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V2500-A1/A5/D5 SERIES PROPULSION SYSTEMS SERVICE BULLETIN

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Bulletin Revision 4

Remove	Incorporate	Reason for change
All pages of the Service Bulletin	Pages 1 to 10 of the Service Bulletin	To change the Compliance category.

International Aero Engines

SERVICE BULLETIN

ENGINE - ACTUATING MECHANISM HP COMPRESSOR VARIABLE VANES - INTRODUCTION OF REVISED STAGE 3 AND STAGE 4 VSV ACTUATING LEVER WITH INCREASED RADIUS

1. Planning Information

A. Effectivity

(1) Airbus A319

(a) V2522-A5, V2524-A5, V2527M-A5 Engines prior to Serial No.V10240.

(2) Airbus A320

(a) V2500-A1 Engines prior to Serial No.V0362.

(b) V2524-A5, V2527-A5, V2527E-A5 Engines prior to Serial No.V10240.

(3) Airbus A321

(a) V2530-A5, V2533-A5 Engines prior to Serial No.V10240.

(4) Boeing MD-90

(a) V2525-D5, V2528-D5 Engines prior to Serial No.V20132.

B. Concurrent requirements

None.

C. Reason

R (1) Problem

Fractures of A5 Stage 3 VSV levers have occurred as a result of High Cycle Fatigue (HCF). The HCF is caused by vibrational stresses in the lever arm adjacent to the lever arm boss.

R (2) Evidence

The problem has been found on several engines in service.

R (3) Substantiation

R A satisfactory engineering analysis has been carried out on the changes
R introduced by this Service Bulletin.

(4) Objective

The purpose of this Service Bulletin is to maintain reliability.

(5) Effect of Bulletin on:

(a) Operation

Not affected.

(b) Maintenance

Not affected.

(c) Overhaul

Affected (Refer to 1.M. Other Publication affected).

(d) Repair Scheme

Not affected.

(e) Interchangeability

Not affected.

(f) Fits and Clearance

Not affected.

D. Description

(1) The changes introduced by this Service Bulletin are as follows:

(a) A revised Stage 3 VSV Lever arm of the HP Compressor has been introduced with the changes that follow:

(i) The radius of the lever arm has increased from 0.047 in. +/-0.011 in. (1,2 mm +/-0,3 mm) to 0.197 in. +/-0.011 in. (5,0 mm +/-0,3 mm).

(ii) The surface finish has also been improved.

E. Compliance

R Category Code 4

R Accomplish at the first visit of an engine or module to a maintenance base
R capable of compliance with the accomplishment instructions regardless of the
R planned maintenance action or the reason for engine removal.

F. Approval

The part number changes and/or part modification 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.

G. Manpower

Estimated manhours to incorporate the full intent of this bulletin:

(1) In Service

R Total - 24 Hours.

(2) At Overhaul

Applicable (Hours not affected).

H. Material Price and Availability

(1) A modification kit is not necessary.

(2) Refer to Section 2. Material Information for availability of future
R spares.

R (3) Refer to IAE Spares and/or current price catalogue for current prices.

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

R (1) A319/A320/A321 Aircraft Maintenance Manual, Chapters 71-00-00 Test No. 3
R and 11.

R (2) A319/A320/A321 Aircraft Maintenance Manual, Chapters 71-13-00 and 78-32-00
R Opening/Closing.

R (3) A319/A320/A321 Aircraft Maintenance Manual, Chapters 71-52-42, 71-51-43,
R 75-31-42, 75-31-43 and 74-11-38 Removal/Installation.

R (4) MD90 Aircraft Maintenance Manual, Chapters 71-02-03 Test No. 3 and
R 71-02-11 Test No.11.

R (5) MD90 Aircraft Maintenance Manual, Chapters 71-13-00 and 78-32-00
R Opening/Closing.

R (6) MD90 Aircraft Maintenance Manual, Chapters 71-52-54, 75-32-42, 75-32-43
R and 74-10-01 Removal/Installation.

(7) IAE V2500 Engine Manual (E-V2500-1IA and -3IA), Chapter 72-41-30
Removal/Installation.

(8) IAE V2500 Standard Practices/Procedures Manual (SPP-V2500-1IA), Chapters
R 70-41-01 and 70-44-00.

R (9) Internal Reference No.

R Engineering Change No. 97VR004.

R (10) ATA Locator - 72-41-34, 75-31-42 and 75-31-43.

O. Other Publications Affected

(1) IAE V2500 Engine Manual (E-V2500-1IA and -3IA), Chapters 72-41-30 and
R 72-41-34.

(2) For effect on Illustrated Parts Catalogue (IPC), refer to 2. Material
R Information.

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	OLD PART NO.	INSTR DISP
72-41-34					
03-120	6A6547	8	Lever assembly of - HP Compressor, Stage 3 VSV	6A3322	(A)(B) (S1)
Existing parts:					
72-41-34					
03-060	6A2037C01	4	Spacer washer	-	(A)
03-062	6A2037C02	4	Spacer washer	-	(A)
03-064	6A2037C03	4	Spacer washer	-	(A)
03-066	6A2037C04	4	Spacer washer	-	(A)
03-068	6A2037C05	4	Spacer washer	-	(A)
03-070	6A2037C06	4	Spacer washer	-	(A)
03-072	6A2037C07	4	Spacer washer	-	(A)
03-074	6A2037C08	4	Spacer washer	-	(A)
03-076	6A2037C09	4	Spacer washer	-	(A)
03-123	4W0002	12	Bi-hexagonal nut	-	(A)
75-31-42					
01-115	AS44692	2	Locking washer	-	(A)

	FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
	01-600	MS9967-12	A/R	Packing (O-ring)	-	(A)
	01-610	MS9967-11	A/R	Packing (O-ring)	-	(A)
	01-620	MS9967-11	A/R	Packing (O-ring)	-	(A)
	01-630	MS9967-11	A/R	Packing (O-ring)	-	(A)
	75-31-43					
	01-115	AS44692	1	Locking washer	-	(A)
	01-600	MS9967-11	A/R	Packing (O-ring)	-	(A)
	01-610	MS9967-11	A/R	Packing (O-ring)	-	(A)
	Contingency Parts:					
	72-41-34					
	03-202	AS21020	2	Bolt	-	(A)
	03-206	6A2520	2	Dowel	-	(A)
	03-284	AS21014	1	Bolt	-	(A)
R	03-288	6A2527	1	Dowel	-	(A)

D. Redundant parts:

None.

E. Instruction disposition codes:

(A) New parts are currently available.

(B) Old parts will be discontinued.

(S1) Old and new parts are freely and fully interchangeable.

3. Accomplishment Instructions

A. Rework Instructions

(1) None.

B. Assembly Instructions

(1) For removed engines:

(a) Remove the eight old VSV levers, P/N 6A3322 from the engine (Refer to the applicable Engine Manual, Chapter 72-41-30).

(b) Install the eight new VSV levers, P/N 6A6547 to the engine (Refer to the applicable Engine Manual, Chapter 72-41-30).

(2) For installed engines:

Remove the VSV levers as follows:

(a) Get access to the right area of the High Pressure (HP) compressor case

(i) Open the fan cowl doors (Refer to the Aircraft Maintenance Manual, Chapter 71-13-00).

(ii) Open the thrust reverser halves (Refer to the Aircraft Maintenance Manual, Chapter 78-32-00).

(b) Release and move the fire detection harness and the core EEC harness clear of the Stage 3 VSV mechanism (Refer to the Aircraft Maintenance Manual, Chapter 71-52-42, 71-51-43 (A1/A5) and 71-52-54 (D5)).

(c) Move the harness support raceways, P/N 6A2153 and P/N 6A5314 clear of the Stage 3 VSV mechanism.

(d) Remove the LPC bleed master actuator and support bracket if necessary (Refer to the Aircraft Maintenance Manual, Chapter 75-31-42 (A1/A5) and 75-32-42 (D5)).

(e) Remove the LPC bleed slave actuator and support bracket, then move the fuel drain pipe, P/N 745-5279-503 clear of the VSV mechanism (Refer to the Aircraft Maintenance Manual, Chapter 75-31-43 (A1/A5) and 75-32-43 (D5)).

(f) Remove the igniter box and support brackets if necessary (Refer to the Aircraft Maintenance Manual, Chapter 74-11-38 (A1/A5) and 74-10-01 (D5)).

(g) With the rigging pins, lock the VSV crankshaft and the Stage 3 VSV unison ring in position (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (A1/A5) and 75-31-02 (D5)).

(h) Disconnect the Stage 3 actuator rod from the Stage 3 unison ring (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (A1/A5) and 75-31-02 (D5)).

NOTE: Care must be taken to keep the bushes on the bolts, between the unison ring and the two bridge pieces.

(i) Remove the bridge pieces of the unison ring.

(j) To remove the two lever arms from each bridge piece, remove the stage
R 3 connector housing, P/N 6A3988.

Then remove one at a time, each of the lever arms, P/N 6A3322 and spacer washer adjacent to the bridge piece position.

(k) Remove and discard the spacer washers, range P/N 6A2037C01 thru to P/N 6A2037C09.

(3) For installed engines, install the VSV levers as follows:

(a) Install the eight lever arms, P/N 6A6547 to the stage 3 vane adjacent to the left and right split lines of the HP Compressor case. Do not install the spacer washers. Safety the lever arms with the bi-hexagonal nuts, P/N 4W0002.

(b) Pull each lever arm away from the case. Measure the clearance between the base of the lever and the case. Identify each lever with its position and write down the dimension of the clearance. Then get the correct spacer from the range P/N 6A2037C01 thru to P/N 6A2037C09 to get a clearance of between 0.003 and 0.005 in. for each of the lever arms.

(c) Remove the lever arms.

(d) Install the applicable lever arms, P/N 6A6457 and spacer washers, range P/N 6A2037C01 thru to P/N 6A2037C09 to the correct stage 3 vanes adjacent to the split lines of the HP compressor. With the new bi-hexagonal nuts, P/N 4W0002, safety the lever arms.

(e) Install the applicable lever arms, P/N 6A6457 and spacer washers, range P/N 6A2037C01 thru to P/N 6A2037C09 to the Stage 3 vanes adjacent to the stage 3 connector housings, P/N 6A3988 of the bridge pieces. With the new bi-hexagonal nuts, P/N 4W0002 safety the lever arms.

(f) Install the bridge pieces to the unison ring and the two lever arms, P/N 6A6547 to the VSV's. Then install the correct washers. Install the bolts and the location dowels to the bridge pieces and the lever arms. Use new bi-hexagonal nuts, P/N 4W0002 to safety the lever arms and spacer washers.

(g) Measure the total depth of the lever arms and the two spacer washers.

Make sure that the dimension is the same as that in B.(3)(b) for each specific position. If the dimension is not the same, then remove the
R lever arms and do steps B.(3.)(a) to (f) again.

(h) Install the Stage 3 actuator rod to the Stage 3 unison ring (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (A1/A5) and 75-31-02 (D5)).

(i) Remove the VSV rigging pins (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (A1/A5) and 75-31-02 (D5)).

(j) Install the igniter box and support bracket if necessary (Refer to Aircraft Maintenance Manual, Chapter 74-11-38 (A1/A5) and 74-10-01 (D5)).

(k) Install the support bracket of the LPC bleed slave actuator if necessary. Install the LPC bleed slave actuator. Use new packers, P/N MS9967-011 on the adjacent tubes and a new lock washer, P/N AS44692 on the adjacent tubes and a new lock washer, P/N AS44692 on the actuator rod pin (Refer to the Aircraft Maintenance Manual, Chapter 75-31-43 (A1/A5) and 75-32-43 (D5)).

(l) Install the support bracket of the LPC bleed master actuator if necessary. Install the LPC bleed master actuator. Use new packers, P/N MS9967-11 thru to P/N MS9967-12 on the adjacent tubes and a new lock washer, P/N AS44692 on the actuator rod pin (Refer to the Aircraft Maintenance Manual, Chapter 75-31-42 (A1/A5) and 75-32-42 (D5)).

(m) Install the harness support raceway P/N 6A2153 and P/N 6A5314 if necessary.

(n) Safety the fire detection harness and the core EEC harness if necessary. (Refer to Aircraft Maintenance Manual, Chapter 71-51-43 (A1/A5) and 71-52-54 (D5)).

R (4) Make sure that the work area is clean and clear of tools, equipment and
R other unwanted materials.

(5) Close the access to the High Pressure (HP) compressor case

(a) Close the thrust reverser halves (Refer to the Aircraft Maintenance Manual, Chapter 78-32-00).

(b) Close the fan cowl doors (Refer to the Aircraft Maintenance Manual, Chapter 71-13-00).

R (6) Do a Test No. 3 - Idle Leak Check (Refer to the Aircraft Maintenance
R Manual, Chapter 71-00-00 (A1/A5) and 71-02-03 (D5)).

R (7) Do a Test No. 11 - High Power Assurance Test (Refer to the Aircraft
R Maintenance Manual, Chapter 71-00-00 (A1/A5) and 71-02-11 (D5)).

C. Recording Instructions

A record of accomplishment is necessary.