EASA	AIRWORTHINESS DIRECTIVE
	AD No.: 2012-0057R2 **Date: 07 November 2014** 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.

This AD is issued in accordance with EU 748/2012, Part 21.A.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].

Type Approval Holder's Name :	**Type/Model designation(s) :**
ROLLS-ROYCE PLC	RB211 Trent 900 engines

TCDS Number:	EASA.E.012
Foreign AD:	Not applicable
Revision:	This AD revises EASA AD 2012-0057R1 dated 22 January 2013. The original issue of this AD superseded EASA AD 2010-0008R1 dated 04 August 2010.

ATA 72	**Engine – Intermediate Pressure Shaft Rigid Coupling – Inspection / Replacement**
Manufacturer(s):	Rolls-Royce plc
Applicability:	RB211 Trent 970-84, 970B-84, 972-84, 972B-84, 977-84, 977B-84 and 980-84 engines, all serial numbers. These engines are known to be installed on, but not limited to, Airbus A380 aeroplanes.
Reason:	Wear, beyond Engine Manual limits, has been identified on the abutment faces of the splines on the Trent 900 Intermediate Pressure (IP) shaft rigid coupling on several engines during strip. The shaft to coupling spline interface provides the means of controlling the turbine axial setting and wear through of the splines would permit the IP turbine to move rearwards. Rearward movement of the IP turbine would enable contact with static turbine components and would result in loss of engine performance with potential for in-flight shut down, oil migration and oil fire below the LP turbine discs prior to sufficient indication resulting in loss of LP turbine disc integrity. Some of these conditions present a potential unsafe condition to the aeroplane. Consequently, EASA issued AD 2010-0008R1 to require inspection of the IP shaft rigid coupling splines and, depending on the results, further repetitive inspections or corrective actions. Since EASA AD 2010-0008R1 was issued, it was found that when an engine is removed from one aeroplane engine position and is re-installed in a different aeroplane and/or engine position, it may exhibit a change in wear rate. It was therefore found necessary to introduce specific inspection

	requirements to address these cases. Rolls-Royce (RR) also introduced a modification to the design of the IP shaft rigid coupling through Service Bulletin (SB) RB.211-72-G585 and Modification (Mod) 72-G585 in order to reduce the spline wear rate to an acceptable level. Until service experience confirmed its efficacy, it was deemed necessary to also require repetitive inspections of engines that had been modified in accordance with that RR SB or Mod, but with extended intervals compared with those for engines not incorporating that modification. The inspection technique for engines incorporating the modification differed from that for engines not incorporating the modification. Prompted by these developments, EASA issued AD 2012-0057 (later revised), retaining the requirements of EASA AD 2010-0008R1, which was superseded, and adding repetitive inspections for post-SB and post-Mod 72-G585 engines. Since EASA AD 2012-0057R1 was issued, in-service evidence has demonstrated that post-SB RB.211-72-G585 and post-Mod 72-G585 IP shaft rigid couplings successfully eliminate the wear associated with the earlier standard, therefore cancelling the requirement for inspections and replacements. For the reason described above, this AD is further revised to limit the inspection and replacement requirements to pre-SB RB.211-72-G585 and pre-Mod 72-G585 IP shaft rigid couplings, identified by Part Number (P/N) FW33264 (RR Fig. Item No. 01415).
Effective Date:	Revision 2: 07 November 2014 Revision 1: 22 January 2013 Original issue: 17 April 2012
Required Action(s) and Compliance Time(s):	Required as indicated, unless already accomplished: Note: Where in this AD, reference is made to an RR SB or NMSB with an 'A' (Alert) in the number, it should be recognised that an earlier or later revision may not have that 'A'. This kind of change does not effectively alter the publication references for the purpose of this AD. (1) For engines in pre-SB RB.211-72-G585 or pre-Mod 72-G585 standard, incorporating IP shaft rigid coupling P/N FW33264 (RR Fig. Item No. 01415): ▪ On-wing - Within the applicable compliance times indicated in Appendix 1 of this AD, accomplish the actions specified in that Appendix, as applicable, in accordance with the instructions of sections 1.D(1)(a) and 3.A of RR Alert Non Modification Service Bulletin (NMSB) RG.211-72-AG329 Revision 4. ▪ Each time the engine is inducted into an engine shop (in-shop), accomplish the actions specified in sections 1.D(1)(b) and 3.B of RR NMSB RB.211-72-AG329 Revision 4. (2) DELETED. (3) For an engine where a new pre-SB RB.211-72-G585 or pre-Mod 72-G585 standard IP shaft rigid coupling P/N FW33264 (RR Fig. Item No. 01415) has been installed during an in-shop inspection, or the IP shaft rigid coupling has passed the in-shop inspection, as required by paragraph (1) or (2) of this AD, except those as specified in paragraph (4) of this AD, within 400 flight cycles (FC) after this last in-shop inspection, accomplish on-wing inspections as required by paragraph (1) or (2) of this AD, as applicable. (4) For an engine where the pre-SB RB.211-72-G585 or pre-Mod 72-G585 standard IP shaft rigid coupling P/N FW33264 (RR Fig. Item No. 01415) has passed the borescope inspection in accordance with the instructions

	of NMSB RB.211-72-AG329 Revision 4, accomplish the next on-wing inspection, as required by paragraph (1) of this AD, within the time specified in Figure 10 of NMSB RB.211-72-AG329 Revision 4, and thereafter as specified in Appendix 1 of this AD. (5) If, during any inspection as required by this AD, discrepancies are found, exceeding the criteria as specified in RR NMSB RB.211-72-AG329 Revision 4, that would allow an IP shaft rigid coupling to remain in service or return to service, before next flight (on-wing inspection), or before release to service of the engine (in-shop inspection), as applicable, replace the affected IP shaft rigid coupling with a serviceable part. (6) Inspections and corrective actions, accomplished prior to 17 April 2012 [the effective date of the original issue of this AD], in accordance with the instructions of RR NMSB RB.211-72-AG329 original issue, Revision 1, Revision 2 or Revision 3, are acceptable to comply with the requirements of paragraph (1) of this AD. After 17 April 2012 [the effective date of the original issue of this AD], repetitive inspections and corrective actions must be accomplished in accordance with the instructions of RR NMSB RB.211-72-AG329 Revision 4. (7) Replacement of an IP shaft rigid coupling as required by paragraph (5) of this AD, or replacement of an engine with a serviceable engine, if a pre-SB RB.211-72-G585 or pre-Mod 72-G585 standard IP shaft rigid coupling P/N FW33264 (RR Fig. Item No. 01415) is installed, does not constitute terminating action for the repetitive inspections required by this AD.
Ref. Publications:	RR RB211-Trent 900 NMSB 72-AG329 Revision 4, dated 23 March 2012. The use of later approved revisions of this document is acceptable for compliance with the requirement of this AD.
Remarks :	1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD. 2. Based on the required actions and the compliance time, EASA have decided to issue a Final AD with Request for Comments, postponing the public consultation process until after publication. 3. Enquiries regarding this AD should be referred to the Safety Information Section, Certification Directorate, EASA. E-mail ADs@easa.europa.eu. 4. 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. If you do not have a designated representative or Aeromanager account, please contact **Corporate Communications** at **Rolls-Royce plc**, P.O. 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**.

Appendix 1 - On-wing Borescope Inspection – Initial and Repetitive Inspection

<table>
<tr><th colspan="4">For engines with pre-SB RB.211-72-G585 or pre-Mod 72-G585
standard IP shaft rigid coupling P/N FW33264 (RR Fig. Item No. 01415) installed</th></tr>
<tr><td>Condition, on 18 August 2010 [the effective date of EASA AD 2010-0008R1]</td><td>Action</td><td>Compliance Time Initial Inspection</td><td>Compliance Times Repetitive Inspections</td></tr>
<tr><td>Engines where the coupling life is 250 FC or less (see Note)</td><td rowspan="2">Inspect the IP shaft rigid coupling splines – measurement of spline crest – in accordance with section 3.A of Rolls-Royce NMSB RB.211-72-AG329 Revision 4</td><td>Before the engine has accumulated 400 FC since new</td><td rowspan="2">As specified in sections 1.D(1)(a) and 3.A and Figures 9 and 10 of Rolls-Royce NMSB RB.211-72-AG329 Revision 4</td></tr>
<tr><td>Engines where the coupling life is more than 250 FC (see Note)</td><td>Within 150 flight cycles after 18 August 2010 [the effective date of EASA AD 2010-0008R1]</td></tr>
</table>

Note: Coupling life is the time since new, or since last inspection of the coupling in accordance with the Cleaning, Inspection and Repair Manual. If the coupling life cannot be determined, the life since last shop visit should be used to establish the inspection threshold.