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

This document transmits Revision 6 to Service Bulletin EV2500-72-0384

Document History

Service Bulletin Revision Status		Supplement Revision Status
Initial Issue	Oct.3/00	
Revision 1	Dec.15/00	
Revision 2	Sep.21/01	
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Revision 4	Jun.19/02	
Revision 5	Mar.16/04	

Bulletin Revision 6

Remove	Incorporate	Reason for change
	Page 1 and 2 of the Summary	To amend address for GKN Aerospace Chem-tronics Inc. and to add Summary pages.
All pages of the Service Bulletin	Pages 1 to 20 of the Service Bulletin	To amend address for GKN Aerospace Chem-tronics Inc. and to add Summary pages.
All pages of Appendix 1	Page 1 and 2 of Appendix 1	To amend address for GKN Aerospace Chem-tronics Inc. and to add Summary pages.
All pages of Appendix 2	Pages 1 to 3 of Appendix 2	To amend address for GKN Aerospace Chem-tronics Inc. and to add Summary pages.

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
If any have not been received please advise Publication Services, Rolls-Royce plc, Derby, England

LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 6 are as follows:

Page		Revision Number	Revision Date
	Summary		
R	1	6	Jul.1/04
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R	3	6	Jul.1/04

ENGINE - LP COMPRESSOR BLADES AND FILLERS - INTRODUCTION OF A REVISED LP COMPRESSOR BLADE WITH METCO 58 - REWORK

SUMMARY

R 1. PLANNING

R A. EFFECTIVITY

R Engine

R V2500-A1
R V2500-A5
R V2500-D5

R B. CONCURRENT REQUIREMENTS

R None.

R C. REASON/PROBLEM

R Problem

R Frettage between the LP compressor blade root and the fan disc can occur. In
R extreme cases this can result in fatigue cracking of the blade root

R The problem is attributed to the loss of the dry film lubricant coating from
R the blade root, as a result of cyclic contact loading on the blade /disc
R bedding faces. This allows an increase in friction levels between the blade and
R disc and also frettage of the bedding surfaces.

R Background

R One example of LP compressor root cracking has been discovered to date.

R Substantiation

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

R Objective

R Incorporation of the changes introduced by this Service Bulletin (Modification)
R is designed to maintain reliability.

R

R

R

R D. DESCRIPTION

R This Service Bulletin introduces a coating that is applied to the fan blade
R root flank surfaces to increase the retention of dry film lubricant and
R minimise friction between the fan blade root and the fan disc.

R A revised LP compressor blade is introduced similar to the existing item except
R for the introduction of Metco 58 to the blade root flank surfaces prior to the
R application of the dry film lubricant.

R E. COMPLIANCE

R Category Code 4

R Accomplish at the first shop 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.

R F. MANPOWER

R In service - Not applicable.

R At overhaul - Not affected.

R G. INTERCHANGEABILITY OF PARTS

R It is recommended that the parts introduced by this Service Bulletin are
R introduced as a set.

R 2. MATERIAL INFORMATION

R A. PARTS PRICES

R None (No new parts are introduced by this Service Bulletin).

ENGINE - LP COMPRESSOR BLADES AND FILLERS - INTRODUCTION OF A REVISED LP COMPRESSOR BLADE WITH METCO 58 - REWORK

1. Planning Information

A. Effectivity

(1) Airbus A319

V2522-A5, V2524-A5, V2527M-A5 Engines

(2) Airbus A320

(a) V2500-A1 Engines

(b) V2527-A5, V2527E-A5 Engines

(3) Airbus A321

V2530-A5, V2533-A5 Engines

(4) Boeing Longbeach Division MD-90

V2525-D5, V2528-D5 Engines

B. Concurrent Requirements

None

C. Reason

(1) Problem

Frettage between the LP compressor blade root and the fan disc can occur. In extreme cases this can result in fatigue cracking of the blade root

The problem is attributed to the loss of the dry film lubricant coating from the blade root, as a result of cyclic contact loading on the blade /disc bedding faces. This allows an increase in friction levels between the blade and disc and also frettage of the bedding surfaces.

(2) Background

One example of LP compressor root cracking has been discovered to date.

(3) Objective

Incorporation of the changes introduced by 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 successful rig and development engine testing and experience.

(5) Effect of Bulletin on:

(a) Operation

Not affected

(b) Maintenance

Not affected

(c) Overhaul

Affected

(d) Repair Schemes

Affected

(e) Interchangeability

Not affected

(f) Fits and Clearances

Not affected

D. Description

(1) This Service Bulletin introduces a coating that is applied to the fan blade root flank surfaces to increase the retention of dry film lubricant and minimise friction between the fan blade root and the fan disc.

A revised LP compressor blade is introduced similar to the existing item except for the introduction of Metco 58 to the blade root flank surfaces prior to the application of the dry film lubricant.

(2) Existing LP compressor blades can be reworked. See Figs 1 to 3

E. Compliance

Category Code 4

Accomplish at the first shop visit of an engine or module to a maintenance base capable of compliance with the accomplishment instructions regardless of the 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

(1) In service

Not applicable

(2) At overhaul

Not affected

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

H. Material Price and Availability

Modification kit not required, existing parts can be reworked

I. Tooling Price and Availability

Tools will be required and are shown in the Accomplishment Instructions or in Engine Manual, 72-31-11, Repair VRS1723 - LP Compressor blade - Shot peen blade root

J. Weight and Balance

(1) Weight Change

None

(2) Moment Arm

None

(3) Datum

Engine front mount centreline (Power Plant Station PPS 100)

K. Electrical Load Data

This Service Bulletin has no effect on the aircraft electrical load

L. References

(1) IAE V2500 Service Bulletins.

ENG-70-0025	Information - LP compressor - To announce a fan blade with improved bonding features
ENG-70-0307	Information - Engine - To announce the availability of a new fan blade that eliminates unnecessary manufacturing features
ENG-72-0271	Engine - LP compressor blades and fillers - Introduction of revised pressure and suction aerofoil panels
ENG-72-0372	Engine - LP compressor blades and fillers - Introduction of a revised wide chord fan blade with deleted root stop pin and revised front and rear chocking pads
ENG-72-0375	Engine - LP compressor blades and fillers - Introduction of a revised LP compressor blade with Metco 58
ENG-72-0386	Engine - LP compressor fan blades - Dovetail root flank ultrasonic inspection and application of dry film lubricant - Non-Modification Service Bulletin
ENG-72-0387	Engine - LP compressor fan blades - Dovetail root flank - Inspection and re-application of dry film lubricant - Non-Modification Service Bulletin
ENG-72-0409	Engine - LP compressor fan blades - Dovetail root flank - Inspection and re-application of dry film lubricant - Non-Modification Service Bulletin

(2) Engine Manual, 72-31-00, Disassembly and Assembly

(3) Aircraft Maintenance Manual, 72-31-11, Disassembly and Assembly

R (4) Internal reference EC 00VR011, 04VR711, 04VR807.

(5) ATA Locator - 72-31-11.

M. Other Publications Affected

(1) V2500 Engine Illustrated Parts Catalogue, 72-31-11 will be revised

(2) V2500 Engine Manual, 72-31-11, Cleaning 02 and Inspection/Check 02

N. Interchangeability of Parts

It is recommended that the parts introduced by this Service Bulletin are introduced as a set.

2. Material Information

A. The kit required consists of the following parts:

None

B. Parts to be reworked:

V2500-A1 Engines

72-31-11

For engines not incorporating SB70-0025

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01300	6A7649	22	Blade assy rotor compressor LP	-	6A3494	(S1) (1D)

For engines incorporating SB70-0025

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01300	6A7650	22	Blade assy - rotor LP compressor	-	6A3971	(S1) (1D)

For engines incorporating SB70-0307

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01300	6A7651	22	Blade assy - rotor LP compressor	-	6A5485	(S1) (1D)

For engines incorporating SB72-0271

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01300	6A7652	22	Blade assy - rotor LP compressor	-	6A6519	(S1) (1D)

For engines incorporating SB72-0372 and 70-0025

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01300	6A7653	22	Blade assy - rotor LP compressor	-	6A7403	(S1) (1D)

For engines incorporating SB72-0372 but not 70-0025

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01300	6A7658	22	Blade assy - rotor LP compressor	-	6A7656	(S1) (1D)

C. V2500-A5 and D5 engines

72-31-11

For engines not incorporating SB72-0271

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01300	6A7654	22	Blade assy rotor LP compressor	-	6A4700	(S1) (1D)

For engines incorporating SB72-0271

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01300	6A7655	22	Blade assy rotor LP compressor	-	6A6521	(S1) (1D)

D. Instructions disposition codes:

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

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

3. Accomplishment Instructions.

A. Rework existing LP Compressor Fan Blade Assemblies - 6A3494, 6A3971, 6A5485, 6A6519, 6A7403, 6A7656, 6A4700 and 6A6521 (Refer to 72-31-11, Fig/Item 01-300)

NOTE: Blades that have been used in service can only be reworked to this Service Bulletin if they have been inspected and accepted to:

(a) Ultrasonic examination requirements, as specified in Non-Modification Service Bulletin V2500-ENG-72-0386, 72-0387 or 72-0409 Accomplishment Instructions

(b) Penetrant examination requirements as specified in Standard Practices Manual, TASK 70-23-04-230-501

(c) Visual examination requirements as specified within this Service Bulletin (SB 72-0384), 3. Accomplishment Instructions, including Appendix 1 (Threshold Limits).

NOTE: These rework instructions contain aspects which require Source Demonstration, such as repair VRS1723 and metal spray coating of dovetail working flanks. Only companies that have letters of approval from International Aero Engines (IAE) are authorised to carry out this work

Companies authorised to carry out this work are:

R GKN Aerospace Chem-tronics Inc
R 1150 West Bradley
R El Cajon
R CA 92020
USA

R Tel (619) 258 5040
R Fax (619) 448 6992

R Director Product Development Mr Terry Barker

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

Tel 44(0)1355 277434
Fax 44(0)1355 277601

Customer Business Manager Mr Ian Halliday

NB The shot peening to VRS1723 will be subcontracted to Metal Improvements Company (MIC) Derby

Sermatech Repair Services Limited
High Holborn Road
Codnor
Derbyshire
DE5 3NW

Tel 44 (0)1773 748926
Fax 44 (0)1773 570706

The Engineering Manager: Mr Lee Van Der Velde

Hong Kong Aero Engine Services Limited (HAESL)
70 Chun Choi Street
Tseung Kwan O Industrial Estate
Tseung Kwan O
New Territories
Hong Kong

MTU Maintenance GMBH
Flughafen Hannover
Muncher Strasse 31
30855 Langenhagen
Germany

Tel 49 511 7806 582
Fax 49 511 7806 603

The Customer Support Director - Parts Repair - Dr Carl Fredin

Ishikawajima - Harima Heavy Industries Co., Ltd. (IHI)
229 Tonogaya Mizuho-machi,
Nishitama-gun,
Tokyo 190 - 1297
Japan

Attn: Customer Support Manager, Maintenance Department,
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E-Mail: EPAR@lht.dlh.de
Web: www.lufthansa-technik.com/epar
The Sales Executive: Mr Fritz Beiner

Tools

Tools will be required and are shown either within the body of these instructions or in Engine Manual, 72-31-11, in the repairs that follow:

VRS1723	LP compressor blade - Shot peen blade root

NOTE: Locally manufactured tooling can be used in the course of performing these rework instructions, providing they have been approved by IAE Technical Services Derby, Repair Engineering, prior to use

Consumable Materials

CoMat 03-261	Metco 58NS metal spray powder - copper, nickel, indium
CoMat 05-002	Abrasive blast media
CoMat 06-022	Ultra high sensitivity post emulsified fluorescent penetrant

Consumable Materials

Other consumable materials will be required and are shown either within the body of these instructions or in Engine Manual, 72-31-11, in the repairs that follow:

VRS1022	LP compressor blade - Replace the chocking pads
VRS1028	LP compressor blade - Replace the chocking pads
VRS1021	LP compressor blade - Replace the dry film lubricant
VRS1023	LP compressor blade - Replace the dry film lubricant
VRS1723	LP compressor blade - Shot peen blade root

Standard Equipment

Chemical cleaning equipment

Standard workshop equipment

Penetrant crack test equipment

Vibro engraving equipment

Abrasive blasting equipment

Metal spray equipment

CAUTION: TITANIUM COMPONENTS: ALL GRINDING WHEELS, STONES AND ABRASIVE PAPERS USED FOR CUTTING AND POLISHING MUST BE OF THE SILICONE CARBIDE TYPE. IF MECHANICAL CUTTERS ARE USED, ONLY LIGHT CUTS MUST BE MADE TO PREVENT OVERHEATING OF THE MATERIAL. IF THE MATERIAL IS DISCOLOURED BECAUSE OF HEATING, DARKER THAN A LIGHT STRAW COLOUR, THE COMPONENT IS TO BE REJECTED

PROCEDURE	RELATED DATA
(1) Remove front and rear chocking pads from blade	Refer to Fig 1 Refer to Engine Manual, TASK 72-31-11-300-009, (Repair VRS1022) or Refer to Engine Manual, TASK 72-31-11-300-013, (Repair VRS1028)
(2) Remove dry film lubricant from blade	Refer to Fig 1 Refer to Engine Manual, TASK 72-31-11-300-021, (Repair VRS1023) or Refer to Engine Manual, TASK 72-31-11-300-011, (Repair VRS1021)

(3)	Ultrasonically inspect both flanks of the LP compressor blade root	Refer to Non-Modification Service Bulletin (NMSB) V2500-ENG-72-0386, 72-0387 or 72-0409 Accomplishment Instructions for equipment and procedure. NOTE: Make sure both concave and convex flanks are examined. Reject blade if outside acceptance limits
(4)	Penetrant crack test the repair area	Refer to Standard Practices Manual, TASK 70-23-04-230-501. Use CoMat 06-022 Ultra high sensitivity post emulsified fluorescent penetrant. Use penetrant crack test equipment. Reject if cracked/scarred
(5)	Visually examine the blade root	Refer to Figs 1 and 2 Refer to Appendix 1 Refer to SPM TASK 70-21-01-220-501. Visually examine the blade root. Reject if cracked/scarred
(6)	Shot peen the blade root	Refer to Figs 1 and 2 Refer to Engine Manual, TASK 72-31-11-300-024, (Repair VRS1723) NOTE: VRS1723 is a source demonstrated repair
(7)	Mask the blade	Refer to Figs 1 and 2 Refer to SPM TASK 70-34-01-340-001. Put suitable masking on the areas not to be abrasive blasted and metal sprayed. NOTE: It is important to make sure the masking is positioned correctly

(8) Abrasive blast the blade	Refer to Figs 1 and 2 Refer to SPM TASK 70-34-01-340-001. Abrasive blast the area to be metal sprayed at 20 to 25 psi. Use pressure pot abrasive blasting equipment. Keep a nozzle to part distance of at least 76mm (3in.). Make sure the blasting cabinet is thoroughly cleaned and the abrasive medium changed before blasting each set of fanblades (22 off). Use Co-Mat 05-002 abrasive blast media. Use abrasive blasting equipment
(9) Renew blade masking if necessary	Refer to Figs 1 and 2. Refer to SPM TASK 70-34-01-340-001
(10) Apply metal spray coating to blade dovetail root working flanks	Refer to Figs 1 and 2 Refer to SPM TASK 70-34-01-340-501, SUBTASK 70-34-01-340-005. Use CoMat 03-261 (Metco 58NS) metal spray powder - copper, nickel, indium. Apply the metal spray to a finished thickness of 0,10 to 0,15mm and leave in the 'as sprayed condition'. Use 3R19551 rotating metal spray fixture and test piece holder - 1 off. Use metal spray equipment NOTE: This activity is a source demonstrated requirement
(11) Remove the blade masking	Take care not to damage the sprayed coating. Use hand methods
(12) Inspect the metal sprayed coating	Refer to Figs 1 and 2 Refer to SPM TASK 70-34-01-340-501, SUBTASK 70-34-01-340-005 Make sure the metal sprayed coating has been correctly applied. Make sure the thickness of the sprayed coating is within the limits given by measuring the coating thickness on the metal spray test pieces
(13) Apply dry film lubricant to blade root	Refer to Fig 1 Refer to Engine Manual, TASK 72-31-11-300-021, (Repair VRS1023), or Refer to Engine Manual, TASK 72-31-11-300-011, (Repair VRS1021)

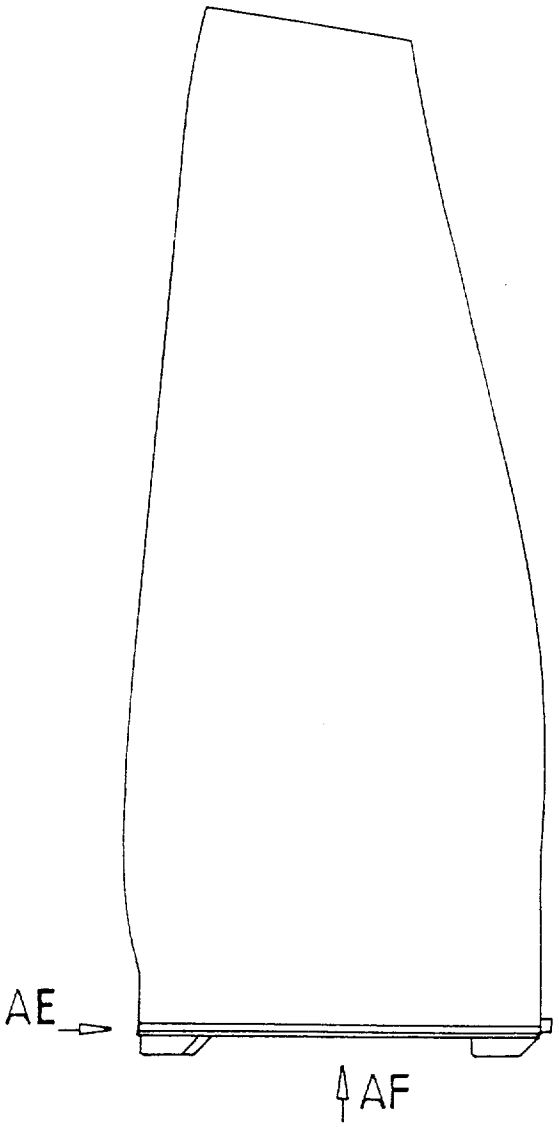
(14) Bond chocking pads to blade root	Refer to Fig 1 Refer to Engine Manual, TASK 72-31-11-300-009, (Repair VRS1022), or Refer to Engine Manual, TASK 72-31-11-300-013, (Repair VRS1028)	
(15) Re-identify by cancelling the existing blade assembly part number and adjacent to it mark new assembly part number followed by the letters 'ASSY'	Refer to Fig 3	
	Existing	Re-number
	6A3494	6A7649
	6A3971	6A7650
	6A5485	6A7651
	6A6519	6A7652
	6A7403	6A7653
	6A7656	6A7658
	6A4700	6A7654
	6A6521	6A7655
	Use vibro-peening equipment	

B. Assembly Instructions

The revised parts introduced by this Service Bulletin are interchangeable with existing. Remove and install in accordance with current overhaul procedures and maintenance practices (Engine Manual 72-31-00, Disassembly and Assembly and Aircraft Maintenance Manual 72-31-11, Disassembly and Assembly).

C. Recording Instructions

A record of accomplishment is required



VIEW OF LP COMPRESSOR
BLADE ASSEMBLY

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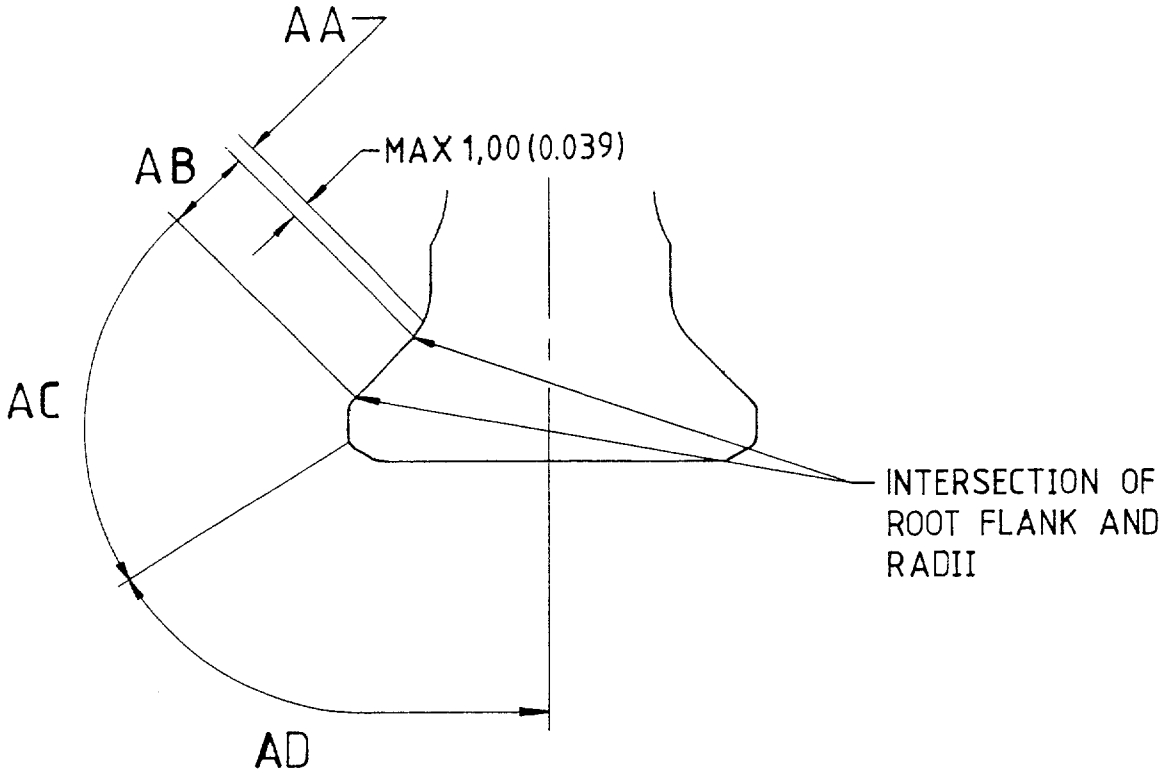
View of LP compressor blade assembly
Fig 1



VIEW → AE
ZONES ARE SYMMETRICAL
AND APPLY TO FULL LENGTH
OF BLADE ROOT

GRIT BLAST ZONES AA AND AB TO THE INSTRUCTIONS
METAL SPRAY TO BE APPLIED TO ZONE AB TO THE
INSTRUCTIONS WITH A RUNOUT INTO ZONE AA
OVERSPRAY IS ACCEPTABLE WITHIN ZONE AC AS A NATURAL
RUNOUT BUT NOT ACCEPTABLE WITHIN ZONE AD

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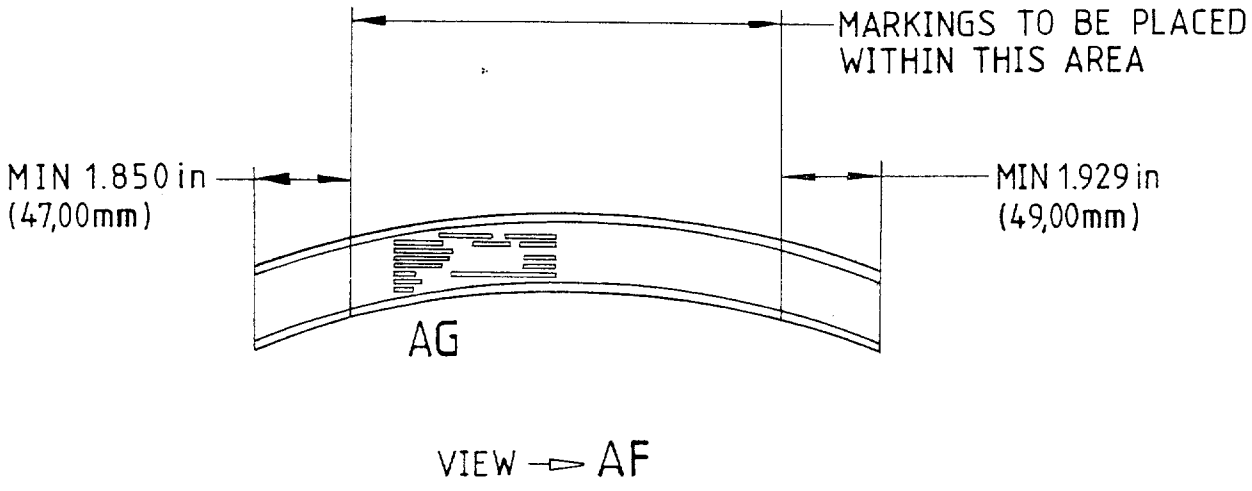
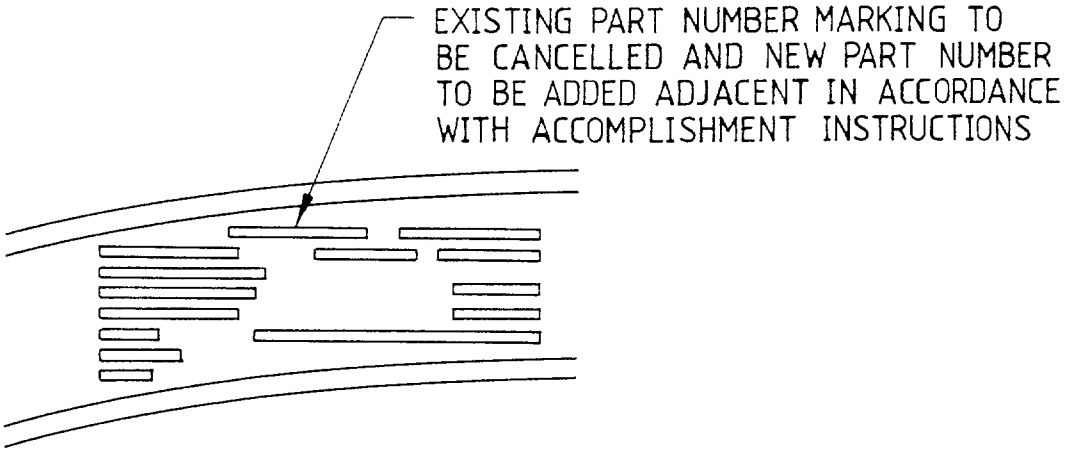
LP compressor blade view at AE
Fig 2





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LP compressor blade view at AF
Fig 3

Baseline

V2500-ENG-70-0025
Information-LP Compressor-To announce a fan blade with improved bonding features.

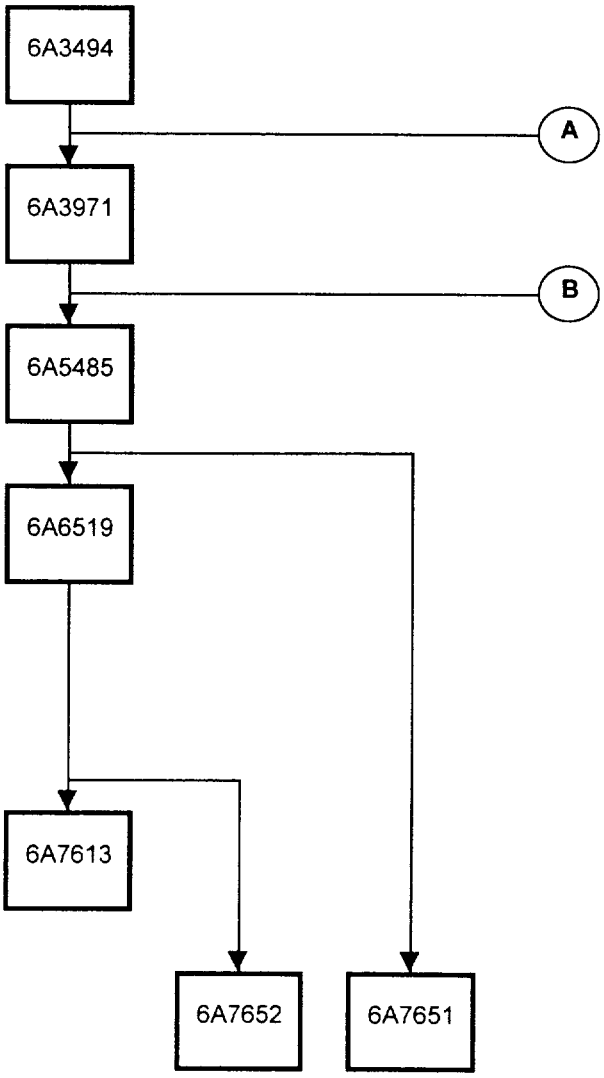
V2500-ENG-70-0307
Information-Engine-To announce the availability of a new fan blade that eliminates unecessary manufacturing features.

V2500-ENG-72-0271
Engine-LP Compressor blades and fillers-Introduction of revised pressure and suction aerofoil panels

V2500-ENG-72-0372
Engine-LP Compressor blades and fillers-Introduction of a wide cord fan blade with deleted root stop pin and revised front and rear chocking pads.

V2500-ENG-72-0375
Engine-LP Compressor blades and fillers-Introduction of a revised LP Compressor blade with metco 58.

V2500-ENG-72-0384
Engine-LP Compressor blades and fillers-Introduction of a revised LP Compressor blade with metco 58-Rework



V2500-A1 Fan Blade Family Tree

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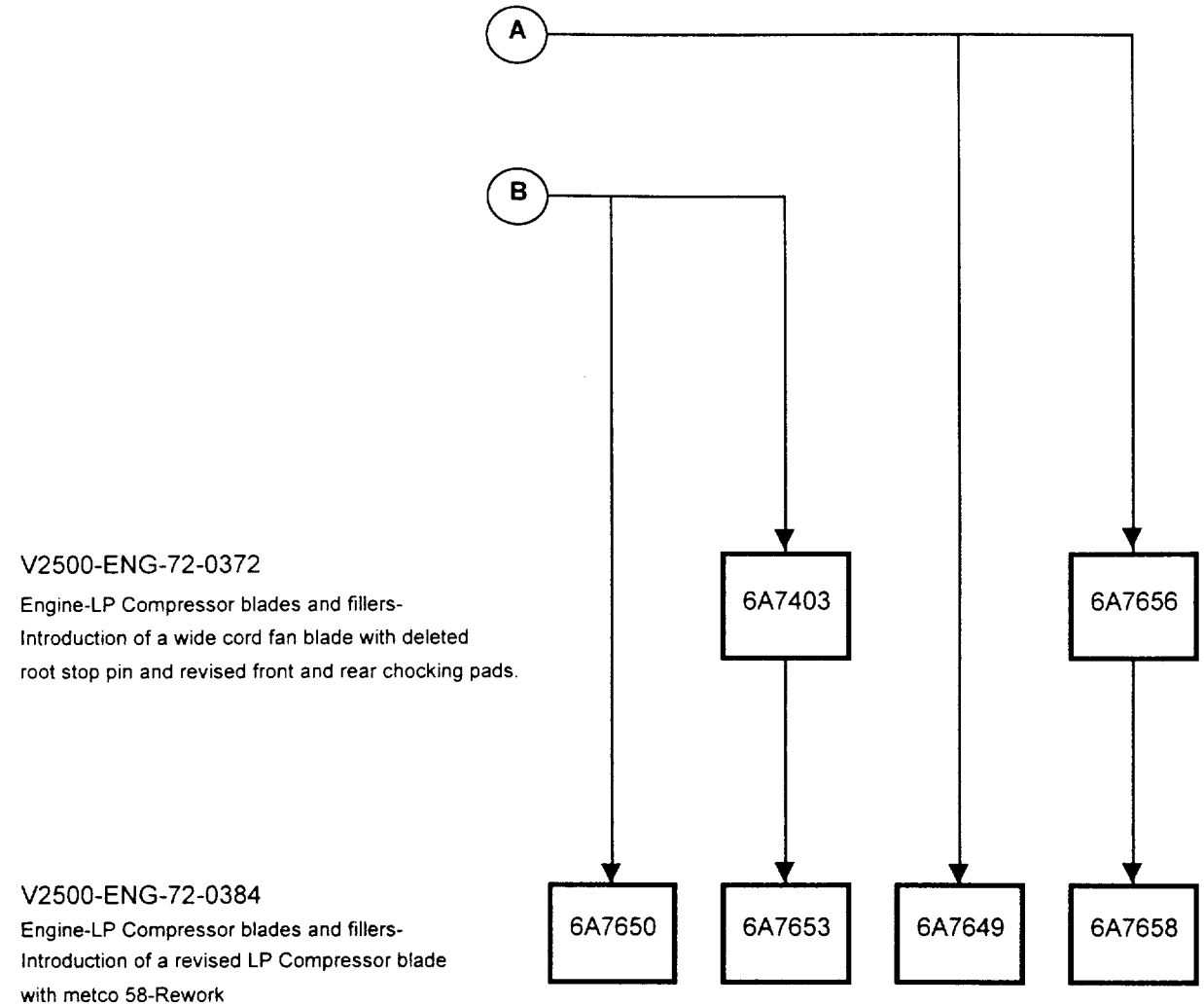
V2500-A1 fan blade family tree
Fig 4



V2500-ENG-72-0372
Engine-LP Compressor blades and fillers-
Introduction of a wide cord fan blade with deleted
root stop pin and revised front and rear chocking pads.

V2500-ENG-72-0384
Engine-LP Compressor blades and fillers-
Introduction of a revised LP Compressor blade
with metco 58-Rework

V2500-A1 Fan Blade Family Tree

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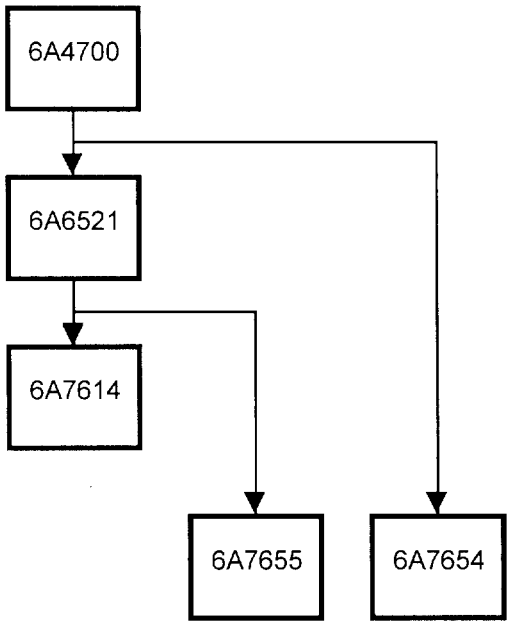
V2500-A1 fan blade family tree
Fig 5

Baseline

V2500-ENG-72-0271
Engine-LP Compressor WCFB-Introduction of revised pressure and suction aerofoil panels

V2500-ENG-72-0375
Engine-LP Compressor blades and fillers-Introduction of a revised LP Compressor blade with metco 58.

V2500-ENG-72-0384
Engine-LP Compressor blades and fillers-Introduction of a revised LP Compressor blade with metco 58-Rework



V2500-A5 AND D5 Fan Blade Family Tree

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V2500-A5 and D5 fan blade family tree
Fig 6

APPENDIX 1

Visual Inspection Requirements

1. General

The Metco 58 rework is to be applied to the fan blade before a definite number of flight cycles (threshold) has been reached (see below for special requirements relating to part numbers 6A4700 and 6A6521 which have exceeded the recommended Metco 58 rework threshold number of cycles). The flight cycle thresholds are given below and are dependent upon the fan blade part number and the engine rating. These thresholds apply to all marks of the V2500-A5 engine. All other engine marks can be reworked at any time during the life of the fan blade. For fan blades that have operated at different engine ratings, the highest rating threshold life is to apply. The life of the fan blade is not re-initialised by the application of Metco 58.

The technique for carrying out binocular visual inspection is detailed in Appendix 2.

2. Fan Blades to Part Number 6A4700

Rework of fan blades to add Metco 58 is carried out before the blades have completed more than the number of flight cycles detailed below

NOTE: If blade cycle life or engine mark is not known, then the minimum threshold of 2100 (flights) must be applied

Engine Mark	Metco 58 rework threshold (flights)
V2522-A5	N/A
V2524-A5	N/A
V2527-A5	11300
V2527M-A5	11300
V2527E-A5	11300
V2530-A5	4300
V2533-A5	2100

Fan blades with the part number 6A4700 which have operated more flights than the recommended Metco 58 rework threshold can only be reworked providing they meet the acceptance standards for ultrasonic root inspection and a x30 binocular root inspection.

3. Fan Blades to Part Number 6A6521

Rework of the fan blades to add Metco 58 is carried out before the blades have completed more than the number of flight cycles detailed below

NOTE: If fan blade cycle life or engine mark is not known, then the minmum threshold of 1000 (flights) must be applied.

Engine Mark	Metco 58 rework threshold (flights)
V2522-A5	12200
V2524-A5	9800
V2527-A5	5300
V2527M-A5	5300
V2527E-A5	5300
V2530-A5	2000
V2533-A5	1000

Fan blades with the part number 6A6521 which have operated more flights than the recommended Metco 58 rework threshold can only be reworked providing they meet the acceptance standards for ultrasonic root inspection and a x30 binocular root inspection

4. Fan Blades to all other Part Numbers

Where there is no flight cycle (threshold) life applicable, these blades will be visually inspected as detailed in the Standard Practices Manual, TASK 70-21-01-220-501

APPENDIX 2

Binocular Visual Inspection Technique

1. Tooling and Equipment

A. Desk lamp (local supply), 40-50W bulb with shade less than 110mm diameter and 110mm length

B. Blade mounting fixture, IAE3R19454 or local manufacture

C. Binocular (local supply), minimum magnification range of x10 to x50 and overhang such that the centre of binocular can be positioned 350mm away from edge of base mounting.

NOTE: Advice on suitable binoculars can be provided by Rolls-Royce. An example of a ssuitable binocular would be a Nikon SMZ645 with x10 eyepieces and C-US2 stand.

2. Introduction

This technique covers the inspection of V2500 fan blade roots for top edge of bedding cracking in the region shown in Appendix 2 Fig 7.

The person carrying out this inspection should be proficient at binocular inspections. Additional specific training is recommended for this inspection, contact Rolls-Royce.

3. Preparation

Carry out swab etch of convex and concave root flank in accordance with SPM TASK 70-11-08-300-503. The etch should extend for at least 5mm above the top edge of bedding but no more than 20mm up the blade measured from the root base.

4. Inspection

A. Position fan blade in mounting fixture to view the convex side

B. Adjust lamp to optimum illumination position for highlighting top edge of bedding, as illustrated in Appendix 2 Fig 7

C. Set magnification of binocular to x10 and bring the top edge of bedding at leading edge end of the inspected region into focus. Adjust magnification to x30 and refocus if necessary

D. Slowly traverse along the blade, inspecting the entire top edge of bedding from leading edge to trailing edge as shown in Appendix 2 Fig 7

NOTE: The inspection should cover the area approximately 2mm above and below the top edge of bedding. Refocus binocular and adjust lamp as required

E. Check any suspicious features by inspecting at x50 magnification

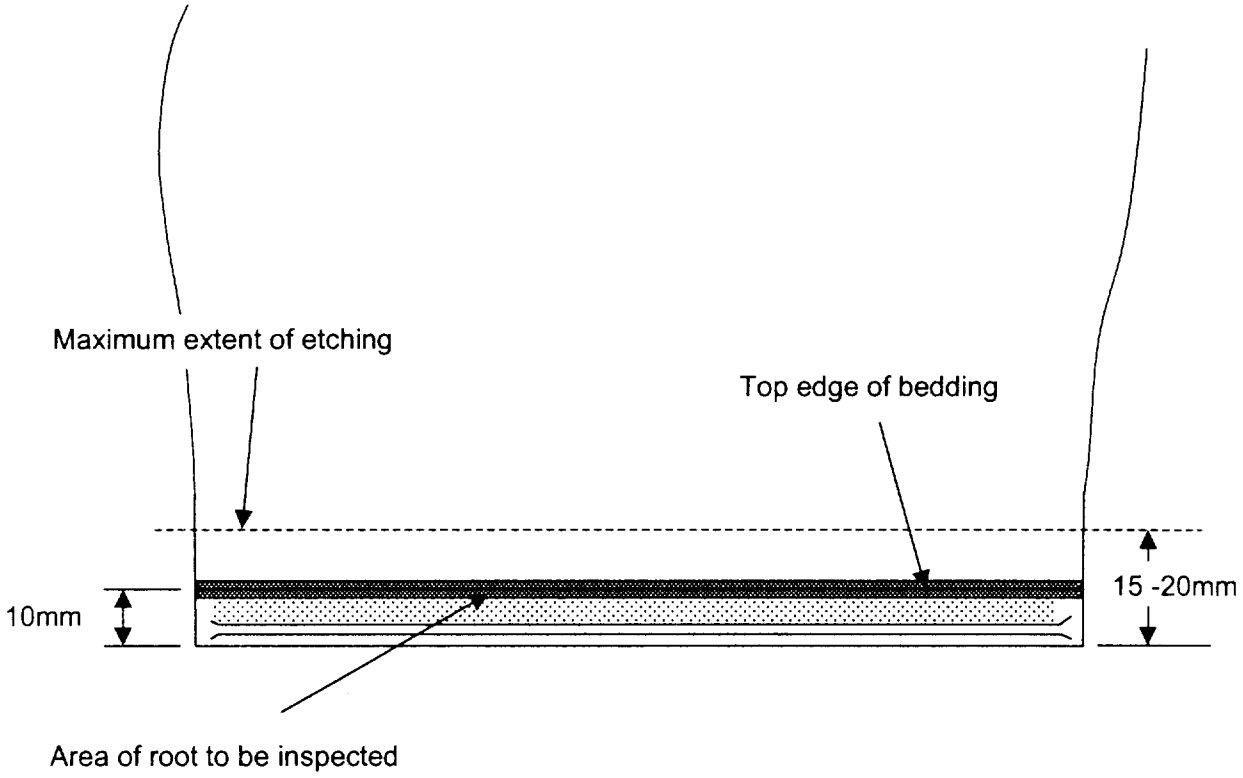
F. Repeat for viewing the concave side

5. Acceptance Standards

A. Reject any blade exhibiting a crack like feature running axially along the root in the inspected region

NOTE: Dark islands standing proud of the surface are likely to be areas of residual dry film lubricant. These areas must be cleaned thoroughly, re-etched and inspected

B. Reject any blade exhibiting a 'scar' or crater-like feature



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Area to be inspected
Fig 7