SECTION 8

HANDLING AND MAINTENANCE

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SECTION 8

HANDLING AND MAINTENANCE

GENERAL

This section outlines procedures recommended for handling, servicing, and maintaining the R66 helicopter. Every owner should stay in close contact with a Robinson Service Center to obtain the latest service and maintenance information. Owners should also be registered with the factory to receive service bulletins, changes to this handbook, and other helpful information as it becomes available. These publications are available on RHC's website: www.robinsonheli.com.

Federal Regulations place responsibility for maintenance of a helicopter on the owner and operator. The owner/operator must insure that all maintenance is performed by qualified mechanics and in accordance with the R66 Maintenance Manual (Instructions for Continued Airworthiness), Service Bulletins/Service Letters, and FAA Airworthiness Directives.

All limits, procedures, safety practices, time limits, servicing, and maintenance requirements contained in this handbook are considered mandatory.

Authorized Robinson Service Centers will have recommended modification, service, and operating procedures issued by the FAA and by Robinson Helicopter Company. This information will be useful in obtaining maximum utility and safety with the helicopter.

REQUIRED DOCUMENTS

The Airworthiness Certificate (FAA form 8100-2) must be displayed in the aircraft at all times. The following additional documents must be carried in the aircraft:

1. Registration Certificate (FAA Form 8050-3)
2. Pilot's Operating Handbook
3. Current Weight and Balance

The following documents should not be carried in the aircraft, but must be available for use by any mechanic or pilot servicing the aircraft:

1. Aircraft Logbook
2. Engine Logbook

NOTE

Required documents may vary in countries other than the United States.

RECORDING TIME IN SERVICE

It is the operator's responsibility to maintain a record of time in service for the engine, airframe, and all life-limited components, as well as the number of start cycles for the engine. Two hourmeters are provided: the hourmeter on the console records all run time including ground idle and is provided for reference. The hourmeter located outboard of the pilot's seat is collective-activated and records run time only when the collective is raised off the down stop. The collective-activated hourmeter may be used to determine time in service for maintenance purposes, including time in service for all life-limited components.

REQUIRED INSPECTIONS

Federal Regulations require most civil aircraft of U.S. registry to undergo a complete inspection every twelve months. This annual inspection must be signed off by a mechanic with Inspection Authorization (IA). In addition to the annual inspection, the R66 Maintenance Manual requires a complete inspection after every 100 hours of operation.

The R66 helicopter includes many unique features. Without special training, Airframe and Powerplant (A&P) mechanics are not qualified to perform the above inspections. Only appropriately rated personnel who have successfully completed a factory-approved maintenance course, or are under the direct supervision of such personnel, should perform maintenance, repairs, or inspections on the R66 helicopter.

The helicopter incorporates a number of fatigue life-limited components which must be retired at specified time intervals. A list of these components is contained in the Airworthiness Limitations section of the R66 Maintenance Manual and Instructions for Continued Airworthiness. The engine also has life limits based on both time in service and start cycles. These limits are found in the RR300 Series Operation and Maintenance Manual (OMM).

The factory occasionally publishes Service Bulletins and the Federal Aviation Administration (FAA) occasionally publishes Airworthiness Directives (ADs) that apply to specific groups of aircraft. They are mandatory changes or inspections which must be complied with within the time limit specified. Owners should periodically check with Robinson Service Centers to be sure that the latest Service Bulletins and ADs issued have been complied with.

PREVENTIVE MAINTENANCE BY THE PILOT

14 CFR Part 43 of the Federal Regulations allows a certificated pilot to perform preventive maintenance. Preventive maintenance is defined in the above regulations, and, as they apply to the R66 helicopter, include the following:

1. Remove or replace cowling or inspection panels.
2. Replace bulbs, reflectors, and lenses of position and landing lights.
3. Replace the following filters: Engine air, engine oil, fuel, main gearbox oil, and hydraulic fluid.
4. Change or replenish the following: Engine oil, main and tail gearbox oil, and hydraulic fluid.
5. Inspect and clean chip detectors.
6. Service or replace battery.
7. Replace wear shoes on landing gear skids.
8. Clean or refinish exterior of aircraft.

Although the work above is allowed by law, it should only be performed by pilots confident that they are qualified to reliably complete the work. All work must be done in accordance with the R66 Maintenance Manual.

After completing the work, when required, the pilot must enter the following in the appropriate logbook:

1. Date work accomplished.
2. Description of work.
3. Total hours on aircraft.
4. Pilot certificate number.
5. Signature of pilot.

ALTERATIONS TO AIRCRAFT

The compactness and many unique design features of the R66 helicopter make any modification inadvisable. Dynamic characteristics and susceptibility to fatigue of the rotor, drive, and control systems make any modifications to these systems extremely hazardous.

Also hazardous is installation of any electronic equipment or avionics not factory-approved and supplied. The compactness of the console and tunnel containing the controls and wire bundles makes installation of any additional wires likely to interfere with free control movement. The electronic tachometers and other instruments may be affected by other electronic devices and their reliability and accuracy is essential for safe operation of the helicopter. Installation of unauthorized electrical devices can result in a hazardous condition.

Because of these potential hazards, Robinson Helicopter Company does not authorize any modification or alteration other than those which are factory-supplied and installed by factory-trained personnel.

GROUND HANDLING

For leveling, hoisting, or jacking, see appropriate sections of the maintenance manual.

The helicopter may be maneuvered on the ground using ground handling wheels. Ground handling wheels are attached inboard of the landing gear skid tubes forward of the rear struts. Recommended tire pressure is 60 psi (4 bar). Wheels must be removed for flight.

To attach wheels:

1. Hold handle and wheel with protruding spindle in its lowest position.
2. Insert spindle into support mounted on skid. Make sure spindle is all the way in.
3. Pull handle over center to raise helicopter and lock wheel in position.

CAUTION

When lowering helicopter, handle has a tendency to snap over.

Ground handling generally requires two people: one to hold the tail down and steer by holding the tail gearbox and a second to push on the fuselage. On later aircraft, a handhold is provided inside the right-side engine cowl door. Keep feet clear of skid tubes. Alternately, a Robinson electric tow cart may be used per the instructions provided.

CAUTION

Do not move helicopter by gripping tail rotor guard, outboard part of horizontal stabilizer, tail rotor, or tail rotor controls.

CAUTION

Horizontal stabilizer protrudes outboard beyond landing gear skid. Ensure stabilizer clearance during ground handling.

PARKING

1. Place cyclic control in neutral and apply friction.
2. Put collective full down and apply friction.
3. Align rotor blades approximately fore and aft. Apply rotor brake. Use blade tie-downs in windy conditions.

CAUTION

If using rotor blade tie-downs, do not overtighten tie-down straps (5 lb max tension). Do not pull down on blades to teeter rotor. To lower a blade, push up on opposite blade.

4. During storm conditions, helicopter should be hangared or moved to a safe area.

CABIN DOORS

All four cabin doors may be removed and installed by maintenance personnel or pilots. To remove a door, disconnect door strut by lifting inboard end of strut while holding door in full open position, remove cotter rings in upper and lower hinge pins, and then lift door off. To install doors, use reverse procedure. Adjust weight and balance as required when removing or installing doors.

ENGINE OIL AND FILTER

Full oil quantity is six quarts and minimum quantity for takeoff is four quarts. Quantity is indicated as follows:

Six quart indication is top of knurled section of dipstick. Four quart indication is bottom of knurled section of dipstick or center of oil tank sight gage.

If shut down for more than 15 minutes, some oil may drain from the oil tank to the engine giving a false low oil quantity indication. If oil level appears low, motor the engine with the starter (ignition switch off) for 30 seconds and re-check level before adding oil.

Only turbine engine oil per specification AS 5780 HPC is approved. The following products are known to meet the specification and are approved by Rolls-Royce.

Product	Manufacturer
MJO 254 or MJO 387	Exxon Mobil Lubricants
BPTO 2197	Air BP Lubricants
ETO 2197	Eastman Chemical Company

The engine oil filter is located on top of the engine and is accessible via a right side cowl door. A red indicator pin (impending bypass indicator) extends from the end of the filter housing if the filter becomes contaminated. Operation with a contaminated filter may allow oil to bypass the filter element. Oil will still be supplied to the engine but will be unfiltered. If erroneous indication is suspected, the bypass indicator may be reset by pushing it back in. If the indicator extends during next engine run or flight, service the filter. Refer to RR300 Series Operation and Maintenance Manual for servicing instructions.

Recommended engine oil change intervals are every 400 hours or 12 months. See R66 Maintenance Manual.

HYDRAULIC FLUID

Hydraulic fluid level is indicated by a sight gage in the reservoir. The sight gage can be viewed by opening a left side cowl door. A light activated by a switch at the door illuminates the sight gage. A filler/vent cap is located on top of the reservoir. If hydraulic fluid is not visible in the reservoir sight gage with helicopter sitting level, add Robinson part number A257-15 fluid (MIL-PRF-5606) per R66 Maintenance Manual.

NOTE

Sight gage reading will be higher with system hot.

GEARBOX OIL AND FILTER

Main and tail gearbox oil quantities are indicated by sight gages. The main gearbox sight gage is on the left side of the gearbox and can be viewed by opening a left side cowl door. A light activated by a switch at the door illuminates the sight gage. The tail gearbox sight gage is located at the aft end of the tail gearbox. Both gearboxes use Robinson P/N A257-22 oil. Both gearboxes should be filled to center of sight gage with helicopter sitting level.

A filler plug is provided on top of each gearbox. See R66 Maintenance Manual for oil addition instructions.

The main gearbox oil filter is located in the gearbox compartment and is accessible via a left side cowl door. A red indicator pin (impending bypass indicator) extends from the end of the filter housing if the filter becomes contaminated. Operation with a contaminated filter may allow oil to bypass the filter element. Oil will still be supplied to the gearbox but will be unfiltered. If erroneous indication is suspected, the bypass indicator may be reset by pushing it back in. If indicator extends during next run-up or flight, service filter. Refer to R66 Maintenance Manual for servicing instructions.

AIR FILTER

The engine air filter element may be removed for cleaning as required. The standard foam filter element should be cleaned when visibly dirty or when contamination is indicated by the AIR FILTER annunciator. It should be replaced if foam is visibly damaged or deteriorated. The optional high-efficiency pleated-element filter should be cleaned if the sight gage indicator approaches the red line. It should also be cleaned and replaced per the schedule provided in the R66 Maintenance Manual. Servicing procedures for both styles of filter are provided in the Maintenance Manual.

NOTE

The high-efficiency filter is recommended for operating in dusty conditions. The foam filter may not filter fine sand or dust, resulting in reduced engine life.

COMPRESSOR RINSE AND WASH

The engine requires periodic compressor rinses when operated in a corrosive atmosphere. Compressor washes must be completed at specified intervals or when engine performance is not satisfactory. Refer to R66 Maintenance Manual for compressor rinse and compressor wash procedures and recommended intervals.

FUEL BLADDERS

The fuel tank is equipped with a crash-resistant flexible bladder. The bladder is subject to deterioration, which may cause it to leak or seep fuel as it ages. To prolong bladder life, the fuel tank should be topped off when the helicopter is stowed to keep the bladder material from drying out. Extreme heat and water adversely affect the material. Therefore, ensure the sump is drained of water and use a hangar for stowage when possible.

FUEL

Approved fuel grades and capacity are given in Section 2.

The aircraft should be electrically grounded prior to fueling. Grounding provisions are provided inside the fuel filler cowl door for a grounding clip or an M83413/4-1 style plug. Attach the ground cable before removing the filler cap.

On later helicopters, a fuel quantity dipstick is stowed inside the fuel filler cowl door. The dipstick is used by fully inserting it into fuel tank until the handle rests on the filler port, then blocking the vent hole on top of the handle and lifting it out of the tank far enough to see the fuel level in the tube. The dipstick indicates usable fuel quantity in U.S. gallons and is accurate only when the helicopter is parked on level ground. The dipstick will read high if the left side of the aircraft is low.

A quick drain located at the fuel tank low point is accessible via a cowl door on the left side of the aircraft. A small quantity of fuel should be drained using the quick drain prior to the first flight each day and after refueling. On later helicopters, a glass tube stowed inside the upper aft cowl door is provided which may be used to catch fuel samples. Drain enough fuel to remove any water or contaminants. If fuel contamination is suspected, continue to drain fuel until all contamination is eliminated.

The engine is equipped with a fuel filter. A switch at the filter illuminates the FUEL FILTER annunciator if the filter becomes contaminated. Fuel will continue to flow to the engine with a contaminated filter but may bypass the filter element. Refer to RR300 Series Operation and Maintenance Manual for filter servicing instructions.

BATTERY

The 24-volt battery is located in a compartment in the left side of the baggage compartment. The battery is sealed and does not require fluid level checks.

A discharged battery is NOT AIRWORTHY because it will not have the reserve capacity to operate the electrical system should the charging system fail in flight.

The battery may be charged using the external power receptacle located inside the right engine cowl door. For charging currents less than 10 amps, power connected to the receptacle will flow directly to the battery without the aircraft battery switch ON. Later aircraft have a special receptacle for the Batteryminder charger (Robinson part number MT990-1 for 120-volt AC power or MT990-2 for 240-volt AC power). Use of this charger will ensure a fully-charged battery and will maximize battery life.

For information on battery replacement or capacity checks, see R66 Maintenance Manual.

FIRE EXTINGUISHER (OPTIONAL)

The optional fire extinguisher (model RT-A400) should be weighed monthly to verify it contains a sufficient charge of extinguishing agent. Results should be recorded on the decal affixed to the extinguisher or in other maintenance records. If weight falls below 500 grams, remove extinguisher from service.

The extinguisher is rated for a storage and operating temperature of 120°F (49°C). If operating conditions would expose extinguisher to higher temperatures (e.g. parking in the sun in a hot climate), remove extinguisher and store it in a cooler area between flights.

CLEANING HELICOPTER

CLEANING EXTERIOR INCLUDING ROTOR BLADES

The helicopter should be washed with mild soap and water. Harsh abrasives, alkaline soaps, or detergents should not be used because they could scratch painted or plastic surfaces or could cause corrosion of metal. Cover areas where cleaning solution could cause damage. Use the following procedure:

1. Rinse away loose dirt and salt residue with water.
2. Apply cleaning solution with a soft cloth, sponge, or soft bristle brush.
3. To remove stubborn oil and grease, use a cloth dampened with aliphatic naphtha.
4. Rinse all surfaces thoroughly.
5. Apply carnauba wax to rotor blades and renew wax when water no longer beads on blade surface. Any good automotive wax may be used to preserve other painted surfaces. Soft cleaning cloths or a chamois should be used to prevent scratches when cleaning or polishing.

CAUTION

Never use high-pressure spray to clean helicopter. Never blow compressed air into main or tail rotor blade tip drain holes.

CLEANING WINDSHIELD AND WINDOWS

1. Remove dirt, mud, and other loose particles from exterior surfaces with clean water.
2. Wash with mild soap and warm water or with aircraft plastic cleaner. Use a soft cloth or sponge in a straight back and forth motion. Do not rub harshly.
3. Remove oil and grease with a cloth moistened with isopropyl alcohol (rubbing alcohol) or aliphatic naphtha.

CLEANING HELICOPTER (cont'd)

CLEANING WINDSHIELD AND WINDOWS (cont'd)

CAUTION

Do not use gasoline, other alcohols, benzene, carbon tetrachloride, thinner, acetone, or window (glass) cleaning sprays.

4. After cleaning plastic surfaces, apply a thin coat of hard polishing wax. Rub lightly with a soft cloth. Do not use a circular motion.

CAUTION

Windshield surface must be hydrophobic (water repellent) for good visibility in rain. When using a new cleaning or polishing product on windshield, verify water beads on surface before flying.

5. On acrylic windows (standard windshield), scratches can be removed by rubbing with jeweler's rouge followed by hand polishing with commercial plastic polish. Use a figure eight motion when polishing.

NOTE

Impact-resistant windshields are made from polycarbonate with a protective hardcoat and cannot be polished.

CLEANING UPHOLSTERY AND SEATS

1. Vacuum and brush, then wipe with damp cloth. Dry immediately.
2. Soiled upholstery, except leather, may be cleaned with a good upholstery cleaner suitable for the material. Follow manufacturer's instructions. Avoid soaking or harsh rubbing.
3. Leather should be cleaned with saddle soap or a mild hard soap and water.

CLEANING HELICOPTER (cont'd)

CLEANING CARPETS

Remove loose dirt with a whisk broom or vacuum. For soiled spots and stains, use nonflammable dry cleaning liquid.

STORAGE

The helicopter requires special preparation for long-term storage (greater than 30 days). Contact your maintenance provider to determine appropriate procedures prior to storage.

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