# SERVICE BULLETIN

NON-MODIFICATION SERVICE BULLETIN — ENGINE — OIL CONSUMPTION MONITORING AND NO. 4 FRONT AND REAR SEAL SEAT REPLACEMENT

MODEL APPLICATION

V2500-A1

BULLETIN ISSUE SEQUENCE

V2500 Series 72-0670

ATA NUMBER

72-00-43



Compliance Category

3

P&W Distribution Code

V2500

Summary

The purpose of this Service Bulletin is to do a one-time replacement of the No. 4 bearing front and rear seal seats for those selected engine serial numbers that are not equipped with first run or IAE source approved refurbished No. 4 bearing front and rear seal seats. Until such replacement occurs, this Service Bulletin also provides instructions to monitor oil consumption and to inspect the Turbine Exhaust Case (TEC) weep hole. Following engine removal and No. 4 bearing front and rear seal seat replacement, the High Pressure Turbine (HPT) module must be inspected for oil ingestion and ignition. This Service Bulletin supersedes the instructions provided in Reference 7, Non-Modification Service Bulletin V2500-ENG-79-0107 and Reference 6, Non-Modification Service Bulletin V2500-ENG-72-0668.

## Planning Information

### Effectivity Data

#### Engine Models Applicable

1. V2500-A1 Engines with serial numbers:

   V0008, V0023, V0024, V0026, V0027, V0028, V0030, V0036, V0038, V0043, V0044, V0045, V0050, V0052, V0056, V0057, V0059, V0062, V0063, V0064, V0068, V0070, V0071, V0072, V0073, V0074, V0077, V0079, V0080, V0082, V0087, V0092, V0094, V0095, V0097, V0098, V0100, V0102, V0105, V0107, V0108, V0109, V0114, V0116, V0117, V0118, V0125, V0134, V0140, V0145, V0151, V0197, V0198, V0200, V0220, V0221, V0224, V0228, V0238, V0239, V0243, V0244, V0246, V0252, V0257, V0270, V0271, V0272, V0273, V0278, V0279, V0280, V0281, V0282, V0289, V0290, V0297, V0298, V0299, V0303, V0304, V0306, V0307, V0308, V0309, V0312, V0329, V0330, V0341, V0342, V0345, V0346, V0348, V0352, V0353, V0354, V0355, V0356, V0357, V0358, V0359, V0360

### Concurrent Requirements

There are no concurrent requirements.

### Reason

1. Condition: An uncontained event occurred on a V2500-A1 series engine, which was attributed to a fractured 2nd stage air-seal located in the High Pressure Turbine (HPT) module.
2. Background: Analysis of all the findings to date has shown that the preliminary cause of the event was blockage at the No. 4 bearing seal seat anti-weep grooves created during the overhaul process at an engine overhaul shop. Blockage of these anti-weep grooves could allow oil to escape the No. 4 compartment and migrate to the HPT. Oil migration to the HPT could result in the oil ignition in the HPT and may eventually result in a 2nd stage air-seal fracture.
3. Objective: Do a one-time replacement of the No. 4 bearing front and real seal seats for the selected engine serial numbers that are not equipped with first run or IAE source approved refurbished No. 4 bearing front and rear seal seats. Until such replacement occurs, introduce monitoring of oil consumption and inspection of the TEC weep hole. Following engine removal and No. 4 bearing front and rear seal seat replacement, the HPT must be inspected for potential oil ingestion and ignition.
4. Substantiation: Actions contained within this Service Bulletin have been substantiated through engineering analysis and investigation conducted to date.

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

This Non-Modification Service Bulletin (NMSB) recommends operators to do a one-time replacement of the No. 4 bearing front and rear seal seats and provide instructions to monitor oil consumption and to inspect the Turbine Exhaust Case (TEC) weep hole.

Compliance

Category 3

1. Part A

   Do this Service Bulletin within 250 flight hours from the issuance of this Service Bulletin.

   NOTE: Parts B and C are not required if the No. 4 front and rear seal seats meet the requirements outlined within Accomplishment Instructions, Part A, Step 1.A.

2. Part B

   Do this Service Bulletin within 250 flights hours from the issuance of the Service Bulletin and within every 250 flight hours until the requirements outlined within Accomplishment Instructions, Part C has been met.

3. Part C

   Do before 31-Dec-2016.

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 holder has been informed of this inspection.

Manpower

1. In Service

   ..... Not Applicable.

2. At Overhaul

   ..... Not Applicable.

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 — 72-00-43, 72-43-11 and 72-43-14.
2. V2500-A1 Series Illustrated Parts Catalog, P&W Ref. PN 2A4427, Chapter/Section 72-00-43, 72-43-11 and 72-43-14.
3. V2500 A1/A5 Series Engine Manual, P&W Ref. PN 2A4407, Chapter/Section 72-00-43, 72-43-11, 72-45-00.
4. V2500 A1/A5 Series Troubleshooting Manual (TSM) Chapter/Section 79-00-00.
5. V2500 Aircraft Maintenance Manual, Chapter/Section 71-00-00 and 71-00-20.
6. V2500 Service Bulletin V2500-ENG-72-0668 (Non-Modification Service Bulletin — Oil — Turbine Exhaust Case (TEC) Weep Hole, No. 4 Bearing Weep Line — Inspection Of, To Detect Oil Leaks).
7. V2500 Service Bulletin V2500-ENG-79-0107 (Non-Modification Service Bulletin — Oil — Oil Consumption Monitoring And Troubleshooting).

Other Publications Affected

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. None.

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. There is no kit provided to do this Service Bulletin.
2. 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 V2500-A1 Engines:

| New PN | Qty | Estimate of Unit Price ($) | Keyword | Old PN | Instructions — Disposition |
|---|---|---|---|---|---|
| | 1 | * | SEAT — NO. 4 BRG SEAL | 2A3432 (72-43-11-01-10) | (4)(C) |
| | 1 | * | SEAT — NO. 4 BRG SEAL | 2A3433 (72-43-14-01-20) | (4)(C) |
| | | | OR | | |
| | 1 | * | SEAT — NO. 4 BRG SEAL | 2A0066 (72-43-11-01-10) | (4)(X)(N) |
| | 1 | * | SEAT — NO. 4 BRG SEAL | 2A0067 (72-43-14-01-20) | (4)(X)(N) |
| | | | OR | | |
| | 1 | * | SEAT — NO. 4 BRG SEAL | 2A1998 (72-43-11-01-10) | (4)(X)(N) |
| | 1 | * | SEAT — NO. 4 BRG SEAL | 2A1999 (72-43-14-01-20) | (4)(X)(N) |

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.

(4) Do an inspection as specified in the Accomplishment Instructions.

Spare Parts Availability

(C) The old part will continue to be supplied.

(N) The old part is not available.

(X) See Reference 2, Service Bulletin V2500-ENG-72-0405 for replacement No. 4 bearing seal seats.

Vendor Services or Special Components/Materials

Vendor Services or Special Components/Materials

| P&W Designation | Vendor Designation | Name | Vendor Name & Address |
|---|---|---|---|
| 2A3432 | | Seat — No. 4 Brg Seal | PAS Technologies, Inc. (formerly Praxair Surface Technologies)<br>1234 Atlantic Street<br>North Kansas City, MO 64116-4142<br>USA<br>Tel: (816) 556-4600 |
| 2A3433 | | Seat — No. 4 Brg Seal | |
| OR | | | |
| 2A3432 | | Seat — No. 4 Brg Seal | WGI, Inc. (formerly Westfield Gage Company, Inc.)<br>34 Hudson Drive<br>Southwick, MA 01077<br>USA<br>Tel: (413) 569-9444 |
| 2A3433 | | Seat — No. 4 Brg Seal | |

NOTE: EXCEPT FOR WORK OR SUPPLIES TO BE PERFORMED OR FURNISHED BY IAE, IT IS UNDERSTOOD THAT IAE DOES NOT ENDORSE THE WORK PERFORMED BY THE COMPANY OR COMPANIES NAMED HEREIN OR ANY OTHER COMPANY AND DOES NOT ACCEPT RESPONSIBILITY TO ANY DEGREE FOR THE SELECTION OF SUCH COMPANY OR COMPANIES FOR THE PERFORMANCE OF ANY WORK OR PROCUREMENT OF SUPPLIES.

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

Part A — Previous Shop Visit Records And Historical Data Review

1. Do a review of the repair history from the last shop visit for each engine serial number listed in the Effectivity list to determine applicability.

   A. If the No. 4 bearing front and rear seal seats installed were new (no previous repairs performed) or refurbished by an IAE source approved vendor as specified in Reference 3, Engine Manual, Chapter/Section 72-43-11, Repair Tasks 72-43-11-300-001, VRS3101, 72-43-11-300-002, VRS3102, 72-43-14-300-001, VRS3107, 72-43-14-300-002, VRS3108, 72-43-11-300-005, VRS3693 or 72-43-14-300-005, VRS3694, reference Material Information, then no further action is required and this Service Bulletin is considered accomplished. Record Accomplishment of the Service Bulletin as specified in Step 3 below.

   B. If the No. 4 bearing front and rear seal seats installed were not new or refurbished by an IAE source approved vendor, then do the steps below.

2. Calculate the average oil consumption rate since last shop visit, using the most complete set of data available. This calculation is accomplished by dividing the oil quantity added to the specified engine during each 250 +/- 25 flight hour time period by the actual engine operating hours during the same 250 +/- 25 flight hour time period.

   A. If the average oil consumption rate for any 250 +/- 25 hour time period exceeded 0.15 quarts (0.3 US pints) per hour and the assignable cause was not corrected to return the oil consumption rate to less than or equal to 0.15 quarts (0.3 US pints) per hour, remove the engine from service within five flight cycles and proceed to Part C. Refer to Reference 5, Aircraft Maintenance Manual, Chapter/Section 71-00-20, Task 71-00-20-000-040 and Task 71-00-20-400-040. Record Accomplishment of this Service Bulletin as specified in Step 3 below.

   B. If the average oil consumption is 0.15 quarts (0.3 US pints) or less per hour, continue to Part B. Record Accomplishment of this Service Bulletin as specified in Step 3 below.

3. A record of accomplishment is required.

   A. Complete Section I: Previous Shop Visit Records And Historical Data Review. See Figure 7.

   B. Record the accomplishment of this NMSB in the applicable engine records.

   C. Inform local IAE office that NMSB V2500-ENG-72-0670 has been accomplished and provide Section I completed to IAE Technical Services. See Figure 3.

Part B — On-Wing Weep Hole Inspection

1. Do a visual inspection of the turbine exhaust case weep hole.

   A. Do a visual inspection of the the turbine exhaust case weep hole for oil wetting. See Figures 5 and 6.

      (1) If oil wetting is found, do the steps that follow.

         (a) Calculate the oil consumption rate using the oil quantity added to the specified engine during the last 250 +/- 25 flight hour time period divided by the actual engine operating hours during the same 250 +/- 25 flight hour time period.

1 If oil consumption is greater than 0.15 quarts (0.3 US pints) per hour, remove the engine from service and proceed to Part C. Refer to Reference 5, Aircraft Maintenance Manual, Chapter/Section 71-00-20, Task 71-00-20-000-040 and Task 71-00-20-400-040. Record Accomplishment of the Service Bulletin as specified in Step 3 below.

2 If oil consumption is less than or equal to 0.15 quarts (0.3 US pints) per hour, do the procedure to dry out the high pressure turbine after oil contamination. Refer to Reference 5, Aircraft Maintenance Manual, Chapter/Section 71-00-00, Task 71-00-00-700-013.

a If the dry out procedure is successful, the engine may continue service. Record Accomplishment of the Service Bulletin as specified in Step 3 below.

b If the dry out procedure is not successful, remove the engine from service and proceed to Part C. Refer to Reference 5, Aircraft Maintenance Manual, Chapter/Section 71-00-20, Task 71-00-20-000-040 and Task 71-00-20-400-040. Record Accomplishment of the Service Bulletin as specified in Step 3 below.

(2) If oil wetting is not found during inspection continue to Step 2.

2. Calculate the oil consumption rate using the oil quantity added to the specified engine during the last 250 +/- 25 flight hour time period divided by the actual engine operating hours during the same 250 +/- 25 flight hour time period.

A. If the oil consumption is more than 0.3 quarts (0.6 US pints) per hour, perform troubleshooting as specified in Reference 4, Troubleshooting Manual (TSM), Tasks 79-00-00-810-838 or 79-00-00-810-839 in its entirety until the source of the high oil consumption has been confirmed before the next flight.

(1) If the cause of the oil consumption was corrected such that it is less than or equal to 0.15 quarts (0.3 US pints) per hour the engine can return to service. Record Accomplishment of the Service Bulletin as specified in Step 3 below.

(2) If the cause of the oil consumption cannot be corrected such that it is less than or equal to 0.15 quarts (0.3 US pints) per hour, remove the engine from service within five flight cycles and proceed to Part C. Record Accomplishment of the Service Bulletin as specified in Step 3 below.

B. If the oil consumption is more than 0.15 quarts (0.3 US pints) and less than or equal to 0.3 quarts (0.6 US pints) per hour, perform troubleshooting as specified in Reference 4, TSM, Tasks 79-00-00-810-838 or 79-00-00-810-839 in its entirety until the source of the oil consumption has been confirmed within 250 flight hours.

(1) If the cause of the oil consumption was corrected such that it is less than or equal to 0.15 quarts (0.3 US pints) per hour the engine can return to service. Record Accomplishment of the Service Bulletin as specified in Step 3 below.

(2) If the cause of the oil consumption cannot be corrected such that it is less than or equal to 0.15 quarts (0.3 US pints) per hour, remove the engine from service within 250 flight hours from the time the threshold was exceeded. Record Accomplishment of the Service Bulletin as specified in Step 3 below.

C. If oil consumption is less than or equal to 0.15 quarts (0.3 US pints) the engine may continue in service. Record Accomplishment of the Service Bulletin as specified in Step 3 below.

3. A record of accomplishment is required.

   A. Complete Section II: Engine On-Wing Action. See Figure 8.

   B. Record the accomplishment of this NMSB in the applicable engine records.

   C. Inform local IAE office that NMSB V2500-ENG-72-0670 has been accomplished and provide Section II completed to IAE Technical Services. See Figure 4.

Part C — No. 4 Bearing Front And Rear Seal Seat Replacement

1. Do the following procedures. See Figures 1 and 2.

   A. Remove the No. 4 Bearing Front and Rear Seal Seats, per the Material Information section from the No. 4 bearing compartment. Refer to Reference 3, Engine Manual, Chapter/Section 72-00-43, Task 72-00-43-020-001.

      (1) Do not perform any maintenance, including cleaning, on these parts. Return the removed parts to IAE for a detailed inspection. Parts will be returned after the inspection has been completed. Refer to IAE's shipping address. Contact your IAE Field Support Representative (FSR) for shipping instructions. Provide your IAE FSR with the quantity of parts being shipped with the following: Part Number (PN), Serial Number (SN) and Engine Serial Number (ESN) of the engine the parts were removed from.

| Pratt & Whitney — Customer Parts Returns |
|---|
| 400 Main Street, Well No. 5 |
| RMR No. 34189 |
| Attention: Maria Inacio |
| East Hartford, CT 06118 |
| USA |

   B. Examine The HPT rotor and stator assembly after possible oil ignition event Inspection-001, Refer to Reference 3, Engine Manual, Chapter/Section 72-45-00, Task 72-45-00-200-801.

   C. Install No. 4 Bearing Front and Rear Seal Seats, PN 2A3432 and PN 2A3433 from the No. 4 bearing and rear compartment. Refer to Reference 3, Engine Manual, Chapter/Section 72-00-43, Task 72-00-43-420-001.

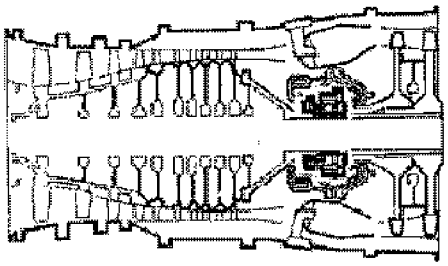
      (1) Install a new or refurbished No. 4 bearing front and rear seal seat. A refurbished No. 4 bearing front and rear seal seat must be repaired as specified in Reference 3, Engine Manual, Chapter/Section 72-43-11, Repair Procedures 72-43-11-300-002, VRS3102, 72-43-14-300-002, VRS3108, 72-43-11-300-005, VRS3693 or 72-43-14-300-005, VRS3694, from an IAE source approved vendor listed within Material Information section.

2. A record of accomplishment is required.

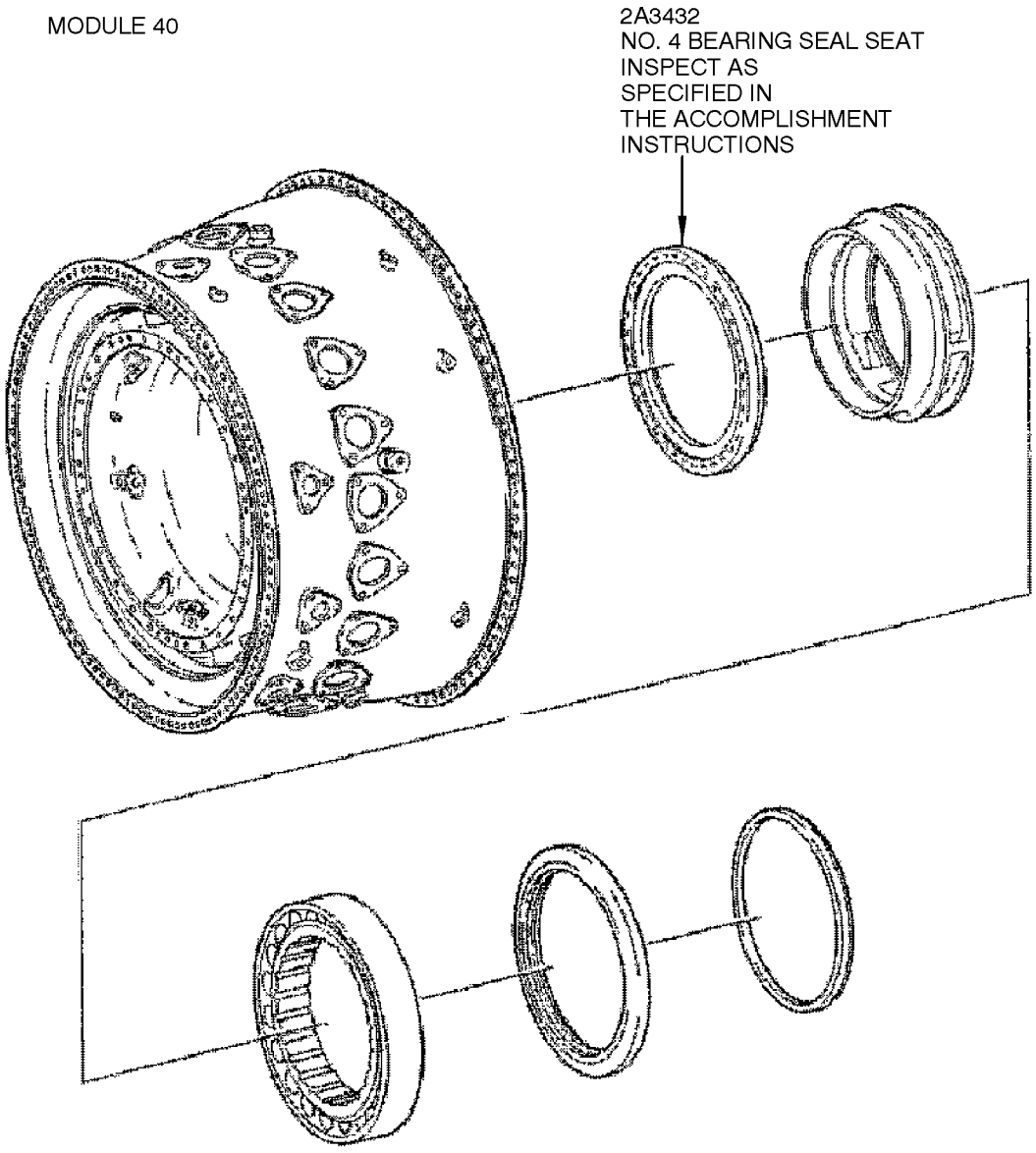
   A. Complete Section III — In Shop — Removed Engine Action. See Figure 9.

   B. Record the accomplishment of this NMSB in the applicable engine records.

   C. Inform local IAE office that NMSB V2500-ENG-72-0670 has been accomplished and provide Section III completed to IAE Technical Services.



MODULE 40

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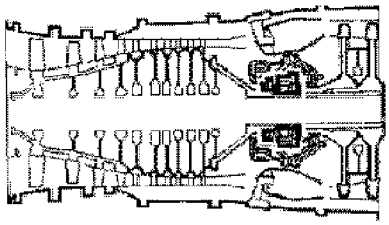
LOCATION OF THE NO. 4 BEARING FRONT SEAL SEAT
72-43-11
FIGURE 1



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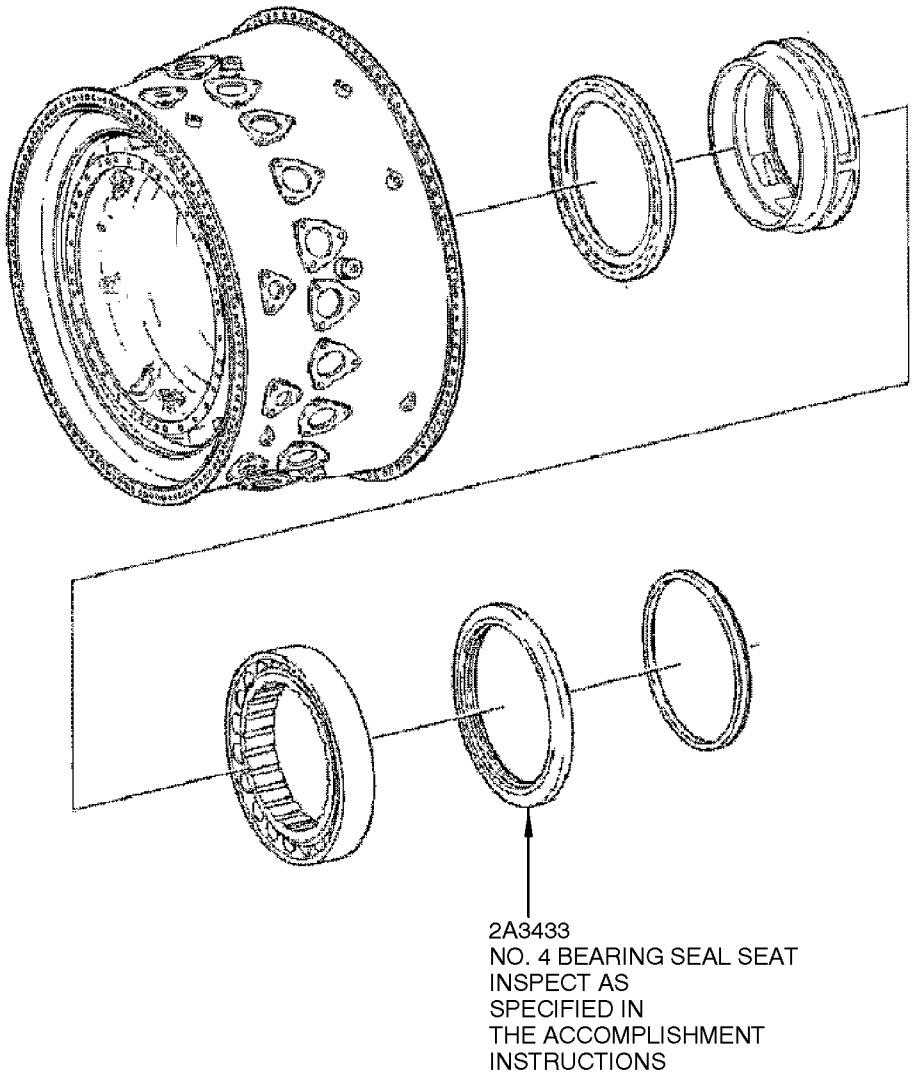


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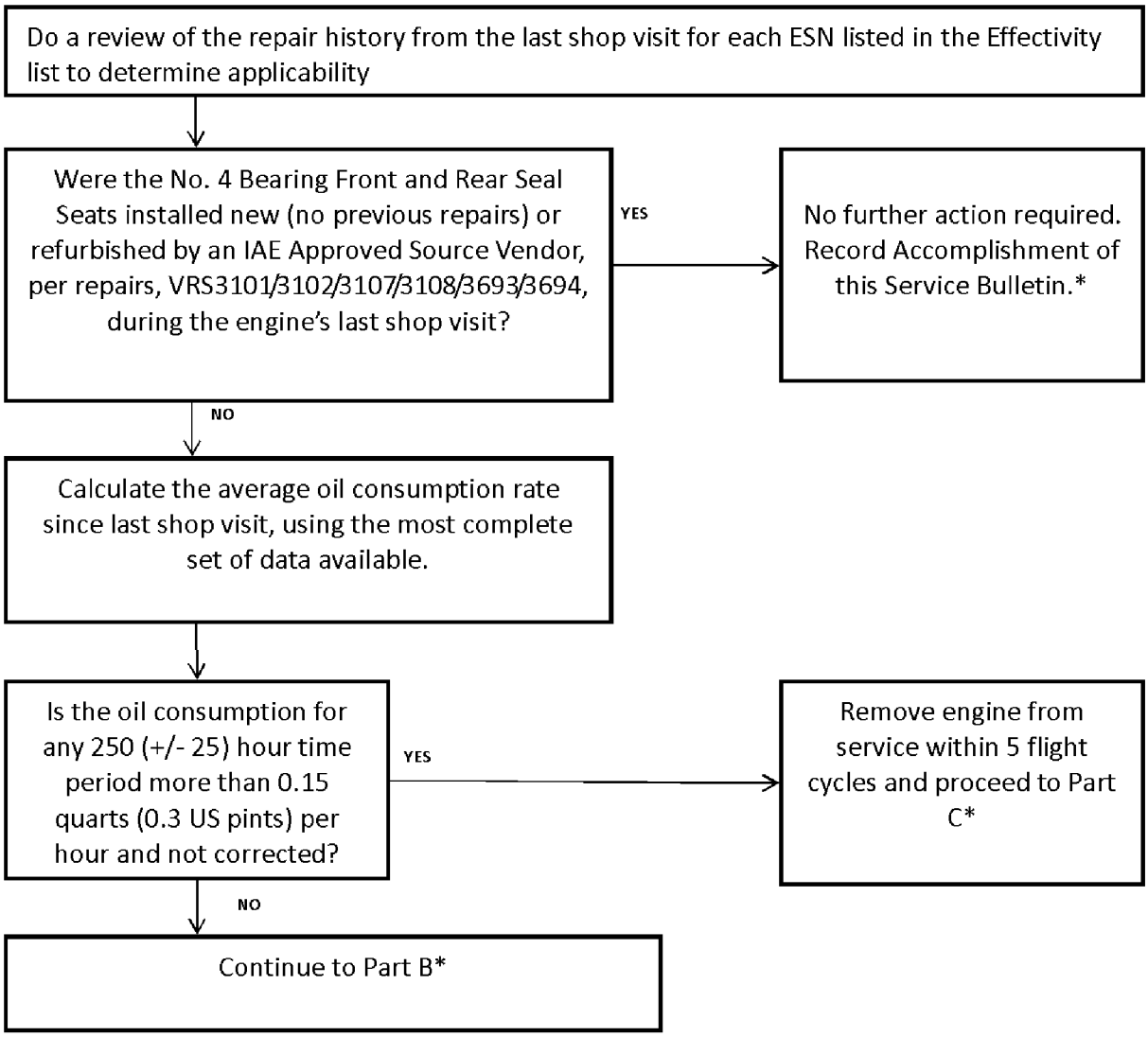
LOCATION OF THE NO. 4 BEARING REAR SEAL SEAT
72-43-14
FIGURE 2




* Proceed to Step 3 to Record Accomplishment of Part A of this Service Bulletin.

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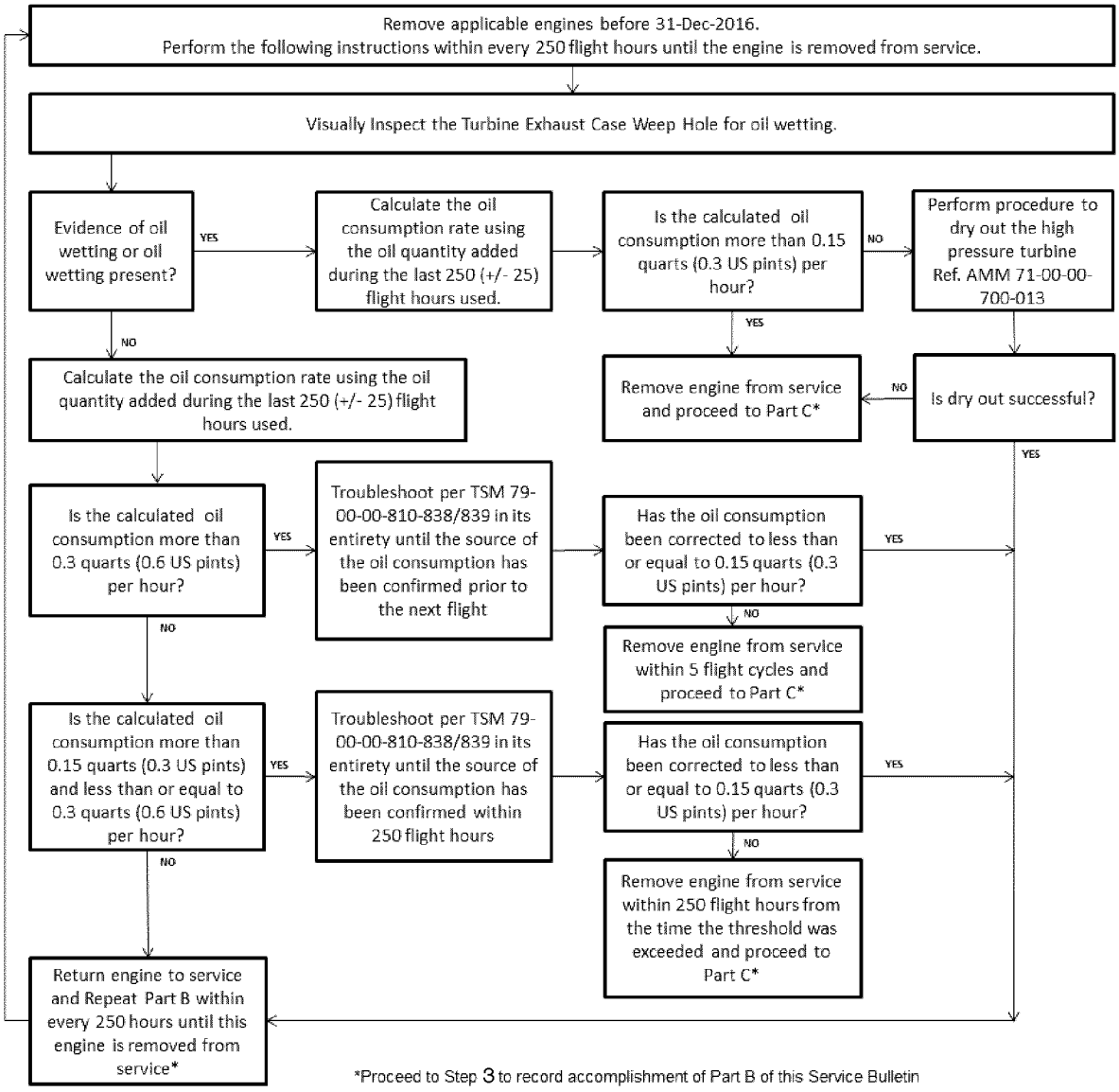
FLOWCHART FOR PART A
FIGURE 3

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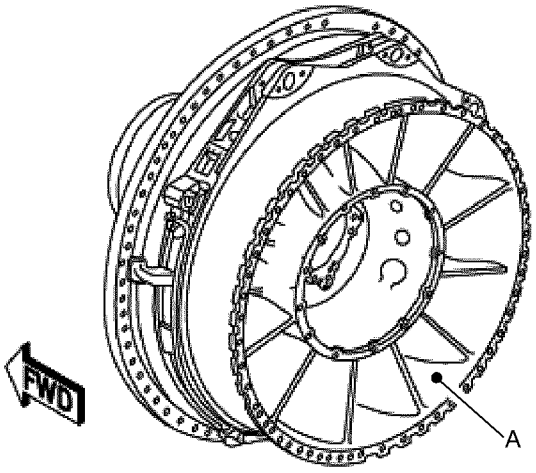
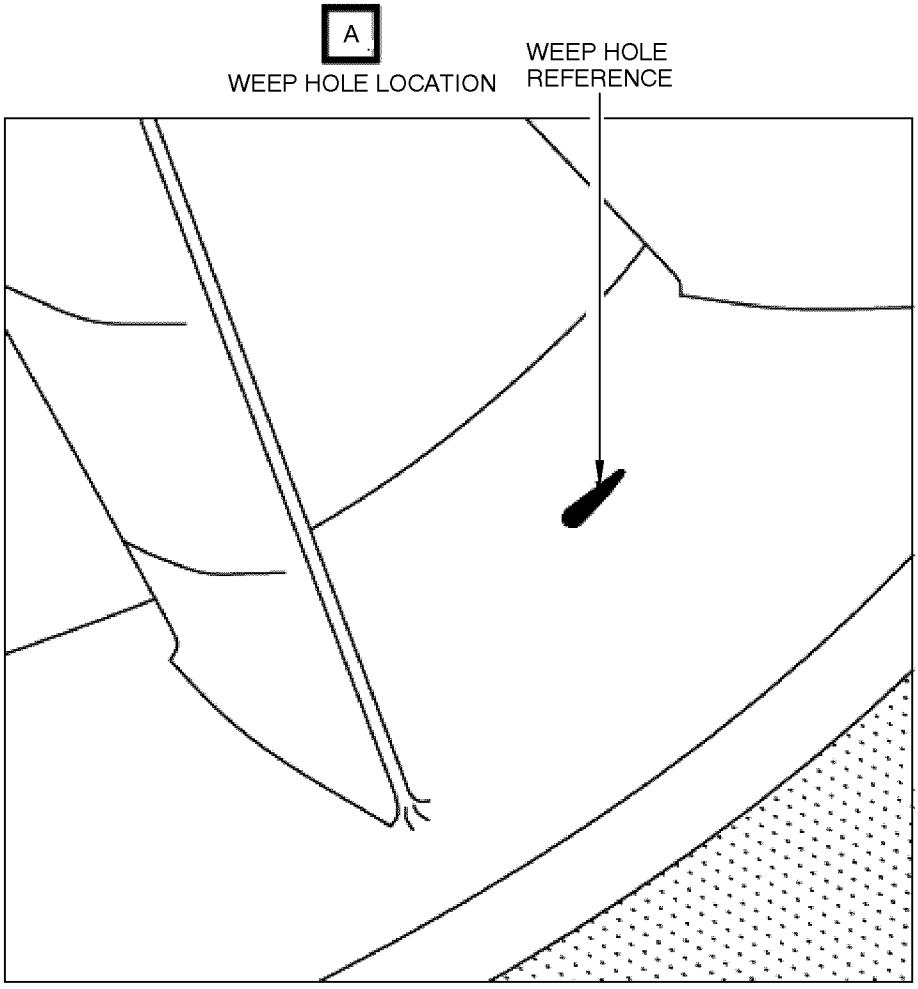
FLOWCHART FOR PART B
FIGURE 4

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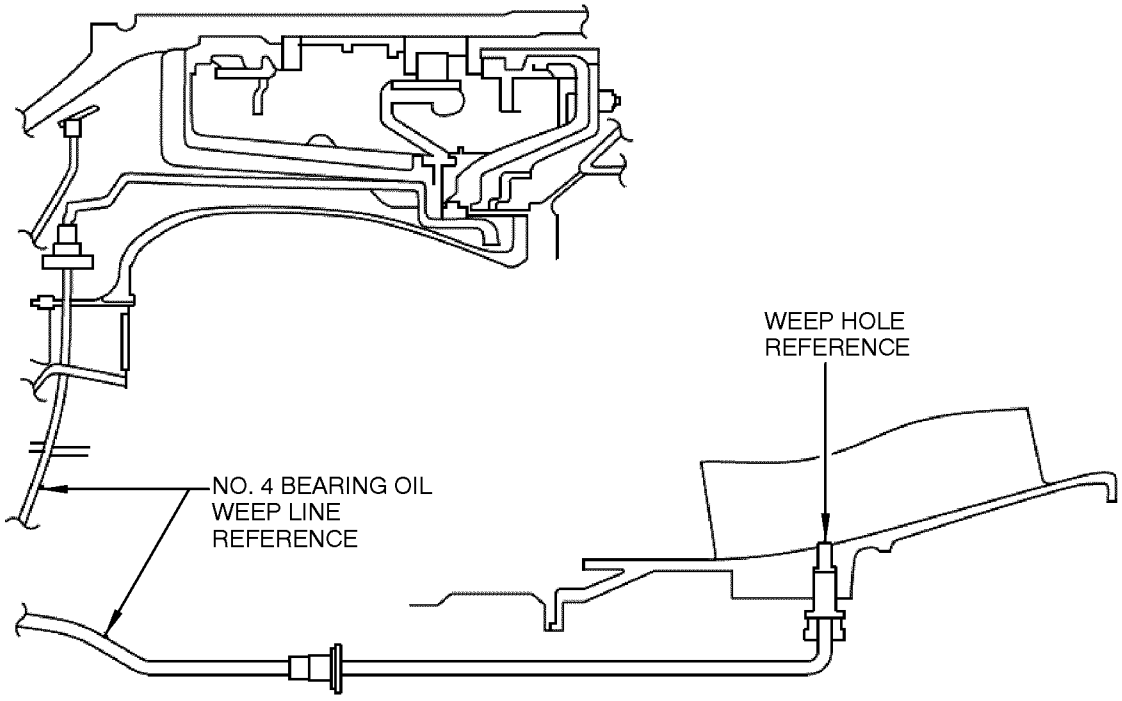
LOCATION OF THE WEEP-HOLE
FIGURE 5

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LOCATION OF THE NO. 4 BEARING WEEP LINE
FIGURE 6

## Section I* - PREVIOUS SHOP VISIT RECORDS AND HISTORICAL DATA REVIEW.
## (Circle all that apply)

(*) This section only needs to be submitted one time per engine.

**Date of Accomplishment:** _____

**Engine Serial Number:** _____

**Engine TSN/CSN:** _____ / _____

**Engine TSLV/CSLV:** _____ / _____

| | | |
|---|---|---|
| 1. Engine's historical records from last shop visit and previous oil consumption history completed? | YES | NO |
| 2. Engine can remain in service? | YES | NO |
| 3. Date engine removed from service (if applicable): | | |
| 4. Planned date for engine removal to meet Dec. 31st, 2016 requirement (if available): | | |
| 5. Comments (optional): | | |

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PREVIOUS SHOP VISIT RECORDS AND HISTORICAL DATA REVIEW
FIGURE 7

## Section II** - ENGINE ON-WING ACTION.
## (Circle all that apply)

**(**) This section should be filled out after each 250 hour inspection.**

**Date of Accomplishment: _____**

**Engine Serial Number: _____**

**Engine TSN/CSN: _____ / _____**

**Engine TSLV/CSLV: _____ / _____**

| | | |
|---|---|---|
| 1. Has Section I been completed previously? | YES | NO |
| 2. Were all Accomplishment II steps completed? | YES | NO |
| 3. Engine can remain in service? | YES | NO |
| 4. Date engine removed from service (if applicable)? | | |
| 5. Planned date for engine removal to meet Dec. 31st, 2016 requirement (if available): | | |
| 6. Comments (optional): | | |

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ENGINE ON-WING ACTION
FIGURE 8

## Section III* - IN SHOP – REMOVED ENGINE ACTION
## (Circle all that apply)

(*) This section only needs to be submitted one time per engine.

**Date of Accomplishment:** _____

**Engine Serial Number:** _____

**Engine TSN/CSN:** _____ / _____

**Maintenance Shop:** _____

| | | |
|---|---|---|
| 1. Has the Procedure, Engine Manual Task 72-45-00-200-801 been completed: | YES | NO |
| 2. Date No. 4 Bearing Seal Seats were replaced with New or Refurbished per the instructions of this Service Bulletin: | | |
| 3. Comments (optional): | | |

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IN SHOP — REMOVED ENGINE ACTION
FIGURE 9

Appendix

Added Data

Internal Reference Information

| Revision No. | Reference Document | Origination |
|---|---|---|
| Original | EA16VC072 | AC/IEL |

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 |
| EIPC — A1 | V2500-A1102Q00 | S-V2500-1IA | 2A4427 |