M156 Supercharger Installation Manual

COMFORT POWER BY KLEEMANN®™

Rev 280213

This instruction manual provides a step by step process for installing the KLEEMANN M156 supercharger system. It is recommended that you read the instruction manual completely before starting the installation of the kit to gain an overview of the entire process. If questions arise during the installation, you are welcome to contact us directly. We are ready to provide answers and assistance. It is essential for all involved that the installation is done correctly, the car performs flawlessly and the customer is satisfied.

It is of the utmost importance that only KLEEMANN programs the ECU. Any other supplier, what ever they may make, should not be utilized for programming. Using an alternative source for ECU programming will void the KLEEMANN warranty, immediately and entirely. KLEEMANN's programming utilizes features no other supplier utilizes, keeping all factory safe running strategies in place.

The installation will be simplified with the use of just a few specialized tools. It is recommended that you have the following tools at the ready:

Crank Pulley Wrench, MB # 112 589 00 40 00
MBZ Star Diagnosis or similar diagnostic tool (AutoLogic etc)
KLEEMANN belt alignment tool
Air Fuel Ratio tool, preferably wide band
Boost pressure gauge, 0-1 bar (0-15 psi)

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Factory Engine Bay

The engine compartment should be in as built condition.

Make sure to remove any existing tuning software from the ECU and double check that the OE software is the latest updated version from Mercedes Benz. Remove any other tuning items at this time and return the car to OE (Sprint Booster, Under Drive Pulleys, Cotton/Oil Air Filters, etc).

Run the compression test from within DAS. All cylinders should have equal contribution, if not, remedy the issue before proceeding! No fault = proceed with installation.

Step 1:

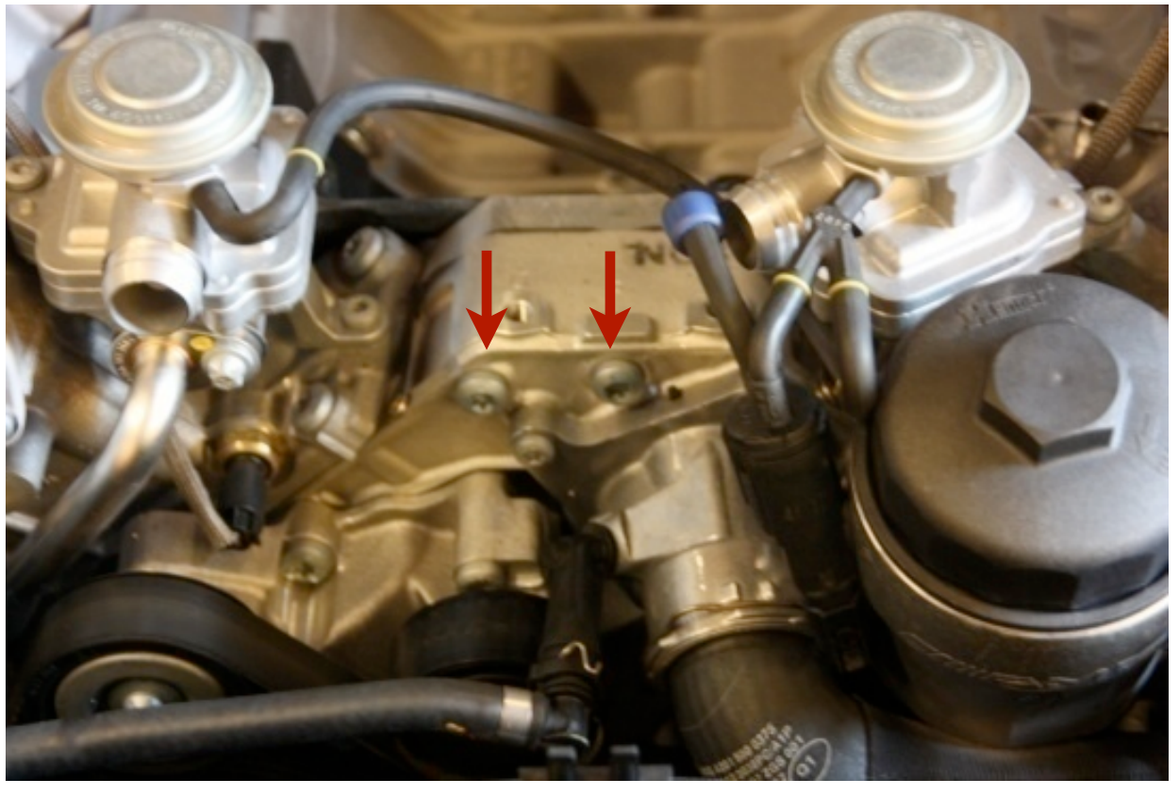
Remove the nose cover, inlet tubes, air filters and the Y-piece on the inlet housing.

Step 3:

Remove all hoses and tubes. Remove the 10 bolts witch hold the manifold to the cylinder heads. Check that the inlet manifold is completely free and lift it off the car. Temporarily cover the intake ports with wide, easy release, tape. Set the OE manifold aside for now, you will be removing components from it later.

Step 4:

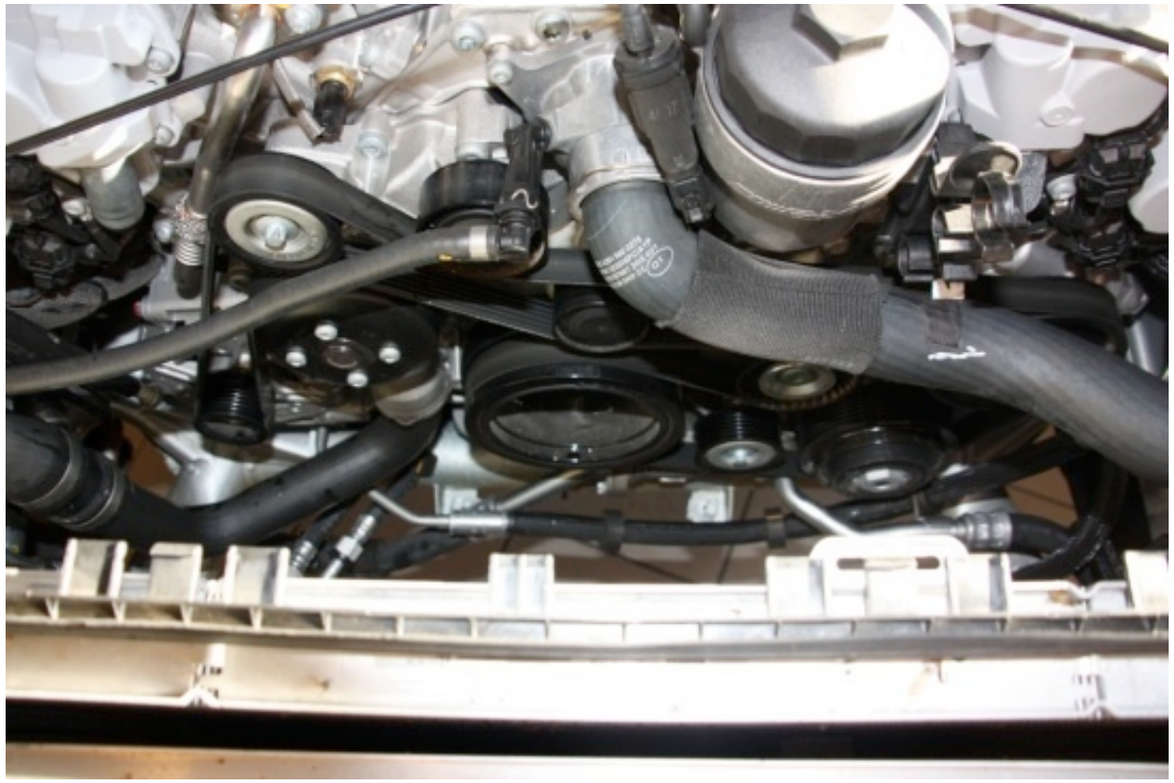
Remove the power steering tank, its hoses, and replace the 2 bolts in the cam chain housing
Remove all 3 engine lifting brackets/eyes.



Step 5:

Remove crank pulley/harmonic damper.

MB tool: 112 589 00 40 400



Step 6:

After removing the original crank pulley, please check the radial oil seal for damage. If damaged, replace the seal, if serviceable, install the Kleemann crank pulley.

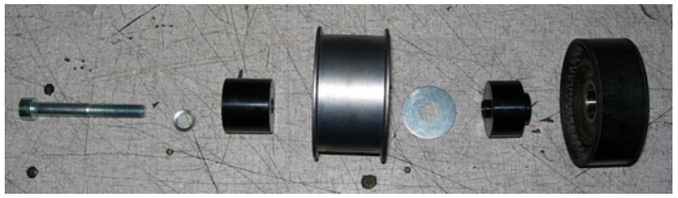
MB tool: 112 589 00 40 400
Bolt TQ:
Stage 1= 184 lbs/ft · 250 nm
Stage 2 = release (CCW 180º)
Stage 3 = 147 lbs/ft · 200nm
Stage 4 = CW +180º

Radial oil seal = MB A023 997 84 47

Step 7:

Install the two Kleemann idler pulleys outboard of the OE idler pulleys along with the brace.

Stacking order, L to R = Outer to Engine shown below:

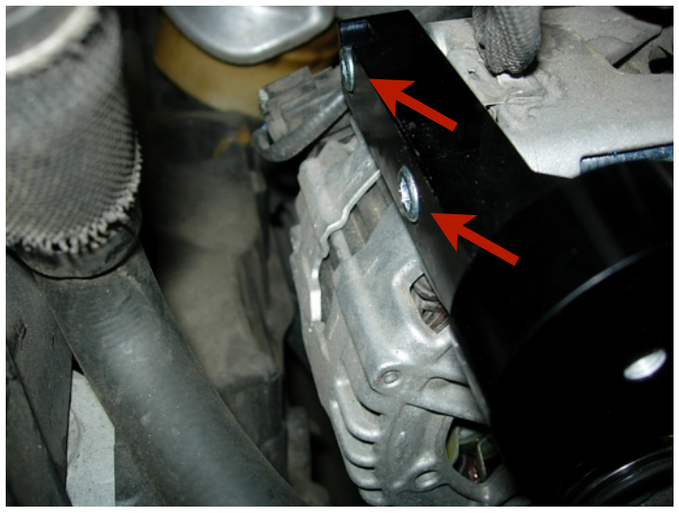


The larger washer between the outer most pulley and the stand-off for the OE pulley have been eliminated in SC systems produced from April 2013 onward.

Step 8:

Install the belt tensioner bracket, witch is mounted on the outboard side of the alternator. Do not fully tighten the mounting bolts, you will align this bracket later.

Do NOT fully tighten those bolts at this step!



Step 9:

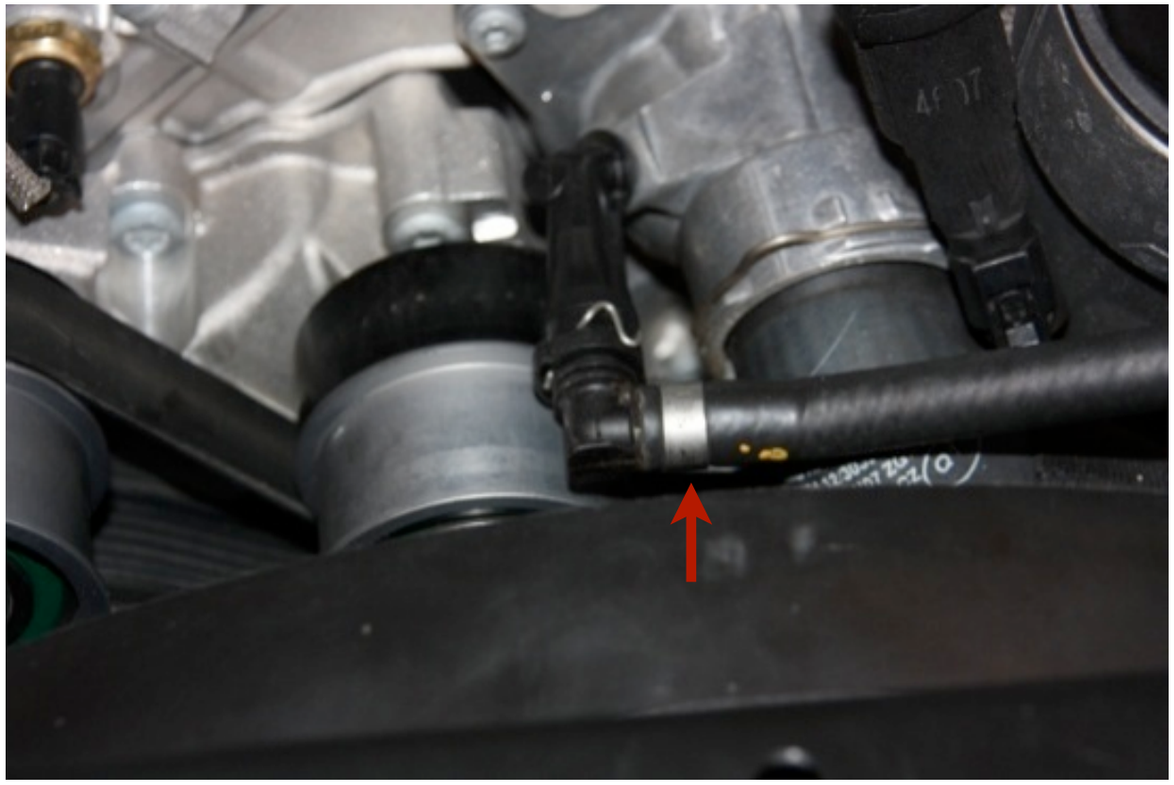
Remove the two bolts indicated by the arrows.

Step 10:

Install the power steering oil reservoir bracket as shown.

Step 11:

This hose is normally directed to the left. Cut the clamp and remove the hose. Install one end of the 8mm hose from the Kleemann kit. Place the hose neatly in front of the radiator fan. Do NOT cut the other end yet!



Step 12:

Remove clamp from hose A .Remove hose assembly B. Insert the hose from step 11 fully into hose A, reuse the OE clamp.

Step 13:

Install the intercooler water tank with the provided bracket as shown. W209 shown, other chassis are similar.

Step 14:

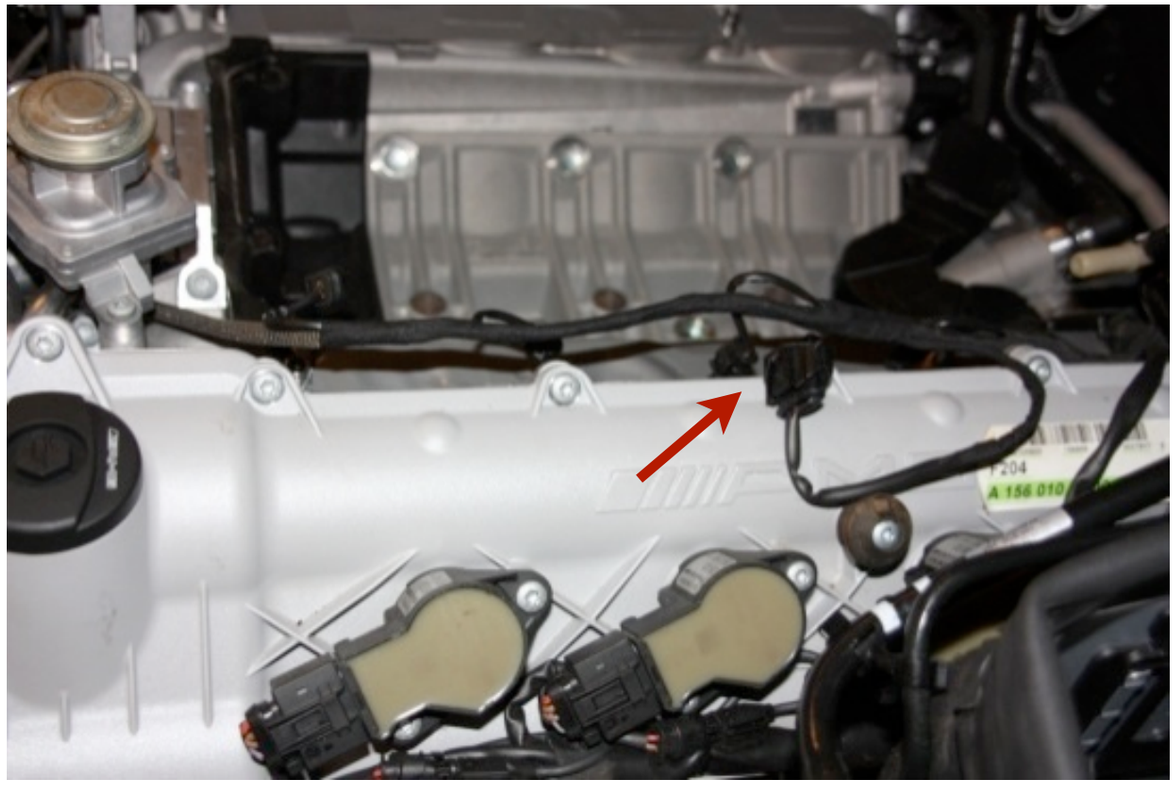
Remove the OE cloth tape from the wiring harness at the location shown.

Step 15:

Move the wires for the fuel pressure sensor to the rear of the engine compartment as shown. Reapply cloth harness wrap to the harness.

Step 16:

The harness should now look like this.



Step 17:

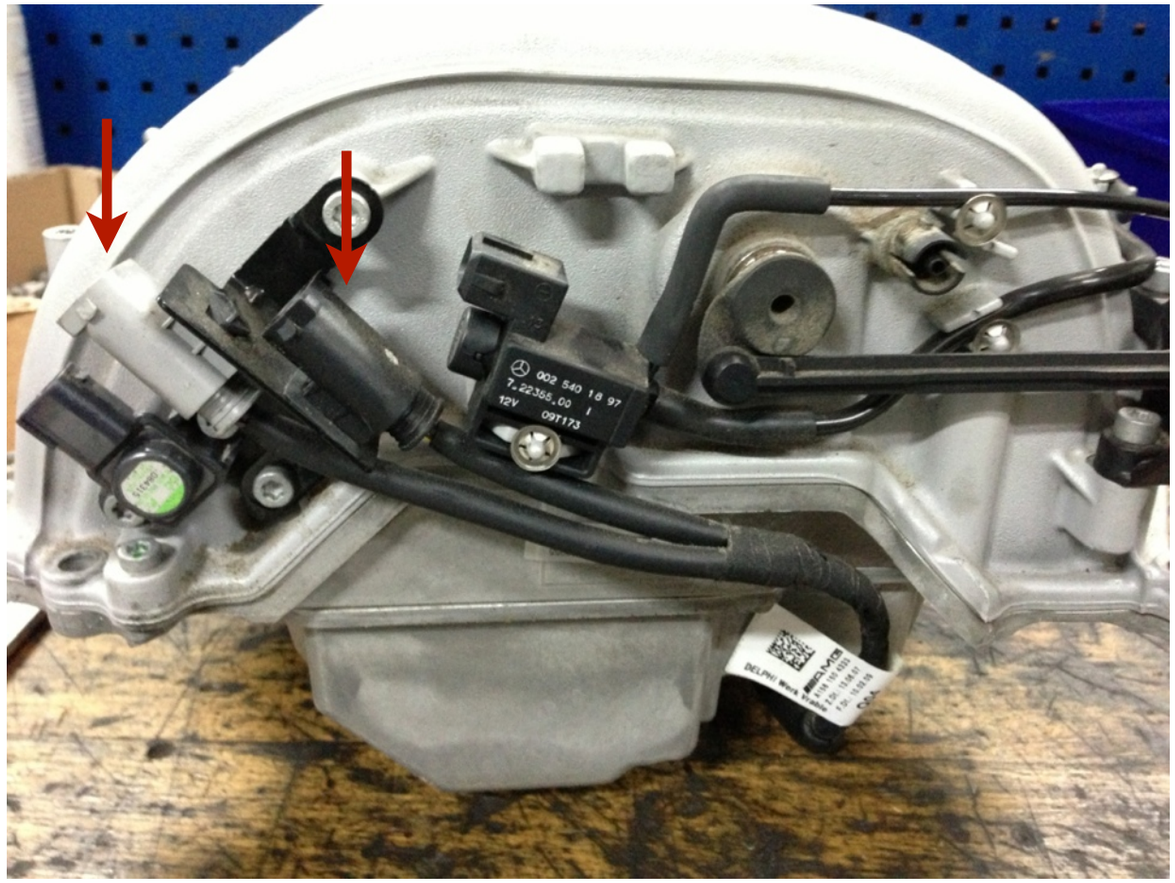
Remove the fuel injectors from the OE fuel rail. Check the injector o-rings, top and bottom, for damage.Replace any damaged o-rings and set the injectors aside. Remove the fuel pressure sensor and set it aside. Install the OE fuel rail back onto the OE manifold for safe keeping.

O-Rings:

Upper: MB 014 997 68 45
Lower: MB 016 997 77 45

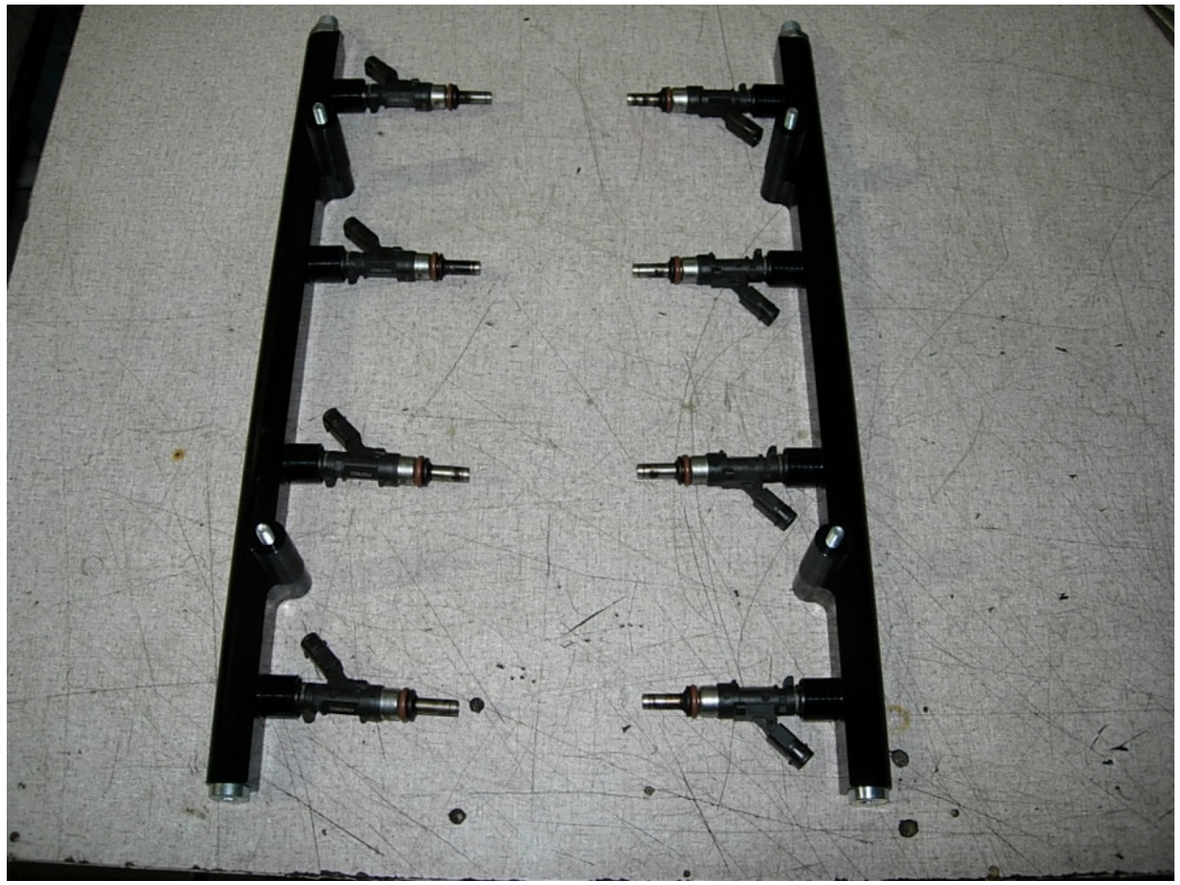
Step 18:

Remove the throttle body cables from the metal bracket on the front of the OE intake manifold.



Step 19:

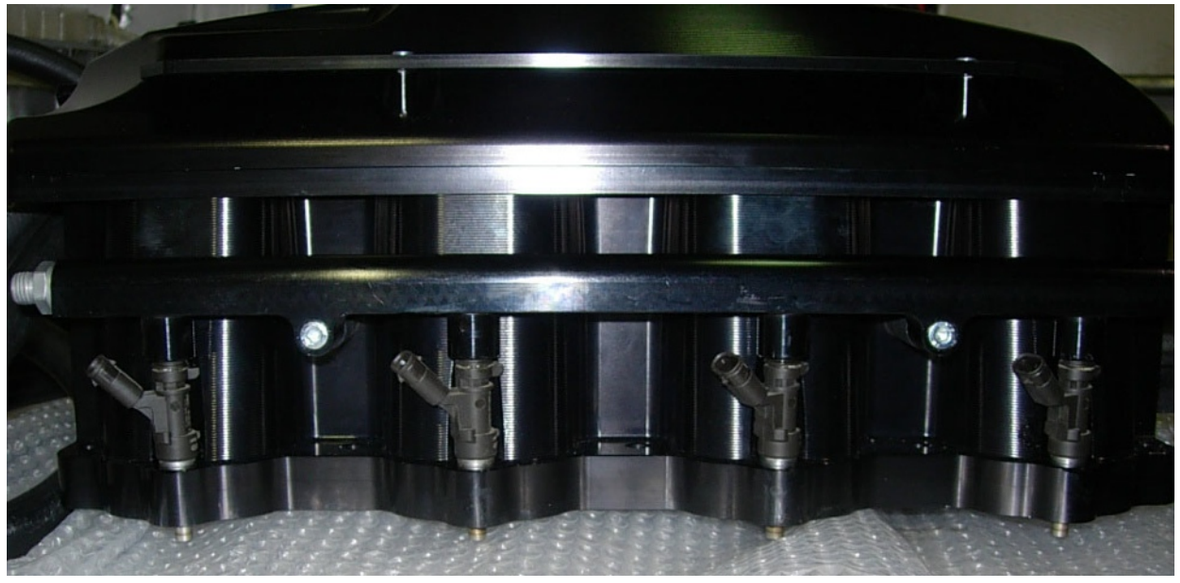
Lubricate the o-rings on both ends of the fuel injectors and install the injectors into the two KLEEMANN fuel rails.



Step 20:

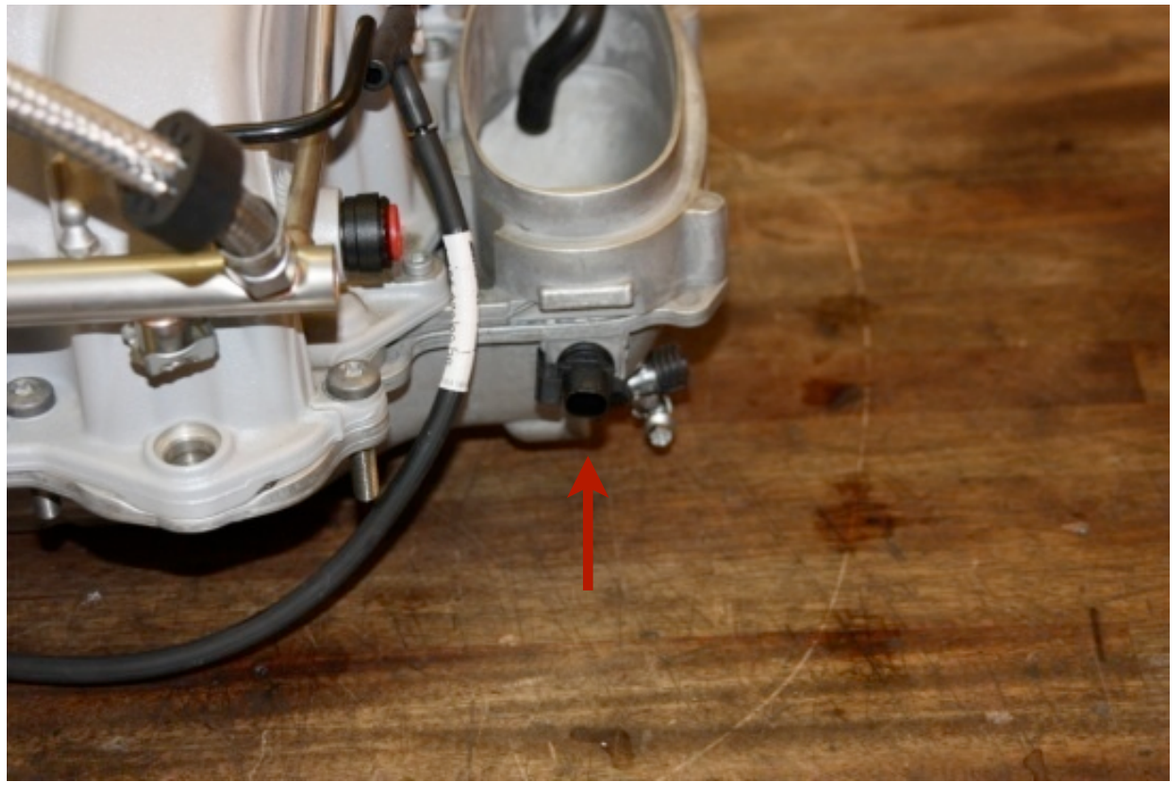
Install the the two KLEEMANN fuel rails onto the supercharger manifold assembly. The feed ports of the rails should face the back of the manifold assembly (throttles).

From this point forward extreme caution must be used with the manifold assembly. The fuel injectors project from the manifold ports and care should be taken to ensure the injectors are not exposed to impacts of any kind.



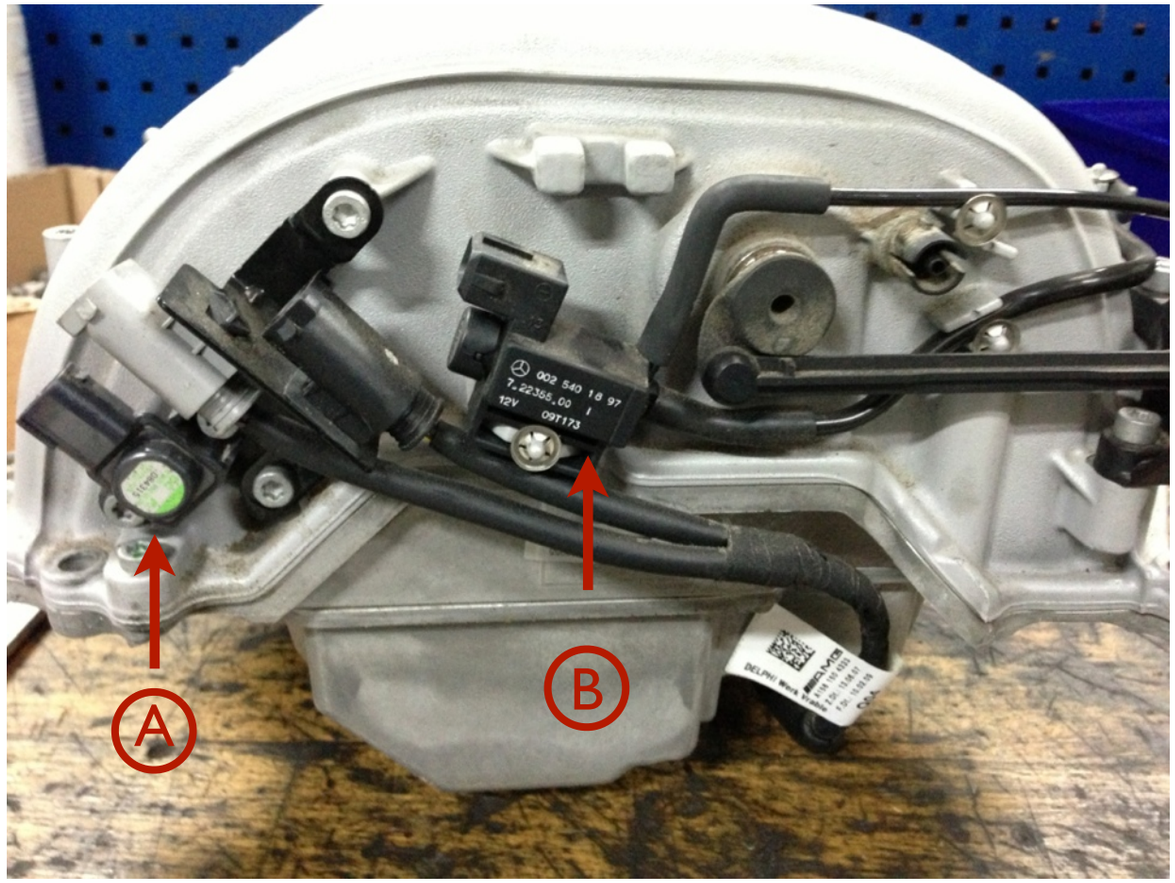
Step 21:

Remove the intake air temperature sensor from the OE manifold.



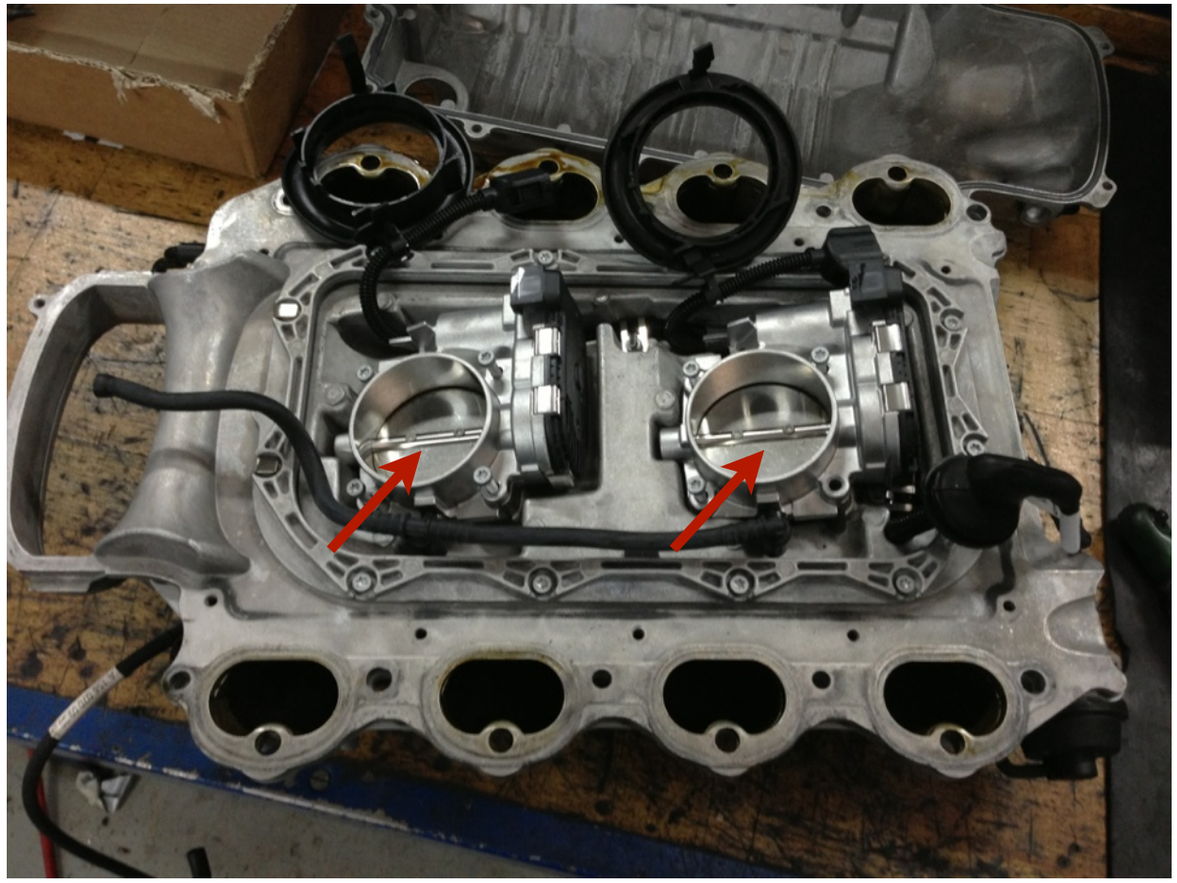
Step 22:

Remove OE MAP sensor (A) and the variable length intake runner valve (B) from the OE manifold.



Step 23:

Remove the intake manifold lower cover of the OE intake manifold to expose the two throttles. Remove the two throttles from the plenum.



Step 24:

Using a razor knife, cut off the rubber grommet around the throttle wiring harness. Be extremely careful to not damage the wiring. Wrap the wiring harness were the grommet was with cloth tape.

Step 25:

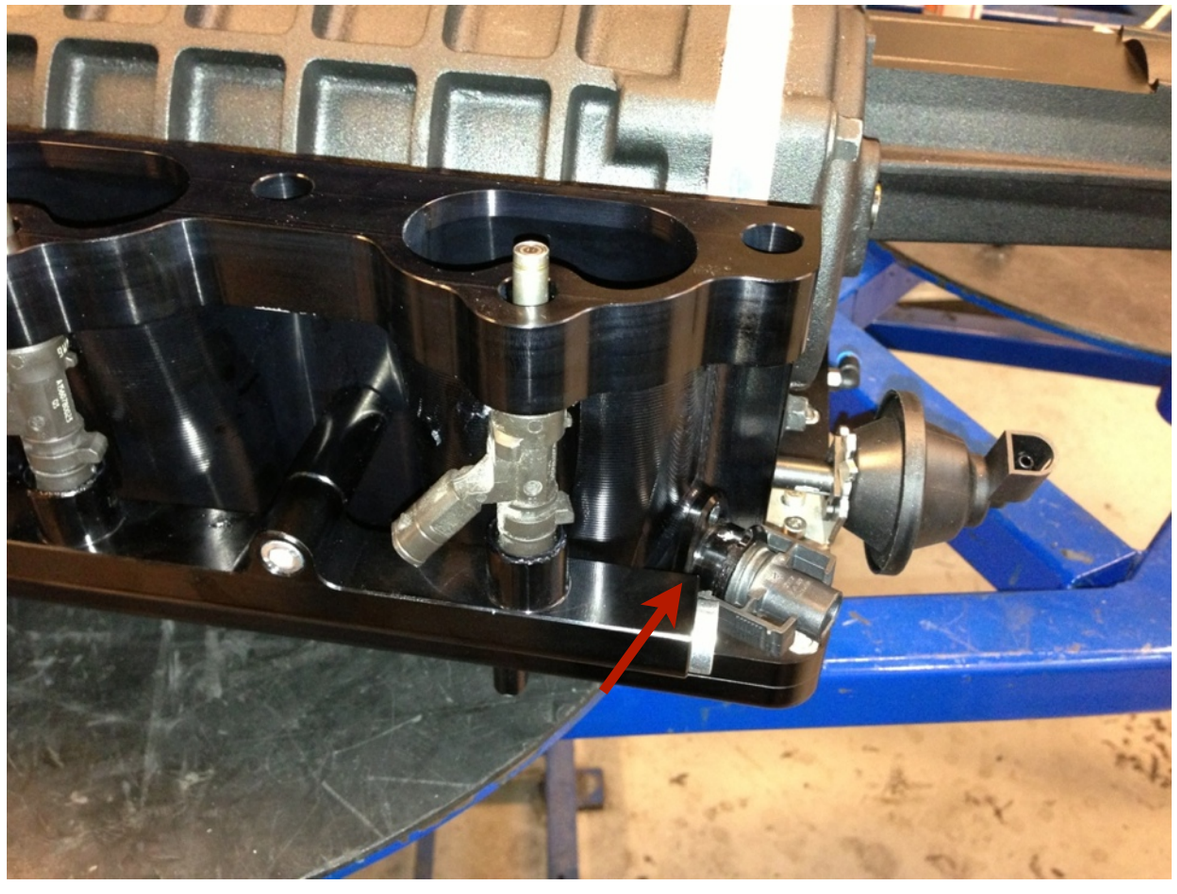
Install the fuel pressure sensor into the KLEEMANN fuel splitter block. Install the splitter block on the firewall.

W204

W212

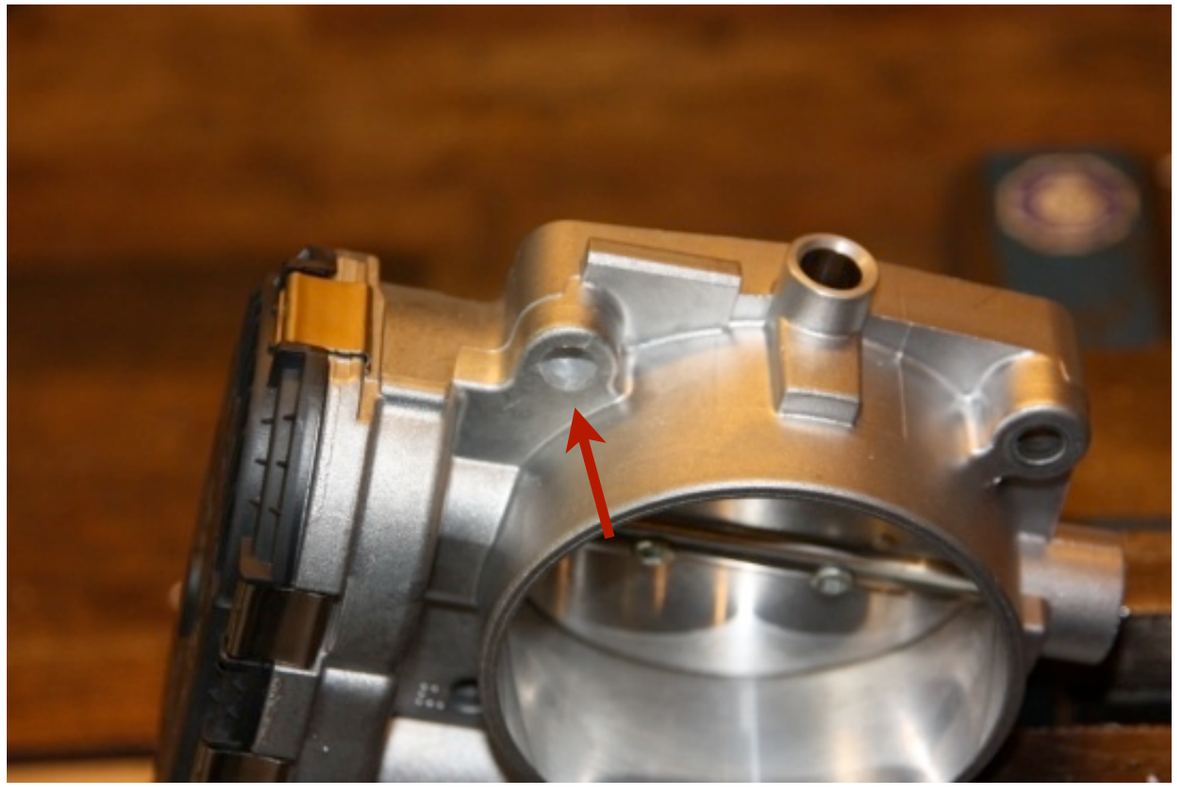
Step 26:

Place the KLEEMANN supercharger/manifold assembly on a clean work bench (use a large cloth on the bench surface to protect the manifold finish). Place the intake air temperature sensor into intake runner #5 as shown.



Step 27:

Take one of the throttles (it does not matter which one) and drill a 9 mm hole in the bolt location shown.



Step 28:

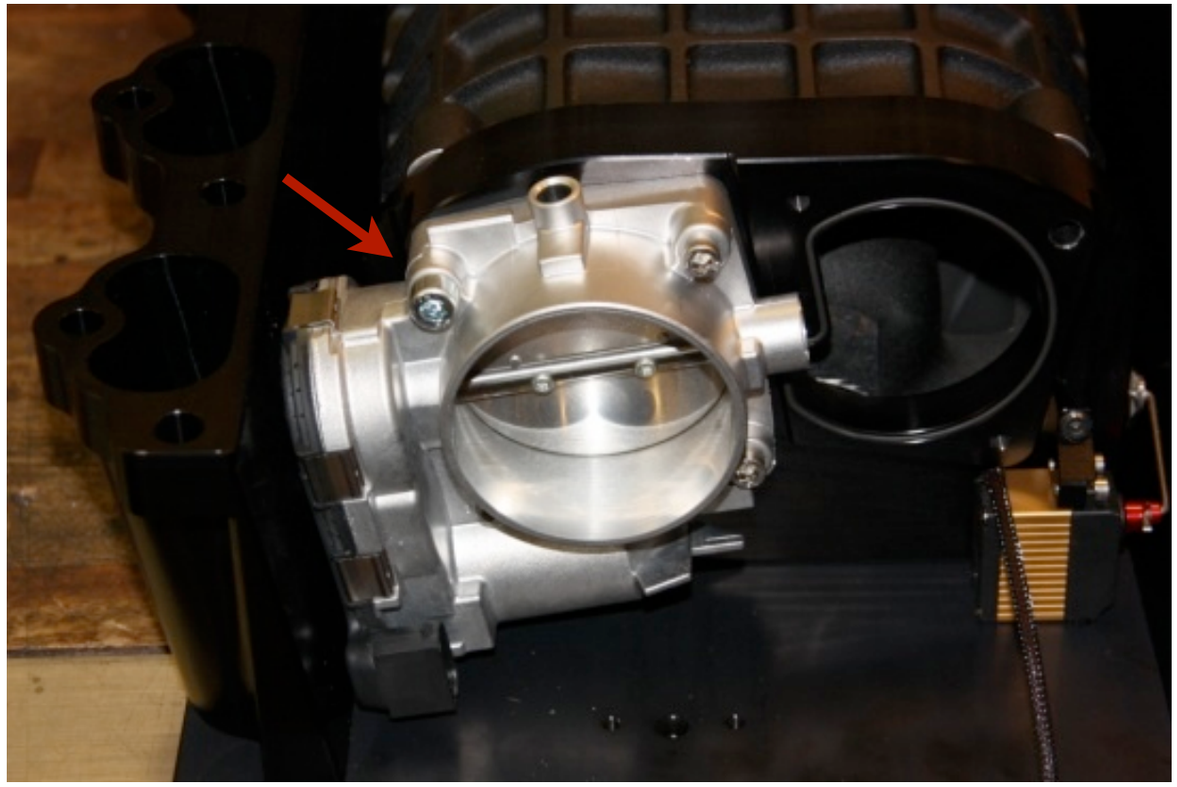
Tap the ventilation port with a 10 x 1.5 mm tap. Using the square boss to the left of the ventilation port as a guide for straightness and height, cut the port and the square boss with a hack saw. Remove approx 3-4mm of material from the square boss. Lightly countersink the hole. Clean the port well with brake cleaner and a blow gun and air dry. Make sure there are no chips or debris in any portion of the throttle. Install a 10 x 1.5 mm cap screw with Loctite 271. Do this step for BOTH throttles.

Be sure to remove 3-4 mm from the square boss on the throttles. Failure to remove this material will cause a false air leak which can lead to fault codes, improper mixture formulation and engine failure!

Step 29:

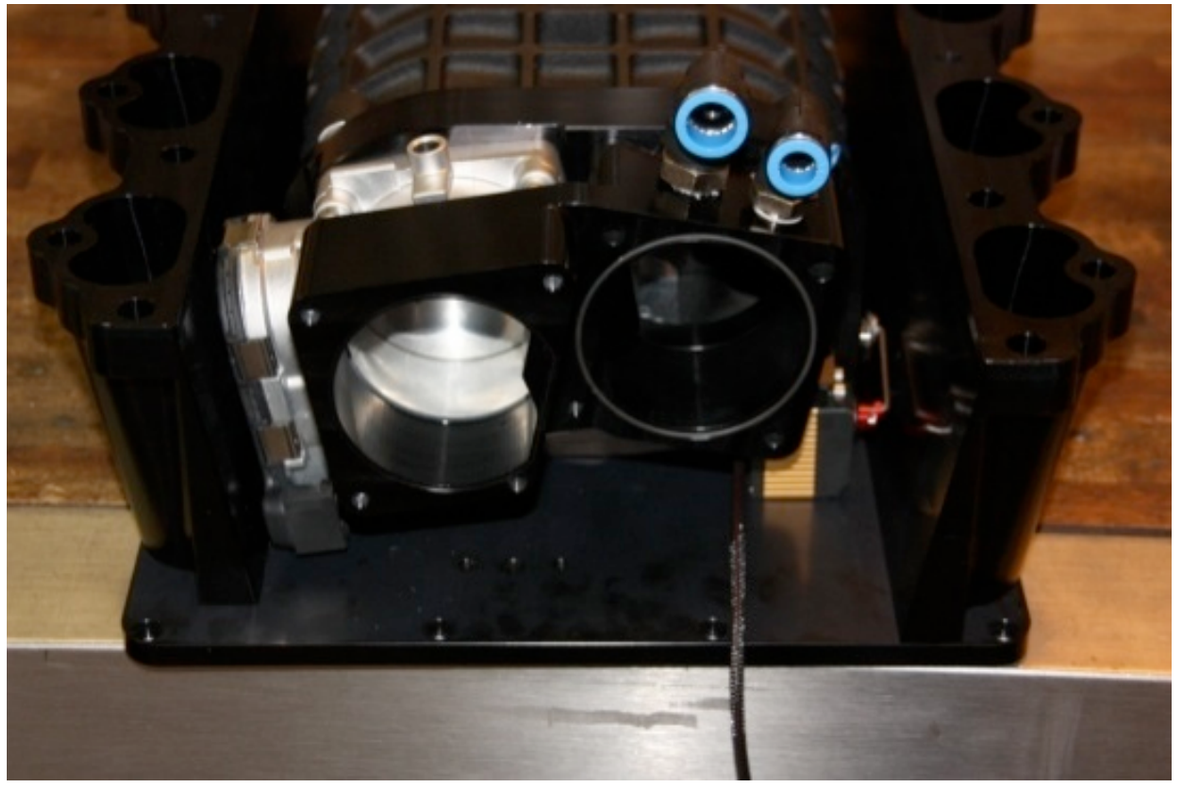
Install the first throttle as shown, leave bolts slightly loose. Move the throttle blade to full open with your fingers, check to make sure it opens and closes fully and without interference. Tighten the bolts fully.

Note location of larger diameter bolt at approx 10 o'clock.



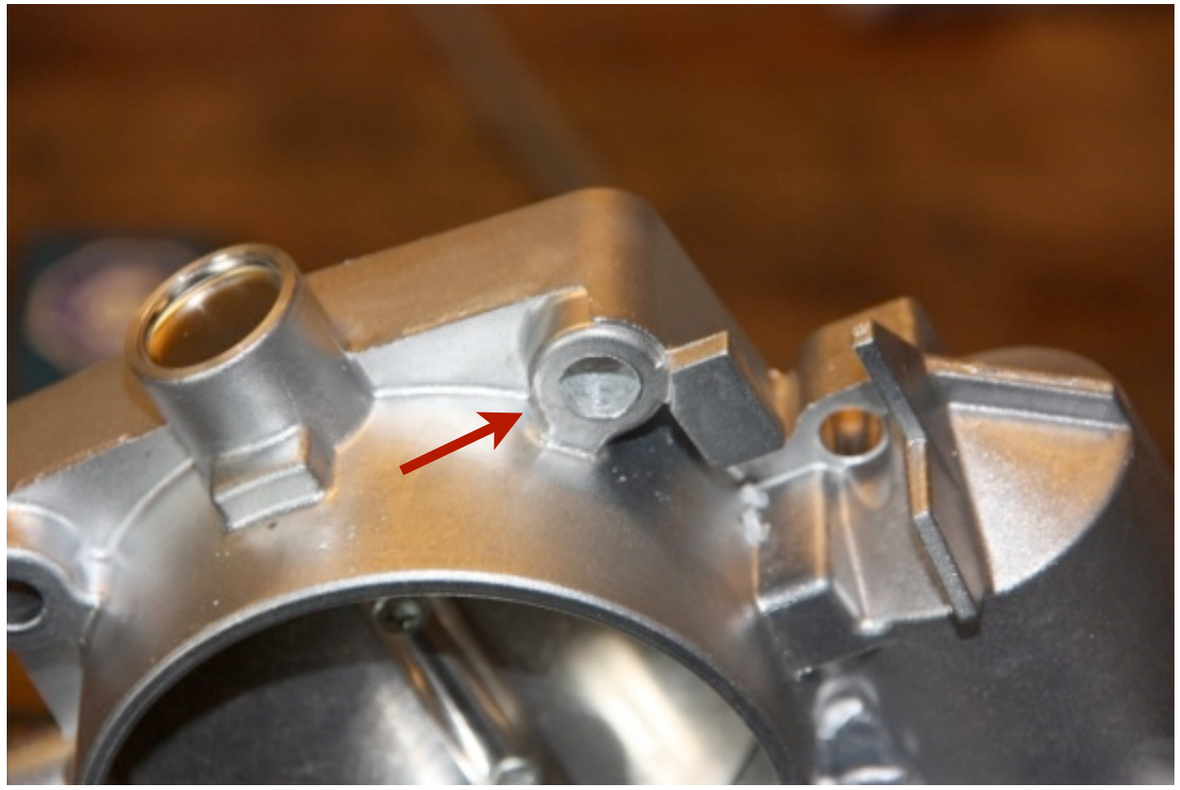
Step 30:

Lubricate the the o-rings (throttle side of throttle adaptor plate), then install the throttle adaptor plate as shown. Plug in the throttle wiring harness to the first throttle. Check for interference between the first throttle and the throttle adaptor plate- correct/adjust as required.



Step 31:

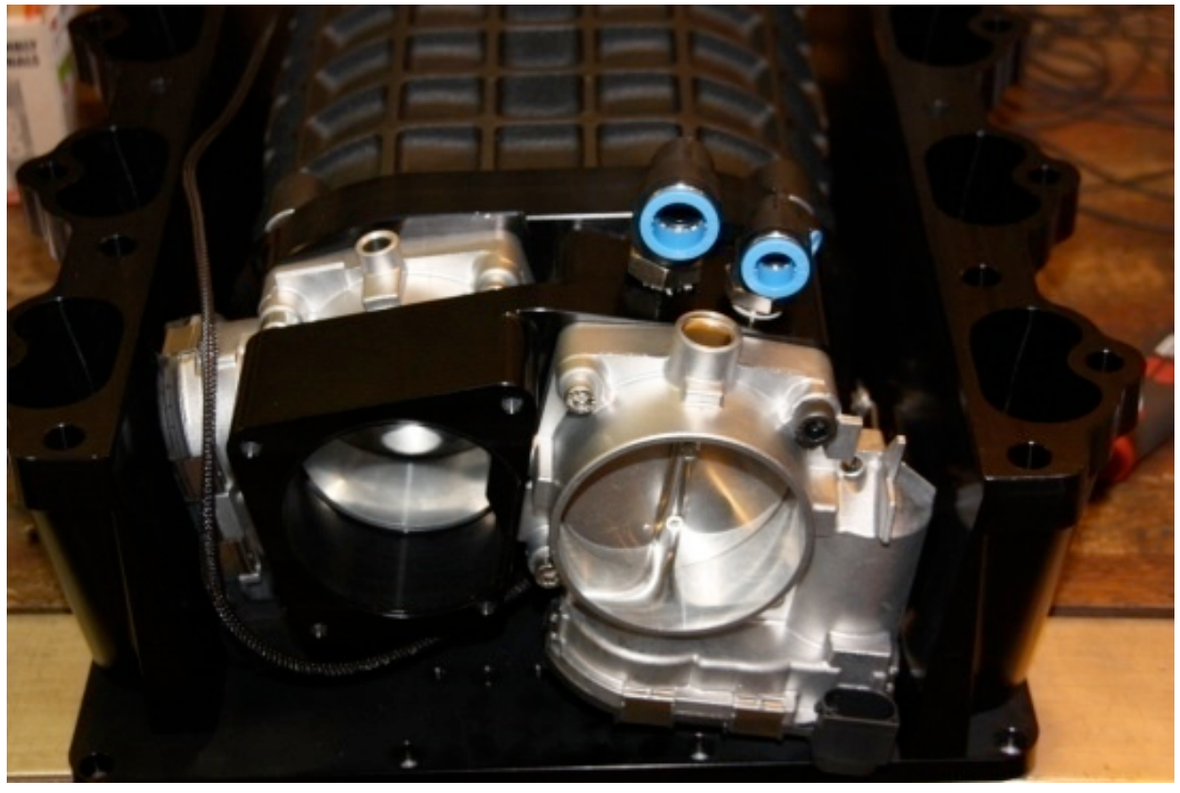
Drill a 9 mm hole in the second throttle body at the location shown.



Step 32:

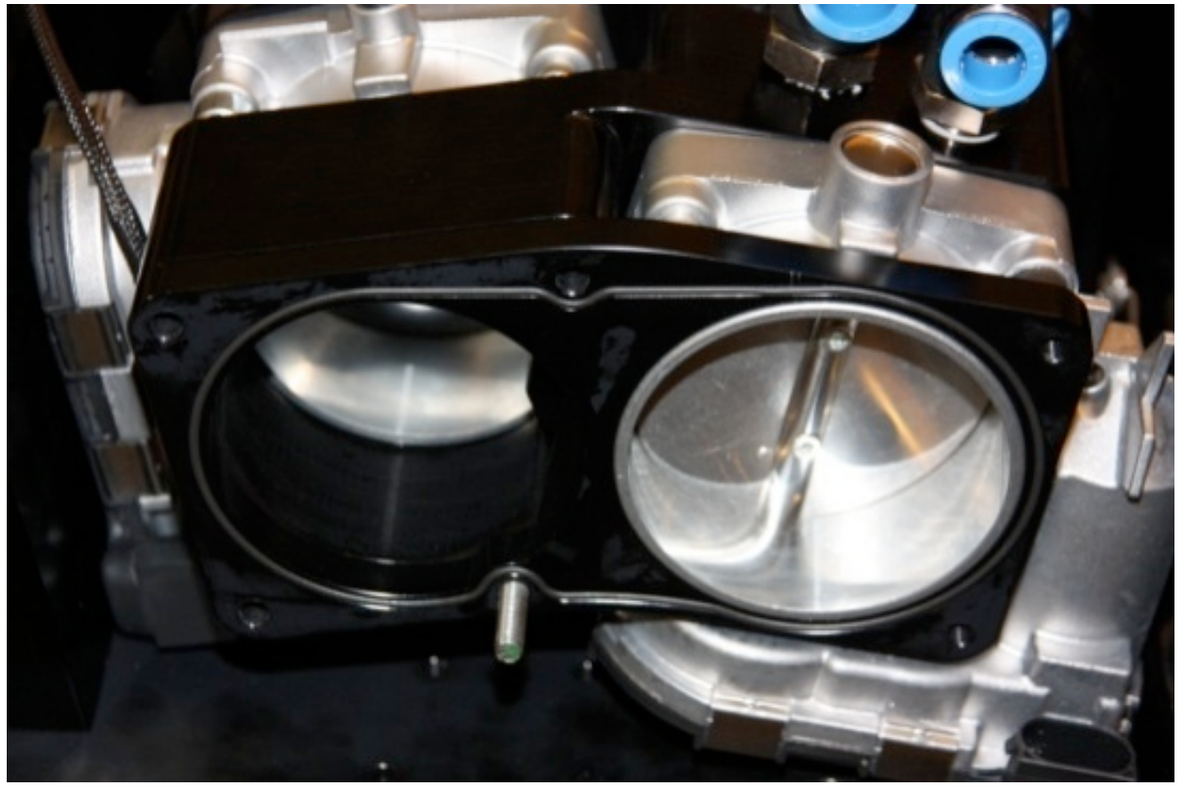
Install the bolts in the second throttle body, hand tighten them so there is still the possibly for the throttle body position to be adjusted on the adaptor plate.

Note location of larger diameter bolt at approx 2 o'clock.



Step 33:

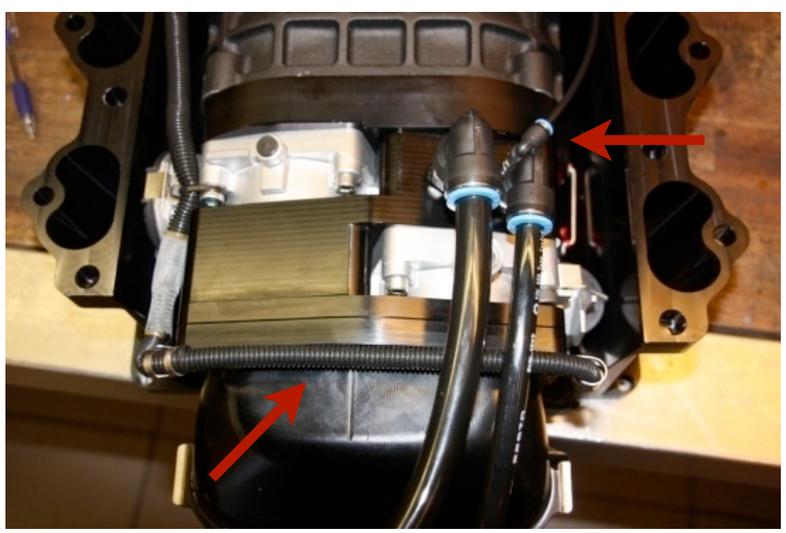
Test install the inlet housing plate, check to make sure all holes are in alignment and the second throttle is fully seated in the plate. Carefully remove the plate and tighten the bolts on the second throttle. Install the plate agin and check again that the plate is aligned and that both throttles have full range of movement with no interference of any kind.



Step 34:

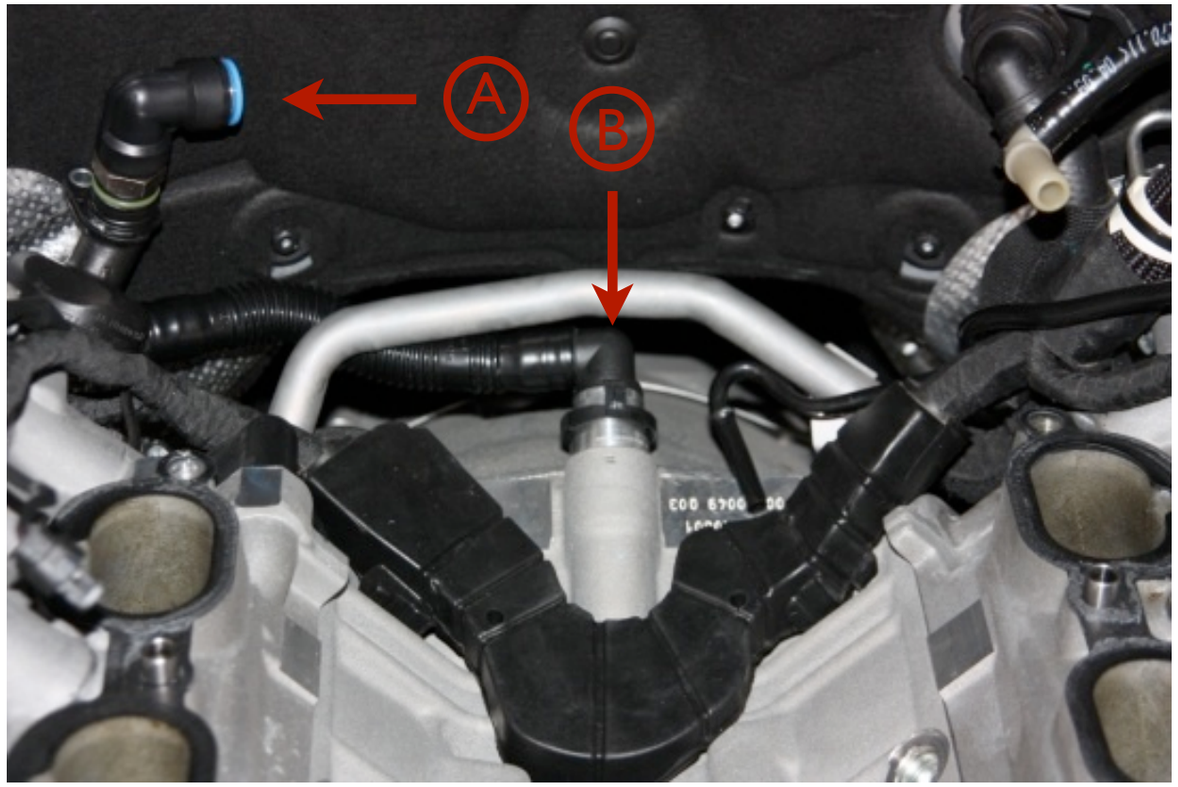
Install the inlet housing as shown. Plug in the second throttle and route the cable under the inlet housing. Install the 3 plastic pipes into the fittings on the throttle adaptor.

Note cable routing and plastic pipes below:



Step 35:

Install the elbow snap fitting for the crank breather hose, turning it inwards as shown (A). Pace breather hose under bridge pipe as shown (B).



Step 36:

Place the supercharger assembly onto the engine, use new intake manifold gaskets. Be sure the crank breather hose is placed in the position as shown. Install the manifold bolts.

Step 37:

Attach the fuel lines from the splitter to the fuels rails. Reconnect all hoses and wiring connectors.

Be careful not to mix up the left MAF sensor and the fuel pressure sensor (the connectors are very similar) or component damage can occur!

Refer to the vacuum diagram at the back of the manual for proper hose routing.

Step 38:

Cut the tank ventilation line as shown

Step 39:

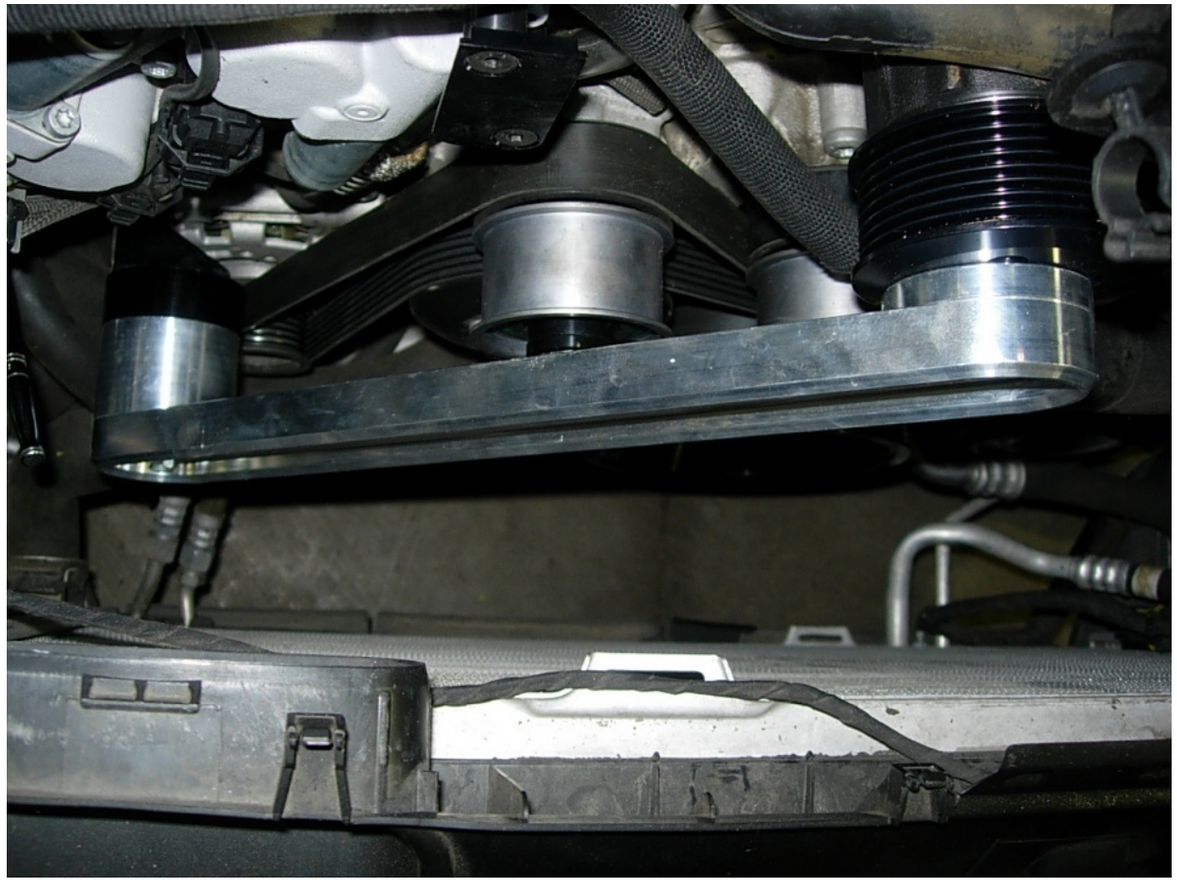
Cut the brake booster line as shown.

Step 40:

Install the quick coupler onto the brake booster line and connect it to the 12 mm line on the supercharger manifold assembly. The proper line/port is located under the throttles.

Step 41:

Install the belt alignment tool onto the bracket attached to the alternator in step 8 with the provided bolt. Align the tool so it is tangent (and touching) the supercharger drive pulley.Tighten the two bolts on the tensioner bracket (attached to the alternator). Remove the alignment tool.



Step 42:

Install the dynamic belt tensioner onto the tensioner bracket (alternator).

Step 43:

Install both belts.

Refer to the belt diagrams at the back of the manual for proper belt routing.

Step 44:

Install the hoses on the KLEEMANN power steering reservoir. The original metal pipe can often be reused if it is flipped 180º, if not, use hose from the kit. Attach the reservoir to the bracket installed in step 10. Fill reservoir with the proper oil to “MIN HOT” level as indicated on the dipstick.

Check clearance to the electric fan and adjust as required to provide adequate clearance.

Step 45:

Install the OE switchover valve for the variable length manifold runners. Attach the valve to the wiring harness and find a suitable place for it to lay. The valve no longer has any function, but it must be connected electrically to prevent fault codes. Loop a small section of 4 mm hose onto the barbs to keep debris out.

Step 46:

Install the hose for the secondary air injection system as shown.

Check clearance to the supercharger pulley, adjust hose length as required.

Step 47:

Remove the Bumper cover. Install the intercooler radiator beneath the front bumper. The intercooler radiator should be centrally located on the bumper, brackets are screwed directly to the underside of the bumper beam. Install the intercooler water pump on the right side. Use the supplied brackets. Be sure to allow adequate clearance for hoses not to pinch or chafe.

Refer to the intercooler diagram at the back of the manual for proper hose routing.

Wire the intercooler pump with the supplied relay kit to a KOEO (key on, engine on) power source. It is imperative to use the relay kit as the pump draws high amperage. DO NOT direct wire the intercooler pump to ANY OE system, damage will result.

The small port on the intercooler reservoir is not used. Cap and clamp it with the provided hardware.

Step 48:

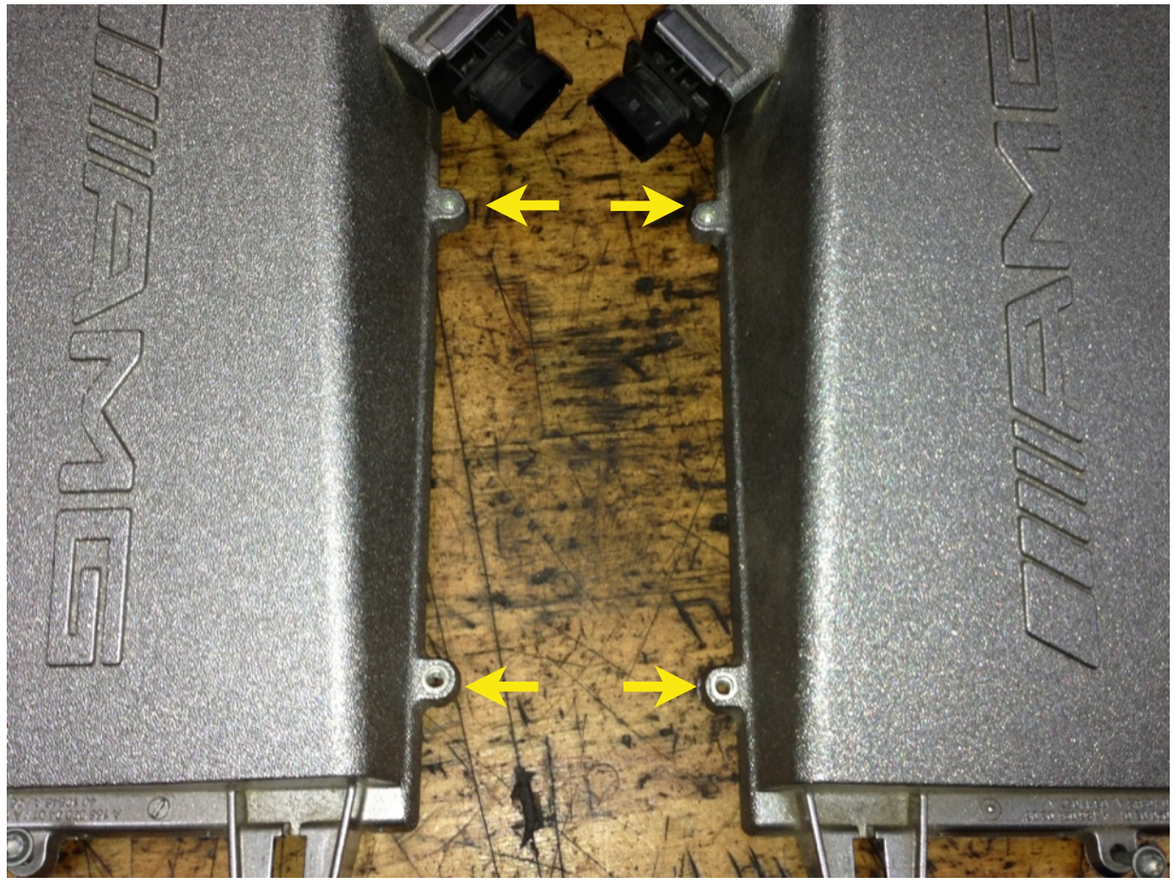
Fill the intercooler system with a 50/50 mix of anti-freeze and water. Energize the pump to self bleed, top up coolant as bleeding occurs.

It is recommended that a 50/50 mix of anti-freeze and water be used in the intercooler. “Orange” ethylene glycol is preferred.

Step 49:

In order to use the OE air box tops they must be modified. Drill out the two inboard holes of the upper tops to 7 mm. Insert the supplied rivet-nuts and secure using a rivet gun.

Bolts will be fed from the top side of the air box, use care that the inserts are fastened into the air boxes correctly.



Step 50:

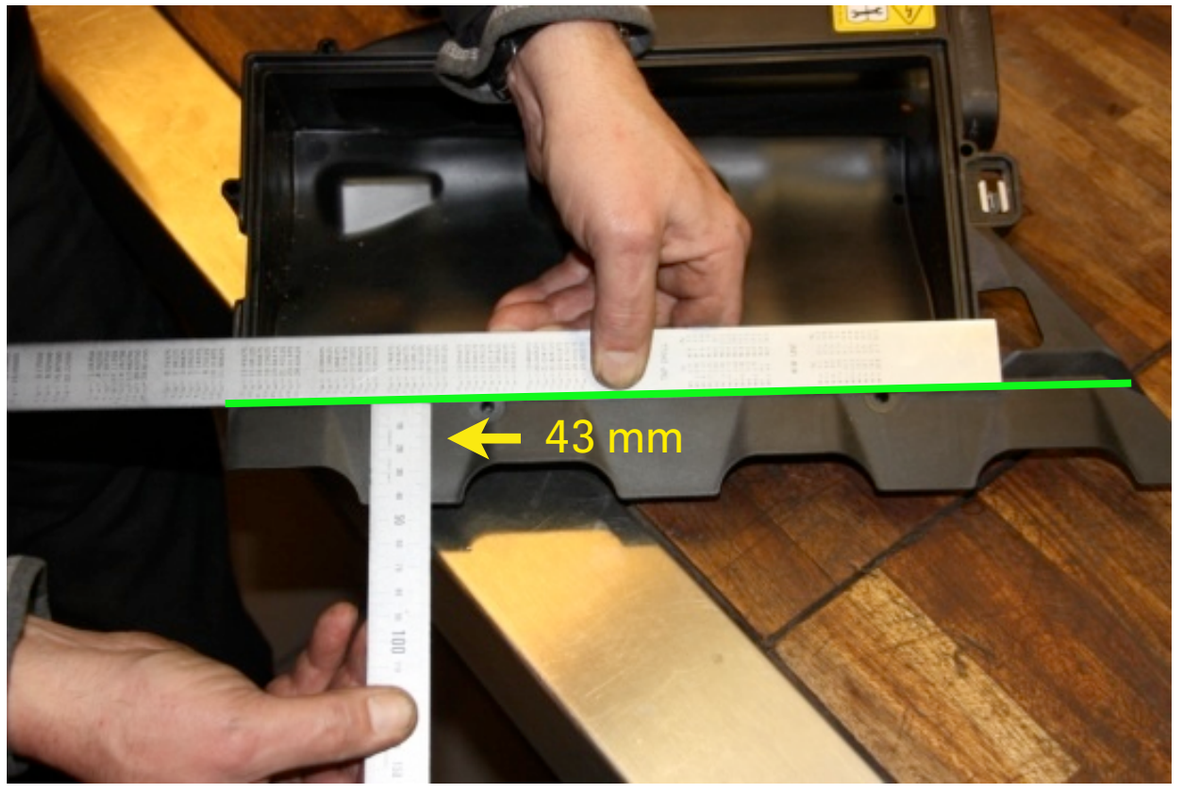
Trim the nose panel to the scribe line as shown.

This edge will be visible to the eye when installed so use care while cutting.

Step 51:

Mark the lower halves of the air boxes as shown. Cut on the indicated line, all the way through.

43 mm / 1.70”

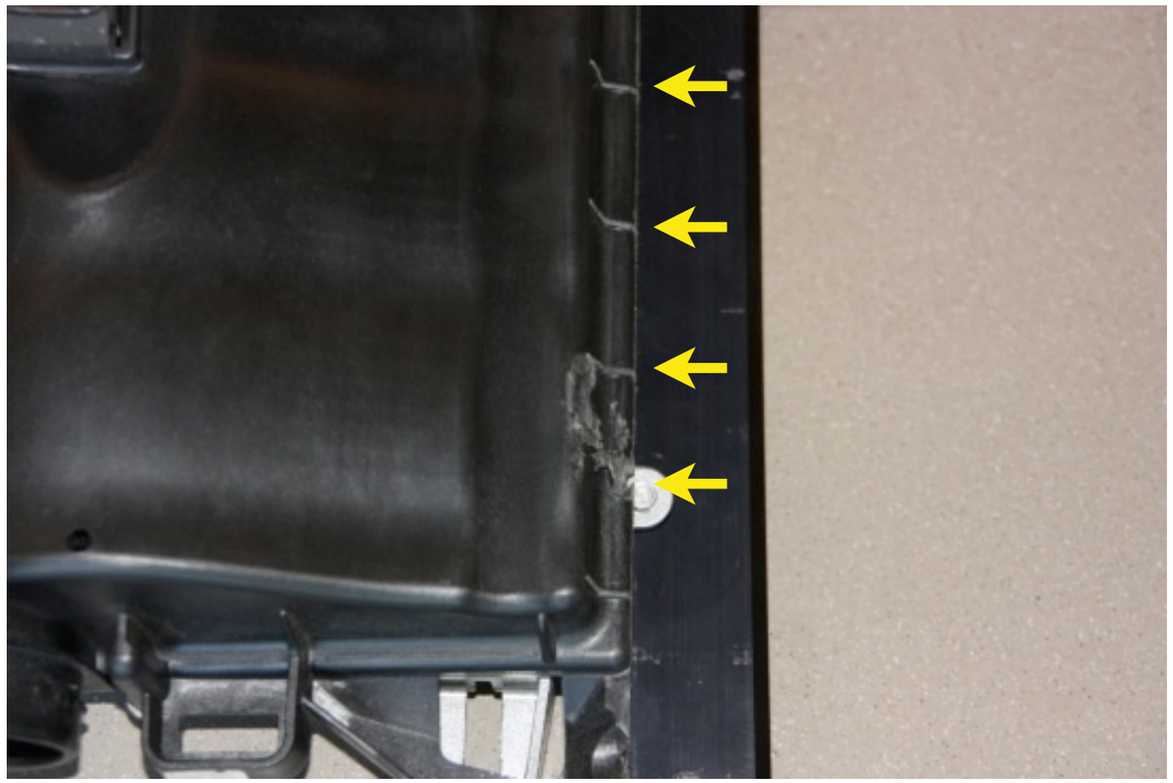


Step 52:

After the primary cross-cut, dress the air box edges with a file.

Step 53:

Turn the lower halves of the air boxes over and remove the ribs as shown.



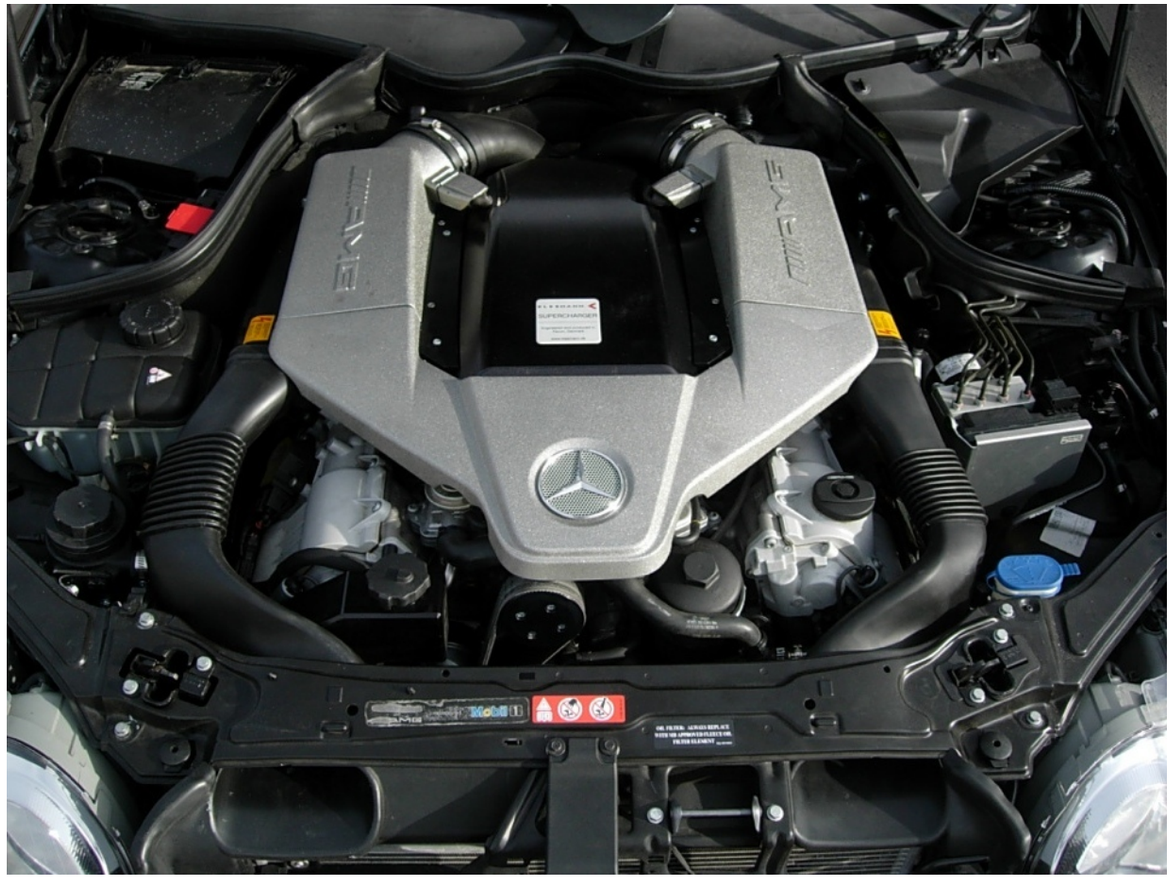
Step 54:

Instal the air box side edge as shown. Assemble and install the air boxes, front panel and intake tubes.

On some models it may be required that you modify the right side intake tube by hot forming a small pocket in the tube to clear the power steering reservoir.

Step 55:

Completed installation.



Step 56:

Verify that the vehicle starts and idles with the OE ECU. Check all your work.

ONLY after verifying that the vehicle starts and idles without issue should you send in the ECU for programming. Programming the ECU first presents a variable for diagnosis of problems that will only complicate fault finding.

Verify air fuel ratio under all operating circumstances. Contact KLEEMANN if anything is out of specification.

Notes:

Vacuum Line Diagram, M156 SC

Schematic layout only, not shown to scale or orientation.

All OE vacuum consumers must be connected to the VAC/ATMOS port ONLY!

The VAC/ATMOS/BOOST port is for testing or GGE purposes ONLY!

SC bypass valve is connected to the VAC/ATMOS port ONLY!

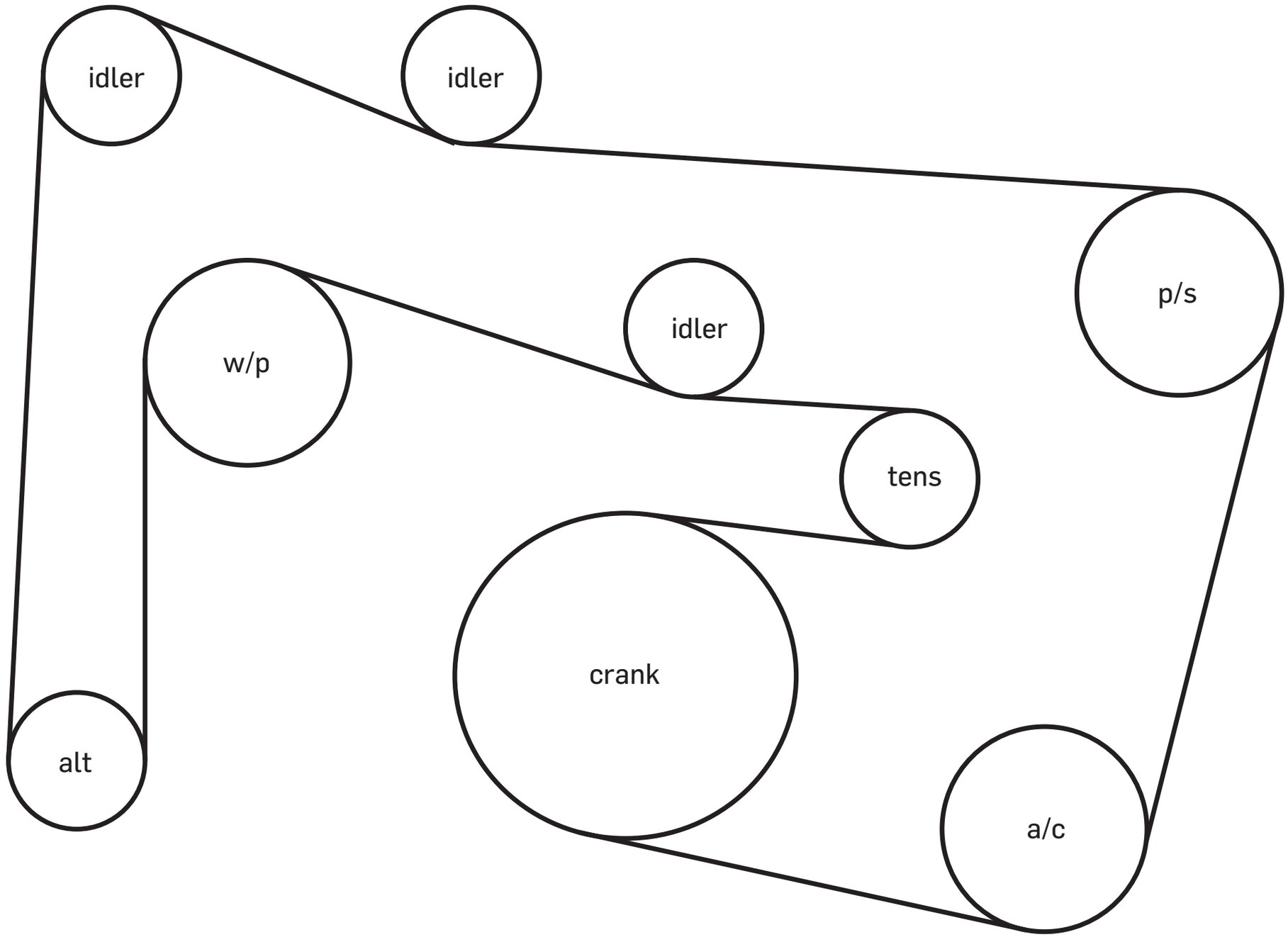
Vacuum/Atmosphere signal:

- OE MAP Sensor
- OE Air Injection Switchover
- OE Tank Ventilation
- SC Bypass Valve
- Any other OE Vacuum Consumer (varies by chassis)

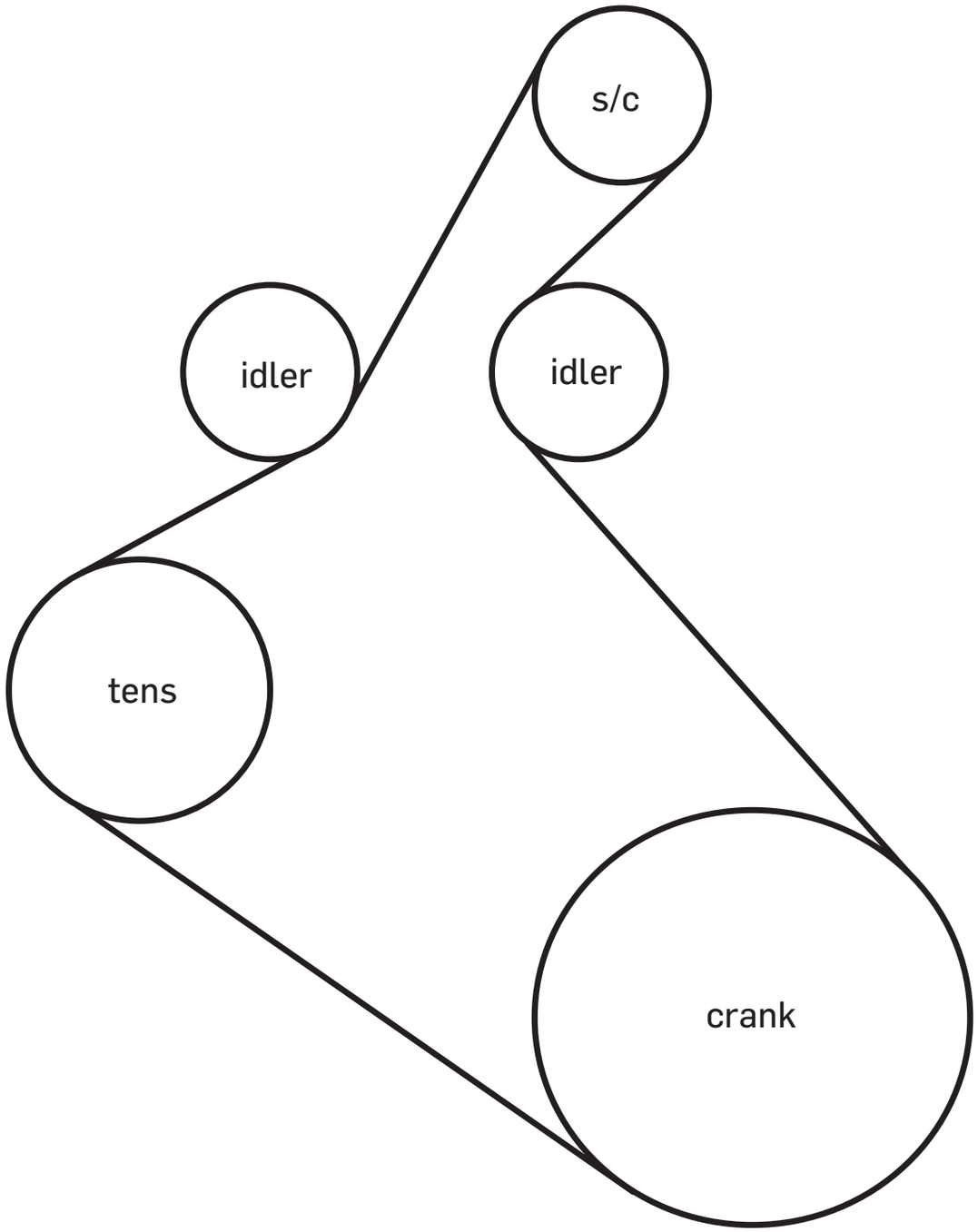
Vacuum/Atmosphere/Boost signal:

- Test Port
- Boost GGE

Accesory Belt Routing Diagram, M156 SC



SC Belt Routing Diagram, M156 SC



SC Intercooler Diagram, M156 SC

Schematic layout only, not
shown to scale or orientation.