

HOW TO FLY A NOSE GEAR RV

Most production airplanes, particularly training airplanes, have massive, over-designed, nose gear assemblies. Their designers are willing to pay quite heavy drag and weight penalties to buy strength. Even so, these nose gears are a major source of maintenance. On higher performance sport aircraft, flown by pilots who are past the student stage, the designer can choose to balance the design equation toward performance and build a nose gear that looks less like the Sydney Harbour Bridge. However, no matter how the gear is built, operating techniques have a profound effect on the life expectancy of nose gear legs.

Here are some ideas on how to fly your RV-6A or RV-8A in a way that will increase the life of your nose gear:

You can land two ways:

1. Touch down at speeds above stall and let the full weight fall on the nose wheel— or even push forward on the stick and apply an additional aerodynamic load to the nose wheel.
2. Land at stall speed (full flare), retain back pressure on the stick to hold the nose wheel off the runway until it finally comes down, then keep back pressure on the stick at lower (even taxi) speeds to reduce the weight on the nose wheel.

If you want your landing gear to last a long time, choose 2.

Land and take off at near the minimum speed appropriate for the conditions. Everything else being equal, lower speeds mean less stress on the landing gear. On a smooth pavement runway, speed might seem to be of little importance. However, forces caused by wheel spin-up and hitting even minor bumps will increase dramatically with speed. Consider that the energy increases as the square of the speed; so hitting a bump at 71 mph causes twice the stress of hitting it at 50 mph.

Of greater importance is the fact that the weight on the nose gear will also directly affect the stress it sees. This weight is partially controllable by the pilot. How? Simply by holding back pressure on the stick and using the power of the elevator to take some of the weight off of the nose wheel. Even at low speeds, for instance, rolling out after landing or just starting the take-off roll, the elevator can relieve forces on the nose wheel.

Landing at high speed also implies a lower angle of attack, which means that the nose wheel is nearer the ground relative to the mains. If the landing is fast enough, the nose wheel can actually hit first and cause extreme stress on the gear leg.

Now consider the case of a short field landing with hard braking. If you lower the nose and hold forward stick, more weight is shifted to the nose that means less weight on the mains for braking. If you hold back pressure, the nose wheel will be brought down by the pitching action of braking, but the end result will mean less weight on the nose and more on the mains, therefore lower stress on the nose gear, and more braking power—a win/win situation.

The condition of the runway and taxiway surfaces will affect the severity of the loads borne by the nose gear leg and ultimately its service life. Every flight instructor teaches short and soft field takeoff and landing techniques. Obviously, these skills help a pilot operate from shorter or softer runways, but they are also designed to reduce the loads on the landing gear when operating from less than perfect surfaces. Particularly when landing on a rough field, hold back pressure throughout the landing roll. It just makes sense. You want to keep as much weight as possible off of the nose gear to minimize the beating it will take. When taxiing on unprepared or poorly prepared parking areas, slow down. Those gopher mounds and ground hog holes can be brutal.

In a nutshell, landing or taxiing faster than necessary will increase the stress. At any speed or runway condition, holding back pressure on the stick will lessen the load on the nose gear, and thus the stress. Neutral or forward elevator pressure will increase the load and stress.

We're doing all we can to assure a long service life of your RV-6A and RV-8A nose gear legs. Regardless of how much better we can make the nose gear leg, the pilot will always have a major effect on gear life and performance. Operating your aircraft with skill and understanding will enhance the life of every part of your airplane...and your safety.