



Subaru Liberty/Legacy/Outback

EZ36 engine

Congratulations on the purchase of a Raptor Supercharger system for your Subaru vehicle. The system will give you years of enjoyment and performance providing you pay attention to detail while installing the system and employ a good servicing standard. Abuse of your product will shorten its working life and may lead to other component damage on your vehicle

Supercharger system install guide for **DO IT YOURSELF RATING – EASY**

(we don't know your abilities, your choice to DIY or have it professionally fitted. (We are not liable for your mistakes, extra work, additional tools/costs if you screw up)



SAFETY CONSIDERATIONS

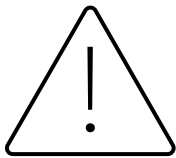
- REMOVE THE KEY FROM THE IGNITION OF THE CAR –
- DISCONNECT BATTERY - NEGATIVE TERMINAL
- DO NOT SMOKE OR CONSUME ALCOHOL DURING THIS EXERCISE
- NO NAKED FLAMES OR OTHER IGNITION SOURCES.
- PRE-READ ALL INSTRUCTIONS BEFORE STARTING
- WEAR SUITABLE PPE FOR THIS TASK i.e. GLOVES, EYE PROTECTION – assess your risk
- ASSESS ANY OTHER POTENTIAL DANGERS AT YOU FITTING SITE BEFORE YOU BEGIN THE INSTALLATION - PUT PROTECTIVE MEASURES IN PLACE
- ALLOW 12 HOURS ON AVERAGE FOR FULL KIT INSTALL – IT'S NOT A RACE. ACCURACY/ATTENTION TO DETAIL IS MORE IMPORTANT THAN HOW QUICKLY YOU COMPLETED!!
- Fit a NEW GENUINE FUEL FILTER before installing the supercharger kit
- You **WILL** dyno check the vehicle for correct air fuel ratio before using at full power on road

Recommended actions:

Fit a new fuel filter the vehicle BEFORE you fit the supercharger kit, afterwards will be too late! Engine damage could occur due to insufficient fuel flow


Clean the engine ENTIRELY before you begin installation of the supercharger system – pressure cleaning is recommended, just don't direct water into the alternator and other sensitive areas

You MUST remove the drivers side half of sump guard/under engine guard prior to starting work (refit when kit is installed)



Wherever you see this ICON, there is personal danger and you must take precautions

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Preparation for kit installation

WASH THE ENGINE THOROUGHLY, DRY AND TEST RUN PRIOR TO DISASSEMBLY

Remove the original Subaru air intake system, the airbox, the pipework to the throttle body and the MAF electrical connection.

When you have completed this task your engine bay will be ready for supercharger installation



REMOVE THESE PARTS

The cold air intake plastic

The Engine cover

The air filter box and air ducting across to the throttle body

Removal of engine belt, engine belt diagram



You will need a 12mm socket to loosen the manual tensioner to loosen the belt, and subsequently remove it. First undo the locking nut, then turn the tensioner bolt anti clockwise to loosen the belt and then remove the belt



Fitting the autotensioner

You have been provided with the auto tensioner and the two bolts to fit it . It bolts into this position directly under the alternator and the powersteering pump cradle. The tensioner is a genuine Subaru part for the previous model of EZ36 engine



Supercharger Bracket Fitting

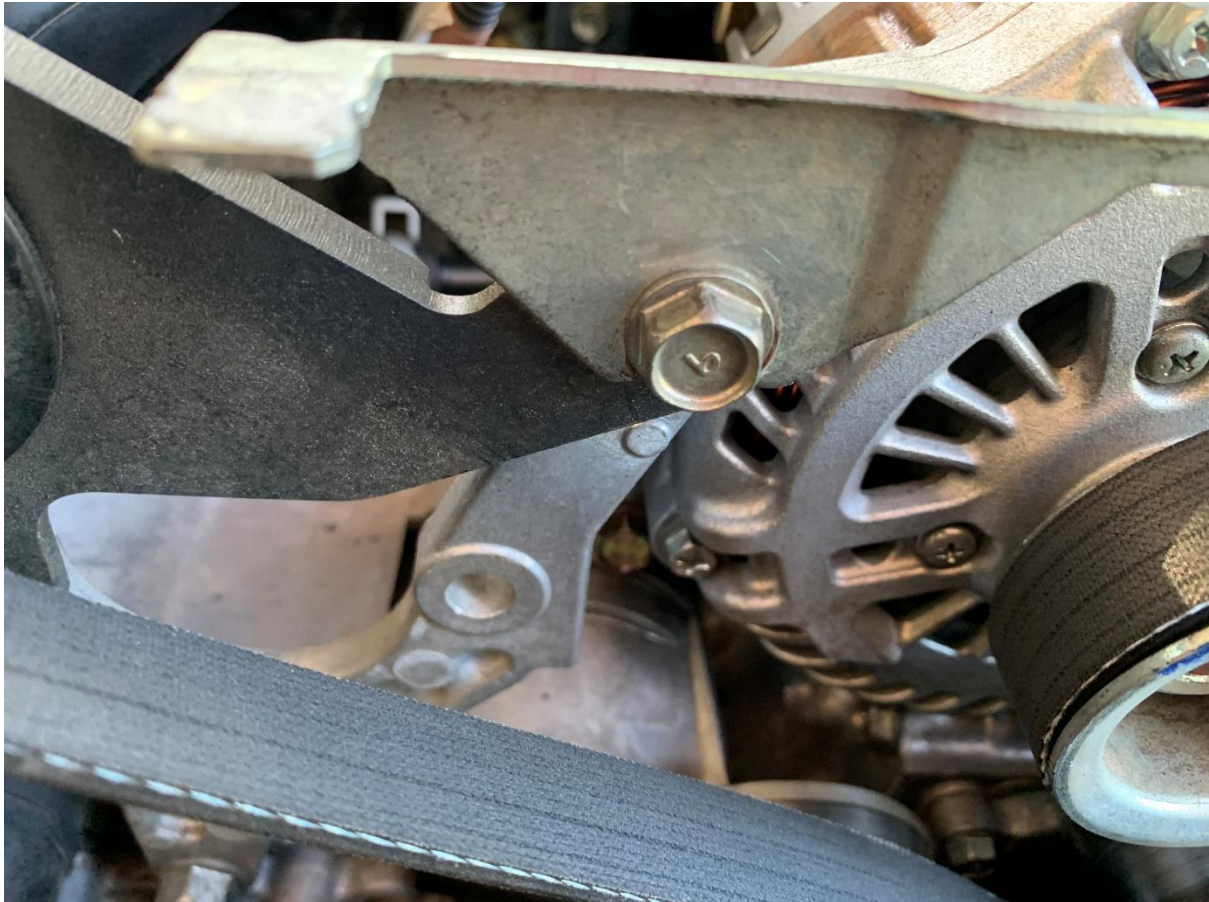
The bracket of this shape and bolt it directly onto the side of the engine at the fuel rail cover

Remove the original bolts and use the supplied bolts, do not tighten the bolts, leave them so the bracket can be moved as needed



Fitting the main mounting bracket

Remove the alternator mount bolt, slide end of bracket into position and refit the bolt



Then fit the bolt through the bracket into the power Steering pump cradle - again, fit the bolt but do not tighten it - yet



Then fit the two button headed bolts through the mount plate and into the stay bracket that you fitted to the side of the fuel rail cover earlier – leave them slightly loose so you can move the bracket if needed

Now, level the bracket so that it appears level along its top edge

1. Tighten the stay bracket bolts into the fuel rail cover
2. Tighten the button heads fully
3. Then tighten the bolt at the alternator
4. Finally tighten the bolt at the power steering cradle



Fitting the supercharger to the bracket

Fit the supercharger so that the outlet is horizontal and facing towards the engine

Use the supplied 8 stainless steel countersunk screws. Fit the screws and tighten firmly, do not overtighten or you will stretch the socket head of the screws – which is bad

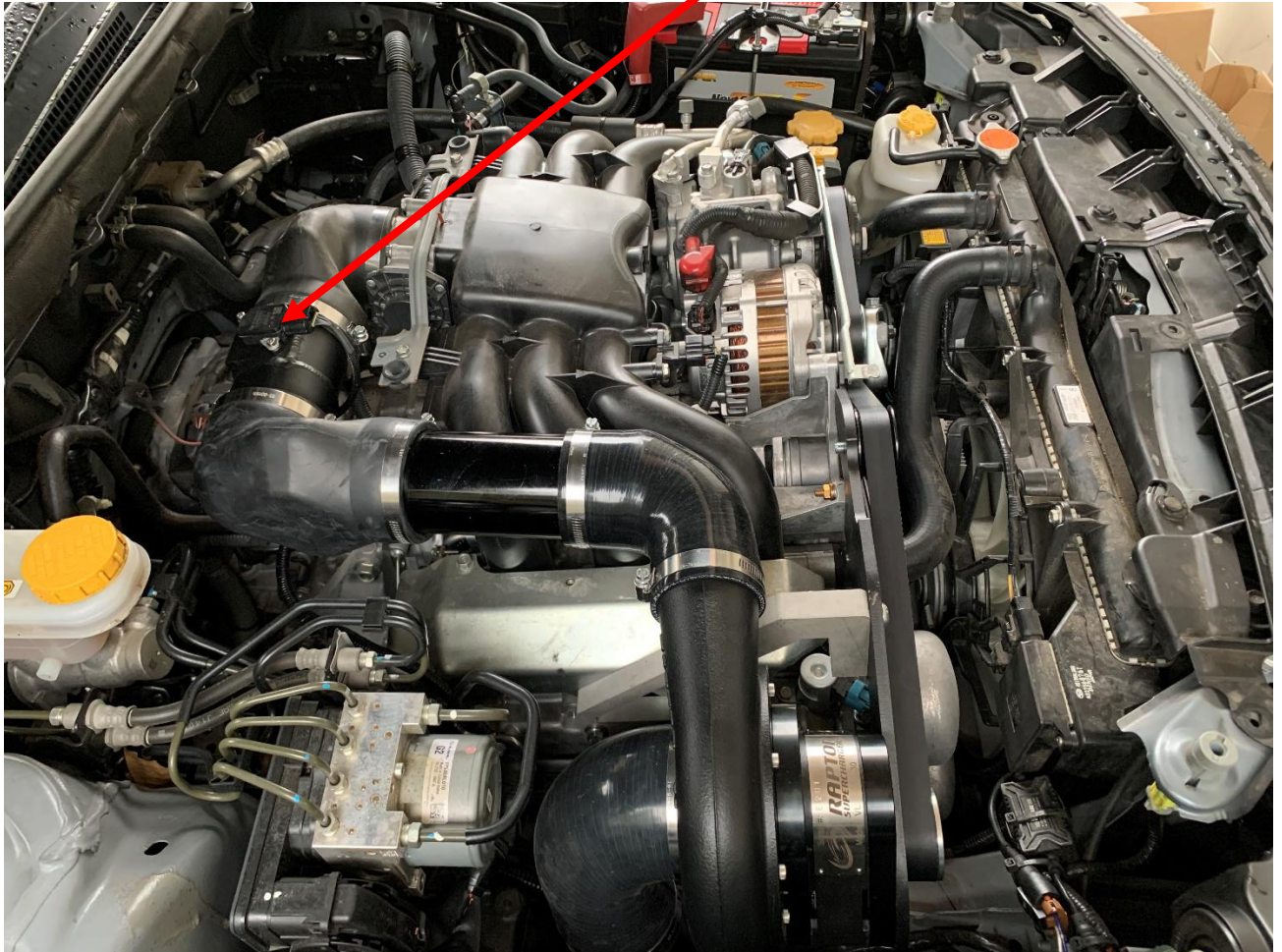
Do not use any Loctite or locking compounds on the screws



Fitting the pipe work – pressure side

Your pressure side pipework is preassembled, simply fit it as shown and properly tighten all the hose clamps

Fit the MAF meter extension cable into original MAF plug, then fit the MAF sensor to the pipework – then plug cable into the sensor



Fitting the intake pipe and air filter



You have been supplied with an assembly, you fit this to the intake of the supercharger and tighten the clamps, making sure that the filter and assembly in general are not touching any other parts

Supercharger cooling fan

You have been supplied with a cooling fan, and a universal wiring kit with power relay and fuse
Raptor Superchargers will advise you on whether you need to fit this cooling fan or not

Typically, only customers operating their vehicles in HOT CLIMATES will need to fit this fan unit
Fit this item in the cool air area between front bumper and A/C condenser radiator

Cooling fan system

This consists of a

1. Blue MOTOR CONTROLLER
2. A speed controller that plugs into the motor controller
3. Black and Red Power feed wires that plug into the motor controller
4. A mounting bracket and 4 x 3mm screws to mount fan to bracket
5. Air delivery hose with adaptor on one end to fit the fan unit
6. Fan itself, 2 stage variable speed centrifugal fan w/ 3phase AC motor



COOLING FAN WIRING

FAN Wiring guide

PIN NUMBERS ARE NOTED ON THE UNDERSIDE OF RELAY

There should be 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 86)

Your Relay needs an earth, so you run the PIN 85 wire to Earth (battery or body)

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

Your RED fan power wire from blue fan controller connects to this pin (as the 2 pin female plug on the end) connects to PIN 87A (blue wire coming from relay)

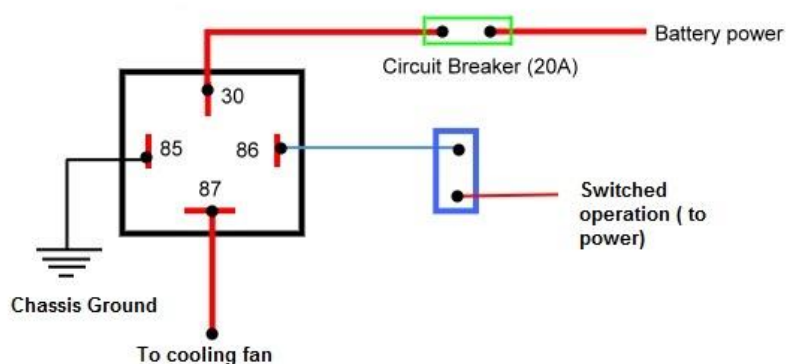
Your Black fan earth wire should ideally go to chassis or even back to the battery

Now you can plug that two wire female into the blue fan controller

Then you take the fan speed controller with its 3 wire plug (but is 5 pins wide if I recall) and plug it directly into the blue fan controller also, and insulate it and keep it nearby to fan controller – adjust it for 60% of maximum speed once its all going

Then, plug the motor and its wide connection plug directly into the blue fan controller as well

If you have all that completed correctly, your fan will start and run when the key is turned on

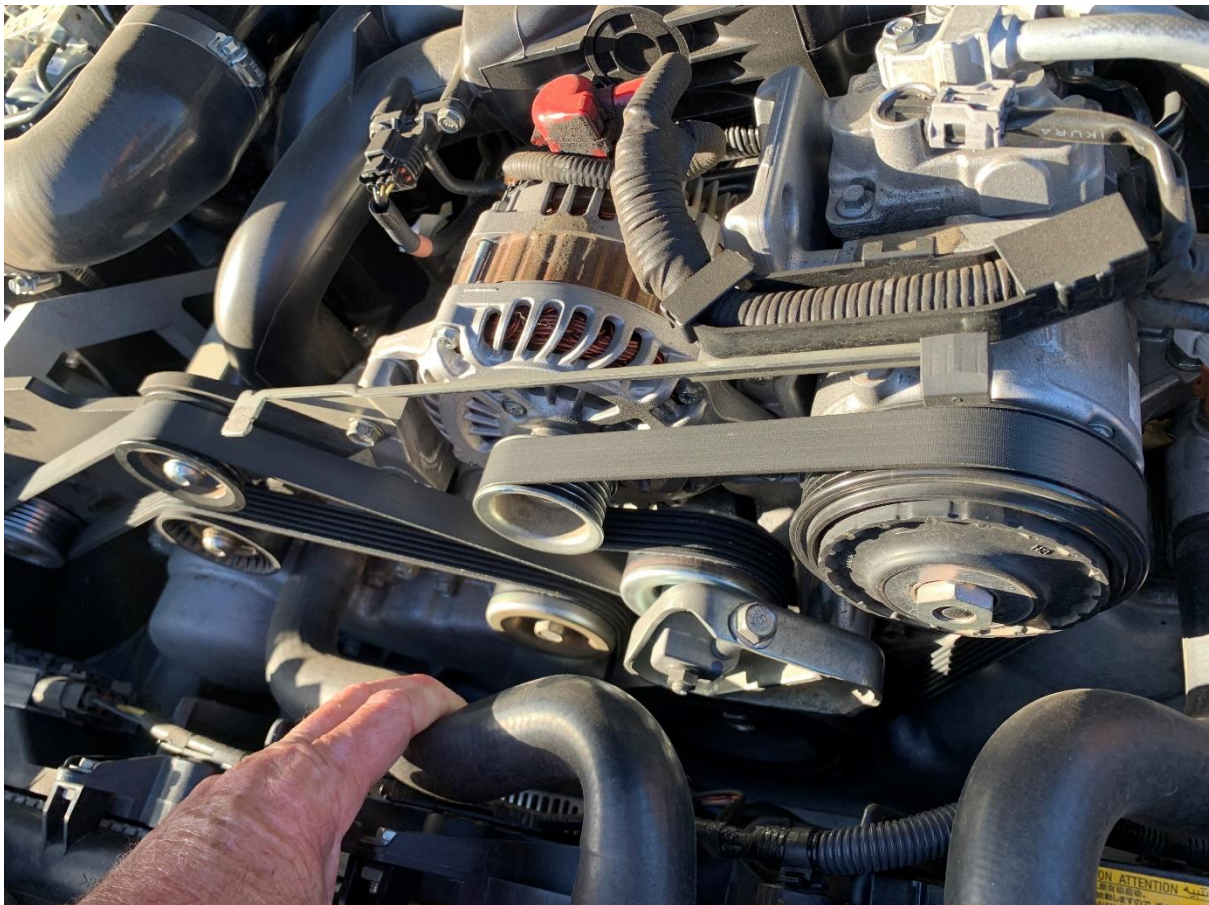


ENGINE BELT FITTING

The method is quite interesting

Fit the belt to the engine

1. Then tension the MANUAL adjuster (the one you loosened to remove the original engine belt) and monitor the movement of the AUTOMATIC TENSIONER
2. The sliding section of the manual tension will end up about half way up its total travel distance and at this point you should be noticing that the automatic tensioner is about half way through its total arc of travel.
3. Once you have achieved this, lock the nut on the manual tensioner, and from now on the entire belt will be automatically tensioned, however if you note that the auto tensioner is no longer adjusting, then add some more tension at the manual tensioner – this may be necessary after a year of operation to make the tension good

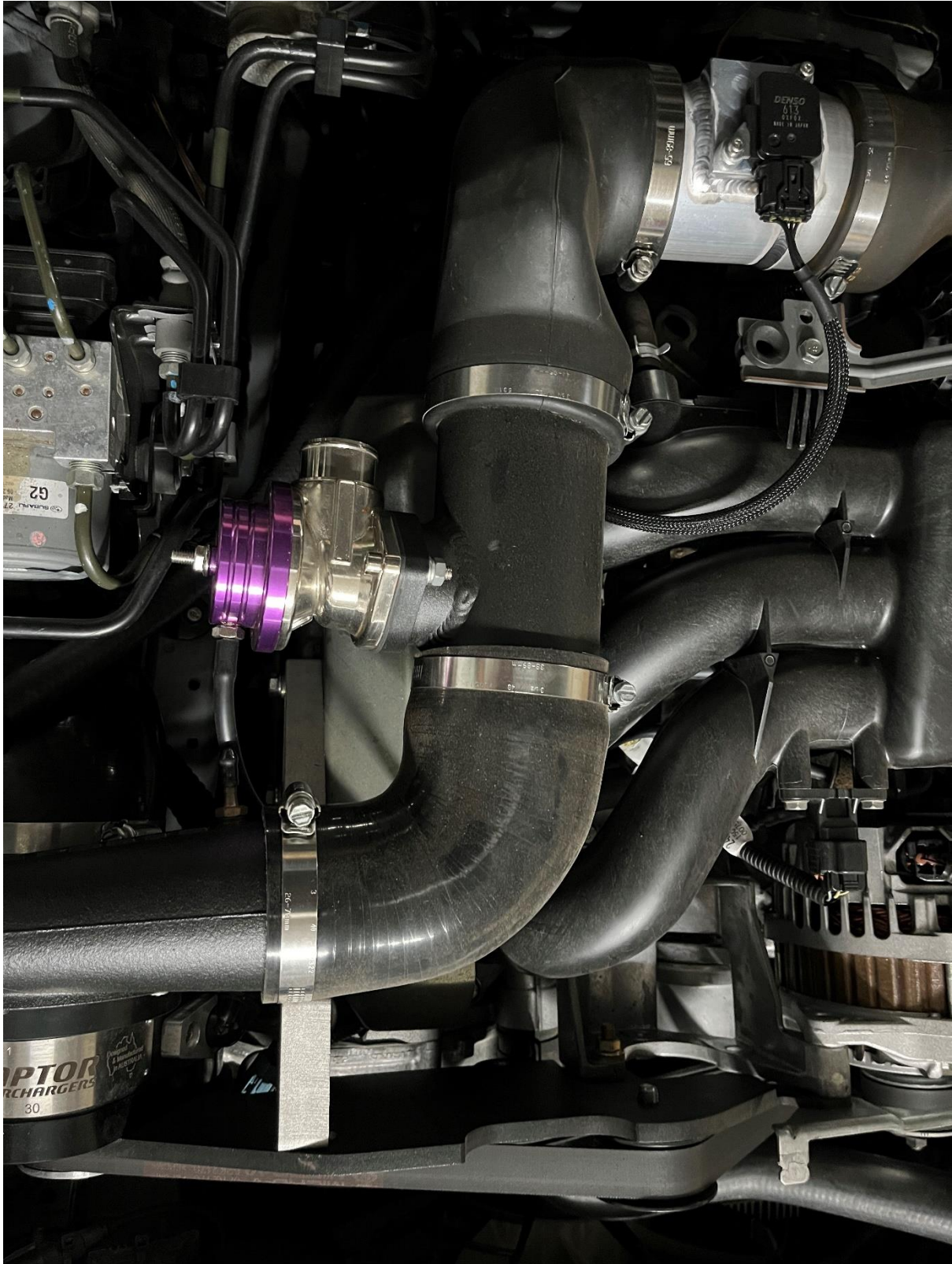


BOV

The BOV actuator line is connected to the MAP sensor hose with the supplied T section – see image/s. This is at the front of the intake manifold, just left of the rear of the alternator



BOV is positioned like this, to clear the ABS module



Supporting parts

These are parts you might use to enhance the performance of your supercharger installation

Raptor EZ36 headers – can be purchased from Raptor Superchargers – example installation



Spark plugs by NGK

The RUTHENIUM Spark plug

NGK 93420 LFR6BHX Ruthenium HX Plug



High flow fuel pump

Typically you will have been supplied with a fuel pump (SIMILAR, not necessarily the same as in the picture



Water methanol injection kit – to cool the induction charge for maximum horsepower potential

Optional - you source this yourself

AEM V3 1 Gallon Water/Methanol Injection Kit 30-3300



Optional Intercooler – you source this yourself

If you chose air to air, this is only type recommended – vertical flow by TREADSTONE USA

You need to use BOV on hot side and BOV on cold side – use same valve type as on the non intercooled kit. ATA intercoolers can be very troublesome with boost loss/flow restrictions



Suggested servicing guide

Item	Product	Frequency	
Engine oil service	5/40,	6000km	
Sparkplugs	OEM in Ruthenium	Every 70 000k	
Engine belt	6PK2170	Once a year	
Auto trans fluid	CVT Subaru		
Fuel	98 octane only	ALWAYS	
Engine water level	Subaru Coolant	Weekly check	

FUEL PUMP INSTALLATION – TANK



FLAMMABLE LIQUIDS – ELECTRICAL CONNECTIONS = FIRE/EXPLOSION





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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 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 prior to driving your supercharged vehicle for the first time.

YOU MUST DYNO TEST THE VEHICLE AND CHECK IT IS SAFE FOR OPERATION

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.