# SERVICE BULLETIN

NON-MODIFICATION SERVICE BULLETIN — ENGINE — NO. 2 BEARING — BORESCOPE INSPECTION OF,

MODEL APPLICATION

V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, V2528-D5

BULLETIN ISSUE SEQUENCE

V2500 Series 72-0679

ATA NUMBER

72-32-52



Compliance Category

4

P&W Distribution Code

V2500

## Summary

The purpose of this Non-Modification Service Bulletin (NMSB) is to provide instructions to perform a borescope inspection of the No. 2 bearing in order to confirm that the No. 2 bearing was properly installed during the last engine visit.

## Planning Information

### Effectivity Data

#### Engine Models Applicable

V2522-A5, V2524-A5, V2527M-A5, V2527-A5, V2527E-A5, V2530-A5, V2533-A5
Engine Serial No. V10974
Engine Serial No. V11530
Engine Serial No. V11599
Engine Serial No. V11726
Engine Serial No. V11762
Engine Serial No. V11764
Engine Serial No. V12033
Engine Serial No. V12040
Engine Serial No. V12049
Engine Serial No. V12076
Engine Serial No. V12160
Engine Serial No. V12215
Engine Serial No. V12226
Engine Serial No. V12475

V2525-D5, V2528-D5
Engine Serial No. V20059
Engine Serial No. V20068

### Concurrent Requirements

There are no concurrent requirements.

### Reason

1. Condition: The potential exists for engine serial numbers listed within Effectivity Data to have the No. 2 bearing outer race installed backwards at last shop visit.
2. Background: Engines V11572 and V11593 were found to have the No. 2 bearing outer race installed backwards.
3. Objective: To ensure all engines that were recently serviced within same repair facility as Engines V11572 and V11593, had the No. 2 bearing outer race installed correctly.
4. Substantiation: The borescope inspection to the front bearing compartment has shown the capability of identifying the orientation of the No. 2 bearing outer race.
5. Effects of Bulletin on:

   Removal/Installation: Not Affected.

   Disassembly/Assembly: Not Affected.

   Cleaning: Not Affected.

   Inspection/Check: Not Affected.

   Repair: Not Affected.

Testing: Not Affected.

6. Supplemental Information

None.

Description

Inspect the No. 2 bearing outer race to identify if installed correctly.

Compliance

Category 4

Accomplish at the first visit of an engine or module to a maintenance base capable of compliance with the accomplishment instructions regardless of the planned maintenance action or the reason for engine removal.

NOTE: The borescope inspection can be conducted anytime between the issuance of this NMSB and the next scheduled shop visit. If the borescope inspection results show that the No. 2 bearing outer race was installed correctly, no further action is required. If the borescope inspection results show that the No. 2 bearing outer race was installed backwards, the engine can continue in service until the next scheduled shop visit, but at that time the engine must be torn down and the No. 2 bearing must be overhauled.

Approval Data

The compliance statement and the procedures described in this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the engine model listed.

The aircraft Type Certificate (TC) holder has been informed of this inspection.

Manpower

1. In Service

To Gain Access ..... 0.75 hours

To Perform Inspection ..... 2.0 hours

To Close Access ..... 0.75 hours

Total Necessary Man-hours ..... 3.5 hours

2. At Overhaul

To Perform Inspection ..... 2.0 hours

Total Necessary Man-hours ..... 2.0 hours

Weight and Balance

1. Weight Change

None.

2. Moment Arm

No Effect.

3. Datum

Engine Front Mount Centerline (Power Plant Station (PPS) 100).

Electrical Load Data

This Service Bulletin has no effect on the aircraft electrical load.

Software Accomplishment Summary

Not Applicable.

References

NOTE: In 2014 IAE converted the V2500 Technical Publications to a new system. As a result of the conversion, some manuals were consolidated. All manuals received new P&W part numbers. To facilitate the use of this Service Bulletin, a Technical Publications conversion table is provided in the Appendix.

1. ATA Locator — 72-32-52.
2. Internal Reference No. — 16VC347.
3. V2500 Standard Practices and Processes, P&W Ref. PN 2A4414, Chapter/Section 70-41-00.
4. V2500-A5 Series Illustrated Parts Catalog, P&W Ref. PN 2A4428, Chapter/Section 79-22-49.
5. V2500-D5, Series Illustrated Parts Catalog, P&W Ref. PN 2A4426, Chapter/Section 79-22-49.
6. V2500 A1/A5 Series Engine Manual, P&W Ref. PN 2A4407, Chapter/Section 72-32-52.
7. V2500-D5 Series Engine Manual, P&W Ref. PN 2A4416, Chapter/Section 72-32-52.
8. V2500-A1/A5 Series Aircraft Maintenance Manual, AMM, Chapter/Section 71-13-00.
9. V2500-D5 Series Aircraft Maintenance Manual, AMM, Chapter/Section 71-13-00.

Other Publications Affected

Not Applicable.

Interchangeability of Parts

Not Applicable.

Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (No)

Added Data (Yes)

Revision to Table of Limits (No)

Inspection Procedures (No)

Material Information

Material — Price and Availability

1. Part prices were not available at the time of Service Bulletin publication. Contact IAE Spares Management & Logistics for firm quotations.
2. There is no kit provided to do this Service Bulletin.
3. Part availability information is provided in material data Instructions — Disposition.

Industry Support Program

Not Applicable.

The material data that follows is for each engine.

For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5 Engines:

| New PN | Qty | Estimate of Unit Price ($) | Keyword | Old PN | Instructions — Disposition |
|---|---|---|---|---|---|
| AS43013-120 | 1 | * | RING - SEALING TOROIDAL | AS43013-120 (79-22-49-10-096) | (2)(E) |

The material data that follows is for each engine.

For V2525-D5, V2528-D5 Engines:

| New PN | Qty | Estimate of Unit Price ($) | Keyword | Old PN | Instructions — Disposition |
|---|---|---|---|---|---|
| AS43013-120 | 1 | * | RING - SEALING TOROIDAL | AS43013-120 (79-22-49-10-096) | (2)(E) |

Instructions/Disposition Code Statements:

Parts Modification Conditions

Estimated part prices are provided when they are available at time of publication. The Estimate of Unit Price is only for planning purposes and does not constitute a firm quotation. An asterisk (*) is shown where part pricing information was unavailable. In either case, contact IAE Spares for firm quotations.

(2) The new part is a replacement part only, and cannot be obtained by modification of the old part.

Spare Parts Availability

(E) The part is an expendable item necessary to do this bulletin.

Vendor Services or Special Components/Materials

Not Applicable.

Tooling — Price and Availability

Special tools are not required to accomplish this Service Bulletin.

Reidentified Parts

Not Applicable.

Other Material Information Data

Not Applicable.

Accomplishment Instructions

FOR ENGINES INSTALLED ON AIRCRAFT

WARNING:

1. BE CAREFUL WHEN YOU WORK ON THE ENGINE AFTER SHUTDOWN. THE ENGINE CAN REMAIN HOT FOR A LONG TIME. IF YOU DO NOT OBEY THIS WARNING INJURY CAN OCCUR.
2. REFER TO MSDS FOR ALL MATERIAL USED AND THE MANUFACTURERS SAFETY INSTRUCTIONS FOR ALL EQUIPMENT USED. IF YOU DO NOT OBEY THIS WARNING INJURY CAN OCCUR.

CAUTION: IN ORDER TO REDUCE THE POTENTIAL FOR MULTIPLE-ENGINE IN-FLIGHT SHUTDOWN, POWER LOSS, OR OTHER ANOMALY DUE TO MAINTENANCE ERROR, IAE RECOMMENDS THAT OPERATORS AVOID PERFORMING MAINTENANCE ON MULTIPLE ENGINES INSTALLED ON THE SAME AIRCRAFT AT THE SAME TIME. IF IT IS NOT POSSIBLE TO AVOID MAINTENANCE ON MORE THAN ONE ENGINE AT THE SAME TIME, IAE RECOMMENDS THAT ADDITIONAL CONTROLS ARE APPLIED IN ORDER TO ENSURE THAT MAINTENANCE TASKS HAVE BEEN COMPLETED AS DEFINED. MAINTENANCE GUIDELINES SHOULD BE REVISED, WHERE POSSIBLE, TO PROMOTE THIS RECOMMENDATION.

1. Job set-up information
   A. Safety Precautions (V2500-A5 model)
      (1) On the center pedestal, on the ENG panel 115VU place a warning notice not to start the engine.
      (2) Make sure that the engine 1(2) shutdown occurred not less than 5 minutes before you do this procedure.
      (3) On the overhead maintenance panel 50VU.
         (a) Make sure that the ON legend of the ENG/FADEC GND PWR/1(2) pushbutton switch is off.
         (b) Put a WARNING NOTICE(S) to tell persons not to energize the FADEC 1(2).
   B. Safety Precaution (V2500-D5 model)
      (1) Tag the throttle/thrust lever with a DO NOT OPERATE tag.

      WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

      (2) Open these circuit breakers and install safety tags:

Table 2 — Lower EPC, DC Transfer BUS

| ROW | Col. | Number | Name |
|---|---|---|---|
| U | 34 | B1-1097 | Left Engine Start Switch |
| X | 39 | B1-1096 | Right Engine Start Switch |

Table 3 — Lower EPC, XFER Transfer BUS

| ROW | Col. | Number | Name |
|---|---|---|---|
| S | 37 | B1-1137 | LEFT ENGINE THRUST CH. A |
| S | 38 | B1-1139 | LEFT ENGINE RVSR CH. B |

Table 4 — OVERHEAD, EMERGENCY DC BUS

| ROW | Col. | Number | Name |
|---|---|---|---|
| DL 911-965 C | 10 | B1-1136 | R. ENG THRUST RVSR CH. A |
| DL 901-910 C | 11 | B1-1136 | R. ENG THRUST RVSR CH. A |
| DL ALL C | 11 | B1-1138 | R. ENG THRUST RVSR CH. A |

C. Get Access (V2500-A5 model)

(1) Open the fan cowls. Refer to Reference 8, AMM TASK 71-13-00-010-010.

(2) For 1000EM1 (ENGINE-1) 437AL, 438AR.

(3) For 1000EM2 (ENGINE-2) 447AL, 448AR.

(4) Put the access platform 1M (3 FT) in position to gain access to the air intake cowl.

D. Get Access (V2500-D5 model)

(1) Open the lower fan cowls. Reference 9, AMM TASK 71-13-00-010-801.

(2) Open the upper fan cowls. Reference 9, AMM TASK 71-13-00-010-802.

(3) Put the access platform 4 – 8 ft. (1.2 – 2.4 m) in position to gain access to the air intake cowl.

E. Prepare the support equipment

(1) Prepare the Borescope, PN IAE 6F10408 or equivalent for use as given in the makers instructions. Refer to Figure 5.

2. Procedure (V2500-A5 model and V2500-D5 model)

A. Remove the oil No. 1, 2, 3 B A/O tube.

(1) Remove the inter tube support bracket. Refer to Figure 2

(2) Disconnect the oil No. 1, 2, 3 B A/O tube. Refer to Figure 2.

(a) Remove the lockwire which safeties the tube coupling nut of the oil A/O tube.

(b) Disconnect the oil No. 1, 2, 3 B A/O tube from the oil A/O tube with the Wrench, PN IAE 1R18003.

(c) Remove the three (3) bolts and remove the oil No. 1, 2, 3 B A/O tube. Refer to Figure 2 and 3

CAUTION: DO NOT REMOVE THE OIL & AIR TRANSFER TUBE FROM THE ENGINE. REFER TO FIGURE 3.

(d) Remove the torodial sealing ring from the oil No. 1, 2, 3 B A/O tube. Discard the torodial sealing ring. Refer to Figure 2 and Figure 3.

B. Put the Borescope, PN IAE 6F10408, or equivalent into position in the front bearing compartment. Refer to Figure 4 and Figure 8.

(1) Put the borescope into the position through the oil & air transfer tube and the No. 3 strut.

(2) Adjust the borescope to see the No. 2 bearing.

(a) Using the speed and trim sensor wiring as a guide, maneuver the borescope in front of the No. 2 bearing support housing. Position the borescope rearwards and identify No. 2 bearing cage and outer race.

C. Examine the No. 2 bearing.

(1) For a correctly installed No. 2 bearing, the locking tangs should be visible. Refer to Figure 6.

(2) For incorrectly installed No. 2 bearing, the locking tangs are not visible. Refer to Figure 7.

(3) Record still images of bearing outer race assembly.

(4) If the bearing outer race is installed correctly:

(a) Accept, no further action required.

(5) If the bearing outer race is incorrectly installed:

(a) Re-assemble the No. 2 bearing at the next scheduled shop visit in accordance with Reference 6 or 7, Engine Manual, Chapter/Section 72-32-52.

1 Perform additional inspection in accordance with Level 3 of the eMMP Section 10.

D. Remove the borescope from the engine.

E. Install the oil No. 1, 2, 3 B A/O tube.

(1) Install the new Torodial Sealing Ring, PN AS43013-120. Refer to Figure 2 and 3.

(a) Lubricate the Torodial Sealing Ring, PN AS43013-120 with Approved Engine Oil CoMat 10-077.

(b) Install the Torodial Sealing Ring, PN AS43013-120 into the groove in the oil No. 1, 2, 3 B A/O tube.

(2) Install the oil No. 1, 2, 3 B A/O tube to the oil & air transfer tube with three (3) bolts, tighten the bolts fingertight. Refer to Figure 2 and 3.

(3) Torque the three (3) bolts to 85 to 105 lbf-in (10 to 12 N.m). Refer to Figure 2 and Figure 3. Refer to Reference 3, Standard Practices and Processes, Chapter/Section 70-41-00.

(4) Install the four (4) inter tube support brackets around the oil A/O tube at the clip positions. Refer to Figure 2

(5) Torque the bolts at the inter tube support brackets to 36 to 45 lbf-in (4 to 5 N.m) Refer to Figure 2. Refer to Reference 3, Standard Practices and Processes, Chapter/Section 70-41-00.

(6) Connect the oil No. 1, 2, 3 B A/O tube to the oil A/O tube. Refer to Figure 2.

(7) Torque the coupling nut to 566 to 611 lbf-in (64 to 69 N.m) with Wrench, PN IAE 1R18003. Refer to Reference 3, Standard Practices and Processes, Chapter/Section 70-41-00. Safety the tube coupling nut with lockwire. Refer to Figure 2.

3. Close-up

A. Close Access (V2500-A5 model)

(1) Close the fan cowls. Reference 8, AMM TASK 71-13-00-410-010.

(2) For 1000EM1 (Engine-1) 437AL, 438AR.

(3) For 1000EM2 (Engine-2) 447AL, 448AR.

(4) Remove the warning notice(s).

B. Close Access (V2500-D5 model)

(1) Close the lower fan cowl. Reference 9, AMM TASK 71-13-00-410-801.

(2) Close the upper fan cowl. Reference 9, AMM TASK 71-13-00-410-802.

4. Recording Instructions

A. A record of accomplishment is required.

FOR ENGINES NOT INSTALLED ON AIRCRAFT

1. Procedure (V2500-A5 model and V2500-D5 model)

A. Remove the oil No. 1, 2, 3 B A/O tube.

(1) Remove the inter tube support bracket. Refer to Figure 2

(2) Disconnect the oil No. 1, 2, 3 B A/O tube. Refer to Figure 2.

(a) Remove the lockwire which safeties the tube coupling nut of the oil A/O tube.

(b) Disconnect the oil No. 1, 2, 3 B A/O tube from the oil A/O tube with the Wrench, PN IAE 1R18003.

(c) Remove the three (3) bolts and the oil No. 1, 2, 3 B A/O tube. Refer to Figure 2 and 3

CAUTION: DO NOT REMOVE THE OIL & AIR TRANSFER TUBE FROM THE ENGINE. REFER TO FIGURE 3.

(d) Remove the torodial sealing ring from the oil No. 1, 2, 3 B A/O tube. Discard the torodial sealing ring. Refer to Figure 2 and 3.

B. Put the Borescope, PN IAE 6F10408 or equivalent into position in the front bearing compartment. Refer to Figure 4 and Figure 8.

(1) Put the borescope into the position through the oil & air transfer tube and the No. 3 strut.

(2) Adjust the borescope to see the No. 2 bearing.

(a) Using the speed and trim sensor wiring as a guide, maneuver the borescope in front of the No. 2 bearing support housing. Position the borescope rearwards and identify No. 2 bearing cage and outer race.

C. Examine the No. 2 bearing.

(1) For a correctly installed No. 2 bearing, the locking tangs should be visible. Refer to Figure 6.

(2) For incorrectly installed No. 2 bearing, the locking tangs are not visible. Refer to Figure 7.

(3) Record still images of No. 2 bearing outer race assembly.

(4) If the No. 2 bearing outer race is installed correctly:

(a) Accept, no further action required.

(5) If the No. 2 bearing outer race is incorrectly installed:

(a) Re-assemble the No. 2 bearing in accordance with Reference 6 or 7 Engine Manual, Chapter/Section 72-32-52.

1 Perform additional inspection in accordance with Level 3 of the eMMP Section 10.

D. Remove the borescope from the engine.

E. Install the Oil No. 1, 2, 3 B A/O tube.

(1) Install the new Torodial Sealing Ring, PN AS43013-120. Refer to Figure 2 and 3.

(a) Lubricate the Torodial Sealing Ring, PN AS43013-120 with Approved Engine Oil CoMat 10-077.

(b) Install the Torodial Sealing Ring, PN AS43013-120 into the groove in the oil No. 1, 2, 3 B A/O tube.

(2) Install the oil No. 1, 2, 3 B A/O tube to the oil & air transfer tube with the three (3) bolts, tighten the bolts fingertight. Refer to Figure 2 and 3.

(3) Torque the three (3) bolts to 85 to 105 lbf-in (10 to 12 N.m). Refer to Reference 3, Standard Practices and Processes, Chapter/Section 70-41-00. Refer to Figure 2 and Figure 3.

(4) Install the four (4) inter tube support brackets around the oil No. 1, 2, 3 B A/O tube at the clip positions. Refer to Figure 2

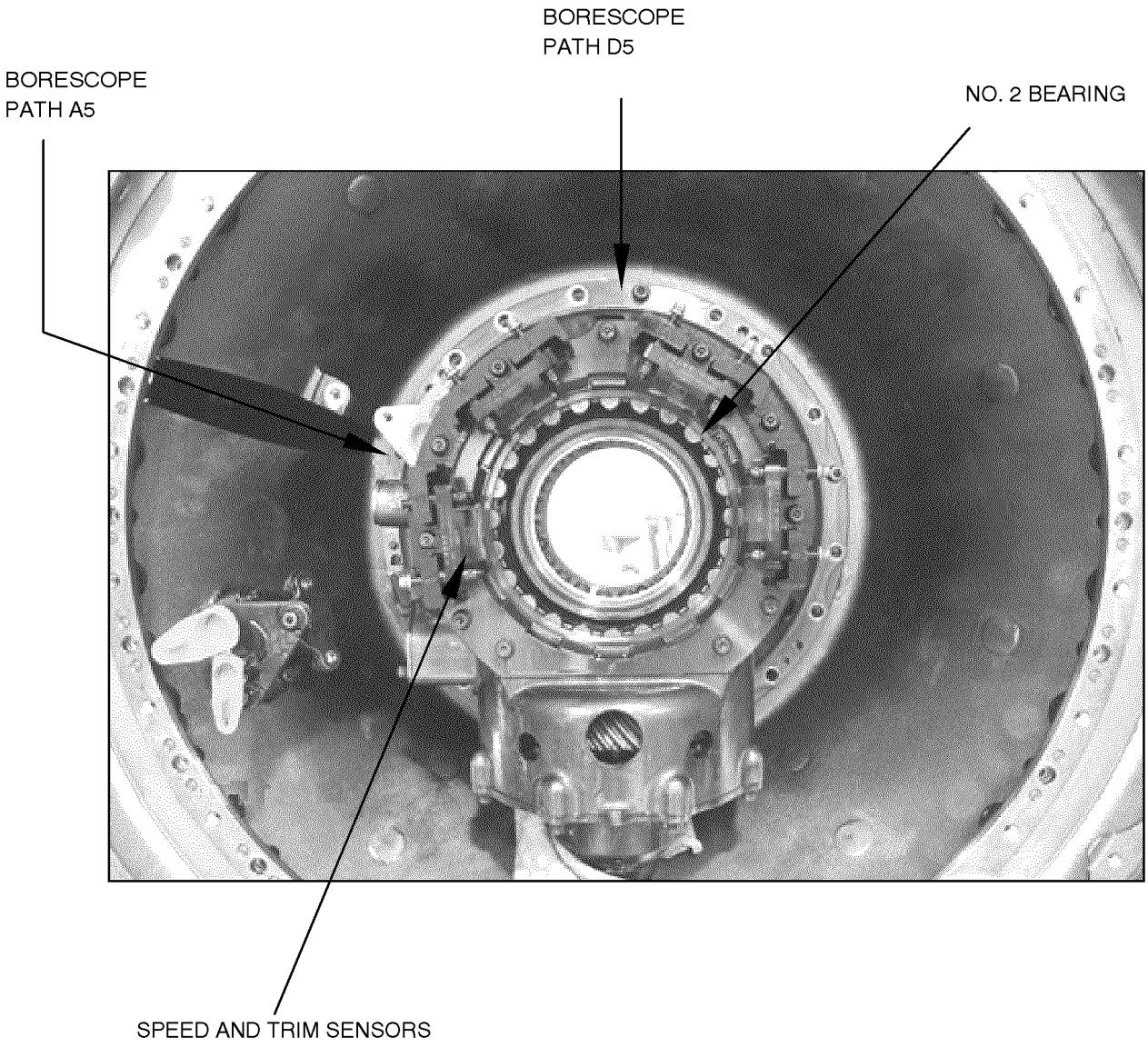
(5) Torque the bolts at the inter tube support brackets to 36 to 45 lbf-in (4 to 5 N.m). Refer to Reference 3, Standard Practices and Processes, Chapter/Section 70-41-00. Refer to Figure 2.

(6) Connect the oil No. 1, 2, 3 B A/O tube to the oil A/O tube. Refer to Figure 2.

(7) Torque the tube coupling nut to 566 to 611 lbf-in (64 to 69 N.m) with Wrench, PN IAE 1R18003. Refer to Reference 3, Standard Practices and Processes, Chapter/Section 70-41-00. Safety the tube coupling nut with lockwire. Refer to Figure 2.

2. Recording Instructions

A. A record of accomplishment is required.

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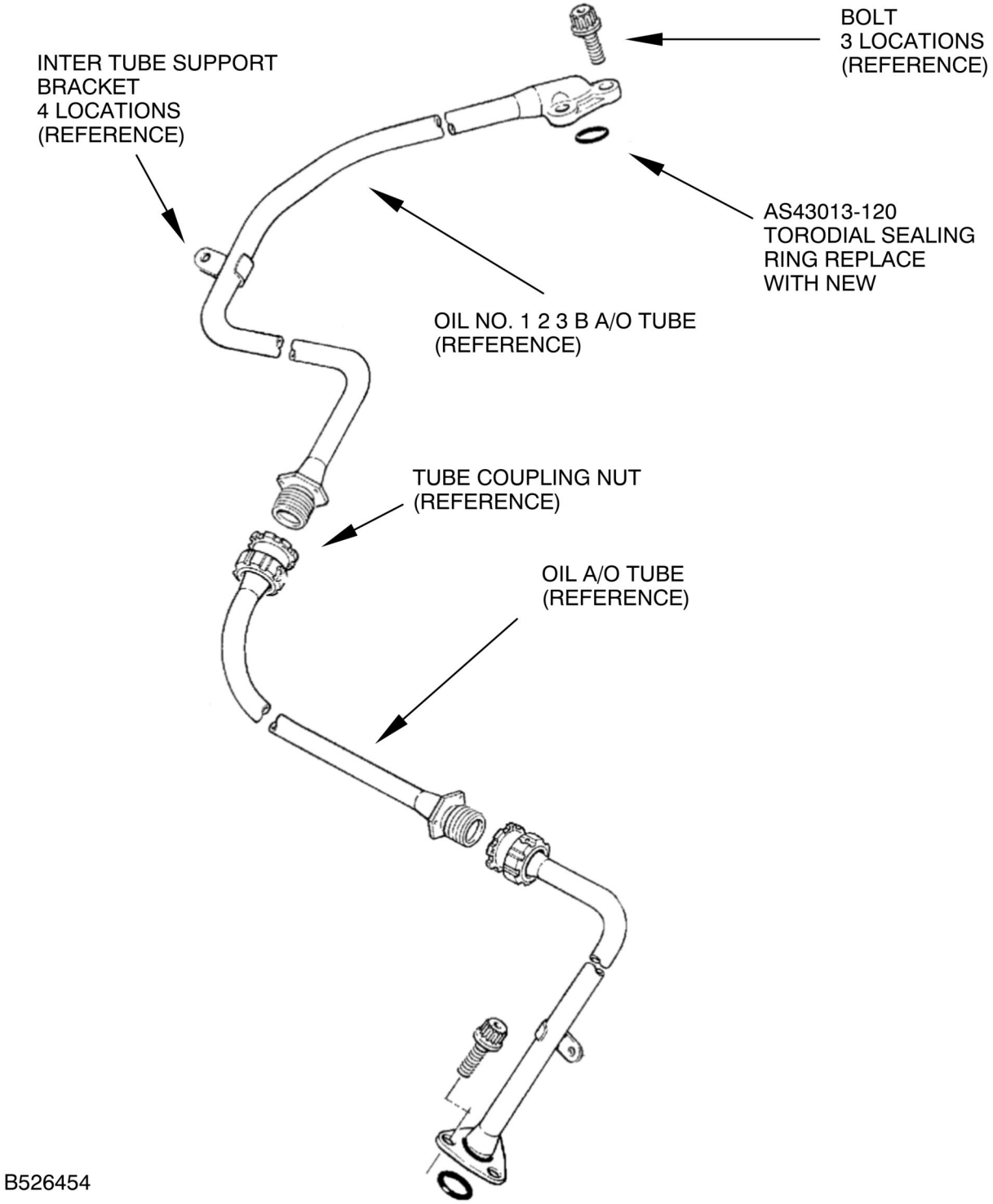
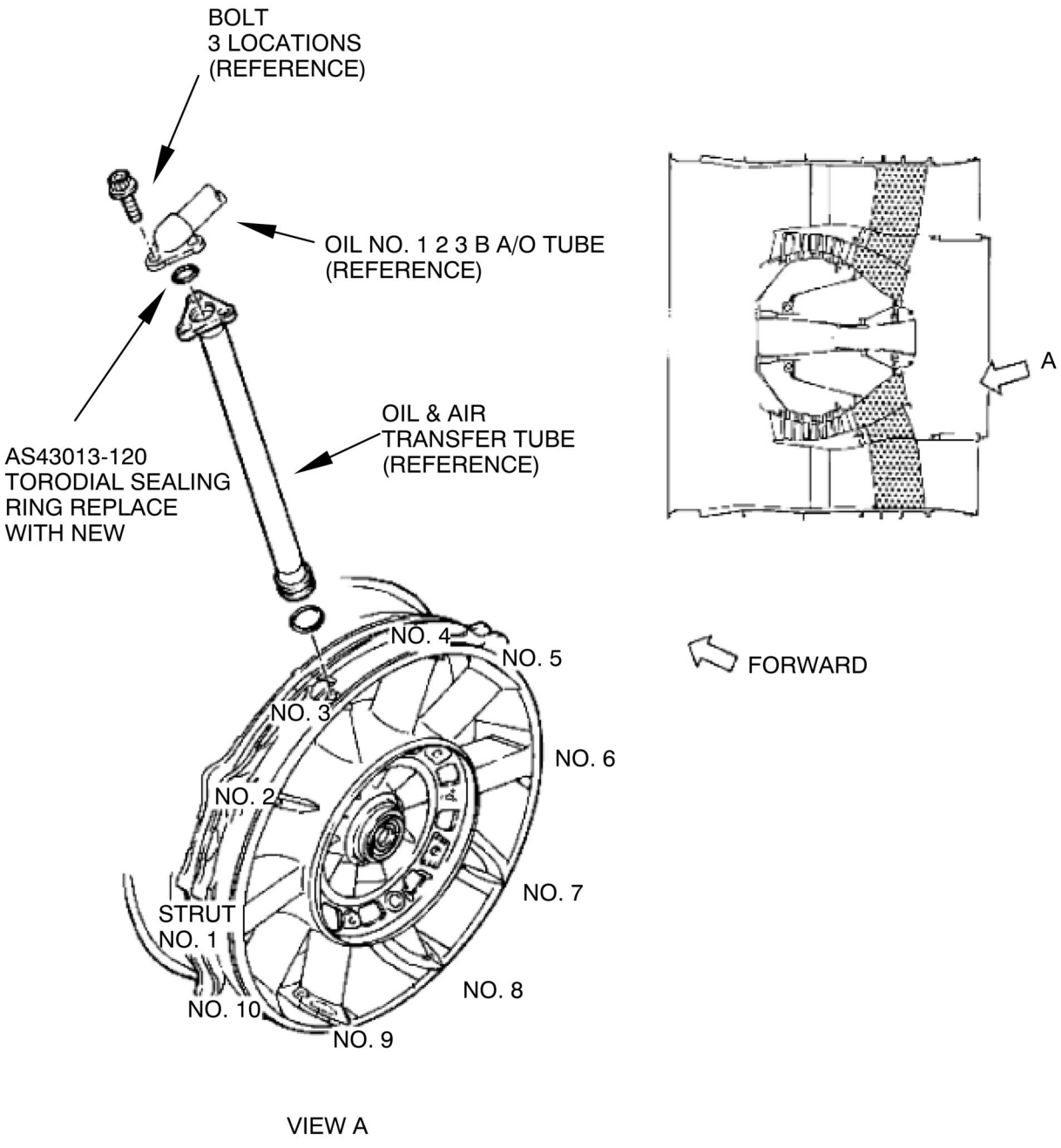
NO. 2 BEARING CAVITY (PARTIALLY DISASSEMBLED - VIEW LOOKING AFT)
FIGURE 1




LOCATION OF THE OIL TUBING
FIGURE 2

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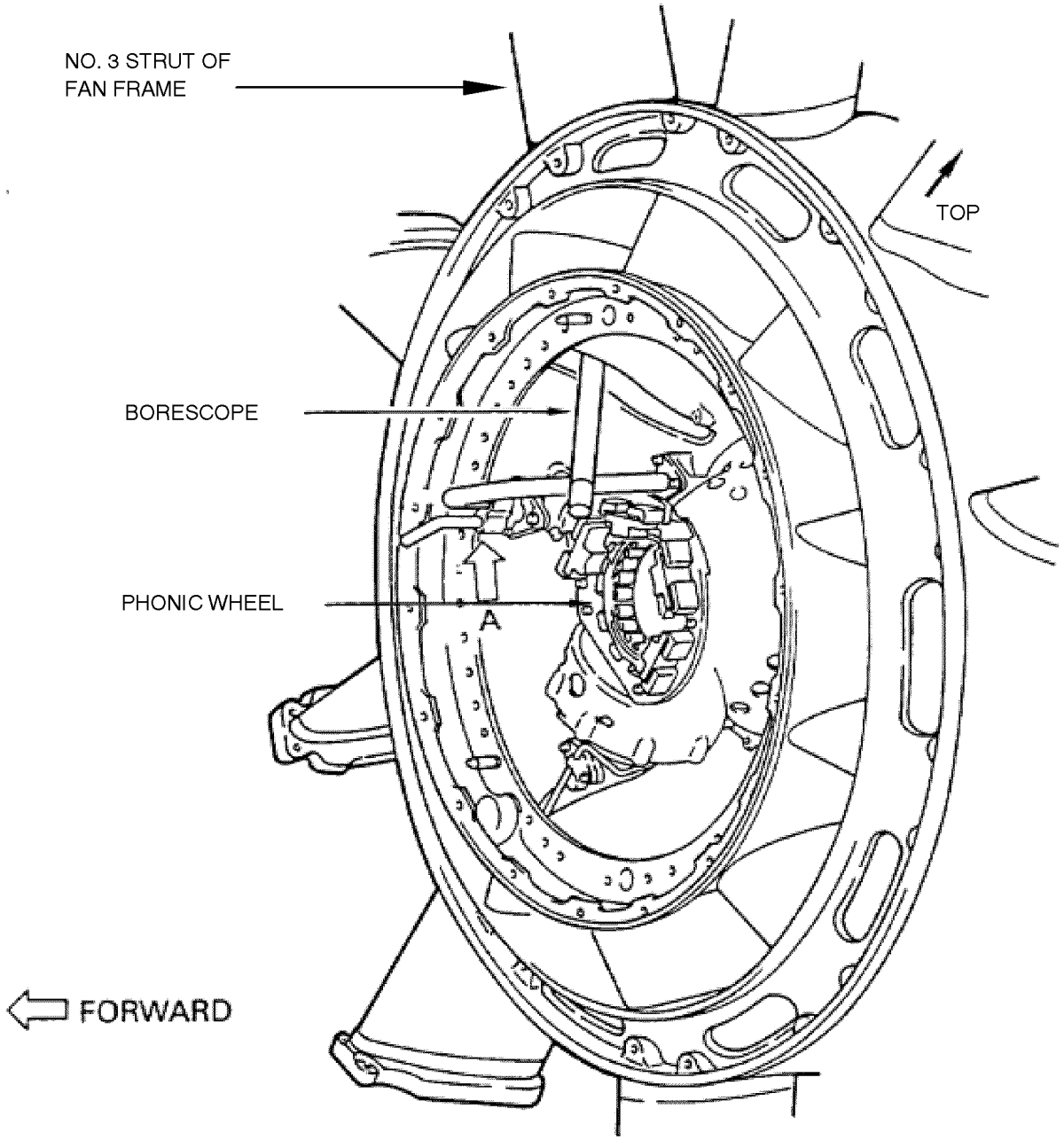
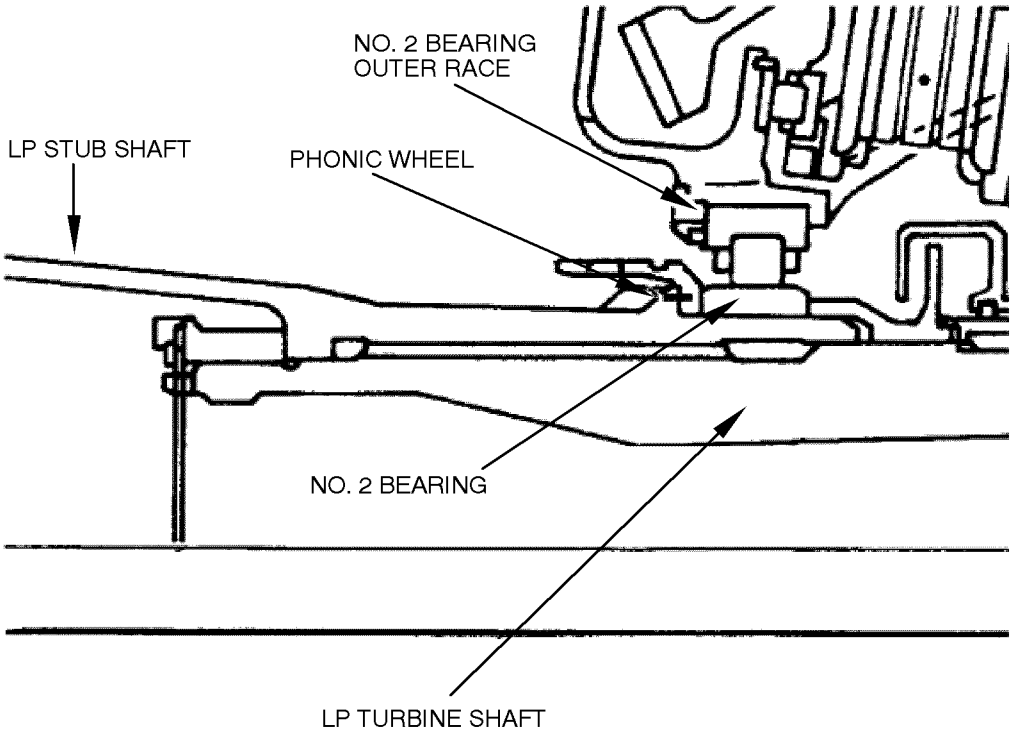
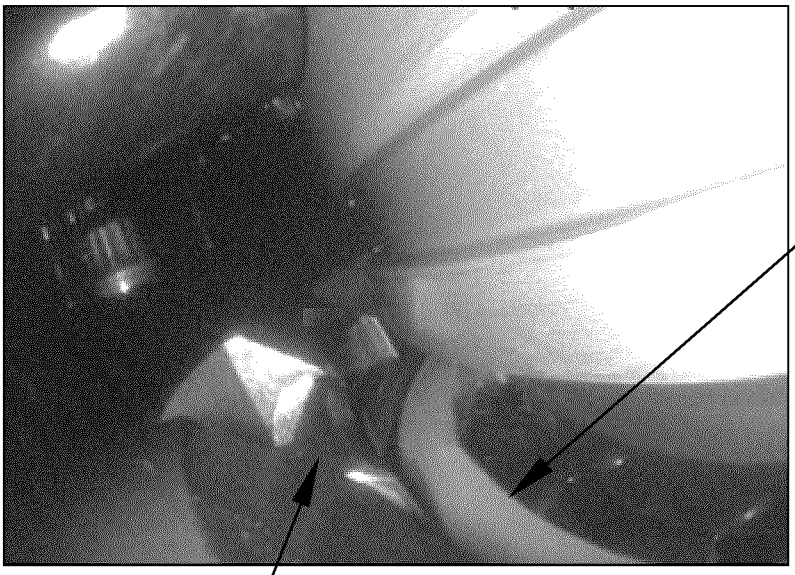
LPC INTERMEDIATE STRUCTURE MODULE
FIGURE 3



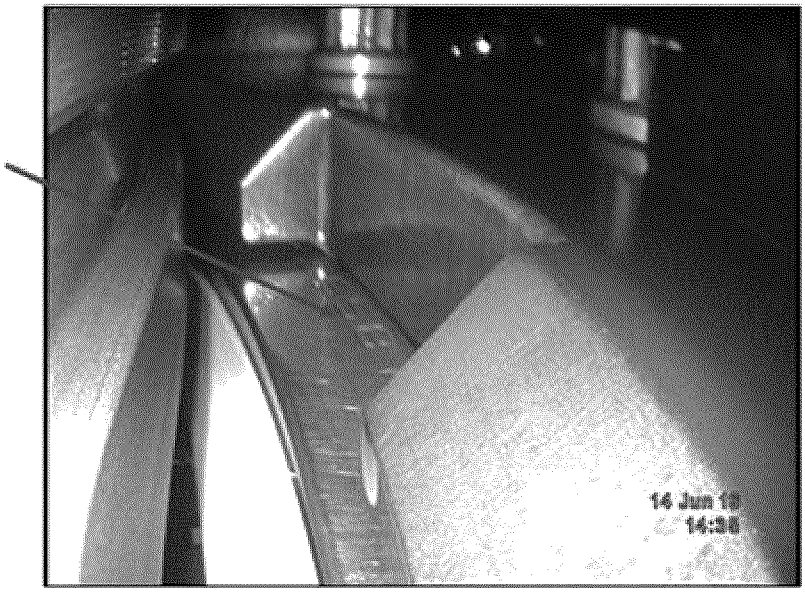

BORESCOPE LOCATION
FIGURE 4




LOCATION OF NO. 2 BEARING
FIGURE 5




CORRECTLY INSTALLED NO. 2 BEARING
FIGURE 6

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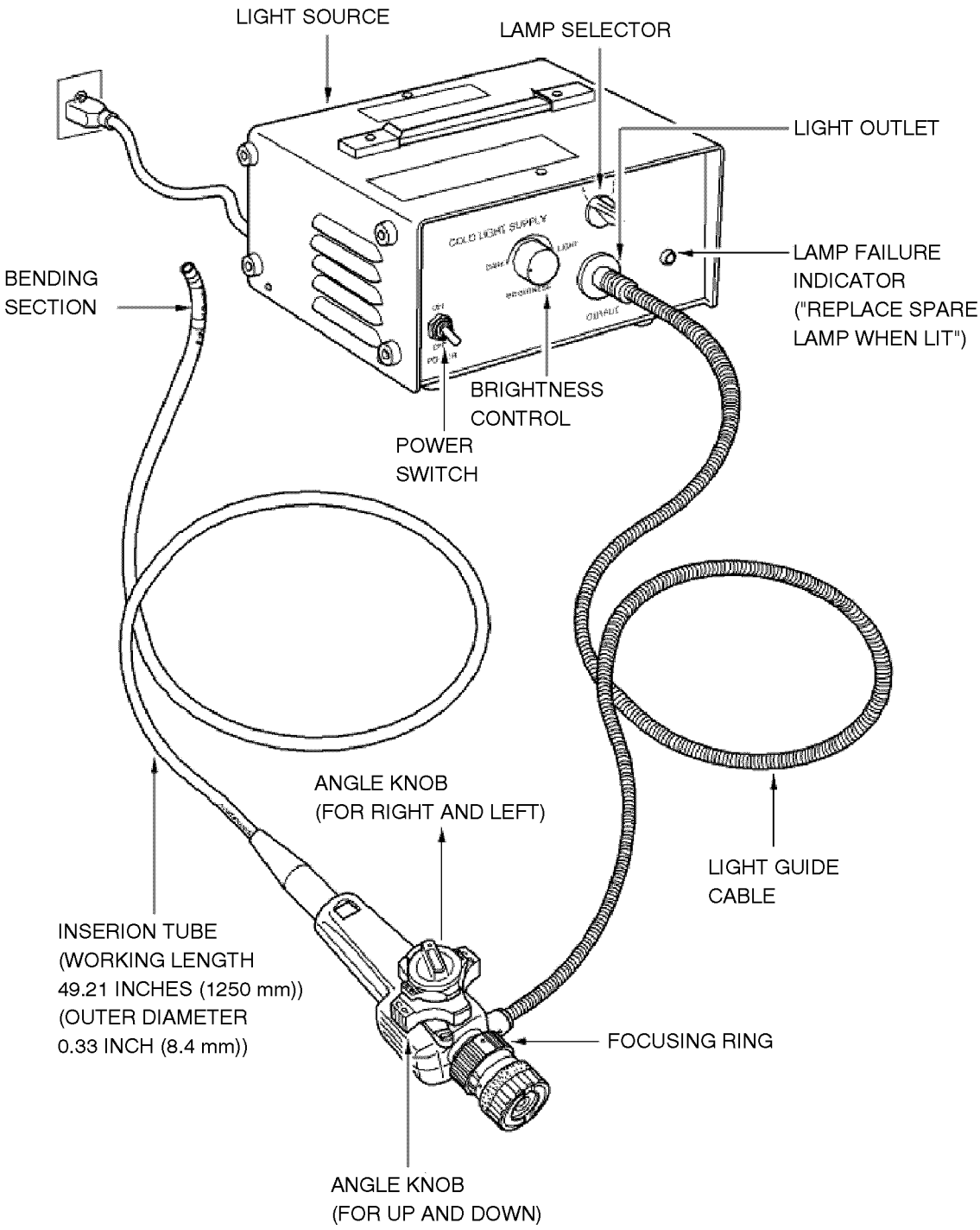
INCORRECTLY INSTALLED NO. 2 BEARING
FIGURE 7




BORESCOPE INSPECTION EQUIPMENT
FIGURE 8

Appendix

Added Data

Internal Reference Information

| Revision No. | Reference Document | Origination |
|---|---|---|
| Original | EA 16VC347 | TK/RCM |

Number values shown in parentheses adjacent to U.S. values are International System of units (SI) equivalents.

NOTE: In 2014 IAE converted the V2500 Technical Publications to a new system. As a result of the conversion, some manuals were consolidated. All manuals received new P&W part numbers. To facilitate the use of this Service Bulletin, the following Technical Publications cross reference table is provided.

Technical Publications Cross Reference Table

| Publication | Engine Model(s) | IAE IETM Pub Ref | P&W Part Number |
|---|---|---|---|
| ENGINE MANUAL — A1, A5 | All | E-V2500-1IA | 2A4407 |
| CMM-EHC — A1, A5 | All | EHC-V2500-1IA | 2A4409 |
| CMM-FN — A1, A5 | All | FN-V2500-1IA | 2A4410 |
| CMM-MMC — A1, A5 | All | MECH-V2500-1IA | 2A4411 |
| CMM-THD — A1, A5 | All | THD-V2500-1IA | 2A4412 |
| TLM — A1, A5 | All | T-V2500-1IA | 2A4408 |
| ENGINE MANUAL — D5 | All | E-V2500-3IA | 2A4416 |
| CMM-EHC — D5 | All | EHC-V2500-31A | 2A4418 |
| CMM-FN — D5 | All | FN-V2500-3IA | 2A4419 |
| CMM-MMC — D5 | All | MECH-V2500-3IA | 2A4420 |
| CMM-THD — D5 | All | THD-V2500-3IA | 2A4423 |
| TLM — D5 | All | T-V2500-3IA | 2A4417 |
| SPPM (SPM) — A1, A5, D5 | All | SPP-V2500-1IA | 2A4414 |
| EIPC — A1 | V2500-A1102Q00 | S-V2500-1IA | 2A4427 |

| Publication | Engine Model(s) | IAE IETM Pub Ref | P&W Part Number |
|---|---|---|---|
| EIPC — A5 | V2522/V2524/V2527M-AQ02 | S-V2500-6IA | 2A4428 |
| | V2522/V2524/V2527M-AQ03 | S-V2500-6IB | |
| | V2522/V2524/V2527M-SQ02 | S-V2500-6SA | |
| | V2522/V2524/V2527M-SQ03 | S-V2500-6SB | |
| | V2522/V2524/V2527M-SQ04 | S-V2500-6NA | |
| | V2522/V2524/V2527M-SQ05 | S-V2500-6NB | |
| | V2527/V2527E-AQ02 | S-V2500-7IA | |
| | V2527/V2527E-AQ03 | S-V2500-7IB | |
| | V2527/V2527E-SQ02 | S-V2500-7SA | |
| | V2527/V2527E-SQ03 | S-V2500-7SB | |
| | V2527/V2527E-SQ04 | S-V2500-7NA | |
| | V2527/V2527E-SQ05 | S-V2500-7NB | |
| | V2530-AQ02 | S-V2500-2IA | |
| | V2530-AQ03 | S-V2500-2IB | |
| | V2530-SQ02 | S-V2500-2SA | |
| | V2530-SQ03 | S-V2500-2SB | |
| | V2530-SQ04 | S-V2500-2NA | |
| | V2530-SQ05 | S-V2500-2NB | |
| | V2533-AQ02 | S-V2500-5IA | |
| | V2533-AQ03 | S-V2500-5IB | |
| | V2533-SQ02 | S-V2500-5SA | |
| | V2533-SQ03 | S-V2500-5SB | |
| | V2533-SQ04 | S-V2500-5NA | |
| | V2533-SQ05 | S-V2500-5NB | |
| EIPC — D5 | V2525/V2528-AQ02 | S-V2500-3IA | 2A4426 |
| | V2525/V2528-AQ03 | S-V2500-3IB | |
| | V2525/V2528-AQ04 | S-V2500-3IC | |