



MACE ENGINEERING GROUP AIR TO AIR FITTING INSTRUCTIONS



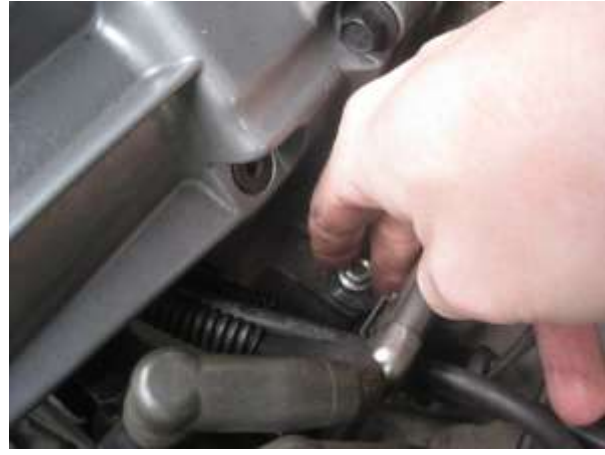
Step 1 – Disconnecting the battery terminal

For safety measures, disconnect the negative battery terminal as shown below.



Step 2 – Removing Injector rail

Proceed by removing the injector rails by unfastening all the injector rail bolts. There are 5 areas where the injector rail is fastened as shown below.







Step 3 – Removing Alternator support bracket

The support bracket for the alternator must then be removed by removing the bolts on the alternator and supercharger.



Step 4 – Removing injector cables

Using a flat-headed screw driver, unclasp the clips shown below in order to detach the cable from each injector.



Step 6 – Removing injector cable clips

Also remove any plastic clip-on brackets by detaching them using a screwdriver, in order to release the cables from the injector rail.



There are 2 clips as such, with one on either side of the rail.



Step 7 – Lifting off injector rail

Carefully lift the the injector rail off the supercharger ensuring each injector is released from the cylinder heads.

The injector rail need not be completely detached from the vehicle, as it can be maneuvered out of way whilst still being connected by the two black hoses.



Step 8 – Removing throttle body

After removing the intake hose by loosening the 2 hose clamps using a screwdriver, proceed by unbolting the throttle body in order to remove it.



There are 2 bolts which physically hold the throttle body onto the elbow.



There are also 3 nuts connecting the throttle cable bracket to the throttle body which also must be removed



Step 9 – Removing plugs

Remove the plug from the throttle position sensor which is located on the left side of the throttle body.



Also remove the plug from the idle air control valve located on the right side of the throttle body.



Step 10 – Disconnecting hoses

Remove the 2 hoses which are connected to the throttle body by loosening the hose clamps where necessary.



The throttle body can now be removed from the elbow. It will still be attached by the throttle cables but will enable itself to be maneuvered out of way.



Step 11 – Removing supercharger

Once the supercharger belt has been removed, proceed by removing all the bolts which fasten the supercharger onto the lower inlet manifold.

There are 10 bolts as such. Take notice of 2 bolts which are hidden at the back of the supercharger housing.





The following three images show the hidden bolts at the back of the supercharger.



Step 12 – Disconnecting supercharger elbow hoses

Remove the 2 hoses which are connected to the elbow bend behind the supercharger.



There is a small hose and a larger hose. The larger hose is attached by a clamp which can be removed by hand or using some vice grips.

Once all bolts and hoses are removed, the supercharger is then free to be lifted off the car.



Step 13 – Removing coil pack

The next step is to remove the coil pack which must eventually be relocated to make space for the intercooler adapter plate.



There are 3 bolts as such.





Step 14 – Cleaning surfaces

It is strongly recommended to clean the surface of the lower inlet manifold and supercharger before installing the intercooler plate on the vehicle. This can be done using a wire brush whilst ensuring all entries are covered to ensure no debris or contaminants enter the cylinder chambers.



Step 15 – Sealing

Seal and/or replace o-rings on lower inlet manifold



Step 16 – Gasket Sealing

Apply gasket maker around all entries and holes before placing the gasket onto the manifold and once again applying gasket maker onto the paper gasket itself.



Step 17 – Gasket Sealing

Apply gasket maker onto the bottom side of the intercooler adapter plate as shown below, before placing it



Step 18 – Locating plate position

Locate the exact position of the plate as shown below using the bolts provided



Step 19 – Gasket sealing

Apply gasket maker to the top face of the plate before placing the second paper gasket onto the plate. Once again apply gasket maker onto the paper gasket itself before placing the supercharger back onto the car.



Step 20 – Moving loom

It may be necessary to accommodate the raised supercharger by moving the loom at the back out of the way as shown below. Undo the clips where necessary.



Step 21 – Reinstalling supercharger

Proceed by fastening 9 bolts in total for the supercharger which travel through the plate and into the manifold. Please note that only 9 bolts are used instead of 10 as the front-most bolt is left out in order to make way for the adapter plate outlet.



Use a torque wrench to torque the bolts up to 18 Nm



Once supercharger is secure, attach all hoses back onto the supercharger housing and elbow.

Step 22 – Installing injector rail extenders



Start by removing the existing studs from the manifold. There are 4 studs as such.



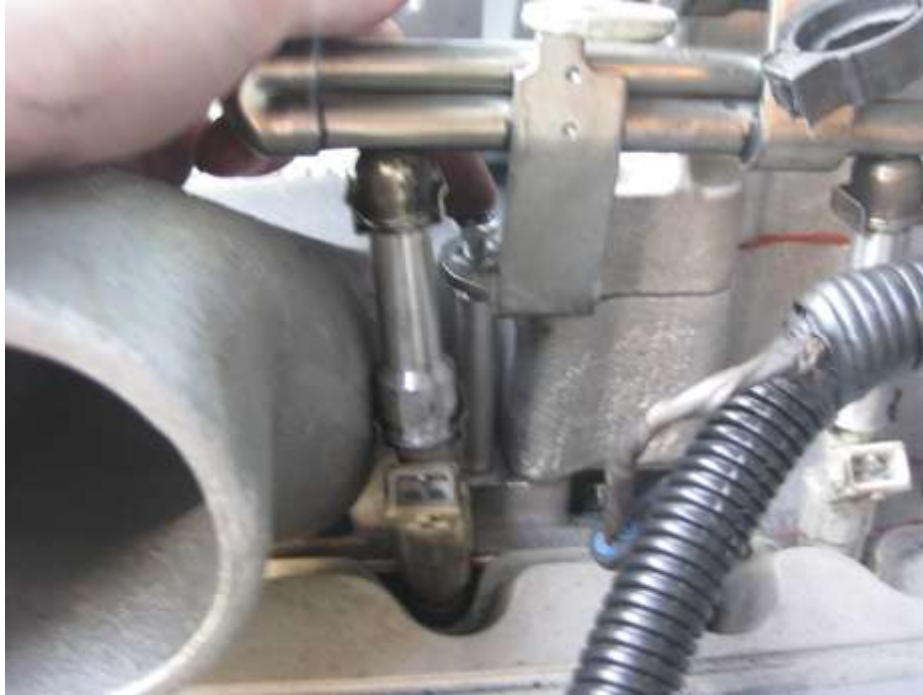
Remove the injectors from the rail by removing the metal clips in order to fit the extender in between as shown below. Injectors and extenders must clip in around the o-rings for a perfect fitment.



Replace metal clips and use extra clips as provided in order to assemble the injector and extender to the rail as shown below.



It is important to first connect the injectors into the cylinder heads ensuring all o-rings pop into place. Proceed by carefully wedging the hollow cylinder shafts in between the manifold and the existing fuel rail brackets before placing the 4 bolts through the holes and fastening them.



Step 23 – Blocking off casting holes

Using Teflon tape around the brass plugs supplied, close off the 2 casting holes at the front and back of the plate.



Step 24 – Removing Reo bar

There are 3 bolts on each side of the reinforcement bar underneath the headlight compartment. 2 are located on the outside and one on the inside under the headlight compartment.

Step 25 – Accomodating the front mount intercooler

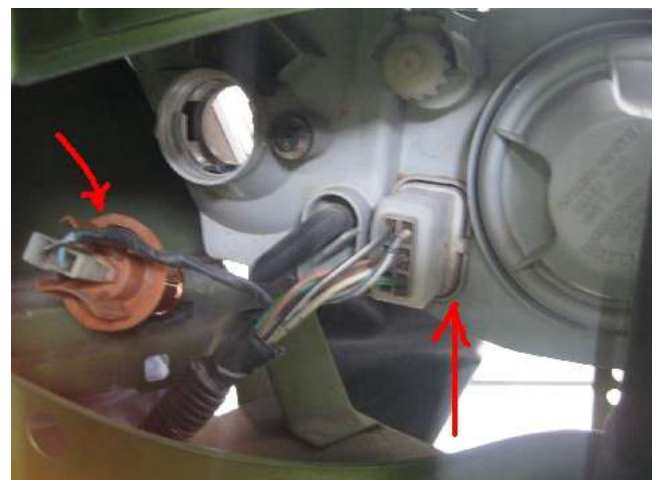
Loosen the bracket on the air conditioner receiver-drier (bellow left) in order to release the power steering fluid cooler pipe. Then release the pipe on the left side from the bracket (below right). This enables the pipe to be pushed back to make room for the intercooler plate.

PLEASE NOTE: For the VN – VS Commodore/Statesman the Receiver Dryer will need to be removed completely or relocated which may incur additional installation costs. These steps are not shown here.



Step 26 – Removing the headlights

There are 3 bolts which hold the headlight onto the car. One is located at the top. One is behind the headlight inside the engine compartment and one is on the inner front side of the headlight at shown below. Disconnect the indicator globe and wiring loom.





Step 27 – Radiator support housing modification

The circled areas must be modified in order to fit the front mount intercooler. The power steering cooler pipe should already have been pushed back as explained above.

Mark out the required section which must be cut off

*Please note, the modifications and cuts on this vehicle were to accommodate an intercooler core of dimension 600 x 300. Different size cores may need more or less material removed.



The material removed includes one of the bolt holes for the headlights. The headlight will still be supported by 2 other bolts making it still very rigid. An extra support may be made up.



Step 28 – Securing the intercooler core

Using the brackets provided, start by securing the top and bottom of the intercooler core to the support housing.



Using self tapping screws, drill the screws into place as shown below making sure the core sits evenly between the headlights.



Step 29 – Reo bar modification

Place the reo bar as good as possible onto the radiator support panel to locate and mark the cutting areas where necessary.



Take notice of the bottom of the reo bar as this may need adjustment too. At the same time roughly position the core outlet piping into place in order to determine where further modification is required.



Once the reo bar has been fully marked begin cutting off the desired areas using an angle grinder. Be sure to use a vice to secure the bar into place and use safety glasses at all times when using power tools.





Once the cuts have been made, spray with rust guard and test fit the reo bar onto the car to determine if further cutting is necessary.

Step 30 – Fitting core pipes

Begin aligning the first pipes to the core outlets. Carefully note the exact areas which interfere with the pipes. These areas are most likely underneath as shown in the bottom right image.



Using a shifter, carefully adjust these areas in order to provide enough space for the pipes.



Once all desired modifications are made, continue by connecting silicone hoses to pipes and tighten the hose clamps to secure the pipes.



Step 31 – Adjusting headlights

The marked are as shown below must be removed using an angle grinder in order to properly fit the headlights.



Both sides should end up aligning as shown below



Step 32 – Fitting rest of piping

Continue by connecting all other hoses and pipes as shown in the following images.



Slight adjustment using cable ties may be required to keep pipe from knocking onto the radiator fan. Also note the location of the hump below hose as shown in the image below right.



Continue fitting all other hoses and clamps



Step 33 – Relocation of the coil pack

Start by mounting the brackets to the coil pack and placing the coil pack into a position where it is possible to connect all ignition leads. This is best achieved in between the passenger side strut tower and rocker cover.

After placing the coil pack into position, connect all ignition leads before marking out the desired location for holes as shown below. Use self tapping screws to mount the coil pack brackets onto the chassis rail and strut tower.



Step 34 – Removing the fog lights

VY S-Pac commodores will need to have the foglights removed in order for the front bar to fit properly. Mark the area ready for cutting and carefully shave and smooth out the area with an angle grinder as shown below. A flap disk is very helpful for this application.



Final notes

- Depending on pulley size and/or engine mount condition, engine lining may need to be trimmed to prevent supercharger pulley or belt from rubbing up against the lining.
- Intake snorkel may not fit perfectly and may need adjustment. Consider trimming the snorkel for a perfect fit. The MACE CAI will not have any trouble fitting.

