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PRIOR TO INSTALLATION READ THESE INSTRUCTION COMPETELY
For questions, Call the FORD PERFORMANCE Techline 1-800-367-3788

For warranty eligibility, the vehicle must be registered.
Please visit https://www.performanceparts.ford.com or contact the Techline for warranty information.

FORD PERFORMANCE

WHIPPLE Superchargers

WHIPPLE SUPERCHARGER/FORD PERFORMANCE INSTALLATION MANUAL

2024 FORD MUSTANG GT AND MUSTANG DARK HORSE

KIT PART NUMBER: M-6066-M8800



WHIPPLE SUPERCHARGERS
3292 NORTH WEBER AVE
FRESNO, CA 93722
TEL 559.442.1261
FAX 559.442.4153
WWW.WHIPPLESUPERCHARGERS.COM

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

CALIFORNIA AIR RESCOURCE BOARD EXECUTIVE ORDER #D-231-119

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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.
- 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 DIAGHRAM.***
- **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 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

Ford Performance highly recommends running Ford Motorcraft 5W-50 full synthetic motor oil (**PN #XL-5W50-QGT**) vs the stock oil. You will need up to 10 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 Philips 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. 2.0 gallons of **DISTILLED** water and Ford Factory specification engine coolant. This is not supplied in the kit, you can find engine coolant at any local auto parts store. **NEVER USE TAP WATER**, as it can corrode and create poor performance.

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STOP AND READ BEFORE PROCEEDING



The Whipple Supercharger system is designed to run on premium fuel **ONLY**. Failure to run anything other than 91 or higher (RON+MON)/2 will result in **ENGINE FAILURE** and will **VOID YOUR POWERTRAIN WARRANTY!**

Drain the fuel if any of these five situations are possible. **WARNING!** Draining your fuel means you physically remove the fuel from the vehicle, from the gas tank or fuel rail until empty, not by running vehicle down to low range. Today's vehicles are **RETURNLESS**, the fuel in the filter, pump and lines will not be returned to tank, thus, your initial fuel delivery will be the fuel that was left in the system from improper draining.

1. **New vehicles with less than 100 miles. New vehicles are shipped with lower than 87 octane fuel from manufacturer.**
2. **Any of the last 2 tanks fills had less than 91 or higher octane (RON+MON)/2.**
3. **Fuel is older than 3 months.**
4. **Fuel has been mixed between low and high octane.**
5. **You're not 100% sure of the fuel type and octane.**

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PRE-INSTALLATION CHECKLIST

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

1. Vehicle Break-in: Brand new vehicles with sub 1000 miles should maintain OEM break-in procedures for the engine, clutch or transmission. Applying extra stress to the powertrain before proper break-in is not recommended and could lead to damage which is not warrantable.

2. 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.

3. **!! CAUTION !! This product is intended for use only on STOCK, UNMODIFIED, WELL-MAINTAINED vehicles and engines. Installation on a worn-out or modified engine is not recommended. Custom engine configurations are not supported, Whipple does not offer custom calibrations.**

4. Verify Fuel System: Supercharger systems should only be installed on vehicles that have new or clean fuel filters, Stage 1 uses stock fuel pump, if near 100,000 miles, its recommended that you upgrade to Stg 2 fuel pump.

5. 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.

6. **!! CAUTION !! DO NOT remove the protective seal on the supercharger prior to installation. Foreign material entering the supercharger will automatically void all warranties.**

7. Identify Supercharger Kit Components: Before beginning installation, identify all the components of your Whipple Supercharger Kit and ensure all items are present and undamaged.

8. **!! 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.

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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
EECPV	Electronic Evaporative emissions Canister Purge Valve
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

WARNING

***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.

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WHIPPLE TOMAHAWK INSTRUCTION MANUAL

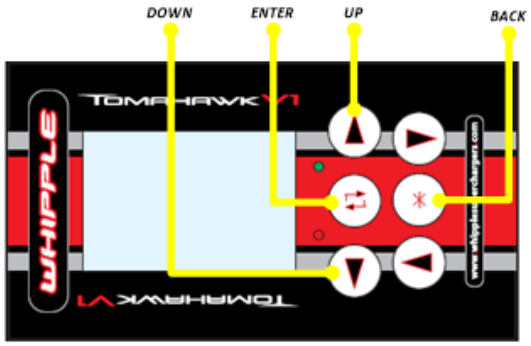
2024 AND UP S650 MUSTANG GT AND DARK HORSE



INTERNET ACCESS REQUIRED
SD MEMORY CARD READER REQUIRED

The Whipple calibration procedure is based off factory calibration files. If you have an aftermarket calibration, put the calibration back to STOCK. The TOMAHAWK will not upload and backup your file.

NOTE: ANY CONNECTION TO THE CAN NETWORK OR OBDII PORT FOR AUXILLARY GAUGES, STEPS OR OTHER AFTERMARKET ACCESSORIES MUST BE UNPLUGGED/DISCONNECTED FOR PROPER PROGRAMMING. ANY EXTRA CONNECTION TO THE CAN NETWORK WILL CAUSE PROGRAMMING ERROR CODES.



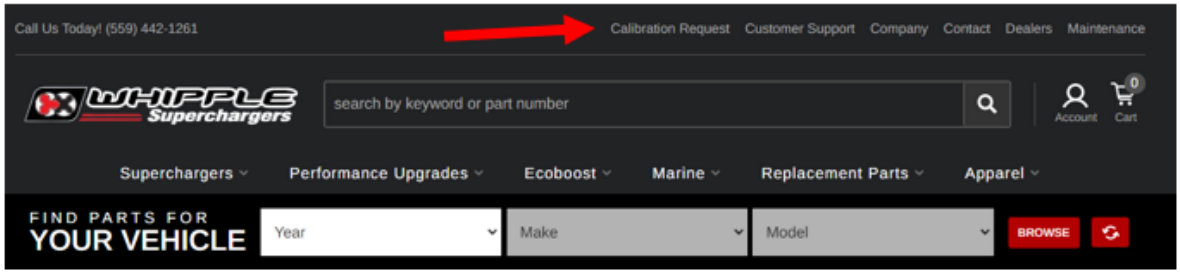
1. Turn the ignition to the **ON/RUN** position, engine not running (with foot OFF brake if push button)
2. Connect the Tomahawk tool to the factory OBD2 port (after vehicle ignition key/on).
3. Using the toggle buttons, select **Request Cal File**. Hit enter button. The tool will auto ping the factory PCM and create a **TOMAHAWK.REQ** file to the supplied SD card.

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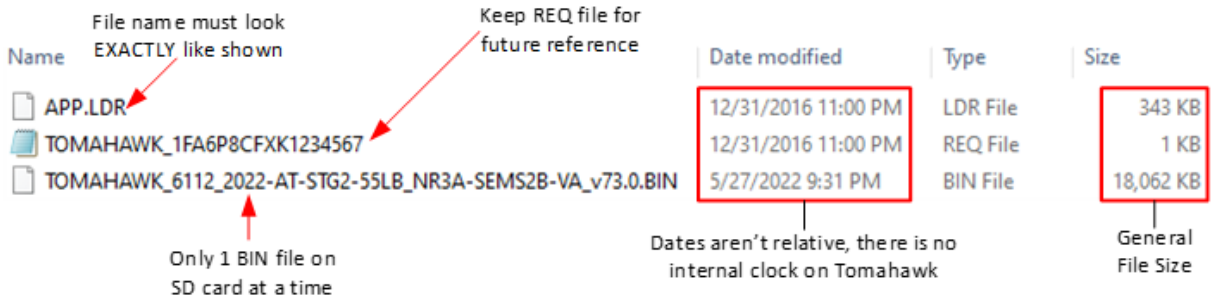
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4. Remove the SD card from the Tomahawk tool by pressing it in until it springs out. Install the SD card in a memory card reader on your PC/Laptop and locate the REQ file.

5. Go to www.whipplesuperchargers.com and click the calibration request link (Whipple Superchargers Calibration Request). Note: Typical response time is up to 24 hours from request time during normal business hours.

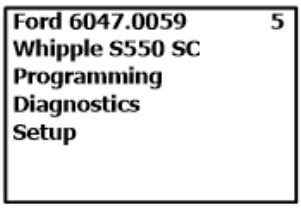


6. Whipple Superchargers will email your calibration file which will have a unique file name ending with **.BIN** and firmware file named **APP.LDR (HAS TO BE EXACTLY AS SHOWN)**. Save these files for future access. Drag/drop or save these files to the supplied SD card using a laptop/PC. ***Only 1 BIN and LDR file can be stored at a time. Never change the file names, this will cause a conflict with the tool. If you have downloaded more than once, windows will add a (1) or (2) at the end of the file name. Always delete this.** ****NOTE: Keep your TOMAHAWK.REQ file on the tool for later use if needed for future updates.**



7. Turn the key to the **run/accessory position**. Connect the Tomahawk tool to the factory OBD2 port. The new firmware (**APP.LDR**) will install automatically when the tool is powered on. **NOTE:** If it's stuck on the REQUEST CAL screen, you have an error with the **APP.LDR** file. If this file name is different than **APP.LDR**, it will error, ensure name is correct.

8. With the ignition key set to the ON/RUN position, use the arrow options to select "**Programming**" tab and click the enter button. Follow the onscreen menu for flashing the vehicle. Once you're done flashing, cycle the key off for 5 seconds, then back on.



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9. Once you're done flashing, cycle the key off for 5 seconds, then back on. Select the "**Diagnostic**" tab, read all the DTC (trouble codes). Erase all codes. Note: De-energizing relay code is common after flashing and will go off after a few driving cycles or if you hit clear DTC 5-6 times. The vehicle will run proper even if this code is on.

10. After flashing the PCM, in some rare cases, a crank/profile relearn is required. This only needs to be performed **IF** you get a random misfire code, hard starting issues, or, you have changed the clutch on a manual transmission. To perform a profile relearn, start the engine, leave the vehicle in **PARK**. Select the "**Diagnostics**" option. Scroll to the Profile Relearn and click enter. Follow the onscreen instructions. Note that the engine must be at normal operating temp (160deg F+) to perform this test and you must blip the throttle to get RPM over 4500rpm for the process to work. If you begin the test, but leave it unfinished, it will set a crank learn DTC as it erases the original data. Therefore, to run properly, this procedure needs to be finished to remove this DTC.

11. After flashing PCM, if the axle ratio and/or tire size is not stock, follow instructions for correcting for changes. Turn the ignition key to the "**ON**" position (no foot on brake). Click the "**Diagnostic**" tab. Scroll to the **Tire/Axle Change** and hit **Enter**. Using the on-screen instructions and arrow keys, change the axle ratio to desired ratio (ex. 3.55, 3.73, etc). For tire size changes, tire size is the tire circumference in millimeters. Measure the rollout of the tire, to convert from inches to MM, multiply by 25.4. Example (97.48" x 25.4 = 2476mm). Another, less exact method, measure the real height of the tire (as shown below), multiply by **3.14** to get the circumference. Enter this number using the arrow keys. Hit **Enter** when done and follow the on-screen menu to complete the tire/axle changes. You may do the tire and axle at the same time, or just one.

Tire/Axle Change

Tire: 2476mm
Axle: 3.73
▶ = Toggle edit
* = cancel



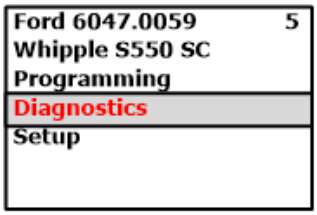
Tire Height (measured) INCH	Tire Height (measured) MM	Recommend Starting Tire size
32.0	813	2517
32.5	826	2557
33.0	838	2596
33.5	851	2635
34.0	864	2675
34.5	876	2714
35.0	889	2753
35.5	902	2793
36.0	914	2832
36.5	927	2871
37.0	940	2911
37.5	953	2950
38.0	965	2989
38.5	978	3029
39.0	991	3068

Tomahawk Error Codes	
Code #	**Description**
2200	Multiple BIN files found on SD Card
2201	Flash file on SD card exceeds max name length
3560	Max number of downloads reached
3610	VIN read error
3670	Enter flash mode error
3673	SBL download error
4681	Tire/axle size out of range

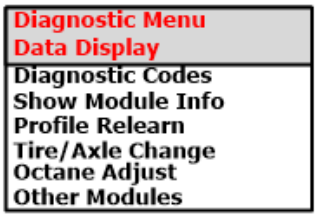
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DATA LOGGING WITH TOMAHAWK TOOL

1. Connect the OBDII connector to vehicles OBDII connector. Turn the ignition to the ON position with engine not running. Allow the Tomahawk tool to power up. The Tomahawk will start with a Whipple splash screen, hit the enter button to continue. Toggle to **DIAGNOSTICS** and click the enter button.

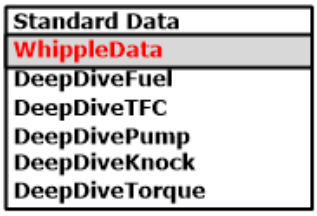


2. Select **DIAGNOSTIC MENU DATA DISPLAY**.

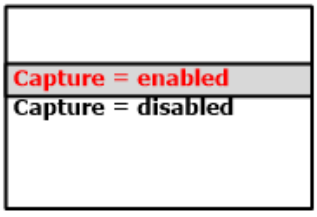


3. Whipple has provided pre-made PID list for logging. Unless instructed otherwise, always use **WhippleData** list for logging.

   a. Standard Data: Generic SAE Pids.
   b. WhippleData: Enhanced Pids.
   c. DeepDive logs are proprietary logs that are encrypted and cannot be viewed by customer. These are only to be used when having specific problems, Whipple Tech may instruct you to log using one of these special lists.



4. Toggle to the **CAPTURE = ENABLED** option to record data. The **CAPTURE = DISABLED** is for live viewing only, as this will not save the data.



5. Start the vehicle. Click the enter button to start the logging. If given specific instructions on what to test, follow these. If not, give a 2-4 minute general drive that has idle and part throttle driving.

6. **To save data log:** Prior to turning ignition off, hit the asterisk once to stop the data log and second time to save the data log. Remove the SD card and install in PC. The **CSV** or **ENC** file are the logs. Send this to tuning@whipplesuperchargers.com or to support@whipplesuperchargers.com.

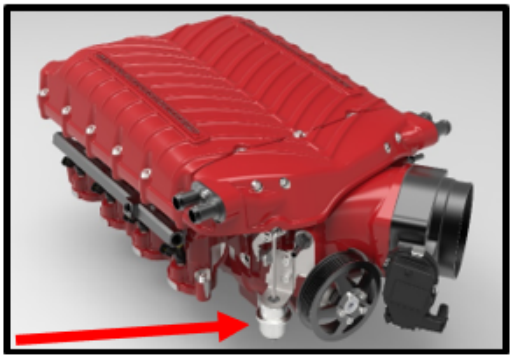
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SUPERCHARGER INSTALLATION INSTRUCTIONS

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

1. BYPASS ACTUATOR: This is pre-assembled and pre-installed. DO NOT MOVE the actuator, damage may occur.



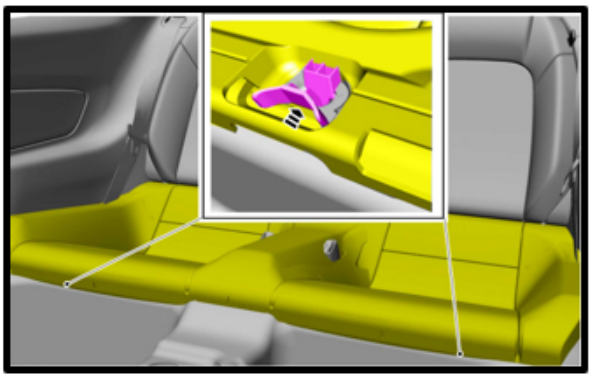
2. Using an air hose, blow off any loose dirt or debris from engine compartment. If overly dirty, steam clean the engine compartment before proceeding to the next step.

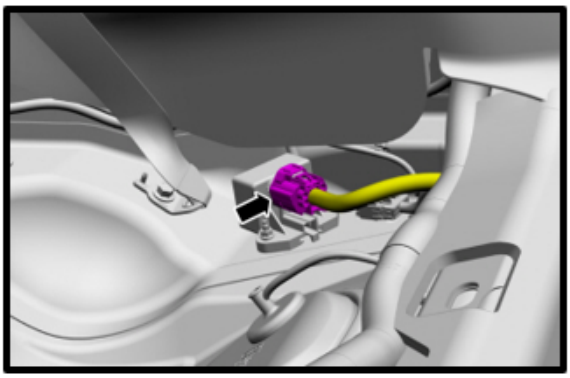
3. Release the fuel system pressure (NOTE: The following procedure is taken directly from the Ford Service Manual).

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: Never 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.

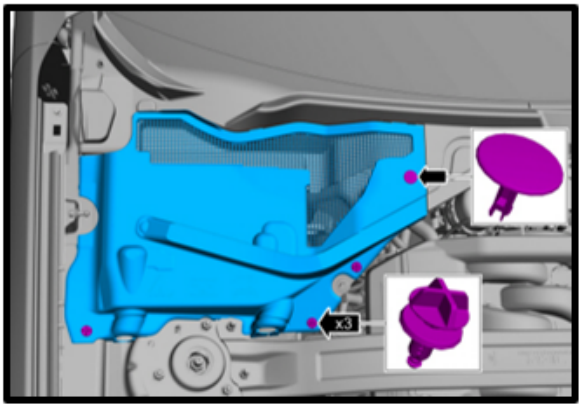
A. Remove the rear seat cushion.
B. Disconnect the factory FPDM (Fuel Pump Driver Module).
C. Start the engine and allow it to idle until it stalls.
D. After the engine stalls, crank the engine for approximately 10 seconds to make sure the fuel injector supply pressure has been released.
E. Turn the ignition switch to the OFF position. Reconnect the FPDM electrical connector.

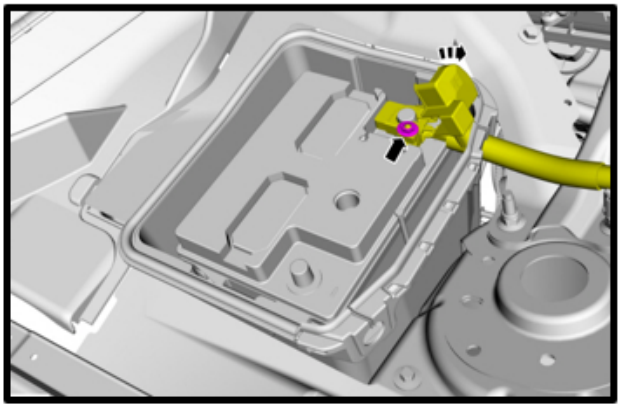




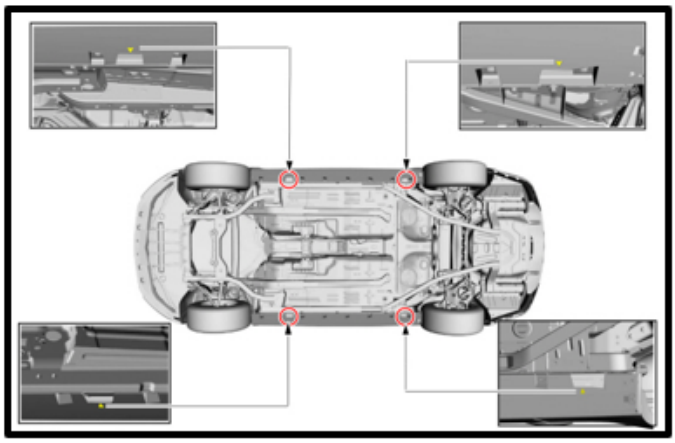
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4. Locate the battery. Remove the plastic cover, (1) retaining clip and (3) retaining nuts for battery access. With an 8mm wrench disconnect both (-) battery cables from battery. Make sure the cables are far enough away from the battery that it does not accidentally touch the battery and make connection during installation.

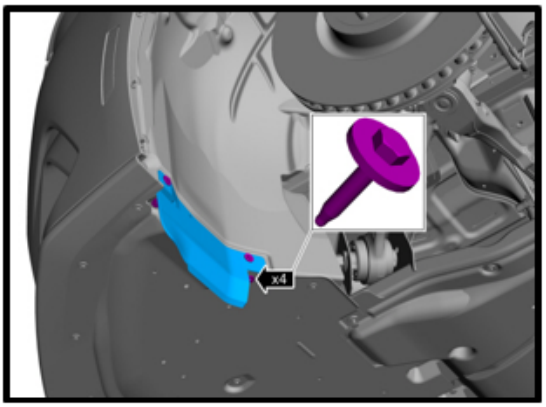




5. Lift the front of the vehicle using the Ford recommended lifting points and place on safety stands. It's recommended to remove the front wheels for easier access to front fascia.

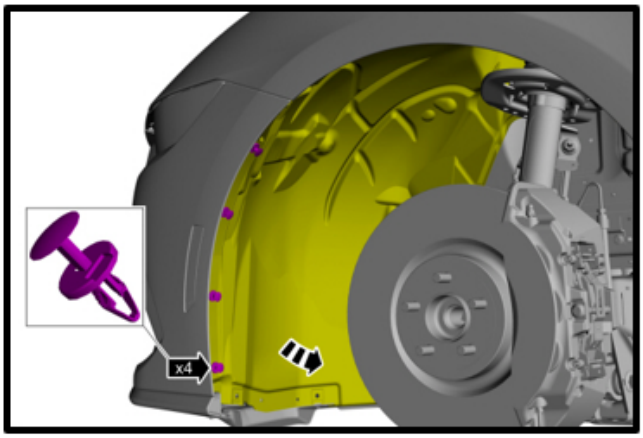


6. On both sides, remove the (4x) fasteners from body side front shield.

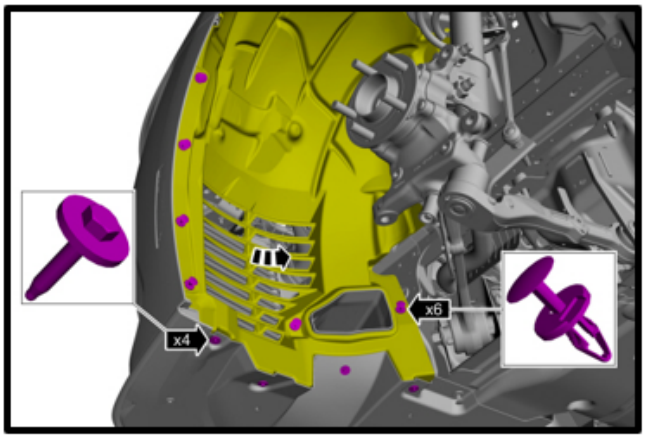


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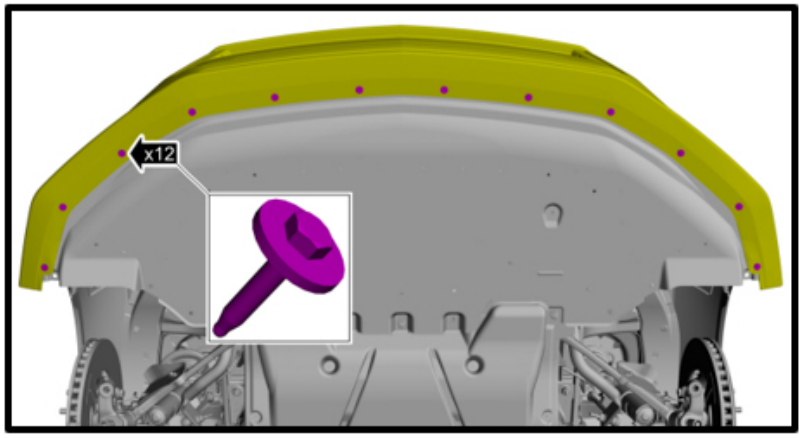
7. (**GT ONLY**) On both sides, remove the (4x) push pins and position aside the front fender splash shield.



8. (**DARK HORSE**) On both sides, remove the (4x) fasteners and (6x) push pins from front fender splash shield.

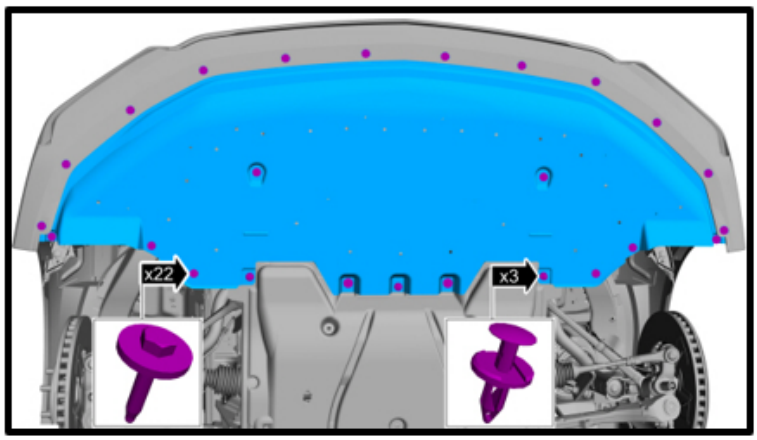


9. (**GT ONLY**) Remove the (12x) fasteners from the front chin splitter.

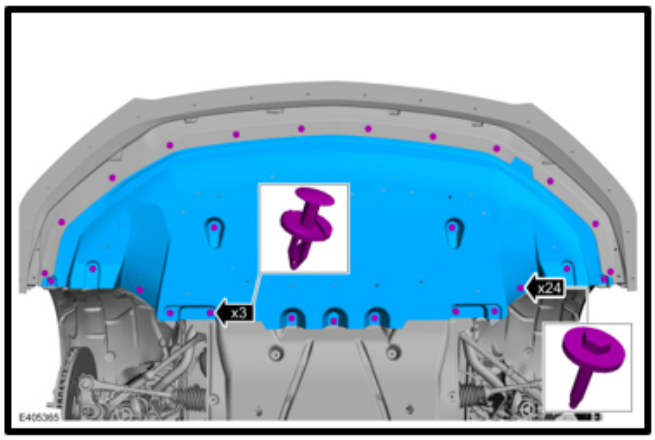


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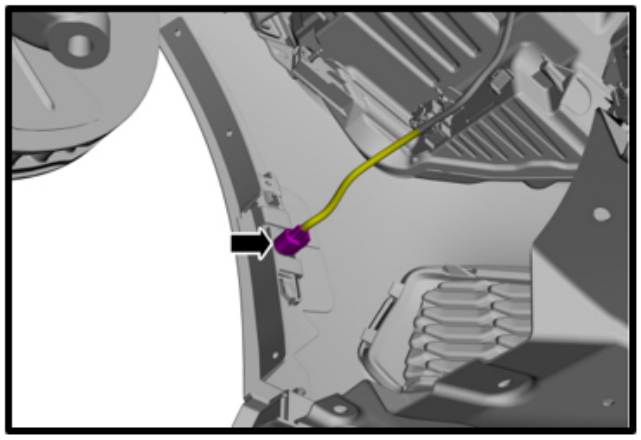
10. (**GT ONLY**) Remove the (22x) fasteners and (3x) push pin from the underbody shield. Remove shield from vehicle.



11. (**DARK HORSE**) Remove the (24x) fasteners and (3x) push pins from underbody shield.

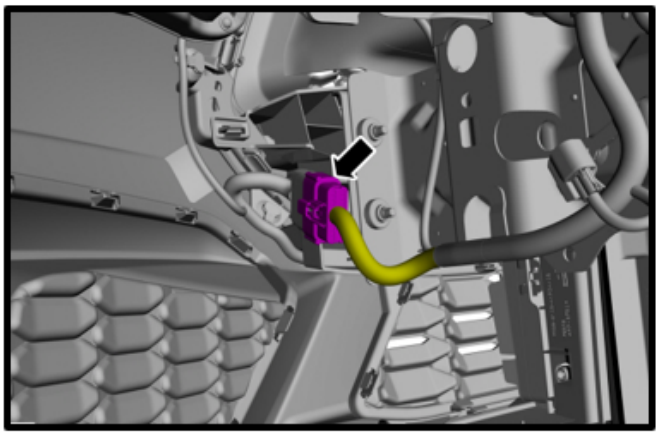


12. On both sides, disconnect electrical connector from front marker light.

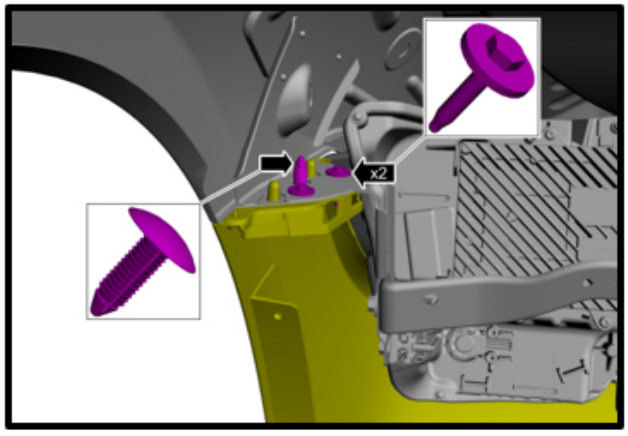


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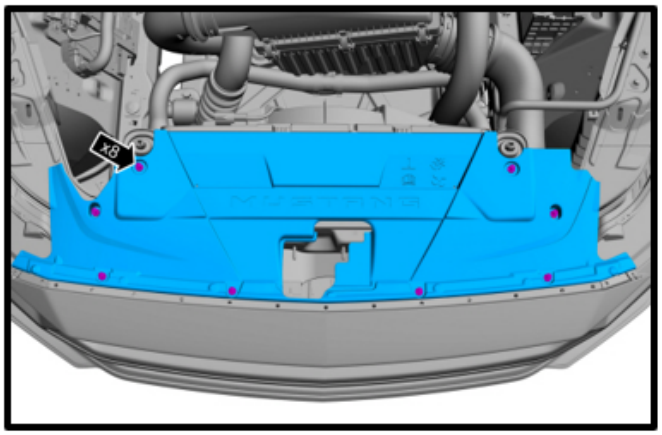
13. Disconnect the front bumper cover electrical connector.



14. On both sides, remove the front bumper cover to fender push-pin and the bolts.

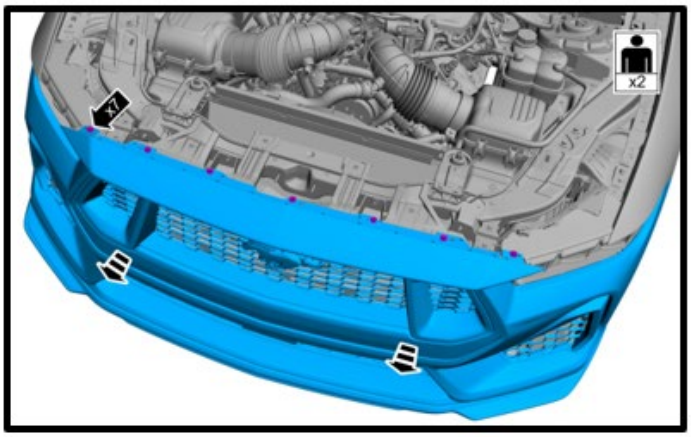


15. Remove the radiator sight shield by removing the (8x) push pins. Use a flat head screwdriver to pry the center head up. These will all be reused.

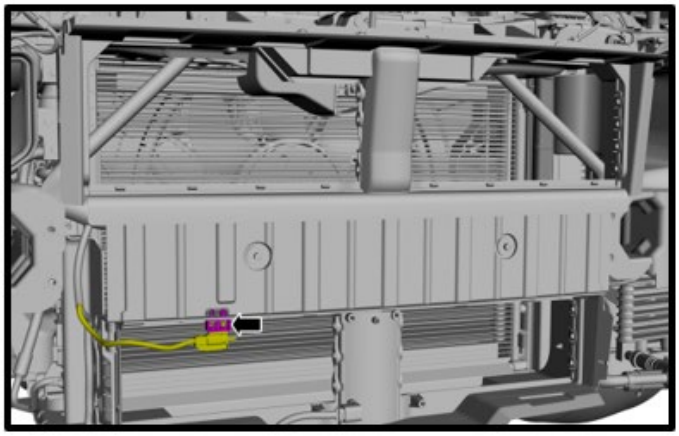


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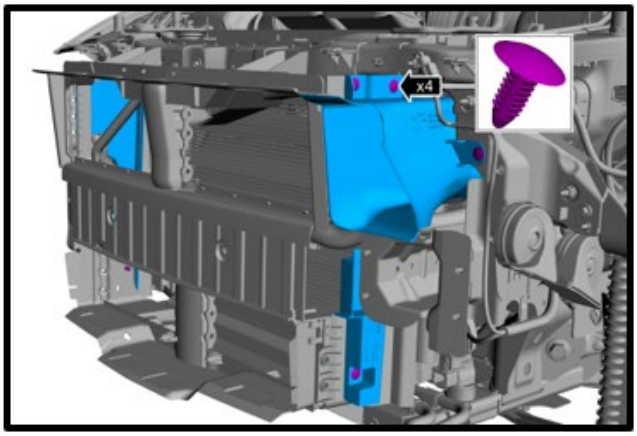
16. Remove the (7x) fasteners from fascia. Carefully pull the fascia forward.



17. If equipped, disconnect the ambient air temperature sensor.

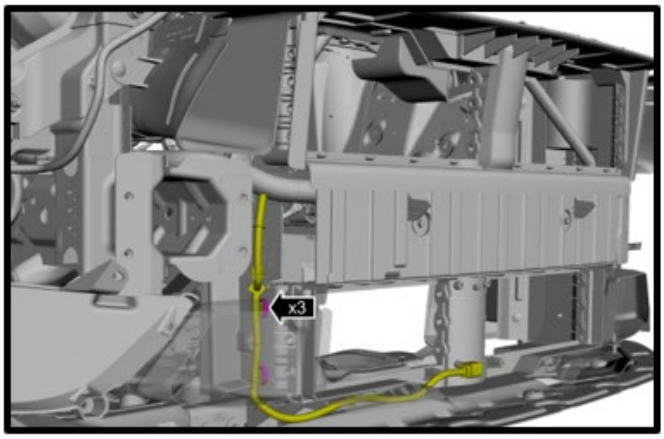


18. Temporarily remove the retainers (4x per side) from air ducts and remove ducts.

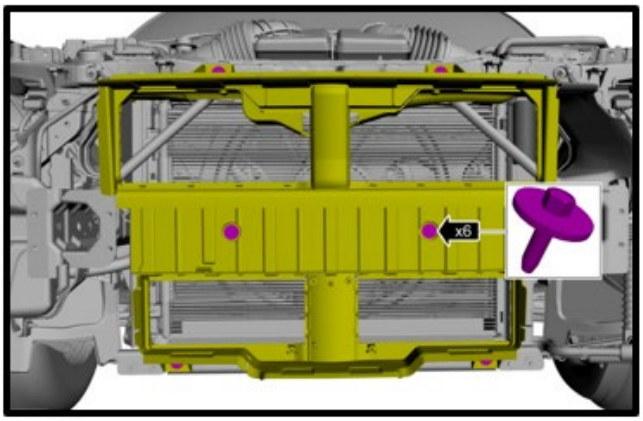


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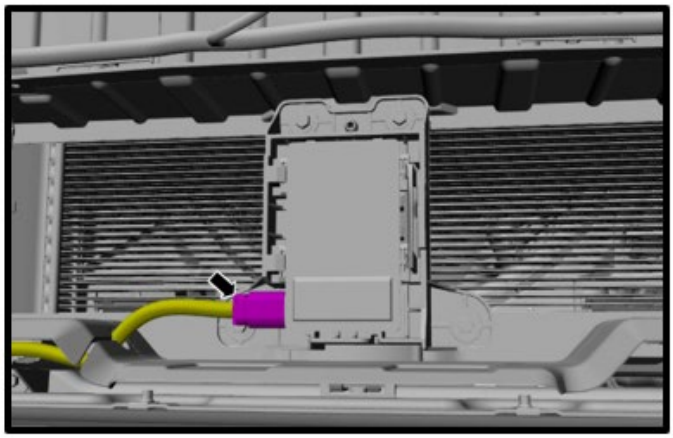
19. Detach wiring harness retainers (3x) and position aside.



20. Remove the (6x) bolts and position active grille shutter forward.

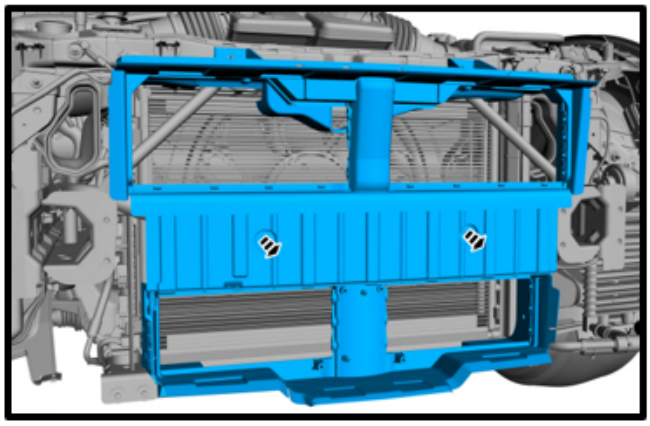


21. If equipped, disconnect the CCM wiring connector.

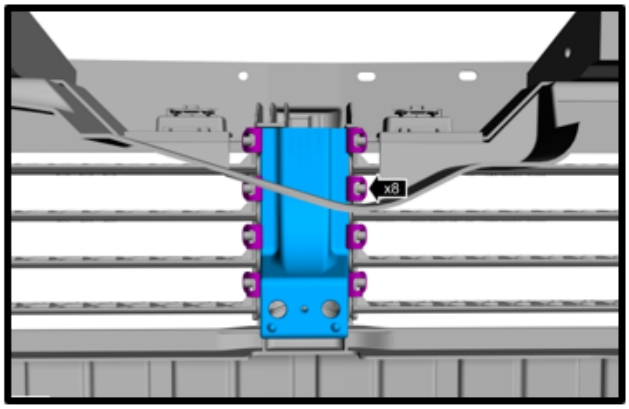


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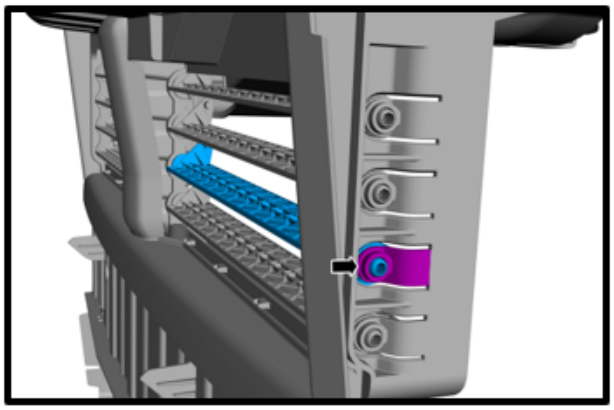
22. Remove the active grill shutter from vehicle.



23. **(Vehicles equipped with active shutter grilles)** Release the tabs and remove upper linkage.

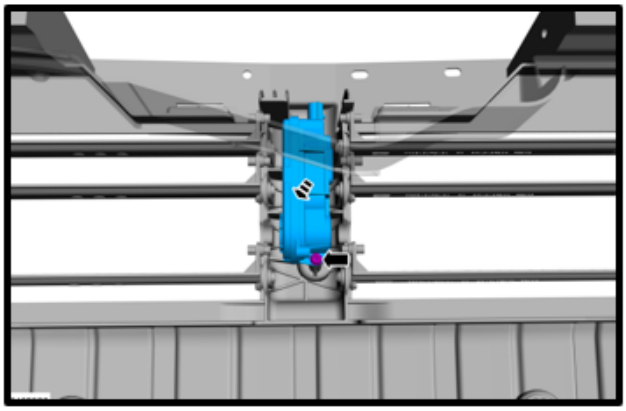


24. **(Vehicles equipped with active shutter grilles)** Release the tab and remove the vane. **NOTE:** These are no longer used.

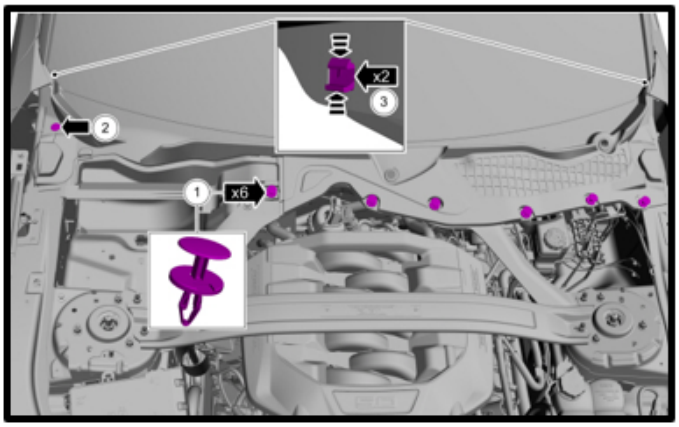


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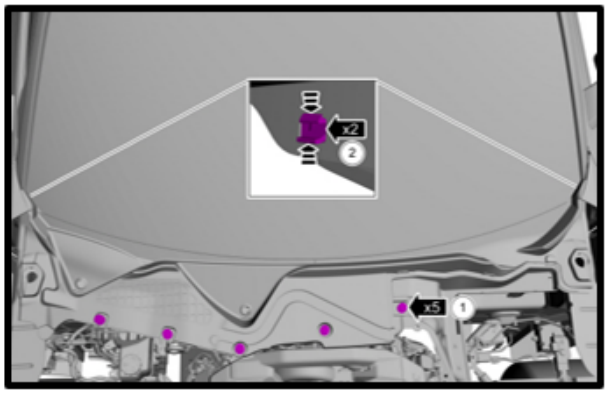
25. **(Vehicles equipped with active shutter grilles)** Remove the bolt and the active grille shutter actuator. **NOTE:** These are no longer used.

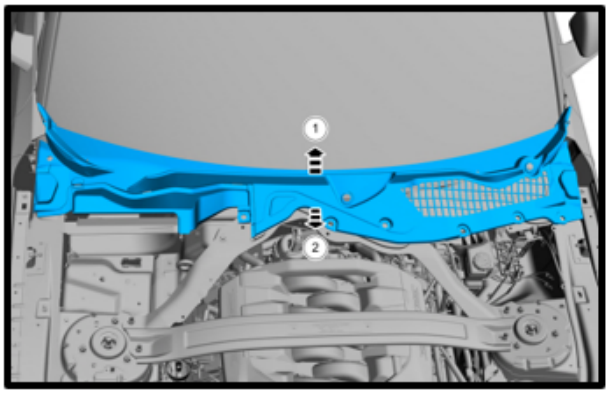


26. Remove the (6x) push pins (1), (2x) retainers (2) and depress and remove the clips (3) (2x).



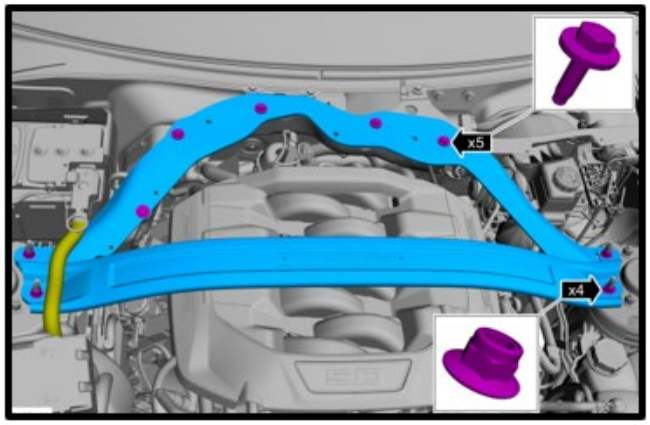
27. Remove the (5x) push pins (1) and depress the (2x) clips (2). Lift and then pull cowl panel grille out and remove.



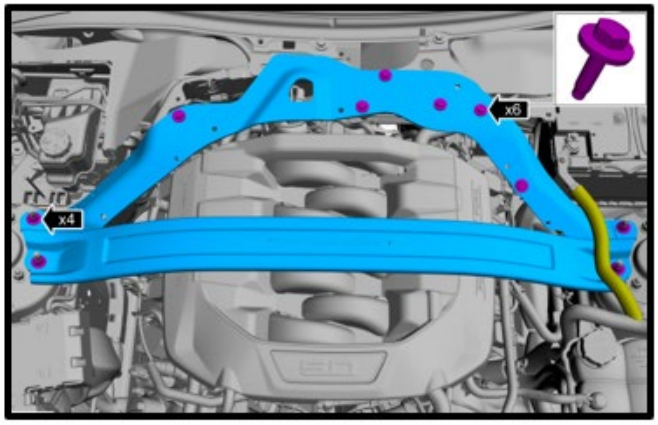


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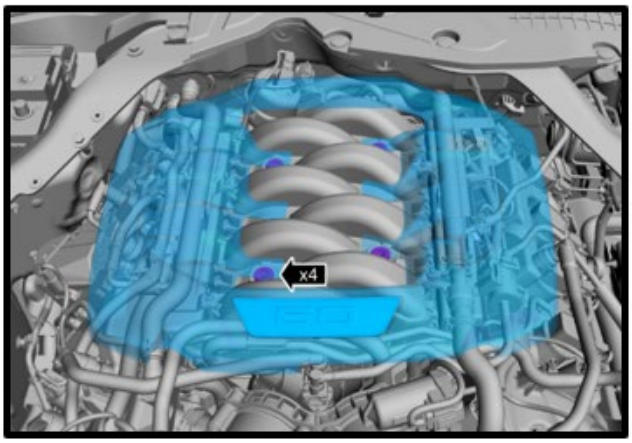
28. (**LHD ONLY**) If equipped, remove the strut tower brace by detaching the battery wire retainer. Remove the (4x) nuts and (5x) bolts. Reinstall factory nuts (4) and torque to 41 lbs-ft.



29. (**RHD ONLY**) If equipped, remove the strut tower brace by detaching the battery wire retainer. Remove the (4x) nuts and (6x) bolts. Reinstall factory nuts (4) and torque to 41 lbs-ft.

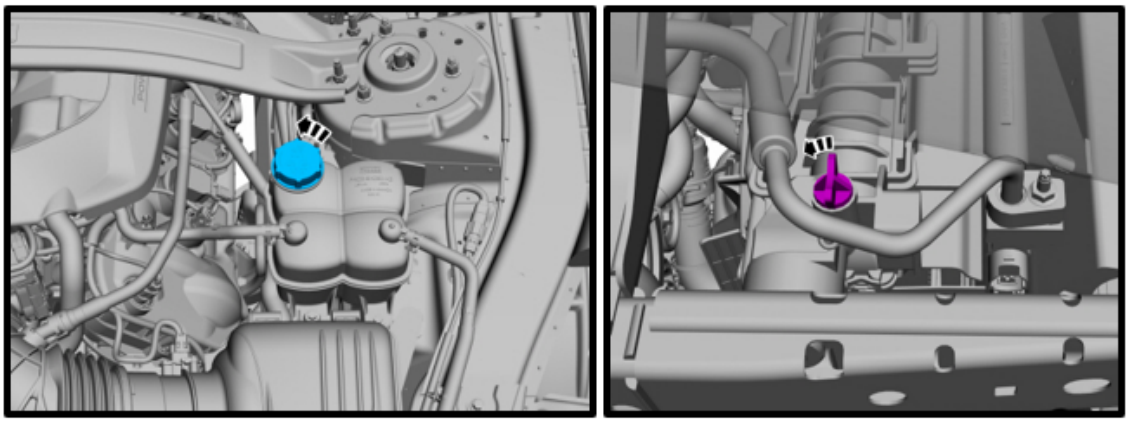


30. Lift and remove cover from the engine.

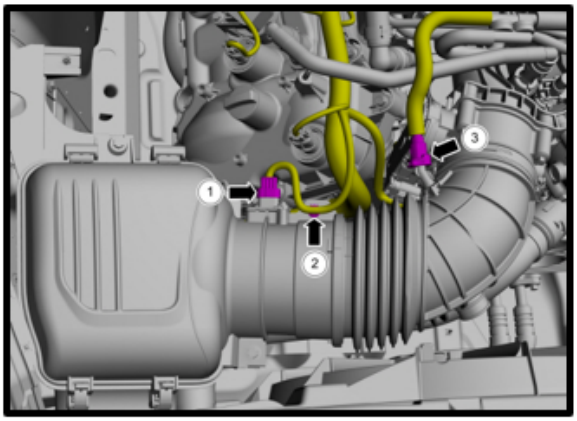


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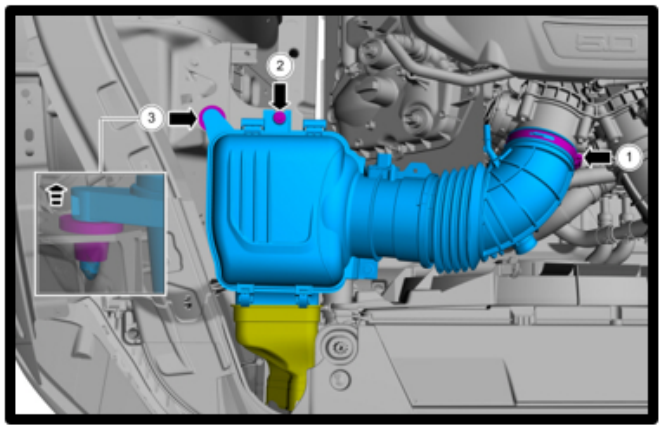
31. With a cool engine drain the coolant into a clean drain pan for reuse later. Remove the radiator cap to vent the system. (Be careful not to remove the radiator cap if the engine is still hot). The drain petcock is located on the passenger, bottom side of radiator. Loosen spigot using a ¾" wrench and drain into pan.



32. Disconnect the MAF sensor, MAF sensor retainer and remove make up air hose from air tube.

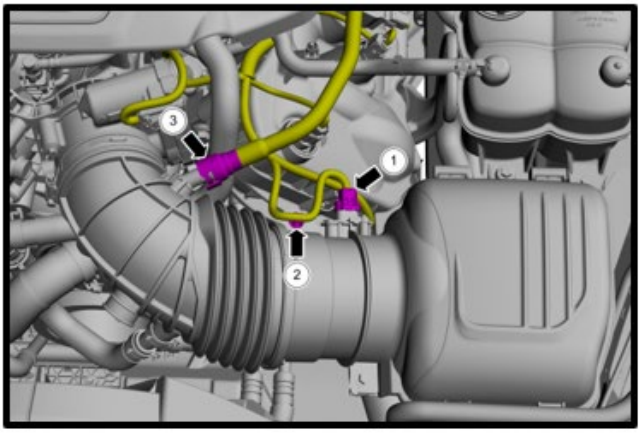


33. Loosen the hose clamp from throttle body using nut driver. Remove the air cleaner bolt. Detach the air cleaner from grommets and remove the air cleaner.

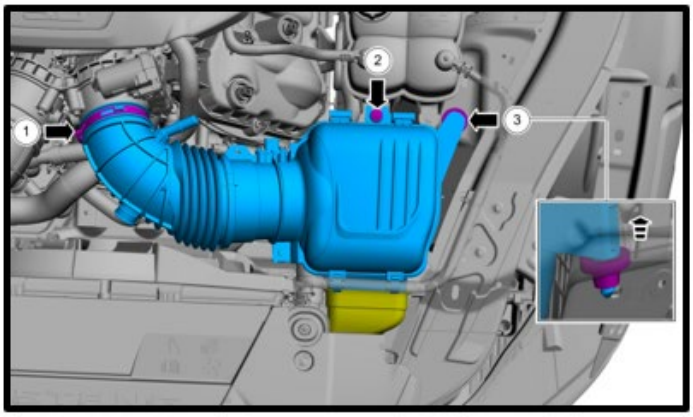


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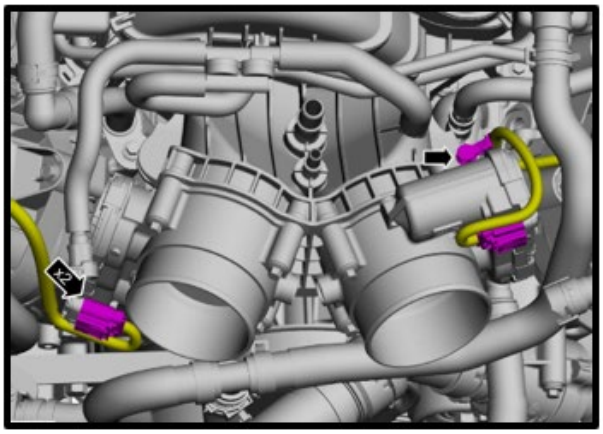
34. Disconnect the MAF sensor, MAF sensor retainer and remove make up air hose from air tube.



35. Loosen the hose clamp from throttle body using nut driver. Remove the air cleaner bolt. Detach the air cleaner from grommets and remove the air cleaner.

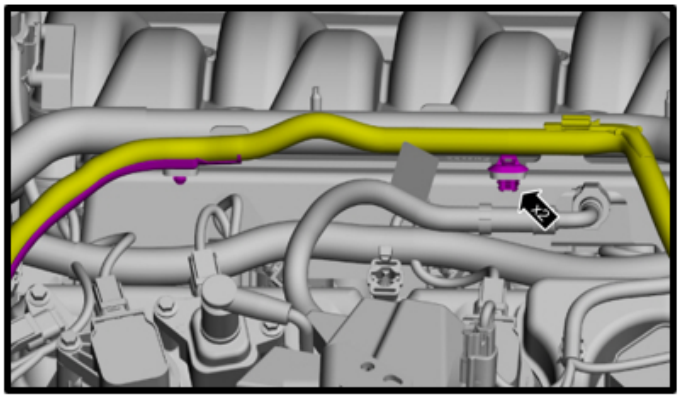


36. Disconnect the electronic throttle electrical connectors by pushing up on the safety lock and then squeezing the connector and pulling away. Remove the harness retainer from manifold.

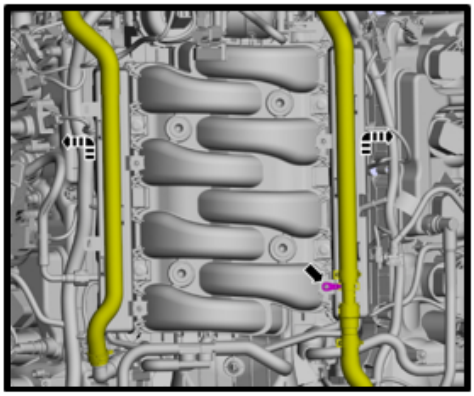


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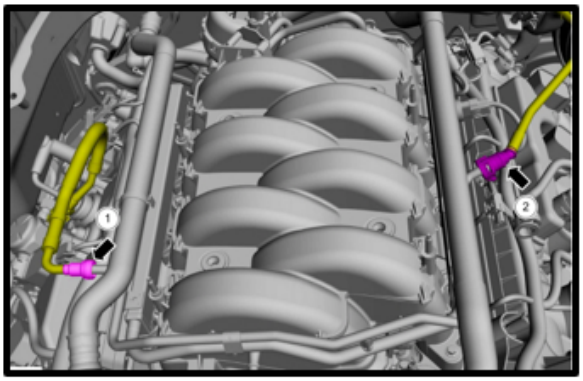
37. If equipped, detach the wiring harness retainers.



38. Detach the heater hose retainer. Remove the heater hose from both driver and passenger side of block by pulling locking tab back and pulling away. Position the heater hoses aside.

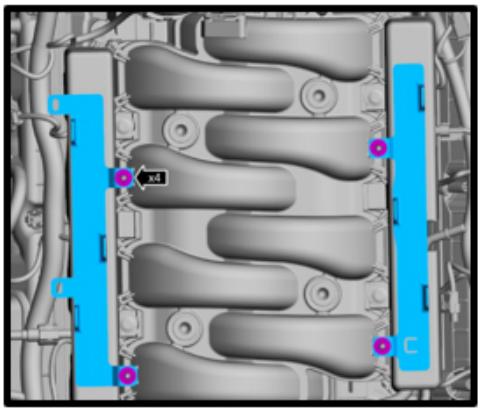


39. Carefully disconnect the factory fuel feed hose from the fuel rail. The fuel system may still have pressure, use protective eyewear and multiple rags to catch any possible fuel leak. To release, press the blue safety latch and pull the fuel fitting away from fuel rail. Using a 3/8" fuel line spring lock coupling removal tool, remove the DI pump fuel feed line from PI fuel rail. ***NOTE: THIS FUEL LINE HAS A CHECK VALVE, DO NOT FLIP ORIENTATION. DO NOT REMOVE FROM DI PUMP TO ELIMINATE CONFUSION. 90-DEG END ALWAYS CONNECTS TO FUEL FEED SUPPLY!***

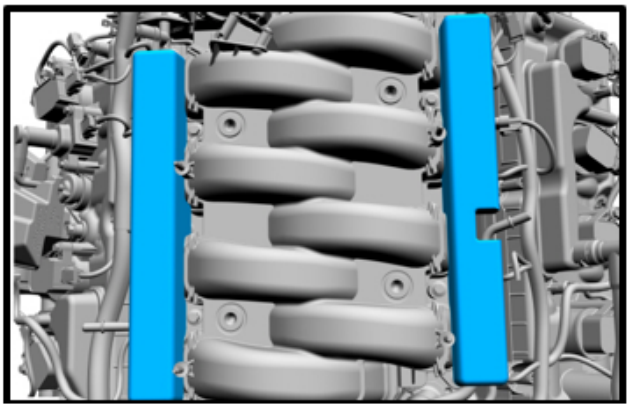


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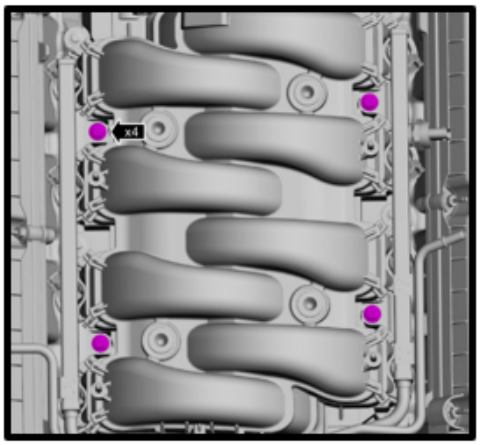
40. Remove the (4x) nuts from the top of the intake manifold, remove heater hose supports.



41. Remove the left and right fuel rail insulators, these will no longer be used.

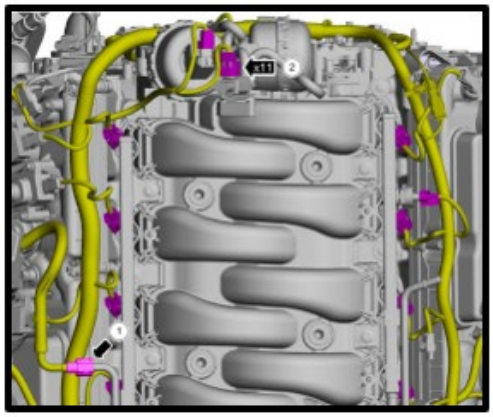


42. Loosen the (4x) bolts holding the fuel rails down, these go through to the cylinder head (10mm socket). Fuel rail does not need to be removed.

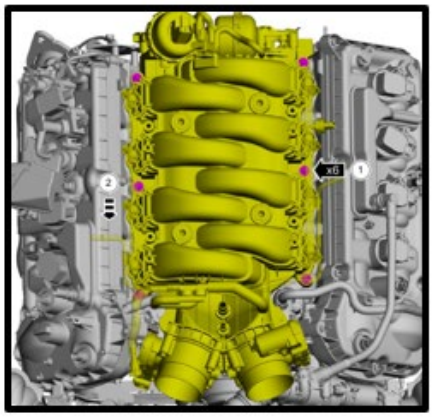


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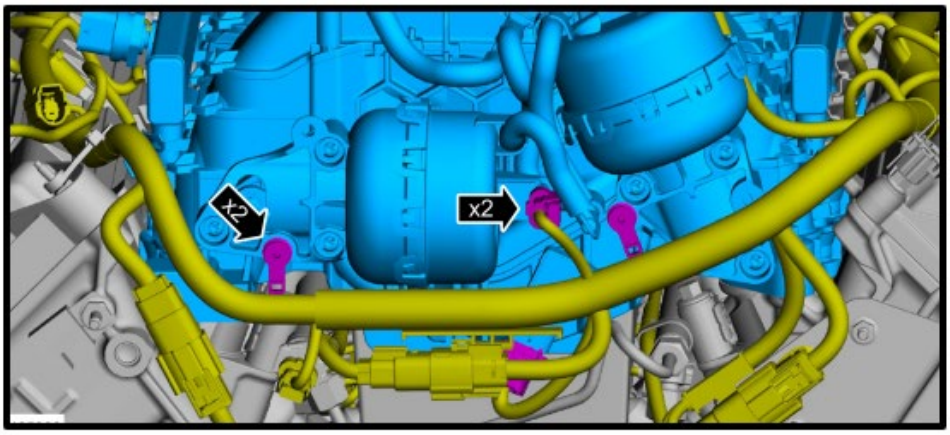
43. Disconnect the PI to DI fuel feed line from fuel rail (1). Remove the (11x) electrical connectors (2) (IMRC, fuel injectors, fuel port injector pressure sensor).



44. Loosen the (6x) manifold to cylinder head bolts using an 8mm socket. Position the manifold up and towards the front of the engine to access the rear of the manifold.

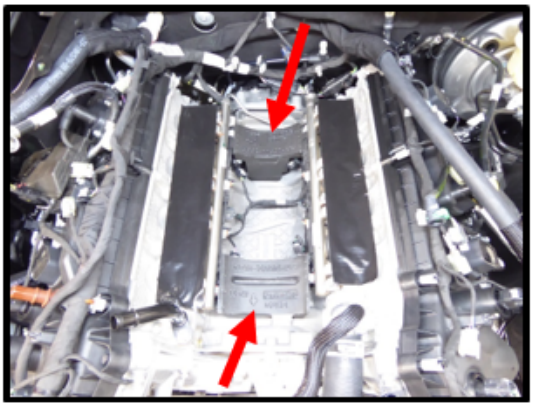


45. Disconnect the engine wiring harness electrical connectors and detach the retainers. Remove intake manifold.

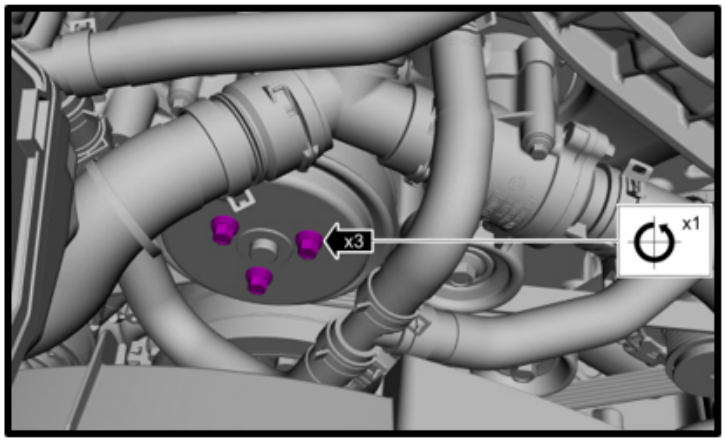


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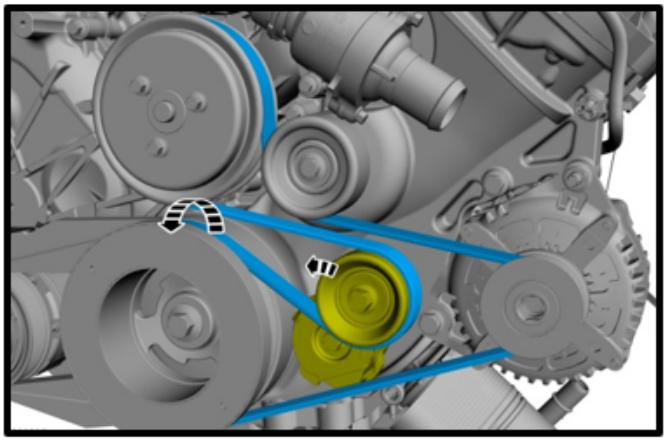
46. Remove the (2) foam inserts in the valley of the block. Clean the intake manifold to cylinder head surface using carb cleaner or acetone. Install tape over the exposed ports until manifold installation.



47. Loosen the (3x) bolts securing the water pump pulley (while belt is on) using a 10mm socket.

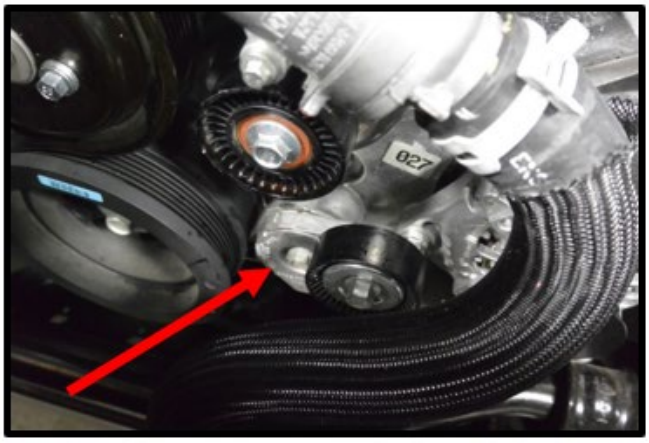


48. Remove the belt from the engine by using a 15mm socket on a ½" breaker bar and rotating the spring-loaded tensioner in a clockwise direction.

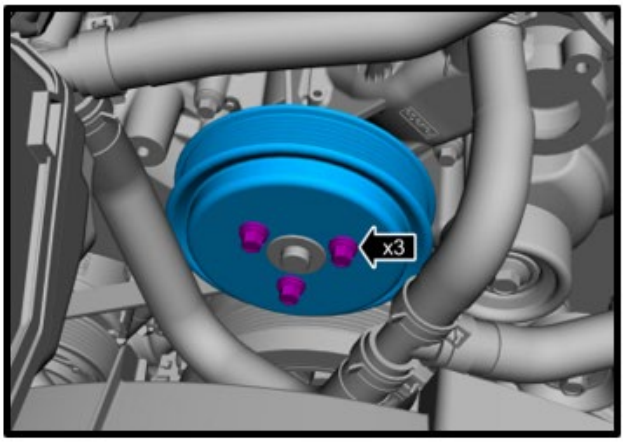


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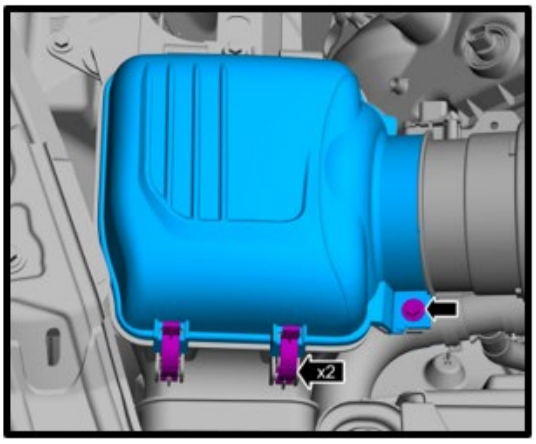
49. Remove the spring-loaded tensioner from the engine using a 13mm socket.



50. Remove the water pump pulley using a 10mm socket (this will be reused).



51. Remove the stock air box lid and MAF housing from airbox by unclipping the (2x) clips and the (1) bolt.



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52. **Gap the supplied sparkplugs to .031".** Only use a .31" feeler gauge, any other method will lead to inconsistent results. **DO NOT CRUSH THE ELECTRODE!!** Install the supplied Ford Performance **M-12405-M50A** spark plugs. Apply a light amount of anti-seize to threads. Torque spark plugs to 128lbs-in. Reinstall the coils on plugs and torque bolts to 53lbs-in. The new spark plug maintenance schedule becomes **20K miles**.

USE OF ANY OTHER SPARKPLUGS WILL VOID WARRANTY, AS SYSTEM DAMAGE MAY OCCUR!!



53. Remove stock pinch clamp and water neck hose from stock water neck.

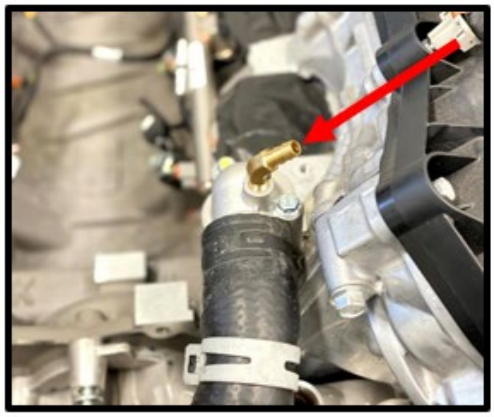


54. Loosen water Y junction. Remove water neck by removing the (2x) fasteners.



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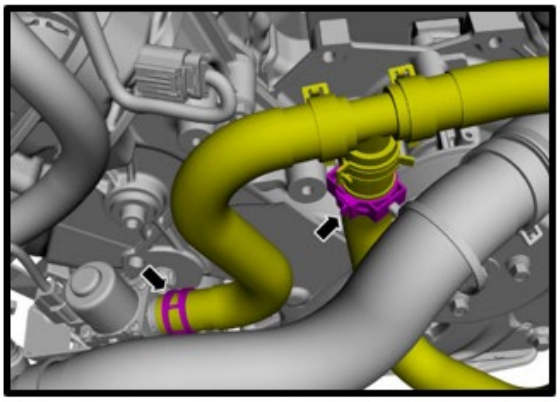
55. Transfer stock oring from stock water neck to new water neck. Apply pipe sealant to threads of 1/8" NPT to 5/16" 45 Deg fitting. Install fitting to water neck, rotate so it ends facing directly towards driver side. Install water neck to motor using stock fasteners (10mm socket), torque to 89 lbs-in.

56. Trim the reservoir vent line right at the ENG printing on hose. Reinstall stock hose to new fitting. Secure with supplied #4 clamp.

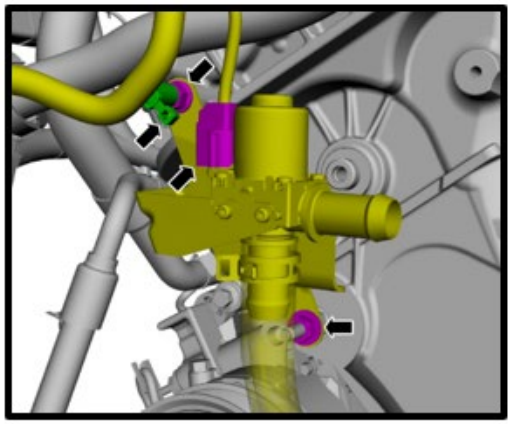



57. (**Auto Transmission**) Release the hose clamp from transmission fluid valve and hose facing down from tee. Remove plastic hose retainer from oil cooler solenoid hose.

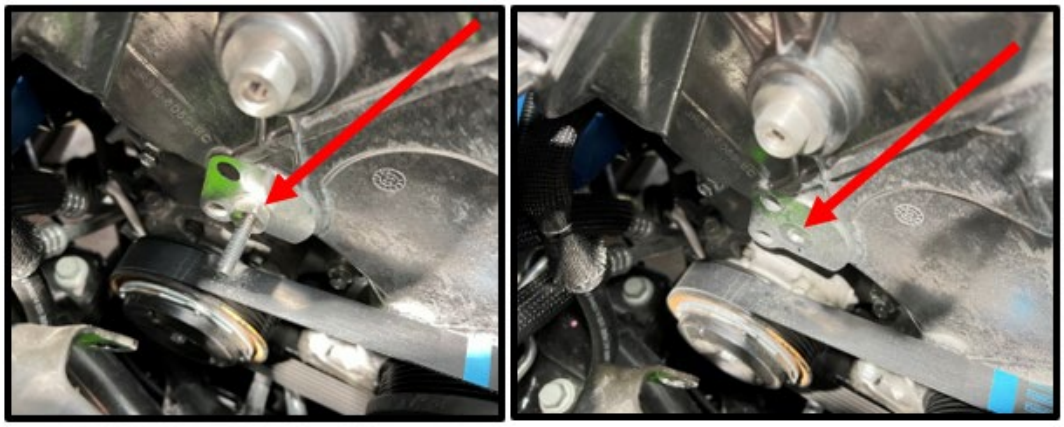


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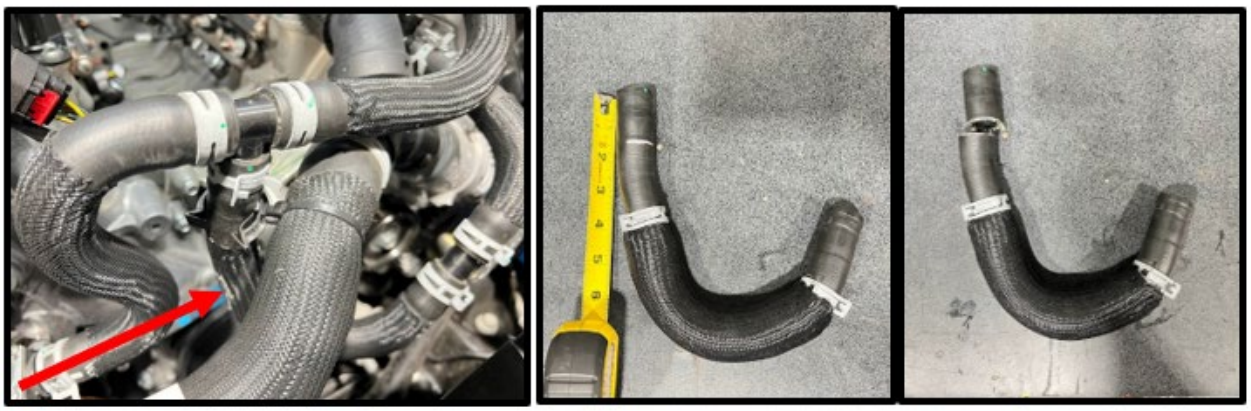
58. (**Auto Transmission**) Detach wiring harness retainer from transmission fluid valve bracket. Disconnect valve 2-way connector. Remove the fasteners to remove valve from engine.



59. Remove stud from engine timing cover, this will not be reused.

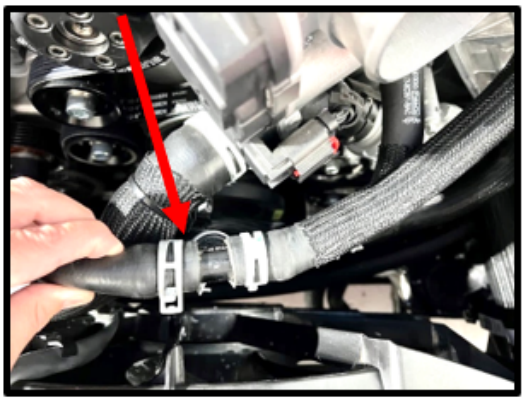
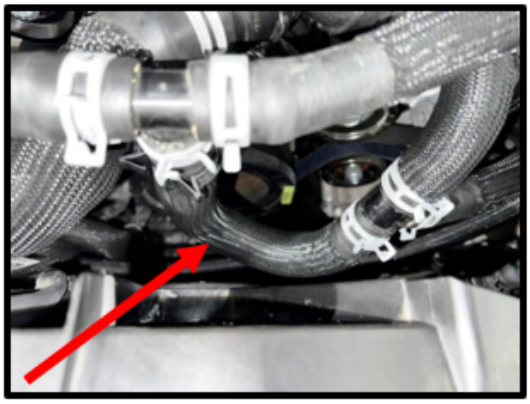


60. (**Auto Transmission**) Remove the U shape hose from the factory tee's. Cut 1 3/4" from the long end as shown.

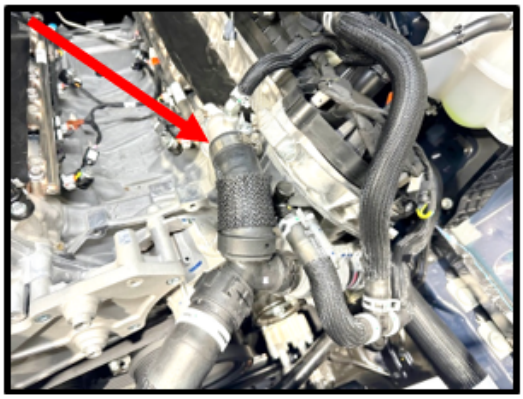


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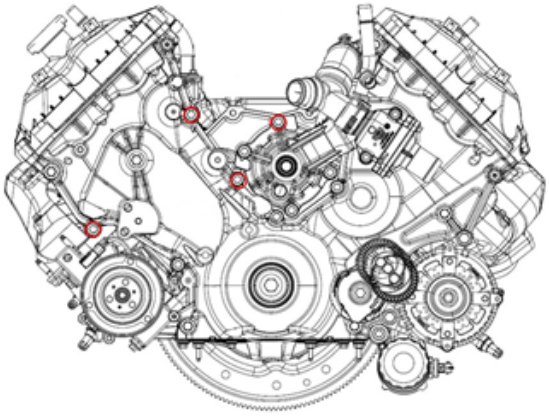
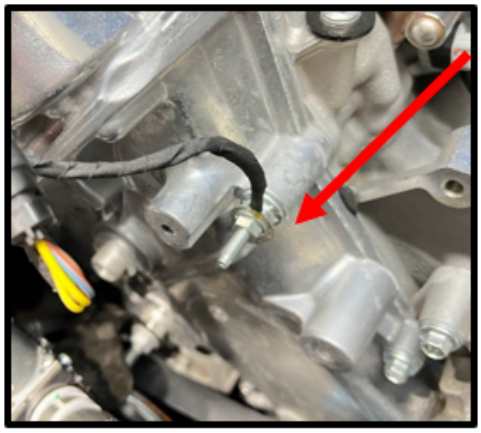
61. (**Auto Transmission**) Connect U shape hose back to stock tees, install/position to **FRONT** side of radiator hose (this stops it from getting to water pump pulley. Rotate the factory hose retainer and connect to this hose to secure in place.

62. Using 5/16" nut driver, secure hose using supplied #24 hose clamp. Rotate the clamp at water neck towards the driver side for future clearance of the SC.



63. Using 10mm socket, remove the (3x) factory fasteners from the timing chain to head cover and (1x) from water pump (for new idler plate), this includes the factory ground wire/eyelet.

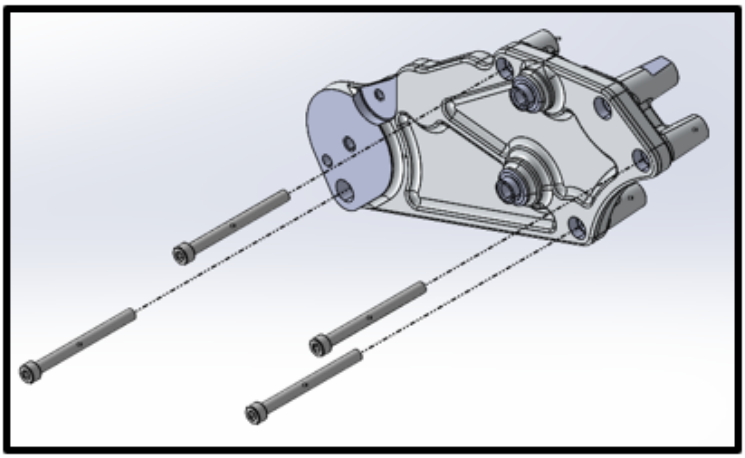



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64. Using 10mm socket, remove the stock fastener (1x) from the top of the RH timing chain cover. Relocate stud with ground wire to the top timing chain cover location. Torque to 22 lbs-ft.



65. Use supplied (4x) 8mm x 90mm in the (3x) lower holes 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.

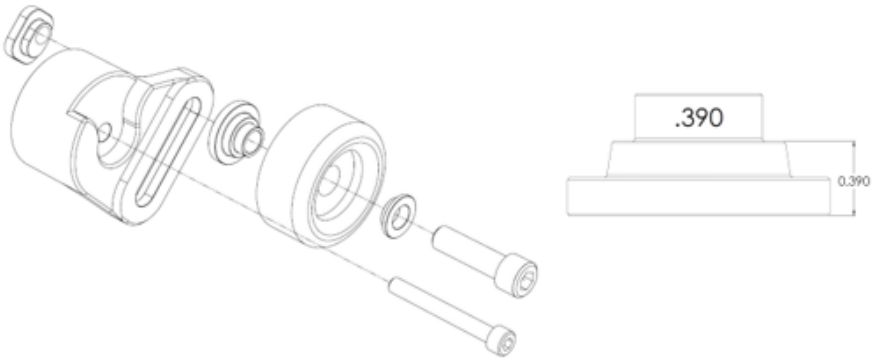


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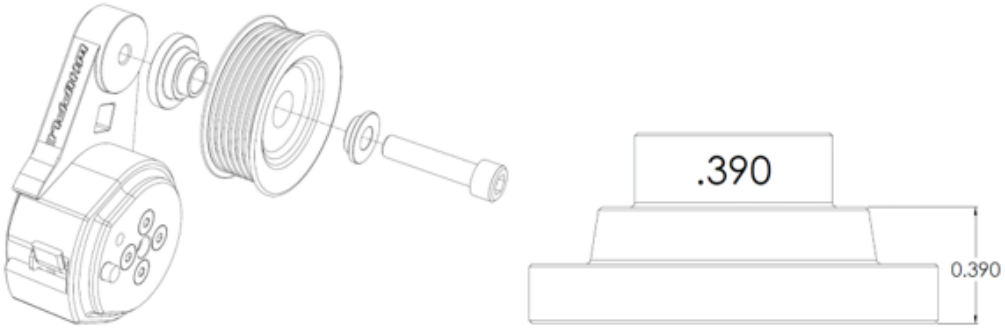
66. Install supplied adjustable idler assembly to factory spring loaded tensioner position. Locate the dowel pin to factory pin hole. Secure to engine using the stock bolt, torque the factory bolt to 35 ft-lb. Install supplied smooth idler pulley to supplied bracket, use supplied (**.390"**) step spacer against the adjustable idler bracket. Sandwich the smooth idler pulley (**#36101**) to step spacer and supplied step washer to front side of idler. Install supplied "tee" nut to the back side with the offset hole facing the driver side. Secure with the supplied ½"-13 x 1 ¾" SHCS. **TIP:** Use light amount of anti-seize on threads of supplied bolts.





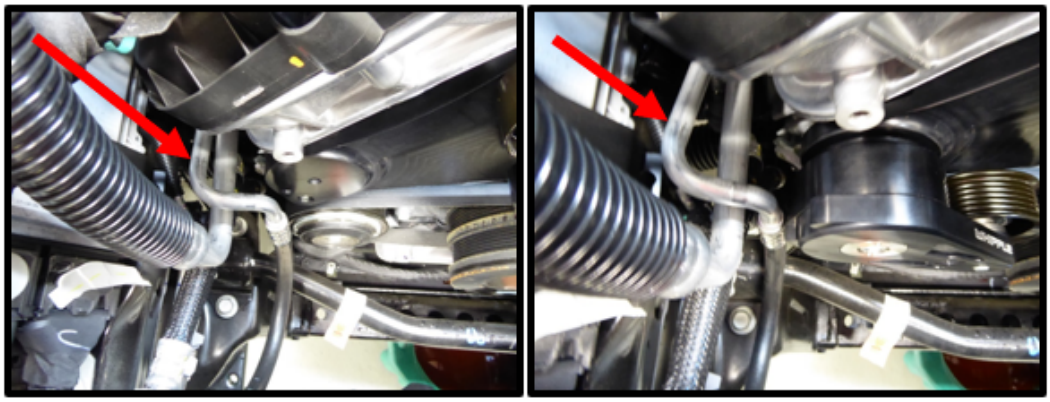


67. Assemble spring-loaded tensioner by mounting supplied spacer with female register to tensioner. Install grooved idler pulley (**#36326**) to tensioner and (**.390"**) step spacer. Use supplied step washer to front face of pulley bearing and (1x) 10mm x 40mm SHCS (***10-Rib uses 10mm x 60mm SHCS***) bolt. Use light amount of anti-seize on threads. Torque to 18 lbs-ft. **NOTE:** Verify you're using the proper spacer as shown.

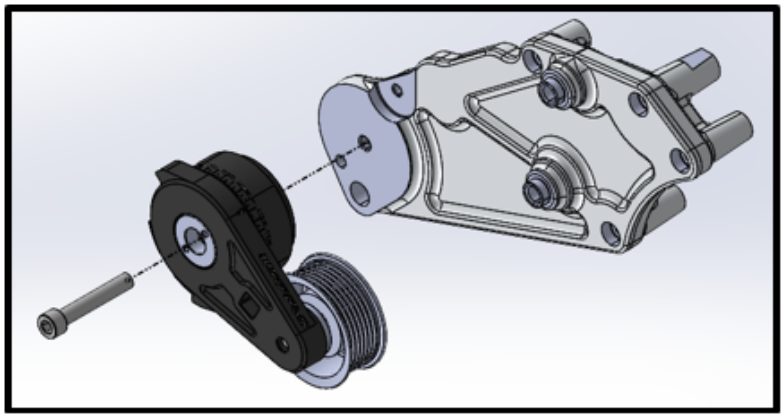


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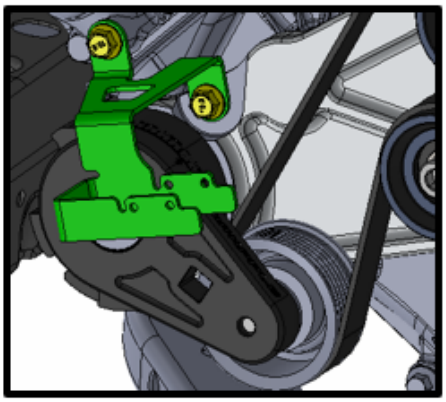
68. Carefully bend the factory AC line down and towards passenger side. Install spring loaded tensioner to plate to check clearance. You should have a minimum of 3/8" of clearance from the tensioner to the AC line.



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

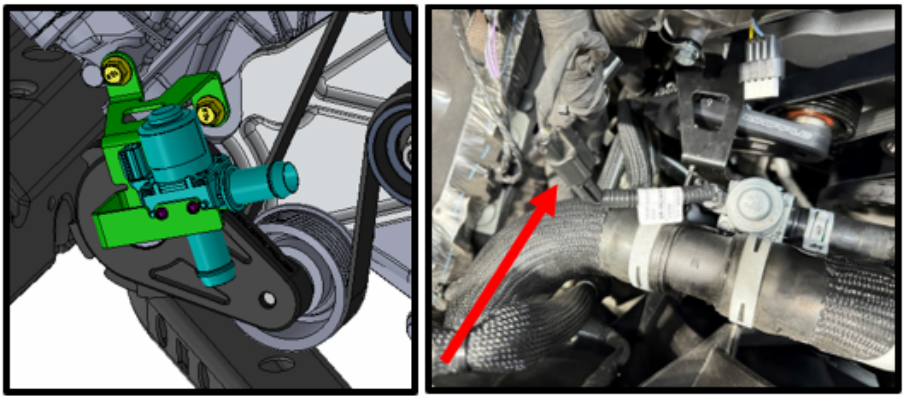


70. (**Auto Transmission**) Install supplied trans cooler solenoid bracket to the tensioner plate and engine block using (2x) 8mm x 20mm HHFCS. Torque to 120 in-lbs.

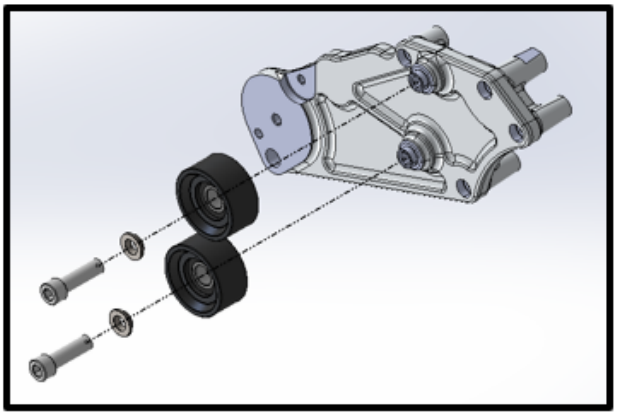


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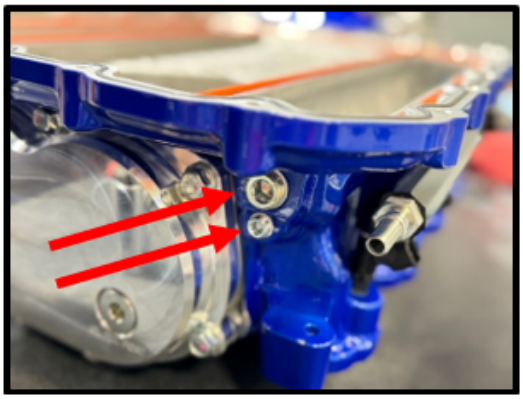
71. (**Auto Transmission**) Mount trans cooler solenoid to the supplied bracket using (4x) stock fasteners. Connect extension harness to stock connectors.



72. Install supplied (2x) smooth aluminum idler pulleys (**#3102717**) to the idler plate. Secure using the (2x) step washer through front of bearing and (2x) ½"-13 x 1 ¾" SHCS (with light amount of anti-seize on threads) bolts. Torque to 30 lbs-ft. using a 3/8" allen socket.



73. Apply light amount of pipe sealant to supplied 1/8" and 3/8" NPT plugs. Install in rear open ports of supercharger. NOTE: Boost gauge could be used here.

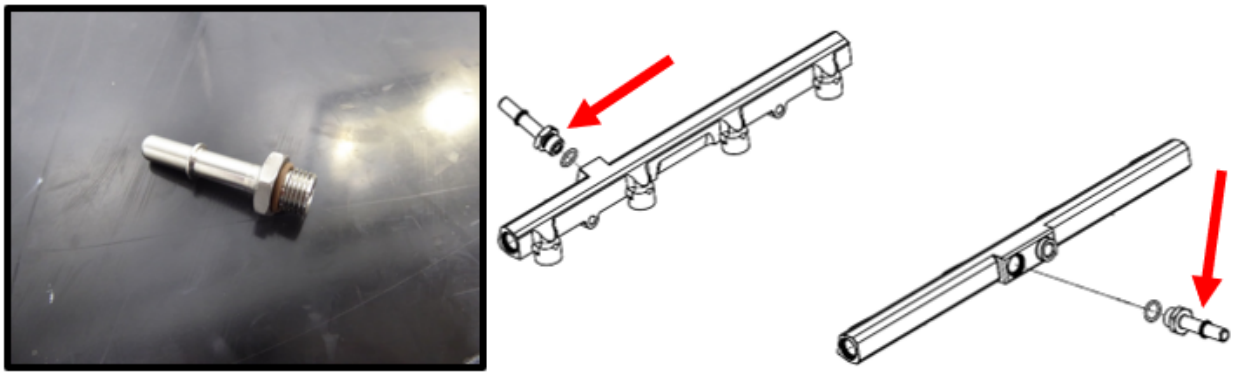


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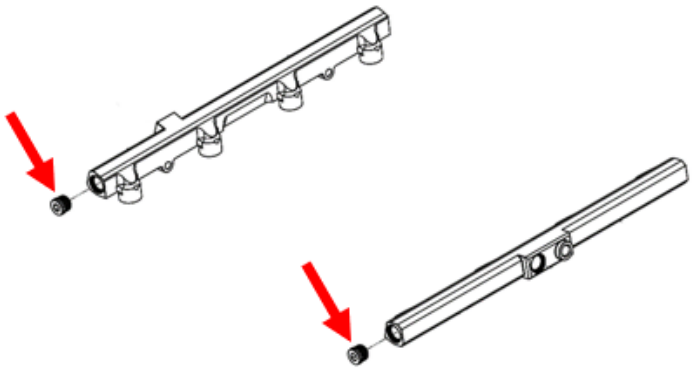
74. Using 27mm socket, remove the fuel PSI sensor from the factory fuel rail. Using 27mm socket, remove fuel PSI sensor from factory fuel rail. Install factory fuel PSI sensor to the fuel rail using a 27mm socket. Torque to 53 lbs-in, then an additional 25-degree rotation. **NOTE: Never use sealant on these threads.**



75. Install supplied (2x) #2-906 Viton oring to (2x) 45mm long 9.49mm fuel fittings. Apply light amount of grease to oring for ease of installation and install fitting. Install fittings, one per rail.

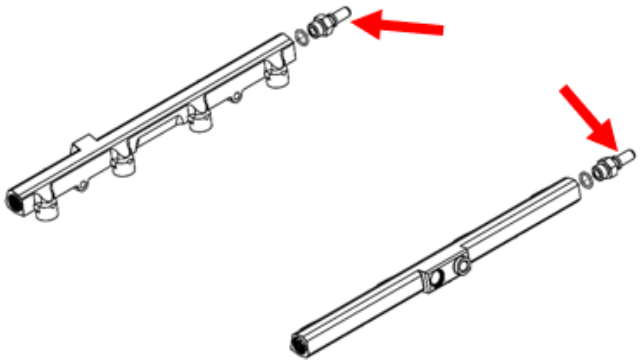


76. Apply light amount of grease to -6 ORB plugs, install the supplied (2x) -6 ORB plugs to front fuel rail ports.

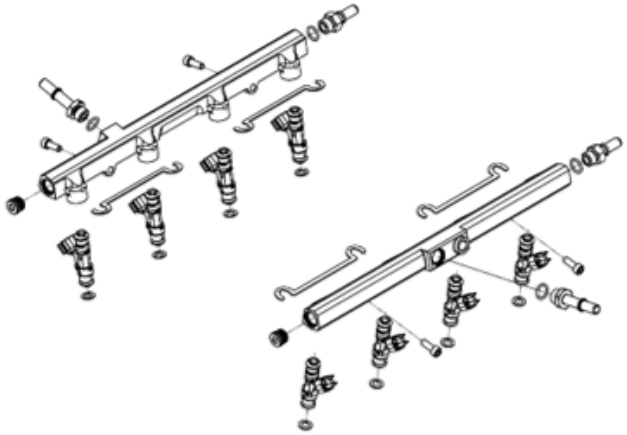


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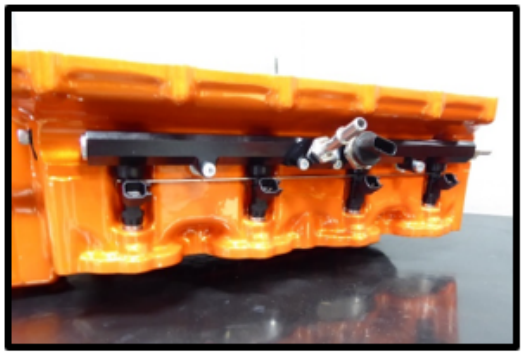
77. Install supplied (2x) #2-906 orings to (2x) -6 ORB to 9.49mm short fittings. Install the (2x) fittings into rear side of fuel rails. Apply light amount of grease to oring for ease of installation. Using a ¾" wrench (or ¾" deep socket) on both the front and rear fittings, tighten both.



78. Install fuel injectors to the fuel rail, apply generous amount of grease to oring for easy installation. Install supplied fuel injector position lock bracket to clock the supplied fuel injectors into proper position. While installing lock bracket, secure fuel injectors so it doesn't add pressure to injector body. **CAUTION:** ***Failure to clock the injector correctly can cause severe running issues.***

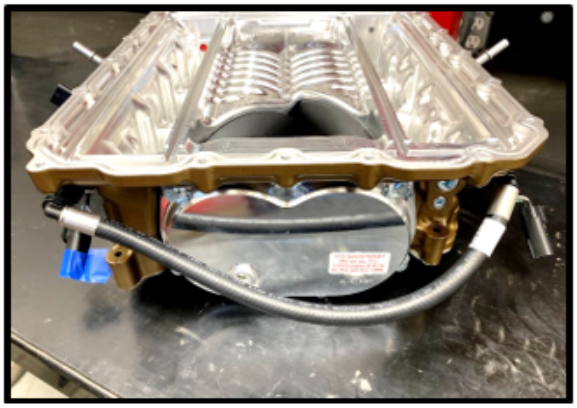


79. Apply generous amount of grease to injector orings for ease of installation. Install supplied fuel injectors, rails and lock bracket to intake manifold, secure with the (4x) 6mm x 16mm SHCS using a 5mm allen socket. Use **Blue Loctite #243** on the threads of each bolt. Torque to 90 lbs-in.

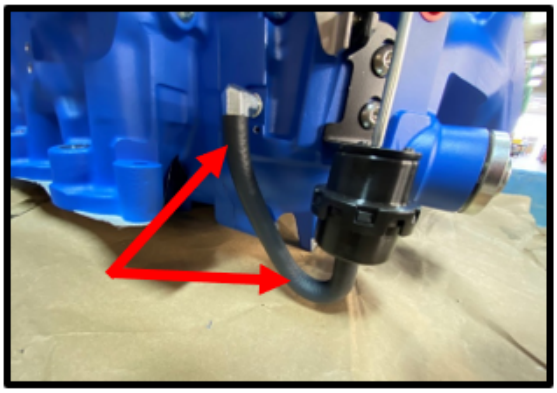


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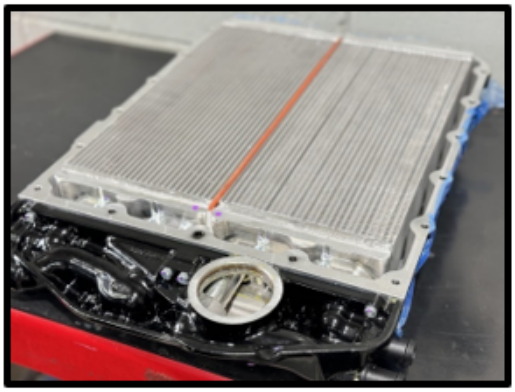
80. Install supplied 3/8" fuel cross over line around back of the supercharger by pressing until they click and lock in place. ***NOTE:** The 90deg end goes to **LH** side.



81. Install supplied ¼" ID bypass actuator to bypass nipple and ¼" 90deg nipple on SC inlet. **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.

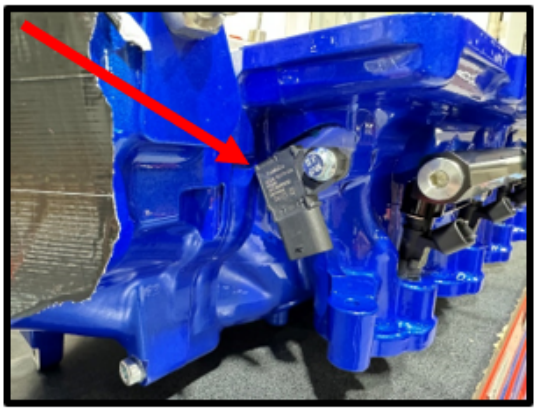


82. Using a 10mm socket, remove the (4x) 6mm flanged hex bolts securing the supercharger lid to housing. Remove the lid from the housing. Set the lid and intercooler assembly on a padded surface so no damage can occur to intercooler cores or top surface.



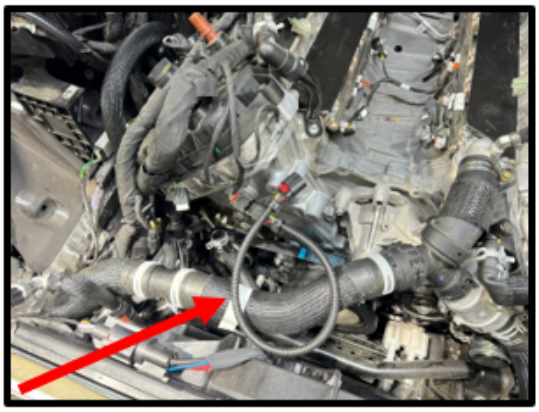
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83. Install supplied 3-bar TMAP sensor to the front of the intake manifold using the supplied (1x) 6mm x 20mm SHCS with (1x) 6mm AN washer, apply light amount of **Blue Loctite #243** to the threads. Apply generous amount of grease to oring for easy installation. Torque to 65 in-lb.

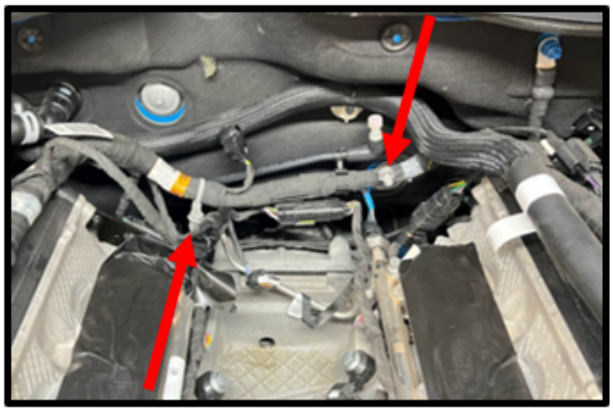


84. Install supplied electronic throttle pigtail to the factory **RH/PASSENGER SIDE** electrical connector. Push until it locks in place, then lock the safety lock. Route to **LH** side of vehicle for later connection to throttle body. **TIP:** When pressing together, hold the wires and connector to ensure the wires cannot come loose during connection.





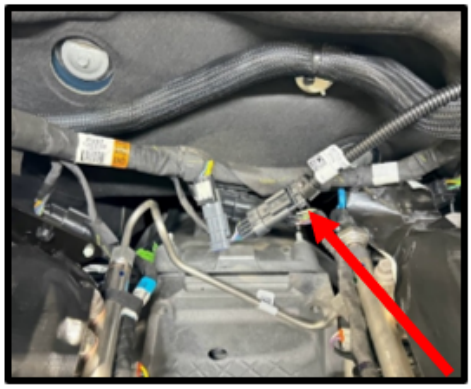
85. Remove plastic harness retainers from loom at the back of the engine.



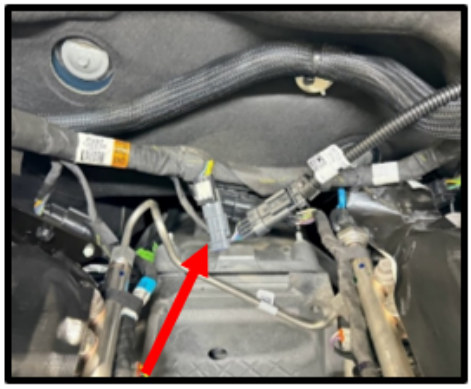
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86. Install supplied TMAP pigtail to stock connector at rear of engine. Route to **LH** side of vehicle for later installation to supplied 3-Bar TMAP sensor.





87. Install supplied IMRC electrical connector plugs (2x). Zip-tie to harness.



88. Install supplied wiring plug (1x) to the **LH** throttle electrical connector. Zip-tie harness away from belt system.

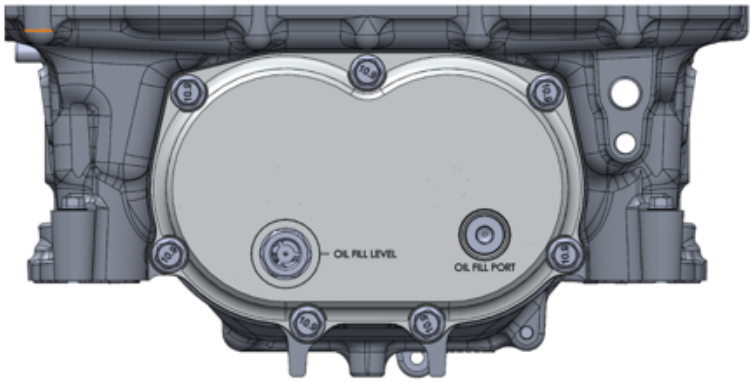


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89. Install supplied (8x) manifold orings to the Whipple intake manifold to cylinder head surface, apply light amount of grease to ease installation.



90. Make sure the supercharger is on a flat surface. Remove the oil fill plug using an 8mm allen socket.
    - Fill the compressor to the **MIDDLE** of the sight glass (**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.

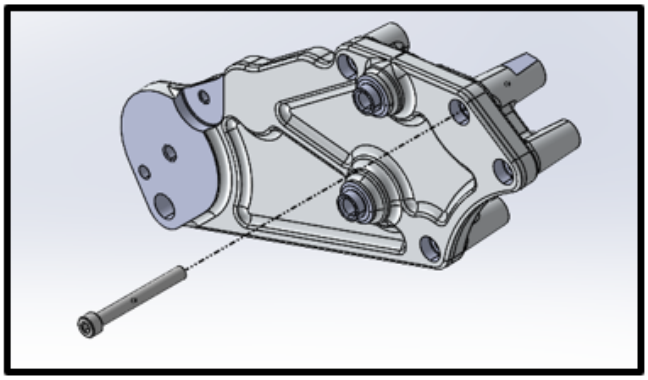


91. Install supercharger housing (without lid) to the engine. Use the supplied (4x) 6mm x 45mm HHFCS on the outer bolt holes and (6x) 6mm x 75mm HHFCS bolts with the supplied (6x) #2-009 orings on the bolt, under the head to the inner bolt bosses. Use **Blue Loctite #243** on the threads of each bolt. **Leave hand tight for now**.

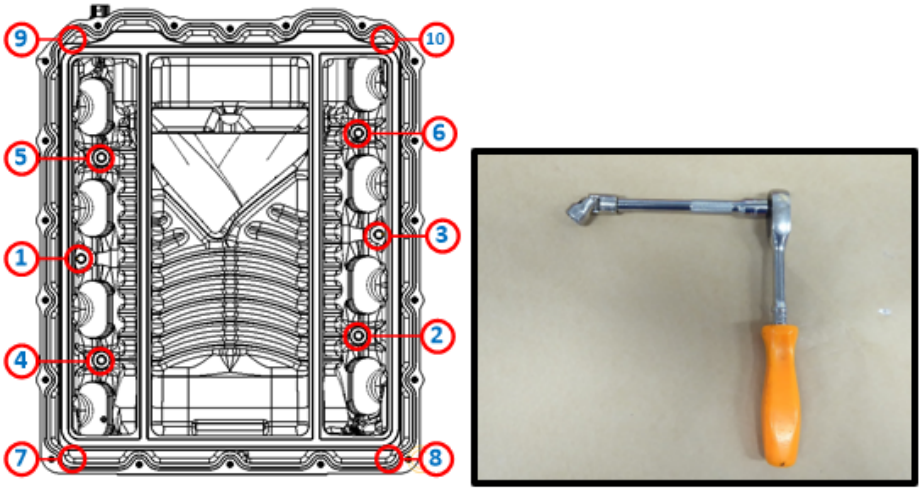


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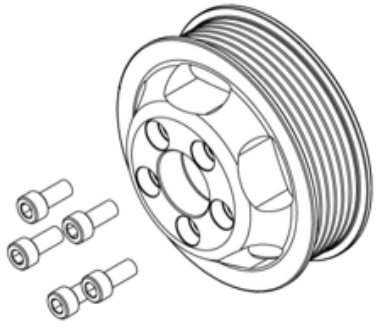
92. Using 6mm allen socket, secure the (1x) 8mm x 70mm SHCS to pull SC forward to plate. Torque to 22 lbs-ft. **NOTE:** Failure to do so could cause belt alignment issues.



93. Torque (10x) 6mm HHFCS manifold bolts in the following pattern using a 10mm socket. First pass: 88 lbs-in. Second pass: 106 lb-in. **NOTE:** For bolt #10, a ¼" socket with 4"-6" extension, 10mm wobble is the best possible tool to get into this tight area.

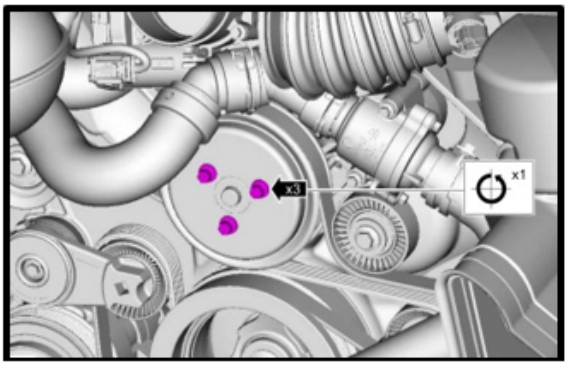


94. Install supercharger pulley using the supplied (5x) 6mm x 15mm SHCS using a 5mm allen socket. Leave hand tight until after belt installation.

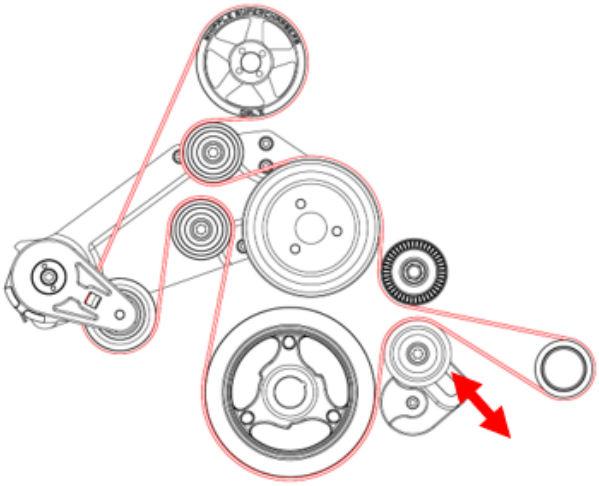


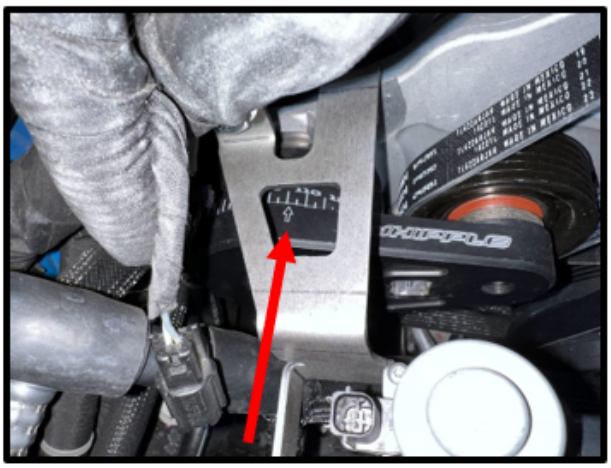
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95. Reinstall water pump pulley using a 10mm socket, torque to 14 lbs-ft.

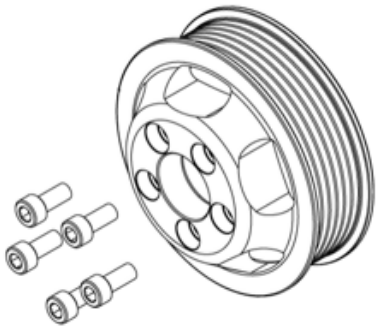


96. Install supplied supercharger belt by following the routing diagram. Once in position, lock the adjustable idler pulley by torquing the SHCS to 30 lbs-ft. **NOTE:** Set the tensioner position so the arrow points to the machined line or **100** (80%-85% travel) by removing slack via the adjustable 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.



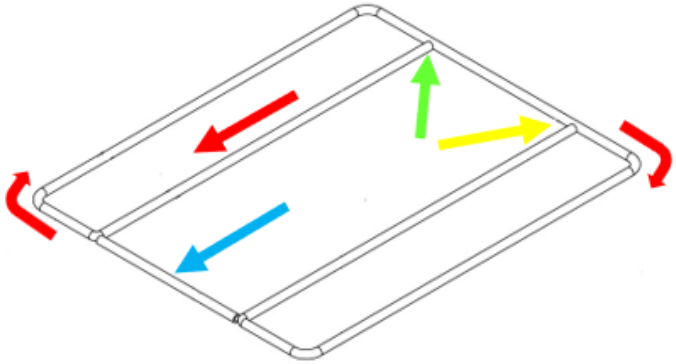


97. With belt holding the SC pulley in position, torque the supercharger (5x) 6mm x 15mm SHCS bolts to 130 lbs-in using a 5mm allen socket. Do not use Loctite on threads, it is not required.



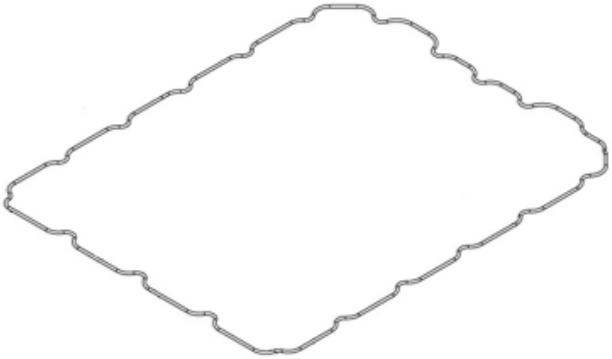
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98. Using supplied 5/16" OD silicone tube, install the (1x) 80 1/2" cord. Start as shown with green arrow, go in a clockwise motion, to the front, then around the perimeter. End at yellow arrow position. Bunch it up so it has no gap at the end as any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

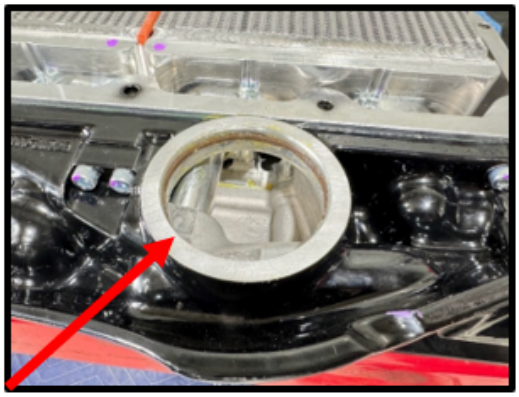


99. Install supplied pre-formed 65.3" x .103" oring to the top sealing surface of the SC housing. Apply generous amount of grease to help ease the oring into place. **TIP:** To install oring into dove-tail groove, press vertically, vs sliding finger along.



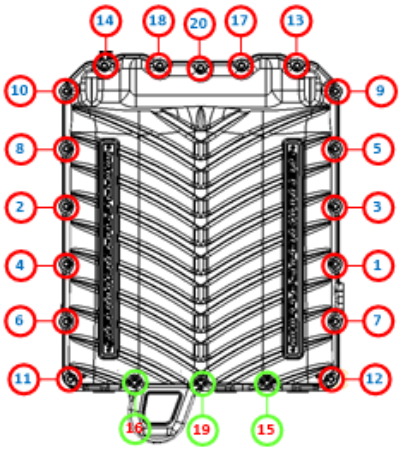


100. Install (1x) #2-230 internal bypass oring to the lid bypass passage. Use generous amount of grease to secure oring in place and help with installation.

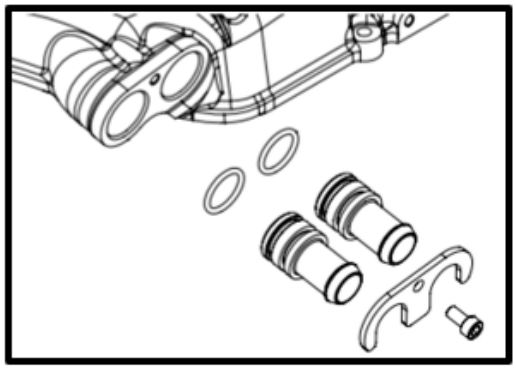


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101. Apply generous amount of grease to the (1x) #2-230 Viton bypass oring. Install the supercharger lid to the supercharger housing by carefully placing the bypass down. Secure the SC lid using the (17x) 6mm x 30mm HHFCS and (3x) 6mm x 70mm HHFCS (***marked green***) using the following pattern. Torque to 90 lbs-in using an 8mm socket.



102. Install (4x) 2-117 IC fitting orings to the (4x) IC fittings. Apply grease to the (4x) 2-117 IC fitting orings. Slide fittings into lid. Secure fittings with supplied fitting retainer bracket and (2x) 6mm x 12mm SHCS bolt. Torque to 80 in-lbs.

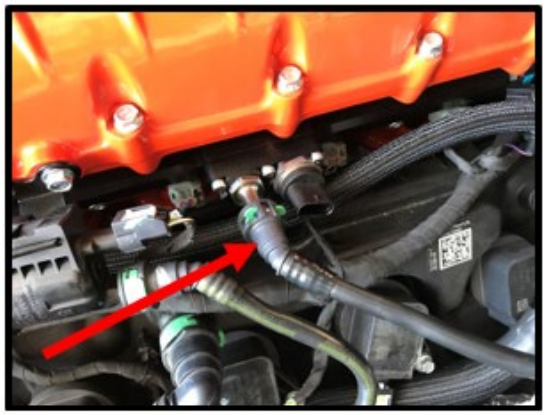


103. Connect factory passenger side rail fitting to the DI pump factory hose, press until it clicks and locks in place. ***NOTE: THIS FUEL LINE HAS A CHECK VALVE, DO NOT FLIP ORIENTATION FROM STOCK DIRECTION. THE 90-DEG END ALWAYS CONNECTS TO FUEL FEED SUPPLY FROM FUEL RAIL! 30-DEGREE ALWAYS CONNECTS TO PUMP!***



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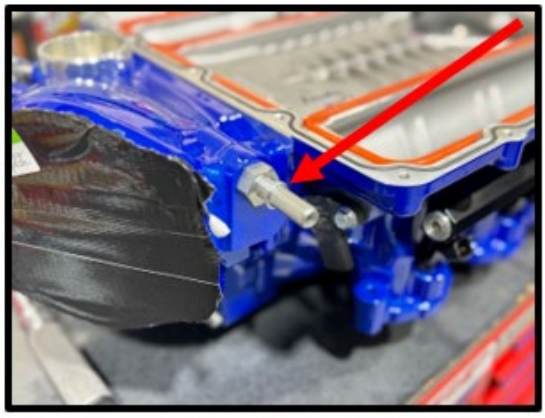
104. Connect factory fuel inlet line to the driver side fuel fitting, press until it clicks and locks in place.



105. Connect the factory fuel PSI sensor connector to sensor, press safety lock until it clicks and locks in place.

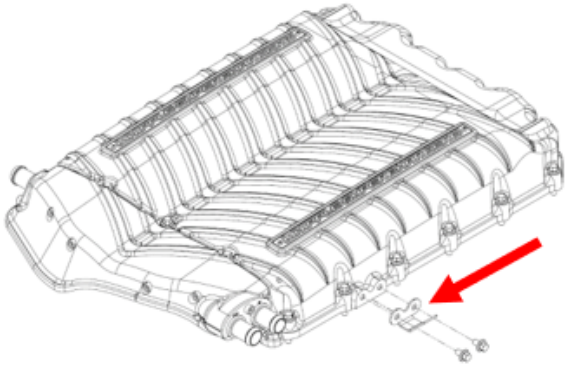


106. Install (1x) #906 oring to the supplied (1x) -6 ORB to 9.89mm quick connect fitting. Install fitting to the **LH** side port using an 11/16" socket.



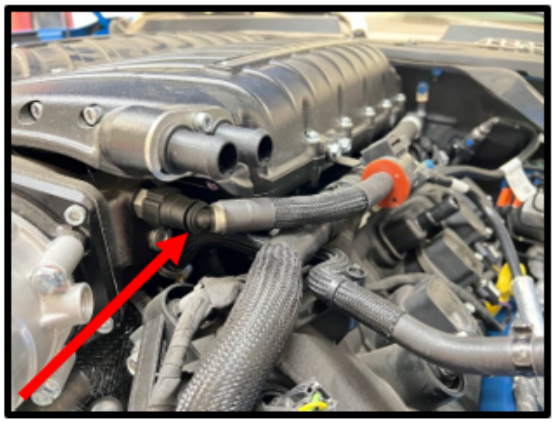
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107. Mount EECPV bracket to SC lid, use (2x) 6mm x 10 HHFCS. Torque to 80 lbs-in using 10mm socket. Slide EECPV to bracket. Connect factory plastic quick connect fitting to EECPV until it clicks and locks in place. Connect 2-way electrical connector to EECPV, press locking tab back in place.

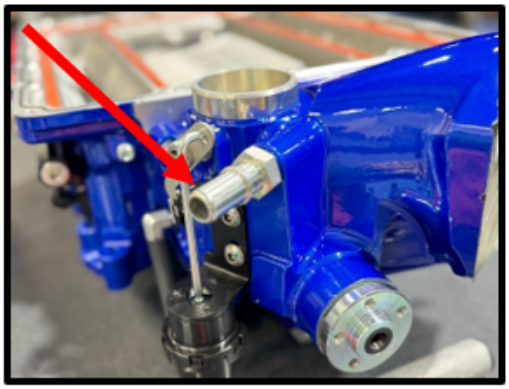




108. Install supplied 3/8" ID x 5 ½" with 55deg quick connect fitting hose (#5000030) to the EECPV barb fitting and **LH** quick connect fitting on SC inlet. Push until it clicks and locks into place.



109. Install (1x) supplied #906 oring to the (1x) -6 ORB to 15.82mm quick connect fitting. Install fitting to **RH** side on the inlet using a 7/8" socket.

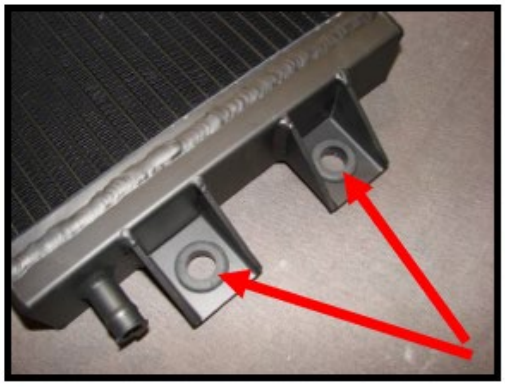


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110. Install supplied 1/2" ID x 9" hose (#3103159) to the passenger side valve cover. Connect other end to supercharger inlet quick connect fitting. Push until it clicks and locks into place.

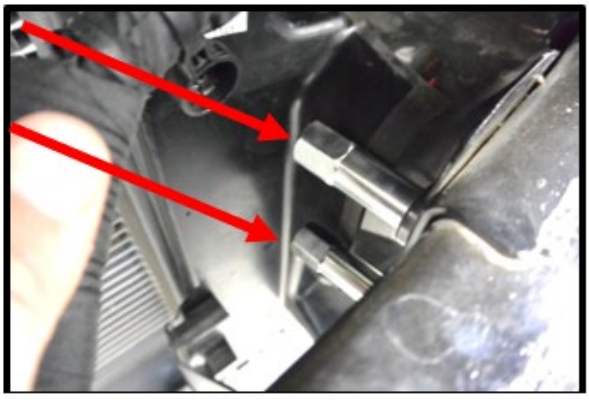


111. Install supplied (4x) rubber grommets to the LTR mounts. Install the supplied (4x) aluminum LTR spuds to rubber grommets installed in LTR.



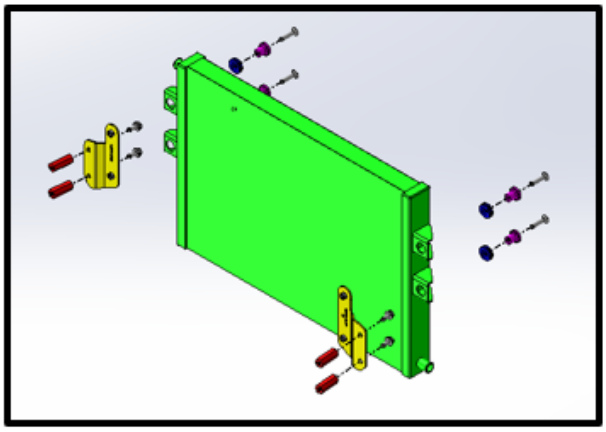


112. Install the supplied (4x) hex coupling nuts to the factory bolt threads on the back side of the front bumper support (2 driver side, 2 passenger side) using a 16mm wrench.

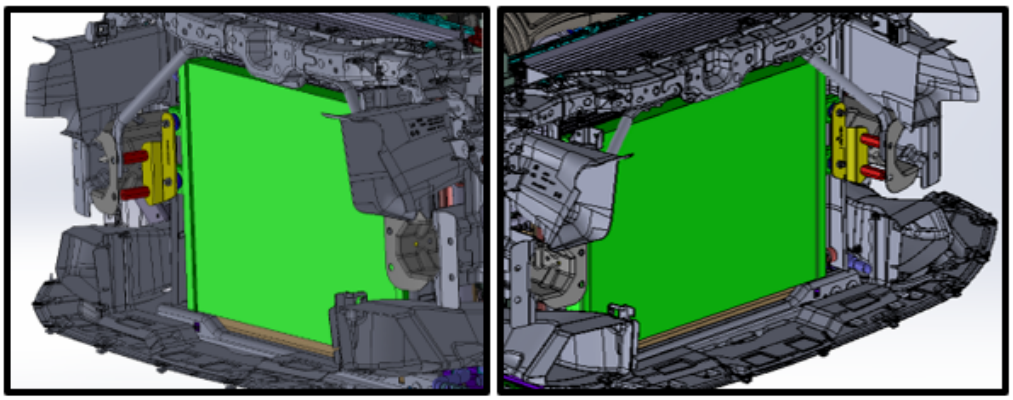


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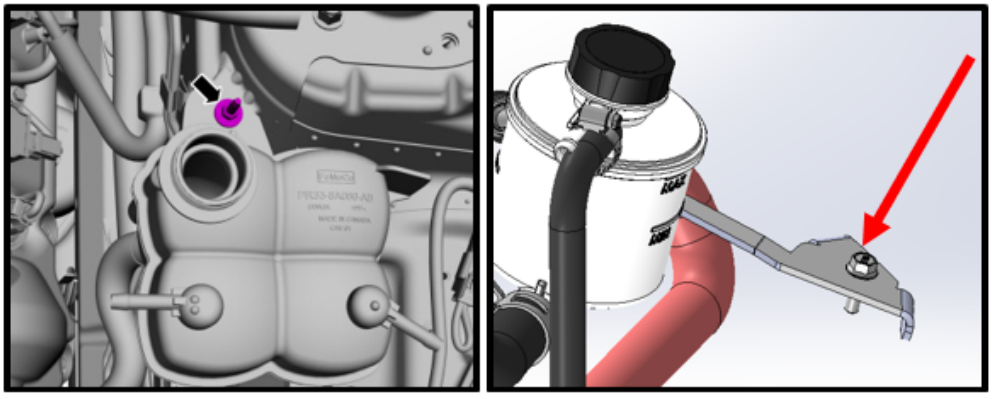
113. Install the LTR brackets to the LTR using the supplied (4x) 8mm x 35mm FHSCS bolts through the aluminum heat exchanger spuds (5mm allen socket). NOTE: HD heat exchanger mounts the same way but the inlet fitting moves to RH side (same as outlet).



114. Slide the LTR assembly up from the bottom. Connect the LTR brackets to the coupling nuts using the supplied (4x) 8mm x 16mm hex headed flanged bolt (12mm ratchet wrench).



115. Remove factory coolant reservoir fastener. Install supplied reservoir bracket and secure on top of coolant reservoir. Secure using supplied (1x) 6mm x 20mm HHFCS. Torque to 71 in-lbs.

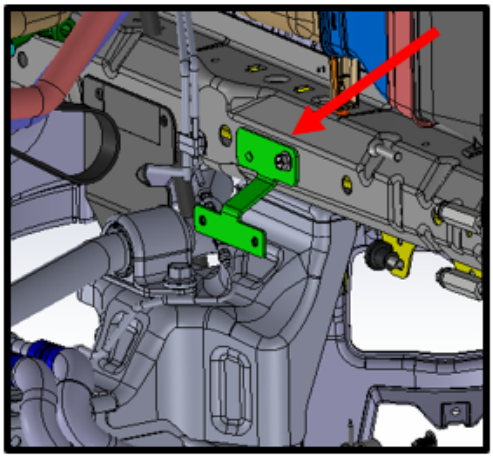


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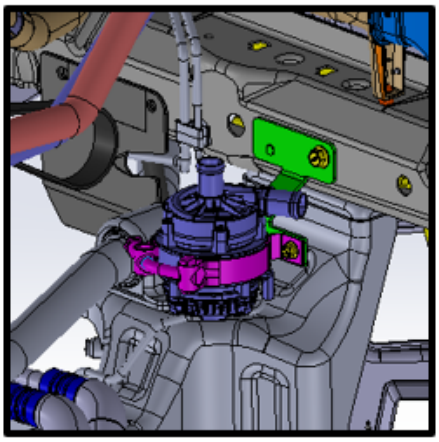
116. Mount IC reservoir to bracket using (2x) 6mm x 12mm HHFCS.



117. Mount IC pump bracket to the LH inner frame rail, using (1x) 8mm x 16mm HHFCS bolt.

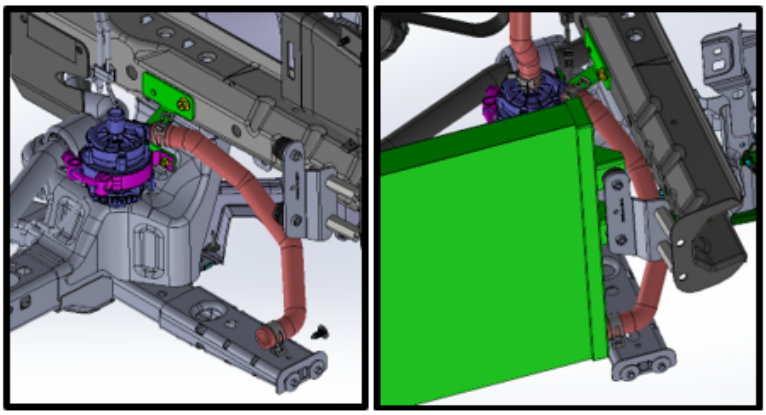


118. Mount IC pump clamp to the pump bracket using (2x) 6mm x 8mm HHFCS bolts. Install pump to clamp, pump inlet should be facing the front of the vehicle. Leave loose until IC hoses are installed.

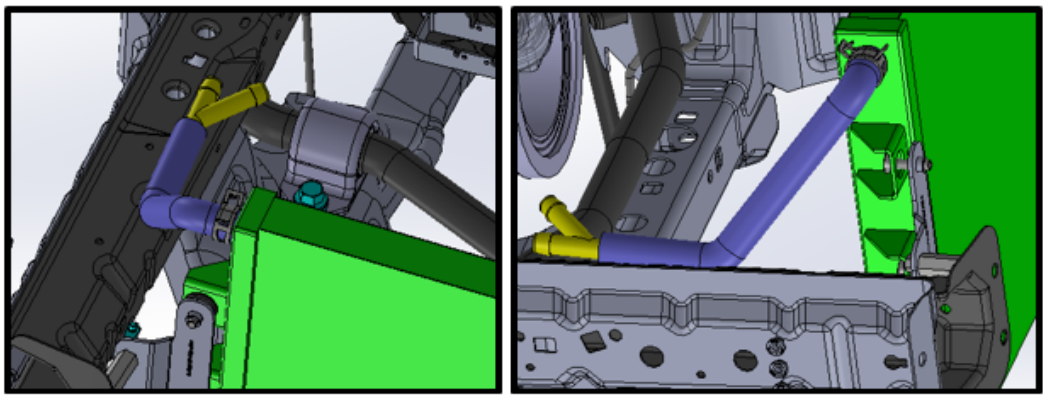


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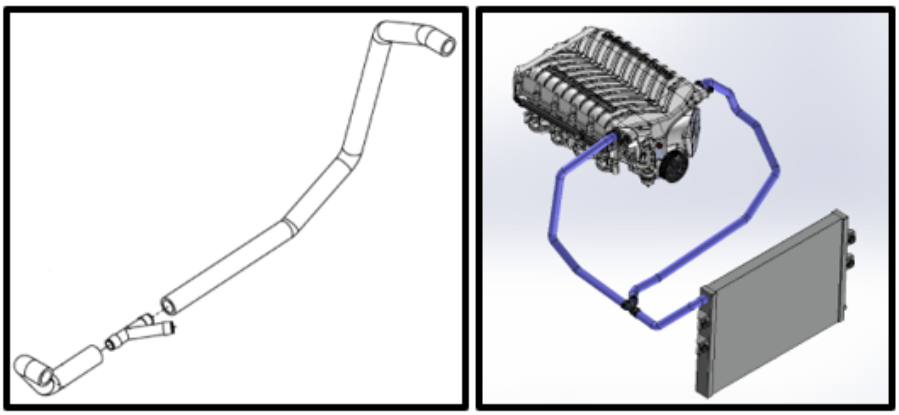
119. Install hose #3103407 from IC pump to LTR **LH low** (inlet) fitting. Secure using supplied #16 pinch clamps. Tighten IC pump clamp.



120. Install hose #3103409 from LTR **RH top** (outlet) fitting. Route to frame rail next to airbox snorkel. Install offset Y to end of hose. Use supplied #16 pinch clamps to secure hose.

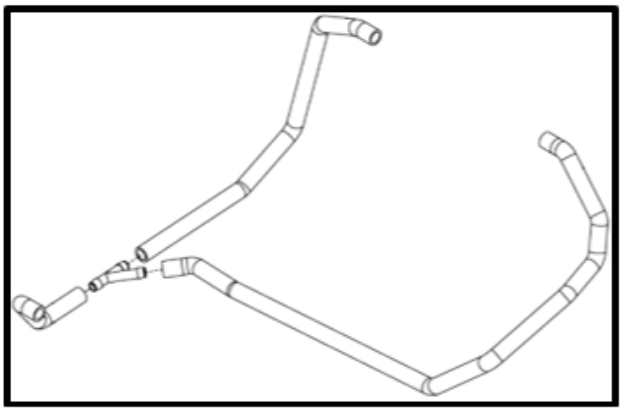


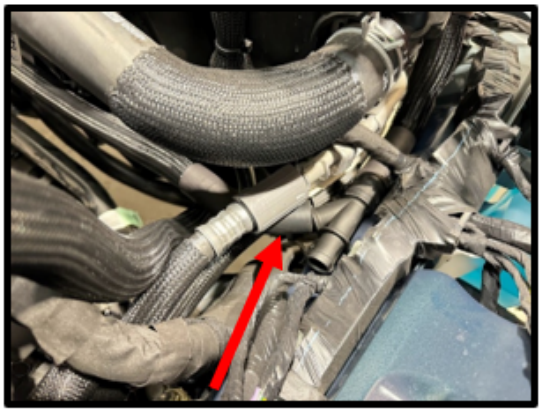
121. Install hose #3103408 from offset Y straight to **RH rear** most IC fitting (inlet). Use supplied #16 silver worm clamp to secure hose to Y and #16 Black clamp to IC fitting. **NOTE:** Routing IC hose incorrectly can result in poor performance and potential damage!

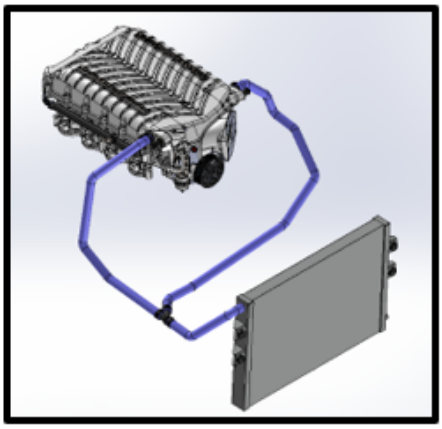


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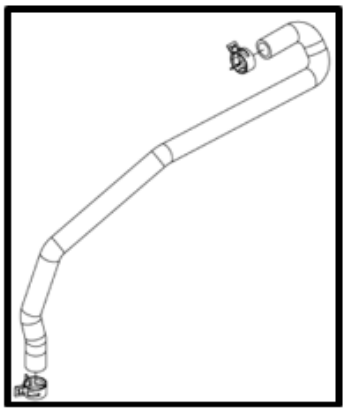
122. Install hose #3103410 from offset Y, across front of engine to **LH rear** most IC fitting (inlet). Use supplied #16 silver worm clamp to secure hose to tee and #16 Black clamp to IC fitting. **NOTE:** Routing IC hose incorrectly can result in poor performance and potential damage!

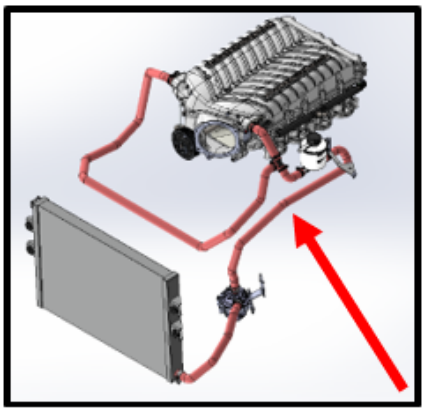






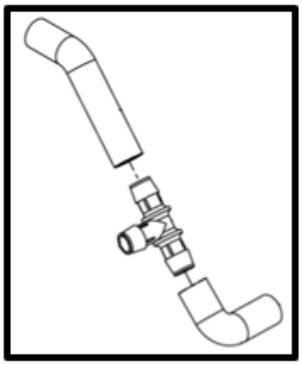
123. Install hose #3103405 from rearmost IC filler reservoir fitting to the top IC pump fitting (inlet). Use supplied #16 pinch clamps to secure hose.



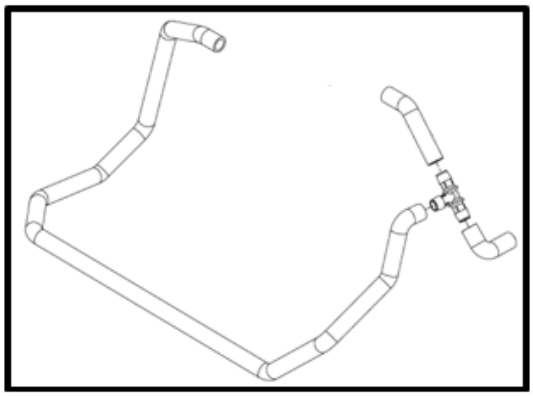


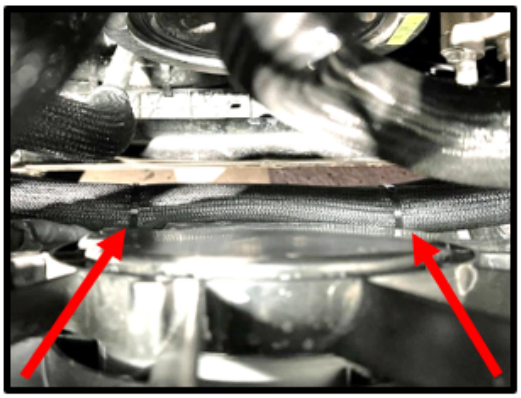
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124. Install hose #3103406 from **LH forward** most IC fitting (outlet). Secure hose to IC fitting with #16 Black worm clamp. Install TEE fitting with TEE facing forward. Install supplied 90deg hose #3103158 to end of TEE and secure to front most IC filler reservoir fitting (inlet). Secure 90deg hose to tee and reservoir with #16 Black clamps.



125. Install hose #3103411 from TEE forward facing fitting (outlet). Secure hose to TEE fitting using supplied #16 Black worm clamp. Route #3103411 across front of the motor to **RH forward** most IC fitting. Secure hose to tee with #16 Black clamp. Zip tie both this and the feed line that goes in the same path together.



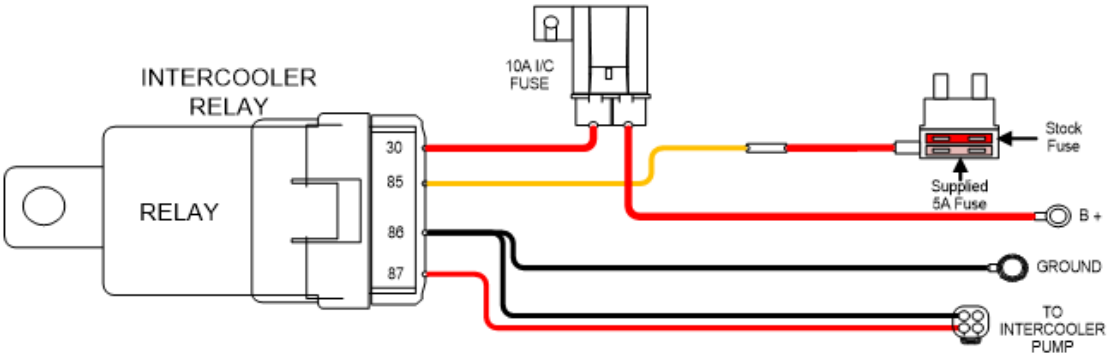


126. Secure supplied 3/8″ 90deg hose to IC filler reservoir top barb using #4 hose clamp. Route down and secure hose to ¾″ IC pump feed hose using zip tie. Route down away from engine.

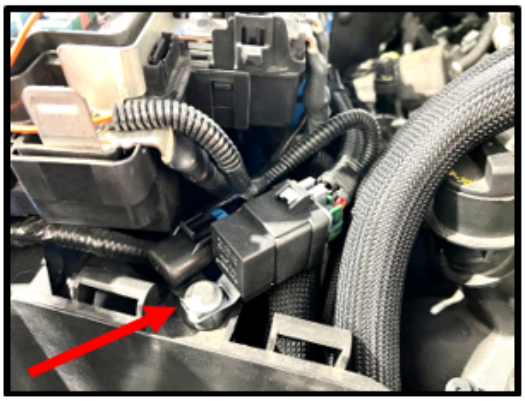


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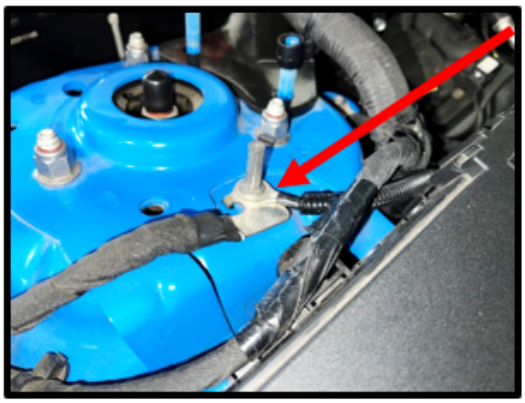
127. Review intercooler circulating pump relay harness diagram below before installing. ***NOTE**: You're required to remove stock fuse from instructed fuse location, install this into the fuse tap to properly complete the circuit. Failure to do so may result in codes and/or poor performance.



128. Mount relay and fuse holder to the factory airbox stock fastener, secure with zip-tie. Route 2-wire connector down, below radiator, along sway bar to the LH side of the vehicle. Connect to IC pump. Secure harness using zip-ties along bottom of vehicle.

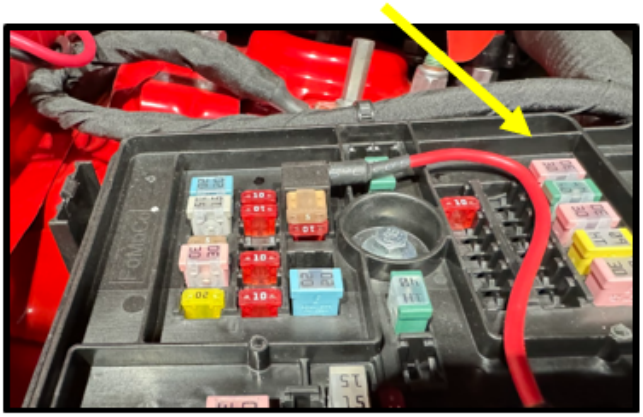


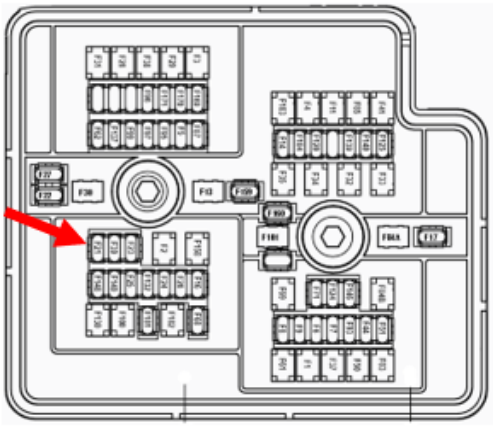
129. Locate stock ground wire stud, located on RH side of vehicle, next to strut tower brace using an 8mm socket. Install intercooler relay harness ground eyelet (black wire) along with factory ground wire. Reinstall bolt using an 8mm socket.



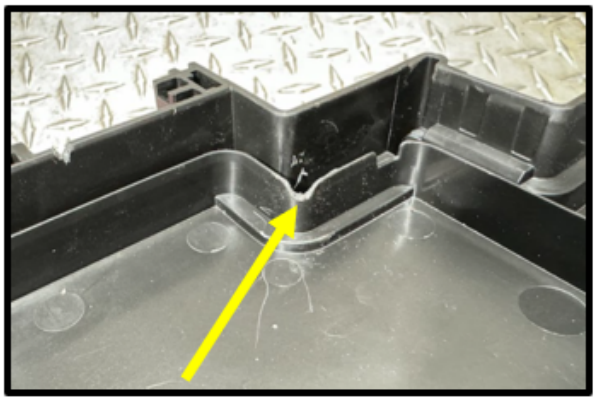
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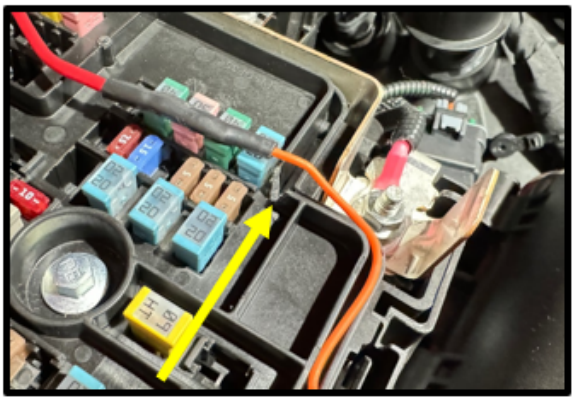
130. Pull red 10amp fuse from position **#F21**. Install 10amp red fuse in unused fuse slot on fuse tap. Install supplied fuse tap into position **#F21**. **Note:** 10amp red fuse should be in bottom slot, 5amp should be in top slot.



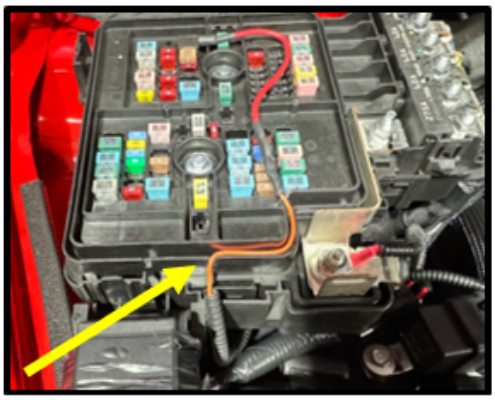


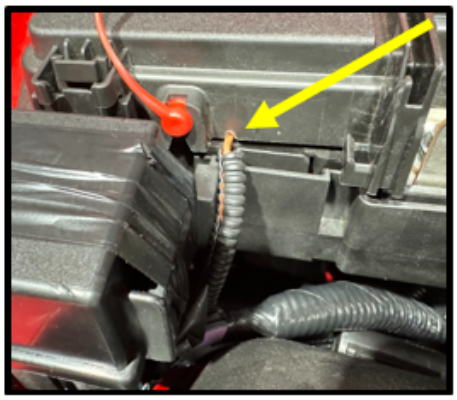
131. Use small set of cutters or file, make a small notch in fuse box cover lid and fuse box to allow wire to fit. use small file to clean up and round edges





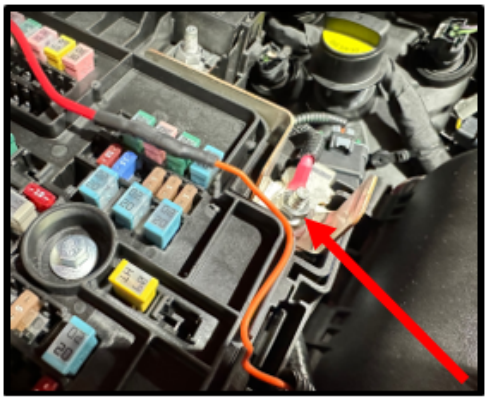
132. From fuse tap, route to slot you previously made. Route to stock slot at the front of fuse box. Add small relief in lid for wire as it comes out of the box. use small file to clean up and round edges. Test fit lid and ensure it does not interfere with this wire. Failure to route properly will lead to IC pump operation failure, resulting in poor performance.



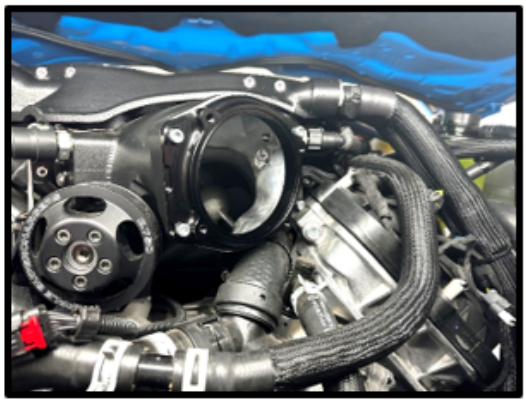


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133. Using a 10mm socket, remove the 12V (+) power stud nut from the far post. Install the IC pump relay power eyelet (red wire) to the 12V stud. Use a 10mm socket to secure stock and IC power wire.



134. Install throttle body adapter to supercharger inlet using the supplied (4x) 6mm x 18mm SHCS (5mm allen socket) and supplied 123mm x 2mm oring between TB adapter and SC inlet. Use **Blue Loctite #243** on the threads of each bolt. Torque to 88 lbs-in.



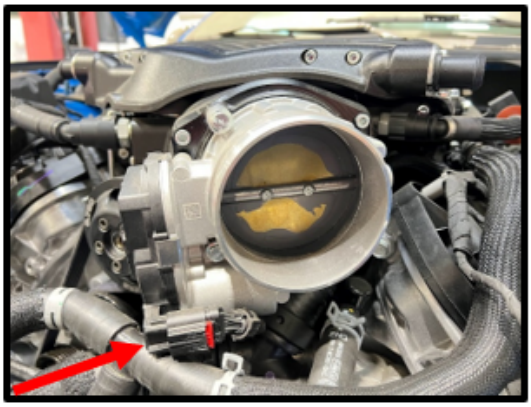
135. Install supplied (1x) #2-045 V75BR oring to TB adapter. Install the supplied 92mm throttle body using the (4x) 6mm x 35mm HHFCS bolts using a 10mm socket.



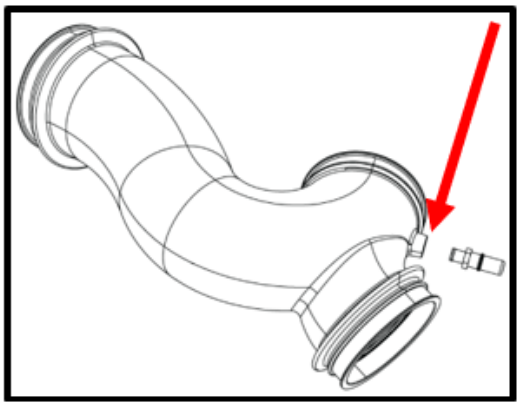


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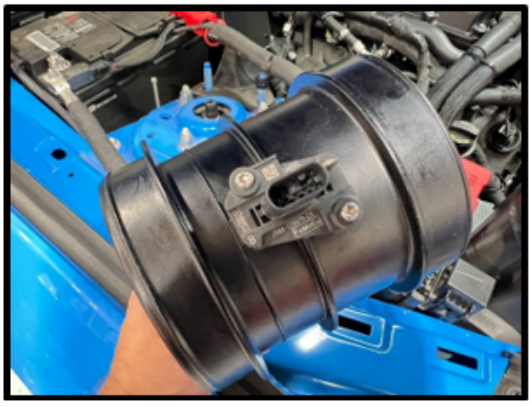
136. Connect previously installed throttle extension pigtail to the throttle body electrical connector. Secure wiring using zip-tie. **NOTE: Failure to secure wire may result in the wire catching the belt system!**



137. Install supplied (1x) 1/2" to 15.82mm hose adapter to the inlet tube 3/8" boss.



138. Install factory MAF sensors to the new MAF housings using supplied (4x) 4mm x 10mm SHCS. Torque to 17 lbs-in. ****DO NOT USE STOCK BOLTS**. *NOTE: Verify arrow position for airflow direction.**

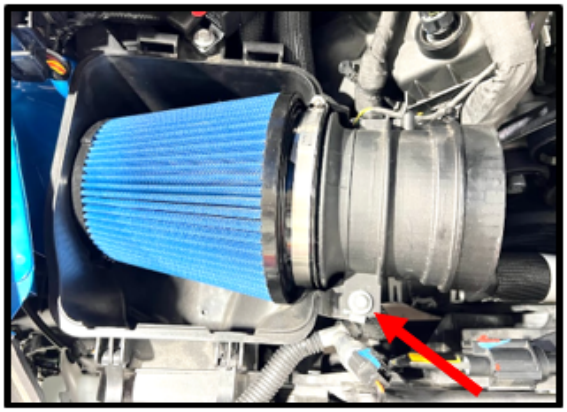


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139. Install supplied filters to MAF housing, secure using supplied filter clamp. Install the MAF housings into the Y tube (for ease of installation), pre-install #80 hose clamp to Y tube, leave loose until later.



140. Install the MAF housings to the airbox brackets using supplied stock fastener to supplied brackets.



141. Install the inlet tube to the MAFs and throttle body. Secure using the supplied clamps, (2x) #80 on MAF side and (1x) #64 to throttle body. Reconnect MAF connectors to MAF sensors.



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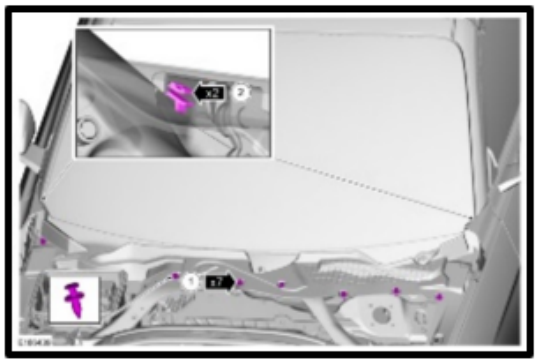
142. Install supplied ½" x 13 ¼" make up air hose to the LH valve cover. Push until it clicks and locks into place. Install other end to air inlet tube fitting previously installed.

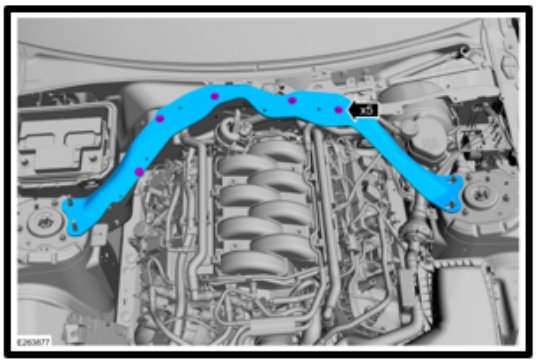


143. Reinstall factory airbox covers.



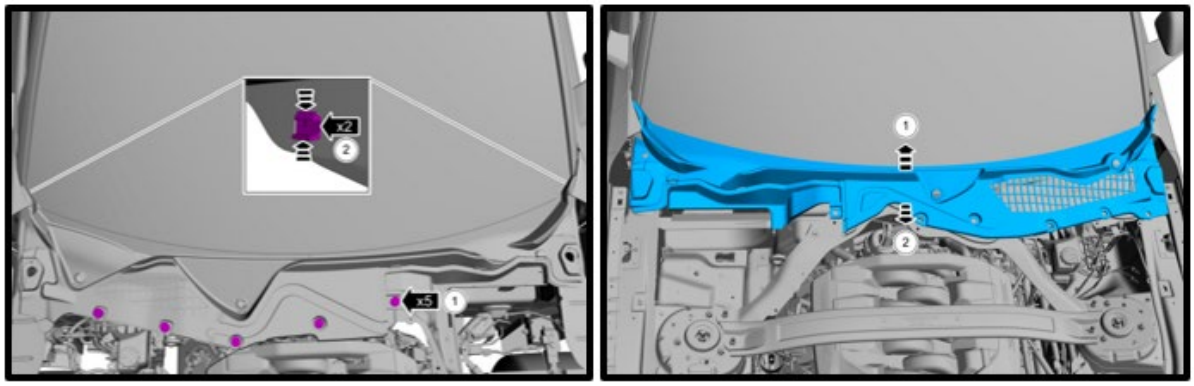
144. Reinstall the K-Brace over the studs and into position on the vehicle. Install the (2x) nuts on the studs and torque to 25 Nm using a 15mm socket. Install the (5x) mounting bolts and torque to 25 Nm using a 13mm socket. Reinstall the (7x) pushpin retainers on the cowl trim panel.



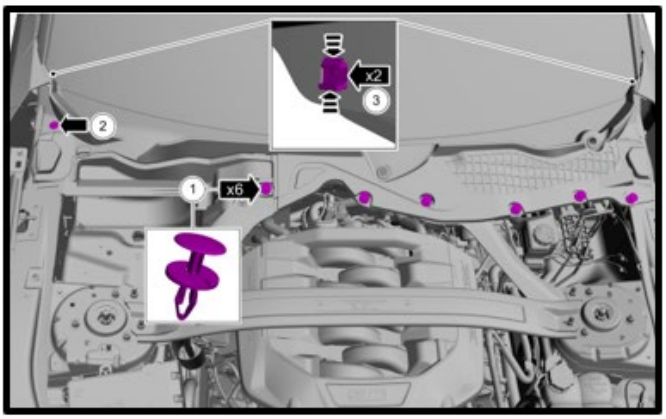


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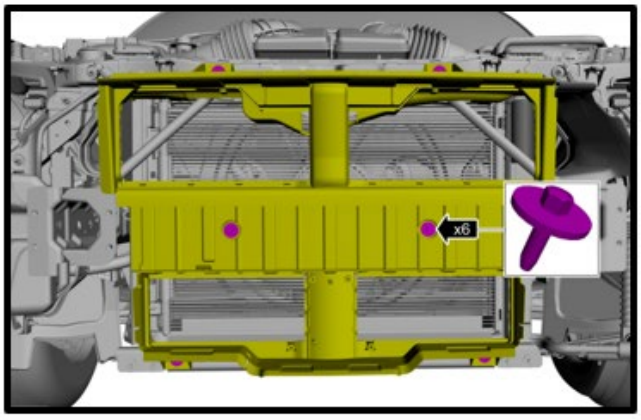
145. Install the (5x) push pins (1) and depress the (2x) clips (2).



146. Install the (6x) push pins (1), (2x) retainers (2) and the clips (3) (2x).

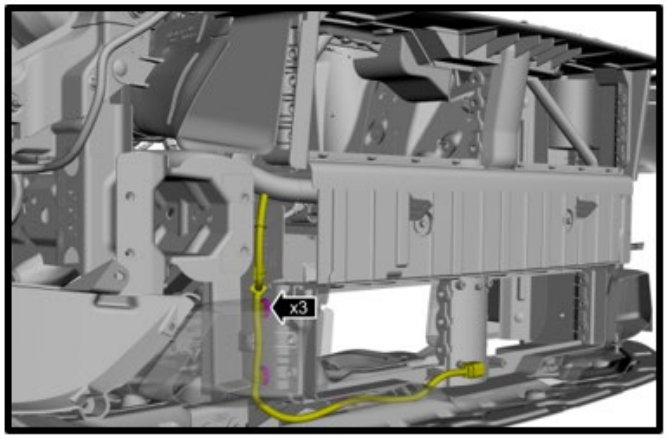


147. Install the (6x) bolts and position active grille shutter **SHELL ONLY (shutter grilles are NOT reused)**. Torque to 71 lb-in.

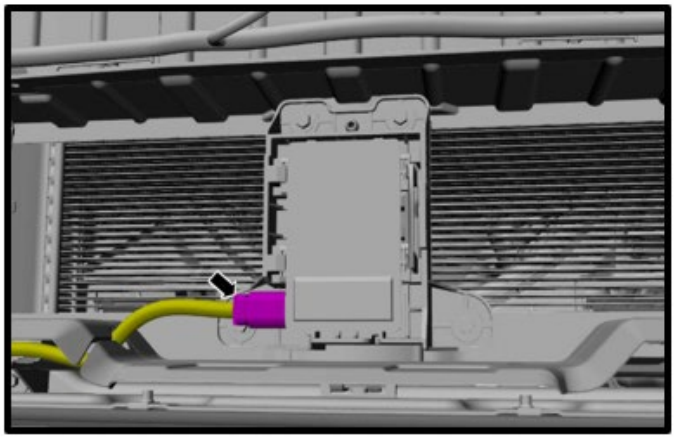


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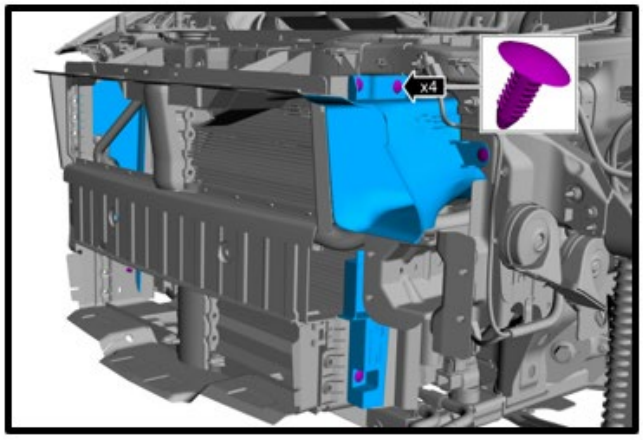
148. Attach wiring harness retainers (3x) if equipped.



149. If equipped, reconnect the CCM wiring connector.

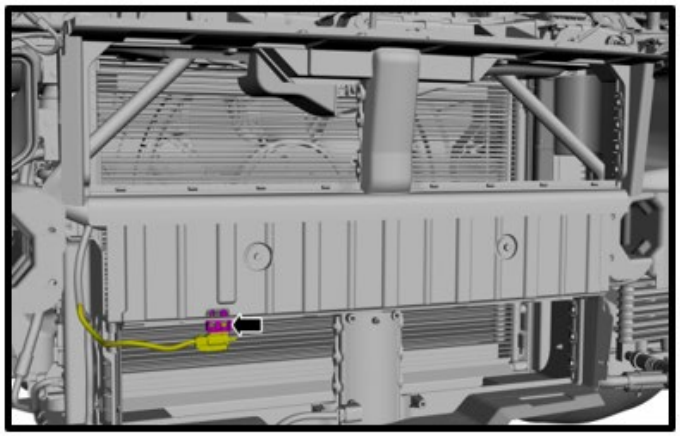


150. Reinstall airbox air ducts with stock retainers (4x per side).

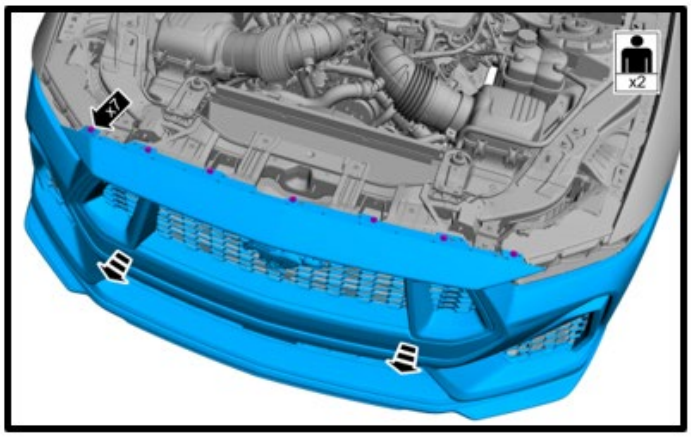


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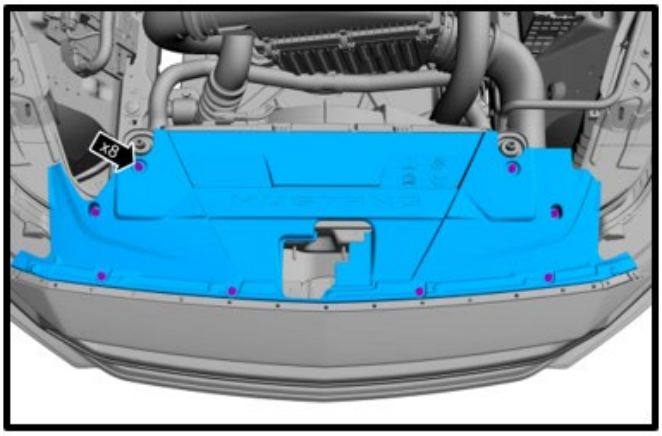
151. If equipped, connect the ambient air temperature sensor.



152. Install the (7x) fasteners from fascia.

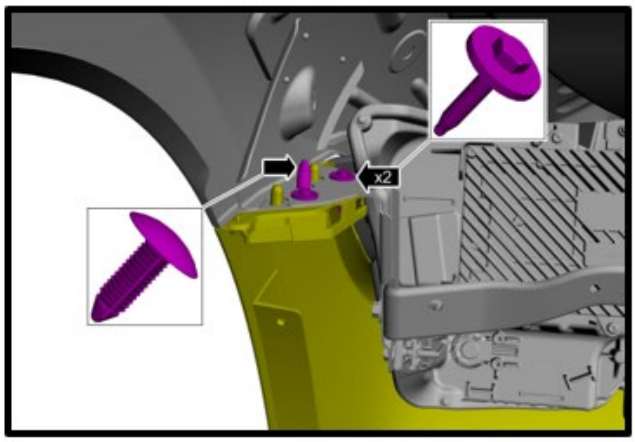


153. Install the radiator sight shield, secure using the (8x) push pins.

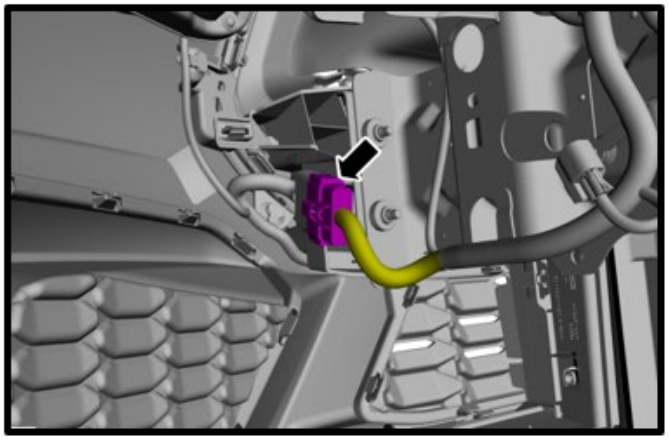


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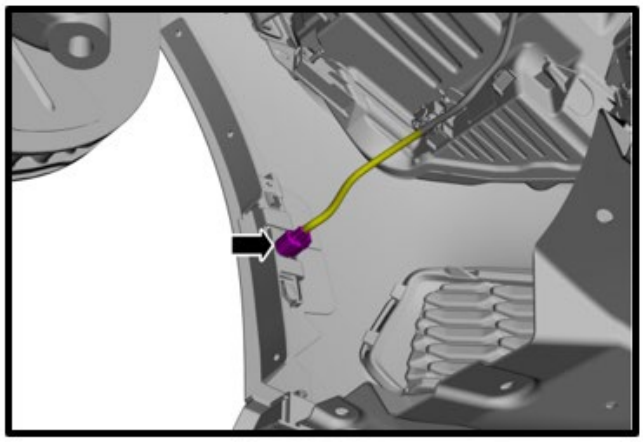
154. On both sides, install front bumper cover to fender with original push-pin and the bolts. Torque to 44 lb-in.



155. Connect the front bumper cover electrical connector.

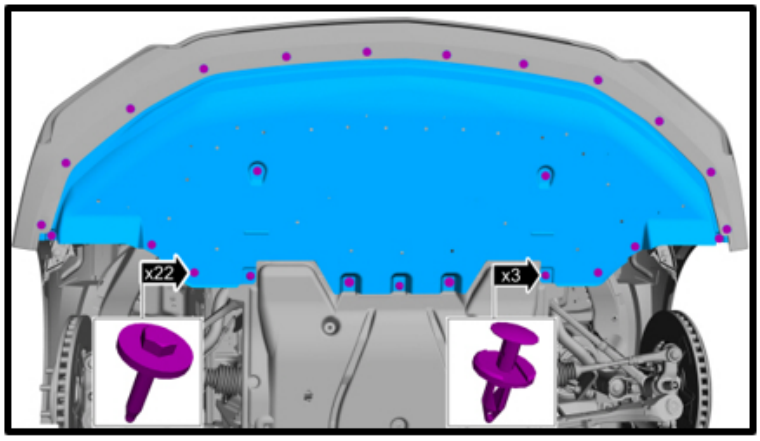


156. On both sides, connect front marker lights.

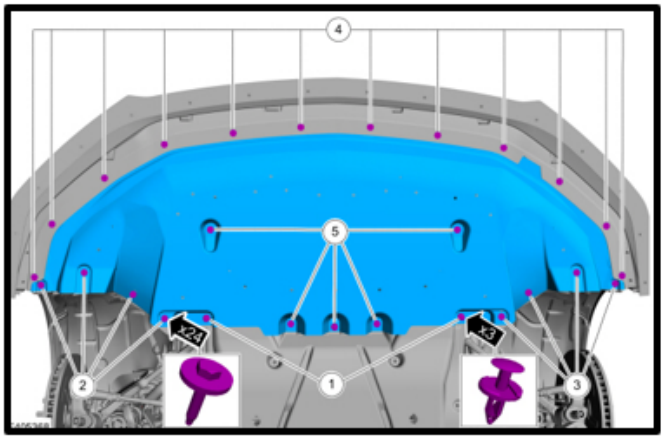


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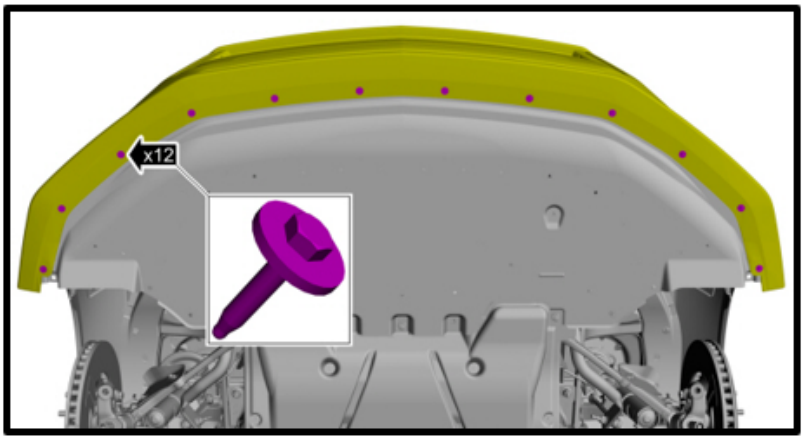
157. (**GT ONLY**) Install the (22x) fasteners and (3x) push pins, torque to 18 lb-in.



158. (**DARK HORSE**) Install under shield and chin spoiler in the following order, torque to 18 lb-in.

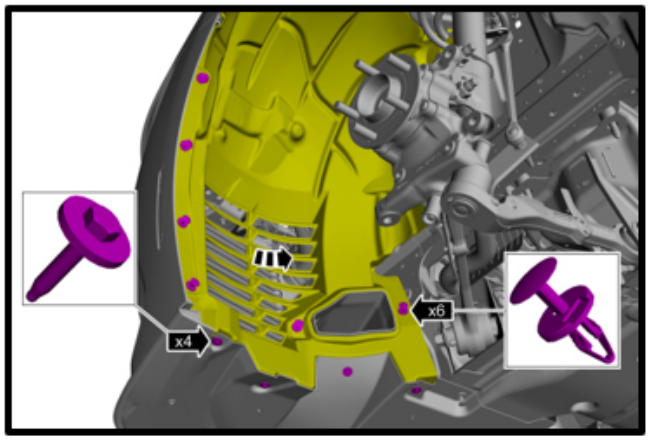


159. (**GT ONLY**) Install the (12x) fasteners to front chin splitter, torque to 18 lb-in.

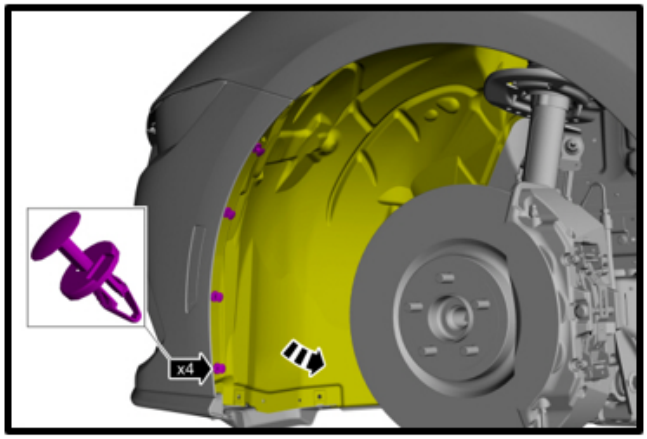


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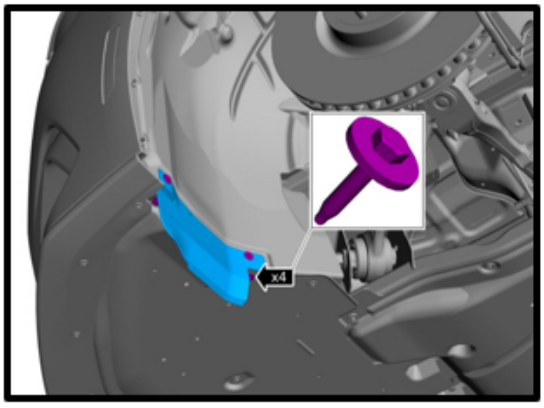
160. (**DARK HORSE**) On both sides, install the (4x) fasteners and (6x) push pins to front fender splash shield, torque to 18 lb-in.



161. (**GT ONLY**) On both sides, install the (4x) push pins to front fender splash shield.



162. On both sides, install the (4x) fasteners to body side front shield, torque to 18 lb-in.



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163. 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.** **⚠ WARNING!! NEVER USE TAP WATER OR NON-FORD APPROVED ENGINE COOLANT, THIS WILL CAUSE CORRISION IN THE SYSTEM.**

164. Install the supplied 50-state legal sticker and maintenance decal to the hood next to the factory emissions sticker. Use light amount of acetone to clean surface before installing.

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



166. Attach the negative cable to the battery and tighten using an 8mm wrench.

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.

167. Using a Lisle 24680 Spill-Free Funnel, or equivalent, secure the appropriate filler neck adapter to the filler neck.

168. 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.

169. 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 it's 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.

170. Cycle the ignition to the ON position again and repeat until the sound of the electric pump is continuous without pulsation and the fluid level is between ½ to ¾ full. ***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!***

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171. 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 bleed 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.

172. 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. Never, ever mix questionable or low octane fuel with new fuel. The Mustang fuel system is return less, this means the fuel does not return to the tank, even if you put new fuel in tank, the fuel in lines, filter and pump are going to be the other fuel. This can be up to 3 gallons worth of fuel. Running this fuel, even with low load can damage the engine.

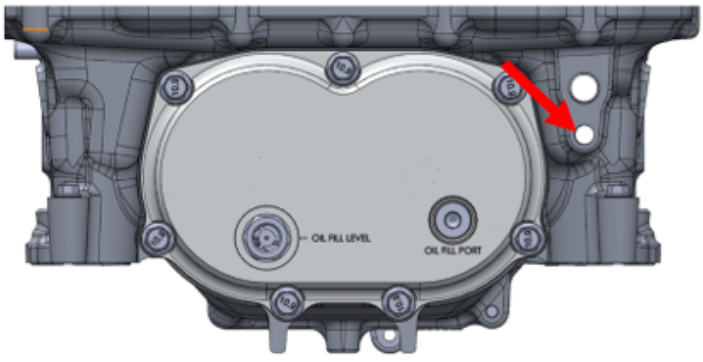
173. Reverse the order for vehicle reassembly.

174. 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. Use the Tomahawk tool for logging and checking performance. Using the Whipple List, monitor the MCT (manifold charge temp), this should stay between 0-40deg above ambient, if it exceeds this, you will need to continue to bleed the air out of the intercooler water system. Monitor the knock sensor activity, + is adding timing, - is removing timing. Its standard for it to bounce back and forth.

175. Re-check the radiator and intercooler reservoir coolant level regularly over the first 1,000 miles, top off level as needed.

176. Re-check SC oil level regularly over the first 1,000 miles, level may drop very slightly as it fills the bearings and cavities.

177. If adding a boost gauge, Whipple has provided an extra 1/8" NPT port at the back of the SC for easy installation. Remove pipe plug using ¼" allen socket, install boost gauge adapter (Whipple not supplied).



178. 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.

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179. If you have questions about your vehicle's 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 support@whipplessuperchargers.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. ***DO NOTE MANUALLY MOVE ACTUATOR, DAMAGE MAY OCCUR!***

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. **NOTE: If spinning the SC faster than standard operation, oil should be changed earlier. Severe damage will occur if oil level is over filled.**
6. Check intercooler level at the IC filler tee every 7500 miles. Level should be at the middle of the reservoir when coolant is at ambient temp.
7. Change engine oil every 5,000 miles, use 5W-50 Motocraft oil **PN #XL-5W50-QGT.**
8. Service high-flow air filter element every 10,000 miles.
9. Replace spark plugs every **20,000 miles** or earlier. Only run **Motorcraft SP583 or Ford Racing M-12405-M50A, 031" gap.**
10. Follow your factory service intervals for all maintenance items unless specified.
11. 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 and are not emissions legal.

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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 Whipple Website for more information in regard to the limited warranty. NOTE: Whipple Superchargers will not authorize any warranty repair work or supercharger replacement for normal noise.

IMPORTANT INFORMATION

DYNO INSTRUCTIONS
Always have adequate airflow to the vehicle to avoid overheating. Always cool down for a minimum of 5 minutes between runs to allow the engine and exhaust to properly cool off. Always listen for pinging/detonation, if you hear more than one ping, lift immediately.

10R80, Automatics: 7th gear is 1:1 which will show the highest power value on inertia-based dynos on the automatic but will lead to unwarranted transmission failures and will not finish due to speed limit. 5th gear is the safest for testing, 6th gear should be used once you have validated everything is in proper working condition.

Manuals: GT based manual, 1:1 is 4th gear. Dark Horse manual, 1:1 is 5th gear. Manuals should run 1 gear lower than 1:1 to minimize heat and tire speed. **CAUTION:** Manual Mustangs can set ABS based codes on the dyno, if the wrench light is on, NEVER run on dyno with wrench light on, the vehicle will operate in a failure mode, these ABS and U codes must be erased before you can make a dyno pull.

BOOST LEVELS
All Whipple kits are shipped with boost levels that Whipple feels achieves maximum power while maintaining reliability with stock engines (@ sea level). Higher boost levels must run higher octane levels, void your warranty and are no longer emissions legal.

EXHAUST
Cat-back exhaust systems help reduce heat and minimize exhaust back pressure. Standard rear exit exhaust won't affect the calibration and are always a good idea for added safety and performance. Long tube headers and/or high flow cats greatly affect emissions and O2 sensor readings, these are not emissions legal and are not supported in anyway.

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 an 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.

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FUEL SYSTEM

The Whipple fuel system (FLOW) needs no additional changes for power levels supplied by Whipple. Smaller pulley changes are not supported outside the complete kits supplied. Pulley changes can decrease reliability and lead to engine failure.

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). The PCM constantly adapts, if it senses better fuel, it will increase power accordingly.

ENGINE COOLANT

Whipple recommends running a 50/50 mix of distilled water and coolant. The engine coolant temp should run between 200-210deg F under normal driving conditions, cylinder head temp will generally be 10-20deg F higher than coolant temp. 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 LEVEL

Never operate at WOT when the vehicle fuel levels are below an a 1/8th 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.