

HOLDEN COMMODORE VF V8
6.0L GEN 4 (2013-2017)

**VORTECH INTERCOOLED
SUPERCHARGER KIT
INSTALLATION MANUAL**

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INTRODUCTION

Congratulations on selecting the best performing and best backed automotive supercharger available today. Before beginning 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 engine 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 Engine 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:		
Vortech Supercharger CCR, Special Outlet,	1	
Supercharger Pulley 3.8"	—	
Supercharger Pulley 3.6"	—	
Supercharger Pulley 3.48"	—	
SEALED SUPERCHARGER ONLY		
Pre-Filled Lubricant 180cc	1	
Supercharger Surge Oil Bottle & Fittings	1	
Oil Bottle Bracket & Bolts	1	
8mm Nut, Spring & Flat Washer	1	
450mm 3/8 Hose	1	
450mm Convoluted Tube	1	
8-22 Clamps	2	
OIL FEED AND DRAIN SUPERCHARGER ONLY		
3/8" BSP Male to Female 45° Elbow	1	
3/8" BSP x 5/8" Barb	1	
Rotabroach Kit	1	
13-32mm Clamps	2	
800mm Oil Drain Line 1/2"	1	
Vortech Oil Feed Kit	1	
Air Assist Kit (Fitted)	1	
45° 1/8" BSP x 7/16 JIC / -4AN (Fitted)	1	
MOUNT / DRIVE SYSTEM:		
Supercharger / Engine Belt		
6PK2300 Green Strap Heavy Duty	1	
6PK 2345 (with O/D Balancer Only)	1	
Idler Pulley, Steel 76mm (Location Pulley C)	1	
See Pulley Locations on Page 6 of this manual.		
Supercharger Mounting Bracket	1	
Supercharger Support Brace & Cyl Head Spacer	1	
100mm x 10mm Bolt, Flat and Spring Washer	1	
30mm x 12mm Bolt, Flat and Spring Washer	1	
137mm Bracket Spacer	3	
170mm x 10mm Bracket Mounting Bolts	3	
10mm Flat Washers	3	
62mm Steel Idler & Drilled Sleeve (Location Pulley B)	1	
35mm Idler Spacer	1	
85mm x 1/2 Bolt & Washer	1	
3/8" x 1.5 UNC Cap Head Bolts, Flat and Spring Washers	5	

Parts List continued on Next Page...

KITS PARTS LIST, CONTINUED

	Quantity	Checked
INTAKE		
CAPA 3.5" Offset Air Filter	1	
DISCHARGE & INTERCOOLER		
Intercooler	1	
LH Intercooler Mounting Bracket	1	
RH Intercooler Mounting Bracket	1	
2 ¾ 90° Rubber Bend Top Intercooler Hose	1	
6mm x 16mm Bolts, Spring & Flat Washers (Bracket to Cooler)	4	
Silicon Joiner, 65mm 3" Pipework	1	
Silicon 45* Bend (I-cooler to lower pipe)	1	
38-89mm Hose Clamps	4	
95-118mm Hose Clamps	1	
60-108mm Hose Clamps	6	
90° 3" Throttle Body Bend	1	
3" – 3.875" Silicone Elbow Reducer	1	
Top Alloy Intercooler Tube	1	
Bottom Alloy Intercooler Pipe	1	
Blowoff Valve	2	
Blowoff Valve Sock & Tie	2	
200mm 1" BOV Hose	1	
18-38mm Hose Clamps	2	
1200mm BOV Vacuum Hose	2	
50mm x 10mm Hose (Manifold PCV to BOV)	2	
4mm Brass T Piece	1	
PCV HOSE FITMENT		
2000mm x 10mm Vacuum Hose	1	
PCV Breather Fitting (In filter 3/8)	1	
3/8 Brass T Piece	1	
3/8 Brass 90 Degree	1	
100mm x 10mm Heater Hose	1	
WASHER BOTTLE REPLACEMENT		
Washer Bottle (no pump)	1	
Washer Bottle Bracket	1	
6mm x 16mm Bolt, Flat & Spring Washer & Nut	3	

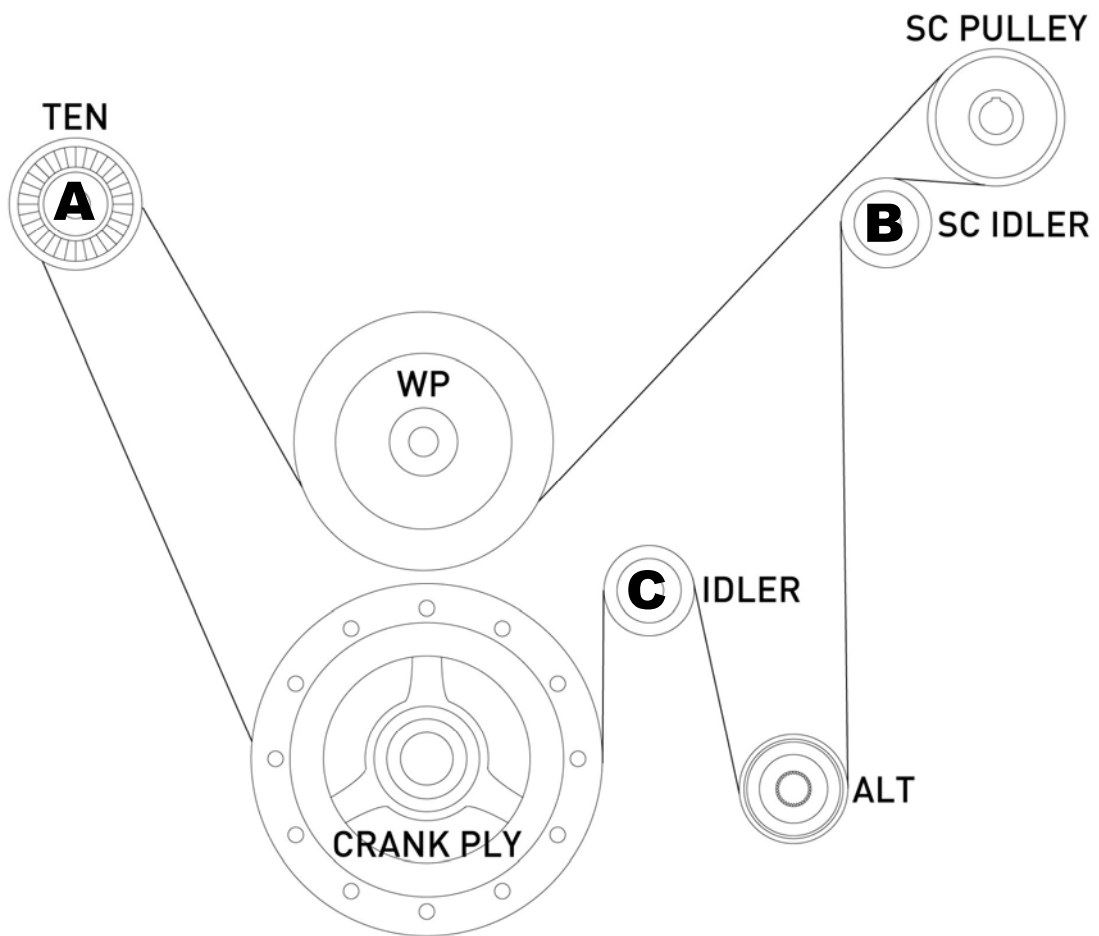
Important: Before beginning installation, verify that all parts are included in the kit - report any shortages or damaged parts immediately.

PREPARATION & PART REMOVAL

1. Remove Front Bumper and Undercover
2. Remove Passenger Side Headlight
3. Remove Engine Cover
4. Remove Top Radiator Cover
5. Remove Complete Airbox and Airflow Meter Ducting
6. Remove Engine Drive Belt
7. Remove Bolt on Alternator Bracket between Crankshaft and Alternator, ready to accept extra Idler Pulley.
8. Remove Aluminium Front Crossmember
9. Remove Washer Bottle & Radiator Ducting from Crossmember

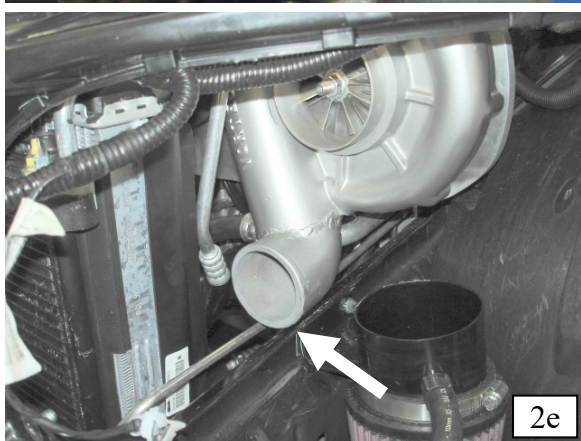
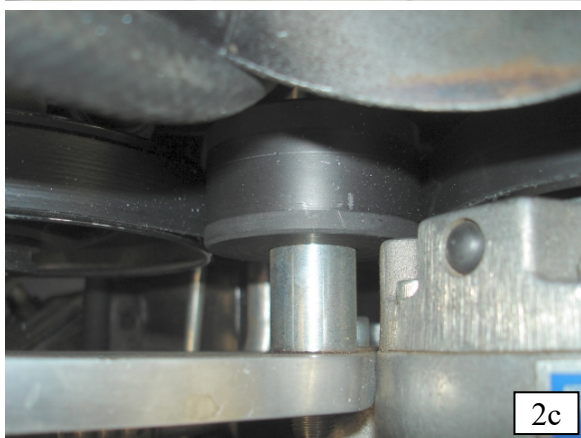
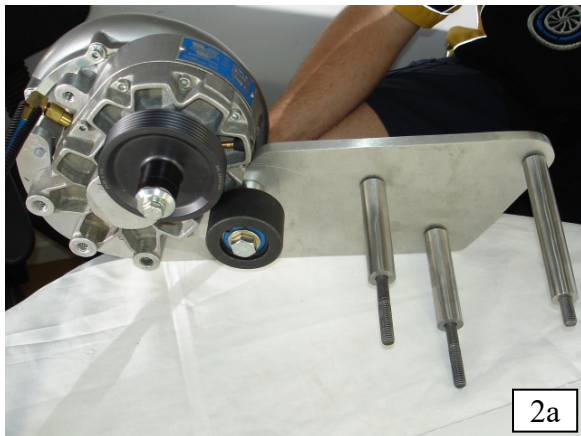


INSTALLATION



1. Replace factory Idler 'Idler C' with 76mm flat steel idler supplied.

2. With the supercharger mounted to the bracket, bolt the 62mm idler bolted in position using an 85mm x 12mm bolt, flat & spring washer. A 35mm spacer will centralise the idler to the supercharger pulley as per photo 2c & 2d. Remove the top two power steering pump mounting bolts and one of the power steering reservoir mounting bolts that align with the bolt holes on the bracket. Fit bracket to the car using bolts and spacers provided. The two 96mm spacers bolt to the pump and the 132mm spacer bolts to the reservoir mounting. Use three 170mm bolts & flat washer to mount as per photos 2a and 2b.



NOTE: With the supercharger mounted and in position, make sure there is adequate clearance between the volute outlet and the chassis rail.

3a. Sealed Vortech Kits Only

With the supercharger mounted and in position, fit the oil feed bottle. The bottle mounts to one of the airbox retaining studs, just under the positive terminal. Mount with 8mm nut, spring & flat washer and fasten to vehicle. Route hose from bottle to supercharger using blue oil feed hose and then cover with convoluted hose. Ensure hose is clear of any hot or moving parts.



3b. Oil Feed and Drain Vortech Kits Only

To provide an oil drain for the supercharger, it is necessary to make a hole in the side of the sump. Locate and centre punch where the hole is to go. (Needs to be high enough to clear bottom of sump and across enough to miss internal wall in sump. Drill 1/8" pilot hole at centre location.

Using the 9/16" Rota-broach supplied to drill a hole in the sump. Break through the pan easily so that the cut out piece does not go into the sump. Once hole is cut, tap the hole with a 3/8"NPT tap until the fitting can be started. Ensure the flutes of the tap are packed with grease to hold metal fillings. Thoroughly clean threaded area, cleaning into the sump, ensuring all metal filings have been removed. Fit the 3/8" NPT hex nipple in new hole formed, ensuring a generous amount of Loctite is used to ensure a seal is formed. Screw elbow fitting to this with final position of the fitting pointing towards where the supercharger is situated

Remove the two bolts holding the small casting located above the oil filter. Drill through the existing hole in the casting neck with a 8.5mm drill bit and tap 1/8" NPT. Clean thoroughly to remove all metal fillings. Install the supplied 1/8" NPT to #4 straight fitting so it will point forward and away from the exhaust when installed on the vehicle. Attach oil feed line to the now oil feed line once back on the engine routing the hose along base of engine, utilising clamps supplied to prevent hose from kinking, abrasion etc up to where the supercharger is situated.



This area is situated on the passengers' side of the sump, up on a diagonal from the front edge of the steering rack.

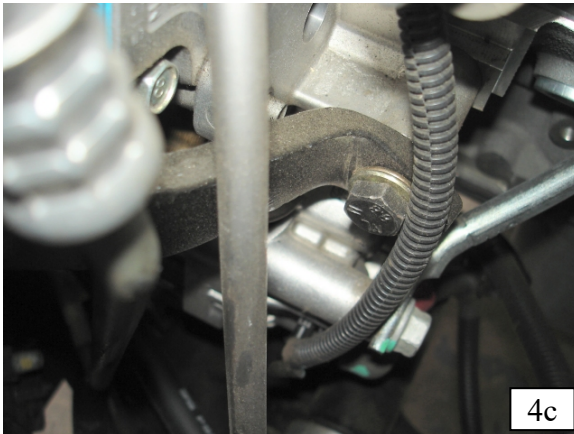
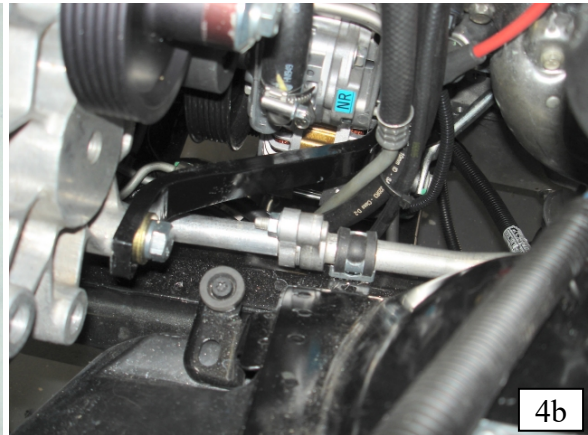
(Note faint line markings on sump. This indicates floor of sump as well internal cross brace)

NOTE: If your fitting looks different to pictured, you can tap into the side of the sump pan transfer cover which directs the oil hose into the direction required. Seal with Loctite and Master Gasket.



4. Mounting Supercharger Support Brace

Remove power steering pump side mounting bolt. Fit support brace in position and check that it lines up with bolt holes on supercharger and engine. Mount to engine using 10mm x 70mm bolt, flat & spring washer. Mount to supercharger using 12mm x 30mm bolts, flat & spring washers, tension but do not over tighten, see photos 4b and 4c.



5. Mounting Air Filter

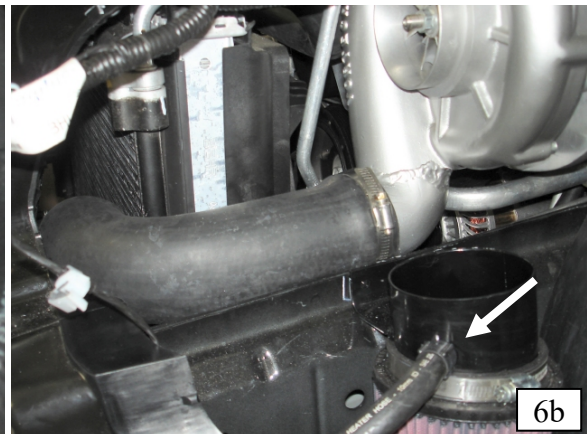
The air filter mounts to the metal sleeve supplied, which is then connected to the convoluted tube. The filter then hangs in position. See Photo 5a.



6. PCV Valve Breather

Remove existing black plastic tube from rocker cover breather on driver's side and replace with 10mm Hose as per photo 6a. Route hose to the air filter sleeve and connect with fitting in sleeve as per photo 6b.

NOTE: When filling engine with oil, disconnect breather hose shown in photo 6a from tappet cover. This will stop any oil going down this hose if tappet cover backs up with oil in the filling process. This will ensure no oil gets into the supercharger.

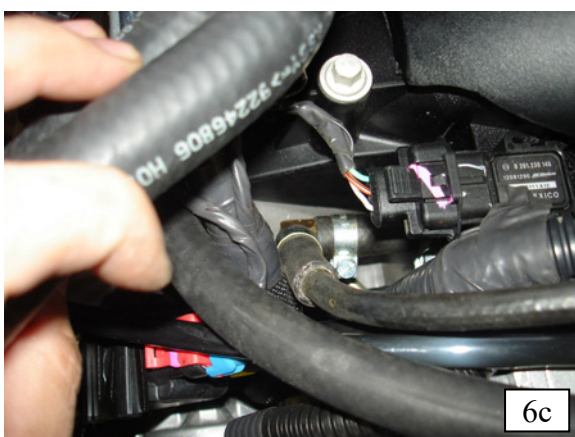


7. With the PCV valve breather in place, remove the factory breather hose from the throttle body to the manifold as per photo 7a. Cap off and throttle body pipe using an 8mm rubber cap and clamp provided. Connect hose to manifold outlet and T into breather hose fitted in step 7 using a 3/8 brass T piece as per photo 7c.



8. Fitting Vacuum Source

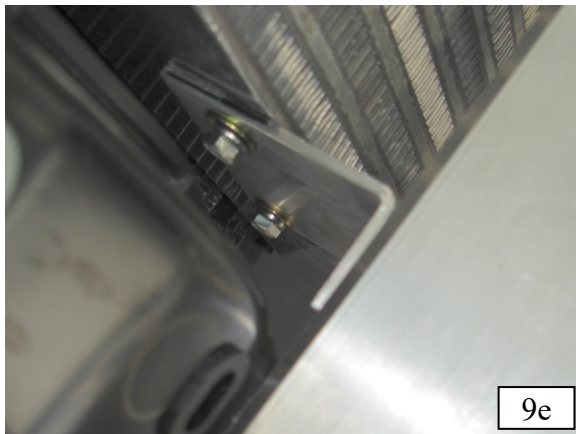
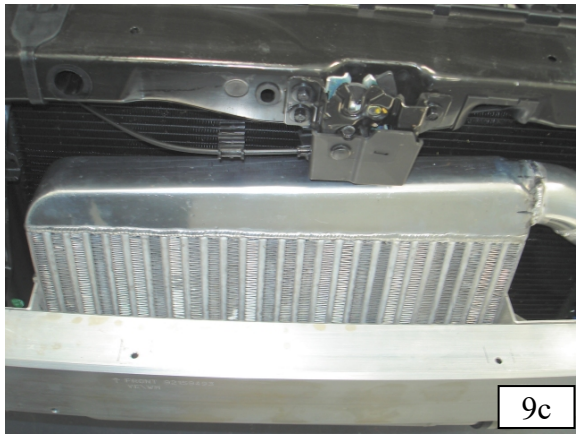
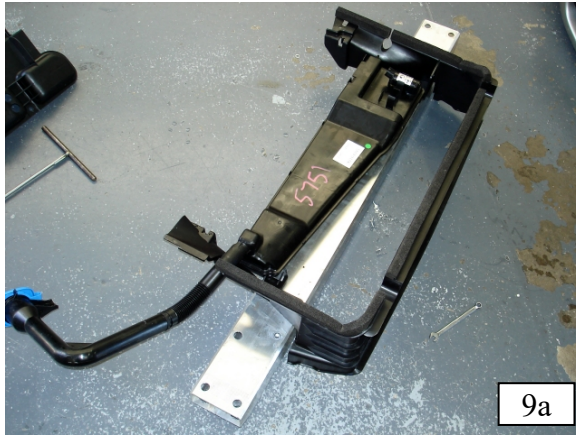
Boost reference is now sourced from barb located behind rear of throttle body, on throat of manifold, where passenger side pcv used to source vacuum reference from, Refer Picture 6c.



9. Intercooler Fitment

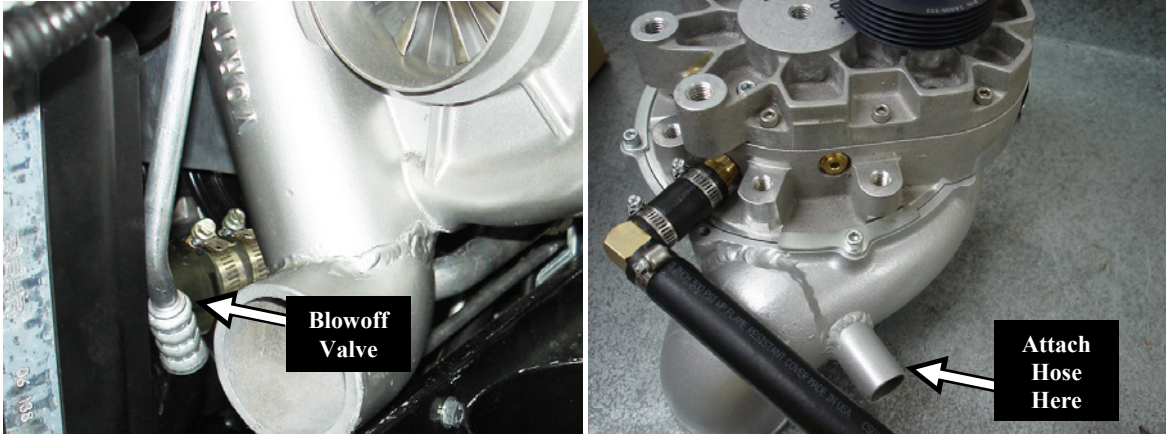
With the aluminium front crossmember still removed, fit the intercooler to the crossmember using left and right brackets and original washer bottle mounting bolts. Use four 6mm x 16mm bolts, flat & spring washers to mount bracket to intercooler. Refit crossmember into position using original bolts (discard washer bottle and plastic air dam).

Ensure the top intercooler pipe does not come into contact with the radiator support panel as shown in photo below 9d.



10. Supercharger Blowoff Valve Fitment

Fit rubber joiner, blowoff valve, sock and tie to supercharger using 18-38mm hose clamp. Tee in vacuum line T Piece to bypass valve and run the vacuum line to the front of vehicle for fitment of the second blowoff valve.

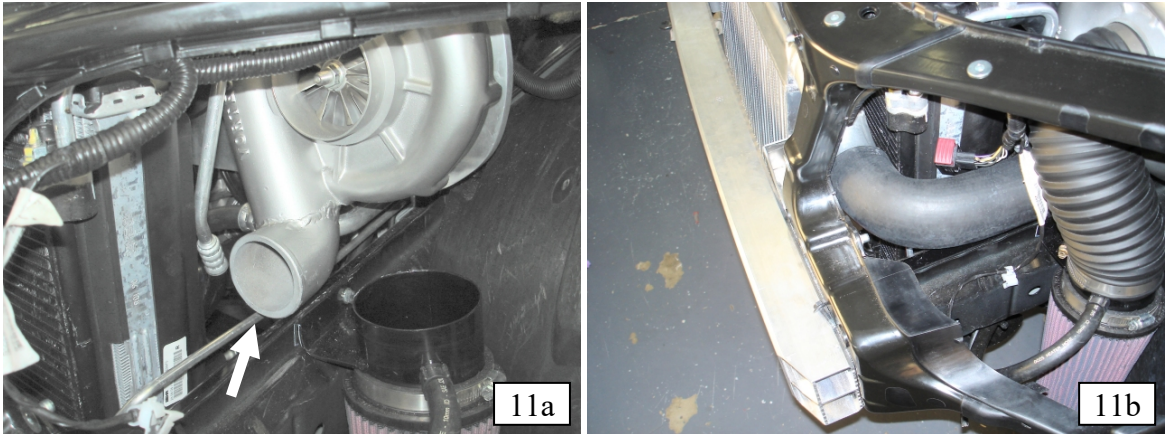


11. Bottom Intercooler Pipe Fitment

With the intercooler in position fit the bottom pipe using the 45° Silicon elbow supplied and two 38-89mm clamps, the silicon bend should be angled to the front of the vehicle.. This pipe goes up underneath the headlamp so the correct mounting procedure is critical for clearance. With the pipe in place, fit blow off valve and grommet, connect vacuum line and sock to blowoff valve.

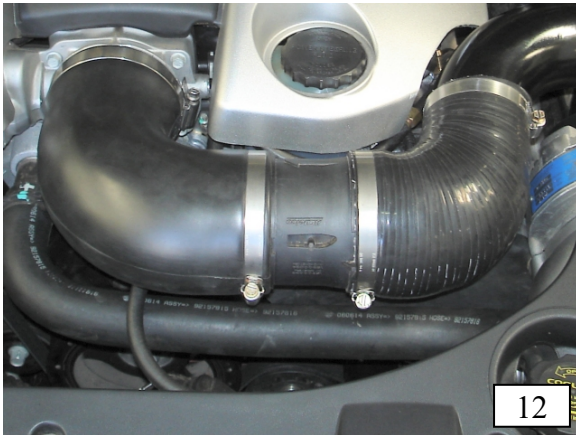
12. Top Intercooler Pipe Fitment

Fit 2 3/4" 90° hose from top intercooler outlet to the volute on the supercharger. Fasten using two 38-89mm hose clamps as per photo. Fit 4" ducting from supercharger outlet to the air filter as shown in photo 11b using 90-108mm hose clamps. Ensure supercharger outlet and rubber intercooler hose do not contact the chassis rail.



13. Intake Pipe Fitment

Fit 3" 90° rubber bend to throttle body. Fit airflow meter to rubber bend, with the plug on the airflow meter facing slightly down to ensure easy fitment of the wiring plug, align with supercharger bracket. Fit the black 90° reducer and clamp together as per photo. Connect airflow meter OR if MAF less fit IAT adaptor pipe supplied



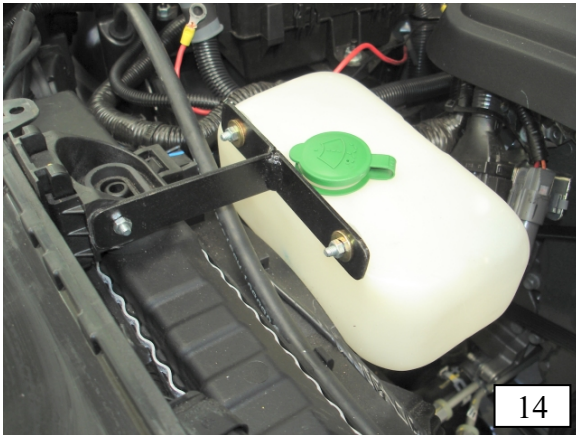
14. Top Pipework Fitment

Connect the top pipe to the 90° reducer and then angle it past the supercharger and down behind the headlamp. Connect top and bottom pipe using 65mm 3" joiner. Fit the supercharger pipe mount bracket to side of supercharger with 3/8" UNC bolt supplied.. Then M8 bolt to cooler pipe bracket..



15. Washer Bottle

Mount washer bottle to bracket with two 6mm x 16mm bolts, nuts, flat & spring washers. Drill a 6mm hole through the plastic radiator mounting bracket & fasten the bracket using 6mm x 16mm bolt, two flat washers & nut. Fit the original pump to the bottle and fit all original hoses and wiring.



16. Fit Engine Drive Belt

Start engine and check belt for alignment. Engine belt layout shown below.

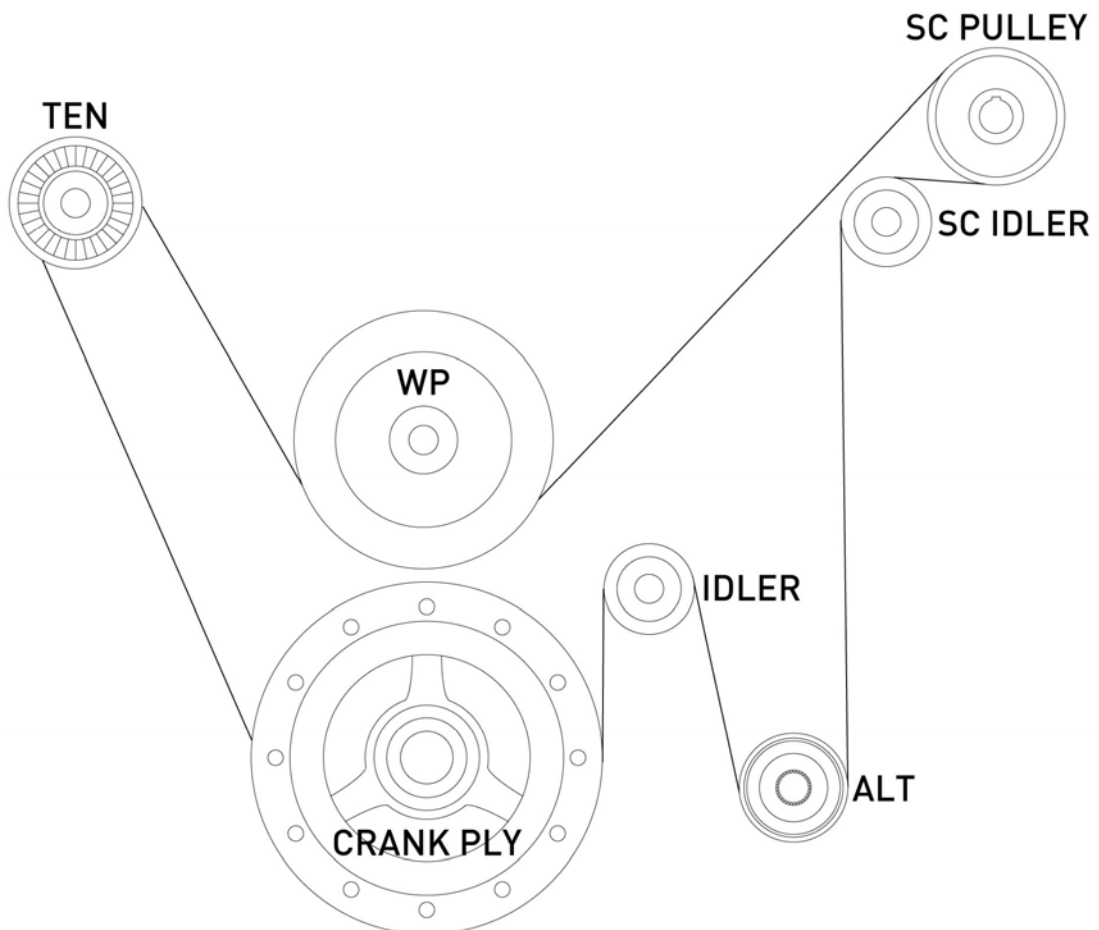


Diagram 1: Engine Belt Layout

17. Engine Cover Fitment

Before refitting the engine cover you must trim the passenger side front corner for the pipework to clear as per photo 16.



18. Installation is now complete.



19. Start up and run in procedure

When vehicle is started for the first time the engine check light will appear. Drive vehicle for 10km at light throttle. This will enable the vehicle to learn itself and compensate for the increased amount of airflow. After 10km drive, disconnect battery for 1 minute. This will clear the engine code light, the light should not reappear. The vehicle is now ready to be run on the dyno.

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...

