The Engine Overhaul Myth

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In order to discuss engine overhauls, we should start by looking at a few regulations. FAR 43.2 requires any “person” [defined at FAR 1] that describes a product as being “overhauled” in any required maintenance record [defined at FAR 43.9] to have “[used] methods, techniques, and practices acceptable to the Administrator ...” Further, the product must have been “…disassembled, cleaned, inspected, repaired as necessary, and reassembled ...” After reassembly, the product must be “…tested in accordance with [FAA] approved [defined at FAR 1] standards and technical data [read overhaul agency such as a repair station], 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 [read Lycoming or Continental for example]...”

For the sake of argument here let us agree that we are describing an “overhauled” engine, not a factory remanufactured engine. Additionally, there are no such legal overhauls as “top” or “bottom!” These are repairs because there is no data available that complies with FAR 43.2(a) concerning such work.

The first thing aircraft owners often consider when looking for an overhaul agency is if they are rated for the work. An FAA certificated powerplant mechanic can overhaul a complete engine and legally approve it for return to service. In fact, there are a number of engine overhaul shops that aren’t repair stations but rather operate with certificated mechanics.

In the case of shops not operating as a repair station, often the only time the FAA gets involved with an individual mechanic is by specific complaint or an aircraft accident! In the case of problems with an overhaul, the FAA can not proceed against the company, only the individual.

Beware, the company may attempt to lay the blame at the feet of the mechanic who signed off the overhaul. It will cite FAR 43.7 laying the responsibility on the individual because the company is NOT certificated.

On the other hand, a repair station is held co-liable with their employees because FAR 145 requires a repair station to supervise the employees. Because of this, many owners choose a rated repair station to perform their overhauls. (This does NOT imply that individual mechanics don’t perform quality overhauls!)

To avoid any problems, repair stations and individual mechanics alike should provide customers in writing up front exactly what technical data they intend to use to overhaul
the engine. Further, owners may wish to get in writing exactly what minimum parts you will replace AND where you intend to get them from. Are the parts genuine factory parts, or are they going to be PMA parts? If you intend on using PMA parts, be sure to let the customer know up front. Even though use of PMA parts without the owner’s knowledge or consent is absolutely legal with respect to the FARs, it is good practice to let the customer know.

‘Inspected’ and ‘repaired as necessary’
Remember FAR 43.2 and the words “inspected” and “repaired as necessary?” Beware! Inspected and repaired as necessary in accordance with what? In accordance with FAA approved data OR the engine type certificate holder’s data?

FAR 43.9 describes the records required for “maintenance” [defined at FAR 1] which include “inspection, overhaul, repair ... and the replacement of parts.” Is this not what is required when overhauling an engine? You bet it is! The records for an engine overhaul MUST comply with FAR 43.9 for each of these activities. It would be perfectly legal for a certificated person under FAR 43.7 to sign a complete engine overhaul off for return-to-service with the simple statement, “I certify that I overhauled this engine in accordance with the [specific type certificate holder] overhaul manual number [show manual number].” All of the requirements of FAR 43.9 are met, i.e. description of the work performed [overhauled], and reference to [FAA] acceptable data [the TC holder’s overhaul manual].

What about “repaired as necessary” though? This gets tricky and here is where maintenance technicians can get in trouble.

“Repaired as necessary” means in accordance with technical data, not your whim or best guess. Is the “repair” major or minor [defined at FAR 1 and at FAR 43, Appendix A]? There are specific repairs shown in TC holder’s overhaul manuals, and some constitute major repairs. Guess what? Most overhaul manuals are FAA approved because major repairs require ONLY FAA approved data! (Major repairs always require a Form 337; however, repair stations are granted a deviation allowing them to record major repairs on workorders, in accordance with FAR 43, Appendix B, PROVIDED the customer receives a SIGNED copy of the workorder.) Again, all requirements for recording repairs during overhaul must meet FAR 43.9 record requirements.

Beware of specials
Now it gets more complicated. There are repair stations out there who advertise “special” processes that entice owners to use their agencies over some others. The engine overhaul business is very competitive! However, “special” processes deviate in most cases from the TC holder’s overhaul data; otherwise they wouldn’t be called “special.” Please be advised that ALL PROCESSES accomplished by ANY FAA certificated repair station MUST be FAA approved! In fact, FAR 145.33(c) specifically requires [using the word “shall” defined at FAR 1.3 as being “imperative”] that ANY PROCESS used MUST BE LISTED on the repair station’s FAA approved Operations Specifications.
Now we are down to the real meat of the engine overhaul minefield! How many ads have you seen for special engine paint schemes such as powder coating? Perhaps an ad or two for chrome or nickel plating rocker covers and hardware? I have even seen an ad for 24K gold plated rocker covers!

How about ads for Parkerizing internal engine parts? Further, ads exist that describe a process whereby connecting rods and other internal parts are subjected to metal removal to balance the components to each other. NONE of these processes usually appear in the TC holder’s data. ALL of these processes are required to be on a repair station’s Operations Specifications if you use them!

Don’t be fooled! FAR 43. Appendix A, section (b)(2) specifically describes major repairs as, “special repairs to structural engine parts by welding, plating, metalizing, or other methods.” Common sense dictates that the nickel plating of crankcase attachment hardware is STRUCTURAL! Further, taking the used hardware from the engine and having it replated, even with the same cadmium treatment, IS A PROCESS! It must be approved AND a repair station must be approved to use it unless it specifically appears in the TC holder’s technical overhaul data. (Guess what? Most TC holders want you to use all new hardware!)

In the end, make no mistake about what is “right” when it comes to engine overhauls. Your customer’s life and the lives of his or her loved ones depends upon your honesty and integrity.

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