Safety Notice SN-10

Issued: Oct 1982 Revised: Feb 1989; Jun 1994

FATAL ACCIDENTS CAUSED BY LOW RPM ROTOR STALL

A primary cause of fatal accidents in light helicopters is failure to maintain rotor RPM. To avoid this, every pilot must have his reflexes conditioned so he will instantly add throttle and lower collective to maintain RPM in any emergency.

The R22 and R44 have demonstrated excellent crashworthiness as long as the pilot flies the aircraft all the way to the ground and executes a flare at the bottom to reduce his airspeed and rate of descent. Even when going down into rough terrain, trees, wires or water, he must force himself to lower the collective to maintain RPM until just before impact. The ship may roll over and be severely damaged, but the occupants have an excellent chance of walking away from it without injury.

Power available from the engine is directly proportional to RPM. If the RPM drops 10%, there is 10% less power. With less power, the helicopter will start to settle, and if the collective is raised to stop it from settling, the RPM will be pulled down even lower, causing the ship to settle even faster. If the pilot not only fails to lower collective, but instead pulls up on the collective to keep the ship from going down, the rotor will stall almost immediately. When it stalls, the blades will either "blow back" and cut off the tailcone or it will just stop flying, allowing the helicopter to fall at an extreme rate. In either case, the resulting crash is likely to be fatal.

No matter what causes the low rotor RPM, the pilot must first roll on throttle and lower the collective simultaneously to recover RPM **before** investigating the problem. It must be a conditioned reflex. In forward flight, applying aft cyclic to bleed off airspeed will also help recover lost RPM.

ROBINSON
HELICOPTER COMPANY

Safety Notice SN-11

Issued: Oct 1982 Revised: Nov 2000; Jul 2025

LOW-G PUSHOVERS – EXTREMELY DANGEROUS

Pushing the cyclic forward following a pull-up or rapid climb, or under some conditions even from level flight, may produce a low-G (weightless) flight condition. During a low-G condition the thrust from the rotor disc is reduced and the ability to generate the moments necessary for attitude control is reduced. Helicopters have low rotational inertia about the roll axis and any imbalance in aerodynamic forces will lead to an accelerating roll. The severity of the roll increases significantly with increasing airspeed and when lightly loaded, and is strongly influenced by the type of horizontal stabilizer fitted to the helicopter:

- Helicopters equipped with the asymmetric horizontal stabilizer (earlier version, mounted adjacent to the tail rotor gearbox) may experience a rapid right roll under low-G conditions.
- Helicopters equipped with the symmetric horizontal stabilizer (later version, mounted under tailcone forward of tail rotor) may experience a less severe roll to the right OR left.

With reduced thrust from the rotor, the decreased control effectiveness can result in the pilot making large control inputs to counteract rolling motion; low-G mast bumping can occur as a result of these improper control inputs. Severe in-flight low-G mast bumping usually results in main rotor shaft separation and/or rotor blade contact with the fuselage.

The rotor must be reloaded before lateral cyclic can stop any roll. To reload the rotor, immediately apply a gentle aft cyclic, but avoid any large cyclic inputs.

Never attempt to demonstrate or experiment with low-G maneuvers, regardless of your skill or experience level. Even highly experienced test pilots have been killed investigating the low-G flight condition. Always use great care to avoid any maneuver or condition which could result in a low-G condition. Low-G mast bumping accidents are almost always fatal.

Pushovers are not the only cause of low-G conditions. A pilot's improper response to turbulence may also introduce a dangerous loss of loading on the rotor. See SN-32 for more information.

NEVER PERFORM A LOW-G PUSHOVER!!

Safety Notice SN-12 has been superseded by SN-24

Safety Notice SN-13

Issued: Jan 1983 Revised: Jun 1994

DO NOT ATTACH ITEMS TO THE SKIDS

The landing gear strut elbows have cracked on several helicopters when the pilot attempted to carry an external load strapped to the landing gear skids. The landing gear is optimized to take high "up" loads. Consequently, it has very low strength in the opposite or "down" direction. Also, even a small weight attached to the landing gear may change the natural frequency enough to cause high loads due to inflight vibration. Do not attempt to carry any external load or object attached to the landing gear.

Safety Notice SN-14 has been superseded by SN-17, SN-27, & SN-28

INTENTIONALLY BLANK

Safety Notice SN-30

Issued: Jun 1994 Rev: Apr 2009

LOOSE OBJECTS CAN BE FATAL

Fatal accidents have occurred due to loose objects flying out of the cabin and striking the tail rotor. Any object striking the tail rotor can cause failure of a tail rotor blade. Loss of or damage to a tail rotor blade may cause a severe out-of-balance condition which can separate the tail rotor gearbox or entire tail assembly from the tailcone, resulting in a catastrophic accident. Accidents have also been caused by fuel caps, birds, and other objects striking the tail rotor. Before each flight perform the following:

1) Walk completely around the aircraft checking fuel cap security and tail rotor condition. Ensure no loose objects or debris in helicopter vicinity. Verify cotter rings or pins are installed in all door hinge pins.

2) Stow or secure all loose objects in the cabin. Even with doors on, items such as charts can be sucked out of a vent door.

3) Instruct passengers regarding the dangers of objects striking the tail rotor. Warn them never to throw anything from the helicopter or place items near vent doors where they could get sucked out.

4) Firmly latch all doors.

5) Never fly with a left door removed. (Remove only the right door for ventilation.)

Safety Notice SN-31

Issued: Dec 1996

GOVERNOR CAN MASK CARB ICE

With throttle governor on, carb ice will not become apparent as a loss of either RPM or manifold pressure. The governor will automatically adjust throttle to maintain constant RPM which will also result in constant manifold pressure. When in doubt, apply carb heat as required to keep CAT out of yellow arc during hover, climb, or cruise, and apply full carb heat when manifold pressure is below 18 inches.

Also remember, if carb heat assist is used it will reduce carb heat when you lift off to a hover and the control may require readjustment in flight.

ROBINSON
HELICOPTER COMPANY

Safety Notice SN-32

Issued: Mar 1998 Revised: Jun 2020; Jul 2025

HIGH WINDS OR TURBULENCE

Flying in high winds or turbulence should be avoided. A pilot's improper application of control inputs in response to turbulence or high winds can lead to a loss of control and/or create a dangerous low-G condition. The pilot must be aware of conditions that can be associated with turbulence, including convective activity, strong surface winds over terrain of varying elevation, mountain waves, and strong inversions. Avoid flying over terrain where turbulence will likely be severe. If moderate or greater turbulence is expected or encountered, the following procedures are recommended:

- Reduce power and use a slower-than-normal cruise speed (60–70 knots). Low-G mast bumping is significantly less likely at lower airspeeds.
- Tighten seat belt and rest right forearm on right leg to minimize unintentional control inputs. Some pilots may choose to apply a small amount of cyclic friction to further minimize unintentional inputs.
- Disengage autopilot upper modes such as ALT, VS, IAS, HDG, and NAV.
- Do not overcontrol. Allow aircraft to move with the turbulence, then restore aircraft attitude with smooth, gentle control inputs. Momentary airspeed, heading, altitude, and RPM excursions are to be expected.
- If a low-G condition is encountered, reload the rotor with a gentle aft movement of the cyclic prior to correcting any roll deviations.
- If appropriate, adjust course to avoid terrain likely to cause turbulence, such as the downwind side of hills, ridges, or tall buildings.

The helicopter is more susceptible to turbulence at light weight. Reduce speed and use caution when flying solo or lightly loaded.

Do not fly if extreme conditions are anticipated.

Refer to SN-11 for more information about low-G conditions.

ROBINSON
HELICOPTER COMPANY

Safety Notice SN-33

Issued: Mar 1998 Revised: Jul 2013; Jul 2021

DRIVE BELT SLACK

Pilots must ensure R22 and R44 drive belts do not have excessive slack during engine start. Belts that are too loose may jump out of their sheave grooves while being tensioned, but the pilot has no way of observing this. Therefore, the following checklist items are very important.

1. Per preflight checklist, with clutch disengaged, deflect belts inboard just above fan scroll on aircraft right side. Verify a maximum of 1.5 inches (4 cm) deflection. If belts deflect further, have belt tension actuator adjusted prior to flight.
2. Per run-up checklist, verify rotor turns within 5 seconds after engaging clutch switch. If time is longer, shut down and have belt tension actuator adjusted prior to flight.

INTENTIONALLY BLANK

ROBINSON
HELICOPTER COMPANY

Safety Notice SN-41

Issued: May 2013 Revised: Jul 2021; Jul 2025

PILOT DISTRACTIONS

Pilot distractions have caused or contributed to numerous fatal accidents. Examples of distractions include the use of mobile phones and portable electronic devices, unexpected events, consuming food or beverage, and attending to passengers.

Distractions may be visual, physical, or mental as each of these divert the pilot's attention from the primary duty of flying the helicopter. Numerous studies have shown that distractions while driving a motor vehicle are the equivalent of driving while impaired, leading to laws prohibiting this behavior. Operation of an aircraft while distracted is similarly affected and equally dangerous.

It is your responsibility as the pilot to maintain focus on the operation of the helicopter by not engaging in activities that unnecessarily distract from this responsibility.

Use of an autopilot never frees a pilot from the responsibility to closely monitor and control the aircraft. Do not fall prey to complacency while the autopilot is engaged or regard its use as an opportunity to engage in non-essential activities.

The following guidelines will help ensure your safety and the safety of your passengers:

- Keep your hands available to assume control of the aircraft at all times.
- Postpone lower priority activities until it is safe to do so or until after landing.
- Always maintain your visual scan outside the aircraft and of the flight instruments.
- Maintain situational awareness and mental engagement with the operation of the helicopter.
- Any avionics programming that takes more than a few seconds should be done while on the ground.
- If a door opens in flight, always land before attempting to close it.
- When hovering, keep both hands on the controls. If tuning a radio or other task is required, first land and reduce collective pitch.

Safety Notice SN-42

Issued: May 2013 Revised: Jul 2019

UNANTICIPATED YAW

A pilot's failure to apply proper pedal inputs in response to strong or gusty winds during hover or low-speed flight may result in an unanticipated yaw. Some pilots mistakenly attribute this yaw to loss of tail rotor effectiveness (LTE), implying that the tail rotor stalled or was unable to provide adequate thrust. Tail rotors on Robinson helicopters are designed to have more authority than many other helicopters and are unlikely to experience LTE.

To avoid unanticipated yaw, pilots should be aware of conditions (a left crosswind, for example) that may require large or rapid pedal inputs. Practicing slow, steady-rate hovering pedal turns will help maintain proficiency in controlling yaw. Hover training with a qualified instructor in varying wind conditions may also be helpful.

Note that thrust of any tail rotor decreases significantly as RPM decreases. Low RPM combined with high torque, as occurs when over-pitching, may result in an uncontrollable right yaw (see also Safety Notice SN-34).

Safety Notice SN-43

Issued: Jan 2015

USE EXTRA CAUTION DURING POST-MAINTENANCE FLIGHTS

A number of fatal accidents have occurred during flights immediately following maintenance. In several cases, the cause was incorrect or incomplete reassembly of the helicopter, and the error would have been detectable during a careful preflight inspection.

Even the best maintenance personnel can become distracted and make a mistake. Pilots should conduct an especially thorough preflight inspection after maintenance has been performed. If possible, speak to the technicians who performed the work, find out exactly what was done, and pay special attention to those areas. Professional maintenance personnel will appreciate the pilot's commitment to safety and will welcome an additional check of their work.

Any work done on the flight control system deserves special attention because a flight control disconnect is almost always catastrophic. During track and balance work, always climb up to the rotor head for a close inspection of the pitch link and control tube fasteners after each adjustment. Never rush or skip preflight steps.