Australian Government
Civil Aviation Safety Authority

Airworthiness Bulletin

AWB 67-006 Issue 5 - 28 July 2022

Robinson R22/R44 Governor Control Anomalies

An Airworthiness Bulletin is an advisory document that alerts, educates, and makes recommendations about airworthiness matters. Recommendations in this bulletin are not mandatory.

1. Effectivity

R22 and R44-series helicopters with an Engine Monitoring Unit (EMU) installation. (Factory new helicopters purchased after 15 January 2020 had EMUs installed).

Note: EMU installations can be identified by the presence of a status indication light;

For R22-series helicopters, EMU status is indicated by an amber light on the aft wall of the compartment under the pilot's seat.

For R44-series helicopters, status is indicated by the amber EMU segment on the annunciator panel.

2. Purpose

To advise owners, registered operators, pilots, maintenance organisations and Licensed Aircraft Maintenance Engineers of reports of intermittent or abnormal operation of the Engine RPM Governor [1] leading to engine overspeed or underspeed conditions during flight.

To gather data to form a clear understanding of all potential causative factors so that solutions can be implemented through design, manufacturing, component, or operational changes.

At this time, the airworthiness concern described in this Airworthiness Bulletin is not considered an unsafe condition that would warrant an Airworthiness Directive to be issued under Part 39 of the Civil Aviation Safety Regulations 1998.

3. Background

Several cases have been reported of the governor not controlling engine RPM under normal conditions leading to either a rotor overspeed or underspeed condition requiring the pilot to override the governor by applying corrective throttle inputs to arrest the condition and complete the flight.

Robinson Helicopter Company, as the Type Certificate (TC) holder for the affected aeronautical products, are investigating those reports to identify causal factors and solutions. The US Federal Aviation Administration (FAA), as the TC issuer for Robinson Helicopters, has also been notified and engaged as part of the investigation.

[1] Engine RPM Governor – This system senses engine RPM and makes adjustments to the throttle control to maintain a constant engine RPM, which leads to a constant rotor RPM in flight.

Issue 4 was prompted by continued reporting of erratic governor controller operation, even on aircraft in a post SB-111 or SB-119 configuration. Robinson Helicopters is continuing to analyse all relevant data to determine a final solution, with oversight by the FAA.

Issue 5 expands the recommended actions to include removal of the C143 engine RPM sensor for cleaning to assure signal integrity.

4. References

Robinson Helicopter R22 Service Bulletin SB-119

Robinson Helicopter R22 Kit Instructions KI-288

Robinson Helicopter R44 Service Bulletin SB-111

Robinson Helicopter R44 Kit Instructions KI-287

R22-Series and R44-Series SAFETY ALERT

Robinson Helicopter R22 Service Letter SL-94

Robinson Helicopter R44 Service Letter SL-83

News: RPM governor AWB (atsb.gov.au)

5. Recommendations

Note that the governor is designed to assist in controlling RPM under normal conditions, it may not prevent over or under speed conditions during aggressive manoeuvres.

Exercise care not to unintentionally override governor by squeezing throttle twist grip too tightly.

Monitor governor operation during flight by keeping hand lightly on throttle twist grip. A properly functioning governor will provide relatively slow, small, and frequent twist grip rotation in both directions. If twist grip rotation becomes erratic or stops altogether, governor may be malfunctioning.

If a governor malfunction is suspected, switch governor off, assume manual RPM control using twist grip, land as soon as practical, and have governor serviced by qualified maintenance personnel. Note that a mechanical linkage from the collective to the engine provides assistance and lessens the need for manual inputs.

Regardless of the Governor & Engine RPM Sensor configuration, pilots need to remain vigilant and consciously monitor governor system operation.

If an overspeed condition is encountered the Robinson rotorcraft maintenance manual must be consulted for the appropriate inspection. CASA AWB 62-007 also refers to recent main rotor spindle bearings being worn or brinelled which may be a result of an overspeed event.

Carry out the maintenance actions within the latest revision of the following Robinson Helicopter Service Bulletins.

- R44 Service Bulletin SB-111
- R22 Service Bulletin SB-119

NOTE:
Assure strict adherence with Governor & Engine RPM Sensor Connector Upgrade Kit Instructions (KI-288 or KI-287 as applicable), to prevent potential contamination of connectors or wiring.

Further, Steel and iron wear particles generated during engine break-in may accumulate on the C143 engine RPM sensor, causing signal interference. Carry out cleaning of the sensor assembly in accordance with the compliance procedure given in the latest revision of Robinson Helicopter Company Service Letter SL-94 or SL-83 as applicable to the aircraft series.

The FAA is currently reviewing the associated actions with a view of adopting a new airworthiness directive (AD) for applicable R22 and R44 helicopters.

Irrespective of the FAA review outcome, Robinson Helicopter instructions for continued airworthiness (ICA) include, but are not limited to, the helicopter Maintenance Manual (MM), Illustrated Parts Catalogue (IPC) and Service Bulletins, (for example, refer R22 Series MM, Chapter 1, Section 1.000). This is reiterated within sub-regulation 42A of the Civil Aviation Regulations (CAR 1988) where ICA's are to be taken to form part of the manufacturer's maintenance schedule.

Strict adherence to MM instructions also needs to be assured to prevent potential contamination of associated system connectors and wiring, for example; MM Ch. 23 Standard Practices - Cleaning Helicopter - CAUTION- Never use high-pressure spray to clean helicopter.

6. Reporting

Report all instances of governor control problems to CASA via the DRS system available on the CASA website. Details of previous maintenance history and troubleshooting for related events should be provided in addition to information concerning fault isolation and rectification.

Where possible, flight operational parameters should also be reported together with any other information on possible triggers for the reported event. This information will facilitate a detailed review of potential failure causes and contributing factors.

7. Enquiries

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

AirworthinessBulletin@casa.gov.au

or in writing, to:

Airworthiness and Engineering Branch
National Operations and Standards
Civil Aviation Safety Authority
GPO Box 2005, Canberra, ACT, 2601