PUBLICATION TRANSMITTAL

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V2500-A1 PROPULSION SYSTEMS SERVICE BULLETIN

This document transmits the Revision 1 of Service Bulletin V2500-ENG-72-0404.

Document History

Service Bulletin Revision Status

Initial Issue. Nov.16/01.

Service Bulletin Revision 1

Remove	Incorporate	Reason for change
All pages of the Service Bulletin.	Pages 1 to 13 of the Service Bulletin.	To add approved repair vendors. Minor editorial changes.
	Page 1 of the Supplement.	To add the Supplement.

V2500-ENG-72-0404
Transmittal - Page 1 of 1

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

SERVICE BULLETIN

ENGINE – HP COMPRESSOR SHAFT – INTRODUCTION OF REVISED HP COMPRESSOR REARSHAFT ASSEMBLY WITH NO.4 BEARING LOCATION COATING (A1 MODEL)

1. Planning Information

A. Effectivity

(1) Airbus A320

V2500-A1 Engines prior to Serial No.V0362.

B. Concurrent Requirements

R None.

C. Reason

R (1) Condition

Wear has been observed on the HP Compressor rear shaft and the inner race of the No.4 bearing. In extreme cases this may result in the fit between the components exceeding acceptable limits.

R This is attributed to the variation in thermal expansion of components throughout the flight cycle, causing movement of the bearing inner ring relative to the shaft, resulting in frettage.

(2) Background

R This has been experienced on engines in service and highlighted at overhaul.

(3) Objective

Incorporation of this Service Bulletin (Modification) is designed to maintain reliability.

(4) Substantiation

The changes introduced by this Service Bulletin have been the subject of extensive engineering assessment and successful development engine testing.

(5) Effect of Bulletin on:

(a) Operation

R Not affected.

(b) Maintenance

R Not affected.

(c) Overhaul

R Affected (Refer to paragraph 1.0. Other Publications Affected).

(d) Repair Schemes

Affected.

(e) Interchangeability

Not affected

(f) Fits and Clearances

Not affected.

D. Description

(1) This Service Bulletin introduces an anti-frettage coating to the No.4 bearing location diameter of the HP compressor rear shaft assembly in order to minimise frettage and eliminate loss of fit between these two components.

The changes introduced are:

A revised HP compressor rear shaft assembly similar to the existing item except for:

(a) A recess is machined into the diameter of the shaft at the No.4 bearing location to a controlled depth of 0,076mm to 0,152mm, with a width sufficient to ensure the final run-out of applied coating is well beyond the front and rear faces of the bearing.

(b) A tungsten carbide cobalt coating is applied to the recess and machine ground back in order to maintain the current No.4 bearing location diameter.

(2) Existing HP compressor rear shaft assemblies may only be reworked providing that the No.4 Bearing diameter (identified as ZONE AB) has not been repaired with Chromium Plate in accordance with repair VRS6509 - see Figs 1 and 2.

(3) For effect on declared life see Time Limits Manual 5-10-01.

E. Compliance

Category Code 6

Accomplish when the sub assembly (i.e. modules, accessories, components, build groups) is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

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
R Aviation Regulations and are FAA-APPROVED for the engine models listed.

G. Manpower

R (1) In Service

R Not applicable.

R (2) At Overhaul/Shop Visit

R Applicable (hours not affected).

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

H. Material Price and Availability

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

R For prices and availability of future spares see 2. Material Information.

I. Tooling Price and Availability

R Special tools are not required.

J. Industry Support Information

R None.

K. Weight and Balance

(1) Weight Change

R None.

(2) Moment Arm

R No effect.

(3) Datum

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

L. Electrical Load Data

R The aircraft electrical load is not affected by this Service Bulletin.

M. Software Accomplishment Summary

R Not applicable.

N. References

(1) IAE V2500 Reference Repair Schemes:

VRS6509 HPC REAR SHAFT ASSEMBLY - REPAIR THE BEARING, FRONT SEAL, SEAL SPACER AND HPT LOCATION DIAMETERS BY CHROMIUM PLATING.

R (2) Internal reference: EC 01VR005.

(3) Engine Manual:

(a) 72-40-00, Disassembly-04 and Assembly-03

(b) 72-41-10:

(i) Disassembly, Config 1

(ii) Assembly-01, Config 1

(iii) Assembly-02, Config 1

R (4) ATA locator 72-41-13.

O. Other Publications Affected

(1) Illustrated Parts Catalogue (IPC), 1IA, 72-41-13 will be revised.

(2) Engine Manual, 1IA, 72-41-13:

R (a) Inspection/Check-01, Config 5

(b) Cleaning-01, Config 2

(c) Repairs

(d) Rework 003

(3) Time Limits Manual, 05-10-01, Config 1

P. Interchangeability of Parts

Not affected.

2. Material Information

A. The kit required consists of the following parts:

None.

B. New production parts:

R None.

R C. Parts affected by this Service Bulletin:

All Engines

72-41-13

	FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
R	01-850	6A7707	1	.Shaft, assy - rear HP Compressor	-	6A4150	(A)(C)(S1) (1D)
R	01-900	6A7708	1	..Shaft - rear HP Compressor	-	6A4151	(B) (C) (S1) (1D)

D. Instruction disposition codes:

R (A) New part is currently available.

(B) Reference only. Will not be made available as a spare for replenishment purposes.

R (C) Old part is no longer available.

(S1) New and old parts are freely and fully interchangeable.

(1D) Old part may be reworked and re-identified to the new part number.

3. Accomplishment Instructions

A. Rework Instructions

(1) This is a Source Demonstrated Service Bulletin which can only be carried out by approved vendors

The source demonstration requirements of this Service Bulletin means that any facility not authorised to accomplish this Service Bulletin, either utilise the authorised repair vendors listed below or contact the IAE Repair Services Group to determine if a qualification program can be initiated at their facility.

IAE - International Aero Engines AG
C/O Rolls-Royce plc
PO Box 31
Derby
DE24 8BJ
England
Attn: Manager Technical Services

Authorised repair vendors for Service Bulletin 72-0404 are listed below:

Rolls-Royce - Aero Repair and Overhaul
Mavor Avenue
Nerston
East Kilbride
Glasgow G74 4PY
Scotland

R MTU Maintenance Zhuhai Co. Ltd
R No. 1 Tianke Road
R Free Trade Zone
R Zhuhai, Guangdong
R PC: 519030 P.R. China
R Attn. Manager, Parts Repair

R Lufthansa Technik AG
R Weg Beim Jager 193
R D-22335 Hamburg
R Germany
R Attn. Manager, Repair Development

The designation by IAE of an authorised repair vendor indicates that the repair vendor has demonstrated the necessary capabiity to enable it to carry out the listed Service Bulletin work. However , IAE makes no warranties or representations concerning the qualifications or quality standards of the repair vendor to carry out the Service Bulletin work and accepts no responsibility whatsoever for any work that may be carried out by a repair vendor other than when IAE is listed as the repair vendor. Authorised repair vendors do not act as agents or representatives of IAE.

(2) Rework the parts that follow:

6A4150 HP compressor rear shaft assembly. Refer to Illustrated Parts Catalogue (IPC), 72-41-13, Fig/Item 01-850.

NOTE: 6A4150 (Fig/Item 01-850) is an assembly and contains the part 6A4151 (01-900).

(3) Standard equipment

Locally made grinding fixture
Cylindrical grinding machine
Dial test indicator
Standard workshop equipment
Standard workshop inspection equipment
Chemical cleaning equipment
X10 binoculars
Penetrant crack test equipment
Vibro engraving equipment

(4) Consumable materials

CoMat 06-003 Adhesive tape waterproof black
CoMat 06-022 Fluorescent penetrant

(5) Prepare the HP compressor

(a) Remove the HP compressor assembly from the engine. Refer to the applicable Engine Manual (EM) 72-00-41, Removal and Installation.

(b) Disassemble the HP compressor assembly. Refer to the applicable Engine Manual (EM)72-41-00, Removal and Installation.

(c) Disassemble the HP compressor rotor. Refer to the applicable Engine Manual (EM) 72-41-10, Removal and Installation.

PROCEDURE	RELATED DATA
(6) Make sure the HP compressor rear shaft assembly can be repaired	You cannot rework the assembly if the assembly is identified 6A7707, VRS6509/1, VRS6509/2, VRS6509/3, VRS6509/4 and/or with a triangle with the letters A, B, C or D inside it.
(7) Grind the HP compressor rear shaft assembly	
(a) Install the fixture into the cylindrical grinding machine	Use a locally made grinding fixture and cylindrical grinding machine
(b) Install the HP compressor rear shaft assembly on to the fixture and set to turn correctly	Refer to Fig 1 and Fig 2. Use a dial test indicator and standard workshop equipment. Make sure that datums A, B and C are set to turn correctly
(c) Grind the HP compressor rear shaft assembly	Refer to Fig 1 and Fig 2. Refer to approved vendor process

PROCEDURE	RELATED DATA
(d) Remove burrs	Use standard workshop equipment
(8) Inspect the HP compressor rear shaft assembly	Refer to approved vendor process. Use standard workshop inspection equipment.
(9) Chemically clean the HP compressor rear shaft assembly	Refer to SPM TASK 70-11-01-300-503. Use chemical cleaning equipment
(10) Cold ferric chloride etch surface AB on the HP compressor rear shaft	Refer to Fig 1 and Fig 2. Refer to SPM TASK 70-11-39-300-503, SUBTASK 70-11-39-300-001. Use chemical cleaning equipment
(11) Visually examine surface AB on the HP compressor rear shaft	Refer to Fig 1 and Fig 2. Use X10 binoculars. Indications of defects are not permitted
(12) Do a local penetrant crack test on surface AB of the HP compressor rear shaft	Refer to Fig 1 and Fig 2. Refer to SPM TASK 70-23-05-230-501. Use CoMat 06-022 fluorescent penterant, with penetrant crack test equipment. Cracks are not permitted

PROCEDURE	RELATED DATA
(13) Shot peen surface AB on the HP compressor rear shaft	
(a) Seal the full assembly but for the area which is to be shot peened	Refer to Fig 1 and Fig 2. Use CoMat 06-003 adhesive tape black waterproof or a mechanical seal. Patch mask all identification marks and symbols
(b) Shot peen the area which is to be shot peened	Refer to Fig 1 and Fig 2. Refer to vendor approved process
(c) Make sure all loose unwanted cast steel shot is removed	
(d) Remove iron contamination after you have shot peened, as necessary	Refer to Fig 1 and Fig 2. Refer to vendor approved process
(e) Remove adhesive tape and/or mechanical seals	
(f) Examine the shot peened area	Refer to Fig 1 and Fig 2. Refer to vendor approved process
(14) Apply the metal spray hard coating to surface AB on the HP compressor rear shaft	Refer to Fig 1 and Fig 2. Refer to vendor approved process
NOTE: Overspray of the metal spray coating is permitted on surfaces AE	
(15) Grind the hard coating on the HP compressor rear shaft	
(a) Install the fixture into the cylindrical grinding machine	Use a locally made grinding fixture
(b) Install the HP compressor rear shaft assembly on to the fixture and set to turn correctly	Refer to Fig 1 and Fig 2. Use a dial test indicator and standard workshop equipment. Make sure that datums A, B and C are set to turn correctly
(c) Grind the HP compressor rear shaft assembly	Refer to Fig 1 and Fig 2. Refer to approved vendor process
(d) Remove burrs	Use standard workshop equipment
(16) Visually and dimensionally inspect the HP compressor rear shaft assembly	Refer to Fig 1 and Fig 2. Use standard workshop inspection equipment
(17) Do a crack test	Refer to vendor approved process

(18) Chemically clean the repaired area	Refer to SPM TASK 70-11-26-300-503, SUBTASK 70-11-26-300-002	
(19) Cancel the existing part number and re-identify the HP compressor rear shaft assembly with the new part number adjacent to the existing part number	Refer to SPM TASK 70-09-00-400-001. Use vibro-engraving equipment	
	Existing	Re-number
	6A4150	6A7707

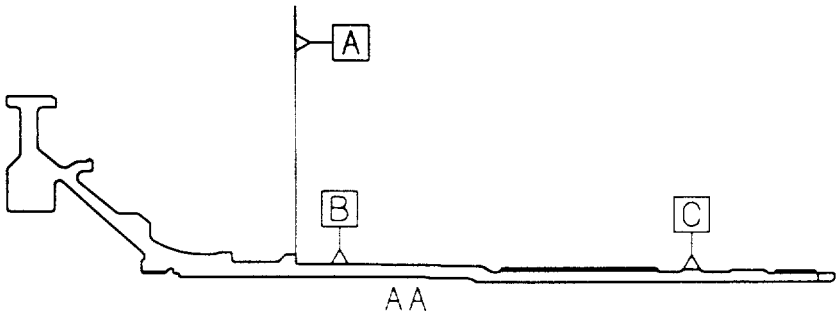
NOTE: Estimated 14 man-hours for rework only

B. Assembly Instructions

The revised HP compressor rear shaft assembly introduced by this Service Bulletin is interchangeable with existing. Remove and install in accordance with current overhaul procedures (Engine Manual, 72-40-00, 72-41-10, Disassembly and Assembly (see 1.N. References)).

C. Recording Instructions

R (1) A record of accomplishment is required.

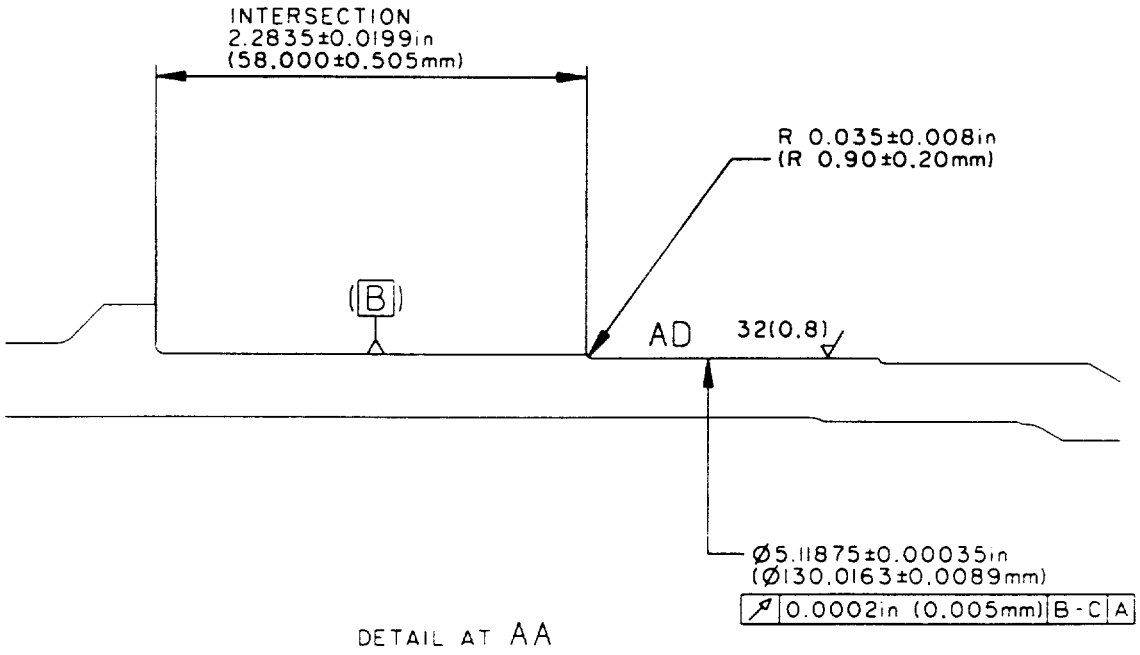


BASIC SECTION THROUGH
HP COMPRESSOR REAR SHAFT

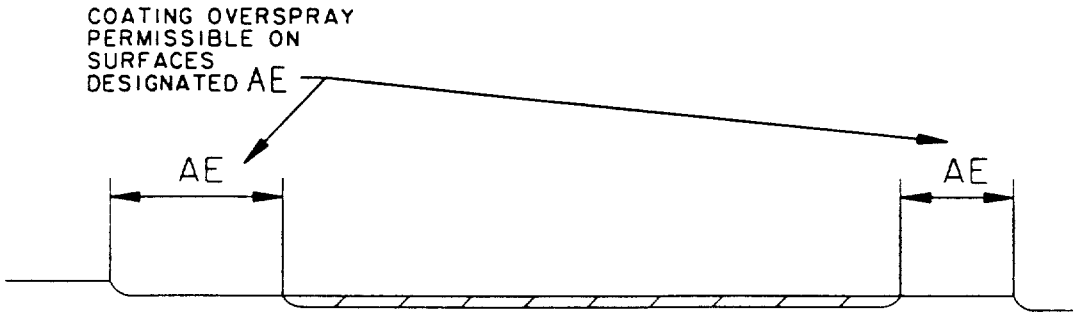
SURFACE TEXTURE VALUES IN MICROINCHES (MICROMETRES)
GEOMETRIC SYMBOLS CONFORM TO ISO R1101

dem0000610

Rework of HP compressor rear shaft
Fig 1



DETAIL AT AA



DETAIL AT AD

dem0000612

Rework of HP compressor rear shaft
Fig 2

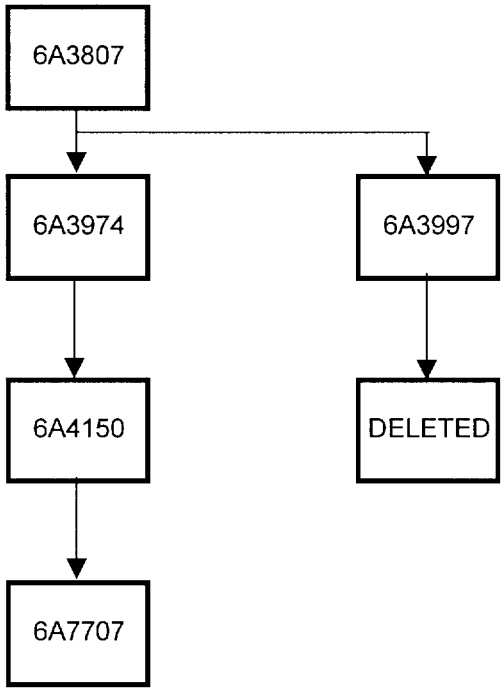
V2500-A1 Family Tree

Baseline

V2500-ENG-72-0068
Engine - HPC Rear Shaft - Increased life rear shaft

V2500-ENG-72-0098
Engine - HP Compressor - To announce a new rear shaft assy for the HP Compressor

V2500-ENG-72-0404
Introduction of a revised HP Comp rear shaft assembly with No.4 bearing location diameter coating



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V2500-A1 family tree
Fig 3

SERVICE BULLETIN

ENGINE – HP COMPRESSOR SHAFT – INTRODUCTION OF REVISED HP COMPRESSOR REARSHAFT ASSEMBLY WITH NO.4 BEARING LOCATION COATING (A1 MODEL)

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
6A7707	.Shaft, assy – rear HP Compressor	118,670.00

Part is currently available for sale.

3. Tools

None.