Australian Government
Civil Aviation Safety Authority

AIRWORTHINESS BULLETIN

Robinson R44 Main Rotor Gearbox.

AWB 63-008 **Issue** : 1
Date : 1 May 2012

1. Effectivity

All Robinson Helicopter Company (RHC) R44 helicopters.

2. Purpose

To inform maintenance personnel and operators that during an Australian Transport Safety Bureau (ATSB) investigation into an in-flight main rotor drive failure, severe corrosion was found on the gear carrier which had resulted in cracking and failure of the gear carrier.

3. Background

Following the loss of main rotor drive on a RHC R44 helicopter, the ATSB conducted an investigation which revealed failure of the gear carrier located in the main rotor gear box (MRGB). This failure was attributed to fatigue cracking stemming from corrosion found on the gear carrier. The owner of the RHC R44 arranged for an inspection of a second helicopter in their fleet, where the gear carrier also showed evidence of corrosion.

A third gearbox from an Australian registered RHC R44 helicopter was returned to Robinson for repair following warning chip light indications. During the disassembly at the RHC factory, the gear carrier assembly was found to be fractured; reportedly from the effects of fatigue and corrosion in a similar manner as the previous two events.

The ATSB and CASA are currently in discussions with RHC in an attempt to identify particular rotorcraft which may be affected.

The key factors in the above three failures are, that each helicopter was based and operated in Northern Australia, and were not stored under cover, in hangars.

Figure 1
Photograph Supplied by Robinson Helicopters.
Failed gear carrier assembly.

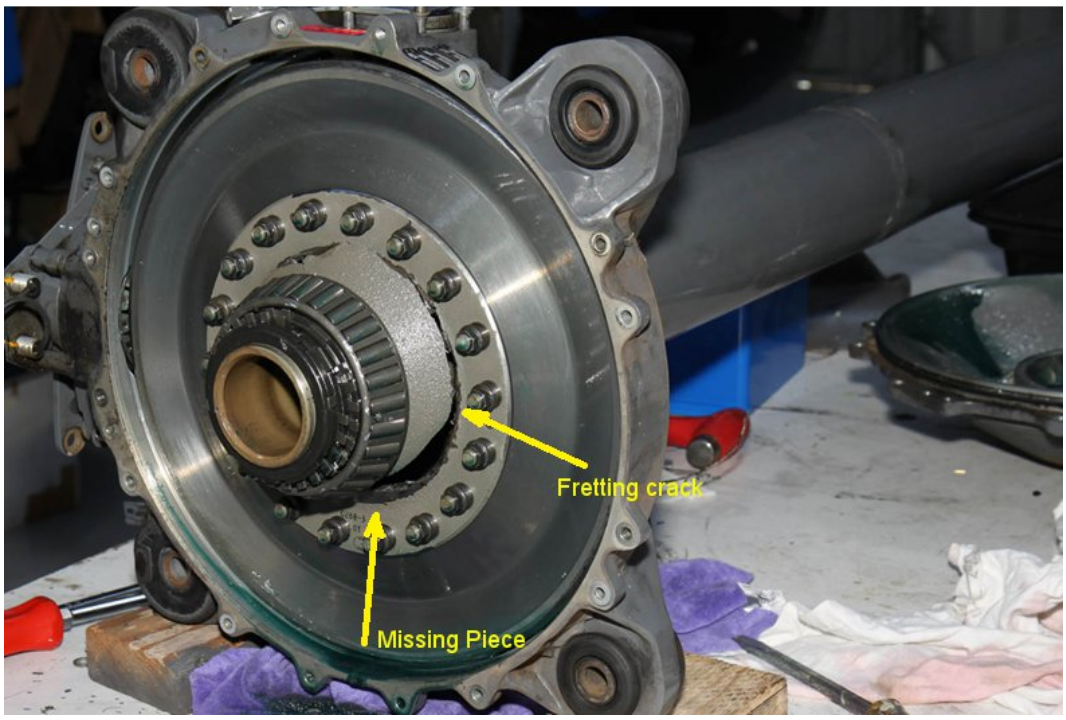

Figure 2
Photograph supplied by the ATSB.
Fractured gear carrier.

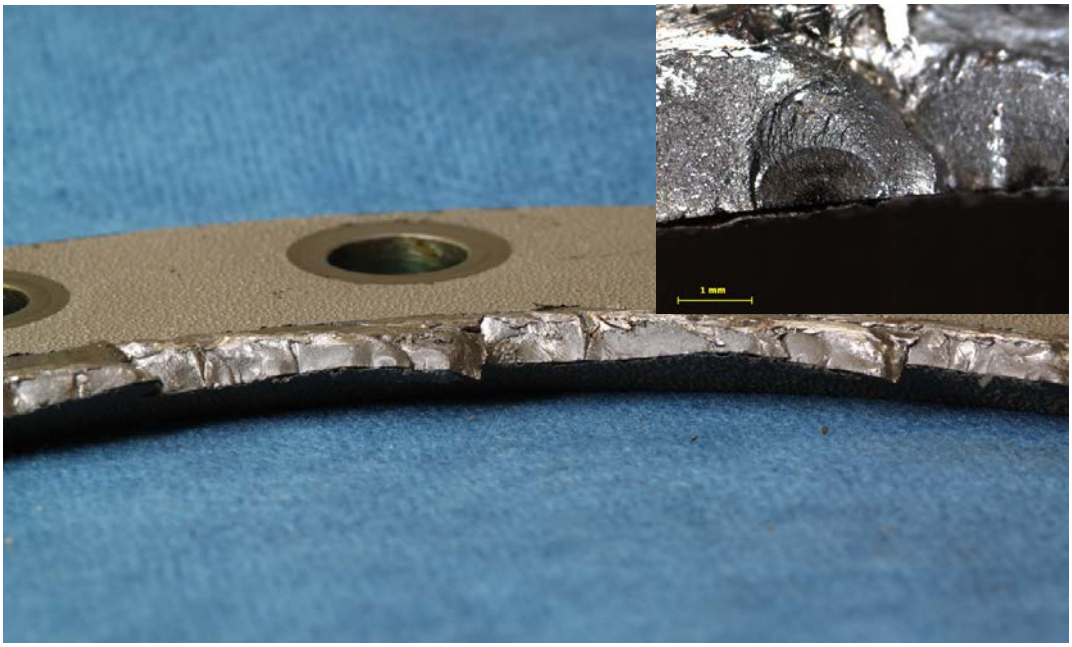

Figure 3
Fatigue cracking of gear carrier, ATSB laboratory photographs.

4. Recommendations

It is recommended that all registered operators and maintainers of RHC R44 helicopters particularly those located in tropical locations carry out the following actions.

- Request their maintenance facility conduct a MRGB oil inspection for any contaminants, ie: water, rust or paint. If any anomalies are found contact RHC for further direction.
- Where appropriate, store the rotorcraft under cover, or cover the main rotor mast and head assembly in inclement weather conditions.
- During lengthy periods (7 days or more) of storage or inactivity in tropical conditions, additional preservation action should be taken to ensure the risk of internal corrosion of the MRGB is reduced. Contact RHC for further details.
- In the event of a MRGB warning chip light indication, the helicopter should be landed immediately and the issue investigated by an appropriately endorsed LAME, inn accordance with manufacturer's data.
- Report all water, rust, paint contamination of the MRGB oil system and any corrosion discovered to CASA via the SDR system.

5. Enquiries

Enquiries with regard to the content of this Airworthiness Bulletin should be made via the direct link e-mail address:

AirworthinessBulletin@casa.gov.au

or in writing, to:

Airworthiness & Engineering Branch
Civil Aviation Safety Authority
GPO Box 2005, Canberra, ACT, 2601