HOLDEN COMMODORE VF V6
SIDI 3.6L (2013-2017)

VORTECH ENGINE BELT DRIVE SUPERCHARGER KIT INSTALLATION MANUAL

For any further technical information contact:

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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. 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
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**).

    Impeller speed calculated as below:

Vortech V-2 / V-3 Supercharger

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

13. 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)

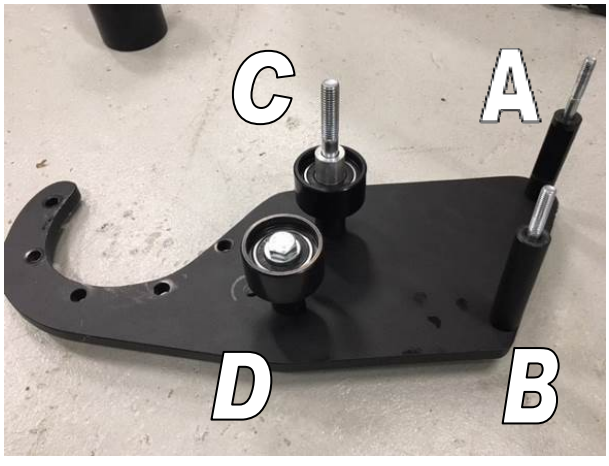
PRESSURE RATIO
Manifold absolute pressure divided by standard barometric pressure.
P.R. = gauge pressure +
atmospheric pressure
absolute pressure

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

KITS PARTS LIST

	Quantity	Checked
SUPERCHARGER ASSEMBLY:		
Supercharger V3 SI CCW	1	
Vortech Oil Reservoir Bottle & Fitting	1	
Vortech 6-Rib Supercharger pulley (3.48" / 3.6")	__	
Sealed Supercharger Oil – Installed in Supercharger	1	
Oil Drain Line – 300mm	1	
M6 Nyloc Nut and Washer	1	
¾" x ¼" UNC Bolts, Spring and Flat Washer	2	
MOUNT / DRIVE SYSTEM:		
6PK 2567 RPM Belt - Non Intercooled – 3.6" Pulley	__	
6PK 2540 RPM Belt - Intercooled – 3.48" Pulley	__	
Supercharger Bracket	1	
Supercharger Bracket Brace	1	
M12 x 30mm Bolt, Flat & Spring Washer	1	
M10 x 100mm Bolt, Flat & Spring Washer	1	
1 ¼" x 5/16" UNC Cap Head Bolts, Flat and Spring Washers	5	
<u>Pedestal "A"</u>		
M8 x 140mm Bolt, Spring and Flat Washer	1	
Machined Pedestal with Milled Cut Out – 79mm	1	
<u>Pedestal "B"</u>		
M8 x 140mm Bolt, Spring and Flat Washer	1	
Machined Pedestal – 79mm	1	
<u>Pedestal "C"</u>		
M12 x 150mm Bolt, Spring and Flat Washer	1	
54mm Single Bearing Steel Idler Pulley w/ 12mm ID. Insert	1	
Machined Pedestal – 43mm	1	
Machined Pedestal – 21mm	1	
<u>Pedestal "D"</u>		
M12 x 90 Bolt & Nyloc Nut	1	
M12 Flat Washers	2	
54mm Single Bearing Steel Idler Pulley w/ 12mm ID. Insert	1	
Machined Pedestal – 43mm	1	

Parts List Continued on Next Page…



KITS PARTS LIST, CONTINUED

	Quantity	Checked
AIR INTAKE		
CAPA 3 ½"Air Filter w/ BOV Fitting in bottom	1	
3 ½" Air Filter Hanger w/ PCV Fitting	1	
550mm 3 ½" Intake Hose	1	
HS56 Hose Clamps	3	
AIR DISCHARGE - NON INTERCOOLED		
3" – 3 ½" Silicone 90 Degree Bends	2	
HS56 Hose Clamps	2	
HS48 Hose Clamps	2	
3 ½" MAF Pipe	1	
PCV HOSE FITMENT		
PCV Driver's Side		
40mm x 10mm Fuel Hose	2	
One Way Valve	1	
PCV Passenger's Side		
1500mm x ½" Fuel Hose	1	
BYPASS VALVE		
Plastic Bypass Valve	1	
300mm x 1" Hose (intercooled)	1	
1000mm x 1" Hose (non-intercooled)	1	
HS16 Hose Clamp	1	
1500mm x 4mm Vac Hose (intercooled)	1	
500mm x 4mm Vac Hose (non-intercooled)	1	
½" to 3/16" Barb Tee Joiner	1	
100mm x ½" Fuel Hose	1	
Twin BOV Intercooled		
Plastic Bypass Valve	1	
Bypass Valve Filter	1	
3/16" Barb Tee Joiner	1	
100mm x 4mm Vac Hose	1	

Parts List Continued on Next Page…

KITS PARTS LIST, CONTINUED

	Quantity	Checked
INTERCOOLER KIT		
Intercooler 2 ½" top – 2 ¾" bottom outlets	1	
LH Side Cooler Bracket	1	
RH Side Cooler Bracket	1	
M6 x 16mm Bolt, Spring and Flat Washers	4	
M6 x 25mm Bolt, Spring and Flat Washers	4	
Bottom Intercooler Pipe	1	
Bypass Valve Grommet	2	
2 ¾" Silicone 45 Degree Joiner	3	
HS44 Hose Clamps	6	
Top Intercooler Pipe w/ MAF Fitting	1	
2 ¾" to 2 ½" Silicone 90 Degree Joiner	1	
3 ½" to 3" Silicone 90 Degree Joiner	1	
3" Straight Silicone Joiner	1	
HS48 Hose Clamps	3	
HS56 Hose Clamps	1	
HS44 Hose Clamps	2	
3" Aluminium Joiner Sleeve	1	
2 ¾" Aluminium Joiner Sleeve	1	
Medium Zip Ties	6	
Small Zip Ties	6	
WASHER BOTTLE REPLACEMENT		
Washer Bottle	1	
Washer Bottle Bracket	1	
M6 x 16mm Bolts, Nyloc Nuts	3	
M6 Flat Washers	6	
Loom Extension	1	

Misc. Parts

2 Bar Map Sensor	1

Base Calibration Tune File – Contact sales@capadrift.com.au, Quote Invoice number to receive file.
(Please note this is only a BASE file for reference and may need to be modified)

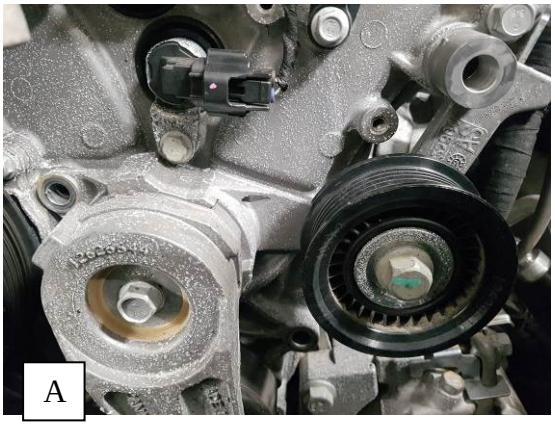
Important before beginning installation, verify that all parts are included in the kit. Report any shortages or damaged parts immediately.

PREPARATION & PART REMOVAL

1. Remove front bumper and lower cover
2. Remove left hand headlamp
3. Remove engine cover
4. Remove airflow meter, ducting and complete airbox
5. Remove Belt

INSTALLATION

1. **Supercharger Bracket Fitment Preparation**
   Remove idler bracket from the side of the engine, disregard this part as it is no longer used. Picture A shows the M12 bolt that needs to be removed and Picture B shows the M10 bolt that needs to be removed from the side of the engine to remove the idler bracket. Also remove the M8 bolts on either side of the tensioner refer to picture A to see their locations.


A

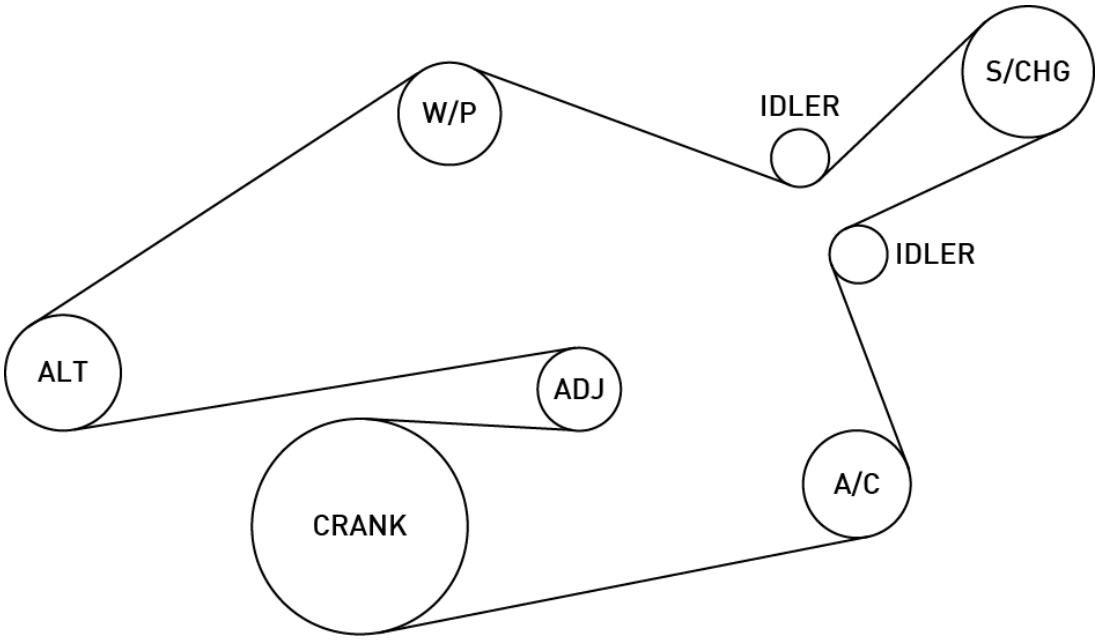

B

2. The supercharger bracket will be pre-assembled out of the box. Before fitting the bracket to the car mount the bracket onto the supercharger using 5x 1 ½" x 3/8" UNC cap head bolts. With the supercharger in place mount the assembly to the front of the engine. The three mounting bolts will align with the bolts removed previously.

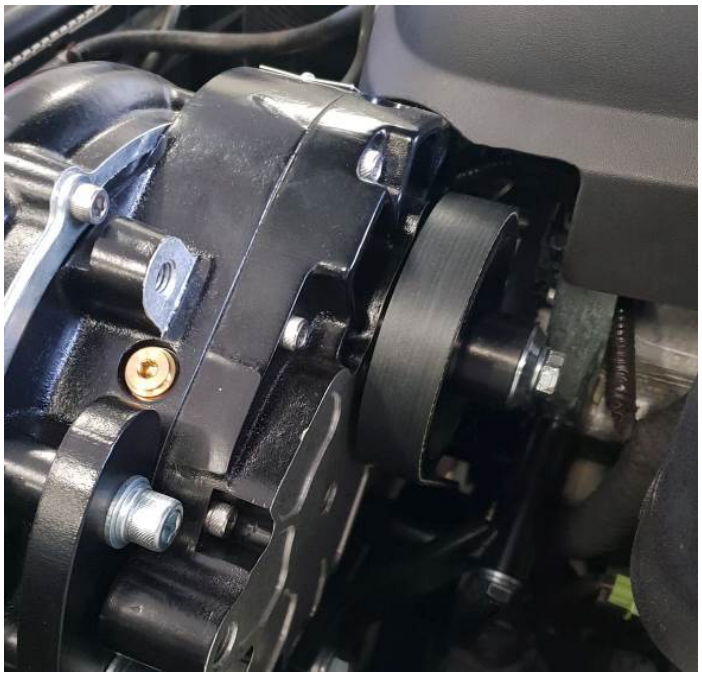
3. At this stage mount the blow off valve to the volute as per photo and fit blow off valve hose and filter (if non-intercooled). Only half tighten the supercharger bracket to the engine as you will need to remove two of the pedestals to route the belt.

4. With supercharger in position, fit oil header bottle to the top air box mount on the suspension tower, just under the positive battery jump point. Use 2x ¾" x ¼" UNC bolts and flat washers to fix mount to the bottle and 1x M6 nyloc nut and flat washer to fix mount to the suspension tower. Cut back and fit 5/8" oil hose from the supercharger to the barb on the bottom of the bottle. Tighten clamp. Make sure the tank has steel wool inside of the bottle.

5. With everything sitting in place route the belt as per the diagram, two pedestals will need to be removed, one at a time to route the belt correctly. Do not tension the belt in this step



6. With the bracket still loose on the bolts and the belt in place, mount the bracket brace on the rear of the supercharger using the M12 bolt, washer and spring washer supplied. On the engine side of the brace remember to remount the bracket for the engine cover, the cover will be refitted later on. Use the M10 bolt supplied to mount brace to engine.



7a. With everything now sitting in place tighten up the 3 pedestal bolts at the front of the bracket. Take note the pedestal closest to the water pump has a machined section, make sure it's in the right location before tightening. Tighten the bracket brace next and keep the engine cover bracket in the correct spot for later. Lastly in this step mount the belt around all accessories and tension.

7b. **If Intercooled disregard this step**
Fit the 3.5" to 3.0" 90° bend to the throttle body then mount the airflow meter adapter pipe. Mount the other 3.5" to 3.0" 90° onto supercharger as per photo. Once all aligned tighten the 4 hose clamps supplied.

8. Fit 2.5 Bar Map sensor to the centre of the manifold. See pic below for location.

9. **Drivers Side PCV**
Using the hose and one way valve supplied cut and add in the hose in the centre of the manifold. Make sure the valve allows air to travel into the manifold and not out into the engine (preventing boost pressure to feed back to the rocker cover)

10. **Passenger's Side PCV**

Early you would have removed this hose from the intake duct as you removed the air box assembly in the preparation stages. Ref photo A., You now need the cut off the fitting and disregard the fitting from the hose. Refer photo B. Slide the ½" hose provided onto the tube. Route hose down into the inner guard ready for intake fitment later on. Ref photo C.

A


B

C

11. Disconnect the vacuum line that routes to the brake booster from the passenger side of the manifold. Add the 3/8" Tee Piece hose assembly as per the picture. Re fit the booster hose to the other side of the tee and on the reduced add connect the 3/16" hose to the fitting.
Non Intercooled – Connect the 3/16" hose to the BOV on the front of the supercharger.
Intercooled – Route 3/16" hose down under the passenger side chassis rail ready for BOV connection later in intercooler piping.

Intercooler Kit –

12. **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 supplied wiring loom extension.

13. With the front bar removed undo the 6x bolts holding the intrusion beam on from the front.. There are also some screws fastened in from the back that need to be accessed and removed to complete the removal of the intrusion beam. Put factory washer bottle aside (no longer needed.)

Pic of Intrusion Beam Assembly removed.

14. Remove intercooler and mount brackets from packaging as well as the 2 x M6 x 16mm Bolts Using the intrusion beam as reference bolt the 2 brackets onto intercooler and tighten

15. Remove plastic infill panel and cut as per picture below, giving you 2 pieces.
On Passenger side Panel, trim the panel to allow it to sit into position over the intercooler outlet

16. Position Intercooler and modified plastic infill panels onto intrusion beam and using the M6 x 20mm Bolts provided bolt up as an assembly

17. Refit Intrusion beam / Cooler Assembly back onto car, utilising factory bolts

18. Fit Lower intercooler pipe to cooler & SC outlet, using silicon joiner and clamps supplied.

19. Prior to fitting intercooler top pipe, refit factory MAF electrics to top pipe. Using the 2.5"-2.75" Silicon 90° Elbow supplied fit to top i/cooler outlet..
Fit 3" Silicon T/Body pipe onto Top pipe and push down into location. Fit to t/body and check fitment.. Adjust until happy with position then tight clamps up.
Route MAF Loom down to MAF location and connect.

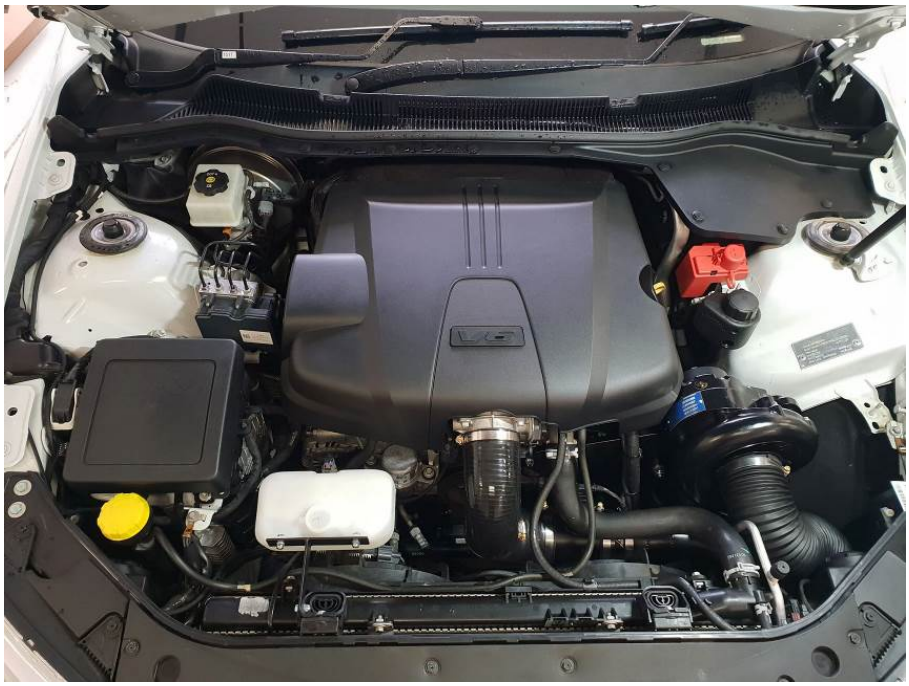
20. Fit By-pass Valve into lower i/cooler pipe, NOTE, higher boost applications will have a 2nd bypass valve supplied. Ref to step 11, locating your Vacuum source for the bypass valves and connect.. (Pic below shows By-pass valve recirculating back into inlet)

21. Fit intake duct to inlet of S/C unit and clamp.

Fit Intake adaptor filter assembly as per pic below. Once in position connect By-pass valve recirculation pipe.

Refer to Step 10 locating your passenger side breather hose, route around and connect to fitting on inlet adaptor pipe.

22. Overview installation, once happy with install, tie / secure vacuum lines etc. to prevent rubbing, clamps are tight
Position Engine cover back on motor and trim to relieve area that the s/c touches as per pics below



23. Review s/c oil level instructions to ensure oil level is correct.
Check again once unit has been run in..

24. Time for tuning, contact CAPA for base calibration file (HP Tuners)

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...