
AIRWORTHINESS DIRECTIVE

For the reasons set out in the background section, the CASA delegate whose signature appears below revokes Airworthiness Directive (AD) AD/PMC/41 and issues the following AD under subregulation 39.1 (1) of CASR 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.

Propellers - Variable Pitch - McCauley

**AD/PMC/41
Amdt 1**

Propeller Hub Eddy Current Inspection

1/2004

Applicability: All McCauley threaded propeller hubs.

Requirement: Inspect the threaded area of the propeller hub assembly where the blade retention nut screws into the propeller hub using either:

- a. The eddy current inspection (ECI) procedure detailed in McCauley standard practices manual (SPM) 101; or
- b. An approved ECI procedure.

Note 1: NDI/EC/McCauley/41 constitutes one such technique.

Note 2: NDI/EC/McCauley/41 is only approved for the requirement detailed in this Directive. Refer CAR 2A (1988)

Compliance: Whenever the propeller is disassembled to a point that would allow access to the propeller hub threaded area.

This Amendment becomes effective on 22 January 2004.

Background: This amendment includes reference to the manufacturers procedure that is a required task to be carried out each overhaul. NDI/EC/McCauley/41 is approved only for the inspection requirement of this Directive.

A number of threaded hubs have failed during take-off resulting in propeller blade loss.

The original issue of this Directive became effective 21 April 1988.



Jim Coyne
Delegate of the Civil Aviation Safety Authority

4 December 2003



Australian Government
Civil Aviation Safety Authority

NDT PROCEDURE: McCauley Propeller



PROCEDURE NO: NDI/EC/McCAULEY/41

TEST METHOD: EDDY CURRENT TESTING

AMENDMENT NO: TWO (2)

DATE: 31 MARCH, 2005

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	NAME	SIGNATURE	DATE
Approved By	N Joiner		31/03/2005
CAR 2A Delegate	D. PATTIE		13 MAY 2005

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1.0 PURPOSE

The purpose of this inspection is to detect the presence of cracks in the root of the threads in McCauley propeller hubs as required by AD/PMC/41

2.0 PREPARATION

The threaded section of the hub must be thoroughly cleaned. It is recommended that the inspection be performed when the hub has been prepared for dye penetrant testing as required by the McCauley Overhaul Manual.

3.0 REFERENCE DOCUMENTS

3.1 AD / PMC / 41 – Propeller Hub, Eddy Current Inspection

4.0 PERSONNEL

Personnel performing this inspection must be approved by Civil Aviation Safety Authority or their approved delegated signatory within the Maintenance Organisation.

5.0 EQUIPMENT

This procedure was developed using the Hocking Locator UH, however any other equipment meeting the performance characteristics of this procedure shall be considered acceptable. Phase analysis is considered superior to the Locator UH and may also be used for this inspection. The suitability of alternative equipment shall be assessed by a qualified NDT Level III specialist.

5.1 A special eddy current probe shaped to fit the thread of the hub and containing a coil positioned so that its ferrite core is contiguous with the root of the thread in the hub.

Note:- Special probes suitable for use with the instruments listed above are available as follows:-

Part No. 29P199A (Locator – 500 KHz)

Part No. 29P299A (Locator – 200 KHz)

6.0 CALIBRATION SAMPLES

6.1 A standard aluminium alloy test specimen containing a slot 0.5mm deep and not more than 0.25mm wide (flat samples of the type normally supplied by the instrument suppliers and satisfying the dimensional requirement are acceptable for this procedure. Refer to Figure 1.

7.0 PROCEDURE

- 7.1 Select a test frequency of 200KHz or 500KHz as appropriate to the instrument and adjust the sensitivity control to 70% of maximum.
- 7.2 Place the probe on the test sample remote from the slot and adjust for lift-off by pressing the train button and rocking the probe.
- 7.3 Realign the probe to give the maximum response from the surface of the sample, press the zero button and then traverse the probe across the 0.5mm deep slot, being careful to maintain the optimum probe orientation with respect to the surface. Readjust the sensitivity control so that a maximum meter reading of 50 divisions is obtained from the slot.
- 7.4 Apply the probe to the test article and readjust for the threaded lift-off and section to re-zero the meter.
- 7.5 Scan the entire thread between the commencements of its run-out at each end (approx. 6 revolutions).

8.0 ACCEPTANCE CRITERIA

- 8.1 Any crack-like indication resulting *in* a meter deflection of 50 divisions or greater *is* cause for rejecting the hub. Crack-like indications are characterised by a relatively fast needle deflection at the extremities of the indication.

9.0 WORKSHEETS

Worksheets shall include the following information:

Name of testing laboratory
Client
Report Number
Test technique
Aircraft Registration Number
Blade Serial No. (If applicable)
Acceptance Standard
Statement of compliance
Date of test
Identity of test personnel
Test location

10.0 REPORTING

Reporting requirements shall be satisfied by a test report containing the following information:

Name of testing laboratory

Identification of the eddy current testing equipment

Aircraft Registration Number

Blade Serial No. (If applicable)

Reference to this procedure any variation of the method imposed

Identity of test personnel

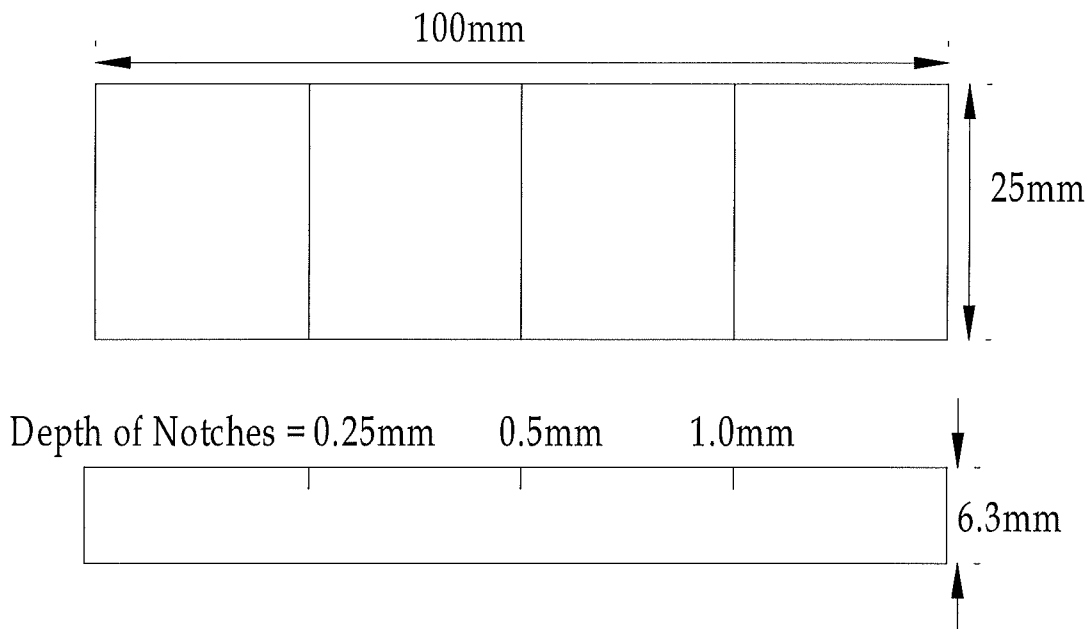
Date of examination

Location of test

Results of test

Report Number and date of issue

Sketches of defect locations when appropriate



Notes:-

- 1) Material:- Aluminium Alloy 7075-T6 or similar
- 2) Width of Notches – 0.25mm maximum
- 3) Notches to be equally spaced.

FIGURE 1