Powering up

Engines and props move front and center

BY THOMAS A. HORNE

This month brings more good news about the Twin Comanche sweepstakes. You'll recall from last month that our propellers—apparently the 40-year-old originals—had flunked their inspections.

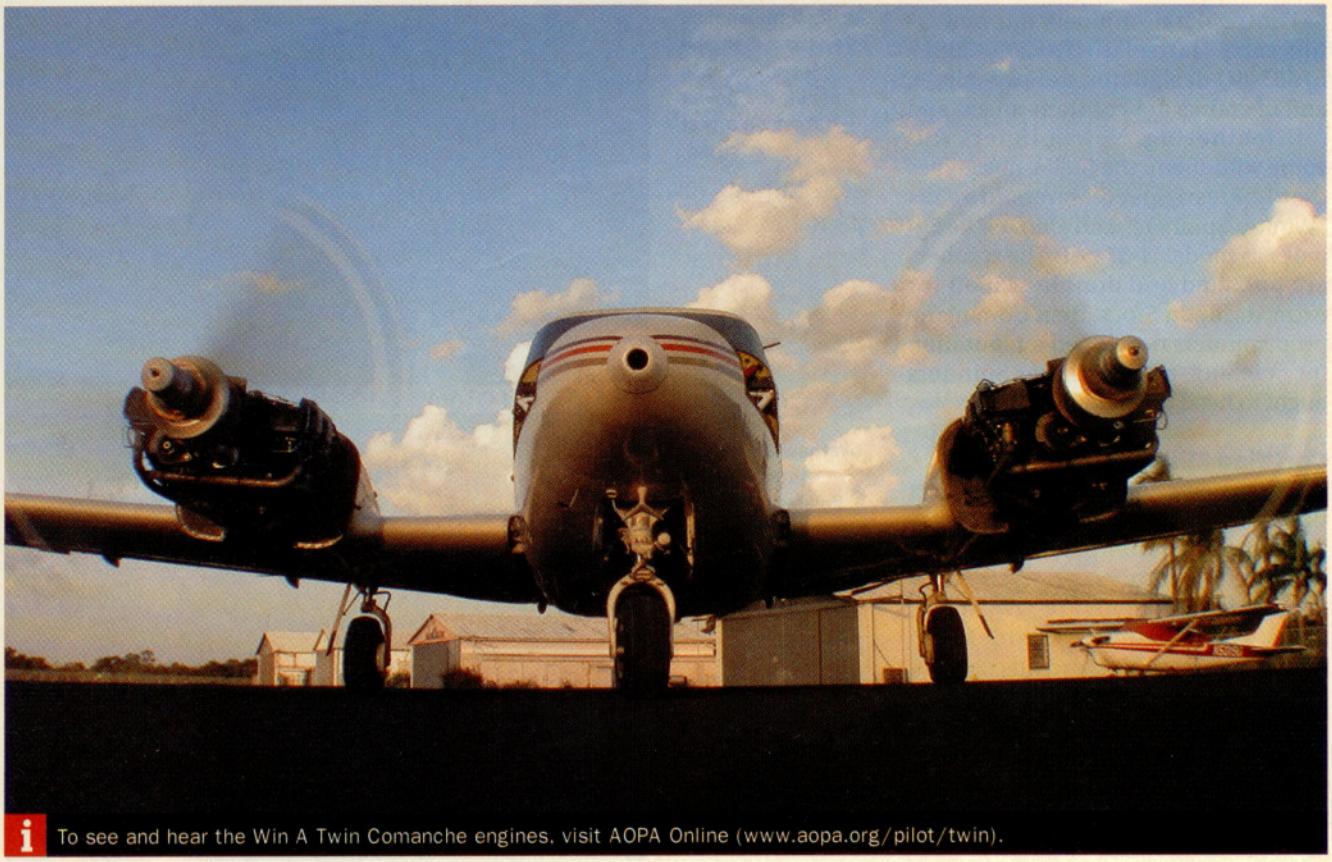
Thoroughly. One prop hub was damaged, the feathering springs were worn out, there was corrosion, and many parts were simply worn beyond repair. The hunt was on for a set of good, used, serviceable replacements, so Tiffin Aire (the company overhauling the propeller governors) put out a mass plea via fax and e-mail. There were no bites. Seems that there's a huge demand for these propellers. What to do?

Hartzell Q-tips

Hartzell Propeller Inc. came to our rescue with an offer of an STCed kit marketed through its "Top Prop" Conversions program. And what a kit it is. It will give our/your Win A Twin Comanche a pair of Q-tip propeller variants of the stock Twin Comanche props.

The TwinCo's new engines and props, just after installation and running for the first time on the airframe.

Hartzell says there are no performance penalties with these Q-tips, and several very nice benefits. For starters, these propellers should be slightly quieter than the plain-Jane props, provide an inch more ground clearance because of the propellers' smaller diameters, and have improved hub assemblies. Moreover, the Q-tips carry an increased 2,400-hour/six-year TBO (time between overhauls) recommendation.



i To see and hear the Win A Twin Comanche engines, visit AOPA Online (www.aopa.org/pilot/twin).

AOPA SWEEPSTAKES

Propellers have recommended TBOs? You bet they do, but many aircraft owners either don't know it, ignore it, or postpone it until they forget. Propellers don't seem to attract the kind of maintenance attention that engines do, but regular inspection and maintenance of propellers are every bit as important. We know firsthand, having been presented a $21,000 repair estimate for our ratty original props. Economically, it made no sense to even attempt to overhaul them. They'd probably never meet service limits, no matter how much work was done to them.

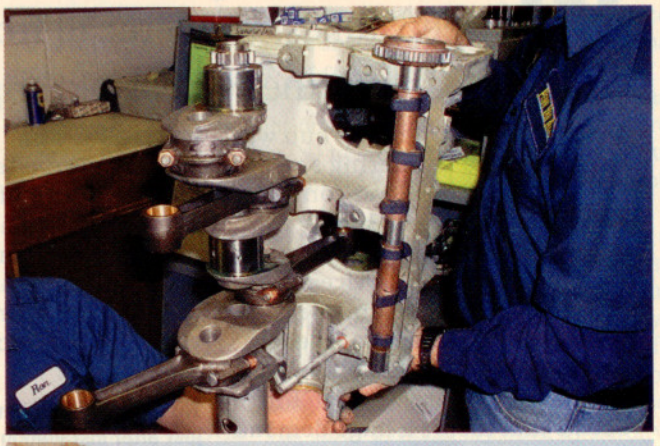
The wear our props sustained is common in the general aviation fleet. Without regular propeller teardowns and inspections—and adherence to the recommended TBO intervals—owners have no way of knowing the true condition of their propellers. Preflight inspections of the blades and hubs for nicks or leaks are often not useful for determining a propeller's deep-down condition. (Finding excessive play at the junction of the propeller shaft and hub is, however, a reliable preflight signal of serious internal troubles.)

For the detail-minded, our new Q-tips carry Hartzell's HC-E2YL-2BSF/F7663-6Q designator, are two-blade, and of course are constant-speed and full-feathering. New spinners will come with them, the bullet-nose types that LoPresti Speed Merchants calls "Winner Spinners" and Hartzell designates as model D-5749-P. The spinners are polished and double-walled for extra strength. Stock Twin Comanche prop spinners developed a reputation for cracking, so the Winner Spinners ought to head off that problem.

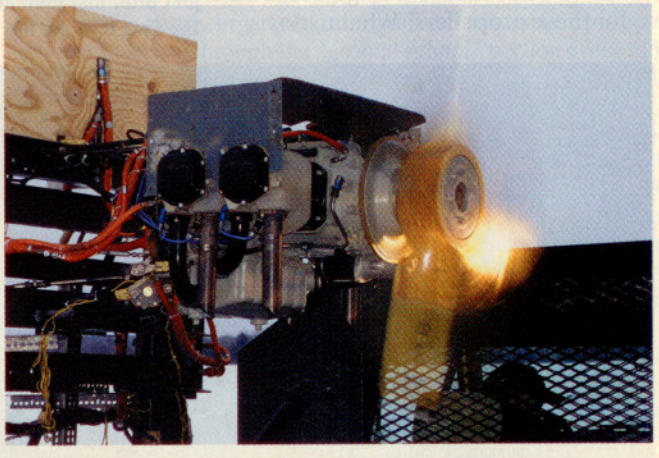
Certified Millennium engines

In other news, we're happy to report that the overhauled Lycoming IO-320 160-horsepower engines have been transformed into Superior Air Parts' Certified Millennium Pre-Owned engines. The Millennium engine is designed to Superior's standards and tolerances, which the company stresses are more exacting and durable than the stock engines. As part of the overhaul, Superior also ensures that all the engines' airworthiness directives (ADs) and mandatory service bulletins are

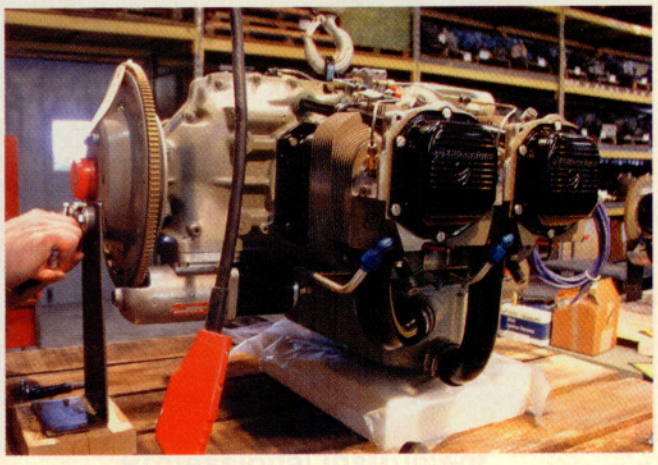
A Penn Yan Aero technician uses a feeler gauge to check the match of the piston rings against the cylinder walls.



Superior Air Parts' crankshaft bearings and camshaft being installed in the newly cleaned and reconditioned crankcase journals.



One of the last steps in the Certified Millennium Pre-Owned engine overhaul is to check the power output on a test stand.



The freshly overhauled engine, its paperwork finished, is being prepared for crating and shipment.

complied with. To top it all off, the engines carry a full parts-and-labor warranty that lasts five years or TBO (which is 2,000 hours for the IO-320). This warranty is transferable to subsequent owners, too—an important boost to the airplane's value.

The overhauls were completed at Penn Yan Aero (one of Superior's authorized Millennium engine facilities), the rejuvenated engines successfully passed runs in test cells, and they are now installed on the airplane. All the associated hardware—reconditioned engine mounts and exhaust manifolds, new vibration isolators, and all engine accessories—also should be installed and flying by the time you read this.

The complete Millennium conversion implies, of course, major overhauls to new limits. This means that the engines' tolerances now meet those of a new—or zero-time—engine. Many of the parts—including the camshafts, cam lifters, crankshaft and camshaft bearings, pistons, cylinders, valves, valve guides, valve seats, and wrist pins—used in these overhauled engines were designed and manufactured by Superior Air Parts.

The overhaul process is an exhaustive one. Superior requires a 67-part quality control checklist throughout the build process. Penn Yan Aero's Bill Middlebrook explained that the overhaul entails the following steps:

- Inventory. When a beat-up engine arrives, its part numbers and serial numbers are logged, photos are taken, and the engine exterior is given a complete check.
- Teardown. The engine is taken apart and cleaned. At this point, many problems are spotted during an initial visual inspection.
- Complete inspection. All steel parts are magnafluxed to check for cracks; aluminum parts get a dye penetrant check for the same purpose.
- Mandatory parts replacement. This is when the old parts are replaced with new. The Lycoming crankcase, crankshaft, connecting rods, and certain gears are retained and reconditioned

Insurance issues

Maybe you're asking yourself: If I win the Twin Comanche, will I be insurable to fly it? Good question. Aging light twins such as the Twin Comanche present a number of special issues for insurers, driving up rates and compelling checkout requirements much higher than those of complex, high-performance single-engine airplanes.

Greg Sterling, executive vice president and general manager of AOPA Insurance Agency, says that insurance underwriters want to see several qualifications before insuring pilots to fly light twins such as the Twin Comanche. "Ideally they're looking for someone with multiengine and instrument ratings, along with several hundred hours of multi time, and preferably some time in type," Sterling said. But often this isn't enough to satisfy many insurers. Even pilots with significant multi time can expect a DFI (dual flight instruction) requirement if they have little or no time in the make and model of airplane they expect to fly. And some insurers won't even offer terms on a Twin Comanche, citing its age, its low power, or—as is the case with any older retractable-gear airplane—the likelihood of a landing-gear problem. Finally, any time a hull loss approaches the insured value of the airplane, an older twin with lower insured value is likely to present the insurer with a total loss—something it definitely wants to avoid.

Even so, insurers like to see airplanes with current avionics and good paint jobs and interiors. While never a guarantee, it's a general indication of overall condition. And the Win A Twin will be in great overall condition, to say the least.

Sterling ran some numbers based on a well-maintained, good-looking mid-1960s Twin Comanche valued at $100,000, with $1 million each-occurrence liability coverage and coverage limited to $100,000 per passenger. The Win A Twin Comanche presents a unique situation because of its extensive upgrades, so setting its premiums becomes a challenge and would be considered on a case-by-case basis. Also, the winner may elect to boost insurance, and therefore premium, levels. The airplane, while purchased for $67,500, will have had some $200,000 worth of improvements by the time the winner takes the controls.

So what would average costs be? For a private pilot with 300 hours total time (TT), 10 multiengine hours, and no time in Twin Comanches, annual premiums run about $7,500.

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Add an instrument rating, have 750 hours TT, 70 hours in multiengine airplanes, but still no time in Twin Comanches, and you'll pay around $6,200 per year. But there will be a DFI requirement of at least 10 hours, followed by 10 solo hours before such a pilot is allowed to carry passengers.

Commercial pilots with 8,000 hours TT, 6,000 multi hours, and 350 hours in Twin Comanches should pay $4,200 and have no DFI requirement. The lowest rate—$4,000 per year—goes to commercial/multi/instrument pilots with 5,000 hours TT, 1,600 multi hours, and 1,500 hours in make and model. Again, no DFI is required.

High-time multi driver and newly minted multiengine pilots alike may still face an annual recurrent training requirement. Insurers sometimes reward this training with a premium credit.

While the Win A Twin may command insurance premiums $1,000 or more higher than the ones just quoted, it's a necessary evil when owning and flying such a fine contemporary-classic restoration.

—*TAH*