International Aero Engines

SERVICE BULLETIN

ENGINE - HP COMPRESSOR - INTRODUCE A NEW STAGE 3 HPC ROTOR BLADE WITH A CUT BACK CLAPPER - CATEGORY CODE 6 - MOD.ENG-72-0201

1. Planning Information

A. Effectivity

(1) Aircraft:
(a) Airbus A320
(b) Airbus A321
(c) McDonnell Douglas MD90

(2) Engine:
(a) V2527-A5 Engines prior to Serial No.V10105 except for V10103
(b) V2530-A5 Engines prior to Serial No.V10105 except for V10103
(c) V2525-D5 Engines prior to Serial No.V20014
(d) V2528-D5 Engines prior to Serial No.V20014

B. Concurrent Requirements

None

C. Reason

(1) Condition

HP compressor stage 3 rotor blades have experienced clapper cracking.

(2) Background

Isolated instances of stage 3 rotor blade clapper load face cracking have been found on development engines.

(3) Objective

To prevent the blade clapper cracking or corner release.

(4) Substantiation

Testing has confirmed that increasing the radius on the clapper leading edge corner is an effective solution to reduce stresses and improve fatigue capability.

(5) Effect of Bulletin on Workshop Procedures:

Removal/Installation	Not affected
Disassembly/Assembly	Not affected
Cleaning	Not affected
Inspection/Check	Not affected
Repair	Not affected
Testing	Not affected

(6) Supplemental Information

None

D. Description

This bulletin introduces a stage 3 HP compressor rotor blade with an increased radius on the leading edge acute corner of the clapper on the convex side of the blade aerofoil.

Existing blades can be reworked by machining.

E. Approval

The part number changes and/or part modifications 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.

F. 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 parts and to all affected spare parts.

G. Manpower

Estimated manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
(1) In Service	Not applicable
(2) At Overhaul	
(a) To rework the blades	3 hours 10 minutes
TOTAL:	3 hours 10 minutes

H. Material - Price and Availability

(1) Modification Kit not required.

(2) See "Material Information" section for prices and availability of future spares.

I. Tooling - Price and Availability

Special tools are not required

J. Weight and Balance

(1)	Weight change	None
(2)	Moment arm	No effect
(3)	Datum	Engine front mount centerline (Power Plant Station (PPS) 100)

K. Electrical Load Data

This Service Bulletin has no effect on the aircraft electrical load.

L. References

(1) Internal Reference No.

94VR037

(2) Other References

A320/A321 Engine Manual.

MD-90 Engine Manual.

M. Other Publications Affected

(1) V2500 Illustrated Parts Catalog (S-V2500-2IA and S-V2500-3IA) Chapter/Section 72-41-15.

(2) V2500 Engine Manual (E-V2500-1IA and E-V2500-3IA), 72-41-15, Cleaning, Inspection/Check and Rework.

(3) Repair Schemes VRS6009, VRS6065, VRS6150, VRS6236 and VRS6486 are affected by this Service Bulletin.

2. Accomplishment Instructions

A. Rework Instructions

(1) Rework the following parts:

6A4188, blade, rotor stage 3, HP compressor (Refer to 72-41-15, Fig/Item 01-200)

Consumable Materials

CoMat 06-022	Fluorescent penetrant

Standard Equipment

Chemical cleaning equipment
Hand file
Portable grinding machine
Penetrant crack test equipment
Vibro engraving equipment

PROCEDURE	SUPPLEMENTARY INFORMATION
CAUTION: 1. TITANIUM COMPONENT - USE SILICON CARBIDE TYPE ABRASIVE WHEELS, STONES AND PAPERS TO DRESS, BLEND AND POLISH THIS COMPONENT.	
2. TITANIUM COMPONENT - DO NOT USE FORCE WITH MECHANICAL CUTTERS OR THE MATERIAL WILL BECOME TOO HOT.	
3. TITANIUM COMPONENT - IF THE MATERIAL SHOWS A CHANGE IN COLOR TO DARKER THAN A LIGHT STRAW COLOR, THE COMPONENT IS TO BE REJECTED.	
(a) Chemically clean the HP Compressor Stage 3 Rotor Blade(s)	Refer to SPM TASK 70-11-01-300-503. Use chemical cleaning equipment
(b) Cut back the corner of the clapper on the convex side of the blade airfoil	Refer to Figure 5. Use a hand file or a portable grinding machine with a locally made inspection template
(c) Chemically clean	Refer to SPM TASK 70-11-01-300-503, SUBTASK 70-11-01-300-001. Use chemical cleaning equipment

(d)	Do a swab etch on the affected area	Refer to SPM TASK 70-11 08-300-503, SUBTASK 70-22-08-300-002. Use chemical cleaning equipment
(e)	Do a local penetrant crack test on the affected area	Refer to SPM TASK 70-23-05-230-501. Use CoMat 06-022 fluorescent penetrant with penetrant crack test equipment
	(i) If cracked	Reject
(f)	Visually examine and measure the dimensions of the new radius	Refer to Figure 5. Use a locally made inspection template
(g)	Visually examine the clapper coating	Refer to Figure 5.
	(i) If damaged	Refer to VRS6236, TASK 72-41-15-300-035
(h)	Cancel the existing part number and identify with the new part number	Refer to SPM TASK 70-09 00-400-501, SUBTASK 70-09-00-400-001 Existing Renumber 6A4188 6A5942 Use vibro-engraving equipment

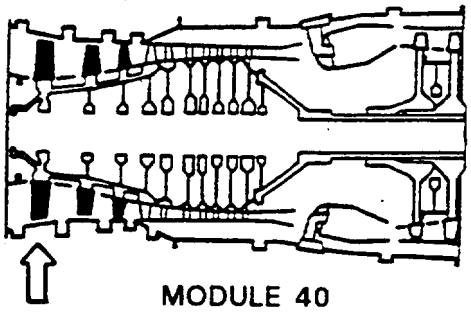
B. Assembly Instructions

(1) The new 6A5942 stage 3 HPC rotor blades introduced by this Service Bulletin must be fitted as a COMPLETE SET in place of old parts.

(2) Assemble new or re-worked 6A5942 stage 3 HPC rotor blades by use of approved procedures, Engine Manual, 72-41-10 Assembly.

C. Recording Instructions

(1) A record of accomplishment is necessary.



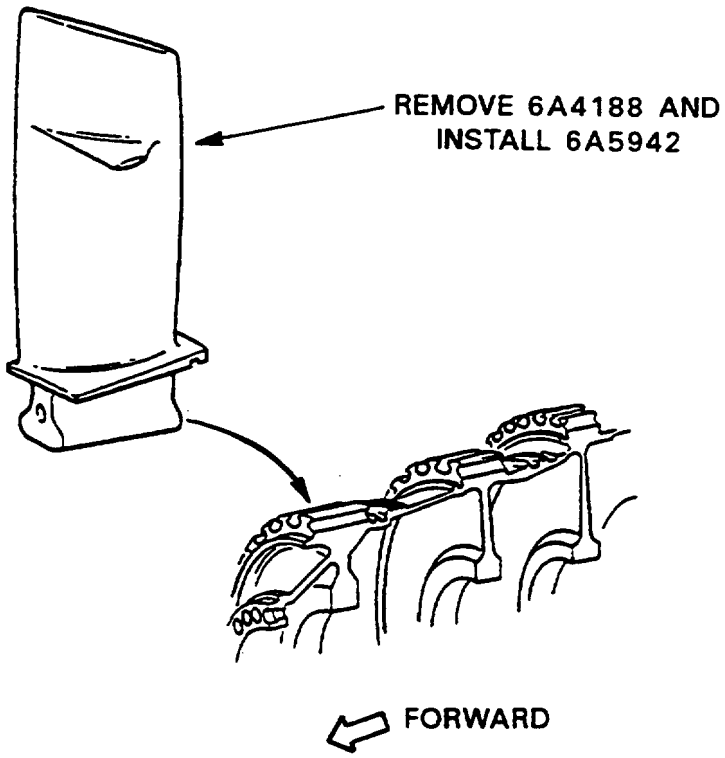


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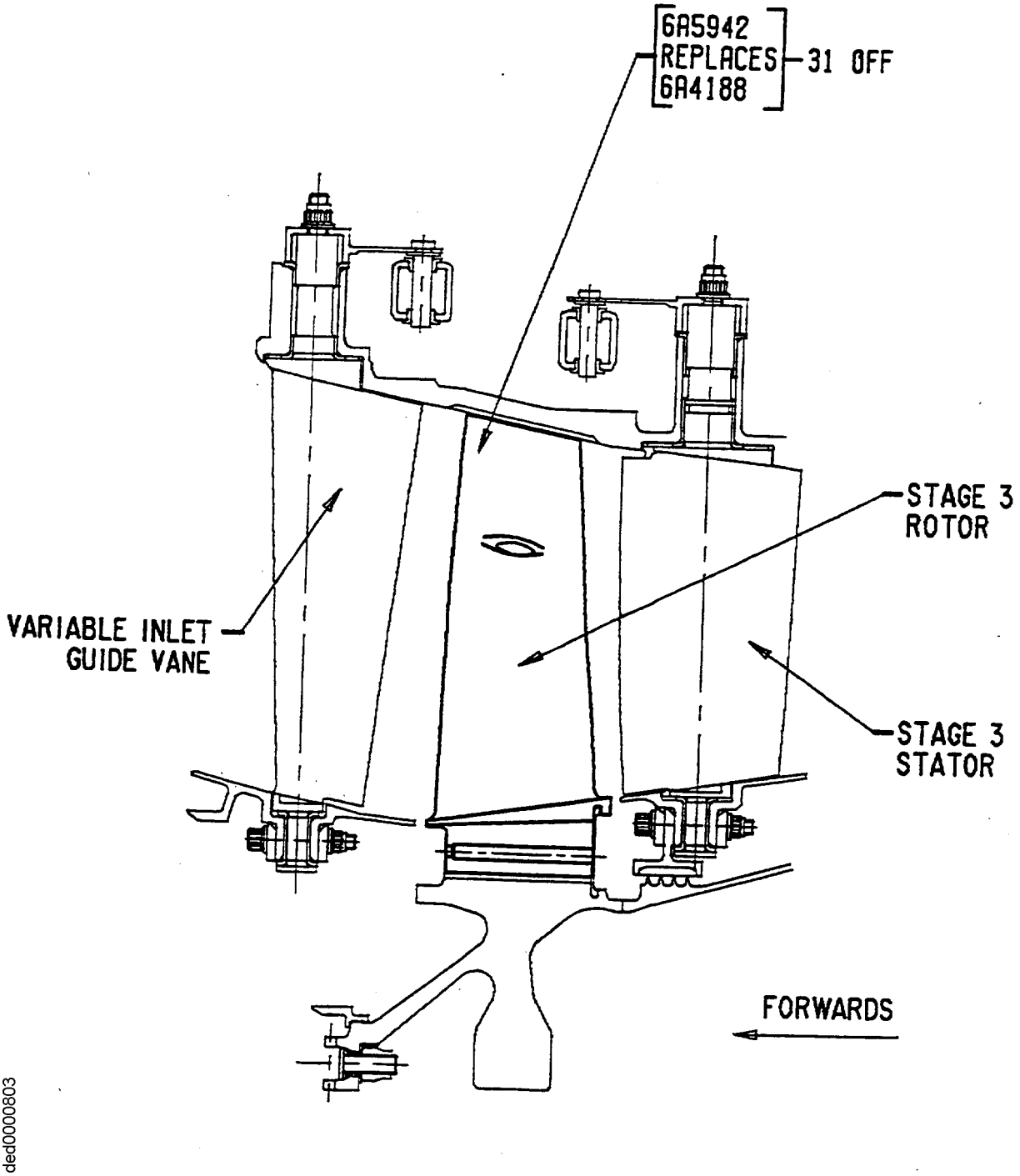
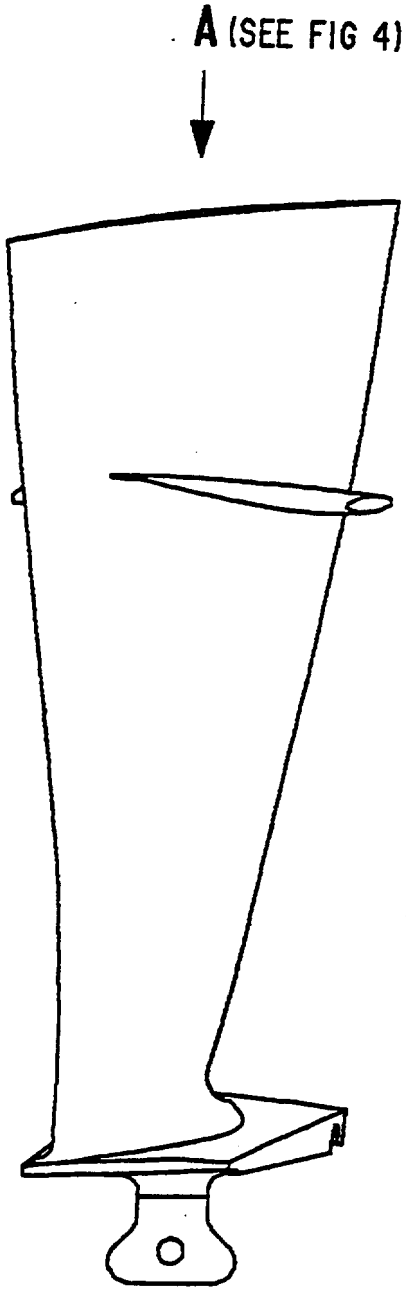
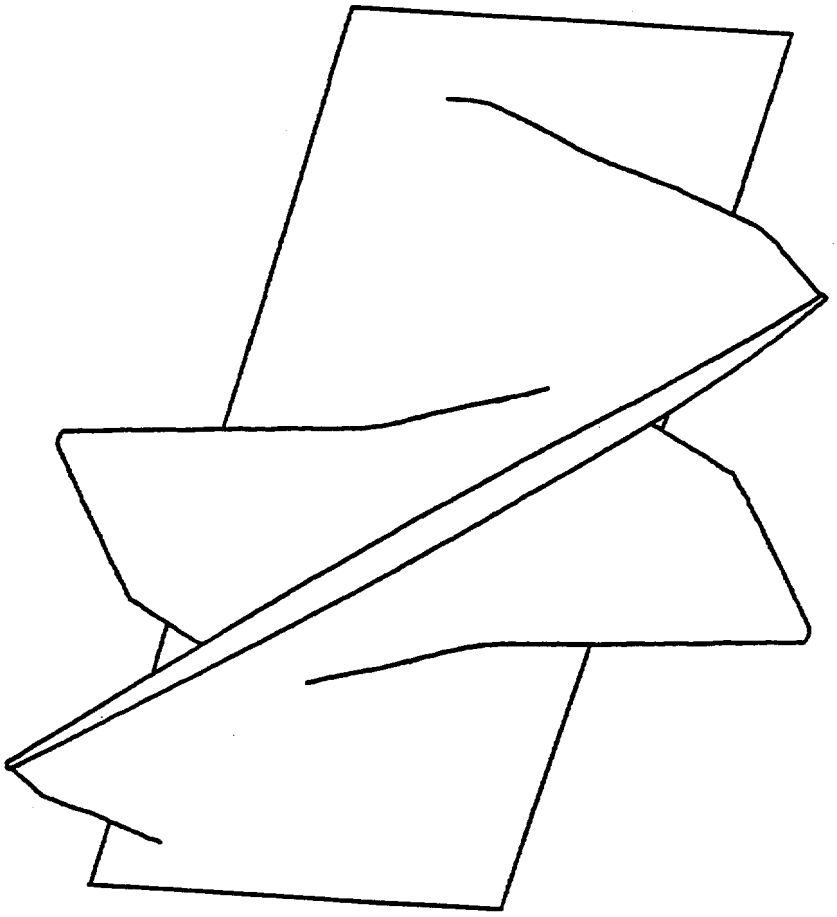
Fig.1



Part section thru HP compressor - Before and after alteration
Fig.2



View on stage 3 rotor blade - Reworking of stage 3 rotor blade
Fig.3



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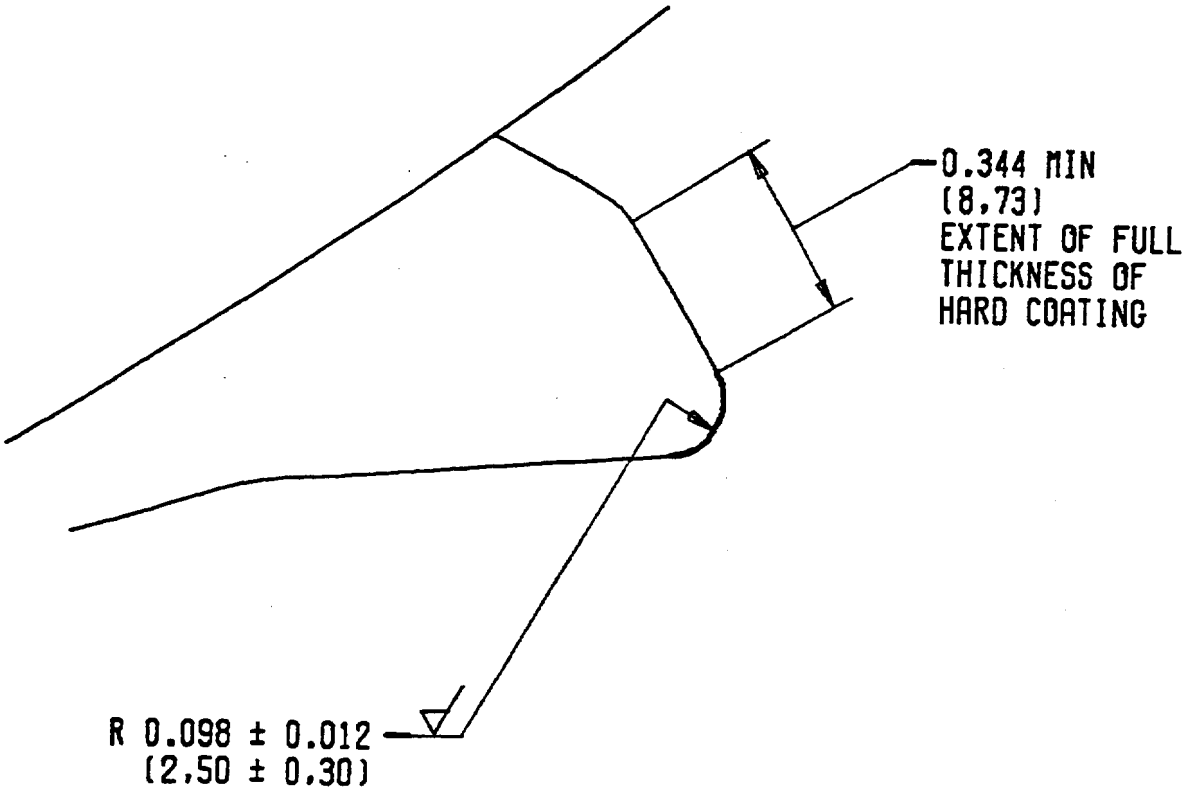
View on arrow A (See Figure 3) - Reworking of stage 3 rotor blades
Fig.4



SHARP EDGE CREATED BY MACHINING RADIUS TO BE REMOVED BY BLENDING UNIFORMLY BETWEEN EXISTING LEADING AND TRAILING EDGE CORNER RADII.

ALL DIMENSIONS IN INCHES WITH METRIC CONVERSIONS IN PARENTHESIS.

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Repeat part view on A (See Figure 3) - Reworking of stage 3 rotor blades
Fig.5

3. Material Information

Applicability: For each V2500 Engine to incorporate this Bulletin.

A. Kits associated with this Bulletin:

None

B. Parts affected by this Bulletin:

New Part No. (ATA No.)	Qty	Est'd Unit Price ($)	Keyword	Old Part No. (IPC No.)	Instructions Disposition
6A5942 (72-41-15)	31	1198.00	Blade, rotor stage 3, HP Compressor	6A4188 (01-200)	(A)(B) (S1)(1D)

C. Instructions/Disposition Code Statements:

(A) New parts are currently available.

(B) Old parts are no longer available.

(S1) New parts coded (S1) must replace old parts coded (S1) as a COMPLETE SET per engine.

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

NOTE: The estimated 1995 unit prices shown are provided for planning purposes only and do not constitute a firm quotation. Consult the IAE Price Catalog or contact IAE's Spare Parts Sales Department for information concerning firm prices.