P U B L I C A T I O N T R A N S M I T T A L

International Aero Engines

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

DATE: Feb.25/10

V2500-A5/D5 SERIES PROPULSION SYSTEMS SERVICE BULLETIN

This document transmits the Revision 1 of Service Bulletin V2500-ENG-72-0555.

Document History

Service Bulletin Revision Status

Initial Issue. May 22/08

Service Bulletin Revision 1

Remove	Incorporate	Reason for change
All Pages of the Service Bulletin.	Pages 1 to 10 of the Service Bulletin.	To revise the Effectivity. To revise the Compliance.
All Pages of the Supplement.	Page 1 of the Supplement.	To revise the prices.

V2500-ENG-72-0555

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
If any have not been received please advise IAE International Aero Engines AG

SERVICE BULLETIN

ENGINE – HIGH PRESSURE (HP) COMPRESSOR – PINCH POINT REDUCTION ON STAGE 3, 4, 5 AND INTRODUCTION OF STAGE 4 SHROUDS WITH CLOSE TOLERANCE BOLTS

1. Planning Information

A. Effectivity

(1) Airbus A319

R (a) V2522-A5, V2524-A5, V2527M-A5 Engines prior to Serial No. V12723 and
R Engines from Serial No. V12724 to V13009 (A5 Standard and A5
R SelectOne™ Retrofit Standard).

(2) Airbus A320

R (a) V2524-A5, V2527-A5, V2527E-A5 Engines prior to Serial No. V12723 and
R Engines from Serial No. V12724 to V13009 (A5 Standard and A5
R SelectOne™ Retrofit Standard).

(3) Airbus A321

R (a) V2530-A5, V2533-A5 Engines prior to Serial No. V12723 and Engines from
R Serial No. V12724 to V13009 (A5 Standard and A5 SelectOne™ Retrofit
R Standard).

(4) Boeing MD-90

(a) V2525-D5, V2528-D5 Engines prior to Serial No.V20286.

B. Concurrent Requirements

R (1) Part 1 – of this Service Bulletin can only be introduced on engines where
R Part 1 or Parts 3, 4 and 5 of Service Bulletin – V2500-ENG-72-0410 have
R been incorporated or will be incorporated at the same time.

R (2) Part 2 – of this Service Bulletin can only be introduced on engines where
R Part 1 or 3 of Service Bulletin – V2500-ENG-72-0410 have been incorporated
R or will be incorporated at the same time.

R (3) Part 3 – of this Service Bulletin can only be introduced on engines where
R Part 1 or 4 of Service Bulletin – V2500-ENG-72-0410 have been incorporated
R or will be incorporated at the same time.

R (4) Part 4 – of this Service Bulletin can only be introduced on engines where
R Part 1 or 5 of Service Bulletin – V2500-ENG-72-0410 have been incorporated
R or will be incorporated at the same time.

C. Reason

(1) Condition

Several events have been recorded where the dowel pins, which align the front and the rear half of the stage 4 inner shroud halves, have detached, resulting in downstream damage to the airfoils. Analysis has shown the continued interference fit between pin and shroud to be compromised by the difference in the thermal expansion of materials involved. The shroud is manufactured from aluminum while the pins are made from nickel steel. At worst case operating conditions the pin may move to a clearance fit and start wearing within the shroud hole leading to a subsequent pin release.

Furthermore, extensive wear has occurred on stage 4 and 5 inner shrouds bushes which are located in counterbores between the shroud and each vane spindle. Thermal pinch has been identified as the cause of problem which leads to secondary damage of the inner shrouds and variable vanes as they
R come into contact. Another effect of thermal pinch is increased Variable
R Stator Vane (VSV) action loads which can result in track check errors, especially at maximum operating temperature during take-off.

(2) Background

The problem has been experienced on engines in service.

(3) Objective

Incorporation of this Service Bulletin is designed to maintain reliability.

(4) Substantiation

The changes introduced by this Service Bulletin were the subject of satisfactory engineering analysis. This Service Bulletin complies with the applicable engine certification basis.

(5) Effect of Bulletin on:

(a) Operation

Not affected.

(b) Maintenance

Not affected.

(c) Overhaul

Not affected.

(d) Repair Schemes

Not affected.

(e) Interchangeability

Affected (Refer to 1.B. Concurrent Requirements).

(f) Fits and Clearances

Not affected.

(6) Supplementary Information

None.

D. Description

(1) This Service Bulletin introduces an improved stage 4 shroud half assembly to prevent potential damage to downstream components. All three dowel pins of each stage 4 inner shroud half assembly are deleted. A total of 12
R close tolerance bolts are fitted to each half shroud assembly, three are located in holes with a reduced diameter and provide the locating function of the three deleted pins. The remaining nine bolts are located in holes with clearance fit.

(2) Additionally this change reduces frictional loads on the VSV actuating system at high temperatures through increased clearance between the inner shroud bushes and the VSV inner spindle ends. This is achieved by an increased counterbore depth on the inner shrouds of VSV stage 3, 4 and 5.

(3) This Service Bulletin is divided into four parts as follows:

Part 1 - Covers full embodiment of new HP Compressor stage 3, 4 and 5 half shroud assemblies.

Part 2 - Embodiment of HP Compressor stage 3 half shroud assemblies.

Part 3 - Embodiment of HP Compressor stage 4 half shroud assemblies.

Part 4 - Embodiment of HP Compressor stage 5 half shroud assemblies.

NOTE: New production engines fully embodying this Service Bulletin will not be annotated with a modification part and can be considered equivalent to Part 1.

E. Compliance

R For Part 3 of this Service Bulletin:

R Category Code 5

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

R NOTE: IAE recommends to replace the stage 4 shrouds at next shop visit, when the engine is disassembled sufficiently to afford access to the shroud.

R For Part 2 and 4 of this Service Bulletin:

R Category Code 7

R Accomplish when the supply of superseded parts has been depleted.

F. Approval

The part number changes and/or part modifications described in sections 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.

G. Manpower

(1) In Service

Not applicable.

(2) At Overhaul

Applicable (Hours not affected).

H. Material Price and Availability

Modification kit is not required; parts supplied as single line items.

For prices and availability of spares, refer to the Supplement to this Service Bulletin.

I. Tooling Price and Availability

Special tools are not required.

J. Industry Support Information

Not applicable.

K. Weight and Balance

(1) Weight Change

None.

(2) Moment Arm

No effect.

(3) Datum

Engine Front Mount Centreline (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 Engine Manual (E-V2500-1IA, E-V2500-3IA), Chapters 72-00-40, 72-41-00 and 72-41-30.

(2) V2500 Service Bulletin:

V2500-ENG-72-0410 - ENGINE - HP COMPRESSOR VARIABLE VANE INNER SHROUDS - INTRODUCTION OF REVISED ONE PIECE BUSHES

(3) Internal Reference No.

R Engineering Change No. 07VR005 and 07VR005-05.

(4) ATA Locator - 72-41-33.

O. Other Publications Affected

(1) IAE V2500 Engine Illustrated Parts Catalogs (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-V2500-7IB), Chapter/Section 72-41-33 to add the new part.

(2) IAE V2500 Engine Manuals (E-V2500-1IA, E-V2500-3IA) Chapter/Section 72-41-33 Cleaning, Inspection and Repair to add the new part.

P. Interchangeability of Parts

Affected (Refer to paragraph 2.E. Instruction disposition codes).

2. Material Information

A. The kit required consists of the following parts:

None.

B. Parts to be reworked:

None.

C. New production parts:

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
Part 1 and Part 2						
72-41-33						
02-200	6B1156	2	.Shroud, Assy Stage 3 half	-	6A7719	(A)(S1)
Part 1 and Part 3						
72-41-33						
03-138	AS22919	24	.Bolt, Close Tol Bihex HD	-	4W0114	(A)(S2)
03-200	6B1175	2	.Shroud, Assy Stage 4 half	-	6A7561	(A)(S3)
Part 1 and Part 4						
72-41-33						
04-200	6B1158	2	.Shroud, Assy Stage 5 half	-	6A7563	(A)(S1)

D. Redundant parts:

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
Part 1 and Part 3						
72-41-33						
03-220	-	3	..Ring, Retaining	-	AS20762	(E)
03-222	-	3	..Pin, Grooved Headless	-	AS20743	(E)

E. Instruction disposition codes:

(A) The new parts are available.

(E) Deleted part.

(S1) Old and new parts are fully interchangeable.

(S2) Old and new parts are not interchangeable.

(S3) Old and new parts are not interchangeable, but the new part can be fitted in lieu of the old part, but not vice versa.

3. Accomplishment Instructions

A. Assembly Instructions

(1) Remove the High Pressure (HP) compressor assembly from the engine (Refer to the Engine Manual, Chapter 72-00-41).

(2) Disassemble the HP compressor front case assembly (Refer to the Engine Manual, Chapter 72-41-00).

(3) Disassemble the HP compressor upper and lower half front cases (Refer to the Engine Manual, Chapter 72-41-30)

(a) Part 1 and Part 2:

Remove the two old HP compressor stage 3 half shroud assemblies (72-41-33, 02-200), P/N 6A7719 from the HP compressor upper and lower half front cases.

(b) Part 1 and Part 3:

Remove the two old HP compressor stage 4 half shroud assemblies (72-41-33, 03-200), P/N 6A7561 from the HP compressor upper and lower half front cases

(i) Remove the 24 old bolts (72-41-33, 03-138), P/N 4W0114 from the two old HP compressor stage 4 half shroud assemblies (72-41-33, 03-200).

(c) Part 1 and Part 4:

Remove the two old HP compressor stage 5 half shroud assemblies (72-41-33, 04-200), P/N 6A7563 from the HP compressor upper and lower half front cases.

(4) Assemble the HP compressor upper and lower half front cases (Refer to the Engine Manual, Chapter 72-41-30)

(a) Part 1 and Part 2:

Install the two new HP compressor stage 3 half shroud assemblies (72-41-33, 02-200), P/N 6B1156 to the HP compressor upper and lower half front cases.

(b) Part 1 and Part 3:

Install the two new HP compressor stage 4 half shroud assemblies (72-41-33, 03-200) to the HP compressor upper and lower half front cases.

NOTE: The new HP compressor stage 4 half shroud assembly consists of the front half shroud and rear half shroud as a matched set. Check correlation markings on the front and rear half shrouds to ensure that the stage 4 half shroud assembly will be installed as a matched set.

(i) Install the new HP compressor stage 4 half shroud assembly (72-41-33, 03-200), P/N 6B1175 to the HP compressor upper half front case

(1) Align the prepared half front cases vertically with the VIGV at the top and with all variable vanes installed.

(2) Install the 25 inner shroud bushes (72-41-33, 03-190) to the stage 4 inner vanes spindles.

(3) Locate the new HP compressor stage 4 front half shroud (72-41-33, 03-250), P/N NND6884 with the integral air seal (72-41-33, 03-150) onto the inner shroud bushes.

(4) Make sure that the inner shroud bushes installed on the stage 4 inner vanes spindles are engaged correctly in stage 4 front half shroud.

(5) Load the inner shroud bushes radially inwards to achieve nominal gap between vane inner penny and inner shroud bush.

(6) Install the new HP compressor stage 4 rear half shroud (72-41-33, 03-260), P/N NND6885 onto the new HP compressor stage 4 front half shroud (72-41-33, 03-250) and clamp them together using suitable clamping tools equally spaced.

NOTE: Make sure that the inner shroud bushes installed on the stage 4 inner vanes spindles are engaged correctly in the stage 4 half shroud assembly and the integral air seal is forward of the stage 4 inner vanes spindles.

(7) Install the three new bolts (72-41-33, 03-138), P/N AS22919, the six dee-headed washers (72-41-33, 03-134) and the three nuts (72-41-33, 03-130) to the stage 4 half shroud assembly at the position marked "1st" and tighten them.

(8) Remove the clamping tools.

(9) Install the remaining nine new bolts (72-41-33, 03-138), P/N AS22919, the 18 dee-headed washers (72-41-33, 03-134) and the nine nuts (72-41-33, 03-130) to the stage 4 half shroud assembly at the remaining positions.

(10) Torque the nuts to between 36 and 45 lbf in. (4 and 5 Nm).

(ii) Install the new HP compressor stage 4 half shroud assembly (72-41-33, 03-200), P/N 6B1175 to the HP compressor lower half front case

(1) Install the new HP compressor stage 4 half shroud assembly and integral air seal as given in steps 3.A.(4)(b)(i)(1) to (10).

(c) Part 1 and Part 4:

Install the two new HP compressor stage 5 half shroud assemblies (72-41-33, 04-200), P/N 6B1158 to the HP compressor upper and lower half front cases.

(5) Assemble the HP compressor front case assembly (Refer to the Engine Manual, Chapter 72-41-00).

(6) Install the HP compressor assembly to the engine (Refer to the Engine Manual, Chapter 72-00-41).

(7) Make sure that the work area is clean and clear of tools, equipment and other unwanted materials.

B. Recording Instructions

R (1) A record of the accomplished part is required.

SERVICE BULLETIN

ENGINE - HIGH PRESSURE (HP) COMPRESSOR - PINCH POINT REDUCTION ON STAGE 3, 4, 5 AND INTRODUCTION OF STAGE 4 SHROUDS WITH CLOSE TOLERANCE BOLTS

SUPPLEMENT - PRICES AND AVAILABILITY

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

1. Modification Kit:

Not applicable.

2. New Production Parts:

	Part No.	Description	Unit Price US Dollars
R	6B1156	.Shroud, Assy Stage 3 half	3,987.00
R	6B1175	.Shroud, Assy Stage 4 half	4.103.00
R	6B1158	.Shroud, Assy Stage 5 half	6,444.00
R	AS22919	.Bolt, Close Tol, Bihex HD	18.60

3. Tools

None.