
AIRWORTHINESS DIRECTIVE

For the reasons set out in the background section, the CASA delegate whose signature appears below issues the following Airworthiness Directive (AD) under subregulation 39.1 (1) of CAR 1998. The AD requires that the action set out in the requirement section (being action that the delegate considers necessary to correct the unsafe condition) be taken in relation to the aircraft or aeronautical product mentioned in the applicability section: (a) in the circumstances mentioned in the requirement section; and (b) in accordance with the instructions set out in the requirement section; and (c) at the time mentioned in the compliance section.

Pratt and Whitney Canada Turbine Engines - PT6A Series**AD/PT6A/32****Exhaust Duct Cracking****3/2003**

Applicability: All PT6A-6, -6A, -6B, -11, -11AG, -15AG, -20, -20A, -20B, -21, -25, -25A, -25C, -27, -28, -34, -34AG, -34B, -36, -110, -112, -135, and -135A series turboprop engines fitted with turbine exhaust ducts that are not in compliance with Pratt and Whitney Canada (P&WC) Service Bulletins (SB) 1610, 1610R1, 1610R2 or 12173R1.

Requirement:

1. Inspect the turbine exhaust duct for low-quality welds, created during repair, on the turbine exhaust duct near flange "A", in accordance with Paragraphs 3B through 3E of:
 - a. P&WC SB PT6A-72-1610 Revision 2 for models PT6A-6, -6A, -6B, -20, -20A, -20B, -21, -25, -25A, -25C, -27, -28, -34, -34AG, -34B, -36, -135, and -135A engines; or
 - b. P&WC SB PT6A-72-12173 Revision 1 for models PT6A-11, -11AG, -15AG, -110, and -112 engines.
2. If it is determined that the welds meet acceptable criteria as detailed in Requirement 1a or 1b of this Directive:
 - a. Return the duct to service.
 - b. Carry out an internal inspection of the exhaust duct for cracking in accordance with the applicable P&WC Engine Overhaul Manual.
3. If it is determined that the welds do not meet acceptable criteria as detailed in Requirement 1a or 1b of this Directive:
 - a. Replace the duct with a serviceable part; or
 - b. Carry out an inspection as detailed in Requirement 4 of this Directive.
4. Use a 5x magnification to visually inspect the circumference of the forward area of the exhaust duct from the propeller reduction gearbox mounting flange to 2 inches aft of the flange for any crack indication:
 - a. If no cracks are found, return the duct to service and repeat the initial inspection as detailed in Requirement 4 at the detailed interval.

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- b. If cracks are found exceeding the limits below, replace the duct with a serviceable part;
 - i. If 3 or less cracks are found, and the total cumulative length of the cracks exceeds 2 inches; or
 - ii. If any one crack exceeds 1 inch in length; or
 - iii. If any 2 cracks are separated by less than 6 times the longest crack (6L) or 3 inches or less, whichever is the closest separation; or
 - iv. If more than 3 cracks are found.
- c. If cracks are found that are within the limits set by requirement 4b(i) through (iv) of this Directive, mark all allowable cracks on the duct with a suitable metal marking material; and record the length of the crack, location, number of duct operating hours, and time since overhaul; and
 - i. Repeat the inspection and replace ducts exceeding the limits of Requirement 4b(i) through (iv) of this Directive;
 - ii. Monitor the growth of existing cracks. For cracks exceeding a growth rate of 0.015 inches per hour time in service since the last inspection, replace the duct with a serviceable part.

Note 1: Canadian AD CF 2002-47 refers.

Note 2: Suitable marking materials can be found in the PWC Engine Manual.

Note 3: A replacement duct is one that meets the acceptability limits of this Directive.

- Compliance:
- 1. At the next shop visit or within 150 flight hours from the effective date of this Directive, whichever occurs first.
 - 2.
 - a. At the completion of Requirement 1 of this Directive.
 - b. At the next overhaul.
 - 3. Prior to further flight.
 - 4.
 - a. At intervals not to exceed 150 flight hours.
 - b. Prior to further flight.
 - c. At intervals not to exceed 25 flight hours.

This Airworthiness Directive becomes effective on 20 March 2003.

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Background: This Directive requires the inspection of certain turbine exhaust ducts for cracks. The cracks have developed following repairs using a different welding process. Excessive cracking of the turbine exhaust duct could lead to reduction gearbox separation and/or decoupling of the power turbine shaft, which could in turn lead to the release of turbine blades.



James Coyne
Delegate of the Civil Aviation Safety Authority

3 February 2003