

[4910-13-U]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [66 FR 17105 3/29/2001]

[Docket No. 2001-SW-13-AD]

RIN 2120-AA64

Airworthiness Directives; Bell Helicopter Textron, Inc. Model 47B, 47B-3, 47D, 47D-1, 47G, 47G-2, 47G2A, 47G-2A-1, 47G-3, 47G-3B, 47G-3B-1, 47G-3B-2, 47G-3B-2A, 47G-4, 47G-4A, 47G-5, 47G-5A, 47H-1, 47J, 47J-2, 47J-2A, and 47K Helicopters

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of Proposed Rulemaking

SUMMARY: This document proposes superseding an existing airworthiness directive (AD) for Bell Helicopter Textron, Inc. (BHTI) Model 47B, 47B-3, 47D, 47D-1, 47G, 47G-2, 47G2A, 47G-2A-1, 47G-3, 47G-3B, 47G-3B-1, 47G-3B-2, 47G-3B-2A, 47G-4, 47G-4A, 47G-5, 47G-5A, 47H-1, 47J, 47J-2, 47J-2A, and 47K helicopters. That AD currently requires either recurring liquid penetrant or eddy current inspections of the main rotor blade grip (grip) threads for a crack. If a crack is detected, that AD requires, before further flight, replacing the cracked grip with an airworthy grip. That AD also establishes a retirement life of 1200 hours time-in-service (TIS) for each grip. This AD contains the same requirements but adds two part numbers (P/N) to the applicability and requires only recurring eddy current inspections of the grip threads. This AD also requires reporting any results of the grip inspections to the FAA Rotorcraft Certification Office. This proposal is prompted by the results of an accident investigation, an operator survey conducted by a trade association, various comments concerning the current AD, and a further analysis of field service data. The actions specified by this AD are intended to prevent failure of a grip, loss of a main rotor blade, and subsequent loss of control of the helicopter.

DATES: Comments must be received on or May 29, 2001.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Office of the Regional Counsel, Southwest Region, Attention: Rules Docket No. 2001-SW-13-AD, 2601 Meacham Blvd., Room 663, Fort Worth, Texas 76137. You may also send comments electronically to the Rules Docket at the following address: 9-asw-adcomments@faa.gov. Comments may be inspected at the Office of the Regional Counsel between 9 a.m. and 3 p.m. Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Marc Belhumeur, Aviation Safety Engineer, FAA, Rotorcraft Directorate, Rotorcraft Certification Office, Fort Worth, Texas 76193-0170, telephone (817) 222-5177, fax (817) 222-5783.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified under the caption "ADDRESSES." All communications received on or

before the closing date for comments will be considered before taking action on the proposed rule. The proposals contained in this document may be changed in light of the comments received.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of this proposal. All comments submitted will be available in the Rules Docket for examination by interested persons. A report summarizing each FAA-public contact concerned with the substance of this AD will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their mailed comments submitted in response to this proposal must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 2001-SW-13-AD." The postcard will be date stamped and returned to the commenter.

Availability of NPRMs

Any person may obtain a copy of this NPRM by submitting a request to the FAA, Office of the Regional Counsel, Southwest Region, Attention: Rules Docket No. 2001-SW-13-AD, 2601 Meacham Blvd., Room 663, Fort Worth, Texas 76137.

Discussion

On May 12, 1987, the FAA issued AD 86-06-08R1 (52 FR 24135, June 29, 1987) that amended AD 86-06-08 (51 FR 11300, April 2, 1986). Those AD's required an initial and repetitive fluorescent dye penetrant inspection of each grip. On August 31, 2000, the FAA issued Emergency AD 2000-18-51 that superseded AD's 86-06-08 and 86-06-08R1. AD 2000-18-51 requires initial and recurring liquid penetrant or eddy current inspections of the grip threads for a crack and, before further flight, replacing any cracked grip with an airworthy grip. That AD also establishes a retirement life of 1200 hours TIS for each grip.

That action was prompted by the results of an investigation of an August 1998 accident in which a grip failed on a BHTI Model 47G-2 helicopter due to a fatigue crack. An analysis of Australian field service data revealed fatigue cracks in the majority of the grips inspected. The requirements of that AD are intended to prevent failure of a grip, loss of a main rotor blade, and subsequent loss of control of the helicopter.

Since issuance of Emergency AD 2000-18-51, other cracked grips with less than 1200 hours TIS have been discovered including one grip with a 2-inch crack through the grip. Therefore, the FAA has determined that the liquid penetrant inspection is not adequate for finding cracks in the grip threads and proposes requiring eddy current procedures only. Because the eddy current procedure will find smaller cracks, the FAA proposes increasing the inspection interval from 200 hours TIS to 300 hours TIS for each grip. In addition, two parts produced under Parts Manufacturer Approval (PMA) were omitted from the applicability section of the current AD but are added to this AD.

Disposition of Comments

The FAA received additional data and comments about the current AD from 31 commenters, including the Experimental Aircraft Association (EAA), Helicopter Association International (HAI), and the National Agricultural Aviation Association (NAAA). We have reviewed each comment. Since many of the comments are similar, we will discuss each group of comments.

A commenter states that AD 2000-18-51 should be rescinded because the extent of cracked grips in the United States fleet is not as extensive as the 70 percent of cracked grips found in the Australian survey. The FAA does not concur with the request to rescind the AD. Although only 11 cracked grips have been found in the United States thus far, each of these grips is unairworthy and could result in a total fracture of the grip in flight. The FAA attributes the difference in the number of cracked grips found to be due to the unreliability of the dye penetrant inspection used by most U.S. operators versus the eddy current inspection used by the Australian operators. The FAA proposes that U.S operators only use eddy current inspections for finding cracks in the grip threads.

Other commenters state that AD 2000-18-51 should be rescinded because the FAA Rotorcraft Directorate failed to apply United States BHTI Model 47 owner/operator user data to the equation when

issuing the AD. The FAA does not concur. The FAA's Rotorcraft Directorate researched this safety concern before determining that an emergency AD was necessary. We continuously monitor in-service problems of the worldwide BHTI Model 47 fleet, taking into account accident data and service difficulty information from the entire fleet. The FAA received data, most recently from Australia and Canada, indicating that BHTI Model 47 grips were cracking. We asked BHTI to submit all the field service information they had on the BHTI Model 47 grips. The airworthiness authorities in Australia and Canada had also extensively researched and analyzed the grip problem. Using this information, the FAA determined that fatigue cracks in the grips are likely to exist on the BHTI Model 47 helicopters. This condition, if not corrected, could result in failure of a grip, loss of a main rotor blade, and subsequent loss of control of the helicopter.

Several commenters also state that the United States user data will show that there has not been one accident, incident, or other maintenance issue concerning the BHTI Model 47 blade grip in over 40 years. The FAA does not concur. The United States data actually shows two accidents in the United States because of fatigue cracking in the grip threads. One resulted in a fatality in New Jersey during 1971 and the other involved injuries in Iowa during 1972. The United States data also shows 11 grips with cracks and 5 of those had less than 1200 hours TIS. An EAA survey shows that one operator found a 2-inch crack through the threads of his grip as a result of complying with AD 2000-18-51.

A commenter also states that AD 2000-18-51 should be rescinded because the basis for the AD was a Bell 47 accident that occurred in Canada on August 13, 1998. That commenter states that neither the accident investigation report, Transportation Board of Canada (TSB) Report No. A98O0214, the accident, nor the resulting Transport Canada AD called for the extreme measures the FAA took when it issued the AD's. Other commenters offer similar comments. The FAA does not concur. The TSB suggested in Report No. A98O0214 under "Safety Action" the possible need for a fatigue crack examination at an interval that provides a greater margin of safety than the existing inspection cycle. Transport Canada changed the initial inspection from 1200 hours to 600 hours TIS and thereafter at intervals not to exceed 300 hours TIS.

Without providing substantiating data, many commenters state that AD 2000-18-51 should be rescinded because they think the history on the helicopter that crashed August 13, 1998, in Canada is questionable. The FAA does not concur because the records indicate that the helicopter was certified, equipped, and maintained in accordance with existing regulations and approved procedures.

Some commenters state that the AD should differentiate between the grips. They state that it was one of the smaller grips, P/N 47-120-135-5, that was involved in the 1998 Canadian accident and that the larger grips were only involved in one accident and that grip had over 5600 TIS when it fractured. The FAA does not concur because 41 of the larger grips were found with cracks. Based on this service history, we have determined that both smaller and larger grips require the same inspection interval.

Some commenters state that the inspection intervals should be increased to 300 hours TIS similar to the previous United States AD and to the current Canadian AD to allow operators more operational use between inspections. The FAA partially concurs. The Canadian AD only allows eddy current inspections. The FAA believes liquid penetrant inspections may not be effective in detecting a small crack. Therefore, we propose to require the use of eddy current inspection exclusively. Similarly, because we now believe that it is unlikely that a crack will propagate to failure within 300 hours TIS for either the smaller or larger grip, we propose to increase the inspection intervals for eddy current inspections from 200 hours TIS to 300 hours TIS.

Commenters state that the AD should be rescinded and allow AD 86-06-08R1 to be effective because that AD has adequately eliminated the unsafe fatigue cracking condition. The FAA does not concur because AD 86-06-08-R1 does not address the cracking found in grips with less than 1200 hours TIS.

Other commenters state that during recurring inspections, the reinstallation of the steel adapter nuts to the aluminum grip would damage the aluminum grip and create an unsafe condition. The FAA does not

concur. Both the adapter and the grip must be cleaned and inspected for any burrs, damage, or out-of-tolerance threads. These grips have had recurring inspections since 1985, and the service history suggests that reinstalling the adapter to the grip threads produces no damage if done properly. Plus, we are extending the TIS intervals for inspecting the grips.

A commenter states that the AD should be rescinded because 36 of the grips identified in the field survey were P/N 47-120-252-3, and these grips only have a 300-hour retirement life. They believe that cracks found on these grips should not be considered since the grips should have been retired at 300 hours TIS. The data the FAA reviewed does not support that supposition, and we do not concur. The grip, P/N 47-120-252-3, is identical to the grips, P/N 47-120-252-7 and 47-120-252-11, except the grip, P/N 47-120-252-3, does not have bushings installed. The threaded area of these grips is identical to the threaded area on grips, P/N 47-120-252-7 and 47-120-252-11; therefore, a crack found in the threads of a grip, P/N 47-120-252-3, is relevant to the FAA's analysis.

A commenter states that the AD should be rescinded because the reason the grip fractured in Canada during 1998 was due to water lodged in the grip's thread and pitting in the roots of the threads. The FAA does not concur. The accident report stated water was dislodged during disassembly of the grip from the hub. This does not mean that water was in the threads, and the report does not suggest water in the threads. The report states there was extensive pitting in the threads. These pits were 0.0008 inch or less and cannot be seen with the naked eye. This kind of micro pitting is allowed by military specifications and manufacturing procedures. The FAA believes that the main reason the fatigue cracks have started in the root of the threads is because the root radii are not controlled and have been shown to be as sharp as 0.001 inch.

Numerous commenters state that the AD should be rescinded because the economic impact was underestimated and did not address that replacement parts were unavailable. The commenters also state that this AD created an unnecessary financial hardship on operators, possibly forcing numerous operators out of business. The FAA understands these concerns. Several operators comment that the average economic impact per BHTI Model 47 helicopter ranged from \$8,000 to \$32,000. Their economic impact cost may be indicative of most costs associated with a business having to comply with the AD. However, normally AD cost calculations do not go beyond initial labor and parts costs and do not include costs that operators may incur in individual maintenance or cost that operators might pass on to others. The FAA recognizes that there are additional costs associated with a shorter retirement life on these rotorcraft. Assuming the helicopter is operated for 300 hours TIS per year, the cost of replacing the grips at 1200 hours vs. 5000 hours and changing the inspection requirements is calculated as follows:

Additional part replacement cost:

$$((300\text{hr}/\text{yr})/(5000\text{hr}))((2\text{ea}/\text{set})(\$4000)) = \$480 \text{ per } 300\text{hr TIS year for original set.}$$

$$((300\text{hr}/\text{yr})/(1200\text{hr}))((2\text{ea}/\text{set})(\$4000)) = \$2000 \text{ per } 300\text{hr TIS year for reduced life set.}$$

$$\$2000 - \$480 = \$1520 \text{ per } 300\text{hr TIS year per set replacement.}$$

Additional inspections and installations (job) cost:

$$((300\text{hr}/\text{yr})/(5000\text{hr})) (10\text{hr}/\text{job})(\$60\text{per hr})((1\text{job}(\text{initial})+(5000\text{hr}-1200\text{hr})/(300\text{hr}/\text{job})) = \$504 \text{ per } 300\text{hr TIS year.}$$

$$((300\text{hr}/\text{yr})/(1200\text{hr}))(10\text{hr}/\text{job})(\$60\text{per hr})((1\text{job}(\text{initial})+(1200\text{hr})/(200\text{hr}/\text{job})) = \$1050 \text{ per } 300\text{hr TIS year.}$$

$$\$1050 - \$504 = \$546 \text{ per } 300\text{hr TIS year.}$$

$$\text{Total additional cost per } 300\text{hr TIS yr } \$1520 + \$546 = \$2066 \text{ per } 300\text{hr TIS year.}$$

$$\text{Total additional cost per hr TIS is } \$2066/300\text{hr TIS} = \$7 \text{ per hr TIS.}$$

These additional costs do not include the economic impact to the operator if the parts are not available. The FAA recognizes that if parts are not available, an operator's helicopter may become grounded and result in an overwhelming financial burden on the operator. When adopting a regulation, the FAA must determine that the benefits of the intended regulation justify the cost. The FAA did not anticipate that a

significant shortage of parts existed and the subsequent grounding of a portion of the fleet. Even though the FAA did not anticipate the shortage, despite the shortage of parts, we would still have issued the AD based on the extent of the unsafe condition. The AD was intended to restore the level of safety established in the certification basis and the type design. If this part failed, the result could be catastrophic. For example, one operator reported finding a 2-inch crack in a grip as a result of the current AD.

One commenter states that the AD should be rescinded because the manufacturer stated that the AD is unwarranted. The FAA does not agree. There has been enough data reviewed that shows cracks have occurred prior to the 1200-hour life limit. The FAA does not allow flight with a crack in a critical component. Cracks do develop at less than 1200 hours TIS, and neither the initiation mechanism nor the crack growth characteristics have been determined; therefore, the recurring inspection mitigates risk. The FAA is also concerned that without design changes, newly produced parts could also develop cracks before the manufacturer's recommended 1200-hour life limit. The manufacturer has agreed to a crack propagation test on one of the existing grips, P/N 47-120-135-5, which had cracks show up during an eddy current inspection. The manufacturer has also agreed to redesign the grip to at least include a change to MIL-S-8879 threads with controlled root radius.

Several commenters state that the AD should not have gone out as an Emergency AD because the Rotorcraft Directorate did not follow the risk assessment process in the Small Airplane Directorate's "Airworthiness Concerns Process Guide" (guide). The FAA agrees that we did not follow the risk assessment process in that guide because that process was originally developed to address small airplanes under a type certificate whose owner no longer provides engineering support for the type certificate. Since that guide as it currently exists may not be appropriate for rotorcraft, we do plan to evaluate a procedure that could be used for rotorcraft. The FAA decided to issue the Emergency AD because of an in-flight failure of a grip at approximately 200 hours TIS.

We have identified an unsafe condition that is likely to exist or develop on other BHTI Model 47B, 47B-3, 47D, 47D-1, 47G, 47G-2, 47G2A, 47G-2A-1, 47G-3, 47G-3B, 47G-3B-1, 47G-3B-2, 47G-3B-2A, 47G-4, 47G-4A, 47G-5, 47G-5A, 47H-1, 47J, 47J-2, 47J-2A, and 47K helicopters of the same type designs. The proposed AD would supersede AD 2000-18-51 with the following requirements:

- For grips, P/N 47-120-135-2, 47-120-135-3, 47-120-135-5, 47-120-252-1, 47-120-252-7, 47-120-252-11, and for grips manufactured under PMA, P/N 74-120-252-11, 74-120-135-5, R74-120-252-11, and R74-120-135-5, conduct eddy current inspections of the threads of both grips as follows:
- Within 300 hours TIS since initial installation on any helicopter or within 10 hours TIS for grips with 300 or more hours TIS, or within 200 hours TIS since last liquid penetrant or eddy current inspection, whichever comes first, conduct an eddy current inspection in accordance with Appendix 1 or an equivalent FAA-approved procedure that contains the requirements of the procedure in Appendix 1. Thereafter, conduct the eddy current inspection at intervals not to exceed 300 hours TIS.
- Report the results of each inspection to the FAA Rotorcraft Certification Office by providing the information requested in the sample format report in Appendix 3. Reporting requirements have been approved by the Office of Management and Budget and assigned OMB control number 2120-0056.
- Before further flight, replace any cracked grip with an airworthy grip.

The proposed AD would require maintaining the current retirement life of 1200 hours TIS for each affected grip.

The FAA estimates that 1130 helicopters of U.S. registry will be affected by this AD, that it will take approximately 10 work hours per helicopter to accomplish the disassembly, inspection, and reassembly of the grips from the helicopter, and that the average labor rate is \$60 per work hour. Required parts, if a grip needs to be replaced, will cost approximately \$4,000 per grip (there are two grips on each helicopter).

Based on these figures, the total cost impact of the AD on U.S. operators is estimated to be \$9,718,000, assuming one inspection per helicopter and replacement of both grips on each helicopter.

The regulations adopted herein will not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, it is determined that this final rule does not have federalism implications under Executive Order 13132.

For the reasons discussed above, I certify that this proposed regulation (1) is not a “significant regulatory action” under Executive Order 12866; (2) is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) if promulgated, will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A copy of the draft regulatory evaluation prepared for this action is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption "ADDRESSES".

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

The Proposed Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. Section 39.13 is amended by removing Amendment 39-11983 and by adding a new airworthiness directive to read as follows:

BELL HELICOPTER TEXTRON, INC.: Docket No. 2001-SW-13-AD. Supersedes AD 2000-18-51, Amendment 39-11983, Docket No. 2000-SW-35-AD.

Applicability: Model 47B, 47B-3, 47D, 47D-1, 47G, 47G-2, 47G2A, 47G-2A-1, 47G-3, 47G-3B, 47G-3B-1, 47G-3B-2, 47G-3B-2A, 47G-4, 47G-4A, 47G-5, 47G-5A, 47H-1, 47J, 47J-2, 47J-2A, and 47K helicopters, with main rotor blade grips, part number (P/N) 47-120-135-2, 47-120-135-3, 47-120-135-5, 47-120-252-1, 47-120-252-7, 47-120-252-11, 74-120-252-11, 74-120-135-5, R74-120-252-11, and R74-120-135-5, installed, certificated in any category.

Note 1: This AD applies to each helicopter identified in the preceding applicability provision, regardless of whether it has been otherwise modified, altered, or repaired in the area subject to the requirements of this AD. For helicopters that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (e) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

To prevent failure of a main rotor blade grip (grip), separation of a main rotor blade, and subsequent loss of control of the helicopter, accomplish the following:

(a) Conduct an eddy current inspection of the threads of both grips for a crack in accordance with Appendix 1 of this AD or an equivalent FAA-approved procedure containing the requirements of the procedure in Appendix 1 within 300 hours time-in-service (TIS) since initial installation on any helicopter or within 10 hours TIS for grips with 300 or more hours TIS or within 200 hours TIS since the last liquid penetrant or eddy current inspection of grip threads, whichever comes first.

(1) Thereafter, conduct the eddy current inspection in accordance with Appendix 1 of the AD or an equivalent FAA-approved procedure containing the requirements of the procedure in Appendix 1 at intervals not to exceed 300 hours TIS.

(2) Report the results of each inspection to the FAA Rotorcraft Certification Office within 7 calendar days. Reporting requirements have been approved by the Office of Management and Budget and assigned OMB control number 2120-0056.

Note 2: See Appendix 2 of this AD for a list of known eddy current inspection facilities.

(b) If a crack is detected, before further flight, replace any cracked grip with an airworthy grip.

(c) On or before 1200 hours TIS, replace each grip with an airworthy grip.

(d) This AD establishes a retirement life of 1200 hours TIS for the grips, P/N 47-120-135-2, 47-120-135-3, 47-120-135-5, 47-120-252-1, 47-120-252-7, 47-120-252-11, 74-120-252-11, 74-120-135-5, R74-120-252-11, and R74-120-135-5.

(e) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Rotorcraft Certification Office, FAA. Operators shall submit their requests through an FAA Principal Maintenance Inspector, who may concur or comment and then send it to the Manager, Rotorcraft Certification Office.

Note 3: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Rotorcraft Certification Office.

(f) Special flight permits may be issued in accordance with 14 CFR 21.197 and 21.199 to operate the helicopter to a location where the requirements of this AD can be accomplished.

Issued in Fort Worth, Texas, on March 23, 2001.

Mark R. Schilling, Acting Manager, Rotorcraft Directorate, Aircraft Certification Service.

APPENDIX 1

NONDESTRUCTIVE INSPECTION PROCEDURE

TASK: EDDY CURRENT (ET) INSPECTION OF MAST THREADS FOR CRACKS

1.0 AREA OF INSPECTION

1.1 The inboard inside diameter machined threads (reference figure 1).

2.0 EQUIPMENT

2.1 Zetec Miz-20/22, Phasec 2200 or equivalent piece of equipment.

2.2 Match molded ET probe SPC-193 (100kHz) or equivalent. (See Figure 3.)

2.3 Reference standard EC-010-021, or equivalent. (See Figures 4 and 5.)

2.4 Light oil.

3.0 PERSONNEL REQUIREMENTS

3.1 Personnel performing the ET inspection must be minimally qualified to a Level II in ET inspection, certified in accordance with an industry accepted standard (such as, ATA-105, NAS-410, or MIL-STD-410) or an FAA accepted company procedure.

4.0 STANDARDIZATION

4.1 Connect probe to flaw detector and turn power on.

4.2 Adjust the Phasec 2000 as shown in table 1. Adjust all other equipment as necessary.

4.3 Adjust the V:H gain ratio to 1.5:1 - 2:1.

4.4 Monitor the crack response when moving the probe in one direction only across each EDM notch of the standard. Adjust the coarse gain for a crack response of 2 - 3 units from the smallest (0.04") notch. Record the number units of displacement and noise level for each of the EDM notches.

5.0 PRE INSPECTION

5.1 The part shall be clean and free of loose debris.

5.2 A thin coating of clean oil may be applied to the teeth to help the ET probe slide easily.

6.0 INSPECTION

6.1 Place the probe into the threaded area and slide it in the same direction as was done on the standard while monitoring the screen for root cracks. Moving the probe in the same direction produces a repeatable display that allows for more accurate flaw size determination. Scan the probe along each individual thread until all the threads are inspected. (See Figures 2 and 3.)

NONDESTRUCTIVE INSPECTION PROCEDURE (CONT.)

7.0 EVALUATION

7.1 Repeat standardization and rescan any areas where there is a vertical crack-like deflection.

7.2 If indication persists, mark the location on the part. Record the number units of displacement, phase orientation, and noise level.

8.0 ACCEPT/REJECT CRITERIA

8.1 All repeatable crack-like indications above the noise level detected shall be cause for rejection.

Zetec M12 - 20/22, Phasec 2200 Settings

Dialogue: English	Alarm Stretch: 1S	Probe: Standard
Printer: HP PCL	Alarm Shape: Off	Drive: +10dB 6.3V
Bright Bal} Low Split	Apply to: Trace 1	Analogue 1: Out Off
Graticule: Rect. A	Alarm action} Run Silent	Analogue 2: Out Off

Ser'l Conf. Alarm I/O Time Batt.

Hi-pass: DC	CH1 Freq: 100KHz	Mode: Diff 1Ch
Lo-pass: 20 Hz	CH1 PHASE: 193.0°	Display: XY
Inp. Gain: +20dB	CH1 GAIN: 46.0Db	View: Ch1
Optimize: + }	CH1 X:Y: X -3.0dB	Persist: Permn't

Table 1, Appendix 1

NONDESTRUCTIVE INSPECTION PROCEDURE (CONT.)

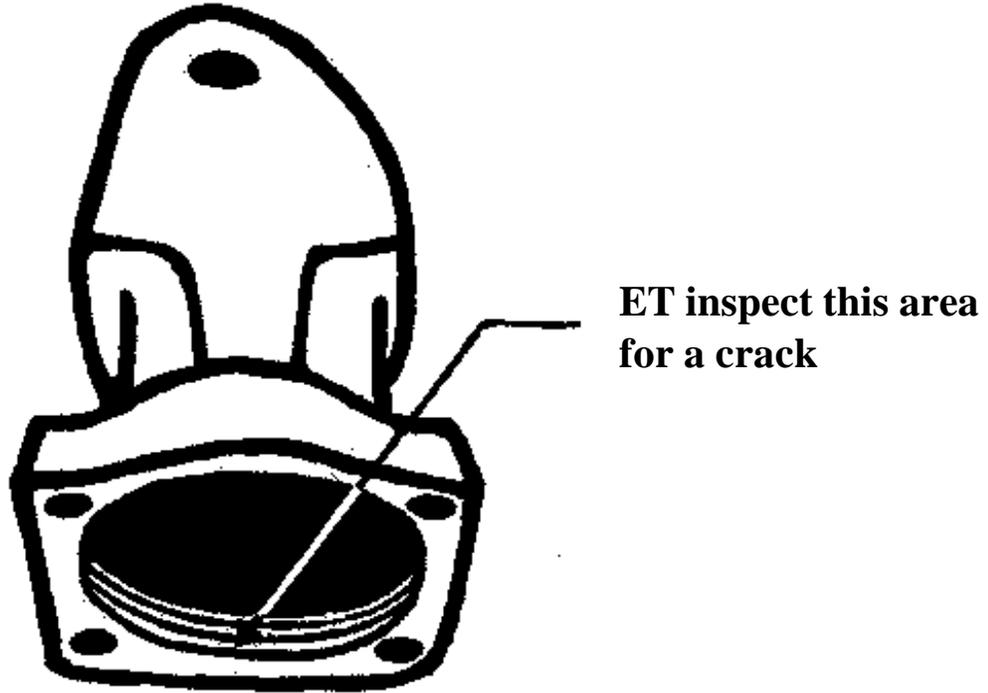


Figure 1, Appendix 1

NONDESTRUCTIVE INSPECTION PROCEDURE (CONT.)

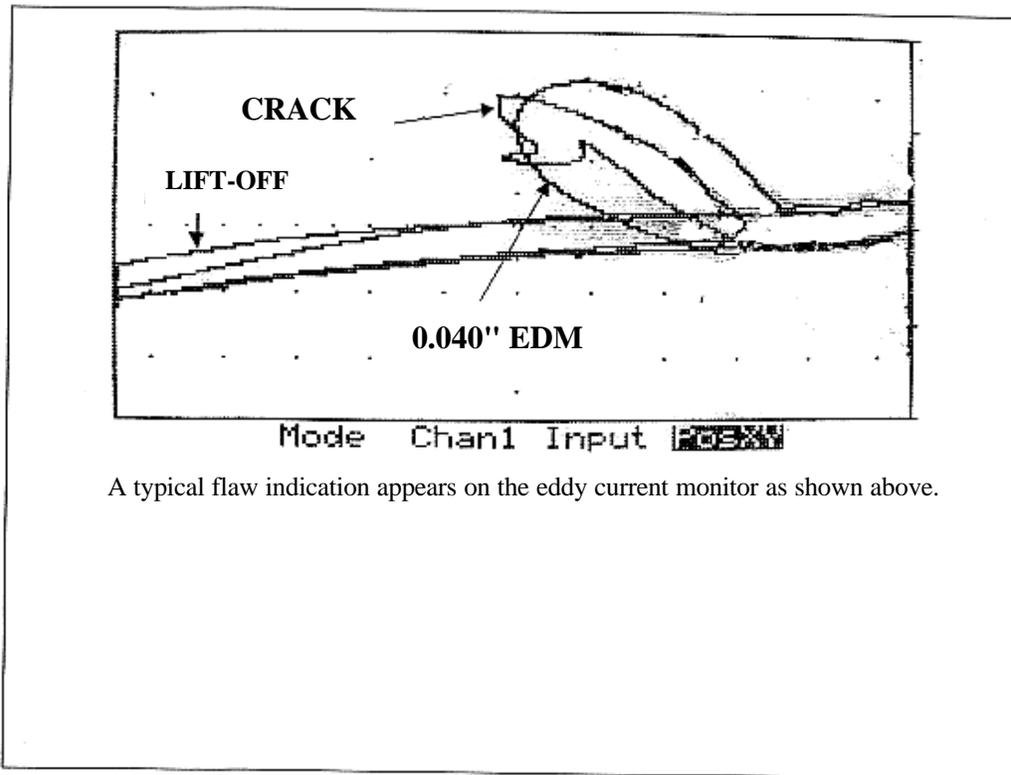


Figure 2, Appendix 1

NONDESTRUCTIVE INSPECTION PROCEDURE (CONT.)

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

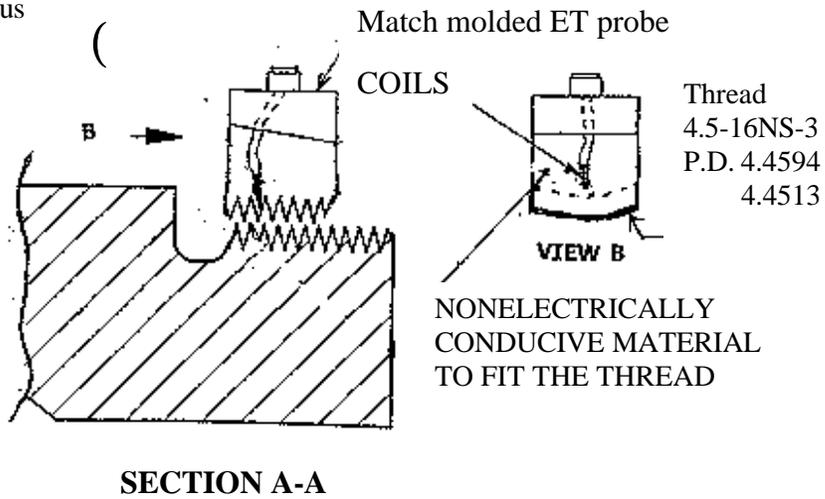
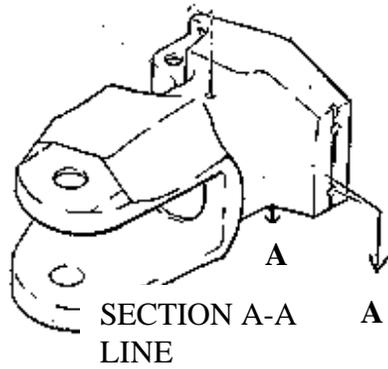
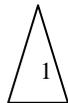
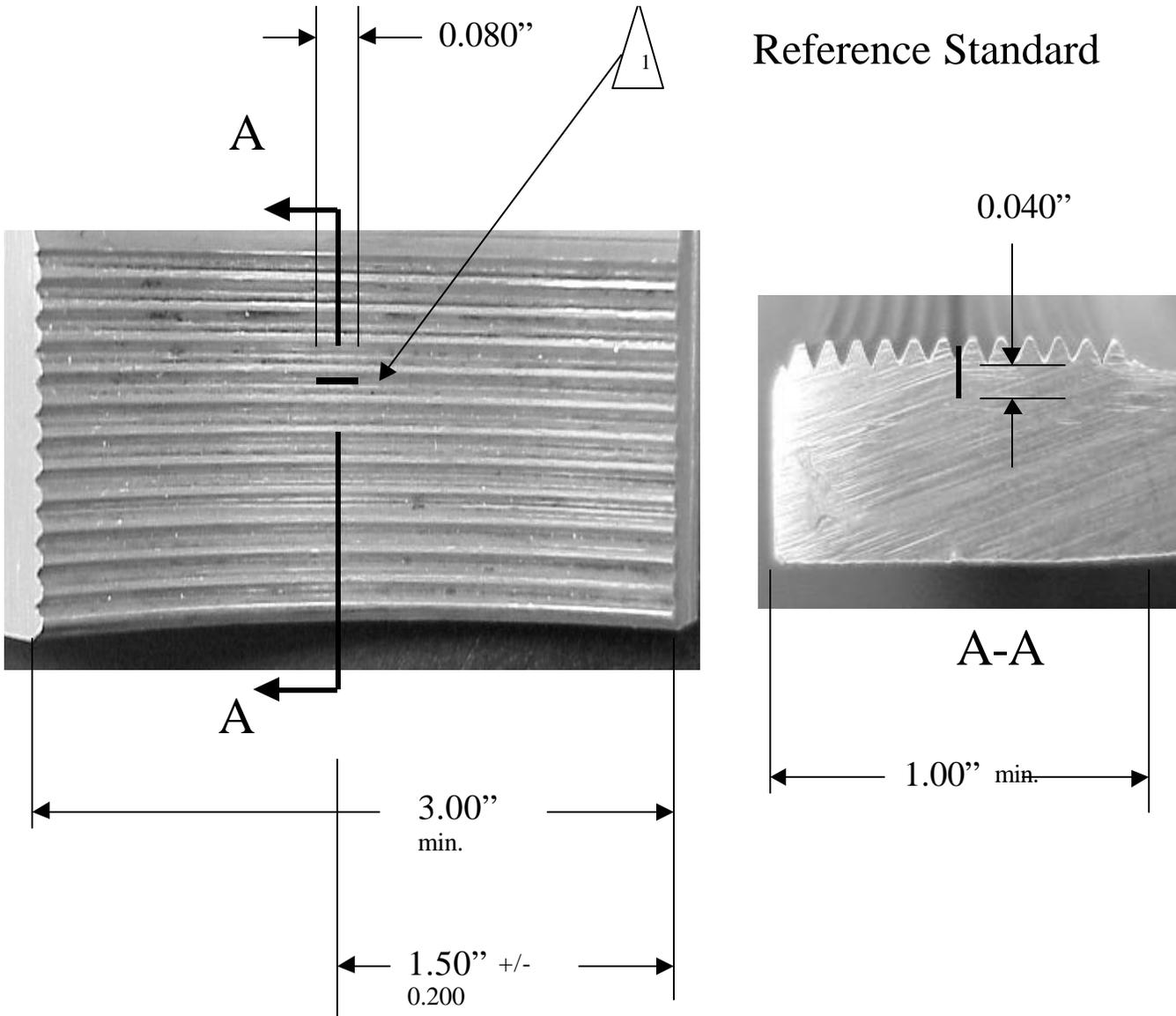


Figure 3, Appendix 1

NONDESTRUCTIVE TESTING PROCEDURE (CONT.)



EDM 1 place only in thread root.
 Notch width shall be 0.004 max.
 All other dimensions to be +/- 0.004 from indicated.

Figure 4, Appendix 1

NONDESTRUCTIVE INSPECTION PROCEDURE (CONT.)

Reference Standard

MACHINING NOTES:

1. Standard may be machined from aluminum tube stock.
2. The standard shall contain a minimum of four teeth per the tooth dimensions specified.
3. The EDM notch shall be placed in the center most tooth root as measured across the width of the standards. There shall be no less than two teeth and one root on either side of the EDM notch.

CHAMFER 45 DEG. X .06
4.500 - 16 NS - 3B
THREAD PER
FED - STD. - H28/2
P.D. 4.4675
4.4594

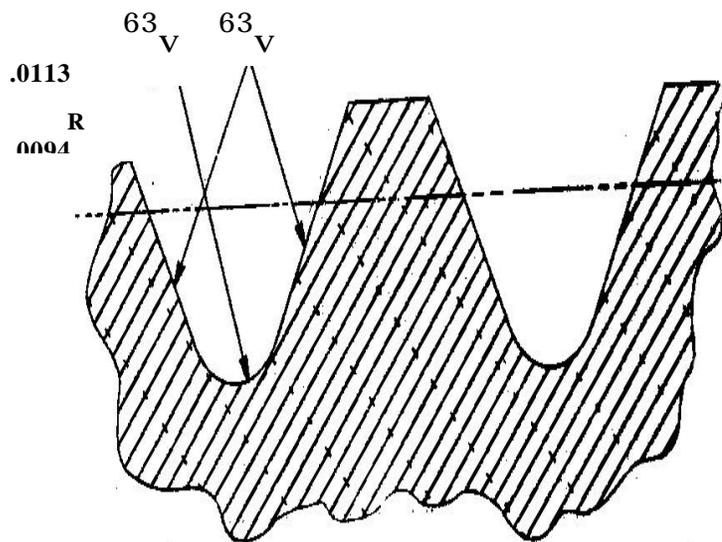


Figure 5, Appendix 1

APPENDIX 2
PARTIAL LIST OF NONDESTRUCTIVE INSPECTION
TESTING FACILITIES IDENTIFIED BY OPERATORS AND FAA

Met Chem Testing Laboratories Inc.
369 W. Gregson Ave. (3085 S.)
Salt Lake City, Utah 84115-3440
Phone: (801) 487-0801
FAX: (801) 466-8790
www.metchemtesting.com

Galactic NDT Services
10728 D. South Pipeline RD
Hurst, Texas 76053
Phone: (800) 458-6387

Global Testing Technologies
1173 North Service Rd. Unit D3
Oakville Toronto Canada
Phone: (905) 847-9300
FAX: (905) 847-9330

Paragon Services, Inc.
1015 S. West St.
Wichita, KS 67213
Phone: (316) 945-5285
FAX: (316) 945-0629

NOE Services
8775 E. Orchard Rd. #809
Englewood, CO
Phone: (303) 741-0518
FAX: (303) 741-0519

Applied Technical Services, Inc.
1190 Atlanta Industrial Drive
Marietta, GA 30066
Phone: (770) 423-1400
FAX: (770) 514-3299

Rotorcraft Support
Van Nuys CA 91406
Phone: (818) 997-7667
FAX: (818) 997-1513

Other FAA Approved repair facilities may be used.

Appendix 3
AD COMPLIANCE INSPECTION REPORT (Sample Format)
BELL MODEL 47 MAIN ROTOR BLADE GRIP

Provide the following information and mail or fax it to:

Manager, Rotorcraft Certification Office
Federal Aviation Administration
Fort Worth, Texas, 76193-0170, USA
Fax: 817-222-5783

Aircraft Registration No:

Helicopter Model:

Helicopter Serial Number:

Owner and Operator of the Helicopter:

Grip #1 Grip #2

Part Number:

Serial Number:

Hours TIS on the part at Inspection:

Crack Found (Y/N)
If yes, describe below.

Description of Findings

Who performed the inspections?

If a crack was found, describe the crack size, location, and orientation (provide a sketch or pictures with the grip part and serial number).

Provide any other comments.