International Aero Engines

400 MAIN STREET, MAIL STOP 121-10
EAST HARTFORD, CT 06108, USA.
TELEPHONE:- 860 565 5515
FAX:- 860 565 0600

P.O. BOX 31, DERBY
TELEGRAMS - 'ROYCAR' DERBY
TELEX - 37645
TELEPHONE:- 44 (0) 1332 242424
FAX:- 44 (0) 1332 249936

DATE: Nov. 7/05

V2500-A5 SERIES PROPULSION SYSTEMS NON-MODIFICATION SERVICE BULLETIN

This document transmits Revision 7 to Service Bulletin EV2500-72-0386

Document History

Service Bulletin Revision Status		Supplement Revision Status
Initial Issue	Oct.3/00	
Revision 1	Mar.27/01	
Revision 2	Aug.20/01	
Revision 3	Oct.12/01	
Revision 4	May 10/02	
Revision 5	Oct.6/03	
Revision 6	Jan.20/04	

Bulletin Revision 7

Remove	Incorporate	Reason for change
Pages 1 to 15 of the Service Bulletin	Pages 1 to 17 of the Service Bulletin	Revision to interval rates, addition of Scotchbrite and Multi-rating cautions.
All pages of Appendix 1	Page 1 and 2 of Appendix 1	Revision to interval rates, addition of Scotchbrite and Multi-rating cautions.
All pages of Appendix 2	Pages 1 to 3 of Appendix 2	Revision to interval rates, addition of Scotchbrite and Multi-rating cautions.

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

All pages of Appendix 3	Page 1 of Appendix 3	Revision to interval rates, addition of Scotchbrite and Multi-rating cautions.

Printed in Great Britain

LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 7 are as follows:

	Page	Revision Number	Revision Date
	Bulletin		
R	1	7	Nov.7/05
R	2	7	Nov.7/05
R	3	7	Nov.7/05
R	4	7	Nov.7/05
R	5	7	Nov.7/05
R	6	7	Nov.7/05
R	7	7	Nov.7/05
R	8	7	Nov.7/05
R	9	7	Nov.7/05
R	10	7	Nov.7/05
R	11	7	Nov.7/05
R	12	7	Nov.7/05
R	13	7	Nov.7/05
R	14	7	Nov.7/05
R	15	7	Nov.7/05
R	16	7	Nov.7/05
R	17	7	Nov.7/05
	Appendix 1		
R	1	7	Nov.7/05
R	2	7	Nov.7/05
	Appendix 2		
R	1	7	Nov.7/05
R	2	7	Nov.7/05
R	3	7	Nov.7/05
	Appendix 3		
R	1	7	Nov.7/05

International Aero Engines

SERVICE BULLETIN

ENGINE - LP COMPRESSOR FAN BLADES - DOVETAIL ROOT FLANK ULTRASONIC INSPECTION AND APPLICATION OF DRY FILM LUBRICANT (ROOT FRETTING/WEAR - SCARRING) NON-MODIFICATION SERVICE BULLETIN

1. Planning Information

A. Effectivity

(1) Airbus A319, A320, A321

V2500-A5 - All Engines.

B. Concurrent Requirements

None.

C. Reason

Latest fan blade dovetail inspections have revealed the need for early action to make sure fan blade dovetail deterioration is minimised. The intent of this NMSB is:

(1) To make sure the blade root dovetail dry film lubricant is maintained in the best possible condition, thereby minimising root stresses.

(2) For higher rated engines, to make sure there is current population integrity, before the dry film lubricant is applied.

D. Compliance

Category Code 3

R NOTE: This NMSB is split into 6 sections:

SECTION 1. Visual inspection and re-application of dry film lubricant.

SECTION 2. In Service ultrasonic inspections.

SECTION 3. Shop visit inspections.

SECTION 4. All inspected engines in Sections 1, 2 and 3

R SECTION 5. Revised interval instructions after use of Scotchbrite (or
R other abrasive).

R SECTION 6. Revised interval instructions for multi-rating operators.

NOTE: IN ORDER TO REDUCE THE POTENTIAL FOR MULTIPLE ENGINE IN-FLIGHT SHUTDOWN, POWER LOSS, OR OTHER ANOMALIES DUE TO MAINTENANCE ERROR, IAE RECOMMENDS THAT OPERATORS AVOID PERFORMING MAINTENANCE ON MULTIPLE ENGINES INSTALLED ON THE SAME AIRCRAFT AT THE SAME TIME. IF IT IS NOT POSSIBLE TO AVOID MAINTENANCE ON MORE THAN ONE ENGINE AT THE SAME TIME, IAE RECOMMENDS THAT ADDITIONAL CONTROLS BE APPLIED IN ORDER TO ENSURE THAT MAINTENANCE TASKS HAVE BEEN COMPLETED AS DEFINED. MAINTENANCE GUIDELINES SHOULD BE REVISED WHERE POSSIBLE, TO PROMOTE THIS RECOMMENDATION.

NOTE: DURING REMOVAL/INSTALLATION OF FAN BLADES ENSURE THAT BLADES ARE RE-INSTALLED IN THE SAME POSITION THAT THEY WERE REMOVED FROM.

The actions detailed in 3. Accomplishment Instructions are to be carried out at the intervals that follow:

(1) SECTION 1 - Visual inspection and re-application of Dry Film Lubricant (DFL)

NOTE: SECTION 1 OF THIS SERVICE BULLETIN IS TO BE CARRIED OUT AT THE INTERVALS DEFINED BELOW. IN CIRCUMSTANCES WHERE INSPECTION COULD NOT BE CARRIED OUT DUE TO UNPLANNED ENGINE REMOVAL, SECTION 1 OF THIS SERVICE BULLETIN CAN BE CARRIED OUT IN THE OVERHAUL SHOP TO MEET THE CUSTOMERS REQUIREMENTS.

(a) All in-service engines - except those at (b) below:

INTERVAL	If fan blade life has exceeded 2000 cycles, (from new or since last DFL application), remove the fan blades from the fan disc within 500 cycles, following receipt of this Non Modification Service Bulletin (NMSB) and action as below.(Refer to Aircraft Maintenance Manual (AMM) 72-31-11, Removal/Installation and Fig.1) Repeat at intervals no greater than 2500 cycles
CLEAN	Remove any loose particles of dry film lubricant on the fan blade root using a lint free cloth R CAUTION: R DO NOT USE ANY ABRASIVE (E.G. SCOTCHBRITE) TO R REMOVE ANY DRY FILM LUBRICANT. IF ABRASIVE HAS R BEEN USED REFER TO SECTION 5.
INSPECT	Do a visual inspection (Refer to AMM 72-31-11, Inspection/Check)

ACTION — Apply a coating of dry film lubricant to the fan blade root dovetail flanks prior to re-installation of the fan blades (Refer to AMM 72-31-11, VRS1030)

(b) All in-service engines with post SB 72-0375 and/or post SB 72-0384 (Metco 58 coated blade roots) fan blades installed:

R INTERVAL — For 30K and 33K rated engines: Within 2500 cycles following receipt of this NMSB remove the fan blades from the fan disc and action as below.(Refer to AMM 72-31-11, Removal /Installation and Fig 1)

R — Repeat every 2500 cycles.

R — For engines at 27K rating and below: Within 5000
R cycles following receipt of this NMSB remove the fan blades from the fan disc and action as below. (Refer to AMM 72-31-11, Removal/Installation and Fig 1)

R — Repeat every 5000 cycles.

CLEAN — Remove any loose particles of dry film lubricant on the fan blade root using a lint free cloth

R CAUTION:
R DO NOT USE ANY ABRASIVE (E.G. SCOTCHBRITE) TO
R REMOVE ANY DRY FILM LUBRICANT. IF ABRASIVE HAS
R BEEN USED REFER TO SECTION 5.

INSPECT — Do a visual inspection (Refer to AMM 72-31-11, Inspection/Check)

ACTION — Apply a coating of dry film lubricant to the fan blade root dovetail flanks prior to re-installation of the fan blades (Refer to AMM 72-31-11, VRS1030)

(2) SECTION 2 - In-service ultrasonic inspection

NOTE: SECTION 2 OF THIS SERVICE BULLETIN IS TO BE CARRIED OUT AT THE INTERVALS DEFINED BELOW. IN CIRCUMSTANCES WHERE INSPECTION COULD NOT BE CARRIED OUT DUE TO UNPLANNED ENGINE REMOVAL, SECTION 2 OF THIS SERVICE BULLETIN CAN BE CARRIED OUT IN THE OVERHAUL SHOP TO MEET THE CUSTOMERS REQUIREMENTS.

NOTE: This section only applies to pre SB 72-0375 and/or pre SB 72-0384 fan blades (non-Metco 58 coated root).

For in-service V2530K and V2533K engines with pre SB 72-0375 and/or pre SB 72-0384 fan blades that have achieved the threshold inspection life given in Table 1 action as below:

(a) All V2530K and V2533K Engines with any pre SB 72-0375 and/or pre SB 72-0384 fan blades - Except those at b) below:

INTERVAL	Within 100 cycles after receipt of this NMSB revision and after at intervals given in Table 1, remove the fan blades from the fan disc and action as below. (Refer to AMM, 72-31-11, Removal/Installation and Fig.1)
CLEAN	Remove any loose particles of dry film lubricant on the fan blade root using a lint free cloth
R	CAUTION:
R	DO NOT USE ANY ABRASIVE (E.G. SCOTCHBRITE) TO
R	REMOVE ANY DRY FILM LUBRICANT. IF ABRASIVE HAS
R	BEEN USED REFER TO SECTION 5.
INSPECT	Do a visual inspection (refer to AMM 72-31-11, Inspection/Check) and an ultrasonic inspection (refer to 3. Accomplishment Instructions, A, B, C)
ACTION	Apply a coating of dry film lubricant to the fan blade root dovetail flanks prior to re-installation of the fan blades (Refer to AMM 72-31-11, VRS1030)

(b) V2530K and V2533K Engines with any SB 72-0271 (Pre SB 72-0375 and/or Pre SB 72-0384) fan blades within the Serial Number range RGA 20851 to RGA 32779 installed:

NOTE: The majority of the above blades were originally installed in V2500-A5 engines V10244 to V10646 inclusive.

NOTE: A number of the fan blades in the above range were supplied as spareable items and may have been installed in any V2500 engine in service at the date of issue of this Non-Modification Service Bulletin.

NOTE: It is possible that some of the fan blades in the above range may have been transferred between engines or removed for maintenance/trim balancing purposes or during engine shop visit and these may be held in Operator or Repair shop stores as serviceable items.

INTERVAL	Within 100 cycles after receipt of this NMSB revision and after at intervals given in Table 1, remove the fan blades from the fan disc and action as below (Refer to AMM, 72-31-11, Removal/Installation and Fig.1)
CLEAN	Remove any loose particles of dry film lubricant on the fan blade root using a lint free cloth
R	CAUTION:
R	DO NOT USE ANY ABRASIVE (E.G. SCOTCHBRITE) TO
R	REMOVE ANY DRY FILM LUBRICANT. IF ABRASIVE HAS
R	BEEN USED REFER TO SECTION 5.
INSPECT	Do a visual inspection (refer to AMM 72-31-11, Inspection/Check) and an ultrasonic inspection (refer to 3. Accomplishment Instructions, A, B, C)
ACTION	Apply a coating of dry film lubricant to the fan blade root dovetail flanks prior to re-installation of the fan blades (Refer to AMM 72-31-11, VRS1030)

(3) SECTION 3 - Shop Visit Inspections

All rated Engines with pre or post SB 72-0375 and pre or post SB 72-0384 (Metco 58 and non-Metco 58 coated root).

(a) Remove the dry film lubricant on all fan blades and the fan disc, regardless of the condition of the coating on receipt (Refer to Fig.1 and Engine Manual (EM) 72-31-11 and 72-31-12, Cleaning.

(b) Do an ultrasonic inspection on all fan blades (Refer to 3. Accomplishment Instructions, A, B and D).

(c) If any blade is rejected following (b) do a detailed inspection of the Fan Disc, including a x30 binocular inspection of the bedding surfaces of the fan disc dovetail slots (Refer to EM 72-31-12, Inspection/Check). Advise the IAE Representative of the findings of both the fan blade(s) and fan disc binocular inspections.

(d) On acceptable parts accomplish all remaining engine manual inspections (EM, 72-31-11, Inspection/Check) and rework including the re-application of dry film lubricant on all acceptable fan blades and fan discs (Refer to EM, 72-31-11, VRS1023 and 72-31-12, VRS1154).

(4) SECTION 4 All inspected engines in sections 1, 2 and 3

(a) When the accomplishment instructions are completed on acceptable parts, record that V2500 Non-Modification Service Bulletin 72-0386 has been completed. It is recommended to notify the IAE representative that this Non-Modification Service Bulletin has been accomplished.

(b) In addition IAE recommends completion of the proforma attached in Appendix 1 for each engine and that a copy is provided to your IAE Representative.

(c) For tracking purposes, IAE would recommend that all operators record all fan blade change details, along with the Part Number, Serial Number, life and location of all fan blades in their fleet, including any removed and held as serviceable spares.

R (5) SECTION 5 - Revised interval instruction after use of Scotchbrite (or
R other abrasive)

R Post SB 72-0375 and SB 72-0384 fan blade roots feature a Metco 58 coating.
R Metco 58 is a metal spray, and leaves a rough surface designed to improve
R the retention of root lubricant. At new production root lubricant is
R stoved onto the Metco 58 coating. Subsequent coats of Dry Film Lubricant
R applied in service (as per this Service Bulletin) are air dried.

R When applying the Dry Film Lubricant any existing root lubricant must not
R be removed. All that is required is to wipe the root with a lint free
R cloth made moist with methyl-ethyl-ketone (material number V10-076) or
R isopropyl alcohol (material number V10-106) prior to lubricant
R application. This is to make sure that no grease remains on the blade root
R and any loose flakes of existing lubricant are removed.

R There have been cases where operators have completely removed existing
R coats of root lubricant before re-applying dry film lubricant.

R The dry film lubricants specified in this Service Bulletin are not as
R durable as the stoved on lubricant applied during new manufacture or
R overhaul. Therefore it is beneficial to leave as much of the existing
R coating on the blade root as possible.

R Also the removal of existing lubricant from the blade root can involve the
R abrasion of the Metco 58 coating. This abrasion can cause the Metco
R coating to become smoother and lose its ability to retain lubricant.

R Failure to correctly apply the Dry Film Lubricant can increase friction
R between the fan disc and fan blade root. This can lead to increased levels
R of vibration and increased stresses in the fan blade root and fan disc. In
R addition, increased levels of wear in the fan disc and fan blade root can
R be observed.

R CAUTION:

R IF AN ABRASIVE HAS BEEN USED TO REMOVE DRY FILM LUBRICANT FROM THE METCO
R 58 COATING THEN THE SURFACE ROUGHNESS HAS TO BE ASSUMED TO HAVE BEEN
R REMOVED. IN SUCH CASES THE RETENTION PROPERTIES OF THE METCO 58 COATING
R MUST BE ASSUMED TO BE INEFFECTIVE. THEREFORE THE PRE-METCO 58 INTERVAL
R RATES IN SECTION 1 (a) AND SECTION 2 MUST BE USED UNTIL THE METCO 58
R COATING IS RE-APPLIED.

R (6) SECTION 6 - Revised interval instructions for multi-rating operators

R In SECTION 1 and SECTION 2 there is a definition of inspection intervals
R based on engine rating. Some operators use multiple ratings.

R In the case of multi-rating usage the following equation should be used:

R Cycles to next inspection = NI x (1 - (OC/OI))

R where

R NI = interval at the new rating

R OI = interval at the old rating

R OC = cycles completed at the old rating (since last inspection)

R For example, if an engine has performed 1500 cycles at 33k rating since
R last inspection, but is then re-rated to 27k

R Cycles to next inspection = 5000 x (1 - (1500/2500)) = 2000 cycles

R i.e the engine has utilised 60 percent of its interval at 33k, so has 40
R percent remaining at 27k. The total time between inspections then becomes
R 1500 + 2000 = 3500, which is part way between the two ratings and
R recognises the mixed operation.

R For Operators to use this equation it is required to record fan blade life
R and location of all fan blades in their fleet, including any removed and
R held as serviceable spares.

E. Approval

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

F. Manpower

Estimate of manhours to embody this Service Bulletin in full:

(1) In service

Sections 1, 2 and 4 - 8 hrs 45 mins.

(2) At overhaul

Sections 3 and 4 - 6 hrs 30 mins.

NOTE: The parts affected by this Service Bulletin are accessible at scheduled maintenance and/or overhaul.

G. References

R (1) Internal reference number - 00VJ633F

(2) Other References

(a) In-Service

(i) A319/A319CJ/A320/A321 Aircraft Maintenance Manual (AMM):

(1) 72-31-11, Removal/Installation, Inspection/Check and Repair VRS1030.

(ii) Powerplant Illustrated Parts Catalogue, 72-31-11.

(b) In-Shop

(i) V2500 Engine Manual (EM) (E-V2500-1IA):

(1) 72-31-11, Disassembly/Assembly.

(2) 72-31-11, Inspection/Check, Cleaning and Repair VRS1023.

(3) 72-31-12, Inspection/Check, Cleaning and Repair VRS1154.

(ii) V2500 Standard Practices/Processes Manual (SPM-V2500-1IA).

(iii) Engine Illustrated Parts Catalogue 72-31-11.

(c) V2500 Service Bulletins:

(i) ENG-72-0271 Engine - LP compressor blades and fillers - Introduction of a revised pressure and suction aerofoil panels

(ii) ENG-72-0375 Engine - LP compressor blades and fillers - Introduction of a revised LP compressor blade with Metco 58

(iii) ENG-72-0384 Engine - LP compressor blades and fillers - Introduction of a revised LP compressor blade with Metco 58 - Rework

(3) ATA Locator - 72-31-00.

2. Material Information

None.

3. Accomplishment Instructions

A. Tools and Equipment

(1) Ultrasonic flaw detector - For operation in the 5 - 10 MHz range (eg Buehler Krautkramer - USN52 (IAE recommend the use of: Buehler Krautkramer - USN52 {Krautkramer Branson - USN52} or EPOCH 3B).

(2) Ultrasonic couplant CoMat 06-148.

(3) Items 4) and 5) are included in kit: IAE2R19429.

(4) Test block QC6827 - IAE2R19315.

(5) Ultrasonic probe - IAE2R19316.

B. Calibration of Ultrasonic Detector

(1) Set up the ultrasonic flaw detector for dual or through transmission operation, with zero delay.

(2) Set the amplifier switch to 5-10 MHz.

(3) Apply couplant to the rear angled flank and position the probe on the test block.

(4) 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 percent screen height.

(5) 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 percent screen height.

(6) 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 trigger at 60 percent screen height.

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

WARNING: YOU MUST PUT A WARNING NOTICE ON THE INSTRUMENT PANEL IN THE COCKPIT TO TELL PERSONS NOT TO START THE ENGINES.

WARNING: YOU MUST MAKE SURE THAT THE ENGINE HAS BEEN SHUT DOWN FOR AT LEAST 5 MINUTES BEFORE STARTING THE INSPECTION.

WARNING: 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 Aircraft Maintenance Manual (AMM) 72-31-11, Removal/Installation).

(2) Do a general inspection of the fan blades. (Refer to AMM 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 at the area to be inspected. Position the probe at the front of the leading edge of the concave blade root flank and move the probe along the first 2.4in. (60 mm.) of the chordal width of the blade root. (Refer to Fig. 2).

(b) Monitor the signal very carefully as you move the probe over this area.

(c) Reject the blade if a signal greater than 60 percent screen height is produced between the 4.5 and 5.5 division lines on the time base.

(d) Apply the couplant to the convex face of the blade root flank at the area to be inspected. Position the probe at 1.77in. (45 mm.) from the front face of the blade root (immediately behind the front chocking pad, if still installed) and move the probe along the next 4.33in. (110 mm.) of the chordal width of the blade root, terminating the inspection at 6.10in. (155 mm.) from the front face of the blade root (approximately 3.3in. (85 mm.) from the rear face of the root).

(e) Monitor the signal very carefully as you move the probe over this area.

(f) Reject the blade if a signal greater than 60 percent screen height is produced between the 4.5 and 5.5 division lines on the time base.

(g) Subsequently to the above, if excess dry film lubricant is still present at the ultrasonic reject indication position on the blade root flank in the areas X and Y defined in Fig.3, remove this by lightly rubbing with Scotchbrite (using CoMat 05-125 to 05-127). Repeat the ultrasonic check as in (a), (b), (d) and (e) above. Reject the blade if a signal greater than 60 percent screen height is still present between the 4.4 and 5.5 division lines on the time base.

(h) If any blades are rejected at (g) above, it is recommended to identify the location of any such indication(s) on the blade. Record on the proforma (refer to Appendix 1) the ultrasonic signal percentage height and position from the root front face and advise the IAE Representative.

(i) If no cracking is present following step (g), it is recommended to record on the proforma that an ultrasonic inspection has been successfully completed.

D. Ultrasonic inspection - Engine shop visit

(1) Remove the fan blades. (Refer to the Engine Manual (EM) 72-31-11, Disassembly).

(2) Do a general inspection of the fan blades. (Refer to EM 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 at the area to be inspected. Position the probe at the front of the concave blade root flank and move the probe along the first 2.4in. (60 mm.) of the chordal width of the blade. (Refer to Fig 2).

(b) Monitor the signal very carefully as you move the probe over this area.

(c) Reject the blade if a signal greater than 60 percent screen height is produced between the 4.5 and 5.5 division lines on the time base. It is then recommended to identify the locations of all indications over 60 percent screen height from the root front face and record on the proforma (Refer Appendix 1) the ultrasonic signal percentage height and position from the root front face.

(d) Subsequently to the above, on pre SB72-0375 or pre SB72-0384 fan blades (non Metco 58) perform a X30 binocular inspection at each indication position (refer to Appendix 2). Reject any blades where cracking is confirmed by this inspection. On post SB72-0375 or post SB72-0384 fan blades (Metco 58), remove the Metco coating and re perform the ultrasonic inspection (refer to appendix 3). Reject any blades where cracking is confirmed by this inspection.

(e) Apply the couplant to the convex face of the blade root flank at the area to be inspected. position the probe at 1.77in. (45 mm.) from the front face of the blade root (immediately behind the front chocking pad if still installed) and move the probe along the next 4.33in (110 mm.) of the chordal width of the blade root, terminating the inspection at 6.10in. (155 mm.) from the front face of the blade root (approximately 3.3in. (85 mm.) from the rear face of the root).

(f) Monitor the signal very carefully as you move the probe over this area.

(g) Reject the blade if a signal greater than 60 percent screen height is produced between the 4.5 and 5.5 division lines on the time base. Identify the locations of all indications over 60 percent screen height from the root front face and record on the proforma (Refer Appendix 1) the ultrasonic signal percentage height and position from the root front face.

(h) Subsequently to the above, on pre SB72-0375 or pre SB72-0384 fan blades (non Metco 58) perform a X30 binocular inspection at each indication position (refer to Appendix 2). Reject any blades where cracking is confirmed by this inspection. On post SB72-0375 or post SB72-0384 fan blades (Metco 58), remove the Metco coating and re perform the ultrasonic inspection (refer to appendix 3). Reject any blades where cracking is confirmed by this inspection.

(i) On any rejected blade at (d) or (h) above, identify the location of any such indication(s) on the blade. It is also recommended to record the indication positions and length on the proforma (Refer to Appendix 1) and advise the IAE Representative.

(j) If no cracking is present following steps (d) and (h) , the blade is considered suitable for completion of any further engine manual inspection/rework operations required to return it to service operation. On any such blade, record, on the proforma, that a x30 binocular inspection or repeat ultrasonic inspection has been successfully completed with no cracking being detected.

R

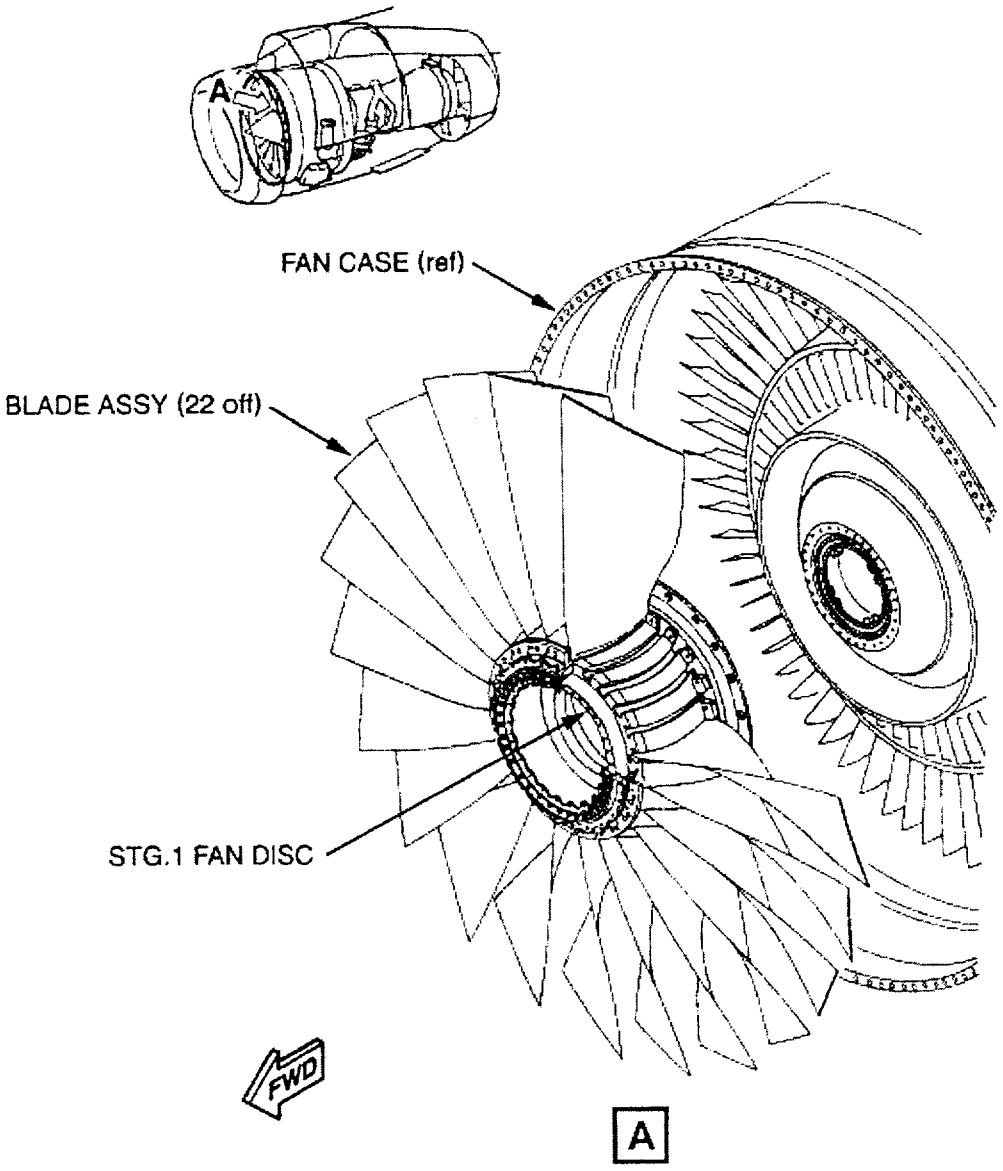
R

R

TABLE 1

	Action	Commence inspection if fan blades exceed the threshold life cycles given below	Repeat inspect at the cyclic interval below	Visual inspection	Ultrasonic inspection
	Engine Type				
R	i) Any V2530-A5 engine with pre SB 72-0375 and/or pre SB 72-0384 fan blades outside the specified S/N range installed(see*)	10000	920	Yes (Refer AMM 72-31-11, Inspection/ Check)	Yes (Refer to 3.)
R	ii) Any V2530-A5 engine with pre SB 72-0375 and/or pre SB 72-0384 fan blades in the specified S/N range installed(see*)	7300	920	Yes (Refer AMM 72-31-11, Inspection/ Check)	Yes (Refer to 3.)
R	iii) Any V2533-A5 engine with pre SB 72-0375 and/or pre SB 72-0384 fan blades outside the specified S/N range installed(see*)	5000	570	Yes (Refer AMM 72-31-11, Inspection/ Check)	Yes (Refer to 3.)
R	iv) Any V2533-A5 engine with pre SB 72-0375 and/or pre SB 72-0384 fan blades in the specified S/N range installed(see*)	3500	570	Yes (Refer AMM 72-31-11, Inspection/ Check)	Yes (Refer to 3.)

* Serial Number range: SB 72-0271 fan blades within Serial Number range (RGA 20851 to RGA 32779) installed.



jax0800029

Location of blade assembly and stage 1 fan disc
Fig.1

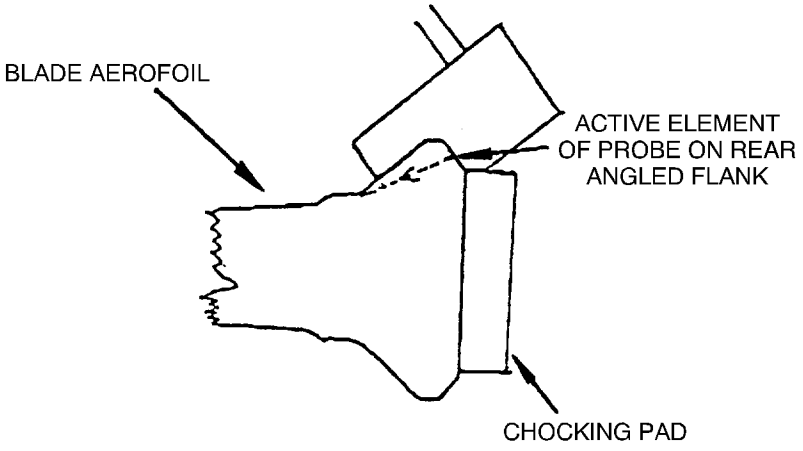
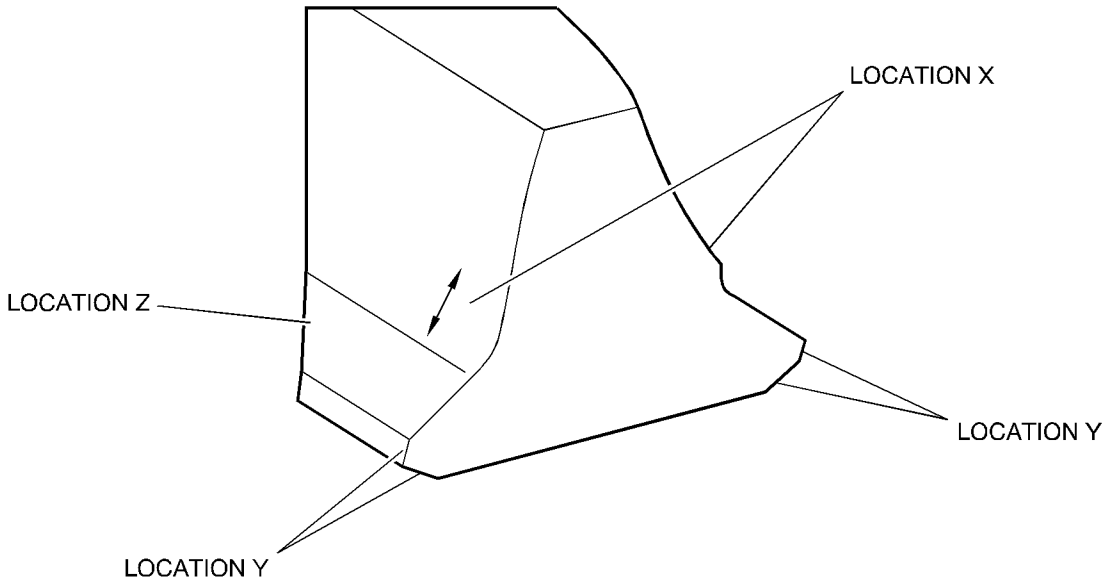


FIGURE 2

ded0002629a

Schematic diagram showing position of probe on blade root flank
Fig.2



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

ded0004370

Removal of excess Dry Film Lubricant (DFL)
Fig.3

APPENDIX 1

Binocular inspection on a blade rejected following the Ultrasonic Inspection on shop visit engines

After completion fax this information to the IAE representative

Operator:	Rating:	Data of inspection:
Engine S/N:	Previous rating if applicable:	Engine TSN/CSN:
Fan Set TSN/CSN (if different to engine symbols)		TSN/CSN:
U/Sonic Inspection of Fan Set		Yes/No (Delete as appropriate)
Are the Fan Blades Metco 58 standard		Yes/No (Delete as appropriate)
(Shop visit only) Metco 58 coating applied per SB 72-0384 at this shop visit		Yes/No (Delete as appropriate)

NOTE: The information contained above is required as a minimum.

The table below is to be completed if any Fan Blade/s are rejected by Ultrasonic inspection.

NMSB 72-0386 Fan Blade			% DFL loss on contact surface	Frettage on contact surface	Time (TSN/CSN) since		U/sonic Inspection (USI) (Rejection Indication Data)			Binocular inspection (shop visit only)	
P/N	S/N	TSN/ CSN*	Concave (CV) / Convex (CX)	Yes/No	Last DFL lubri-cation	Last USI	US signal (% screen height)	CX or CV side of Fan Blade	Position from Leading Edge (mm)	Confirmed indication Yes/No	Length of indication
6A	RG										

* If different to engine cycles

ded0004371

Inspection Proforma
Appendix 1, Fig.1

APPENDIX 2

Binocular inspection on a blade rejected following the Ultrasonic Inspection on shop visit engines - Pre SB72-0375 or pre SB72-0384 Fan Blades Only (Non Metco 58)

Tooling and Equipment

Desk lamp (local supply)	40 - 50W bulb with shade, less than 110 mm dia. and 110 mm. length.
Blade mounting fixture	Local manufacture
Binocular (local supply)	Minimum magnification range of x10 to x30 and overhang such that centre of binocular can be positioned 350 mm. away from edge of base mounting.

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

A. Introduction

This technique covers the additional binocular inspection of V2500 fan blade roots for possible top edge of bedding cracking, detected by ultrasonic inspection as shown in Appendix 2, Figure 1.

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

B. Preparation

Ensure that dry film lubricant (DFL) has been removed from the fan blade root using:

TASK 72-31-11-100-002-A00 for Non Metco 58 coated root in accordance with EM practices.

C. Inspection

(1) Position fan blade in mounting fixture to view the side of the fan blade root presenting an ultrasonic indication.

(2) Adjust lamp to optimum position for highlighting top edge of bedding at ultrasonic indication position, as illustrated in Appendix 2, Figure 1.

(3) Set magnification of binocular to x10 and bring the top edge of bedding at the ultrasonic indication position into focus. Adjust magnification to x30 and re-focus if necessary.

(4) Slowly traverse along the blade, inspecting the top edge of bedding 10 mm. either side of the ultrasonic indication position, as shown in Appendix 2, Figure 1.

(5) Check any suspicious features by inspecting at the highest magnification available.

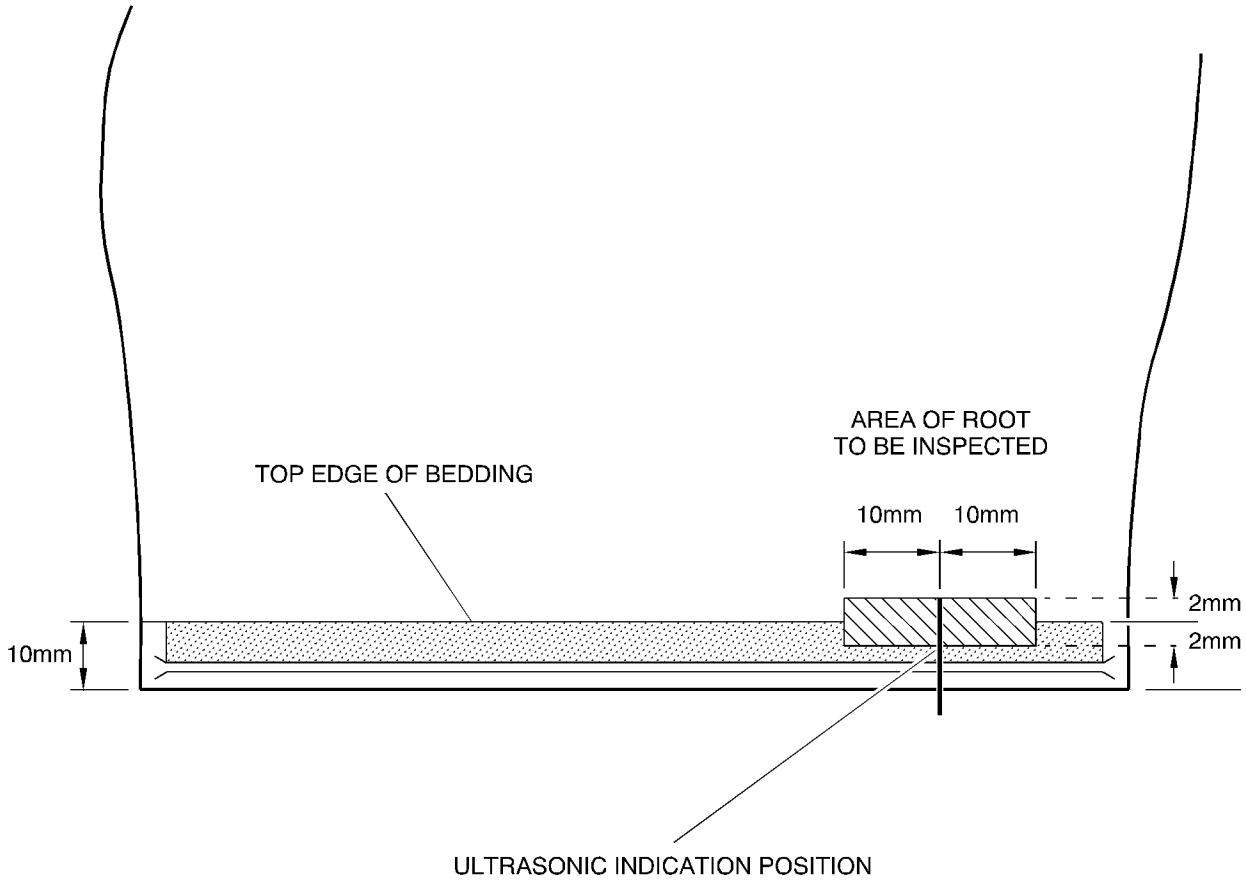
NOTE: The inspection should cover the area approximately 2 mm. above and below the top edge of bedding. Re-focus the binocular and adjust the lamp as required.

(6) Repeat steps (1) to (5) above for each ultrasonic indication position.

D. Rejection criteria:

(1) Reject any blade exhibiting a crack-like feature running axially along the root in the inspected region.

(2) Reject any blade exhibiting a 'scar' or crater-like feature.



ded0004313

Inspection areas
Appendix 2, Fig.1

APPENDIX 3

Repeat Ultrasonic Inspection of a Blade Rejected Following the Initial Ultrasonic Inspection on Shop Visit Engines - Post SB72-0375 or Post SB72-0384 Fan Blades Only (Metco 58)

A. Introduction

This technique covers the repeat ultrasonic inspection of V2500 fan blade roots for possible top edge of bedding cracking, detected by initial ultrasonic inspection as shown in Appendix 2, Figure 1.

B. Preparation

(1) Ensure the dry film lubricant (DFL) has been removed from the fan blade root in accordance with EM TASK 72-31-11-100-002-B00 for Metco 58 coated root.

(2) Remove the Metco 58 coating in accordance with EM TASK 72-31-11-300-032.

C. Inspection

(1) Repeat the ultrasonic examination of the root flank as described in the Accomplishment Instructions 3.D.(3).

C. Rejection Criteria

(1) Rejection criteria are as per the Accomplishment Instructions 3.D.(3).