

Continuing Airworthiness Notice – 14-004



Self-locking Fasteners used on Robinson Helicopters

25 June 2021

Issued by the Civil Aviation Authority of New Zealand in the interests of aviation safety. A Continuing Airworthiness Notice (CAN) is intended to alert, educate, and make recommendations to the aviation community. A CAN contains non-regulatory information and guidance that does not meet the criteria for an Airworthiness Directive (AD). The inspections and practices described in this CAN must still be carried out in accordance with the applicable NZCAR Parts 21, 43 and 91.

CAN numbering is by ATA Chapter followed by a sequential number for the next CAN in that ATA Chapter.

Applicability:

Self-locking fasteners used on Robinson Helicopter Company (RHC) helicopters.

Purpose:

The purpose of this Continuing Airworthiness Notice (CAN) is to remind operators and maintainers of Robinson Helicopter Company (RHC) maintenance requirements about self-locking fasteners.

Background:

The CAA recently received a report from a maintainer of a New Zealand registered Robinson R44, which related to the partial failure of the tail rotor driveshaft connection. Engineers found one bolt assembly missing from the flex plate (drive yoke joint) at the aft connection between the tail rotor driveshaft and the tail rotor gearbox.

The bolt, the self-locking nut and the Palnut (i.e. the trade name for a spring steel fastener) were found in the aft end of the tail boom. The bolt was in good condition, with evidence of some minor fretting damage. The nut still had the green torque stripe as applied at assembly.

The prevailing (drag) torque of the recovered nut and bolt were checked and found to be 0.5-1 inch/lb. The minimum drag torque for this particular size self-locking nut is 3 inch/lbs.

Further investigation by the maintainer determined that the average prevailing torque recorded during repeat installation of new nuts P/N D210-4 nuts on a used bolt is significantly less than with superseded nut P/N MS2104214.

Initial installation figures were comparable between the two types. However, when a new nut P/N D210-4 was re-used, the prevailing torque was less than a quarter of the value recorded during initial installation.

The RHC Maintenance Manual, Section 1.300 provides the requirements for the re-use of a self-locking nuts (i.e. any self-locking nut with a drag torque that has deteriorated appreciably must be replaced).

There is also a requirement in Section 1.310 to replace Palnuts (locknuts) when they are removed, (i.e. Palnuts can only be used once).

Palnuts that have been removed should be disposed and not reused.

Recommendation:

The CAA recommends that D210-4 self-locking nuts installed on critical fasteners (i.e. joints with a secondary lock, or on dynamic components) of RHC helicopters, should be replaced during re-assembly regardless of condition. All self-locking nuts should be replaced when the prevailing torque is appreciably reduced below initial installation figures.

Operators and maintenance providers are also reminded that in accordance with RHC maintenance requirements (refer to the applicable RHC Maintenance Manual), Palnuts must be replaced every time they are removed.

Note:

This CAN will be revised if additional information becomes available.