

Propellers - Variable Pitch - McCauley

**AD/PMC/35
Amdt 1**

**Propeller Blade Butt Retention
Thread - Eddy Current Inspection**

13/88

Applicability: All threaded blade McCauley propellers.

Requirement: In addition to the dye penetrant inspection described in the appropriate McCauley Propeller Service Manual, conduct an eddy current inspection of the tapered thread butt section of the propeller blade in accordance with technique approved by the Secretary.

Eddy Current Technique ATG/NDI/EC/5 constitutes one such technique. Copies of this technique, and test samples may be obtained through regional offices of the Authority.

Compliance: 1. Each time propeller is overhauled.
2. Whenever propeller disassembly will allow inspection of the blade butt retention threads.

Background: Two recent local failures have occurred at the butt thread section of McCauley propeller blades. One other cracked blade has been detected using eddy current equipment. All subject blades had shot peened and truncated threads. Laboratory tests indicate that the compressive surface formed by the shot peening process may prevent detection of substantial cracks when inspecting with dye penetrants.

This Amendment raised to clarify reinspection requirements.



Australian Government
Civil Aviation Safety Authority

NDT PROCEDURE: McCauley Propeller Blade Butt Retention Thread

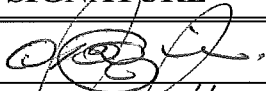

PROCEDURE NO: DOT/NDI/EC5

TEST METHOD: EDDY CURRENT TESTING

AMENDMENT NO: TWO (2)

DATE: 31 MARCH, 2005

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	NAME	SIGNATURE	DATE
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1.0 PURPOSE

To detect the presence of cracks in the four outboard threads of McCauley threaded propeller "blades as required by AD/PML/35.

2.0 PREPARATION

The threaded section of the blade must be thoroughly cleaned. It is recommended that the inspection be performed after the blade has been cleaned and subjected to caustic etching as specified in the McCauley Overhaul Manual as a prelude to dye penetrant inspection.

3.0 REFERENCE DOCUMENTS

3.1 AD / PML / 35 – Propeller Blade Butt Retention Thread, 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 threads and containing a coil positioned so that its ferrite core is contiguous with the root of the thread as shown in Figure 1.

6.0 CALIBRATION SAMPLES

6.1 A calibration standard shall be manufactured in accordance with the requirements of 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 0.125mm wire slot, 1mm deep, 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 reference 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 thread so that the last four outboard threads and at least half of the thread run-out are traversed by the coil. As the coil traverses the thread run-out a steadily changing zero reading will result and some readjustment of the zero control may be necessary.

8.0 ACCEPTANCE CRITERIA

- 8.1 Any sharp meter deflection of 50 divisions or greater should be cause for rejection of the blade. Crack-like indications (i.e. sharp meter deflections returning to zero with relatively little probe movement) of -less than 50 divisions should be subject to further investigation.

9.0 WORKSHEETS

Worksheets shall include the following information:

Name of testing laboratory
Client
Report Number
Test technique
Aircraft Registration Number
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

Serial No. (If applicable)

Reference to this procedure any variation of the method imposed

Identity of test personnel

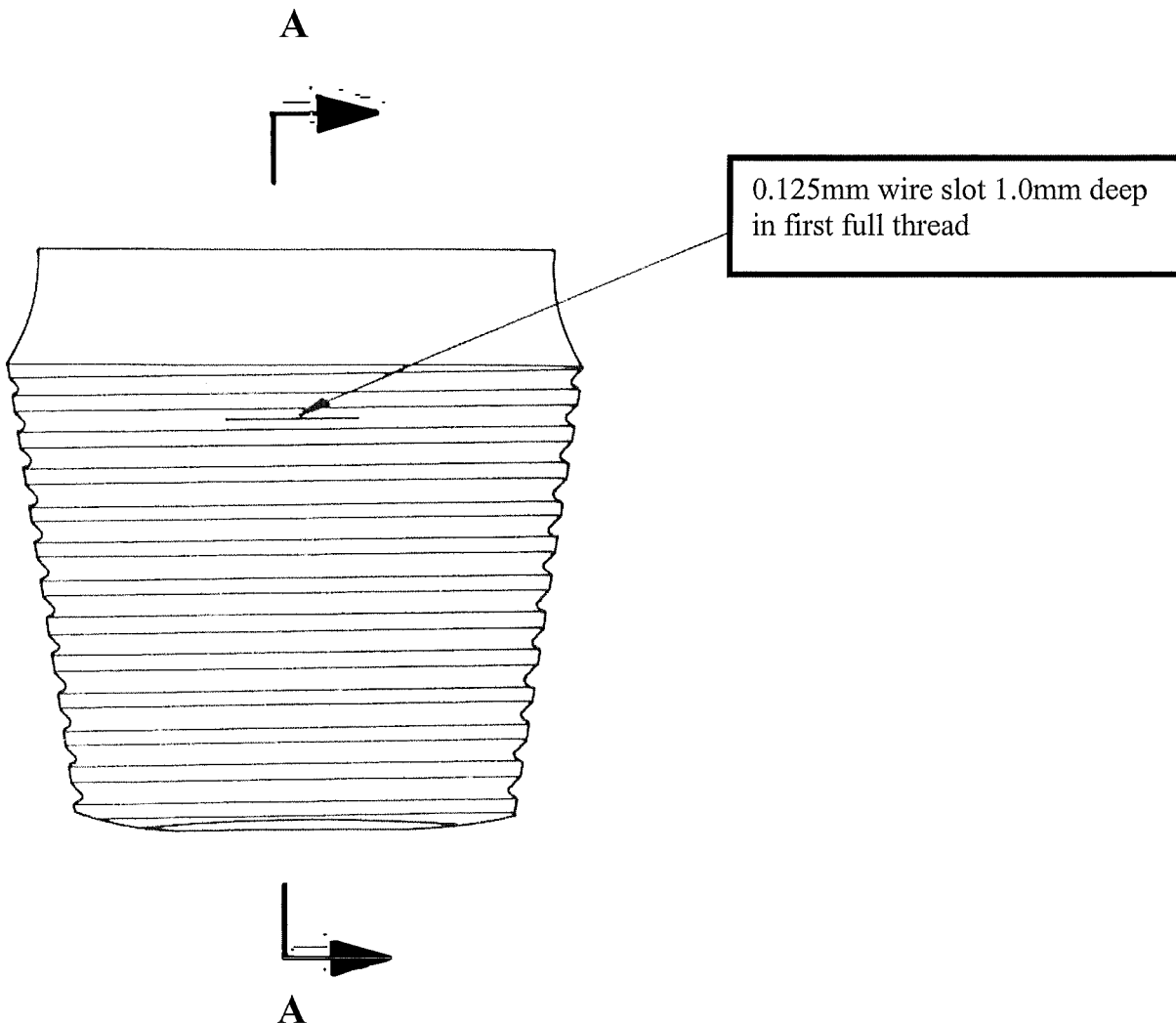
Date of examination

Location of test

Results of test

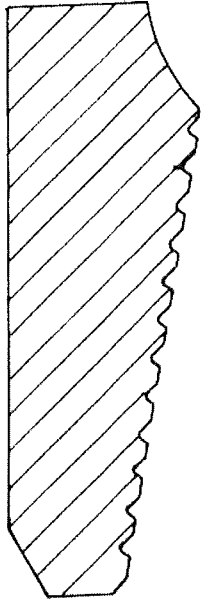
Report Number and date of issue

Sketches of defect locations when appropriate

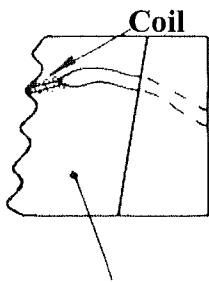


Reference Standard containing reference slot in first full thread.

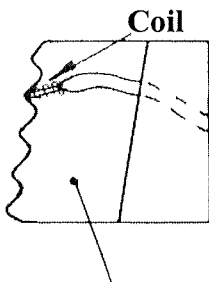
FIGURE 1



Reference Standard containing reference slot in first full thread.



Non electrically conductive material machined to fit the thread contour



Non electrically conductive material machined to fit the thread contour

FIGURE 2