OPINION

Is repair a lost art?

When to get a second opinion

BY MIKE BUSCH A&P/IA

WHEN THE CO-OWNER OF A 1976 Cessna 172M emailed me, she had just come from talking to her mechanic and was clearly in a state of sticker shock: "Where can I locate a used battery box for my Skyhawk without having to rob a bank? Our Gill battery (that has constantly leaked from shortly after we bought it) has caused corrosion that cannot be repaired, so we are told. Our plane is down for its annual, and apparently will remain unairworthy until this issue is resolved to the FAA's standards.

"In the past, we've used acid-proof paint to protect the aluminum box, and pads to soak up any leakage, but the problem has now become severe enough that the A&P says we have to replace the whole box. I thought our current one could be repaired, but according to the mechanic the bottom of the box has the stamp on it that makes it legal, and that area is damaged and needs to be replaced. New boxes from Cessna are nearly $1,000, which we find totally ridiculous and unacceptable. What can we do?"

There is absolutely no reason that the existing battery box can't be repaired. There's no FAA rule that says the box needs some magic stamp to be legal. (It might need a stamp to be legal to sell, but not to use. Big difference!)

MINOR REPAIR

Repairing the battery box is a minor repair and can be done by any A&P mechanic using standard sheet metal repair techniques. Those techniques are thoroughly documented in FAA Advisory Circular AC 43.13-1B, Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair. The resulting repair requires nothing more than a simple logbook entry.

The regulations classify aircraft repairs as being either major or minor. A major repair is one "(1) That, if improperly done, might appreciably affect weight, balance [limits], structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness; or (2) That is not done according to accepted practices or cannot be done by elementary operations." Repairs other than major repairs are minor.

FAR Part 43 Appendix A lists numerous examples of major repairs. It is not an exhaustive list, but provides helpful guidance in understanding how the FAA interprets the aforementioned definitions.

A major repair is one that the FAA wants to know about. It must be done in accordance with "approved data" that has been officially blessed by an authorized representative of the administrator (typically an FAA engineer, inspector, or designated engineering representative). It must be inspected and approved by a technician with inspection authorization (IA), documented on an FAA Form 337 (record of major repair or alteration), and filed with the FAA Records Branch in Oklahoma City, where it becomes a permanent part of the aircraft's official records.

A minor repair does not require approved data, an IA's involvement, or a Form 337. It may be performed by any A&P mechanic, and documented with a simple logbook entry. A minor repair may be done in accordance with "acceptable data," which means materials, methods, and techniques that meet FAA certification

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standards and conform with accepted industry practices. Acceptable data include FAA advisory circulars; manufacturer's maintenance manuals, service bulletins and service kits; and military specifications (mil-specs) and technical manuals. Unlike approved data, acceptable data do not require FAA approval.

The mechanic who is performing a particular repair makes the determination of whether it is major or minor, using FAR 1.1 and Part 43 Appendix A as guidance. In making this determination, the mechanic is essentially deciding whether the repair requires the FAA and an IA to get involved.

The overwhelming majority of aircraft repairs are minor repairs. Repairing an aluminum battery box is a minor repair.

The Skyhawk owner may have had other options. It's likely that a PMA-approved battery box is available from a third-party source at a price substantially less than what Cessna charges. It's also likely that a used but serviceable battery box can be obtained from a salvage yard.

OWNER-PRODUCED PART

Even if the Skyhawk's battery box were on the verge of crumbling into dust and totally unrepairable, it would still be perfectly legal for the aircraft owner to produce one from scratch and document it in the logbooks as an owner-produced part. In doing this, the owner could enlist the aid of his A&P, a machine shop, or anyone else he likes and it would still qualify as an owner-produced part.

It's an oddity of the FARs that mechanics may repair broken parts, but they have no authority to produce new parts from scratch. The FARs grant that authority to aircraft owners, so long as the parts they produce are for installation on their own aircraft and not for sale or for installation on an aircraft they do not own. (The FAA authorizes owners to produce parts for their own certified aircraft because "orphaned" aircraft whose manufacturers no longer exist might wind up grounded forever.)

The FAA will consider a part to be owner-produced if the owner is meaningfully involved in its production in any of these ways: provides the specifications or the part to be duplicated; provides the materials to make the part; provides manufacturing techniques or assembly methods; provides quality assurance; or supervises the manufacture of the part.

To be legal, an owner-produced part has to be airworthy. For a part to be airworthy, it must conform to the aircraft's type design. If you decide to fabricate a battery box for your Skyhawk, you must duplicate the original battery box as closely as possible, using the same dimensions, materials, and construction methods used in the original. Resist the urge to make it better than the original, because then it would legally become an alteration rather than a repair.

You'll need help in fabricating an owner-produced part, and the most likely person to help is your A&P. That's because the owner-produced part won't do you much good unless your A&P is satisfied that it is airworthy and is willing to install it and approve your aircraft for return to service. Your mechanic can legally manufacture the

owner-produced part for you, provided you supervise his work.

MAJOR REPAIR

Some of the confusion surrounding major and minor repairs is the personal judgment that is required for each case. While a Cirrus SR22 was undergoing its annual inspection at an authorized Cirrus Service Center, the inspecting mechanic discovered some light corrosion on the aircraft's welded steel tubing engine mount, caused by an exhaust leak. The mechanic informed the owner that repair of an engine mount is a major repair that requires approved data. (Engine mount repair is listed as a major repair in Part 43 Appendix A.) He advised the owner that it would be necessary to obtain an Engineering Order (EO) from Cirrus for the repair, and that Cirrus had quoted an engineering fee of $2,000 to prepare the EO. This did not include parts or labor for the repair itself!

Although an engine mount repair is a major repair, there was no need to pay Cirrus for an EO because the FAA has already provided approved data for such a repair in AC 43.13-1B. The signature page of this advisory circular states, in pertinent part: "The repair data [in AC 43.13-1B] may also be used as approved data, and the AC chapter, page, and paragraph listed in block 8 of FAA form 337 when: a. the user has determined that it is appropriate to the product being repaired; b. it is directly applicable to the repair being made; and c. it is not contrary to manufacturer's data."

The AC also states that if the corrosion is sufficiently minor it can be removed without reducing the tubing wall thickness by more than 10 percent, no further repair is necessary other than priming and painting.

The owner approached his service center with this information, but the center would not budge. I counseled the owner to ask another A&P to look at the corroded mount. The independent mechanic confirmed my suspicion that the corrosion was so minor that it could simply be removed with ScotchBrite and elbow grease, and then primed and painted without requiring any structural reinforcement.

Under my advisement, the owner instructed the service center to finish the annual but without addressing the engine mount corrosion, and to sign off the annual with a discrepancy. The owner then proceeded to taxi his aircraft to the other A&P's shop, where the corrosion was treated and the aircraft approved for return to service at a total cost of just a couple of hundred bucks.

Shops and mechanics who are more interested in limiting their liability than in doing what's right and reasonable for their aircraft owner customers practice too much "defensive maintenance." There's no reason for aircraft owners to put up with this. The next time an A&P tells you that you have to do something expensive because FAA regulations require it, you might consider doing what the Skyhawk and Cirrus owners did: Get a second opinion. **AOPA**

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