

ENGINE - HP TURBINE ROTOR AND STATOR ASSEMBLY - INTRODUCE A NEW FIRST STAGE TURBINE AIR SEAL - CATEGORY CODE 6 - MOD.ENG-72-0180

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1. Planning Information

A. Effectivity

- (1) Aircraft: Airbus A320, A321
McDonnell Douglas MD-90
- (2) Engine: V2500-A5 Engines before Serial No. V10046*
V2500-D5 Engines before Serial No. V20007*

The serial Number data shown is of a preliminary nature and is provided for advanced planning only. A future revision to this Service Bulletin will confirm final serial number effectivity.

B. Reason

(1) Condition

It is possible that unwanted oil can collect in the area between the Stage 1 HPT Air Seal and the Stage 1 HOT Turbine Hub.

(2) Background

It was found that the unwanted oil will not drain from the area unless there was a modification to the Stage 1 HPT Air Seal.

(3) Objective

To provide a Stage 1 HPT Air Seal with features that let the unwanted oil drain more quickly. These features include: Removal of the front knife-edge, additional drain holes, an elongated cooling air hole and a damper groove with a decreased wall height.

(4) Substantiation

Analysis of a structural durability, performance, and part life verify configuration design integrity.

(5) Effects of Bulletin on Workshop Procedures:

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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.

C. Description

- (1) Improve the features of the Stage 1 HPT Air Seal so that more of the unwanted oil will drain from the area between the air seal and the Stage 1 Hub.
- (2) For the effect on declared lift, see the Engine Manual, 5-10-01, Group A Parts Lives.

D. Approval

The Part Number Changes and/or part modifications described in Section 2 and 3 of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the Engine Models listed.

E. Compliance

Category Code 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.

F. Manpower

Estimated Manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
(1) In service	Not applicable
(2) At overhaul	Not applicable

G. Material - Price and Availability

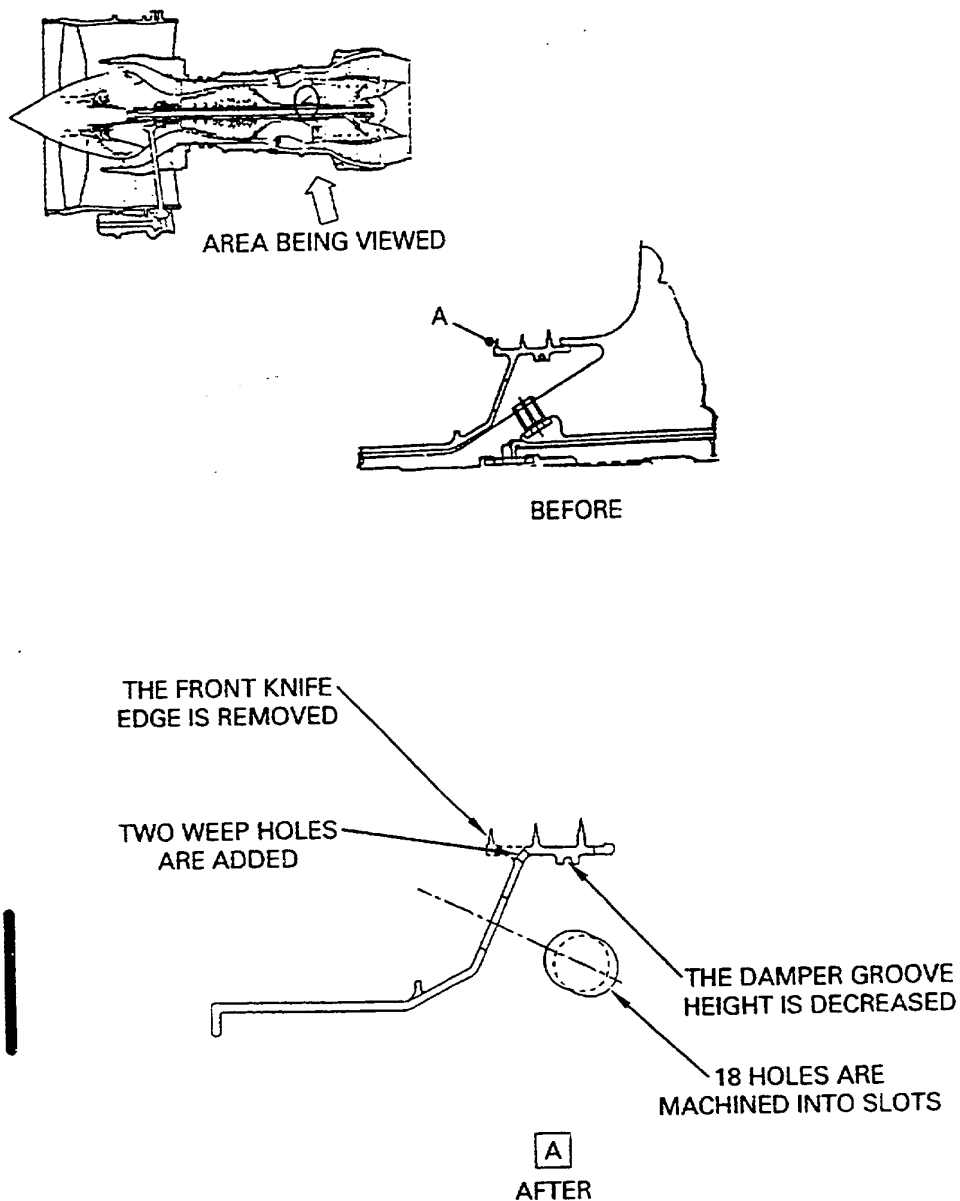
- (1) Modification Kit not required.



- (2) See "Material Information" section for prices and availability of future spares.

H. Tooling - Price and Availability

Special tools are not required to accomplish Sub-division 2 of this Service Bulletin.



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Before and After view of configuration changes that affect the High Pressure Turbine Rotor and Stator Assembly
Fig.1

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**SERVICE BULLETIN****I. Weight and Balance**

- | | | | | |
|-------------------|----|----|----|---|
| (1) Weight change | .. | .. | .. | None |
| (2) Moment arm | .. | .. | .. | No effect |
| (3) Datum | .. | .. | .. | Engine front mount Centerline
(Powerplant station P.P.100) |

J. Electrical Load Data

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

K. Reference

- (1) Internal Reference No.

93VA093

93VA124C

- (2) Other References

V2500 Engine Illustrated Parts Catalogs (V2500-A5 and V2500-D5).

V2500 Engine Manual.

MD-90 Engine Manual.

V2500 Standard Practices Manual.

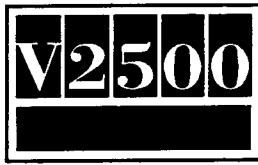
L. Other Publications Affected

- (1) The V2500-A5 Engine Illustrated Parts Catalog Chapter/Section 72-45-13, Figure 1, to add the new part.
- (2) The V2500-D5 Engine Illustrated Parts Catalog Chapter/Section 72-45-13, Figure 1, to add the new part.
- (3) The V2500 Engine Manual, Chapter/Section 5-10-01, Group A Parts Lives to add the new part.
- (4) The MD-90 Engine Manual, Chapter/Section 5-10-01, Group A Parts Lives to add the new part.
- (5) The V2500-A5 Engine Manual Chapter/Section 72-45-13, Cleaning, to add the new part.
- (6) The MD-90 Engine Manual Chapter/Section 72-45-13, Cleaning, to add the new part.

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- (7) The V2500-A5 Engine Manual Chapter/Section 72-45-13, Inspection, to add the new part.
- (8) The MD-90 Engine Manual Chapter/Section 72-45-13, Inspection to add the new part.
- (9) The V2500-A5 Engine Manual Chapter/Section 72-45-13, Repair, to add the new part.
- (10) The MD-90 Engine Manual Chapter/Section 72-45-13, Repair, to add the new part.



2. Accomplishment Instructions

- A. The Source Demonstration requirements of this work mean that any facility not authorized to accomplish the rework either utilize the Authorized Repair Vendors listed below or contact IAE Manager Maintenance Operations to determine if a qualification program can be initiated at their facility.

IAE - INTERNATIONAL AERO ENGINES AG
400 Main Street M/S 121-10
East Hartford, CT 06108 USA

- B. Authorized Rework Vendors for the bulletin are listed below:

Beacon Industries INC.
85 Grandby St.
Bloomfield CT 06002

- C. The designation by IAE if an authorized rework vendor indicates that the vendor has demonstrated the necessary capability to enable it to carry out the listed rework. However, IAE makes no warranties of representations concerning the qualifications or quality standards of the vendors to carry out the rework, and accepts no responsibility whatsoever for any work that may be carried out by a rework vendor, other than when IAE is listed as the vendor. Authorized rework vendors do not act as agents or representatives of IAE.

D. Rework Instructions

- (1) Do a modification to the 2A1352 Stage 1 HPT Air Seal (See Reference (1), Chapter/Section 72-45-13, Figure/Item No. 01-200) and identify as follows:

Procedure	Supplementary Information
(a) Set-up and machine to the dimensions specified and as follows:	Refer to Figures 1 and 2.
1 Machine to remove the front knife edge seal.	
2 Machine two holes at the locations and to the dimensions specified.	
3 Machine 18 slots E at the hole locations specified.	
4 Machine the damper groove height to the dimensions specified.	
(b) Do a check of the static unbalance at 900 RPM with the part held on	Refer to Figure 2.

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- (c) Mark the new number adjacent to the old part number. Use the vibration peen method.

Old Part No.	New Part No.
2A1352	2A3032

See Reference (2),
Control No./TASK No.
70-09-00-400-501.
Refer to Figure 3.

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B. Inspection Instructions

- (1) Inspect the HPT Module by the interface inspections specified in References (2) or (3), Chapter/Section 72-00-45, Inspection/Check.
 - (a) If the module is not in the limits, follow the instructions given in Reference (2) or (3) for further disassembly and inspection requirements.
 - (b) If the module is in the limits proceed to paragraph C.

C. Disassembly Instructions

- (1) When you remove the Stage 1 HPT Air Seal by the procedure given in Chapter/Section 72-45-10 Disassembly proceed as follows:

NOTE: The HPT module is front up in the IAE 1P16028 Build Stand.

- (a) Make a mark to keep the location of the Stage 1 HPT Air Seal for subsequent reference.
- (b) Remove the Stage 1 HPT Air Seal with the IAE 1P17027 Puller.

D. Assembly Instructions

- (1) Install the 2A3032 Stage 1 HPT Air Seal (1 off) by the approved procedure given in References (2) or (3), Chapter/Section 72-45-10 Assembly. See Figure 2.

WARNING: DRY ICE CAN FREEZE ON CONTACT. YOU MUST PROTECT YOUR SKIN FROM THE DRY ICE.

- (a) Cool the Stage 1 HPT Air Seal in dry ice before you install it.
 - (b) Use the IAE 1P16029 Drift to install the Air Seal.
 - (c) Install the new Air Seal with the balance mark at the same location as the removed Stage 1 HPT Air Seal.
- (2) Identify the new rotor assembly as 2A8721 by the procedure specified in Reference (4), Chapter/Section 70-09-00, Marking of Parts.

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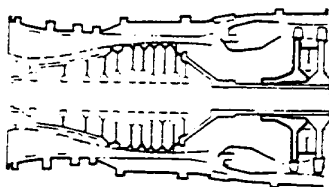


(a) Mark the new part number adjacent to the old part number.

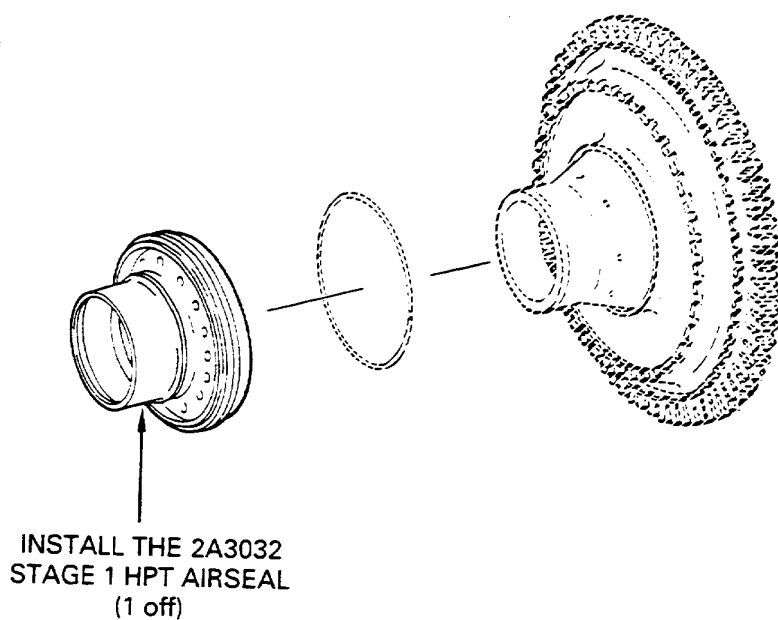
(b) Use the vibration peen method.

E. Recording Instructions

(1) A record of accomplishment is necessary.



MODULE 40



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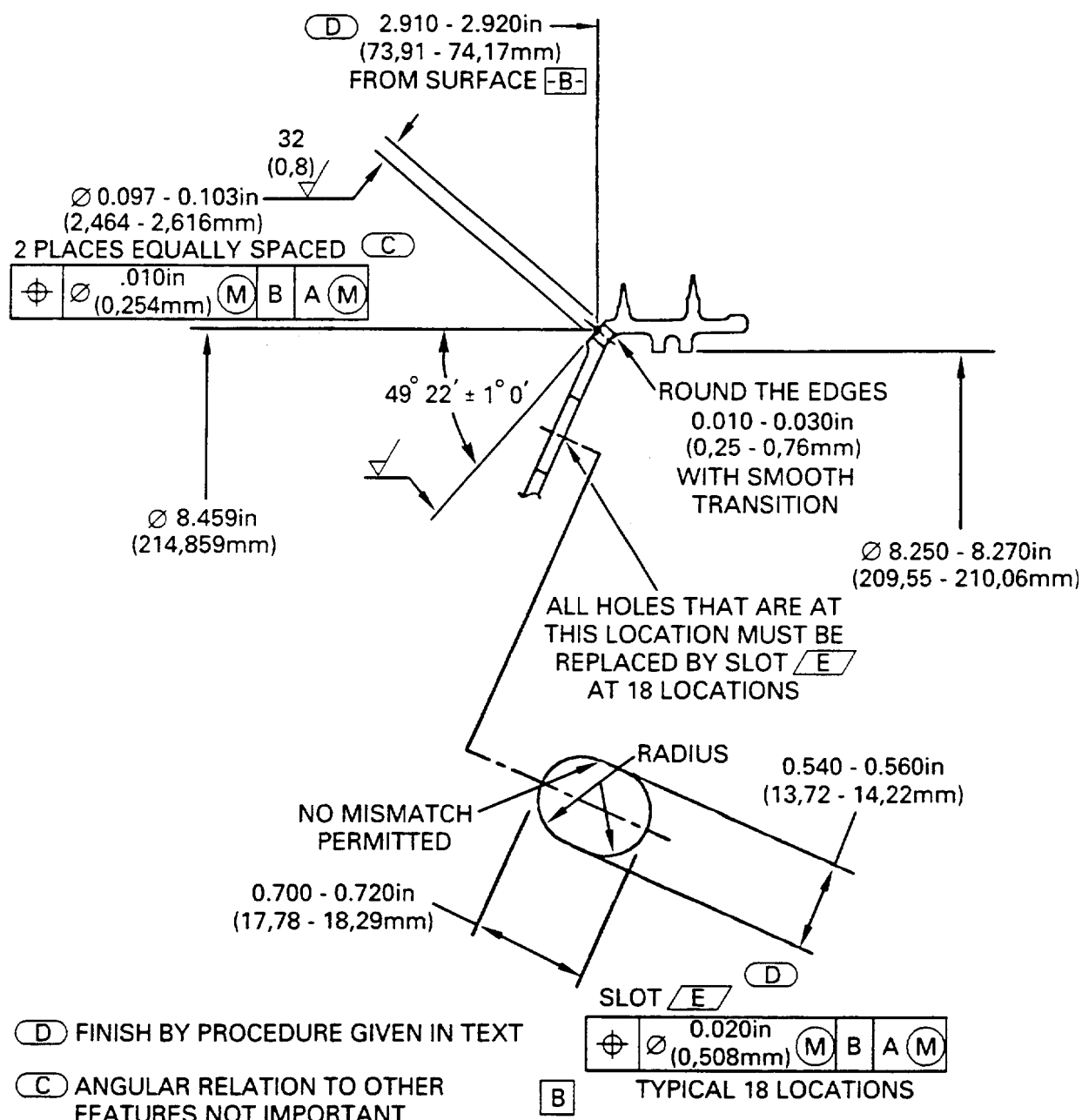
Location of the Stage 1 HPT Air Seal
Fig.2

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UNLESS DIFFERENTLY SPECIFIED ALL MACHINED
SURFACES ARE 90° SEE TEXT
(2,25)°

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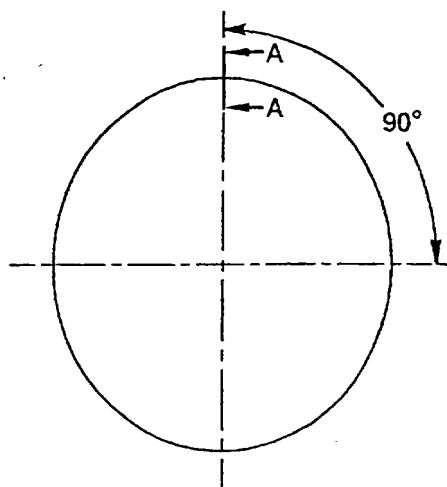
Modification of the Stage 1 HPT Air Seal
Fig.3 (Sheet 1)

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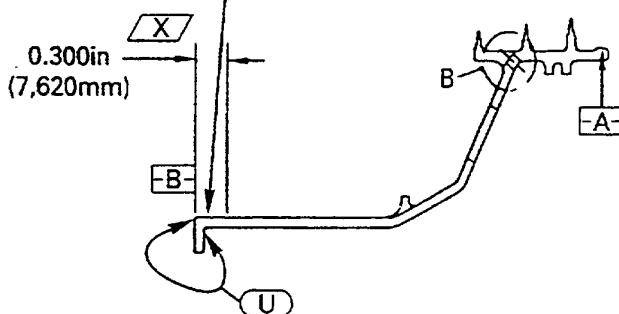


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DO A CHECK OF THE BALANCE
AT 900 RPM. MAKE A MARK
AT THE POINT OF MOST
UNBALANCE (Heavy side) WITH THE
SYMBOL Δ IN DISTANCE Δ X
MAKE A RECORD OF THE AMOUNT
OF UNBALANCE IN OZ - IN (gmm)
ADJACENT TO THE SYMBOL Δ



SCHEMATIC VIEW
REAR VIEW WHEN YOU LOOK FORWARD



SECTION A - A

(U) ELECTRICAL CONTACT IS PERMITTED
ONLY IN THIS AREA NO BURNS PITS
OR SELECTIVE ATTACK PERMITTED

Δ MAKE A MARK TO SHOW THE PART NUMBER
SEE TEXT

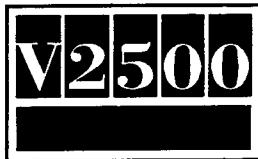
UNLESS DIFFERENTLY SPECIFIED ALL MACHINED SURFACES ARE $\sqrt{2,25}$
SEE TEXT

90

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Modification of the Stage 1 HPT Air Seal
Fig.3 (Sheet 2)

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3. Material Information

Applicability: For each V2500-A5 and V2500-D5 Engine to incorporate this Bulletin.

A. Kits associated with this Bulletin:

None.

B. Parts affected by this Bulletin.

New Part No. (ATA No.)	Qty	Est'd Unit Price (\$)	Keyword	Old Part No. (IPC No.)	Instructions Disposition
2A8721 (72-45-10)	1	-	Turbine Rotor Assembly, Stage 1	2A8421 (01-010)	(S1) (A) (B)
2A3032 (72-45-13)	1	-	Seal Air Stage 1 HPT	2A1352 (01-020)	(S1) (1D) (B) (C)

C. Instruction/Disposition Code Statements:

- (S1) The old part and the new part are directly interchangeable.
- (1D) You can do a modification to the old part and identify it as the new part number. Part life is limited to 8000 cycles if this Service Bulletin is not done before 5500 cycles. Part life is 15000 cycles if this Service Bulletin is done before 5500 cycles.
- (A) The new part is supplied on a quotation basis only.
- (B) The old part will no longer be supplied.
- (C) The new part is currently available.

NOTE: The estimated 1994 unit prices shown are provided for planning purposes only and do not constitute a firm quotation. Consult the IAE Price Catalog or contact IAE's Spare Parts Sales Department for information concerning firm prices.

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