

Repeater Technical Variance



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This is a repeat application technical variance. It is the responsibility of the operator / overhaul base to control the application of this document.

This document is supplemental to the Manual(s) specified below and should be suitably stored in accordance with local airworthiness requirements.

Technical Variance No.	132043	Issue	1	Date	25 MAR 2013
Operator / Applicant	ALL OPERATORS / ALL APPLICANTS			Original Request No.	DK_08_03_2013
Engine Type	RB211	Engine Mark(s)	TRENT 900 ALL ENGINE MARKS		
Part Description	LP TURBINE EXHAUST CASE (TAIL BEARING HOUSING)				
Part No.	FW35923, FW51434, FW27718				
Manual Title	EM	Ref.	NA	ATA Ref.	72-52-51
TV Title	MOUNT LUG FORGING LEADING EDGE INSPECTIONS				
Hours	NA	Cycles	NA		
Existing Requirement The Engine Manual (EM) does not contain a procedure to inspect the Tail Bearing Housing (TBH) Mount Lug Forging Leading Edge (LE) area for crack indications in shop.					
Requested Variance Currently there is a requirement to inspect the TBH Mount Lug Forging LE area on Trent 900 engines in shop. NMSB72-AH154 will follow the issue of this repeater TV and will include details of the new inspection. This repeater TV includes the details of the inspection until NMSB72-AH154 is finalised and issued. This Technical Variance may be applied until 28th June 2013. The results of this inspection are to be reported to Rolls-Royce.					
Summary of Investigation and Conclusions Rolls-Royce Engineering has reviewed the above requirement and an inspection technique has been developed. This TV is issued to instruct the inspection of the TBH Mount Lug Forging LE area.					
Approval on Behalf of Rolls-Royce					
Title	C/E SERVICE ENGINEERING				
Signature	<i>D. Richardson</i>	Printed name	D. RICHARDSON	Date	25 MAR 13
Document Created by	<i>Daniel Kebede</i>				

Declaration of Approval

This document is approved under the authority of Airbus EASA Design Organisation Approval no. EASA.21J.031.

Refer to Repair Design Approval Sheet reference no

Rolls-Royce plc. Proprietary Information – Not for Manufacture



A. Compliance

This TV should be applied on all Engines where the Module 52 is Level 1 (Serviceability). The inspection should be carried out whilst the part is at module level and strip of the module to piece part is not required.

For Engines where the Module 52 is Level 2 (Check and Repair) the TV is not required as the TBH will receive a full Fluorescent Penetrant Inspection (FPI) in accordance with NMSB 72-AG971.

For all Engines currently in shop, this TV should be applied regardless of rebuild status.

For engines that are hospital shop visit, this TV can be applied.

For all Engines not currently installed on an Aircraft and not planned for induction into an overhaul shop, this TV can be applied.

B. Manpower Requirements

1) In Shop

- (a) Time to inspect Mount Lug Forging LE Areas

2 hours (2 persons)

The FPI defined in this Technical Instruction shall only be performed by personnel qualified to Fluorescent Penetrant Inspection FPI Level 2 or higher and in possession of an up to date eyesight record in accordance with EN4179/NAS410 or alternative standards/guidelines accepted by the applicable National Aviation Authority.

C. Material Price and Availability

OMat 632 – Aerosol penetrant - Commercially Available

OMat 617 – Aerosol developer - Commercially Available

OMat 150 – Acetone - Commercially Available

OMat 2/101 – Lint Free Cloths - Commercially Available

OMat 677 – Penetrant Test Panel - Commercially Available

D. Tooling Price and Availability

Dark Non-Reflective cover to darken the area for inspection – Commercially Available

UV Light source – Commercially Available

Mirror – Commercially Available

E. References

(1) Engine Manual (EM):

- (a) 72-52-51-200-801 Cleaning/Inspection and Repair Data Task, Examine the LP Turbine Exhaust Case.

- (b) 70-00-00, Overhaul Process 210, Fluorescent Penetrant Inspection



F. In-Shop – Local Inspection Mount Lug Forging LE

- 1) Processing the penetrant test panel
 - (i) The OMat 677 – penetrant test panel must be processed at the beginning of each shift and viewed in each engine that is to be inspected during the shift in order to ensure that the test environment and materials are acceptable.
 - (ii) Ensure the OMat 677 – penetrant test panel is clean and there is no residual fluorescence.
 - (iii) Cover the region of the engine to be inspected with a dark non-reflective cover in order to reduce the white light levels in the leading edge inspection area.
 - (iv) Apply OMat 632 penetrant to the OMat 677 – penetrant test panel by sponge applicator or brush. The penetrant must be dispensed from a sealed aerosol can and any unused penetrant must go to waste following the inspection.
 - (v) Leave the penetrant in contact with the panel for 20 minutes.
 - (vi) After the 20 minutes contact time, take the OMat 677 penetrant test panel inside the darkened area to process. Allow 3 minutes for eye adaptation to the low light levels.
 - (vii) Remove the excess penetrant from the panel surface by wiping thoroughly with a clean, dry OMat 2/101 – lint free cloth whilst illuminating the panel with UV light.
 - (viii) Soak a clean OMat 2/10 - lint free cloth in water and then gently squeeze the excess water out to reduce the flow of water on the panel surface.
 - (ix) Whilst illuminating the OMat 677 – penetrant test panel with UV light, wipe off the penetrant with the wet cloth before immediately wiping over with a clean, dry OMat2/10 lint free cloth. Repeat this process using the minimum application necessary to achieve acceptable background fluorescence.
 - (x) Ensure that the panel is dry by wiping with a clean, dry OMat2/10 lint free cloth.
 - (xi) Apply a light, even coating of OMat 617 – non-aqueous wet developer from a sealed aerosol can to the OMat 677 – penetrant test panel.
 - (xii) Allow 10 minutes contact time for the developer prior to inspecting the panel.
 - (xiii) Ensure there are no white light sources or fluorescent items (including clothing) within the darkened area.
 - (xiv) Hold the OMat 677 – penetrant test panel alongside the leading edge of the Top Core Vanes and illuminate it with UV light.
 - (xv) Inspect the OMat 677 – penetrant test panel and check that the visible indications match the control photograph for that panel.
 - (xvi) If the panel matches the photograph then the inspection materials and environment are acceptable and the inspections can be performed.
 - (xvii) Repeat steps (xiii) to (xvi) for each engine to be inspected during the shift. Ensure that the inspection area is darkened for each engine.



- (xviii) Restore the OMat 677 – penetrant test panel to a completely clean condition and ensure there is no residual fluorescence and store in acetone.

2) Carry out the inspection of the Mount Lug Forging LE Area

WARNING: PROTECTIVE GLOVES AND SAFETY GLASSES MUST BE WORN AT ALL TIMES DURING THE INSPECTION. IF YOU GET AN INJURY, SEEK MEDICAL AID IMMEDIATELY.

- (i) Clean the inspection areas (See Fig. 2) with a clean OMat 2/101 – lint free cloth moistened with OMat 150 – acetone.
- (ii) Discard the soiled cloth after use.
- (iii) Repeat the swabbing using fresh OMat 150 – acetone and a fresh OMat 2/101 – lint free cloth until all deposits have been removed.

NOTE: THE INSPECTION SURFACE, MUST BE CLEAN, DRY AND FREE FROM SOILS, OIL, GREASE, PAINT, COATINGS, CORROSION PRODUCTS, SCALE, SMEARED METAL, WELDING FLUX, CHEMICAL RESIDUES OR ANY OTHER MATERIAL THAT COULD PREVENT PENETRANT FROM ENTERING A DISCONTINUITY, AFFECT PROCESS PERFORMANCE OR PRODUCE AN UNACCEPTABLE BACKGROUND.

- (iv) Allow 5 minutes for the area to completely dry prior to penetrant application.
- (v) Apply OMat 632 penetrant to the inspection areas in Fig.2. The penetrants must be dispensed from a sealed aerosol can and any unused penetrant must go to waste.
- (vi) Ensure that the inspection areas are fully covered with penetrant with the aid of the UV lamp and mirror.
- (vii) Leave the penetrant in contact with the components for 20 minutes.

NOTE: THE PENETRANT CONTACT TIME MUST NOT EXCEED 1 HOUR. IF IT DOES THE PENETRANT MUST BE REAPPLIED AND 5 MINUTES CONTACT TIME ALLOWED.

- (viii) After the 20 minutes contact time, remove the excess penetrant from the inspection surface by wiping thoroughly with a clean OMat 2/101 – lint free cloth.
- (ix) Soak a clean OMat 2/10 - lint free cloth in water and then gently squeeze the excess water out to reduce the flow of water on the component surface.
- (x) Whilst illuminating the inspection area with UV light, wipe off the penetrant with the wet cloth before immediately wiping over with a clean, dry OMat2/10 lint free cloth. Repeat this process using the minimum application necessary to achieve acceptable background fluorescence.
- (xi) Ensure that the inspection area is dry by wiping with a dry OMat2/10 lint free cloth.
- (xii) Apply a light, even coating of OMat 617 – non-aqueous wet developer from a sealed aerosol can to the inspection area and the OMat 677 – penetrant test panel.



- (xiii) Allow a minimum of 10 minutes and a maximum of 15 minutes contact time for the developer prior to inspection.
- (xiv) Cover the region of the engine with a dark non-reflective cover in order to reduce the white light levels.
- (xv) Ensure there are no white light sources or fluorescent items (including clothing) within the inspection area.
- (xvi) Positioned inside the darkened area, allow 3 minutes for eye adaptation to the low light levels.
- (xvii) Illuminate the inspection surfaces with UV light in the darkened area and view by line of sight or by using the mirror as necessary.
- (xviii) Assess the Inspection areas for crack indications. White light may be used to aid assessment
- (xix) The "Wipe Off" technique shall be used to determine the nature of any indications.
 - 1. Dampen a cotton swab with acetone.
 - 2. Wipe once across the indication.
 - 3. Allow the acetone to evaporate and inspect immediately.
 - 4. If the indication reappears then record it as a crack. If the indication does not reappear then apply a light, even coating of OMat 617 – non-aqueous wet developer from a sealed aerosol can to the area.
 - 5. Allow the solvent in the developer to evaporate and inspect immediately.
 - 6. If the indication reappears record it as a crack. If the indication does not reappear then allow 10 minutes contact time for the developer.
 - 7. If the indication reappears after the 10 minutes contact time then record it as a crack. If the indication does not reappear then that area is acceptable.
- (xx) Record any suspected crack indication in Appendix 1.

Photograph any crack indications.
- (xxi) No cracks detected ACCEPT
Any Cracks REJECT
- (xxii) Once all indications have been evaluated and recorded, remove the penetrant processing materials from the inspection surface by wiping with a clean OMat 2/101 – Lint Free Cloth moistened with OMat 150 – Acetone.

3) Inspect the fail safe catcher for signs of contact

- (i) Visually inspect the LE face of the fail safe catcher (see Fig.3) for examples of damage (see Fig.4).



- (ii) Inspect in accordance with
CIR: 72-52-51-200-801 Examine the LP Turbine Exhaust
SUBTASK 72-52-51-210-110
18. Examine the LP Turbine Engine Mounting Lug at Location 10
- (ii) Photograph any damage and note location of the damage on the fail safe catcher. See Fig.4 for example photographs of typical damage.

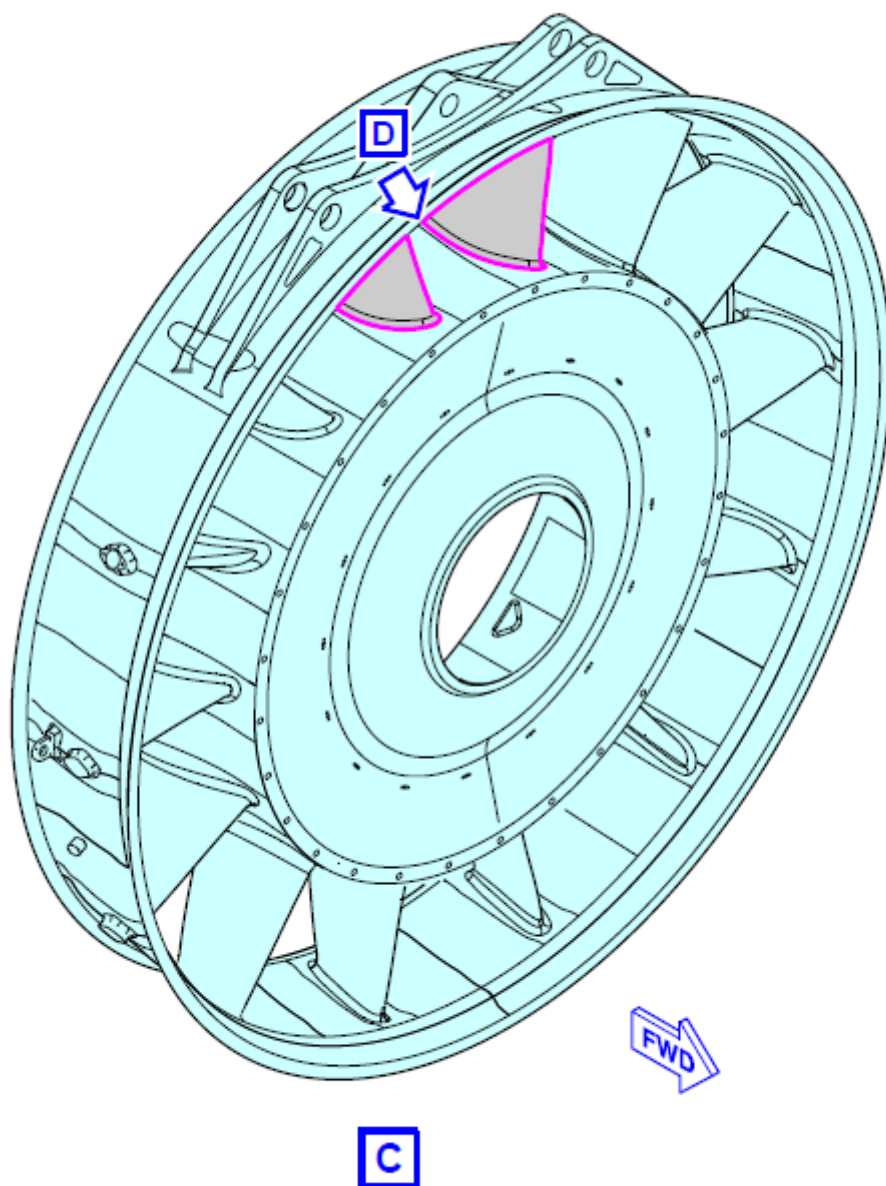


Figure 1 – Tail Bearing Housing

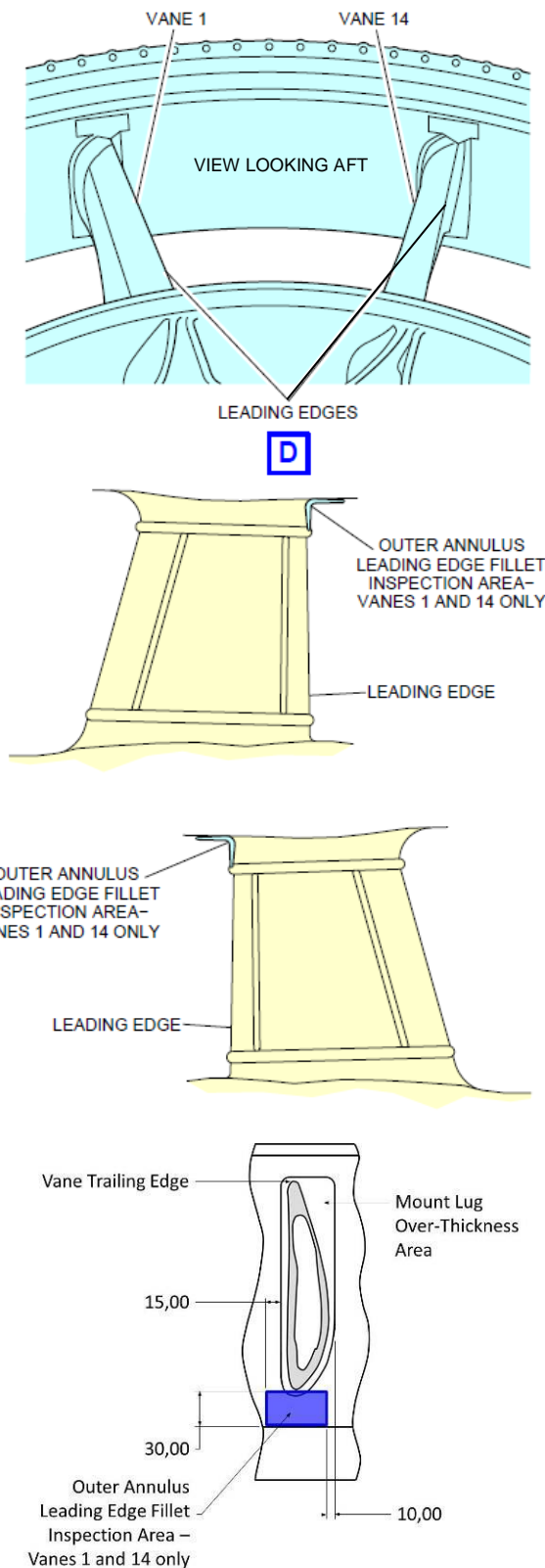


Figure 2 - Mount Lug Forging LE Area

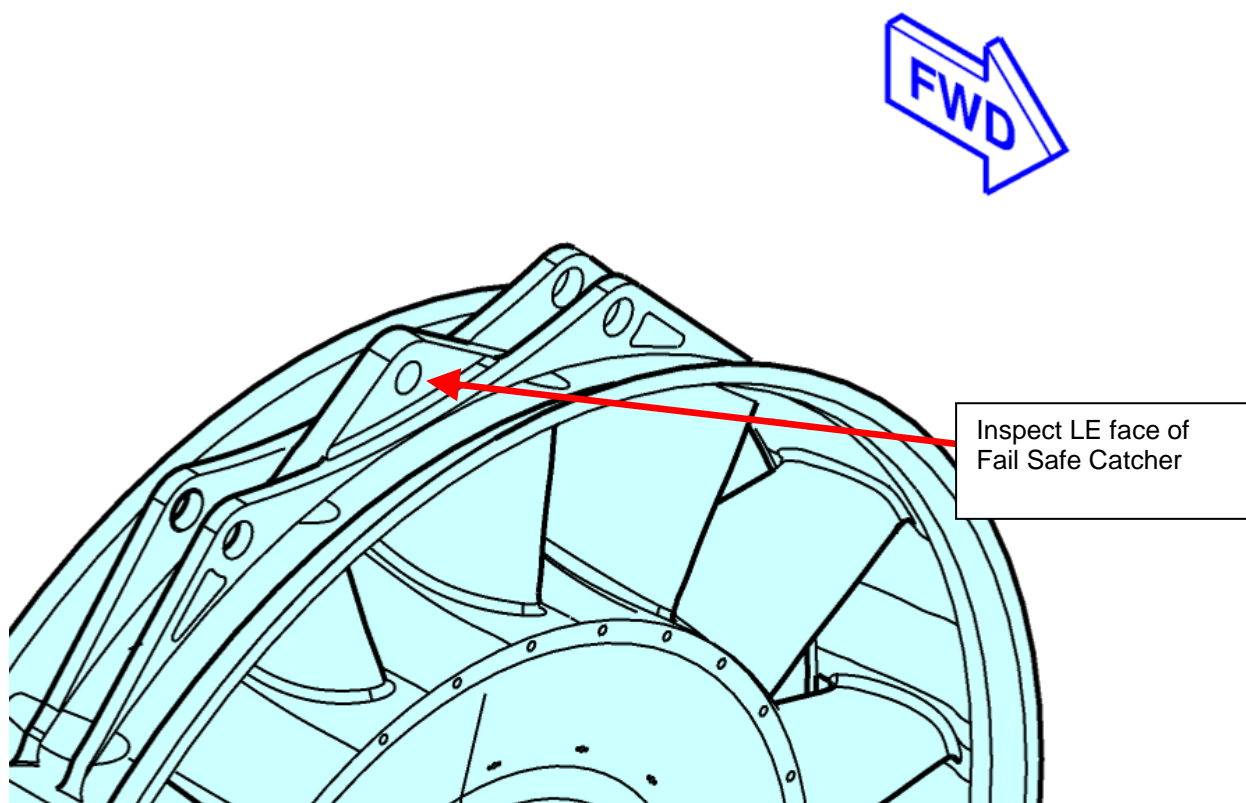


Figure 3 - In Shop - Fail Safe Catcher Inspection Locations

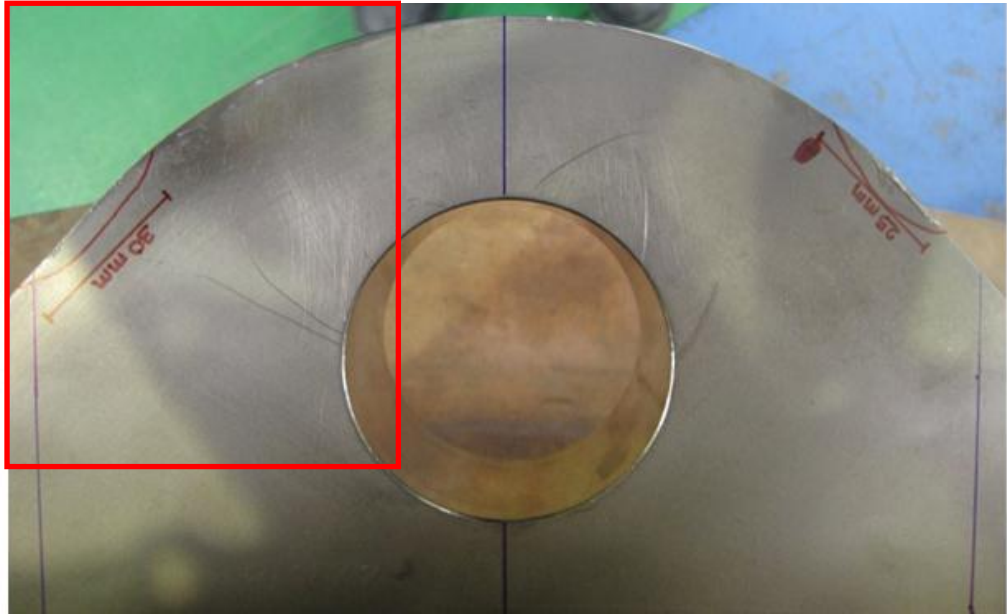


Figure 4 - In Shop - Fail Safe Catcher Damage



APPENDIX 1

This form (or similar) to be completed for every engine/component inspected
Results to be sent to Rolls-Royce via your Service Representative

Feedback Sheet TV 132043		
Overhaul Base		
Operator		
Engine Mark		
Date of Inspection		
Engine Serial Number		
Engine Hours Since New		
Engine Cycles Since New		
08 Module Serial Number		
08 Module Hours Since New		
08 Module Cycles Since New		
Component Part Number		
Component Serial Number		
Component Hours Since New		
Component Cycles Since New		
	Inspection result and comments	
In Shop inspection of Mount Lug Forging Leading Edge Area	Any crack indications?	
	Photographs of crack indications	
In Shop inspection of Fail Safe Catcher LE face and any photographs of damage		