

EASA	AIRWORTHINESS DIRECTIVE
	<p>AD No.: 2010-0266</p> <p>Date: 21 December 2010</p> <p>Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) No 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.</p>
<p>This AD is issued in accordance with EC 1702/2003, Part 21A.3B. In accordance with EC 2042/2003 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [EC 2042/2003 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [EC 216/2008, Article 14(4) exemption].</p>	
<p>Type Approval Holder's Name :</p> <p>ROLLS-ROYCE PLC</p>	<p>Type/Model designation(s) :</p> <p>RB211 Trent 500, 700 and 800 engines</p>
TCDS Number :	EASA E.042, EASA.E.060 and UK CAA 1051
Foreign AD :	Not applicable
Supersedure :	This AD supersedes EASA AD 2007-0052 dated 23 February 2007, including the correction dated 28 February 2007.
ATA 72	Engine – Intermediate Pressure Compressor Rotor Shaft and Balance Weights – Inspection
Manufacturer(s):	Rolls-Royce plc
Applicability:	<p>Models RB211 Trent 553-61, 553A2-61, 556-61, 556A2-61, 556B-61, 556B2-61, 560-61 and 560A2-61 engines, all serial numbers.</p> <p>These engines are known to be installed on, but not limited to, Airbus A340-500 and A340-600 series aeroplanes.</p> <p>Models RB211 Trent 768-60, 772-60, 772B-60 and 772C-60 engines, all serial numbers.</p> <p>These engines are known to be installed on, but not limited to, Airbus A330 series aeroplanes.</p> <p>Models RB211 Trent 875-17, 877-17, 884-17, 884B-17, 892-17, 892B-17 and 895-17 engines, all serial numbers.</p> <p>These engines are known to be installed on, but not limited to, Boeing 777 series aeroplanes.</p>
Reason:	<p>Cracks have been found on the Intermediate Pressure (IP) Compressor rotor shaft of two in-service Trent 800 engines and on one in-service Trent 700 engine. The cracking had initiated from fretting marks caused by balance weights, but the key factors behind the crack propagation are not fully understood.</p> <p>Stress analysis of the damage condition has shown that it presents a possible threat to the rotor integrity.</p> <p>This condition, if not detected and corrected, could lead to IP Compressor</p>

	<p>rotor shaft failure and consequent non-contained high energy debris, possibly resulting in damage to the aeroplane. EASA issued AD 2007-0052 to address this unsafe condition.</p> <p>Recent evaluations and analyses have indicated the need for improved inspection methods for the Trent 700 and 800 engines, which have now been developed. In addition, since EASA Proposed AD (PAD) 10-065 was issued, Rolls-Royce have also developed a modification for those engines, accomplishment of which will terminate the need for repetitive inspections.</p> <p>For the reasons described above, this AD supersedes EASA AD 2007-0052 and requires, for the Trent 700 and 800 engines, repetitive on-wing borescope and in-shop Eddy Current inspections of the IP Compressor rotor shaft for discrepancies and, depending on findings, corrective actions.</p> <p>For the Trent 500 engines, this AD requires repetitive in-shop visual inspections, in accordance with Rolls-Royce Alert Non-Modification Service Bulletin (NMSB) RB211-72-AF260 at Revision 4 or, alternatively, in-shop Eddy Current inspections in accordance with Rolls-Royce NMSB RB211-G448 Revision 1, to detect discrepancies in the IP Compressor rotor shaft and, depending on findings, corrective actions.</p>																
Effective Date:	04 January 2011																
Required Action(s) and Compliance Time(s):	<p>Required as indicated, unless already accomplished:</p> <p>Trent 700 and Trent 800 engines:</p> <p>(1) Within the time period indicated in Table 1 or Table 2 of this AD, as applicable to engine type, accomplish on-wing inspections of the IP Compressor rotor shaft for discrepancies, in accordance with the instructions of the associated Rolls-Royce RB211 Propulsion System Alert Non Modification Service Bulletin (NMSB).</p> <p>Table 1 – Trent 700 engines On-wing inspections</p> <table border="1" data-bbox="572 1173 1450 1426"> <thead> <tr> <th>Inspection</th><th>Compliance time</th><th>NMSB</th></tr> </thead> <tbody> <tr> <td>Initial</td><td>Within 625 Flight Cycles (FC) after the effective date of this AD</td><td rowspan="2">RB211-72-AG270 Revision 1</td></tr> <tr> <td>Repetitive</td><td>At intervals not to exceed 625 FC</td></tr> </tbody> </table> <p>Table 2 – Trent 800 engines On-wing inspections</p> <table border="1" data-bbox="572 1520 1450 1774"> <thead> <tr> <th>Inspection</th><th>Compliance time</th><th>NMSB</th></tr> </thead> <tbody> <tr> <td>Initial</td><td>Within 475 Flight Cycles (FC) after the effective date of this AD</td><td rowspan="2">RB211-72-AG264 Revision 2</td></tr> <tr> <td>Repetitive</td><td>At intervals not to exceed 475 FC</td></tr> </tbody> </table> <p>(2) In addition to the inspections required by paragraph (1) of this AD, during each qualifying shop visit of a Trent 700 or Trent 800 engine after the effective date of this AD, inspect the IP Compressor rotor shaft and balance weights for discrepancies in accordance with the instructions of Rolls-Royce RB211 Propulsion System Alert NMSB RB211-72-AG085 Revision 1.</p> <p>Note 1: For the purpose of this AD, a qualifying shop visit is when the engine</p>	Inspection	Compliance time	NMSB	Initial	Within 625 Flight Cycles (FC) after the effective date of this AD	RB211-72-AG270 Revision 1	Repetitive	At intervals not to exceed 625 FC	Inspection	Compliance time	NMSB	Initial	Within 475 Flight Cycles (FC) after the effective date of this AD	RB211-72-AG264 Revision 2	Repetitive	At intervals not to exceed 475 FC
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	<p>is sufficiently disassembled to expose the IP Compressor Module rear face.</p> <p>Note 2: Accomplishment of a shop visit inspection as required by paragraph (2) of this AD may substitute the accomplishment of an on-wing inspection as required by paragraph (1) of this AD.</p> <p>(3) If, during any inspection as required by paragraph (1) or (2) of this AD, discrepancies (as described in NMSB RB211-72-AG264, NMSB RB211-72-AG270, or NMSB RB211-72-AG085, as applicable) are detected, within the time period specified in the NMSB, depending on findings, or before release to service of the engine, as applicable, accomplish the appropriate corrective action(s), or replace the affected parts with serviceable parts. Corrective action as required by paragraph (3) of this AD does not constitute terminating action for the repetitive inspections required by this AD.</p> <p>(4) Modification of an engine in accordance with the instructions of Rolls Royce Service Bulletin (SB) 72-G401 (for RB211 Trent 800) or Rolls Royce SB 72-G402 (for RB211 Trent 700) constitutes terminating action for the repetitive inspections required by paragraph (1) of this AD for that engine.</p> <p>Trent 500 engines:</p> <p>(5) At the next qualifying shop visit after the effective date of this AD and thereafter during each qualifying shop visit, accomplish a visual inspection of the IP Compressor rotor shaft and balance weights for discrepancies, in accordance with the instructions of Rolls-Royce RB211 Propulsion System Alert NMSB RB211-72-AF260 Revision 4.</p> <p>(6) As an alternative to each inspection as required by paragraph (5) of this AD, an Eddy Current inspection of the IP Compressor rotor shaft and visual inspection of the balance weights can be accomplished during a qualifying shop visit, in accordance with the instructions of Rolls-Royce NMSB RB211-G448 Revision 1.</p> <p>(7) If, during any inspection as required by paragraph (5) or (6) of this AD, discrepancies (as described in NMSB RB211-72-AF260 Revision 4 or Rolls-Royce NMSB RB211-G448 Revision 1, as applicable) are detected, before release to service of the engine, accomplish the appropriate corrective action(s), depending on findings, in accordance with the instructions of Rolls-Royce NMSB RB211-72-AF260 Revision 4 or Rolls-Royce NMSB RB211-G448 Revision 1, as applicable, or replace the affected IP Compressor rotor rear balance land with a serviceable part. Corrective action as required by paragraph (7) of this AD does not constitute terminating action for the repetitive inspections required by this AD.</p>
Ref. Publications:	<p>Rolls-Royce NMSB RB211-72-AF260 Revision 4 dated 28 July 2009.</p> <p>Rolls-Royce NMSB RB211-72-AG085 Revision 1 dated 27 September 2010.</p> <p>Rolls-Royce NMSB RB211-72-AG264 Revision 2 dated 14 December 2009</p> <p>Rolls-Royce NMSB RB211-72-AG270 Revision 1 dated 14 December 2009.</p> <p>Rolls-Royce NMSB RB211-G448 Revision 1 dated 29 October 2010.</p> <p>Rolls-Royce SB RB211-72-G401 dated 30 September 2010.</p> <p>Rolls-Royce SB RB211-72-G402 dated 30 September 2010.</p> <p>The use of later approved revisions of these documents is acceptable for compliance with the requirements of this AD.</p>
Remarks :	<p>1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.</p>

	<ol style="list-style-type: none">2. The required actions and the risk allowance have granted the issuance of a Final AD with Request for Comments, postponing the public consultation process after publication.3. The requirements for Trent 700 and Trent 800 engines as described in this Final AD were posted on 25 June 2010 as PAD 10-065 for consultation until 23 July 2010. The Comment Response Document can be found at http://ad.easa.europa.eu.4. Enquiries regarding this AD should be referred to the Airworthiness Directives, Safety Management & Research Section, Certification Directorate, EASA. E-mail ADs@easa.europa.eu.5. For any question concerning the technical content of the requirements in this AD, please contact your designated Rolls-Royce representative or download the publication from your Aeromanager account at www.aeromanager.com. <p>If you do not have a designated representative or Aeromanager account, please contact Corporate Communications at Rolls-Royce plc. PO Box 31, Derby, DE24 8BJ, United Kingdom, telephone: +44 (0) 1332 242424, or send an e-mail through http://www.rolls-royce.com/contact/civil_team.jsp identifying the correspondence as being related to Airworthiness Directives.</p>
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