



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

DATE: Jul.19/04

P.O. BOX 31, DERBY  
TELEGRAMS - 'ROYCAR' DERBY  
TELEX - 37645  
TELEPHONE:- 44 (0) 1332 242424  
FAX:- 44 (0) 1332 249936

## V2500-D5 SERIES PROPULSION SYSTEM SERVICE BULLETIN

Printed in Great Britain

This document transmits Revision 1 to Service Bulletin EV2500-72-0464 and Revision 1 to the Supplement

### Document History

Service Bulletin Revision Status  
Initial Issue Dec.22/03

Supplement Revision Status  
Initial Issue Dec.22/03

### Bulletin Revision 1

Remove	Incorporate	Reason for change
	Page 1 and 2 of the	To revise Figure 2 and make
	Summary	corrections to Effectivity.
		Format to latest standards.
Pages 1 to 11 of the	Pages 1 to 11 and	To revise Figure 2 and make
Service Bulletin	13	corrections to Effectivity.
	to 17 of the	Format to latest standards.
	Service Bulletin	

### Supplement Revision 1

Remove	Incorporate	Reason for change
All pages	Page 1	To revise Figure 2 and make
		corrections to Effectivity.
		Format to latest standards.

# V2500-ENG-72-0464

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 1 to the Bulletin and Revision 1 to the Supplement are as follows:

<u>Page</u>	<u>Revision Number</u>	<u>Revision Date</u>
Summary		
R 1	1	Jul.19/04
R 2	1	Jul.19/04
Bulletin		
R 1	1	Jul.19/04
R 2	1	Jul.19/04
R 3	1	Jul.19/04
R 4	1	Jul.19/04
R 5	1	Jul.19/04
R 6	1	Jul.19/04
R 7	1	Jul.19/04
R 8	1	Jul.19/04
R 9	1	Jul.19/04
R 10	1	Jul.19/04
R 11	1	Jul.19/04
R 13	1	Jul.19/04
R 14	1	Jul.19/04
R 15	1	Jul.19/04
R 16	1	Jul.19/04
R 17	1	Jul.19/04
Supplement		
R 1	1	Jul.19/04

Printed in Great Britain

NEW FIRST STAGE BLADE OUTER AIR SEAL AND HPT VANE SUPPORT (CONTROLLED SERVICE USE)

# SUMMARY

R 1. PLANNING

R A. EFFECTIVITY

R Engine Serial No.

R V2525-D5, V2528-D5 V20129, V20130, V20150, V20151, V20154,  
R V20155, V20164, V20165, V20167 thru V20171,  
R V20174 thru V20176, V20180, V20181, V20184,  
R V20185, V20188 thru V20191, V20194 thru  
R V20201, V20206 thru V20208, V20211, V20212,  
R V20218, V20228, V20232, V20233, V20236 thru  
R V20239, V20242 thru V20246, V20248 thru  
R V20252, V20256, V20257, V20262 thru V20266,  
R V20270 thru V20276, V20278, V20280.

R

R B. CONCURRENT REQUIREMENTS

R None.

R C. REASON/PROBLEM

R Problem

R Field experience has shown that the 1st stage Outer Air Seal Segments have  
R experienced axial cracking and inward radial bowing of the segment.

R Background

R This condition could result in an interaction between the 1st Stage Blade Tip  
R and Outer Air Seal that may contribute to increased blade tip clearance and  
R reduced time on-wing. Desert operators have experienced sand plugging which  
R aggravates the distress.

R Substantiation

R The component was allocated additional turbine cooling air. The additional  
R cooling resulted in a reduced susceptibility of the component to axial cracking  
R and inward, radial bowing. The interim design ran successfully in x804-24. The  
R test parts showed that the durability enhancements reduced the axial cracking  
R and inward, radial bowing.

R

R

## R Objective

R Redesign the Blade Outer Air Seal (BOAS) to improve its durability for desert  
R operators by enhancing the cooling pattern of the component and increasing the  
R air allocation. This will help alleviate the seal distress and distortion. The  
R BOAS is redesigned with larger holes in both the new outer air seal and the new  
R impingement plate. This provides increased cooling to the component.  
R Furthermore, the larger cooling holes will mitigate the sand plugging  
R encountered by the desert operators.

R A new 1st Vane Support is opened to increase flow to the 1st Blade Outer Air  
R Seal.

## R D. DESCRIPTION

R Replace the 1st Stage Duct Segments and HPT Vane Support with new parts that  
R provide greater cooling.

## R E. COMPLIANCE

R Category Code 8

R Accomplish based upon experience with the prior configuration.

## R F. MANPOWER

R In service – Not applicable.

R At overhaul – Not applicable.

## R G. INTERCHANGEABILITY OF PARTS

R Old and new parts are directly interchangeable in complete sets.

R 2. MATERIAL INFORMATION

## R A. PARTS PRICES

R The estimated price of new material is \$102,790.00 to do this Service Bulletin  
R when the part modification procedure is used.

NEW FIRST STAGE BLADE OUTER AIR SEAL AND HPT VANE SUPPORT (CONTROLLED SERVICE USE)

1. Planning Information

A. Effectivity Data (For Boeing MD-90)

Engine Models Applicable

V2525-D5, V2528-D5 Engine Serial Nos. V20129, V20130, V20150, V20151, V20154, V20155, V20164, V20165, V20167 thru V20171, V20174 thru V20176, V20180, V20181, V20184, V20185, V20188 thru V20191, V20194 thru V20201, V20206 thru V20208, V20211, V20212, V20218, V20228, V20232, V20233, V20236 thru V20239, V20242 thru V20246, V20248 thru V20252, V20256, V20257, V20262 thru V20266, V20270 thru V20276, V20278, V20280.

B. Concurrent Requirements

There are no concurrent requirements.

C. Reason

- (1) Problem: Field experience has shown that the 1st stage Outer Air Seal Segments have experienced axial cracking and inward radial bowing of the segment.
- (2) Background: This condition could result in an interaction between the 1st Stage Blade Tip and Outer Air Seal that may contribute to increased blade tip clearance and reduced time on-wing. Desert operators have experienced sand plugging which aggravates the distress.
- (3) Objective: Redesign the Blade Outer Air Seal (BOAS) to improve its durability for desert operators by enhancing the cooling pattern of the component and increasing the air allocation. This will help alleviate the seal distress and distortion. The BOAS is redesigned with larger holes in both the new outer air seal and the new impingement plate. This provides increased cooling to the component. Furthermore, the larger cooling holes will mitigate the sand plugging encountered by the desert operators.  
  
A new 1st Vane Support is opened to increase flow to the 1st Blade Outer Air Seal.
- (4) Substantiation: The component was allocated additional turbine cooling air. The additional cooling resulted in a reduced susceptibility of the component to axial cracking and inward, radial bowing. The interim design ran successfully in x804-24. The test parts showed that the durability enhancements reduced the axial cracking and inward, radial bowing.

## (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.

D. Description

Replace the 1st Stage Duct Segments and HPT Vane Support with new parts that provide greater cooling.

E. Compliance

Category 8

Accomplish based upon experience with the prior configuration.

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

R Estimated man-hours to incorporate the full intent of this Bulletin:

R (1) In Service

R Not Applicable

R (2) At Overhaul

R Not Applicable

R H. Material – Price and Availability

R 1. The estimated price of new material is \$102,790.00 to do this Service  
R Bulletin when the part modification procedure is used.

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 I. Tooling – Price and Availability

R Special tools are not required to accomplish this Service Bulletin.

R J. Industry Support Program

R Not applicable.

K. Weight and Balance

R (1) Weight Change

R None

R (2) Moment

R No Effect

R (3) Datum

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

L. Electrical Load Data

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

M. Software Accomplishment Summary

Not Applicable.

N. References

1. IAE V2500 Service Bulletin V2500-ENG-72-0147 (Engine – HP Turbine Rotor And Stator Assembly – Provide New Stage 1 HPT Support Assembly And A New Stage 1 HPT Vane Assembly).
2. IAE V2500 Service Bulletin V2500-ENG-72-0237 (Engine – HP Turbine Rotor And Stator Assembly – Provide New Stage 2 HPT Vanes).

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-72-0310 (Engine - High Pressure Turbine - Provide New Stage 1 And 2 High Pressure Turbine Duct Segments).
  6. IAE V2500 Service Bulletin V2500-ENG-72-0341 (Engine - HP Turbine Rotor And Stator Assembly - Provide A New Stage 1 High Pressure Turbine Support Assembly Which Contains A New Seal).
  7. IAE V2500 Service Bulletin V2500-ENG-72-0364 (Engine - High Pressure Turbine - Provide New Stage 2 High Pressure Turbine Duct Segments).
  8. IAE V2500 Service Bulletin V2500-ENG-72-0365 (Engine - Provide Pretrenched Second Stage HPT Air Sealing Ring Segments).
  9. IAE V2500 Service Bulletin V2500-ENG-72-0368 (Engine - Provide New 2nd Stage High Pressure Turbine (HPT) Vanes).
  10. IAE V2500 Service Bulletin V2500-ENG-72-0412 (Engine - Provide Additional Oil Drain Hole In 2nd Stage Turbine Air Seal).
  11. V2500 Engine Illustrated Parts Catalogs (S-V2500-3IA, S-V2500-3IB), Chapter/Section 72-44-10 Figure 1 Item 010 and 72-45-23 Figure 01 Items 060 and 062.
  12. V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-44-10, 72-45-23, and 72-45-23.
  13. V2500 Standard Practices/Processes Manual (E-V2500-3IA), Chapter/Section 70-09-00-400-501.
- R 14. Internal Reference No. - 01VC042N, 01VC042R.
15. ATA Locator - 72-44-00 and 72-45-00.

0. Other Publications Affected

None.

P. Interchangeability of Parts

Old and new parts are directly interchangeable in complete sets.

R

R



Q. Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (Yes)

Added Data (Yes)

Revision to Table of Limits (No)

Inspection Procedures (No)

## 2. Material Information

### A. The material data that follows is for each engine.

R For V2525-D5, V2528-D5 Engines:

R 72-44-10

R	FIG	NEW	QTY	PART TITLE	OLD	INSTR
R	ITEM	PART			PART	DISP
R	NO.	NO.			NO.	
R	01-010	2A3896	1	.Support, HPT, 1st,	2A2703	(1)(C1)(I)
R				Assy of		
R				or		
R	01-010	2A3896	1	.Support, HPT, 1st,	2A3367	(1)(C1)(I)
R				Assy of		

R 72-45-00

R	FIG	NEW	QTY	PART TITLE	OLD	INSTR
R	ITEM	PART			PART	DISP
R	NO.	NO.			NO.	
R	01-001	2A8800-001	1	Rotor and Stator Assy,	2A8800	(3)(C1)(I)
R				HPT Module		
R				or		
R	01-001	2A8400-001	1	Rotor and Stator Assy,	2A8400	(3)(C1)(I)
R				HPT Module		
R				or		
R	01-001	2A9300-001	1	Rotor and Stator Assy,	2A9300	(3)(C1)(I)
R				HPT Module		

R 72-45-20

R	FIG	NEW	QTY	PART TITLE	OLD	INSTR
R	ITEM	PART			PART	DISP
R	NO.	NO.			NO.	
R	01-005	2A3219-001	1	.Case and Vane Assy,	2A3219	(3)(C1)(I)
R				Turbine		
R				or		
R	01-005	2A3215-006	1	.Case and Vane Assy,	2A3215-001	(3)(C1)(I)
R				Turbine		
R				or		
R	01-005	2A3364-002	1	.Case and Vane Assy,	2A3364	(3)(C1)(I)
R				Turbine		
R				or		
R	01-005	2A3215-007	1	.Case and Vane Assy,	2A3215-002	(3)(C1)(I)
R				Turbine		
R				or		

Printed in Great Britain

R	FIG	NEW	QTY	PART TITLE	OLD	INSTR
R	ITEM	PART			PART	DISP
R	NO.	NO.			NO.	
R	01-005	2A3469-001	1	.Case and Vane Assy, Turbine	2A3469	(3)(C1)(I)
R				or		
R	01-005	2A3416-001	1	.Case and Vane Assy, Turbine	2A3416	(3)(C1)(I)
R				or		
R	01-005	2A3475-001	1	.Case and Vane Assy, Turbine	2A3475	(3)(C1)(I)
R				or		
R	01-005	2A3215-008	1	.Case and Vane Assy, Turbine	2A3215-003	(3)(C1)(I)
R				or		
R	01-005	2A3215-009	1	.Case and Vane Assy, Turbine	2A3215-004	(3)(C1)(I)
R				or		
R	01-005	2A3364-003	1	.Case and Vane Assy, Turbine	2A3364-001	(3)(C1)(I)
R				or		
R	01-005	2A3215-0010	1	.Case and Vane Assy, Turbine	2A3215-005	(3)(C1)(I)
R						
R	72-45-23					
R	FIG	NEW	QTY	PART TITLE	OLD	INSTR
R	ITEM	PART			PART	DISP
R	NO.	NO.			NO.	
R	01-060	2A3887-01	38	.Duct Segment, HPT 1st Assy of	2A3061-01	(2)(B)(C1)(I)
R	01-062	2A3888	1	..Cover, HPT Duct Segment	2A3061-02	(2)(B)(NP)(I)
R				or		
R	01-060	2A3887-01	38	.Duct Segment, HPT 1st Assy of	2A3579-01	(2)(B)(C1)(I)
R	01-062	2A3888	1	..Cover, HPT Duct Segment	2A3561	(2)(B)(C1)(I)
R						

#### B. Instructions/Disposition Code Statements:

##### Parts Modification Conditions

- (1) The new part can be obtained by modification of the old part as specified in the Accomplishment Instructions.
- (2) The new part is a replacement part only, and cannot be obtained by modification of the old part.
- (3) The new part is a field identification of an assembly incorporating this Service Bulletin.

### Spare Parts Availability

- (A) The new part is available.  
 (B) The new part will be available approximately December, 2003.  
 (C1) The old part will continue to be supplied for use at other locations.  
 (NP) The part is an item that is usually not procured as a spare item.

### Cleaning, Inspection and Repair Information

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

### C. Reidentified Parts

#### R Reidentified Parts Data

R	New PN	Keyword	Old PN
R	2A3896	.Support,HPT,1st Stg,Assy of	2A2703
R	2A3896	.Support,HPT,1st Stg,Assy of	2A3367
R	2A8800-001	Rotor and Stator Assy,	2A8800
R		HPT Module	
R	2A8400-001	Rotor and Stator Assy,	2A8400
R		HPT Module	
R	2A9300-001	Rotor and Stator Assy,	2A9300
R		HPT Module	
R	2A3219-001	.Case and Vane Assy, Turbine	2A3219
R	2A3215-06	.Case and Vane Assy, Turbine	2A3215-001
R	2A3364-002	.Case and Vane Assy, Turbine	2A3364
R	2A3215-007	.Case and Vane Assy, Turbine	2A3215-002
R	2A3469-001	.Case and Vane Assy, Turbine	2A3469
R	2A3416-001	.Case and Vane Assy, Turbine	2A3416
R	2A3475-001	.Case and Vane Assy, Turbine	2A3475
R	2A3215-008	.Case and Vane Assy, Turbine	2A3215-003
R	2A3215-009	.Case and Vane Assy, Turbine	2A3215-004
R	2A3364-003	.Case and Vane Assy, Turbine	2A3364-001
R	2A3215-009	.Case and Vane Assy, Turbine	2A3215-004
R	2A3364-003	.Case and Vane Assy, Turbine	2A3364-001
R	2A3215-010	.Case and Vane Assy, Turbine	2A3215-005
R	2A3887-01	.Case and Vane Assy, Turbine	2A3061-01
R	2A3887-01	.Case and Vane Assy, Turbine	2A3579-01

### D. Other Material Information Data

Not Applicable.

### 3. Accomplishment Instructions

#### (1) Rework Instructions

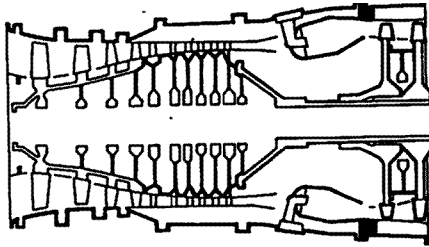
- (a) Do a modification of the 2A2703 or 2A3367 Stage 1 HPT Vane Support (1 off). See Reference (12), Chapter/Section 72-44-10, Figure/Item No. 01-010. See Figure 2.
  - (i) Remove the 1st stage HPT Seal PN 2A3328. See Figure 1.
  - (ii) It is recommended that the Nut PN 743645 (40 off) be removed to avoid damage to the Nut during modification.
  - (iii) Enlarge hole 'F' 20 places. in Stage 1 HPT Vane Support 2A2703 or 2A3367 . See Figure 2
- (b) Mark the new part numbers on all affected parts per the Reidentified Parts section. See reference (13) Standard Practices/Process Manual.

#### (2) Assembly Instructions

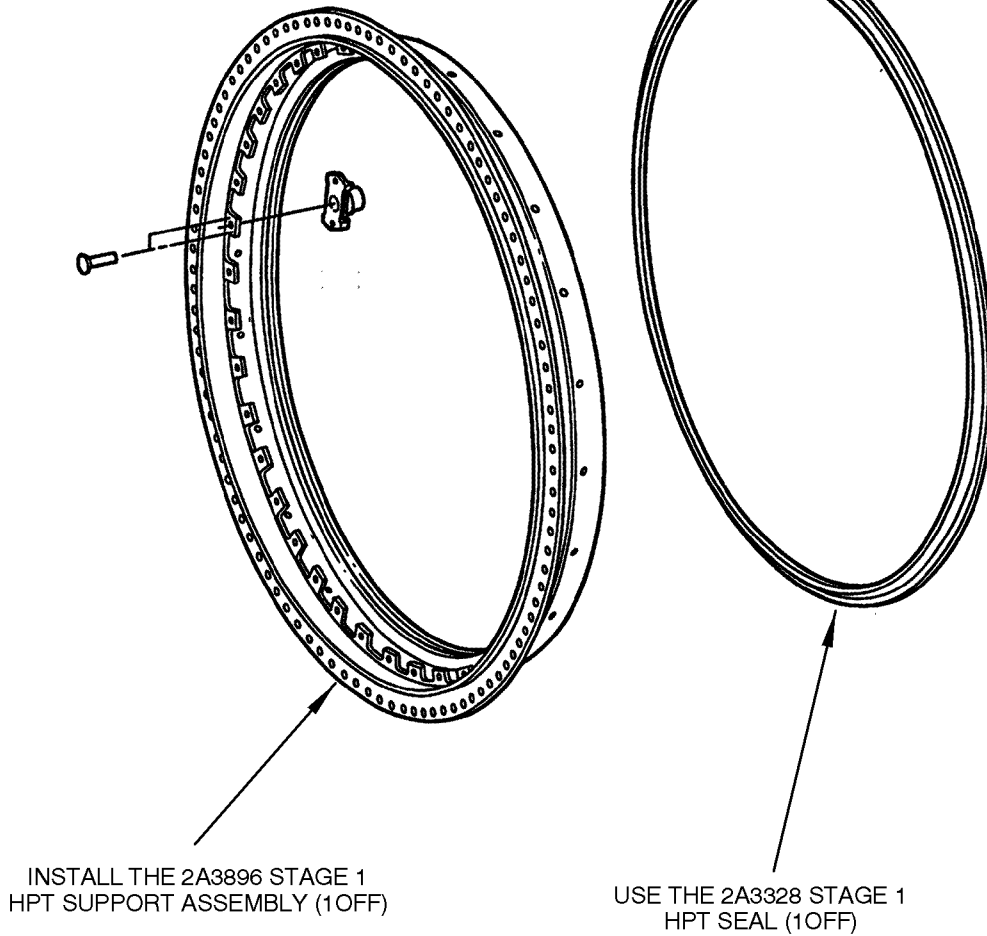
- (a) Assemble the engine per reference 12., using new duct segments (outer air seal) and HPT vane support assembly.

#### (3) Recording Instructions

- (a) A record of accomplishment is required.

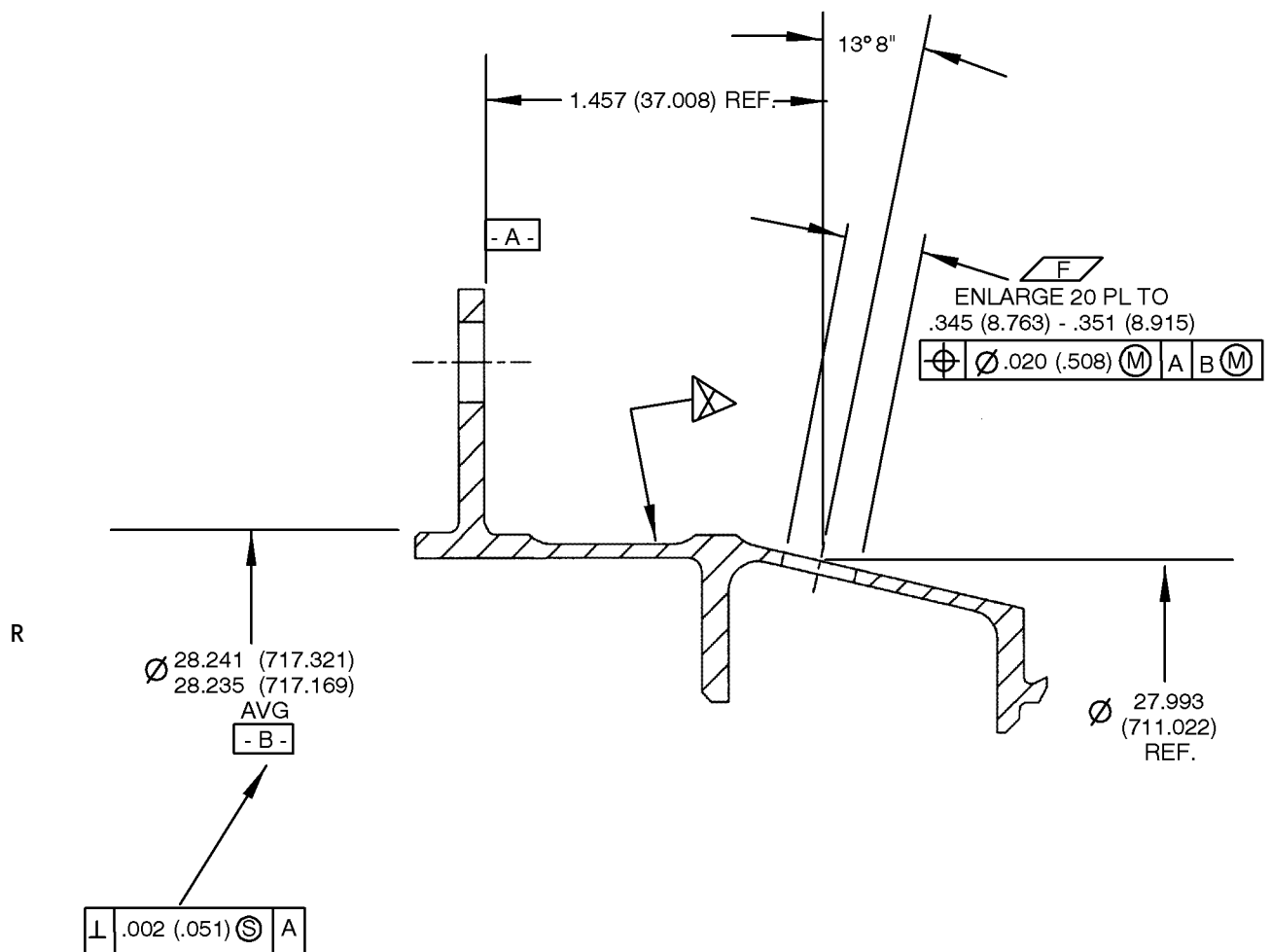


MODULE 40



LOCATION OF THE STAGE 1 HIGH PRESSURE TURBINE SUPPORT ASSEMBLY  
FIGURE 1

pw0b513130



 MARK NEW PART NUMBER

pw0b513131A

R      MODIFICATION OF PN 2A2703 OR 2A3367 STAGE 1 HIGH PRESSURE TURBINE VANE SUPPORT  
R    FIGURE 2

Dec 22/03  
R Jul. 19/04

V2500-ENG-72-0464

Page 11

© Rolls-Royce plc

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





APPENDIXParts Progression To Show the Changed Part in Relation to Other Parts

## Added Data

Number values shown in parentheses adjacent to U.S. values are International System of units (SI) equivalents.

Printed in Great Britain

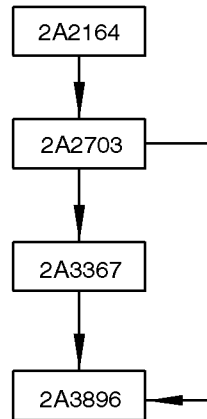
## MODIFICATIONS

## PART NUMBER CHANGE

BASELINE

V2500-ENG-  
72-0147

V2500-ENG-  
72-0341

V2500-ENG-  
72-0464


Printed in Great Britain

pw0b513132

FAMILY TREE – FIRST STAGE HPT SUPPORT ASSEMBLY REF. CATALOG SEQUENCE NO. 72-44-10  
FIGURE 01 ITEM 010  
Chart 1

# V2500-ENG-72-0464

Appendix – Page 2

Dec 22/03  
R Jul.19/04

© Rolls-Royce plc

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

MODIFICATIONS

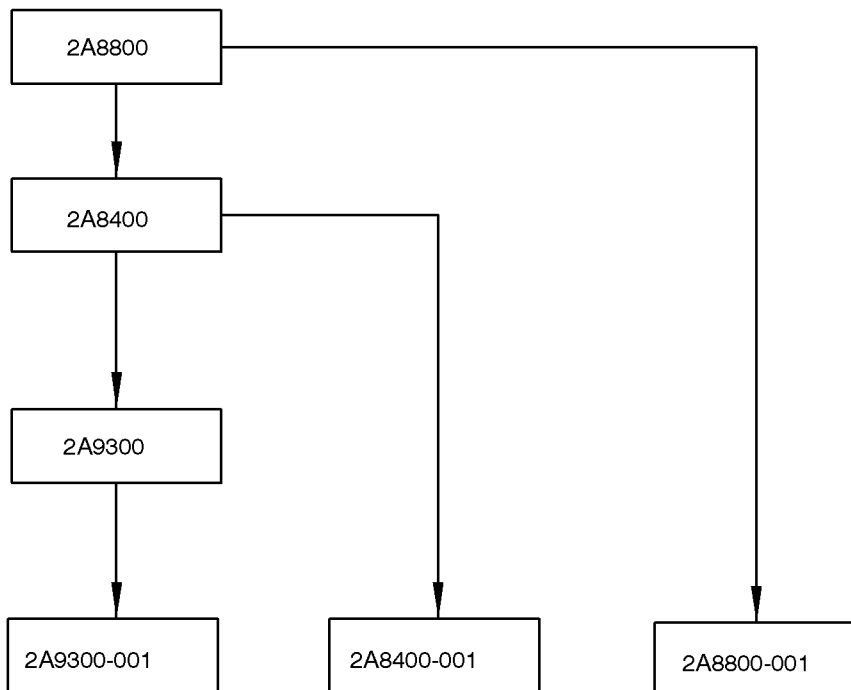
PART NUMBER CHANGE

V2500-ENG-  
72-0240

V2500-ENG-  
72-0242

V2500-ENG-  
72-0412

V2500-ENG-  
72-0464



pw0b513133

FAMILY TREE – ROTOR AND STATOR ASSEMBLY REF. CATALOG SEQUENCE NO. 72-45-00 FIGURE 01  
ITEM 001  
Chart 2

Dec 22/03  
R Jul.19/04

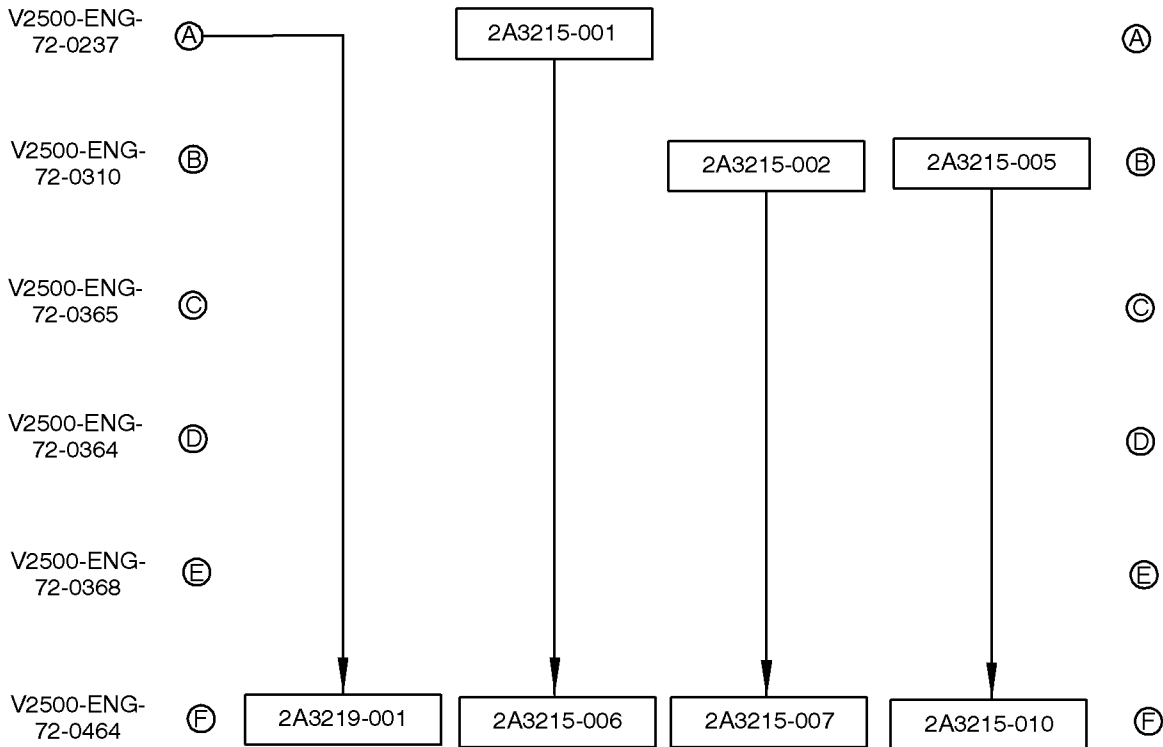
**V2500-ENG-72-0464**  
Appendix – Page 3

© Rolls-Royce plc

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

MODIFICATION

PART NUMBER CHANGE



Printed in Great Britain

pw0b513135

FAMILY TREE – CASE AND VANE ASSEMBLY REF. CATALOG SEQUENCE NO. 72-45-20 FIGURE 01  
ITEM 005  
Chart 3 (Sheet 1)

Dec 22/03  
R Jul.19/04

**V2500-ENG-72-0464**  
Appendix – Page 4

© Rolls-Royce plc

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

MODIFICATION

PART NUMBER CHANGE

V2500-ENG-72-0237 (A)

V2500-ENG-72-0310 (B)

V2500-ENG-72-0365 (C)

V2500-ENG-72-0364 (D)

V2500-ENG-72-0368 (E)

V2500-ENG-72-0464 (F)

2A3215-003

2A3215-004

2A3364-001

2A3215-008

2A3215-009

2A3364-003

pw0b513136

FAMILY TREE - CASE AND VANE ASSEMBLY REF. CATALOG SEQUENCE NO. 72-45-20 FIGURE 01  
ITEM 005  
Chart 3 (Sheet 2)

Dec 22/03  
R Jul.19/04

**V2500-ENG-72-0464**  
Appendix - Page 5

© Rolls-Royce plc

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



NEW FIRST STAGE BLADE OUTER AIR SEAL AND HPT VANE SUPPORT (CONTROLLED SERVICE USE)

Printed in Great Britain

R

SUPPLEMENT – PRICES AND AVAILABILITY

R The prices (if shown) are for estimating purposes only and as such are given in good  
R faith, without commercial liability for advanced planning purposes only. Refer to  
R IAE Spares and/or current price catalogue for current prices.

R 1. Modification Kit:

R Not applicable.

R 2. Parts required:

R			Unit Price
R	Part No.	Description	US Dollars
R	2A3887-01	Duct Segment, HPT,	2,705.00
R		1st Assy of	
R	2A3888	Cover, HPT Duct	47.60
R		Segment	

