EASA	AIRWORTHINESS DIRECTIVE
	AD No : 2007-0255 **Date: 14 September 2007**

No person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of that Airworthiness Directive unless otherwise agreed with the Authority of the State of Registry.

Type Approval Holder's Name :	**Type/Model designation(s) :**
Rolls-Royce plc	RB211 TRENT 768-60, 772-60, 772B-60 engines

TCDS Number: EASA E.042

Foreign AD: Not applicable

Supersedure: This Airworthiness Directive (AD) supersedes EASA AD 2005-0024 dated 14 October 2005.

ATA 72	**Engine – HP Turbine Bearing Oil Vent & Scavenge Tube – Inspection / Modification**
Manufacturer(s):	Rolls-Royce plc
Applicability:	RB211 Trent 768-60, 772-60, and 772B-60 engines, except when previously modified in accordance with Rolls-Royce SB 72-E708, SB72-F227 or SB 72-E965 at original issue or later revision. These engines are known to be installed on, but not limited to, Airbus A330 series aircraft.
Reason:	In 2004, two Trent 700 engines were removed due to high oil consumption. Investigation has established that the HP/IP turbine bearing oil tubes had been fretted by the tubes' damaged heat shields. On both occasions, the outer heat shield had fretted though the tube wall, in one case affecting the feed tube and the other on the scavenge tube. A previous service incident has shown that ingestion of HP3 cooling air into a breached scavenge- or vent tube can cause over-pressurisation of the HP/IP bearing chamber. This would cause oil ejection from the rear of the chamber. The possible ignition of this oil could result in an IPT shaft failure, leading to IPT disc overspeed and resultant release of hazardous high energy debris. For the reasons described above, CAA United Kingdom issued Airworthiness Directive (AD) G-2005-0016, requiring the inspection of the vent- and scavenge tubes and heatshields for damage. That AD was revised and subsequently superseded by EASA AD 2005-0024, retaining the requirements thereof and requiring the modification of the tubes to delete or upgrade the outer heatshield. The present AD supersedes EASA AD 2005-0024, retaining the requirements thereof and adding an inspection of the vent pipe restrictor, to

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	ensure that blockage of the restrictor, due to carbon deposits loosened by the heatshield inspection, does not occur. **Note:** EASA AD 2007-0202 has been issued to require vent pipe restrictor inspections on engines previously subjected to vent- and scavenge tubes and heatshield inspections. This new AD also references the recently published Rolls-Royce Service Bulletin (SB) 72-F227 and SB 72-E965 as optional terminating actions for the inspection requirements of this directive. Some minor editorial changes are introduced, including revised terminology used in the Compliance section.
Effective Date:	28 September 2007
Compliance:	(1) <u>Inspection - On wing</u> Inspect and assess the condition of the HP/IP turbine support assembly internal oil vent and scavenge tubes and heatshields in accordance with Rolls-Royce Alert Non Modification Service Bulletin RB211-72-AE-32 revision 3 (or later approved issue) section 3 Accomplishment Instructions Part A as follows: a) For HP/IP turbine support assembly internal oil vent and scavenge tubes/heatshields which have not been previously inspected in accordance with this AD (see Note 2 below): i) Inspect at an HP module threshold life of 10 000 hours or 2 500 cycles (whichever occurs first) since new or since overhaul: (a) For HP modules that exceed the threshold life on the effective date of this AD, carry out the inspection within 1 month after the effective date of this AD. **Note 1:** All engines should have previously met this requirement in compliance with the superseded AD's. (b) For HP modules that are below the threshold life on the effective date of this AD, carry out the inspection within 3 months of reaching the threshold life. ii) Determine the serviceability and establish interval to next inspection as follows: (a) Outer heat shields of the vent and/or scavenge tubes with no visible damage must be re-inspected at a 'never exceed' interval of 10 000 hours or 2 500 cycles, which ever occurs first. (b) Outer heat shields of the vent and/or scavenge tubes with partial cracking up to 90 degrees around the circumference or 10 mm along the length of either outer heat shield must be re-inspected at a 'never exceed' interval of 6 400 hours or 1 600 cycles, which ever occurs first. (c) Outer heat shields of the vent and/or scavenge tubes with cracking in excess of that in 1(ii)(b) but less than 360 degrees around the circumference of either outer heat shield must be re-inspected at a 'never exceed' interval of 1 600 hours or 400 cycles whichever occurs first. (d) Outer heat shields of the vent and/or scavenge tubes with cracking around the complete circumference of either outer heat shield, or if there is any missing material from either outer heat shield, re-inspect or reject in accordance with the following;

(i) If the insulation blanket is in place inside the heat shield and preventing frettage between the heat shield and the tube, re-inspect at a 'never exceed' interval of 1 600 hours or 400 cycles, which ever occurs first.

(ii) If either vent or scavenge tube is fretted at the outer heatshield position where the maximum depth of frettage at any point around the full 360 degrees of each tube is less than 0,46mm/0.018 inch, re-inspect at a 'never exceed' interval of 400 hours or 100 cycles, which ever occurs first.

(iii) If it is not possible to determine the maximum depth of frettage around the full 360 degrees of each tube and (i) (above) is not applicable, then the HP/IP turbine support assembly must be rejected from service within 50 cycles of the inspection being carried out.

(iv) If either vent or scavenge tube is fretted at the outer heatshield position and the maximum depth of frettage is greater than 0,46mm/0.018 inch, then the HP/IP turbine support assembly must be rejected from service within 10 cycles of the inspection being carried out.

b) For HP/IP turbine support assemblies which have been previously inspected in accordance with this AD (see Note 2 below):

i) Inspect the internal oil vent and scavenge tubes and heatshields before reaching the 'never exceed' interval as previously established (in 1 a) ii) or 2 a) i)).

ii) Determine the serviceability and 'never exceed' period to the next inspection as detailed in 1 a) ii) above.

c) After a high power ground run on or not later than 25 service cycles after heat shield inspection, inspect the Vent Flow Restrictor in accordance with Section 3 Accomplishment Instructions of Rolls-Royce Alert Non Modification Service Bulletin RB211-72-AE792 Revision 3 (or later approved revision).

Note 2: For the purposes of compliance with this AD, HP/IP turbine support assembly internal oil vent and scavenge tube/heatshield inspection carried out previously in accordance with the superseded ADs is deemed to be valid.

(2) Inspection- In shop

a) For 05 modules in-shop which are not undergoing strip and overhaul. Inspect and assess the condition of the HP/IP turbine support assembly internal oil vent and scavenge tubes and heatshields in accordance with Rolls-Royce Alert Non Modification Service Bulletin RB211-72-AE792 revision 3 (or later approved issue) section 3 Accomplishment Instructions Part B as follows:

i) Determine the serviceability and establish interval to next inspection of the HP/IP turbine support assembly internal oil vent and scavenge tubes and heatshields as follows:

(a) Outer heat shields of the vent and/or scavenge tubes with no visible damage to the outer heat shields must be re-inspected at a 'never exceed' interval of 10 000 hours or 2 500 cycles, whichever occurs first.

(b) Outer heat shields of the vent and/or scavenge tubes with visible cracking up to 90 degrees around the circumference or 10 mm along the length of either outer heat shield must be re-inspected at a 'never exceed' interval of 6 400 hours or 1 600 cycles, whichever

	occurs first. (c) Outer heat shields of the vent and/or scavenge tubes with visible cracking greater than 90 degrees of the circumference or 10 mm in length of either heat shield must be rejected and the Terminating Action as detailed in 3) below should be carried out. b) For 05 modules in-shop which <u>are</u> undergoing strip and overhaul carry out the Terminating Action as detailed in 3) below. c) Inspect the Vent Flow Restrictor (after pass-off test) in accordance with Section 3 Accomplishment Instructions of Rolls-Royce Alert Non Modification Service Bulletin RB211-72-AE792 Revision 3 (or later approved revision). (3) <u>Terminating Action</u> At the next 05 module overhaul, but not later than 31 May 2010, whichever occurs first, introduce revised HP/IP turbine bearing support structure in accordance with either: a) RR Modification Service Bulletin RB211-72-E708 revision 2 (or later approved issue) or; b) RR Immediate Operational Request RB211-72-E965 revision 1 (or later approved issue) or; c) RR Modification Service Bulletin RB211-72-F227 original (or later approved issue). **Note 3:** 1) The hours and cycles quoted in paragraph 1(a) and 2(a) of this AD refer to those hours and cycles accumulated on the 05 module. 2) For the purposes of this AD the references to “05 module strip and overhaul” quoted in paragraph (2) of this Directive refers to an 05 module shop visit where the HP/IP turbine internal vent and scavenge tubes have been exposed and the tube heat shields subjected to a detailed visual inspection in accordance with the Trent 700 Engine Manual task 72-51-24-200-801.
Ref. Publications:	RR Non-Modification Service Bulletin RB211-72-AE792 Revision 3; RR Modification Service Bulletin RB211-72-E708 revision 2; RR Immediate Operational Request RB211-72-E965 revision 1; RR Modification Service Bulletin RB211-72-F227; or later approved revisions of these documents.
Remarks :	1. If requested and appropriately substantiated, EASA can accept Alternative Methods of Compliance for this AD. 2. This AD was posted on 13 August 2007 as PAD 07-140 for consultation until 10 September 2007. No comments were received during the consultation period. 3. Enquiries regarding this AD should be referred to the AD Focal Point - 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: Rolls-Royce plc, Publication Services, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; Telephone: +44 (0) 1332 242424, Fax: +44 (0) 1332 249936.