

# AMROBA<sup>®</sup>inc

ADVOCATE OF THE AVIATION MRO INDUSTRY

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## Aircraft Maintenance Who Provides Quality?

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Under new government regulations, Australia will implement a unique approach regarding the quality of aircraft base maintenance. One would have thought, with all the publicity that aircraft reliability has had recently, the new government regulatory requirements would not make a major change in the quality control aspects of aircraft base maintenance.

If any change was to be made then the government should have adopted the slightly more rigorous EASA or FAA system. For years, the Licensed Aircraft Maintenance Engineer has had regulatory responsibility to sign for stages of maintenance and the completion of maintenance.

The current 1988 regulatory system, similar to the EASA and FAA system, requires stages of maintenance to be certified by the LAME to ensure the maintenance being performed by AMEs are meeting acceptable maintenance quality standards.

These stage certifications were either included by the RO in their aircraft system of maintenance or in AMO worksheets.

Apparently there is a lack of understanding of the role that LAMEs had in providing quality control of aircraft base maintenance because the new regulations has removed that role.

In GA, most supervising LAMEs do these inspections more regularly than they are recorded during their supervision of AMEs and apprentices. At the end of an aircraft maintenance, the AME work is countersigned to recognise that these stages were carried out.

However, under the new regulations, the base maintenance LAME actually carries out and certifies aircraft maintenance tasks. They may 'supervise' someone else doing maintenance but they must sign for that maintenance.

This is not EASA.

### EASA

Europe has adopted the same standard as the FAA. They use B1 & B2 LAEs to assist the C certifier to ensure quality of work being performed during base maintenance.

Reference:

EASR 145.A.30. (h) Any organisation maintaining aircraft, except where stated otherwise in paragraph (j) shall:

- (i) B1 and B2 support staff shall ensure that all relevant tasks or inspections have been carried out to the required standard before the category C certifying staff issues the certificate of release to service.

*'Category B1 and B2 support staff'* means those category B1 and B2 staff in the base maintenance environment *who do not hold necessarily certification privileges*

The EASA B1 & B2 LAEs are there to support the "C" certifier by providing quality support – not to perform & sign a maintenance task. They provide quality control. The AMO is tasked to employ competent AME/AMT to do maintenance.

### FAA

The FARs require an A&P mechanic holding an Inspection Authorisation to carry out safety checks at nominated stages during base maintenance to ensure the quality of work being performed.

Both the EASA and FAA system utilise the LAME as a 'work quality inspector' during stages of base maintenance.

Changing our practices so there is no quality role for the CASA B1 & B2 LAE is not adopting the EASA system – who doesn't want LAMEs doing quality checks during base maintenance? Certainly not our members.

The concept is wrong.

# FAA Overhauled v Repaired

## Watch the language?

Many operators and maintenance organisations continue to question the fitting of components having a FAA ARC (Form 8130-3) issued after maintenance quoting either FAR43.2. (a) or (b)

In our language, FAR 43.2 means the component could be repaired or overhauled. 43.2(a) states "overhauled" and 43.2(b) states "rebuilt".

### FAR 43.2 - Records of Overhaul and Rebuilding

(a) No person may describe in any required maintenance entry or form an aircraft, airframe, aircraft engine, propeller, appliance, or component part as being overhauled unless—

(1) Using methods, techniques, and practices acceptable to the Administrator, it has been disassembled, cleaned, inspected, repaired as necessary, and reassembled; and

(2) It has been tested in accordance with approved standards and technical data, or in accordance with current standards and technical data acceptable to the Administrator, which have been developed and documented by the holder of the type certificate, supplemental type certificate, or a material, part, process, or appliance approval under §21.305 of this chapter.

(b) No person may describe in any required maintenance entry or form an aircraft, airframe, aircraft engine, propeller, appliance, or component part as being rebuilt unless

it has been disassembled, cleaned, inspected, repaired as necessary, reassembled, and

tested to the same tolerances and limits as a new item, using either new parts or used parts that either conform to new part tolerances and limits or to approved oversized or undersized dimensions.

### US Clarification of FAR 43.2 terms.

- New means never used. Dimensionally, a new component meets new fits and limits.
- Rebuilt means a previously used component that has been overhauled to new fits and limits (possibly using approved oversize or undersize parts) by the original manufacturer. (For example, only the TCM factory can "rebuild" a TCM engine, although any A&P mechanic can "overhaul" one.) (OEM only rebuilt)

- Overhauled means disassembled, cleaned, inspected, repaired as necessary, reassembled and tested in accordance with the manufacturer's approved technical data (normally the overhaul manual). The word "overhaul" implies conformance to service limits, not necessarily new limits, so if you want new limits you have to specify "new-limits overhaul." (A new-limits overhaul is essentially the same as "rebuilt" except that it doesn't have to be performed by the original manufacturer.) (FAR 43.2(a))
- Repaired means inspected and repaired as necessary ("IRAN") to restore the inoperative component to proper working condition. This term implies nothing about fits and limits, because there is no requirement to measure anything when performing a repair. One could, for example, remove a cylinder, replace the exhaust valve and guide, and then put the cylinder back on the engine without measuring anything, and call it a "repair." A repair differs from an overhaul primarily in that there's no obligation to follow the fits, limits, mandatory replacements, and other procedures in the manufacturer's overhaul manual. (FAR43.2(a))

### Traps for Australian buyers:

FAR 43-2(a) 'overhauled', unless clearly stating to "new fits and limits" (using approved oversized or undersized dimensions)" on Form 8130-3 or in the Engine Log Book, will mostly mean overhauled to in-service limits not new limits.

If you obtain an ARC from other than the FAA approved OEM, then it is probable that the overhaul included in-service limits and mandatory replacement parts may or may not have been replaced.

Repaired simply means that the minimum has been done to return the component to service.

The Australian overhaul is to "new fits and limits" and all mandatory parts replaced. This is the same standard applied under FAR 121/135 for example.

How many US "overhauled" components are in aircraft in this country that have not been return to service meeting 'new fits and limits'?

## Non Airline Future

AMROBA is concerned that, after more than two decades of regulatory reform, we are still 5-6 years away from seeing the CASA managed regulatory reform being completed.

Indecision and change of direction over the last two decades has left this industry with low confidence that a reasonable system will be developed by CASA so that regional aviation can stay competitive without other forms of transport.

If the airline regulations were applied to the non airline sector there would not be a charter business.

Originally, the purpose was to remove duplication of regulations globally and to reduce the regulatory imposts on small business.

What has happened is increased regulations and regulatory imposed costs that, as far as small business is concerned, does nothing to enhance aviation safety.

Charter aviation is the backbone of GA small MRO businesses—without charter many small maintenance businesses would fold.

GA needs their own dedicated CASR Part based on FAR Part 43 for maintenance matters.

This could happen within 6 months if we had a government with the same approach as they did for the certification regulations (CASR Part21).

The other factor is training of AMEs. This industry needs industry full time training similar to Europe and North America. Both use two year full time training courses to provide the industry with the skills it needs.

Decisions are needed this year so small businesses that are under enough economic stress can make decisions for their future.

AMROBA management will be meeting with the Minister this week to raise our concerns.

## Salvaged Parts Traceability

CASA has clarified a recent interpretation stating it only applies to “suppliers” of parts. So who are the “suppliers” in the eyes of CASA?

AMROBA has asked CASA to clarify what they recognise as a “supplier”. See below.

### Parts without documentation.

If a part is obtained from a source without documentation it is critical that the LAME makes a determination that the part is serviceable and identical. That is the responsibility of the LAME.

These parts should have enough evidence identifying the product and providing details of service life and maintenance history. For example, a statement identifying the aircraft from which it was removed.

If it is a component that may need to be dismantled to determine it is serviceable, the LAME would send the component to an AMO component workshop for dismantling and checking.

The current situation is that CASA accepts an AMO using such a part from their own stock as acceptable.

However, the concern is that, in the eyes of a court, many of the sources currently used to obtain spare parts could now be seen as “suppliers.”

- Is a Registered Operator providing a part from their own spare parts a ‘supplier’?
- Is another AMO providing a part from their salvaged/parted out aircraft a ‘supplier’?
- Is a salvage yard in Australia or overseas also a ‘supplier’?
- Any other source providing a part without documentation.

None of the above provide ARC?

AMROBA suggests the following should be taken into consideration until CASA sets policy.

Without getting into a debate on the interpretation of the legislation there is also a duty of care responsibility on anyone fitting such a part to include in maintenance records where the parts was sourced.

Logbook entry “*serviceable part ex VH-XXX fitted and functionally checked*”.

Parts from official “suppliers” come with documentation as listed in CAAP 42W-1—this is undisputed. The CAAP also identifies that some parts will come with no documentation. This then shifts serviceability inspection responsibility to the installer—this also means that parts that are obtained from such sources must still have traceability.

Many GA AMOs will have access to spare parts from salvaged aircraft to some degree. This process has kept the ageing GA fleet flying safely.

Important: Before such a part with no release documentation is used, the installer has an obligation to obtain from the aircraft Registered Operator (RO) or PiC permission to fit such a part. In fact, the maintainer has a responsibility to have authorisation from the RO or PiC to perform maintenance.

Many ROs may not agree to the use of such parts. The same applies if a PMA part is to be used—the permission should be sought from the RO/PiC.

CAR 42ZC(1) makes this quite clear. It is the RO/PiC that must authorise maintenance and this includes replacement parts.

In addition, there is a responsibility on the maintainer to provide the RO with all the necessary information so they may keep their records correctly or provide that service for the RO.

To keep Australia’s ageing aircraft fleet flying, legislation places responsibility on a LAME to determine if a part is identical and serviceable for good reason. Many manufacturers only produce spare parts on demand or the OEM is out of business.

## CASA General Aviation Project

This is the first positive action that CASA has shown with regards to the non airline sector.

Obviously, CASA CEO McCormick knows that the charter and general aviation would not survive if the EASA philosophies were applied to other than the RPT sector.

There are many issues that CASA will need to address such as:

- Is a DAMP needed for small business?
  - D&H standards only apply to the Air Transport industry in other countries.
  - CASA random testing is ample.
- Is a SMS applicable to a small business?
  - Small business—one boss does it all.
- A return to ‘direct supervision’ would resurrect aircraft maintenance safety standards.
  - Removes need for complicated written system of quality.
  - Direct supervision provides high safety.
- A move to the FAA Part 43.13 standard to return an aircraft to service is more compatible to the majority of non RPT aircraft on CASA’s aircraft register.
- Reduction of current regulatory imposts is needed to obtain viability. Three levels:
  - Air Transport pax ops
  - Charter & below—modified CAR30
  - Independent LAME—club/private owner

# Piston Engine Safety

Low utilisation of aircraft raises concerns with safety. Are owners taking the right action to keep engines functional and safe?

Recently, it has been brought to our attention that many owners are only doing the standard oil changes even if the aircraft does less than 50 hours/annum.

With so many aircraft not flying more than 100 hours/annum, it is time to look seriously at the maintenance of the engines.

Preventing derogation of a low utilised engine can be significantly improved by more frequent oil changes.

The following is an excerpt from the Lycoming Flyer. The principles are the same for other engine manufacturers .

*"Another contributor to a variety of engine problems,*

*including valve sticking, is frequent long periods of inactivity. An engine should be flown regularly to stay in tiptop condition. The oil in the sump collects residue from combustion such as moisture, acid and lead sludge. Flying the aircraft tends to heat the oil enough to vaporize the moisture and help eliminate some of these contaminants, but an engine that is not flown will collect moisture, acids and gums which may contribute to corrosion and to valve-train problems. In addition to frequent flight, these contaminants are also eliminated from the engine by changing the oil. Lycoming Service Bulletin No. 480 makes these recommendations for engines operating under normal (non-dusty) conditions:*

- a. 50-hour interval oil change and filter replacement for all engines using a full-flow filtration system.
- b. 25-hour interval oil change and screen cleaning for all engines employing a pressure-screen system.
- c. A total of four months maximum between oil changes

*for either of the systems discussed under a. and b., even if the engine is not flown.*

*Reports from aircraft owners continue to indicate that trouble-free operation through TBO is most often obtained with engines subjected to frequent oil change intervals. Absurd as it may seem, an engine which does not fly regularly should have the oil changed at more frequent flight time intervals than one that does fly regularly.*

*Preventing a build-up of contaminants is just as important as eliminating those that do form. Avoiding long periods of ground operation is a vital step since moisture can enter the breather, but will not vaporize when the oil is not heated to normal operating temperatures. Ground running also involves a slightly rich mixture which contributes to the formation of lead sludge in the oil. During flight, the deposit of lead sludge in the oil can be minimized by proper leaning.*



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## The Aircraft Maintenance Engineers/Technician Creed

### Worth Remembering

*"UPON MY HONOR I swear that I shall hold in sacred trust the rights and privileges conferred upon me as a qualified aircraft maintenance engineer/technician. Knowing full well that the safety and lives of others are dependent upon my skill and judgment, I shall never knowingly subject others to risks which I would not be willing to assume for myself, or for those dear to me.*

*IN DISCHARGING this trust, I pledge myself never to undertake work or approve work which I feel to be beyond the limits of my knowledge nor shall I allow any non qualified superior to persuade me to approve aircraft or equipment as airworthy against my better judgment, nor shall I permit my judgment to be influenced by money or other personal gain, nor shall I pass as airworthy aircraft or equipment about which I am in doubt either as a result of direct inspection or uncertainty regarding the ability of others who have worked on it to accomplish their work satisfactorily.*

*I REALIZE the grave responsibility which is mine as a qualified aircraft maintenance engineer/technician, to exercise my judgment on the airworthiness of aircraft and equipment. I, therefore, pledge unyielding adherence to these precepts for the advancement of aviation and for the dignity of my vocation."*