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DATE: Mar.30/07

V2500 A1/A5/D5 SERIES PROPULSION SYSTEM SERVICE BULLETIN

This document transmits Revision 2 to Service Bulletin EV2500-72-0491 and Revision 2 to the Supplement

Document History

Service Bulletin Revision Status		Supplement Revision Status	
Initial Issue	Feb.8/05	Initial Issue	Feb.8/05
Revision 1	May 11/05	Revision 1	May 11/05

Bulletin Revision 2

Remove	Incorporate	Reason for change
All pages of the Summary		To revise the Background, the Compliance and References and to make some minor changes.
All pages of the Service Bulletin	Pages 1 to 11 of the Service Bulletin	To revise the Background, the Compliance and References and to make some minor changes.

Supplement Revision 2

Remove	Incorporate	Reason for change

V2500-ENG-72-0491

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
If any have not been received please advise Customer Data Services, Rolls-Royce plc, Derby, England

All pages	Page 1	To revise the Background, the Compliance and References and to make some minor changes.

Printed in Great Britain

LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 2 to the Bulletin and Revision 2 to the Supplement are as follows:

	Page	Revision Number	Revision Date
	Bulletin		
R	1	2	Mar.30/07
R	2	2	Mar.30/07
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R	9	2	Mar.30/07
R	10	2	Mar.30/07
R	11	2	Mar.30/07
	Supplement		
R	1	2	Mar.30/07

International Aero Engines

SERVICE BULLETIN

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

Printed in Great Britain

1. Planning Information

A. Effectivity

(1) Airbus A319

Engine Models Applicable

V2522-A5, V2524-A5, V2527M-A5

Engine Serial No. - All engines

(2) Airbus A320

Engine Models Applicable

V2500-A1

Engine Serial No. - All engines

V2527-A5, V2527E-A5

Engine Serial No. - All engines

(3) Airbus A321

Engine Models Applicable

V2530-A5, V2533-A5

Engine Serial No. - All engines

(4) Boeing MD-90

Engine Models Applicable

V2525-D5, V2528-D5

Engine Serial Nos. V20001 thru V20285

B. Concurrent Requirements

There are no concurrent requirements.

C. Reason

(1) Problem: There have been occurrences of cracks in the High Pressure Turbine (HPT) stage 2 Airseal (ATA 72-45-00 01-080). When a crack develops in the HPT stage 2 air seal front fillet radius, an increasing trend in N2 vibration occurs and the front OD of the seal contacts with the HPT air seal (PN 2A0045 /ATA 72-45-15 01-020). The crack can propagate and result in a fracture of a piece of the HPT stage 2 air seal, which could result in significant damage to the HPT and LPT.

R (2) Background: When performing vibration monitoring per early revisions of
R All Operators Wire (AOW) 1069, Non-Modification Service Bulletin (NMSB)
R V2500-ENG-72-0500 (Ref.3) or NMSB V2500-ENG-72-0501 (Ref.4), under certain
R circumstances a borescope inspection of the HPT stage 2 seal was required.
R Based on the current procedures in NMSB V2500-ENG-72-0500 and
R V2500-ENG-72-0501, borescope inspection of the OD surface of the seal is
R not required under any circumstance.

NOTE: Be advised that on the A1 Engine models ESN V0267 and up, or engines that have incorporated Service Bulletin V2500-ENG-72-0122 part 2 (reference 2), prevents access through the stage 2 vane. Therefore this borescope procedure cannot be accomplished on A1 engines, ESN V0267 and up, or engines that have incorporated Service Bulletin V2500-ENG-72-0122.

(3) Objective: This document provides a borescope procedure to inspect the OD surface of the HPT stage 2 air seal for contact (an indication that the seal is cracked).

(4) Substantiation: Inspection and identification of contact on the OD of the HPT stage 2 air seal has been successfully demonstrated on a service engine.

(5) Effects of Bulletin on:

Removal/Installation: None.

Disassembly/Assembly: None.

Cleaning: None.

Inspection/Check: None.

Repair: None.

Testing: None.

(6) Supplemental Information

None.

D. Description

Provide a Borescope Inspection procedure to inspect the OD surface of the HPT stage 2 air seal for contact (an indication that the seal is cracked at the front fillet radius).

E. Compliance

R Category TD (Technical Data)

R Accomplish only when directed by an IAE Representative.

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

(a) To gain access

45 Minutes

(b) To incorporate NMSB

1 Hour 10 Minutes

(c) To return Engine to Flyable status

45 Minutes

(2) Total Necessary Man-hours

2 Hours 40 Minutes

(3) At Overhaul

Not Applicable.

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. V2500 All Operators Wire 1069 (HPT2 Airseal Cracking).

2. IAE V2500 Service Bulletin V2500-ENG-72-0122 (Engine - HP Turbine Rotor And Stator Assembly - Provide New Stage 2 HPT Vane Assemblies, Stage 2 Air Sealing Ring Segment Assemblies, And Stage 2 HPT Seals).

R 3. IAE V2500 Service Bulletin V2500-ENG-72-0500 for Model A1/A5 (Non-Modification
R Service Bulletin - N2 Vibration Monitoring For The High Pressure Turbine (HPT)
R Stage 2 Air Seal).

R 4. IAE V2500 Service Bulletin V2500-ENG-72-0501 for Model D5 (Non-Modification
R Service Bulletin - N2 Vibration Monitoring for the High Pressure Turbine (HPT)
R Stage 2 Air Seal).

5. 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 72-20-00.

6. V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-20-00.

7. V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-20-00.

R 8. Internal Reference No. - 04VC279A and 04VC279B.

9. ATA Locator - 72-20-00.

L. Other Publications Affected

R None.

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. Material - Price and Availability

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

B. Industry Support Program

Not Applicable.

C. The material data that follows is for each engine.

This Service Bulletin is for inspection only.

D. Instructions/Disposition Code Statements:

Parts Modification Conditions

Not applicable.

Spare Parts Availability

Not applicable.

Cleaning, Inspection and Repair Information

Not applicable.

E. Tooling - Price and Availability

The following special tools are required to accomplish this Service Bulletin.

(1) Kit IAE 2P16534 or locally obtained as follows:

(a) 1.5 mm Borescope (Machida Part Number FBA-1.5Q-100).

(b) Guide Tube Part Number IAE2P16530. Local Manufactured -- Nylon Guide Tube 5/32 Outside Diameter with an ID to accommodate a .060 (1.524 mm) Borescope - Granger item 4HM11 or equivelant.

(i) Required tube length is 12.0 (304.800 mm) .

(1) Modify tube as follows:

A Cut scallop as indicated in Figure 2; approximately a 15 degree cut.

(c) Light source - (Machida Part Number RH-24N)

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F. Reidentified Parts

Not Applicable.

G. Other Material Information Data

Consumable Material.

(1) VO2-126 (Corrosion Resistant Steel Lockwire).

Expendable Parts.

(1) PN 2A147O C Seal QTY 1

(2) PN 2AO696 C Seal QTY 1

3. Accomplishment Instructions

NOTE: Service bulletin incorporation on engines installed on aircraft is desirable.

(1) Job set-up procedure

(a) Safety Precautions

(i) On the center pedestal, on the ENG panel 115VU put a No specific warning notice to tell persons not to start the engine as soon as possible after engine shutdown.

(ii) On the overhead maintenance panel 5OVU make sure that the ON legend of the ENG/FADEC GND PWR pushbutton switch is off for engine 1 and 2.

(1) Put a No specific warning notice to tell persons not to energize the FADEC for engine 1 and 2.

(b) Open the fan cowls (Ref. AMM TASK 71-13-OO-O1O-O1O).

(c) Deactivate the thrust reverser.

WARNING: REMOVE ALL PERSONS FROM THE AREA AROUND THE THRUST REVERSER BEFORE YOU DO A POWER EXTENSION OR RETRACTION OF THE TRANSLATING SLEEVES. THE TRANSLATING SLEEVES EXTEND AND RETRACT IN 4.5 SECONDS OR LESS AND CAN CAUSE INJURY AND DAMAGE.

(i) Deactivate the thrust reverser hydraulic control unit (HCU) (Ref. AMM TASK 78-3O-OO-O4O-O12).

(d) Open the thrust reverser halves (Ref. TASK 78-32-OO-O1O-O1O).

(e) Install the foot operated motor drive unit to the gearbox crank pad (Ref. AMM Fig. 654/TASK 72-00-00-991-235) (Ref. AMM TASK 72-00-00-480-010).

NOTE: With this unit the rotor can be turned 360 degrees to permit complete inspection.

(2) Inspection Procedure.

(a) General

CAUTION: THE ENGINE IS HOT IMMEDIATELY AFTER SHUTDOWN AND CAN CAUSE BURNS AND DAMAGE TO THE BORESCOPE EQUIPMENT. WAIT 2-3 HOURS AFTER SHUT DOWN BEFORE YOU DO A BORESCOPE INSPECTION.

(b) Remove Right Hand Upper TCA tube per A321 AMM 75-23-49.

NOTE: When the inserts screw threaded (EIPC 72-41-23 Fig. 02 Item 433, P/N: AS52762) were off from the HP Compressor Rear Case, repair per A321 AMM 70-35-26.

(c) Visual Borescope Inspection

(i) Insert the guide tube into the forward cooling passage in the HPT 2nd Nozzle Guide Vane at the exposed port until it stops. Orientate the handle notch of the guide tube towards the front of the engine. If using a locally fabricated tube orientate the opening of the scallop towards the front of the engine.

(ii) Insert the borescope into the guide tube while viewing through the eye piece or monitor.

(iii) When the tip of the borescope reaches the end of the guide tube it should enter the cavity between the 2nd Nozzle Guide Vane (NVG) platform and the HPT Stage 2 Airseal.

(iv) Push the borescope into the cavity until the tip section is clear of the exit port of the NGV (approximately 1 inch). This will ensure that no damage will occur to the borescope articulating cables while articulating the tip.

(v) Articulate the borescope to view the honeycomb seal under the 2nd NGV.

(vi) Push the borescope in approximately 8 to 10 inches until the upper honeycomb seal is in close view.

NOTE: It is possible to view both upper and lower honneycomb seals. The upper honneycomb is the seal to view.

(vii) Articulate the borescope to view the gap between the Stage 1 Rear Air Seal and the outer flange outside diameter of the Stage 2 turbine airseal (hammer head).

NOTE: The Stage 1Rear Air Seal is comprised of 64 segments. When viewing you will see a gap between each segment.

(viii) Rotate the gearbox slowly. Ensure that the rotor is turning toward the borescope.

(ix) Inspect the surface of the outer flange outside diameter of the Stage 2 turbine airseal (hammer head) for indications of fretting. Fretting will appear as dark irregular linear patches at various places along this surface.

R (x) Inspect HPT Stage 2 Airseal the described in Figure 1. Turn 360
R degree. No fretting is permitted. Fretting would have an
R appearance of chafing or wear marks on the surface.

(3) Close - up

(a) Remove the foot operated motor drive unit from the gearbox crank pad (Ref. AMM TASK 72-00-00-080-010).

(b) Close Access

(i) Install any tubes that were removed per the AMM.

(ii) Make sure that the work area is clean and clear of tool(s) and other items.

(iii) Close the thrust reverser halves (Ref. AMM TASK 78-32-00-410-010).

(c) Activate the thrust reverser HCU (Ref. AMM TASK 78-30-00-440-012).

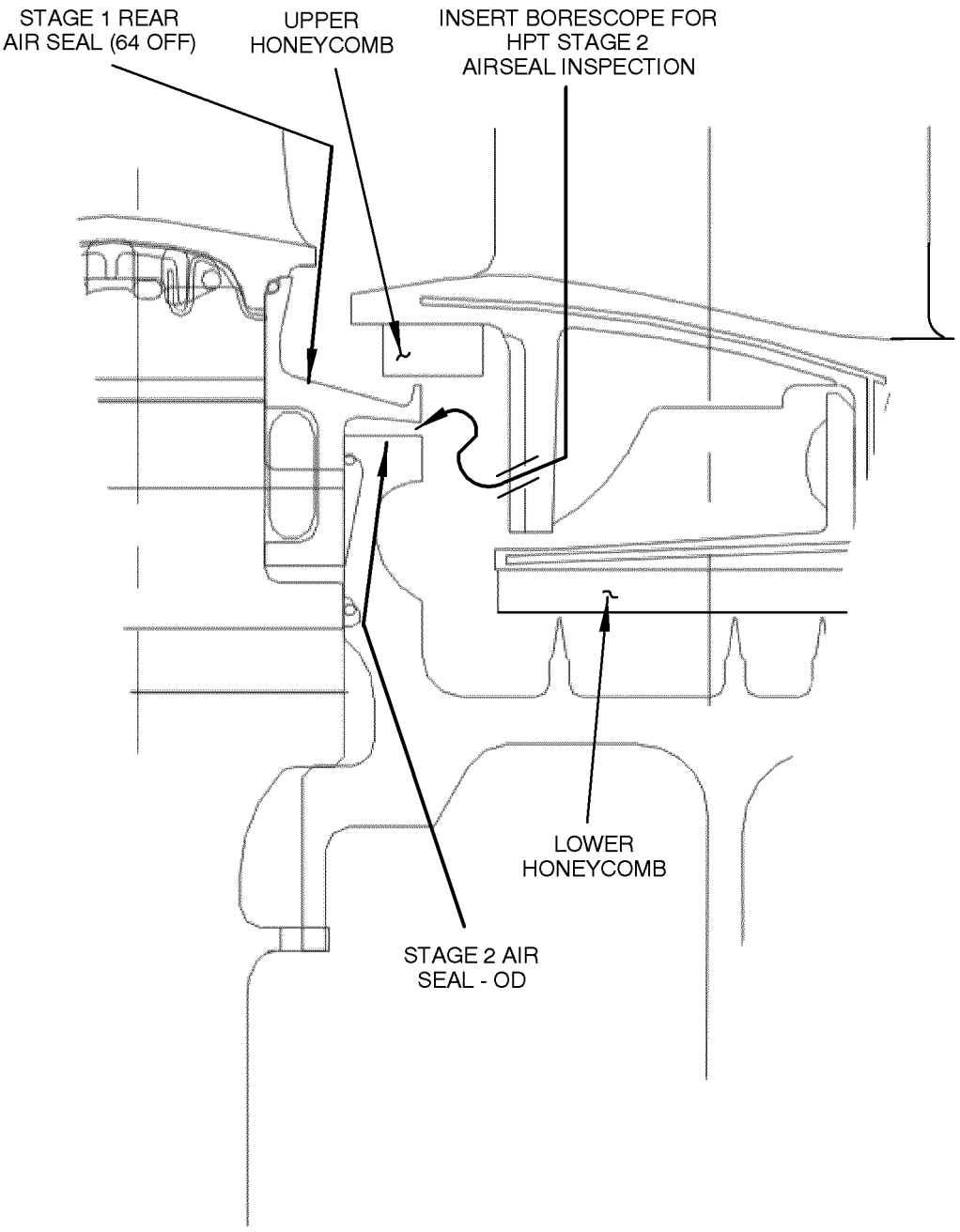
(d) Close Access

(i) Close the fan cowls (Ref. AMM TASK 71-13-00-410-010).

(ii) Remove the warning notice(s).

(4) Recording Instructions

(a) A record of accomplishment is required.



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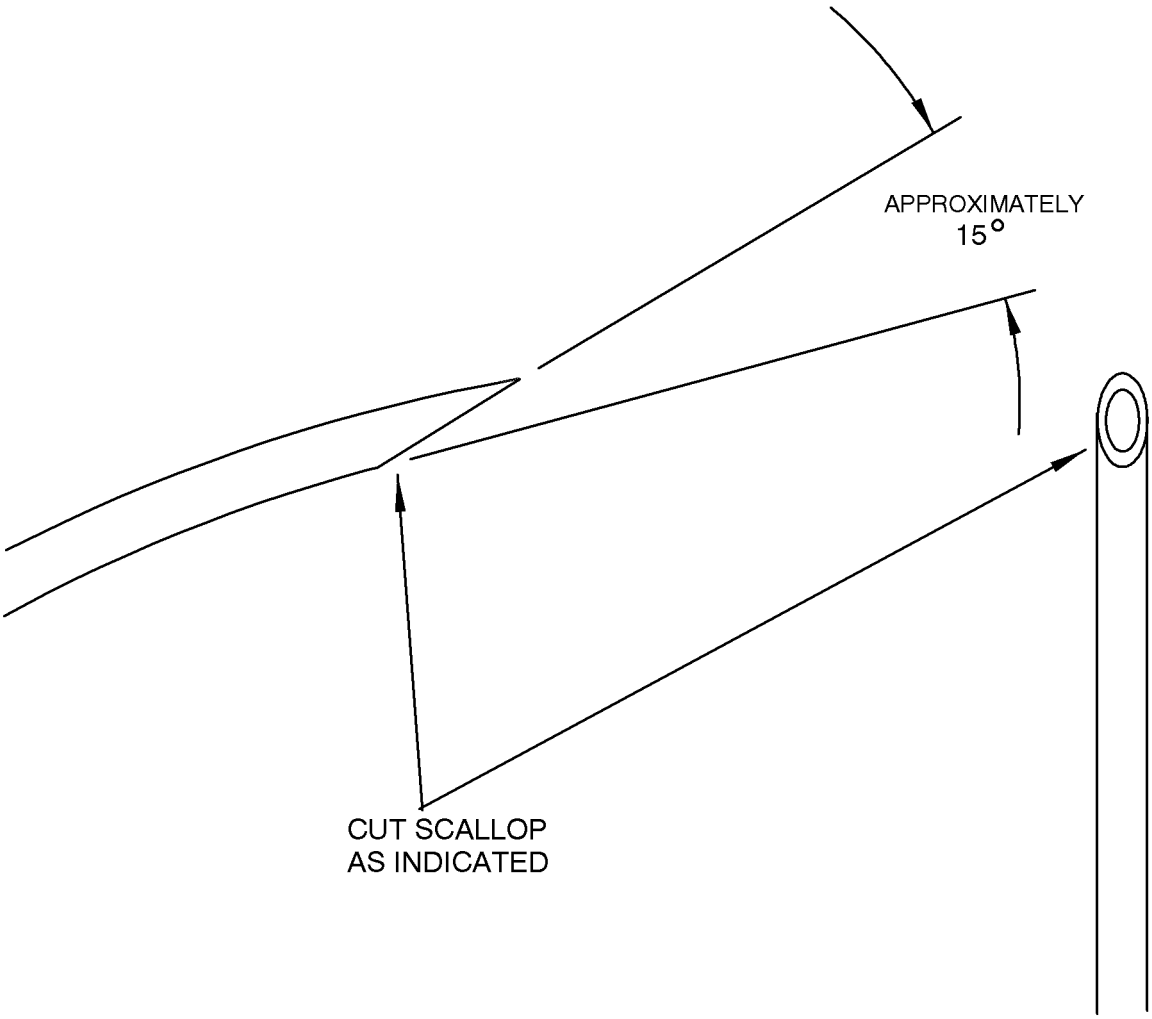
HIGH PRESSURE TURBINE STAGE 2 SEAL INSPECTION AREA
Figure 1



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GUIDE TUBE MODIFICATION
Figure 2

International Aero Engines

SERVICE BULLETIN

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

Supplement

Printed in Great Britain

V2500 All

1. Modification Kit

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

2. Material Cost

Not applicable.