



GEN 5 SUPERCHARGER INSTALLATION MANUAL

2015-2017 FORD MUSTANG S550 5.0L COYOTE



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PREMIUM FUEL ONLY (91 OCTANE OR BETTER ALWAYS) RON+MON/2

CALIFORNIA AIR RESOURCE BOARD EXECUTIVE ORDER# D-231-63

COMPETITION BASED PRODUCT MAY BE USED SOLELY ON VEHICLES USED IN SANCTIONED COMPETITION WHICH
MAY NEVER BE USED UPON A PUBLIC ROAD OR HIGHWAY

INTRODUCTION

Before beginning installation, please read this manual and important notes:

- Please read the installation manual and verify that all items are present. If you are missing hardware or have any questions, please contact your dealer or Whipple Superchargers before you start the installation.
- Modifications to your Fascia and Grill can greatly affect performance. Other aftermarket parts may also create issues. The SC system is designed for stock vehicles.
- Premium fuel (US 91 octane) is required to prevent spark-knock/detonation under certain operating conditions. Other countries must meet US 91 octane standards, RON+MON/2. **If fuel of less than 91-octane is present in the vehicle fuel tank, the tank must be completely drained and refilled with 91 or higher octane to 1/8th of a tank. The fuel system is returnless, therefore, initial fuel in the system will be low octane. Drain all fuel!**
- Operating your engine without the Whipple Calibration can result in engine damage or failure and will void your warranty.
- Supply your VIN number (along with gear ratio, transmission type, throttle body type and any changes to vehicle) to Whipple ahead of time so your unique PCM calibration can be built prior to the SC installation to minimize any down time. **NOTE:** Whipple does not support long tube headers or cat removal. While the vehicle may run correctly, it will no longer be emissions legal and therefore not supported.
- **NEVER MANUALLY MOVE THE BYPASS ACTUATOR, YOU CAN RUPTURE THE INTERNAL DIAPHRAM.**
- COMPETITION BASED PRODUCT MAY BE USED SOLELY ON VEHICLES USED IN SANCTIONED COMPETITION WHICH MAY NEVER BE USED UPON A PUBLIC ROAD OR HIGHWAY, UNLESS PERMITTED BY SPECIFIC REGULATORY EXEMPTION (VISIT THE "EMISSIONS" PAGE AT [HTTP://WWW.SEMASAN.COM/EMISSIONS](http://www.semasan.com/emissions) FOR STATE BY STATE DETAILS.
- COMPETITION BASED PRODUCT IS LEGAL IN CALIFORNIA ONLY FOR RACING VEHICLES WHICH MAY NEVER BE USED, OR REGISTERED OR LICENSED FOR USE, UPON A HIGHWAY.
- IT IS THE RESPONSIBILITY OF THE INSTALLER AND/OR USER OF THIS PRODUCT TO ENSURE THAT IT IS USED IN COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS.

RECOMMENDED TOOLS AND SUPPLIES

The following items are not included in this supercharger kit and it is strongly recommended that they're used for ease of installation or maximum performance:

Engine Oil

Whipple highly recommends running Ford Motorcraft 5W-50 full synthetic motor oil (PN #XL-5W50-QGT) vs the stock 5W-20. You will need 8 quarts for an oil change along with a Motorcraft oil filter #FL-500.

Tools

¼" and 3/8" torque wrenches. Safety glasses, metric wrench set, electric or air drill, 1 ½" hole-saw, hack saw, ¼", 3/8", ½" assorted metric socket set, 5mm ball head allen, 3/8" assorted metric allen socket set, 3/8" assorted torx socket set, 8mm hex allen wrench, ½" breaker bar, flat head and Phillips screw drivers and drain pan (for coolant). Heat gun or small torch for heat shrinking. Electric tape. Trim pad tool (for pushpin removal). Clean shop towels.

Tie Straps

These will be useful for securing the wiring harness away from the installation area as directed in the instruction manual. They are inexpensive and will be very handy during installation. You will need an assortment of 4", 8" and 12".

Sealants, Chemicals and Lubricants

Anti-seize for bolt and spark plug threads (use only when stated, otherwise the torque value must be reduced). Assembly lubricant (white lithium grease or petroleum jelly). Cleaner/degreaser such as carb cleaner. Blue Loctite #243 or equivalent.

You'll be required to fill your intercooler system with approx. 2.5 gallons of distilled water and Ford Factory specification engine coolant. This is not supplied in the system, you can find the coolant at any local auto parts store. NEVER USE TAP WATER, as it can corrode and create poor performance.

PRE-INSTALLATION CHECKLIST

Before installing your Whipple Supercharger Kit, complete the following checklist.

1. Verify Condition of Vehicle: Before the supercharger kit is installed, ensure the engine runs smoothly and that the factory malfunction indicator light (MIL) is off. Only install the supercharger kit if the engine runs smoothly *and* the MIL is off.
2. **!! CAUTION !!** This product is intended for use only on STOCK, UNMODIFIED, WELL-MAINTAINED engines. Installation on a worn-out or modified engine is not recommended without factory computer and fuel system modifications. Custom engine configurations could require custom tuning and other supporting modifications.
3. Verify Fuel System: Supercharger systems should only be installed on vehicles that have new or clean fuel filters.
4. Assess Cleanliness of Installation Area: Make sure your work area and the under-hood area are free from debris. This supercharger is a high-quality, close-tolerance compressor and must not be subjected to contamination by dirt or any type of foreign material. If necessary, vacuum around engine to remove any foreign material.
5. **!! CAUTION !!** DO NOT remove the protective seal on the supercharger prior to installation. Foreign material entering the supercharger will automatically void all warranties.
6. Identify Supercharger Kit Components: Before beginning installation, identify all the components of your Whipple Supercharger Kit and ensure all items are present and undamaged.
7. **!! CAUTION !!** Do not attempt to start the engine before adding the supplied Supercharger Oil to the supercharger!

SAFETY PRECAUTIONS



CAREFULLY READ THE IMPORTANT SAFETY PRECAUTIONS AND WARNINGS BEFORE PROCEEDING WITH THE INSTALLATION!

Appropriate disassembly, assembly methods and procedures are essential to ensure the personal safety of the individual performing the kit installation. Improper installation due to the failure to correctly follow these instructions could cause personally injury or death. Read each step of the installation manual carefully before starting the installation.

- Always wear safety glasses for eye protection.
- Place the ignition switch in the off position.
- Always apply the parking brake when working on vehicle.
- Block the front and rear tire surfaces to prevent unexpected vehicle movement.
- Operate the engine only in well-ventilated areas to avoid exposure to carbon monoxide.
- Do not smoke or use flammable items near or around fuel system.
- Use chemicals and cleaners only in well-ventilated areas.
- Batteries can produce explosive hydrogen gas which can cause personal injury. Do not allow flames, sparks or flammable sources to come near the battery.
- Keep hands and any other objects away from the radiator fan blades.
- Keep yourself and your clothing away from moving parts when the engine is running.
- Do not wear loose clothing or jewelry that can be caught in rotating or moving parts.

GLOSSARY OF TERMS

ABBREVIATION	DESCRIPTION
ACT	Air Charger Temperature
DTC	Diagnostic Trouble Code
ECT	Engine Coolant Temperature
EGR	Exhaust Gas Recirculation
ETC	Electronic Throttle Control
EVAP	Evaporative emissions system
FHSCS	Flat Head Socket Cap Screw
IAT	Inlet Air Temperature
IC	Intercooler
ID	Internal Diameter
LB-IN	Pound-force inch
LB-FT	Pound-force foot
LTR	Low temp radiator
MAF	Mass Air Flow
MAP	Manifold Absolute Pressure
MY	Model Year
OBD	On Board Diagnostics
OD	Outside Diameter
PCV	Positive Crankcase Ventilation
PSI	Pound per Square Inch
SC	Supercharger
SHCS	Socket Head Cap Screw
TPS	Throttle Pressure Sensor
TRQ	Torque



****NOTICE:** Installation of Whipple Supercharger products signifies that you have read this document and have agreed to the terms stated within.

It's the purchaser's responsibility to follow all installation instruction guidelines and safety procedures supplied with the product as it's received by the purchaser to determine the compatibility of the product with the vehicle or the device the purchaser intends to install the product on.

Whipple Superchargers assumes no responsibility for damages occurring from accident, misuse, abuse, improper installation, improper operation, lack of reasonable care or all previously stated reasons resulting from incompatibility with other manufacturer's products.

There are no warranties expressed or implied for engine failure or damage to the vehicle in any way, loss of use or inconvenience or labor reimbursement. This includes merchantability and fitness.

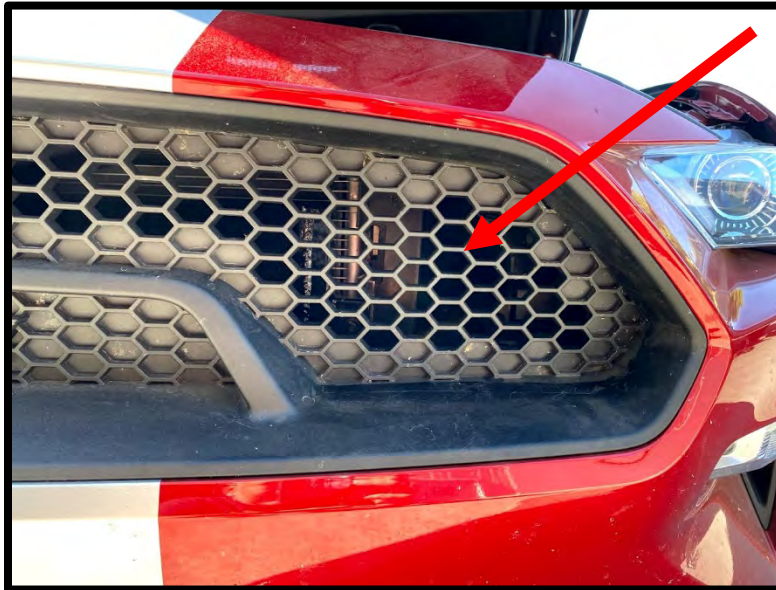
The information contained in this publication was accurate and in effect at the time the publication was approved for printing and is subject to change without notice or liability. Whipple Superchargers reserves the right to revise the information presented herein or to discontinue the production of parts described at any time.

WARNING!

VEHICLE MODS CAN CREATE RUNNING ISSUES

The 2015+ Mustang is Mass Air Flow (MAF) based. The MAF sensor is located after the air filter. Changes to the flow of the airbox can greatly affect the airflow path, which creates potential fueling related issues, especially at low airflow areas. Changes to the front grill/fascia and the factory airflow path can create issues. Whipple does not offer custom calibrations based on aftermarket changes.

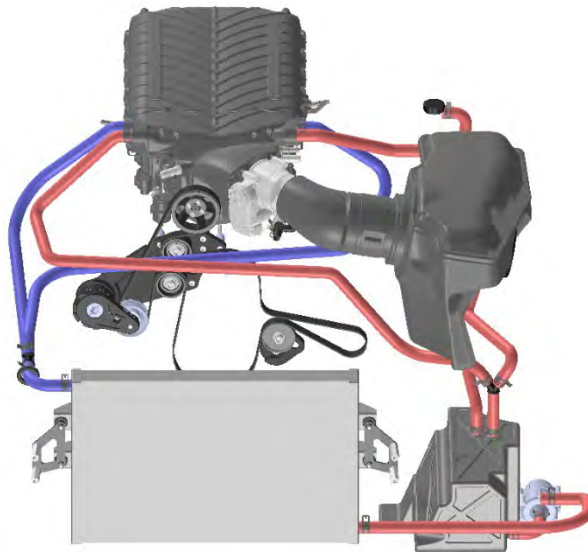
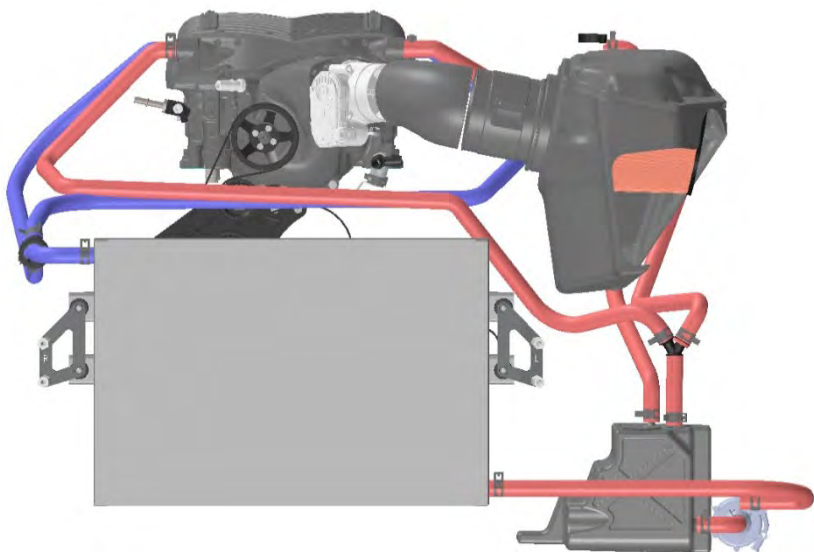
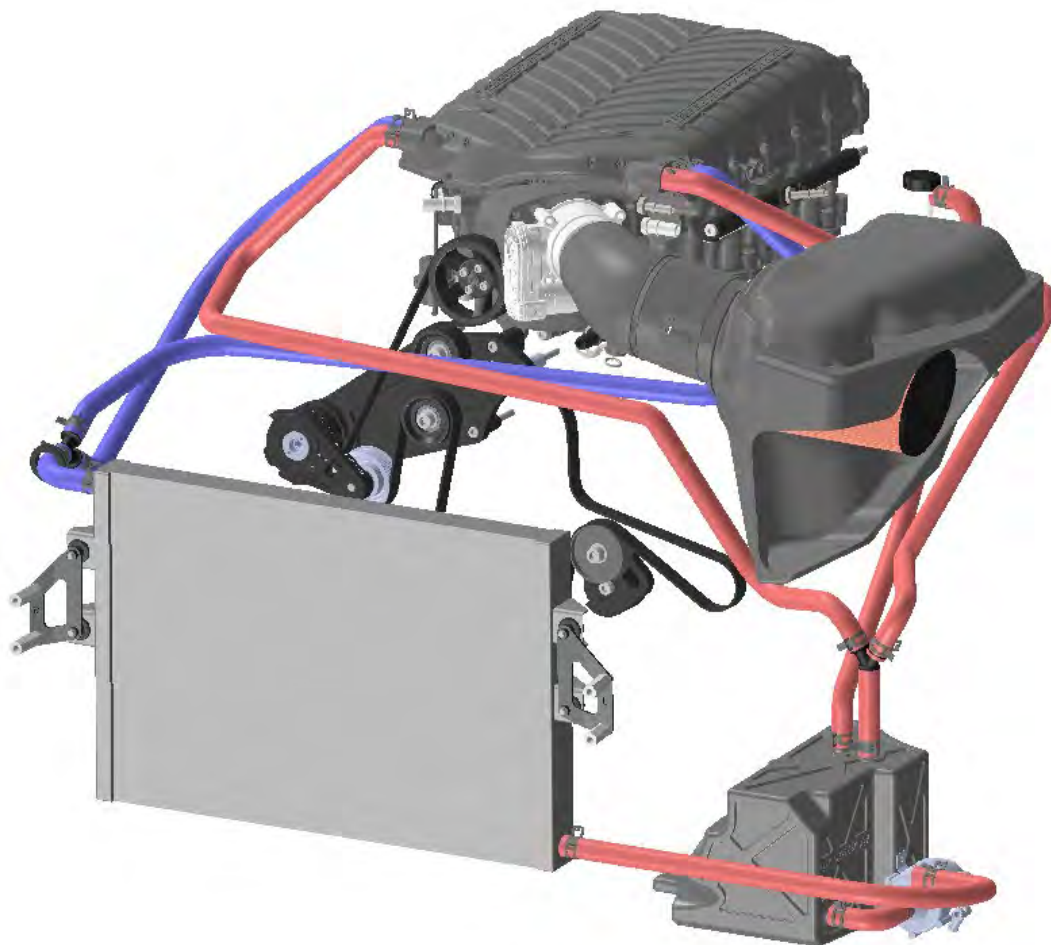
Example of a fascia mod that will greatly affect performance.



Stock fascia and grill has the main air feed through the center radiator area, the air makes a 90deg turn to factory snorkel.




INTERCOOLER SYSTEM




SUPERCHARGER INSTALLATION INSTRUCTIONS

It is strongly recommended that you read through this guide **before** you begin installing the Whipple Supercharger.

1. Using an air hose, blow off any loose dirt or debris from engine compartment. If really dirty, then steam clean the engine compartment before proceeding to the next step.
2. Release the fuel system pressure (NOTE: The following procedure is taken directly from the Ford Service Manual).

WARNING : Fuel in the system remains under high pressure even when the engine is not running. Before working on or disconnecting any of the fuel lines or fuel system components, the fuel system pressure must be relieved. Failure to do so can result in personal injury.

WARNING : Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and can be ignited, resulting in personal injury.

A: Open the vehicle doors and lift the bottom cushion of the back seat. It is held in place by a push tab in the center of each cushion.

B: Disconnect the Fuel Pump Control Module electrical connector. NOTE: The fuel pump control module is located under the driver side back seat.



C: Start the engine and allow it to idle until it stalls.

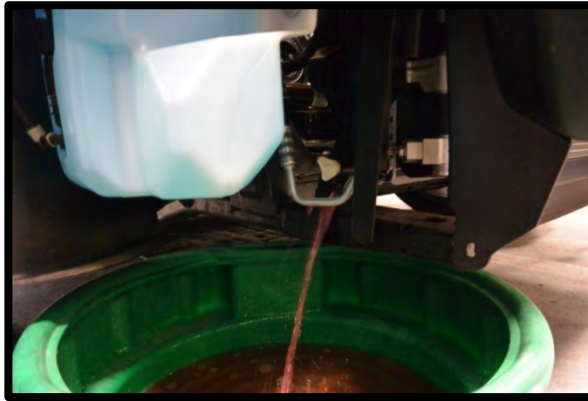
D: After the engine stalls, crank the engine for approximately 10 seconds to make sure the fuel injector supply manifold pressure had been released.

E: Turn the ignition switch to the OFF position.

F. Reconnect the fuel pump driver module and reinstall rear seat.

3. Locate the battery on the passenger side of vehicle. Remove the plastic cover and (3) retaining nuts for battery access. With an 8mm wrench disconnect the (-) negative battery cable. Make sure the cable is far enough away from the battery that it does not accidentally touch the battery and make connection during the installation.

4. With a cool engine drain the coolant into a clean drain pan for reuse later. Remove the radiator cap to vent the system. (Be careful not to remove the radiator cap if the engine is still hot). The drain petcock is located on the passenger, bottom side of radiator. Loosen spigot and let it drain into pan. Add a 3/8" ID hose to the end of the petcock for cleaner procedure.

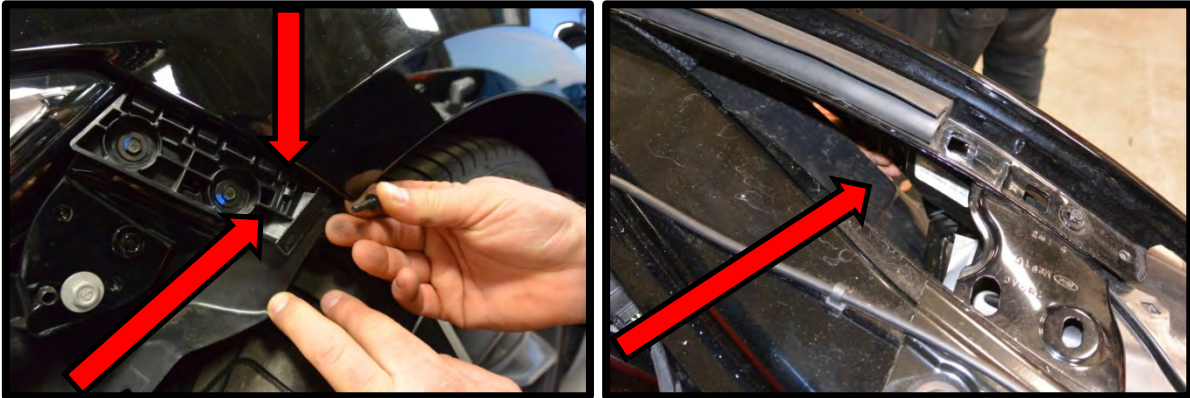


5. Lift the fuse box so it's slightly up by squeezing the (2) pins on the fuse box lid for better PCM access.

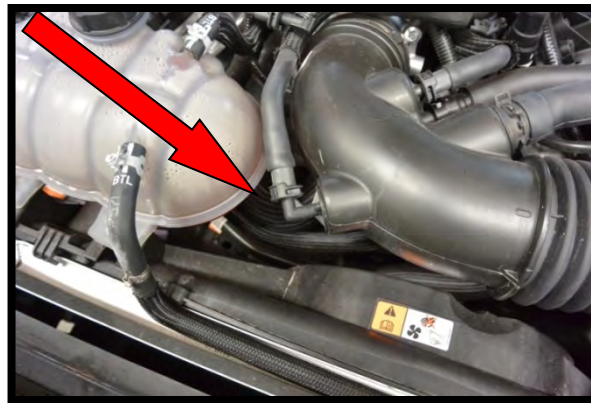


6. (**Complete kits/Tomahawk tool**). Follow the supplied Tomahawk flash tool instructions. Request your calibration a minimum of 48 hours before installation so your installation is not delayed.
7. Lift the front of the vehicle using the Ford recommended lifting points and place on to safety stands.
8. Remove the factory plastic radiator shroud by pulling the center of the (8) push pins and then out. Use a flat head screw driver to pry the center head up. This will all be reused.
9. Remove the driver and passenger side inner wheel well push pins (14) securing the inner wheel well to fascia.
10. Remove the (19) lower close-out panel bolts and the (2) push pins. Remove the lower close-out panel from vehicle. Use a 7mm socket.

11. To remove the front fascia, just behind and below the headlights, there is (1) bolt (per side) that secures the fascia to the body. Using a 7mm wobble socket on a ¼" ratchet and an 8" extension. You will have to loosen from the gap between the body and fender.



12. Carefully pull the fascia forward, disconnect the fog lamps before pulling away.
13. If equipped, remove the strut tower brace by removing the (4) factory bolts. This will not fit over the supercharger. Reinstall factory nuts (4) and torque to 25 lbs-ft.
14. Remove the factory plastic engine cover from the engine by pulling up.
15. Remove the quick connect fitting from the factory inlet tube by squeezing the connector and pulling away.



16. Remove the pinch clamp securing the sound resonator tube to the inlet tubing. Remove rubber line from inlet tube.



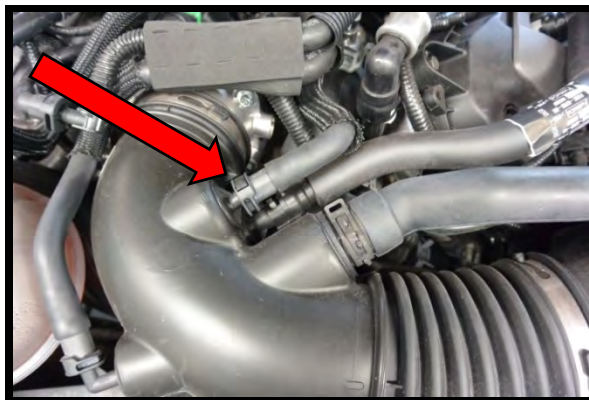
17. Remove the driver side valve cover vent line quick connect fitting from the inlet tube by squeezing the connector and pulling away. Remove from valve cover by squeezing the connector and pulling away.
18. Remove the passenger side valve cover vent line from valve cover and intake manifold. One of these 90deg connectors will be reused.



19. Remove the passenger side IMRC vacuum line coming from the intake manifold by squeezing the connector and pulling away from brake booster hose.



20. Remove the vent line coming from the driver side IMRC vacuum line by squeezing the connector and pulling away from hose.

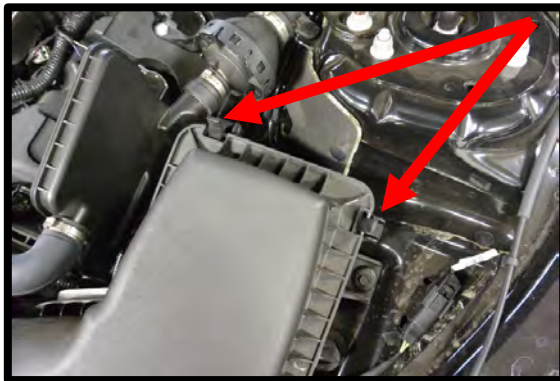


21. Disconnect the factory MAF connector by pulling back on the safety lock, then squeezing the unlocking tab and pulling back.



22. Loosen both hose clamps on the inlet tube (throttle body and air box lid) (7mm nut driver). Remove tube from engine.

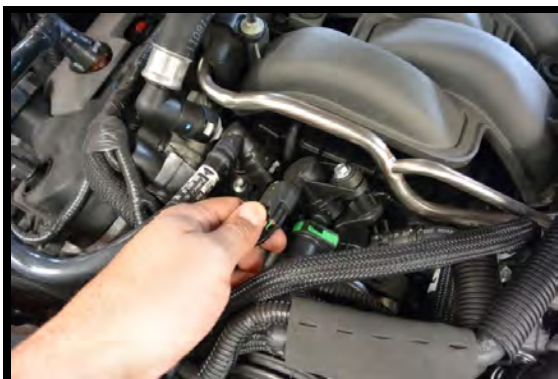
23. Loosen the factory air box lid by pushing the (2) locking tabs back. Remove push pin holding the MAF harness to airbox. Lift air box lid from air box, this will not be reused.



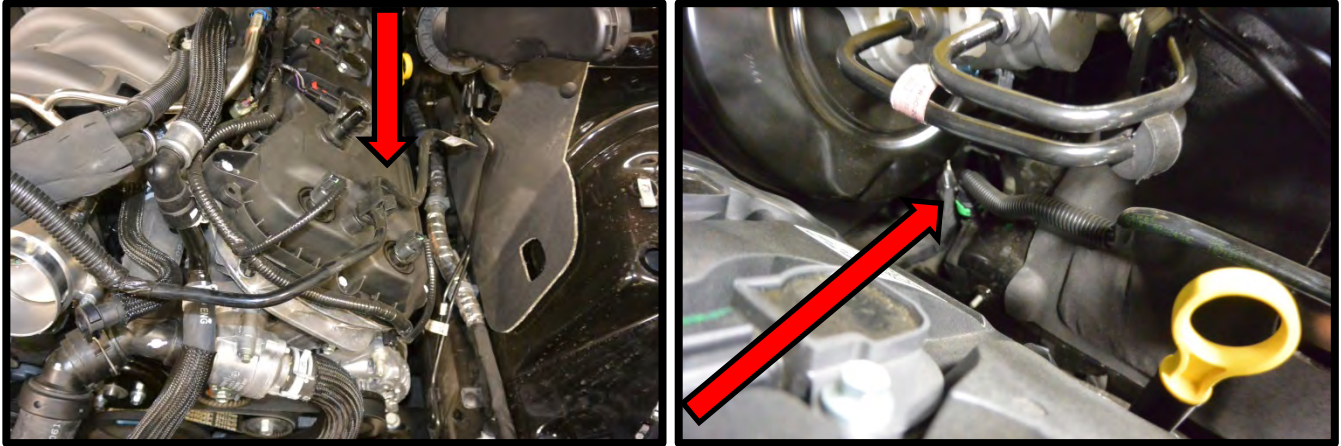
24. Remove the air filter element from airbox. Remove the airbox bottom by removing the (1) bolt on the driver side inner fender (10mm socket).

25. Pull the (2) push pins securing the engine harness to the frame on the driver side, this will be reused later to secure the airbox.

26. Disconnect the EVAP solenoid connector by squeezing locking tab and pulling away. Remove the EVAP vent line quick connector from the EVAP solenoid by pushing the (2) locking tabs away and squeezing the tab, then pull away. Pull this line away from engine (goes down to driver side lower firewall area).



27. Remove the EVAP tubing from driver side valve cover (remove support from valve cover) and down below brake booster.



28. Remove the manifold vent hose next to the EVAP, use a pinch clamp tool to remove pinch clamp and hose.



29. Remove the vent hose coming from the thermostat housing fitting by removing pinch clamp. Remove vent line from overflow tank by removing pinch clamp using a pinch clamp tool.

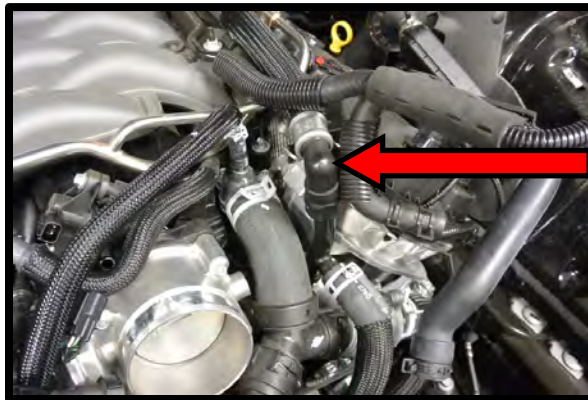


30. Carefully cut the electric tape securing the ETC wires to the throttle body. Disconnect the electronic throttle electrical connector by pushing up on the safety lock and then squeezing the connector and pulling away.

31. Remove the heater hose from passenger side of block by pulling locking tab back and pulling away. Push to the back of the engine for later use.

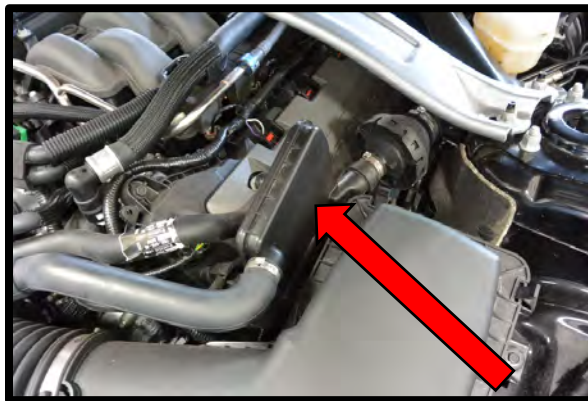


32. Remove the quick connect fitting on the heater tube, drivers side. Push hose to the back of the engine for later use.



33. Remove the brake booster vacuum line from check valve by removing the pinch clamp.

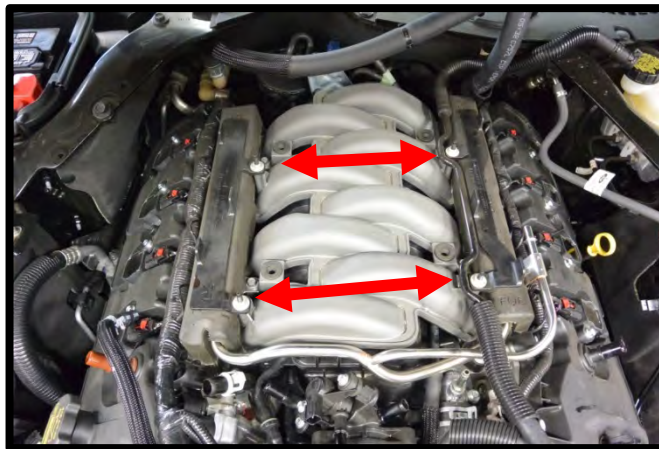
34. Remove the sound tube from the firewall by removing the (1) nut using a 10mm ratchet wrench and the push pin on the driver side shock tower area. Pull away from vehicle. This passage will be plugged at a later step.



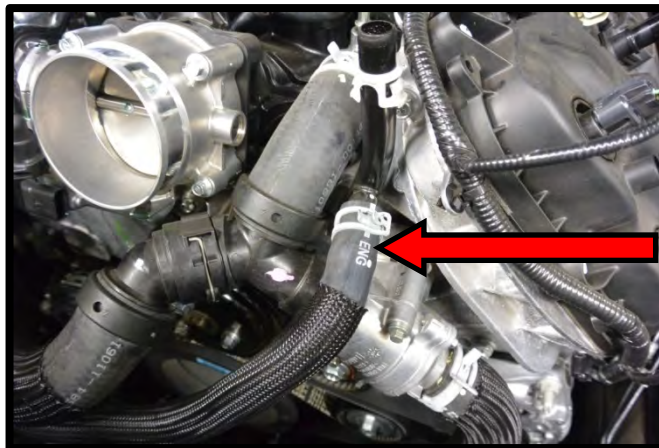
35. Carefully disconnect the factory fuel feed hose from the fuel rail. The fuel system may still have pressure, use protective eyewear and multiple rags to catch any possible fuel leak. To release, press the blue safety latch and pull the fuel fitting away from fuel rail.



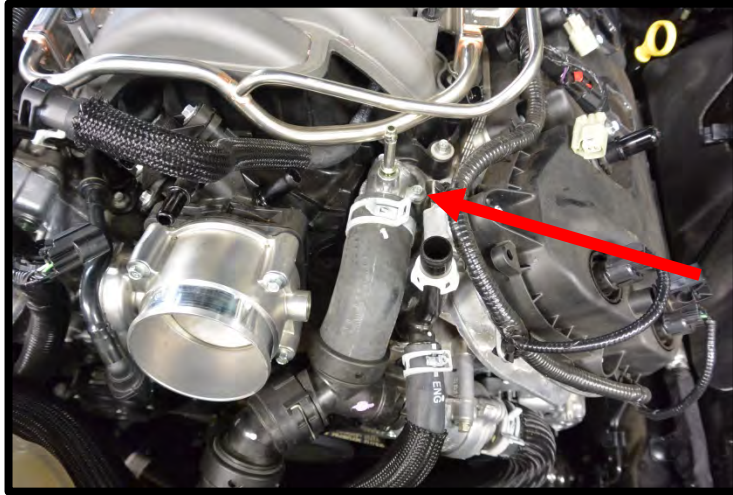
36. Remove the (4) bolts from the top of the intake manifold that secures the (2) heater hose trays. Use a 10mm deep well socket. Once bolts are removed, remove tray and foam material.



37. Remove the coolant to heater tube overflow hose using a pinch clamp tool. Pull away from heater tube.



38. Remove the water neck hose using a pinch clamp tool. Pull away from water neck.



39. Remove the quick connect water fitting from the water neck to thermostat housing tee. Pull the locking metal wire, then pull connector back away from tee.



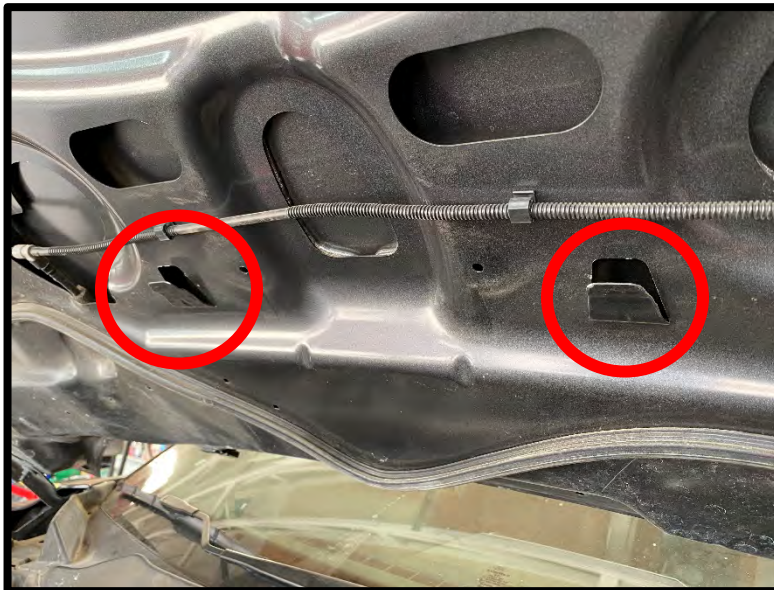
40. Remove the thermostat housing hose using a pinch clamp tool. Pull away from thermostat housing.



46. Clean the intake manifold to cylinder head surface using carb cleaner or acetone. Install tape over the exposed ports until manifold installation.



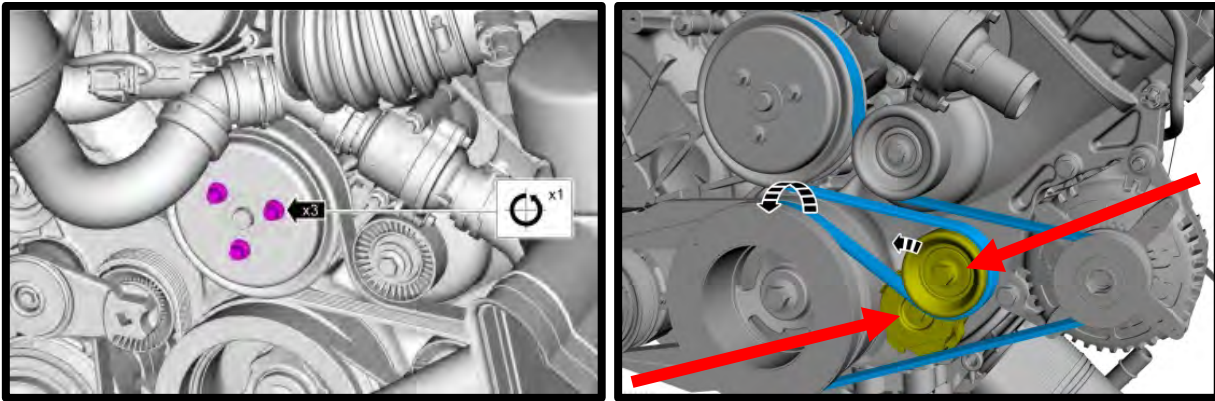
47. Remove the hood inner liner, this will rub the top of the supercharger. Measure the marked hood cut outs (for inner liner) using tape measure. By hand, bend the inner liner hood cut outs towards the hood. Push the cut outs back into hood and this will bend them back. These need to bend 1/4" away from engine to clear the supercharger lid.



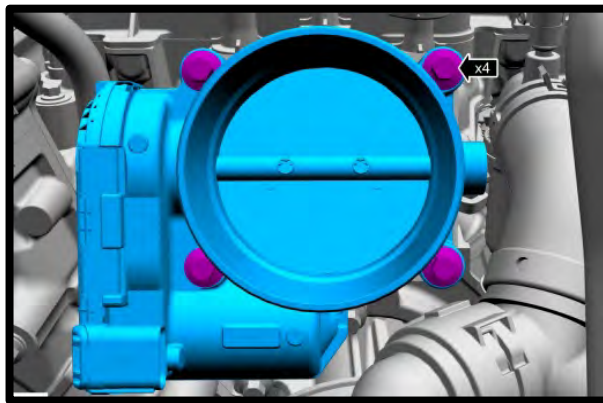
48. Remove the driver side heater tube from engine by removing the (1) bolt using an 8mm socket.



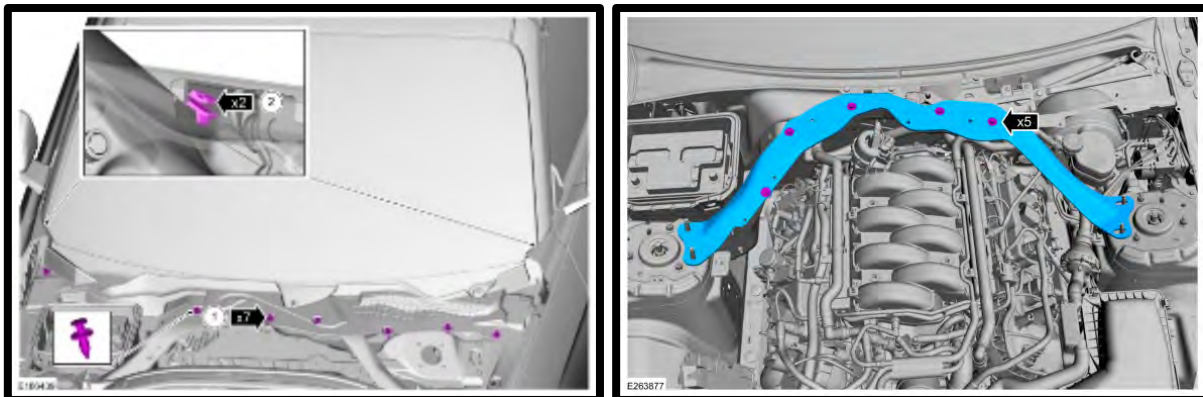
49. Loosen the (3) bolts securing the water pump pulley (while belt is on) using a 10mm socket. Remove the belt from the engine by using a 15mm socket on a 1/2" breaker bar and rotating the spring-loaded tensioner in a clockwise direction. Remove the spring-loaded tensioner from the engine using a 13mm socket. Using 10mm socket, remove water pump pulley from engine (will be reused later).



50. **(Stock throttle installations)** Remove the throttle body from the manifold by removing the (4) bolts using a 10mm socket. 132mm and 150mm TB's will not use this TB.



51. Remove the upper cowl for K-brace access. Remove the (7) push pin retainers and (2) tabs on the cowl. Lift up the cowl trim panel and remove the (4) nuts and (5) bolts from the K-Brace using a 13mm socket, remove from vehicle for later installation.



52. Using shears or saw, cut the stock stud from firewall .50" (to clear SC lid). Leave the clip as is to retain the firewall shrouding.

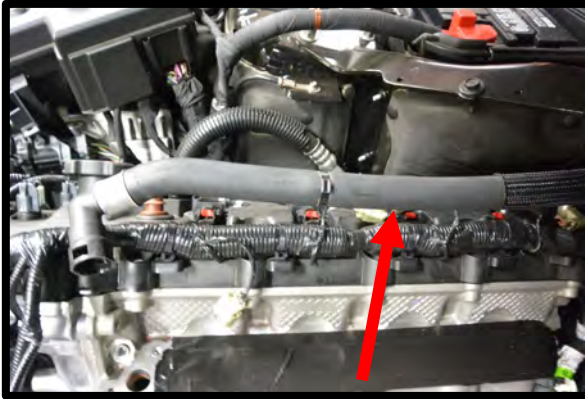


53. **(Complete kits) Gap the supplied spark plugs to .028" (NGK out of box is .050")**. Only use a .28" feeler gauge, any other method will lead to inconsistent results. Install the gapped NGK LTR7IX OR Denso ITV22 spark plugs. Apply light amount of anti-seize to threads. Torque spark plugs to 128 lbs-in. Reinstall the coils on plugs and torque bolts to 53 lbs-in. **NOTE:** Competition systems require you to source your own spark plugs, consult your tuner for information.
54. Install the induction resonance tube delete grommet in the hole that was exposed when the tube was removed.

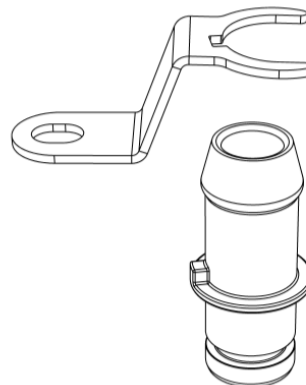


55. Secure thermostat housing with the factory (2) fasteners. Using an 8mm socket, torque to 89 lbs-in.
56. Reinstall the thermostat housing hose using the factory clamp.

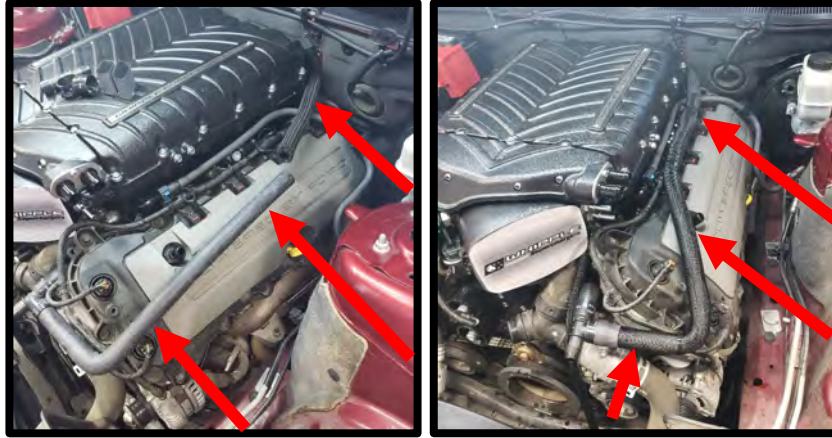
57. Remove the factory sheaving off the passenger side heater hose. Measure 2" after the internal water restrictor (towards firewall). Using the supplied barb fitting, cut factory hose. Once cut, slide the supplied sheaving on the stock and (2) pieces of rubber heat shrink (for later install). Install the supplied shrink clamp over factory heater hose. Install the factory heater hose to the coupler. Use a heat gun to secure the shrink clamp and sheaving.



58. Install the supplied driver side plastic heater tube to driver side of block. Install the supplied oring to the tube and apply light amount of grease to oring surface. Install tube into block, then secure locking bracket with the factory bolt using an 8mm socket. NOTE: The bracket and heater tube has one locking tang, ensure they are lined up during installation. Torque to 89 lbs-in.



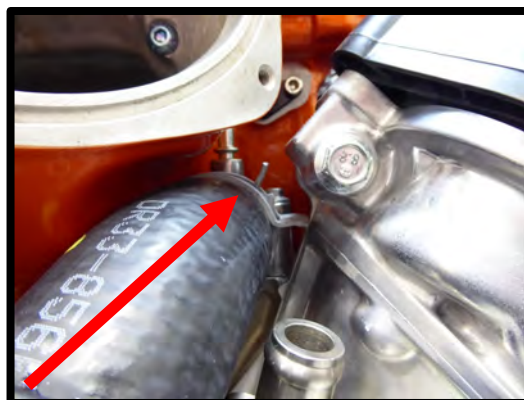
59. Using the supplied 3/4" ID x 24.5" hose (18MST-1010 bag) coming from the supplied tee fitting, route between cylinder head and water neck. Cut factory hose length so the hose will go straight back towards firewall. **TIP:** Best place to cut is between cylinder 5 and 6 coils. Once cut to proper length, slide the supplied sheaving on the supplied hose and (2) pieces of rubber heat shrink (for later install). Install the supplied shrink clamp over factory heater hose. Install the factory driver side heater hose to the coupler. Use a heat gun to secure the shrink clamp and lightly shrink sheaving to hose. **TIP:** Use zip-ties to secure hose to LH cam cover.



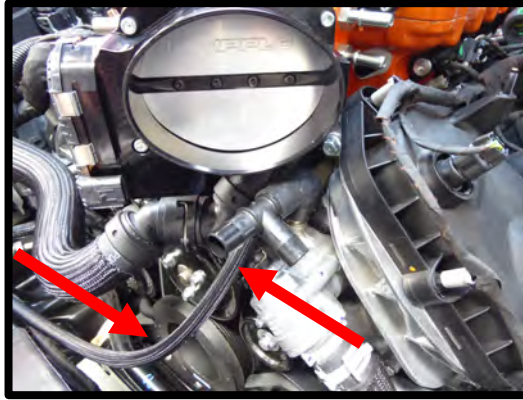
60. Reinstall the factory coolant overflow hose to the new supplied tee fitting on the driver side. Secure using factory pinch clamp.



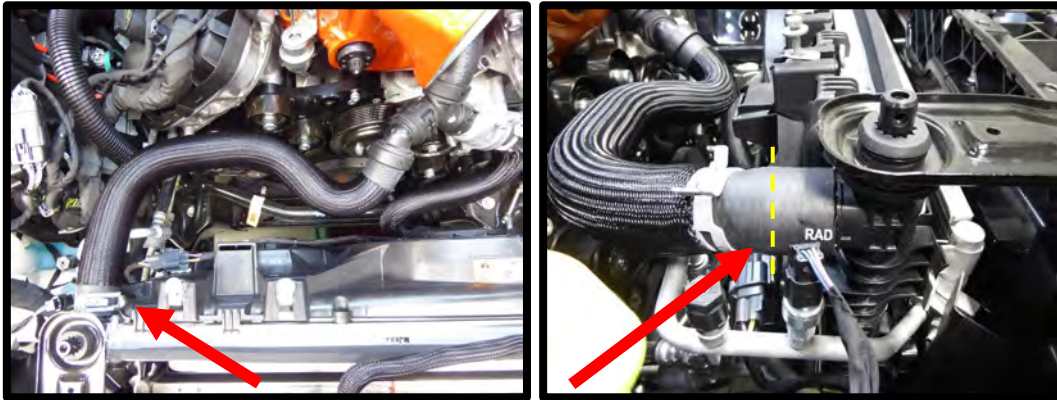
61. Using needle nose pliers, rotate the factory pinch clamp at the water neck towards the driver side for future clearance of the SC. **NOTE:** Image shows clamp with SC installed to illustrate max clearance.



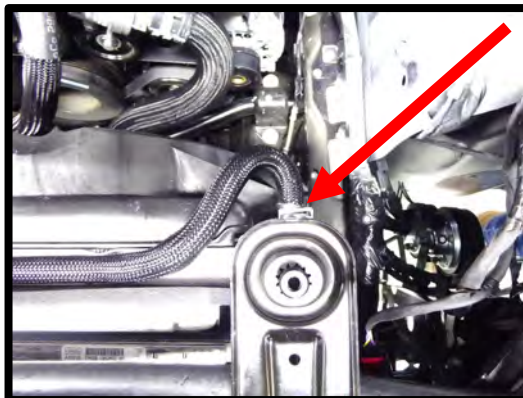
62. Install the supplied ¼" to 3/8" (COYO-2700-R1) formed hose from the water neck vent line, route towards the overflow tank for later installation. Secure with stock clamp. **NOTE:** Shown with SC on for routing direction.



63. Remove the upper radiator hose from radiator. Use a hose cutter, remove 1" from the radiator hose end. Reinstall hose once completed and secure with factory hose clamp. **TIP:** This is for added clearance for the new belt system.



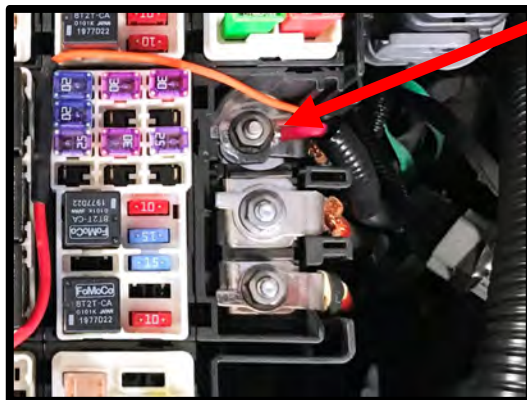
64. Remove the coolant vent hose from the radiator and pull back the plastic sheaving. Shorten this hose end by 1" for additional clearance. Reinstall hose using factory clamp.



65. Locate the stock ground wire bolt, located on RH side of vehicle, next to strut tower brace using an 8mm socket. Install the intercooler relay harness ground eyelet (black wire) along with factory ground wire. Reinstall bolt using an 8mm socket.
1. **Dual fan installations:** Add the secondary relay harness ground to same location.



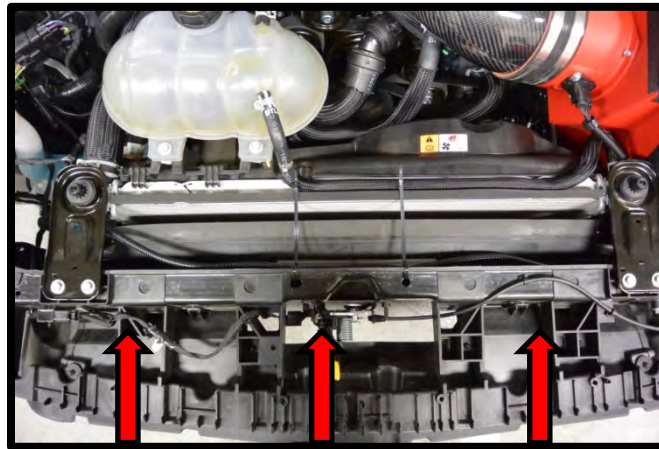
66. Open the fuse box lid. Using a 10mm socket, remove the 12V (+) power stud nut from the far post. Install the IC pump relay power eyelet (red wire) to the 12V stud. Use a 10mm socket to secure stock and IC power wire.
1. **Dual fan installations:** Add the secondary relay harness power eyelet to same 12v stud.



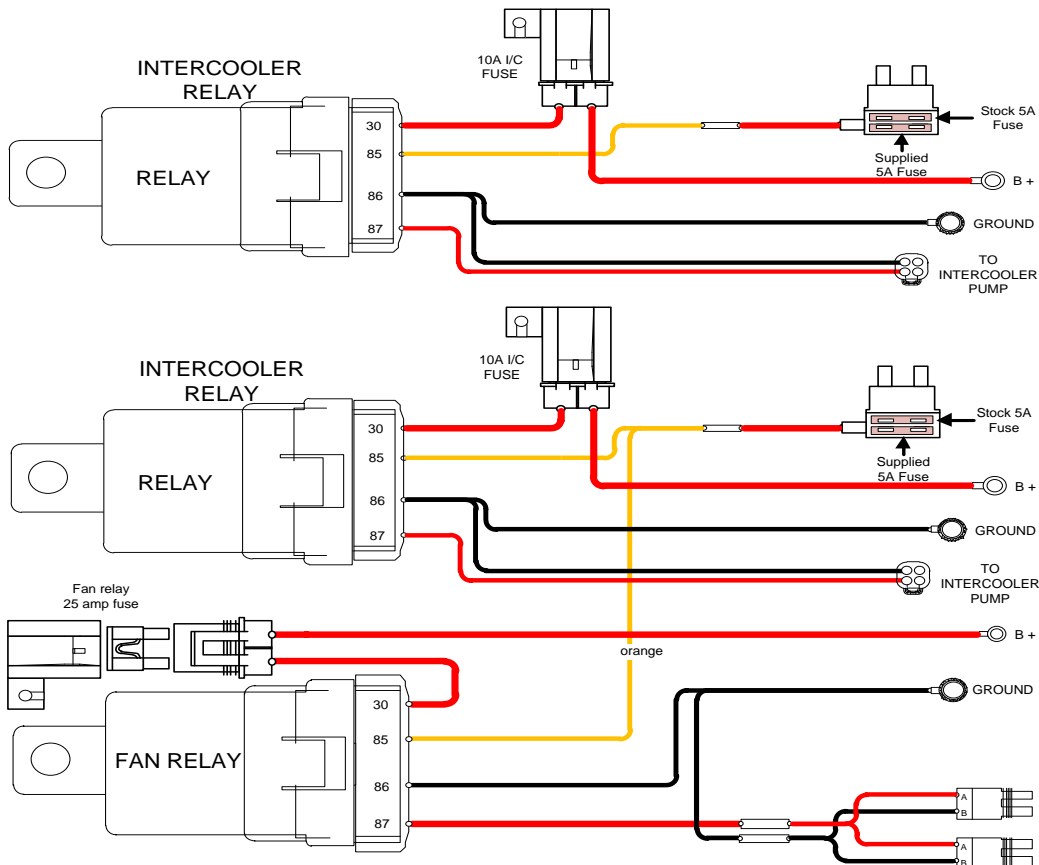
67. Pull the pink 5amp fuse from position #62. Install the 5amp pink fuse in the unused fuse slot on the fuse tap. Install the supplied fuse tap into position #62. Note: 5amp brown fuse should be in bottom slot, 5amp should be in top slot. Route wire above power stud and between center fuses. **NOTE:** Make sure wire has enough room when fuse cover closes. **NOTE:** Failure to install stock fuse back will result in ABS faults.



68. Route the IC pump 2-way connector under the upper radiator support, across the vehicle (secure with 2 zip-ties) and back down to the IC pump on the driver side inner fender.

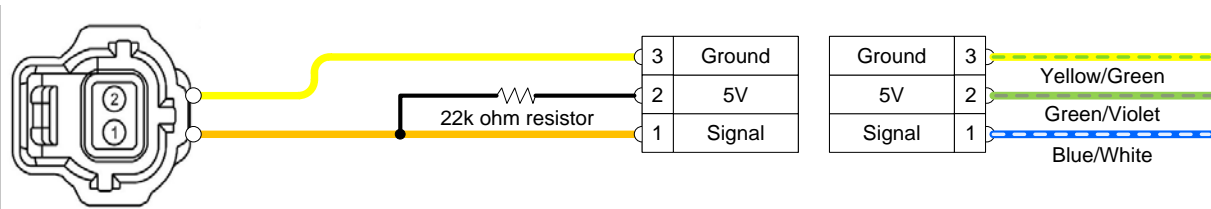


69. Mount the relay and fuse holder to the factory wire harness, secure with zip-tie. Route the 2-wire connector along the top of the condenser, to the LH side of the vehicle (near headlight). Secure harness using zip-ties.
1. **Dual fan installation:** Connect the turn on, one-way connector from the IC pump relay to the dual fan relay.
 2. Mount the relay and fuse to factory harness to the factory wire harness using a zip-tie.

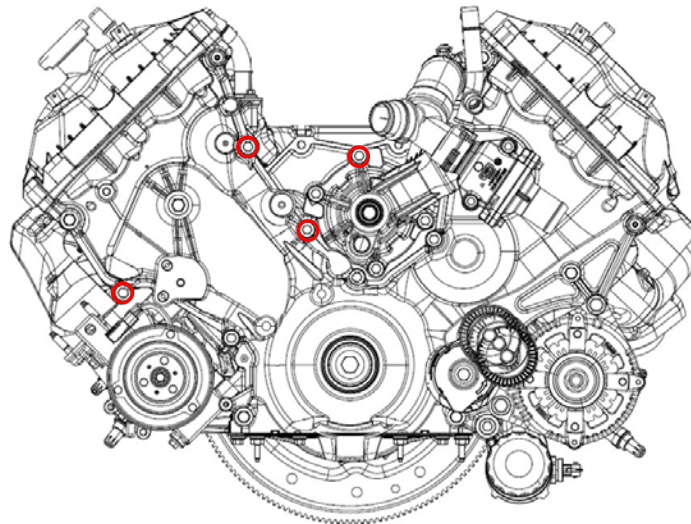


70. Install the supplied electronic throttle pigtail to the factory electrical connector. Push until it locks in place, then lock the safety lock. **TIP:** When pressing together, hold the wires vs connector to ensure the wires do not come loose during connection.

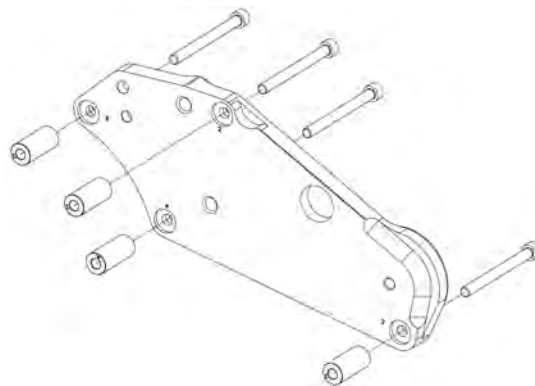
71. **(Complete kits)** Connect the supplied 3-way to 2-way air charge temperature pigtail at the rear of the passenger side cylinder head to the 3-way IMRC connector (**Light blue/white, violet/green, yellow/green wires**). Route to the driver side back of engine for later installation into the ACT sensor (IAT2 manifold air temperature). **NOTE:** Only works with Whipple calibration. Aftermarket calibrations require different sensor and pigtail.



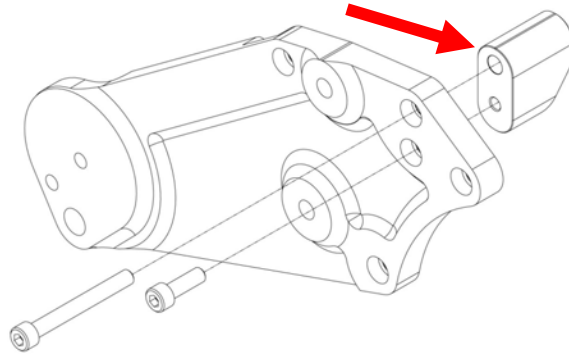
72. Using a 10mm socket, remove the (3) factory fasteners from the timing chain to head cover and (1) from water pump (for new idler plate).



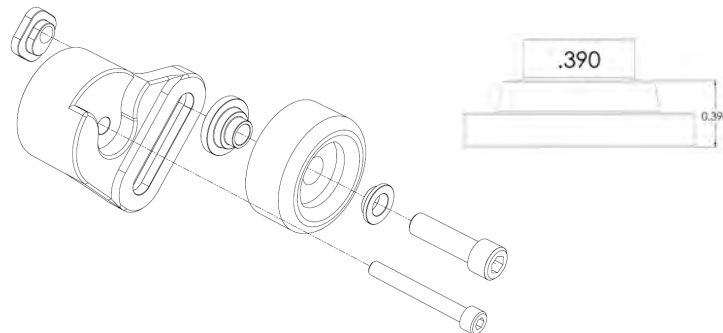
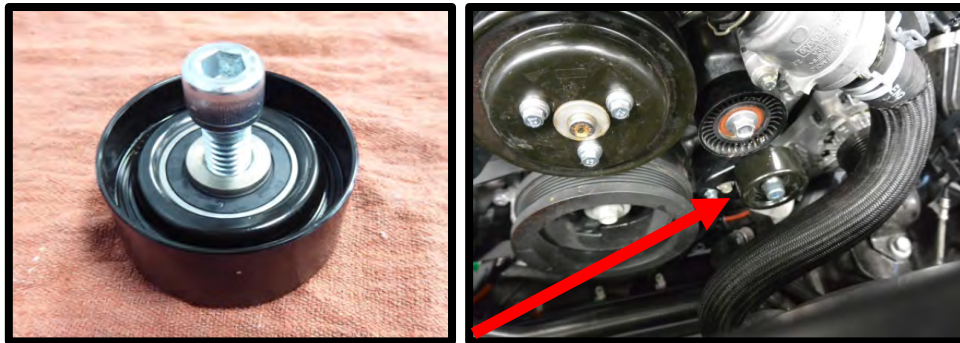
73. Use the supplied (4) 8mm x 90mm SHCS to secure the idler plate to the front of the passenger side of engine, install hand tight. Using a 6mm allen, torque to 22 lbs-ft.



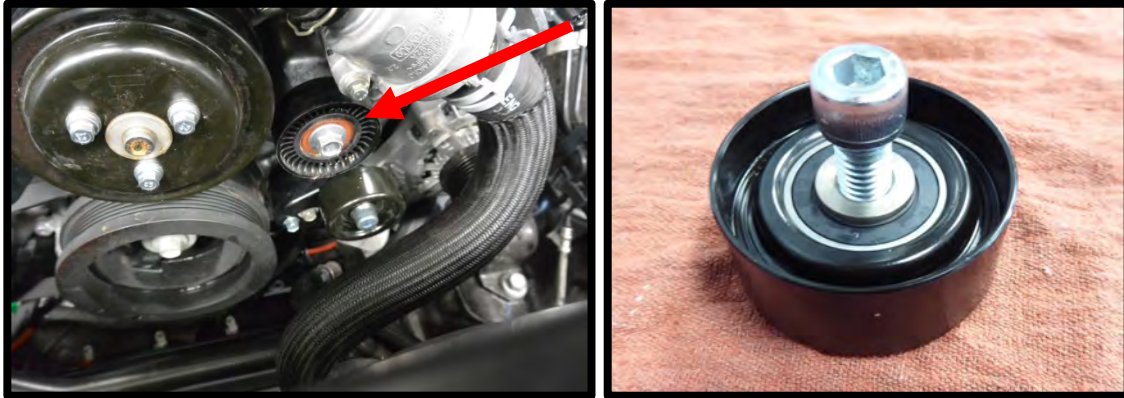
74. Preinstall the supercharger support bracket by installing on the back of the idler plate. Secure with the (1) 8mm x 70mm SHCS and (1) 8mm x 25mm SHCS, leave **loose** until supercharger assembly.



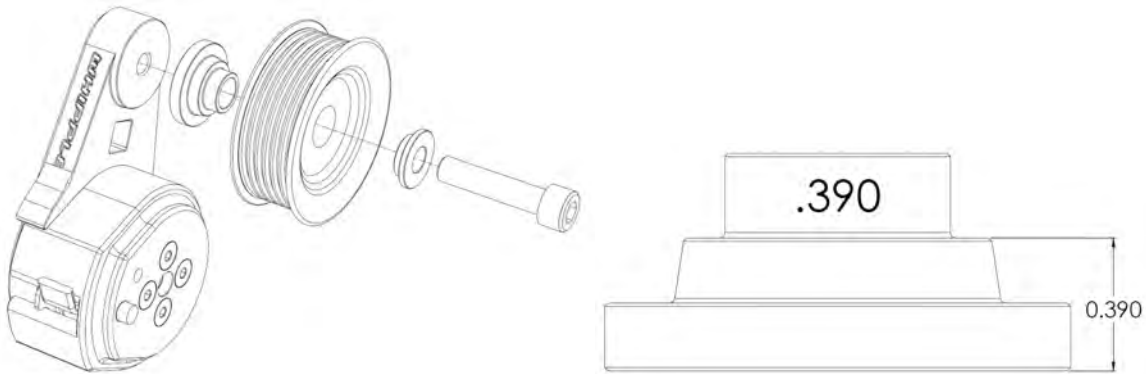
75. Install the supplied adjustable idler assembly to the factory spring loaded tensioner position. Locate the dowel pin to factory pin hole. Secure to engine using the stock bolt, torque the factory bolt to 35 ft-lb. Install the supplied idler pulley to the adjustable idler, use the supplied (.390") step spacer against the adjustable idler arm. Sandwich the smooth idler pulley (#36101) to step spacer and the supplied step washer to front side of idler. Install the supplied "tee" nut to the back side with the offset hole facing the driver side. Secure with the supplied $\frac{1}{2}$ "-13 x 1 $\frac{3}{4}$ " SHCS. **TIP:** Use light amount of anti-seize on threads.



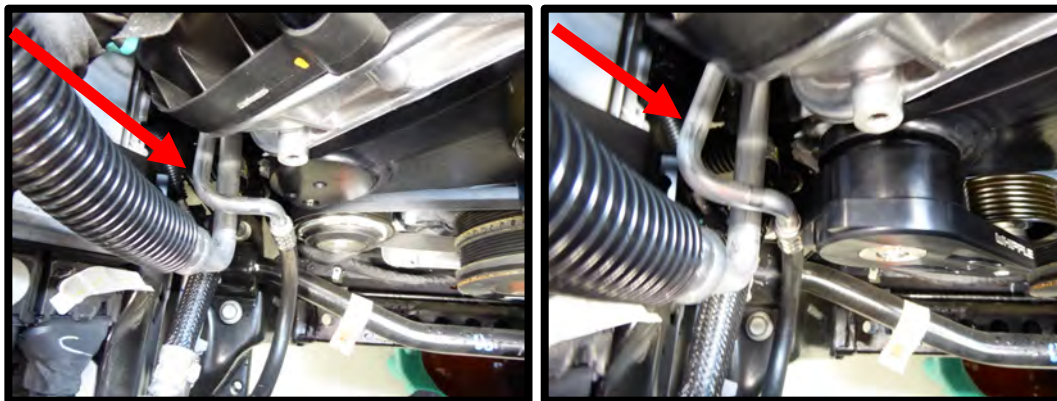
76. Remove the factory plastic smooth idler pulley from the engine. Replace with the supplied steel idler pulley. Use the factory fastener to secure. Torque to 18 lbs-ft with a 13mm socket. **NOTE:** Image shows proper direction of idler assembly.



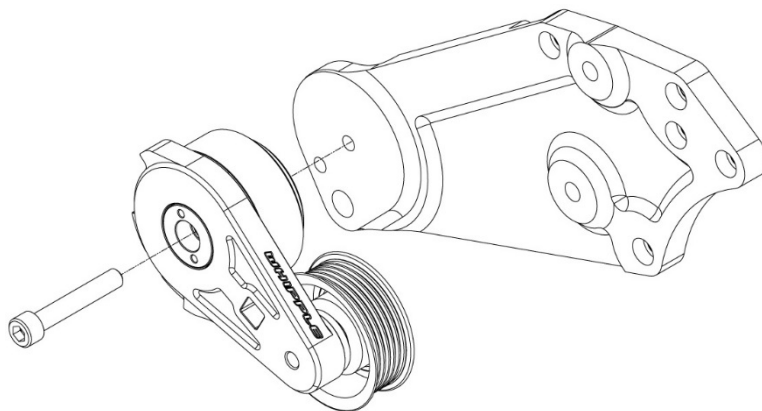
77. Assemble the spring-loaded tensioner by mounting the supplied spacer with the female register to the tensioner. Install the grooved idler pulley (#36326) to the tensioner and (.390") step spacer. Use the supplied step washer to center the bearing and the 10mm x 40mm SHCS (10-Rib uses 10mm x 60mm SHCS) bolt to secure idler to tensioner. Use light amount of anti-seize on threads. Torque to 18 lbs-ft.



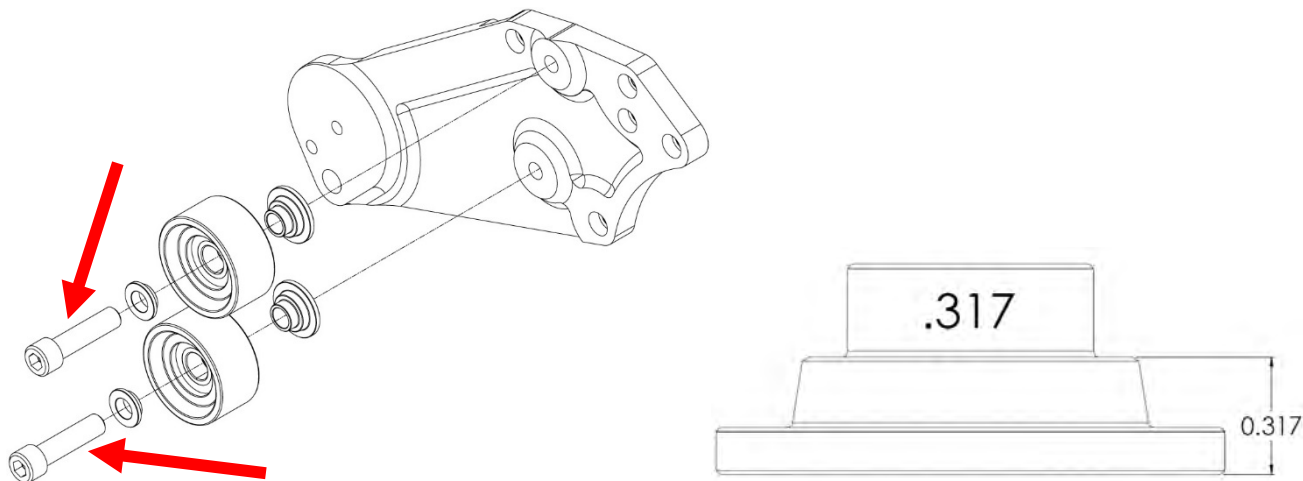
78. Carefully bend the factory AC line down and towards passenger side. Install spring loaded tensioner to plate to check clearance. You should have a minimum of 3/8" of clearance from the tensioner to the AC line.



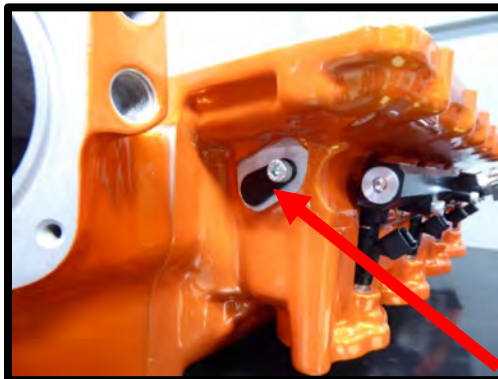
79. Install the spring-loaded tensioner to idler plate, locating the tang into position. Secure with the supplied (1) 10mm x 60mm SHCS. Use light amount of anti-seize on threads. Torque to 25 lbs-ft.



80. Install the supplied (2) smooth aluminum idler pulleys to the idler plate using the (2) (.317") step spacers. Sandwich the idler pulley to the (2) (.317") step spacer using the supplied (2) step washer, (2) 1/2"-13 x 2" SHCS. Torque to 30 lbs-ft. using a 3/8" allen socket. Use light amount of anti-seize on threads.



81. Install the (1) #2-109V75 oring to the MAP sensor block off and apply light amount of grease to oring. Install the MAP sensor block off with the supplied block off plate, secure using the supplied (1) 6mm x 16mm SHCS. Torque to 70 lbs-in.



82. Using a 10mm socket, remove the (20) 6mm flanged hex bolts securing the supercharger lid to housing. Remove the lid from the housing. Set the lid and intercooler assembly on a padded surface so no damage can occur to intercooler cores.

83. Install the supplied (4) #2-015 viton oring to the (2) fuel rail adapters. Apply light amount of grease to the orings. Install the fuel rail adapters to the fuel rails using the supplied (6) 5mm x 18mm SHCS, apply light amount of Blue Loctite #243 to the bolt threads. Torque to 75 in-lbs using a 4mm allen socket. **TIP:** Many orings are provided and some look similar, ensure that you are using the correct size in each step.



84. Install the supplied (1) #2-906 Viton oring to the (1 of 2) 45mm long 9.49mm inlet fitting. Apply light amount of grease to oring for ease of installation. Install fitting to the fuel inlet block.



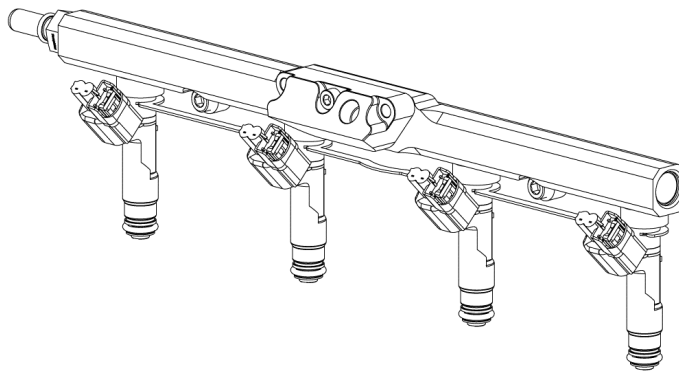
85. Install the supplied 1/8" NPT plug to RH fuel rail. This is for aftermarket fuel PSI sensors only.



86. Install the supplied (2) #2-906 orings to the (2) inlet/outlet fittings. Install these (2) fittings into rear side of fuel rails. Apply light amount of grease to oring for ease of installation. Using a $\frac{3}{4}$ " wrench (or $\frac{3}{4}$ " deep socket) on both the front and rear fittings, tighten both. Install the (2) supplied 6AN 180deg swivel fittings to front port on each rail. Using a $\frac{3}{4}$ " wrench, secure fittings to fuel rails.



87. Install the fuel injectors to the fuel rail, apply generous amount of grease to oring for easy installation. **Stage 1 55lb/hr only**, install the supplied fuel injector position lock bracket to clock the supplied fuel injectors into proper position (**Stage 2** and competition kits with other injectors do not apply). While installing the lock bracket, secure the fuel injector so it does not add pressure to the injector body. **Note:** This is for dual spray pattern injectors only that must be at the correct angle. **Competition** kits should consult their tuner to verify whether the injector has to be clocked at a certain position (single spray pattern injectors do not). **TIP: Failure to clock the injector correctly can cause severe running issues.**



88. Install the supplied (1 per injector port) .515" injector shims to be installed to the injector port of the SC housing, to hold the injector up to its proper position. Install the fuel injectors to the fuel rail, apply generous amount of grease to oring for easy installation.



89. Apply generous amount of grease to the injector orings for ease of installation. Install the fuel injectors, rails and lock bracket to the intake manifold, secure with the (4) 6mm x 16mm SHCS using a 5mm allen socket. Torque to 90 lbs-in.



90. Install the supplied 3/8" fuel cross over line around the back of the supercharger by pressing until they click and lock in place. ***Note:** The 90deg end goes to bank 2 side.



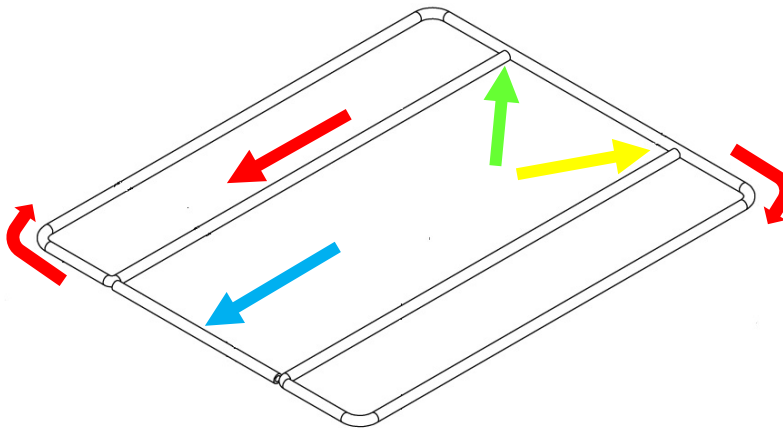
91. Route the supplied 3/8" x 50" cross over fuel hose around the back of the supercharger. (2) Adel clamps are supplied to secure to 2 SC Lid bolts across the back when installing lid later.



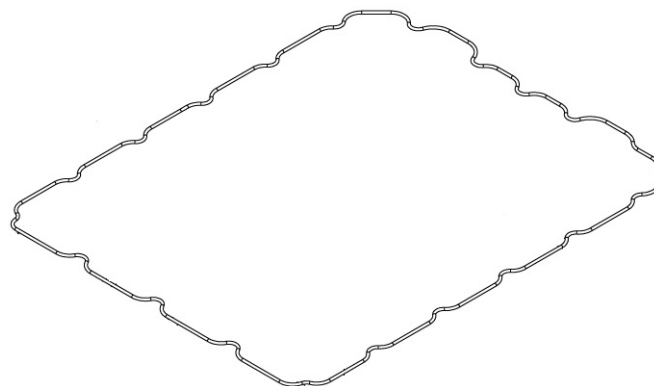
92. Install the supplied 1/4" ID bypass actuator to the bypass nipple and 1/4" nipple on SC housing. **CAUTION:** Do not open/close bypass actuator by hand. This may damage actuator internally. It only moves properly with equal vacuum/boost at the actuator reference port. **NOTE: Install zip tie to 90deg rubber fitting on bypass actuator nipple to secure, failing to do so may end with the hose coming off during WOT operation.**



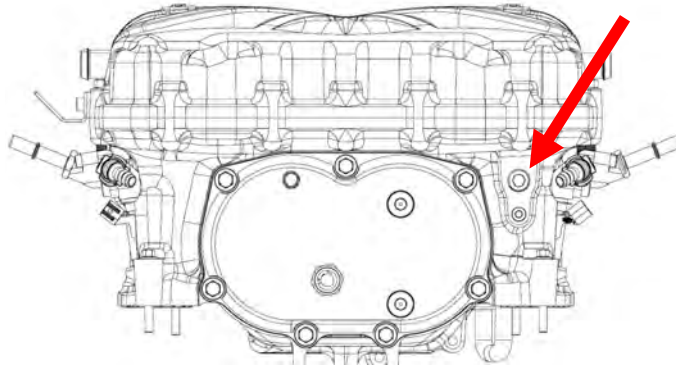
93. Using the supplied 5/16" OD silicone tube, install the (1) 80 1/2" cord. Start as shown with green arrow, go in a clockwise motion, to the front, then around the perimeter. End at yellow arrow position. Bunch it up so it has no gap at the end as any gap will be an air leak of un-intercooled air. Install the (1) 6.5" cord in the front section shown with the blue arrow.



94. Install the supplied pre-formed 65.3" x .103" oring to the top sealing surface of the SC housing. Apply generous amount of grease to help ease the oring into place. **TIP:** To install oring into dove-tail groove, press vertically, vs sliding finger along.



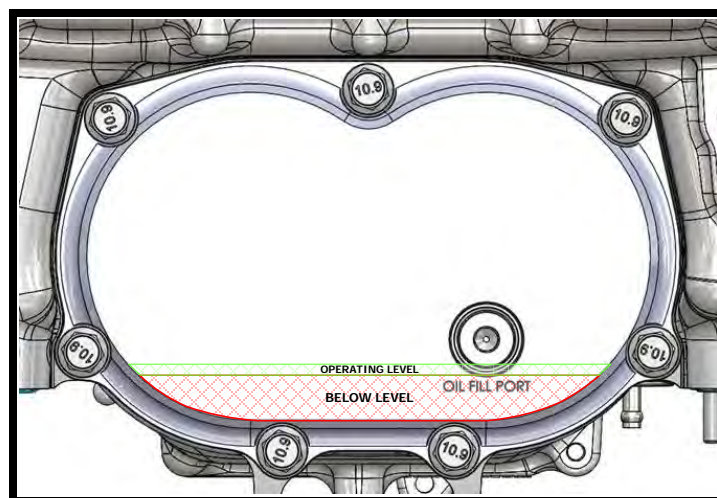
95. **(Complete Kits)** Install the supplied air temp sensor to the 3/8" NPT port on the back of the intake manifold. Be careful, as the plastic sensor can break if over torqued. Use light amount of oil on threads. **(Competition Kits)** Per your tuner, if adding an air temp sensor for post intercooler, install in 3/8" NPT port on back of SC housing, if not, plug the hole using the 3/8" plug.



96. Install the supplied (8) manifold orings to the Whipple intake manifold to cylinder head surface, apply light amount of grease to ease installation.



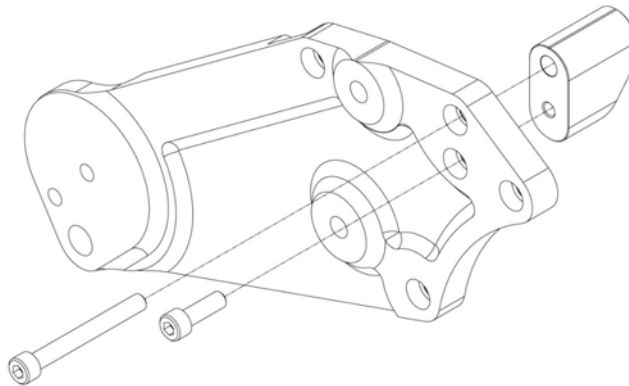
97. Make sure the supercharger is on a flat surface. Remove the oil fill plug using an 8mm allen socket.
- Fill the compressor to the **BOTTOM** of the fill plug (**4.0 FL/OZ**). Rock compressor back and forth. Then spin the compressor/rotors by the pulley so the oil fills the bearings. **NEVER OVER FILL THE SUPERCHARGER!**
 - Apply light amount of grease to oil fill plug oring, reinstall. Torque to 140 lbs-in.



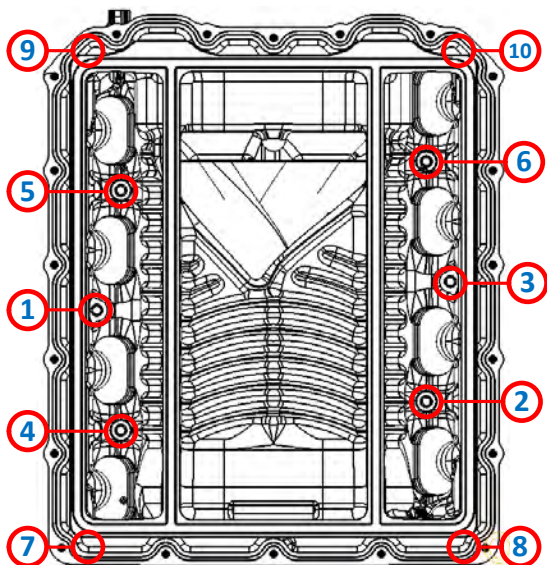
98. Install the supercharger housing (without lid) to the engine. Use the supplied (4) 6mm x 55mm HHFCS on the outer bolt holes and the (6) 6mm x 80mm HHFCS bolts with the supplied (6) #2-009 orings on the bolt, under the head. Use **Blue Loctite #243** on the threads of each bolt. Leave hand tight for now.



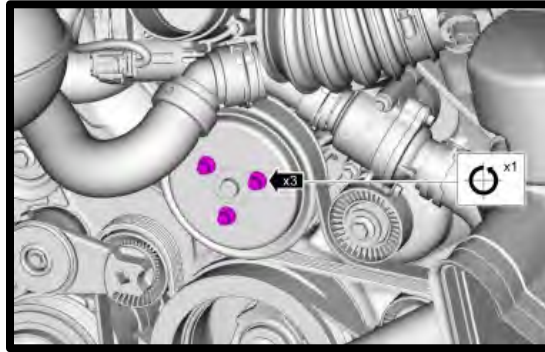
99. Using a 6mm allen socket, secure the (1) 8mm x 70mm SHCS and (1) 8mm x 25mm HSCS to the front support bracket. Torque to 22 lbs-ft.



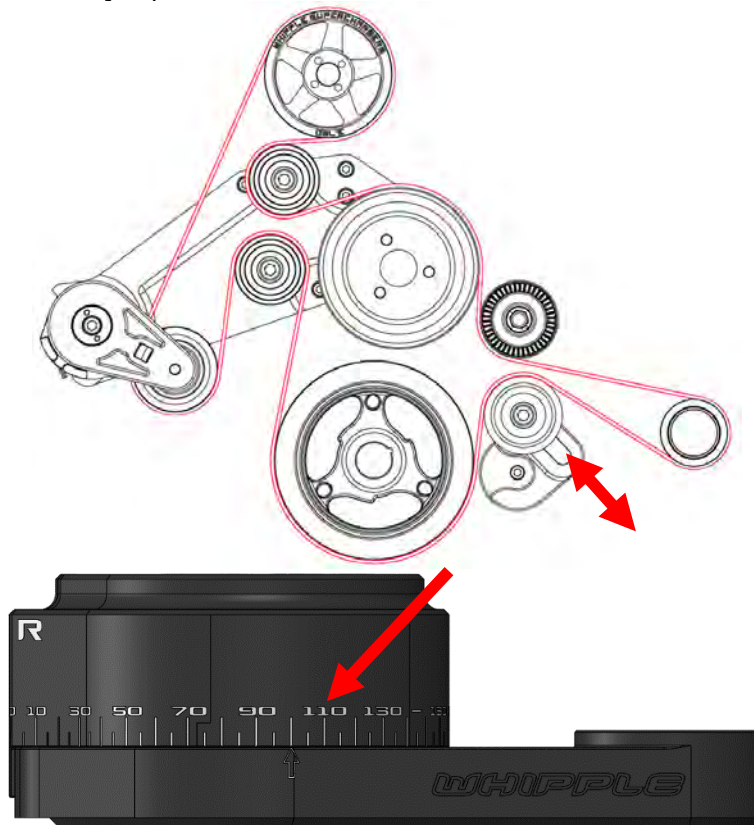
100. Torque the (10) 6mm bolts in the following pattern using a 10mm socket. First pass: 88 lbs-in. Second pass: 106 lb-in. **NOTE:** For bolt #10, a 1/4" socket with 4"-6" extension, 10mm wobble is the best possible tool to get into this tight area.



101. Reinstall the water pump pulley using a 10mm socket, torque to 14 lbs-ft.



102. Install the supercharger pulley using the supplied (4) 6mm x 14mm SHCS using a 5mm allen socket. Leave hand tight until after belt installation.
103. Install the supplied supercharger belt by following the routing diagram. Once in position, lock the adjustable idler pulley by torqueing the SHCS to 30 lbs-ft. **NOTE:** Set the tensioner position so the arrow points to **100** (80%-85% travel) by removing slack via the adjustable idler pulley. If setup at max open position, the tensioner will consistently hit its stop. If setup near its full close position, then the tensioner will not continue to apply torque to the belt during belt stretch and will allow it to jump or walk.

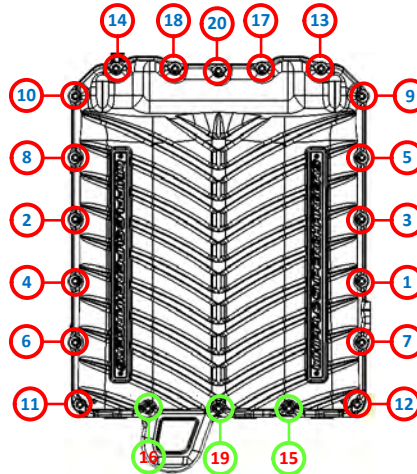


104. With the belt holding the SC pulley in position, torque the (4) 6mm x 14mm SHCS SC pulley bolts to 130 lbs-in using a 5mm allen socket. Do not use Loctite on threads, it's not required.

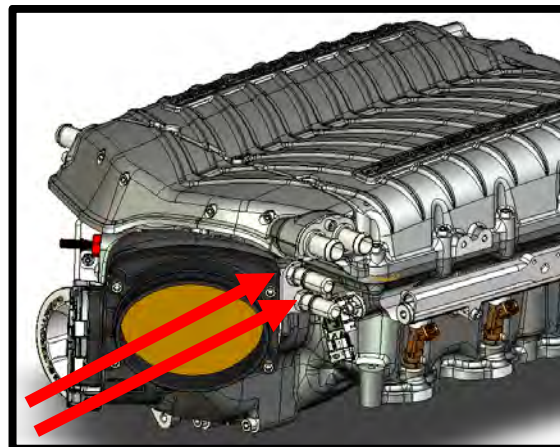
105. Install the (1) #2-230 internal bypass oring to the lid bypass passage. Use generous amount of grease to secure oring in place.



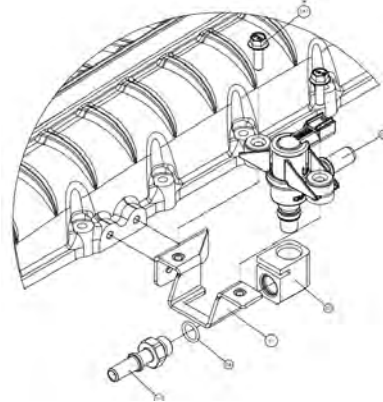
106. Apply generous amount of grease to the (1) #2-230 Viton bypass oring. Install the supercharger lid to the supercharger housing by carefully placing the bypass passage down first. Secure the SC lid using the (17) 6mm x 30mm HHFCS and (3) 6mm x 70mm HHFCS (*marked green*) using the following pattern. Torque to 90 lbs-in using an 10mm socket.



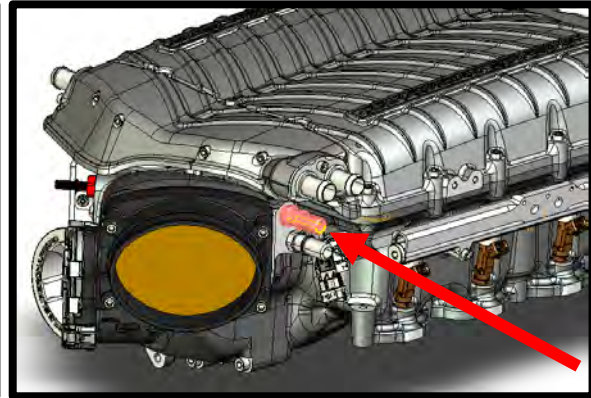
107. Connect the supplied 3/8" x 11" fuel line to the factory fuel connection at firewall and then the fuel rail inlet fitting.
108. Install the (2) supplied 6AN viton oring (#906) to the (2) 6AN to 3/8" quick connect fittings. Install these fittings to the passenger side lower 6AN fittings on the inlet using an 11/16" socket.



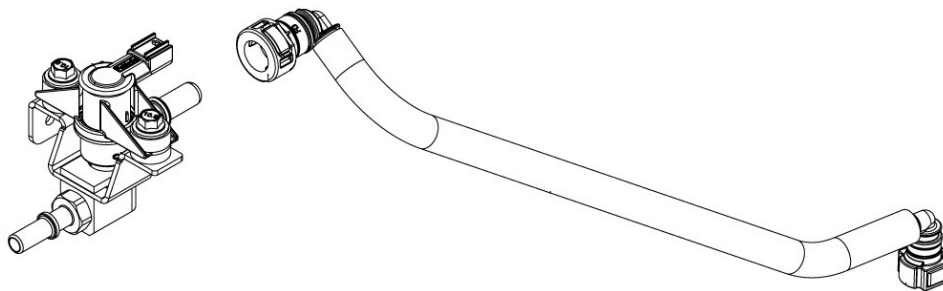
109. Install the EVAP to the supplied billet adapter with the electrical connector facing the back of engine. Install the supplied 9.89mm quick connect fitting and 6AN oring to billet adapter. Secure supplied EVAP bracket to the supercharger lid using the supplied (2) 6mm x 10mm HHFCS bolts. Secure EVAP assembly to bracket using the supplied (2) 6mm x 20mm HHFCS bolts.



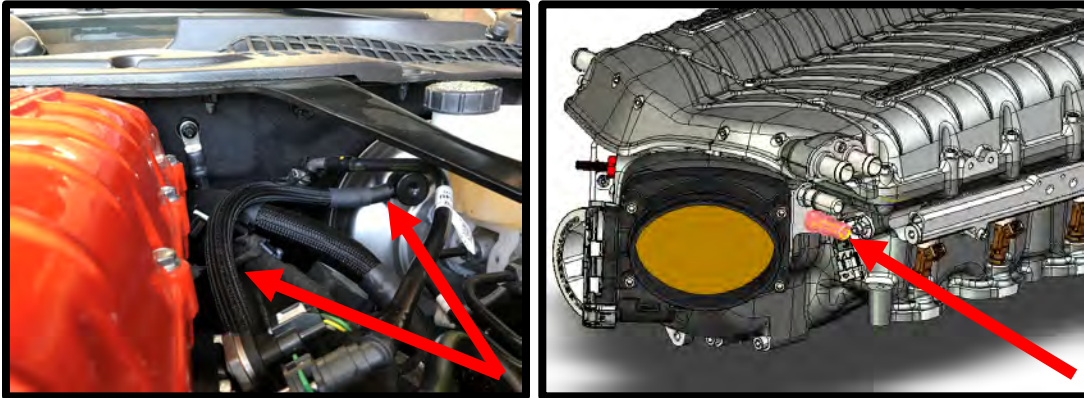
110. Install the supplied 3/8" ID x 4 1/2" hose to the EECPV barb fitting and **upper** quick connect fitting (55 Deg) on SC inlet. Push until it clicks and locks into place.



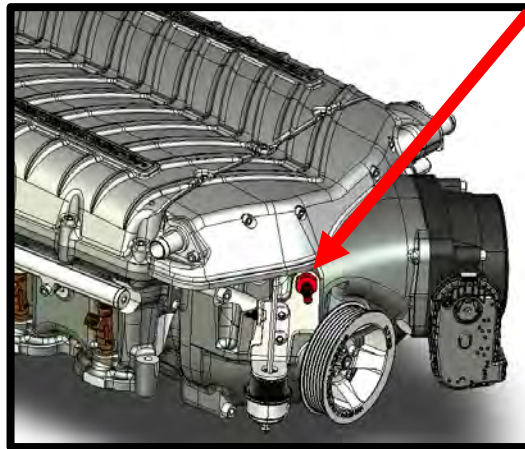
111. Install the supplied 3/8" x 20 1/2" hose from the EVAP solenoid rear fitting to the EVAP fitting located under the brake booster.



112. Install the supplied 3/8" ID x 24" with 55deg quick connect fitting. Route from brake booster to the **lower** quick connect fitting on the supercharger inlet. Push until it clicks into place. **TIP:** For best routing, nestle in between cam cover and fuel rail, under the wiring and heater hose.



113. Install the (1) supplied 6AN viton oring (#906) to the (1) 6AN to 5/8" quick connect fittings. Install this fitting to the driver side 6AN fittings on the inlet using a 7/8" wrench.

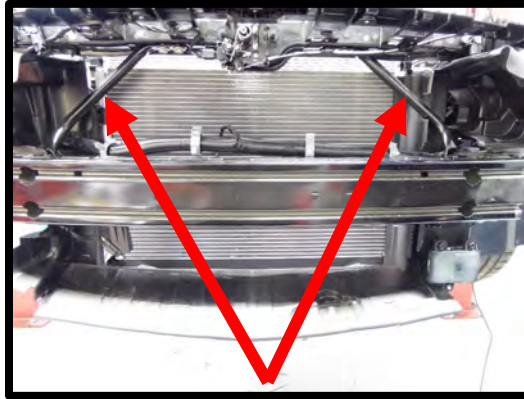


114. Install the supplied 5/8" ID hose to the passenger side valve cover. Connect other end to the supercharger inlet quick connect fitting. Push until it clicks and locks into place.

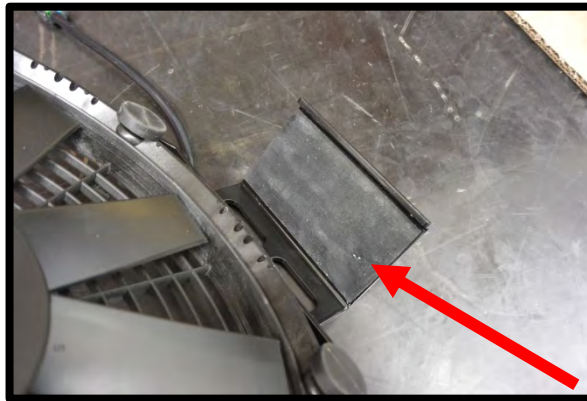


115. (**Complete kits**) Connect the previously routed Air Charge Temperature pigtail to the ACT sensor located in the back of the intake manifold.

116. Mustangs equipped with the Performance Package must remove the (2) front support braces connecting the front bumper support to the upper radiator support. Remove the (4) bolts per bracket and remove brackets from vehicle.



117. **(Dual fan installation)** Install the (8) supplied rubber feet to the fan mount bosses.
118. **(Dual fan installation)** Install the supplied (4) rubber strips to the bottom flat portion of the fan mount brackets. Clean the brackets with soap and water. Remove the protective tape from the rubber strip and install to the bracket.



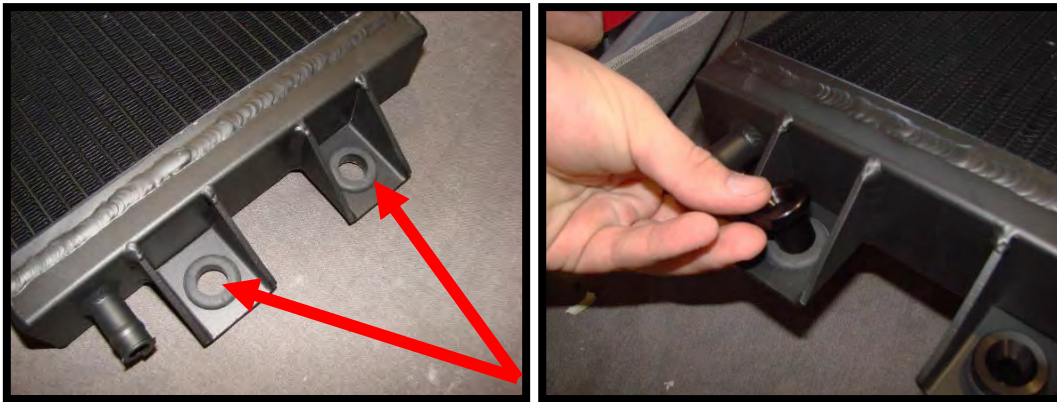
119. **(Dual fan installation)** Install the (4) brackets to the fans by sliding the square tab into the fan notch and the steel channel bracket will slide on the outside. The angled side will face the fan. This slides together easier if the bracket is facing slightly up. Once these are lined up, push until the seat together. Repeat on the other (3) brackets. Leave nyloc nuts loose for now.



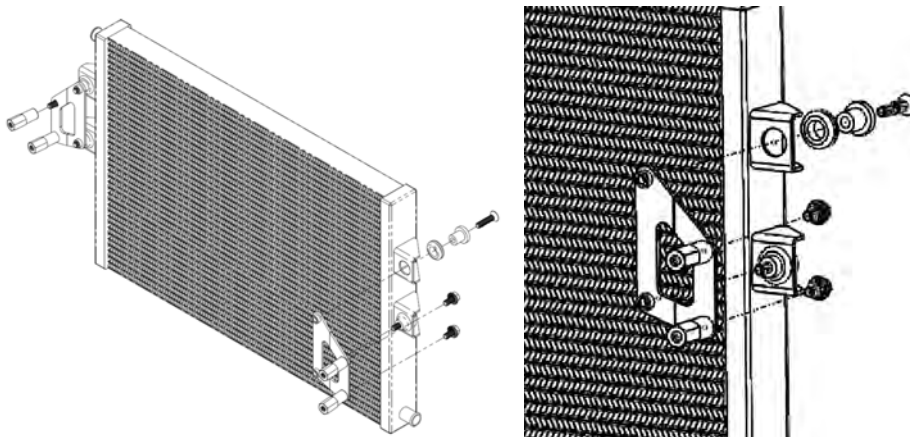
120. **(Dual fan installation)** Carefully set both fan assemblies on top front of the LTR, space these evenly before installing.



121. **(Dual fan installation)** Carefully pull open brackets and push onto the LTR. Its best to do both ends at the same time otherwise the bracket can be at an angle and hard to get on. **NOTE:** Electrical connectors should face down.
122. **(Dual fan installation)** Carefully snug up the (8) nyloc nuts using a ¼" ratchet and 10mm socket. Do not over tighten.
123. Install the supplied (4) rubber grommets to the LTR mounts. Install the supplied (4) aluminum LTR spuds to rubber grommets installed in LTR.



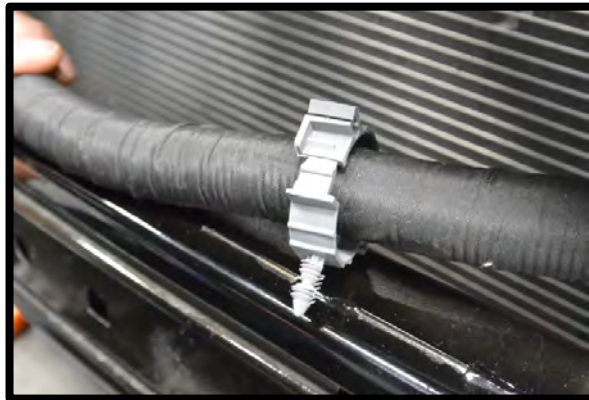
124. Install the LTR brackets to the LTR using the supplied (4) 8mm x 35mm FHSCS bolts through the aluminum heat exchanger spuds (5mm allen socket). **NOTE:** HD heat exchanger mounts the same way but the inlet fitting moves to RH side (same as outlet).



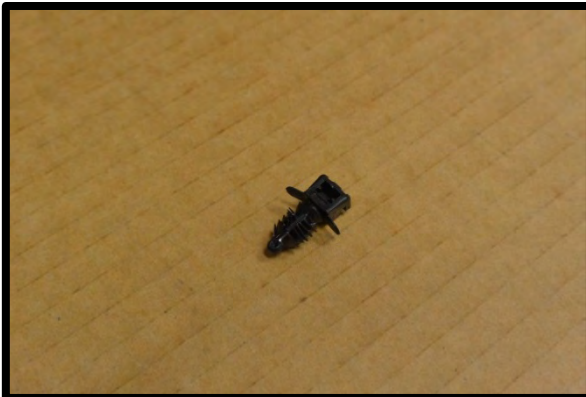
125. Install the supplied (4) hex coupling nuts to the factory bolt threads on the back side of the front bumper support (2 driver side, 2 passenger side) using a 16mm wrench.



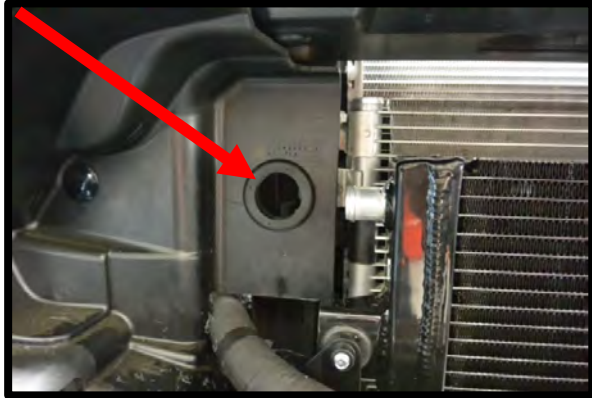
126. **(HD LTR installation)** Remove the factory plastic support clamps from the wire harness. Use a flat blade screw driver to open. Use a plastic pin pry tool to remove the clamps from the vehicle.



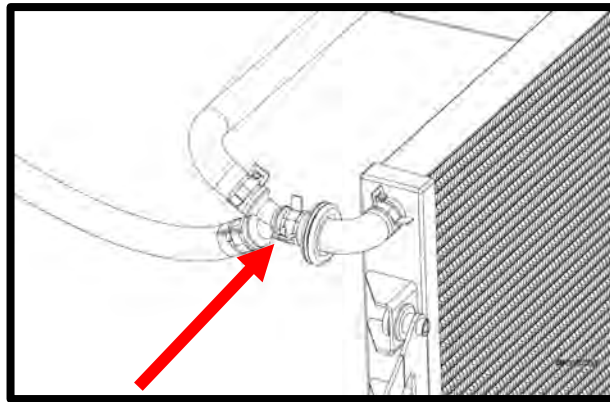
127. Slide the LTR assembly up from the bottom. Connect the LTR brackets to the coupling nuts using the supplied (4) 8mm x 16mm hex headed flanged bolt (13mm ratchet wrench).
128. **(Dual fan installation)** Use the original plastic zip-tie push pin into the 2 inner most holes. Use (2) new zip-ties to secure harness back in place. Push harness back in between brace and dual fans.



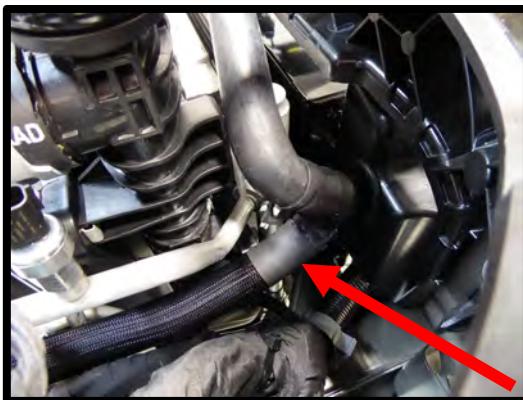
129. With the LTR mounted, mark the centerline of the LTR fitting and horizontally center of the plastic radiator (passenger side) shrouding. Verify on the back side of the shrouding that you have proper clearance for the $\frac{3}{4}$ " hose and Y fitting. Using a 1 $\frac{1}{2}$ " hole saw, drill a hole through the plastic shrouding. Install the supplied 1 $\frac{1}{2}$ " rubber grommet into this hole. **NOTE:** Install hole and grommet as close to the plastic edge as possible. This gives proper clearance on the opposite side for the Y fitting.



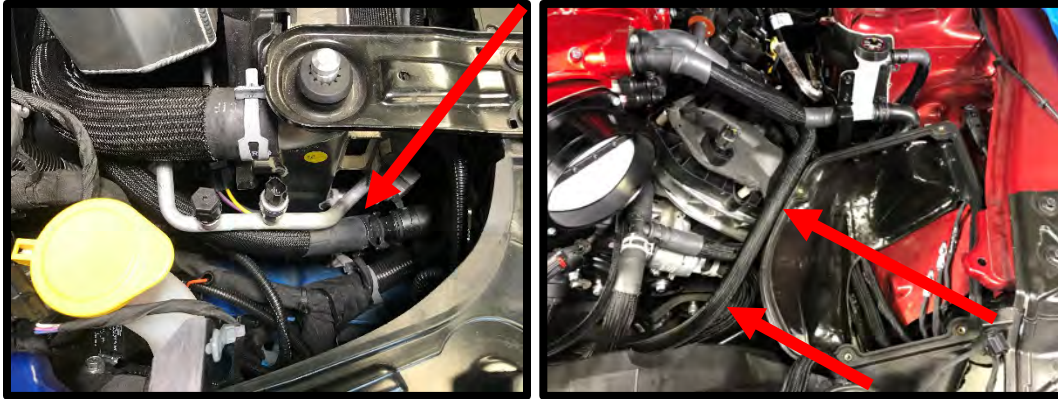
130. Route the supplied 90deg intercooler feed hose #COYO-2006 through the grommet, cut to fit as needed. Install the supplied Y fitting to the end of the hose from the outlet of the LTR, just after the grommet. Secure hose to LTR and hose to Y fitting using supplied constant tension clamps.



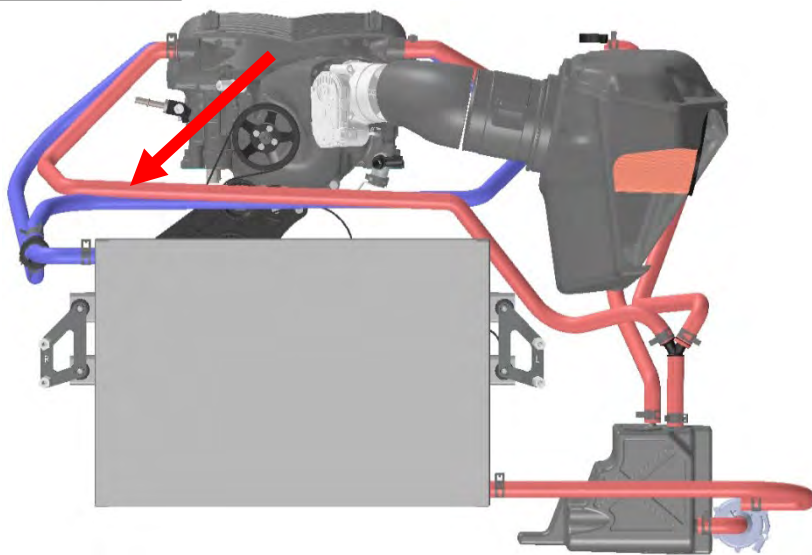
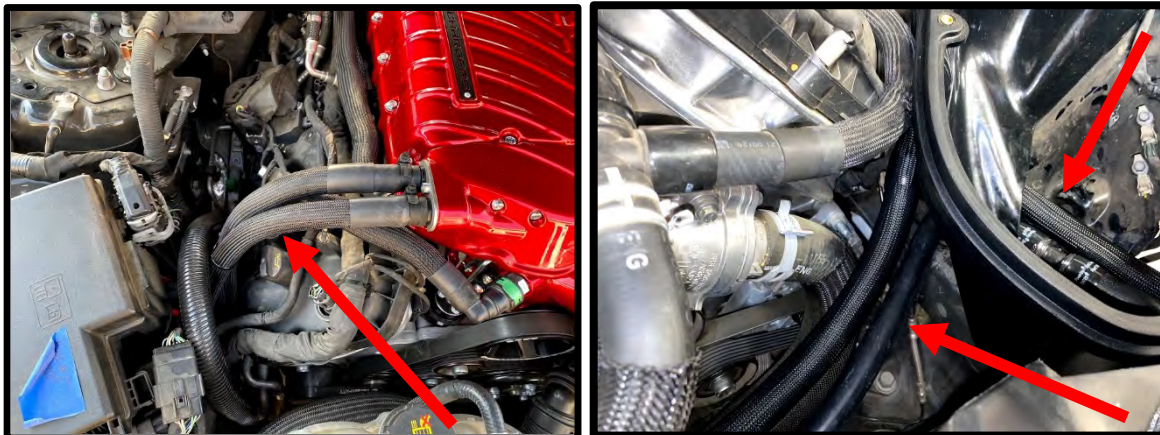
131. Connect the $\frac{3}{4}$ " x 31" hose to the Y fitting lower fitting, secure with pinch clamp. Route to RH intercooler inlet, the rear most water cross fitting. Secure with the supplied worm clamp. For max hood clearance, ensure that the hex is not on top.



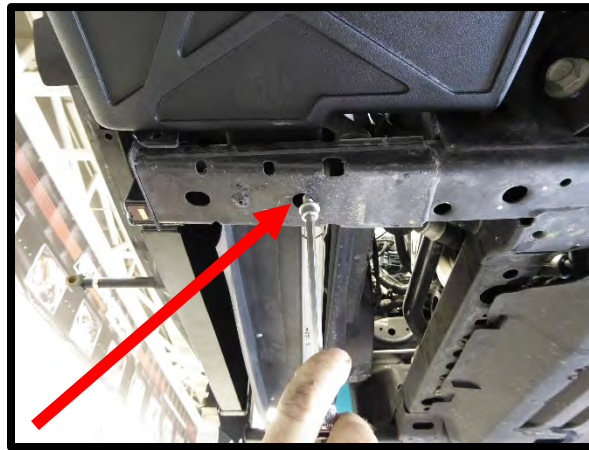
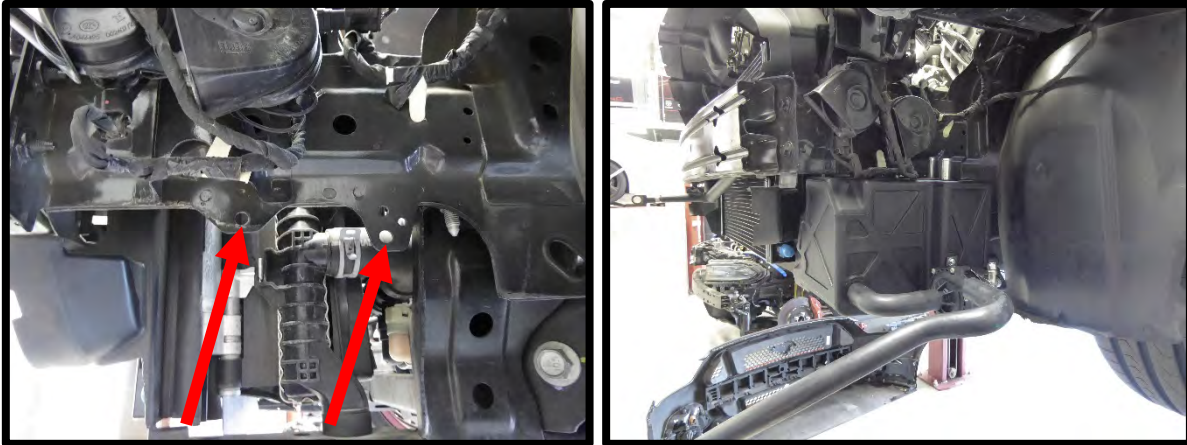
132. Install the supplied preformed $\frac{3}{4}$ " x 48" hose to upper Y-fitting and secure with constant tension clamp. The straight end goes to the Y. Route between the engine and radiator to LH side of vehicle. Leave this end loose until airbox installation. Secure hose to factory heater lines using zip-ties. **NOTE:** Failure to secure line will result in hose hitting belt system.



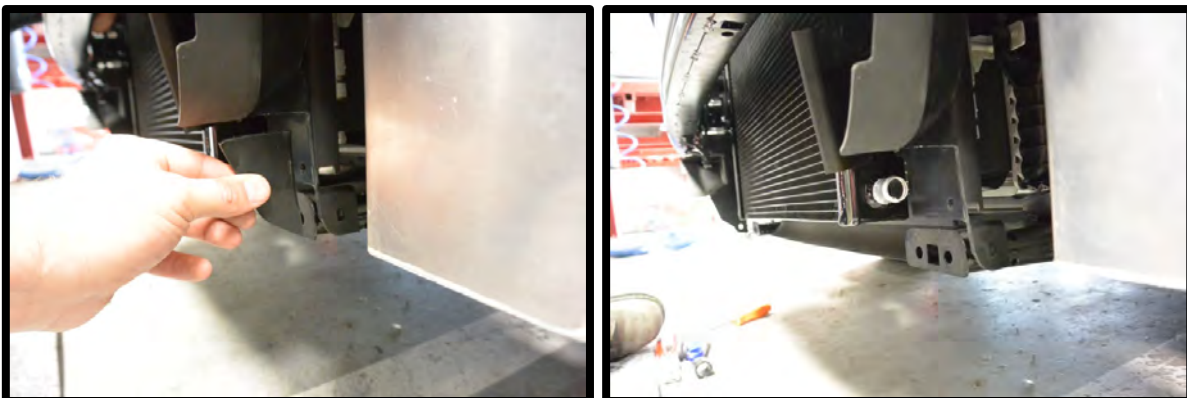
133. Install the supplied $\frac{3}{4}$ " x 54" (at straight section) hose to the bank 2 intercooler outlet fitting and secure with black worm clamp. Note: The preformed section goes around and under airbox, use straight section at IC outlet. Route below the wiring loom then around the front of the engine, just below the radiator hose. It should then run next to the bank 1 intercooler feed line, then to the IC reservoir. ***Image shows airbox to illustrate best routing.** Secure this hose to radiator hose and other intercooler hoses with zip-ties for a clean installation and safe from belt.



134. Mount the intercooler reservoir to the driver side below headlight. Secure using the (2) holes coming from the fender and one (1) from radiator support bracket. Secure the upper using the supplied (2) 8mm x 20mm hex head flange bolts with the flat washer against the head using a 13mm socket. Use the supplied (1) 8mm x 16mm SHCS and (1) 8mm AN washer from the bottom side of radiator support bracket.



135. (**Standard LTR**) Using a hacksaw, notch the plastic shrouding next the heat exchanger inlet fitting. Use the supplied $\frac{3}{4}$ " ID x 20" hose with 90deg end (from pump outlet to LTR inlet). Secure both ends with constant tension clamps supplied.



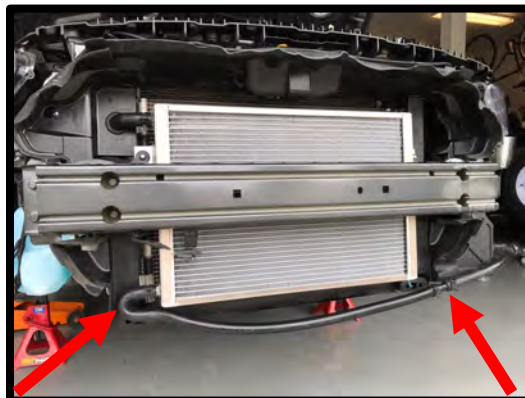
136. Install the supplied intercooler mounting clamp to the IC tank with the supplied (2) 6mm x 10mm BHCS.



137. Install the intercooler pump to the water reservoir using the supplied clamp (leave slightly loose to position after hose installation). Install the supplied 90deg rubber hose and constant tension clamps to reservoir and intercooler pump. Once pump is in position, tighten clamp holding IC pump to reservoir. **Note:** Make sure pump outlet is facing directly out (not up or down).



138. **(HD LTR)** Use the supplied $\frac{3}{4}$ " coupler and (2) pinch clamps to couple the $\frac{3}{4}$ " x 20" hose to the $\frac{3}{4}$ " x 31" extension. Route the 180deg end to the LTR inlet. Secure using constant tension clamps.



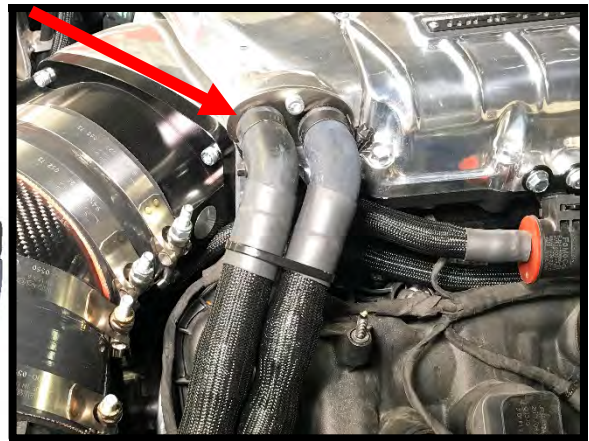
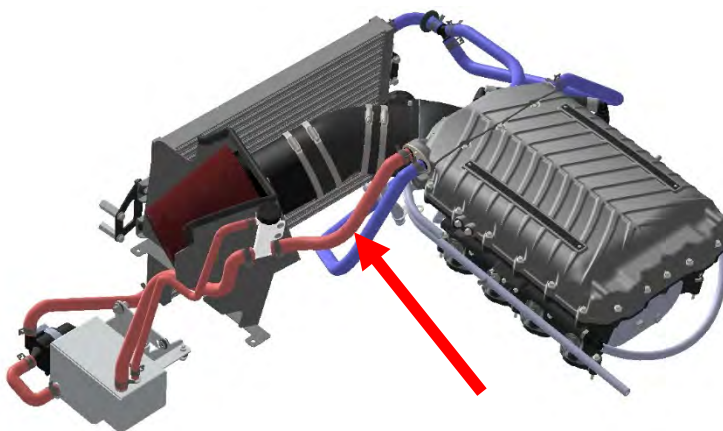
139. Install the supplied tee to the reservoir $\frac{3}{4}$ " ID barb fitting with the $\frac{3}{4}$ " x 3" hose. Secure both ends with supplied constant tension clamps.



140. Install the supplied $\frac{3}{4}$ " ID IC tank to filler tee, $\frac{3}{4}$ " bank 1 intercooler outlet to the plastic Y fitting. Install the $\frac{3}{8}$ " ID IC filler tee to IC reservoir hose to $\frac{3}{8}$ " barbs. Secure all with supplied constant tension clamps.



141. Install the supplied $\frac{3}{4}$ " ID molded hose (enclosed air kit hose #18MST-1001A) (open air kit hose #18MST-1001) from the IC **OUT** fitting to the airbox area for later installation. Secure end with supplied worm clamp. **TIP: The (2) hoses on this side should match in shape/form, therefore ensure it fits correctly. CAUTION: For hood clearance, ensure that the nut of the clamp is not on top.**



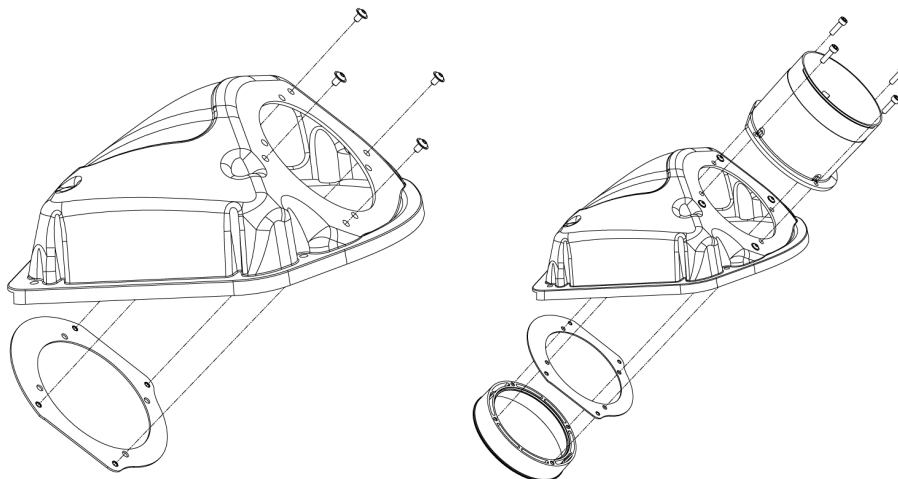
142. Connect the intercooler pump electrical connector to pump until its fully seated. Zip tie wires for clean installation.
143. Install the supplied 38" 90deg rubber weather stripping to opening of airbox. This seals the bottom of the box to the inner fender area.



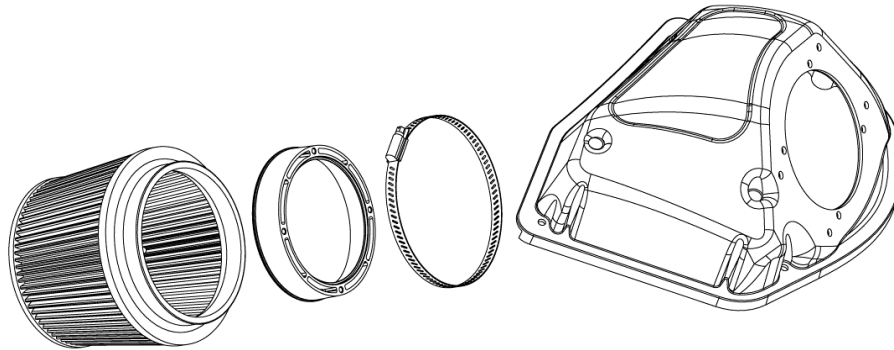
144. **(Complete Kits Only)** Install the supplied lower airbox to the vehicle by slipping over the factory air duct. Make sure the 3/4" and 3/8" IC tank to filler tee hoses go in the allotted area. These should be zip-tied together for clean installation and free of any kinks.



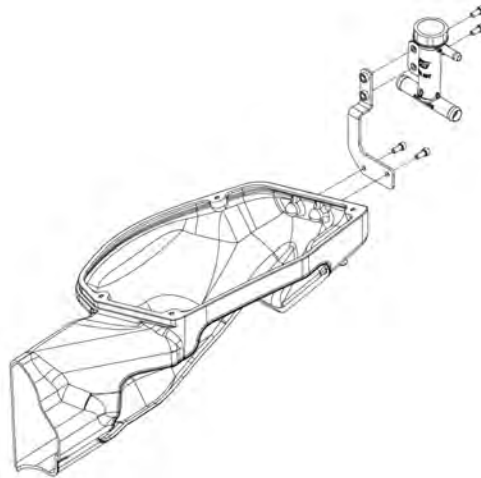
145. **(Complete Kits Only)** Install the steel MAF mounting plate to the airbox lid (to the inside of box). Install the (4) 5mm x 8mm FBHSCS bolts to secure plate to airbox lid. Install the MAF housing to the lid and venturi using the supplied (4) 6mm x 20mm SHCS bolts.



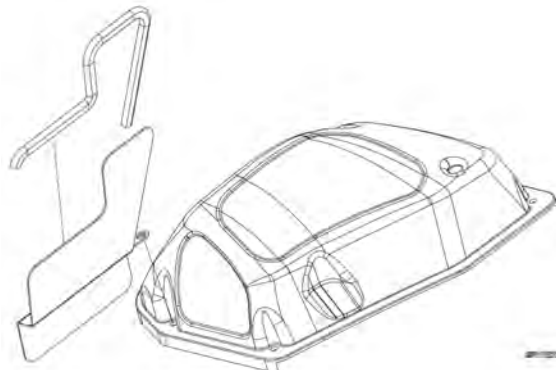
146. **(Complete Kits Only)** Install the high flow filter to the venturi ring you previously installed. Secure with supplied hose clamp.



147. **(Complete Kits Only)** Install the filler tee bracket to the lid using the supplied (2) 6mm x 14mm SHCS. Install the filler tee to the filler tee bracket using the supplied (2) 6mm x 14mm SHCS.



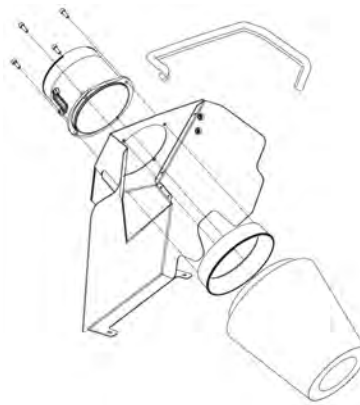
148. **(Complete Kits Only)** Install the filter lid to lower airbox by sliding filter into lower and tilting MAF side up. Once filter is in, you can lower the MAF side. Install the supplied heat shield to the front bolt hole closest to the radiator. Secure heat shield and the rest of the airbox lid with the (4) 6mm x 12mm FBHSCS bolts. Install the supplied 11" long rubber weather stripping to the top and rear lip of heat shield.



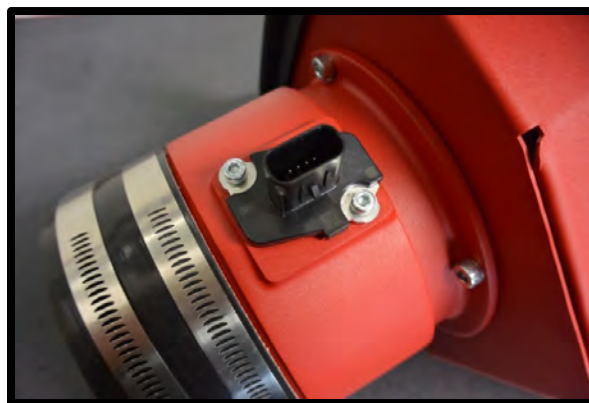
149. **(Complete Kits Only)** Install the supplied 3/8" to 5/8" hose adapter to the SC inlet tube. Install the inlet tube to the MAF and throttle body. Secure using the supplied clamps. #80 on MAF side, #56 for stock TB, #80 for 132mm TB, #88 for 150mm TB.



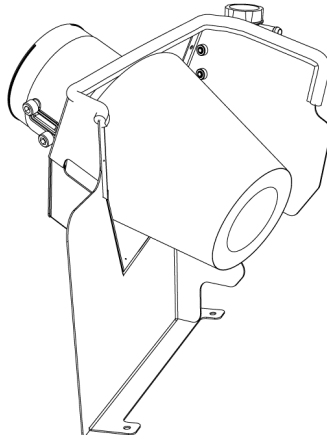
150. **(Competition Kits Only)** Using the supplied MAF housing and 123mm plastic venturi ring, mount to the new cold air box with the (4) 6mm x 16mm SHCS (5mm allen ball socket). Torque to 75 lbs-in. Install the rubber sealing material to top edge of airbox for proper hood sealing.



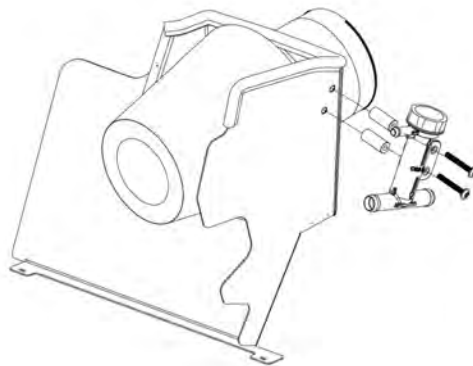
151. Install the factory MAF sensor element into the new MAF housing using the supplied (2) 4mm x 6mm SHCS. Torque to 17 lbs-in. ****DO NOT USE STOCK BOLTS****. ***TIP: Verify arrow position for airflow direction.**



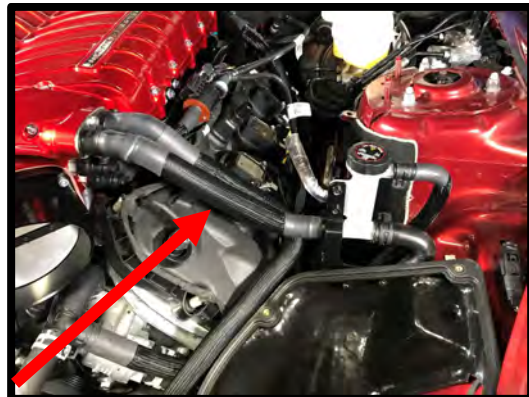
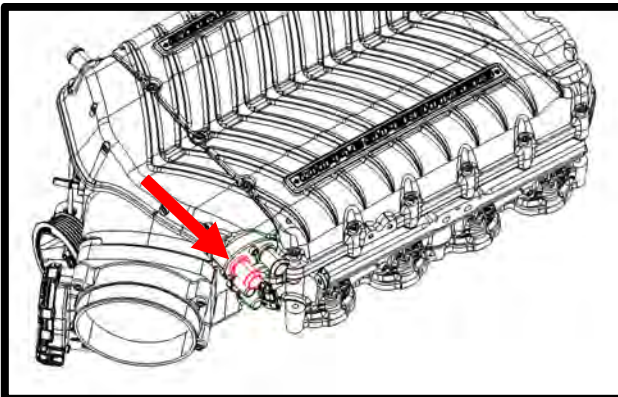
152. **(Competition Kits Only)** Install the high-flow air filter and clamp over the 123mm venturi ring. Once in place, secure hose clamp using a 5/16" nut driver. Drop airbox into position in vehicle. Secure box to frame by using the stock (2) plastic push pins at base of the box.



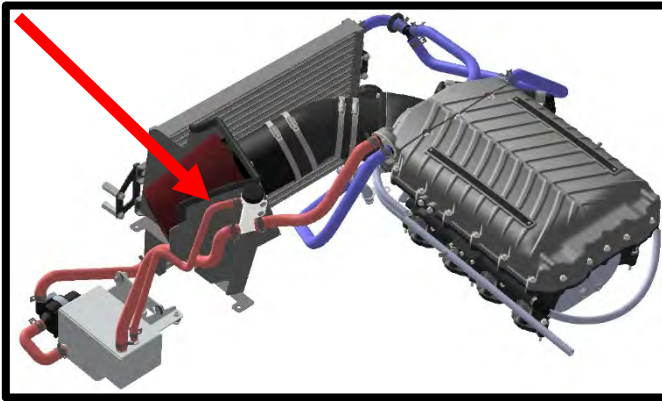
153. **(Competition Kits Only)** Install the intercooler filler neck to the (2) aluminum threaded stands using the (2) 6mm x 45mm BHFCS (4mm allen socket).



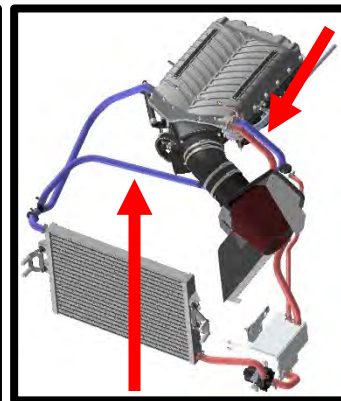
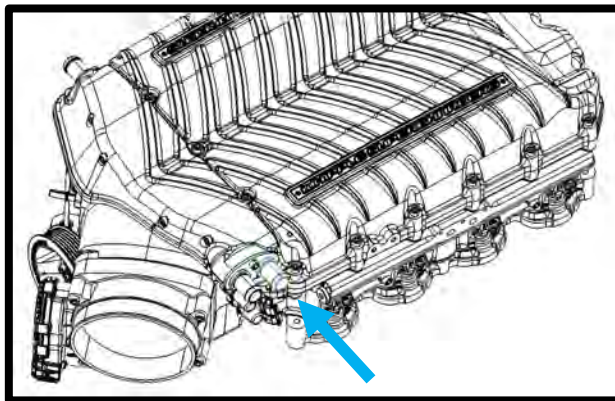
154. Connect the 3/4" ID molded rubber hose you previously installed to the IC (OUT) fitting and connect to the IC filler neck. Secure with supplied pinch clamp.



155. Install the supplied 3/8" ID x 31 1/2" IC vent line (COYO-1400) and the 3/4" ID x 24 1/2" IC rubber hose (COYO-1300) to the filler neck. Both use the 90deg on the filler tee. Secure both with supplied pinch clamps. Route both below the airbox, to the IC reservoir. Secure both ends with supplied pinch clamps. Use multiple zip-ties to secure hoses together. **Watch for hose kinks!**



156. Install the previously routed hose from the Y fitting, to the LH core inlet fitting. Secure with worm clamp. **TIP: For hood clearance, ensure that the nut of the clamp is not on top.** Secure inlet and outlet lines with zip-ties for clean installation and protection from the belt.



157. Install the (1) 5" ID x 2 1/2" silicone hose with dual #80 hose clamps to the MAF housing. Leave loose for now. ****Never over torque the clamp to secure the silicone hose to the MAF housing, this can distort the MAF and lead to running issues.**

158. **(Stage 1 Stock throttle body)** Install throttle body adapter to supercharger inlet using the supplied (4) 6mm x 14mm FHCS (4mm allen socket) using the supplied gasket between TB adapter and SC inlet. Torque to 88 lbs-in.



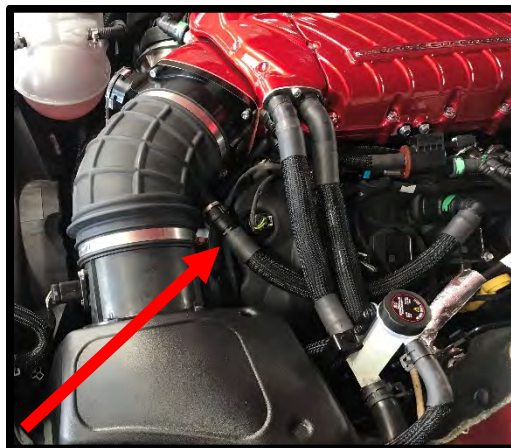
159. **(Stage 1)** Install the stock throttle body using the (4) 6mm x 50mm FHSCS bolts using a 10mm socket. Connect throttle extension harness until it locks in place.



160. **(Stage 2 Whipple 132mm Crusher throttle body)** Install throttle body to supercharger inlet, use the supplied gasket between TB adapter and SC inlet. Secure with the supplied (3) 6mm x 25mm SHCS and (1) 6mm x 50mm SHCS using a 5mm allen socket. Torque to 88 lbs-in. Connect throttle extension harness until it locks in place.



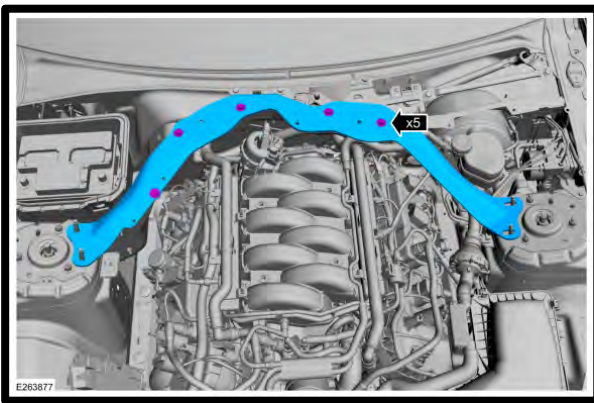
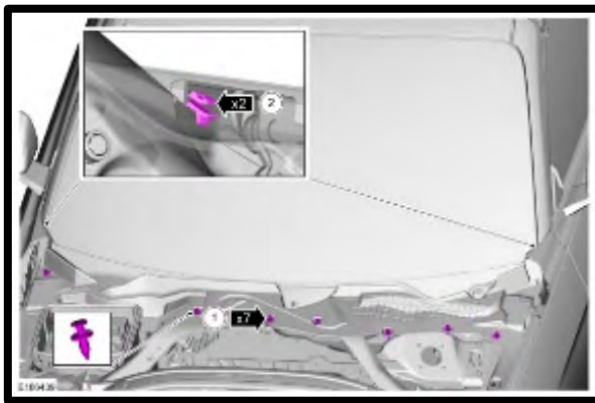
161. Secure driver side vent line quick connect fitting to the 5/8" fitting in the inlet tube previously installed.



162. Connect the previously routed 1/4" vent line to the stock overflow tank, secure with stock clamp. Secure this hose to the radiator hose and heater hose using multiple zip-ties.



163. Reinstall the factory K-Brace by lifting up the cowl trim panel and sliding the K-Brace underneath. Reinstall the K-Brace over the studs and into position on the vehicle. Install the (2) nuts on the studs and torque to 25 Nm using a 15mm socket. Install the (5) mounting bolts and torque to 25 Nm using a 13mm socket. Reinstall the (7) pushpin retainers on the cowl trim panel.



164. Refill the Engine coolant. Verify that your coolant drain is closed, use a filter/strainer to pour the recycled coolant/water mixture that you drained from the radiator. If necessary, top off with a **Ford approved engine coolant**. Whipple also recommends running 2 bottles of Redline Water Wetter which can be found at most automotive parts stores. **⚠ WARNING!! DO NOT USE TAP WATER OR ANY NON-FORD APPROVED ENGINE COOLANT, THIS WILL CAUSE CORRIION IN THE SYSTEM. ** (Vehicles that come equipped with Ford Motorcraft Orange should use Motorcraft Specialty Orange.**
165. Attach the negative cable to the battery and tighten using an 8mm wrench.
166. **(Complete kits)** Install the supplied 50-state legal sticker (when applicable) and maintenance decal to the hood next to the factory emissions sticker. Use light amount of acetone to clean surface before installing.

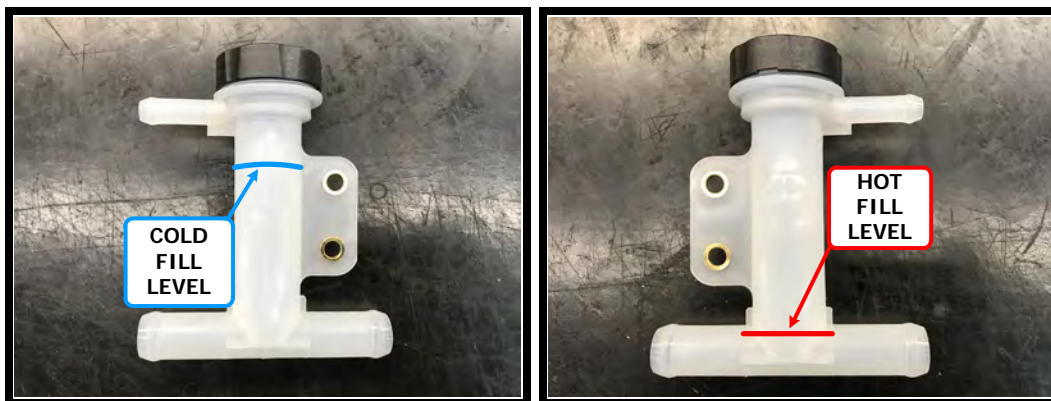
167. Attach the "91 OCTANE OR HIGHER" decal to the gas tank fill cap or door.



The electric water pump used on the Whipple SC system has a built-in micro-processor that will vary pump cycle speed when air bubbles are present in the system. If air is trapped in the system, the pump may cycle at a lower speed while it cavitates, resulting in poor cooling performance, lower power and potentially dangerous conditions.

For the best result, it is highly recommended to use a Radiator Cooling System Vacuum Purge and Refill Kit to properly evacuate the air from the intercooler system before filling the 50/50 mixture of coolant and distilled water. If one is not available, the following procedure will be adequate.

168. Using a Lisle 24680 Spill-Free Funnel, or equivalent, secure the appropriate filler neck adapter to the filler neck.
169. Attach the funnel and fill with a 50/50 mixture of coolant and distilled water until the funnel is half full. Whipple recommends Ford Motorcraft Orange or Zerex G-05 to match the stock color. Whipple also recommends 1 bottle of Red Line Water Wetter or equivalent. Note: The Whipple IC system is compatible with all common types of antifreeze. Never use tap water, this will cause corrosion and destroy the system.
170. Turn the ignition to the **ON** position, after a brief delay, the electric pump motor will cycle. Air bubbles will begin to rise to the filler tee as the coolant level drops, continue to fill while pump is running. Once its done filling, turn the ignition key **OFF**, the level will drop, top off with fluid. Reinstall filler cap and turn the ignition **ON** and let run for 15 seconds. Turn key **OFF**, remove cap to release air. Repeat until the filler tee holds at the cold fill level with key **OFF**. To build more pressure in the intercooler system, try squeezing the intercooler hoses while the pump is cycling. Building pressure in the system will help push the trapped air from the intercooler system to the filler tee. It also helps to lift the filler neck 4"-8" higher than its mount to help purge the air. **NOTE:** Do not let the coolant level in the funnel run empty as this may introduce more air into the system.



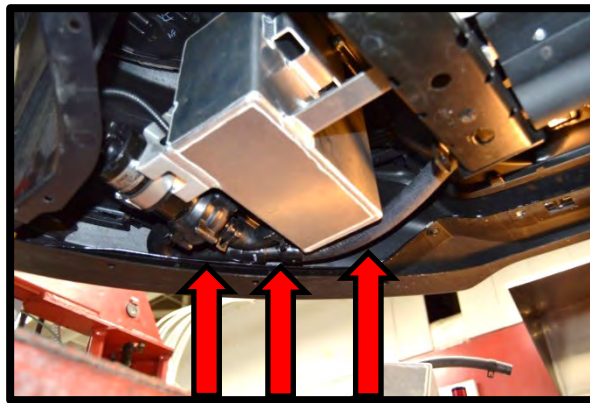
171. Cycle the ignition to the ON position again and repeat until the sound of the electric pump is continuous without any pulsation and the fluid level is met at the filler cap. **NOTE: During water pump start-up, it is normal for a slight pulsation to occur. Once the pump has reached its maximum cycle speed, no pulsations should be present. If any pulsations occur, there is air in the system. NEVER GO WOT UNTIL AIR IS BLED OUT!**

172. Several drive cycles may be required to completely purge the air from the intercooler system. During a drive cycle, the intercooler system will build up pressure as the supercharger temperature increases. Any residual air trapped in the system will have to be bled out when the cap is removed. Use a rag when removing in case there is excess pressure. **TIP: Never go WOT until air has been bled from IC system, engine failure could occur if not bled properly.**

WARNING: Always avoid removing the filler neck cap when the system is hot. The hot coolant is under pressure and may spray out causing burns.

WARNING: Triple check that the intercooler system is properly bled. Failure to do so can result in engine damage. Turn ignition on, let the pump run for 60 seconds, there should be zero cavitation during this test.

173. Reinstall front fascia. Route the IC line coming from the IC pump so it sits in the channel just behind the air dam (below fog light). Make sure to not allow any kinks. Reconnect fog lamps. Reinstall (2) fasteners securing fascia to fender.



174. Before driving, make sure that you have 91 or higher-octane fuel in the system $(RON+MON)/2$. Not ½ tank of 87 and ½ tank of 91, all 91 or better fuel in the system. Whipple does not recommend octane booster.
175. Do not use aftermarket air filter box or duct with the supplied Whipple calibration. The Whipple calibration is designed to work with the Whipple cold air intake system and nothing else. Changes to the air inlet system will require a custom tune which Whipple does not provide.
176. Reinstall front fascia. Reinstall (2) fasteners securing fascia to fender.
177. Reinstall upper radiator shroud using factory push pins (8).
178. Reinstall the lower splash shield to the front fascia using the factory fasteners.
179. Test drive vehicle for the first few miles under normal driving conditions. Listen for any noises, vibrations, engine misfire or anything that does not seem normal. The supercharger does have a slight whining noise under boost conditions, which is normal. If you chose the aftermarket throttle body, idle may take a few minutes to learn.
180. Re-check the radiator and intercooler reservoir coolant level regularly over the first 1,000 miles, top off level as needed.
181. Re-check SC oil level regularly over the first 1,000 miles, level may drop very slightly as it fills the bearings and cavities.
182. Inspect belt system and readjust. It's common for the belt to stretch after first heat cycle.

183. After the initial test drive, go through the belt tensioner process again. On the next test drive, gradually work the vehicle to wide open throttle runs. Listen for any engine detonation (pinging). If engine detonation is present, let up on the throttle immediately. Most detonation causes are low octane gasoline still in the tank.
184. If you have questions about your vehicles performance, please check with your installation facility or call Whipple Superchargers at 559.442.1261, Monday through Friday from 8am to 5:00pm, pacific time or email questions to tech@whipplesuperchargers.com.

⚠ WARNING!! Verify the bypass actuator is working properly. To monitor, look at the bypass arm when the motor is not running. Start engine and verify that the actuator arm has opened. This arm will be extended when the engine is above 2" of vacuum (boost) and will be open when there is more than 3" of engine vacuum.

There is a great deal of misinformation about the function of supercharger bypass systems. The supercharger is a positive-displacement pump; that is, so long as it is rotating, it is always pumping air. During low demand or high vacuum operation (i.e. idle, deceleration, and light throttle cruise), the pumping action is undesirable as it creates unwanted heat and noise. The bypass circuit, when open, prevents any pressure buildup across the supercharger and allows air to circulate through the rotors, allowing the supercharger to "idle" freely during these conditions. This results in reduced noise, and by reducing heat buildup in the intake, significantly improves street and strip performance. As throttle demand increases, the bypass circuit is closed, resulting in full performance and strip performance. As throttle demand increases, the bypass circuit is closed, resulting in full performance from the supercharger. The bypass circuit is never used to limit or control boost during full-throttle operation and defeating or altering the bypass function will not result in improved performance in any condition, and will result in poor drivability and possible supercharger damage.

MAINTENANCE AND SERVICE

Be sure to follow the maintenance and service recommendations below to optimize the life and performance of your Whipple-supercharged vehicle.

For best performance and continued reliability, it is essential to adhere to the following guidelines:

1. Use only premium grade fuel (91-octane or higher). RON+MON/2. The PCM calibration will automatically detect higher octane levels and will increase power accordingly.
2. Always listen for any sign of spark knock or pinging. If present, discontinue use immediately and consult your vehicle owner's manual.
3. Do not operate the vehicle at large throttle opening if the MIL lamp is on steadily. This indicates an electronic engine control malfunction: reduce throttle opening and consult your vehicle dealer.
4. Check the supercharger oil level at every engine oil change. Add Whipple SC oil to the supercharger if required. Do not overfill the supercharger rear gear case.
5. Change the oil in the supercharger every 100,000 miles. Use Whipple SC oil or Ford #XL-4 only.

!! CAUTION !!

Severe damage to the compressor will occur if you overfill the supercharger rear gear case.

6. Do not operate the vehicle at large throttle opening if the MIL lamp is on steadily. This indicates an electronic engine control malfunction: reduce throttle opening and consult your vehicle dealer.
7. Inspect and clean your high-flow air filter element every 7,500 miles.
8. Inspect and replace spark plugs every 20,000 miles. Only run specified plugs.
9. Follow your factory service intervals for oil changes and other typical maintenance items.
10. Check the supercharger/accessory drive belt. Adjust or replace as required

!! CAUTION !!

Any modification to your vehicle's new computer program may cause serious damage to the engine and/or drive train. The PCM is locked to the VIN, never let anyone, including dealerships install updates to the PCM. Modifications to the PCM will lock power to stock power levels. Whipple DOES NOT DO CUSTOM CALIBRATIONS!

CONGRATULATIONS

Your new Whipple Supercharger is engineered to significantly increase your engines power across a broad range of RPM's. It is Whipple's goal to improve your driving experience for many miles and years to come.

Whipple Superchargers operate as an air pump and contain internal rotors that are driven by the engine's crankshaft and serpentine belts. The supercharger compresses outside air and channels it into the engine's intake ports. Because of their design, superchargers may generate some additional noise over the standard, normally aspirated induction system.

At idle, you may hear a medium-pitch rattle from the supercharger main housing. This will diminish at about 400-500 rpm above idle.

You may also experience a muffled high-pitched whine during acceleration. This is caused by the pumping action of the supercharger compressing air and only occurs during boost conditions. It is inaudible during part-throttle acceleration.

These are normal noises associated with any supercharger and have no effect on supercharger performance or engine durability.

Your supercharger is warranted by Whipple Superchargers, please see your terms and conditions on the back of your invoice for more information in regards to the limited warranty. NOTE: Whipple Superchargers will not authorize any warranty repair work or supercharger replacement for normal noise.

IMPORTANT INFORMATION

DYNO INSTRUCTIONS

When testing the Mustang on a chassis dyno, it's important to always disconnect the right front wheel speed sensor. This will disengage traction control and ABS. Pulling fuses does not work as the rear brake will still grab, especially on the automatics. 5th gear is closest to 1:1 which will show the highest torque value on inertia based dyno's but will run into the factory speed limiter, therefore 4th gear is ideal for testing.

BOOST LEVELS

All Whipple kits are shipped with boost levels that Whipple feels achieves maximum power while maintaining reliability with stock engines (@ sea level). Additional pulley's are available for lower and higher boost levels, the supplied calibration (complete kits) for the original pulley or larger (lower boost). Higher boost levels must run higher octane levels and is not emissions legal. One can always lower boost with no cal changes required. Increasing boost levels increases risk of engine failure, void warranty and are no longer emissions legal.

EXHAUST

Cat-back exhaust systems help reduce heat and minimize exhaust back pressure. They do not affect the calibration and are always a good idea for added safety and performance. Long tube headers and/or high flow cats require custom calibrations and are not supported by Whipple and are not emissions legal.

AIR FUEL RATIO

Air fuel ratio is the measurement of the amount of air and fuel being burned during the combustion process. In order for you to monitor the air fuel ratio, you must have a 18mm bung welded into the exhaust or use OBD data logger to monitor the factory wide bands. The ideal placement is pre catalytic converter as the catalytic converter can give false readings. While in some cases, it may not be possible to measure air fuel pre-cat, one must verify that post-cat that the motor is running at stoich at idle and should technically show .20 to .50 leaner air fuel ratio.

The Whipple supplied calibration has is tuned for WOT 12.00:1 considering 91 octane fuel with 10% Ethanol. Whipple maintains Catalytic saver mode which richens the target air fuel to maintain cat life. During this, the air fuel may lower up to one full point to maintain temps.

ENGINE COOLANT

Whipple recommends running a 50/50 mix of distilled water and coolant (race applications should run 70/30). The engine coolant temp should run between 180-190deg F under normal driving conditions. The fans are turned on at an earlier temp to promote cooler operating temps. We also recommend 1-2 bottles of Red Line Water Wetter coolant additive. This will reduce air bubble insulation, which increases overall engine temp.

FUEL SYSTEM

The Whipple fuel system (FLOW) needs no additional changes for power levels supplied by Whipple. Any smaller pulley changes, custom calibration, custom engines may require fuel system changes. Use the chart below for fuel system performance. Whipple programmable fuel pump boosters should be used when stated below. Never operate at WOT when the vehicle fuel levels are below a 1/8 tank. Low fuel levels could cause the fuel pump to cavitate and you'll have fuel flow spikes resulting in lean conditions and consequently detonation.

	58lb/hr	72lb/hr	Octane Required
3.875"	Max	OK	91 or higher
3.75"	W/BAP	OK	93 or higher

FUEL OCTANE

There is a large variance in quality of fuels. Top Tier fuel is from large name brands such as Shell, Chevron, Unocal, Sunoco, Texaco, Phillips and others. Secondary fuel is common from grocery chains, liquor stores and small convenient shops. Never run fuels from secondary suppliers. Never run a fuel octane that is below 91octane, (RON+MON)/2 and never run fuel with more volume than 10% Ethanol (E10). It is recommended, when available, to run 92-94 octane. Never mix mid-level (below 91) with 91+, this is very dangerous and can cause severe engine damage. Do not attempt to increase octane ratings with generic octane boosters, these are very hard on spark plugs and many brands do very little to the actual octane rating (1 point is .1 octane). For emergency situations and racing applications, the best octane booster found to date is Boostane (#1 choice). Some other brands are hard on spark plugs so constant use will require increased spark plug maintenance. The PCM constantly adapts, if it senses better fuel, it will increase power accordingly.

BELT LENGTHS

Changing pulley combinations will require belt changes to minimize belt stretch and tensioner travel. See the following charts for a guide.

NOTE: Boost is a guide and can vary with environment, engines, calibrations, combinations.

PULLEY/BELT LENGTH GUIDE		
SC Pulley	Stock Balancer	20% Balancer
4.000"	82.5"	87.0"
3.875"	82.5"	87.0"
3.750"	82.0"	86.4"
3.625"	82.0"	86.4"
3.500"	81.5"	86.4"
3.375"	81.5"	85.4"
3.250"	81.0"	85.4"
3.125"	81.0"	85.4"
3.000"	80.6"	85.2"
2.875"	80.6"	85.2"
2.750"	80.6"	85.2"

PULLEY/BOOST/132MM TB		
SC Pulley	Stock Balancer	20% Balancer
4.000"	10	15
3.875"	11	16
3.750"	12	17
3.625"	13	18
3.500"	14	19
3.375"	15	20
3.250"	16	21
3.125"	17	22
3.000"	18	23
2.875"	19	24
2.750"	20	25

PULLEY/BOOST/STOCK TB		
SC Pulley	Stock Balancer	20% Balancer
4.000"	9	N/A
3.875"	10	N/A
3.750"	11	N/A
3.625"	12	N/A
3.500"	13	N/A
3.375"	N/A	N/A
3.250"	N/A	N/A
3.125"	N/A	N/A
3.000"	N/A	N/A
2.875"	N/A	N/A
2.750"	N/A	N/A