

This is a repeat application Technical Variance. It is the Operator's/Overhaul base's responsibility to control the application of this document. The technical content of this document will feature as a full revision to the relevant Manual.



Rolls-Royce

**TECHNICAL VARIANCE
DOCUMENT FRONT SHEET**

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Technical Variance No: **TV11807R** Date **07 August 2007**

Operator/Applicant: **ALL / SHORTS**

Original Request No: **N/A**

Date: **07 August 2007**

Engine Type: **BR700-710**

Variant(s): **A1-10 / C4-11**

Part Description: **Nacelle – Nose Cowl Lipskin**

Part No Range: **04C0001Series,**

EXISTING REQUIREMENT AND REQUESTED VARIANCE

Areas of minor pitting/ corrosion have been found on the inner and outer surfaces of the nose cowl lipskin.

Provided that, after rework, the lipskin, will not have a thickness of less than 0.053" (1,35mm) in the discrepant areas, the inner and outer surfaces can be restored to a smooth reflective finish by application of the procedures detailed within this document.

This TV supersedes TV5348R and TV10608R in order to incorporate the abrasive polishing procedure, lipskin thickness checks and the application of Xzilon@3AECI (Aircraft exterior corrosion inhibitor) in accordance with GV CMM 71-11-01 Cleaning -03

SUMMARY OF INVESTIGATION AND CONCLUSIONS

Damages can be removed and the surfaces repolished in accordance with the instructions contained within this Technical Variance to achieve a bright reflective finish. Lipskin thickness should be checked prior and after rework as directed to ensure compliance with minimum thickness requirements of 0.053" (1,35mm).

NOTE: If it is felt that the minimum thickness requirements have or may have been compromised in specific locations, a Technical Variance detailing location and extent of deviation must be requested.

It is recommended that a regular weekly cleaning of the lipskin surfaces in accordance with step 10 of this TV to remove dirt and surface film with help to minimize the requirement for repeat abrasive polishing. Furthermore it is recommended that xzilon@3aeci (aircraft exterior corrosion inhibitor) be applied to the lipskin in order to optimise preservation of the polished finish.

Note: Should the condition of the lipskin necessitate a repeat of these procedures it should be understood that it should only be repeated if the thickness of the lipskin in the discrepant areas will not be less than 0.053" (1,35mm) after re-work.

On completion of the re-work mark TV11807R on the component data plate. Use vibro peening equipment. Refer to Overhaul Processes Manual TSD594-J, OP TASK 363. Make an entry of TV11807R in the appropriate logbook.

HEAD OF SERVICE ENGINEERING (OR NOMINEE)

Signature.......... Printed Name **B. RICHTER**..... Date **28.08.2007**

DECLARATION OF APPROVAL/REJECTION

*delete as appropriate

The above technical variance has been approved by Rolls-Royce Deutschland Ltd & Co KG and Short Bros. Plc. Belfast. It is the responsibility of the applicant/recipient to ensure that prior to use, further approval is obtained as required, from the operator's relevant airworthiness authority.



CONTINUATION SHEET

OP	Procedure	Related Data
1.	Removal of inlet cowl	<p>It is recommended that the inlet cowl be removed before carrying out the thickness check and polishing operation.</p> <p>Refer to AMM- ATA 71-11-01</p>
2.	Protection of the outer surfaces	<p>Carefully mask off the outer skin surfaces using masking tape and a suitable protective covering aft of the lipskin circumferential joint, leaving only the lipskin surface area exposed. Ensure that all vents, probes and apertures are blanked off to prevent contamination by dust that may be produced during the polishing process.</p>
Lipskin thickness inspection procedure steps 3 to 9		
3	Check the lipskin thickness	<p>The lipskin can be checked and measurements recorded for lipskin material thickness at various radials of the lipskin. (Refer to fig.1) Checks should also be made for evidence of previous repairs. These should be recorded on the inlet cowl serial plate or in the aircraft log-book. The following details must be checked prior to carrying out any repairs to the lipskin surface.</p> <ol style="list-style-type: none"> 1. The lipskin must be checked for material thickness using calibrated NDT ultrasonic equipment and measurements recorded. 2. Previous repaired surface areas must be checked in detail, recording material thickness measurements every 0.5" square inches of repaired area prior to carrying out further repairs in that area. 3. Material thickness measurements that are below the minimum allowable limit of 0.053" must be reported to the manufacturer for disposition. 4. Lipskin surface damages must be measured and recorded using suitable calibrated equipment. 5. It is not permissible to carryout a repair that will remove material and create a lipskin thickness condition below the 0.053" (1,35mm) allowable limit. 6. The lipskin must be checked for material condition to confirm conformance to the approved allowable limits.



CONTINUATION SHEET

4	Cleaning of the Aluminium Lipskin	Solvent clean the Aluminium alloy surface by wiping with a lint free cloth (omat 2/101) dampened with an appropriate solvent. MEK (Omat 135) or suitable locally approved alternative Ensure that the solvent is removed before evaporation.
5	Identify and mark off any previous repair areas.	Using a temporary marker pen, Omat 262M, mark the previously repaired areas of the Lipskin (Fig 2) Record the positions on a suitable data sheet.
6	Map out the material thickness of the previous repaired areas.	Mark off the surface area of the repaired lipskin surface into 0.5 square inch sections. (fig.2) Using Ultrasonic NDT equipment, Check each section of the repaired surface and record the material thickness. Note: Minimum allowable material thickness = 0.053 inches (1,35mm)
7	Check lipskin thickness at various radials.	Check the the Lipskin thickness at the following radials: 0 degrees, 45 degrees, 90 degrees, 135 degrees, 180 degrees, 225 degrees 270 degrees, 315 degrees. Record the material thickness for the lipskin profile at circumferential positions A to G Ref figure 1 Record the matrial thickness for the radials listed. Damage areas should also be ckecked and recorded. Note: Minimum allowable material thickness = 0.053 inches (1.35mm)
8	Inspection of measured material records.	Inspect measured thickness readings and check the lipskin has sufficient material to complete the repair. Final repaired Lipskin thickness must not be less than 0.053 inches (1,35mm)
9	Complete the repair	If there is sufficient material thickness at the damage location proceed with the detailed instructions contained in the following procedures recommended for manual polishing.



CONTINUATION SHEET

Lipskin manual abrasive polishing procedure steps 10 to 17

NOTE: If the manual polishing of the lipskin to remove minor pitting / corrosion is not required
Please move to Step 18

10.	Manual polishing of the aluminium lipskin	Solvent clean the aluminum alloy surface by wiping with a lint free cloth (omat 2/101) dampened with an appropriate solvent. MEK (omat 135) or suitable locally approved alternative Ensure that the solvent is removed before evaporation.
11.	Preparation of the surface	Abrade the Aluminum surface using an orbital sander and 220 grit silicone carbide abrasive paper (Omat 5/80) to obtain a smooth uniform surface
12.	Preparation of the surface	Abrade the Aluminum surface using 800 grit silicone carbide abrasive paper (Omat 5/28) to obtain a smooth uniform surface
13.	Clean	Repeat op 10
14.	Inspect	Inspect the surface of the lipskin for smoothness.
15.	Polish	Polish the Aluminum surface using red buffing compound Tripolea 2468 polish and a Divine 6 inch pad with the 12,000-RPM Dotco straight grinder (or suitable alternative).
16.	Polish	Polish the component surface using a Dynabrade G400z burnishing machine with an 8-inch wool bonnet (or suitable alternative), until the reflectivity requirements have been achieved.
17.	Inspect	Inspect the lipskin to ensure that the finish is satisfactory. Check the material thickness of the repaired area. Repeat the processes detailed in op. 7 and map out the repaired area, record final Lipskin material thickness for the repaired section. Record the measurements on a suitable data sheet. Note: Minimum allowable material thickness = 0.053 inches (1.35mm)



CONTINUATION SHEET

18.	Reflectivity test in accordance with the following procedure	<p>This test shall take place under adequate lighting, or natural daylight. In cases of doubt, natural daylight shall take preference</p> <p>All polished surfaces shall be reflectivity tested by holding the label shown in fig 3 at a distance of 4 feet (1.22 m) parallel to, and facing the polished surface.</p> <p>The reflectivity of the polished surface shall be considered acceptable when the definition of the reflected image allows the operator to read the words on the skin. (Ref fig 3)</p>
19.	<p>Note: It is highly recommended that the polished surface of the lipskin be further protected by APPLICATION OF Xzilon@3AECI (AIRCRAFT EXTERIOR CORROSION INHIBITOR) IN ACCORDANCE WITH:</p> <p>- GV CMM 71-11-01 Cleaning -03</p>	Apply in accordance with the manufacturers instructions and apply subsequent coatings in accordance with the manufacturer's recommendations.
20.	Remove protective covers	<p>Carefully remove the masking tape and protective coverings.</p> <p>Ensure all blanking off materials have been removed prior to installation of the inlet.</p>
21.	Inspection of inlet prior to installation	Ensure that repair processes have been satisfactorily carried out and the Inlet Cowl is suitable for installation.
22.	Record the TV number	Record the TV11807R onto the component serial plate and enter into the aircraft log book
23.	Install the Inlet Cowl (if the inlet had been removed)	Refer to Aircraft Maintenance Manual - ATA 71-11-01

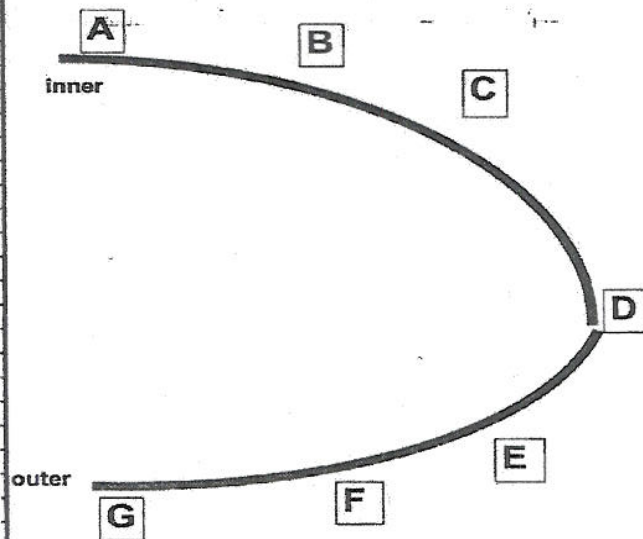


CONTINUATION SHEET

Lipskin Thickness Measurements

04C0104 Drg 0.064" min

Radial	Circum postn	mat. thickness
0	A	
	B	
	C	
	D	
	E	
	F	
	G	
45	A	
	B	
	C	
	D	
	E	
	F	
	G	
90	A	
	B	
	C	
	D	
	E	
	F	
	G	
135	A	
	B	
	C	
	D	
	E	
	F	
	G	
180	A	
	B	
	C	
	D	
	E	
	F	
	G	
225	A	
	B	
	C	
	D	
	E	
	F	
	G	
270	A	
	B	
	C	
	D	
	E	
	F	
	G	
315	A	
	B	
	C	
	D	
	E	
	F	
	G	



profile check.xls

Figure 1 – Example showing Lipskin Profile/Thickness Measurement Table.



CONTINUATION SHEET

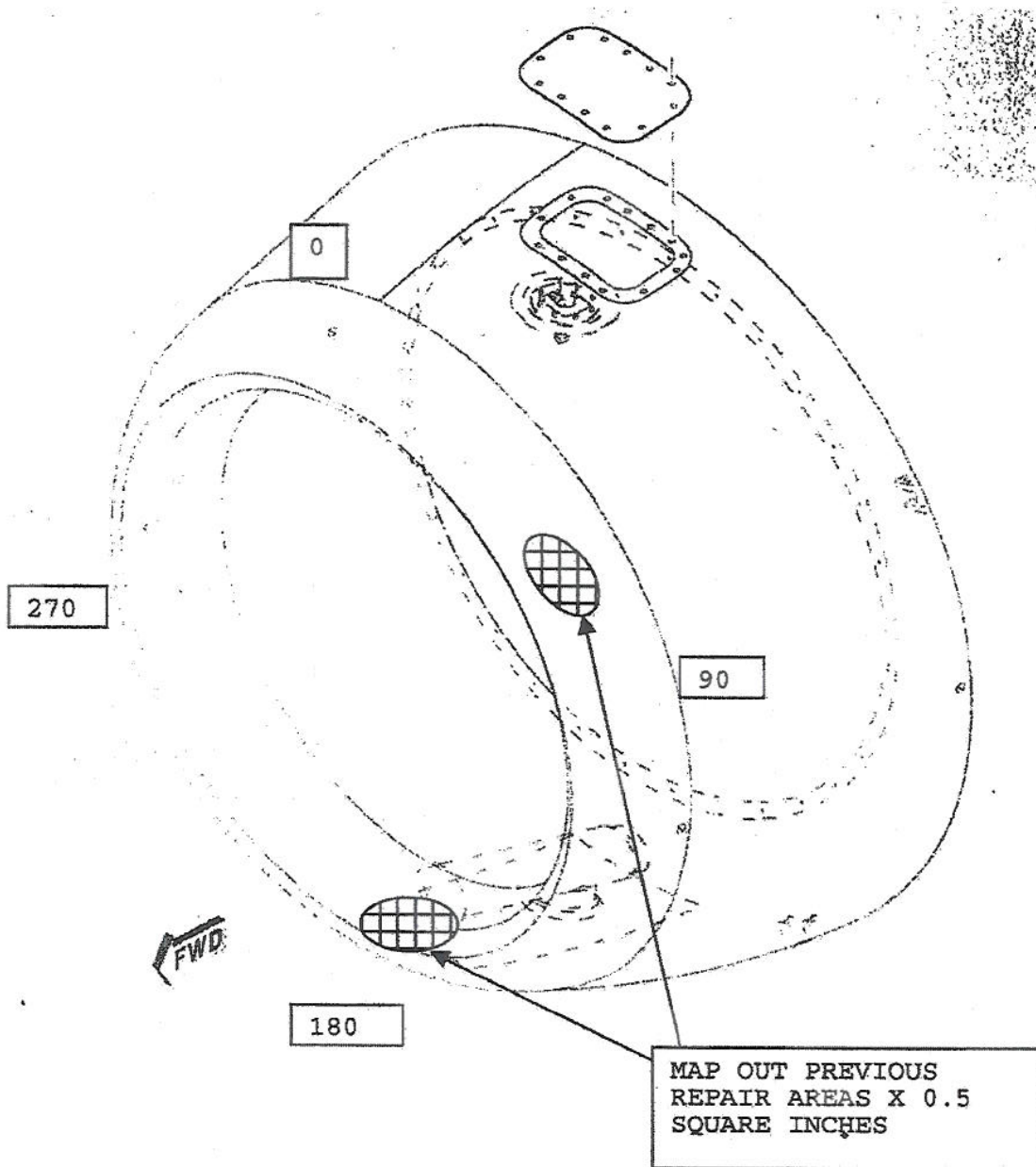


Figure 2 – Example showing 2 off repaired areas, mapped for the thickness measurement.



FIGURE 1

LABEL FOR REFLECTIVITY TEST

- NOTES :** (1) Text shall be Helvetica, Bold, 24 point.
(2) Letters shall be black, on a white background.

Figure 3 – Example showing Label for Reflectivity test.