

# Robinson R66 Turbine Model Guide

The Robinson R66 Turbine is a single-engine turbine helicopter built by Robinson Helicopter Company. The library lists it in production since 2010 with 4 to 5 seats. The Robinson course material lists a Rolls-Royce 250-C300/A1 engine, a two-blade main rotor, skid landing gear, hydraulic flight controls and a fuel bladder system. This guide draws only on the supplied Robinson manuals, checklists, an FAA standardization report, a parts and kit price list and an ATSB accident report.

## KEY TAKEAWAYS

- Robinson course material lists 5 seats, an approximate basic empty weight of 1280 lb and a maximum gross weight of 2700 lb.
- Usable fuel is 73.6 gal (493 lb). The low fuel light means about five gallons remain, and the engine will run out of fuel after ten minutes at cruise power.
- Recommended airspeeds: 100 KIAS for maximum range and 110 KIAS for maximum cruise. In significant turbulence, slow to 60 to 70 KIAS.
- Budget for major inspections: the airframe has a 2000-hour/12-year inspection, and Robinson's 2000-hour R66 maintenance and inspection kit KI-6602 was priced at \$201,000 in October 2022.
- The ATSB's final report on an in-flight break-up of an R66 (VH-KFT) concerns low-G turbulence at high airspeed. Ask whether the symmetrical horizontal stabiliser modification is fitted.

## WHAT IT CARRIES AND HOW IT IS POWERED

The Robinson course material lists 5 seats, an approximate basic empty weight of 1280 lb, a maximum gross weight of 2700 lb and usable fuel of 73.6 gal (493 lb). The powerplant is a single Rolls-Royce 250-C300/A1. The Rolls-Royce ratings are 300 hp for 5 minutes at takeoff and 240 hp continuous, both at 6016 rpm. Robinson's own limits are lower: 270 hp for 5 minutes at takeoff and 224 hp maximum continuous. The same material describes a two-blade teetering main rotor, a two-blade teetering tail rotor, hydraulic flight controls, energy absorbing seats and an engine monitoring unit.

## OPERATING SPEEDS AND PROCEDURES

The Section 4 normal procedures list these recommended speeds: takeoff and climb 60 KIAS, maximum range 100 KIAS, maximum cruise 110 KIAS, landing approach 60 KIAS, autorotation 60 to 70 KIAS and significant turbulence 60 to 70 KIAS. Maximum cruise should not be exceeded except in smooth air, and then only with caution. A third-party normal checklist calls for minimum battery voltage of 24.5V before start and at least 1 minute of idle warm-up. For shutdown it calls for 2:00 of idle.

## OWNERSHIP COSTS AND WARRANTY

The October 2022 Robinson kit list shows the R66 2000-hour airframe maintenance and inspection kit (KI-6602) at \$201,000 with a core charge of \$41,050. The R66 leather interior replacement kit (KI-6603) was \$15,900. A new R66 carried a limited warranty of two years or the first 1000 hours of operation, whichever came first. The maintenance manual lists a 100-hour/annual inspection and a 2000-hour/12-year inspection. It also lists special inspections after events such as tail rotor strike, main rotor strike, rotor/engine overspeed, hard landing and lightning strike.

## TRAINING AND SAFETY RECORD POINTS

The FAA Flight Standardization Board concluded that the R66 did not require specific training for unique flight characteristics. It recommended that the R66 not be added to the Special Federal Aviation Regulation (SFAR) 73 requirements. The ATSB report on VH-KFT found that the asymmetric horizontal stabiliser used on the R22, R44 and R66 contributed to a rapid uncommanded right roll in low-G conditions. Robinson has developed a symmetrical horizontal stabiliser. It is available as a modification on existing Robinson helicopters.

## SPECIFICATIONS

|                                   |      |
|-----------------------------------|------|
| Seats Max                         | 5    |
| Basic Empty Weight Lbs            | 1280 |
| Max Gross Weight Lbs              | 2700 |
| Usable Fuel Gal                   | 73.6 |
| Usable Fuel Lbs                   | 493  |
| Rolls Royce 5min Takeoff Power Hp | 300  |
| Rolls Royce Continuous Power Hp   | 240  |
| Robinson 5min Takeoff Power Hp    | 270  |
| Robinson Max Continuous Power Hp  | 224  |

## PERFORMANCE

|                         |     |
|-------------------------|-----|
| Max Range Speed Kts     | 100 |
| Max Cruise Speed Kts    | 110 |
| Takeoff Climb Speed Kts | 60  |

## V-SPEEDS

|                            |    |
|----------------------------|----|
| Landing Approach Speed Kts | 60 |
| Autorotation Speed Min Kts | 60 |
| Autorotation Speed Max Kts | 70 |
| Turbulence Speed Min Kts   | 60 |
| Turbulence Speed Max Kts   | 70 |

## WEIGHT & BALANCE

|                        |      |
|------------------------|------|
| Basic Empty Weight Lbs | 1280 |
| Max Gross Weight Lbs   | 2700 |
| Usable Fuel Lbs        | 493  |

## SAFETY NOTES

- The ATSB found that the VH-KFT break-up occurred only 3.5 seconds after the low-G condition began, at 115 kt indicated airspeed, which exceeded Robinson's recommended turbulence airspeed.
- Do not use the low fuel caution light as a working indication of fuel quantity. It indicates approximately five gallons remain.
- MR TEMP/PRESS, ENGINE FIRE and ENGINE OIL pressure loss warnings call for LAND IMMEDIATELY, per the Heli Academy emergency checklist. That checklist is for information only, and the POH, AFM and RFM take precedence.
- A low rotor RPM warning indicates rotor speed below 95%. The corrective action is to lower the collective, verify the throttle is full open and, in forward flight, apply aft cyclic.

