

*Robinson Helicopter Company*

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MANDATORY SERVICE BULLETIN

DATE: January 26, 1981

TO: All Current Owners &amp; Operators of Robinson R22 Helicopters

SUBJECT: Inspection of Main Gear Box Flex Coupling Yokes

ROTORCRAFT AFFECTED: R22 Serial No's 0002 thru 0095

TIME FOR COMPLIANCE: Prior to next flight.

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BACKGROUND: The A194-1 Yoke failed on an R22 helicopter after 126 hours of service. Metallurgical examination of the failed part indicated that the heat treatment was below the specified limits and that the surface of the metal had been severely decarburized during heat treatment. In addition, there was a small crack at the edge of the weld, probably induced by the straightening operation performed after heat treat. The soft decarburized surface promoted propagation of the small crack. The rate of crack propagation was extremely slow due to the low stress level. Failure of this yoke in flight could be catastrophic.

MANDATORY INSPECTION: Prior to the next flight, the weld areas on the A192 and A194 Yokes of the main gear box flex coupling must be dye checked with particular attention to the flange surface at the edge of the weld. This one-time inspection shall be performed on all R22 helicopters S/N 0002 thru S/N 0095. In addition, those aircraft with A194 Yokes from production lot 15A, Ship S/N 0074 thru S/N 0095 and S/N 0056, shall be reinspected every ten (10) hours until the A194 Yokes from lot 15A are replaced.

INSPECTION PROCEDURE: See attached instructions on Pages 2 and 3 of this service bulletin for inspection instructions.

FAA APPROVED: January 26, 1981

A192 AND A194 YOKE INSPECTION

Materials Required:

1. Portable dye penetrant inspection kit similar or equivalent to Uresco Model TT-101 spray can system. Penetrant method must be of the Post-Emulsified type per MIL-I-6866B (ASG), Type II visible dye, Method B.
2. Epoxy paint remover similar or equivalent to Tal Strip #2813.
3. Ten-power magnifying glass.
4. Zinc chromate primer.

Inspection Procedure:

1. Disconnect the A193-2 flex plate from the A197-1 tail rotor drive shaft by removing the two pal nuts and NAS679A4 nuts.  
Note: Using a magic marker, place an "X" on one ear of the flex plate and the adjacent ear of the tail rotor drive shaft. Be extremely careful on re-installation to install the bolts and washers exactly as removed, to prevent any shim change of the tail rotor drive line.
2. Disconnect the A193-1 flex plate from the A192 and A194 yokes. Remove the four pal nuts, NAS679A5 nuts, A559 washers and NAS1305-4 bolts. Rest the clutch shaft on the horizontal fire-wall.
3. Remove the cotter pin, castellated nut, and washer that attach the A194 yoke to the main rotor gearbox pinion shaft and remove the yoke.
4. Using the epoxy paint stripper, per the manufacturer's instruction, to remove the paint from the A194 and A192 coupling around the welded areas on both sides of the couplings. The paint should be stripped back at least one-half inch from the weld on the flange side of the joint.

5. Using the dye penetrant kit, per the manufacturer's instructions, inspect both sides of the A194 and A192 yokes. Pay close attention to the flange area adjacent to the welds.
6. Clean and visually inspect the yokes in the areas described in Step 5 with a ten-power magnifying glass.
7. If no cracks are found, reinstall the yokes, using the reverse procedure in Steps 1 through 3.

NOTE 1: Prime with zinc chromate and apply grey enamel prior to reinstallation (areas inspected in Step 6). If any cracks are found, the helicopter must not be flown until the defective yoke is replaced.

NOTE 2: Magnaflux inspection may be substituted for dye penetrant.

NOTIFY ROBINSON HELICOPTER COMPANY IMMEDIATELY.