Technical Variance

Rolls-Royce

This document is issued specifically to address the issue raised in the associated Technical Variance request. Authorisation for repeated application can be covered by the issuance of further documents and may be requested

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

Technical Variance No.	**124801**	Issue	**2**	Date	**04 JUL 2012**
Operator / Applicant	**SIGNAPORE AIRLINES LTD** **ROLLS-ROYCE**			Original Request No.	**TV_27_06_2012 DK**
Engine Type	**RB211**	Engine Mark(s)	**TRENT 970-84,972-84**		
Part Description	**TAIL BEARING HOUSING**			Engine Serial No.	**SEE APPENDIX 1& 2**
Part No.	**FW 35923,FW27718,FW 51434**			Part Serial No.	**VARIOUS**
Manual Title	**EM & AMM**	Ref.	**Airbus-A380 AMM & E-TRENT-9RR**	ATA Ref.	**72-52-51**
TV Title	**Fluorescent Penetrant Inspection of the Tail Bearing Housing, Mount Lug Run-outs.**				

Hours	**N/A**	Cycles	**N/A**

Existing Requirement

The Aircraft Maintenance Manual (AMM) and the Engine Manual (EM) do not contain a specific procedure for Fluorescent Penetrant Inspection (FPI) of the Mount Lug Run-outs. This Technical Variance details the procedure for FPI of the TBH Mount Lug Run-outs.

Requested Variance

ISSUE 2 DUE TO CHANGE IN ENGINE SERIAL NUMBERS.

A Technical Variance is requested to detail the procedure for the TBH inspection for both on wing and in shop inspections on the engines specified in Appendix 1 and 2.

The engines in Appendix 1 are to be inspected on wing. The engine in Appendix 2 is scheduled for induction into SAESL on 17th July 2012 and as such the inspection is to be carried out in shop.

Summary of Investigation and Conclusions

Rolls-Royce Engineering have reviewed the above requirement and an on wing trial of the FPI of the TBH Mount Lug Run-outs has been conducted.

This Technical Variance is issued to instruct the inspection of the TBH Mount Lug Run-outs for the engines specified in Appendix 1 and 2 pending issue of a planned Non-modification Service Bulletin.

Approval on Behalf of Rolls-Royce

Title PRINCIPAL TECHNOLOGIST – SERVICE ENGINEERING
Service Engineering Team Leader / CVE

Signature JDClarke Printed name J D CLARKE Date 04/07/12
4th July 2012

Document Created by Daniel Kebell
Daniel Kebell

Declaration of Approval

This document is approved by Rolls-Royce plc under the authority of EASA Design Organisation Approval no. EASA.21J.035.

Manpower Requirements

1) On-wing

Time to gain access

0.5 hour (1 person)

Time to inspect Tail Bearing Housing (TBH) Mount Lug Run-outs

2 hours (2 persons)

Time to restore to serviceable condition

0.5 hour (1 person)

2) In Shop

Time to inspect Tail Bearing Housing (TBH) Mount Lug Run-outs

2 hours (2 persons)

The Fluorescent Penetrant Inspection (FPI) defined in this Technical Instruction shall only be performed by personnel qualified to 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.

Materials

OMat 651F - F2B - AMS2644 Type 1, Method D, Level 3 (1D3) compliant aerosol penetrant (Fluorescent, Post-Emulsified, Medium Sensitivity).

OMat 617 – AMS2644 Form d – Non-Aqueous Wet Developer – Aerosol.

Ultra Violet Light Source capable of providing a minimum UV radiation intensity of 1200 μW/cm^2 at the inspection surface.

Dark Non-Reflective cover to darken the area for inspection.

OMat 150 – Acetone.

OMat 2/101 – Lint Free Cloths.

OMat 677 – Penetrant Test Panel.

Visual Aids as per AMM Task 70-20-02, Fluorescent Penetrant Inspection.

PROCEDURE – ON WING

WARNING: YOU MUST BE CAREFUL WHEN YOU WORK ON THE ENGINE AFTER THE ENGINE IS SHUTDOWN. THE ENGINE CAN STAY HOT FOR UPTO ONE HOUR.

WARNING: YOU MUST NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE INJURY. IF YOU GET AN INJURY, TREAT WITH COLD WATER FOR 10 MINUTES, THEN SEEK MEDICAL AID.

1) To get access to the Tail Bearing Housing (TBH) Mount Lug Run-outs

i. Open the Fan Cowl Doors in accordance with AMM Task 71-13-00, Maintenance Practices to get access

ii. Make the Thrust Reverser unserviceable for maintenance in accordance with AMM Task 78-30-00 Deactivation/Activation.

WARNING: YOU MUST MAKE THE THRUST REVERSER UNSERVICEABLE (INSTALL AND SAFETY THE INHIBITION DEVICE) BEFORE YOU DO WORK ON OR AROUND THE THRUST REVERSER. IF YOU DO NOT INSTALL AND SAFETY THE INHIBITION DEVICE, THERE IS A RISK THAT THE THRUST REVERSER CAN OPERATE ACCIDENTALLY. THIS CAN CAUSE INJURY TO PERSON AND/OR DAMAGE TO THE EQUIPMENT.

iii. Open the Fan Exhaust Cowls in accordance with the AMM, Task 78-26-00

iv. Use appropriate staging to gain access to the Tail Bearing Housing TBH

2) Carry out the inspection on the Mount Lug Run-outs

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. This inspection must be performed in accordance with the requirements of AMM 70-20-02, Fluorescent Penetrant Inspection.

ii. Local cleaning of the inspection areas must be completed prior to FPI.

iii. Apply OMat 150 – Acetone to a clean OMat 2/101 – Lint Free Cloth.

iv. Clean the inspection surfaces (see Figures 1 and 2) with the moistened cloth.

v. Ensure that all contaminants have been removed. If necessary repeat steps (iii) and (iv) in order to achieve this.

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.

vi. Allow 10 minutes for the area to completely dry prior to penetrant application.

vii. Penetrant Application - Apply OMat 651F – 1D3 Penetrant to the inspection areas (Figures 1 and 2) by brush or sponge applicator. The penetrant must be dispensed from a sealed aerosol can and any unused penetrant must go to waste.

viii. Ensure that the inspection area is fully covered with penetrant with the aid of a UV lamp.

ix. Apply OMat 651F – 1D3 Penetrant to the OMat 677 – Penetrant Test Panel.

x. Leave the penetrant in contact with the components for 30 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.

xi. Penetrant Removal - After the 30 minutes contact time, remove the excess penetrant from the inspection surface and the OMat 677 – Penetrant Test Panel by wiping thoroughly with a clean OMat 2/101 – Lint Free Cloth.

xii. Whilst illuminating with UV light, wipe off the penetrant with a clean OMat 2/10 - Lint Free Cloth moistened with OMat 150 – Acetone. Use the minimum application necessary to achieve acceptable background fluorescence and ensure than acetone is not allowed to flow on the inspection surface.

xiii. Ensure that all traces of the OMat 150 – Acetone have been completely removed.

xiv. Develop - 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.

xv. Allow 10 minutes contact time for the developer.

xvi. Cover the region of the engine with a dark non-reflective cover in order to reduce the white light levels.

xvii. Ensure there are no white light sources or fluorescent items (including clothing) within the inspection area or the inspector's field of vision.

xviii. Do not wear darkened or light sensitive glasses.

xix. Allow 1 minute for eye adaptation to the darkened area.

xx. Illuminate the OMat 677 – Penetrant Test Panel with UV light at an intensity of no less than 1200 $\mu W/cm^2$ in the darkened area.

xxi. Inspect the OMat 677 – Penetrant Test Panel and check that the 4 largest indications are visible and match the control photograph for that individual panel.

xxii. Illuminate the inspection surface with UV light at an intensity of no less than 1200 $\mu W/cm^2$ in the darkened area.

xxiii. Inspect the Mount Lug Run-Outs for crack indications.

xxiv. The “Wipe Off” technique can be used to aid the evaluation of any indications and must be performed as directed by AMM 70-20-02, Fluorescent Penetrant Inspection.

xxv. The cause of all indications must be evaluated under white light using visual aids, such as magnification, as appropriate.

xxvi. Record any suspected crack indication in Appendix x. Report any suspected crack indications to Rolls-Royce local representative.

xxvii. Post Clean - 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) Close access to the Tail Bearing Housing (TBH)

i. Make sure the work area is clean and clear of tools and other items.

ii. Close the Fan Exhaust Cowls in accordance with AMM 78-26-00, Maintenance Practices.

iii. Make the Thrust Reverser serviceable after maintenance in accordance with AMM 78-30-00, Deactivation/Activation as necessary.

iv. Close the Fan Cowl Doors in accordance with AMM Task 71-13-00, Maintenance Practices.

PROCEDURE – IN SHOP

1) Carry out the inspection on the Mount Lug Run-outs

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. This inspection must be performed in accordance with the requirements of 70-00-00, Overhaul Process 210, Fluorescent Penetrant Inspection.

ii. Local cleaning of the inspection areas must be completed prior to FPI.

iii. Apply OMat 150 – Acetone to a clean OMat 2/101 – Lint Free Cloth.

iv. Clean the inspection surfaces (see Figures 1 and 2) with the moistened cloth.

v. Ensure that all contaminants have been removed. If necessary repeat steps (iii) and (iv) in order to achieve this.

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.

vi. Allow 10 minutes for the area to completely dry prior to penetrant application.

vii. Penetrant Application - Apply OMat 651F – 1D3 Penetrant to the inspection areas (Figures 1 and 2) by brush or sponge applicator. The penetrant must be dispensed from a sealed aerosol can and any unused penetrant must go to waste.

viii. Ensure that the inspection area is fully covered with penetrant with the aid of a UV lamp.

ix. Apply OMat 651F – 1D3 Penetrant to the OMat 677 – Penetrant Test Panel.

x. Leave the penetrant in contact with the components for 30 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.

xi. Penetrant Removal - After the 30 minutes contact time, remove the excess penetrant from the inspection surface and the OMat 677 – Penetrant Test Panel by wiping thoroughly with a clean OMat 2/101 – Lint Free Cloth.

xii. Whilst illuminating with UV light, wipe off the penetrant with a clean OMat 2/10 - Lint Free Cloth moistened with OMat 150 – Acetone. Use the minimum application necessary to achieve acceptable background fluorescence and ensure than acetone is not allowed to flow on the inspection surface.

xiii. Ensure that all traces of the OMat 150 – Acetone have been completely removed.

xiv. Develop - 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.

xv. Allow 10 minutes contact time for the developer.

xvi. Cover the region of the engine with a dark non-reflective cover in order to reduce the white light levels.

xvii. Ensure there are no white light sources or fluorescent items (including clothing) within the inspection area or the inspector's field of vision.

xviii. Do not wear darkened or light sensitive glasses.

xix. Allow 1 minute for eye adaptation to the darkened area.

xx. Illuminate the OMat 677 – Penetrant Test Panel with UV light at an intensity of no less than 1200 µW/cm^2 in the darkened area.

xxi. Inspect the OMat 677 – Penetrant Test Panel and check that the 4 largest indications are visible and match the control photograph for that individual panel.

xxii. Illuminate the inspection surface with UV light at an intensity of no less than 1200 µW/cm^2 in the darkened area.

xxiii. Inspect the Mount Lug Run-Outs for crack indications.

xxiv. The "Wipe Off" technique can be used to aid the evaluation of any indications and must be performed as directed by 70-00-00, Overhaul Process 210, Fluorescent Penetrant Inspection.

xxv. The cause of all indications must be evaluated under white light using visual aids, such as magnification, as appropriate.

xxvi. Record any suspected crack indication in Appendix 3. Report any suspected crack indications to Rolls-Royce local representative.

xxvii. Post Clean - 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.

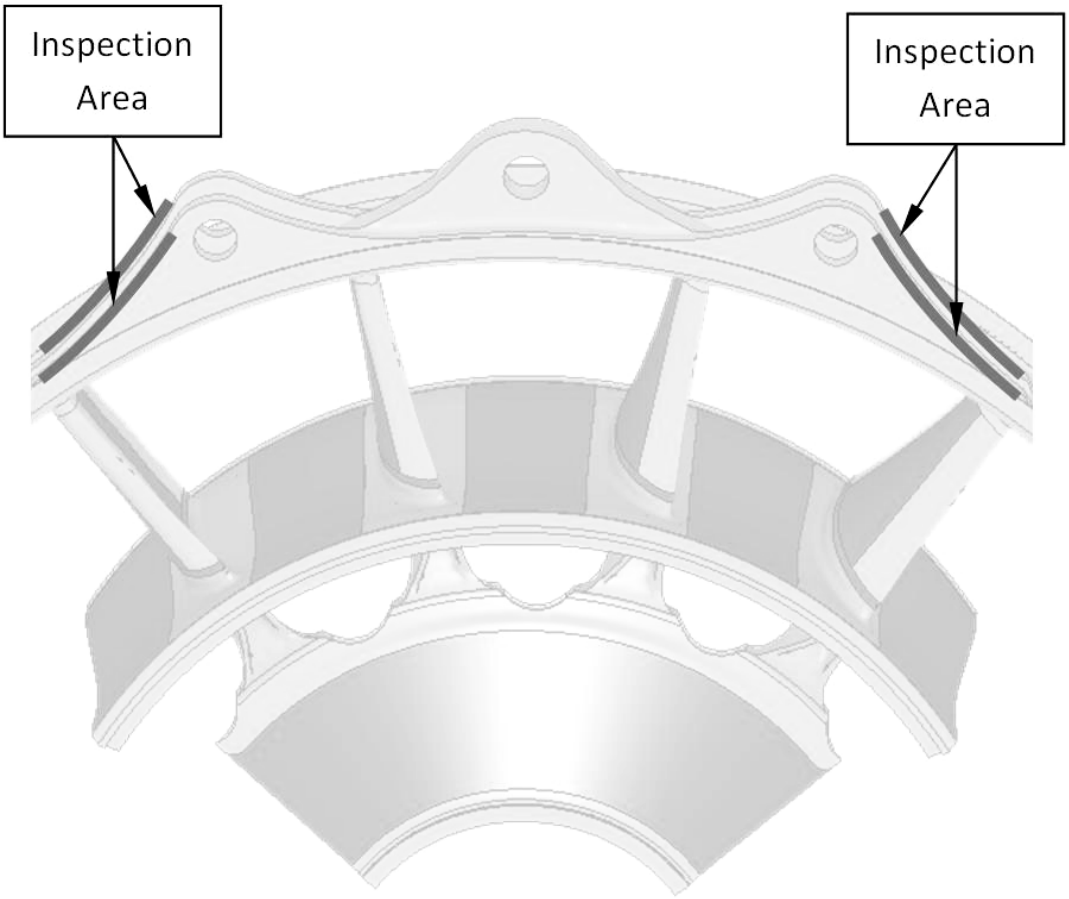

Figure 1 - Mount Lug Run Outs

Inspection Areas:

The curved faces in these 2 positions on each side of the engine must be inspected. In addition, approximately 5 mm coverage is required around the corners.

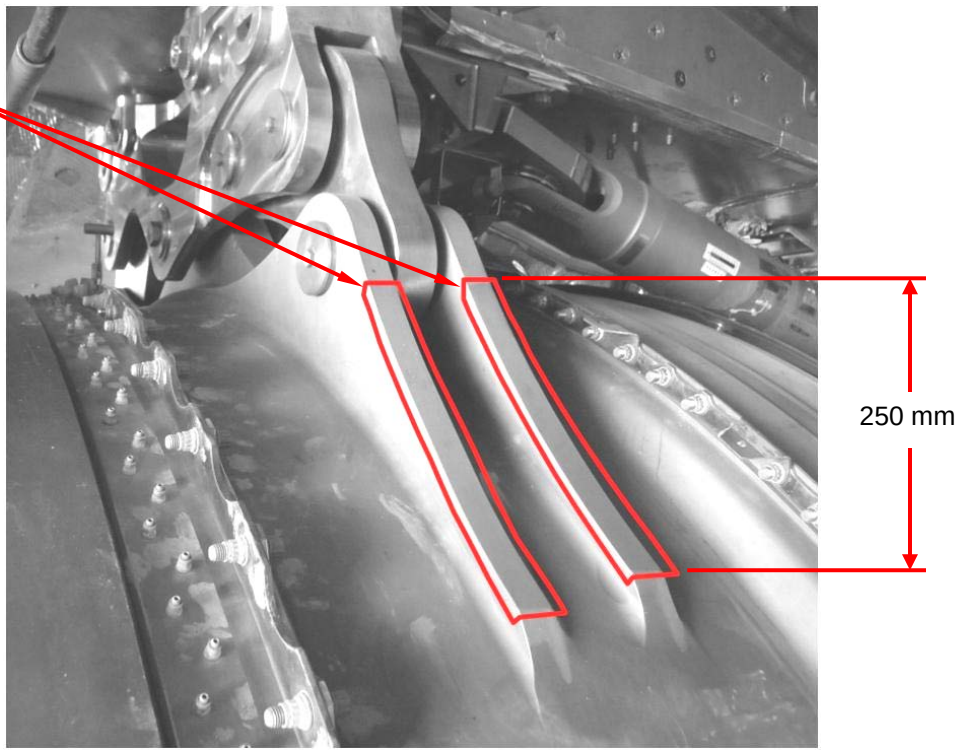

Figure 2 - Inspection Areas

APPENDIX 1

Trent 900 Engines to be inspected **ON WING** using this procedure

Engine Number
91035
91039
91048

APPENDIX 2

Trent 900 Engines to be inspected **IN SHOP** using this procedure

Engine Number
91047

APPENDIX 3

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

Feedback Sheet TV124801	
Overhaul Base (if applicable)	
Operator	
Engine Mark	
Date of Inspection	
Engine Serial Number	
Engine Hours Since New	
Engine Cycles Since New	
Component Part Number	
Component Serial Number	
Component Hours Since New	
Component Cycles Since New	

	Inspection result and comments
On Wing Inspection of Mount Lug Run-outs (if applicable)	
In Shop Inspection of Mount Lug Run-outs (if applicable)	