

# Continuing Airworthiness Notice – 28-011



## Robinson R66 Helicopters - Fuel Handling and Refuelling

25 January 2019

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A Continuing Airworthiness Notices (CAN) is issued by the Civil Aviation Authority of New Zealand in the interests of aviation safety to alert, educate and make recommendations to the aviation community of essential information not considered mandatory. The information in this CAN 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.**

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### Applicability:

Robinson R66 helicopters.

### Purpose:

This Continuing Airworthiness Notice (CAN) is prompted by a Transport Accident Investigation Commission (TAIC) investigation of an accident with a Robinson R66 helicopter. The aircraft experienced low rotor revolutions-per-minute (RPM), which resulted in a heavy landing, minor injuries to the pilot and substantial damage to the aircraft.

The investigation revealed that the low rotor RPM very likely resulted from a momentary reduction in available engine power caused by contaminated fuel (TAIC Final Report AO-2016-008, dated 6 December 2018 refers).

Operators of helicopters need to be aware of the risk of fuel contamination when refuelling in dusty environments and mitigate the risk with good fuel-handling procedures when operating at remote locations.

### Background:

During the engine investigation contaminants were found in the fuel filter housing, the fuel hose assembly running to the fuel nozzle and the fuel nozzle itself.

The fuel filler port on the R66 is flush mounted within a flat area under a hinged cowl where dirt could potentially accumulate. For further detail refer to the photograph on the next page. By comparison, the fuel filler ports on the R22 and R44 have a raised edge to prevent inadvertent dirt contamination.

A foot step for accessing and inspecting the rotor head is located adjacent to the fuel filler port on the R66. Some operators make use of this foot step area to stow a fuel pourer spout. This foot step area is where dirt could accumulate and potentially contaminate the fuel pourer spout. Fuel pourer spouts should always be inspected for cleanliness before use.

Refuelling aircraft at remote locations increases the risk of fuel contamination. Operators should take all precautions to prevent any debris entering the fuel supply chain, from the initial fuel supplier to the aircraft fuel tank.

Hot refuelling can also increase the risk of contaminants and dust entering the fuel system from rotor down wash. Operators carrying out this type of operation should mitigate the risk with robust fuel-handling procedures.

For the RR300 engine Rolls-Royce states: *Do not refuel aircraft from remote fuelling sites (drums etc.) without the use of an external low pressure fuel filter. This will prevent engine fuel system contamination. If you fail to use an external low pressure fuel filter, engine malfunction and damage can occur.* For further information refer to the Rolls-Royce RR300 Operation and Maintenance Manual, System Description Section, Chapter 71-00-01, Page 12 - Cautions to consider when refuelling aircraft from remote sites.

### Recommendation:

- Refuelling aircraft at remote locations increases the risk of fuel contamination. Operators should take all precautions to prevent any debris entering the fuel supply chain, from the initial fuel supplier to the aircraft fuel tank.
- Operators of affected aircraft should ensure that they have documented procedures, guidance material and recorded training for the handling of aviation fuels to mitigate the risks of foreign objects and contamination entering the fuel system.
- Fuel pourer spouts including fuel nozzles on supply tanks mounted on support vehicles should always be inspected for cleanliness before use. Refuelling vehicles used in remote locations routinely operate on gravel roads, paddocks and generally unpaved surfaces and the fuel nozzle should be covered or protected from contamination.
- With frequent refuelling cycles with the engine running and rotor blades turning in a dusty environment, increases the risk of the fuel becoming contaminated. This operating environment creates the potential for a one-off fuel contamination event, or for cumulative contamination to build up over time. Operators carrying out this type of refuelling operation should mitigate the risk with robust fuel-handling/refuelling procedures.
- Aircraft fuel-filtering systems are an important defence against contaminated fuel causing an accident. Where available, operators should consider fitting additional airframe filters to aircraft being operated and refuelled at remote locations. The fuel system on the R66 is gravity fed. Installing an additional airframe fuel filter will restrict the fuel flow and potentially require an additional fuel pump to maintain the required fuel pressure. The CAA is not aware that Robinson

Helicopter Company (RHC) has developed an optional airframe fuel filter for the R66. For further information contact RHC.

## Reference Documentation:

- TAIC Final Report AO-2016-008, dated 6 December 2018 – Robinson R66 helicopter partial engine power loss and forced landing <https://taic.org.nz/inquiry/ao-2016-008>
- Rolls-Royce RR300 Operation and Maintenance Manual - Cautions to consider when refuelling at remote sites (System Description Section, Chapter 71-00-01, page 12 refers).
- Advisory Circular AC91-22, revision 1 dated 7 December 2018 Aircraft Refuelling and Defueling – Fire Prevention and Safety Guidance Measures [https://www.caa.govt.nz/assets/legacy/Advisory\\_Circulars/AC091\\_22.pdf](https://www.caa.govt.nz/assets/legacy/Advisory_Circulars/AC091_22.pdf)
- Rolls Royce RR300 Notice to Operators No RR300-015, dated 7 February 2011 - Recommendation to install additional fuel filters when operating from isolated locations where fuel is stored in drums or similar extended fuel storage containers.

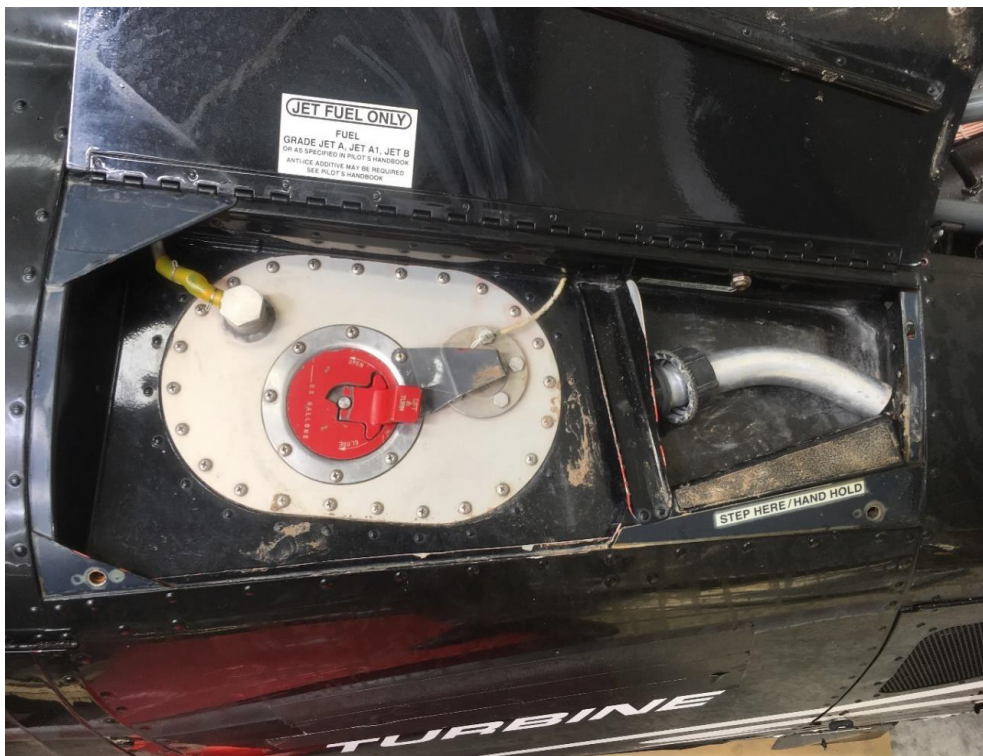
**Note:** The fuel system on the R66 is gravity fed. Installing an additional airframe fuel filter will restrict the fuel flow and potentially require an additional fuel pump to maintain the required fuel pressure.

The CAA is not aware that Robinson Helicopter Company (RHC) has developed an optional airframe fuel filter for the R66.

## Enquiries:

All other enquires regarding this CAN should be made to:

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Location of the fuel filler port on the R66 helicopter.  
(Flush mounted within a flat area under a hinged cowl on the port side of the helicopter).