International Aero Engines
SERVICE BULLETIN

Nov.29/99

Subject: Transmittal of Revision 2 to Service Bulletin V2500-ENG-72-0332.

Service Bulletin Revision History:

Event	Date
Initial Issue	Dec.11/98.
Revision 1	Oct.15/99.
Revision 2	Nov.29/99

Reason for Revision:

(1) To alter level of category and add special incorporation requirements note following negotiation between Rolls-Royce/IAE and the FAA-DER..

Effect on Past Compliance:

Change from 3 to 4.

List of Effective Pages:

Page No.	Revision No.	Effective Date
1 and 2	Revision 2	Nov 29/99.
3 and 4	Revision 1	Oct 15/99
5 to 8	Revision 2	Nov 29/99
9 and 10	Revision 1	Oct 15/99

International Aero Engines

SERVICE BULLETIN

ENGINE - HP COMPRESSOR BLADES - INTRODUCTION OF STAGE-6 BLADES IN REVISED TITANIUM MATERIAL WITH RE-DEFINED ROOT GEOMETRY

MODEL APPLICATION

V2522-A5
V2524-A5
V2527-A5
V2527E-A5
V2530-A5
V2533-A5
V2525-D5
V2528-D5

BULLETIN INDEX LOCATOR

72-41-00

Compliance Category Code

4

Internal Reference No.

EC98VR004
ECM98VR004-03

Dec. 11/98
Revision 2 Nov.29/99

V2500-ENG-72-0332

ENGINE - HP COMPRESSOR BLADES - INTRODUCTION OF STAGE-6 BLADES IN REVISED TITANIUM MATERIAL WITH RE-DEFINED ROOT GEOMETRY

1. Planning Information

A. Effectivity

(1) Aircraft:

(a) Airbus A319.

(b) Airbus A320.

(c) Airbus A321.

(d) Boeing-Douglas MD-90.

(2) Engines:

(a) V2522-A5 Engines prior to Serial Number V10533 but excluding V10500, V10502, V10503, V10504, V10506 and V10508 to V10531.

(b) V2524-A5 Engines prior to Serial Number V10533 but excluding V10500, V10502, V10503, V10504, V10506 and V10508 to V10531.

(c) V2527-A5 Engines prior to Serial Number V10533 but excluding V10500, V10502, V10503, V10504, V10506 and V10508 to V10531.

(d) V2527E-A5 Engines prior to Serial Number V10533 but excluding V10500, V10502, V10503,V10504, V10506 and V10508 to V10531.

(e) V2530-A5 Engines prior to Serial Number V10533 but excluding V10500, V10502, V10503 V10504, V10506 and V10508 to V10531.

(f) V2533-A5 Engines prior to Serial Number V10533 but excluding V10500, V10502, V10503 V10504, V10506 and V10508 to V10531.

(g) V2525-D5 Engines prior to Serial Number V20263.

(h) V2528-D5 Engines prior to Serial Number V20263.

B. Concurrent Requirements

R Refer to para L.

C. Reason

(1) Problem

Fracture of the root of the Stage-6 blade of the HP Compressor has occurred. This has resulted in the release of the platform and aerofoil, which can cause subsequent damage of the HP Compressor.

An investigation has shown that the fractures are caused by Low Cycle Fatigue (LCF) cracks. The cracks start on the face of the narrow root bedding, and then subsequently grow under High Cycle Fatigue (HCF).

(2) Evidence

To date, there has been four fractures reported on V2500-A5 engines.

(3) Substantiation

A successful stress analysis, a comprehensive vibration fatigue test programme and an engine resonance endurance test have been done on the changes 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

Not affected.

(d) Repair Schemes

Not affected.

(e) Interchangeability

Affected. (Refer to 2. C.).

(f) Fits and Clearances

Not affected.

D. Description

(1) This Service Bulletin introduces revised Stage-6 blades for the HP Compressor manufactured from a Titanium material with improved LCF properties. To reduce root stresses, the root geometry and balance of the blade have been re-defined. The changes introduced are as follows:

(a) The depth of the root is increased by 0.30mm.

(b) The width of the root is increased by 0.60mm.

(c) To optimise the balance of the blade, the aerofoil has been tangentially moved towards the pressure surface by 0.25mm.

(d) Because the aerofoil has been moved, the run out of the aerofoil radius on the trailing edge of the platform has decreased. On the locking blades only, the breakout of the locking feature into the aerofoil radius has been increased.

(e) The Titanium alloy has changed from Ti6/4 to Ti5331S.

E. Approval

The part number changes and/or part modifications are given in Section 2 and 3 of this Service Bulletin. They comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the engine models listed.

F. Compliance

R Category Code 4

R This Service Bulletin must be accomplished at the first visit of an engine or module to a
R maintenance base that can comply with the accomplishment instructions. This is regardless
R of the planned maintenance action or the reason for engine removal.

R Special Incorporation Requirements:

R (1) It is recommended that this Service Bulletin be retrofitted with the guidance of IAE Technical Services and be accomplished under one of the conditions that follow:

(a) Within 10,000 cycles engine life.

or

(b) Where the life of the engine is more than 4,000 cycles and the engine is at an overhaul facility, regardless of the planned maintenance activity.

or

(c) Where the life of the engine is less than 4,000 cycles and the engine is at an overhaul facility and the HP Compressor is diassembled sufficiently to get access to the affected components.

(2) At the aircraft level IAE are monitoring the duel IFSD risk as the engines on the same airframe accumulate cycles. An operator of pre-mod engines may be approached to introduce life stagger to minimize this risk. (S I L 131 Issue 2 refers).

G. Manpower

Estimate of manhours necessary to embody this Service Bulletin in full:

(1) In Service

(a)	To gain access	16 Minutes
(b)	To remove engine	8 Hours 00 Minutes

(c)	To disassemble engine to get access to HP system	48 Hours 00 Minutes
(d)	To disassemble and assemble HP system	61 Hours 00 Minutes
(e)	To return aircraft to a serviceable condition	96 Hours 30 Minutes
	Total	213 Hours 46 Minutes

(2) At Overhaul

(a)	To embody this Service Bulletin	18 Hours 00 Minutes

NOTE: It is possible to get access to the parts affected by this Service Bulletin at overhaul.

H. Material - Price and Availability

(1) Support Programme

To assist with incorporation of the improved Stage 6 HP Compressor Blades, International Aero Engines will provide a one time credit to customers upon the initial incorporation of Service Bulletin 72-0332 standard blades in each eligible engine. The credit will be in the amount of 50 percent of the catalog price of the Service Bulletin 72-0332 standard blades at the time of engine removal.

(2) Administration

The standard International Aero Engine Warranty Claim Form (FIAE-15 Form Ref. :WCE IAE-185 Rev. 4/98) is to be used for the administration of this programme to ensure the appropriate credits are issued in a timely and accurate fashion.

The completed Warranty Claim Form must quote IAE internal tracking number CA S484 UI and must be countersigned by the local IAE Representative. The completed form, plus a copy of the portion of the FAA Form 337 that substantiates incorporation of Service Bulletin 72-0332 in the applicable engine, is to be returned to :

IAE International Aero Engines AG
400 Main Street, M/S 121-10
East Hartford, CT 06108
USA

Attn. IAE Warranty Administration

After receipt of the completed Warranty Claim Form and the FAA Form 337, IAE Warranty Administration will authorize the appropriate credit to be applied to the Customer's Spare Parts Account with IAE.

I. Tooling - Price and Availability

Special tools are not necessary.

J. Weight and Balance

(1) Weight Change

Plus 0.3lb (0.14kg).

(2) Moment Arm

14.7in (373mm) rearwards.

(3) Datum

Engine Front Mount Centreline (Power Plant Station (PPS) 100).

K. Electrical Load Data

The aircraft Electrical load is not affected by this Service Bulletin.

L. References

(1) This Service Bulletin must only be installed to engines which embody one of the V2500 Service Bulletins that follow:

ENG 72-0178	ENGINE - HP COMPRESSOR DISCS - STAGE-3 TO 8 ROTOR DRUM WITH THICKER STAGE-6 DISC HUB AND DAMPING WIRE LOCATING LIPS.
ENG 72-0254	ENGINE - HP COMPRESSOR DISC (STAGES 3 TO 8) - INTRODUCTION OF HP COMPRESSOR DRUM WITH REVISED DISC PROFILES.
ENG 72-0300	ENGINE - HP COMPRESSOR DISCS (STAGES 3 TO 8) - INTRODUCTION OF REVISED STAGE-3 TO 8 DISC ASSEMBLY AND STAGE-7 AND 8 SEALING WIRES.

(2) This Service Bulletin can also be installed to engines which embody the V2500 Service Bulletin that follows, but not engines that are pre Service Bulletin ENG 72-0178:

(3) A5 Engine Manual (EM), Chapter/Section 72-41 10, Assembly-03 CONFIG-2, -4 and -6 and Disassembly.

(4) D5 Engine Manual (EM), Chapter/Section 72-41 10, Assembly-03 and Assembly-03 CONFIG-1 and -2 and Disassembly.

(5) For the A5 Models only, this Service Bulletin is associated with Airbus aircraft modification No.: 28069.

M. Other Publications Affected

(1) Illustrated Parts Catalog (IPC), Chapter/Section 72-41-15.

(2) A5/D5 Engine Manual (EM), Chapter/Section 72-41-15, Cleaning-03 CONFIG-1 and Inspection/Check-04.

2. Material Information

Applicability: For each V2500 engine for which this Service Bulletin is applicable.

A. Kits necessary for this Service Bulletin:

None.

B. Parts affected by this Service Bulletin:

NEW PART NUMBER	QTY	EST'D UNIT PRICE ($)	PART TITLE	OLD PART No. (IPC No.)	INSTR DISP
6A7406 (72-41-15)	2	316.00	.Blade, Stage-6 LH Lock - HP Compressor	6A4902 (02-170)	(A) (B) (S1)
6A7407 (72-41-15)	2	316.00	.Blade, Stage-6 RH Lock - HP Compressor	6A4903 (02-185)	(A) (B) (S1)
6A7405C01 (72-41-15)	52	280.00	.Blade, Stage-6 nominal - HP Compressor	6A4904C01 (02-200)	(A) (B) (S1)
6A7405C01 (72-41-15)	23	280.00	.Blade, Stage-6 nominal - HP Compressor	6A4904C01 (02-215)	(A) (B) (S1)
6A7405C02 (72-41-15)	23	280.00	.Blade, Stage-6 undersize - HP Compressor	6A4904C02 (02-217)	(A) (B) (S1)

NOTE: The unit prices, if shown, are an estimate and they are given for the purposes of planning only. For information about actual prices, refer to the IAE Price Catalogue or contact IAE's spare parts sales department.

C. Instruction Disposition Codes:

(1) (A) New part will be available from November 1998.

(2) (B) Old part will be discontinued. Old parts to be discarded.

(3) (S1) New parts coded (S1) are only interchangeable with old parts coded (S1) as a complete engine set. Old parts and new parts must not be mixed together.

3. Accomplishment Instructions

A Rework Instructions

None.

B Assembly Instructions

(1) For the correct Removal/Installation procedures refer to one of the manuals that follow:

(a) Refer to the A5 Engine Manual (EM), Chapter/Section 72-41-10, Assembly-03 CONFIG-2, -4 and -6 and Disassembly.

or

(b) Refer to the D5 Engine Manual (EM), Chapter/Section 72-41-10, Assembly-03 and Assembly-03 CONFIG-1 and -2 and Disassembly.

C Recording Instructions

A record of accomplishment is necessary.