

## Industry News March 2010 Issue

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### Engine Shop Survey: Zephyr Gets Top Marks

It's just a sad fact that a wear item could have a replacement price tag up to a third of the value of your aircraft. That's the way it is with engines, yet most owners accept this and worry more about surviving the engine-change experience with a reliable motor that will last rather than finding the cheapest solution.

But the best path to getting that reliable motor isn't clear cut. Should you do a field overhaul or get an engine from the factory? Is it worth shipping the engine cross-country for that

overhaul or is a local shop just fine? Does it matter who does the engine installation itself?

Every few years, we ask our readership, and that of our sister publication AVweb.com, to weigh in with their real-world experiences on engine overhauls. The latest results are consistent with the past: Your best bet is a field overhaul from a shop with a solid track record for quality work and after-the-sale support.

#### Top Overhaul Shops

We think a good field overhaul offers more options and our survey respondents must agree. About 80 percent chose a field overhaul over buying an engine from the factory.

Field overhaul is a nebulous term, meaning anything from assembling the engine in your garage to sending it out to a rebuild shop. Nine respondents did the job themselves or at the local shop. "Where did this idea of sending an engine somewhere for a major start? It's ridiculous. I am not an A&P but majored this engine twice with no problems. If your mechanic is incapable, get another one. It's 1930s technology."

While he's got a point, you may not have a local shop you trust with such a large investment. Customer support is the strongest argument for sending out your engine to a trusted shop. Any company can look good when nothing goes wrong, but, in this survey, a surprising 28 percent of the engine jobs had a warranty issue of some kind. It's really telling to see what a shop does after it comes to light that they screwed up.

"The original crankshaft was improperly machined by Poplar Grove Airmotive, resulting in total engine failure at 1.4 hours and 500 feet AGL over the field," a Navion owner told us. "Poplar Grove Airmotive paid for the engine's removal, round trip shipping from the West Coast to their Illinois facility, complete teardown and replacement of the defective crankshaft, reassembly and extended bench testing." While this customer (understandably) says he won't go back to Poplar Grove, he rated them a four out of five in overall satisfaction and warranty support. Given the circumstances, that's pretty good.

Other shops that ranked well (see page 13) consistently had positive comments on responsiveness and support after the sale. "[Victor Aviation] was very communicative and professional, and concerned that I was happy. They did the job on time and to the exact quote. They recommended a great shop to remove and replace the engine." "[Western Skyways] was flawless in every respect; technically and customer relations." "Aircraft Cylinders and Engines is extremely methodical in the work and responsive to concerns. It's a very small shop, but it does fabulous work."

But even the high-ranked shops saw some negative reports and a few tales of woe. This just reinforces our belief that a shop known for good communication is critical. If you can use a shop that's relatively close to you, that's a plus as amicable solutions are far more likely face-to-face.

Seventy percent of the field overhauls used new cylinders, with a slight preference for ECI. We picked ECI and Lycoming factory cylinders as best choices in earlier reports. New cylinders add \$1000-\$3000 to the price of the engine.

As for whether corrosion is enough of an issue to pay the extra amount for cylinders like ECI's Nickel+Carbide or if steel barrels are just fine, we have mixed data. Rebuilders tell us they are seeing plenty of corrosion issues on low-use aircraft. But in our survey, premature corrosion showed up in only four percent of the engines.

Field overhaul of cylinders is a money-saving option that may make sense with a first-run engine and mid-time cylinders. This can save real dollars if done properly on cylinders with little wear. One O-470-U owner actually saved bucks twice with this option, as the new TCM cylinders that he could have used instead of the overhaul ended up being subject to an expensive AD. Some shops will supply overhauled cylinders rather than overhaul yours. In this case, we'd look for a shop that guaranteed these were only first-run (one-time overhauled) cylinders.

Along those lines, you have two options with field overhaul tolerances: new tolerances and service tolerances. All the major shops we spoke with rebuilt to new tolerances and we recommend you demand the same. Given the overall expense of the rebuild the savings aren't worth the potential for shortened lifespan on the rebuild. We recommend only FAA-certified shops or the factory for overhauls and would shy away from low-ball estimates you might see in *Trade-*



*a-Plane* or on the web. These shops can't compete in quality or follow-up.

A good shop may throw in some money-saving perks to get your business. Penn Yan Aero offers free shipping for engines within the lower 48. Another example was, "Aero Engines delivered the airplane 800 miles to me in exchange for an airline ticket to their next destination. That saved me a lot of time and money."

You also want a shop that has experience with your engine. For common motors, this isn't an issue. If your Stinson has a six-cylinder Franklin in it, that's a different story.

## The Factory Option

Only three percent of our respondents bought a factory-new engine. However, 10 percent spent for a factory remanufactured (zero-timed) engine. While technically not new, these engines get a new logbook. If a new or zero-time engine matters to you, the factory is the only option.

A factory replacement may be the right choice for an engine that has seen several rebuilds. The field overhaul quotes assume usable sub-assemblies. If it turns out that your crank is toast, for example, expect a significant charge for the replacement that may negate any gains over the factory price. Turning that engine back to the factory for a core credit would require reassembly, which would be all on your dime. Our survey contained one horror story with exactly this scenario. (As an aside, 21 percent of the respondents got a new crank with their engine.)

We've heard mixed reports of quality from Teledyne-Continental Motors (TCM) over the past few years. In this survey, one owner who rebuilt a Continental E-225 for his Bonanza told us, "The bottom end is great, but half the new TCM cylinders experienced valve leaks and head separation at 750 hours. After much 'discussion,' TCM agreed to replace these at no charge." There were similar comments from some other TCM customers. Reported satisfaction with TCM engines was on the bottom end in our survey, and the number of warranty issues was far higher than with Lycoming (see page 13). We have also seen customer satisfaction with what's now Teledyne-Mattituck Services slide ever lower in surveys over the past 10 years.

One final note is that Lycoming or TCM rarely stand by a warranty beyond the stated period. We had numerous reports of field shops supporting their work beyond warranty.

## The Rest of the Job

Overhauling the engine itself is only half the job. There's also the small matter of removal and reinstallation. About half our respondents had the removal and reinstall done by the overhauling shop and paid a single price. For those that didn't, there was too wide a range of local shops for us to make any real recommendations. We did see a few big complaints.

"PennYan that did the engine was great but the maintenance shop sucked. They overcharged us big time. We paid \$19,000 for the engine. We did an owner assist, yet the shop charged us \$23,000 with us doing all the uninstal work and part of the renistall. I refused to pay that amount as the flat rate was only about \$5000-8000 at the time. We finally settled. I will never do business with that maintenance shop again."

"Factory overhaul by Lycoming is great; R&R work by Flightlevel sucks! Subsequent inspection by a third-party IA revealed shoddy workmanship in installing the new engine: oil filler tube loose and missing a gasket, exhaust flanges not flush and leaking, fuel strainer not safety wired, original brittle fuel and oil hoses re-used and original poorly-functioning air filter re-used."

Our advice here as simple: Even if you're just using the local shop for the removal and reinstall, get an estimate in writing that clearly states what will be replaced, what will be reused and what the whole job should cost, barring any surprises. There's nothing wrong with reusing parts that are in good shape as long as you know what you're getting for your bucks up front.

But that's a good plan for this whole process. Know what you're getting for your money and do business with the folks who have a proven record of respecting their customers.