

FORD FALCON AU V8
5.0L WINDSOR (1998-2002)

**VORTECH CRANK DRIVE
SUPERCHARGER KIT
INSTALLATION MANUAL**

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INTRODUCTION

Congratulations on selecting the best performing and best backed automotive supercharger available today. Before beginning this installation please read this instruction booklet thoroughly.

CAPA Supercharger Systems are a performance improving device. This product is intended for use on healthy and well maintained engines. Installation on a worn-out or damaged engine is not recommended and may result in failure of the engine and or the supercharger. CAPA IS NOT RESPONSIBLE FOR ANY DAMAGES RESULTING FROM THE USE OF THIS KIT.

For best performance and durability please take note of the following key points:

1. Use only premium unleaded fuel.
2. The engine must have stock compression ratio.
3. If the motor has been modified in any way, check with CAPA prior to installation.
4. Change your oil and oil filter. Refill with the best synthetic oil available.
5. Cold Starts - never race your engine when your engine is cold. Allow water temperature to rise up to operating range before driving above 2500 r.p.m. Engine damage may result in high r.p.m. and boost conditions when cold.
6. Always listen for signs of deterioration (pinging) and discontinue hard use (no boost) until the problem is resolved.
7. Change oil and oil filter every 5,000km.
8. Always use an air-filter.
9. Never strike the supercharge pulley with a hammer or other tools. (Evidence of such force will void warranty).
10. Retention belt after 500-600km, if not sooner, because the belt will stretch during initial brake in period. Tighten belt only enough to stop slippage (the belt must still have some flex), over tension of the belt is the cause of input bearing failure
11. **Vortech Oil Feed & Drain Only** - every 5,000km remove oil feed spray fitting at side of blower and clean filter gauze. Blow compressed air backwards through the small orifice.
12. Never over-rev supercharger. Internal step up on a Vortech V-3 Supercharger is 1.0 to 3.60. Impeller speed must not exceed 50,000r.p.m (**Sealed Vortech**).

Vortech Impeller speed calculated as below:

Vortech V-2 / V-3 Supercharger – Do not exceed 50,000r.p.m.

$$\frac{\text{Crank Pulley Diameter}}{\text{Supercharger Pulley Diameter}} \times 3.60 \times \text{Engine RPM} = \text{Impeller Speed}$$

Powerdyne Impeller speed calculated as below:

Powerdyne Supercharger – Do not exceed 38,000r.p.m.

$$\frac{\text{Crank Pulley Diameter}}{\text{Supercharger Pulley Diameter}} \times 3.05 \times \text{Engine RPM} = \text{Impeller Speed}$$

NOTE: The reason for grooved belts to move over one or more grooves or come off completely is always due to an alignment problem. Misalignment can also be caused by over tightening of the belt - which may damage the drive system.

GLOSSARY

COMPRESSOR HOUSING

The housing which makes up the enclosure portion of the compressor. Also referred to as the volute, scroll or snail.

COMPRESSOR SURGE

The phenomenon that occurs when the pressure ratio is too high for a given flow, or impeller speed. All centrifugal compressors can experience it. In automotive use it is most often found during decelerations when the engine speed is still high and the throttle is closed.

DETONATION

The uncontrolled rapid expansion or explosion of the air/fuel mixture in the combustion chamber.

GAUGE PRESSURE

The measure of pressure above atmospheric pressure.

IMPELLER

The bladed wheel inside the compressor housing that accelerates the air.

INDUCER

The air inlet portion of the compressor.

NATURALLY ASPIRATED

An engine without a supercharger.

PRESSURE, BOOST

The difference in pressure between barometric and intake manifold absolute pressure on a supercharged engine (read as gauge pressure).

PRESSURE, ABSOLUTE

The sum of gauge pressure and atmospheric pressure. One standard atmosphere = 29.92 in. of mercury (Hg) = 14.696 lbs./in.² (psi)

PRESSURE RATIO

Manifold absolute pressure divided by standard barometric pressure.

$$P.R. = \frac{\text{gauge pressure} + \text{atmospheric pressure}}{\text{absolute pressure}}$$

STOICHIOMETRIC

The correct chemical mixture of air and fuel to yield complete combustion

KITS PARTS LIST

Part no.	Description and Size	Quantity	Checked
	Vortech blower - curved	1	
	Vortech Bracket assembly	1	
	Top Idler Plate	1	
	Bottom Idler Plate	1	
	Reservoir bottle with cap <i>(Sealed Unit)</i>	1	
	Bottle mount bracket <i>(Sealed Unit)</i>	1	
	Bottle Mount Bolts 1/4 x 1/2 " NC <i>(Sealed Unit)</i>	2	
	200mL Sealed Oil Top Up <i>(Sealed Unit)</i>	1	
	Blower oil drain fitting <i>(Oil Feed / Drain Unit)</i>	1	
	Sump oil drain fitting <i>(Oil Feed / Drain Unit)</i>	1	
	Oil drain hose 450mm x 12.5mm <i>(Oil Feed / Drain Unit)</i>	1	
	Oil drain clamps <i>(Oil Feed / Drain Unit)</i>	2	
	Oil pump Y piece <i>(Oil Feed / Drain Unit)</i>	1	
	Oil delivery hose and fitting <i>(Oil Feed / Drain Unit)</i>	1	
	Idler pulley - flat	2	
	Idler bearing spacer & dished washers	2	
	3/8" x 2.5" Bolt, spring & flat washers - Idler pulley retaining bolts	2	
	M12 x 35 x 1.5mm Idler mount plate retaining bolts	3	
	M8 x 30mm special cut Allen head bolt	1	
	7/16" NC x 5.5" special cut bolt	2	
	7/16" NC x 5.5" bolt, spring and flat washer	1	
	Supercharger Belt 8pk 1670 3.48"	—	
	8pk 1660 3.33"	—	
	Crankshaft pulley Assy 8rib	1	
	5/8 NF x 3 1/2" Crank bolt	1	
	Blower pulley size 3.48" / 3.33" 8rib	1	
	1 1/4 x 3/8" NC cap bolts spring & flat washers	5	
	Modified Radiator hose extension CH945	1	
	Radiator Hose Joiner Sleeve	1	
	Hose clamps 33/57	3	
	500mm 2 Core wire	1	
	400mm 4 Core wire	1	
	1m Conduit	1	
	Wire Shrink wrap 200mm	1	
	Clamps 68/86	6	
	160mm Aluminium Tube with BOV & IAT grommet	1	
	45° 2.75"-3" Silicon Elbow (sc to discharge tube)	1	
	45° 3" Silicon Elbow shortened	1	

Parts List continued on Next Page...

KITS PARTS LIST, CONTINUED

Part no.	Description and Size	Quantity	Checked
	Air Filter Adapter	1	
	Air Filter Adapter to body mount bracket	1	
	M6 x 20mm bolt, spring, flat, nut (Air Filter Adaptor - A/F meter)	3	
	M6 x 25mm bolt, spring, flat, nut (A/F Adaptor - Bracket)	1	
	M6 x 16mm bolt, spring, flat (Air Filter Assembly - body)	1	
	Air Filter Assembly	1	
	3" Silicon Hose 20mm wide (Air Flow meter seal)	1	
	Blow off valve	1	
	3.5" Flexible Intake Duct 400mm	2	
	330mm Blow-off Hose	1	
	PCV Breather Hose 300mm x 10mm	1	
	Throttle body cap & clamp - small	1	
	10mm PCV fitting in intake 90° bend	1	
	Blow off hose 90° fitting 1" (facing towards blower)	1	
	600mm 4mm Vac Hose	1	
	Brass tee piece	1	
	Plastic ties (various sizes)	15	
	Clamps 89/108	4	
	Precaution Air Inlet Low Sticker	1	

Important before beginning installation, verify that all parts are included in the kit - report any shortages or damaged parts immediately.

PREPARATION & PART REMOVAL

1. Disconnect Battery.
2. Remove air cleaner box and duct assembly.
3. Remove fan assembly.
4. Remove main bolt from Crank pulley.
5. Remove Air Flow meter.
6. Remove bottom cover & bumper bar assembly.
7. Remove shroud under passenger side Headlight assembly.
8. Drain Radiator via drain plug in LHS of radiator, and keep coolant for later use.
9. Remove bottom radiator hose at water pump.
10. Remove bottom radiator hose holder bracket (near harmonic balancer).
11. Remove top air-conditioner compressor bolts.
12. Remove spark plugs.
13. Remove temperature sensor from intake duct. To be used in new system.

SPECIAL TOOLS

- 90 deg reverse drill
- lathe or use off
- hole saw or nibbler
- die grinder
- dyno or use of
- accurate fuel ratio meter
- boost gauge
- fuel pressure gauge
- fuel return gauge
- dial indicator
- long straight edge

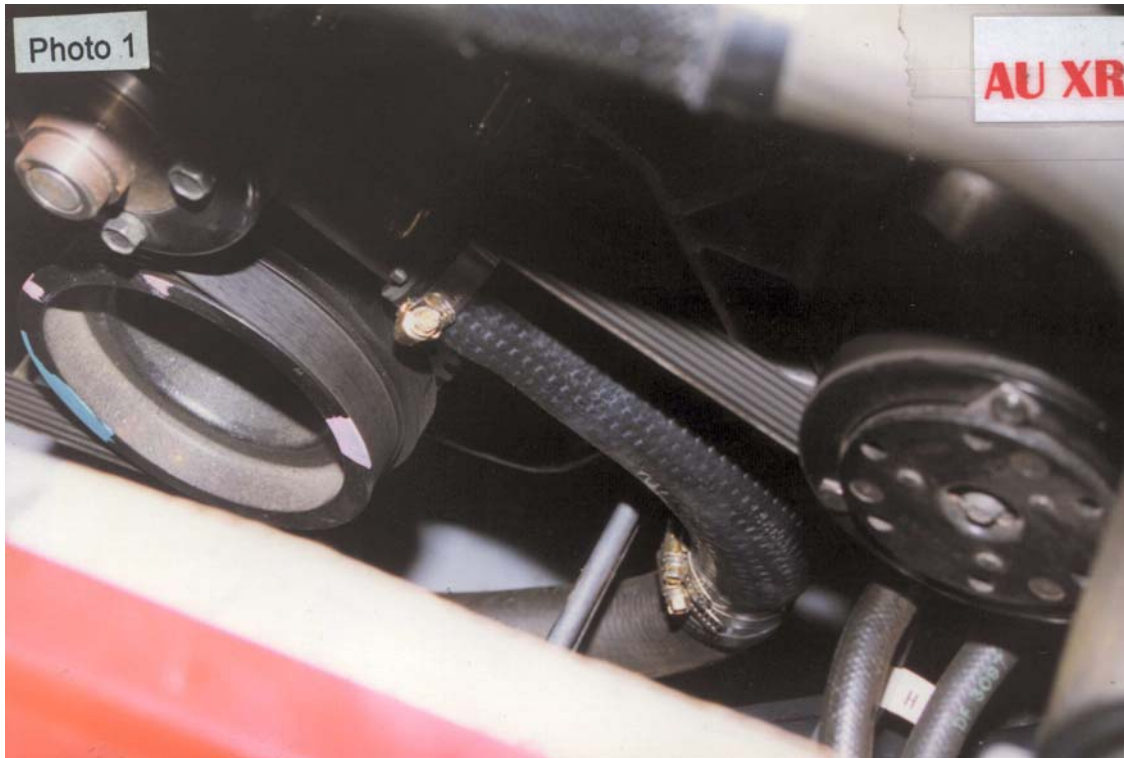
VORTECH SUPERCHARGER OIL FEED SUPPLEMENTARY SECTION

1. The Vortech supercharger fits in the same manner as the Powerdyne unit.
2. It is recommended that the oil drain hose from the supercharger is fitted to an oil fitting at the sump, 1" down from the block and inline with a main journal. So it doesn't infringe on crankshaft or con-rods. This will also ensure that the crankshaft windage doesn't restrict the oil flow from the supercharger to the sump. The sump should be removed for the fitment of this fitting. Make sure that you don't infringe with the engine's oil pump when fitting the oil drain.
3. Supercharger oil delivery line is connected via oil light switch port. Unscrew oil light switch, fit in Y piece supplied, screw on oil light switch then screw in oil delivery line on the other end, re-fit oil light switch wire. Connect other end of oil pressure line to supercharger.

WARNING: DO NOT USE TEFLON TAPE OR ANY OTHER SEALANTS ON ANY OIL FEED LINES OR FITTINGS, SEALANT WILL BLOCK OIL FEED RESTRICTOR IN SUPERCHARGER. SUPERCHARGER DAMAGE WILL OCCUR AND VOID WARRANTY.

INSTALLATION

1. Fit bottom radiator hose extension using steel joiner sleeve, connect the extension hose to the water pump and existing radiator hose.(*see Photo 1*).



2. With hose stay removed on rail near balancer fit protective rubber over bottom hose and plastic tie in place.(*see Photo 2*).



3. Extend Air Flow metre wire using the 4 Core wire supplied and cover with conduit.
4. Extend Air Temp sensor wire using 2 Core wire supplied. Cover with conduit.
5. Fit new crankshaft spacer and pulley on top of the original pulley, check that it bolts up square, using the original thick washer under bolt head. Use a Dial Indicator to ensure that the Crank Pulley runs true.*(see Photo 4).*

NOTE: Ensure all surfaces are clean.



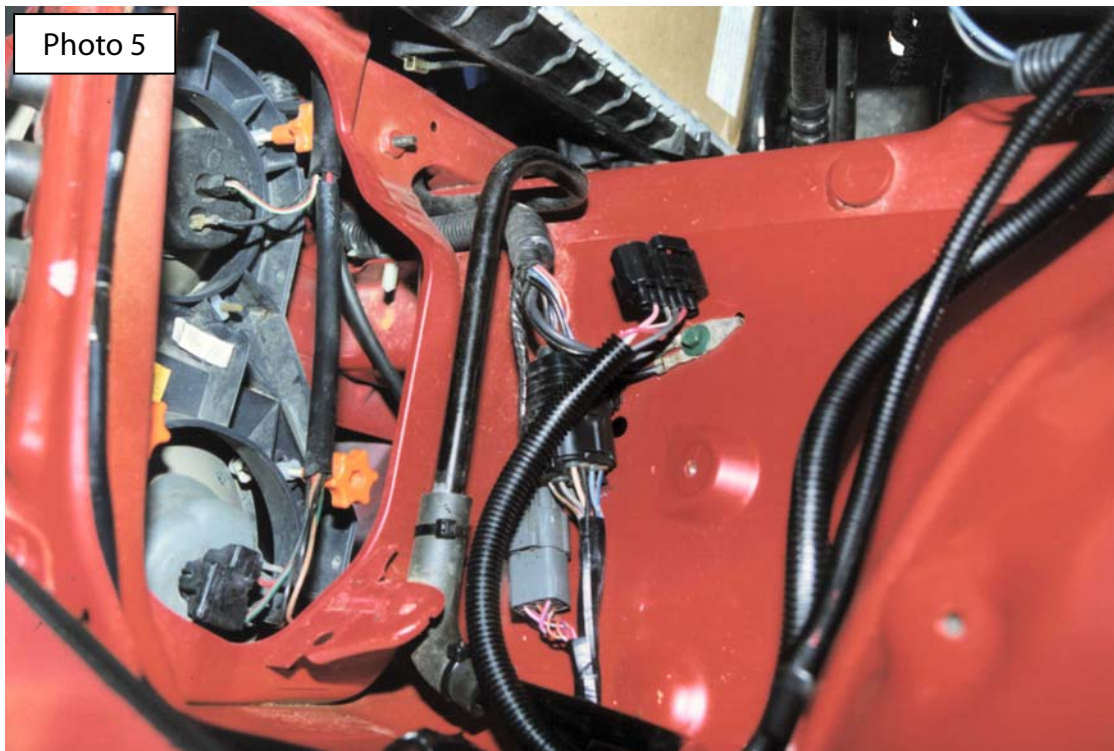
6. **Vortech Only** - Assemble and fit bracket as per drawing below. Remove power steering pulley, and fit counter-sunk bolts into bracket end. Fit bracket and check alignment.



7. Fit Air Filter adaptor and bracket to Air Flow Meter using the bolts supplied (**see photo 6**).



8. Fit air filter assembly and air flow meter with bracket supplied to corner headlight bracket. (**see Photo 5**). Filter and meter assembly fits in position (**see Photo 7**).



9. Fit supercharger to bracket with bolts supplied, 5 x 1 1/4 x 3/8NC cap bolts. Fit idler pulley assembly to bracket, just nip it up. Check the position of the scroll.

NOTE: Position scroll on blower. You may need to heat scroll slightly to change position. Do not rotate, lift off and re-position. Take care, do not bump impellor. Re-check impellor clearance with feeler strips min .8mm.

10. Check blower pulley is running true with crank - shaft pulley. With a long straight edge, check that the blower lines up with the crankshaft pulley. Check that the blower is on the same vertical tilt angle as the crankshaft pulley, you can use a fishing line with a weight on the end of it to check this. Position the car so that the vertical tilt line is square with the crankshaft pulley. Check this against the blower pulley to make sure that the blower and bracket are at the same vertical tilt angle. Check against other pulleys if possible just for your own reference that you are measuring vertical. Check the measurement from straight edge to the first pulley groove on the crankshaft pulley, it must be the same on the blower pulley. Take this into consideration when adjusting the idler pulleys as well. Re check alignment after tightening all bolts.*(see Photo 10).*

NOTE: if unsure call for assistance, this is important. If you don't get this right, the belt will move on the idler pulley when you rev up the motor underload above 3500rpm.



11. Fit the blower belt provided. Tension belt idler pulley only. Tension belt tightly enough to eliminate slippage. Re-tension the belt after 500km. Do not overtighten the belt.

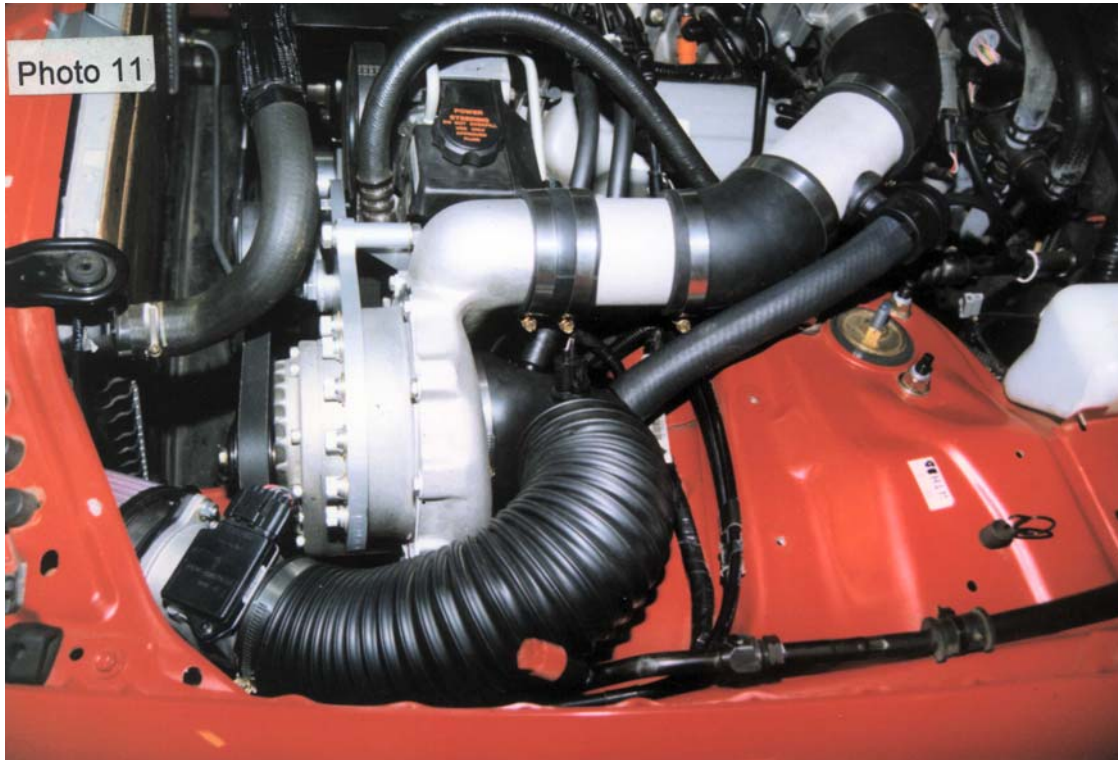
NOTE: Check belt for clearance to transmission/Power steering cooler hoses under belt.

12. To recheck that all pulleys lines up. Later, wind the motor over, then start the motor. Let idle and check. Then rev up motor to check if the belts walk off the pulleys. **Do this task at the end of the fitment tasks. Continue checking the belt during breaking in procedure and complete the rev up test at the end of the breaking in procedure. Before road test review the final checklist.**
13. With the bumper bar removed. Remove the headlight under cover to allow air to the air filter under the headlights (*see Photo 5 & 14*).



17. Fit Intake duct to the rear of Supercharger. Connect to air flow meter with thin silicon hose already fitted to air flow meter outlet. Secure with clamps. (*see Photo 7*).
18. Fit Air Temp sensor into discharge tube.

19. Install discharge assembly. Starting at the throttle body using a shortened 45° into the Aluminium tube with blow off valve grommet in it. Then into a shortened 45°rubber bend, to the discharge side of the blower. All should be joined via clamps. **(See Photos 11 & 12).**
20. Connect blow off valve to aluminium tube. Connect blow off valve hose to valve. And run the blow hose back into the intake tube on the blower. **(See photo 11).**



21. Connect 4mm vacuum hose to the blow off valve to vacuum source at inlet manifold.
22. Disconnect the PCV breather hose from the throttle body. **Using the plug and cap provided, cap off throttle body PCV outlet.**
23. Refit Bumper and inner guard linings.
24. Refit Radiator Fan assembly.
26. Drain the petrol tank and refill with 98octane Fuel.
27. Re-connect the battery.
28. Refill the cooling system then **start the engine as per task 12**. As the engine idles bleed out any air from the cooling system and add coolant. Do this in conjunction with **task 12**.

NOTE: Do not mix two different types of coolant together.
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29. Check and adjust the idle if necessary, you might have to turn idle down slightly, check after running for 10 minutes. Run in blower as per breaking in procedure.
30. Review 'Breaking In' procedure.

BREAKING IN

Run motor at idle and fast idle for 5 to 10 minutes, do not rev up motor, then stop motor allow blower to cool for 10 minutes, then drive at no boost for approximately 10 minutes, not exceeding 3,000rpm, then allow blower to cool. Drive vehicle not exceeding 3,500rpm at no boost for approximately 100 to 150kms. This will ensure that the bearings and drive belt are run in before loading up the system by boosting. Always warm the motor - blower, before using boost. This will help in the life longevity of both the motor and blower. **Before driving, review the Final Check List. This procedure is very important and must be carried out to the letter.** Dyno tuning may only be done after this procedure is completed.

Do not dyno run car until the 100-150km has been driven.

GENERAL NOTES

It is the installers responsibility to dyno the car to check that all systems are working correctly, especially maximum fuel delivery and to check for any presence of detonation.

Check boost on dyno and that advertised boost is not exceeded and rpm occurs at designated rpm.

Have injectors cleaned and flowed. A must on used injectors, peace of mind on new injectors.

Make sure that all fuel hoses are in excellent condition, or replace. Check that all clamps are tight and that there are no fuel leaks.

The blower will have a sweet high pitched whirring noise from the belt drive. As the blower goes through its running in time, the noise will slowly dissipate.

PRECAUTION: If the blower ever gets louder or starts to make an erratic noise or a noise through the intake tube, such as a air hissing noise, disconnect the blower belt and call CAPA for assistance and advice.

FINAL CHECKLIST

1. Carefully review the entire installation. Check oil and fuel lines near moving parts and the exhaust system to ensure that these lines are safe, secure and not twisted or kinked. All wires and hoses should be firmly secured with clamps or wire ties.
2. Check all fluid levels. Your vehicle should be filled with premium fuel before any driving. It is important that you performed an oil and filter change. If you did not do so before, it should be performed now before proceeding further.
3. Start engine and idle for a few minutes. Check your timing. You want to run as much timing as possible while avoiding detonation. It is better to lean on the side of less timing and no detonation!
4. Shut off your engine and check for fluid leakage, signs of rubbing parts, and other potential problems. Pay particular attention to fuel leaks, check by using CRC spray any vacuum leaks at base of injector.
5. Check nothing is near any hot spots.
6. Your vehicle should display a significant increase in performance when you step into the throttle, with no detonation, yet should maintain its previous driveability during daily driving. If this is not so, review your installation, then contact CAPA assistance.
7. For best performance and reliability, **always use premium grade fuel** and listen for signs of detonation. Back off throttle should detonation occur. With a properly installed supercharger and appropriate timing, detonation should not be an issue.
8. Never race your engine when your engine is cold. Allow the water temperature to climb into operating range for several minutes before driving above 2,500r.p.m. to ensure adequate oil lubrication.
9. Please review the maintenance and warranty sections within this owner's manual.
10. Please take special note, operation of vehicle without all sub assemblies completed and properly installed may cause failure of major components.
11. After road test or first hard drive, check belts are okay and running properly in their grooves. Check the tension of belt and retension if necessary

WARNING

DO NOT ATTEMPT TO OPERATE VEHICLE UNTIL ALL COMPONENTS ARE INSTALLED AND COMPLETE. SUPERCHARGER KITS EXTRUDE A HUGE AMOUNT OF HORSEPOWER FROM A STOCK ENGINE THEY ARE NOT INTENDED FOR CONTINUOUS PERIODS OF MAXIMUM POWER OUTPUT. IT IS NOT OUR INTENTION TO CREATE RACE PROVEN HORSEPOWER BUT LEISURE ENDURING SYSTEMS.

GET OUT THERE & ENJOY...

