

International Aero Engines

RR-DERBY

400 MAIN STREET, MAIL STOP 121-10  
EAST HARTFORD, CT 06108, USA.  
TELEPHONE: 860 565 5515  
FAX: 860 565 0600

P.O. BOX 31, DERBY  
TELEGRAMS - 'ROYCAR' DERBY  
TELEX - 37645  
TELEPHONE - DERBY 242424

DATE ~~R~~ Oct.31/02

## V2500-A1 SERIES PROPULSION SYSTEMS SERVICE BULLETIN

Printed in Great Britain

This document transmits Revision 4 to Service Bulletin EV2500-72-0351

Document History

## Service Bulletin Revision Status

Initial Issue	May 31/99
Revision 1	Aug.2/99
Revision 2	Oct.8/99
Revision 3	Mar.14/01

## Supplement Revision Status

Bulletin Revision 4

Remove	Incorporate	Reason for change
Pages 1 to 14 of the	Pages 1 to 15 of the	To change Category Code
Service Bulletin	Service Bulletin	from 4 to 3

# V2500-ENG-72-0351

Transmittal - Page 1 of 2

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED

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

© Rolls-Royce plc (date as above) Printed in Great Britain

# LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 4 are as follows:

<u>Page</u>		<u>Revision Number</u>	<u>Revision Date</u>
	Bulletin		
R	1	4	Oct.31/02
R	2	4	Oct.31/02
R	3	4	Oct.31/02
R	4	4	Oct.31/02
R	5	4	Oct.31/02
R	6	4	Oct.31/02
R	7	4	Oct.31/02
R	8	4	Oct.31/02
R	9	4	Oct.31/02
R	10	4	Oct.31/02
R	11	4	Oct.31/02
R	12	4	Oct.31/02
R	13	4	Oct.31/02
R	14	4	Oct.31/02
R	15	4	Oct.31/02

Printed in Great Britain



ENGINE - HP TURBINE ROTOR AND STATOR ASSEMBLY - INTRODUCE A NEW FIRST STAGE TURBINE  
AIR SEAL

1. Planning Information

A. Effectivity

(1) Airbus A320

V2500-A1 Engines prior to Serial No.V0362

B. Concurrent Requirements

None.

C. Reason

(1) Condition:

Under certain engine windmill operating conditions, engine oil can flood the No.4 bearing compartment, leak out and accumulate in the area of the HPT Stage 1 inner rotating air seal. Subsequent engine operation can ignite the accumulated oil and result in heat distress to the surrounding hardware.

(2) Background:

The No.4 bearing compartment has reduced scavenging capability during engine windmilling operation. Under certain windmilling conditions, engine oil can flood and leak from the No.4 bearing compartment and accumulate in the area of the HPT Stage 1 inner rotating air seal.

(3) Objective:

Modify the HPT Stage 1 inner rotating air seal by providing a drain capacity that will allow any accumulated engine oil to drain away from the HPT area, eliminating the possibility of oil ignition and associated hardware distress.

(4) Substantiation:

R Development testing on X802-8E and No.4 bearing compartment rig analysis proved successful.

(5) Effects of Bulletin on Workshop Procedures:

Removal/Installation	Not affected
----------------------	--------------

Disassembly/Assembly	Not affected
----------------------	--------------

May 31/99

R Oct.31/02

V2500-ENG-72-0351

Page 1 of 15



Cleaning	Not affected
Inspection/Check	Not affected
Repair	Not affected
Testing	Not affected

(6) Supplemental Information

It is permissible to install the seal in the HPT module without disassembling the module or rebalancing the first stage rotor assembly provided interface inspection requirements are met.

D. Description

- (1) Improve the features of the air seal so that more of the unwanted oil will drain from the area between the air seal and Stage 1 Hub. See Figure 1.
- (2) For the effect on declared life, the Time Limits Manual, 5-10-01, Group A Parts Lives will be updated to include the following:

PART NUMBER	2A0884-001	SBE 72-0351
	and	
	2A3109	SBE 72-0351

Approved Life (Flight Cycles)	15,000
Bump usage cycles (up to 5 percent)	0 to 750
Certified Life up to 5 percent Bump usage	15,000
Bump usage cycles (up to 15 percent)	751 to 2250
Certified Life up to 15 percent Bump usage	12,000
Bump usage cycles (up to 30 percent)	2251 to 4500
Certified Life up to 30 percent Bump usage	10,000
Bump usage cycles (up to 100 percent)	4501 to 8000
Certified Life up to 100 percent Bump usage	8,000

NOTE: The Time Limits Manual 5-10-01 is scheduled to incorporate the Part Service Life Limits related to this Service Bulletin and will take precedence over the Service Bulletin.

E. 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 Model listed.

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

F. Compliance

- R Category Code 3  
R Accomplish by July 2003.

G. Manpower

Estimated manhours to incorporate the full intent of this Bulletin:

## (1) In Service

Not applicable

## (2) At Overhaul

Not applicable

NOTE: The parts affected by this Service Bulletin are accessible at overhaul.

H. Material – Price and Availability

- (1) Modification kit is not required. Parts are supplied as single line items.  
(2) Refer to 2. Material Information for the prices and availability of future spares.

I. Tooling – Price and Availability

Special tools are not required.

J. Weight and Balance

## (1) Weight change

None

## (2) Moment Arm

No effect



(3) Datum

Engine front mount centerline (Power Plant Station (PPS) 100)

K. Electrical Load Data

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

L. References

(1) V2500-A1 Engine Illustrated Parts Catalog (S-V2500-1IA), Chapter/Section 72-45-13.

(2) V2500 Standard Practices/Processes Manual.

(3) V2500 Engine Manual.

(4) IAE V2500 Service Bulletin:

V2500-ENG-72-0190 - Engine - HP Turbine Rotor and Stator Assembly -  
Introduce a New Stage 1 Air Seal and a New No.4 Bearing Rear Cooling Duct  
Assembly.

R (5) Internal Reference Nos - 93VA124D, 93VA124D-01, 93VA124N, 93VA124O,  
R 93VA124P.

R (6) ATA Locator - 72-00-00.

M. Other Publications Affected

(1) V2500 Engine Manual, Chapter/Section 5-10-01, Group A Parts Lives, to add  
new parts.

(2) V2500 Engine Manual, Chapter/Section 72-45-13, Cleaning, to add the new  
parts.

(3) V2500 Engine Manual, Chapter/Section 72-45-13, Inspection, to add the new  
parts.

(4) V2500 Engine Manual, Chapter/Section 72-45-13, Repair, to add the new  
parts.

R N. Interchangeability of Parts

R Old and new parts are directly interchangeable.



## 2. Material Information

### R A. Material Price and Availability

- R (1) Part prices were not available at the time of Service Bulletin  
R publication. Contact IAE's Spare Parts Sales Department for firm  
R quotations.
- R (2) There is no kit provided to do this Service Bulletin.
- R (3) Part availability information is provided in material data Instructions -  
R Disposition.

### R B. Industry Support Program

R Not applicable.

### R C. The Material Data that follows is for each engine:

Applicability: For each V2500-A1 Engine to incorporate this Bulletin:

R 72-45-10

	FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
R	01010	2A5201	1	Turbine Rotor, Assembly, Stage	2A8021	(1D)(A)
R				1		(I)
R	72-45-13					
R	01020	2A3109	1	.Seal Air, Stage 1 HPT	2A1203	(1D)(A)
R						(I)
				OR		
R	72-45-10					
R	01010	2A2121-001	1	Turbine Rotor, Assembly, Stage	2A2121	(1D)(A)
R				1		(I)
R	72-45-13					
R	01020	2A0884-001	1	.Seal Air, Stage 1 HPT	2A0884	(1D)(A)
R						(I)

### D. Instructions Disposition Code Statements:

#### R Parts Modification Conditions

(1D) You can obtain the new part by modification of the old part and  
identification to the new part number.

#### R Spare Parts Availability

(A) The old part will no longer be supplied.



**International Aero Engines**

**SERVICE BULLETIN**

R      Cleaning, Inspection and Repair Information

R      (I)    The cleaning, inspection and repair requirements are the same for the old  
R      and new part. The applicable engine manuals will be revised.

Printed in Great Britain

May 31/99  
R Oct.31/02

**V2500-ENG-72-0351**

Page 6

© Rolls-Royce plc

Not subject to the EAR per 15 C.F.R. Chapter 1, Part 734.3(b)(3).





### 3. Accomplishment Instructions

- A. The Source Demonstration requirements of this rework mean that any facility not authorized to accomplish the rework either utilize the authorized Rework Vendor(s) or contact IAE Technical Services to determine if a qualification program can be initiated at their facility.

NOTE: The Source Demonstration applies only to the modification of the 2A0884 and 2A1203 Stage 1 Air Seals.

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

Contact your local IAE representative for a list of authorized rework vendors. The list of authorized vendors is maintained by V2500 Technical Support, Hot Section.

- C. The designation by IAE of 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. Disassembly Instructions

- (1) When you remove the Stage 1 HPT Air Seal by the procedure given in Reference (3), 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 1P16027 Puller

#### E. Rework Instructions

Do a modification to the 2A0884 or 2A1203 Stage 1 HPT Air Seal (See Reference (1), Chapter/Section 72-45-13, Figure/Item No. 01-200) and identify as follows:

PROCEDURE	RELATED DATA
(1) Set up and machine to the dimensions specified	Refer to Figures 2 and 3.
(2) Machine to remove the front knife edge seal. Finish as specified	Refer to Figure 3. See Reference (2), Control No./Task No. 70-35-09-350-501.



- (3) Machine two holes at the locations given. Hold to the dimensions and finish as specified Refer to Figure 3. See Reference (2), Control No./Task No. 70-35-09-350-501.
- (4) Machine the damper groove to the dimension specified Refer to Figure 3, Sheet 2.
- (5) Machine to remove the debris discourager. Hold to the dimensions and finish as specified. (PN 2A1203 only) Refer to Figure 3, Sheet 3, View C. See Reference (2), Control No./Task No. 70-35-09-350-501.
- (6) Machine two weep scallops to the dimension specified Refer to Figure 3, Sheet 3, View D-D.
- (7) Fluorescent penetrant inspect by SPOP 82. No cracks are permitted Refer to the procedure given in Reference (2) Control No./Task No. 70-23-03-230-501 or Control No./Task No. 70-23-08-230-501.
- (8) Do a check of the static unbalance at 900 RPM with the part held on Refer to Figure 3.
- (9) Make a mark to show the location of the heavy point by the procedure specified. Use CoMat 06-072 Dye or the Vibration Peen method See Reference (2), Control No./Task No. 70-09-00-400-501
- (10) Mark the new part number adjacent to the old part number. Use the vibration peen method. Refer to Figure 3. See Reference (2), Control No./Task No. 70-09-00-400-501

Old Pt No.	New Pt No.
2A0884	2A0884-001
2A1203	2A3109

F. The following source has demonstrated the capability to perform the machining reoperation in this Service Bulletin:

MTU Maintenance GMBH  
Flughafen Hannover  
Munchener Strasse 31  
D-30855 Langenhagen  
Germany

FAA Repair Station License CQ5Y788M

Cage Code: C7262

Pratt and Whitney Aftermarket Services  
400 Main Street, Well No. 14  
East Hartford Ct. 06108  
USA

Cage Code: 8N802

V2500-ENG-72-0351

Page 8

May 31/99  
R Oct.31/02

© Rolls-Royce plc

Not subject to the EAR per 15 C.F.R. Chapter 1, Part 734.3(b)(3).



#### G. Assembly Instructions

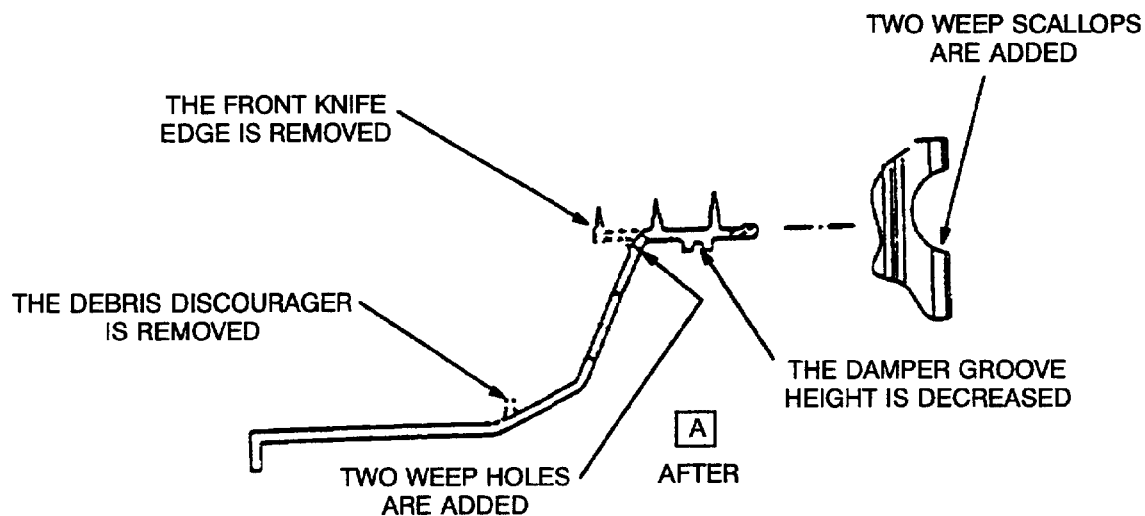
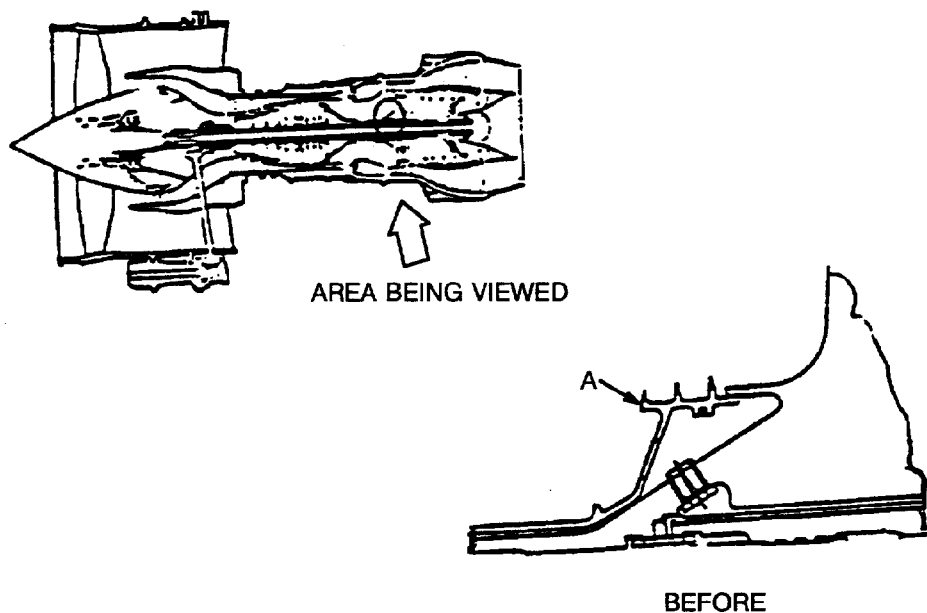
- (1) Install the 2A0884-001 or 2A3109 Stage 1 HPT Air Seal (1 off) by the approved procedure given in Reference (3), Chapter/Section 72-45-10 Assembly. See Figure 2.

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

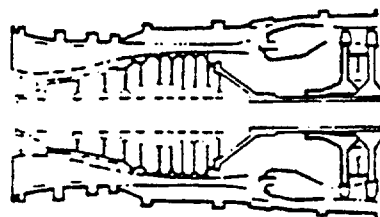
- (a) Cool the Stage 1 HPT Air Seal in dry ice before you install it.
  - (b) Use the IAE 1P16029 Drift to install the new Air Seal with the balance mark at the same location as the removed Stage 1 HPT Air Seal.
- (2) Identify the new rotor assembly as 2A2121-001 or 2A5201 by the procedure specified in Reference (2), Chapter/Section 70-09-00, Marking of Parts.
  - (a) Mark the new part number adjacent to the old part number.
  - (b) Use the vibration peen method.

#### H. Recording Instructions

- (1) A record of accomplishment is necessary.

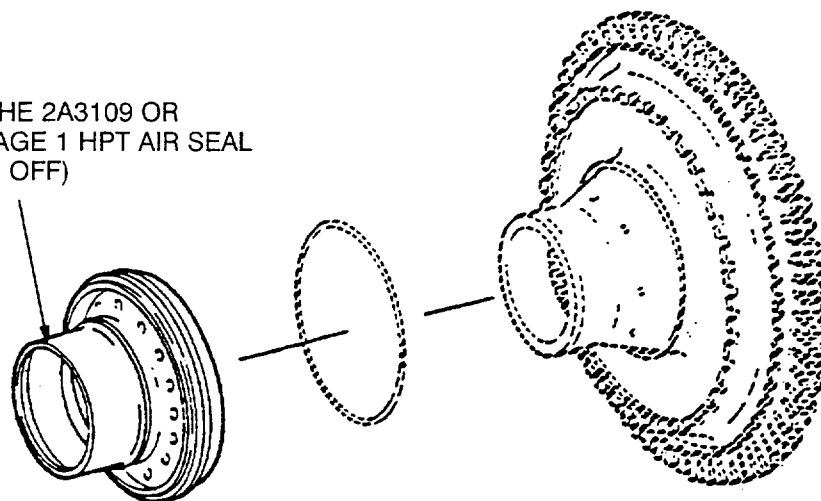


Before and After views of configuration changes that effect the High Pressure Turbine Rotor and Stator Assembly  
Figure 1



MODULE 40

INSTALL THE 2A3109 OR  
2A0884-001 STAGE 1 HPT AIR SEAL  
(1 OFF)

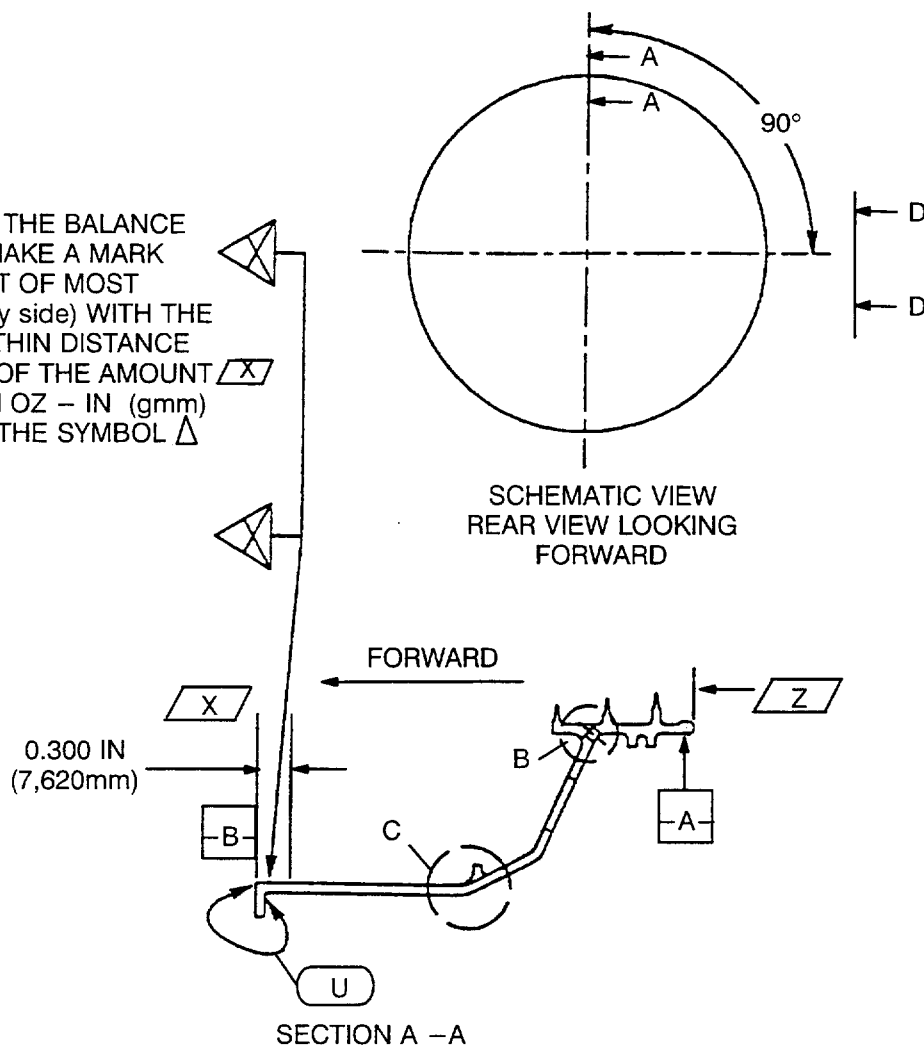


de000e8130

Location of the Stage 1 HPT Air Seal  
Figure 2



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



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

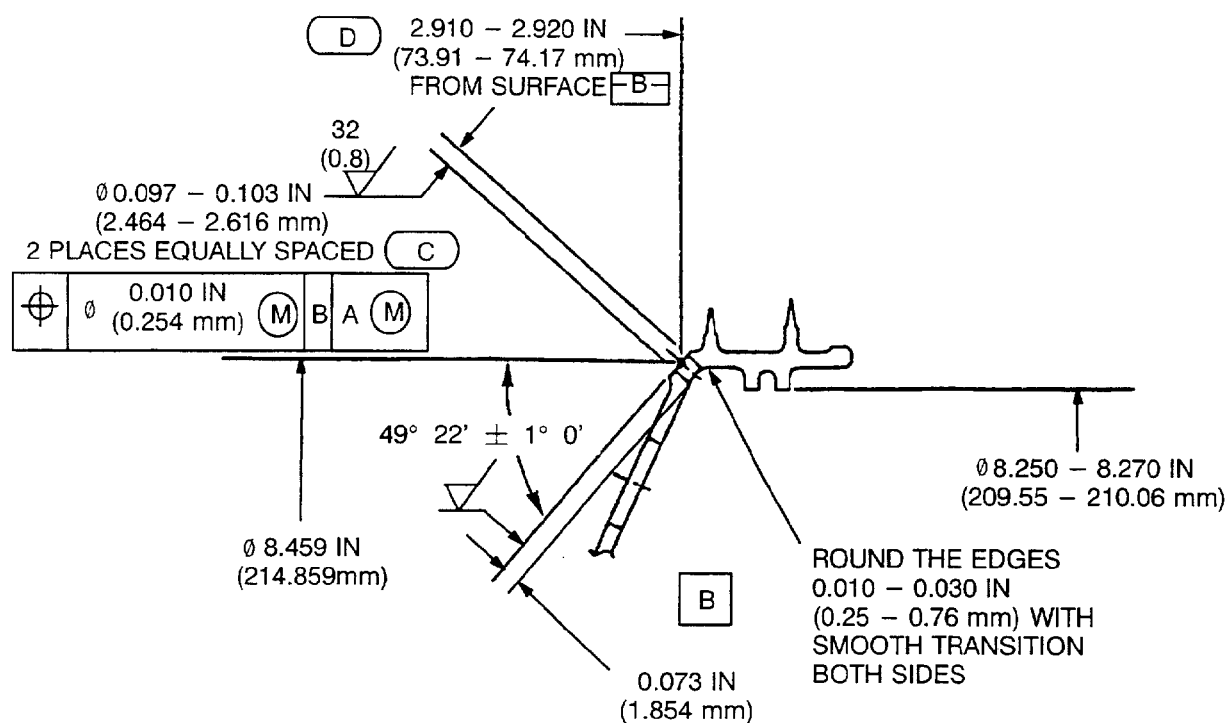
$\Delta$  MAKE A MARK TO SHOW THE PART NUMBER  
SEE TEXT

UNLESS DIFFERENTLY SPECIFIED ALL MACHINED SURFACES ARE  
SEE TEXT

90  
(2.25)✓

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

V2500-ENG-72-0351



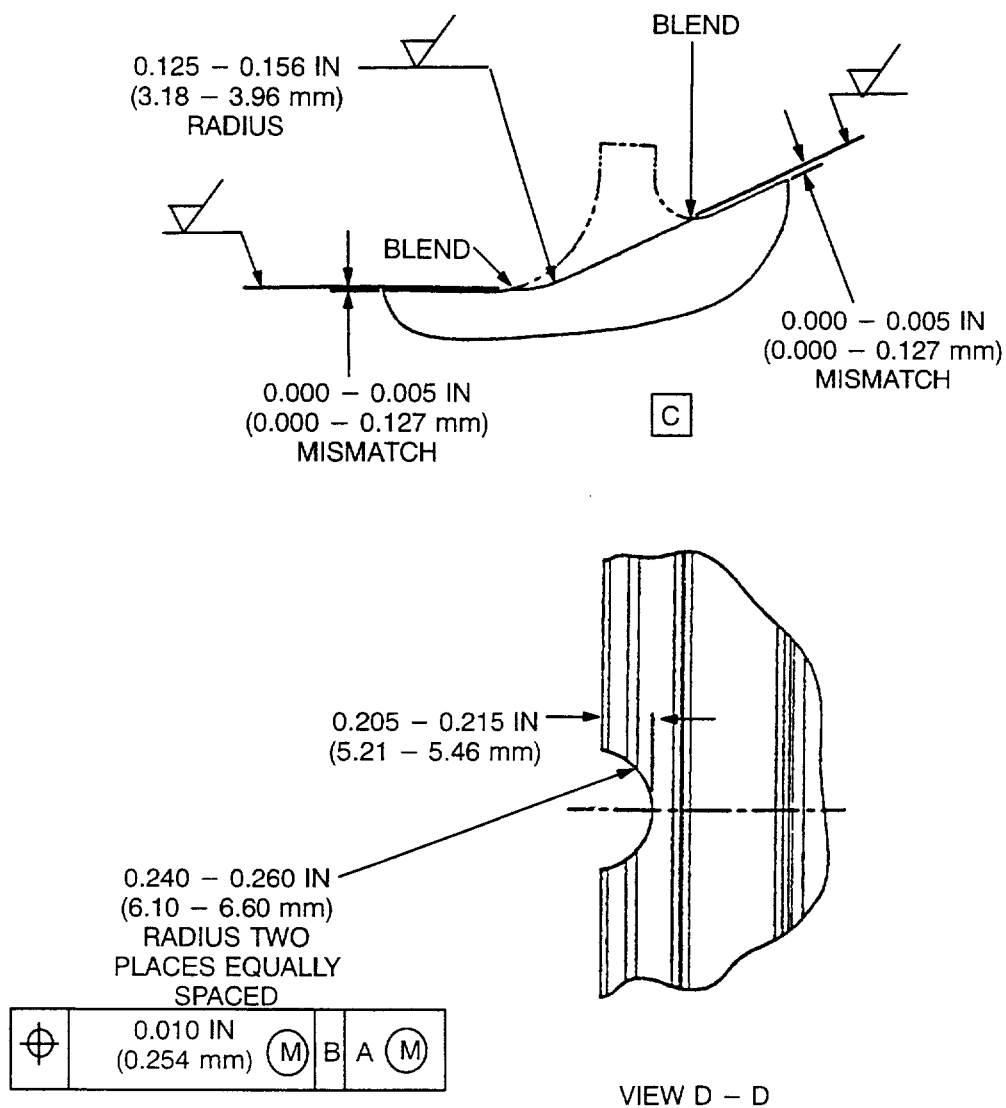
D FINISH BY PROCEDURE GIVEN IN TEXT

C ANGULAR RELATION TO OTHER FEATURES  
NOT IMPORTANT

UNLESS DIFFERENTLY SPECIFIED ALL MACHINED SURFACES ARE  
SEE TEXT

90  
(2.25)

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



UNLESS DIFFERENTLY SPECIFIED ALL MACHINED SURFACES ARE  
SEE TEXT

90  
(2.25)✓

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

**V2500-ENG-72-0351**

May 31/99  
R Oct.31/02

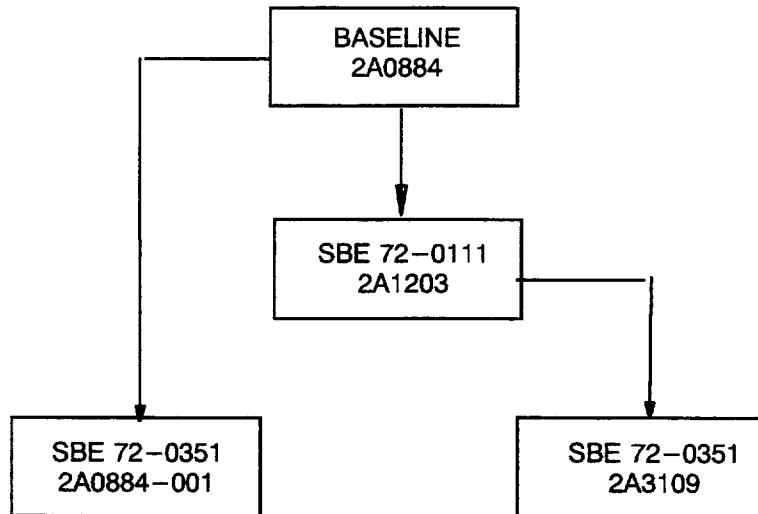
© Rolls-Royce plc

Page 14

Not subject to the EAR per 15 C.F.R. Chapter 1, Part 734.3(b)(3).

de000e8133a





de000e8134

Family Tree - Ref. Catalog Sequence No. 72-45-13. Fig.01 Item 20  
Figure 4

