



HOLDEN COMMODORE VT V8  
5.0L & 5.7L (1997-1999)

## **VORTECH 8-RIB CRANK DRIVE SUPERCHARGER KIT INSTALLATION MANUAL**

**For any further technical information contact:**

**Centrifugal Air Pumps Australia Pty Ltd**  
20 Verrall Cres, Berri SA 5343, Australia  
Email [sales@capadrift.com.au](mailto:sales@capadrift.com.au)  
Phone 08 8582 3499 (Intl. +61 8 8582 3499)

# 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. Replace spark plugs and if possible use 1 stage cooler plugs, do not use resistor or platinum plugs. 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.
9. Always use an air-filter.
10. Never strike the supercharge 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), overtension of the belt is the cause of input bearing failure
12. Every 5,000km remove oil feed spray fitting at side of blower and clean filter gauze. Blow compressed air backwards through the small orifice.
13. 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

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

**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 overtightening 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.<sup>2</sup> (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
1.	Crankshaft pulley	1	
2.	1 ½ x 5/16 NC bolts & flat & spring washers	4	
3.	Blower pulley and mount kit ( <i>Blower pulley size 11 or 9psi</i> )	1	
4.	Blower assembly	1	
5.	Blower mount bracket	1	
6.	1 ¼ x 3/8 cap bolts & spring washers	5	
7.	Inlet tube 1000mm x 90mm	1	
8.	Air filter assembly	1	
9.	Air filter mount angle tube with air temperature sensor	1	
10.	Plastic air filter cover	1	
11.	Wheel arch screw pack 10S/tap 3 plastic clips	1	
12.	Clamps 89-106	3	
13.	Discharge rubber 45 deg. Angles sleeve	2	
14.	Clamps 65-89	4	
15.	Blow off valve	1	
16.	Blow off valve Aluminium tube and grommet	1	
17.	Brass tee pieces	2	
18.	600mm x 25mm blow off hose	1	
19.	25mm to 12mm plastic reducer	1	
20.	12mm rubber hose/90 degree end	1	
21.	Blow off 12mm hose to intake hose connector (plastic)	1	
22.	PCV outlet cap and clamp	1	
23.	800mm x 12.5mm PCV hose	1	
24.	Plastic PCV hose fitting plus clamp (large)	1	
25.	Water pump bracket bolts 4.25 x 5/16 NC spring & flat washer	2	
26.	Alternator swing bolt 4.75 x 3/8 NF spring & flat	1	
27.	Alternator mount bolt 5.25 x 3/8 NC spring & flat	1	
28.	Bracket spacer 23mm	1	
29.	Bottom alt. mount bolt 8mm x 50mm, spring & flat washers	1	
30.	Bottom alt. mount spacer washers	3	
31.	2 core wire 500mm temperature sensor	1	
32.	Conduit 500mm temperature sensor	1	
33.	Bracket shim kit	1	
34.	Fuel Management unit FMU with 2 mount screws 6:1	1	
35.	FMU angle fittings	2	
36.	High pressure hose 1200mm	1	
37.	Hose cover fuel 1000mm (plastic)	1	
38.	4mm x 1600mm hose	1	
39.	Plastic ties (medium)	20	
40.	T-Rex fuel pump and mount plate	1	
41.	Rubber mounting pads nuts and washes	4	
42.	Fuel pump plate mount bolts (self tapping)	4	
43.	Self tapping screw (relay)	1	
44.	Relay and mount screw	1	

**Parts List continued on Next Page...**

## KITS PARTS LIST, CONTINUED

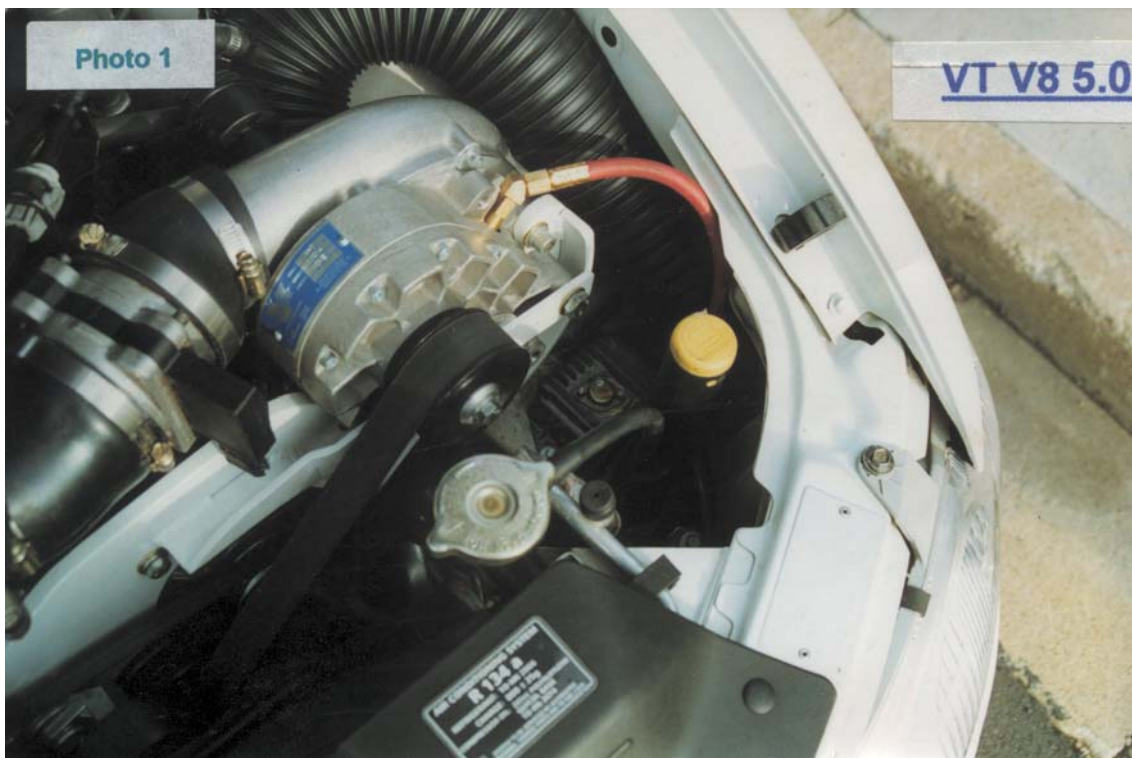
Part no.	Description and Size	Quantity	Checked
45.	Fusible link wire	1	
46.	Hose clamps fuel hose pump	4	
47.	2 core wire 1000mm	1	
48.	5m x 4mm wire red	1	
49.	4 core wire 1000mm (air flow meter plug)	1	
50.	200mm x 4mm wire black	1	
51.	Fuel filter 92059409	1	
52.	Fuel pump hose 500mm of EFI hose	1	
53.	Fuel pump pressure switch assembly	1	
54.	Female spade insulated terminals	7	
55.	Blue hole terminal	4	
56.	<b>5Lt only</b> - Injectors blue	8	
57.	Spark plugs BP7EFS	8	
58.	Alternator idler adjusting bolt	1	
59.	Alternator idle spacer	1	
60.	Fan cooling washers flat	9	
61.	Ignition transistor self tapping bolts	2	
62.	Alternator water pump belt 4pk 1165	1	
63.	120mm intake protector strip	1	
64.	Blower oil drain fitting & connector	1	
65.	Oil drain hose 350mm x 12.5mm	1	
66.	Oil drain clamps	1	
67.	Modified dip stick tube plus joiner hoses & 2 clamps	1	
68.	Oil pump Y piece and extra 45° fitting	1	
69.	Oil delivery hose and fittings	1	
70.	Idler pulley shim kit	1	
71.	1 ½ x ½ NF bolt spring & flat washer	1	
72.	Idler mount post 1 ¾	1	
73.	Double bearing idler	1	
74.	Double bearing spacer & dished washer	1	
75.	Large plastic ties	4	
76.	Belt 8pk 1485 3.15 pulley 2.9 – 8pk 1475	1	
77.	Idler double bearing spacer	1	
78.	Intake PCV fitting	1	
79.	Breather cap with 90 deg fitting	1	
80.	20mm x 12mm x 1.5 bolt & flat washer	2	
81.	Memcal	1	
82.	Premium Unleaded/Synthetic Oil Stickers	1	
83.	Precaution Air Inlet sticker	1	
84.	5.7 Lt 11psi option – Red Injector & Air Flow Meter	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 front and both sides – engine covers.
3. Remove air cleaner box, duct assembly and air flow meter.
4. Remove fan assembly and radiator as on unit. Save coolant.
5. Remove alternator mount steel bracket including bolts.
6. Remove alternator assembly.
7. Remove 2 left hand end water pump bolts. **(see photo 1)**
8. Remove all belts and remove crank shaft pulley – by removing four bolts.
9. Remove cruise control cable and bracket – if fitted.
10. **5 Litre Only** - Remove fuel rail and fuel injectors.
11. Remove computer from behind left hand kit panel and remove chip.
12. Remove dip stick tube assembly.
13. Remove spark plugs.
14. Check all ignition leads for condition and resistance value, if not in perfect condition, then replace.
15. Remove front bumper bar.
16. Remove windscreen washer bottle and pump assembly.
17. Remove left hand head light assembly.

**NOTE:** In the case that the original injectors are used it may be necessary to have them cleaned and flowed before completing the installation.





## 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
- long straight edge

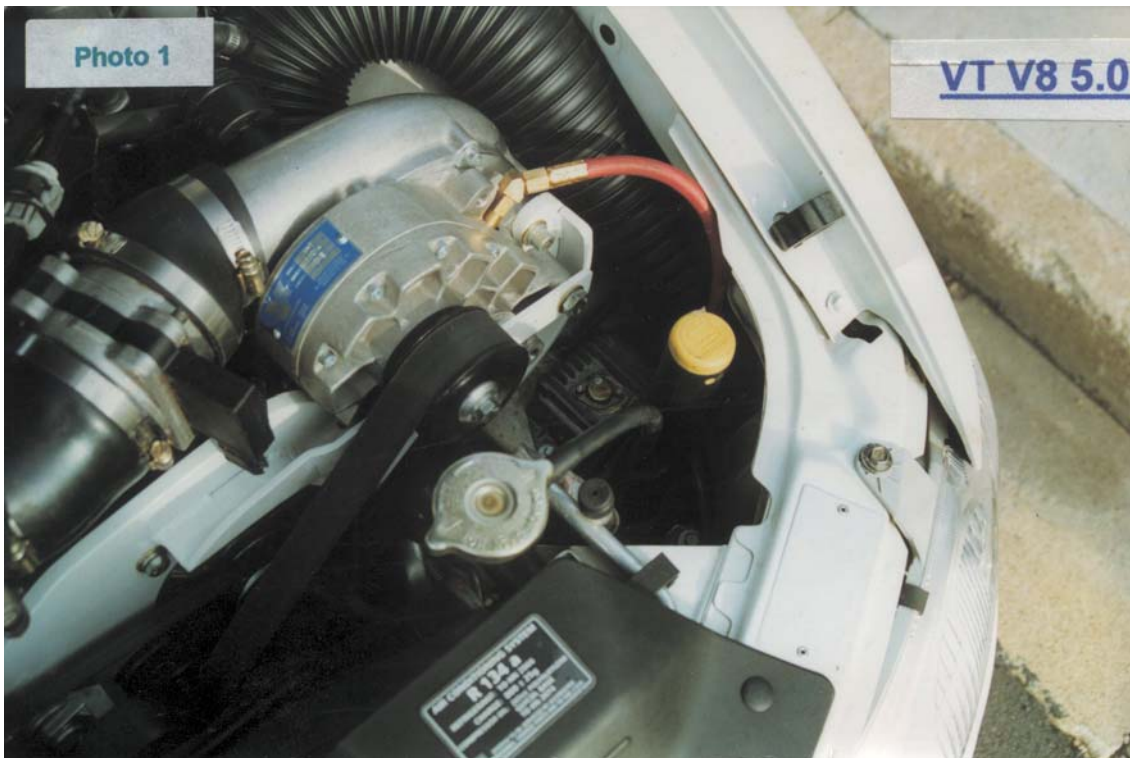
## INSTALLATION

1. Replace spark plugs supplied in the kit, they are one range cooler, at standard gap.
2. Fit crank shaft pulley supplied using 4 x 1 ½ x 5/16 NC bolts flat and spring washers.
3. With alternator removed, unscrew oil light switch, fit in Y piece supplied, screw on oil light switch on right hand side, then screw in oil delivery line on the other end, refit oil light switch wire (**see photo 2 for correct angle**)

**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.



4. Reposition spark transistor box to inner top guard, near radiator bottleneck, (**see photo 1**) tie down and tidy wiring loom.



5. With supercharger and alternator idler bolt and pulley fitted to bracket, fit bracket to motor using new bracket bolts supplied, with spring and flat washers:

2 x 4 ¼ x 5/16 NC  
1 x 4 ¾ x 3/8 NF  
1 x 5 ¼ x 3/8 NC

Fit spacer to water pump top bolt. Fit alternator mount bolt – position alternator in position and fit bolt through. Thus swinging alternator. Nip both bolts then check clearance at water pump bolts, shim up spacers at water pump or if spacers are too tight, file down spacer. Then nip up all 4 bolts, check clearance at bottom alternator bolt, shim clearance and fit bolt M8x50mm spring and flat washers.

**NOTE:** If unsure call for assistance, this is **IMPORTANT**.

6. Connect Supercharger to throttle body with hose angles provided and blow off tube. Fit smaller of two to throttle body side. Fit clamps and tighten.

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



7. Fit blower to bracket with bolts provided. Nip up bolts. With a long straight edge, check that the blower lines up with the crankshaft pulley, check blower is on the same vertical tilt angle as the crankshaft pulley, you can use a piece of fishing line with a weight on the end of it. Position the car so that the vertical fishing line is square with the crankshaft pulley. Check this against the blower pulley to check that the blower and bracket are at the same vertical tilt angle. For your own reference check against any of the other pulleys if possible that you are measuring vertical. You may have to fit shims into one or more of the four bolts at the mounting bracket to line up the pulleys, then tighten up all the bolts, then recheck, align again. Adjust shims behind idler pulleys, so that the pulleys run in line with crank and blower pulley. **Check the measurement from straight edge to the first pulley. Take this into consideration when adjusting the idler pulleys as well.**

**NOTE:** After fitting bracket, check that throttle position switch wires do not rub on bracket.

**NOTE:** 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.

8. Fit v-belts over pulleys, fit new alternator belt, 4pk 1170. Refit the powersteering and airconditioner belt. Do not tension alternator belt at this stage.
9. Fit blower belt, recheck that idler pulley is aligned. Tension the belt, tighten the idler pulley and tensioner bolt.
10. To recheck that all pulleys line 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.**

**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 and will cause the belt to run off the pulleys.

11. With left hand headlight removed, with a soft mallet, tap down steel trim at bottom behind headlight fit protector strip on edge. Fit intake angle long side to the end of intake duct fit clamp and tighten. Fit intake duct through hole. Fits in corner under blinker.
12. Fit air flow meter and filter element to short end of rubber 90 degree and tighten clamp. If needed press tube down oval slightly and spray with CRC to fit headlight back in place, make sure no excessive pressure exists against the headlight, it must be a snug fit.
13. Cut loom and extend air temperature sensor switch wires. Do not mix wires up. Connect to new sensor in rubber angle supplied. Plastic tie wire wherever possible.
14. Cut loom and extend air flow meter. Connect to sensor in new position under headlight. In temp sensor bend. **(Do not fit air flow meter between supercharger and throttle body)**

15. Fit headlight and secure if no water injection is to be fitted. Re-fit bumper bar.
16. Fit water injection kit.

**NOTE:** For water injection kit instructions, go to Water Injection Supplement.

17. Fit oil feed hose to blower via angle fittings. **(See photo 1)**
18. Fit air intake tube alongside blower and inner mudguard. You may have to oval tube slightly so it will not rub against the blower but sits hard against inner guard. **(See photo 1)**

**NOTE:** Intake tube may be cut to length.

**PRECAUTION: The air filter is mounted in this position to ensure that it collects the cold air without being effected from engine bay temperature. You will notice that its position is lower on the car than original mounting position. Take this into consideration when attempting water crossings in extreme conditions the possibility exists of water entering the intake. Ensure all drivers are aware of this possibility and take necessary precautions.**

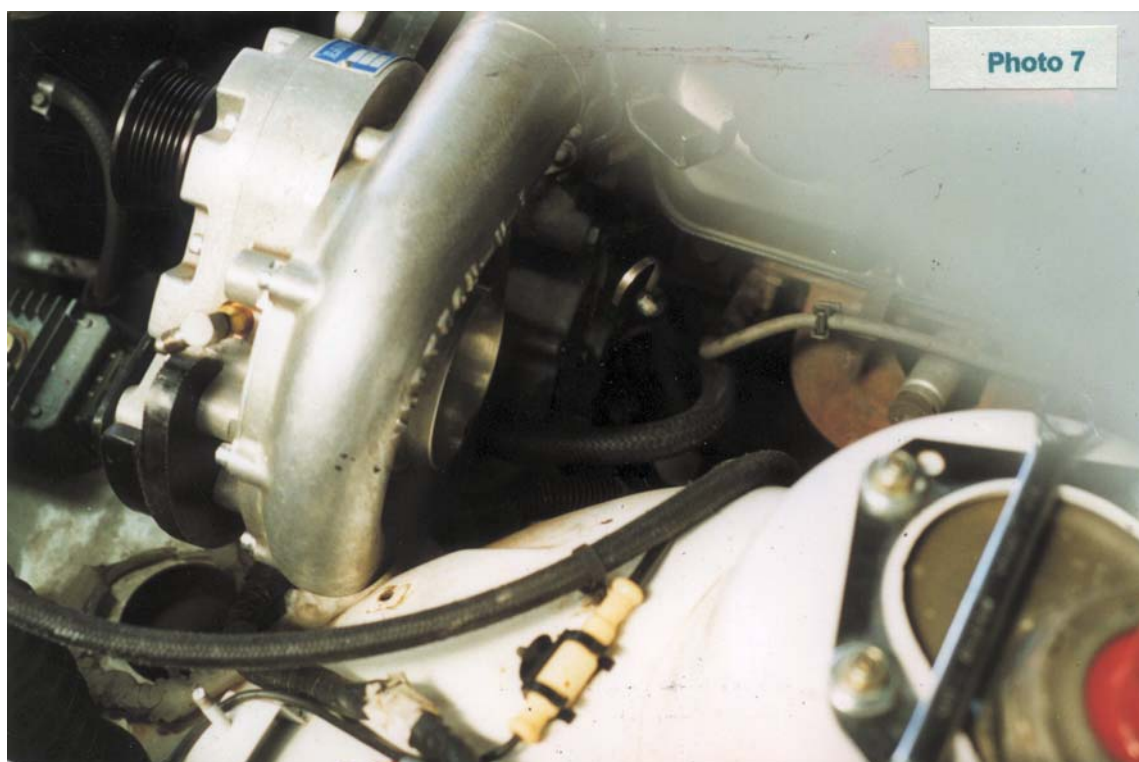
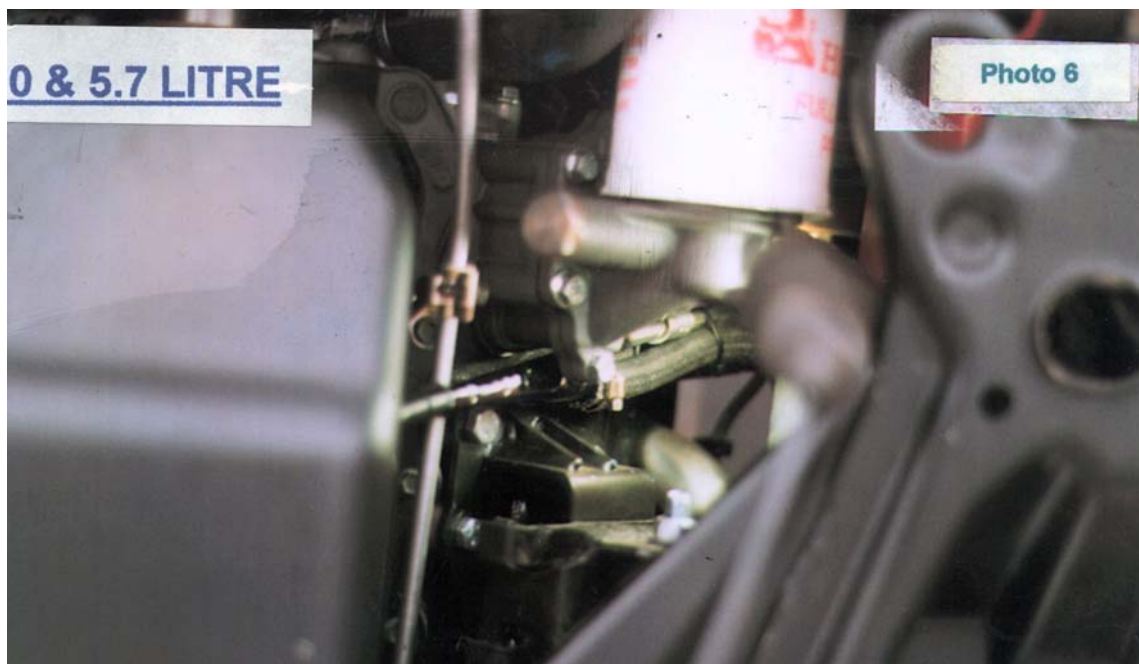
19. Fit wheel arch cover, fits to the front and bottom of wheel arch and meets up to the bottom of the bumper bar, screw up into position. Use plastic clips for the top edge that go into engine bay. Seal with sealer.

**NOTE:** The cover boxes in the air filter. Stops water and dirt being flicked off by wheel.

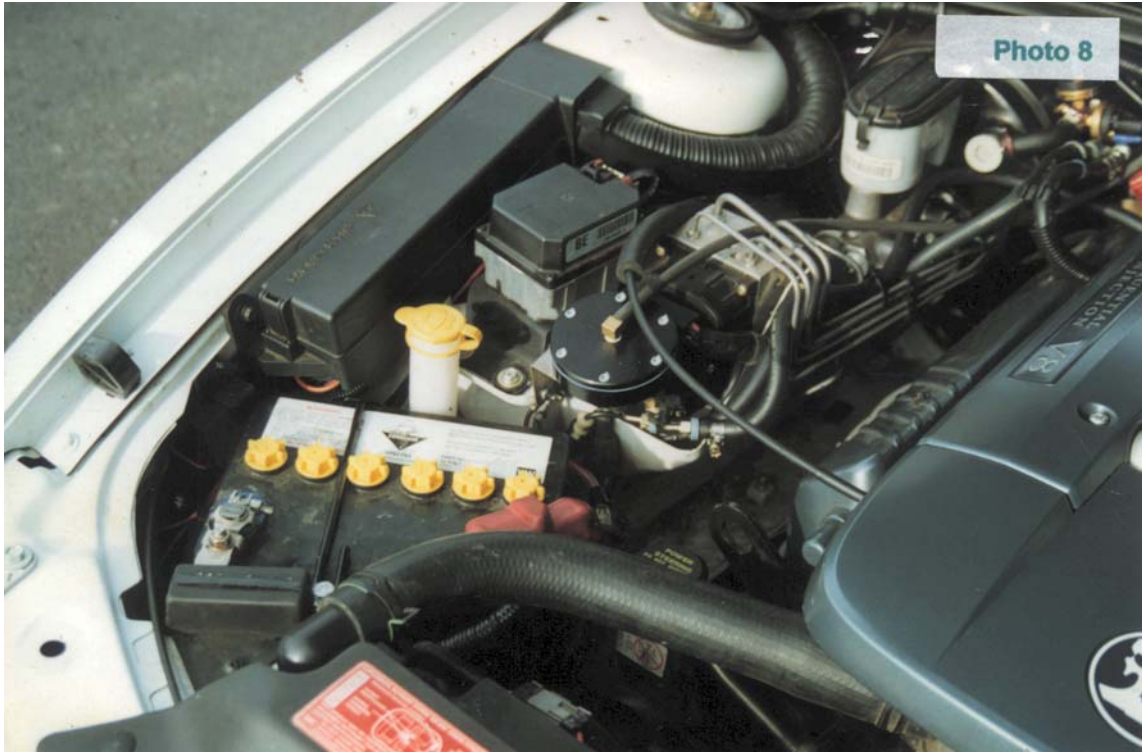
20. Fit supplied dipstick with return hose fitted, trim hose to size and clamp to drain pipe at bottom of blower. **(See photo 6 & 7)**

**NOTE:** For extreme driving conditions, we recommend that the sump be removed and an oil drain fitting be fitted directly in the side of the sump. This alleviates any oil flow problems at high rpm. Contact CAPA for instructions to complete this task.

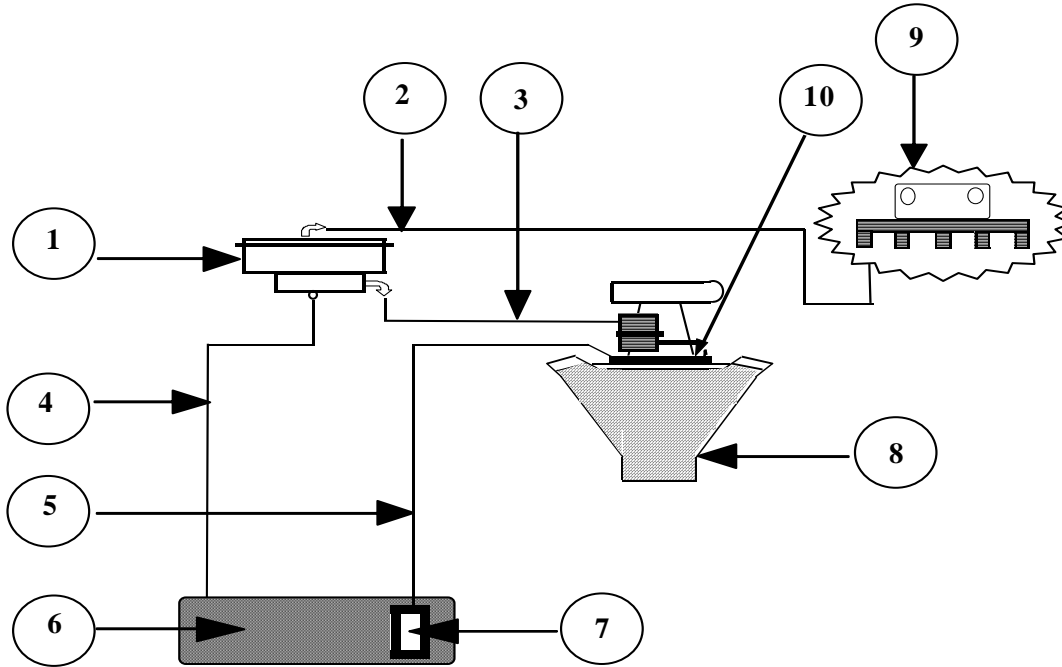
**WARNING:** THIS OIL RETURN LINE MUST NOT BE KINKED OR BENT. ANY RESTRICTION IN THE OIL RETURN LINE WILL CAUSE OIL BACKUP IN THE SUPERCHARGER, WHICH WILL DAMAGE THE SUPERCHARGE AND VOID YOUR WARRANTY.



21. Fit Fuel Management Unit in positions shown by an **arrow in photo 8**. Note that the middle FMU fitting returns fuel back to the fuel tank, the outside fitting receives fuel from the original fuel regulator. Fit vacuum hose to engine via a brass tee piece supplied, use high pressure hoses and clamps supplied. It is **IMPORTANT** that you get this right. **See FMU Fitment Diagram.**
22. **5 Lt only** - fit new injectors supplied, check for fuel leaks on start-up later. With CRC, spray around the bottom of the injector to check for any vacuum leaks at injectors.



# FMU FITTMENT DIAGRAM

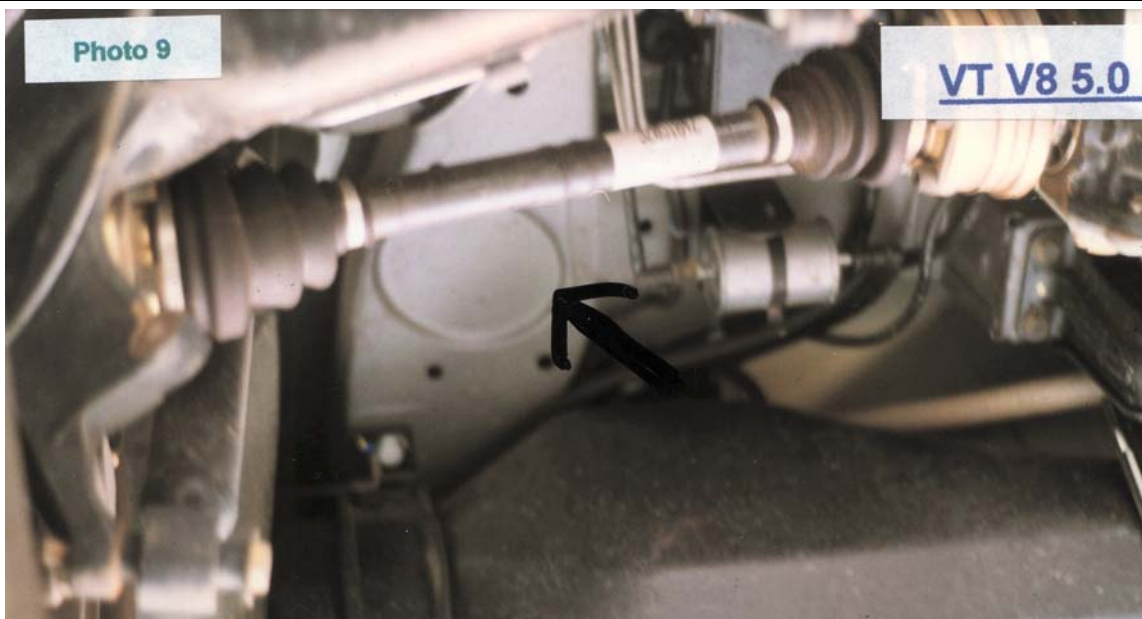


ITEM	DESCRIPTION
1	FUEL PRESSURE CONTROLLER FMU
2	CONNECT TO MANIFOLD VACUUM/PRESSURE AT VACUUM TREE
3	INLET FUEL LINE INTO FMU SIDE FITTING FROM FACTORY REGULAROR
4	FUEL RETURN LINE TO FUEL TANK
5	FUEL FEED LINE
6	FUEL TANK
7	FUEL PUMP
8	ENGINE
9	VACUUM SOURCE
10	FUEL RAIL



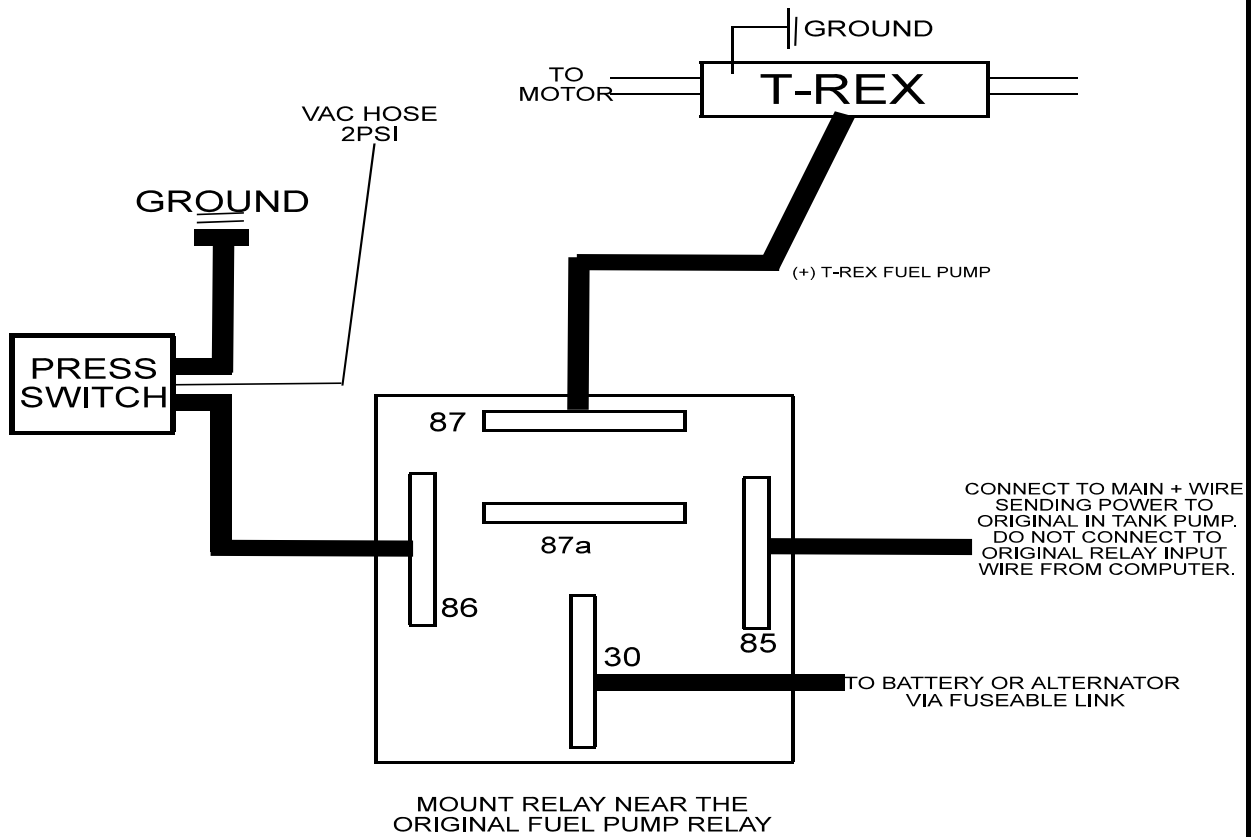
23. Fit T/Rex fuel pump supplied, test flow of original intake pump, if not within OE specifications, replace it with an OE replacement pump only. Replace fuel filter with one supplied. Mount T/Rex pump under car indicated by arrow in **photo 9** making sure that it is far from any rubbing parts. Mount 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. (See photo 12)**

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





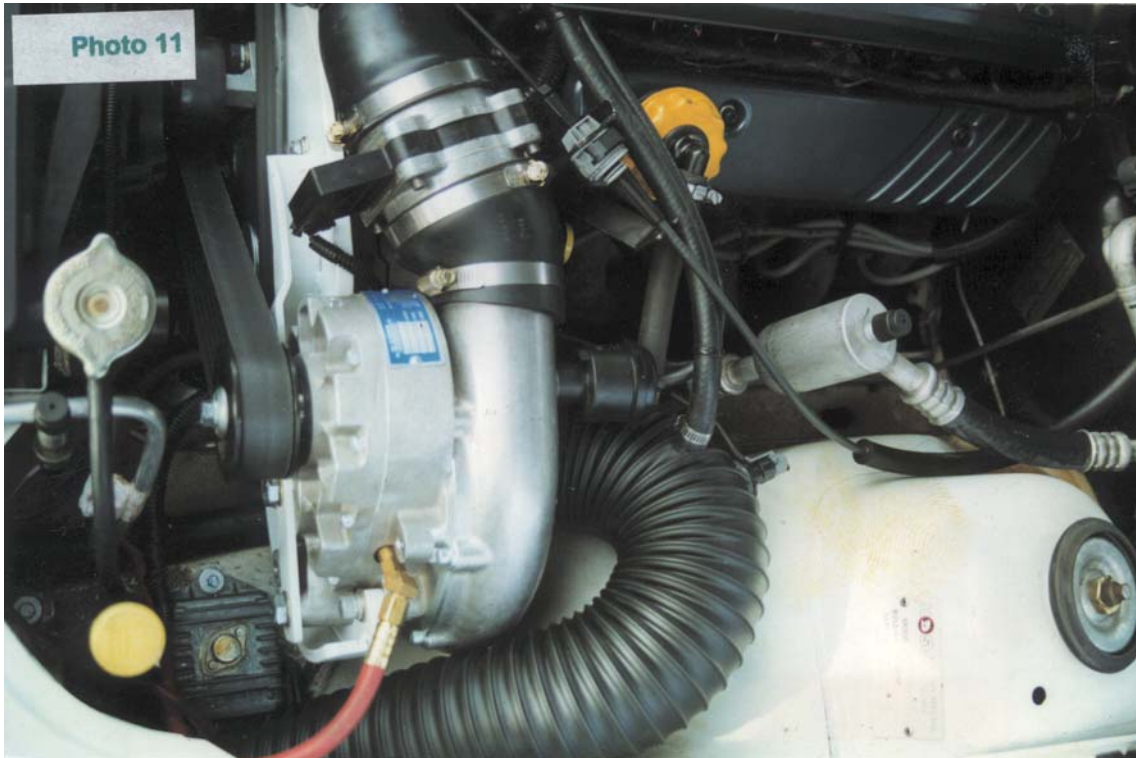
# RELAY WIRING DIAGRAM



24. Fit Blow off valve into grommet in Aluminium tube at throttle body. Connect 1" hose Loop over blower and connect in to BOV return sleeve in intake tube.
25. Connect vacuum tube to blower blow off valve using tee piece provided. Run vacuum hose down valley near left hand taper cover to vacuum source, use another tee piece.

26. Disconnect the right hand tappet cover breather tube at throttle body. Fit the rubber cap and clamp supplied to throttle body outlet. **(See photo 11)**

Run ½ inch PCV breather hose from driver's side tappet cover to supercharger intake tube, use the special fitting in the BOV/PCV return sleeve and fit to end of hose.



27. Replace oil filler cap with breather cap supplied. Fit to the intake tube with supplied hose and fitting. **Pierce intake tube and push fitting out from the inside connect hose from breather cap and clamp.**
28. Remove fan housing from radiator. Remove left hand fan assembly from housing. Re-fit fan on inside of housing instead of original position outside. ; Use washers supplied as spacers. Fit fan motor in new position turned as well so wire loom comes out on top. Plastic tie loom to support legs and cut off plastic hooks or they will foul blower idler pulley. Re-fit fan assembly to radiator. **(See photo 10 on next page)**

**NOTE:** Check fan blades on left hand motor have enough clearance so that if fan blade comes forward slightly they will not foul radiator.



29. Re-fit radiator and fan assembly. Re-connect hoses and wiring. Fill radiator with coolant saved from drain. When motor is started, purge air filter system and complete top up of system. Check between cooling fans and engine that nothing is close, or that nothing will rub if motor comes forward a small amount.

**NOTE:** Do not mix coolants.

**NOTE:** Check that the battery is still disconnected and the ignition is off before this procedure.

30. Fit new computer chip and re-fit computer.
31. Fit engine covers back on motor.
32. Drain fuel tank and refill with premium fuel.
33. Re-connect the battery.
34. **Go back and complete task number 10.**
35. 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.
36. Review 'Breaking In' procedure.

## WATER INJECTION

Water injection is available as an option and has its benefits.

1. Maintaining a cooler intake charge due to the evaporation of water.
2. Reducing heat soak at blower and inlet manifold.
3. Added protection for detonation on extremely hot days.

**NOTE** - CAPA kits are not designed with water injection, so its use is not critical for reliability and performance. If water injection is fitted, you will enjoy extra benefits that go with its use.

## 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 installer's 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...***

