inspection of Gearbox Rear Housing (Heavy Maintenance Only)

(1) If the exhaust duct assembly has been remove, examine the reduction gearbox rear case:

(a) Examine the exposed surface of the reduction gearbox rear case for carbon, oil wetting, etc.

(b) After cleaning (Ref. Para. 6. C.), examine the rear case surface for damage, corrosion, galling, pitting and the integrity of the protective coating.

(c) If the reduction gearbox rear case shows evidence of corrosion or pitting, return the power section to an approved overhaul facility for replacement of the reduction gearbox rear case.

8. Approved Repairs

A. Replacement of Accessory Drive Seals from Propeller Gearbox

(1) Remove accessory unit, if applicable from mounting pad on reduction gearbox.

(2) Remove seal and seal carrier (Ref. 72-60-00).

(3) Install replacement seal (Ref. 72-60-00).

(4) Reinstall accessory unit, as applicable.

B. Repair of Thrust Bearing Cover (Corroded Seal Cavity)

NOTE: Mask bearing and propeller shaft, to prevent ingress of debris.

(1) Remove corrosion from seal cavity contact surface using abrasive cloth (PWC05-061).

(2) Clean area with solvent (PWC11-027).

(3) Apply adhesive (PWC08-002) at corroded surface following manufacturer's instructions. Remove excess adhesive.

(4) Install seal element (Ref. Para. F.).

(5) Allow adhesive to cure following manufacturer's instructions.

C. Propeller Shaft - On Wing Repair of Coating (Post-SB1563) (Ref. Fig. 206)

(1) Remove the propeller shaft seal half plates (Ref. Removal/Installation).

NOTE: Keep the seal in position to prevent contamination of the RGB internal components.

(2) Mask the seal, the propeller mounting face and all areas marked NP per SPOP 19 to protect them from damage and overspray.

CAUTION: DO NOT REMOVE TIN FLASH FROM BOLT HOLES.

(3) Remove all traces of tin flash from area A with an abrasive pad (Ref. Fig. 206).

(4) Roughen area A with 240 Grit abrasive paper (PWC05-270).

(5) Clean area A with isopropyl alcohol (PWC11-014).

(6) Coat the propeller shaft area A as follows:

(a) Apply one coat of Epoxy primer (PWC13-001) using SPOP 148 to a dry film thickness between 0.0005 to 0.0010 inch.

(b) Allow primer to dry at room temperature for a minimum of one hour in a clean dust free environment.

(c) Apply two coats of Aluminum Epoxy Enamel (PWC05-037) using SPOP 148 to a total dry film thickness of 0.002 to 0.004 inch.

NOTE: Allow enamel to dry 24 hours at room temperature between coats.

(7) Remove masking from the propeller shaft and propeller shaft seal.

(8) Inspect the propeller shaft seal. Replace the seal if it is damaged.

(9) Install the propeller shaft seal half plates (Ref. Removal/Installation).

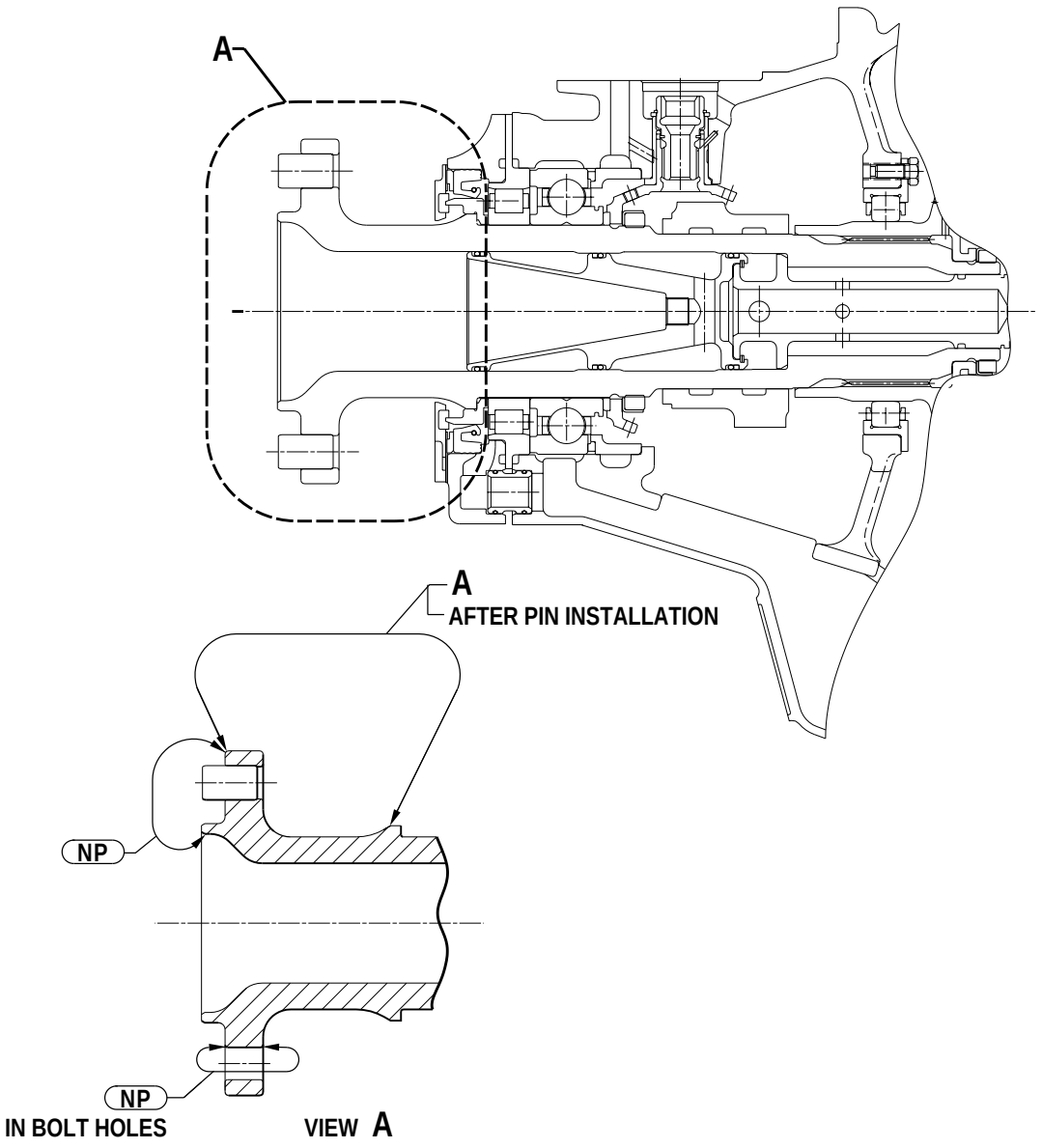
D. Propeller Shaft Anti-corrosion Treatment (Alternate Method)

(1) Touch-up existing coated areas:

(a) If required, remove the propeller shaft seal retaining rings.

CAUTION: INSTALL PROTECTIVE COVERS TO PROTECT THE SHAFT FLANGE AND GEARBOX DURING THE CLEANING AND COATING PROCEDURES.

(b) Mask the bore containing the propeller shaft seal and the propeller shaft flange bolt holes.



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Propeller Shaft - On Wing Repair (SB1563)
Figure 206

(c) Use abrasive cloth (PWC05-061) to remove any corrosion and/or stains on the propeller shaft.

(d) Use a swab dipped in isopropyl alcohol (PWC11-014) to clean the surface to be coated.

(e) Apply coating (PWC07-023):

CAUTION: THOROUGHLY MIX THE ALUMINUM AND ZINC COATING PAINT (PW07-023) BEFORE USE. TO PRODUCE AN UNIFORM COATING, THE MIXTURE MUST BE CONTINUALLY STIRRED DURING THE APPLICATION DUE TO THE HIGH DENSITY OF THE PIGMENT.

1 Use a fine brush to apply a thin, even coat of paint.

2 Allow the coating to dry for a minimum of four hours.

NOTE: Immediately clean the brush in warm water.

3 Apply a second coat.

a The second coat can be handled after 30 minutes and will be completely dry in 28 to 48 hours, or air dry for 10 minutes and use a heat gun to cure for 30 minutes minimum.

b Use a nylon pad to polish the touch-up area.

E. Repair of Corrosion - Front and Rear Reduction Gearbox Housing

NOTE: Corrosion must not be deeper than 0.010 in. and must not cover an area greater than 30 percent of the total surface of the front and rear RGB housing.

(1) Apply a suitable covering material around the area to be repaired.

(2) Clean the surface of the area to be repaired with a swab soaked in isopropyl alcohol (PWC11-014) and crocus cloth (PWC05-061).

(3) Remove all traces of corrosion (magnesium oxide) using a suitable steel brush, crocus cloth (PWC05-061), abrasive cloth (PWC05-101), file or grit paper. Remove all traces of debris using a vacuum cleaner.

(4) Flush the area with clean water at room temperature.

(5) Dry the area with clean compressed air at 29 psig.

WARNING: REFER TO THE MATERIAL SAFETY DATA SHEETS BEFORE YOU USE THESE MATERIALS FOR INFORMATION SUCH AS HAZARDOUS INGREDIENTS, PHYSICAL/CHEMICAL CHARACTERISTICS, FIRE, EXPLOSION, REACTIVITY, HEALTH HAZARD DATA, PRECAUTIONS FOR SAFE HANDLING, USE AND CONTROL MEASURES. SOME OF THESE MATERIALS CAN BE DANGEROUS. YOU CAN GET THE DATA SHEETS FROM THE MANUFACTURERS OR THE SUPPLIERS OF THESE MATERIALS.

(6) Prepare a chrome pickle solution (Ref. Chap. 70-00-00, MAINTENANCE PRACTICES, Touch-Up Solution).

(7) Using a swab or brush, apply the chrome pickle solution, at a temperature of 17° to 29°C (55° to 85°F), to the prepared surface for 30 to 45 seconds.

NOTE: Repeat the application frequently to make sure that the affected surface is continually wet with the solution.

(8) Swab the area with clean water until successive swabs are no longer stained yellow.

(9) Dry the area with local heating (air dry or a heat gun at a low setting).

(10) Clean the affected area with a rag soaked in clean water.

(11) Dry the area with clean, compressed air at 29 psig.

(12) Apply two coats of primer (PWC13-001).

NOTE: The primer can be diluted with 10% solvent.

(13) Allow the primer to air dry for eight hours before applying enamel paint. Use compressed air at 29 psig to accelerate the drying time.

(14) Apply three to four coats of enamel (PWC05-037) to the primed surface. Allow the surface of the enamel to become tacky (approximately 15 minutes) between each coat. The final coat of enamel must dry for 24 hours before returning the engine to service.

NOTE: Drying time for the primer and paint can be reduced with the use of a heat gun at a low setting. Refer to the manufacturers instructions.