P U B L I C A T I O N T R A N S M I T T A L

RR-DERBY

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DATER Sep.11/03

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

This document transmits Revision 4 to Service Bulletin EV2500-72-0316

Document History

Service Bulletin Revision Status		Supplement Revision Status
Initial Issue	May 15/98	
Revision 1	Jun.5/98	
Revision 2	Aug.28/98	
Revision 3	Dec.4/98	

Bulletin Revision 4

Remove	Incorporate	Reason for change
Pages 1 to 6 of the Service Bulletin	Pages 1 to 8 of the Service Bulletin	Revise pass/fail criteria. Include hints to avoid spurious USI readings.

V2500-ENG-72-0316

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 4 are as follows:

	Page	Revision Number	Revision Date
	Bulletin		
R	1	4	Sep.11/03
R	2	4	Sep.11/03
R	3	4	Sep.11/03
R	4	4	Sep.11/03
R	5	4	Sep.11/03
R	6	4	Sep.11/03
R	7	4	Sep.11/03
R	8	4	Sep.11/03

ENGINE - LP COMPRESSOR FAN BLADES - ULTRASONIC INSPECTION OF FAN BLADE ROOTS - NON-MODIFICATION SERVICE BULLETIN

1. Planning Information

A. Effectivity

(1) Aircraft:

(a) Airbus A320

(b) Boeing-Douglas MD-90

(2) Engines:

(a) V2500-A1 All Engines.

(b) Any V2500-A5 Engine which has experienced loss of a cover sheet for the fancase acoustic panel.

(c) Any V2500-D5 Engine which has experienced loss of a cover sheet for the fancase acoustic panel.

B. Reason

(1) Cracks have been found on the front face of the root flank on a small number of fan blades on an in-service engine. The cracks start from the pressure flank of the bedding area of the blade root and extend to the front face of the root.

(2) It has been determined that the only method of detection for cracks of this type, is an ultrasonic inspection along the length of the blade root.

(3) Results from operators, which include inspections of all A1 engines in service, combined with engine development tests has allowed the repeat inspection interval for A1 engines to be increased.

C. Approval

The compliance statement at 1.D. and the procedures in Section 3. of this Non-Modification Service Bulletin, comply with the Federal Aviation Regulations and are FAA-Approved for the engine model listed.

D. Compliance

Category 3

(1) For V2500-A1 Engines only

(a) Accomplish at each aircraft C-Check.

(2) For all V2500 A1, A5 and D5 Engines

(a) For engines which lose an acoustic panel cover sheet after this Service Bulletin has been received, a visual inspection of the fan blade dovetail root must be carried out before the next flight.

(i) If the visual inspection is satisfactory, do step (b).

(ii) If the blades are cracked, contact IAE Technical Services for further information.

(b) The ultrasonic inspection must be accomplished within 25 hours or 10 flights.

E. Manpower

Estimate of man-hours necessary to embody this Service Bulletin in full:

(1) In Service/At Overhaul

Venue	Estimated Man-hours
(a) To get access	1 Hour
(b) To embody	2 Hours
(c) To assemble and install the fan blades	1 Hour
Total	4 Hours

F. References

(1) The A1 Engine Manual (EM), Chapter/Section 72-31-00, Assembly/Disassembly.

(2) The A320/MD-90 Aircraft Maintenance Manual (AMM), Chapter/Section 72-31-11, Removal/Installation.

(3) Internal Reference Nos. - EC98VR775, EC98VR775A, EC98VR775B, EC98VR775C,
R EC03VR905.

(4) ATA Locator - 72-00-00.

2. Material Information

None.

3. Accomplishment Instructions

A. Tools and Equipment

(1) Ultrasonic flaw detector - For operation in the 5-10 Mhz range. (For example: Buehler Krautkramer - USN52 (Krautkramer Branson - USN52)).

(2) CoMat 06-148 Ultrasonic Couplant.

(3) QC6827 Test Block - IAE 2R19315.

(4) Ultrasonic Probe - IAE 2R19316.

B. Calibration of the Ultrasonic Detector

(1) Set up the ultrasonic flaw detector for dual or through transmission operation with zero delay. Set the amplifier switch to 5-10 Mhz.

(2) Apply couplant to the rear angled flank and position the probe on the test block (Refer to Figure 1).

(3) Identify the signal produced by the large Slot-A. With the range control, position this signal at Division Line 5 on the time base and adjust the amplitude to approximately 50% screen height.

(4) Increase the gain by 20dB. Move the probe over Slot-B and identify the signal produced. Adjust the amplifier to bring the signal to 60% screen height.

(5) If a monitor gate is available, position it between the 4.5 and 5.5 Division Lines on the time base. Adjust any visual or audible alarms to
R trigger at 60% screen height. The calibration check is completed.

C. Visual Inspection - In Service (Post Acoustic Panel Cover Sheet Release)

(1) During the tasks that follow, write down the position of any trim balance weights that are installed to the installation bolts of the 24-bolt fairing.

(2) Remove the fairing and the inlet cone. (Refer to the Aircraft Maintenance Manual (AMM), Chapter/Section 72-31-11, Removal/Installation).

(3) Remove the front blade-retaining ring. (Refer to the Aircraft Maintenance Manual (AMM), Chapter/Section 72-31-11, Removal/Installation).

(4) Visually inspect the face of the leading-edge dovetail-root on the fan blades.

(a) If any cracks are found, reject the blades and then contact your IAE representative.

(b) If no cracks are found, do steps D. and E.

(5) Install the front blade-retaining ring, inlet cone and fairing.

(a) Make sure that any trim balance weights that have been removed are installed in their correct positions.

D. Ultrasonic Inspection - In-Service (Installed and spare engines)

CAUTION:

YOU MUST PUT A WARNING NOTICE ON THE INSTRUMENT PANEL TO TELL PERSONS NOT TO START THE ENGINE.

CAUTION:

YOU MUST MAKE SURE THAT THE ENGINE HAS BEEN SHUT DOWN FOR AT LEAST 5 MINUTES.

CAUTION:

YOU MUST MAKE SURE THAT THE RED WARNING PENNANTS ON THE WORKMAT CAN BE SEEN AT A DISTANCE FROM THE AIRCRAFT.

(1) Remove the fan blades. (Refer to the A320 Aircraft Maintenance Manual (AMM), Chapter/Section 72-31-11, Removal/Installation).

(2) Do a general inspection of the fan blades. (Refer to the A320 Aircraft Maintenance Manual (AMM), Chapter/Section 72-31-11, Inspection/Check).

(3) Do an ultrasonic inspection on each of the fan blades.

(a) Apply the couplant to the concave face of the blade root flank. Position the probe on the blade root (Refer to Figure 1) and move the probe along the full chordal width of the blade.

(i) Monitor the signal very carefully as you move the probe, from the front of the leading edge for 2.0 in. (50,00 mm.) to the rear of the concave surface.

NOTE: It is possible that this area is the source of the cracks.

R (b) Reject the blade if a signal greater than 60% screen height is produced between the 4.5 and 5.5 Division Lines on the time base.

R (c) Subsequently to the above, if excess dry film lubricant is still
R present at the ultrasonic reject indication position on the blade root
R flank in the areas X and Y defined in Figure 2, remove this by lightly
R rubbing with Scotchbrite (using CoMat 05-125 to 05-127). Repeat the
R ultrasonic check as in (a) and (b) above. Reject the blade if a signal
R greater than 60% screen height is still present between the 4.5 and
R 5.5 division lines on the time base.

(4) If any fan blades are rejected, contact the IAE representative. Give the details of the signals detected (Position from the leading edge and signal amplitude), part number, serial number and the life of the rejected blade.

(5) Install the fan blades, fan blade retaining-ring, inlet cone and fairing. (Refer to the A320 Aircraft Maintenance Manual (AMM), Chapter/Section 72-31-11, Removal/Installation).

(6) If all the removed parts are replaced in their original locations and no blade rework - apart from re-attachment of loose or detached fan blade chocking pads - has been carried out, a trim balance survey run is not required.

(7) When the accomplishment instructions are completed, write V2500 Non-Modification Service Bulletin ENG-72-0316 in the engine log book. Then tell the IAE representative that this Non-Modification Service Bulletin has been accomplished.

E. Ultrasonic Inspection - Engine Shop Visit

(1) Remove the fan blades. (Refer to the A1 Engine Manual (EM), Chapter/Section 72-31-00, Disassembly).

(2) Do a general inspection of the fan blades. (Refer to the A1 Engine Manual (EM), Chapter/Section 72-31-11, Inspection/Check).

(3) Do an ultrasonic inspection on each of the fan blades.

(a) Apply the couplant to the concave face of the blade root flank. Position the probe on the blade root (Refer to Figure 1) and move the probe along the full chordal width of the blade.

(i) Monitor the signal very carefully as you move the probe, from the front of the leading edge for 2.0 in. (50,00 mm.) to the rear of the concave surface.

NOTE: It is possible that this area is the source of the cracks.

R (b) Reject the blade if a signal greater than 60% screen height is produced between the 4.5 and 5.5 Division Lines on the time base.

(4) If any fan blades are rejected, contact the IAE representative. Give the details of the signals detected (Position from the leading edge and signal amplitude), part number, serial number and the life of the rejected blade.

(5) Install the fan blades, fan blade retaining-ring, inlet cone and fairing. (Refer to the A1 Engine Manual (EM), Chapter/Section 72-31-00, Assembly).

(6) When the accomplishment instructions are completed, write V2500 Non-Modification Service Bulletin ENG-72-0316 in the engine log book. Then tell the IAE representative that this Non-Modification Service Bulletin has been accomplished.

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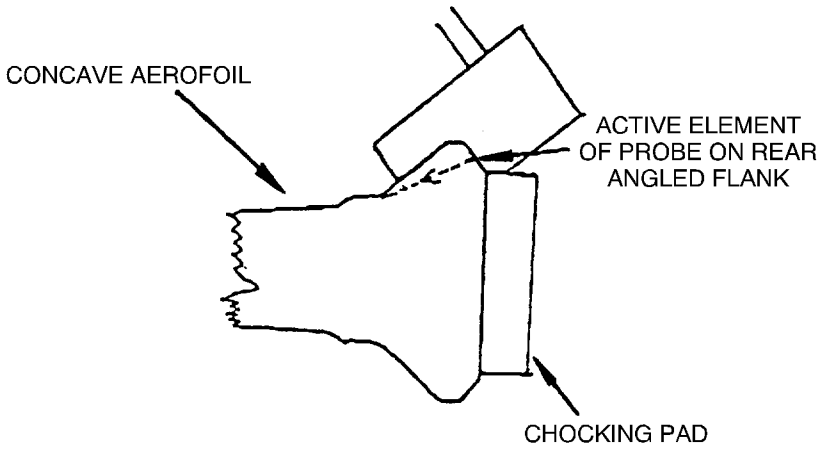

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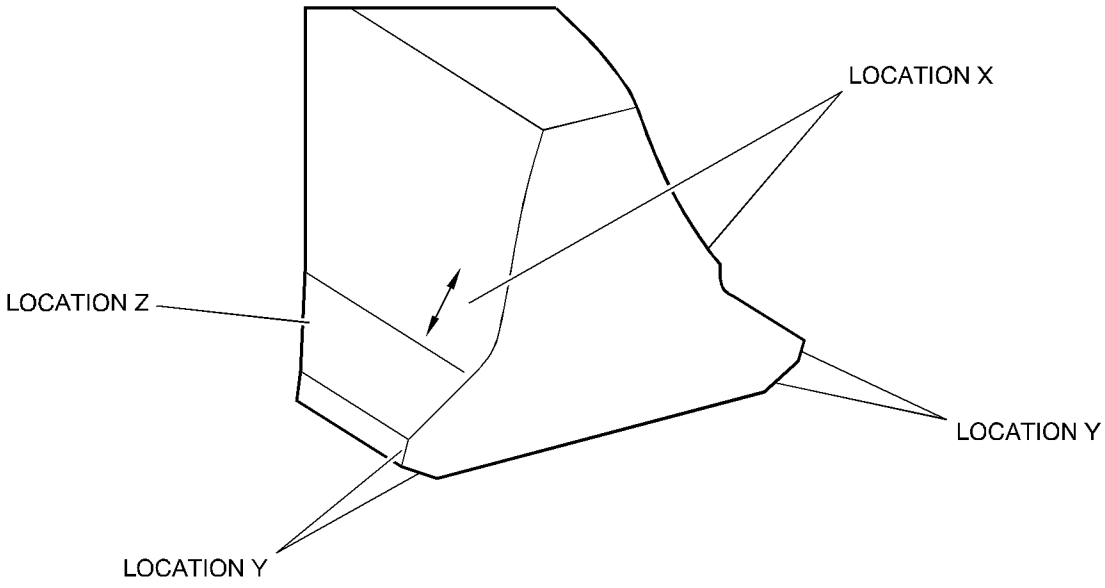
R Calibration of the Ultrasonic Flaw Detector
R Figure 1



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ACTIONS :

1) At the ultrasonic reject indication locations, on either the concave or the convex flanks, remove any excess Dry Film Lubricant (DFL) by lightly rubbing with 'Scotchbrite' using CoMat No 05-125 to 05-127 in the following areas:
   - above the top edge of the bedding (location X)
   - at the lower corner of the root where the ultrasonic probe locates (location Y)

   CAUTION 1: On post SB 72-0375 and post SB72-0384 (Metco 58 coated root) fan blades it is essential not to "scotchbrite" the fan blade bedding surface (Location Z) as this will have a detrimental effect to the coating.

2) If excessive DFL is present, at location X and/or Y that cannot be removed by lightly rubbing with 'Scotchbrite' it is permissable to remove this using a non metallic scraper and then remove any loose residual DFL using 'Scotchbrite'

   CAUTION 2: On post SB 72-0375 and post SB72-0384 (Metco 58 coated root) fan blades it is important not to damage the fan blade bedding surface (Location Z) when using a scraper

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R Removal of Excess Dry Film Lubricant
R Figure 2