

# ROBINSON HELICOPTER COMPANY

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## SERVICE BULLETIN #53

DATE: 1 Oct. 1986

TO: All R22 Owners and Operators

SUBJECT: Cracks in Lower Vertical Fin Attachment Channels.

ROTORCRAFT AFFECTED: S/N 0002 thru S/N 0598

TIME OF COMPLIANCE: Within the next 25 flight hours or by 1 November 1986, whichever occurs first.

### BACKGROUND:

Fatigue cracks have been found in horizontal stabilizer channels near the nutplates which attach the lower vertical fin. In one case the fin separated inflight causing a serious accident.

The fatigue cracks are caused by a combination of one or more of the following:

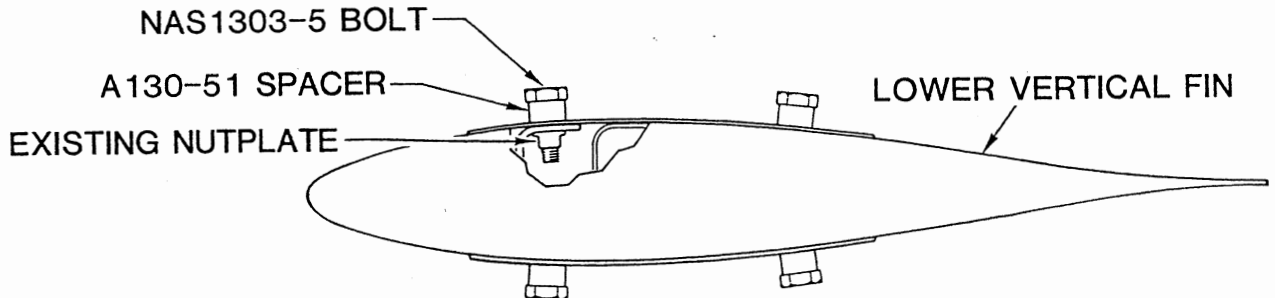
- a) Idling at 60 to 65% RPM so the stabilizer and fins are in resonance with the tail rotor.
- b) Tail rotor out-of-balance.
- c) Tail rotor teeter hinge bearings worn and loose allowing tail rotor to go out-of-balance.
- d) Insufficient clamping from bolts attaching vertical fins to horizontal stabilizer allowing fretting to occur in the joint.

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### COMPLIANCE PROCEDURE:

1. Remove the upper and lower vertical fins.
2. Solvent clean the vertical fin attachment channels on the horizontal stabilizer using solvent in Dye Penetrant kit. Pay particular attention to the areas around the nutplates.
3. Dye penetrant inspect the channels for cracks. Replace immediately any horizontal stabilizer which has a cracked channel.
4. Inspect the area around the nutplates for fretting or corrosion. Loose nutplates may be drilled out and reinstalled with new rivets. Polish out any fretting or corrosion using 300 to 600 grit paper, leaving a minimum material thickness of .045 inches on the channel.
5. Touch up the channels with a very thin coat of epoxy primer or zinc chromate.

6. Reinstall the vertical fins using the bolts and spacers in the RHC KI-52 kit on the lower fin as shown below. Torque the NAS 1302-2 & -5 bolts on both fins to 60 inch pounds plus locking torque for optimum clamping.



7. Touch up paint and torque stripe bolt heads and spacers.
8. Inspect tail rotor teeter hinge bearings for excessive wear or looseness. If radial looseness exceeds .005 inches or axial looseness exceeds .010 inches, replace bearings per Section 9.210 of the R22 Maintenance Manual.
9. Check tail rotor balance using Chadwick-Helmuth Balancer per Sections 10.200, 10.222, and 10.240 of the R22 Maintenance Manual.
10. After flying the helicopter for at least 15 minutes with the engine still hot, adjust the idle speed to 55%. Caution pilots to always idle engine well below 60% or above 70% RPM to avoid stabilizer resonance.

KI-52 Kit Contents:

4 each NAS 1303-5 Bolts  
4 each A130-51 Spacers

Approximate Cost: KI-52 Kit: \$15  
Labor: Two Hours