

IMMEDIATE ACTION REQUIRED*Robinson Helicopter Company*

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MANDATORY SERVICE BULLETIN #5

DATE: October 6, 1980

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

SUBJECT: Possible Installation of Defective Main Rotor Gear Sets

ROTORCRAFT AFFECTED: R22 Serial No's 0006 thru 0060

TIME OF COMPLIANCE: Immediate and every 10 hours thereafter

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BACKGROUND: RHC has just been notified by Indiana Gear Works that a substantial number of the main rotor gears they manufactured for the R22 Helicopter were case hardened incorrectly and are susceptible to premature tooth failure. The processing error was discovered by Indiana during a check of their records and test specimens after RHC reported two gear tooth failures in low time aircraft.

There was no in-flight failure of the drive system in either case. One aircraft started getting MR chip lites at 30 hours and finally returned the gear box to the factory at 51 hours. Four cracked teeth were found on the ring gear. The other aircraft started getting MR chip lites at 70 hours and returned the gear box to the factory at 84 hours. A portion of one ring gear tooth had broken off and another was cracked.

Of the gears produced by Indiana for the R22, approximately 20% were case hardened correctly and 80% are suspect. Though the gear set will usually continue to drive with a cracked tooth, there is always a chance that a broken piece of tooth could recirculate into the gear mesh and cause the gear set to lock, resulting in a catastrophic failure. Therefore, extreme caution should be exercised until the suspect gears can be replaced.

INSPECTION PROCEDURE: Prior to the next flight, raise the right skid of the helicopter until the sight glass on the main rotor gear box can be removed without oil loss. Manually rotate the drive until the gear set number is visible on the outer rim of the ring gear. Each gear is etched with both a set number and a S/N. Find both to be sure you have the set number and not the serial number. When you have the set number, call the factory for confirmation. Set numbers 1 thru 38 were processed correctly and can be used without further inspection.

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Aircraft having gear set numbers 39 thru 210 must complete the following inspection prior to the next flight and every 10 hours thereafter. With the sight glass removed and using a high intensity pen light, visually inspect the convex (driven and most visible) side of all the ring gear teeth. A crack will most likely occur along a horizontal line approximately .15 inches down from the top of the tooth. It will consist of many little cracks close together, giving it a pitted or spalled appearance, and will be most noticeable near the center of the tooth.

MR CHIP LIGHT: As part of your daily pre-flight inspection, use a coin to ground the chip detector terminal on the bottom of the gear box and check to be sure the light on the instrument panel illuminates. If the MR chip light comes on in flight, make a safe landing as soon as possible. Inspect the gear teeth as described above. If no cracks are found, remove and inspect the detector plug from the bottom of the box. If only very fine fuzz or sludge is found, clean and replace the plug. Hover the helicopter close to the ground for at least 2 hours. If the light comes on a second time, or if a chip, sliver, or flakes were found on the first examination, remove the box from the helicopter and ship it back to the factory.

REPLACEMENT OF SUSPECT GEARS: All gear set numbers 39 thru 210 will be replaced by RHC, whether or not they show signs of cracking, as soon as replacement gears are available from the gear manufacturer. Each aircraft owner will be responsible for removal and installation of the gear box and mast assembly, and also for shipping to and from the factory. RHC will replace the gears and required bearings, without charge, whether or not the warranty on the aircraft has expired. All suspect gear sets must be removed from service by 31 January 1981.