

*More than an Airport...
We're an Aviation Neighborhood!*
(815) 544-3471 FAX (815) 544-8900



The Poplar Grove Overhaul

Quality
Engine
Overhaul



By
Quality
People

Finding the right company to overhaul your aircraft engine can be a real challenge. With the seemingly endless variety of options facing today's overhaul customer, it can be difficult to choose the one that's just right for you. The information contained here is designed to arm you with the knowledge necessary to make an educated decision concerning the overhaul of your aircraft engine. After learning more about our approach to engine overhaul, we believe you will choose Poplar Grove Airmotive as your overhaul company.

Why do we take such a straightforward approach to selling our overhaul services? It's simple! We believe the best way to market our services is to help buyers separate fact from fiction, reality from marketing hype. Our greatest sales tool isn't a fancy ad, it isn't a catchy slogan and it isn't promoting the latest "fad." Our greatest sales tool is a growing list of satisfied customers who chose us because of our reputation as a reliable, established company that consistently delivers a solid "factory new limit" overhaul at a fair price.

Please visit our [Overhaul Facts](#), [Overhaul Myths](#), [Warranty](#), and the [PGA Overhaul](#) areas to gain a full understanding of Poplar Grove Airmotive's commitment to service and quality. Give us a call at (800) 397-8181 or stop by and visit us in person. We'll be happy to answer any questions that you may have about PGA and the services we offer. (Airport C77)

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What is an Overhaul?

The term "overhaul" has many different levels of meaning when it comes to aircraft engines. When it's time to overhaul your engine, it is critically important to understand the differences so you can evaluate the best option for you. While many companies promote a seemingly endless array of "mystical options and techniques," engine overhauls fall into four basic categories:

Service Limit Overhaul Factory Overhauled Engines

Each engine manufacturer (with the FAA's approval) sets the minimum standards that will comply with an engine's overhaul requirements. The key word here is minimum. In a Service Limit overhaul, the engine is disassembled, parts are checked, and any part that falls within the service limits set by the manufacturer is reinstalled. This means if a given part is allowed to wear .010" before being "out of service limits" and it checks at .009" during inspection, it can be reinstalled in the engine as part of a "major overhaul". Obviously, an engine overhauled using "service limit" parts is less likely to reach TBO (Time Between Overhaul) without additional (and often costly) maintenance.

New Limit Overhaul

Just like service limits, each manufacturer also establishes the limits allowed for parts used to build a brand new engine at the factory. In a New Limit Overhaul, engine parts are reworked or replaced as necessary to meet these more stringent limits, with the final result being an engine that is functionally equal to a new engine. For those who want an engine with the best chance of achieving "new engine" reliability and longevity, this is generally the overhaul of choice.

Factory "Remanufacture"

The "Factory Reman" is very similar to the new limit overhaul with one major exception. When the engine is remanufactured to "new limits" and completed, it is given a new logbook with "zero time since new" status. A "zero time" reman is presently available only from the engines manufacturer, and typically comes with a new engine warranty. A "Factory Reman" engine typically carries a 50% plus price premium above the cost of a new limit overhaul, but is priced below the cost of a new engine. However, very little is known about previous time on its major component parts.

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The Quality Game

There are a number of companies that offer differing levels of "quality" in their overhaul services. The theory is to offer an overhaul that is "good enough", one that is "like a factory overhaul" and the "super duper special" version. This philosophy allows these companies to attract the price shopper, the informed shopper and the shopper who assumes "if it costs more, it must be better".

Before choosing an overhaul company, stop and consider this for a moment. Most new engines make it to TBO if operated per the manufacturers recommendations. They reach TBO because the manufacturers have spent thousands of hours and millions of dollars to arrive at the best combination of parts and assembly procedures to deliver the power, reliability, fuel efficiency and longevity demanded by aircraft owners and operators. So when it's time for an overhaul, stick with what got your engine safely and reliably to TBO the first time; a "new limit" overhaul. Accepting anything less is inviting problems; paying for anything more is just throwing good money away.

Overhaul Myths

Since overhauls fall into the four basic categories, then what are the "high priced" engine companies charging you for? Here are a few of the more popular advertising claims being made today.

Increased Reliability?

There are many claims being made about special "techniques" and exotic "procedures" that supposedly increase the reliability of a given companies overhauled engines. These claims are accompanied by high overhaul prices that are meant to cover the "cost" of putting this special technology into your engine. Now, stop and ask yourself something: If these companies really DID have a way to increase the reliability of an aircraft engine, wouldn't the manufacturer be doing it and recommending it today? Of course they would.

Modern aircraft engines are, by design, very reliable. A big part of this reliability is due to the fact that engine manufacturers have set standards for the parts used in the engines, the acceptable condition of those parts and the method used to assemble those parts into a complete engine. Strictly following the manufacturers "new engine limits" guidelines at overhaul is the very best way to insure your engine will offer the same level of reliability it did the day it was brand new.

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Increased Performance?

We will be the first to tell you there are specialty shops that can extract considerably more horsepower than is offered in a stock aircraft engine. High compression pistons, special profile camshafts and custom machine work in the combustion chamber and valve areas can produce significant horsepower gains. Some of the hottest experimental aircraft flying today make use of these modified engines to achieve their incredible performance. The key phrase here is *experimental aircraft*.

The engine manufacturers and the FAA have set rigid guidelines concerning modifications that can be made to a certified engine part. A few overhaul shops have elected to explore the "gray area" of these safety guidelines. Unless you fly an experimental aircraft, you should give serious thought to the reliability and liability issues of installing an engine in your aircraft that may have received modifications that could adversely affect its FAA certification.

Increased "Smoothness"?

One of the latest fads is "precision, dynamic engine balancing" for increased smoothness. We agree that reducing the vibration levels in any aircraft is desirable for numerous reasons. Increased passenger comfort, reduced airframe fatigue, longer avionics life.

The engine manufacturers also acknowledge this by establishing the guidelines for the balance of their engines' rotating components. If the engine overhauler follows these guidelines, which take into account the engine's total rotating mass and relatively low operating RPM, your engine will run smoothly. The one thing you can do to significantly reduce vibration is insure the correct balance of the engine/propeller combination once they are installed back into your aircraft. So before you pay to have your engine "dynamically balanced" during overhaul, consider using that money to have your propeller/engine combination dynamically balanced as needed. You, your aircraft and engine will be much happier with the result.

The Bottom Line

After you cut through the "techno-babble," fads, and marketing hype, one simple fact remains:

The best way to insure the same reliability, performance and longevity the manufacturer designed into your engine is to choose an overhaul facility that follows the guidelines set forth by the engine manufacturer and the FAA in order to comply with a "new limit overhaul."

The PGA Overhaul

At PGA, we overhaul engines to one standard: New Limits. We have chosen to forgo the "smoke and mirrors" approach used by others and instead concentrate on supplying our customers an overhauled engine that delivers the power and reliability of a new engine combined with an established reputation for making it to TBO. Join us as we follow an engine through our facility.



Engine Arrival

When your engine arrives at PGA, it is assigned a work order number and a bound workbook that incorporates our quality assurance plan. The workbook covers your engine internally and externally, from front to back, and stays with your engine through every step of the overhaul process. Workbook entries provide full details of each parts condition, work required, and who accomplished the work. In each phase of the overhaul process, workbook entries are reviewed and verified by the the chief inspector prior to proceeding to the next phase. Paperwork ready, your engine moves to Disassembly.



Engine Disassembly

Disassembly starts with a complete set of photos and a listing of all accessories received by part and serial number. The engine is completely disassembled, and accessories are sent to our in-house accessory shop for overhaul.

A preliminary inspection is made and then all engine parts and components are thoroughly cleaned. After cleaning, the engine moves to Inspection.



Engine Inspection

This phase begins with the Zyglu inspection of the crankcase, Magnaflux inspection of all steel parts, and all applicable parts are dimensionally inspected for compliance with New Limit standards. All remaining parts are visually inspected for any abnormalities. A review of AD

notes and Service Bulletins is then accomplished and we generate a complete list of all parts required, and additionally itemize all repair work that must be performed in order to insure "new limit" status. Parts that can be repaired then go to Repair.

Engine Repair

Our extensive repair facilities allow most repairs to be accomplished in-house, saving you both time and money during overhaul. Critical parts such as cylinders, crankcases, crankshafts, camshafts, and connecting rods can often be brought back to "new limits" instead of requiring expensive new parts. After repair, crankcases are assembled and torqued with new bearings installed so crankshaft and camshaft journals can be measured for proper fit. All measurements are permanently recorded for each engine. When all the repair work is completed and signed off by the technicians, the chief inspector reviews and insures 100% conformance with the manufacturer's specifications. Once the chief inspector approves, the engine is ready for Assembly.



Accessory Overhaul

While your engine is being overhauled, our accessory shop technicians are busy overhauling your engine's accessories. Starters, alternators and magnetos are overhauled in-house. Carburetor and Bendix fuel injectors are available for exchange. We are constantly expanding our accessory overhaul capabilities with the goal of doing 100% of our accessory overhauls in-house in the future. Our ability to overhaul most accessories means your accessories receive the same high quality workmanship your engine receives, and it helps hold down the cost of your engine overhaul too.



Engine Assembly

Our most experienced and seasoned personnel, trained in every phase of engine overhaul, assemble your engine. We use a "work center" approach to assembly, which means the engine remains in one assembly location from start to finish. Our assembly technicians follow a set pattern of inspection and assembly that includes

numerous designated checkpoints by the chief inspector. After final inspection and chief inspector acceptance, the completed engine is ready for Testing.



Engine Testing

Every PGA engine is run in our test cell prior to delivery. By starting the "break in" period in this controlled environment, we allow critical components to properly "seat" together. Another major advantage of a test cell run is it allows us to deliver you a proven engine with fittings and fasteners properly re-torqued after the test run. We pride ourselves on delivering a finished engine that is ready to be reinstalled on your aircraft and that you can expect, with proper care and maintenance, to reach TBO.

Engine Warranty

All warranties are necessarily general in nature. Basically, a warranty outlines the seller's obligations to correct defective materials and workmanship within a reasonable period of time after purchase. Our warranty is included below for your review.

Ultimately, the most important aspect of any warranty is a company's proven record of integrity and fairness in honoring claims. PGA's warranty policy is short and to the point. We never do less than it says. We often do more.

Limited Aircraft Engine Warranty

POPLAR GROVE AIRMOTIVE, INC. (PGA) limits its warranty on the listed engine overhauled by PGA to be free from defects in material and workmanship under normal use and service for a period of one year or twenty percent (20%) of the Manufacturer's Published TBO (Time Before Overhaul) in effect at the time of overhaul, whichever occurs first. All accessories overhauled by PGA are warranted for 240 hours of operation or six months, whichever event shall occur first.

The obligation of The Company under this warranty is limited to the repair or

replacement, at the option of PGA, of any part, component or engine, which, in the opinion of PGA is defective. The Company assumes no obligation for work accomplished at a facility other than PGA unless prior notification is given and the owner receives authority from The Company to proceed. PGA additionally reserves the right to furnish any parts and / or components required. If requested by PGA, owner must return all warranted parts, transportation prepaid, to PGA for examination.

Pro-rata PARTS WARRANTY to TBO is subject to a minimum accrual of 40 hours per month from date of delivery. Pro-rata adjustments will not be granted for removal and installation of engines, components or accessories, or for normal routine maintenance, inspections or adjustments. Replacement or repair of an engine, component or accessory will not be construed to extend the initial warranty period.

This warranty shall not apply to engines, their component parts or accessories which have been improperly installed, adjusted, stored, handled, repaired, altered or operated contrary to current manufacturer's recommendations or FAA Airworthiness Directives, or subjected to misuse, neglect, accident, pre-ignition, detonation, hydrostatic lock or corrosion. Pro-rata adjustments on engines, parts or component parts may be granted at the sole discretion of PGA during and up to TBO Adjustments will be based on total pro-rata hours as a ratio to total current list price. The resultant cost per hour will be the basis for crediting unused hours.

PGA does not warrant accessories, such as factory-remanufactured magnetos, carburetors, starters, etc. supplied by a vendor other than PGA when that vendor has its own warranty.

No express warranties and no implied warranties, whether of merchantability or fitness for any particular use, or otherwise (except to title) other than that expressly set forth above, which is made expressly in lieu of all other warranties, shall apply to products sold by PGA.

This warranty and this Company's obligation thereunder is in lieu of all other warranties, expressed or implied, including warranties of merchantability and fitness for a particular purpose, and all other obligations or liabilities, including consequential damages or contingent liabilities arising out of the failure of any engine or part to operate properly, and no person is authorized to give any other warranty or to assume any additional obligation on this Company's behalf unless made in writing and signed by an officer of this company.

Date _____ Model _____ S/N
_____ WO# _____

