



Congratulations on your purchase of the MRN Twin Turbo conversion for 987, see below installation instructions for fitting. This installation requires some mechanical knowledge, please read these instructions completely prior to starting the job and if you are not confident, please seek professional advice/installation.

These instructions are split into sections to help divide up the work load and try to make the installation as time efficient as possible. Always use good engineering practices with regards to tightening fasteners, running cables and hoses protected from sharp edges, ensuring all hoses and pipes are internally clean, all mating surfaces are clean prior to assembly, o-rings are lubricated etc.

Installation typically takes up to 40hrs and should not be rushed so please allow plenty of time.

### **Section #1 – ECU remap**

Tools required:

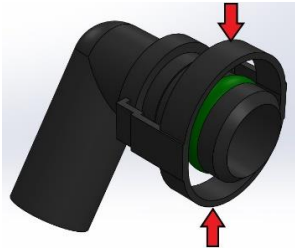
- None
- 
- 1) Connect a battery charger to your car with minimum 10A capability. If your battery goes low when you are uploading/downloading the MAP files you can permanently damage your ECU and/or corrupt the MAP files. MRN Race Technologies will not be held responsible if this happens to your car.
  - 2) Follow the instruction provided for the tablet (<https://www.mrnracetechnologies.com/downloads>) and email the file to [martin.mrnracetech@outlook.com](mailto:martin.mrnracetech@outlook.com)
  - 3) The MAP files will be sent back via return email within a few days then upload to your car following the instructions

### **Section #2 – Upper engine**

Tools required:

- E10 socket
- Socket set with assorted sizes
- T30 Torx bit
- Pliers
- Large flat screwdriver
- Philips head screwdriver
- Tin snips
- Knife
- Dremel/multi-tool (or equivalent) with the ability to cut plastic
- Allen (hex) keys

- 1) Remove engine cover
  - a. Remove luggage net (if fitted) and carpet over engine compartment
  - b. Remove and retain the 5x T30 bolts securing the engine cover
  - c. Lift out cover
- 2) Disconnect the upper AOS breather line
  - a. Squeeze the 2x connectors as shown below and pull away to separate

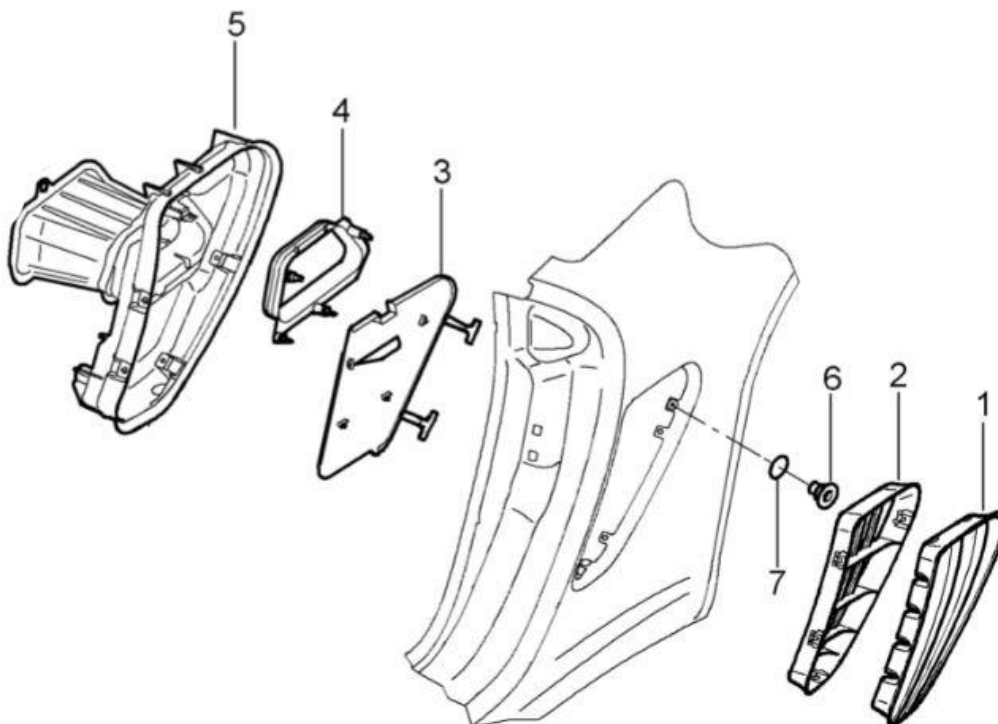


- b. Remove the whole upper hose assembly from the AOS (Air Oil Separator) and discard
- 3) Remove the OEM intake runner link pipes with TB and convoluted pipe
  - a. Loosen the hose clamp that secures the convoluted OEM hose to the MAF (Mass Air Flow sensor), retain this clip for reinstallation
  - b. Loosen the 4 hose clamps that secure the rear connector to the 2x inlet manifolds shown below

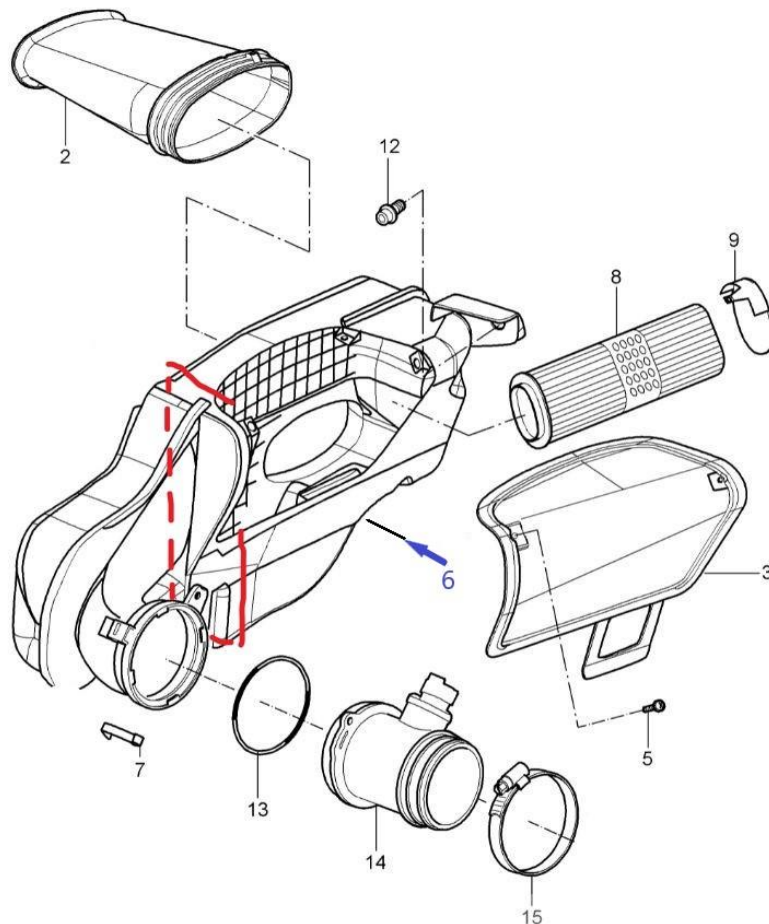


- c. Remove the 10mm nut that secures the inlet snout to the bracket adjacent to the engine hoist bracket
  - d. Slide the 2x rubber connectors circled above outwards as far as they will go
  - e. Gently lift out the OEM inlet snout until access is available to do the following:
    - i. Disconnect the Electrical plug to the OEM Throttle body
    - ii. Disconnect the vacuum line that operates the flap below the main tube
    - iii. Using pliers move the clamp to disconnect the large fuel tank breather line fitted to the underside of the throttle body – The assembly should now lift out of the car
  - f. Using the same process used in step 3b you can lift out the front most like tube, there is a vacuum line to be disconnected under this part also. Retain the hose clamps and rubbers that connect the part to the inlet runners and discard the other parts.
- 4) Remove the left side intake runner
  - a. Unclip the solenoid from the runner and remove it
  - b. Remove all parts secured to the underside to allow removal
  - c. Undo the fasteners that secure the runner to the cylinder head – the front most one is difficult to see/access

- d. Gently pull the fuel rail away from the inlet runner and move away to the side, the injectors will stay attached to the fuel rail
  - e. Lift out the inlet runner and put to one side.
  - f. **Do not let any foreign material enter the engine via the holes exposed by the removal of the runner. Carefully clean the face of the cylinder head and use tape to seal off the inlets to the engine.**
  - g. Remove the electrical connectors and spring clips holding the fuel injectors to the fuel rail and remove the injectors. Make sure that each injector has an o-ring seal on the top and the bottom, if any are missing, they may be left in the runner or fuel rail and need to be removed. **Caution, there will be some fuel leak out of the fuel rail as the injector(s) is removed.**
- 5) Remove the OEM air filter
    - a. Remove plastic inspection cover on airbox
    - b. Remove air filter
  - 6) Remove the inlet grille on the side of the car (#1 in Pic below), this part is clipped in and just required pulling out. It is clipped on the horizontal bars of the vent. It is recommended to do this on a warm day so the plastic is more supple and less likely to break. If the part is cold using a hair drier will warm it enough.
  - 7) Next remove the retaining frame (#2 in Pic below), this is secured with radial plastic pegs and they have 4 tabs that need prying then the frame will pull out towards you.
  - 8) Remove the baffle plate (#3 in Pic below), the clips are visible on the face of the plate and once unclipped the part will come away and out.
  - 9) Remove the frame that the plate was attached to (#4 in Pic below), this frame is located into the rubber surround and just pulls out.
  - 10) Remove the airbox snout, this can be seen when you look into the opening and is an oval shaped tube (#2 in Pic on the following page). This also just unclips and pulls out.

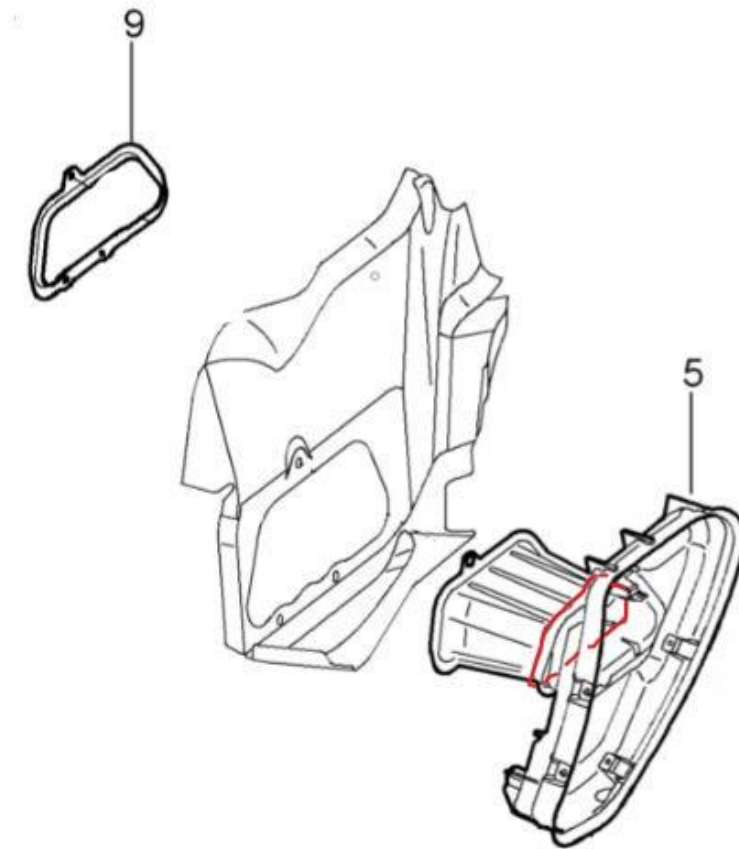


- 11) Remove the MAF sensor (#14 in the Pic below), undo the worm drive clip on the right side (#15 in the Pic below), unclip the 2x metal latches where it connects to the airbox (#7 in the Pic below), unclip and remove the electrical connection and remove the MAF sensor by pulling it right out of the airbox.
- 12) Airbox removal. There are two ways of approaching this, if you have a lot of time on your hands and do not want to cut the OEM airbox you can lower the engine off the engine mounts and get the airbox out in one piece. That is a large undertaking and not a route the majority of customers take so we will only be covering the simple route in these instructions.
  - a. Remove the two fixing screws that secure the airbox to the car, one is high up at the front (#12 in the Pic below) and the other is difficult to access under the airbox (#6 in the Pic below), this uses a 10mm hex head.
  - b. Cut the airbox in to two pieces, a pair of tin snips can get most of the work done then the Dremel will get to the parts the snips cannot. (See red line on the Pic below for a rough guide to cutting)



- 13) Remove the aluminium retaining frame (#9 in the Pic below), this is accessed from the engine side and you may need to pull away some of the sound proofing material to access the fixings.
- 14) Remove and trim the large rubber shield (#5 in the Pic below), once unclipped from the bodywork it will fold up and come out of the side vent of the car. Once removed, trim the part with a sharp knife using the red line in the Pic below as a guide. **Do not trim too close to the main body, the part removed in step #9 above will need to be refitted later.** If unsure, refit the part to the rubber shield and use that as a guide.

- 15) If you have sound proofing material hanging down from above where the new filter will go you need to trim or remove it so as to not block the filter.



- 16) Refit the rubber shield in the reverse way to its removal in step 14.
- 17) Fit the turbo oil feed line
- Using an allen key remove the oil gallery cap in the cylinder head
  - Ensure the sealing face is clean then fit the oil line adaptor with sealing washer where the cap was removed
  - Fit the oil feed line and tighten it so that it is pointing towards the rear of the car
- 18) Refit the inlet runner removed in step 4 in the reverse order, fit 3 of the new fuel injectors supplied in the kit along with the plug adaptors and reconnect the electrical connectors. **Take care to ensure the fuel injectors are properly seated and the rubbers that connect the inlet runners to the plenum are seated correctly, an air leak here can be difficult to diagnose.**
- 19) Assemble the blanking plate and plastic elbow using the M6 fasteners and plain washers provided in the kit. Only fit the two captive fasteners at this time.
- 20) Fit the part assembled in the previous step to the body of the car from the engine side using M6 fasteners and plain washers supplied.
- 21) Fit the air filter from the outside of the car, **take care to ensure the filter is fully seated onto the elbow and try to leave the worm drive clamp in a position that you can tighten it up.** A hex socket on a ratchet should work but do not overtighten the filter. **Make sure all of the filter material is not being fouled by any sound proofing material (refer to step 13).**
- 22) Refit the parts removed in steps 6, 7, 8 & 9 in reverse order.

23) Additional parts to remove

- a. Remove the rubber mount that supported the OEM inlet snout (Step 3c)
- b. Remove and retain the OEM engine hoist bracket secured by the 2x E10 fasteners. Keep this bracket and fasteners in case engine removal is required at a later date
- c. Remove the small plastic vacuum lines right back to the solenoid valves that are clipped to each inlet manifold
- d. Remove the P-Clip secured by the E10 fastener from the black convoluted oil breather hose, take out the rubber lining, flip the p-clip 180° and reinstall it so the hose will clear the new parts

24) In your kit you will find 2x small rubber caps, fit these to blank off where you removed the hoses from the solenoids mentioned in step 23c

25) Take the rubber connector sleeves off the intake runners and clean any oily residue from the inside of them then put them back onto the intake runners

26) Take the MRN Carbon plenum and place it between the OEM inlet manifolds then slide all 4x rubbers over the plenum. There is a raised plastic part in the OEM inlet manifolds to indicate the rubbers are in the correct location. **It is imperative to make sure all 4 rubbers are seated correctly on both the OEM inlet manifold and the MRN carbon plenum prior to tightening the hose clamps as any air leak will cause issues.** Once you are confident the hoses are installed correctly go ahead and tighten the hose clamps.

27) Fit the new 82mm Throttle body.

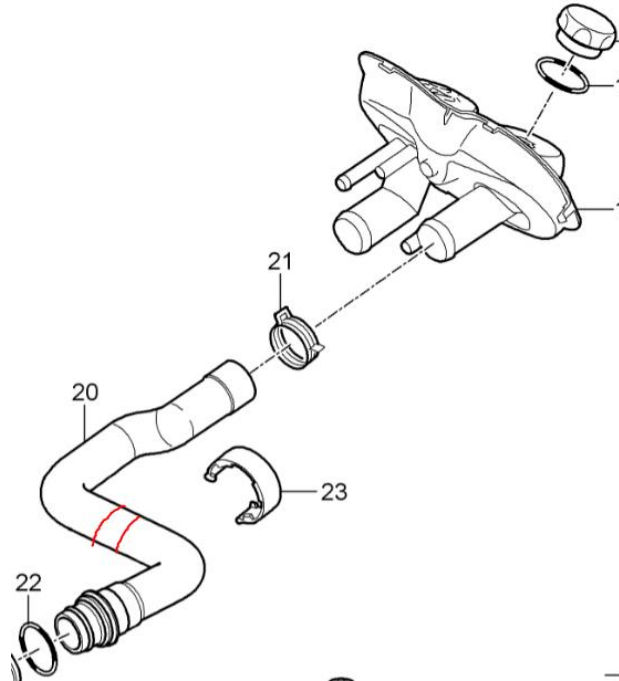
- a. Connect the electrical plug to the throttle body
- b. Ensure the supplied O-Ring is seated correctly into the plenum
- c. If your car is manual gearbox move your cables to the position shown in the picture below
- d. Make sure the throttle body is in the correct orientation (see picture below) then using the fasteners provided secure the throttle body to the plenum.



28) Using a similar method to the left side, replace the fuel injectors on the right side of the engine with the ones included in the kit. You don't have to remove the inlet runner for this side.

29) Fit the turbo oil breather fitting.

- a. Locate the oil fill hose on the right side of the engine
- b. Cut 30mm of hose out of the centre of the straight part that runs from left to right across the car (see section marked in red on the pic below)
- c. Fit the breather fitting with the MRN logo up and secure with worm drive clamps supplied

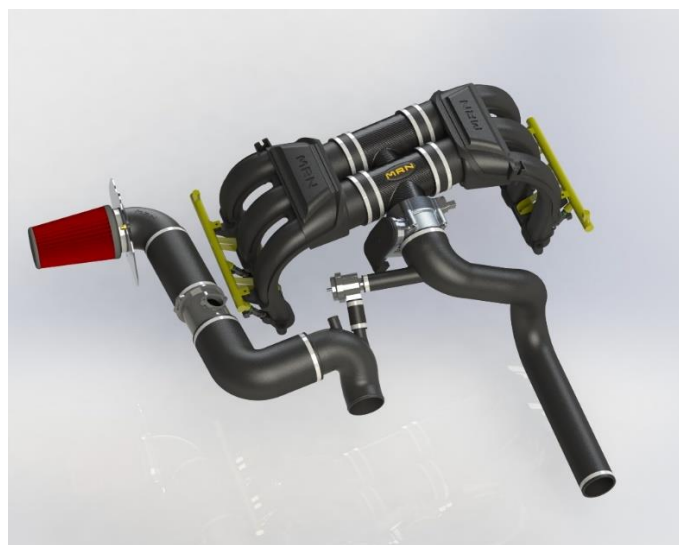


30) Fit the straight silicone pipe, MAF sensor and silicone elbow to the elbow that was fitted in step 20 as shown in the picture below. Leave the worm drive clips loose at this stage to allow alignment later.

31) Take the long boost pipe that connects to the throttle body and pass it down from the top along the right side of the gearbox, it should sit over the top of the triangular gearbox mount beside the engine, it is useful to have someone underneath for this stage to help guide the pipe.

32) Fit the boost pipe to the throttle body with the worm drive clamp supplied.

33) Fit the softest (red) spring in the BOV (blow off valve) kit into the valve then install the BOV in the orientation shown below, and 3D printed elbow to the silicone elbow fitted in step 30. Run and cut to length a piece of 4mm silicone pipe from the BOV to the connection on the underside of the carbon plenum (close to the throttle body), secure with clamps. If you are fitting a boost gauge this is the line to splice into.



- 34) Connect the fuel tank breather line as disconnected in step 3.e.iii to the elbow using the original clip
- 35) Take the 22mm black silicone flexible hose from the kit and run it from the AOS, under the carbon plenum to the elbow, this will need to be cut to length. Putting the ends in hot water will soften them and make it easier to push on if you experience difficulty. Secure both ends with worm drive clamps provided.
- 36) Fit the IAT (Inlet Air Temperature) sensor to the carbon plenum adjacent to the throttle body using the M6 Fastener provided.
- 37) Fit the patch loom to connect up the MAF sensor to the original wiring loom and use the additional tail to plug in to the new IAT sensor.
- 38) Fit the charge cooler header tank.
  - a. Remove the front most fastener that secures the left hand side fuel rail
  - b. Fit the chargecooler header tank using the fastener and spacer provided, fit so that the hose connection is rear facing



### Section #3 – Front of car

Always use good engineering practices with regards to tightening fasteners, ensuring cables and hoses are protected from sharp edges and hot parts, ensuring all hoses and pipes are internally clean prior to fitting, all mating surfaces are clean prior to assembly, o-rings are lubricated etc. Always ensure that when the car is raised off the floor that it is safe to work under before attempting any work. General health and safety should be followed as well as common sense.

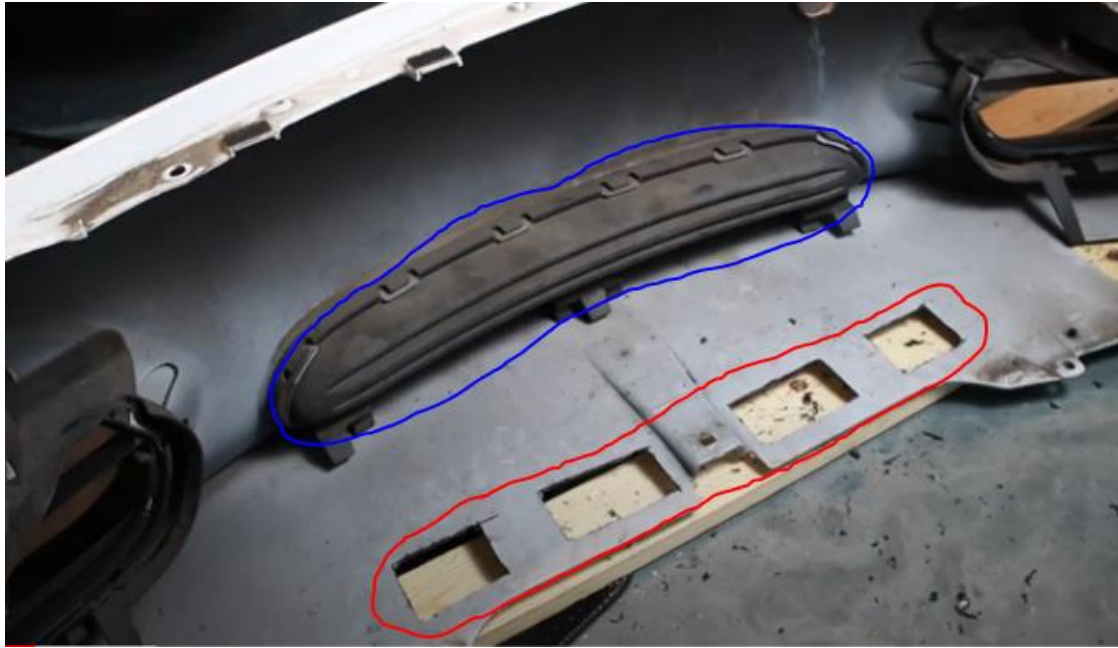
Tools required:

- T25 Torx
- Socket set with assorted sizes
- T30 Torx
- Knife or hose cutter
- Cable snips
- Philips screwdriver

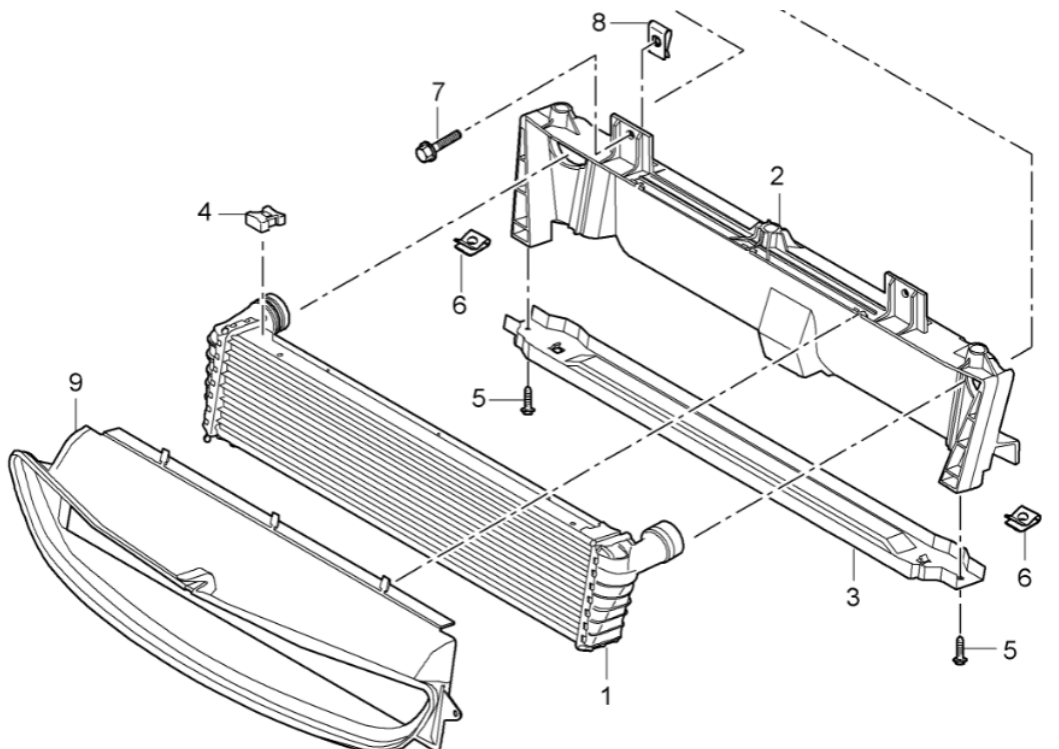
#### 1) Remove front bumper

- a. Open front bonnet/trunk and remove the 3 plastic trim parts from the front and sides of the opening
- b. Remove the 3 Torx screws at the front of the trunk
- c. Behind the carpet to the inside of the headlights there are large rubber blind grommets that once removed allow access to the cam lock fixing for the headlights
- d. Insert the long headlight removal tool from your Porsche tool kit (or a hex socket and long extension) into the hole and ¼ turn (CCW right side, CW left side) until the headlight is released, pull to remove fully.
- e. Remove the front most, lower inner wheel splash guards (both sides), removing the wheels allows better access. There are fasteners under the car to be removed as well.
- f. Remove the Torx screws from the underside of the front bumper
- g. Remove the side indicators by unclipping the spring clip then disconnecting the electrical connector
- h. Remove the Torx screw above where the side indicator was removed (it faces upwards)
- i. Unclip the bumper at the front between the headlight opening and the trunk by pushing/sliding the clip towards the centre of the car
- j. Ease the bumper away from the car and disconnect the fog lights and headlight washers (if fitted) and also any other cables and hoses that are secured to the bumper. You may need a helper to aid you during this stage.

- 2) Now is a good time to remove any debris from the bottom of the left and right radiators, removing the ducting is recommended and is relatively simple to do.
- 3) Trim the underside of the front bumper to allow the air from the third radiator to exit (red in pic below). A sharp knife, jigsaw or multi cutter tool will work ok. Do not remove the centre part where the fastener goes.
- 4) Remove the plastic blank from the bumper that is blocking off the centre opening (blue in pic below) by unclipping the plastic tabs. Then fit the new retaining frame supplied in its place. Cayman bumper is shown, the Boxster version uses the same process but may look slightly different.



- 5) It is not essential to remove the large aluminium cross member but it does make the install a little easier, it is at your discretion.
- 6) Pre-assemble the centre radiator as shown in the picture below, the radiator should have plastic ducting on the front and rear and the metal retaining frame on the underside. The front plastic duct is specific to Cayman or Boxster so may differ from the picture view below.



- 7) Secure the front radiator assembly to the car using the 2 upper fasteners, 2 lower outer fasteners and a single lower central fixing.
- 8) Clip in the water hose adapters to the radiator inlet/outlet, they will only fit one way so that the inlet/outlet is pointing back and in a way that the chargecooler hoses will route well.

- 9) Take the chargecooler hose from the kit and begin running the hoses from the front to the rear of the car. It is recommended not to cut the hose to ensure you have enough to complete the install. The hoses run a similar route to the OEM water cooling pipes going outwards near the wheel splash guards before coming in to the centre of the car and running back in the same channel. All of the under-vehicle plastic covers need to be removed to do this step. At the rear of the car where the front of the engine is both of the hoses need to run to the left side in the area where the exhaust manifold is. These will be picked up and covered off in the Under Car Section. Secure the hoses with cable ties but only secure to the OEM water pipes where absolutely necessary as thermal transfer from the engine coolant to the chargecooler hoses is undesirable.
- 10) Refit the front bumper in the reverse order as removed, pay attention to the ducting for the centre radiator where it meets the opening in the bumper, this is where the duct retaining frame fits and has to be aligned whilst the bumper is being fitted.

## Section #4 – Under engine

Always use good engineering practices with regards to tightening fasteners, ensuring cables and hoses are protected from sharp edges and hot parts, ensuring all hoses and pipes are internally clean prior to fitting, all mating surfaces are clean prior to assembly, o-rings are lubricated etc. Always ensure that when the car is raised off the floor that it is safe to work under before attempting any work. General health and safety should be followed as well as common sense.

Tools required:

- T2
- Socket set with assorted sizes
- T3

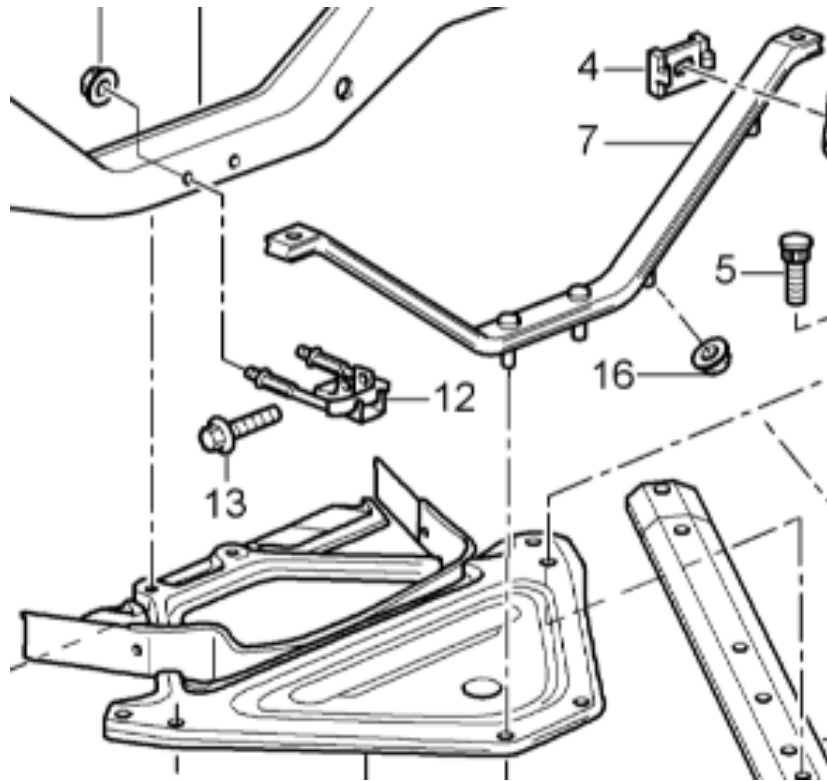
### 1) Fit sump spacer

- a. Drain engine oil
- b. Remove sump and discard the 13 fasteners
- c. Remove the 2 screws securing the oil pickup in place and discard the fasteners
- d. Thoroughly clean the oil pickup and the mating faces on the pickup and the engine
- e. Fit the Oil pickup spacer with the supplied o-ring in the aluminium spacer AND the o-ring in the oil pickup, use the longer bolts provided
- f. Thoroughly clean out and dry the sump and the sump sealing face.
- g. Check the sump spacer is clean and dry the add a smear of the supplied Loctite gasket sealant to the top AND bottom faces of the sump spacer
- h. Place the sump spacer on to the sump so that the oil return spigots will be on the right-hand side of the car when fitted
- i. Fit the sump and sump spacer to the car using the longer flange head bolts provided
- j. There should be a minimal amount of gasket sealant present on the outside of the joints, remember, what has been squeezed to the outside is likely replicated on the inside of your engine so if there is a large amount it is worth removing the sump and spacer, wiping off the excess and repeating the fitting process until you are satisfied that your sump will not have excess sealant inside. **Do not refill your engine with oil at this point, it will all run out of the oil return spigots!**

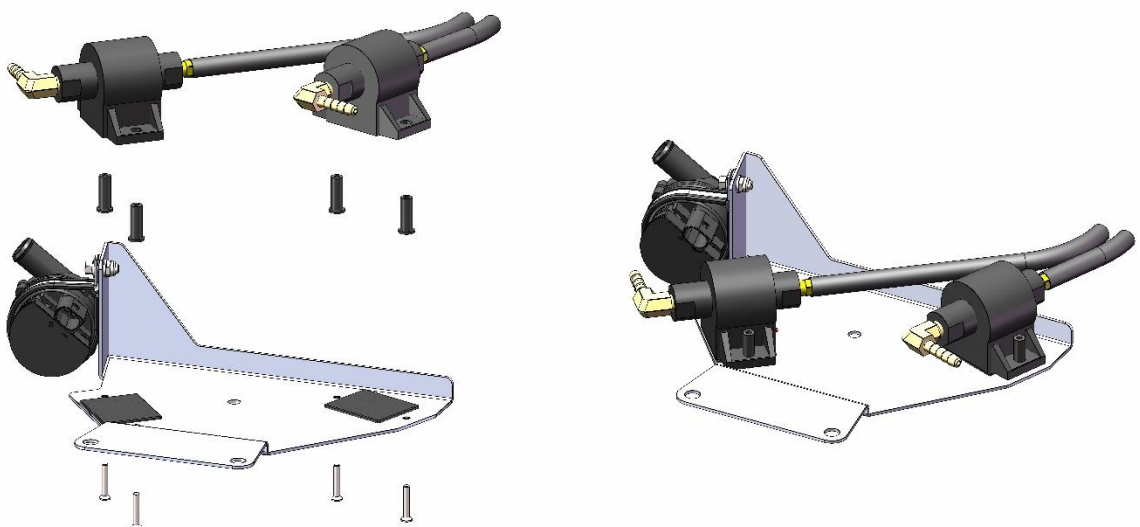
### 2) Remove and discard rear exhaust section

- a. Remove the fasteners that secure the rear exhaust to the headers (manifolds). These can be troublesome to remove as access is limited and they can be quite corroded. For better access the rear wheels can be removed and a plastic access panel can be removed to help
- b. Remove the exhaust retaining frame by removing the bolts that go into the rear of the gearbox. The entire rear exhaust should come down at the back then move rearwards to clear the drive shafts

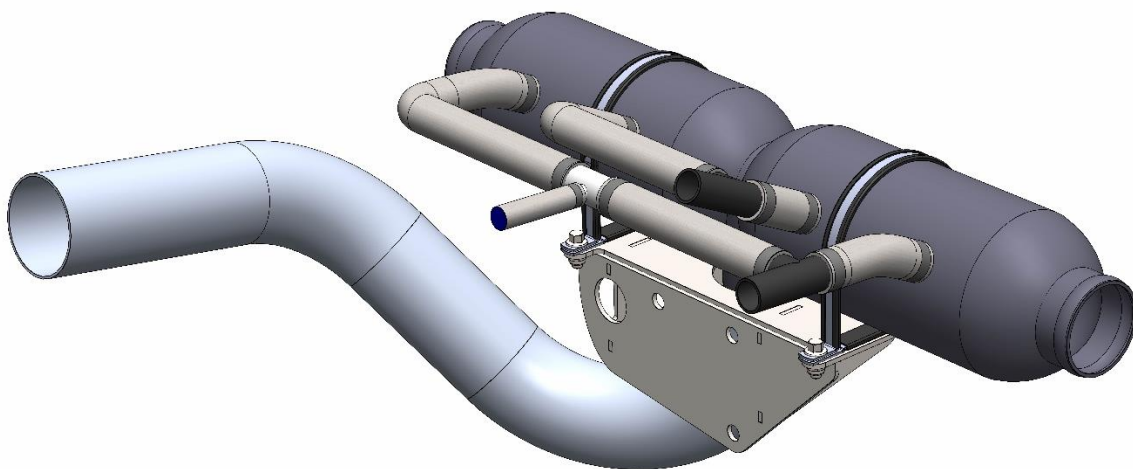
### 3) Remove and discard the V shaped support (#7 in the pic below) by removing the upper and lower fasteners



- 4) Assemble the scavenge pump tray as shown in the pic below with the flow direction going towards the front of the car (to the right in the pic below) then mount it to the top of the triangular tray using fasteners provided. Hose clamps not shown in the below picture, these must be fitted. Do not cut the hose provided until the tray is fitted and the hoses can be cut to fit to the sump spacer spigots, simply fit the hose to the pumps in a loop then cut after the tray is fitted to fit to the sump spacer connections. Secure both hoses with clamps.

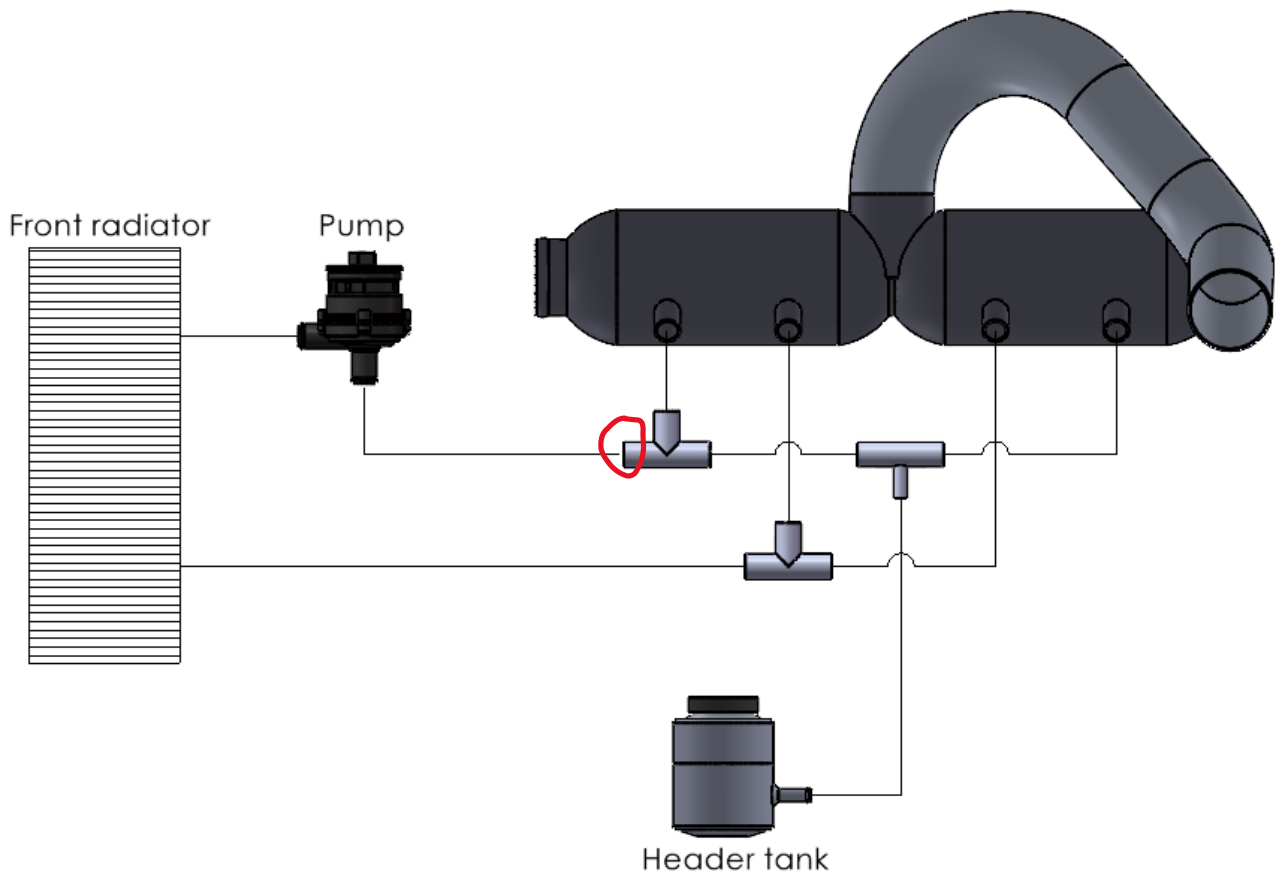


- 5) Locate the cable loom for the tray and connect the 3x pumps, leave the cable routing for now
- 6) Assemble the chargecooler as shown in the pic below, tighten all the water hose clamps but only loosely fit the fasteners for the 100mm P-Clips at this stage then fit the assembly to the rear of the gearbox. Rotate the chargecooler so that the outlet connects to the boost pipe leading to the plenum, protect the water hoses and boost hose if needed then tighten the 100mm P-clips. The 10mm hose (blue arrow) from the central reducing tee should be left full length at this stage, do not cut down the supplied length. That hose runs down the left side of the gearbox, forward and up to the chargecooler header tank. **It is recommended not to route any more chargecooler hoses at this stage because they need to be run with sufficient clearance around the hot components such as exhaust and turbos.**



- 7) Connect the silicone boost hose that was routed in Section#2 step #31 to the chargecooler and tighten the clamp.
- 8) Install the turbo air inlet duct
  - a. Locate and remove the clutch slave cylinder hard pipe pig-tail pipe bracket
  - b. Rotate the bracket 180° and refit the bracket
  - c. Clip the clutch hose to the bracket so that the hard pipe is now positioned lower than the bracket. The hard pipe will need to be gently manipulated (bent) to fit the new bracket location. (see pic below)
  - d. Route the flexi duct hose up over the left side gearbox mount and up to the elbow fitted in Section#2 step #33. Secure the hose with a hose clamp. **Ensure the hose is fitted correctly to the elbow so there can be no air leaks.**
- 9) Fit the left and right front exhaust sections to the 3-bolt flanges on the headers using the new gaskets provided along with new M8 x 30 flange head fasteners. Use the NordLock washers under the nuts but **only tighten finger tight at this stage.**
- 10) Fit the turbos to the exhaust front sections using new gaskets, M8 x 30 flange head fasteners and NordLock washers, **only tighten finger tight at this stage.**
- 11) Fit oil feed lines from Section#2 step #17 to the turbos, make sure the oil lines are routed so that they are not fouling any sharp edges and that it is relaxed in its position and not putting stress on any of the fittings after tightening

- 12) Offer up the silicone reducing elbows that connect the turbo outlet to the chargecoolers and cut down to get the best fit possible. Install both hoses using clamps provided
- 13) Fit aluminium turbo air inlet pipe
  - a. Place the silicone hose joiners onto the boost pipe with the clamps loosely fitted, push the off side hose joiner completely onto the boost pipe to allow fitting
  - b. Offer up the aluminium pipe then slide the silicone hose joiners over the turbo inlets to hold it in place, do not tighten the clamps
  - c. Fit the air duct from step #8 to the aluminium pipe and secure with a clamp. **Ensure the hose is fitted correctly to the elbow so there can be no air leaks. If the hose is touching the gearbox mount or any other potential chaffing points move or protect the hose.**
  - d. Make sure the aluminium pipe is not hitting the gearbox or any surrounding parts and tighten the hose clamps from step #13.b
- 14) Fit oil return lines from the lower 8mm connections on the turbo oil sumps to the scavenge pumps fitted in step #4, secure with clamps
- 15) Refill engine oil. The engine will now take approximately 0.8ltr (800ml) more oil than standard, do not run the car at this point. Have a good look around the sump spacer and new hose connections for any leaks whilst filling the engine and address any leaks right away. Use 0W-40 oil as per the manufacturer recommendation.
- 16) Fit turbo sump breather lines
  - a. Fit a length of 10mm hose with a clamp to the upper connection of each turbo sump and secure with spring clamps and a length of 200mm of heat sleeving to protect the hose from the turbine housing
  - b. Route the hoses up towards the top of the engine avoiding sharp edges, secure with cable ties
  - c. Cut the hoses to length and fit to the oil breather fitting that was fitted in Section#2 step 29, secure with spring clips
- 17) Fit rear exhaust sections using new gaskets with M8 x 30 flange head fasteners and one wasted head hex key fastener (without wedgelock) in the hole closest to the inside of the exhaust bend. Use wedgelock washers, only tighten finger tight at this stage. Fit 2 M8 x 30 flange head fasteners with wedgelock washers under the nut to secure the exhaust to the rear gearbox mount fitted in step #6, do not fully tighten at this stage.
- 18) The exhaust tail pipes should be close to the centre of the opening in the bumper, the exhaust system should be able to be moved a little on the loose fasteners to aid alignment. Once the tips are central tighten up all of the exhaust fixings. If the tips cannot be made central you can slacken off the gearbox mounts and using a prybar you can move the gearbox left or right in the slots until a satisfactory alignment is achieved.
- 19) Route and connect remaining chargecooler hoses as per the schematic diagram below. The hose connection from the chargecooler to the pump is best left until last (circled in red on the picture below), this hose can be raised as high as possible, into the rear wheel well works best, and fill the chargecooler system via that hose using the coolant of your choice, deionised water has the best specific heat capacity but will freeze and damage your system if conditions permit. If your climate can go below freezing you must add a suitable antifreeze. As long as the fill hose is higher than the chargecooler assembly you will be able to fill the whole coolant circuit. When coolant spills out of the open hose you used for filling connect the fill hose to it, try to spill as little coolant as possible. The aim here is to leave as little air in the system as possible. Top up the chargecooler header tank fitted in section #2 step 38. **It is important that your system matches this diagram for optimum performance**



20) Route pump tray cable into cabin. The cable routing is at the installer's discretion, we run the cables through the cable gland/grommet that the gear cables run through between the seats. The cable needs to run through to the area behind the stereo head unit. **Make sure the cable does not come into harm at the front of the engine around the AUX belt and also consider that the gear cables, shifter mechanism and hand brake are moving parts.**



## Section #5 – in cabin wiring

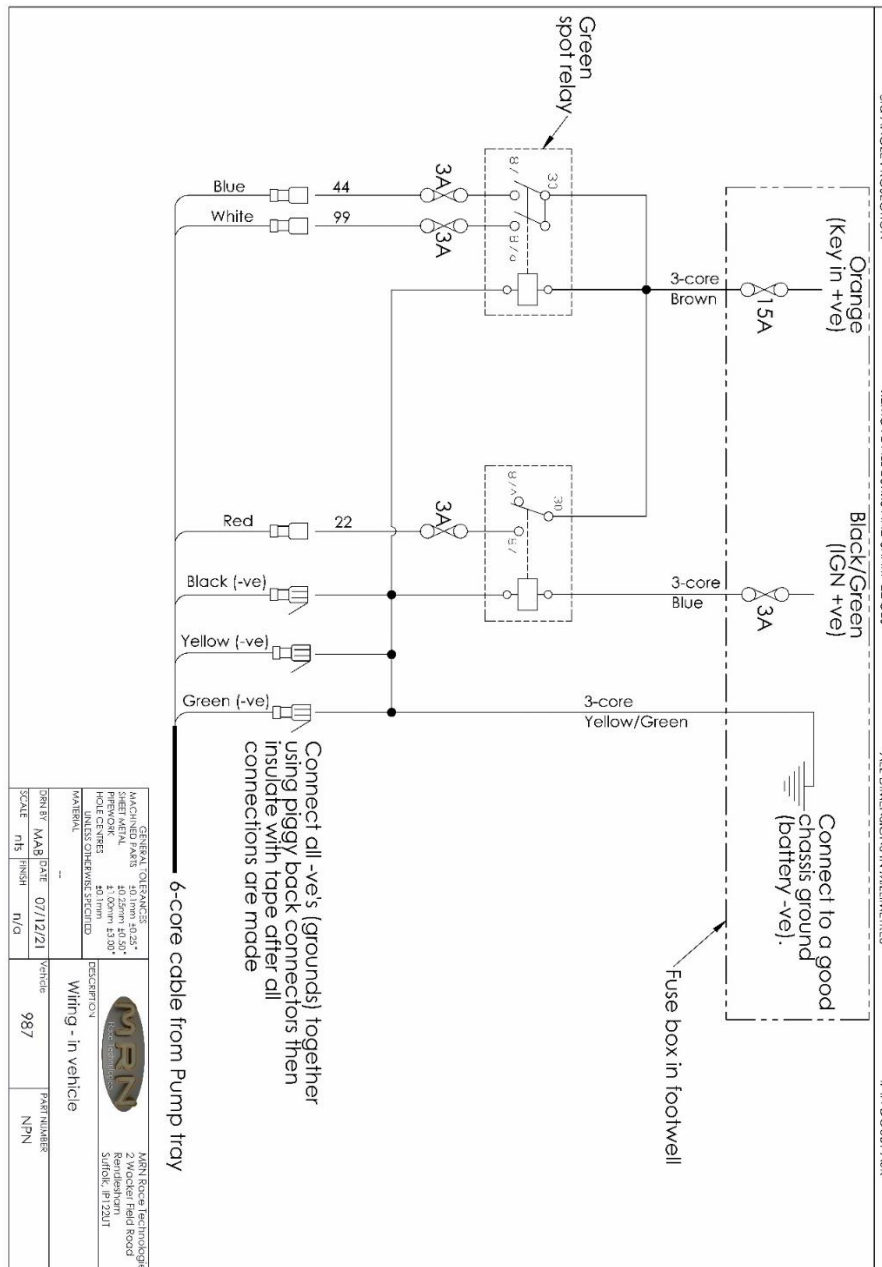
Always use good engineering practices with regards to tightening fasteners, ensuring cables and hoses are protected from sharp edges and hot parts, ensuring all hoses and pipes are internally clean prior to fitting, all mating surfaces are clean prior to assembly, o-rings are lubricated etc. Always ensure that when the car is raised off the floor that it is safe to work under before attempting any work. General health and safety should be followed as well as common sense.

Tools required:

- T2?
  - Socket set with assorted sizes
  - T3?
  - Soldering equipment (soldering iron, fluxed solder etc)
  - Insulating tape/sleeving/heat shrink or similar
  - Cable cutters
  - Cable stripper
  - Terminal crimper
  - Knife
  - Electric multi meter
  -
- 1) Remove the dashboard panel on the right side of the centre console next to the radio by removing the screws and sliding it out towards the rear of the car
  - 2) Pull out the previously run 6-core cable from the pump tray and wire it to the relays/fuses as per the below wiring diagram. Use your multi meter to find a suitable battery –ve (ground) to connect the ring terminals to\*
  - 3) Place the relay/fuse assembly into the area behind the stereo head unit and secure it in place
  - 4) Locate and remove the fuse box cover in the drivers footwell, remove the screws securing the fuse board to the car and ease it out of the compartment
  - 5) Run the 3-core cable from the relay/fuse assembly over the top of the pedal box under the dash and across to the fuse box compartment. Secure it so it can't interfere with your pedals at any time
  - 6) Locate the largest orange wire and the black with green stripe (see pic below), strip these cables back and solder a fuse holder to each cable. Insulate the solder connections so they are safe
  - 7) Connect the Brown cable to the fuse holder that is soldered to the Orange OEM cable
  - 8) Connect the Blue cable to the fuse holder that is soldered to the Black/Green OEM cable
  - 9) \*If you have problems finding a suitable –ve (ground) in the centre console use the 3-core Yellow/Green to bring one over from the fuse box compartment.
  - 10) To test the electrical install we suggest connecting your battery charger then inserting the key into the ignition. Just inserting the key should run both scavenge pumps – **check that BOTH pumps are running**, they are quite noisy when they are not pumping oil but they won't come to any harm by running dry. Once you are happy that both are running ok, turn the ignition on (but don't start the engine) – you should be able to hear the chargecooler pump running. If you cannot you may need to power the pump from the Orange cable also, please contact MRN for instruction.
  - 11) . Filling the system can be difficult, we recommend removing a hose from a connection far away from the filling tee to get started then after the wiring is complete connect a battery charger and run the pump keeping the header tank topped up at all times. Have a good look around for any signs of leaks and fix those if any. **There will be no visible bubbles in any hoses when the system is full. The system must be completely full to function correctly.**

- 12) After the ignition has been cycled the fuel pumps will have been running so have a good look around the fuel injectors and fuel rail to make sure no fuel leaks are present, do not proceed until no leaks are found.
- 13) You can now start your engine and thoroughly check the following
- a. This will be the first time the turbos have oil fed to them so have a good look around the turbo oil inlet fittings, the sumps and the scavenge pumps and their fittings, sometimes oil dripping under the turbo is running down from the top
  - b. Listen to the noise from the scavenge pumps, the sound should go to almost nothing when they are pumping cold oil so use this as a confirmation that you have oil circulating
  - c. You should not see any oil filling the clear oil sump vent hoses
  - d. When the oil is up to temperature and the car is at low RPM (below 1000RPM) the scavenge pump noise will go up, this is completely normal and is confirmation that the turbo lubrication system is functioning well
  - e. There should be no oil smoke from the exhaust (assuming your car typically does not smoke)
  - f. If you have disconnected the battery you may have a PSM fault, this should clear after a short drive, no other warning lights should be present
  - g. The car may not idle perfectly at first but it will recalibrate over approximately the first 50 miles of driving





Installation is now complete. For maximum gains we recommend your car is run on a rolling road by a competent tuner to check that there have been no errors in the installation process. It is advised to check over the install after around an hour of driving to make sure all components have remained secure and tight.

### Running and driving

A good practice is to insert the ignition key to allow the scavenge pumps to run until they are running dry **both before and after** running the engine, you can tell this as the ticking from the pumps becomes louder. You can't damage the pumps by running them dry and this process will help maintain a healthy oil return system, you should only need to run them for around 10 seconds. If you have any oil smoke from your exhaust(s) shortly after starting the engine this should cure it but contact MRN for advice for a permanent fix.

If you have any issues please don't hesitate to contact us via the website, we hope you enjoy your purchase and drive safely!