HOLDEN COMMODORE VS V6
ECOTEC 3.8L (1995-2000)

VORTECH ENGINE BELT 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 minimum of 96-98 RON 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. Check that all components of the ignition system are in top condition.
6. 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.
7. Always listen for signs of deterioration (pinging) and discontinue hard use (no boost) until the problem is resolved.
8. Change oil and oil filter every 5,000km. **OVER FILL OIL BY 0.5 LITRE WHEN KIT IS FITTED.**
9. Always use an air-filter.
10. Never strike the supercharger pulley with a hammer or other tools. (Evidence of such force will void warranty).
11. 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**).

    Impeller speed calculated as below:

Vortech V-2 / V-3 Supercharger

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

12. Never hold RPM on Rev Cut as this will cause damage to the Engine by detonation.

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. = gauge pressure +
atmospheric pressure
absolute pressure

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

KITS PARTS LIST

	Quantity	Checked
SUPERCHARGER ASSEMBLY:		
Supercharger Assembly	1	
Supercharger Pulley	—	
Supercharger Reservoir Bottle	1	
Supercharger Reservoir Bottle Mount and Bracket, VS	1	
½" x ¼" UNC Bolts	2	
650mm x 3/8" Rubber Hose and Conduit	1	
10mm Hose Clamps	2	
MOUNT / DRIVE SYSTEM:		
6PK3055 Belt	1	
Aluminium Supercharger Mount Bracket	1	
1 ¼ x 3/8 UNC Allen Head Cap Screws, Flat and Spring Washers	5	
70mm Idler Pulley	2	
2.5mm Thick Spacer with 17mm Hole	1	
Coil Relocation Bracket (Aluminium)	1	
55mm x 10mm Bolts, Flat and Spring Washers	2	
30mm x 10mm Bolts, Flat and Spring Washers	3	
Earth Extension Lead for Coil Pack	1	
Top Supercharger Bracket Spacer (with milled section)	1	
Middle Supercharger Bracket 2 Piece Spacer w/ 48.7mm Idler	1	
Bottom Supercharger Bracket Spacer (with angle bracket)	1	
165mm x 10mm Bolts, Flat and Spring Washers	2	
Idler Pulley Mount Spacer w/ 48.7mm Idler Pulley	1	
50mm x 12mm Bolt w/ Spring Washer	1	
AIR INTAKE:		
3 ½" x 60mm Silicon Sleeve	1	
90° Plastic Bend, Vortech	1	
(Fitted with 3/8-1/8 Reducer and 10mm Barbed 90° Brass Fitting)		
CAPA3130 Air Filter	1	
HS60 Clamps	2	
AIR DISCHARGE:		
3 ½" x 50mm Rubber Joiner	1	
3 ½" 90° Rubber Bend	1	
280mm Aluminium Tube w/ BOV Grommet & Air Temp Sensor	1	
HS60 Hose Clamps	6	
Plastic Bypass Valve	1	
Sock and Cable Tie	1	
600mm x 1" BOV Rubber Hose	1	
1200mm x 4mm Vacuum Hose	1	
4mm T-Piece	1	

Parts List continued on Next Page…

KITS PARTS LIST, CONTINUED

	Quantity	Checked
PCV HOSE FITMENT:		
900mm x 10mm Hose	1	
900mm x 16mm Convolute	1	
10mm Hose Clamps	3	
10mm Blank Cap	1	
FUEL REGULATOR / FMU (Optional):		
10:1 Fuel Regulator + Fixing Screws	1	
90° FMU Fuel Hose Fittings	2	
450mm x 8mm Fuel Hose	1	
400mm x 8mm Fuel Hose	1	
8mm Hose Clamps	4	
3/16 Brass T Pieces	2	
2000mm x 4mm Hose	1	
INLINE FUEL PUMP KIT (Optional):		
Inline Fuel Pump	1	
Rubber Mounts	4	
Hex Head Screws	4	
Pump Mount Plate	1	
500mm x 5/16 EFI Fuel Hose w/Conduit	1	
EFI Hose Clamps 12-14	4	
Relay	1	
Fusible Link	1	
5000mm x 6mm Red Wire	1	
500mm x 6mm Black Wire	1	
2000mm x 2 Core Wire	1	
Relay / Pump Wiring Connectors	1	
Pressure Switch Assembly on 3/8 Barb	1	

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

PULLEY CONFIGURATION

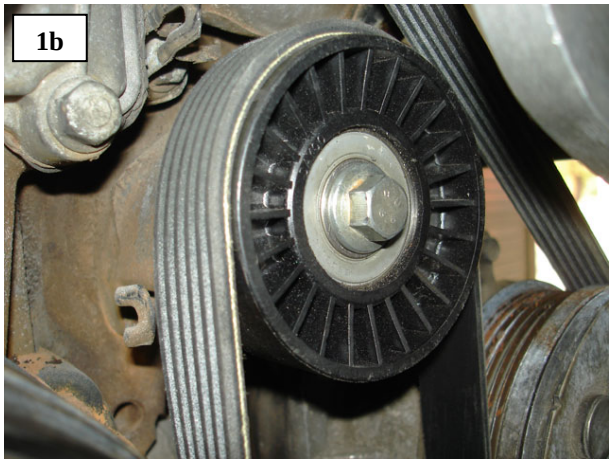
Belt Length	Supercharger Pulley	Boost	Tensioner Pulley	Bottom Idler	Supercharger Idler
6PK3055	3.12″	16psi	76mm Plastic	76mm Plastic	48.6mm Steel
6PK3055	3.3″	14psi	70mm Steel	76mm Plastic	48.6mm Steel
6PK3055	3.48″	12psi	70mm Steel	70mm Steel (76mm Plastic Belt Stretch Upgrade)	48.6mm Steel
6PK3055	3.6″	9psi	70mm Steel	70mm Steel	48.6mm Steel

PREPARATION & PART REMOVAL

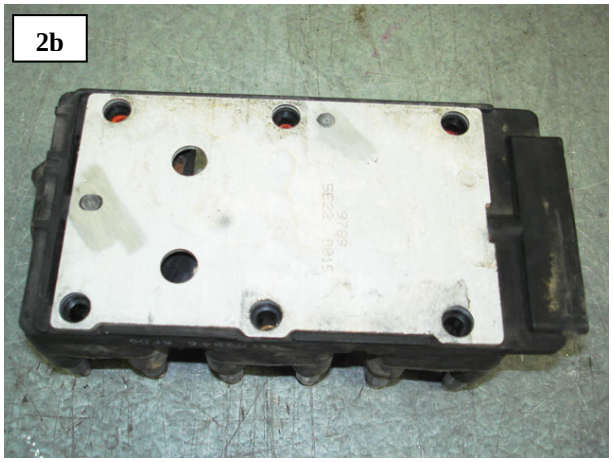
1. Remove Engine Cover
2. Remove Fan and Shroud Assembly
3. Remove Air Filter Box Assembly and Intake Tube
4. Remove Serpentine Belt
5. Remove Idler Pulley, Coil Pack Assembly Mounted to Front LH Head

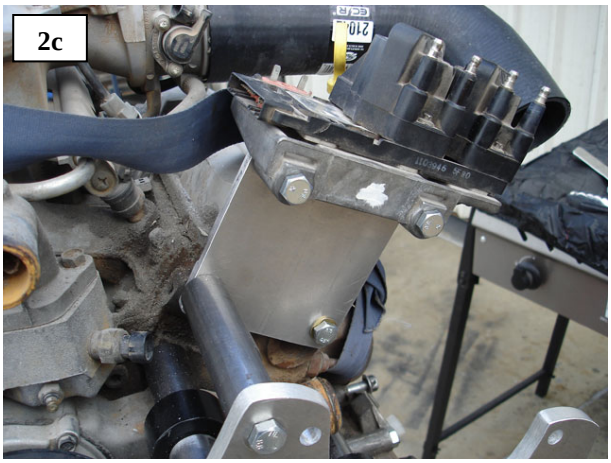
INSTALLATION

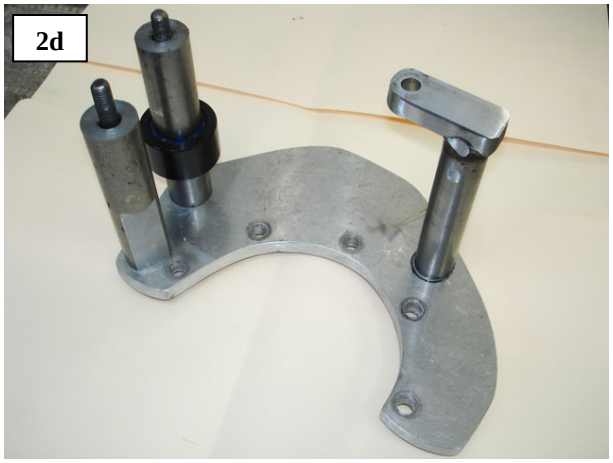
1. Remove automatic tensioner pulley and fit 70mm pulley as supplied in kit *as per photo 1a*. Fit 70mm idler and spacer to lower idler post *as per photo 1b* (spacer needs to go behind idler to allow clearance from post).



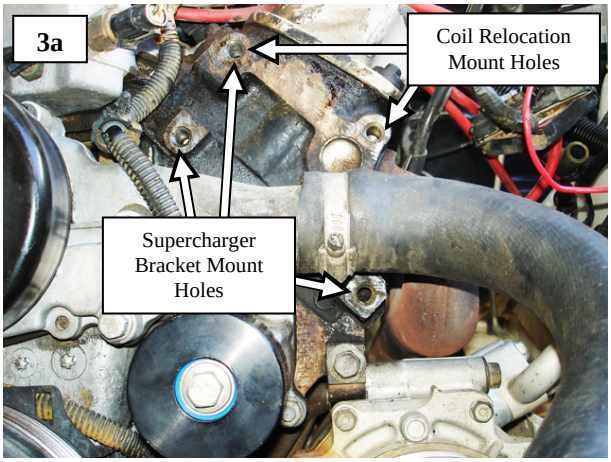
2. Fit aluminium coil relocation bracket to front of LH cylinder head *as per photo 2a* using one 30mm x 10mm bolt, flat and spring washer to bottom hole. Top hole will be secured to supercharger bracket retaining bolt. Coil pack has to be turned on mount. Remove 6 coil retaining bolts, remove coils and base plate. Two locating lugs on bottom of base plate need to be linished off to allow coils to be rotated *as per photo 2b*. Refit coils and base plate to mount bracket and resecure. Mount coil pack to aluminium bracket on cylinder head using two 55mm x 10mm bolts, flat and spring washers *as per photo 2c*. Coil pack earth wire will need to be extended using lead supplied in kit.

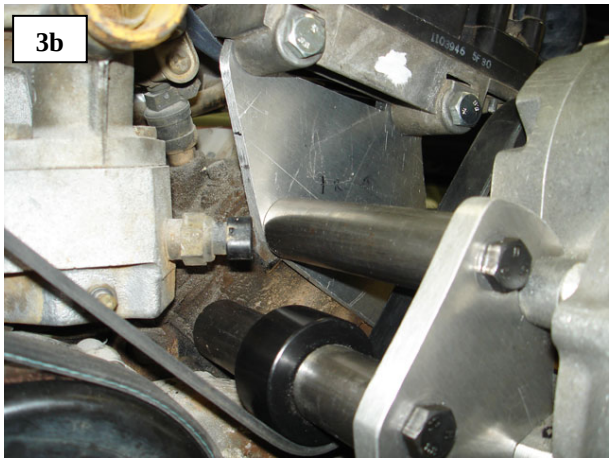


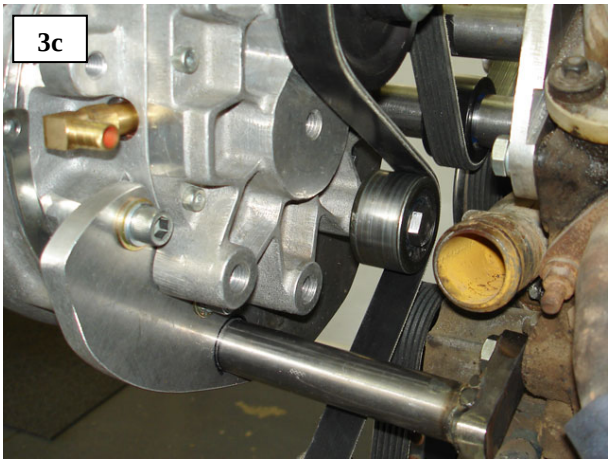


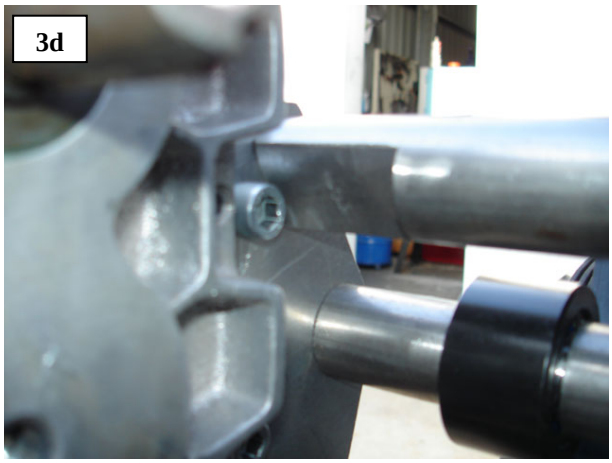


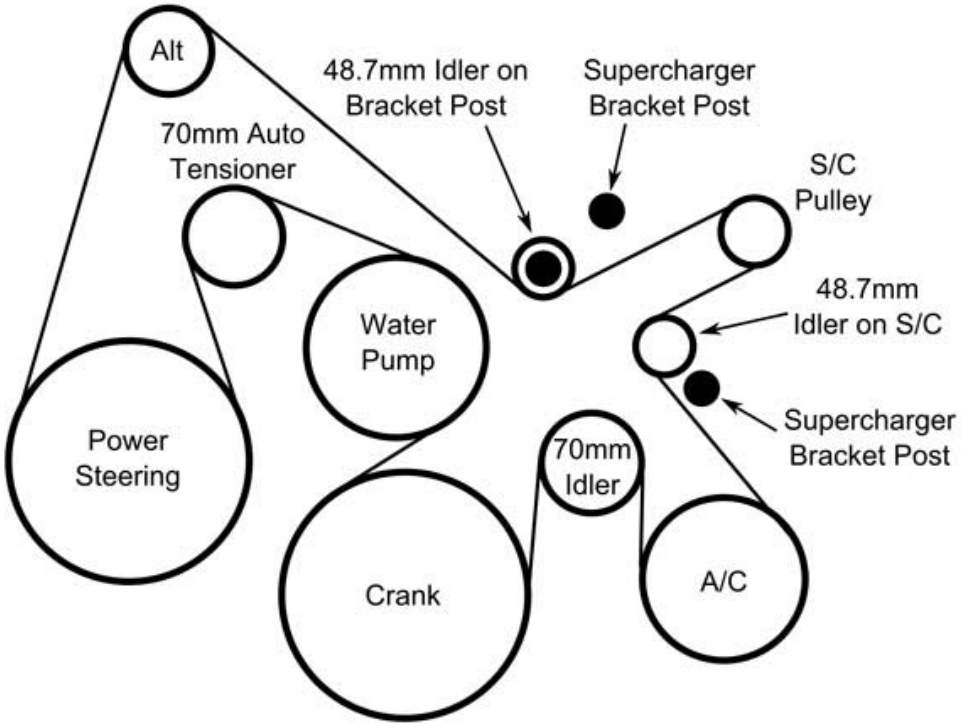
3. Supercharger bracket is fitted to vehicle using two 160mm x 10mm bolts, flat and spring washers *as per photos 2d and* 3a on the top two posts, and two 30mm x 10mm bolts, flat and spring washers on the bottom post *as per photo 3c*. Fit bracket spacer as per photo. Mount bracket to LH cylinder head hole *as per photo 3a* (ensure milled section of top spacer aligns to allow clearance for top supercharger mount. Also ensure belt is under spacer when fitting bracket (spacer positions in belt diagram).





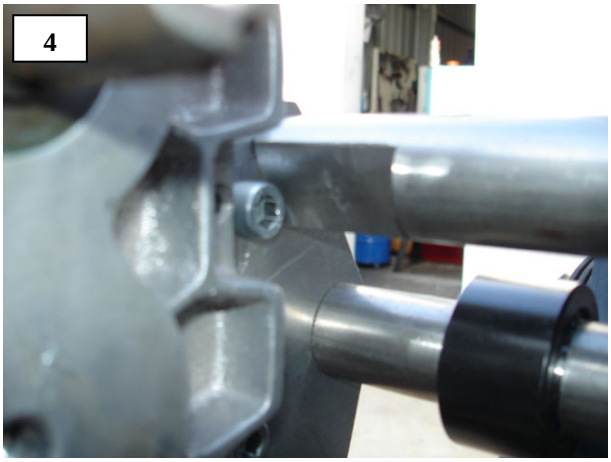




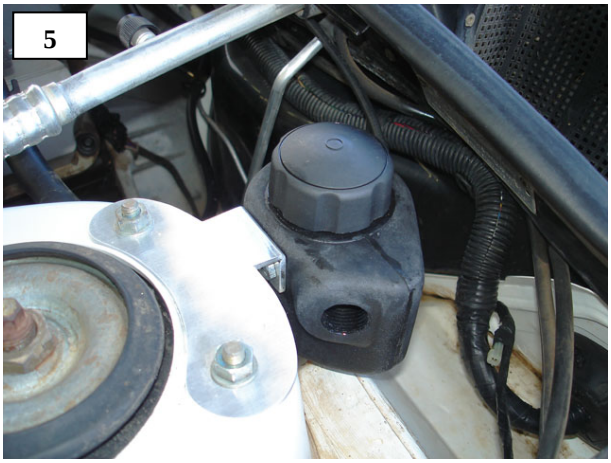


4. Fit supercharger assembly to bracket using five 1 ¼ x 3/8 UNC Allen head cap screws, flat and spring washers.

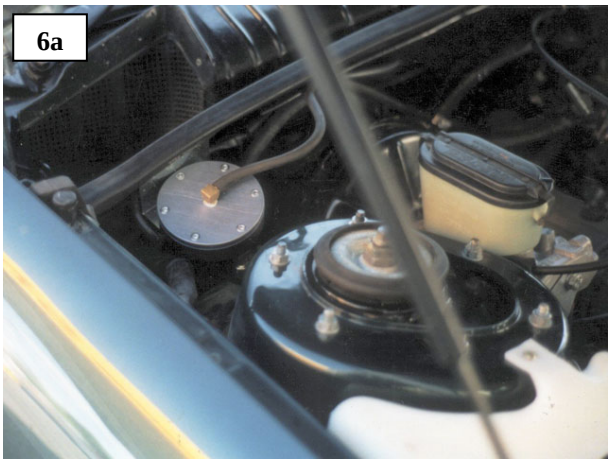
5. Fit idler pulley to bottom of supercharger housing *as per photo 3c*. Fit new belt as supplied in kit. Refer to belt layout diagram.

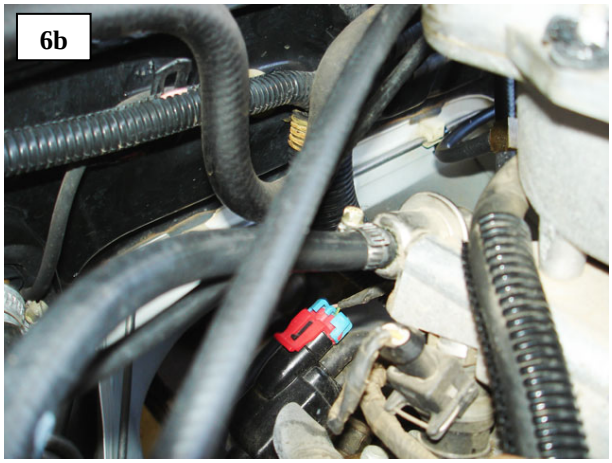


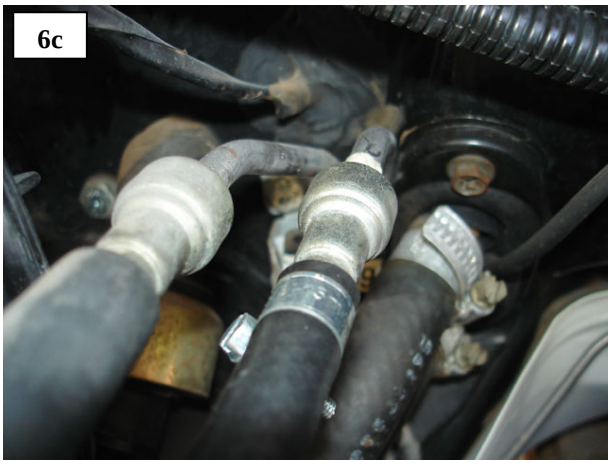
6. Fit supercharger reservoir bottle and bracket to rear of left hand suspension tower *as per photo 5*. Secure hose to brass fitting on supercharger with clamp.

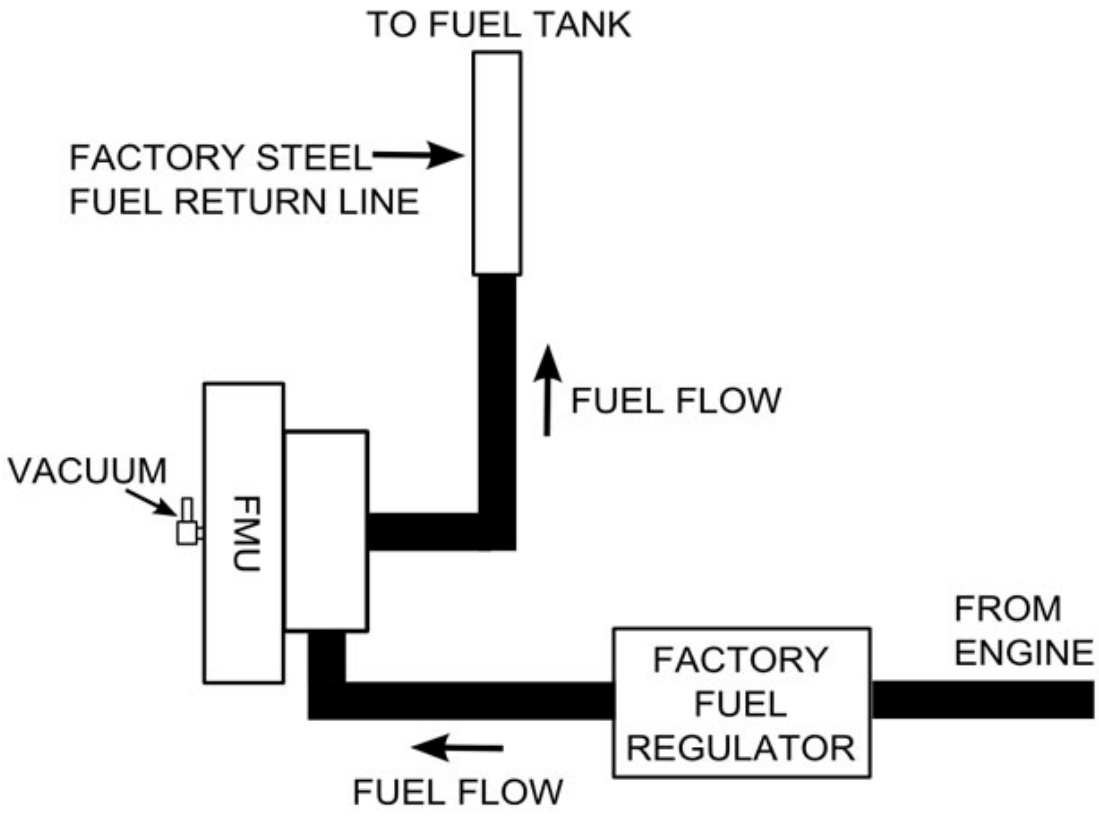


7. Mount fuel regulator to vehicle *as per photo 6a*. Unclip existing fuel hose from firewall and cut hose from fuel reg at back of plenum chamber. Cut fitting from hose and discard hose. Refit fitting to steel tube and plumb to regulator as per diagram.



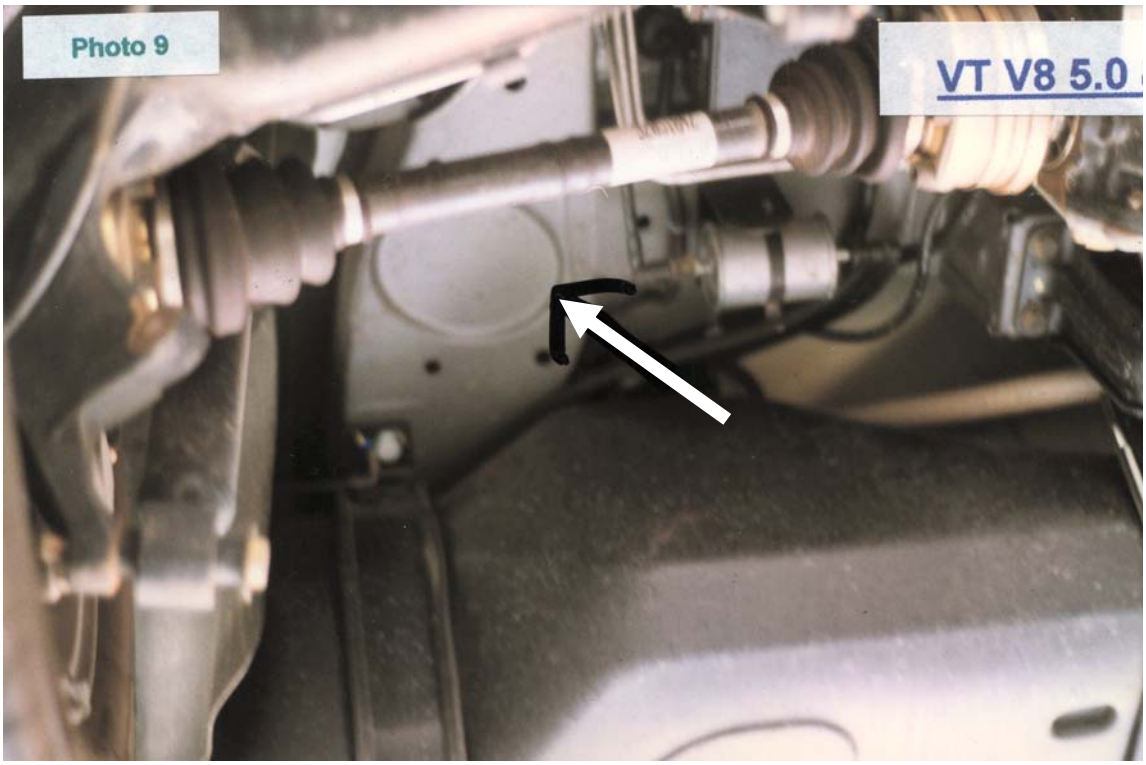


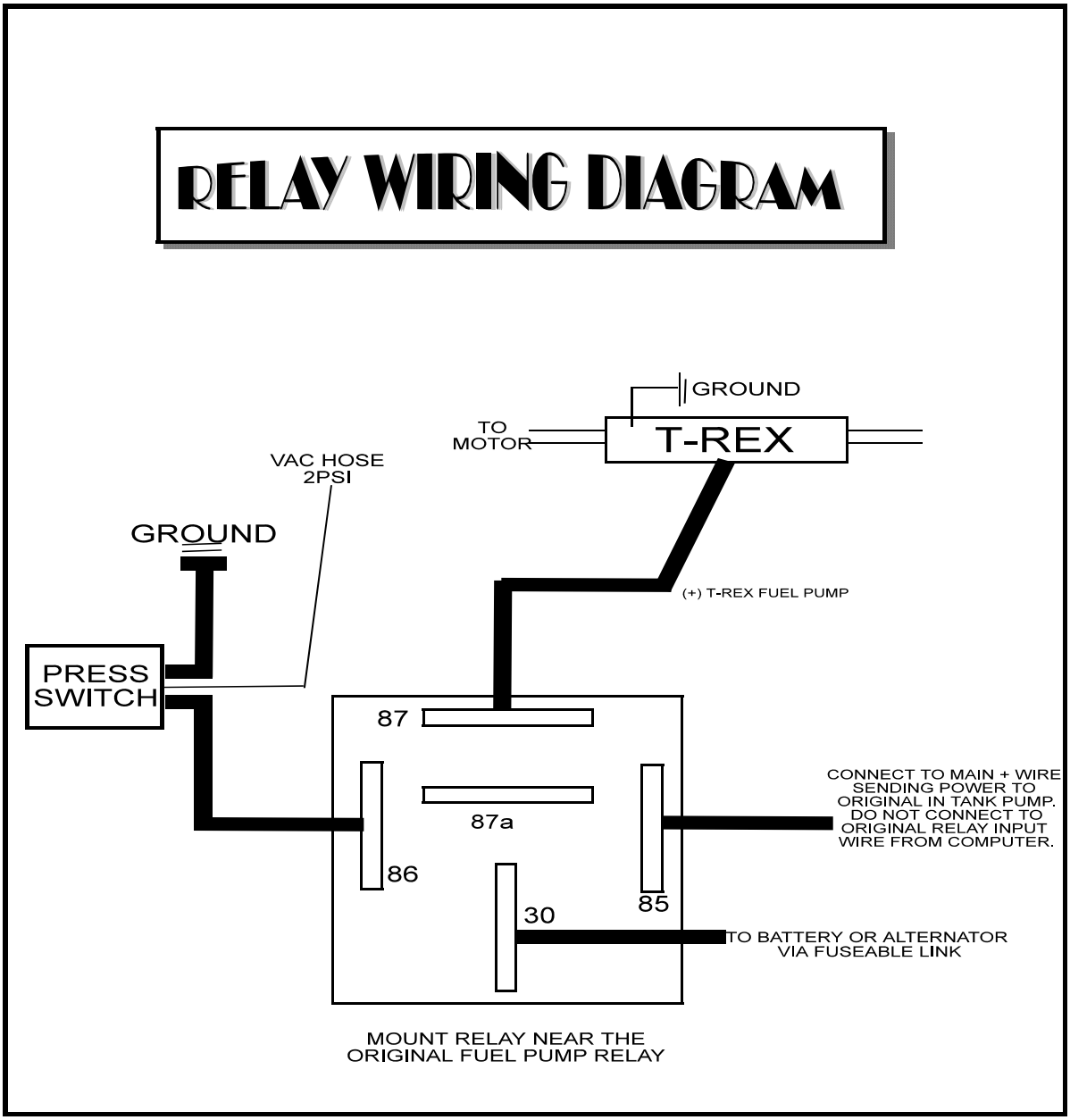




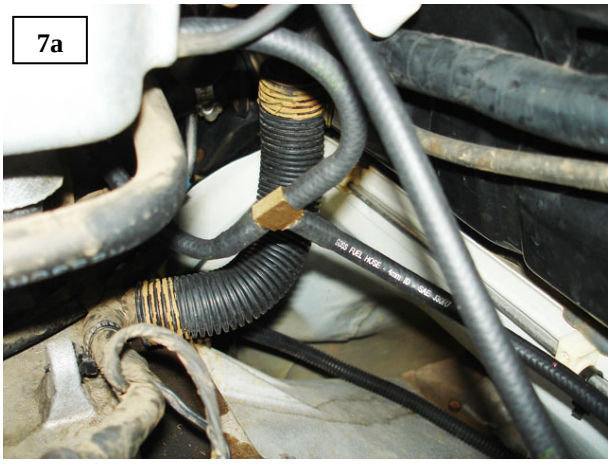
8. Fit Inline Fuel Pump supplied, test flow of original intake pump, if not within OE specifications, replace it with an OE replacement pump only. Replace fuel filter with one supplied. Mount Inline pump under car indicated by arrow in *photo 9* making sure that it is far from any rubbing parts. Mount on brackets supplied. Run high pressure hose from fuel filter outlet to T-Rex fuel pump then connect hose from outlet of T-Rex pump to steel tube sending fuel to motor. Cut and discard small plastic tube originally joining from fuel filter to steel tube. Utilise barbs on both ends for rubber hose use clamps provided. Mount fuel pump relay near original fuel pump relay and wire as per diagram. See relay wiring diagram. Mount the pressure switch to the brake booster hose as close as possible to the manifold fitting, mount in a position where it will not suffer heat from manifold or rattle against anything, using the 2 core wire provided, track the 2 core wire loom back to the relay and earth the wire near the relay. Test fuel pump system to ensure it maintains adequate flow and pressure at top boost, do this test with hot fuel and headlights on high beam.

NOTE: Fuel systems runs under high pressure, check all clamps and tighten, check hoses are in good condition or replace.





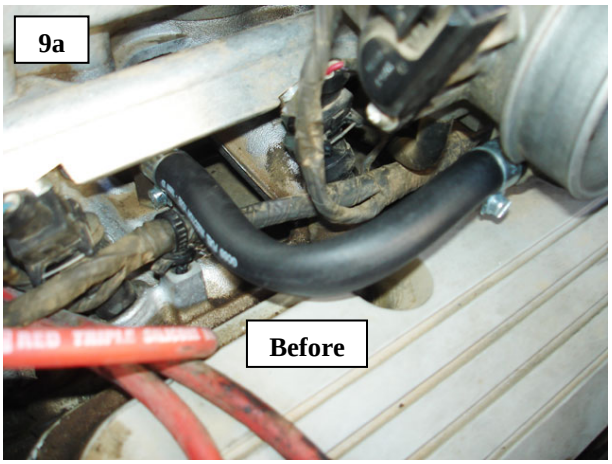
9. Fit T piece joiner to existing vacuum hose at rear of plenum chamber *as per photo 7a*. To outlet of T piece, fit 150mm long piece of 4mm hose. To this fit another T piece *as per photo 7b*. Route 4mm hose from one of the T piece outlets to the vacuum port on the fuel regulator.

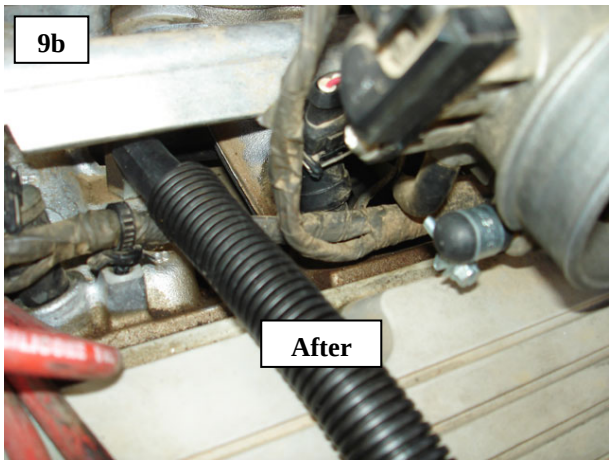


10. Remove airflow meter from factory intake pipe. To throttle body side of airflow meter fit 50mm long piece of 3 ½" rubber hose and secure to throttle body and airflow meter using two hose clamps. Mount discharge tube between supercharger outlet and airflow meter using 90° rubber bend, aluminium sleeve and rubber joiner as per photo (unclip air temp sensor and airflow meter wiring loom from LH inner guard and connect to sensor and meter). To other outlet of vacuum T piece previously fitted, route 4mm vacuum hose to vacuum port on bypass valve on discharge tube. Fit length of 1" rubber hose to outlet port on bypass valve and route down to chassis rail. To end of hose fit sponge sock and secure with cable tie.

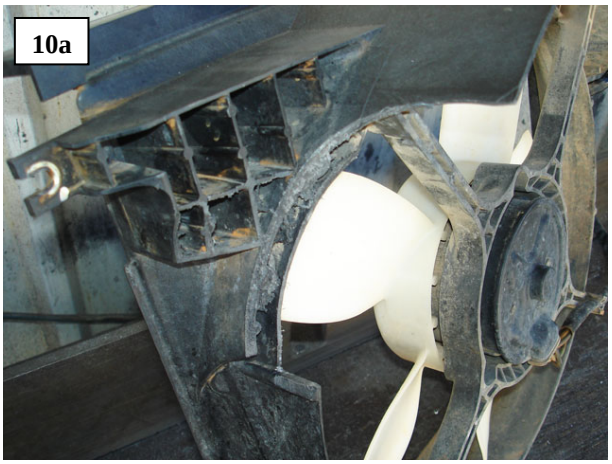
11. Assemble air filter intake *tube as per photo 10b* using air filter plastic 90° bend and silicone joiner. Mount assembly to supercharger and secure with clamps.

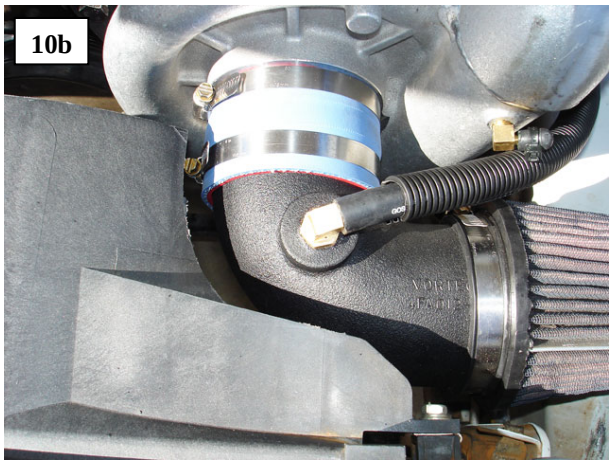
12. Remove existing PCV hose between throttle body and inlet manifold and discard. Block off throttle body outlet using rubber cap and clamp *as per photo 9a*. To manifold outlet fit 10mm hose supplied in kit and route down to brass outlet on air filter inlet pipe. Secure both ends with clamps.





13. Thermo fan shroud will have to be modified *as per photo 10a* to clear air filter tube. Fit fan and shroud to radiator. Refit power steering reservoir bottle to mount bracket on shroud.





14. Engine plastic cover will need to be modified *as per photo 11a* to clear coil pack.

WARNING

1. 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 OR EXTREME PERIODS OF MAXIMUM POWER OUTPUT. IT IS NOT OUR INTENTION TO CREATE RACE PROVEN HORSEPOWER BUT LEISURE ENDURING SYSTEMS.

2. WARRANTY POLICY FOR 12 MONTHS, UNLIMITED KILOMETRES COVERS FAULTY COMPONENTS PROVIDED IN SUPERCHARGER KIT. POLICY DOES NOT INCLUDE LABOUR TO REPLACE FAULTY PARTS.

3. THE RESPONSIBILITY OF ADR COMPLIANCE AND INSURANCE FOR THIS KIT FITTED TO A VEHICLE THAT IS ROAD REGISTERED AND DRIVEN IS THE RESPONSIBILITY OF THE VEHICLE OWNER.

4. RESPONSIBILITY FOR CORRECT FITMENT OF THE KIT IS THE REPONSABILITY OF THE FITTER.

5. DAMAGES TO VEHICLE OR SURROUNDS IS THE RESPONSIBILITY OF THE VEHICLE OWNER. PROVIDED THE KIT FITMENT IS CORRECT, ACCORDING TO THIS MANUAL.

GET OUT THERE & ENJOY...