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## V2500 A1/A5/D5 SERIES PROPULSION SYSTEM NON-MODIFICATION SERVICE BULLETIN

Printed in Great Britain

This document transmits Revision 1 to Service Bulletin EV2500-72-0502 and Revision 1 to the Supplement

### Document History

Service Bulletin Revision Status  
Initial Issue Jul.22/05

Supplement Revision Status  
Initial Issue Jul.22/05

### Bulletin Revision 1

Remove  
All pages of the  
Service Bulletin

Incorporate  
Pages 1 to 8 of the  
Service Bulletin

Reason for change  
To incorporate intent of  
IEN 05VC131A. To delete  
Figure 1.

All pages of  
Appendix 1

To incorporate intent of  
IEN 05VC131A. To delete  
Figure 1.

### Supplement Revision 1

Remove  
All pages

Incorporate  
Page 1

Reason for change  
To incorporate intent of  
IEN 05VC131A. To delete  
Figure 1.

# V2500-ENG-72-0502

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CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED

If any have not been received please advise Customer Data Services, Rolls-Royce plc, Derby, England

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# LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 1 to the Bulletin and Revision 1 to the Supplement are as follows:

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Supplement		
R 1	1	Mar.15/06

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NON-MODIFICATION SERVICE BULLETIN – REPLACEMENT OF HIGH PRESSURE TURBINE (HPT) STAGE  
2 AIR SEAL

1. Planning Information

A. Effectivity Data

(1) (For Airbus A319)

Engine Models Applicable

V2522-A5, V2524-A5, V2527M-A5

R Engine Serial No. – All engines incorporating Seal – Air, 2nd Stage HPT

R Part Numbers Listed in Section 3.

(2) (For Airbus A320)

Engine Models Applicable

V2500-A1

R Engine Serial No. – All engines incorporating Seal – Air, 2nd Stage HPT

R Part Numbers Listed in Section 3.

V2527-A5, V2527E-A5

R Engine Serial No. – All engines incorporating Seal – Air, 2nd Stage HPT

R Part Numbers Listed in Section 3.

(3) (For Airbus A321)

Engine Models Applicable

V2530-A5, V2533-A5

R Engine Serial No. – All engines incorporating Seal – Air, 2nd Stage HPT

R Part Numbers Listed in Section 3.

(4) (For Boeing MD-90)

Engine Models Applicable

V2525-D5, V2528-D5

R Engine Serial No. – All engines incorporating Seal – Air, 2nd Stage HPT

R Part Numbers Listed in Section 3.

**B. Concurrent Requirements**

For all V2500-A5/D5 engines, Service Bulletin V2500-ENG-72-0451 must be incorporated prior to or concurrently with this SB.

For all V2500-A5 engine serial numbers V10001 to V10197 and V2500-D5 engine serial numbers V20001 to V20072, Service Bulletin V2500-ENG-72-0239 must be incorporated prior to or concurrently with this SB.

**C. Reason**

- (1) **Problem:** There have been occurrences of cracks in the High Pressure Turbine (HPT) Stage 2 Air Seal. Cracked seals have occurred on all engine models A1, A5, and D5. The crack can propagate and result in the fracture of a piece of the HPT Stage 2 Air Seal, which could result in significant damage to the HPT and LPT.
- (2) **Evidence:** IAE has embarked on a comprehensive program to manage this issue and identify root cause of the failure. N2 vibration monitoring has been very successful and continues to be critical for fleet management. Over the long term additional steps as described in this Service Bulletin are required while root cause is identified and corrective action implemented. This action is being taken to minimize the risk of additional events.
- (3) **Objective:** This NMSB provides instructions to replace HPT Stage 2 Air Seals which are exposed at shop visit and have accumulated 2000 cycles or more since new. By implementing this seal replacement plan the quantity of unscheduled engine removals will be reduced, and the overall likelihood of an in service event will be reduced.
- (4) **Substantiation:** Statistical analysis of cracked HPT Stage 2 Air Seals shows that compliance with this NMSB will reduce the quantity of unscheduled engine removals, and the likelihood of an in service event.
- (5) **Effects of Bulletin on:**
  - Removal/Installation: None.
  - Disassembly/Assembly: None.
  - Cleaning: None.
  - Inspection/Check: Yes (Examine the HPT Stage 2 Air Seal for crack per Reference K.9. and K.10.).
  - Repair: None.
  - Testing: None.

## (6) Supplemental Information

None.

D. Description

This Service Bulletin provides instructions to replace HPT Stage 2 Air Seals which are exposed at shop visit which have accumulated 2000 cycles or more since new.

E. Compliance

## Category 6

Accomplish when the subassembly (i.e. modules, accessories, components, build groups) is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

NOTE: Compliance of this Service Bulletin is required when the HPT Stage 2 Air Seal has accumulated 2000 cycles or more since new.

NOTE: Compliance of this Service Bulletin is required if HPT Rotor Stages 1 and 2 are separated.

F. Approval Data

The part number changes and/or part modifications specified in the Accomplishment Instructions and Material Information sections of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the engine model(s) given.

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.

G. Manpower

## (1) In Service

Not Applicable.

## (2) At Overhaul

2 hours

H. Weight and Balance

## (1) Weight Change

None.

(2) Moment Arm

No Effect.

(3) Datum

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

I. Electrical Load Data

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

J. Software Accomplishment Summary

Not Applicable.

K. References

1. IAE V2500 Service Bulletin V2500-ENG-72-0207 (Engine - HP Turbine Rotor And Stator Assembly - Provide A New Stage 2 HPT Air Seal Assembly Featuring Recontoured Forward And Rearward Mating Surface And A Tapered Web).
2. IAE V2500 Service Bulletin V2500-ENG-72-0239 (Engine - Diffuser And Combustor Group - Provide New Diffuser Group Adapters And Tube Assemblies).
3. IAE V2500 Service Bulletin V2500-ENG-72-0240 (Engine - High Pressure Turbine Rotor And Stator Assembly - Provide A New Stage 2 HPT Air Seal And New Stage 1 High Pressure Turbine (HPT) Hub Metering Plugs).
4. IAE V2500 Service Bulletin V2500-ENG-72-0242 (Engine - HP Turbine Rotor And Stator Assembly - Provide New Stage 1 HPT Blades).
5. IAE V2500 Service Bulletin V2500-ENG-72-0327 (Engine - High Pressure Turbine Rotor And Stator Assembly - Introduce New Rotating Parts With Potential For Increased Cyclic Life).
6. IAE V2500 Service Bulletin V2500-ENG-72-0412 (Engine - Provide Additional Oil Drain Hole In 2nd Stage Turbine Air Seal).
7. IAE V2500 Service Bulletin V2500-ENG-72-0451 (Engine - High Pressure Turbine First Stage Disk Metering Plug Redesign).
8. V2500 Engine Illustrated Parts Catalogs (S-V2500-1IA, S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA, and S-V2500-71B), Chapter/Section 72-45-00.
9. V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-40-00.
10. V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-40-00.

11. V2500 Standard Practices/Processes Manual (E-V2500-1IA), Chapter/Section 72-40-00.

12. V2500 Standard Practices/Processes Manual (E-V2500-3IA), Chapter/Section 72-40-00.

R 13. Internal Reference No. - 05VC131, 05VC131A.

14. ATA Locator - 72-40-00.

L. Other Publications Affected

Not applicable.

M. Interchangeability of Parts

Not applicable.

N. Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (No)

Added Data (No)

Revision to Table of Limits (No)

Inspection Procedures (No)

## 2. Material Information

### A. Industry Support Program

Contact your IAE customer service representative for all information regarding this Service Bulletin

### B. Tooling – Price and Availability

Special tools are not required to accomplish this Service Bulletin.

### C. Reidentified Parts

Not Applicable.

### D. Other Material Information Data

Not Applicable.

### 3. Accomplishment Instructions

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- R (1) This Service Bulletin applies to the following Seal, Air, 2nd Stage HPT  
R (Reference ATA Chapter/Section 72-45-00-01-080).
- R (a) For V2500-A1 Seal, Air, 2nd Stage HPT part numbers 2A3185, 2A3108,  
R 2A1159, 2A1160, or 2A0487.
- R (b) For V2500-A5/D5 Seal, Air, 2nd Stage HPT part numbers 2A3596, 2A3425,  
R 2A3179, 2A3108, or 2A1160.
- (2) Remove the Seal, Air, 2nd Stage HPT (Ref ATA 72-45-00-01-080) from first  
stage rotor by the procedure given in Reference K.9. or K.10.,  
Chapter/Section 72-45-00.
- R (3) Clean, perform crack inspection and measure bore axial position of the  
R Seal, Air, 2nd Stage HPT by the procedures given in Reference K.9. or  
K.10., Chapter/Section 72-45-00. If a crack is found at the front snap  
diameter fillet radius or if bore axial position is out of limit notify  
your IAE representative.
- R (4) The removed seal must be scrapped locally and cannot be returned to  
R service even if it meets all inspection requirements.
- (5) If a through crack is found in the front fillet radius the following must  
also be removed and replaced with New Production Parts (See Supplement  
Section for part listing) or serviceable parts:
- NOTE: A through crack in the front fillet radius originates in the radius  
on the outer diameter side and extends through to the inner  
diameter side.
- (a) For A5/D5 replace HPT Stage 1 Disk (1 off) and HPT rear air Seals (64  
off).
- NOTE: The preceding removed parts must be scrapped and reported to  
IAE. Parts may be scrapped locally.
- (b) For A1 replace HPT stage 1 Disk (1 off), Stage 2 Disk (1 off) and HPT  
rear air Seals (64 off).
- NOTE: The preceding removed parts must be scrapped and reported to  
IAE. Parts may be scrapped locally.
- R (6) Perform visual inspection of HPC rear stubshaft Heatshield, (Ref ATA  
72-41-13-01-875). If there are any indication of cracks replace by the  
procedures in Reference K.9. or K.10., Chapter/Section 72-41-13.
- NOTE: A cracked HPC rear stubshaft Heatshield, may lead to a false N2  
increasing vibration trend and possibly early engine removal.



- (7) Install new Seal, Air, 2nd Stage HPT PN 2A3596 (A5/D5) or PN 2A3185 (A1) when you assemble the High Pressure Turbine Rotor and Stator Assembly by the procedures given in Reference K.9. or K.10., Chapter/Section 72-45-00. It is also permissible to install any allowable configuration 2nd Stage HPT Air Seal provided it has accumulated less than 2000 cycles since new.
- (8) Recording Instructions
  - (a) A record of accomplishment is required.

NON-MODIFICATION SERVICE BULLETIN – REPLACEMENT OF HIGH PRESSURE TURBINE (HPT) STAGE  
2 AIR SEAL

SUPPLEMENT – PRICES AND AVAILABILITY

V2500 ALL

1. Modification Kit:

A. There is no kit provided to do this Service Bulletin.

2. Material Cost

Not Applicable.

3. Production Parts Subject to Replacement:

New Production Part No.	Units per Engine	Description	Unit Price US Dollars
2A1801	1	Hub, 1STG Turbine (A1) (ATA# 72-45-11-01-011)	119,210.00
2A1202	1	Hub, 2STG Turbine (A1) (ATA# 72-45-31-01-011)	104,310.00
2A5001	1	Hub, Turbine 1STG (A5/D5) (ATA# 72-45-11-01-011)	158,010.00
2A0045	64	Seal, Air, 1st Stage HPT (A1/A5/D5) (ATA# 72-45-15-01-020)	360.00
2A3185	1	Seal, Air, HPT, 2STG (A1) (ATA# 72-45-00-01-080)	97,040.00
2A3596	1	Seal, Air, HPT, 2STG (A5/D5) (ATA# 72-45-00-01-080)	97,040.00