AIRCRAFT ENGINE OVERHAUL
Demanding Maximum Performance & Longevity
“In my career, I couldn’t afford anything less than the best. Victor engines are the best in the business”

For many years, the words “Power-By-Victor” on the cowling of an aircraft have come to represent the ultimate in quality, the best in aviation piston engine technology. Victor Aviation’s unique, down-to-earth attention to personal service, meticulous detail and reliable high performance have become recognized across the U.S. and around the world as the standard by which other overhaul facilities and manufacturers are measured.

Since 1977 the Victor organization has earned a worldwide reputation for quality and excellence, utilizing innovative design techniques to improve performance and advance the state-of-the-art of piston engine technology. Several pilots have successfully flown single engine aircraft Powered by Victor around the world setting speed and endurance records.

Legendary Quality

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Legendary Air Show Pilot Bob Hoover chose Victor engines for his Shrike Commander aircraft because he wanted performance, reliability and endurance. Since 1983 Bob flew in over 570 air shows around the world and flew his “Power-By-Victor” engines to T.B.O. several times with 5,000 hours of trouble free use. No one else in the world can attest to this accomplishment, not even the original engine manufacturer. Bob’s Shrike Commander can now be found at the Smithsonian Air & Space Museum in Washington, D.C.

Victor offers four levels of engine remanufacturing depending upon the customer’s individual needs.

Aviator Series™
BLACK EDITION® V
LIMITED EDITION™ VI
XR BLACK EDITION® VII

Lycoming 360–540–541–720 Cubic Inch Displacement
Continental Motors 360–470–520–550 Cubic Inch Displacement

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X–15 Rocket Pilot Scott Crossfield
Chooses “Power–By–Victor”
BLACK EDITION® Engine

Former X-15 research test pilot and propulsion engineer for the National Advisory Committee for Aeronautics and North American Aviation, Scott Crossfield, selected Victor Aviation because he wanted an engine that he could count on. Scott relied on his “Power-By-Victor” Black Edition II™ engine throughout his career, flying his Cessna 210 to T.B.O. twice with over 3,000 hours of reliable performance.

Scott was the first to fly successfully to Mach 2.0 and Mach 3.0 in the X-15 rocket plane and knew propulsion systems intimately. Scott knew and appreciated Victor’s attention to detail and trusted his life to his engine. Throughout Scott’s heavily decorated aviation career, Victor Aviation was the only company that he ever endorsed, and became an advisor and mentor to Victor Aviation. Victor and Scott pioneered the technology used in Victor’s thrust velocity load cell development and cryogenic engine technology.

Some of the experimental rocket planes that Scott flew were the X-1, XF-92, X-4, X-5, X-15, Douglas D-558-1 Skystreak and the Douglas D-558-II Skyrocket, which can now be found at the Smithsonian Air & Space Museum in Washington, D.C.

“Whether it’s Mach 2.0 or Mach .2 it is all a function of power.”

Painted By W.J Reynolds
The “Power-By-Victor” Black Edition V™ Engine is designed for the pilot who demands the maximum operating potential from their engine without sacrificing safety or reliability. The benefits of the Black Edition V™ Engine are improved safety, enhanced reliability, proven endurance and maximum performance.

Black Edition V™ Engines achieve their advanced performance and maximum operating potential with 10 industry unique “Power-By-Victor” comprehensive processes.

- Precision Three Axis Crankcase Machining
- Enhanced Valve Train Geometry
- Cylinder Volumetric Efficiency Balancing and Flow Testing
- Iron Manganese Phosphate Internal Corrosion Coating
- Real–Time Reciprocating and Rotational Engine Balancing
- Full Domain Frequency Vibration Testing
- Engine Thrust Velocity Load Cell Testing
- Matched Camshaft and Hydraulic Lifters
- Diamond Cut and Matched Piston Rings
- Thermally Emissive Electrostatic Gloss Black Powder Coat

Black Edition® V is a Registered Trademark of Victor Aviation Service, Inc.
Extracting maximum performance from the valve train is essential for best power, smoothness and longevity. As an engine’s valves open and close, the contact angle between the valve and the rocker arm becomes critical to proper valve operation and engine performance. Any valve side loading can decrease cylinder efficiency and reduce available horsepower. Victor’s Black Edition V™ Engines are precision machined for minimum valve side loading for better power, performance and reliability. To help achieve consistency, valve spring pressures and heights are matched for more efficient engine operation.

Similarly, hydraulic lifters are matched for identical bleed down rates to assure uniformity of independent valve overlap timing and maximum throttle response. Valve clearances are also set to consistent “Power-By-Victor” specifications. The camshaft is precision ground or replaced with matched tappet bodies for optimum fuel efficiency.

A common misconception is that conventional lapping and line honing alone always results in a properly aligned and sized crankcase. This is untrue as line honing merely follows existing discontinuities and lapping can create uneven thicknesses. Gear mesh and bearing heat transfer problems may also occur. When necessary, crankcases are straightened, then precision milled to avoid high metal loss, and final machine bored utilizing precision boring equipment to assure proper alignment and size. Crankcase journals are finish tested for size and journal geometry by airflow differential procedures to assure proper fit. This minimizes piston side loading, reduces bearing wear and provides equal loading on crankshaft main journals. Unlike line honing which follows or changes the existing axis, line boring reestablishes the centerline of the crankshaft axis, thereby insuring the centerline is parallel and equidistant to the cylinder deck planes for enhanced engine performance.

**Precision 3 Axis Crankcase Machining**

**Enhanced Valve Train Geometry**

**UNIQUE BLACK EDITION® V ENGINE OVERHAUL PROCESSES**
Cylinder Volumetric Efficiency Balancing and Flow Testing

Volumetric efficiency testing measures airflow into each cylinder and allows Victor Aviation to match cylinders for maximum power so that the pilot can have the benefit of using all available power uniformly and efficiently with all cylinders.

Horsepower of an engine is directly proportional to the volume of air drawn into the cylinders and retained until ignition occurs. With this F.A.A. accepted process of polishing and removal of surface flashings of the intake and exhaust systems, a significant improvement in volumetric efficiency is available. It’s quite common to find airflow volume variations in new cylinders as great as 15 percent between independent cylinders which causes inconsistent cylinder horsepower outputs. After cylinders are volumetrically balanced all cylinders produce uniform airflow to provide for improved uniformity of power distribution. Air flow balancing is performed at multiple valve lift openings to assure for the best in engine fuel efficiency. Such precision tests are virtually unique in the aircraft industry to “Power-By-Victor” Black Edition V™ Engines.

Iron Manganese Phosphate Internal Corrosion Coating

Internal engine parts are very sensitive to the effects of corrosion which can cause premature failure of the engines camshaft hydraulic lifters and gears. Iron manganese phosphate coating is a F.A.A. accepted process of acid etching a lubricant into steel parts to reduce friction, provide for corrosion protection while improving fuel efficiency.

When new parts are installed in an engine there are initial contact surface break-in effects. Phosphate coating will assure a smooth initial contact break-in effect and also improve parts pitting fatigue life. Friction is reduced by the smoothing of the asperities of the mating gear surfaces and aids in keeping the gear tooth surface shape. This chemical conversion treatment forms a crystalline coated surface which provides for a significant improvement in contact fatigue strength and can greatly improve engine parts life.

Real-Time Reciprocating and Rotational Engine Balancing

Engine thrust may be increased by reducing the amount of power wasted in attempting to offset counterbalancing forces induced by out-of-balance internal components. Improving parts balance allows the engine to deliver more power to the propeller and the engine becomes more efficient with less wear on internal moving parts. “Power-By-Victor” Black Edition V™ Engines are uniquely real-time motion balanced by Victor’s A.S.E certified master machinists to within one gram. With this F.A.A. accepted process, individual parts and cumulative reciprocating mass weights are balanced, to provide for the best longevity and smoothness of the engine.

To illustrate the importance of proper balance, a typical six-cylinder engine connecting rod travels four inches. If a connecting rod were only 35 grams out of balance at a takeoff rpm of 2700, the resulting centrifugal force imbalance would be approximately 255 pounds. Over a period of time, such an imbalance could crack engine and accessory mounts, crankcases, exhaust systems cause premature bearing failure, cause accelerated fatigue to sensitive aircraft electronics, propeller, and structural members of the aircraft. Additionally, an engine imbalance can introduce unwanted vibration harmonics in flight controls, navigational and flight instruments, and is one of the leading causes for premature system fatigue.

Balancing not only improves thrust but also reduces pilot and passenger fatigue by lowering the amplitude of various vibration frequencies generated by the engine. The vibration that most pilots feel in an aircraft is generally low frequency vibration, often unrelated to propeller balance. Propeller dynamic balancing alone will not remedy an internal engine vibration and may only mask the symptoms of a larger problem. At Victor Aviation, engine vibration is reduced as a cumulative result of rotational, reciprocating and airflow balancing, improved valve train geometry, inertia supercharging, friction reduction and fuel distribution.
Full Domain Frequency Vibration Testing

Internal engine components move at varying rates of motion and produce different frequencies. These components can be individually revealed by plotting vibration amplitude against frequency. The breaking down of vibration signals into individual frequency components is called frequency analysis, a technique which may be considered the cornerstone of diagnostic vibration measurements. Using a full domain frequency analyzer the frequency and amplitude of a component’s vibration level can be detected using a tri-axial piezoelectric accelerometer.

This F.A.A. accepted testing process enables Victor’s technicians to not only test for complete engine balance but isolate exactly what internal engine components are in need of correction. This level of engine vibration analysis by far exceeds industry standards and enables Victor’s technicians to identify engine design and component problems allowing for a smoother running engine.

Engine Thrust Velocity Load Cell Testing

Engine testing at Victor Aviation is the most extensive procedure used in the industry and performed over a several day cycle process. Victor’s state-of-the-art mobile engine testing apparatus, incorporates a thrust velocity load cell that measures the actual thrust force of the propeller. Engines are installed into a hydraulically activated engine mount, with engine accessories, induction system and exhaust system installed, to simulate real-time engine test parameters.

Using an electronic load cell wafer, the engine’s real-time thrust velocity is recorded at all engine speeds. Internal engine parts are vibration monitored using triaxial piezoelectric accelerometers and a full domain frequency analysis to determine real-time internal engine parts balance. During the test process special dyes are put into the oil system and examined under a black light canopy to detect for any discrepancies. Engines are tested at maximum power and must meet Victor’s rigid test standards.

Thermally Emissive Electrostatic Gloss Black Powder Coat

This F.A.A. accepted process is a dry organic compound coating in which electrostatically charged particles of special resins and pigments are applied onto the crankcase, sub-assemblies, intake system, housings and related components. The engine’s crankcase and components are meticulously prepared, pre-assembled by Victor’s technicians, then heated and degassed in preparation for powder coat application. Then the positive charged particles are pneumatically sprayed and adhere to the negatively charged part’s surfaces and finish baked in a curing oven at 400 degrees Fahrenheit to form an extremely tough durable surface.

In effect this fuses the premium formulated powder to the components filling the rough, porous surfaces to prevent aluminum oxide corrosion and reduces surface fatigue cracking. Due to the special nature of Victor’s specially formulated electrostatic black powder coat, engine heat emissivity is also improved.

Express Limited Warranty for Workmanship

7 YEARS COVERAGE / 750 HOURS / 6 CYL

Coverage for 24 Months or 750 hours whichever occurs first. Prorates after 24 months up to 84 months on certificated fixed wing Faa Part 91 operations.
The Limited Edition VI™ Engine incorporates advanced Cryogenic Processing Technology for enhanced parts performance. Designed to meet maximum engine durability power and fuel efficiency demands. With Victor’s patent pending FAA accepted unique Limited Edition VI™ engine processes we are able to advance engine reliability longevity and fuel efficiency while adding significant aircraft value. The Limited Edition VI™ engine series is valued by the Aircraft Bluebook Price Digest as a 100% added value to aircraft.

Limited Edition VI™ Engines achieve their superior dependability and performance with 16 industry unique “Power-By-Victor” comprehensive processes.

- Cryogenic Liquid Nitrogen Stress Relieving
- Acoustic Resonant Spectroscopy Testing
- Vibratory Stress Relief Testing
- Metal Surface Shot Peening
- Eddy Current Electromagnetic Induction Testing
- Ultrasonic High Speed Velocity Testing
- Thermally Emissive Electrostatic Custom Color Powder Coat
- Precision Three Axis Crankcase Machining
- Enhanced Valve Train Geometry
- Cylinder Volumetric Efficiency Balancing and Flow Testing
- Iron Manganese Phosphate Internal Corrosion Coating
- Real–Time Reciprocating and Rotational Engine Balancing
- Full Domain Frequency Vibration Testing
- Engine Thrust Velocity Load Cell Testing
- Matched Camshaft and Hydraulic Lifters
- Diamond Cut and Matched Piston Rings
Cryogenic Liquid Nitrogen Stress Relieving

To reduce residual parts stress and improve engine performance, Victor Aviation has a unique F.A.A. accepted patent pending process to test parts over a 600 degree range in temperature from -300 to +300 degrees Fahrenheit. This non-destructive testing process is performed in a computer controlled vacuum insulated cryogenic processing chamber over a several day period in a Liquid Nitrogen atmosphere with real-time ultrasound material monitoring.

When metal castings cool and solidify during manufacturing, compressive stresses develop in lower volume areas, which cool first and tensile stresses develop in areas of greater volume, which are last to cool. Shear stresses can develop between the different volume areas. The surface cools first and the core last. In such cases, residual stresses develop as a result of the phase volume change between those layers that transform first and the center portion which transforms last. This testing process can relieve these residual stresses, detect for improperly machined or heat treated parts by measuring material volume changes, provide for longer engine life, better fuel efficiency, and improve engine performance. Cryogenics is widely used by the NASA Space Program, Aerospace Industry, NASCAR, and high performance engine builders to improve parts durability stability, and performance.

Acoustic Resonant Spectroscopy Testing

The principle of acoustic resonance inspection is used to determine the vibration signature of a part when exposed to an external force or striker. Every part has its unique vibration signature or resonant frequency. If there is an internal or external change or imperfection to a part, the frequency of the part will change. Resonant inspection can detect imperfections such as cracks, porosity, material density or heat treating problems.

To determine a parts vibration signature, a striker will contact the part and a microphone will record the resonant frequencies generated on a full domain spectrum analyzer. Frequencies can then be compared to the frequency of a perfect part reference standard, and sets of identical part numbers can be matched for frequency response. This allows Victor’s technicians to match parts to matched resonant frequencies for better parts performance.
**Vibratory Stress Relief Testing**

Vibratory stress relief testing is performed by vibrating engine parts at a sub-harmonic vibration frequency while real-time monitored with a full domain spectrum analyzer. This process measures changes in residual stress concentrations of engine parts caused by manufacturing processes. This F.A.A. accepted testing process is also used to provide for more reliable magnetic test indications during non-destructive testing of engine parts as a result of any shifting of material composition due to stress changes. Using this process can improve parts longevity and durability by neutralizing residual stress and enhances parts performance.

**Metal Surface Shot Peening**

Shot peening is a F.A.A. accepted process accomplished by the pneumatic impingement of metallic, glass or plastic shot on critical engine parts. As a result of this process the parts fatigue strength and resistance to stress corrosion cracking is improved by enhancing parts residual surface compressive stress. Nearly all fatigue and stress corrosion failures originate at the surface of a part, but cracks will not initiate or propagate in a compressively stressed zone. As a result of this unique process, critical stressed surface areas prone to stress corrosion cracking are shot peened to provide for longer lasting more durable parts life.

**Eddy Current Electromagnetic Induction**

Electrically conductive engine parts are tested using an electromagnetic induction process. This process is very effective especially on aluminum castings such as crankcases and housings. The advantage of this method is that it can detect fractures or porosity problems beneath the surface of the material that are not detectable by surface dye penetrant inspection techniques. Eddy current uses alternating electrical current flowing through a coil at a chosen frequency and generates a magnetic field around a coil or probe. When the coil is placed next to a conductive material, eddy current is included in the material. If a flaw in the conductive material disturbs the eddy current circulation such as a crack or porosity problem, the magnetic coupling with the probe is changed and a defect signal can be read by measuring the coil impedance variation. This process is an advanced parts inspection procedure and can detect hidden flaws in materials before they reveal themselves by structural failure.
**Ultrasonic High Speed Velocity Testing**

Using high frequency high speed sound waves, parts are scanned to gauge their integrity, test for flaws and material characterization. A pulse-echo ultrasonic measurement can determine the location of a discontinuity within a part or structure by accurately measuring the time required for a short ultrasonic pulse generated by a transducer to travel through a thickness of the material. The pulse then reflects from the back or surface of the discontinuity, is then returned to the transducer and can identify flaws internally in a part. Using ultrasonic high speed velocity testing can significantly improve engine longevity by detecting sub surface flaws that could have developed into future parts failure.

**Custom Color Electrostatic Powder Coat**

Victor Aviation has a wide array of powder coating colors available, designed to provide a tough, durable and beautiful finish for your “Power-By-Victor” Limited Edition VI™ engine. Custom RAL colors are also available upon request. Customers may choose select colors and design their engine according to their own personal request. The electrostatic powder spray process, is universally accepted and specified as the Best Available Control Technology (BACT).

**Express Limited Warranty for Workmanship**

**10 YEARS COVERAGE / TBO / 6 CYL NON-TURBO**

Coverage for 60 Months or TBO whichever occurs first. Prorates after 60 months up to 120 months on certificated fixed wing Faa Part 91 operations.
Lycoming 360–540–541–720 Cubic Inch Displacement
Continental Motors 360–470–520–550 Cubic Inch Displacement

XR BLACK EDITION® an Iconic Status

Since 1977 Victor Aviation’s Black Edition™ state-of-the-art engines have earned an Iconic Status as the most valued aircraft engines in the world. With the introduction of the XR Black Edition VII™ engine, Victor Aviation has set new standards for the industry for excellence and innovative engine performance. Designed for superior dependability and performance and can handle the toughest and most extreme environmental conditions.


- Isotropic Gear Surface Finishing
- Cylinder Chamber Cubic Centimeter Testing
- Multiple Angle Valve and Seat Machining
- Inertia Supercharging Air Flow Optimization
- Corrosion and Harsh Environment Protection
- High Temperature Ceramics
- Textured Matte Black Thermo Emissivity Powder Coat
- Cryogenic Liquid Nitrogen Stress Relieving
- Acoustic Resonant Spectroscopy Testing
- Vibratory Stress Relief Testing
- Metal Surface Shot Peening
- Eddy Current Electromagnetic Induction Testing
- Ultrasonic High Speed Velocity Testing
- Precision Three Axis Crankcase Machining
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- Full Domain Frequency Vibration Testing
- Engine Thrust Velocity Load Cell Testing
- Matched Camshaft and Hydraulic Lifters
- Diamond Cut and Matched Piston Rings

BLACK EDITION® is a Registered Trademark of Victor Aviation Service, Inc.
Isotropic Metal Surface Finishing

Engine parts are manufactured using grinding and cutting methods that can cause high surface roughness or irregularities in metal surfaces causing an anisotropic surface. This means that the surface irregularities of the parts all run in the same direction. These grinding marks can also interfere with non-destructive testing of a part’s surface. This F.A.A. accepted process enables technicians more reliable test indications when testing parts.

Isotropic surface finishing means that the part has been surface finished, or honed, to obtain a surface that has no discernible pattern thereby reducing friction, heat, noise and reduces contact fatigue. By exposing internal engine parts to a series of improved optional surface finishing techniques utilizing media in a specialized vibratory process, these surface roughness problems are reduced resulting in longer parts life, smoother parts operation improved lubrication and better fuel efficiency.

Cylinder Combustion Chamber Cubic Centimeter Testing

Cylinder combustion chamber and intake port volumes are cubic centimeter (CC) tested for uniformity by fluid test methods for improved engine power and superior engine smoothness on XR Black Edition VII™ engines. New cylinder castings have varying intake port and combustion chamber volumes and can cause changes in individual cylinder horsepower output. A cylinders position installed on an engine can also change individual cylinder horsepower output due to changes in available induction air flow and cylinder cooling causing uneven cylinder effective compression ratio balance. By balancing the individual CC level of a cylinder to the available induction airflow and cylinder position on an engine, a superior improvement can be obtained in providing for the ultimate in engine smoothness and power balance of an engine.
Multiple Angle Valve and Seat Machining

Engine intake air flows in and out of the combustion chamber through the intake and exhaust system by the opening and closing of the valves. As the air passes through the cylinder intake and exhaust ports, the flow of air can be affected by the curvature or radius of the openings caused by the shape of the valve and seat angles. Using specialized equipment, Victor’s technicians can shape these openings and improve the airflow and venturi characteristics by blending an improved curvature radius into the airflow path. Multiple angle valve and seat machining is very effective in making the air flow more efficient. As a result, improved engine performance and fuel efficiency can be obtained with an enhanced throttle response.

Inertia Supercharging Air Flow Optimization

Inertia supercharging is a process to maximize the volume of air trapped in the cylinder for combustion by precisely timing and delivering the proper charge of air. This phenomenon takes advantage of the natural dynamic effects and inertia of the air during the intake cycle. When the intake valve closes, a fast moving high-pressure pulse will hit the valve and bounce back in the intake system. By measuring the intake flow rate and precision machine finishing of the intake tract the returning pulse can be timed to arrive just when the valve opens for the next event cycle, filling the cylinder with an additional charge of air. Since the air column has inertia created by its reversion back from its original collision with the closed valve, it’s called “inertia supercharging.” When this occurs, the manifold is said to be resonating or tuning. RPM, cubic inch displacement, and air flow are related factors that are evaluated to help determine proper engine performance and horsepower which contribute to the inertia supercharging effect. By maximizing the kinetic energy of the air flow into the cylinders with the inertia supercharging effect, the volumetric efficiency is improved and also engine power.
Corrosive and Harsh Environment Protection

Due to thermal changes, moisture conditions, airborne contaminants, and exposure to salt air, aircraft engines can deteriorate quickly and develop premature parts fatigue. To reduce these premature fatigue effects Victor Aviation has developed proprietary formulated Ceramic-Silica and Polymer materials for exterior engine and component finishing on XR Black Edition VII™ engines. These extremely tough and durable high temperature corrosion resistant finishes are applied on the aircraft cylinders, crankcase, induction system, housings and other critical parts. Finished parts are oven baked and specially cured to make a magnificent textured Black Matte finish on XR Black Edition VII™ engines, significantly improving parts longevity and performance.

High Temperature Ceramics

Aircraft engine applications involve exposure to oxidizing fuels, heating and corrosive sources. All non-oxide materials used on engines will undergo oxidation and form some combination of solid, liquid or gaseous reaction to these environmental conditions. It is this oxidation behavior that can cause detrimental effects on engine parts. Special high temperature Silica Ceramics with good chemical stability and strength at high temperature oxidizing environments are used on XR Black Edition VII™ engines to increase heat dispersion and enhance parts performance. Engine parts are pneumatic plastic shot peened, degassed to remove any contaminants, a conversion coating is applied and final coated with a specially formulated XR Black Edition VII™ Black Silica Ceramics. Materials are oil, fuel and corrosion resistant, and can withstand temperatures up to 1300 degrees Fahrenheit.

Thermally Emissive Textured XR Matte Black Powder Coated

XR Black Edition VII™ engines come with the ultimate in electrostatic powdercoat finishing that enhances the durability, corrosion resistance and heat dispersion of engines. Designed to withstand extreme and the toughest conditions, Victor Aviation has been uniquely applying high quality powdercoat materials for over twenty five years on aircraft engines and has partnered with a Fortune 500 company to provide a special textured XR Black Edition VII™ Matte Black finish with exceptional heat dispersion and corrosion protection qualities. Parts are pretreated, pre-baked, electrostatic charged and post baked-cured at high temperature. Material has exceptional ultraviolet, chemical, solvent, salt air and impact resistance while maintaining the high hardness and flexibility needed for optimum performance.

Material specifications meet or exceed salt spray resistance ASTM B-117 and AAMA 2603.

Express Limited Warranty for Workmanship

10 YEARS COVERAGE / TBO / 6 CYL NON-TURBO

Coverage for 60 Months or TBO whichever occurs first. Prorates after 60 months up to 120 months on certificated fixed wing Faa Part 91 operations.
Preferred Installation Facilities

Victor Aviation can direct you to a “Power-By-Victor” preferred installation facility near you. The benefit of having an aircraft engine changed by a “Power-By-Victor” preferred installation facility is the extra confidence and peace of mind you receive by knowing the job is done right.

If you elect to fly your aircraft to a “Power-By-Victor” preferred installation facility, they can provide engine removal and reinstallation, aircraft inspection, propeller and accessory replacement and avionics upgrade services.

About Victor Aviation Service Inc.

Victor Aviation is the world’s most respected name in the Aircraft Engine Overhaul Industry with affiliate installation centers located worldwide and over 70 Preferred Installation Facilities in the US. Victor has global alliances with companies such as Aerodynamics, Inc., Aerolíneas Ejecutivas, Central Flying Service Inc., Cutter Aviation, Eagle Aviation, Inc., Elliott Aviation Inc., Epps Aviation, Inc., Flightcraft, Inc., Flightline Group, Kansas City Aviation Center, Landmark Aviation Maine Aviation Corporation, Midwest Aviation Center, Million Air, Muncie Aviation, Piedmont Aircraft, Inc, Skytech, Inc. Stevens Aviation Tulsair Beechcraft Inc., Woodland Aviation, Osaka Aviation Inc., and DLE Fahrservice GmbH.

The company has achieved international brand recognition using a business model focused on expanding and protecting its trade mark rights and proprietary FAA Approved processes while simultaneously promoting its marks in worldwide affiliations and though its company alliances.

Victor Aviation has ventured into providing other products and services branded with the Victor Aviation mark to Aerospace Industries including NASA, Boeing Aircraft Company and other Fortune 500 commercial accounts including Air Liquide U.S. The team of professionals employed by Victor Aviation include only the highest qualified master machinists and skilled technicians with impeccable reputations for producing the consistent quality that shines under the Victor Aviation brand name products.

The term "remanufactured" is used to describe a Victor category or process. The definition is not intended to contradict any authorized manual, publication or an F.A.R. or F.A.A. authorized publication. Processes specifications, warranty terms and conditions, subject to change without notice at anytime.

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<thead>
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<th>POWER BY VICTOR ENGINE PROCESSES</th>
<th>BLACK EDITION® V</th>
<th>LIMITED EDITION VI™</th>
<th>XR BLACK EDITION® VII</th>
<th>GOLD EDITION VII™</th>
<th>XR555 BIG BORE™</th>
<th>Factory Engines*</th>
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<td>Isotropic Surface Finished Gears</td>
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<td>Isotropic Surface Finished Crankshaft</td>
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<td>Thermally Emissive Textured XR Matte Black Powder Coated</td>
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*Factory engine process specifications and details may vary. Processes, specifications, and limited workmanship warranty coverage subject to change without notice. Other terms and conditions apply.
**Aircraft Bluebook Price Digest – Spring 2011 Volume 11-1**

**AIRCRAFT VALUE COMPARISON**

<table>
<thead>
<tr>
<th>AIRCRAFT MODEL</th>
<th>Added Aircraft Value</th>
<th>Average Retail Value</th>
<th>Average Retail Value @1,000hrs</th>
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<tr>
<td><strong>2006 BEECHCRAFT BONANZA G36</strong></td>
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<td>Zero—Time Rebuilt Engine</td>
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“Power-By Victor” Engines add higher value and hold higher value over time.