Tips for Propeller Maintenance and Service-Life Extension

By Fred Ayres

Propellers are one the most stressed parts of an aircraft. When in operation and in flight, centrifugal forces can exceed upwards of 19 tons on the prop. The two types of propellers – composite and aluminum steel – offer different benefits and strengths. Both can be repaired, with composite propellers having an infinite service-life if properly maintained. There are a few steps owners can take to ensure they get the maximum life and performance out of their propellers.

First, perform frequent inspections on them, including after each flight. This helps to spot nicks, cracks and gouges that can worsen over time and especially if left unattended. In addition to visible damage, signs of corrosion should be checked for.

“Pilots should look for oil or grease leaking, which mainly occurs around the propeller hub,” said Manny Vicioso, Quality manager for Premier Aircraft Service. “They should also inspect the spinner’s attachment points to check for excessive wear or damage. When checking blades, they should also look for excessive blade movement.”

He adds that corrosion usually develops along the leading edge where bonding material has given way and water accumulated. Vicioso says delaminated areas are common along a composite prop’s leading edge. “A good rule of thumb is if you can catch a fingernail on a nick along the leading edge, the area should be repaired before the next flight,” he says. A good test to check for this damage is known as the “tap test,” or simply taking a metal coin and taping along the edges.

Also important is dynamic balancing of the propeller once it’s in with a service shop for an annual inspection or routine overhaul. This balancing is performed when the propeller and engine are running and ensures there are no imbalances causing excessive vibration and improper functioning of the devices.

Repair options are different for both types of propellers. Cracks in a composite prop can be filled and repaired, while aluminum props are filed down to remove damage. “Paint layers provide a significant layer of protection to propellers,” adds Vicioso. “We look for chipped or flaking paint along the leading edges during an inspection. When repainting, you always want to go with flat black as opposed to any glossy paint which could impair a pilot’s visibility.”

Another important step to take after every flight is to wash the aircraft. When cleaning a propeller, wash it with soft cloths and soap and water to remove dirt and debris. Also point the blades in the “down” position and clean toward the ground, which helps prevent water from getting inside the hub. Vicioso says also never push an aircraft by the blades or hub when moving the aircraft as that can cause damage.

To prevent gravel and rocks from damaging your pop, clear any such objects away from the aircraft before starting it. A good removal distance is four to six feet away from the aircraft. Pilots should pay close attention to the prop manufacturer’s Time Before Overhaul (TBO) limit recommendations. Flying an aircraft with a propeller that’s beyond its intended service life can be dangerous. Complying with a manufacturer’s published overhaul limits helps ensure that any issues developing within a propeller are identified early and when they are still repairable.

Following are good video resources on the **inspection** and **maintenance and care** of propellers.