Hamburger's SUPERCHARGERS

SPECIALTY VEHICLE ENGINEERING

2016-2018 Chevrolet Camaro 6.2L DI

Stage I Supercharger System

Installation Manual

Important Notes:

- If you have any questions or concerns with this kit please call: 732-240-3696
- The use of **MINIMUM** 91 Octane Fuel is mandatory.
- The use of fuel additives is not recommended. There is a possibility that these chemicals can damage your engine and cause drivability issues with your vehicle.

BEFORE BEGINNING INSTALLATION SEND THE ECM BACK TO SVE USING THE INCLUDED SHIPPING LABEL AND BOX. THIS WILL ALLOW TIME FOR SVE TO GET THE ECM BACK TO YOU ASAP.

NOTE: IF YOU PURCHASED A "TUNER KIT" THERE IS NO NEED TO REMOVE THE ECU.

WARNING: SVE inc. Recommends allowing the vehicle to cool (not running) for two hours before beginning installation.

WARNING: To avoid the chance of electrical shock or damage to your vehicle's electrical system, disconnect both the negative and positive battery leads (in that order) at the battery.

Disassembly

1. Start by raising the vehicle and removing the front wheels.
2. Remove the front wheel splash shields by removing the five T15 head screws and one plastic retaining clip shown below.

Figure 1: Front Wheel Splash Shield Hardware

3. Remove the front wheel liner, see Figures 2, 3, and 4.

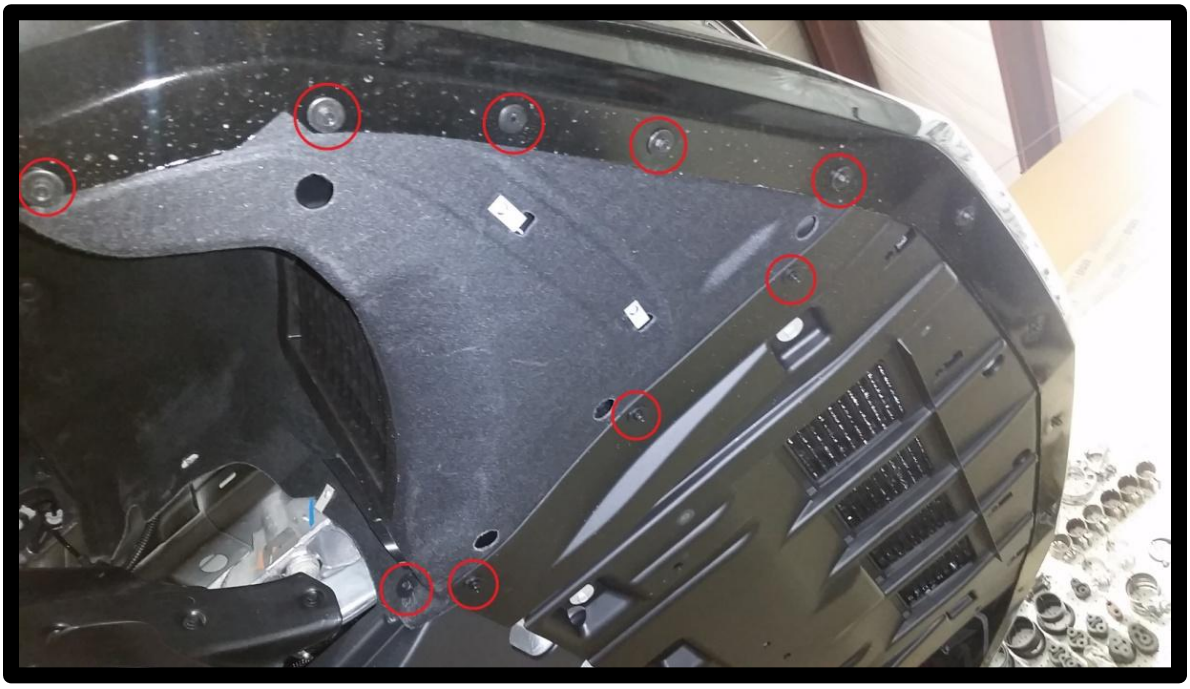

Figure 2: Front Wheel Liner Hardware (1/3)

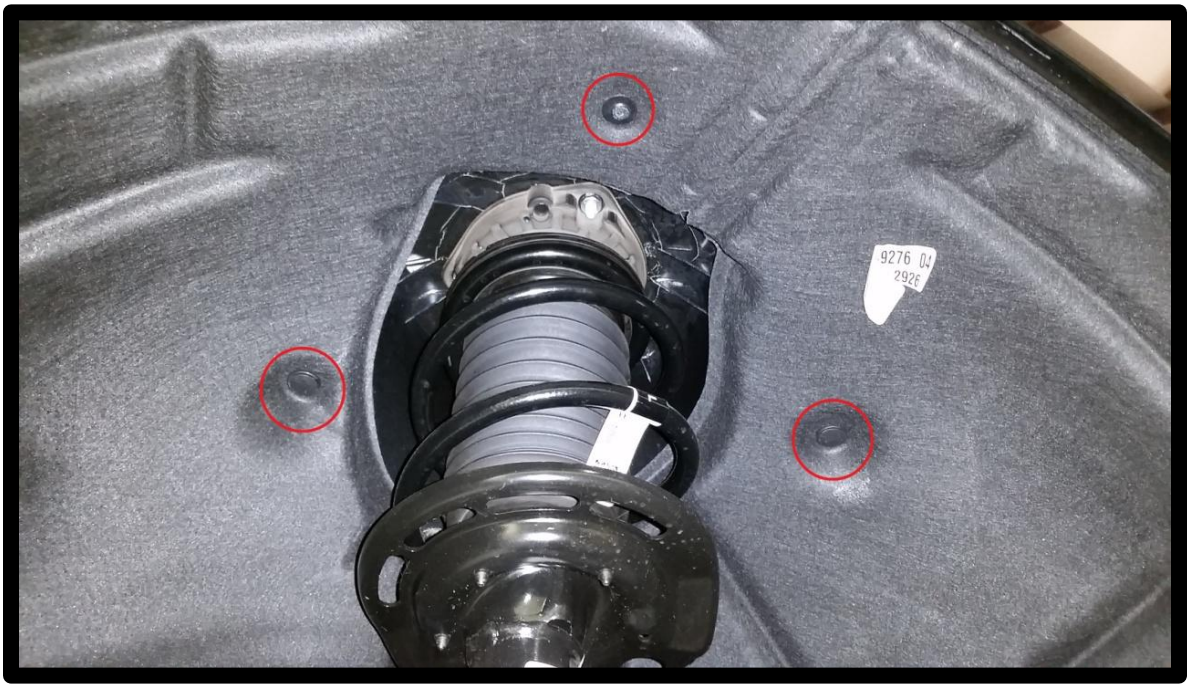

Figure 3: Front Wheel Liner Hardware (2/3)

Figure 4: Front Wheel Liner Hardware (3/3)

4. Remove the engine splash shield as shown in Figure 5.

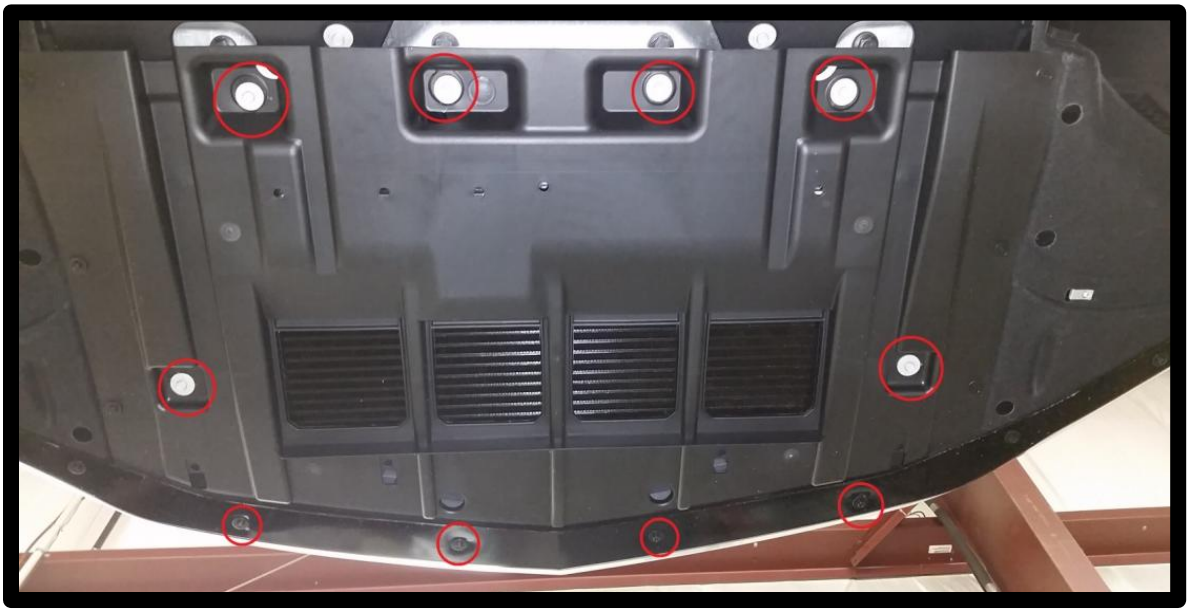

Figure 5: Engine Splash Shield

5. Remove the front fascia to fender mounting hardware and the one front fascia outer bracket bolt shown in Figure 6.

Figure 6: Front Fascia to Fender Mounting

6. Remove the upper fascia mounting hardware, see Figure 7.

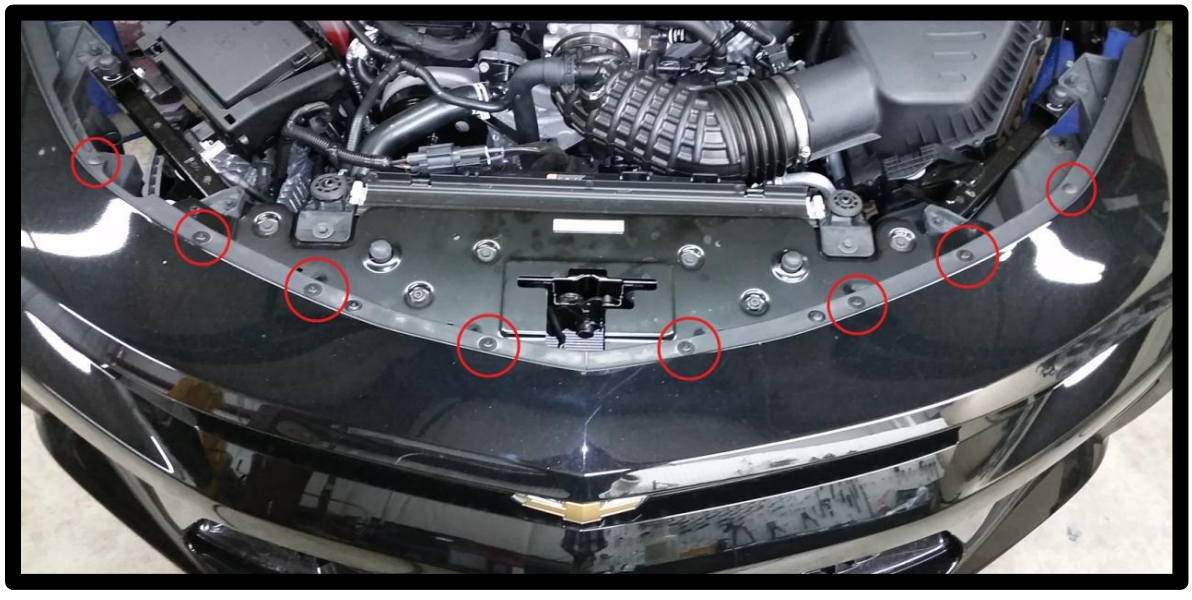

Figure 7: Upper Fascia Mounting Hardware

7. Disconnect the front fascia sub-harness electrical connector.

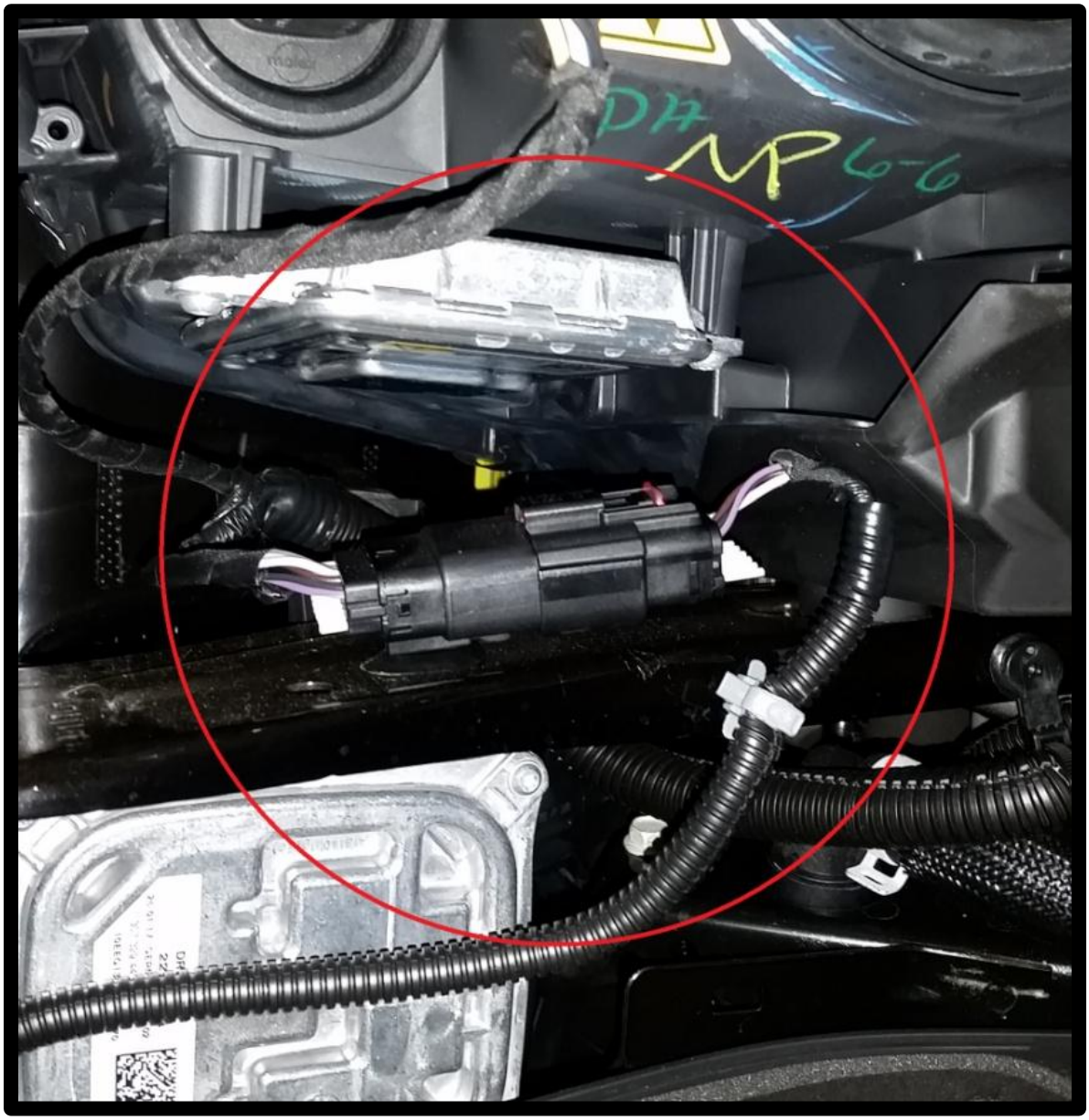

Figure 8: Front Fascia Sub-Harness Connector

8. Pull forward to release the front fascia from the fenders. Once the fascia moves forward a little make sure that the fascia is released from the side support brackets.

Figure 9: Removal of Front Fascia

9. Remove the radiator support cover, see Figure 10.

Figure 10: Radiator Support Cover Mounting Hardware

10. Remove both front headlights; see the images in Figure 11.There are 4 mounting screws and 2 electrical connectors per side.

Figure 11: Headlight Removal

11. Disconnect the vehicles battery ground cable, located in the trunk on the passenger side.

12. Disconnect the engine ground cable near the fuse box.

13. Remove the fuse box tray by pushing the release tab towards the box and lifting the release lever, see Figure 12.Set the tray to the side in order to gain access to the ECU.

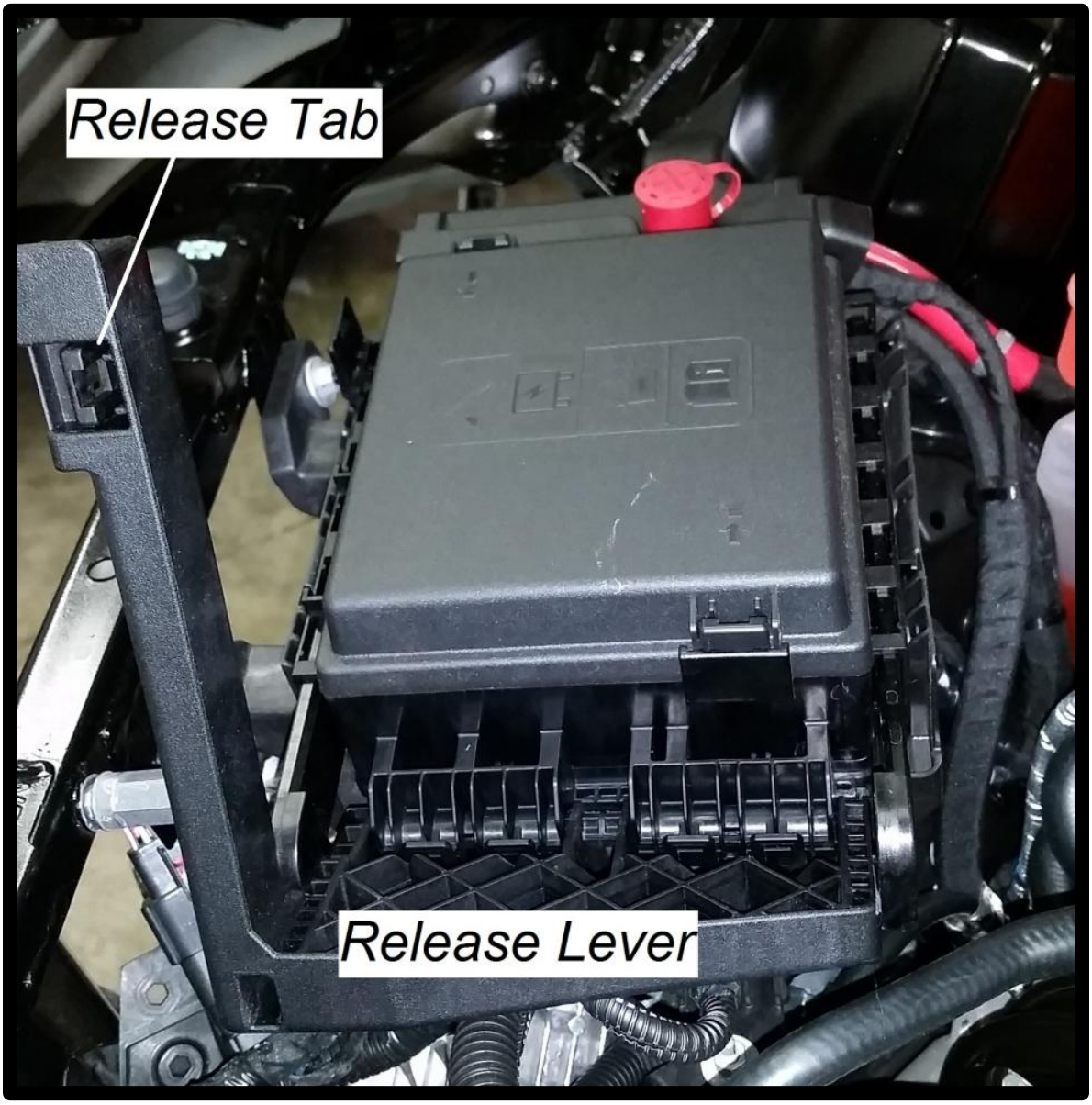

Figure 12: Removing Fuse Box Tray

14. Remove the four fuse box connectors by using a long screwdriver to gently pry the release tabs open and pulling up on the connector, take note of the location of each connector as they have to be installed in the same positions later, see Figure 13.

Figure 13: Removing Fuse Box Connectors

15. Remove the fuse box mount by removing the four 10MM nuts shown in Figure 14.

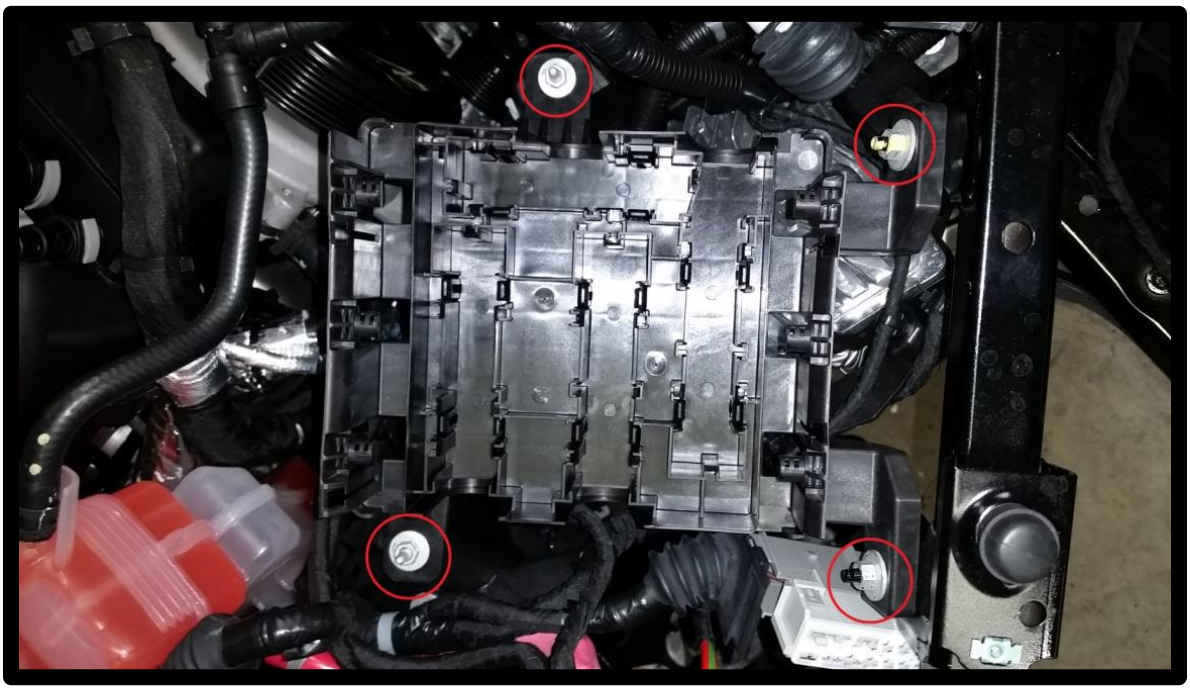

Figure 14: Removing Fuse Box Mount

16. Remove the three main ECU connections from the ECU; they are color coded with the ECU to help when reinstalling them later. To remove the ECU press the two tabs away from the ECU and pull the ECU out, see Figure 15.

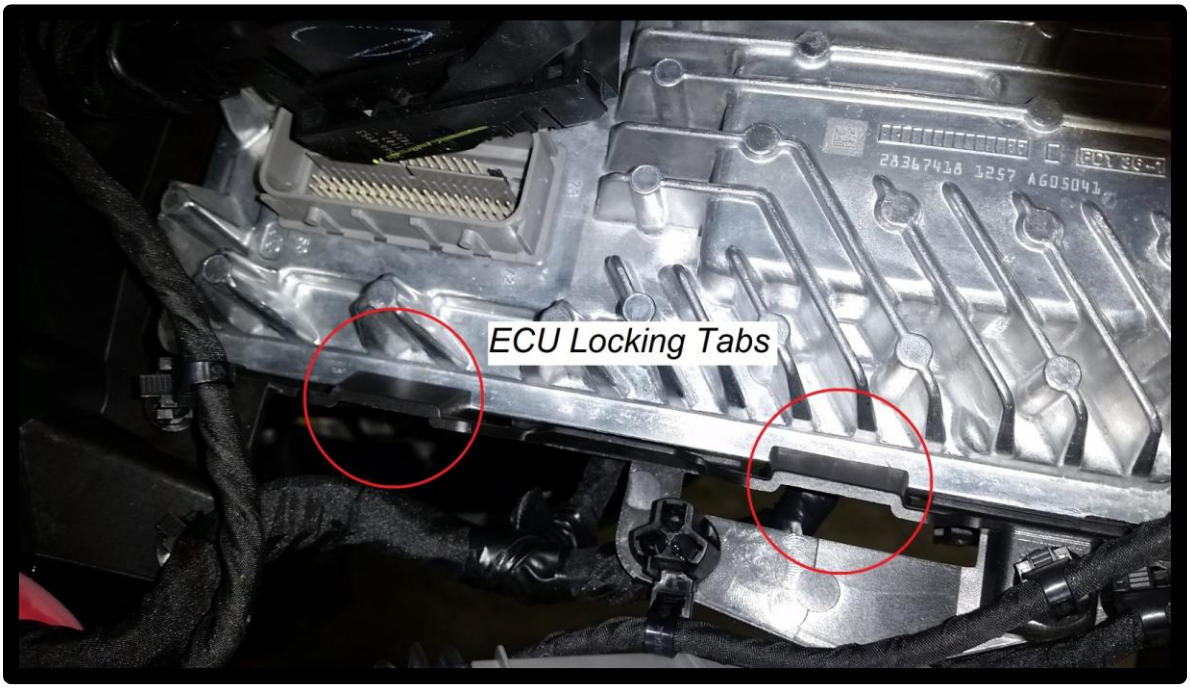

Figure 15: ECU Removal

17. At this point pack the ECU in the prepaid shipping box and send the ECU to SVE to be tuned.

18. Continuing with disassembly, the radiator side baffles will be removed and discarded. This is to make room for the intercooler inlet and outlet tubes. There are three plastic retainers per side, see Figure 16.

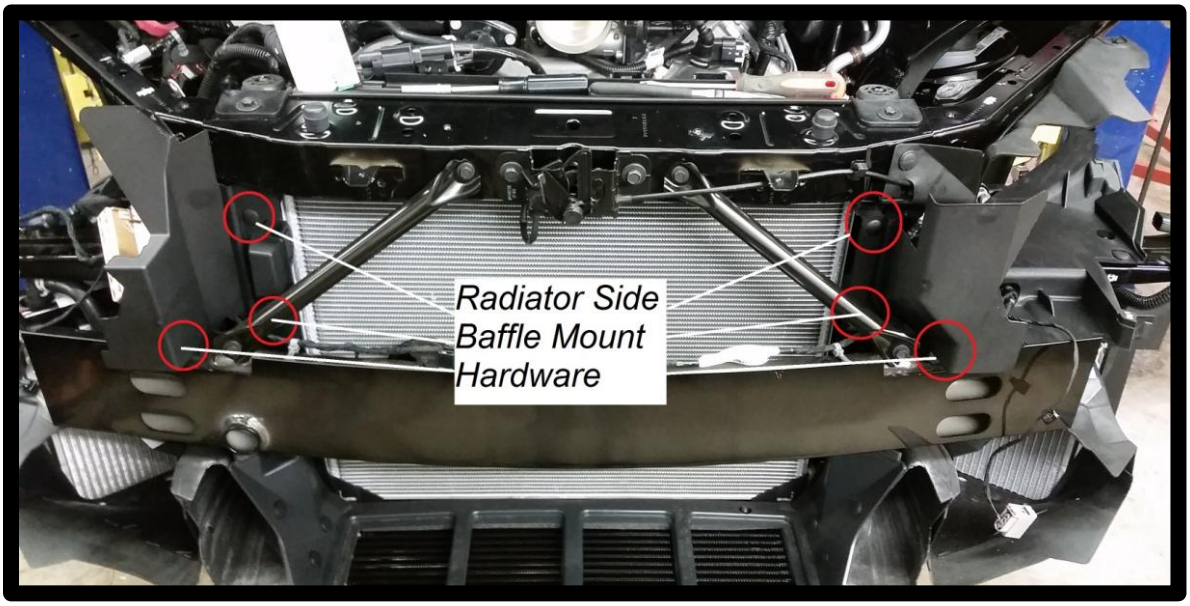

Figure 16: Removing Radiator Side Baffles

19. The air box soft boots on the driver's side will also be removed and discarded, there are four plastic retainers for both pieces, see Figure 17.

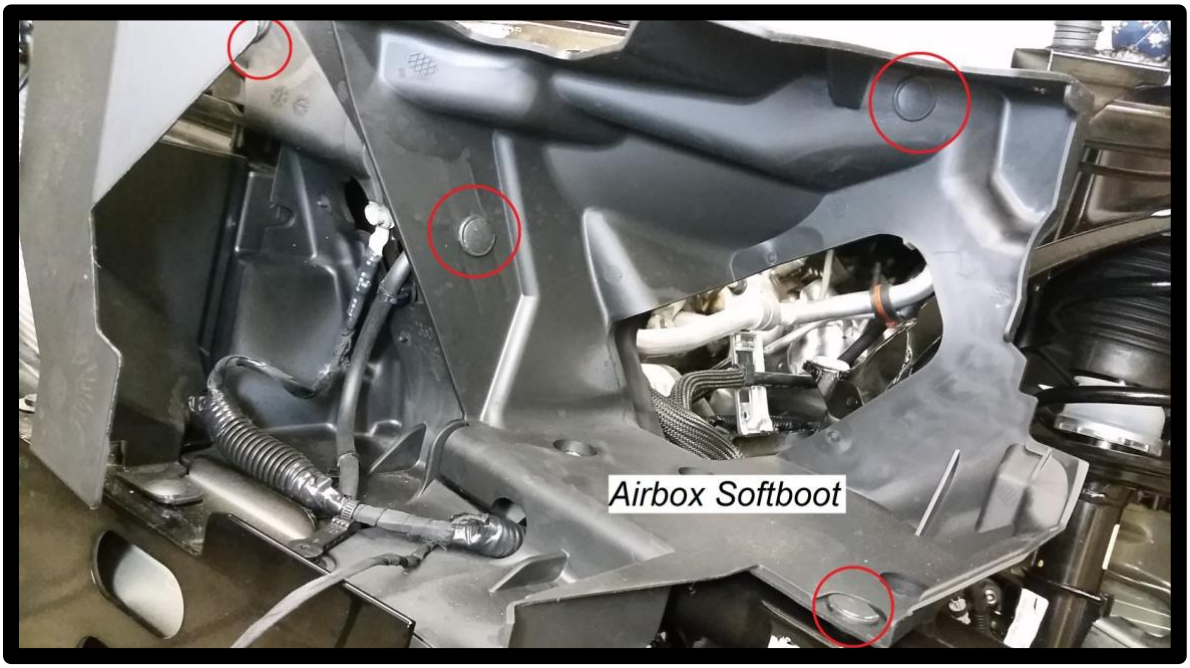

Figure 17: Air Box Soft Boots

20. On convertible models remove the Strut Brace, see Figure 18 below.

Figure 18: Strut Brace Removal

21. Remove the ‘CAMARO’ engine covers.

22. Remove the main engine cover. There are harness retainers that need to be released along the sides of the cover. The MAP sensor must first be disconnected.

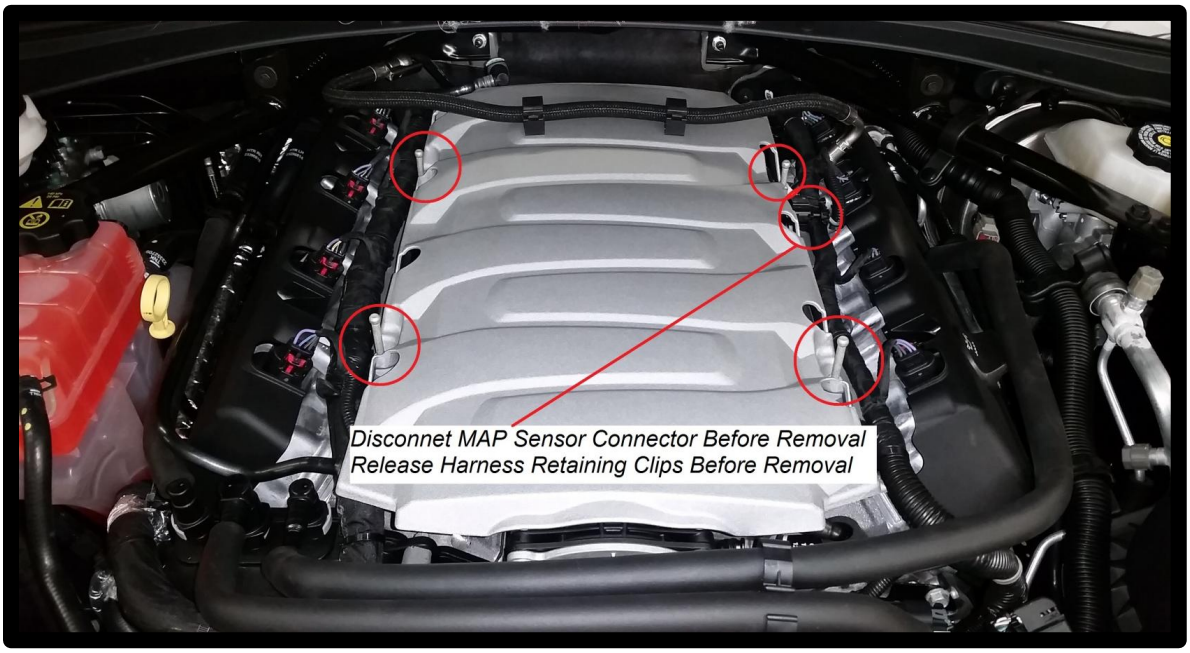

Figure 19: Engine Covers and Map Sensor

23. Replace the stock MAP sensor with the provided MAP sensor.
24. Remove the following components from the factory intake system, none of these components will be reused however it is important to remember to remove the MAF sensor from the air cleaner box as it will need to be reused:
    a. PCV Tube
    b. Throttle Body Inlet Tube
    c. Air Cleaner Resonator
    d. Air Cleaner Resonator Tube; Only Remove Forward Half, Not at Firewall
    e. Air Cleaner Box

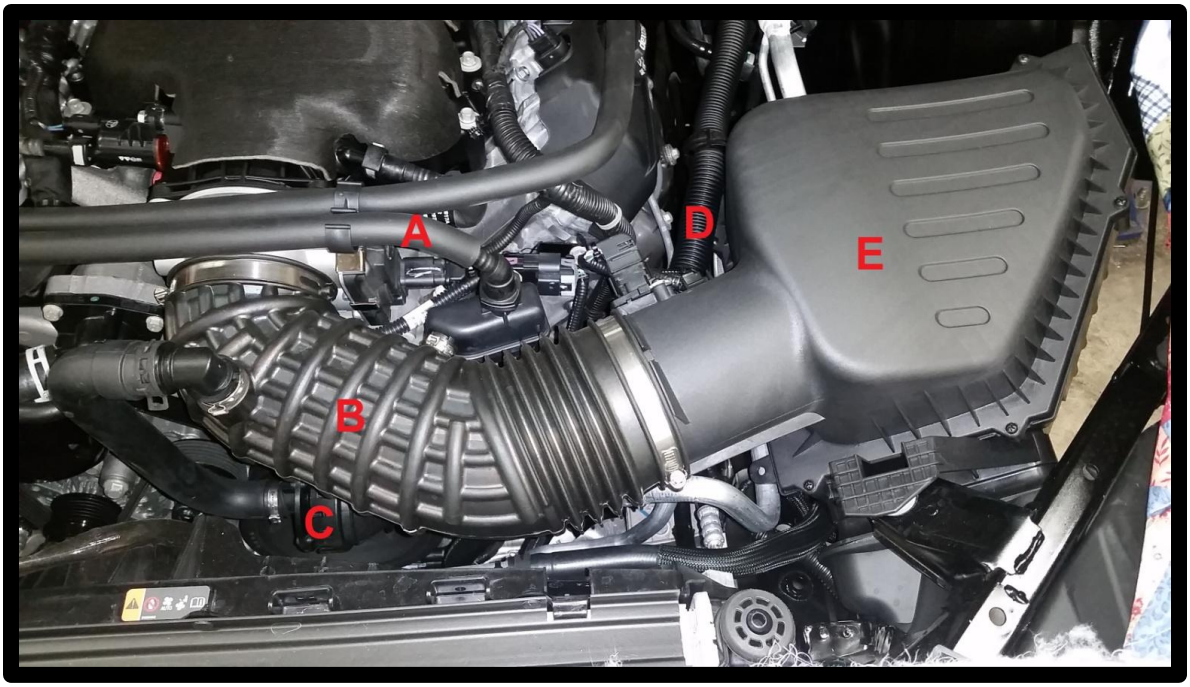

Figure 20: Removal of Intake System

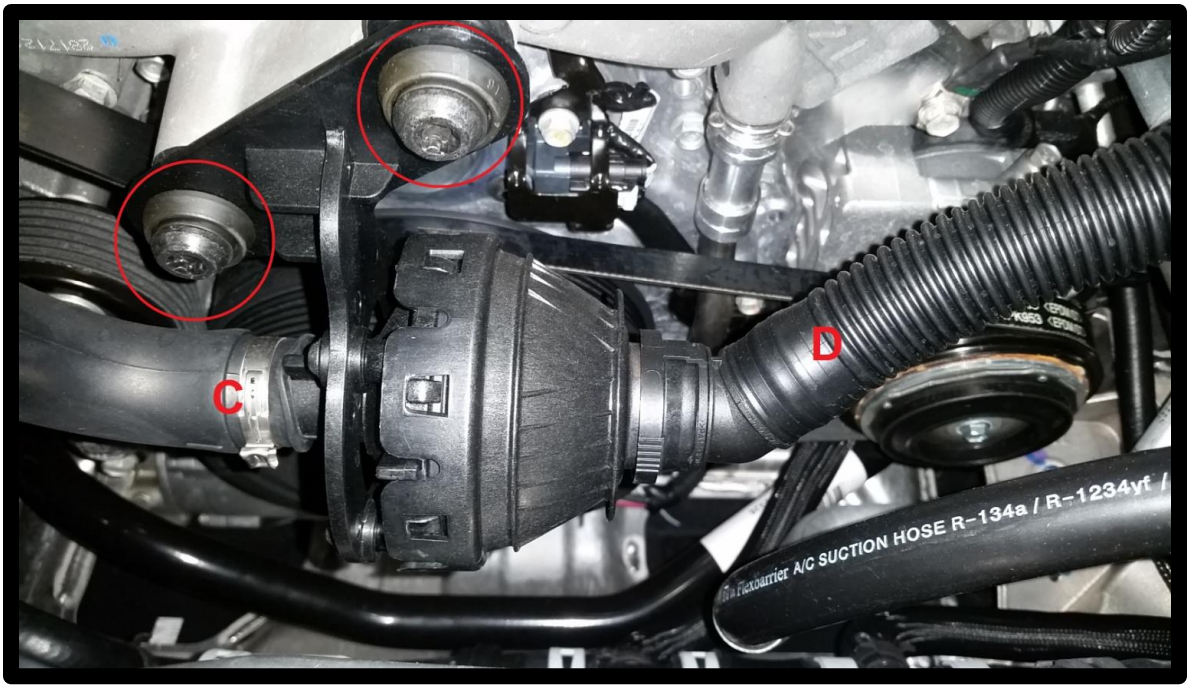

Figure 21: Removal of Air Cleaner Resonator

25. Remove the factory serpentine belt by depressing the factory hydraulic tensioner.
26. The valve covers will need to be swapped in order for the supercharger to fit properly, to do this begin by removing the factory coil pack covers (left and right), see Figure 22.

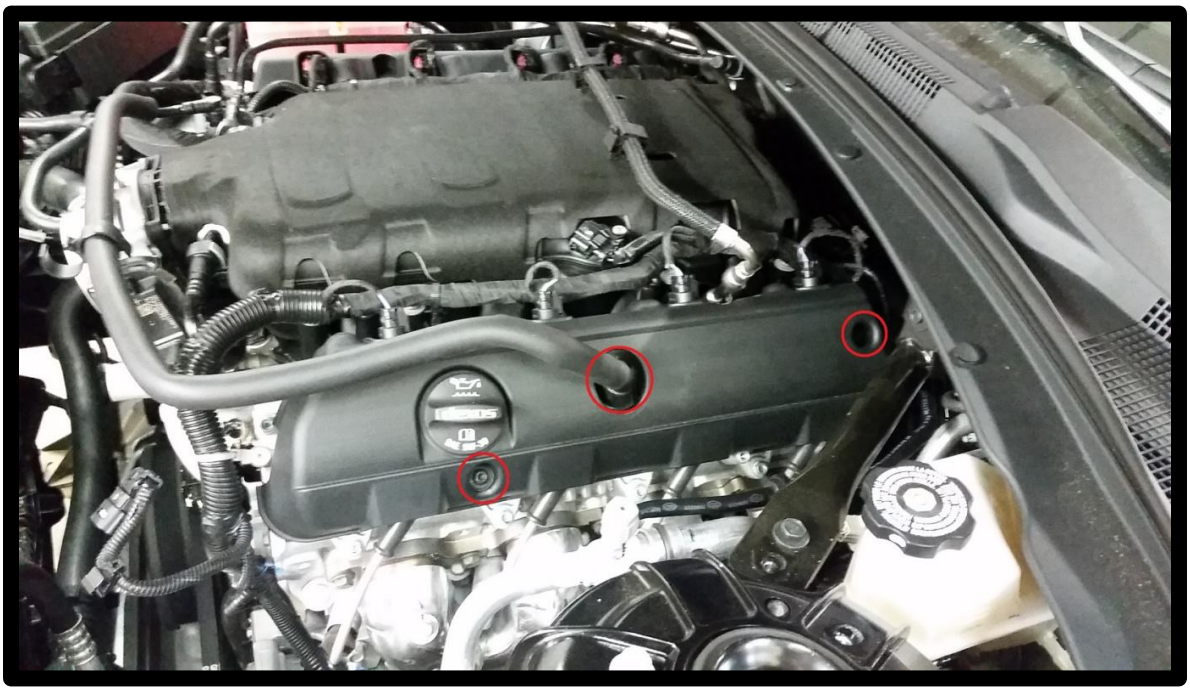

Figure 22: Removing Coil Pack Covers (Driver Side Shown)

27. Disconnect the electrical connectors and spark plug wires on all 8 coil packs, See Figure 23.

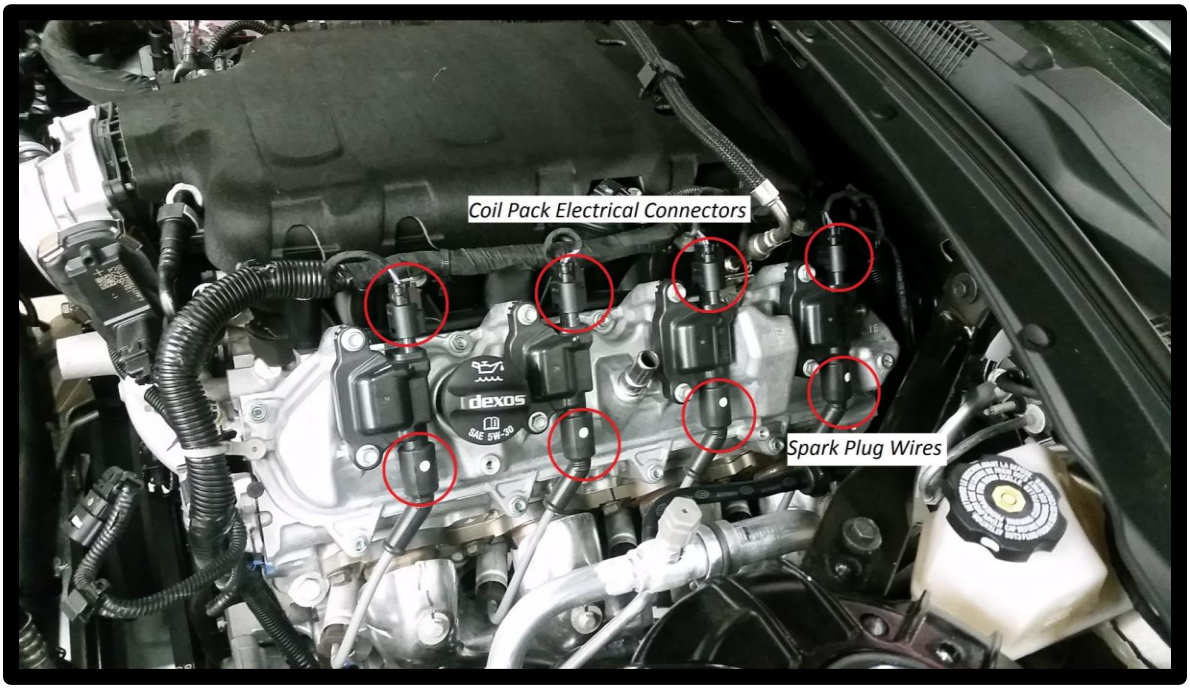

Figure 23: Electrical Connectors and Spark Plug Wires (Driver Side Shown)

28. On the passenger side also remove the factory evap vent tube, which will be reinstalled, and the bracket securing the oil dipstick tube to the valve cover, see Figure 24.

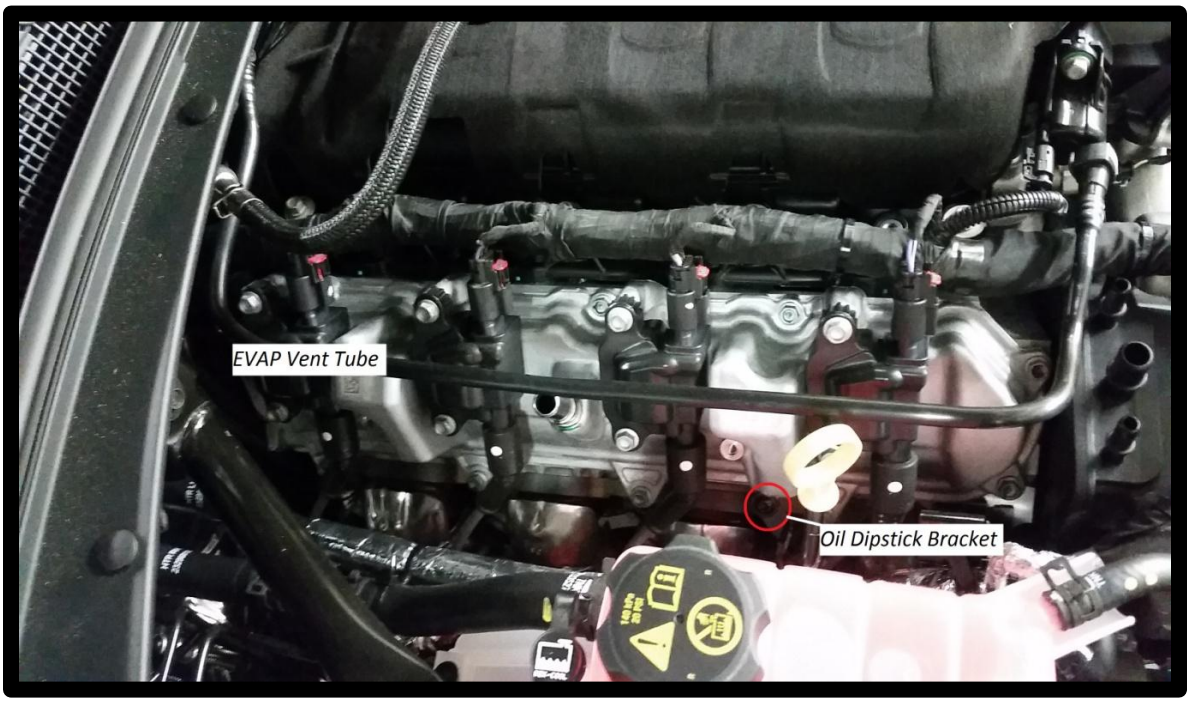

Figure 24: Evap Vent Tube & Oil Dipstick Bracket

29. Remove both valve covers by removing the 10x 10MM Hex Head bolts on each side. Swap the valve covers from left to right. The gasket can be reused making sure that no dirt or debris is on the gasket or mating surface of the head. Torque the bolts to factory torque specs and reconnect all electrical connectors and spark plug wires.
30. When reinstalling the oil dipstick bracket on the passenger side the dipstick bracket needs to be bent slightly. To do this gently tap on the dipstick tube bracket with a 3/8” extension and a hammer as to make sure the dipstick is fully seated in the block and to prevent leaks later. Then reinstall the bracket bolt.
31. The factory coil pack covers will need to be trimmed based on the images in Figure 25 below; this is best completed with a cutoff wheel and die grinder. Reinstall the covers and the evap vent tube when finished.

Driver Side Cover (Originally Passenger Side):

Passenger Side Cover (Originally Driver Side)

Figure 25: Trimming Factory Coil Pack Covers

32. The transmission cooler needs to hung out of the way, it does not need to be removed completely, rather remove the mounting hardware, remove the transmission cooler line clip, and let the cooler drop down and hang for now, see Figure 26.

Figure 26: Transmission Oil Cooler

33. The lower radiator baffle will need to be removed, modified, the reinstalled later, however for now remove the six plastic retainers and the ambient temperature sensor from the lower baffle. See Figure 27.

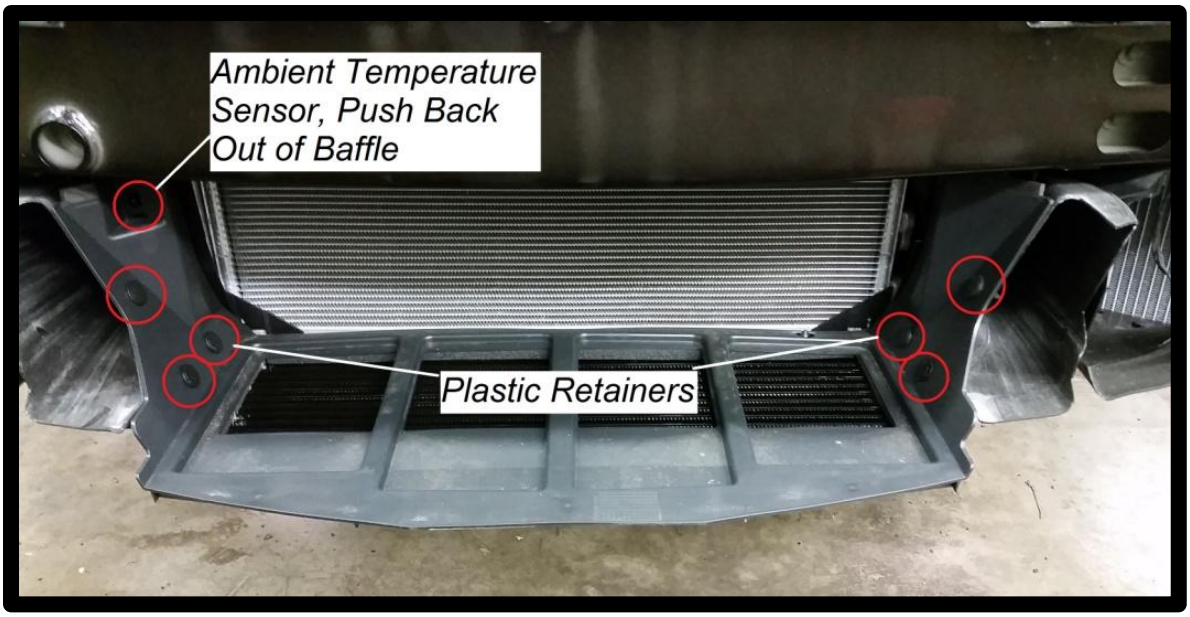

Figure 27: Lower Radiator Baffle

34. The radiator side air seals either need to be trimmed or removed and discarded completely. In order to remove them you must first remove the auxiliary radiator cooling ducts, then the front brake rotor cooling ducts will need to be removed, finally the transmission oil cooler brackets needs to be removed. Then the metal retainers on the side of the radiator can be removed. The driver's side air seal will need to be cut around the A/C lines to be removed.
35. If you opt to leave the air seals on the radiator, use Figure 28 to trim the air seals in the car.

Figure 28: Trimming of Radiator Side Air Seals

36. Remove the driver and passenger side brace by removing the two 10MM Bolts shown in Figure 29, these braces will not be reinstalled. Then remove the horn assembly by pulling the harness retainer off of the stud and removing the 10MM bolt securing the horn, as you pull up do not forget that the horns still need to be disconnected. See Figure 30. Place the horns to the side as they will be reused later.

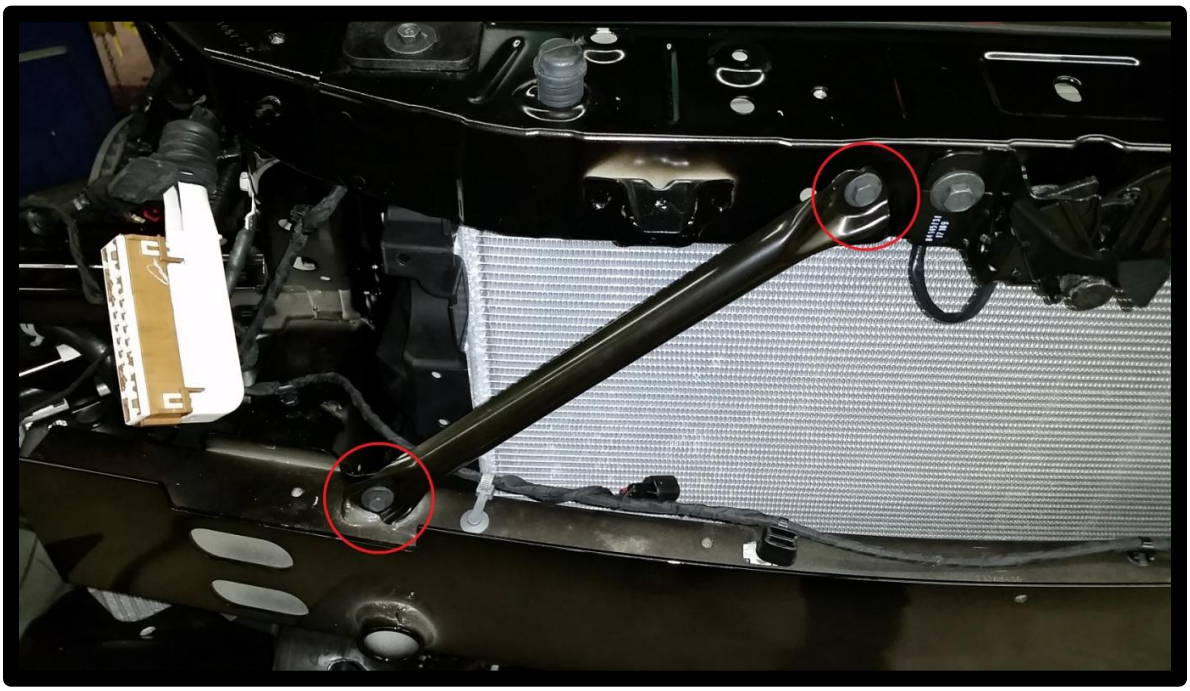

Figure 29: Removing Passenger Side Brace

Figure 30: Removing Horn Assembly

37. The ECM plastic holder under the passenger side headlight needs to be modified as shown below. This can be done in the vehicle with a cutoff wheel and a die grinder. In order to do this; disconnect and lay off to the side the two branches of harness shown in Figures 31 and 32 below. Remove the harness after the marked lines in the direction of the arrows shown. These branches will need to be rerouted one the intercooler and tubes are installed.

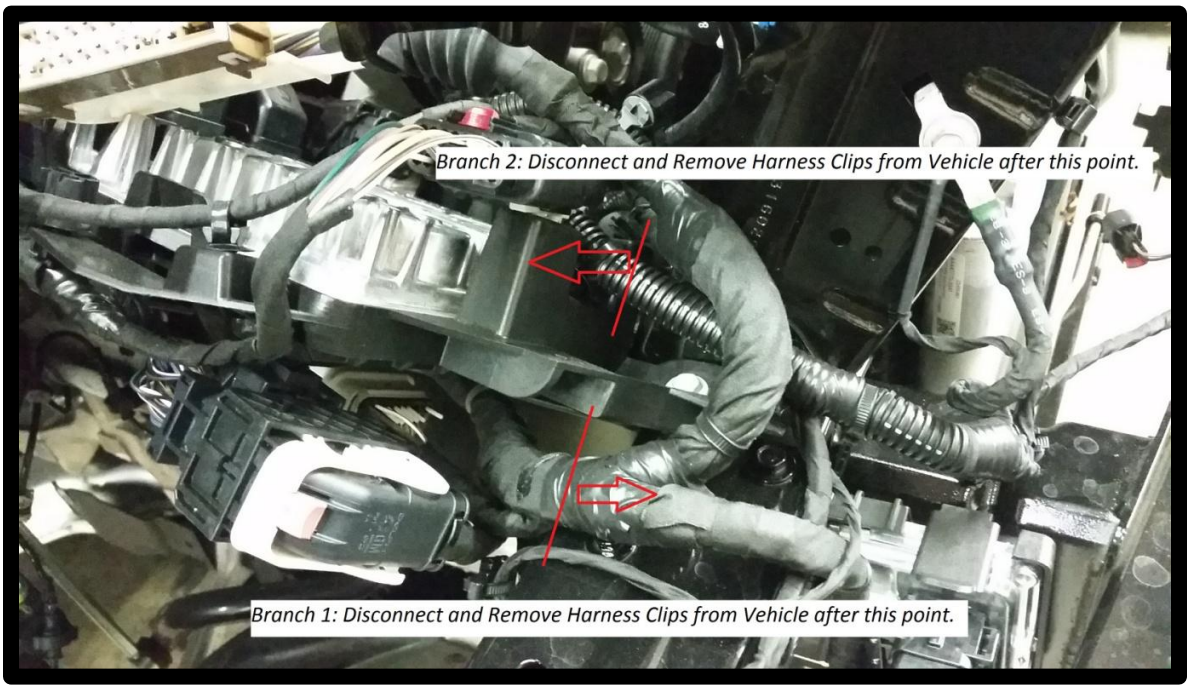

Figure 31: Disconnect Branches of Harness as Shown

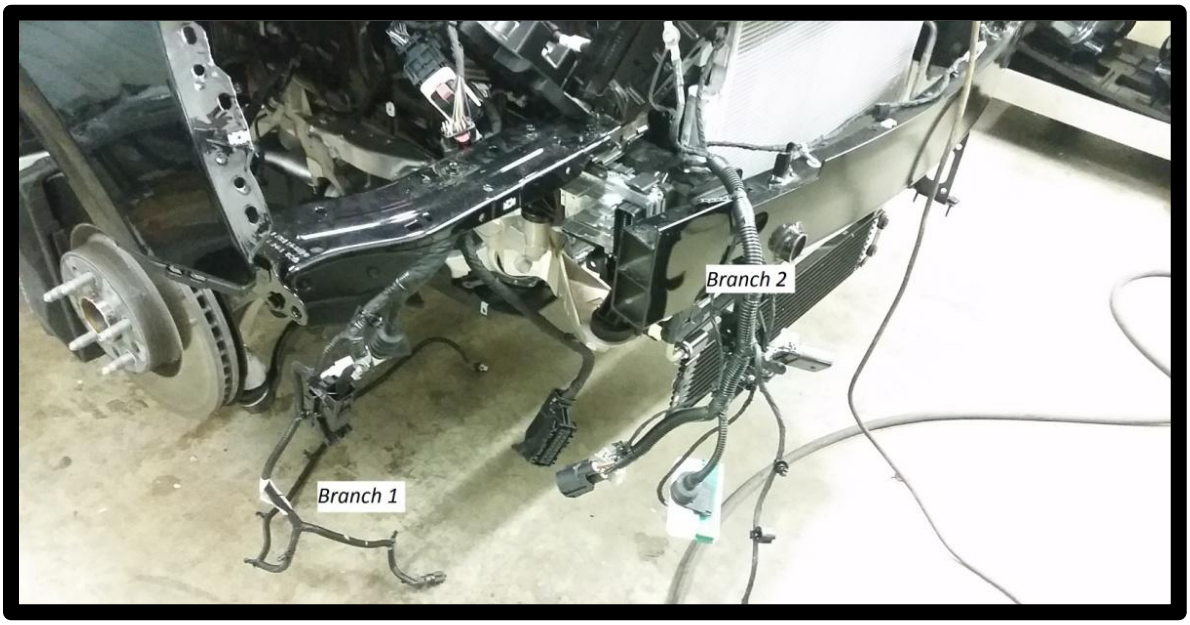

Figure 32: Disconnected Harness

38. Remove part of the ECM plastic holder as shown in Figure 33 below. This will be for clearance of the intercooler outlet tube that will be installed later. The two cuts are shown below-removed from vehicle for clarity.

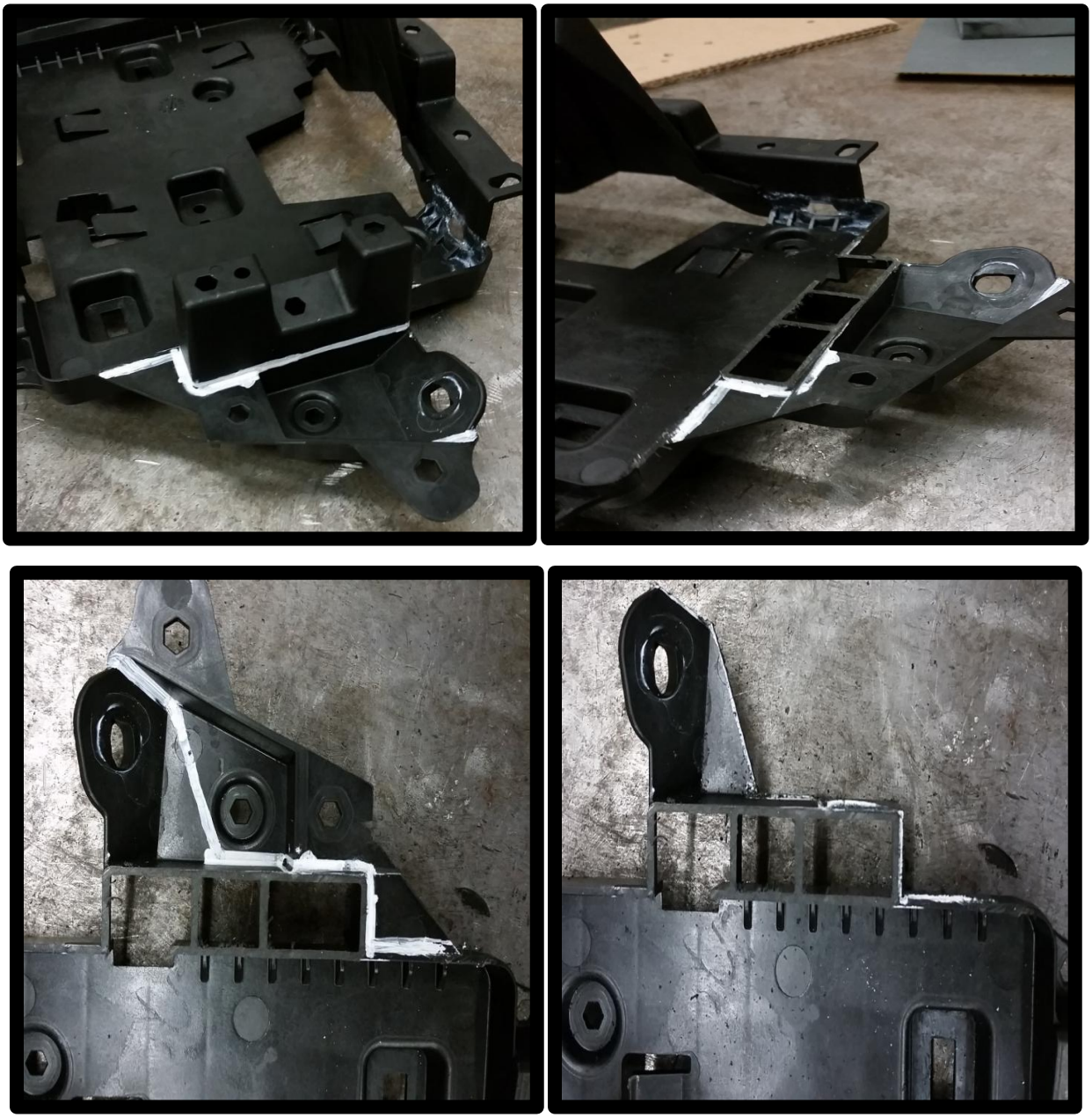

Figure 33: Trimming ECU Bracket

Assembly

1. To begin the assembly, the air-air intercooler will be installed first. The intercooler will be positioned behind the front cross member as shown in Figure 34. The intercooler must be installed from the bottom without any of the brackets attached. Once the intercooler is in place loosely install the upper “L” shaped brackets with two of the supplied M8X1.25X12MM bolts. Then install the lower brackets with the remaining M8X1.25X12MM bolts, as seen in Figure 35.
2. At this point the oil cooler and can also be installed using four of the provided M6X1.0X16MM bolts and four M6x1.0 locking nuts.

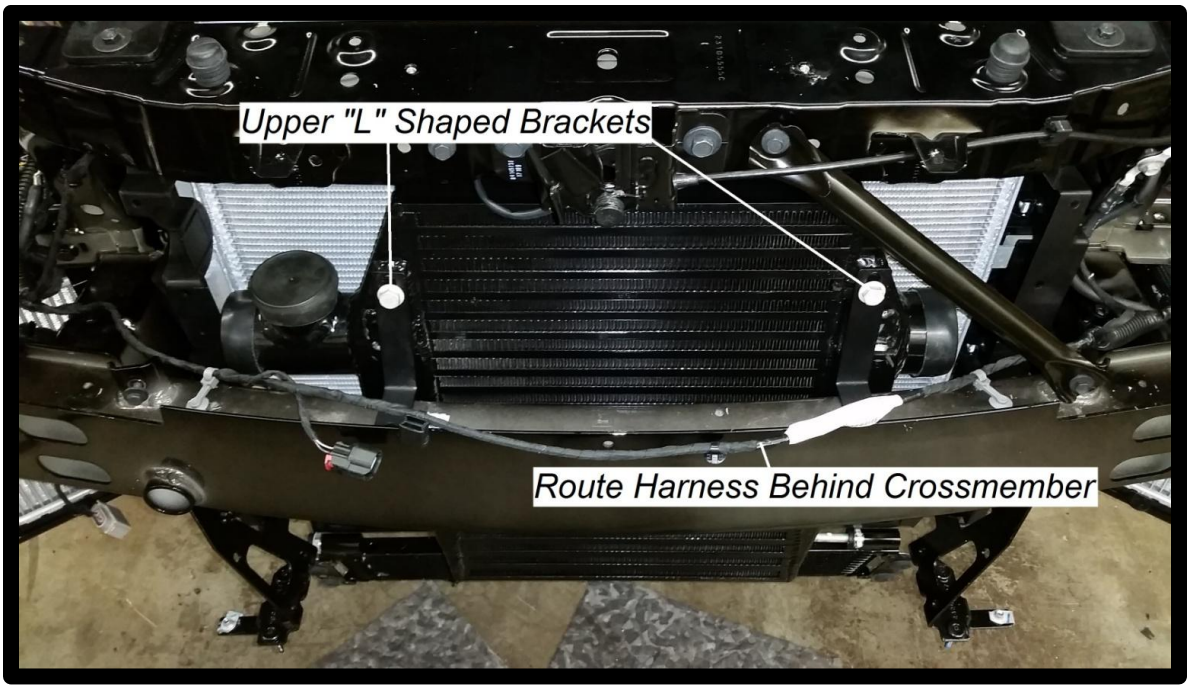

Figure 34: Air-Air Intercooler Positioning

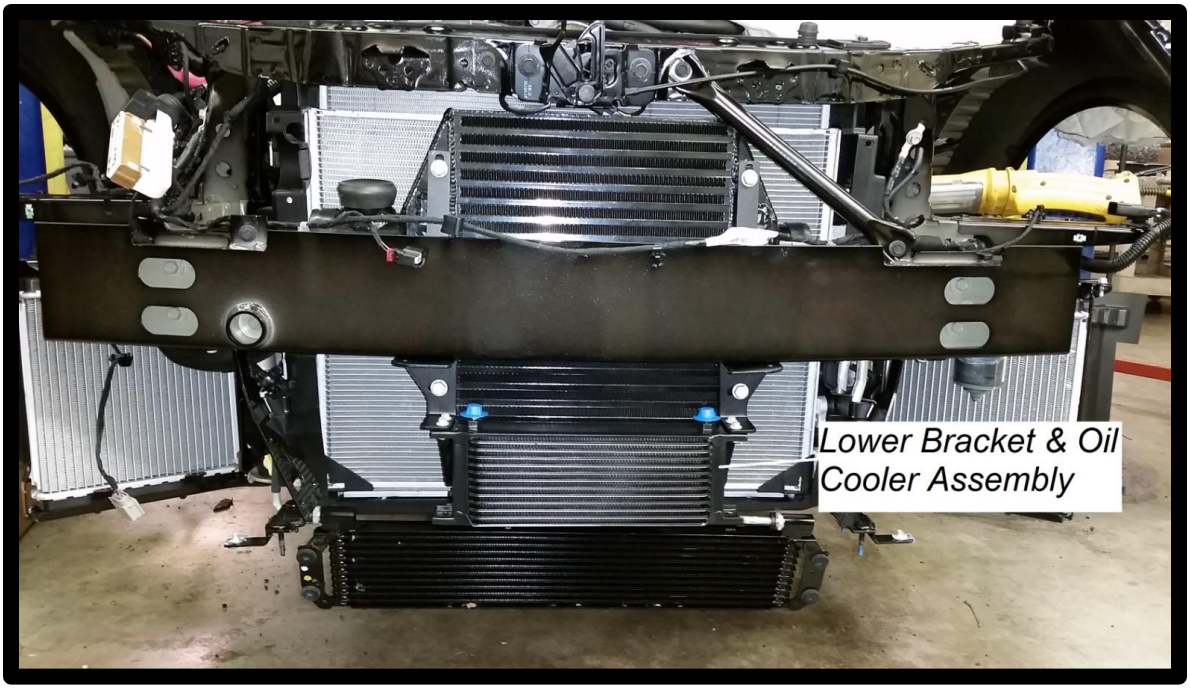

Figure 35: Intercooler and Oil Cooler Installation

3. Once the upper and lower brackets are loosely installed, set the height of the intercooler, the top of the intercooler should be just slightly below the hood latch, about ¼” as shown in Figure 36 below. Once the height is set lightly tighten the upper brackets followed by the lower brackets. These bolts will be final torque after the brackets are secured to the vehicle.

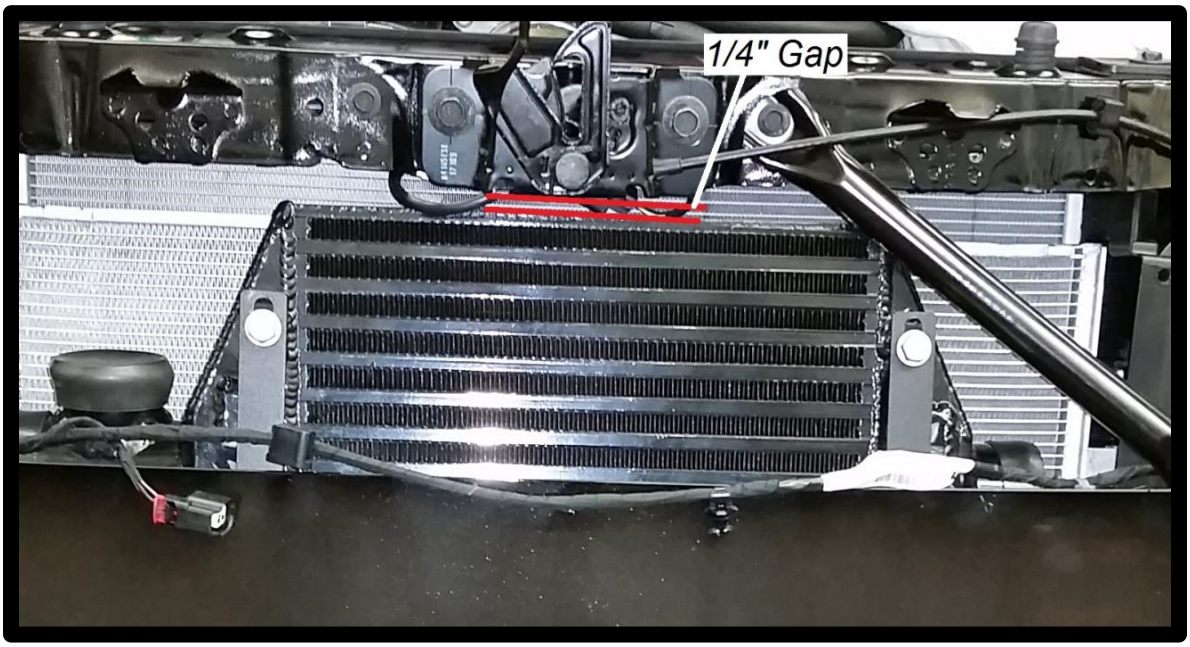

Figure 36: Intercooler Height

4. Once the intercooler brackets are tight the blow off valve needs to be installed onto the intercooler, to do this loosen the provided c-clamp almost all the way and place it on the intercooler. Preinstall the banjo bolt and barb fitting onto the BOV using two of the provided sealing washers. Position the barb fitting such that it will point towards the front of the vehicle when installed. The barb fitting was intended to sitting behind the sheet metal of the radiator support and it may be necessary in some cases to slightly bend the sheet metal outwards, away from the BOV. Then install the provided o-ring onto the intercooler and install the BOV onto the intercooler making sure the o-ring stayed in place. Position the BOV approximately as shown in Figure 37. Hold the BOV in position and tighten the clamp until you cannot rotate the BOV with moderate twisting pressure. Then install the provided 1” inlet filter.

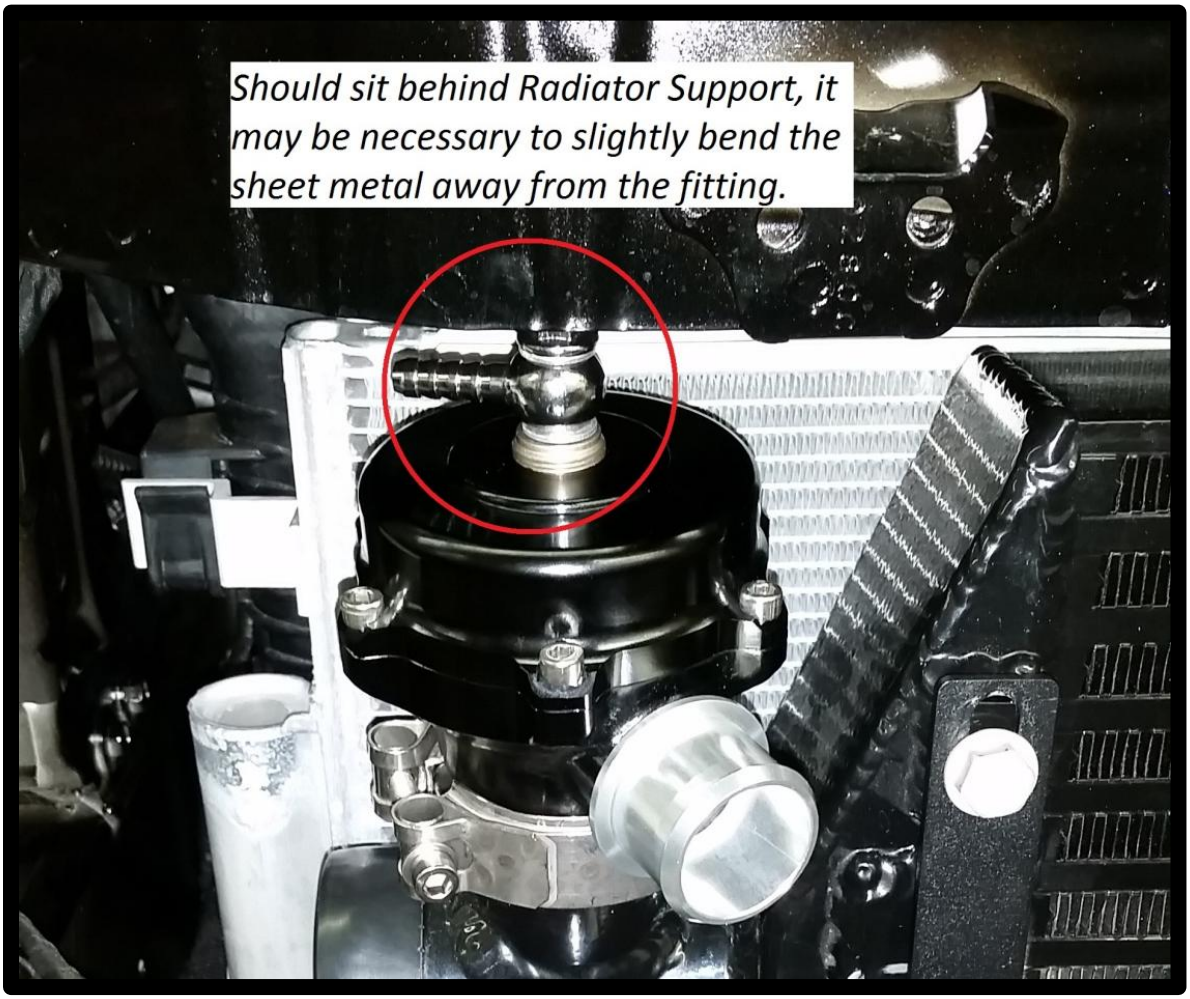

Figure 37: Installed Blow Off Valve

5. The provided protective door edging will be installed onto the sheet metal seam of the radiator support where the intercooler outlet tube will be resting against. Cut the door edging into two pieces and apply as shown in Figure 38. There should be some remaining door edging that will be used later on.

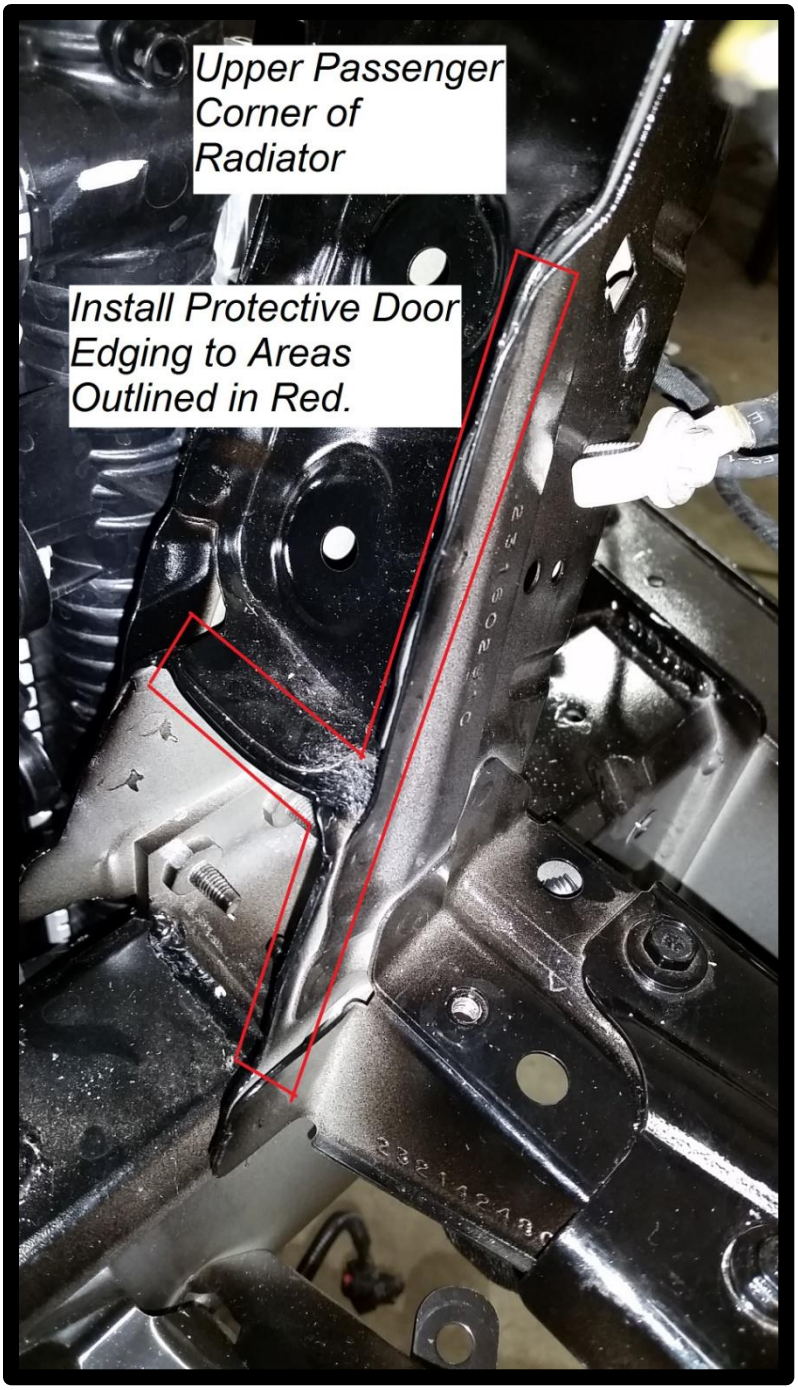

Figure 38: Installing Protective Door Edging

6. On the driver's side there is a small sheet metal hex head bolt that as to be removed and replaced with the supplied M6x1.0x20MM button head bolt. The purpose of this is to avoid the hex head chaffing the intercooler inlet tube. See Figure 39 below for the location of the bolt.

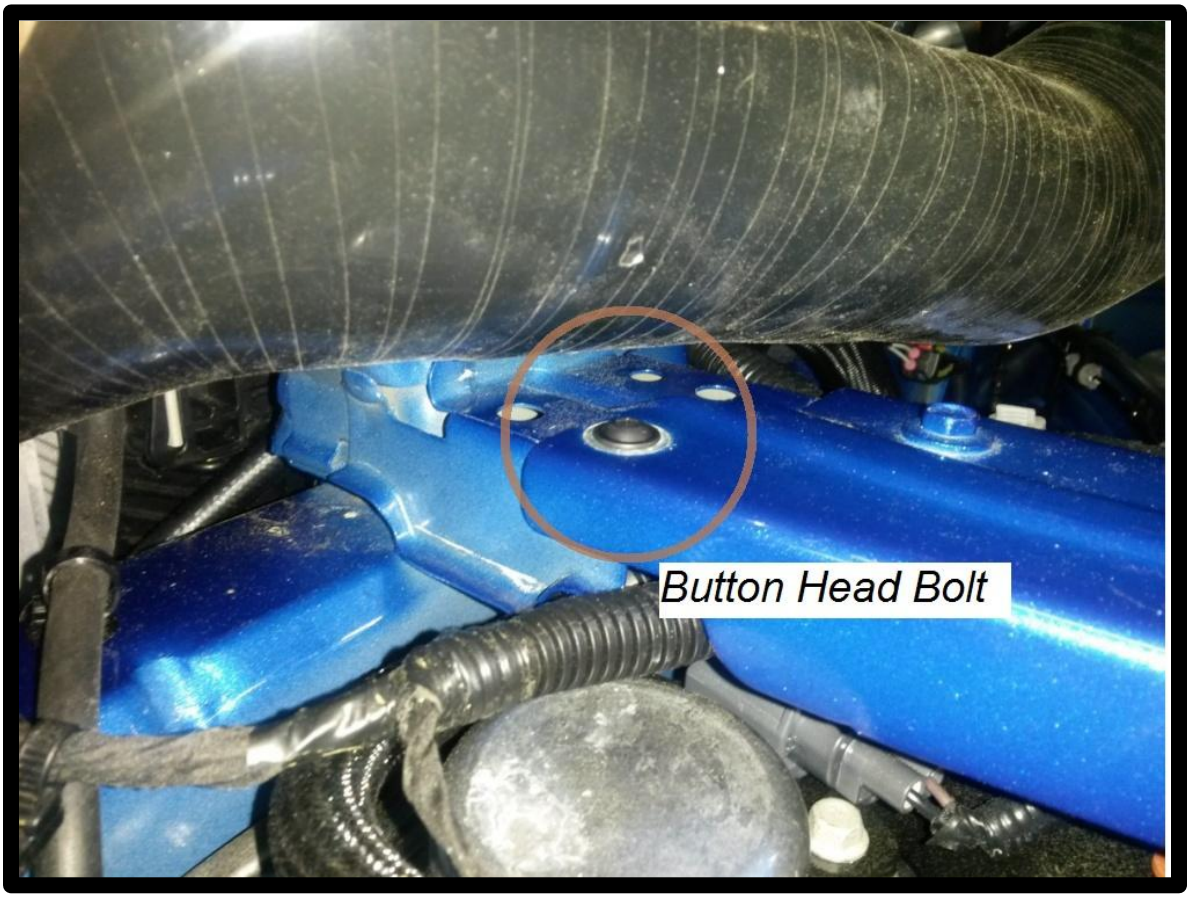

Figure 39: Location of Hex Head Bolt to be replaced with Button Head

7. Now loosely install the two intercooler tubes. The purpose of installing the tubes now is to center the intercooler on the front cross member. Once the tubes are loosely installed, slide the intercooler as far as possible to the driver side without the intercooler outlet tube on the passenger side of the intercooler falling off. The intercooler outlet tube should be touching the protective door edging. See Figure 40.

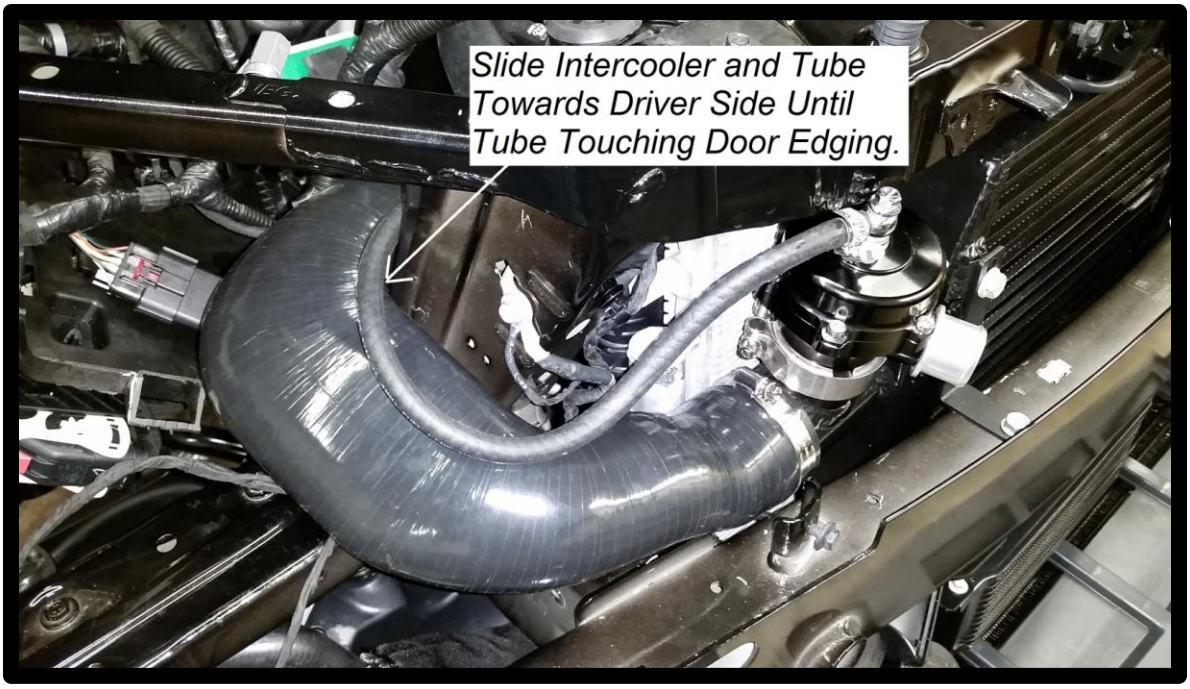

Figure 40: Positioning of Intercooler

8. Using the two strips of cardboard from the oil cooler packaging shim the intercooler away from the condenser. To do this insert the cardboard on the sides behind the intercooler as shown in Figure 41 making sure that you will be able to remove it later.

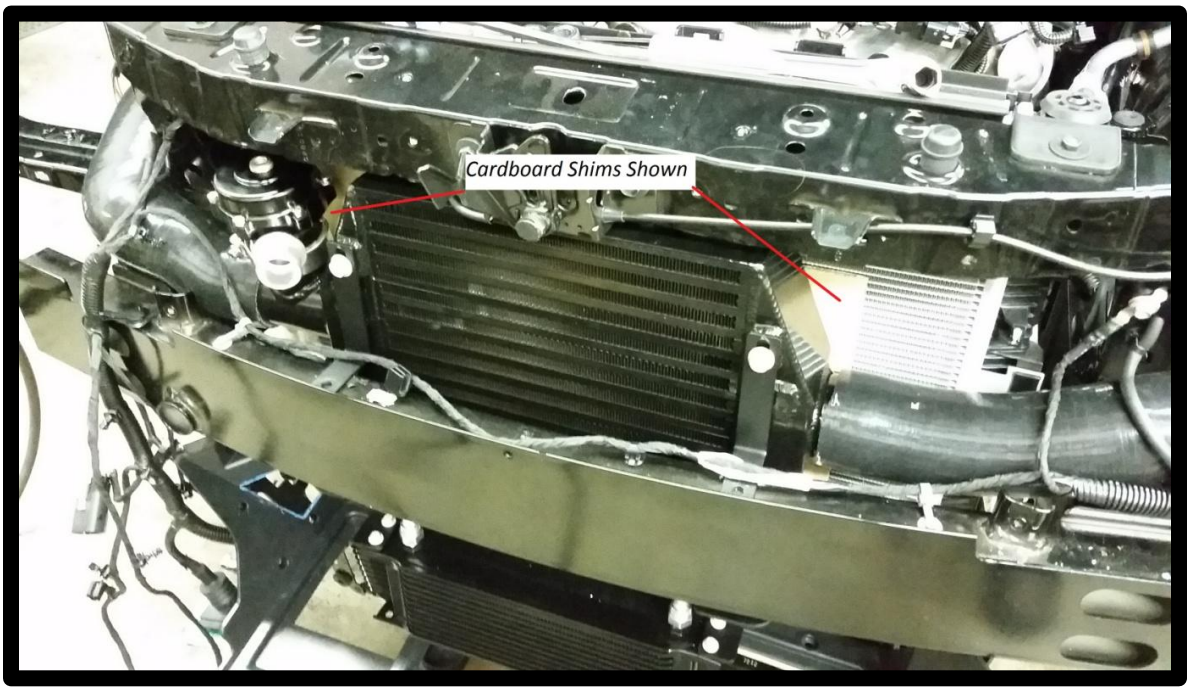

Figure 41: Shimming Intercooler from Condenser

9. Four 9/32” holes will need to be drilled in the front cross member; then the provided 5/16”-18 self tapping bolts will be used to secure the intercooler. However before drilling; check that the intercooler is parallel to and shimmed away from the condenser using the cardboard shims, check that the barb on the BOV is not be forced into the radiator support, check that the top of the intercooler has proper spacing between itself and the hood latch, and finally check that the intercooler tubes are fully installed onto the intercooler and loosely sitting in their natural resting position.
10. Then the holes can be marked and drilled starting with the top brackets. There is no need to remove the intercooler or brackets for this. Once the top holes are drilled it is a good idea to install and tighten the self tapping bolts to secure the intercooler with the top two brackets. However make sure that the harness crossing the front beam is below the passenger side upper intercooler bracket, otherwise the connector for the horns will not reach later. Then repeat this process with the lower brackets. In order to drill the holes it may be necessary to remove the lower bracket and oil cooler assembly after marking the holes to be drilled. Once the lower bracket bolt holes are drilled reinstall the lower bracket and oil cooler assembly and tighten all of the hardware for the intercooler. See Figure 42. Don’t forget to remove the cardboard when finished.

Figure 42: Intercooler and Oil Cooling Installed

11. The horns will need to be rotated in the factory mounts as shown in Figure 43 below. To do this loosen the 10MM nut on each horn and rotate them both clockwise about 90 degrees, then retighten the nut.

Figure 43: Before and After Rotating Horns

12. The lower radiator baffle will also need to be modified in order to accommodate the new location of the horns. See Figure 44 below. The cut should follow the bends of the baffle and then straight across as shown.
13. Then reinstall the lower radiator baffle and remount the transmission oil cooler below the car.
14. The horns will be installed as shown in Figure 45 below and will use an existing hole in the lower radiator baffle and oil cooler mount. Mount the horns using the provided M8X1.25X30MM bolt and M8 x1.25 nut as shown in Figure 46. Once the horns are mounted they can be reconnected to the harness.

Figure 44: Before and After Lower Radiator Baffle

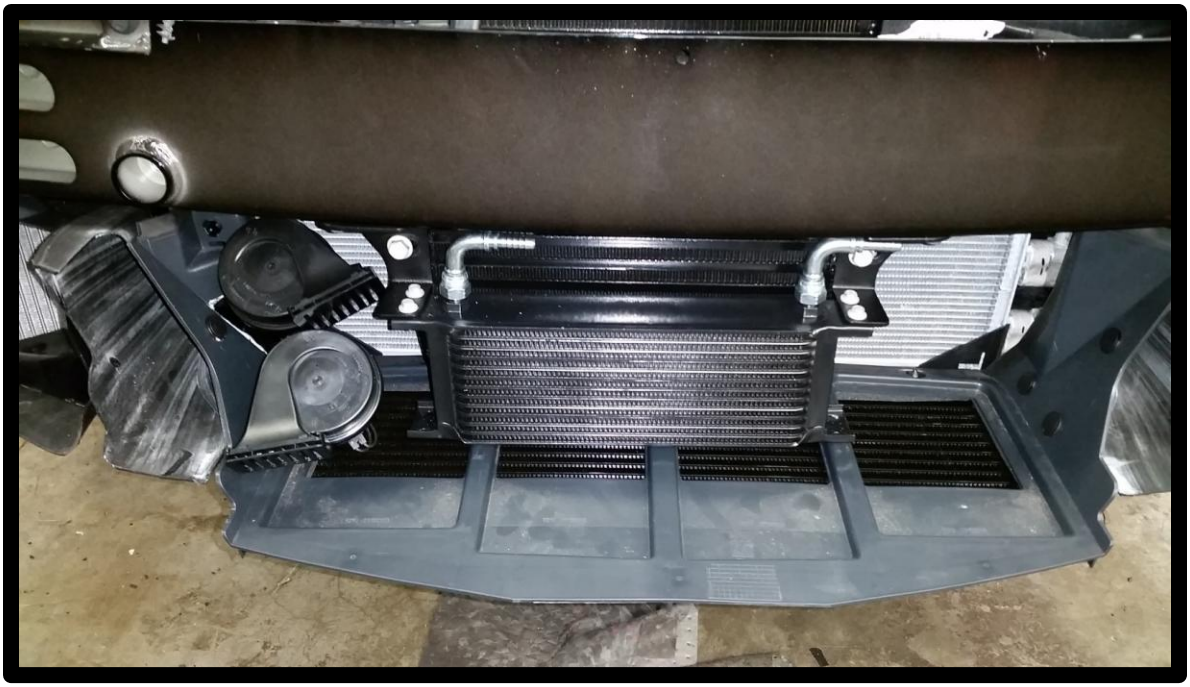

Figure 45: Horns Installed in New Location

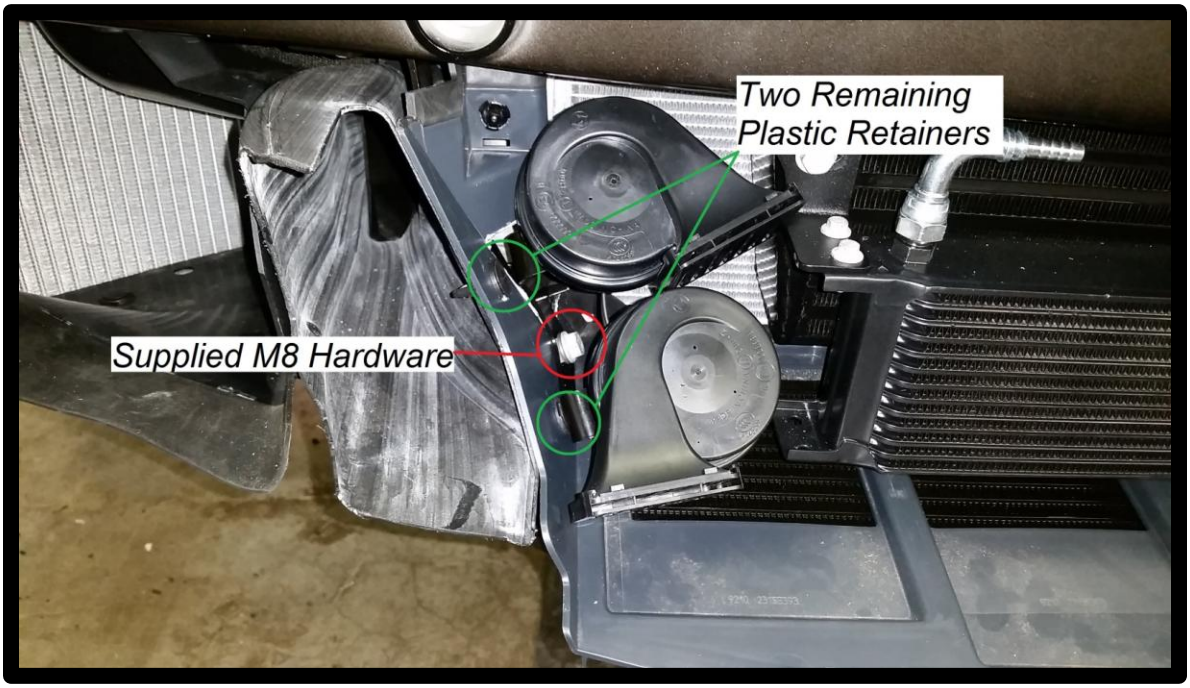

Figure 46: Horn Mounting Location

15. Next we will install the supercharger head unit and main plate but first we will have to remove the connector bracket from the connector and the driver's side cylinder head as shown in Figure 47.

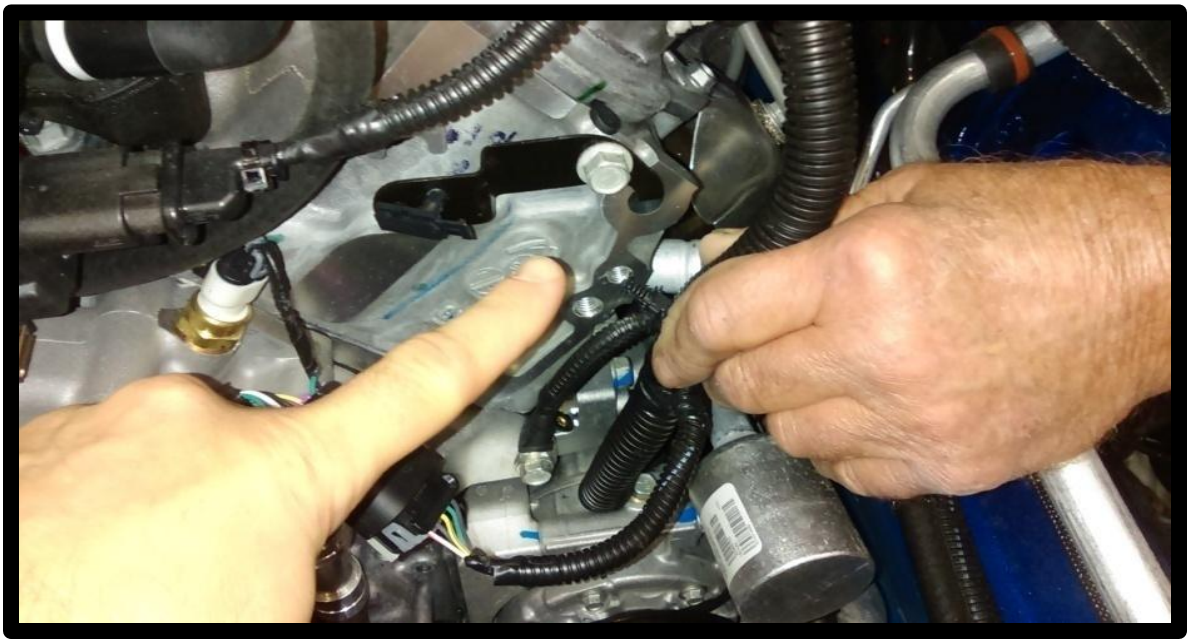

Figure 47: Connector Bracket

16. Preinstall the supercharger head unit onto the supercharged main plate as shown in Figure 48 and Torque the bolts to 23 ft-lbs.

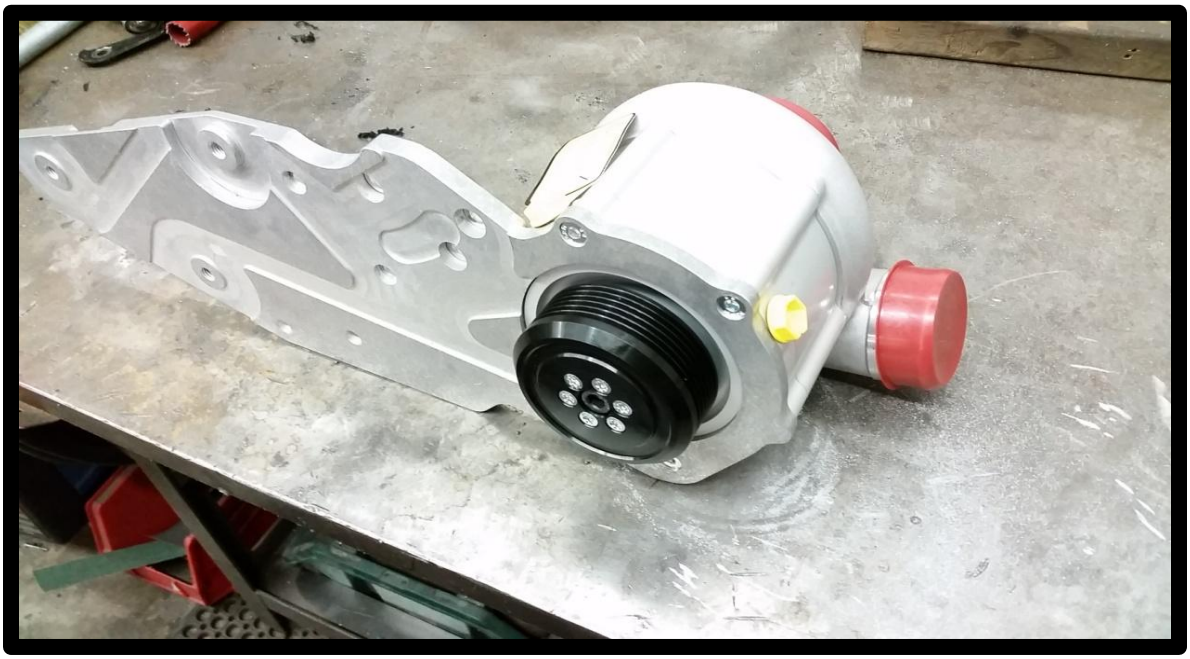

Figure 48: Installing Head Unit onto Main Plate

17. Next install the supercharger and main plate assembly. Utilize the two 8MM spacers colored in orange below along with two M8X1.25X90MM low head socket cap screws and two 10MM spacers colored in pink below along with the two M10X1.5X100MM to mount to the driver side cylinder head. Only loosely install plate at this time. After Step 18 below torque the 8MM bolts to 23 ft-lbs and 10MM bolts to 37 ft-lbs. See Figure 49. Take note of the harness routing through the main plate standoffs as shown in Figure 50 below.

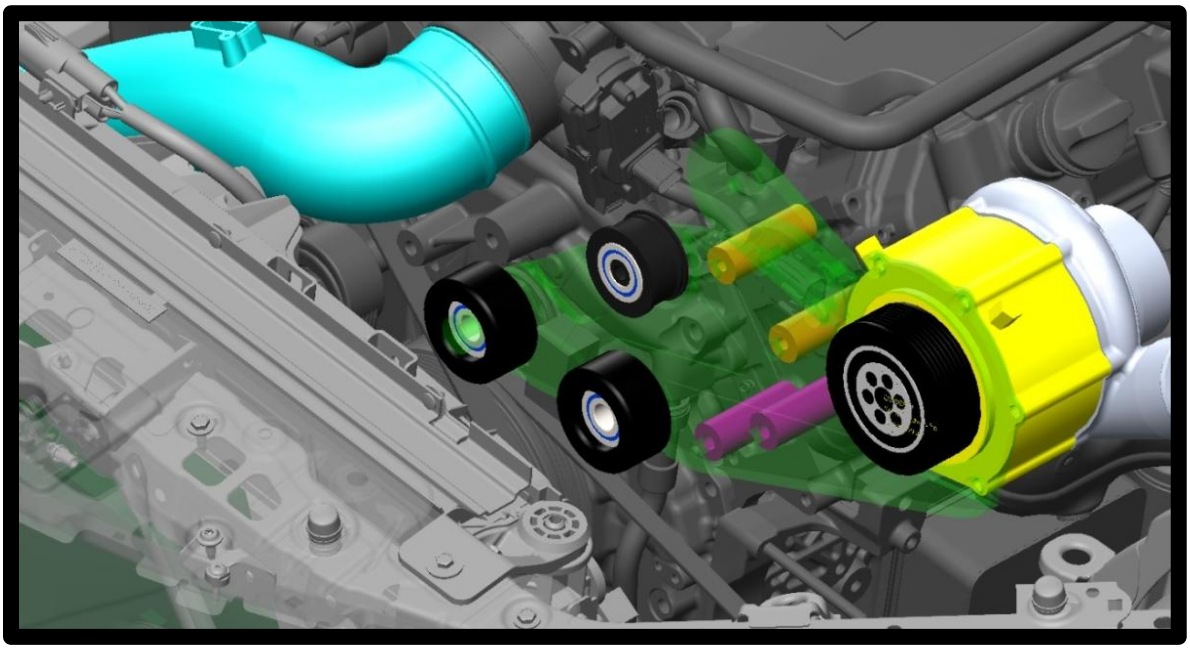

Figure 49: Main Plate Hardware Locations

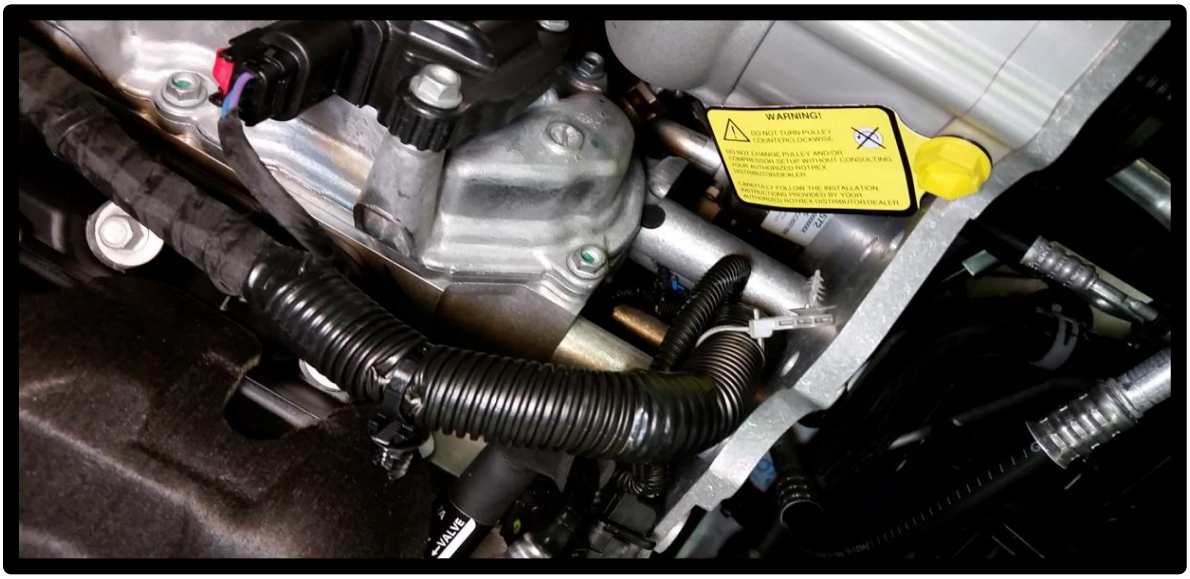

Figure 50: Harness Routing through Main Plate

18. Next install the secondary small front plate as shown below on the existing water pump bosses after putting the pulley on the main plate then the included idler pulley spacer then finally the small front V plate. Utilize the two supplied M10X1.5X30MM bolts and the M10X1.5X60MM bolt and torque to 37 ft-lbs. Go back and now torque the main plate bolts. See Figure 51 below.

Figure 51: Idler Pulley & Plate Assembly and Install Location

19. Install the tensioner plate onto the main plate using the 3 M10X1.5X16MM socket head bolts. Torque to 37 ft-lbs.
20. Next install the tensioner onto the tensioner plate using the included M10X1.5X70MM Bolt and Torque to 37 ft-lbs. See Figure 52 below.

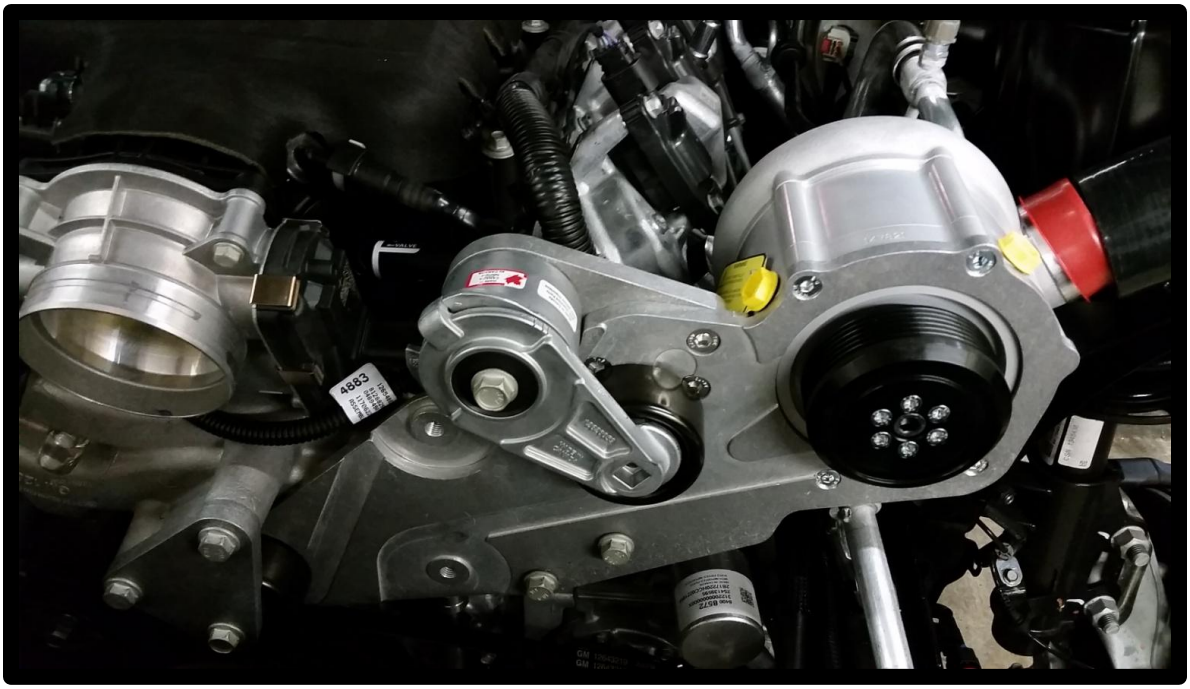

Figure 52: Installed Tensioner

21. Now install the remaining two idlers using the two M10X1.5X40MM bolts. The smooth idler also uses the straight spacer sleeve and the grooved idler is mounted directly to the main plate. These bolts will also be torque to 37 ft-lbs. See Figure 53 below.

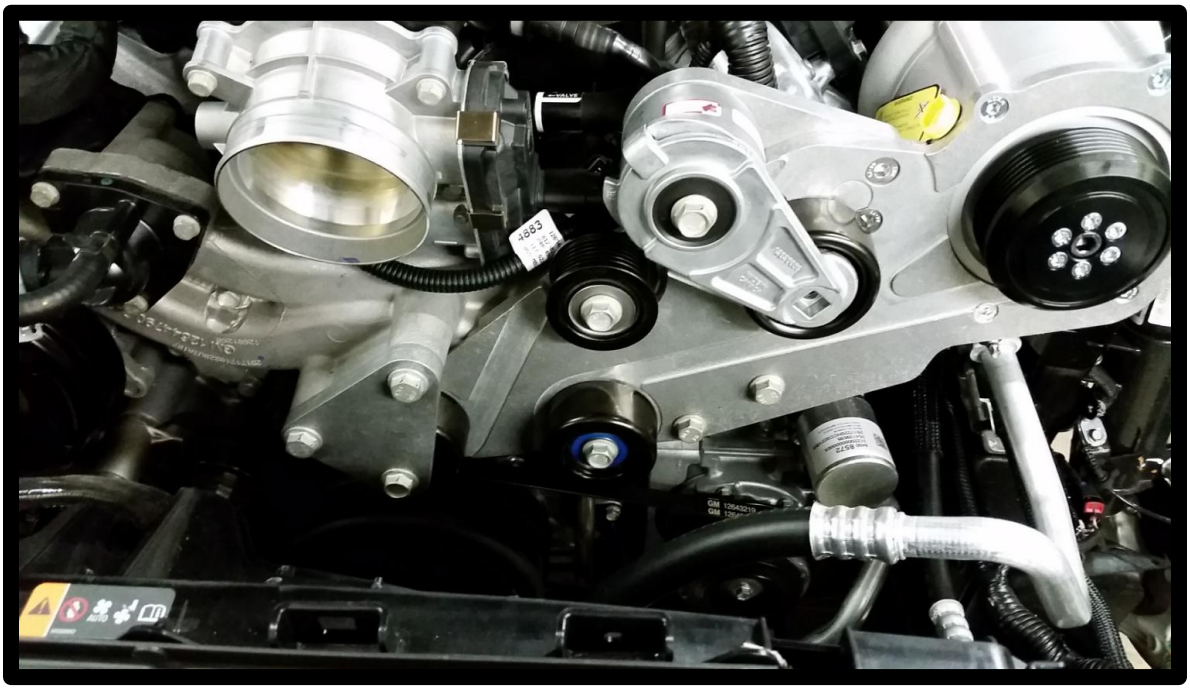

Figure 53: Completed Belt Drive System

22. Now the traction fluid reservoir will be installed. The traction fluid reservoir is to be mounted to the left (driver side) of the radiator on the radiator support using existing holes and the remaining two provided M6X1.0X16MM Bolts and M6x1.0 Locknuts. Using a suitable socket/extension carefully slip the M6 bolt through the provided hole in the frame and out the other side as shown in Figure 54. Then install the oil reservoir mount and M6 nut as shown in Figure 55. Only hand tighten the hardware for the mounts as they may have to be rotated when installing the reservoir. Note: It is sometimes helpful to use grease on the head of the bolt to help hold it onto the socket when installing through the radiator support.

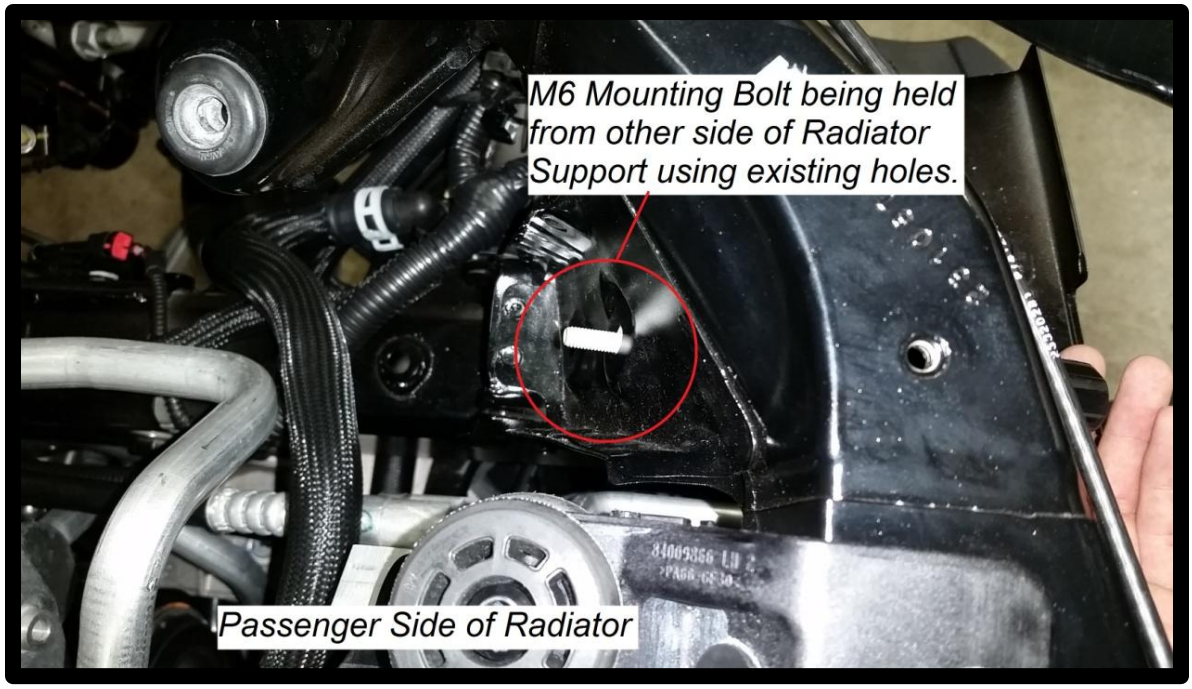

Figure 54: Traction Fluid Reservoir Location

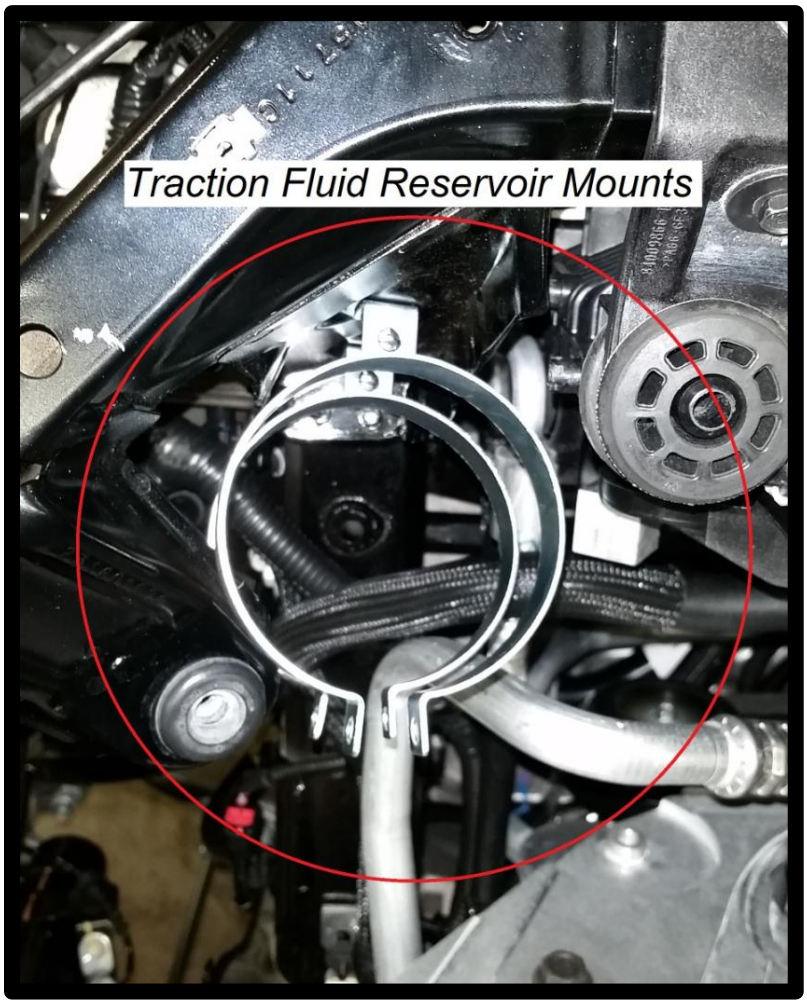

Figure 55: Install Traction Fluid Reservoir Mounts

23. Install the banjo bolts and barb fittings onto the oil reservoir using the provided copper sealing washers. The exact direction of the fittings is not critical at this point and can be adjusted later. This is also a good time to install the banjo bolts and barb fittings onto the supercharger head unit again using the provided copper sealing washers. See Figure 56 below for approximate direction of the fittings.

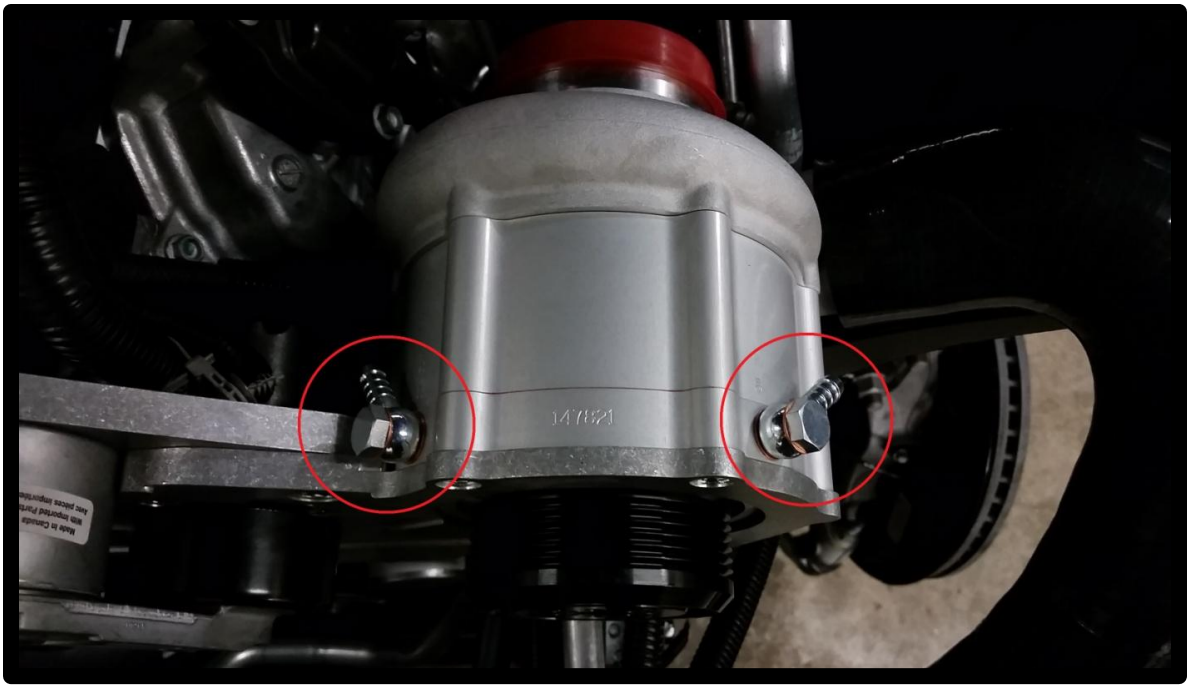

Figure 56: Installing Head Unit Barb Fittings

24. Next install the traction fluid reservoir into the mounts using the provided hardware as shown in Figure 57 below.

Figure 57: Traction Fluid Reservoir

25. The two 90 degree barb fittings supplied with the intercooler will need to be installed facing the driver's side of the vehicle as shown in Figure 58 below. When installing these fittings it is a good idea to lubricate the threads and sealing surfaces. Make sure that the driver side fitting is not protruding past the oil cooler surface as it is possible for the front fascia to make contact later in the install as shown in Figure 59 below.

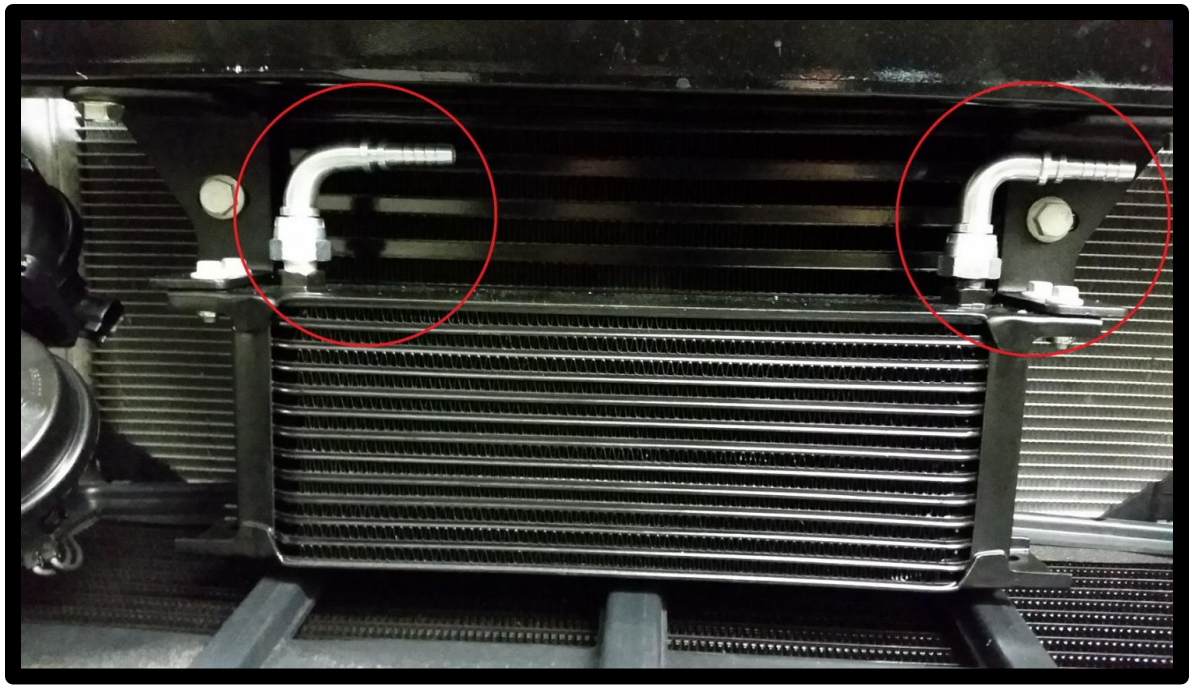

Figure 58: Installing Oil Cooler Fittings

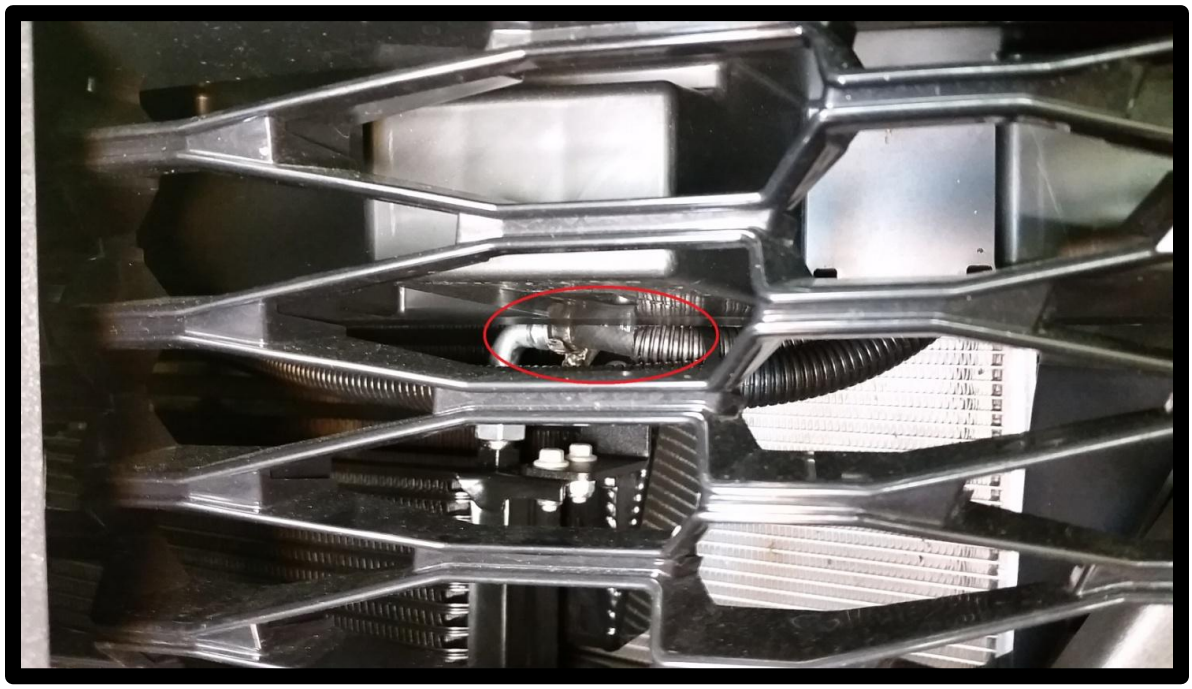

Figure 59: Incorrect Positioning of Oil Cooler Fittings (With Fascia Installed)

26. The supplied 3/8” hose is precut to length and shipped with loom. Connect the system as shown in the diagram in Figure 60 below using the precut hose and supplied 7/32”-5/8” hose clamps. Figures 61 and 62 describe how the hoses were routed. The white numbers written on the hoses indicate the length of that hose.

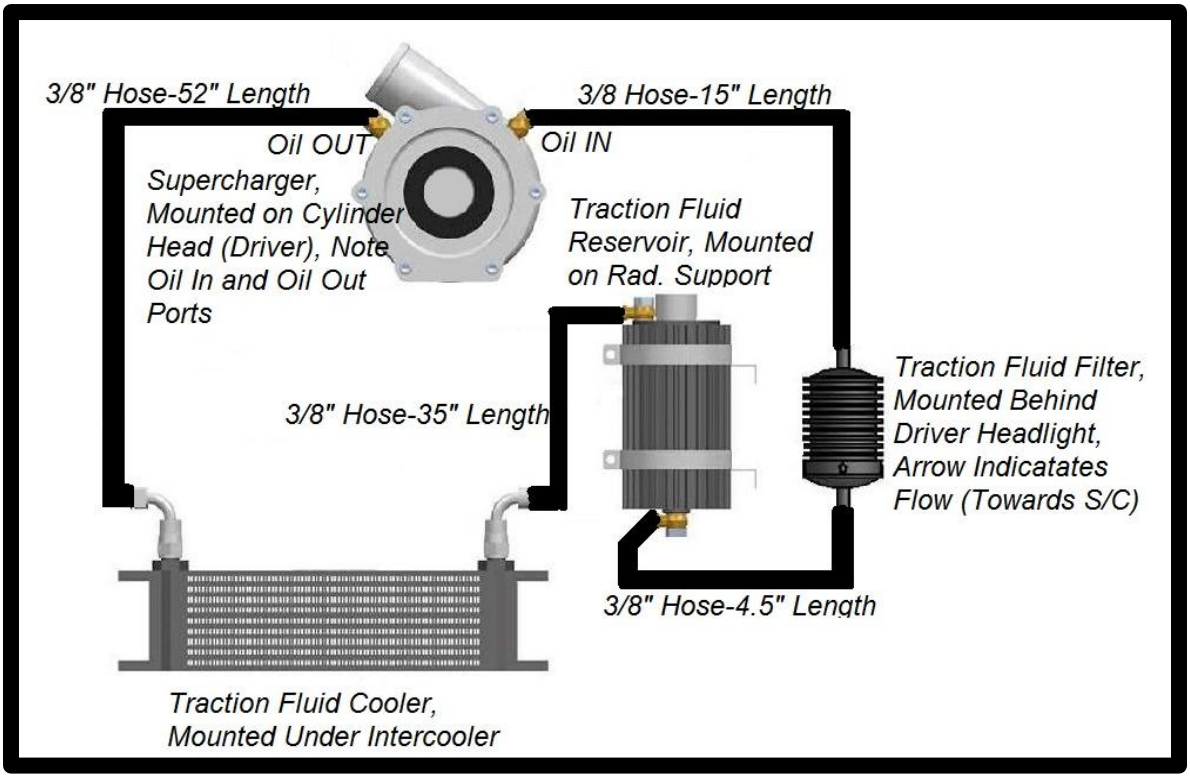

Figure 60: Traction Fluid Cooling System

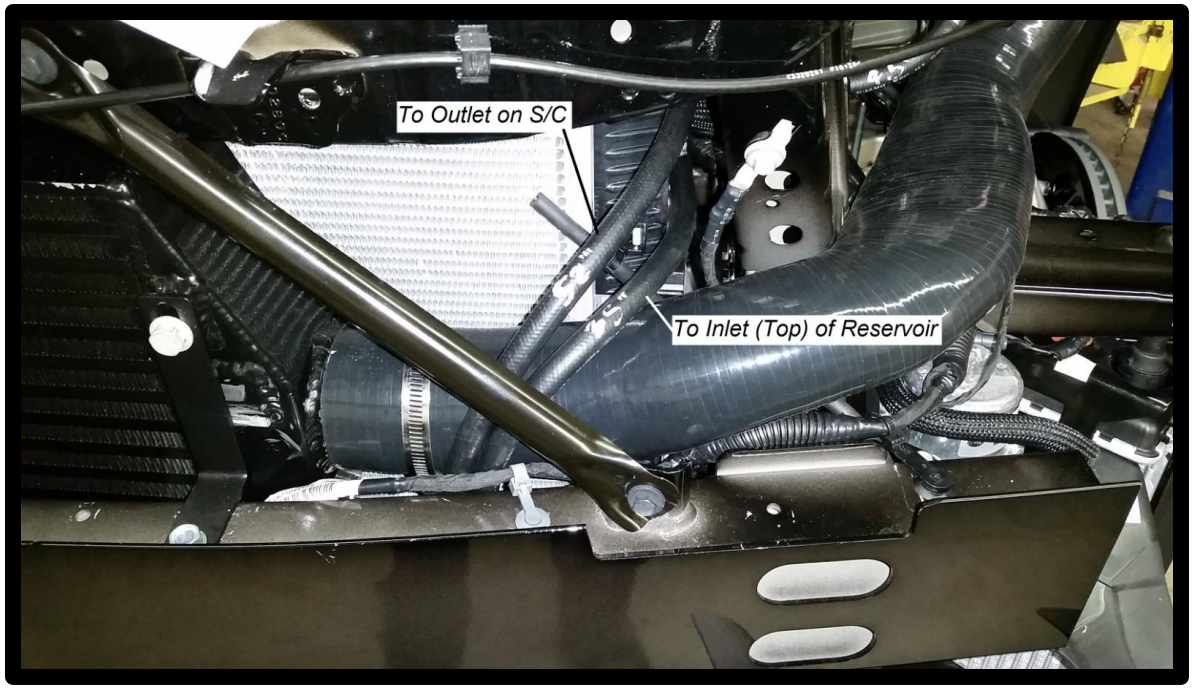

Figure 61: Routing of Traction Fluid Hoses (1/2)

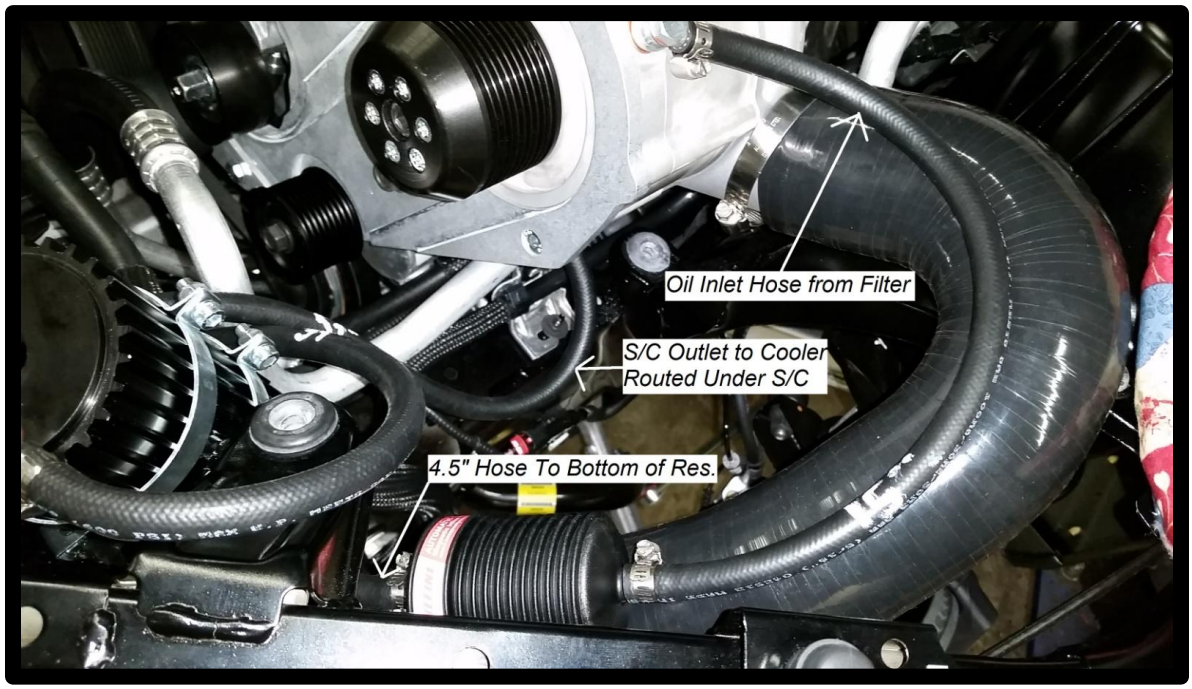

Figure 62: Routing of Traction Fluid Hoses (2/2)

27. Next install the supplied new accessory belt before moving onto the next step. To install the belt both tensioners must be compressed and/or rotated to fit the belt. See Figure 63 below for routing.

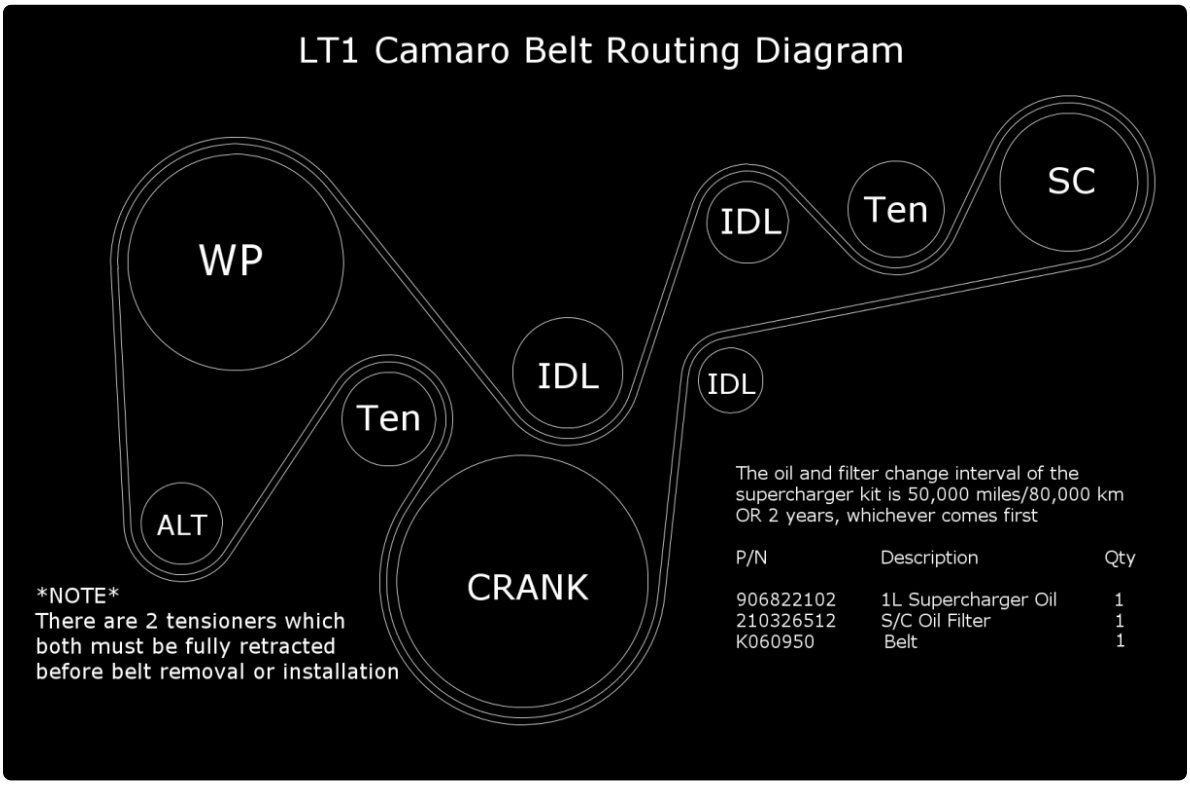

Figure 63: Serpentine Belt Diagram

28. Next install the supercharger outlet tube which runs from the supercharger to the intercooler. Install the tube using the two size 40 worm clamps as shown in Figure 64 and 65 below.

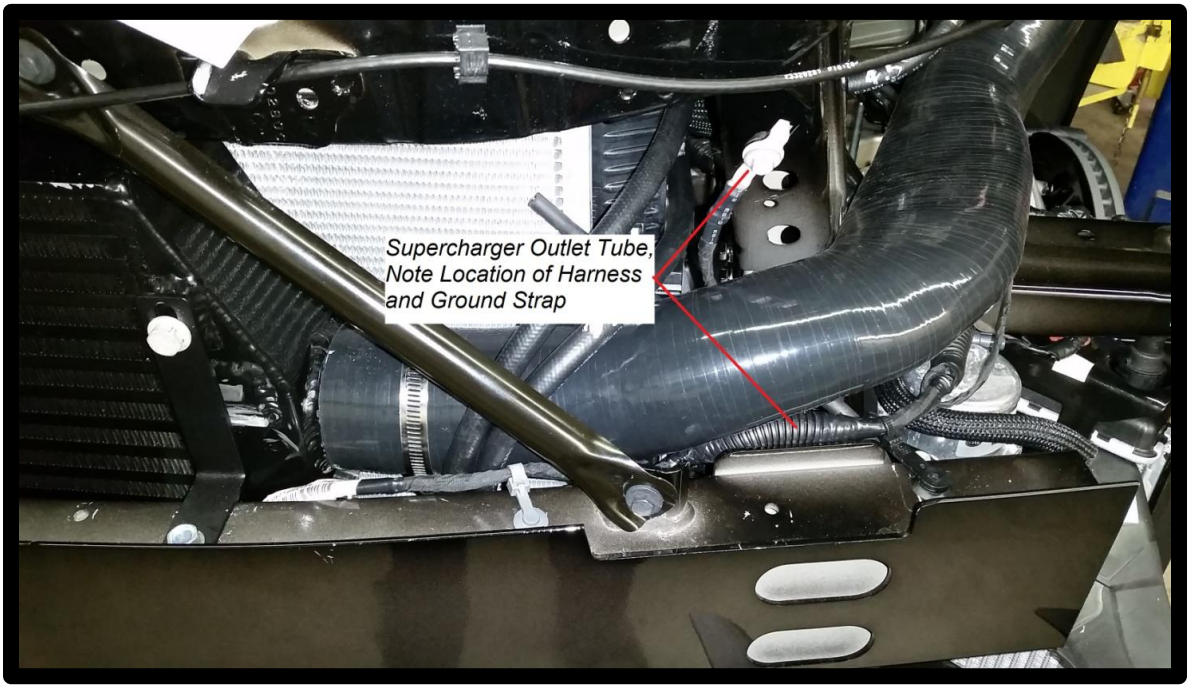

Figure 64: Supercharger Outlet Tube (1/2)

Figure 65: Supercharger Outlet Tube (2/2)

29. Now install the intercooler outlet tube and the throttle body intake tube. The intercooler outlet tube uses a size 40 worm clamp between the intercooler and outlet tube and a size 44 worm clamp between the outlet tube and throttle body intake tube. The throttle body intake tube uses the two provided 3.75” T-Bolt clamps and the silicon sleeve.
30. Once the intercooler outlet tube is loosely installed with the worm clamp install the throttle body intake tube and silicon sleeve as shown in Figure 66. Once both tubes are installed tighten all of the clamps, four total starting at the two throttle body T-Bolt clamps.

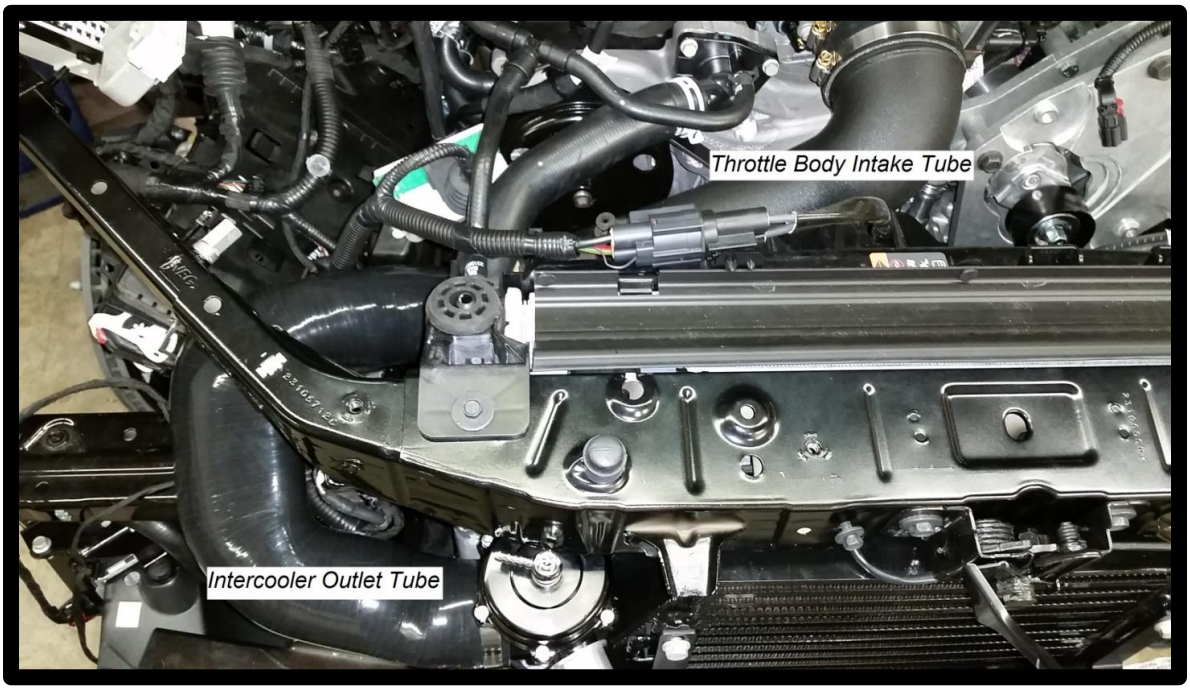

Figure 66: Intercooler Outlet Tube and Throttle Body Intake Tube

31. Once the tubes are tightened, install the old MAF sensor into the new throttle body intake tube as shown in Figure 67 below. Then use the extension harness to connect the MAF sensor to the original MAF sensor connector.

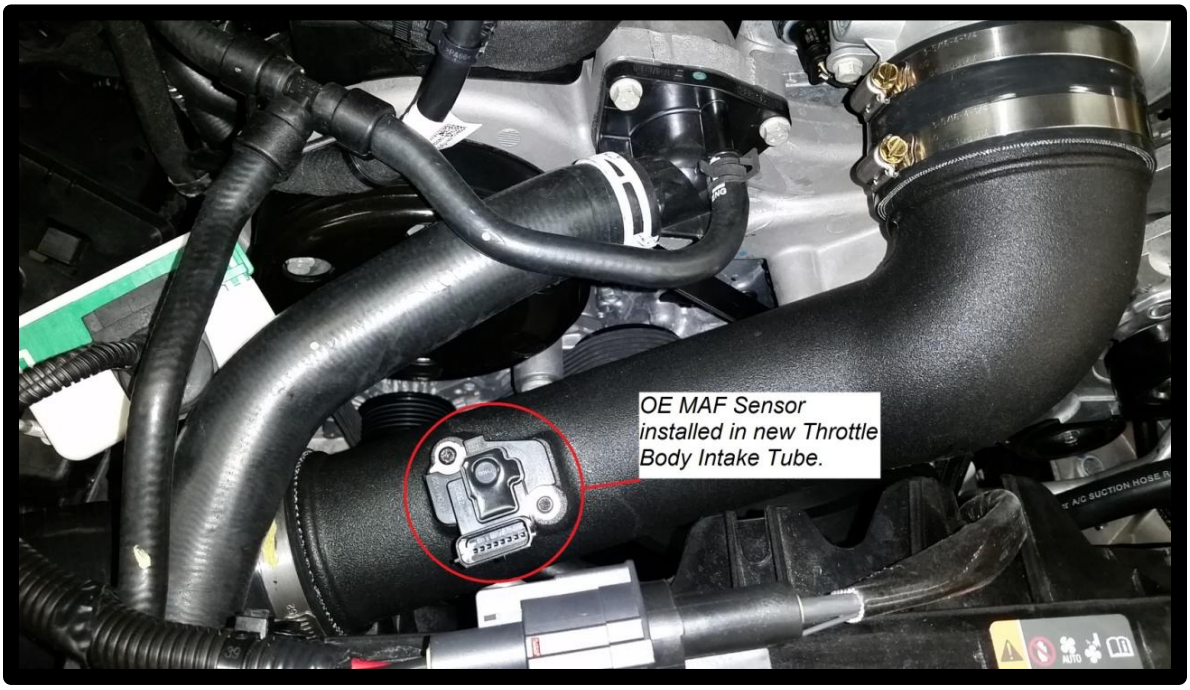

Figure 67: Installing MAF Sensor

32. The supercharger inlet tube and air filter should also be done at this point even though they will have to be removed to bleed the traction fluid system. The supercharger inlet tube uses two size 60 worm clamps and a silicon sleeve. Install the tube as shown in Figure 68 below and snug the worm clamps, do not tighten at this point as the tube will have to be removed later. At this point it is also a good idea to install the new provided PCV hose shown in Figure 69.

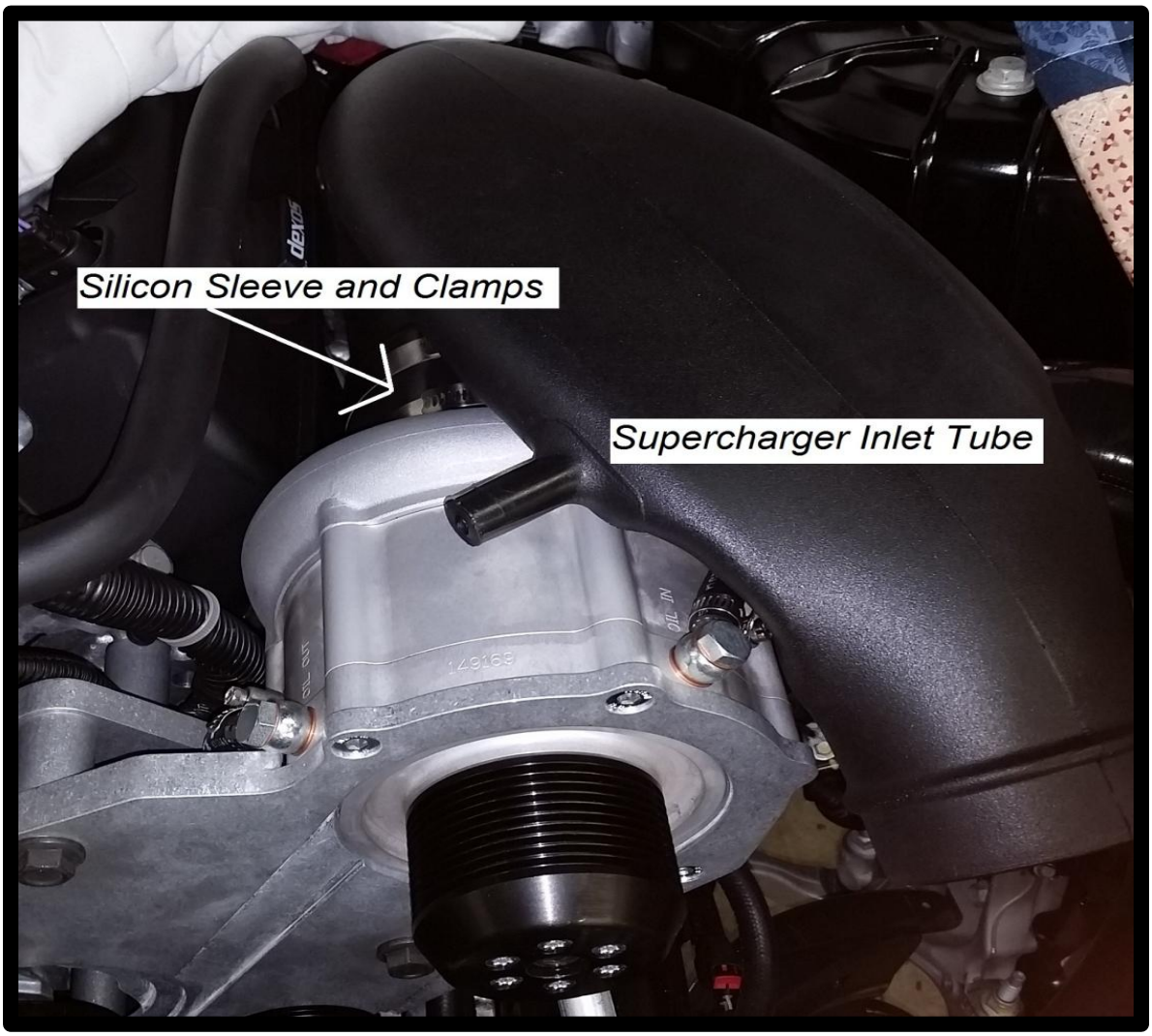

Figure 68: Supercharger Inlet Tube

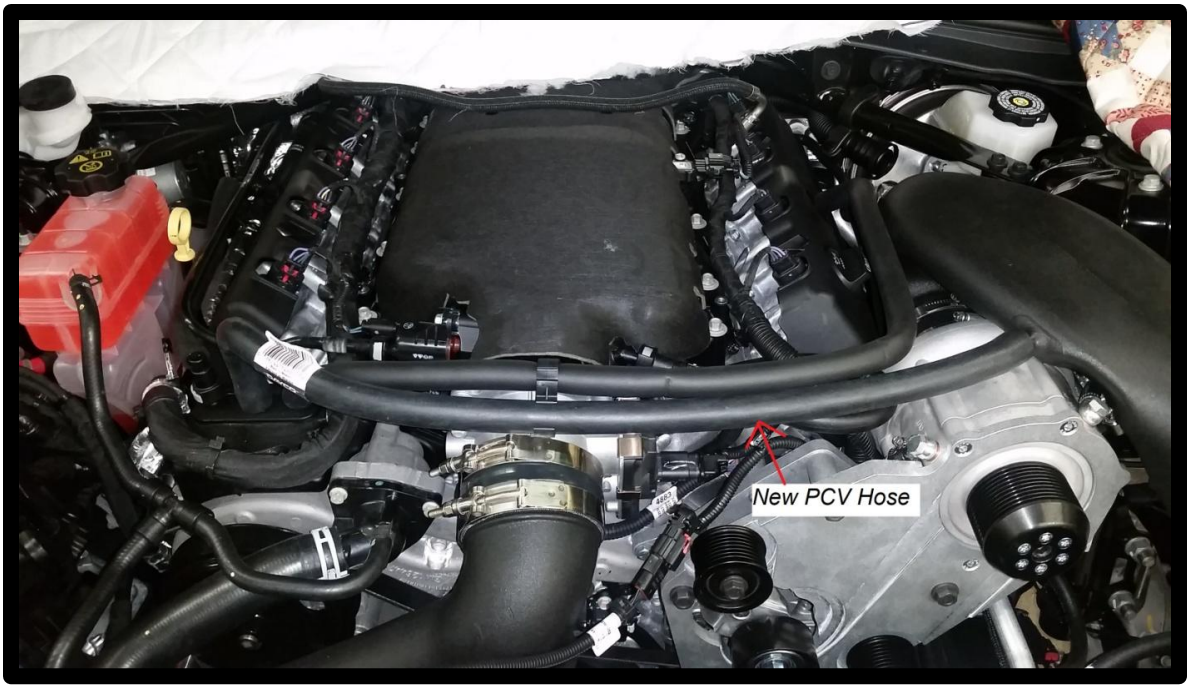

Figure 69: PCV Hose to Supercharger Inlet Tube

33. Now install the BOV vacuum hose using the provided ¼”x60” hose, vacuum “T” and 11/32” PCV Hose. First remove the factory PCV hose and carefully cut the ends off using a razor blade. Install the new hoses and vacuum “T” utilizing the provided clamps and reinstall the assembly into the car as shown in Figures 70-72.

Figure 70: Factory PCV Hose Cut

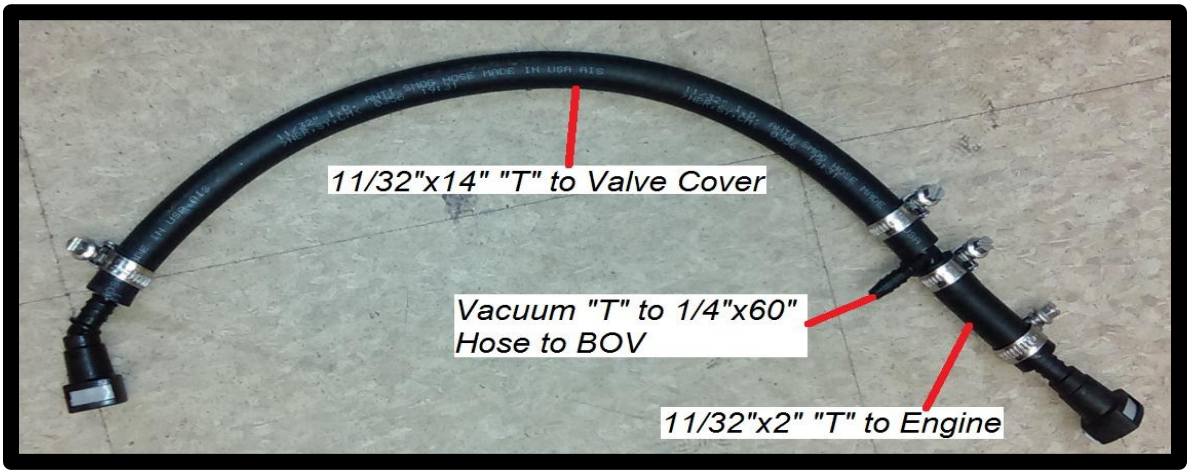

Figure 71: Before and After PCV Hose

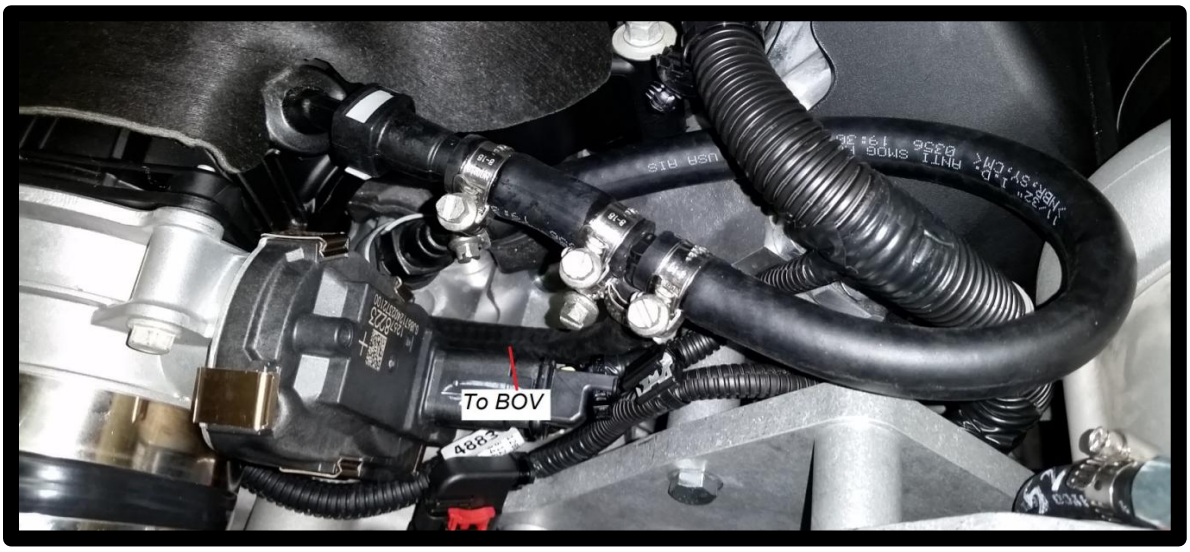

Figure 72: PCV Hose Installed on Engine

34. At this point the tuned ECU has to be reinstalled into the ECU bracket and the three ECU connectors have to be reconnected.
35. The two branches of wiring harness that were disconnected early will now be routed around the intercooler outlet tube. Make sure that all of the connections are reconnected and that no part of the harness will be chaffed or pinched anywhere. If necessary use some of the supplied cable ties to secure the harness.
36. Next reinstall the fuse box mount and reinstall the four fuse box connectors in the same location as before. Make sure that the connectors are all the way locked into their position in the fuse box.

37. Then reinstall the fuse box tray by sitting it on top of the fuse box mount and engaging the lever. Once the lever is engaged close the lever to tighten the fuse box tray to the mount.
38. Reconnect the main ground cable.
39. Reconnect the battery.
40. At this point the vehicle should run but the traction oil system needs to first be primed, to do this it is best to connect a vacuum pump to the hose that runs into the top of the reservoir. To do this you need to connect your vacuum pump to a catch can and connect the catch can to the return hose. Pull a vacuum on the system until you see a steady stream of blue fluid being sucked into the catch can. If you do not have a vacuum pump, follow the steps on the next page to bleed the system.
41. After bleeding the traction fluid system run the vehicle and check for any leaks, repair as needed before reinstalling the fascia.
42. Once the traction fluid system has been bled the rest of the car can be reinstalled in the following order:
    a. Reinstall Headlights
    b. Reinstall Radiator Support Cover
    c. Reinstall Front Fascia
    d. Reinstall Wheel Well Liners
    e. Reinstall Engine Splash Shield
    f. Reinstall Wheel Well Splash Shields
    g. Reinstall Front Wheels
    h. Reinstall Engine Covers
    i. Reinstall Strut Bar (Convertible Models)

Initial start up Oil Bleed Process

To ensure proper traction fluid circulation and adequate lubrication, it is important to prime the oil system before the engine is started for the first time and after the oil change/oil fill.

1. Carefully fill the oil canister with traction fluid without exceeding the maximum mark on the dip stick. The oil level is measured with the thread of the dip stick cap fully engaged
2. The banjo bolt at the oil line attached to the supercharger inlet marked “oil inlet” should be loosened a couple of turns allowing air to escape the system
3. **Carefully** apply pressurized air to the oil filler hole at the top of the canister. Do not pressurize the system to more than 10psi. Use a rag or a sponge as a seal between the air gun and the canister. It is also a good idea to use a rag to catch any oil escaping from the banjo bolt to avoid making a mess.
4. When oil appears at the “oil inlet” with no signs of air, tighten the banjo bolt and the system is primed
5. Carefully top up the oil canister to the maximum mark on the dip stick
6. Install the supercharger inlet tube and air filter
7. Turn on the engine and rev it to 2000-3000 rpm and make sure the oil starts flowing by visual inspection, looking into the oil canister. Do not rev the engine more than specified as this can cause damage to the supercharger. **MAKE SURE THE RESERVOIR DOES NOT EMPTY DURING THIS STEP OR AIR WILL BE INTRODUCED INTO THE SYSTEM AND DAMAGE WILL OCCUR. IF IT DOES START TO EMPTY POUR MORE FLUID IN. UTILIZE AT LEAST ¾ OF THE SUPPLIED BOTTLE OF FLUID TO PRIME AND FILL THE SYSTEM.**
8. Let the engine idle for 5 minutes while checking the oil system for leaks