



Frequently Asked Questions

How tight should I tighten the Vortech® supercharger retaining bolt?

About 25-30 ft./lbs is suggested for the retaining bolt. It is also recommended that a small amount of blue Loctite be applied to the threads prior to inserting the bolt in the input shaft and apply a small amount of anti-seize on the input shaft and key before installing the supercharger pulley.

Why should I use Vortech® pulleys?

Some non-Vortech® pulleys available do not provide the precision fit and balance which are essential for performance and durability and are therefore not recommended. Never force or hammer on the pulley or supercharger shaft. The pulley should barely slip over the shaft when it is 75-80 degrees F. The key to keyway fit is also critical, as is balance. Always use a small of oil or grease on the shaft. Steel pulleys may rust themselves to the shaft if not lubricated.

Why would a Vortech® supercharger belt come off or wear unevenly?

The propensity for grooved belts to move over one or more grooves, or come off completely, is always due to an alignment problem. Either statically (the pulleys are misaligned due to an installation or tolerance problem) or dynamically (the loading or unloading of the system), mainly the mounting plate causes misalignment due to flex or movement. Misalignment can also be caused by over-tightening (and failing) of the belt which may be detrimental to the pulley bearing.

Can I run a cog drive system with a Vortech® supercharger?

The only Vortech® supercharger designations that may be driven with a cogged type belt drive are heavy duty models. They feature special internal modifications that are compatible with cogged type belt drive systems. There still exists the very real possibility of supercharger damage when using this type of drive, but this special configuration is more tolerant. An inherent design

characteristic in serpentine belts is a certain amount of belt slippage. This mainly occurs on deceleration, but may also occur on acceleration if the belt is too loose or if the belt being utilized is not of sufficient width to transmit the horsepower being generated.

Can I operate a Vortech® supercharger system without a fuel management system?

Even with a perfectly calibrated mass air flow system, you still need a fuel management unit for enrichment under boost. The air/fuel ratio must change from 14.7:1 (stoichiometric) naturally aspirated, to about 11.5:1-12.0:1 (rich) under full boost.

What are the adjustments of the Super FMU?

The SFMU has five separate adjustments:

- The main adjusting screw
- The calibration ring and disc
- The vacuum screw
- The bleed screw
- The boost screw

The adjusting screw sets the static pressure level of the unit. By adjusting the main screw any initial static pressure can be set.

The calibration ring and disc are used to set the slope of the fuel pressure increase with increasing boost pressure. Four different rings and discs are included with the SFMU

The vacuum screw acts like a vacuum regulator. If it is set to give for example, 5 in. hg the upper chamber of the SFMU will only see 5 in. hg even though the engine manifold pressure may drop 18 in. hg at idle. The result of this is the fuel pressure remains constant from idle vacuum up to 5 in. hg then the pressure will start to increase.

The bleed screw does two things. First it will lower the slope of the curve set by the calibration ring. So it can be used to "fine tune" the pressure vs. boost curve. Second, it acts as a dampner to "soften" the transition in the curve.

The boost screw acts in a similar manner as the vacuum screw in that it performs like pressure regulator. It can be set to limit the maximum fuel pressure. If the screw is set all the way in it will not regulate and the curve will continue to rise as boost increases. If the screw is set to relieve at, say 10 PSIG then once that manifold pressure is reached any manifold pressure above that will not increase the fuel pressure.

Can I use a 190 liter per hour fuel pump by itself and eliminate the T-Rex?

It is not suggested that the 190 LPH fuel pump be used without the T-Rex fuel pump. The biggest single contributing factor to engine damage is inadequate fuel delivery. Supercharged applications should have excess capacity rather than inadequate capacity as the damage that can be incurred is far more expensive to repair than the cost of the fuel pump.

Where should my initial timing be set with a Vortech® supercharger?

For best performance results, initial timing should be set at the maximum amount that does not cause detonation. What may work on one vehicle will not necessarily work on a similar vehicle. Differences in computer calibration, machining tolerances on timing gears, timing marks on the crank pulley, etc. can all vary slightly. The small differences in all these parts can add up to significant variance in initial timing from one vehicle to another.

What is the purpose of re-calibration of sample tubes in mass air flow sensors?

When changing fuel injectors, it is necessary to change the sample tube for correct calibration of the mass air flow sensor. This is a simple task and can usually be accomplished in 10-15 minutes. To change the sample tube, it is necessary to remove the mass air flow sensor from the engine, remove the two security screws with the special bit provided, remove the two screws retaining the sample tube. Install the new sample tube and reverse the process. Sampling tubes are available for 19, 24, 30, 36, and 42 lb./hr. fuel injectors.

Can I use oil additives with a Vortech® supercharger?

Vortech® Engineering, LLC neither condones nor condemns the use of oil additives.

Can I use the existing drain on the oil pan to return the oil from the Vortech® supercharger?

No. It is imperative that the oil return be higher than the level of the oil in all instances. The oil must be drained gradually downward with no dips, allowing the oil to enter the oil pan above the oil level. Drain restrictions, kinks or returning the oil below the oil level may cause a severe windage problem that consumes significant power and generates heat, supercharger seal failures may also result.

Can I use the Vortech® T-Rex by itself?

Yes, the Vortech® T-Rex fuel pump can operate independently. To properly function, the T-Rex should be fed by a high flow unrestricted hose route.

What is the flow rate of the Vortech® T-Rex fuel pump?

The Vortech® T-Rex fuel pump is custom made for Vortech®, other fuel pumps by other manufacturers may resemble the T-Rex but are not capable of the 50 GPH at 70 PSI that the T-Rex is capable of.

Where is the best place to mount a race or mondo air bypass valve?

Depending on the application, the bypass valve should be mounted on the discharge tube of the supercharger. On other applications, it may be more convenient to mount the bypass valve on the intake plenum. Often times because of space limitations it is more convenient to remote mount the bypass valve at a location where space allows. On custom applications, the location being chosen should allow for the space limitations and aesthetics of the particular systems installation.

When should a race air bypass valve be used?

Any supercharger system that is operating in excess of 10 PSIG requires installation of a race air bypass valve to prevent compressor surge. All V-1 R, V-1 T, V-7, V-3, and V-4 superchargers require a mondo air bypass valve.

When should a standard air bypass valve be used?

A standard air bypass valve should be used on all supercharged applications where the supercharger is making more than 6PSIG. The advantages of using an air bypass valve includes eliminating compressor surge (the noise heard during deceleration) for quieter supercharger operation, and reduced heat soak in the discharge tube and the supercharger.

What would cause my engine to detonate at high RPM?

Detonation at high engine RPM is generally caused by a lack of fuel or improper ignition timing advance setting. Other causes of detonation can be high engine temperature, excessive supercharger discharge temperature, low octane fuel, bad spark plugs or excessive boost.

What is detonation?

Detonation is the sudden increase in cylinder pressure caused by pre-ignition in the combustion chamber. This happens as the flame front moves from the ignition point, pressure waves in the combustion chamber crash into the piston or cylinder walls. This results in the sound known as knock or ping. This condition is strongly influenced by fuel-octane rating, ignition timing, and compression ratio as well as boost levels.

What causes fuel pressure to fluctuate?

Fuel pressure fluctuations can be traced to several situations. Always make sure you have installed the fuel system portions of the kit per the instructions. Make sure the FMU lines are connected correctly at the fuel rail and the FMU. This is the most frequent cause of fuel pressure problems. If the fuel pressure falls off while the system is in boost, this is usually an indication that the fuel delivery is inadequate and the entire fuel system needs to be evaluated to ensure that all portions of the systems are functioning. Check the fuses to make sure the current is flowing to the pumps, check the electrical ground for the pump, also check the voltages at the pump to make sure adequate voltage is present in the system. A boost and fuel pressure gauge should be installed in the vehicle to verify the correlation between boost and fuel pressure.

What is the best size of fuel injector to use with a Vortech® supercharger?

The size of the fuel injector you choose to run depends on the amount of power you desire to produce. In simple terms, it takes fuel to make horsepower. Vortech® supercharger systems are designed to use stock fuel injectors in most cases or have additional fuel system provisions in the supercharger system.

What is the correct cam to run with a Vortech® supercharger?

Cam selections are best discussed with various cam manufacturers. Many people select cams which are not the correct choice for centrifugal superchargers. When discussing the cam with a manufacturer make sure they understand a Turbo cam or a cam for a Roots style supercharger is different than a centrifugal supercharger cam. Generally speaking, the supercharger and the cam do the same thing (increase volumetric efficiency). Be cautious of choosing a cam that has large amounts of lift and duration. Ideally, for a street application retaining decent idle, emissions, and driveability are important. For these reasons, we suggest a "moderate" camshaft. Given the choice between two cams, we suggest the milder of the two for street applications.

Why don't Vortech® superchargers need an Aftercooler or an intercooler?

Vortech® Engineering, LLC has conducted extensive testing of most intercoolers/aftercoolers currently on the market. Test results indicate that for street driven purposes below 8-9 PSIG, installing an aftercooler has marginal effects when using a Vortech® supercharger (due to the high efficiency of the supercharger). Nearly all of the intercoolers/aftercoolers available on the market have poor effectiveness and actually can cause parasitic losses equal to or greater than the power gained by installing a intercooler/aftercooler. Vortech® has developed systems which are substantially more effective at lowering discharge temperatures without causing driveability problems and pressure drops thru the cooling core and ducting.

What does an air/water aftercooler do?

Vortech® offers a unique line of air-water aftercoolers called Maxflow® Powercoolers that cool the intake air for improved power, reliability, and consistency allowing more timing, less fuel, and reduced chances of detonation. It may add 35 to 100 additional hp with no other changes (depending on the application, engine, and boost level). Vortech® Maxflow® Powercoolers utilize a separate pump, radiator, and heat exchanger designed for maximum street or track performance in conjunction with Vortech® supercharger systems. Maxflow® Powercoolers generally lose less than one pound of boost so you'll get maximum performance with excellent driveability. Engine cooling and ground clearance remains just like stock. Maxflow® Powercoolers are available in stand-alone universal, specific bolt-on kits, or in complete kits with supercharger systems at a reduced price for many popular applications. They are recommended for applications requiring maximum performance in racing, towing, or extended high speed driving.

Does Vortech® offer more than supercharger systems?

We offer a complete line Forcepower and Maxflow® accessories including:

- Maxflow® T-rex fuel pumps
- Maxflow® fuel rails
- Maxflow® injectors
- Maxflow® Super Adjustable FMU's
- Maxflow® complete fuel systems for 5.0 Mustangs that can support up to 1,000 hp
- Maxflow® air-water aftercoolers
- Forcepower serpentine and cog pulley packages
- Maxflow® Mondo and Racing air bypass valves
- Maxflow® mass airflow sensors
- Race bracket packages
- Maxflow® custom air intake tubing and elbows
- Gauges, gauge pods, and of course, banners, shirts and decals

Are Vortech® superchargers upgradable?

Yes. With Vortech®, most models are upgradable to the latest technology.

The Vortech® supercharger V-1 exchange program and V-2/V-3 exchange program allows owners of a V-1 A, B, and S-Trim to step up to the V-1 heavy duty Si-Trim, T-Trim, or V-7 YSi-Trim superchargers or our "Super Quiet" V-2/V-3 Si-Trim.

Which Vortech® supercharger do I need for my application?

Through thousands of hours of rigorous testing, we realized one supercharger does not fit all. That's why Vortech® offers a wide array of superchargers designed to fit engines from 1.6 liters to 1,500+hp including the V-5, V-9, V-1 S, V-1 SC, V-1 T, V-1 R, V-4 J, V-4 X, and V-4 XX and V-4 Z trims. Vortech® makes choosing the right supercharger for your application easy. Ask one of our salesman to do a compressor match and answer a few questions and we'll select the appropriate Vortech® compressor for your application.

What do the critics say about Vortech®?

Vortech® has been featured in numerous articles in magazines & TV and here is just a sample of what the critics have to say:

- "This is the afterburner of aftermarket hardware" -Motor Trend
- "It fits, looks, and even sounds like something the factory installed" -Motor Trend
- "Vortech®'s charger is a work horse" -Super Ford
- "ZR-1 performance for half the price" -Road and Track
- "The Vortech® supercharger shaved over 2-seconds from my 0-60 and ¼ mile times" - Motor Week
- "The owner of this truck has a lot more power, giving her confidence and she'll never be late for soccer practice again." -Motor Week

[Click Here](#) for a complete listing of magazine articles featuring Vortech® Superchargers

What is the SAE J1723 supercharger testing standard and why is supercharger efficiency important?

This standard documents the efficiency and performance of a centrifugal supercharger in accurate and usable compressor maps. Vortech® has the only SAE J1723 compliant supercharger test cell in the aftermarket industry and it allows us to refine our superchargers for maximum performance, durability, and efficiency. An efficient supercharger produces the coolest air, requires minimal horsepower to drive it, produces the most overall power while providing the highest dependability. For more information, check out the SAE J1723 supercharger efficiency standard at: www.sae.org/PRODSERV/stds/J1723_199508.htm

Who uses Vortech® supercharger systems?

Vortech® is used and recommended by the world's finest tuners like:

[Alternative Auto Performance](#) - (810) 463-0010

[Anderson Ford Motorsports](#) - (217) 935-3106

[Dinan Engineering](#) - (650) 962-9401

[H.P. Motorsports](#) - (402) 731-7301

[Kenny Brown Performance](#) - (317) 247-5320

[Motorsports Technologies](#) - (281) 870-8787

[Saleen Performance](#) - (800) 888-8945

[Stillen](#) (714) 540-5566

[TPIS](#) - (612) 448-6021

Turn-key installations are available direct from these tuners and many other authorized Vortech® distributors (call for your nearest distributor).

Will Vortech® supercharger systems work with aftermarket chips?

Most computer chip manufacturers produce products which richen up or lean out fuel delivery and advance ignition timing. Because a great number of variables and the fact that leaning out fuel delivery or adding ignition timing to an engine under boost can cause damaging detonation, Vortech® cannot recommend these products unless specifically programmed on a dyno with your actual vehicle.

Will a Vortech® supercharger system hurt my engine?

A Vortech® supercharger system will not affect the engine durability. Supercharged engines, not unlike turbos, operate in vacuum almost all the time. When in boost, at full throttle, the forces on the engine are still lower than the rotational forces. As a general rule, the worst thing you can do to your engine is over rev it (exceed the vehicle manufacturer's specified red line), run non-premium fuel, overboost your engine via pulley changes, and modifying your vehicle with aftermarket heads, cams, etc. without retuning the computer and fuel system to accommodate such changes.

Are Vortech® supercharger systems emissions legal?

Unless otherwise noted, all Vortech® supercharger systems are 50-state emission legal. The California Air Resource Exemption Number of each Vortech® supercharger is stamped on the serial number identification tag. You can also check the Internet for the latest exemption numbers at <http://www.arb.ca.gov/msprog/aftermkt/devices/devices.htm> (after selecting this web site, select the device type "supercharger system").

What will a Vortech® supercharger system do to my mileage?

When the supercharger system is installed as purchased, mileage often times improves due to the increased engine efficiency. If you tend to drive with a "heavy foot," your mileage may suffer.

Will a Vortech® supercharger system void my factory warranty?

The installation of Vortech® products, except those defined as "for racing use only" do not void the new vehicle warranty nor should they cause the vehicle to fail emissions tests. Notify the vehicle manufacturer if either of these situations occur. If the vehicle manufacturer fails to honor emission/warranty claims, you may contact the Environmental Protection Agency (EPA) at (202) 260-2080 or www.epa.gov. If federal warranty protection is denied, call the Federal Trade Commission (FTC) at (202) 326-3128 or www.ftc.gov. Additional information is available at the Specialty Equipment Market Association (SEMA) website www.sema.org.

What is the warranty coverage on a Vortech® supercharger system?

All Vortech® supercharger systems are covered by an exclusive 3-year unlimited mileage warranty and exclusive supercharger efficiency guarantee standard. Forcepower Parts carry a 90-day limited warranty.

Why do boost levels vary on different engines?

Boost levels depend on a number of variables, the cubic inch displacement of the engine, the crank pulley size, the supercharger and/or crankshaft pulley size, the flow capabilities of the intake manifold, heads, fuel systems, etc. Vortech® engineers each supercharger system to produce maximum performance at safe boost levels on stock, unmodified engines. The engine characteristics of a truck system vary greatly from that of a LT1 Camaro. What works well on an LT1 Camaro is not necessarily going to function properly on a vehicle used for towing a race car. This is why Vortech® does not rate its supercharger systems in terms of absolute pounds of boost or PSI. When rating our systems, we rate them conservatively for the average vehicle owner and the pounds of boost on the gauge (PSIG). This ensures the boost level you will receive is true and accurate. It is important to recognize that Vortech® has the most efficient supercharger on the market, which translates to less horsepower required to operate the supercharger, cooler discharge temperatures and boost available sooner in the RPM range.

What spark plugs should I use with a Vortech® supercharger system?

Always utilize the stock specified heat range for street legal applications. For continuous heavy-duty racing, off road use only, use one heat range colder than stock and reduce the gap to 0.032 to .040". (NOTE: the gap requirement varies per the application and intended use). It is suggested that you follow the manufacturers suggested recommendation for spark plugs. Do not use platinum plugs, as they are considered long life spark plugs and are not performance spark plugs. For higher performance engines, consult the spark plug manufacturers for their specific suggestions.)

Which exhaust system should I use with a Vortech® supercharger system?

Stock is OK. However, the increased mass of the intake air makes the exhaust system flow more than it was originally designed for. Therefore, exhaust modifications such as high performance cat-back exhaust systems can add substantial increases.

What type of maintenance is required with a Vortech® supercharger system?

Follow the vehicle owners' manual recommendations for your vehicle. We do ask that you change your engine oil at regular intervals because the engine oil cools and lubricates the supercharger gears and bearings. When changing your oil, remove and clean the oil inlet fitting and strainer. For severe duty or racing, it is suggested that you install an oil cooler and filter. We suggest following the manufacturers recommendations concerning oil type and oil change interval. You can use mineral based, synthetic blend, or full synthetic oils with a Vortech® supercharger system as long as the oil meets or exceeds vehicle manufacturer recommendations.

What kind of fuel is required with a Vortech® supercharger system?

All Vortech® supercharger systems require the use of premium fuel. Octane boosters are not required but may improve performance in severely hot climates or under circumstances where a heavy load is placed on the engine for an extended period of time such as racing or towing. In emergency situations, regular gas can be used with the addition of high quality octane boosters for short periods of time.

What's involved in installing a Vortech® supercharger system?

Vortech® supercharger systems are designed to fit neatly under the factory hood and they 100% complete, even down to the wire ties. Installations are straight forward with step-by-step, fully illustrated installation instructions. Most Vortech® supercharger systems bolt-on with ordinary hand tools in about 7-12 hours with absolutely no fabricating or cutting of body panels. If you wish to have your Vortech® system professionally installed, international turn-key installations are available from your nearest Vortech® distributor (please call Vortech® sales for your nearest authorized Vortech® distributor).

What is included in a Vortech® supercharger system?

Vortech® manufactures complete supercharger systems giving you maximum value for your performance dollar. The following items are included with every system at the time of purchase:

- Vortech® centrifugal supercharger
- High performance calibrated fuel system
- High performance ignition system with boost timing retard (if applicable)

- High performance computer tuning (if applicable)
- High-flow air intake system with reusable high-flow air filter, silicone hose coupling, industrial grade flex hose, stainless clamps, and cast aluminum and/or roto molded urethane air discharge tubing
- OEM style cast aluminum mounting brackets
- 6061 T-6 aluminum supercharger drive pulleys and cast aluminum crankshaft pulleys (if applicable) which are hard anodized, CNC machined for maximum surface contact, and built to SAE standards
- Heavy duty drive belt & hardware
- Hoses and hardware for engine oil lubrication
- Step-by-step, fully illustrated installation instructions
- Owners manual with limited warranty and warranty registration

What are the differences between a Vortech® supercharger system and the competition?

Vortech® Maximum Support:

3-year supercharger limited warranty is available with all complete systems. Excellent technical support from factory-trained knowledgeable and enthusiastic personnel

Advanced System Design:

- Dyno proven to produce more power at the same boost level as other systems that require intercooling.
- Designed for maximum performance at safe boost levels on stock, unmodified engines.
- Optional supercharger upgrades are available to achieve 25+ PSI (requires fuel system, internal engine, and computer modifications).
- 50-state emission legal (unless otherwise noted)
- OBD II & OBD III computer compatible.
- True OEM quality fit and finish.
- 100% complete, even down do the wire ties, making installation and ownership easy and trouble free.

Compressor Matched Systems:

Compressor Matched Vortech® supercharger system ensures that you will get system ensuring you'll get the proper supercharger for your specific application. "One size" does not fit all.

Does Vortech® offer a supercharger system for my application?

Vortech® offers bolt-on supercharger systems for most popular GM, Ford, and Chrysler cars, trucks, and SUVs. If we do not have a complete system for your application, we can refer you to a custom kit manufacturer for further assistance.

What kind of performance increase can I expect from a Vortech® supercharger system?

A 30 to 50% horsepower improvement, depending on the application. Vortech® systems are designed to work within a reasonable margin of safety yet modified engines can easily yield improvements exceeding 100% (this may require the additional changes to the supercharger, fuel system, ignition system, computer system, and internal engine and driveline components).

What does a supercharger do and what are the advantages over other performance modifications?

A supercharger compresses the air/fuel mixture of an engine by forcing air into the engine under pressure. Supercharging increases air density and significantly increases power on an otherwise stock engine. In short, supercharging makes a V-6 perform like a V-8 and makes a small block V-8 perform like a big block V-8. OEM manufacturers like Ford, GM, Mazda, Mercedes, and Jaguar offer factory installed superchargers on several models due to the tremendous benefits. Vortech® supercharger systems offer more HP per dollar than any other single engine modification. Most other modifications available require specific matched parts, in-depth tuning, are not smog legal, and won't produce the performance gains you'll receive from just the addition of a Vortech® supercharger system.

What internal engine modifications are required to install a Vortech® supercharger?

All Vortech® street supercharger systems are designed to work with stock engines and all emissions equipment. If more performance is desired, upgrades to the injectors, heads, cams, intake manifolds, computers, mass air flow sensors, etc. can be built into the engine. NOTE: Vortech® supercharger systems are designed for 100% stock vehicles. Any modifications other than the supercharger may require the additional purchase of larger fuel injectors, a larger fuel pump, custom computer tuning, auxiliary ignition system with boost timing retard, and potentially, internal engine modifications. Vortech® can assist you with general guidelines but we do not recommend brands, or specific combinations.