



Toyota Hilux 05 - 14

V6 1GRFE 4.0 liter

5.8 - 7.5 psi intercooled

280 - 335 Engine Kw

PowerCore/PowerCore Premium

Supercharger system install instructions for DO IT YOURSELF

(We don't know your abilities, your choice to DIY or have it professionally fitted)

Congratulations on the purchase of a Raptor Supercharger system for your Hilux V6. The system will give you years of enjoyment and increased performance providing you pay attention to details while installing the system and employ a good servicing standard. Abuse of your product will shorten its working life and the life of your vehicle.

SAFETY INFORMATION

- REMOVE THE KEY FROM THE IGNITION OF THE CAR –
- DISCONNECT BATTERY
- DO NOT SMOKE NEAR THE CAR.
- NO NAKED FLAMES OR OTHER IGNITION SOURCES.
- PRE-READ ALL INSTRUCTIONS BEFORE STARTING
- WEAR SUITABLE PPE FOR THIS TASK i.e. GLOVES, EYE PROTECTION
- ASSESS ANY OTHER POTENTIAL DANGERS AT YOU FITTING SITE BEFORE YOU BEGIN THE INSTALLATION - PUT PROTECTIVE MEASURES IN PLACE
- DO NOT DRINK ALCOHOL DURING THIS TASK
- ALLOW 5-10 HOURS ON AVERAGE FOR FULL KIT INSTALL – IT'S NOT A RACE. ACCURACY/ATTENTION TO DETAIL IS all that is important
- Fit a NEW FUEL FILTER (Genuine part number 2330031120) and sparkplugs (platinum or iridium) before installing the supercharger kit (if vehicle is not new)



- anywhere you see this, means there is RISK OF PERSONAL INJURY INVOLVED IN THE TASK

Service the rear differential with high specification 85/140 gear oil, the factory oil is too low a grade and if oil is not replaced the vehicle may suffer rear differential failure after a period as short as 12 months, such is the additional torque this supercharger kit can develop. Find correct grade if differential is LSD

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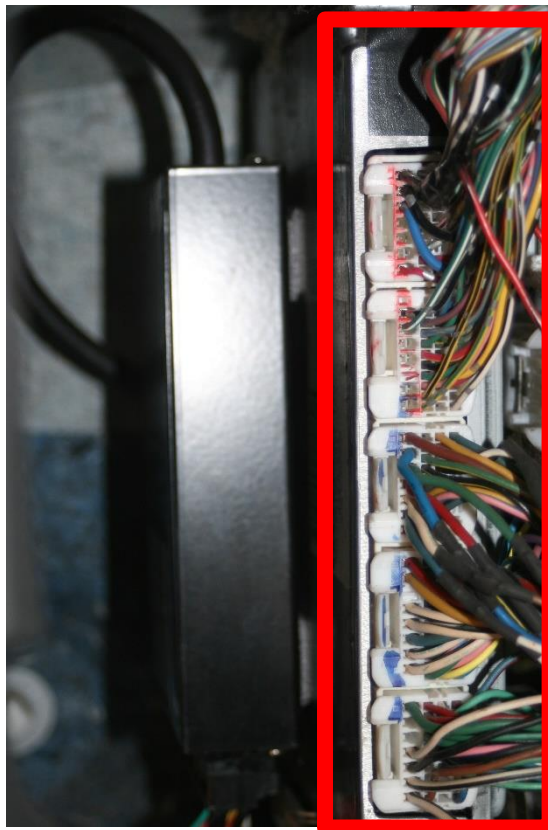
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Basic specifications:

Intercooler Water system capacity – approx 4.0 – 5.0 liters. Use a corrosion inhibitor in the coolant mix and if in a cold climate then add antifreeze also. USE ONLY GREEN colour corrosion inhibitors.

Give the engine a good clean before starting work and dry it properly

1. First task – remove the ECU from behind the glove box and mail this or courier to Raptor for programming, it has 5 WHITE plugs to remove and 4 or so 10mm nuts which affix it to the vehicle. The black box on the side is not a Toyota part. Located vertically. If you are swapping ECU – refer to back of this document for how to swap ECU's



The address to send your ECU to:

ZUCE AUTOMOTIVE TECHNOLOGIES
Unit 10 / 75 Flinders Pde,
North Lakes QLD 4509

Preparation to fit the kit

CLEAN THE ENGINE PROPERLY

Removal of existing air filter and air flow meter assembly. Remove the air filter box, the tube to the inner guard area on the driver's side, then remove the air flow meter from the air filter box assembly. Next, unbolt the entire air filter assembly, disconnect the atmospheric reference hose from the fuel pressure regulator which is typically attached at the back of airbox, disconnect the airflow meter wiring socket and any wiring mounts.

FUEL INJECTORS

Fuel injector fitting. The supplied BOSCH 550cc injectors are direct fit, sometimes it may be necessary to swap the large OEM rubber lower seal onto the new injectors – especially if the new injectors have only the green oring on the base

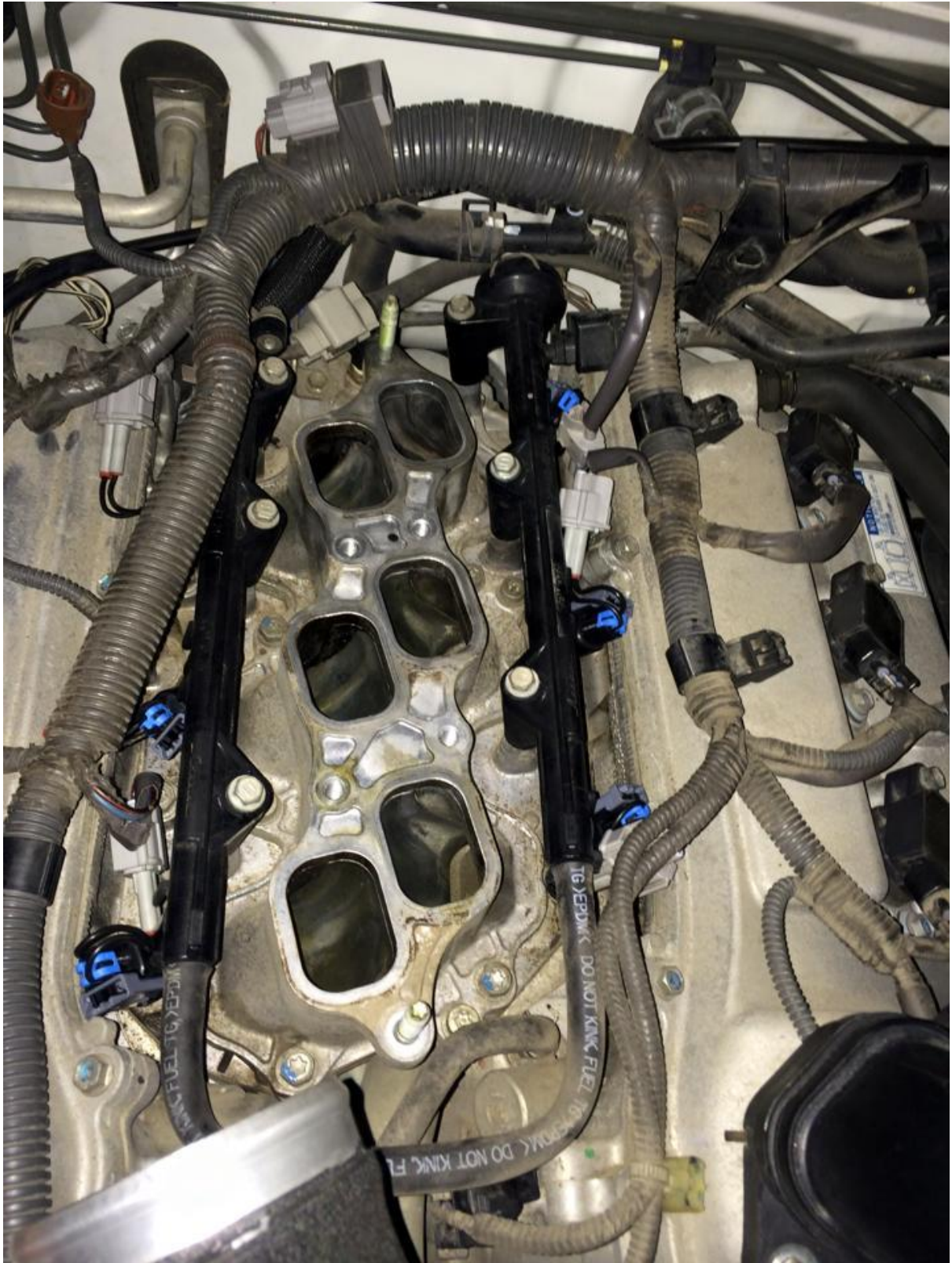
It is incredibly important to be 1000% sure the LOWER seals of the injectors are properly seated. Use some silicon spray to lube orings and rubbers to making fitting much easier

Be patient with the adaptor pig tails, don't damage them

It is advised to replace the plenum gasket – when performing the injector change, but not absolute
550cc injectors correctly assembled and ready to fit to engine



The injectors are provided with adaptor looms to convert from DENSO TYPE 2 to USCAR







Spark plugs

Your kit is supplied with spark plugs, fit and tension as per Toyota recommendations

DOUBLE PLATINUM RANGE





Fuel pump

FUEL PUMP PICTORIAL GUIDE (suit WALBRO, KEMSO, AEROMOTIVE or similar upgrade (255 - 320 lph pumps)).

Be extremely sure of your work with the hose that connects the fuel pump to the top of the tank, 90% of issues arise with this and due to workmanship not being good enough.

WARNING, purchase a new fuel pump assembly retaining nut Toyota: **PART NO. 77144 0K010** before you begin work –









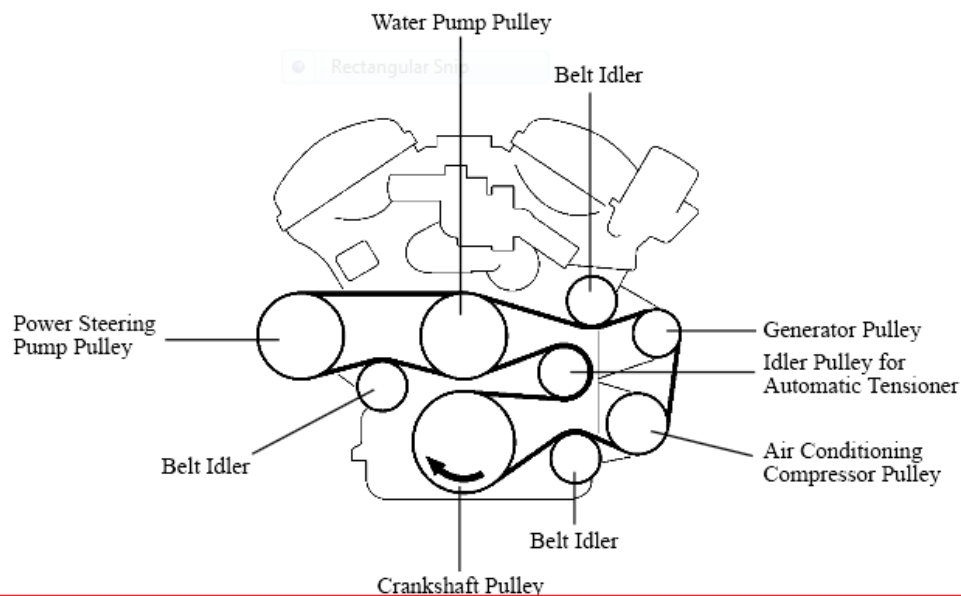


Remove fan belt from engine – 14mm socket and ratchet is needed, fit socket to the idler/automatic tensioner (see belt diagram below) and attempt to rotate the retaining bolt anticlockwise. This will take the tension from the belt and allow it to be slipped off an idler pulley for final removal.

○ SERPENTINE BELT DRIVE SYSTEM

1. General

- ▶ Accessory components are driven by a serpentine belt consisting of a single V-ribbed belt. It reduces the overall engine length, weight and number of engine parts.
- ▶ An automatic tensioner eliminates the need for tension adjustment.

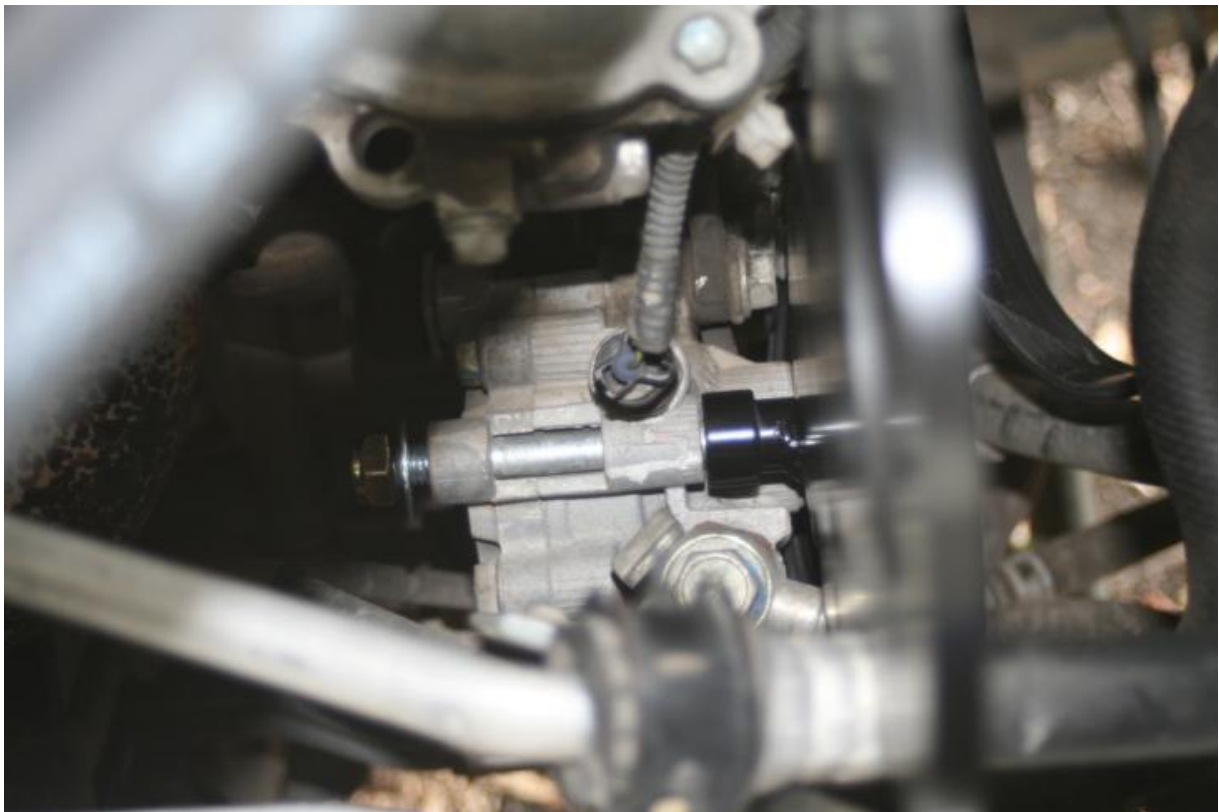


2. Fitment of supercharger to engine

Remove engine oil dipstick – to be refitted later, after the brackets have been fitted, and definitely before the supercharger is fitted to the bracket. Clean the base of the dipstick thoroughly before you remove it, dirt accumulates around the base, this dirt will drop straight into the engine oil if not first cleaned/removed.

THERE ARE TWO BRACKET TYPES – YOUR BRACKET COMES PREASSEMBLED – just loosen some of the fasteners. All brackets mount at the PS pump and at the cylinder head in the same locations. They each feature different idler mount systems.

Take the supercharger bracket and the single long bolt with nyloc nut, slide the bracket down behind the power steering pump pulley and install the long bolt into the mount on the top of the PS pump. See following picture, the bracket has a welded on spacer on the back of it. Fit bolt with nut and washer but do not tighten it just yet, just tighten enough so you can still move the bracket up and down if needed when fitting the alloy stay bracket to cylinder head.



Now fit the alloy bracket with its 2 bolts into the cylinder head and 1 button head through the bracket as shown. FOR the SNORKEL COMPAT KIT the upper button head goes through the bracket as shown, while the lower button head is much longer and passes through the bottom idler pulley, the bracket and finally into the alloy bracket. The upper idler has its own separate bolt.

Tighten the bolts in the following order

1. Tighten button heads with allen key
2. Tighten the bolt through power steering pump, firm but not too tight otherwise the mount on the power steering pump can be severely damaged. You access this bolt through the slots in the power steering pulley.
3. Tighten the 2 x 8mm bolts into the cylinder head, nice and firm but not overly tight.
4. The entire bracket should now be securely fastened to the engine ready for the supercharger and other parts to be fitted.



- ➡ Fit the idlers to the bracket and tighten the button heads as tight as you can possibly do them. The image below shows the idlers being fitted to their respective positions. The upper idler should be fitted to the hole nearest to the middle of the plate, do not use the upper most hole. The 2 holes are approx 20mm apart.



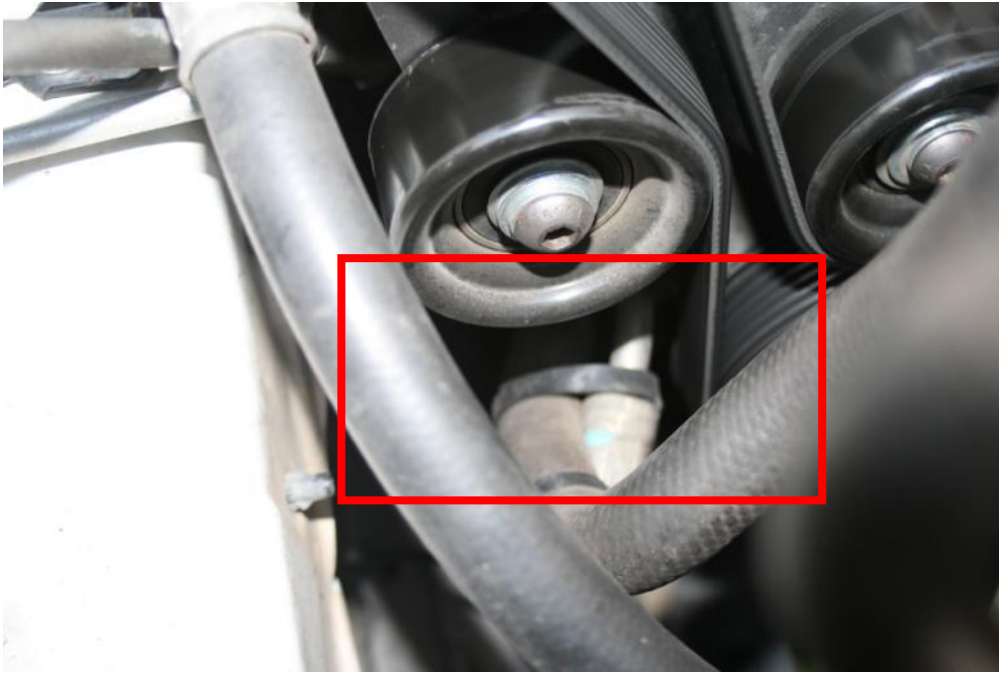
- Now refit the dipstick – put the dipstick tube over your knee and very slightly increase the existing bend a little further. There is a folded section next to the dipstick mount screw, on the rear side, flatten this, use the rear of the 2 holes on the supercharger mount bracket, normally the 6mm screw is already fitted there for use. When your dipstick install is done, it should all look like it does in pic below. No cutting or drilling of the dipstick tube is required.



Installed view – below



- ➡ To the bottom left of the power steering pulley you can see a large zip tie, this is holding the power steering hose away from where the engine belt runs, IT IS **CRITICAL** that this hose is tied securely out of the way, double check and make certain it can never come free and rub on belt. Use as many of the provided HEAVY DUTY zip ties as you need to have PERFECT peace of mind, if this hose rubs on the belt you will lose your power steering assistance. Three large zip ties are provided, use all three!



IF YOU PURCHASED A SNORKEL COMPATIBLE SC KIT – FIT the snorkel AIRBOX at this point. The instructions (printed) for that operation are included with the AIRBOX KIT. This includes the fitting of the ABS relocation bracket

ABS Module (some SR5 models)

If your vehicle has an ABS module in the vicinity of the brake master cylinder you MAY need to unbolt it and use the Raptor ABS relocation bracket to move the ABS model towards the firewall.

NEVER UNPLUG THE ABS FROM ITS ELECTRICAL CONNECTION

Fitting the supercharger to the bracket

Take the 8 stainless countersunk screws and fit the supercharger so the outlet is facing near horizontal as shown in the image below, tighten screws firmly and never use any locking compounds on these at all, if overtightened the stainless screws will be damaged. If screws are too tight you may not be able to remove them at a later time. See the following picture of the stage you are now up to, airbox and supercharger installed

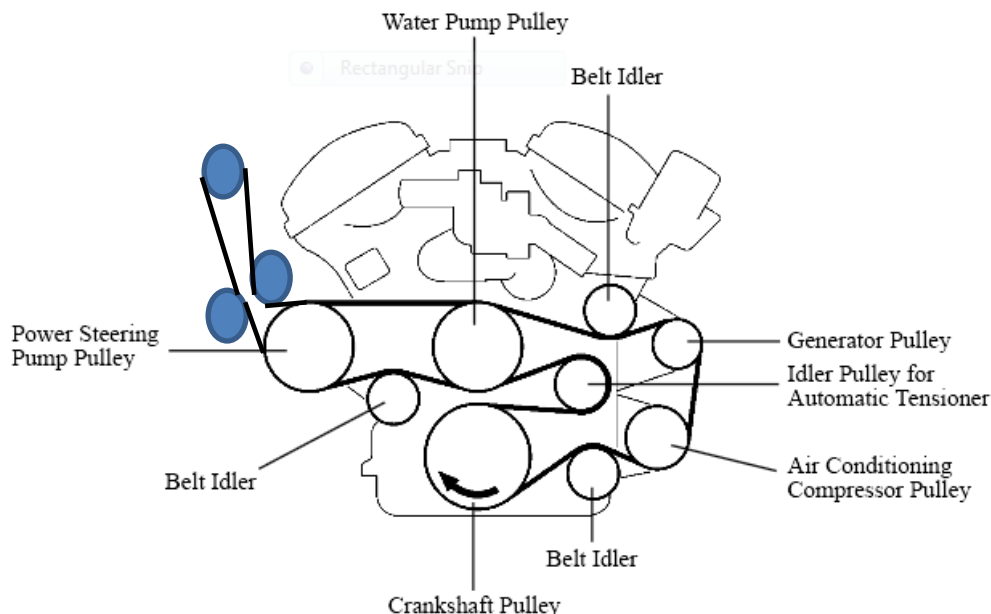


Now the 7PK2672 drive belt can be fitted, take plenty of time to double check that belt is fitted correctly, you only get one chance to get it right, getting it wrong will result in immediate ruination of the belt, no replacement will be provided free of charge if you get it wrong. Follow the belt diagram below, but deviate between the 2 idlers out to the charger. You will need a 14mm socket to operate the autotensioner pulley. Auto tensioners are extremely dangerous – make sure socket is properly engaged and keep fingers out of pinch areas when releasing the auto tensioner. Your new longer belt will be fitted in reverse order, starting by going over the engine fan blades first.

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- Remove the MAF sensor from the factory airfilter box - then clean the airflow meter with some **electronics cleaning fluid and blow dry with compressed air**. This is critical so that the tune supplied will work to its best on your vehicle. Fit MAF to MAF body before fitting assembly to vehicle
- INSTALL INTERCOOLER and AIR FLOW METER. The intercooler is a TIGHT FIT front to back, firewall at the rear and the throttle body at the front, it takes time to get it all just sitting right and flat, a certain twist is usually visible in the hose from the SC to the cooler inlet. The intercooler is supported one end by the AIR FLOW METER and the other end by a long metal bracket, this bracket bolts to intercooler as shown below (2nd image) and connects to another 8mm threaded hole on the cylinder head, see next image. Always fit the silicon hoses with the RAPTOR LOGO's facing up, this is because the hoses have been cut to fit correctly and the logos facing up ensures you have them the correct way – see picture below.
- AIR FLOW METER ASSEMBLY – is installed with the internal honeycomb air straightener facing towards the intercooler, a 90 degree pieces attached to the throttle body, then the MAF inserts into the other end and using the 2.5" to 3" silicone adaptor fit to the intercooler outlet. The airflow meter sensor is simply unscrewed from its mount in the

original airbox and reinstalled using the supplied screws into the new MAF body. Reconnect wiring/plug to air flow meter. Tighten all clamps.



Intercooler stay bracket – example – see BOV in this image also

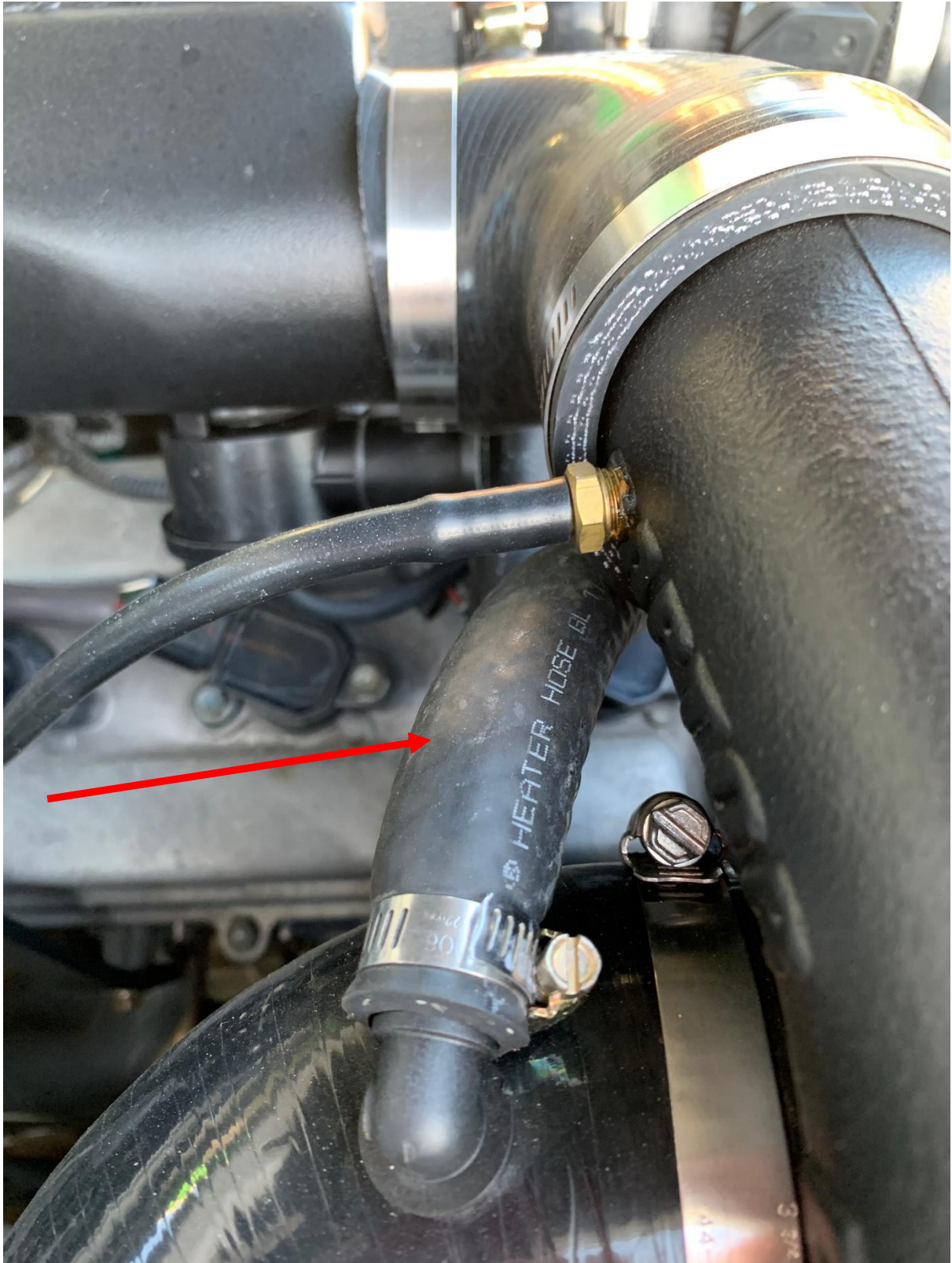


- ➔ Fitting the intercooler hot side air hosing. You have been supplied with a single 2.5" 90 degree bend to connect between the supercharger and the intercooler. Logo up



Engine breather.

In the image above you can see the engine breather connection directly above #1 coil pack, directly below the intercooler towards the front, disconnect the hose entirely and reconnect using the short 16mm hose supplied in your kit. It connects from the breather outlet on cylinder head directly to the 16mm breather connection on the air delivery pipe into the supercharger (fitted last). Cut supplied hose to length. See next picture for the breather line.



- BOV vacuum hose connection – see pic below, this is where the Tee is installed and you run a short line from the BOV through under the throttle body to this position at the Tee. SEE PICTURE on next page



Fitting the air ducting from airbox to the SC inlet – adjust length at the joiner sleeve between the two pieces



There are TWO TYPES OF RADIATOR SYSTEM – THE TWIN SYSTEM or the WINCH COMPATIBLE SYSTEM.

TWIN RADIATOR SYSTEM

Before fitting the fan to intercooler radiator, check its rotation. Fan should be mounted on the backside of the radiator with fan fitted as a PULLER configuration – pulling air through the intercooler radiator. There are instructions with the fan on how to reverse its rotation electrically and to reverse the fan blade itself on the fan motor.

Intercooler water system, radiator/s and pump – Remove the grill. Install pump in position as shown. NOW, install radiator/s as shown in pictures. Fan at the back of the I/C radiator if possible. Wire so fan is on when key is turned to “ON” –



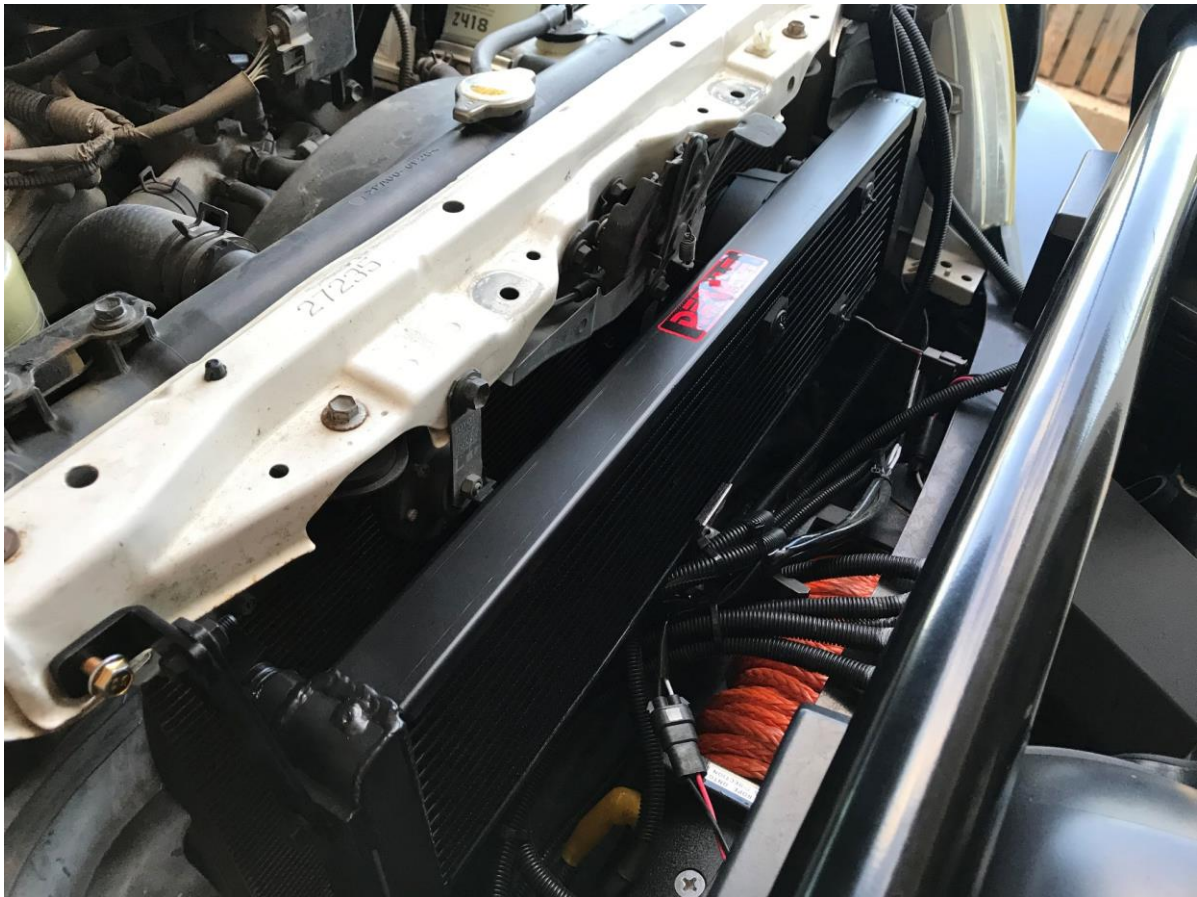
Both radiators are direct bolt in – no cutting, all holes match body holes



WINCH COMPATIBLE RADIATOR SYSTEM

For vehicles equipped with winches, this radiator system is supplied, fans are already fitted.

It features a U bracket with foam insert to mount to vehicle which radiator sits in and two link brackets which fasten radiator to vehicle radiator panel – see pictures. You will need to relocate the HORN

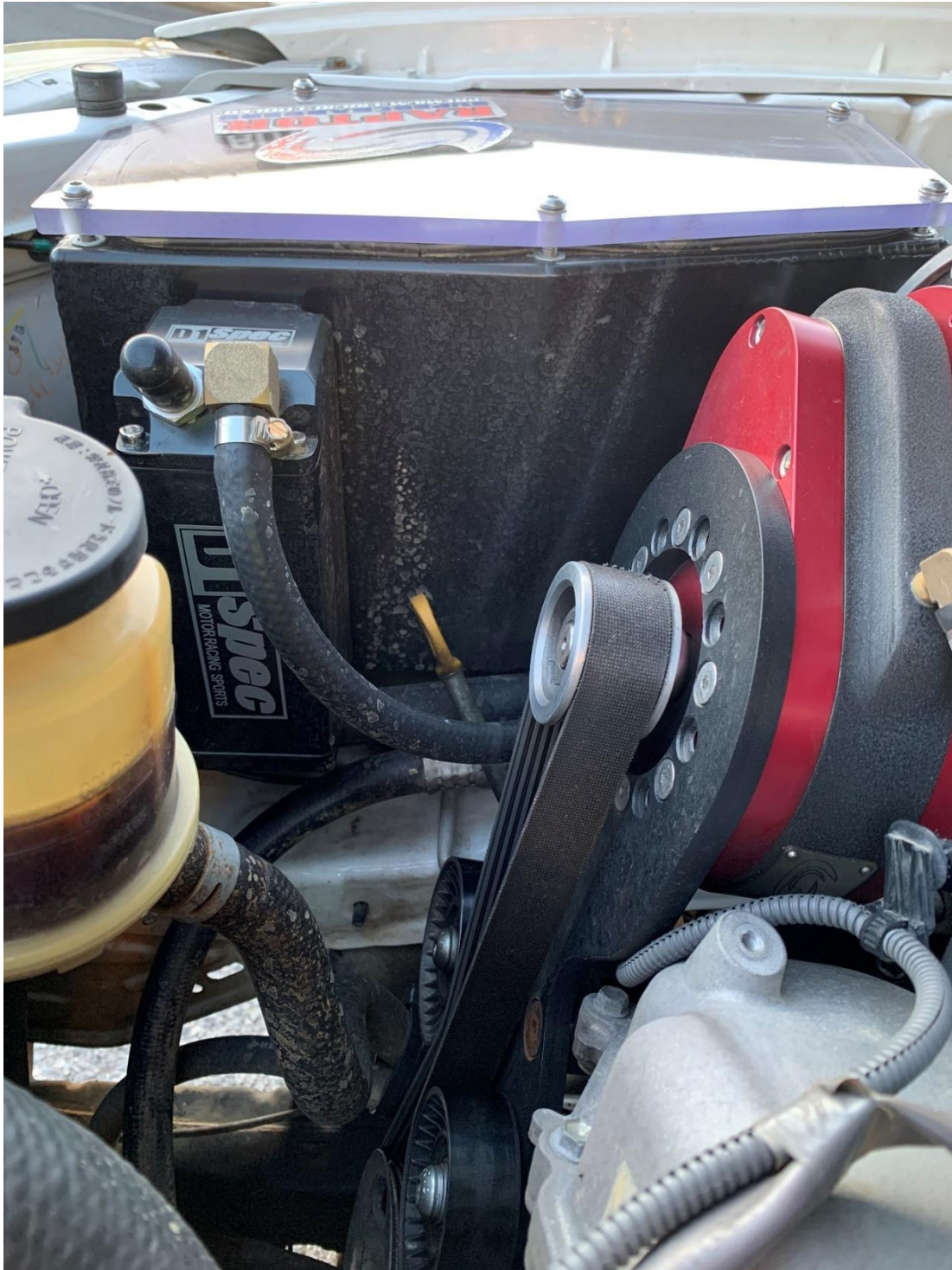


PUMP location, drivers side is best and anywhere that is below the intercooler radiator and out of the way of other 4WD accessories such as winch, wiring, lights etc etc. NEVER RUN THE PUMP WITHOUT LIQUID IN IT – IMMEDIATE DAMAGE WILL OCCUR



Coolant reservoir

is fitted the side PSICO airbox – this is where you top up the system as needed. See next picture, this reservoir is already fitted to the airbox, simply connect the hoses and you are good to go - as described in the next section.



19mm hose routing – 3 hoses

The longest 19mm (2100mm) hose connects from the REAR of the intercooler to the top drivers side fitting on radiator. This is the hot water return

The shortest 19mm (1800mm) connects from FRONT FACE of intercooler to the pump discharge. This is cold water supply to the intercooler from the pump.

The pump suction will need a small length of 19mm hose cut to connect from Passenger side top of radiator to pump suction/intake. This is a cold water line to pump. This extra hose is supplied.

The hoses will pass through a hole in the radiator panel (drivers side) that is covered with black foam from the factory.

Hose clamps are supplied, simply push the hose onto the fittings once you have cut the hoses to a NEAT length, tighten the clamps

10mm hose routing – 3 hoses

The shortest 3/8" hose, connects from brass fitting on front face of intercooler to fitting on top side of the supercharger

The next longer 3/8" hose connects from fitting on lower side of supercharger to brass fitting at the top of the coolant reservoir (also brass fitting).

The longest of the 3/8" hose runs is from the bottom of the coolant reservoir to the Tee section fitting on the pump suction line

Image below shows the water connections on the supercharger – typical connections on all variants of the supercharger kit

Filling the intercooler system with water (coolant later)

Use only clean water for the first month, switch to green coolant (anti corrosion and antifreeze) after 30 days.

Remove rubber covered filler cap from coolant reservoir (located on the front inside of the PSICO airbox)

Disconnect any one of the 19mm hose connections, insert garden hose and hand seal the hose to hose joint, turn hose on full and continue until all the air is expelled from the system, refit the hose to its fitting

Turn key on, pump/fans will run, top up the reservoir over a 5 minute period

Check the water level (once a day) of the intercooler and add water as necessary for the first 4-5 days of use.

Pretty much the last job – connect the pressure tube between the supercharger outlet and the fuel pressure regulator – see picture below



Intercooler and fans electrical

Pump wiring – wiring is provided, we suggest a qualified auto electrician connect the pump and fan to a key switched 12V power supply. Power required for both items is 15 amps. You are provided with relays (35amp), fuses, wiring kit etc.

The pump and fans must always run when the ignition key is in the “ON” position.

RELAY WIRING – one relay for pump and one for fans

Relay pin numbers are written on the underside of the relay body

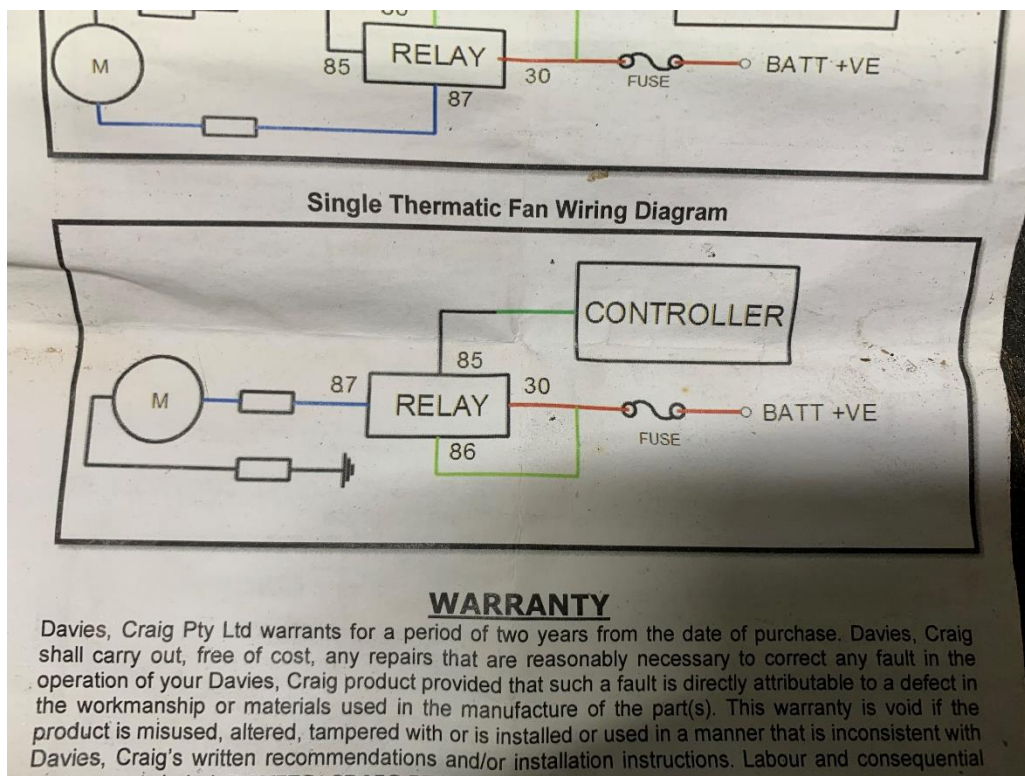
There is a note in this fitting guide as to where the fuse adaptor plugs in to your fuse box – this will give you your KEY ON power supply and signal wire to the relay (pin 85)

Your Relay needs an earth, so you run the PIN 86 wire to Earth

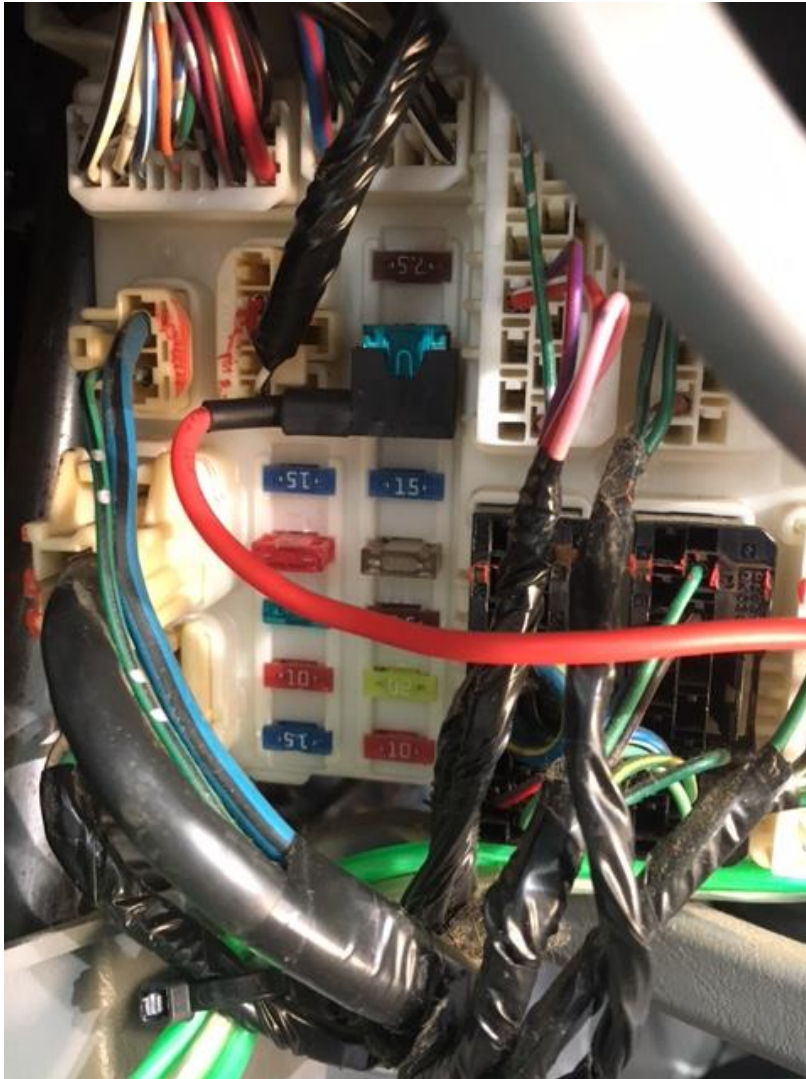
Your relay needs a Power feed direct from battery – battery direct to PIN 30 (thick red wire coming from relay)

Blue 87 from relay goes directly to the RED on your Fans and/or pump

Your fans and pump require their own earth connection

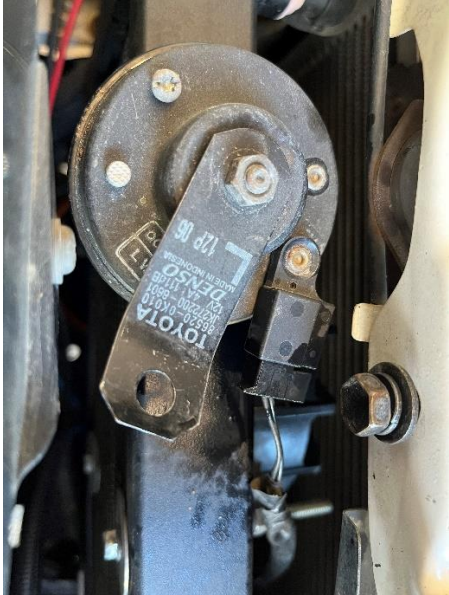


Location for the ADD A FUSE (CONTROLLER WIRE, as per above diagram). Key ON is the control



Horn – refitting to vehicle

The horn can be rotated 360 degrees on its bracket, loosen nut and adjust, then bolt in as shown and reconnect the original wiring

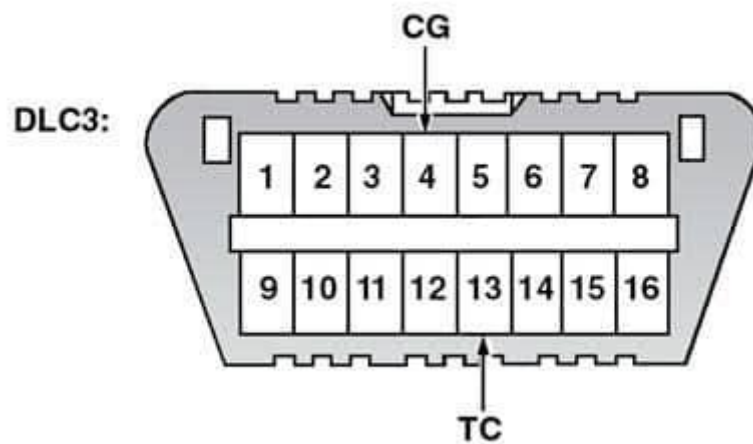


ECU SWAP

If the kit has been supplied with a preprogrammed ECU to directly swap into the vehicle – follow this guide on marrying the replacement ECU correctly to the vehicle

IF YOUR ECU WAS SIMPLY REMAPPED AND SENT BACK TO YOU – THEN THIS SECTION DOES NOT APPLY TO YOUR INSTALLATION

Bridge these 2 pins for 30 mins – the GREEN CRUISE CONTROL LIGHT IN THE UPPER RIGHT HAND SIDE OF THE DASH WILL FLASH ON/OFF for the entire 30 mins. After 30mins, turn key off, remove the bridging wire, turn key on for 60 seconds then start the vehicle. The engine should start, may stall once, then restart and it will run as it should



Completed kit images

The finished article – to be enjoyed immensely - it will take time of to get that intercooler sitting flat just like that (adjust hoses etc), it is possible and worth the effort





Exhaust system

To see the advertised power figure for any/all variants of the Raptor supercharger system it is essential to upgrade the exhaust

Headers should be used, long tube is best

Cats, should be 2.5" 200cpi high flow type

Cat back should be ideally 3.0"

Complete exhaust systems are sold by Hurricane exhausts – example below

Raptor SC also retails this system



ADDITIONAL INFORMATION

Rear Differential (Hilux)

The oil grade should be 85/140 which is compatible with LSD if LSD is fitted.

Service engine oil every 5000 – 6000km max

Engine oil can be 5/30 or 5/40 or 10/40 in a good quality synthetic oil

Change fuel filter every 20 000km

Suggested service schedule

We may have missed some items – follow your Toyota handbook for all other servicing points/schedules

Item	Product	Frequency	
Engine oil service	5/40, 10/40 Syn	5000km	
Intercooler fluid	Green antifreeze	Weekly check	
Sparkplugs	As supplied	Every 50 000k	
Engine belt	7PK2655	Once a year	
Auto trans fluid	LV/WS Toyota	25 000km	
Fuel	98 octane only	ALWAYS	
Fuel filter	Gen Toyota	15000km	
Engine water level	Toyota PINK fluid	Weekly check	
Differential oil	85/140 LSD oil SYN	Every 20 000km	

Email: raptorsc@westnet.com.au

Ph: 0409 897 081

International: 61-0409897081

Fitment of kits and systems

No liability whatsoever (including liability in negligence) is accepted by Raptor Superchargers for the fitment of incorrect tuning or incorrect fitment of kits and systems. The onus is clearly with the fitter to ensure the kit supplied is correct for the particular system. Any damage to parts or consequential damage or cost resulting from the fitment of the incorrect parts or incorrect fitment of parts is totally the responsibility of the fitter

Fuel systems

All Raptor Supercharger systems are fashioned to give adequate fuel enrichment on unmodified (standard engine) vehicles. If vehicle engine is modified ie extractors, air filter pod, fuel pumps, manifolds, etc) most kits will require additional enrichment not provided with kit/s. Raptor superchargers is in no way liable for engine damage arising due to incorrect tuning, un-maintained fuel systems and the like. A new fuel filter must always be fitted at the time the supercharger kit is fitted.

YOU MUST DYNO TEST/TUNE THE VEHICLE AND CHECK IT IS SAFE FOR OPERATION – THE FINAL TEST RESULTS must be forwarded to Raptor SC by email to maintain your system warranty.
raptorsc@westnet.com.au

Insurance

Take care to inform your vehicle insurer of changes you are making/have made so that you retain your policy, also enquire with your state transport department regarding engineering certificates/mod plates that they may require for lawful motor vehicle operation. Companies like Shannon's insurance insure modified vehicles.

Lawful operation

It is your responsibility to make certain that your vehicle complies with the rules, regulations of your particular country, state or town.