



Frequently Asked Questions

Certification

1. Is the XP-360 Engine[®] a new zero time engine?

Yes. The XP-360 Engine is a brand new, zero time engine designed to meet the increasing demands of the Sport Aviation market and airframe manufacturers. Each XP-360 Engine comes with an Operator's Manual, new logbook and a XP-360 Data Plate.

2. Is the XP-360 Engine certified?

No, although the majority of all components are FAA approved the XP-360 Engine has not been type certified as a complete engine. Therefore, once assembled, the engine falls in the experimental category.

3. What do you mean by the majority of parts are certified?

Superior has FAA approval on all major components and the piece parts with the exception of some standard hardware, some accessories and our state of the art Ryton[®] cold air induction sump and roller lifters.

4. When do you anticipate certification of the Vantage Engine?

The FAA type certification for the Vantage Engine was awarded to Superior Air Parts, Inc. on March 31, 2004.

5. Will the Vantage Engine replace the XP-360 Engine?

No, the XP-360 Engine will continue to be the branded product Superior sells to the Sport Aviation Market. This allows the customer to specify options currently available, yet not certified for his engine, such as roller lifters, high compression pistons, aftermarket fuel injection system or electronic ignition system. If a customer desires a type certified (TC'd) engine, Superior's Vantage Engine is an option also.

6. What is a XP-360 PLUS Engine?

The XP-360 PLUS incorporates a revolutionary new camshaft and roller lifter design which is based on proven automotive racing engine technology. The new camshaft features an efficient lobe profile and roller lifters to provide many performance advantages over the standard flat tappet camshaft design.

7. If I purchase an XP-360 Engine, does that mean my engine is certified?

No. The Vantage Engine is a FAA type certified engine, manufactured and assembled under the guidelines and requirements of a type certificate number. The XP-360 Engine is built under experimental guidelines and could have parts not applicable to the Vantage Engine, such as high compression pistons, aftermarket fuel injection system or electronic ignition system.

8. Who builds my engine if I order an XP-360 Engine?

Superior's new state-of-the-art build center is completed with the exception of our test cells. XP-360 engines are assembled at this facility or at one of our approved XP-360 Build Centers. Superior currently utilizes our approved XP Build Centers to complete the acceptance test.

We also offer a Build School that allows the customer to build their own engine under the supervision of our trained staff. This option is for the owner who wants to experience the thrill of building their own engine and learn about engine operation and assembly. This Build School was featured in February 2005 issue of Sport Aviation Magazine. See Superior's website at www.xp-360-com.

Engine Characteristics

1. What is the difference between the XP-360 Engine and a typical Lycoming 360?

The XP-360 Engine includes the latest improvements in technology and many other custom enhancements, yet unavailable on standard Lycoming factory engines.

- The crankcase has been strengthened with reinforced cylinder decks. The reinforced crankcase cylinder deck eliminates deck to deck cracking.
- The crankcase offers a balanced oil system. Totally redesigned, the balanced oil system lubricates the camshaft from both sides to reduce oil pressure fluctuations and to equalize oil-flow through the entire engine.
- Pressured oil lubricates the crankcase thrust face, reducing friction on the loaded surface of the case where the crankshaft pulls the case forward. This process actually acts as a cooling system as well.
- A dynamically balanced VAR Steel crankshaft is balanced to within one-quarter ounce-inch to reduce engine vibration, component wear and pilot fatigue. Also, inside the front main reservoir, Superior's crankshaft has a smooth, groove-free plated I.D. surface that does not hold oil acids or corrode, eliminating the problems addressed in Lycoming's SB 505 inspection and corresponding AD.
- The weight-matched connecting rods and piston sets yield a statically and dynamically balanced reciprocating section for reduced vibration and reduced wear.
- Superior's exclusive computer optimized camshaft features new cam lobe designs for better cruise economy and lower valve train loads. This reduces cam and lifter spalling and decreases guide and valve train wear. The new cam is also optimized for smoother idle and power vibration characteristics, reducing pilot fatigue.

- Our Millennium Standard-Cast and Investment-Cast Cylinders provide 6% greater volumetric efficiency than conventional Lycoming Cylinders. Superior's investment cast cylinders are available as an option. See "Build an Engine" in Superior's web site www.xp-360.com/buildOnline.asp for more details.
- Hi-flow, improved induction sump on standard updraft intake engine.

As you can readily see, the XP-360 Engine is significantly ahead of any other engine in its class. It comes with a comprehensive 1-year parts and labor warranty or an optional 3-year warranty from Superior. Accessories are covered for 1-year from the date of installation. Superior also offers an extended warranty policy. See "Build an Engine" in Superior's web site www.xp-360.com/buildOnline.asp for more details.

2. What is the type and minimum grade of fuel?

The 180HP engine is approved for 91 octane unleaded auto fuel and a minimum of 100LL-aviation fuel. Superior recommends 100LL, although this is not a requirement.

A 170HP, 87 octane version is also available with 7.2:1 compression ratio pistons.

The 185HP version which incorporates 9.0:1 pistons requires the use of 100LL.

3. Does this mean I can use auto gas?

The XP-360 Engine can operate and perform at rated power using unleaded fuel. When operating on unleaded fuel, Superior recommends using fresh, premium auto fuel available at a major brand, reputable gas station. Acceptable fuels are specified per ASTM D-4814.

NOTE: Use of auto fuel blended with ethanol or gasohol is forbidden. Ethanol (alcohol) mixed with unleaded fuel can cause vapor lock, carburetor ice, reduction in range, carburetor problems and damage to the fuel system. The use of an alcohol (and water) tester is recommended.

4. Is there special or specific oil approved for the engine?

The recommended oil must meet MIL-L-22851, ashless dispersant grades. Multi-weights (15W50 or 20W50) are recommended for all temperatures and straight weight oils are recommended for various average ambient air temperatures.

5. Is the engine available in 12-volt and 24-volt configurations?

Yes, both 12 volt and 24 volt configurations are available.

6. Can I use my existing engine mount?

The engine mounts for the XP-360 Engine were designed as a direct "drop-in" for a Lycoming engine replacement. **Please note it is imperative to determine whether your existing engine mount is designed for #1 or #2 dyna-focal mount or a conical mount style engine. The various mount types are part of the engine crankcase and cannot be modified once the engine is assembled.**

7. What is the dry weight of the engine?

The dry weight of the (carbureted) O-360 is 287 lbs. including standard accessories The dry weight of the (fuel injected) IO-360) is 290 lbs. including standard accessories.

8. My aircraft requires a forward mount induction system. Will the XP-360 Engine fit?

A new state-of-the-art Ryton composite, lightweight forward facing and aft facing cold air induction sump is designed for fuel injection applications and is now available only from Superior as an option. See “Build an Engine” in Superior’s web site www.xp-360.com/buildOnline.asp for more details. Superior continues to offer our improved updraft induction system.

9. Does the engine come with an oil filter and an oil screen?

Yes, the XP-360 Engine is supplied with a full flow oil filter and an oil suction (finger) screen.

10. What RPM does the engine turn?

Redline RPM is 2700 RPM. Normal cruise RPM is 2350 – 2450 RPM.

11. Can both a fixed pitch and constant speed propeller be used with this engine?

Yes, Superior offers models of the XP-360 Engine configured for a fixed pitch propeller application and models configured for a constant speed propeller application. **NOTE: Installing a constant speed propeller on engines configured for fixed pitch propeller requires modifications to the engine. Installing a fixed pitch propeller on an engine configured for a constant speed propeller requires engine modifications as well.**

12. What propeller is approved for the engine?

Currently, Hartzell, Sensenich, Aero Composites and MT have propellers approved for the XP-360 Engine.

13. Are there any propeller restrictions with the XP-360 Engine?

Some of the propellers which are approved for the XP-360 series of engines do not have any operating restrictions. There are however some propellers that do have operating restrictions. These restrictions can be obtained by contacting a Superior Air Parts, Inc. sales representative.

14. Is the engine Fuel Injected or Carbureted?

The XP-360 Engine has models available with an experimental RSA-5A fuel injector option or an MA-4-5 carburetor option. Various aftermarket fuel system options are also available. See “Build an Engine” in Superior’s web site www.xp-360.com/buildOnline.asp for all the options available.

15. What types of Accessories come with the engine?

The standard XP-360 Engine includes the following new accessories; Unison magnetos and ignition harness, Unison spark plugs, Sky-Tec starter, Precision Fuel System (carburetor \ Fuel Injection), and

an Aero Accessories fuel pump. See “Build an Engine” in Superior’s web site www.xp-360.com/buildOnline.asp for all the options available.

16. Can I request optional accessories to the standard package?

Yes. Superior has several optional accessories available and will continue to add to the options as new ones come to the market. Currently, we offer packages for Light Speed Ignition Systems, LASAR Ignition Systems, Airflow Performance Fuel Injection Systems and Ellison Fuel Systems. See “Build an Engine” in Superior’s web site www.xp-360.com/buildOnline.asp for more details.

17. Can I buy replacement accessories from Superior

Aftermarket replacement accessories and spare parts are available from Superior’s worldwide distribution network. For Distributor’s and their locations see www.superiorairparts.com.

Performance

1. What is the maximum continuous horsepower rating of this engine?

Max continuous horsepower is 180 HP at sea level.

2. What effect does altitude have on this rating?

All aircraft engines are rated by the amount of horsepower they produce at sea level at standard ISA conditions. Superior’s naturally aspirated XP-360 Engines produce rated 180 HP –0/ +5% at sea level in standard ISA conditions. As with any naturally aspirated engine, as pressure altitude increases, available horsepower decreases, however, this effect does not change the rated horsepower of an engine.

3. Are Turbocharged versions available?

Superior produces a turbo-normalized (TNIO-360) engine for Lancair. This engine application was developed for the Lancair Legacy FG and is sold only through Lancair. Due to the variations in induction systems, exhaust systems and cowlings of the airplanes offered in the experimental market, each turbo-normalized application can be very different and require different sized components. Superior will work directly with any kit manufacturer that would like to offer a turbo-normalized (TNIO-360) engine application.

4. What is the specific fuel consumption of this engine?

The specific fuel consumption of the Superior XP-360 Engine is .43. ie; 10GPH @ 75% power, 8.7GPH @ 65% power.

5. How does that compare to a typical Lycoming 360?

The Lycoming O-360-A1A burns 10.5 GPH at 75% power (compared to 10GPH for the XP-360) and 9.0 GPH at 65% power (compared to 8.7 GPH for the XP-360).

6. Are there performance curves available for the engine and how do I get them?

Yes. Superior has an XP-360 Engine specifications sheet that provide dimensional data as well as power curves. They are available on our web site at www.xp-360.com/aboutEngine.asp.

TBO and Warranty

1. What is the TBO of this engine?

Superior has established a recommended 2000-hour TBO for the XP-360 Engines.

2. What is the warranty of the XP-360 Engine?

Superior warrants the XP-360 Engine to be free from defects in material and workmanship for ONE (1) YEAR from the date of first operation, provided the date of first operation does not exceed six (6) months from the date of shipment. Superior also offers an optional extended 3-year warranty.

Superior warrants the XP-360 PLUS Engine to be free from defects in material and workmanship for Three (3) YEAR from date of first operation, provided the date of first operation does not exceed six (6) months from the date of shipment. See “Build an Engine” in Superior’s web site www.xp-360.com/buildOnline.asp for more details.

3. Does this warranty cover accessories?

Superior warrants the accessories for the XP-360 Engine supplied by Superior Air Parts, Inc. for ONE (1) YEAR, or manufacturers published warranty, whichever is greater, from the date the engine is first placed in service.

4. Is there any specific warranty requirements for the engine such as; time between oil changes?

The XP-360 Engine Operators Manual outlines the required maintenance to maintain warranty, including pre-flight inspections, the initial 25-hour inspection, and routine re-occurring 50, 100 and 500 hour inspections.

Service and Maintenance

1. What are the scheduled maintenance requirements for this engine?

The XP-360 Engine Operators Manual outlines the required maintenance inspections including pre-flight inspections, the initial 25-hour inspection, and routine re-occurring 50, 100 and 500 hour inspections.

2. Who is authorized to perform maintenance on the engine?

The XP-360 Engine is an experimental engine and as such, no specific FAA license is required. However, for the owner’s safety and peace of mind, Superior strongly encourages owners to have a licensed mechanic work with an owner for the first inspections for the purpose of training and to insure the engine is thoroughly inspected.

3. Are piece parts readily available for the engine?

Yes. Superior has a network of Authorized Superior Distributors Worldwide that carries a large assortment of inventory. For a list of our Distributors, please review our web site www.superiorairparts.com.

4. Are there specific break-in procedures for the engine?

Yes. Superior has a published Service Letter 96-08D that applies to our XP-360 Engine. Procedures are also included in our Operator's Manual and can be found on our web site at www.superiorairparts.com/serviceLetters.asp.

Cost and Availability

1. What is the cost of the engine and what is included in the cost?

Due to the various options available on the XP-360 Engine, Superior recommends viewing the "Build an Engine" portion of our web site www.xp-360.com/buildOnline.asp or call our toll free number (800-277-5168) or 972-829-4600 and ask a sales representative for a quote.

2. What is the cost of options for the engine?

Due to the various options available on the XP-360 Engine, Superior recommends viewing our web site www.xp-360.com/buildOnline.asp to determine the price with the options you prefer or call our toll free number (800-277-5168) or 972-829-4600 and ask sales representative for a quote.

3. Can I order an engine today and whom do I order it from?

Yes! Call Superior at 800-277-5168 or 972-829-4600 and ask for an engine sales representative. Our sales representatives can assist you in determining the exact engine you want and answer any questions you may have. We have many options available to you, including being present at the factory and viewing the assembly and testing of your engine.

You can also register for the Build School on-line at www.xp-360.com. You will then be contacted by a Superior Air Parts representative who will assist you with your registration and order.

4. If I ordered an engine today, when can I expect delivery?

Due to the overwhelming demand for our XP-360 Engine, the only way to determine delivery dates is at the time of order. Once the engine is ordered, depending on the backlog of owners ahead of you, we can give you a firm date for delivery.

5. Is a deposit required and is it fully refundable?

Yes, a \$1,000.00 deposit is required to place your order into our production plan. Superior will notify the customer in advance of the actual build date and require full payment of the balance. However, should the price for XP-360 Engine have increased at the time of the build notice, the Customer may cancel the build and Superior will fully refund the down payment deposit.

Miscellaneous

1. I have read about an SV-360, a SL-360 and the XP-360, what is the difference between the three?

The SV-360 is the designator for the FAA certified Superior Vantage Engine. This certified engine is built and tested by Superior under a FAA Type Certificate and Production Certificate. This engine is supplied with a new data plate, a Superior logbook and Operator's Manual and is primarily for use in a certified airplane.

The XP-360 Engine is the designator for the experimental engine. This experimental engine is built and tested by Superior and is supplied with an XP-360 Engine data plate, a Superior logbook and Operator's Manual and is primarily for use in an experimental airplane.

The SL-360 is the designator for an Engine Parts Kit. The SL-360 Engine Parts Kit was developed for the experienced builder who has the tools and ability to assemble his own engine or has the ability to have an experienced person assemble the Kit to a complete engine. The SL Kit Engine comes with all the necessary parts for a complete engine like the XP-360 Engine.

2. Does the SL-360 Parts Kit have the same warranty as the XP-360 Engine?

No, the SL-360 Engine Parts Kit carries Superior's standard parts warranty which is ONE (1) YEAR from the date of shipment. Superior warrants the XP-360 Engine to be free from defects in material and workmanship for ONE (1) YEAR or an Optional THREE (3) YEARS for an additional charge, from the date of first operation. Provided the date of first operation does not exceed six (6) months from date of shipment.

The XP-360 PLUS Engine is not available in an SL Engine Kit.

Superior warrants the accessories for the SL-360 engine kit or the XP-360 Engine (Fuel System, Magnetos and starter) for ONE (1) YEAR from the date the engine is first placed in service.

3. If I get an A&P mechanic to build a SL-Kit engine for me, can I get an XP-360 Engine data plate?

No. The XP-360 Engine data plate is supplied for the XP-360 Engine only. Superior's SL-Kit is supplied with a blank data plate.

4. Is the XP-360 Engine suitable for aerobatics?

The XP-360 Engine does not come from the factory in an aerobatic configuration, however, the crankcase and crankshaft are approved for aerobatic loads and with the addition of the Ryton lightweight sump the XP-360 engine is capable of conversion to perform aerobatic flight.

5. Does a vacuum pump come with the engine?

Superior does not include a vacuum pump with the XP-360 Engine. Because of the various applications the engine may fit in the kit plane market, some customers may not require a vacuum pump. Since vacuum pumps are readily available in the marketplace and to keep the cost down, we allow the customer to make the decision as to whether he needs a vacuum pump.

6. Where does the alternator mount?

Although the XP-360 Engine is not supplied with an alternator, a provision has been provided to mount a bracket to the lower right front portion of the engine. Because of the various applications the engine

may fit and the different requirements for electrical systems and to keep the costs down, Superior does not supply an alternator with the XP-360 Engine.

7. Is there a provision on the XP-360 Engine for bayonet style cylinder head temperature probes?

Yes. Superior's Millennium Cylinders installed on the XP-360 Engine have provisions for bayonet style cylinder head temperature probes.

8. Are there any other versions of the engine in development?

Yes. Superior is currently working on a 200 HP version with a counter-weighted crankshaft, a 320 cubic inch version, a front mounted prop governor version, a version with a solid crankshaft, etc. Our engineering research and development department will always be developing new products for the marketplace.

9. Can I put a deposit on one now, for delivery when it's available?

Yes. If Superior has determined the price for the version you request and an estimated completion date, we will accept your order and down payment. If the price and delivery date have not been established, we will accept your deposit to insure your place in line. When the price and delivery date have been established, we will contact you for an order. If you elect not to purchase the engine due to price or delivery date, Superior will promptly return your deposit in full.

10. Can I come to the factory to see my engine built?

Absolutely! We encourage all XP-360 Engine owners to come to the Superior factory to watch their engine being built or participate in building their engines themselves. We also offer both engine assembly options for an additional fee. Please see our web site www.xp-360.com for more details.

11. Can I get the engine in the color of my choice?

Yes! Superior offers a number of different color choices for the customer that wants his engine personally customized. Visit the "Build an Engine Online" portion of our web site at www.xp-360.com/buildOnline.asp for the various options offered. If it's not listed, call us. We are poised and eager to satisfy your requirements.

For More Information Contact:

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