United Kingdom Civil Aviation Authority

AIRWORTHINESS DIRECTIVE

AD No: G-2004-0030

Issue Date: 23 December 2004

This AD is issued by the UK CAA acting for and on behalf of the European Aviation Safety Agency as the Primary Aviation Authority (ICAO Annex 8 Authority of State of Design) for the affected product(s).

Approved by the European Aviation Safety Agency under approval number on 2004-12165 on 14 December 2004.

In accordance with Article 9(7)(b) of the Air Navigation Order 2000 as amended the following action required by this Airworthiness Directive (AD) is mandatory for applicable aircraft registered in the United Kingdom.
No person may operate an aircraft to which an AD applies except in accordance with the requirements of that AD unless otherwise agreed with the Authority of the State of Registry.

Type Approval Holders Name:	Type/Model Designation(s):
ROLLS-ROYCE PLC	**RB211 TRENT 875-17, 877-17, 884-17, 884B-17, 892-17, 892B-17, 895-17**

Type Certificate Data Sheet No: 1051

Superseded AD: G-2004-0015

ATA 72 – ENGINE - ENGINE FAN BLADE – ROOT SHEAR KEY SLOT INSPECTION/REWORK

Manufacturer(s): Rolls-Royce plc

Applicability: Models RB211 Trent 875-17, 877-17, 884-17, 884B-17, 892-17, 892B-17, 895-17 engines fitted with fan blades to SB RB211-72-D390 (part number FW 18548) standard installed on Boeing 777 Series aeroplanes.

Reason: This Airworthiness Directive has been raised to ensure that the correct profile of the shear key slot in the L.P. compressor (fan) blade root has been manufactured to the specified design dimensions. Service experience has shown that sharp edges in the area of the fan blade root have the potential to generate stress risers with a consequential reduction in fan blade life. A risk analysis has concluded that Mandatory action is necessary to avoid an unacceptable risk of multiple fan blade failure, which would be a potentially hazardous event.

Airworthiness Directive (AD) 001-05-2003 was initially raised to introduce a requirement to inspect and rework fan blade roots in compliance with Rolls-Royce Mandatory SB RB211-72-E055 (Original issue and Revision 1).

Airworthiness Directive G-2004-0015 superseded AD 001-05-2003 by reflecting a change in the Compliance Section of Rolls-Royce SB RB211-72-AE055 Revision 2, permitting the movement of fan blades between aircraft type /engine rating combinations.

This AD supersedes AD G-2004-0015 to introduce revised rework life conversion formulae. This AD also introduces, in some instances, lower rework lives for re-defined aircraft/engine rating combinations, which take into account aircraft gross weight.

Effective Date: 24 January 2005

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Compliance/Action: Carry out rework to all SB 72-D390 standard L.P. compressor (fan) blades as defined in Rolls Royce S.B.RB211-72-AE055 Revision 5, Section 3 Accomplishment Instructions, on or before the rework lives since new stated in the table below;

B777 AIRCRAFT (CATEGORY)	MAXIMUM AIRCRAFT TAKEOFF WEIGHT (GROSS WEIGHT) (1000lbs)	ENGINE RATING	REWORK LIFE (CYCLES SINCE NEW)
- 300	660	892, 884B	2400
	632.5		
- 200 Series	656	892, 895	
- 200 Series	648	892, 892B	3200
	632.5	892B	
- 200 Series	632.5	892	4100
	555	884	
	545	877	
	535	875	
	506		

NOTE 1: Where LP compressor blades have been moved between 'Aircraft Type/Engine Rating' combinations, then the life remaining to rework may be calculated as follows:

Formula 1 (Conversion to a Lower Rework Life).

$$\frac{\text{(Higher rework life limit – Total flights in higher rework life)}}{\text{Higher rework life limit}} = A$$

Lower rework life limit x A = Flight Cycles Remaining

Total flights at the higher rework life limit + Flight Cycles Remaining = Revised rework life limit for the fan blades

Formula 2 (Conversion to a Higher Rework Life).

$$\frac{\text{(Lower rework life limit – Total flights in Lower rework life)}}{\text{Lower rework life limit}} = A$$

Higher rework life limit x A = Flight Cycles Remaining

Total flights at the lower rework life limit + Flight Cycles Remaining = Revised rework life limit for the fan blades.

Rework carried out in accordance with AD's 001-05-2003 and G-2004-0015 is deemed to be acceptable for the purposes of compliance with this Airworthiness Directive.

Reference Publications: Rolls-Royce Alert Service Bulletins RB211-72-AE055 Revision 5 and RB211-72-E044 Revision 2 may be obtained from Publication Services, Rolls-Royce plc. PO Box 31, Derby, DE24 8BJ, United Kingdom. Phone: +44 (0) 1332 242424 Fax: +44 (0) 1332 249936

Remarks: Later EASA approved Service Bulletin issues to those quoted within are also considered to be acceptable to meet the requirements of this Airworthiness Directive.

The fan blade part number associated with SB RB211-72-D390 addressed within is FW 18548, for full form root profile blades.

Enquiries regarding this Airworthiness Directive may be directed to Civil Aviation Authority, Safety Regulation Group, Propulsion Department, Aviation House, Gatwick Airport South, West Sussex, RH6 0YR, United Kingdom. Phone: +44 (0) 1293 573199 Fax: +44 (0) 1293 57397 E-mail: pete.woollacott@srg.caa.co.uk.