GOOD AS NEW 172

AIRFRAME ASPECTS

A 172 makeover. Step two.

BY THOMAS B. HAINES

Being wrong can sometimes be such a pleasure. After dealing with a couple of surly avionics shops, scowling mechanics, and laissez-faire FBOs, pilots sometimes begin to stereotype all such operations. As we've found out lately, those generalizations are unwarranted. ■ The positive response from shops to our announcement in the April issue of *AOPA*

PHOTOGRAPHY BY MIKE FIZER

Slop in the control system is one indication of worn aileron rod ends. Replacement, necessary every couple of thousand hours, is a tedious job.

Pilot of plans to refurbish a Cessna 172 and then give it away in the "AOPA Good as New Sweepstakes" pleasantly surprised us. Practically since the day the April *Pilot* hit the streets, we've been receiving calls and letters from paint, engine, interior, and avionics shops and from aircraft owners eager to either know more about the project or to share their refurbishment and overhaul experiences with us.

The first calls were from observant pilots eying up the avionics in N13057, the well-worn but sturdy 1974 172M we purchased last February and the subject of our refurbishment. Several 172 owners called to inquire about purchasing some of the radios that we'll be trading out for new ones. We have not yet decided just how we'll dispose of those radios, but for those of you who called, I've still got your numbers.

Even more surprising, though, were the many calls from shop owners spotting not only a potential customer, but the chance to show off their work in an international magazine. The savvy on the part of the callers shattered our perception of the noncommunicative, customer-be-damned shop owner. Many have offered to do the work gratis or at least at cost, both because of the potential for exposure in the magazine and because they like the idea that our project may spur other aircraft owners into such a refurbishment program.

Our goal is to show how an older airplane, such as N13057, soon to be known as N172GN (172 Good as New), can be returned to "like-new" condition for about the price of a luxury automobile. We'll be completing the process in about five major steps over the next six months in order to have the airplane ready to give away to some lucky AOPA member when the sweepstakes drawing rolls around in January. For details on the sweepstakes, see pp. 9 and 121.

An individual owner may elect to spread the refurbishment process over a number of years. The steps we have and will be outlining this year include the decision-making process and purchase ("Good as New 172: Skyhawk Sweepstakes," April *Pilot*) and airframe considerations (which we'll get to in a moment); in future months, we'll let you know all about the engine overhaul, interior, avionics panel, and paint.

One of the least glamorous parts of the refurbishment process, but perhaps the most important, is a careful look at the airframe. The rugged and simple 172, with its strut-based wing and built-for-student-abuse landing gear, tends to hide few serious airframe woes. Corrosion is probably the biggest consideration. But any serious corrosion problem should have been caught during a thorough prepurchase inspection.

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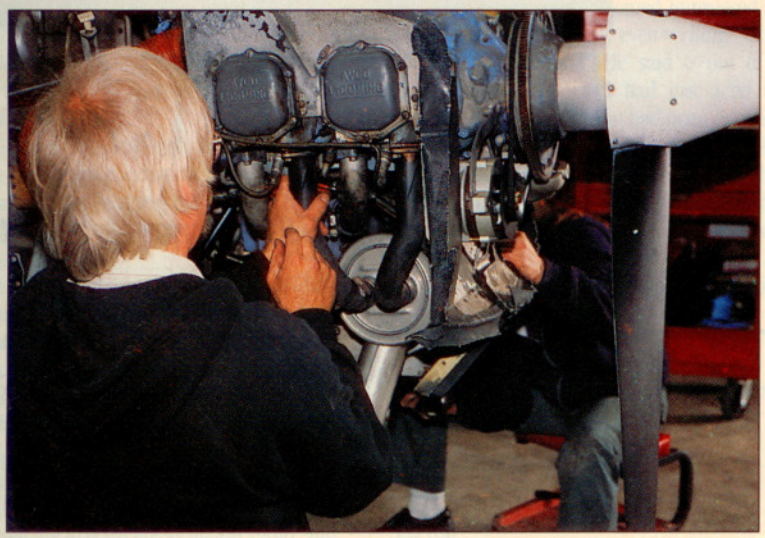
A 172 that has spent most of its life away from the coasts, and particularly in either the dry Southwest or anywhere in the North, will probably fare better than an airplane flying in Florida, for instance (see "Airframe and Powerplant: Corrosion: The Airplane Consumer," February *Pilot*). In fact, corrosion concerns by mechanics follow almost regional lines. Lee J. Getto, general manager of Custom Aero Refurbishing at Akron-Canton (Ohio) Regional Airport, for example, says corrosion usually is not a serious problem in the airplanes that come through his shop. Ben R. Coleman, director of maintenance at Comair Aviation Academy in Sanford, Florida, on the other hand, ranks corrosion and corrosion control at the top of his hit list. "We're fighting it daily," Coleman comments.

Nearly 20 years and more than 2,000 flight hours after leaving the Cessna factory in Wichita, N13057 gets a new muffler. A few warped baffles doomed the original.



While the humid Florida weather and salt air alone can wreak havoc on an airframe, the situation is aggravated by corrosive paint strippers, says Coleman. During the stripping process, the chemicals are forced into seams and joints where they can get at the unprotected alloy skin inside the airframe. The outer skin of a 172 is clad with .005 inches of 99-percent-pure aluminum, which does not corrode. But the other side of the metal is an aluminum alloy that can corrode once moisture is trapped inside. Except for those with the "seaplane" option, 172s did not have corrosion-proofing on the inner surfaces. Comair regularly treats its dozen 172s with either Boeshield T-9 or ACF-50 water-displacing corrosion inhibitors. In addition, the flight school has developed its own steps to keep corrosion at bay, including disassembling wings for inspection and corrosion treatment and the stripping and etching of metal skins followed by careful repriming. The best solution, according to Coleman, is to keep the airplane's original paint in good condition by protecting it from the elements in a dry hangar.

Fortunately, N13057 spent most of its life in Maine and only the last few years along the New England coast. It shows no external signs of serious corrosion. We'll get a better look when it's time to paint. After the paint job, we plan to treat the entire airframe with a corrosion inhibitor.

Cosmetically, nothing steals an airplane's good looks more than the sun. Years of baking in the sun cause the airframe's many plastic parts to become brittle and susceptible to cracking. Wing and elevator tips, rudder caps, fins, and fairings all suffer the same fate. With the newest 172 now more than seven years old, a Skyhawk with no cracked original plastic would be a rare find indeed. Once again, those 172s with youthfully smooth skins are probably those that spend most of their time tucked away in a hangar.

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Replacing a set of wing or elevator tips costs between $150 and $200, according to Getto, an option he often encourages customers to take when they bring their aircraft in for painting. Some plastic parts can be repaired, but it doesn't take much shop-time spent on repairs to equal the price of a new set of wing tips, for example. On the 172, the wing-strut and landing-gear fairings are also likely to need replacing. On our Skyhawk, the plastic is in surprisingly good condition, but we'll take a closer look before heading off to the paint shop later this year.

Other airframe items, such as control cables and pulleys, are less likely to need replacing as long as they are properly maintained. Comair's Coleman says that cables, for example, usually don't begin showing signs of fraying, corrosion, or serious stretching until after about 5,000 flight hours. Some refurbishment shops

recommend replacing the cables earlier and with corrosion-proof stainless steel.

During the prepurchase inspection, the cables and pulleys on N13057, which has about 2,000 hours total time, were found to be in good condition overall. Recently, though, we took it into the shop to have the elevator cable tensions adjusted. At the same time, we had the worn aileron rod ends replaced. Slop in the ailerons is one sign of tired rod ends, but an inspection can also reveal worn and elongated attach points. The four aileron rod ends were $14.25 each. Install time was 1.6 hours at $38 per hour.

Other airframe items to consider—and ones often overlooked—are tires. Tires come in a variety of grades, plies, and prices. The minimum number of plies for a particular model is set by the airframe manufacturer, based on the gross weight and speed of the aircraft. A heavier or faster aircraft requires more plies than a lighter, slower one. The 172s, for example, require a minimum of four- or six-ply tires, depending upon model. A greater ply tire may be used to increase wear time. We replaced one well-worn main gear tire with a six-ply medium-quality Goodyear ($151). Most mechanics agree that lower priced tires, regardless of ply rating, tend to dry rot sooner than better-quality tires; and like automobile tires, better tires tend to simply wear longer. A checkered pattern of cracks on the sidewall is the telltale sign of dry rot. Regular cleaning of tires with an automotive-tire-type rubber preservative goes a long way toward slowing the onset of dry rot.

Most parts ahead of the firewall were to be replaced or overhauled when the engine went in for overhaul, which was slated for mid-May. One exception is the muffler. In the case of N13057, the muffler was original, and a number of the baffles were warped. A new muffler set us back $327.41 and three work hours. Not bad, considering the last one hung in there for nearly 20 years.

A pair of cowling shock mounts was severely worn, allowing the cowling to noticeably vibrate when the engine was running—$10.18 apiece.

These repairs are but a few we'll have to consider throughout the refurbishment process. As noted before, come time for paint, we'll probably have to replace some plastic. Another consideration is the windshield, which suffers from moderate crazing. We'll likely opt for a new one, maybe a little thicker than stock to help quiet the cabin (see "Airframe and Powerplant: The Vision Quest," May *Pilot*). In addition, there are myriad airframe mods available for the 172—everything from low-drag wheelpants and exhaust-stack fairings to aileron and flap gap seals, long-range fuel tanks, and STOL kits (see "Everyman's Airplane: Skyhawk Mods and Ends," May 1992 *Pilot*).

As is surely obvious by now, such a refurbishment process can take many shapes and time lines. You can load your airplane with every mod imaginable or try your best to keep it looking and flying just as it did the day it rolled off the Wichita production line. Spend a lot all at once or a little here and there.

We'll keep you posted on our progress. Next up is the engine overhaul. Look for that report in a couple of months. □