



No.	<b>CF-2005-29</b>	1/4
Issue Date	<b>3 August 2005</b>	

# AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to **Canadian Aviation Regulation (CAR) 593**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

**Number:** CF-2005-29

**Subject:** Field Inspection and Replacement of Propeller Shaft

**Effective:** 12 September 2005

**Applicability:** Pratt & Whitney Canada (P&WC) - PW118, PW118A, PW118B, PW119C, PW120, PW120A, PW121, PW121A, PW123, PW123B, PW123C, PW123D, PW123E, PW124B, PW125B, PW127 and PW127E engines with propeller shafts listed in Tables 1 to 4.

The above engines are installed on, but not limited to, Aerospatiale ATR 42 and ATR 72, Bombardier DHC-8-100/200/300, Dornier 328-120, Embraer EMB120, and Fokker 50 aircraft.

**Compliance:** As detailed below, unless already accomplished.

**Background:** There have been two reported instances of propeller shafts being found with through going cracks at the no. 19 bearing area. The root cause was positively identified as "Hydrogen Embrittlement" caused by the improper nickel-plating repair process performed at two different overhaul facilities. These two exceptional events are related to the excessive period of time that the propeller shaft spent in the nickel-plating tank.

Both events were discovered following a persistent external oil leak in the propeller shaft area, as the crack had migrated past the seal runner.

All critical suspect parts have been removed from service under a fleet campaign. This airworthiness directive mandates the destruction of removed propeller shafts (TABLES 1, 2, and 3), and prescribes a series of inspections on selected shafts until they are ultimately removed from service (TABLE 4).

Transport Canada has issued Service Difficulty Alert AL-2005-05 in March 2005 to provide information about this issue and explain the planned corrective actions to rectify this problem.

**Corrective Action:** **Part I. DESTROY/DISCARD Propeller Shafts.**

Within five days after the effective date of this directive, **DESTROY/DISCARD** propeller shafts identified in Table 1, 2, and 3 of this directive.

**Part II. VISUAL INSPECTIONS for In-Service Propeller Shafts listed in Table 4 below.**

Within five days after the effective date of this directive, and repeated every week afterwards until the propeller shafts are removed from service, perform a visual inspection for oil leaks as per PART A of the Accomplishment Instructions of P&WC SB 21714R2, dated 20 May 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Pursuant to **CAR 202.51** the registered owner of a Canadian aircraft shall, within seven days, notify the Minister in writing of any change of his or her name or address.

To request a change of address, contact the Civil Aviation Communications Centre (AARC) at Place de Ville, Ottawa, Ontario K1A 0N8, or 1-800-305-2059, or [www.tc.gc.ca/civilaviation/communications/centre/address.asp](http://www.tc.gc.ca/civilaviation/communications/centre/address.asp)



- A. If an oil leak is found, do as follows:
1. Do an inspection of the propeller shaft seal area for leaks per the Engine Maintenance Manual – Corresponding Fault Isolation Chart (Oil leak from propeller shaft area).
  2. If the oil leak can be fixed without the propeller removed, the engine can be put back into service.
  3. If the propeller needs to be removed to fix the oil leak, do the procedure for the internal inspection of the propeller shaft in PART 3 of this directive before next flight.
- B. If an oil leak is not found, the engine can be put back into service.

**Part III. INTERNAL INSPECTIONS for in-service propeller shafts listed in Table 4 of this directive:**

**NOTE: FLUORESCENT PENETRANT INSPECTIONS MUST BE PERFORMED BY PERSONS TRAINED AND CERTIFIED IN THIS METHOD.**

Within 250 hours air time, or not more than three (3) months after the effective date of this directive, whichever occurs first, perform an internal inspection of the propeller shafts as per PART B of the Accomplishment Instructions of P&WC SB 21714R2, dated 20 May 2005, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

- A. If a crack is found, remove and discard immediately the propeller shaft, and install a new propeller shaft as per Part C of the Accomplishment Instructions of P&WC SB 21714R2.
- B. If no crack is found, the engine can be put back into service.

Note: (Applies to Part II and Part III inspections: Visual & Internal) Compliance using inspection methods contained in any of the previous versions of P&WC's SB 21714 prior to the effective date of the directive satisfy the requirements of SB 21714, Revision 2, mandated by this directive.

**Part IV. REMOVE and DESTROY/DISCARD Propeller Shafts listed in Table 4 below:**

Propeller shafts listed in Table 4 must be removed and destroyed/discarded no later than 31 December 2007. No extensions or alternate means of compliance are permitted.

**TABLE 1: Propeller Shafts – Removed from service prior to 31 October 2004.**

<b>Action: DESTROY/DISCARD. These shafts which have been removed from service before 31 October 2004 must be destroyed / discarded.</b>	
<b>Part Serial Number (S/N)</b>	<b>RGB S/N</b>
8W644	AE0006
13A077	AE0050
23A991	115410
5N765	120251
2X361	123115
8W099	123353

**TABLE 2: Propeller Shafts – Removed from service prior to 31 January 2005.**

<b>Action: DESTROY/DISCARD. These shafts which have been removed from service before 31 January 2005 must be destroyed / discarded.</b>	
<b>Part Serial Number (S/N)</b>	<b>RGB S/N</b>
1R513	Unknown (PW123)
7T538	AP0004
A00000T7	AV0029
A0000K5A	EB0001
2W477	115597
5L688	120158
8K476	120162
5L745	120395
7T428	123074
7W951	123195
7W415	124450
6W524	124478
7W413	124511
7W486	124518
4R195	125095
22A420	127217

**TABLE 3: Propeller Shafts – Removed from service prior to 28 February 2005.**

<b>Action: DESTROY/DISCARD. These shafts which have been removed from service before 28 February 2005 must be destroyed / discarded.</b>	
<b>Part Serial Number (S/N)</b>	<b>RGB S/N</b>
3L214	115064
3L175	115098
3L941	120079
4L046	120185
6X621	120220
4L043	120260
2T975	123127
6W654	123168
15A646	123211
2T168	123272

**TABLE 4: Propeller Shafts – Remove from service no later than 31 December 2007.**

<b>Action 1: Inspect as per Part 2 and Part 3 above until removed from service.</b>			
<b>Action 2: REMOVE and DESTROY/DISCARD no later than 31 December 2007.</b>			
<b>Part Serial Number (S/N)</b>	<b>RGB S/N</b>	<b>Part Serial Number (S/N)</b>	<b>RGB S/N</b>
1N638	AP0017	5L750	120415
4T645	AP0019	9K945	120417
2W471	115020	6W661	120421

3L904	115084	3M630	120676
1X094	115129	4X505	120748
2T330	115239	3R463	120814
5T079	115285	9W618	121189
7Y496	115342	2X331	121254
10A285	115505	1T822	121296
7T201	115543	4T589	123005
2T353	115555	14A793	123023
5N522	115623	4T534	123120
7T200	115634	4T536	123146
1N635	115652	23A880	123149
1X303	115690	8W094	123155
1W847	115694	7T437	123215
6Y505	116037	4X425	123239
4L048	120086	14A358	123280
9K451	120161	22A426	123314
5L862	120190	6T814	125020
3L230	120396	6W668	125124
1K028	120413	12A692	127020

**Authorization:** For Minister of Transport



R. William Taylor  
Acting Chief, Continuing Airworthiness

**Contact:** Mr. Luc Deniger, Continuing Airworthiness, Ottawa, telephone 613 952-5385, facsimile 613 996-9178 or e-mail [denigel@tc.gc.ca](mailto:denigel@tc.gc.ca) or any Transport Canada Centre.