



Making the Most of Combustion

If poor engine performance or rough running isn't caused by a fuel system or electrical problem, then it is probably related to one or more of the engine cylinders and top end. The team in Aeromotive's Cylinder Bay are experts in the investigation and remedy of such problems.

AEROMOTIVE at Hamilton Airport have a fully equipped Cylinder Bay capable of repair, overhaul and the building up from new kits of all Lycoming and Continental engine cylinders. This bay is run by Gary Williams and complements the Aeromotive Engine Shop, performing both in-house and outside contract work for other maintenance organisations. Current workload is approximately 200 cylinder overhauls per annum, with 50% of these being for in-house engine jobs and 50% from outside. Engineering Manager Brett Puddle notes the advantage this in-house capability provides in regard to obtaining an immediate analysis for customers whose aircraft have been brought to the hangar specifically for engine problems or for other routine maintenance.

On occasions, the team have also undertaken assembly-only work on behalf of other providers, a notable recent job being for Brisbane Aero Engines who supplied parts to Aeromotive for assembly and fitting to an aircraft during its stay in New Zealand.

Common Problems

The most common problem the Cylinder Bay deals with is exhaust valves which typically wear and cause trouble in advance of other cylinder components. These are a frequent cause of poor performance due to high leak down rates (the time for which the cylinder will hold a given pressure), though a high leak down rate can also lead to the discovery of split cylinders and cracks. At times, this can be an elusive process – a recent case of green staining around an intake port which gave all the indications of being a gasket problem turned out to be a pin hole through the casting.

Valve spring problems and breakages are the other common problem encountered, these frequently being determined as the cause of rough running.

Once it has been necessary to remove a cylinder, typical investigation work will include removing valves and springs, measuring the bore, measuring valve stems for necking (which indicates stretching), measuring the valve guide for size and out-of-round, then taking whatever actions are deemed necessary. Reassembly will include re-facing and lapping valves where needed. It is rare to find problems with pistons or rings but when there is, then new rings are fitted and the bore is honed.

Time for Overhaul

The time for full cylinder overhaul will either be at the normal due time or when problematic running and troubleshooting has led to the discovery of cylinder cracks or excessive wear. The cost of building a new cylinder from factory kit components is currently quite competitive with a traditional overhaul and many customers are taking the 'new' option.

The overhaul process usually involves retaining the pistons but replacing rings and honing the bore, matching opposite pistons for weight, replacing exhaust valves and guides, refacing the exhaust port, replacing rocker bushes and refacing rocker faces, as well as fitting new manifold studs.

With a wide range of parts in stock, turnaround time for cylinder overhauls is normally a matter of days only and while this depends to some degree on workload, urgent jobs can more often than not be accommodated to the customer's requirements.

For more information

To find out more about Aeromotive's Engine Shop and Component Bay capabilities, contact Engineering Manager Brett Puddle on (07) 843 3199 or email: brett.puddle@aeromotive.co.nz



Brett Puddle setting up for port re-facing.



Gary Williams re-facing a rocker in the Aeromotive Cylinder Bay.



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