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Technical Variance

Where the recipient of this document works in accordance with regulations under control of the relevant national aviation authority, outside of the EU jurisdiction and no applicable bi-lateral agreement or equivalent exists, it is essential that the recipient ensures that the relevant national aviation authority accepts / approves the incorporation of this Technical Variance.

This Technical Variance is only applicable for parts of the Rolls-Royce Engine Type Design and does not apply to parts marked with 'PMA' in accordance with the national regulations. (e.g. USA/FAA)

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

TV No.	**289228** Issue: **01**	Date of Application:	**06 FEB 2025**
Application Type	One-off ☐ Repeater ☑	Expiry date (If Repeater)	**05 FEB 2026**
Operator/Applicant	**ALL OPERATORS / ALL APPLICANTS**	Original Request No.	**BRG3462 Issue 02**
Engine Type	**BR700-710**	Engine Mark/Model (s)	**BR700-710D5-21**
Part Description	**Low Pressure (LP) Compressor Fan Blade Assembly**	Eng/~~Mod~~ Serial No.	**N/A**
Part No.	**KH89518, KH90969 and LV31558**	Part Serial No.	**N/A**
Manual Title	**EMM** Ref. **M-710-8BR**	ATA/~~DMC~~ Ref.	**72-31-02**
TV Title	**ADVANCE COPY OF BRG3462 ISSUE 02 (LOW PRESSURE (LP) COMPRESSOR FAN BLADE ASSEMBLY – REPAIR OF THE LEADING AND TRAILING EDGES BY RE-PROFILING)**		
Hours	**N/A**	Cycles	**N/A**

Existing Requirement

Currently, BR700-710D5-21 EMM BR700NG-A-72-31-02-02AAA-663A-A contains Issue 01 of the Repair Scheme BRG3462 to repair leading and trailing edges by re-profiling the Low Pressure (LP) Compressor Fan Blade Assembly (PNs KH89518 and KH90969).

Requested Variance

Refer to Page 2 of this TV.

Summary of Investigation and Conclusions

Refer to Page 2 of this TV.

Approval Statement

TV CLASSIFICATION MAJOR ☐ MINOR ☑

The technical content of this document is approved under the authority of:

☑ DOA ref. EASA.21J.065. It has been demonstrated that the TV and areas affected by the TV comply with the type-certification basis.

☐ A representative of European Union Aviation Safety Agency (EASA) Certificate no: *Certificate Number, where applicable.* Rolls-Royce has demonstrated compliance with the type-certification basis and environmental protection requirements, as established and notified by the Agency, following the certification programme as accepted by the Agency.

☐ Airframer reference no: *Airframer Reference Number, where applicable.*

Approval by Airworthiness Office

Airworthiness Approver
DAE 065-003

Digitally signed by Erol, Hamdi
Date: 2025.02.07 14:03:32 +01'00'

Country	Export Classification	Date
GERMANY	Not Listed	06 Feb 25

Technology for Export Control

Requested Variance

This Repeater Technical Variance (TV) has been requested to introduce the fully approved Repair Scheme BRG3462 Issue 02 (Low Pressure (LP) Compressor Fan Blade Assembly - Repair of the leading and trailing edges by re-profiling) in advance.

Summary of Investigation and Conclusions

Engineering assessment has concluded that the fully approved Repair Scheme BRG3462 Issue 02 (Low Pressure (LP) Compressor Fan Blade Assembly - Repair of the leading and trailing edges by re-profiling) may be published in advance as per this TV until such a time when the affected Engine Maintenance Manual is amended to incorporate the repair scheme or until the expiry date on Page 1 of this TV, whichever occurs sooner.

This Technical Variance contains the repair procedure on pages 3 to 20 for BR700-710D5-21 engine. The repair procedure is an extract from fully approved Repair Scheme BRG3462 Issue 02.

Make a record of this TV289228 in the appropriate documentation.

BR700NG-A-72-31-02-02AAA-663A-A

Engine Applicability – BR700-710D5-21

LP compressor fan blade assembly

Repair of the leading and trailing edges by re-profiling– BRG3462, Issue 02

References

Reference	Title
BR700NG-A-70-30-01-00AAA-913A-D	Post-emulsified fluorescent-penetrant - Inspection - General maintenance procedure

List of figures – To be automatically populated by the publication system

List of tables – To be automatically populated by the publication system

Required conditions

Condition	Reference
Legal notices	DMC-BR700NG-A-00-40-00-00A01-023A-D
General data	DMC-BR700NG-A-00-10-00-00A01-010A-D
List of materials	DMC-BR700NG-A-70-02-04-00AAA-913A-D
Powerplant – General engine safety precautions – General maintenance procedure	DMC-BR700NG-A-71-00-00-05AAA-913A-D
Powerplant - General - Procedure to make engine safe for maintenance	DMC-BR700NG-A-71-00-00-00AAA-398A-A
Thrust reverser (for maintenance) – Deactivation procedure	DMC-BR700NG-A-78-30-00-01AAA-560A-A
LP compressor blades - Remove procedure	DMC-BR700NG-A-72-31-02-00AAA-520A-A
LP compressor blades – Detailed inspection - Visual examination	DMC-BR700NG-A-72-31-02-02AAA-310A-A
Non-aqueous liquid degreasing – General maintenance procedure	DMC-BR700NG-A-70-20-01-00AAA-913A-D

Support equipment

Name	Identification/Reference	Quantity	Remarks
Dimensional inspection equipment	No specific	As necessary	Standard equipment
Fluorescent penetrant inspection equipment	No specific	1	Standard equipment
Hand tools (powered or non-powered)	No specific	As necessary	Standard equipment
Inlet cowl mat	No specific	As necessary	Standard equipment
Locally manufactured holding fixture	No specific	As necessary	Standard equipment
Vibro-peen equipment	No specific	1	Standard equipment
10x magnification visual inspection equipment	No specific	1	Standard equipment

Consumables

Name	Identification/Reference	Quantity	Remarks
Waterproof silicone carbide, grit size 600	CSN 70-02-04-05-653	As necessary	05-653
Waterproof silicone carbide, grit size 100	CSN 70-02-04-05-661	As necessary	05-661
Waterproof silicone carbide, grit size 80	CSN 70-02-04-05-662	As necessary	05-662
Fluorescent penetrant ultra high sensitivity, post-emulsified	CSN 70-02-04-05-695	As necessary	05-695
White polishing mop	CSN 70-02-04-05-700	As necessary	05-700
Polishing compound, grade 150s	CSN 70-02-04-05-705	As necessary	05-705
Abrasive stone silicone carbide	CSN 70-02-04-05-793	As necessary	05-793

Waterproof silicone carbide, grit size 800	CSN 70-02-04-05-808	As necessary	08-808

Spares

Name	Identification/Reference	Quantity	Remarks
LP compressor fan blade assembly	Part DL287 / KH89518 CSN 72-31-02-01-010	4 As necessary	No Remarks
LP compressor fan blade assembly	Part DL287 / KH90969 CSN 72-31-02-01-010	4 As necessary	No Remarks
LP compressor fan blade assembly	Part DL287 / LV31558 CSN 72-31-02-01-010	As necessary	No Remarks

General

Reason for the Job

Self-explanatory.

Additional Information

This data module gives the procedure to re-profile the leading edge and trailing edge of the LP compressor fan blade assembly (KH89518) (CSN 72-31-02-01-010) and/or LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010) and/or LP compressor fan blade assembly (LV31558) (CSN 72-31-02-01-010).

Fluorescent penetrant inspection is necessary for this repair, after the leading edge and trailing edge profile is repaired.

This repair can be done to the LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~ with or without removal from the engine.

This repair can be done on the same LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~ more than one time in the permitted repair limits.

This repair can be done to all the LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~ in an engine set.

Always remove the minimum quantity of material from the LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~. Material removal will decrease the LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~ chordal width. If the LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~ chordal width is less than the minimum chord width dimension given in this repair, reject the LP compressor fan blade assembly (~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~.

A. The leading edge and trailing edge must be repaired as near to the initial shape and surface condition as possible. It is allowed to have chord width locally below the minimum acceptance limit, if an aerofoil has been repaired by scalloping and/or re-profiling.

B. If a powered hand tool (mechanical cutters) is to be used, the settings of the tool that controls the spindle speed (surface speed), must be established together with the selected abrasive consumable(s), to ensure that an injury to the operator and/or damage to the component does not occur, refer to Figure 1 (Sheet 9 of 9) for guidance. These parameters/setting must first be established on a test panel made of the same material or a scrap component. The parameters established by one operator are not transferable to another operator, therefore each operator MUST establish his/her own particular settings prior to the repair of each component, or at the start of each batch of multiple parts of the same material type. ALL CAUTIONs relating to the use of mechanical cutters MUST be complied with.

C. ~~All blades that are repaired as per this repair instructions must be swab etched and crack inspected inspection must be done at the next shop visit~~.

D. After the repair is completed, vibration survey must be done to the engine.

E. ~~Material of Components:~~
~~The LP compressor fan blade assembly (KH89518) (CSN 72-31-02-01-010) and/or LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010) is made of titanium alloy Ti6Al4V (TBQ).~~

Table 1. Material data

Component description	Material description (Common name)
LP Compressor Fan Blade Assembly	Titanium Alloy (Ti6Al4V) - TBQ

Safety conditions

WARNING

YOU MUST BE CAREFUL WHEN YOU DO WORK ON THE ENGINE DURING OR AFTER ENGINE OPERATION. THE ENGINE PARTS STAY HOT FOR APPROXIMATELY ONE HOUR AFTER THE ENGINE STOPS. THIS CAN CAUSE INJURY TO PERSONS.

WARNING

DO NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES AND PROTECTIVE CLOTHING. HOT PARTS CAN CAUSE INJURY. IF YOU GET AN INJURY, ~~GET MEDICAL AID IMMEDIATELY~~ PUT IT IN COLD WATER FOR 10 MINUTES AND GET MEDICAL HELP.

WARNING

OBEY THE MANUFACTURER'S HEALTH AND SAFETY DATA FOR THE MATERIALS. YOU MUST ALSO REFER TO LOCAL REGULATIONS TO MAKE SURE THAT THE PROCEDURES ARE DONE SAFELY. IF YOU DO NOT DO THIS, AN INJURY CAN OCCUR.

1 Procedure

~~1~~ ~~Do the procedure to repair the leading edge and trailing edge on the LP compressor fan blade assembly (KH89518) (CSN 72-31-02-01-010) and/or LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010) by re-profiling.~~

1.1 Examine the LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~, refer to Figure 1 (Sheet 1 of ~~89~~), Figure 1 (Sheet 2 of ~~89~~), Figure 1 (Sheet 3 of ~~89~~), Figure 1 (Sheet 4 of ~~89~~), and Figure 1 (Sheet 5 of ~~89~~).

1.1.1 Use the Dimensional inspection equipment (No specific) to measure the minimum chordal width sizes along the length of an airfoil on the LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~.

1.1.1.1 If the chord width dimensions are locally below the minimum permitted limit because of scalloping and/or reprofiling, continue with the repair.

1.1.1.2 If the chord width dimensions of the full fan blade assembly are below the minimum permitted limit, reject the LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~.

WARNING
YOU MUST USE EYE PROTECTION DURING THIS OPERATION. IF YOU DO NOT OBEY THIS INSTRUCTION, SWARF CAN GET INTO YOUR EYES AND CAUSE INJURY.
CAUTION
~~DO NOT USE ALUMINIUM OXIDE TYPE WHEELS, STONES OR ABRASIVE PAPERS TO DRESS, BLEND OR POLISH TITANIUM COMPONENTS. YOU MUST USE SILICON CARBIDE TYPES. IF YOU DO NOT OBEY THIS INSTRUCTION, YOU CAN CAUSE DAMAGE TO THE TITANIUM COMPONENTS.~~ ALL WHEELS, STONES AND ABRASIVE PAPERS USED FOR DRESSING, BLENDING AND POLISHING MUST BE OF SILICON CARBIDE TYPE. DO NOT USE ALUMINIUM OXIDE TYPE ABRASIVE PAPERS.
CAUTION
~~YOU MUST MAKE LIGHT CUTS WHEN YOU USE MECHANICAL CUTS TO PREVENT OVERHEATING. IF YOU DO NOT OBEY THIS INSTRUCTION YOU CAN CAUSE DAMAGE TO THE COMPONENTS.~~
CAUTION

~~DO NOT APPLY FORCE IF YOU USE MECHANICAL CUTTERS ON TITANIUM COMPONENTS. THIS CAN CAUSE THE MATERIAL TO BECOME TOO HOT. IF YOU DO NOT OBEY THIS INSTRUCTION YOU CAN CAUSE DAMAGE TO THE COMPONENT.~~ IF ANY MECHANICAL CUTTERS ARE USED, MAKE ONLY LIGHT CUTS AND REDUCE THE WORKING/CUTTING TIME AND THE PRESSURE EXERTED ON THE TOOL TO PREVENT OVERHEATING OF THE COMPONENT.
CAUTION
~~DO NOT USE MECHANICAL TOOLS WITH A MAXIMUM SPEED OF MORE THAN 1000 RPM WHEN YOU DRESS, BLEND, OR POLISH TITANIUM COMPONENTS. IF YOU DO NOT OBEY THIS INSTRUCTION YOU CAN CAUSE DAMAGE TO THE COMPONENTS.~~ IF MECHANICAL CUTTERS ARE USED, MAKE SURE THE MACHINE SETTING AND/OR THE GRADE OF THE ABRASIVE USED IS NOT ABLE TO GENERATE SPARKS OR DISCOLOURATION OF THE MATERIAL DARKER THAN A LIGHT STRAW COLOUR.
CAUTION
~~DO NOT PRODUCE SPARKS WHEN YOU REMOVE MATERIAL, BLEND OR POLISH TITANIUM COMPONENTS.~~ YOU MUST MAKE SURE THAT DURING DRESSING, BLENDING AND POLISHING NO SPARKS ARE PRODUCED.
CAUTION
~~YOU MUST REJECT THE TITANIUM COMPONENT IF IT CHANGES TO A COLOR THAT IS DARKER THAN LIGHT STRAW WHEN YOU DRESS, BLEND OR POLISH IT. IF YOU DO NOT OBEY THIS INSTRUCTION YOU CAN CAUSE DAMAGE TO THE ENGINE.~~ DO NOT OVERHEAT THE PART. IF THE MATERIAL SHOWS A CHANGE IN COLOUR DURING DRESSING TO A DARKER THAN A LIGHT STRAW COLOUR YOU MUST REJECT THE COMPONENT.
CAUTION
TO PRESENT A CONTINUOUS FRESH CUTTING SURFACE TO THE COMPONENT, THE CUTTING TOOL MUST BE MAINTAINED IN GOOD CONDITION (WORN CUTTING TOOLS SHALL NOT BE USED).
CAUTION
YOU MUST MAKE SURE THAT ALL BURRS CREATED BY THE MATERIAL REMOVAL ARE REMOVED.

1.2 Re-profile the LP compressor fan blade assembly ~~(KH89518) (CSN 72-31-02-01-010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~, leading edge and trailing edge, refer to Figure 1 (Sheet 1 of ~~89~~), Figure 1 (Sheet 2 of ~~89~~), Figure 1 (Sheet 3 of ~~89~~), Figure 1 (Sheet 4 of 9), Figure 1 (Sheet 5 of ~~89~~), Figure 1 (Sheet 6 of ~~89~~), Figure 1 (Sheet 7 of ~~89~~), ~~and~~ Figure 1 (Sheet 8 of ~~89~~) and Figure 1 (Sheet 9 of 9).

1.2.1 Use the Locally manufactured holding fixture (No specific) to install each LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~ into the holding fixture.

1.2.2 Use the Hand tools (powered or non-powered) or Waterproof silicone carbide, grit size 100 (CSN 70-02-04-05-661) and Waterproof silicone carbide, grit size 80 (CSN 70-02-04-05-662) to remove the damage and re-profile the leading edge and trailing edge of the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~.

1.2.3 Use the Waterproof silicone carbide, grit size 100 (CSN 70-02-04-05-661) and Waterproof silicone carbide, grit size 80 (CSN 70-02-04-05-662) to repair the radii and to flush the leading edge and trailing edge of the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72-31-02-01-010)~~.

1.2.4 Use the White polishing mop (CSN 70-02-04-05-700) with Polishing compound, grade 150s (CSN 70-02-04-05-705) or use the Waterproof silicone carbide, grit size 800 (CSN 70-02-04-05-808) or Waterproof silicone carbide, grit size 600 (CSN 70-02-04-05-653) to polish and smooth the leading edge and trailing edge of the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~. Make sure that the surface finish is equal or better than the adjacent surfaces.

NOTE: Make sure that you remove the minimum amount of material necessary to remove the damage.

NOTE: Make sure that the leading and trailing edges are as near to the original shape and surface condition as possible.

NOTE: Use the Polishing compound, grade 150s (CSN 70-02-04-05-705) (silicon carbide) only.

NOTE: Do the complete polish in a radial direction.

1.2.5 Clean the repaired area correctly.

NOTE: The LP compressor fan blade assembly must be removed from the holding fixture if this repair is carried out after removed from the engine.

1.3 Examine the repair area, refer to Figure 1 (Sheet 1 of ~~89~~), Figure 1 (Sheet 2 of ~~89~~), and Figure 1 (Sheet 5 of ~~89~~).

NOTE: This inspection is done before 50 flight hours or 50 flight cycles. If more than 50 flight hours or 50 flight cycles, then do the Step 1.4. Check the log book to verify the flight hours or flight cycles.

1.3.1 Use 10x magnification visual inspection equipment (No specific) to do visual examination of the repair area to make sure that there are no cracks on the repaired area.

1.4 Do a fluorescent penetrant inspection for crack indications in the repaired area.

1.4.1 Use the Fluorescent penetrant inspection equipment (No specific) and Fluorescent penetrant ultra high sensitivity, post-emulsified (CSN 70-02-04-05-695) to do the fluorescent penetrant crack test on the repaired area of the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~. Refer to DMC-BR700NG-A-70-30-01-00AAA-913A-D.

1.4.2 If the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~ is cracked, reject the fan blade assembly.

1.5 Examine the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~, refer to Figure 1 (Sheet 1 of ~~89~~), Figure 1 (Sheet 2 of ~~89~~), Figure 1 (Sheet 3 of ~~89~~), Figure 1 (Sheet 4 of ~~89~~), and Figure 1 (Sheet 5 of ~~89~~).

1.5.1 Use the Dimensional inspection equipment (No specific) to measure the minimum chordal width sizes along the length of an airfoil on the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~.

1.5.1.1 If the chord width dimensions are locally below the minimum permitted limit because of scalloping and/or reprofiling, continue with the repair.

1.5.1.2 If the chord width dimensions of the full fan blade assembly are below the minimum permitted limit, reject the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~.

1.6 Identify the repair, refer to Figure 1 (Sheet 1 of ~~89~~) and Figure 1 (Sheet 8 of ~~89~~).

1.6.1 Make a logbook entry, if the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~ has not been removed to do the repair.

NOTE: Use vibro-peen method at the next check to make sure that the necessary repair identification is done

NOTE: Make sure to use a protective mat in the inlet cowl, if the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~ has not been removed to do the repair.

1.6.2 Identify the repair by vibro-peening method if the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~ has been removed to do the repair.

NOTE: If the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~ is already identified with the repair scheme number BRG3462, it is not necessary to identify the repair number again.

1.6.2.1 Use the Vibro-peen equipment (No specific) to vibro-peen BRG3462 adjacent to the part number on the LP compressor fan blade assembly ~~(KH89518) (CSN 72 31 02 01 010) and/or the LP compressor fan blade assembly (KH90969) (CSN 72 31 02 01 010)~~.

1.6.2.2 Use the Abrasive stone silicon carbide (CSN 70-02-04-05-793) to remove the high material raised because of the vibro-peen engraving process.

1.7 Remove all tools, equipment and unwanted materials from the work area.

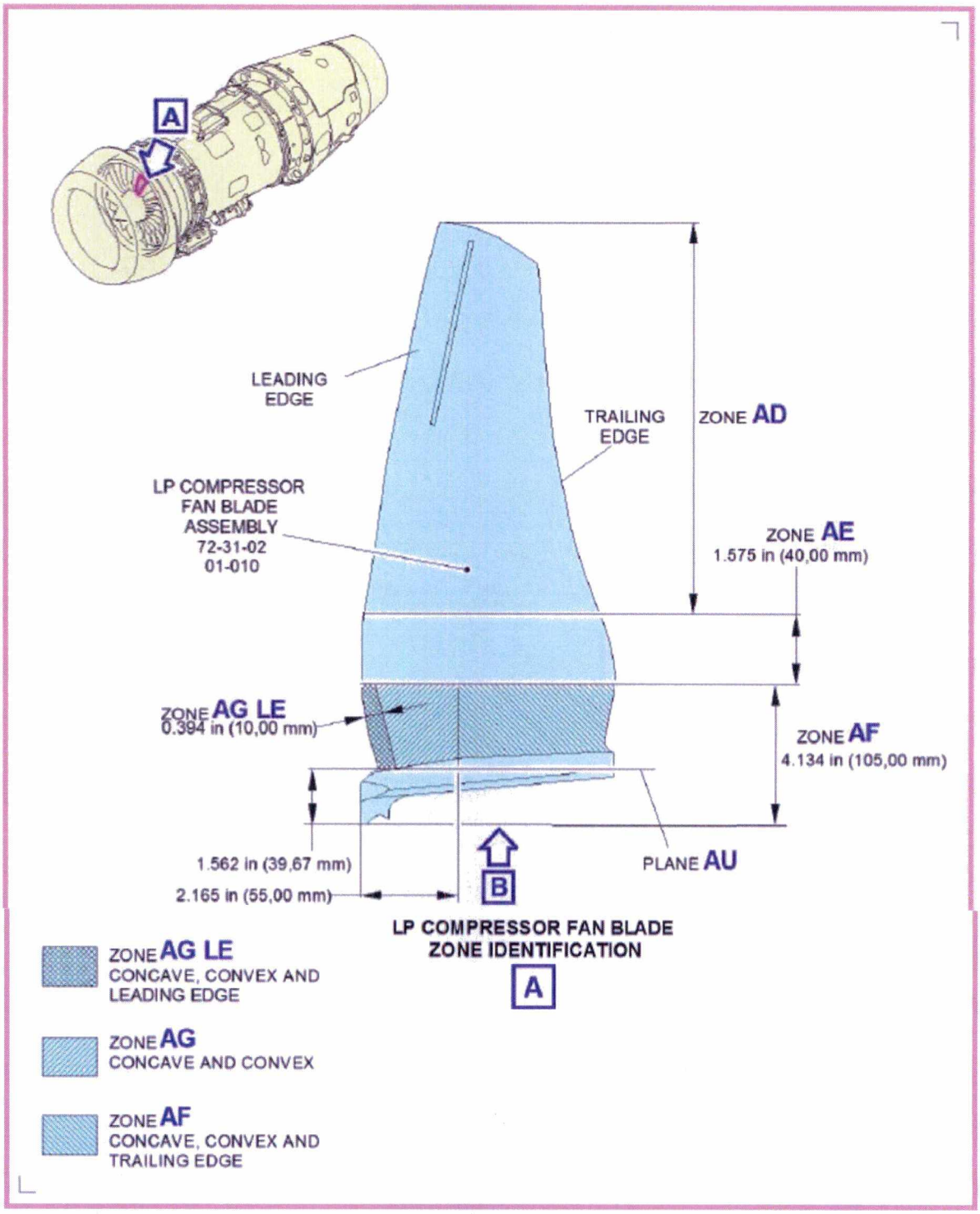
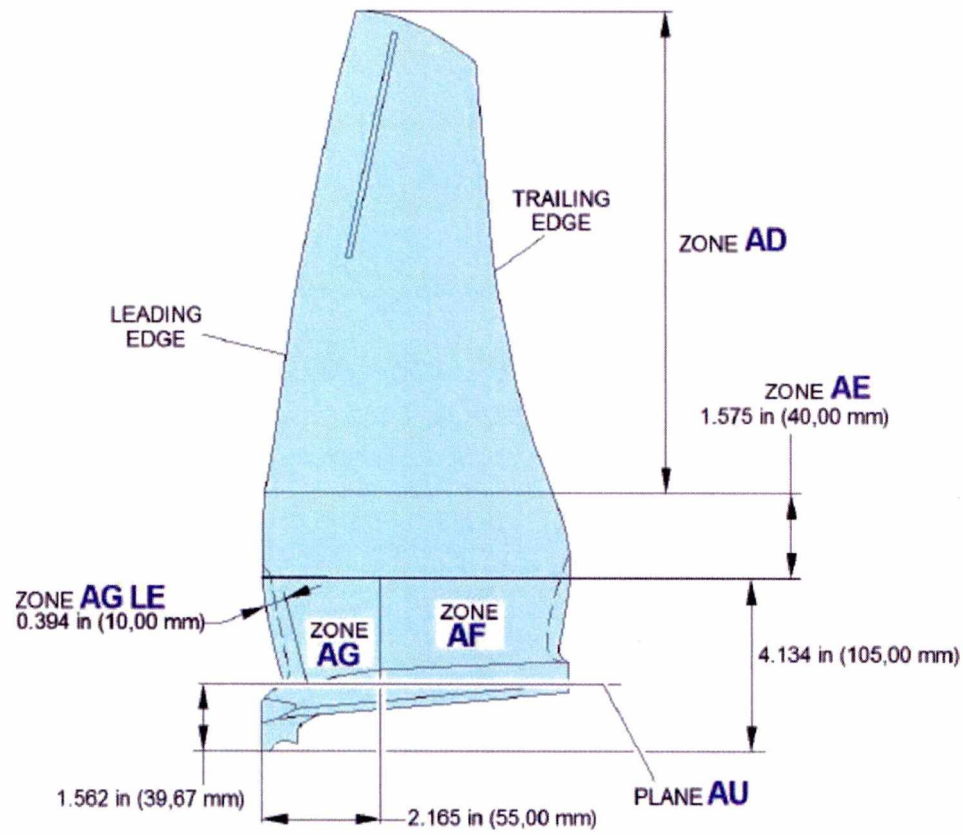


Figure 1, Sheet 1: LP compressor fan blade assembly – Repair details and dimensions (Sheet 1 of ~~89~~)
[Applicable to: BR710D5-21]



LP COMPRESSOR FAN BLADE
SURFACE DAMAGE REMOVAL LIMITS

A

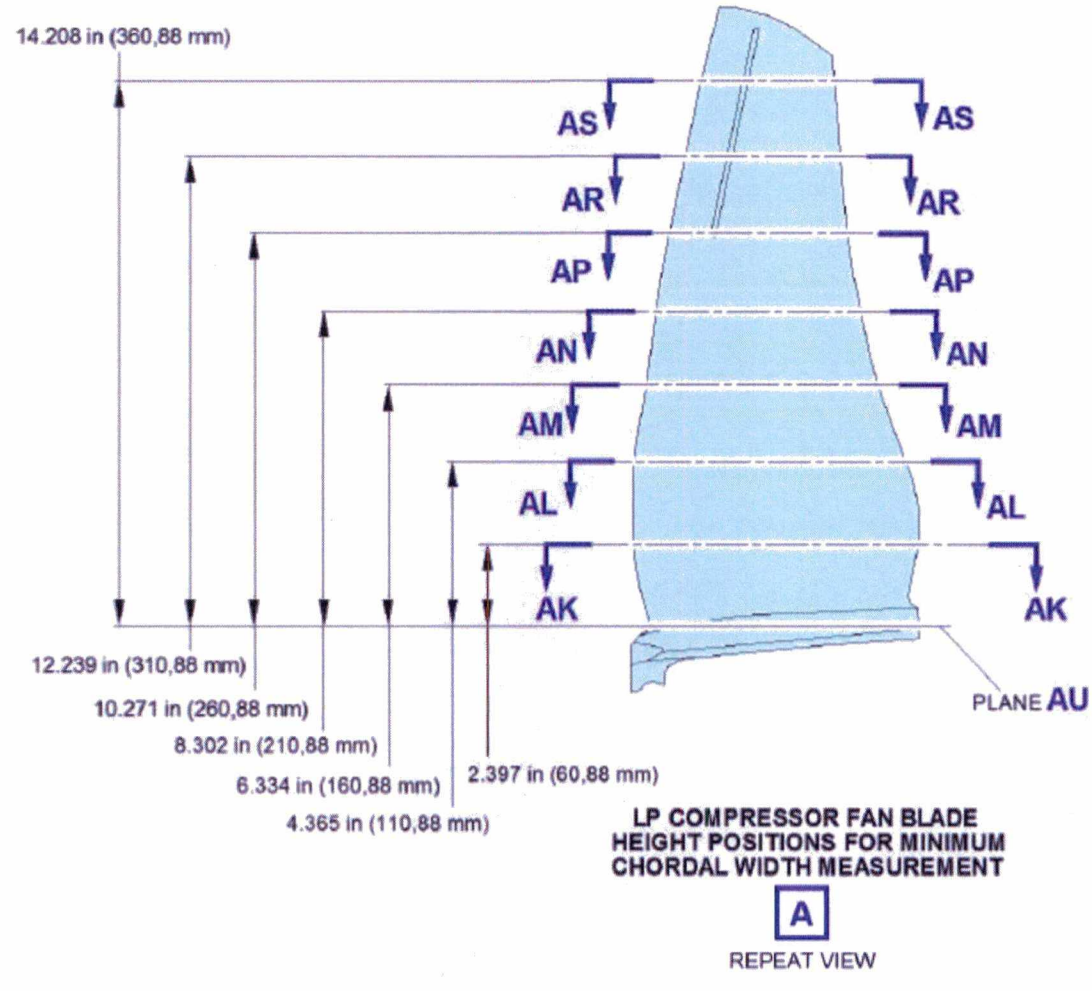
REPEAT VIEW

NOTE:
SINGLE AREA SCALLOPING IN LEADING AND TRAILING EDGE IS NOT PERMITTED IN ZONES AF AND AG LE .

LEADING AND TRAILING EDGE DAMAGE MUST BE REMOVED BY DRESSING, TYPICALLY AS SHOWN BY INTERRUPTED LINE.

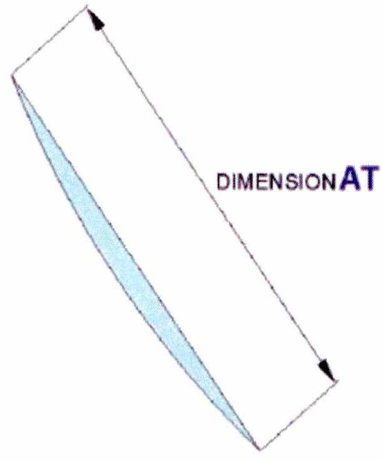
BLENDING IN ZONE AG LE, AF AND AE MUST BE TAPERED OUT INTO ZONE AD.
AFTER LEADING EDGE AND TRAILING EDGE DRESSING,
THE CHORDAL DIMENSIONS IN FIG 3 AND FIG 4 ARE MINIMUM

Figure 1, Sheet 2: LP compressor fan blade assembly – Repair details and dimensions (Sheet 2 of ~~89~~)
[Applicable to: BR710D5-21]



NOTE:
FOR MINIMUM CHORD DIMENSIONS REFER FIG 4.

Figure 1, Sheet 3: LP compressor fan blade assembly – Repair details and dimensions (Sheet 3 of ~~89~~)
[Applicable to: BR710D5-21]



TYPICAL SECTION OF LP COMPRESSOR FAN BLADE
APPLICABLE TO SECTIONS
AK, AL, AM, AN, AP, AR AND AS

POSITION	DIMENSION **AT** (MINIMUM CHORDAL WIDTH)	
SECTION **AK**	7.373 in (187,27 mm)	0 -0.002 in (0,05 mm)
SECTION **AL**	7.613 in (193,37 mm)	0 -0.002 in (0,05 mm)
SECTION **AM**	7.329 in (186,15 mm)	0 -0.002 in (0,05 mm)
SECTION **AN**	7.262 in (184,45 mm)	0 -0.002 in (0,05 mm)
SECTION **AP**	7.329 in (186,15 mm)	0 -0.002 in (0,05 mm)
SECTION **AR**	7.541 in (191,54 mm)	0 -0.002 in (0,05 mm)
SECTION **AS**	7.898 in (200,60 mm)	0 -0.002 in (0,05 mm)

NOTE:
FOR SECTION DETAILS REFER FIG 3.

Figure 1, Sheet 4: LP compressor fan blade assembly – Repair details and dimensions (Sheet 4 of 89)
[Applicable to: BR710D5-21]

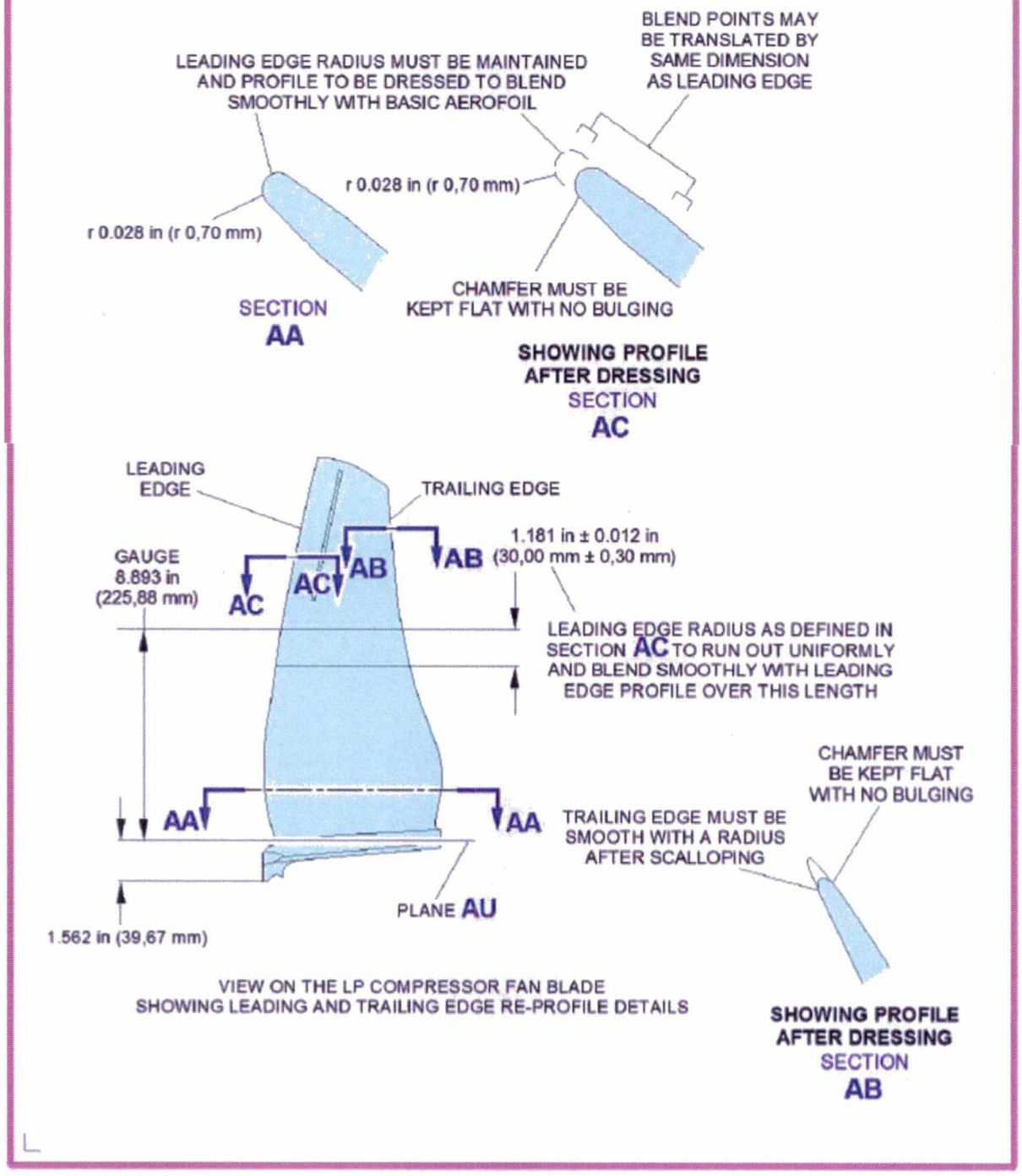
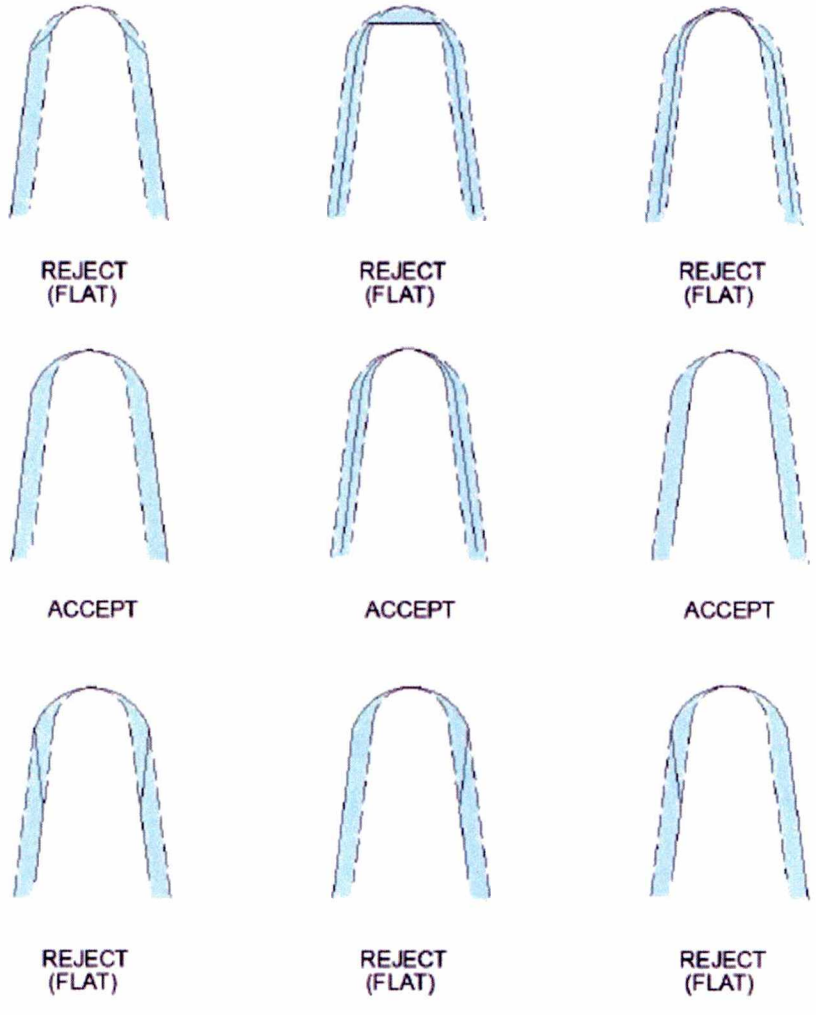


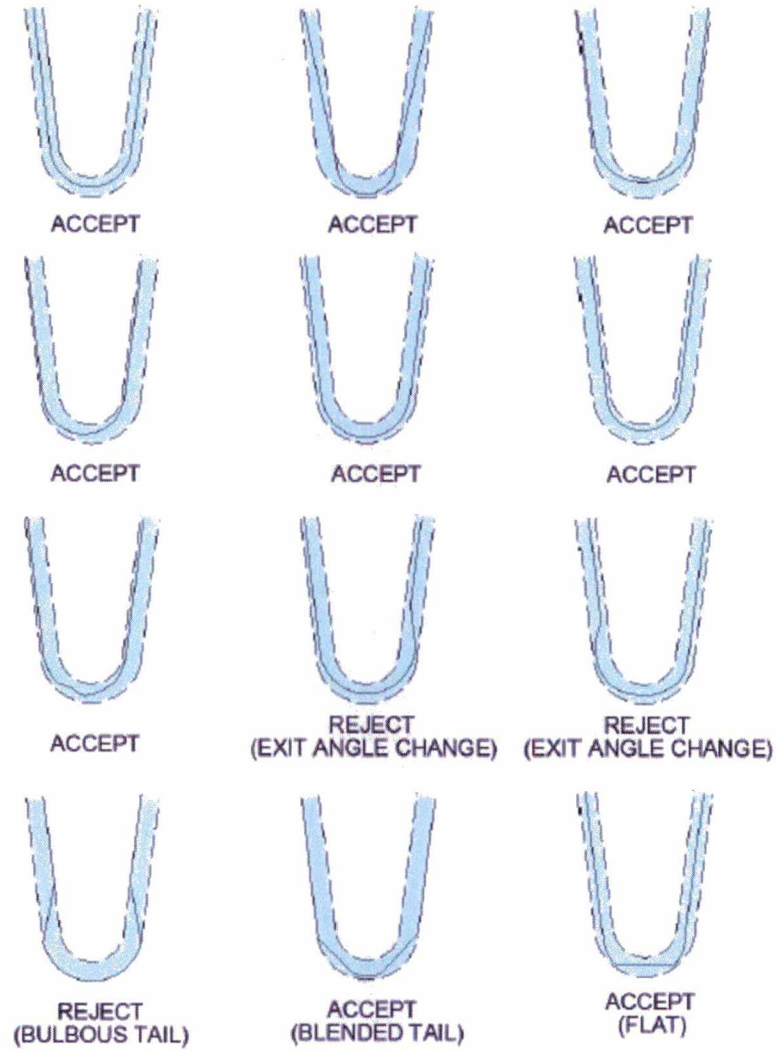
Figure 1, Sheet 5: LP compressor fan blade assembly – Repair details and dimensions (Sheet 5 of ~~89~~)
[Applicable to: BR710D5-21]



TYPICAL LEADING EDGE PROFILE

ICN-BR700NG-A-723102-R-DL287-30068-A-001-01

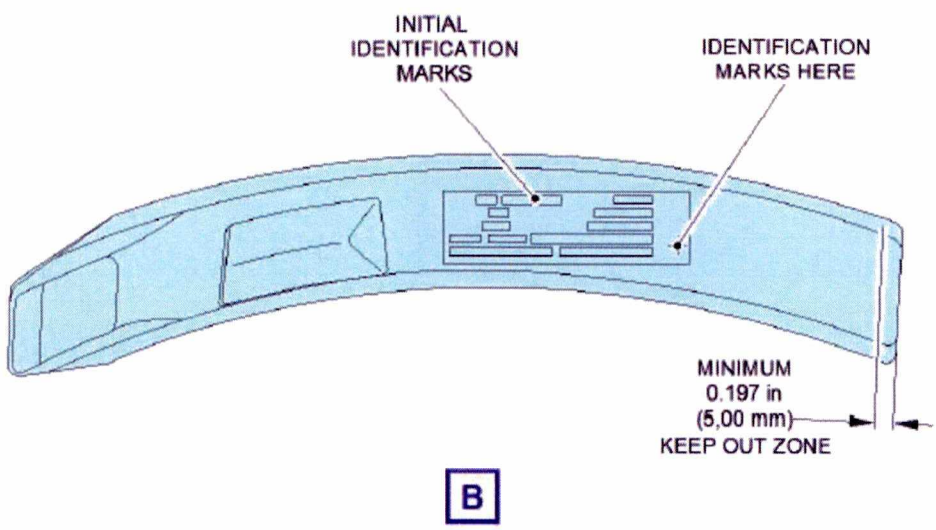
Figure 1, Sheet 6: LP compressor fan blade assembly – Repair details and dimensions (Sheet 6 of 89)
[Applicable to: BR710D5-21]



TYPICAL TRAILING EDGE PROFILE

ICN-BR700NG-A-723102-R-DL287-30069-A-001-01

Figure 1, Sheet 7: LP compressor fan blade assembly – Repair details and dimensions (Sheet 7 of 89)
[Applicable to: BR710D5-21]



MAKE SURE THAT IDENTITY MARKING IS NOT ENCROACHING
IN KEEP OUT ZONE.

Figure 1, Sheet 8: LP compressor fan blade assembly – Repair details and dimensions (Sheet 8 of ~~89~~)
[Applicable to: BR710D5-21]

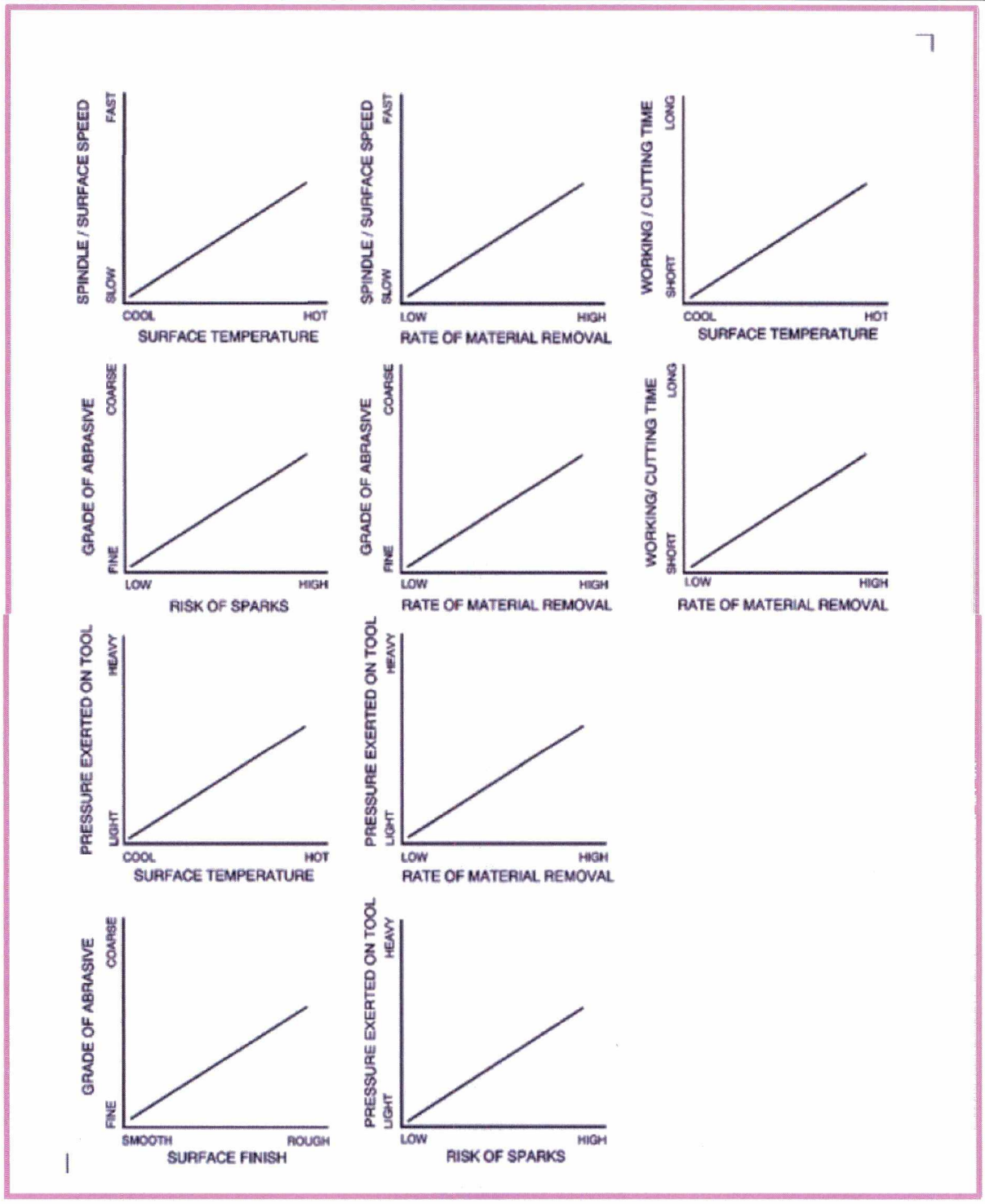


Figure 1, Sheet 9: Powered Tool Dressing – Setting/Characteristic Optimization Charts (Sheet 9 of 9)
[Applicable to: BR710D5-21]

Close-up requirements

Required Conditions

Title/Condition	Data module/Technical publication
LP compressor blades - Install procedure	DMC-BR700NG-A-72-31-02-00AAA-720A-A
Powerplant - General - Engine vibration survey - General maintenance procedure	DMC-BR700NG-A-71-00-00-28AAA-913A-A
Thrust reverser (for maintenance) - Reactivation procedure	DMC-BR700NG-A-78-30-00-01AAA-760A-A
Procedure to restore engine to operation after maintenance	DMC-BR700NG-A-71-00-00-01AAA-398A-A

Rolls-Royce

Technical Variance Approval Sheet

TV No. 289228
Issue 01
Version 01

The signatures below confirm compliance with the Engine Type Certification requirements as stated in EU 21A.433 (a).
This page must not be distributed to the applicant.

Note: All approvals below must include a signature, printed name, role/function and a date.

TV Originator Only required if not originated by a TV Competent Author.	Digitally signed by Ganapathi Raman, Vasudevan Date: 2025.02.06 19:58:55 +05'30'	**TV Competent Author** Responsible for the showing of compliance demonstration, where applicable.	Digitally signed by Tatakuntla, Taraka Date: 2025.02.06 15:31:18 +01'00'

TV Approver

Confirmation that:

- the procedures as specified in the Civil Aerospace Design Organisation handbook have been followed including all mandatory requirements.
- no feature or characteristic has been identified that may make the product unsafe for the uses for which certification is requested. Refer to Standardisation Report Safety Review section of this TV.

Repair Lead

Digitally signed by Erol, Hamdi
Date: 2025.02.07 14:02:57 +01'00'

Generic Approval TV	**TV Number**	*Number, if applicable*	☐	**Applicable** the criteria given in RRCS 10060-003 Appendix A has been confirmed
No	**N/A**	**N/A**	☑	**Not Applicable**

Specialist Function X	**Specialist Function** X	**Specialist Function** X
Specialist Function X	**Specialist Function** X	**Specialist Function** X
Specialist Function X	**Specialist Function** X	**Specialist Function** X

Compliance Verification Engineer (CVE) (Including a RR assigned CVE number)

Confirmation of an independent verification of the compliance demonstration, where applicable. Refer to Standardisation Report Compliance Demonstration section of this TV.

This page must not be distributed to the applicant.

PROPOSED TECHNICAL VARIANCE HAS A POTENTIAL EFFECT ON: *(Tick in the appropriate boxes)*

	Yes	No		Yes	No		Yes	No		Yes	No
Stress		✓	•Performance/ operability		✓	•Noise		✓	*Repair*	✓	
Containment		✓	Balancing/ Vibration		✓	Icing		✓	*Limits*	✓	
Component life		✓	Oil system		✓	•Flight deck indication		✓	*Tooling*		✓
Design		✓	Fuel system		✓	Testing		✓	*Others (Please specify)*		✓
Material		✓	•Engine handling/control		✓	Build/strip procedure		✓	*1.*		
Air system		✓	•Fire and ventilation		✓	Cleaning		✓	*2.*		
Thermals		✓	•Emissions		✓	Inspection		✓	*3.*		

For any ticked to indicate "Yes"; relevant technical substantiation (compliance demonstration with the certification basis) and/or mitigation / justification is to be provided on the Standardisation Report's continuation sheet(s).

Where identified by •, airframer approval may be required.

Future Arisings: - Subject to the understanding at the time of issue of this document.	*Yes*	*No*
Can limits approved in this TV be read across to future TVs for the current marks/models of this engine type?	✓	
Can the limits approved by this TV be introduced into the Manuals?	✓	

If "No" to either of the above – provide justification why these limits cannot be read across for future arisings

If "Yes to either of the above – provide actual limits that can be applied for future arisings

This is to be documented in the Previous Occurrences, Future Arisings and Associated Exit Strategies section of this Standardisation report in this TV.

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Safety Review *(TV Author to tick all 3 boxes to confirm assessment and substantiation completed before TV approval)*

It is the accountability of the TV Approver to ensure that the Safety Review has been correctly completed before TV issuance.

Mandatory Regulatory Requirements - Airworthiness Directives (ADs)

A review of open EASA, FAA and CAA-UK ADs has been carried out and it is confirmed that all applicable ADs have been assessed and substantiated for relevance to the deviation contained in this TV. Chief Engineer and/or Airworthiness Office approval is not mandated for this specific assessment, however guidance may be required if uncertain. ☑

List in the table below all ADs that are applicable to the deviation in this TV. Assess if the applicable AD is additionally relevant, i.e. the deviation contained in this TV contradicts the intent of the AD, and enter "Y" or "N" in the table. Provide substantiation why the applicable AD is relevant or not relevant to the deviation in this TV.

If an AD is both applicable and relevant the TV **MUST NOT be issued.**

Applicable AD No.	Applicable AD Subject	Relevant?	Relevance Substantiation
N/A	N/A	N/A	There are no ADs applicable and relevant to deviation addressed in current TV.

Regulator & Project commitments and Safety Policies - Safety Management Plans (SMPs)

A review of the applicable specific engine type/model SMP has been carried out and it is confirmed that all applicable regulator & project commitments and safety policies have been assessed and substantiated for relevance to the deviation contained in this TV. Chief Engineer and/or Airworthiness Office approval is not mandated for this specific assessment, however guidance may be required if uncertain. However, if any commitments / safety policies are assessed to be both applicable and relevant Chief Engineer approval is mandated, unless specific waiver approval has been provided by the CE in a previous precedent TV for the same deviation. ☑

List in the table below all SMP regulator & project commitments and safety policies that are applicable to the deviation in this TV. Assess if the applicable commitments / safety policies are additionally relevant, i.e. the deviation contained in this TV contradicts the intent of and/or deviates from the declared commitment / safety policy, and enter "Y" or "N" in the table. Provide substantiation why the applicable SMP commitment / safety policy is relevant or not relevant to the deviation in this TV.

If a SMP commitment / safety policy is both applicable and relevant to the deviation contained in this TV Chief Engineer (CE) approval **must be obtained BEFORE TV issuance unless a precedent waiver applies***.

SMP No.	Applicable SMP Commitment	Relevant?	Relevance Substantiation
EDNS01000983731/004	Project Safety Management Plan – BR710 & BR725	N	SMP does not contain specific commitments against the part addressed in this TV.

Safety Occurrence Reporting - Red Tops (RTs)

A review of all open and closed Red Tops (RT) has been carried out and it is confirmed that all applicable RTs have been assessed and substantiated for relevance to the deviation contained in this TV. Chief Engineer and/or Airworthiness Office approval is not mandated for this specific assessment, however guidance may be required if uncertain. However, if open and/or closed Red Top is assessed to be both applicable and relevant Chief Engineer approval is mandated, unless specific waiver approval has been provided by the CE in a previous precedent TV for the same deviation. ☑

List in the table below all open and closed RTs that are applicable to the deviation contained in this TV. For applicable closed RT the closure actions, including ALARP actions, contained in the close-out report must be assessed. Assess if the applicable open RT, and/or closed RT actions, are relevant, i.e. the deviation contained in this TV contradicts the intent of and/or deviates from the declared RT assumptions and/or actions, and enter "Y" or "N" in the table. Provide substantiation why the applicable RT is relevant or not relevant to the deviation in this TV.

If an open RT, and/or a closed RT closure action (including ALARP actions), is both applicable and relevant to the deviation contained in this TV Chief Engineer (CE) approval **must be obtained BEFORE TV issuance unless a precedent waiver applies***.

Applicable RT No.	Applicable RT Subject	Relevant?	Relevance Substantiation
N/A	N/A	N/A	There are few open Red Tops on the subject engine but these are not relevant to the subject Repair Scheme BRG3462, Issue 02.

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Proposed TV Certification Basis, Classification & Rationale

A TV must state the relevant certification basis, TV classification including the rationale and include evidence to demonstrate compliance with relevant certification requirements.

Certification Basis	**Certification Basis in accordance with TCDS No. : E.018: Issue 16:** Airworthiness Standards: CS-E, Amendment 4 dated 12 March 2015 for the engine JAR-E, change 8 plus Amendments E/91/1 and E/93/1 for the Thrust Reverser Special Conditions (SC): None Equivalent Safety Findings CS-E740(b)(1) Endurance Test Schedule CS-E790(a)(1) Large Hailstone Ingestion Deviations: None Environmental Protection: CS-34 Amendment 4 as implemented by ED Decision 2021/011/R (applicable 25 July 2021), ICAO Annex 16 Volume II, Amendment 10 applicable 1 January 2021 as implemented into EU legislation 27 April 2021 . NOx standard in accordance with ICAO Annex 16 Volume II, Part III, Chapter 2, § 2.3.2 e) (CAEP/8). Maximum nvPM mass concentration levels in compliance with Part III, Chapter 4, paragraph 4.2.2.1. nvPM mass and number emissions in compliance with Part III, Chapter 4, paragraph 4.2.2.2 a) 1) and 4.2.2.2 b) 1) (CAEP/11 In-Production standard).
Classification Rationale and Decision	The subject TV has been classified as 'Minor' in line with RRCS10060/002.

MAJOR ☐ **MINOR** ☑

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Technical Substantiation and Compliance Demonstration

Component Classification	SENSITIVE	Material	Titanium Alloy (TBQ)

Assessment:

This TV is only required to publish the approved Repair Scheme BRG3462, Issue 02 and therefore does not need specialist signatures.

The revision to the EMM Inspection/Check Task by revising the repair limits as per technical report, EDNS01000412086/004 for BRG3462 is completely done through Repair Scheme BRG3460 Issue 01.

The fully approved Repair Scheme BRG3462, Issue 02 repair procedure is available on pages 3 to 20 of this Technical Variance. The repair procedure is an extract from fully approved Repair Scheme BRG3462, Issue 02.

Please refer to fully approved Repaired Scheme BRG3462, Issue 02 for approvals.

CR:DW-10869 is raised to incorporate the EMM repair changes approved through Repair Scheme BRG3462, Issue 02.

Demonstration of Compliance

The effect of this TV on the certification requirements has been investigated and the following items have been considered. All other requirements (Airworthiness and Environmental Protection) are deemed to be not applicable to the subject of this TV.

Requirement	Title	Means of Compliance Demonstration	Evidence

☑ **Based on the evidence given compliance with the applicable certification basis has been demonstrated.**

Export Control Information (This table applies to TV Approval Sheet, Standardisation Report & Information Sheet Only)

Country	Export Classification	Date
Germany	Not Listed	06 Feb 25

Note 1 (Germany) : The technology contained in these parts of a TV must be confirmed, by the TV Approver, to have an Export Classification of either "Not Listed" or "PL9009.c". These sections of a TV must NOT contain technology of any other Export Classification but may reference such technology (e.g. Technical Reports). However, such referenced material must NOT be archived in the TV Database.

Note 2 : (All other countries including Singapore & USA) : Export Control must be considered and these parts of the TV document marked in accordance with the requirements of that country. Refer to the relevant Export Control Manager.

Rolls-Royce Technical Variance Information Sheet

TV No. 289228
Issue 01.
Version 01.

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What date is the completed TV due to the customer (RR Promise date)?	Date:

Are the relevant detail drawings, general arrangement and schemes included with the pack? ***Any comments :***	
Are the relevant Engine Manual Inspection Checks, I.P.C. illustrations, Service Bulletins included in the pack? ***Any comments :***	
Has a TV history search for the engine and part number (including description) been completed and appropriate TV's included in the pack? ***Any comments :***	
Has a TV history search for similar engines and part numbers (including description) been completed and appropriate TV's included in the pack? ***Any comments :***	
Are the relevant Previous TVs and FRSs included in the pack and any examples of rejected TV's? ***Any comments :***	
Has a concession search been completed and relevant documentation included in the pack? ***Any comments :***	
Is the condition of mating parts understood (if applicable)? And is the part to be rebuilt reusing the mating part or using matched pair option? ***Any comments :***	
Have the Engine Manual Limits and Aircraft Manual Limits been included (if applicable)? ***Any comments :***	
Has the root cause of damage been identified with the TV request originator and a statement included in the pack? ***Any comments :***	
Has a sketch / diagram of non-conformance been included? ***Any comments :***	
Have replicasts been included? ***Any comments :***	
Are all damaged / repaired areas fully dimensioned on the request? Where applicable, have relevant min remaining wall sections been included? ***Any comments :***	
Are there Repair Parts (Spares) required to carry out the repair, if so, does the relevant supply chain exist? ***Any comments :***	
Has EDC been updated with the latest information? ***Any comments :***	
Have you confirmed that no export controlled technology is within the TV document content? ***Any comments :***	
Have you reviewed all current and historic Red Top Investigations? ***Any comments :***	

NOTE : An entry should be made in all boxes. Acceptable entries include: Y (Yes), N (No) or NA (Not Applicable). Explain briefly within the boxes above if N or NA is entered