

In the Prop Shop at Aeromotive

PROPELLER maintenance and overhaul have been part of Aeromotive's customer care offering for 20 years. A comprehensive capability has been developed that now enables a dedicated team to care for all major brands of GA propellers, turning most jobs around (including full overhauls) within 7 working days. Hartzell, McCauley, Sensenich, MT, and Hamilton Standard are all catered for in various forms of fixed pitch, constant speed, piston and turbine configurations.

Originally put in place with a view to supporting Aeromotive hangar operations, the Prop Shop now undertakes 95% of its work for outside customers in New Zealand and overseas. Run by Dave Rye (since inception), job records for the last year have tallied to well in excess of 200.

A full range of servicing, testing and overhaul options are on offer, including of course, a fly-in service when required.

Minor and Major Repairs

Repairs range from minor nicks and dings caused by stone damage, through to major re-straightening after a prop strike. Most nicks can usually be blended out. It is important that this work is done professionally, with subsequent crack checking, because improper work may leave a crack undetected which can quickly propagate and lead to the blade throwing its tip. Substantial damage usually then occurs from the resulting severe out of balance situation.

Blades with significant leading edge damage can often be reshaped, providing this is with the manufacturer's specifications. The blade shown in the picture above right hit a fence and is in fact still within tolerance for repair.

Prop strikes may result from animals (dogs jump at a starting prop, sheep are stupid, etc) or from pilots running into things, including the ground. Many readers will be surprised to hear that very large bends can be repaired (up to 45 degrees overall depending on the radius location from the hub).

Of course a prop strike involves more than just blade straightening. All manufacturers specify a course of action to follow for any suspected strike and this often requires a full overhaul or at the least, a full disassembly, eddy current inspection, and attention toward any known issues for that brand of propeller.

Troubleshooting and AD's

Troubleshooting and Airworthiness Directive work

also form a part of the Prop Shop workload. A recent example is that of a Cessna 172 which was performing poorly and down on power. Full static rpm was 100rpm low and was fixed by repitching the prop, making a huge difference to the aircraft's performance.

Common AD work includes shot peening of pitch change knobs on Hartzell blades, cold rolling of the blade retention radius to relieve stresses at Hartzell blade roots, and NDT work. For example, the 750 hour 12 month fluorescent liquid dye penetrant test on McCauley Cessna 152 props.



Matt Cox scurfing (surface grinding) a blade surface as part of a propeller overhaul job.



Dave Rye setting up blade angles at the finish of a completed overhaul job.

Propeller Overhaul

Dave says he gains a lot of job satisfaction from receiving in an old prop and returning it to a customer with a factory new appearance.

Propeller overhaul involves paint stripping the blades, NDT inspection with fluorescent dye penetrant, eddy current testing of the hub, and scurfing of the blade to clean out nicks or other surface deterioration. Blade tips may need re-profiling to match them together again and then the blades are alodined and repainted.

Overhauled props are reassembled with all new parts (bearings etc) and static balanced on knives by way of lead addition where required. Dave will then set up the blade angles accurately, a crucial step to ensure dynamic balance. When Aeromotive fit the prop to an aircraft themselves, they also complete an 'on aircraft'

dynamic balance using strobe and accelerometer test equipment.

Used blades in stock

One advantage that comes from a long history in the propeller maintenance business is that Aeromotive carry a good collection of used blades in stock. This can be a particular advantage for customers who might bring a prop in for overhaul and find that one blade is beyond economic repair. Refurbishing a used one from stock can be a cost saving alternative to a new purchase.

For more information

Call Engineering Manager Brett Puddle to discuss any of Aeromotive's comprehensive GA propeller maintenance facilities or other services. Phone Brett on 07 843 3199 or email: brett.puddle@aeromotive.co.nz

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Above: This blade cut through a farm fence. The damage is within tolerance for repair. Below: The result of improper nick blending.

