MAGNUSON SUPERCHARGERS

C8 Corvette TVS2650 Supercharger Installation Guide

(Powertrain In Vehicle)

Kit P/N: 01-26-62-085-BL (Coupe Only, w/ cast lid)
and
Kit P/N: 01-26-62-087-BL (Convertible or Optional appearance upgrade for Coupe, w/ billet lid)

PREMIUM 91 OCTANE GASOLINE FUEL REQUIRED

ATTENTION!
Your MAGNUSON SUPERCHARGER kit is sensitive to corrosion!
Use only the vehicle manufacturer recommended coolant for your engine in the intercooler system as well.

89-89-57-047 Rev.B

Magnuson Superchargers
1990 Knoll Drive, Bldg A, Ventura, CA 93003
(805) 642-8833 phone
magnusonsuperchargers.com

General Notes

Magnuson Supercharger Kit: C8 TVS2650 (Powertrain In the Vehicle)

This manual details the process to install your supercharger kit with the powertrain In the vehicle. If you are planning to remove the powertrain, follow the alternate set of instructions (89-89-57-045).

IMPORTANT: Read through the first 5 pages of this manual, especially page 5 which details the process for unlocking and verifying your ECM, prior to installing your supercharger.

Please take a few moments to review this manual thoroughly before you begin work: Make a quick parts check to be certain your kit is complete (see Bill of Material (BOM) parts list inside the accessory box). If you discover shipping damage or shortage, please call our office immediately. Take a look at exactly what you are going to need in terms of tools, time, and experience. Review our limited warranty with care.

Use only premium gasoline fuel, 91 octane or better. The use of non-premium fuel can cause engine failure and will void your warranty.

Magnuson Products recommend that you run a minimum of one tank of premium 91 octane or better fuel through your vehicle prior to installation of the system to prevent any possible damage that may occur due to running the supercharged engine on lower octane fuel.
DO NOT RUN E85 FUEL WITH THE SUPERCHARGER.
DO NOT USE OCTANE BOOSTERS. If you have used octane boosters in the past you will have to replace your spark plugs and the O2 sensors.

Magnuson Superchargers systems are designed for engines and vehicles in “GOOD” mechanical condition. Magnuson Superchargers recommend that a basic engine system “Health Check” be performed prior to the installation of this supercharger system. Be sure to check for any pending or actual OBDII codes and fix/repair any of the stock systems/components causing these codes. If there are codes prior to the installation they will be there after the installation.

Magnuson Superchargers also recommend the following services to be performed on your vehicle while installing the supercharger system:

- Fuel Filter change
- Engine oil and filter change using brand name oil (organic or synthetic) and filter
  Note: It is **VERY IMPORTANT** to use the factory specified oil viscosity. The original equipment manufacturer has selected this grade of oil to work with your other engine systems such as hydraulic chain tensioner and variable cam controls. Deviation from this specification may cause these systems to fail or not function properly. Please refer to your owner’s manual for the recommended oil viscosity or your engine and application.

Non “Magnuson Superchargers Approved” calibrations or “tuning” will Void ALL warranties and CARB certification.

Required Tools, Vehicle Prep and Consumables

- Small right-angle battery powered driver i.e. Milwaukee Model# 2457-20
- Engine hoist, Engine hoist, forklift or other suitable means to install the supercharger
- Vehicle hoist (2-post style recommended)
- 14 EPL low profile socket (Torx Plus female) for under body fasteners. Snap-On # FLEPL140.
- 8mm ¼ drive swivel socket (for intake bolts)
- Coolant drain pan
- Used engine oil and coolant recycling containers
- Absorbent mat i.e. Pig mat
- China marker
- Constant tension clamp tool
- Fuel line disconnect tools
- Snap-On crow foot adaptors FRDHM12, 13 and FRDHM15 (or longer)
- Snap-On 3/8 in. and ½ in. drive digital torque wrenches
- Stretch belt installation tool (EN-51767-1 Freedom Racing or similar)
- 3 1/8” diameter hole saw (coupe models only) for SC coolant fill reservoir installation
- JGR Billet Aluminum Jacking Lift Pads for Corvette (Amazon). Required to raise vehicle on 2-post hoist.
- Hydraulic jack
- Coolant system evac and fill kit (i.e. Snap-On SVTSRAD272A or OEMTOOLS 24444 Coolant System Refiller Kit)

Project / Vehicle Prep:

- Vehicle must have minimum 91 octane in the fuel tank prior to kit installation.
- Numerous factory hardware items are removed during installation of this kit. It is highly recommended to organize all items that are removed from the vehicle into labelled bags or containers.
- Detailed hose part # info and routing diagrams are provided in an Appendix at the back of this manual to assist with installation. It is imperative that all hoses be routed as far away from rotating parts and hot exhaust system components as possible. Zip ties are provided in the kit for this purpose.

Consumables:

- AC Delco Dexcool 50/50 Premix Antifreeze (P/N 12378390) Approx. 8 gal. per vehicle required if power train is removed.

Contact Information:

Magnuson Superchargers
1990 Knoll Drive, Bldg A
Ventura, CA 93003

Sales/Technical Support Line: **(805) 642-8833**
Websites: **www.magnusonsuperchargers.com**
Email: **sales@magnusonsuperchargers.com**

Table of Contents

Overview: HP Tuners ECM Unlock Procedure

IMPORTANT: Prior to beginning this process, you must take your vehicle to an authorized GM dealer and request that they update all vehicle modules with the latest software. Failure to have the latest updates installed on your modules may result in Loss of Communication trouble codes after your ECM has been unlocked and returned.

Disconnect the battery (see step 19) then proceed to remove the ECM from the vehicle as shown in Appendix C at the back of this manual.

Your ECM will need to be sent to HP Tuners to be unlocked (see the next page). You will also purchase the appropriate number of credits for your vehicle application.

It is strongly recommended that you wait to install your supercharger kit until AFTER you have received your unlocked ECM back from HP Tuners.

When you receive the unlocked ECM back, install it into the vehicle, then start and drive the vehicle to ensure proper functionality of all vehicle systems in stock configuration. Verify that there are no DTC's present using the HP Tuners VCM Scanner software and your MPVI3 interface tool. Contact HP Tuners if there are any issues with the unlock process.

These steps are discussed in detail in subsequent slides.

You can then begin installation of your supercharger kit, request your new calibration file and use the HP Tuners MPVi3 cable and software to flash the Magnuson calibration to the vehicle. The file request process and flashing instructions will be covered in subsequent steps of this manual.

IMPORTANT: You MUST flash a revised calibration file to the ECM after your supercharger has been installed. Severe engine damage could occur if you attempt to drive the vehicle on the factory calibration.

ECM Unlock Process

Go to the HP Tuners website and purchase the following 3 items:

1) Appropriate unlock service for your specific application / model year vehicle.

2) MPVi3 OBD-II Interface.

3) HP Tuners MPVi credits (purchase the appropriate number for your specific application and model year).

Follow the HP Tuners instructions, carefully package your ECM and mail it to HP Tuners to be unlocked.

After you receive your unlocked ECM back, re-install it into the vehicle, re-connect the battery and perform the following steps using the HP Tuners VCM Scanner software and your MPVi3 interface.

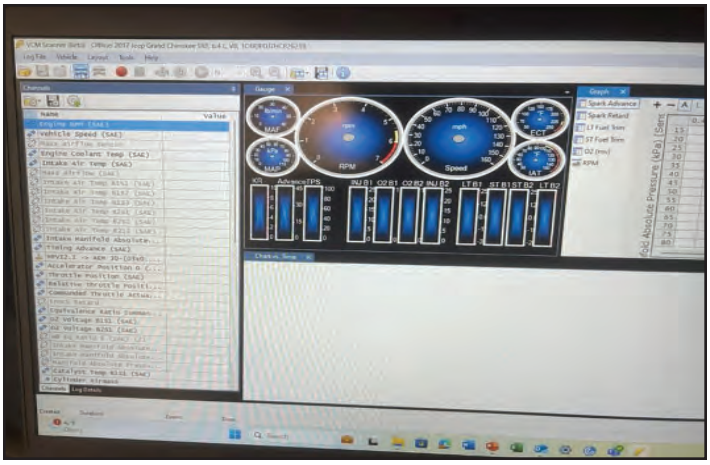
Note: the HP Tuners VCM Suite software can be downloaded from the HP Tuners website. Install it onto your laptop.

ECM Verification Process

1. Connect your HP Tuners MPVI3 interface to the OBDII port on your vehicle.

   Connect the supplied USB cable between the MPVI3 and your laptop.

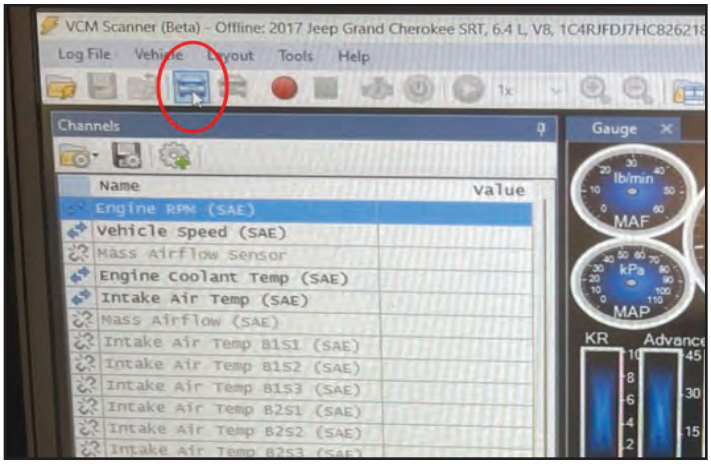
2. Open the HP Tuners VCM Scanner software on your laptop.



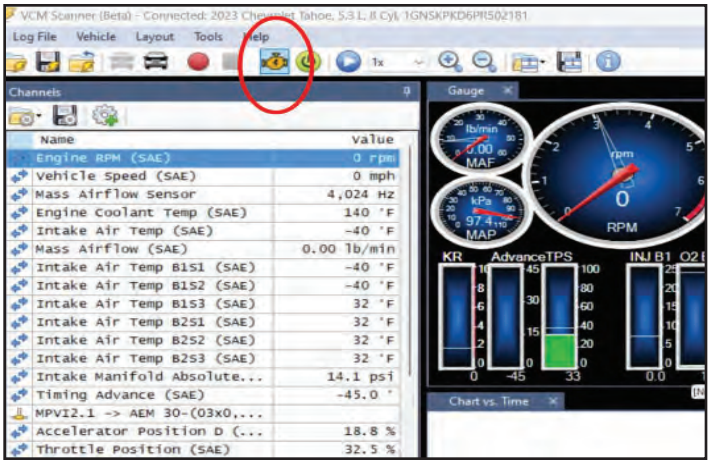
3. DO NOT press on your brake pedal.

   Press and HOLD the start button on the dash until the instrument cluster powers up.

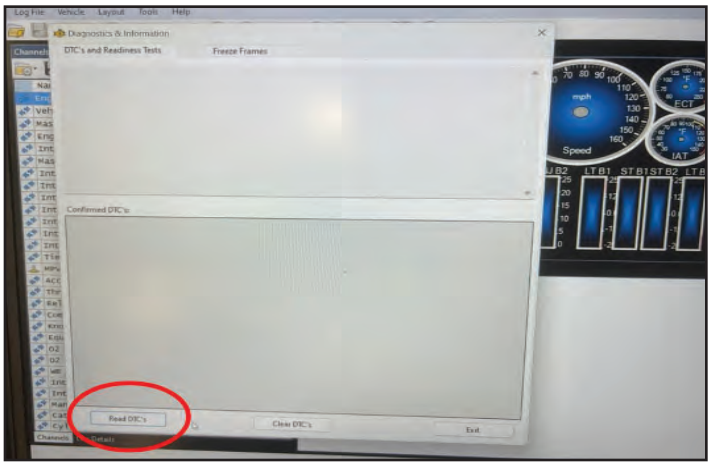
4. Using the HP Tuners VCM Scanner software, click the icon labelled Connect to Vehicle (see photo).



5. Click the Diagnostics and Information icon (circled).

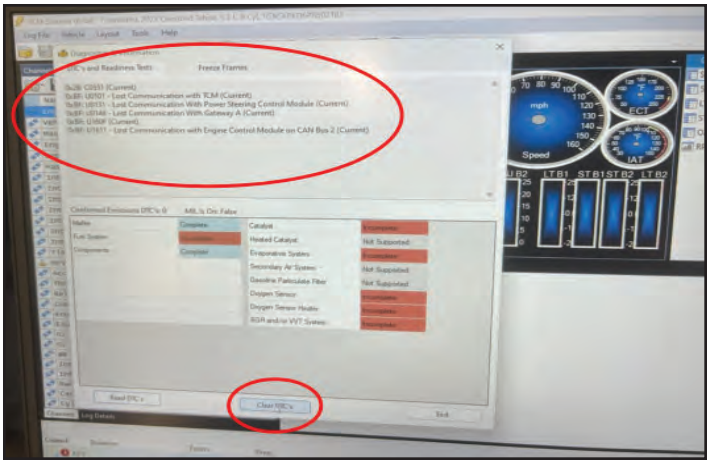


6. At the bottom left of the Diagnostics and Information window, click the Read DTC's button.

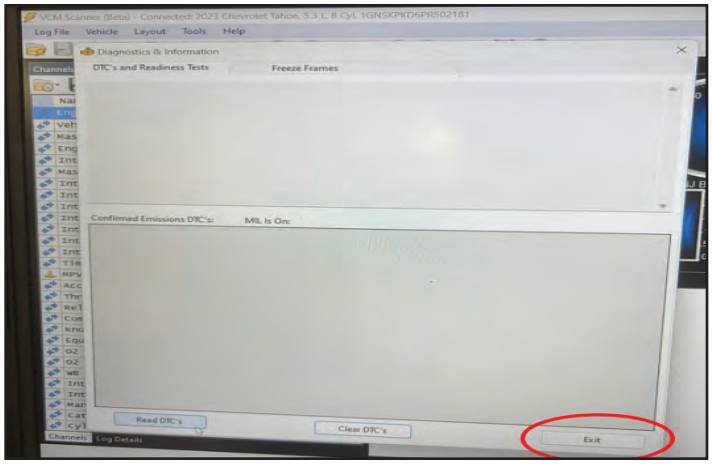


7. There may be a number of initial DTC's present. Take a screen shot or photo of the DTC's that show up in case they are needed for future reference.

   Now click the Clear DTC's button.

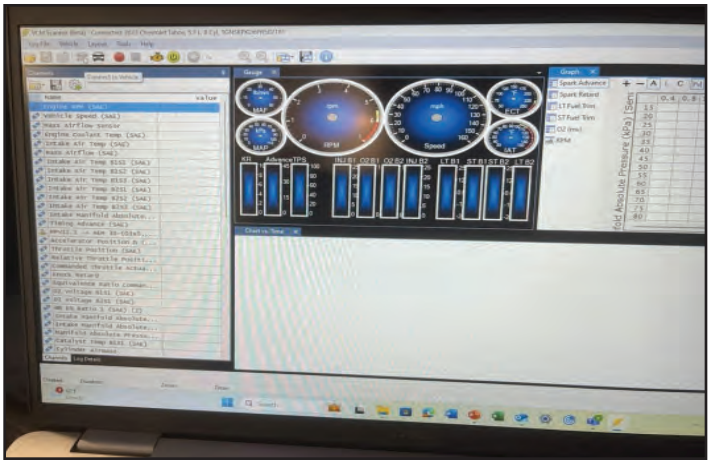


8. After all the trouble codes have cleared, click the exit button.



9. You can now start the vehicle. Perform three brief drive cycles, shutting the engine off and re-starting it between each cycle. This will ensure the unlocked ECM is functioning normally on the factory calibration. Re-verify there are no DTC's after the drive cycles.

   Note that if you are data logging using HP Tuners you may see a warning on the dash for the vehicle anti-theft system. This is normal and will clear after the MPVI3 is disconnected from the OBDII port.



10. **<u>Read the stock file from the ECM</u>**

    Open the HP Tuners **VCM Editor** software.

    Do NOT press the brake pedal.

    Press and HOLD the Start button until the instrument cluster illuminates.

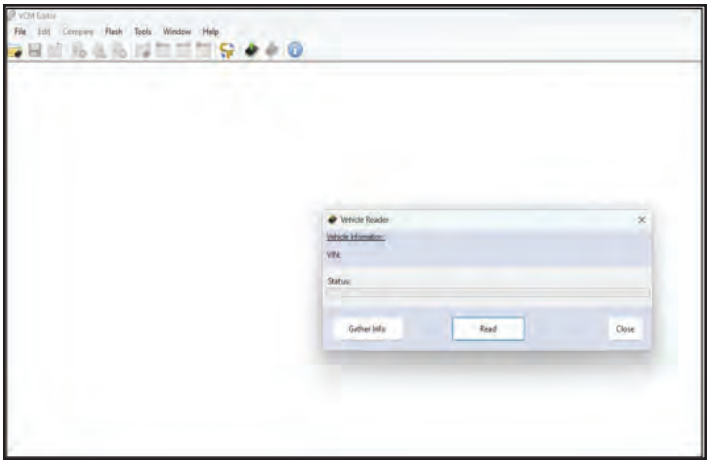
    Click on the Flash tab, then click Read Vehicle.

11. Follow the prompts as directed to read the stock cal file from the vehicle.

    Have your VIN # available.

    Save the stock cal file on your laptop with the following file naming convention.

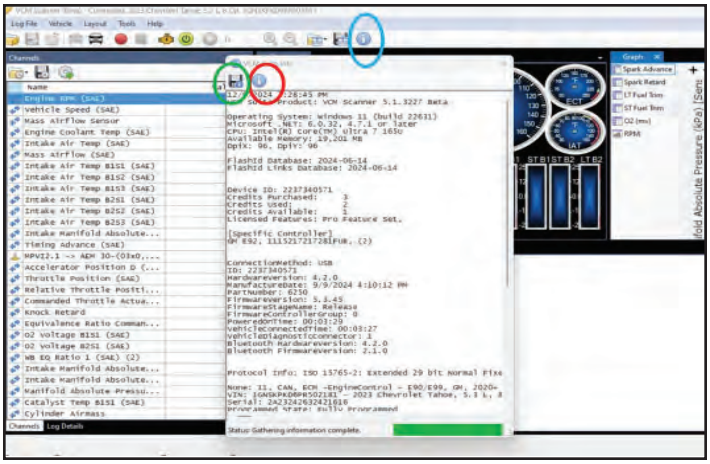
    Last_8_of_VIN_stock.HPT



12. Click on the Info button (blue circled icon) at the top right of the tool bar.

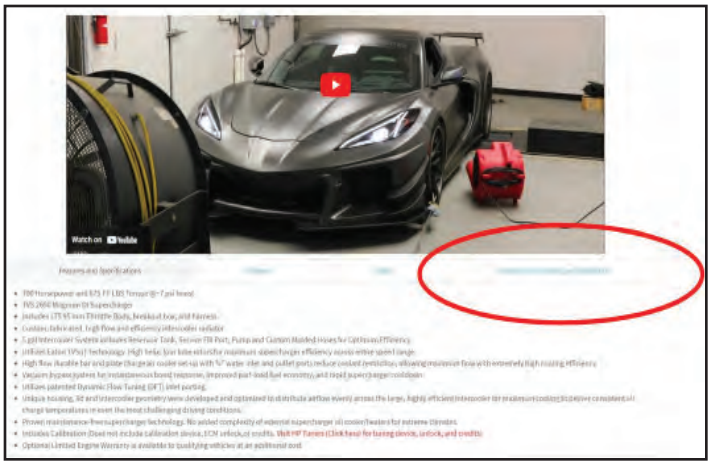
    When the VCM Suite Info window pops up, click on the Info button that is located in the pop-up window (red circled icon).

    Hit the Save button (green circle). Save the Info file in the same folder as your cal file is located.



13. Go to the Magnuson website and locate your kit part #. At the bottom right of the webpage, click the link titled “Manuals, Documents and Calibration”.

    Click the Global A/Global B Calibration Page.



14. Click the Form link and enter the information requested, including your info file and your stock cal file.

    You will receive an updated calibration file to the email address you provide in the form within 24 hours (excluding weekends and holidays).

    Once you receive your new cal file, you can now proceed with installation of your supercharger kit, as detailed in the following steps.

Any reference to the left or right side of the vehicle is given from the driver's seat perspective.

Section 1: Vehicle Teardown/ Powertrain Removal

15. **Before beginning the installation run a full tank of premium 91 octane or higher fuel through your engine. DO NOT USE E85 FUEL OR OCTANE BOOSTER! The vehicle must have premium fuel prior to starting the install.**

16. To provide access to both sides of the engine, the rear of the vehicle will need to be jacked up, and the wheels will need to be removed.

    Use of a hoist is strongly recommended in order to allow sufficient access to the underside of the vehicle during this installation.

    Use the proper vehicle jacking locations (see next slide).

17. Prepare vehicle to be lifted on hoist.

    Only raise the vehicle via factory lift locations using the proper lift pucks (noted at the beginning of this manual).

    Secure the vehicle to the hoist using ratchet straps and clamps @ LH / RH rear as required.

    Remove the rear wheels.

18. **For C8 Convertible applications:** Turn on accessory power by holding start button for several seconds until the dash powers up, then raise the convertible top to allow access to the engine.

19. Raise hood and trunk **BEFORE** disconnecting negative battery cable from battery.

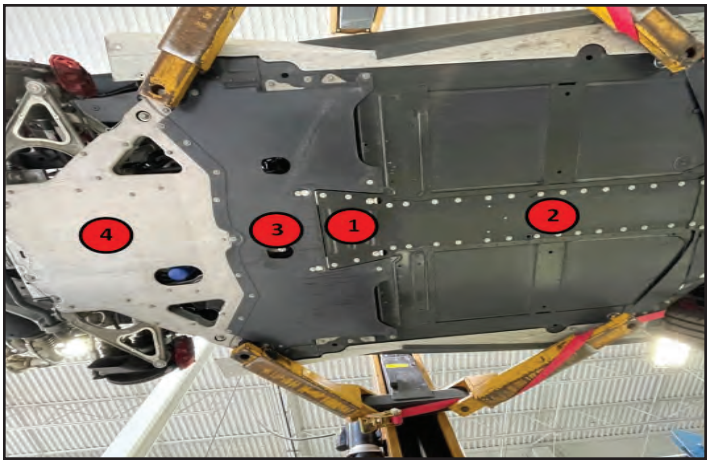
    After battery cable has been removed, place a rag between the cable and the terminal to ensure they do not accidentally contact each other.

20. Inside trunk, remove carpet from trunk then remove fasteners from perimeter of front closure panel.

    Remove front closure panel and set aside.

    Place all fasteners in an identified bag.

21. Working from under the vehicle, remove (4) under body panels in the center of chassis, in the order shown in the photo.

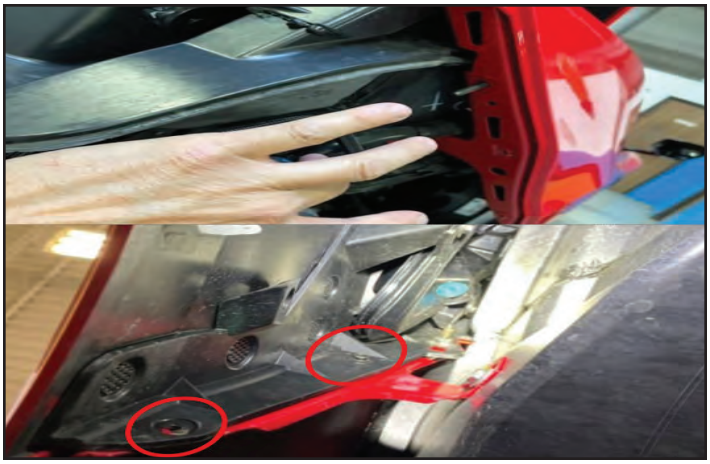


22. Pull plastic rock guards off LH / RH rear corners of wheel wells (right-hand photos).

    Remove LH / RH rear inner fender panels using a Torx T15 socket for screws and forked trim removal tool for plugs.

23. To avoid damage to the rear fascia during installation of the kit, it is recommended that it be removed from the vehicle.

    Facing rearward from inside each rear fender, locate and remove the nut and (2) screws that secure the rear fascia to the fenders @ rear upper corners.



24. Remove fasteners around perimeter of rear upper valance.

    Note quantity of shims that are located between rear valence and body structure at each location. A grease pencil can be used to identify the quantity by each screw hole.

    Remove all shims and place in an identified bag.

25. Remove fasteners in upper LH / RH corners securing rear valence to rear fenders.

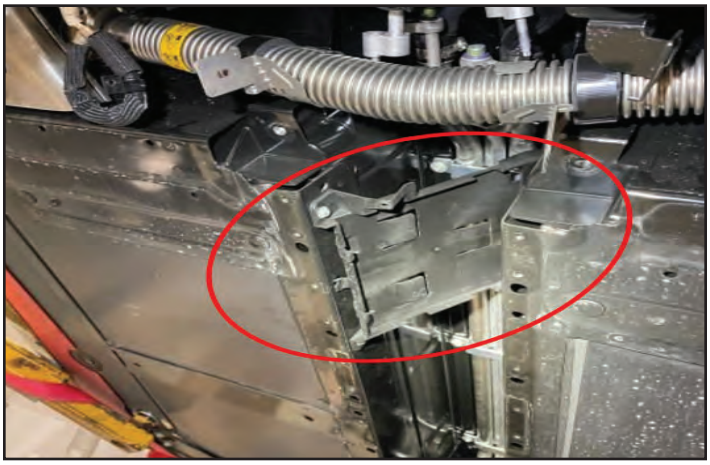
26. With help from a second person, gently lift and begin to separate rear fascia from vehicle.

    Disconnect (3) electrical connectors between body and rear fascia.

    Set the rear fascia aside on a soft, clean surface to avoid scratches.

27. Follow the directions from Appendix C at the back of this manual to remove the ECM.

28. On vehicles with tunnel mounted ECM's, remove the ECM bracket from the tunnel.

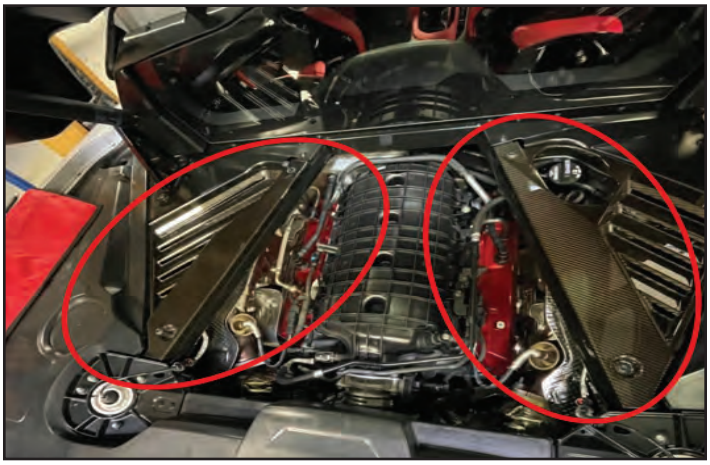


29. Convertible Only: Remove fasteners around the perimeter of the engine access cover.

    With a helper, remove the cover and set aside.

30. Remove header beauty covers (if installed) and engine strut braces in order to allow for additional access.

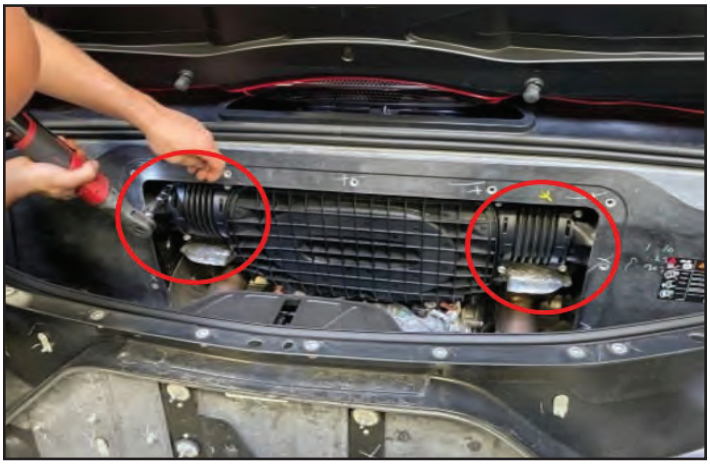
    The OE black torx bolts will be replaced with new bolts later in the process when the struts are re-installed.



31. Disconnect the vapor purge line connection @ RH side of engine.

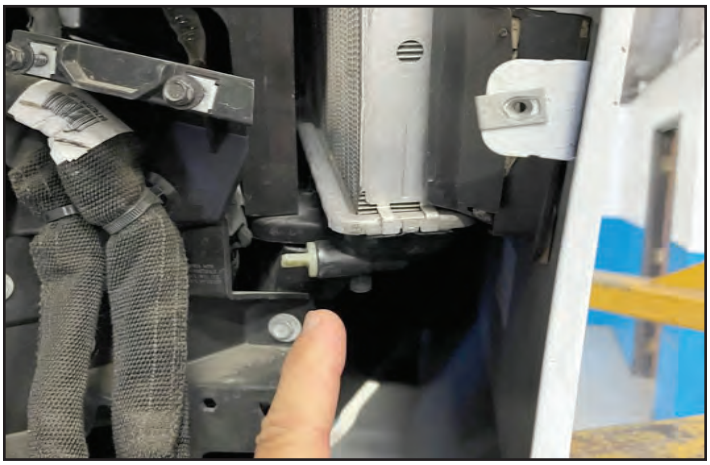
    Remove purge line clip fastened to body brace.

32. Loosen the LH and RH air inlet ducts (4 fasteners per side) and remove from vehicle.



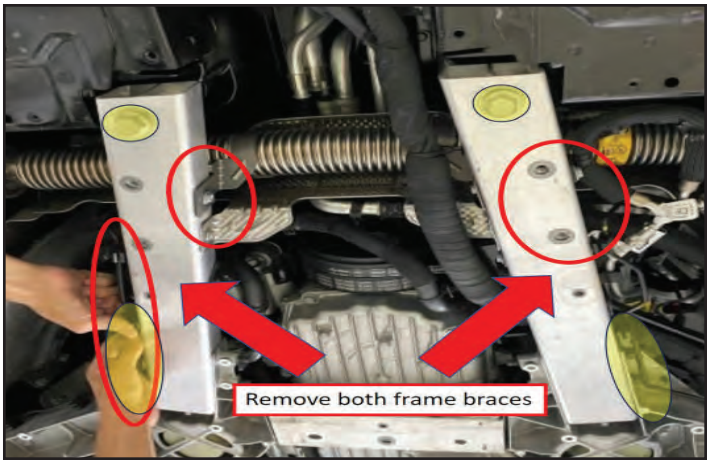
33. Convertible Only: The factory engine coolant bottle will need to be removed so that modifications can be made to the drip tray for clearance to the supercharger. This will be covered in subsequent slides.
    Remove the radiator cap from the reservoir and set it aside.
    Drain the coolant from the vehicle. The drain plug is located at the bottom of the radiator, inside the RH rear wheel well as shown in the following slide.
    Coupe Only: Do not drain the coolant at this time. Further instructions will be provided in a later step.

34. Convertible Only: Working from inside the RH rear wheel well, place a large, clean container below the radiator to catch the coolant.
    Install a 3/8” I.D. rubber hose onto the drain tube. Place a rag under the drain then loosen the coolant drain @ bottom of radiator and allow coolant to drain into the container.
    Dispose of used coolant properly by returning it to your local recycling center or auto parts store.

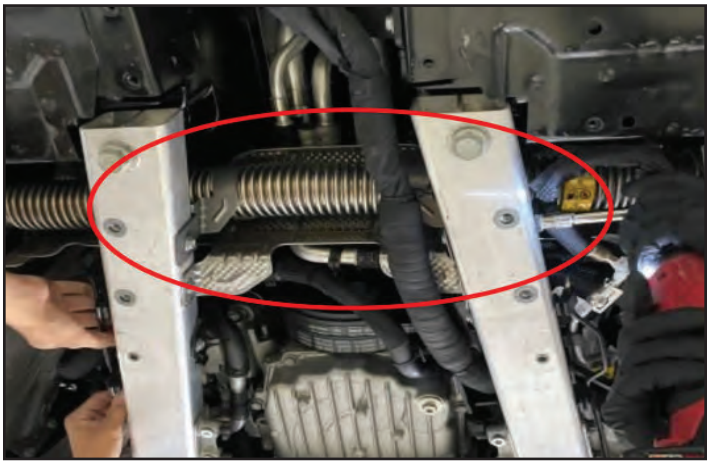


35. Convertible only: Inside RH side of engine bay, disconnect (2) coolant fittings.

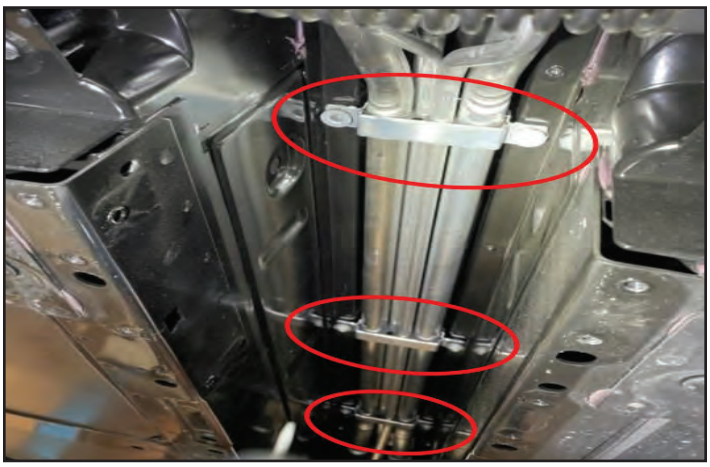
36. Remove any fasteners holding the brake line brackets and heat shields from the LH and RH aluminum frame braces by the fuel cross-over.
Remove the fir tree connectors securing the brake lines to the brackets.
Remove LH and RH frame braces from the vehicle. Two fasteners secure the braces to the rear sub-frame at the back and one large fastener secures it at the front (highlighted yellow areas).



37. Remove (4) push pins securing the fuel cross-over heat shield. Remove the heat shield from the vehicle.



38. Remove (3) tunnel tube brackets from top of tunnel.



39. Cut the A/C belt. A new one is provided in the kit.

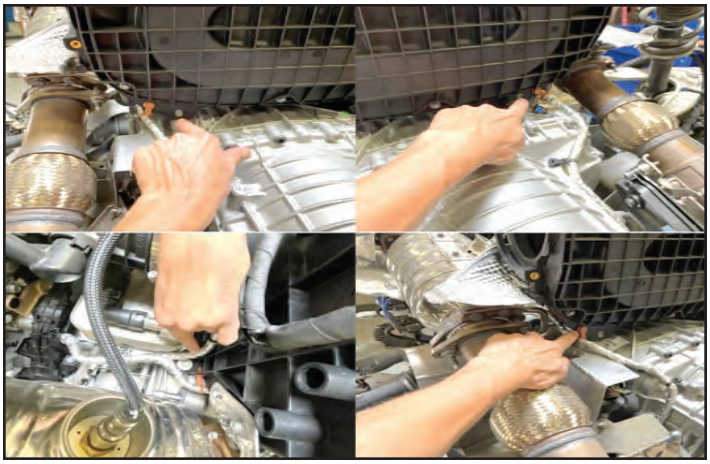
40. Cycle the tensioner by tightening the idler bolt clockwise slowly. This will cause the tensioner to collapse downward and release the tension from the belt. Remove the belt from the engine.

    The factory belt will not be reused.

Section 2: Supercharger Installation / Vehicle Upfit

41. Remove the OE airbox.

    To remove airbox, remove (2) fasteners @ bottom rear, (1) sensor @ bottom rear, (2) wiring harness fir tree connectors @ bottom rear corners and fir tree connectors securing the wiring harnesses and trans vent breather to the front of the airbox. Additional detail is shown in the next step.



42. Disconnect all fir tree connectors and takeouts securing wiring harnesses to the airbox.

    Loosen the gear clamp securing the clean air tube to the airbox.

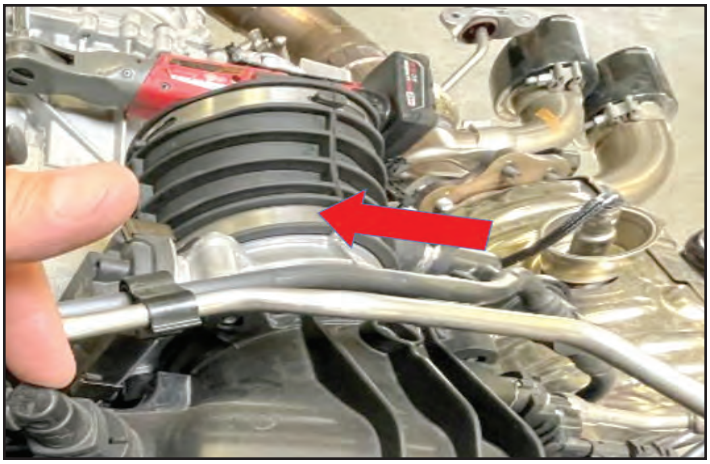
    Disconnect the remote keyless entry sensor wiring takeout from the top of the airbox.

    Remove the airbox.

43. Loosen gear clamps at both ends of the rubber inlet adaptor between airbox and throttle body.

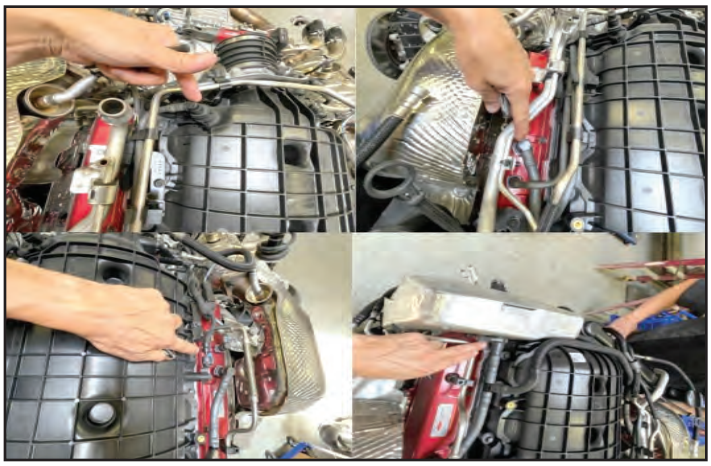
    Disconnect PCV tube from adaptor.

    Remove the adaptor and set it aside.



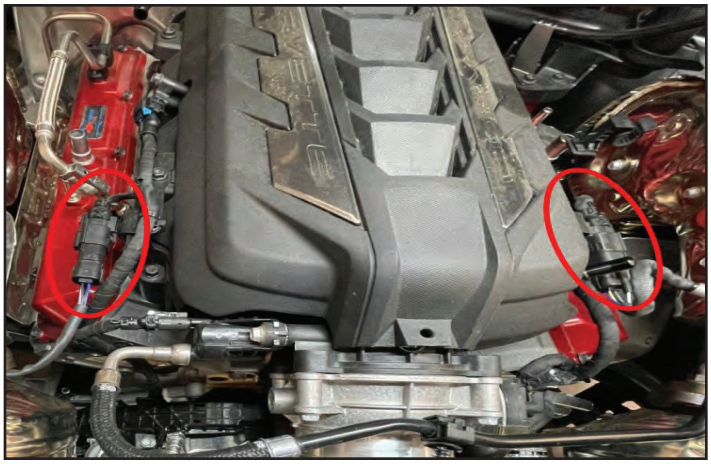
44. Remove the entire Purge and PCV tube assemblies from the engine.

    Parts of this hardware will be re-used in a later step.



45. Disconnect the oxygen sensor fir tree connectors from both sides of the intake where they attach to the brackets.

    Place the wiring out of the way of the intake for now.

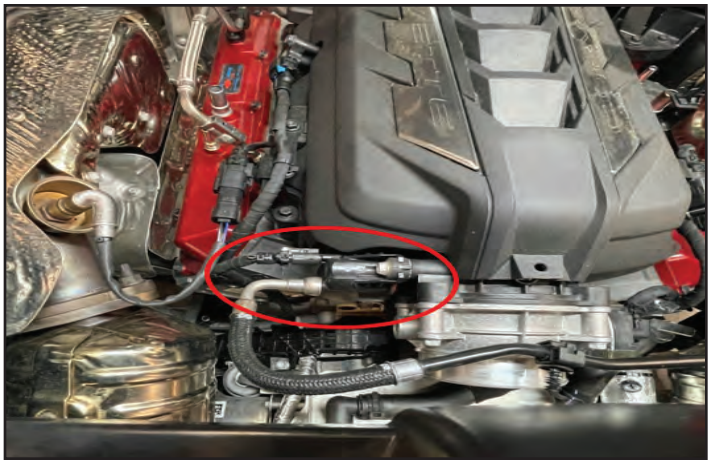


46. Disconnect the harness from the electronic throttle body at the back of the engine.

47. Disconnect the MAP sensor harness at the RH side of the intake.

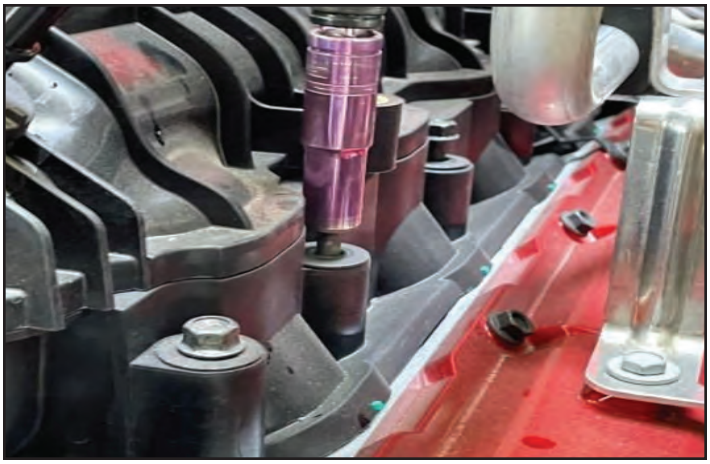
48. Remove the purge solenoid together with the hose from the intake.

    The solenoid and its' OE fastener will be re-installed to the inlet adaptor on the supercharger in a later step.



49. Loosen and remove (2) brackets attached to intake manifold. Loosen all intake fasteners.

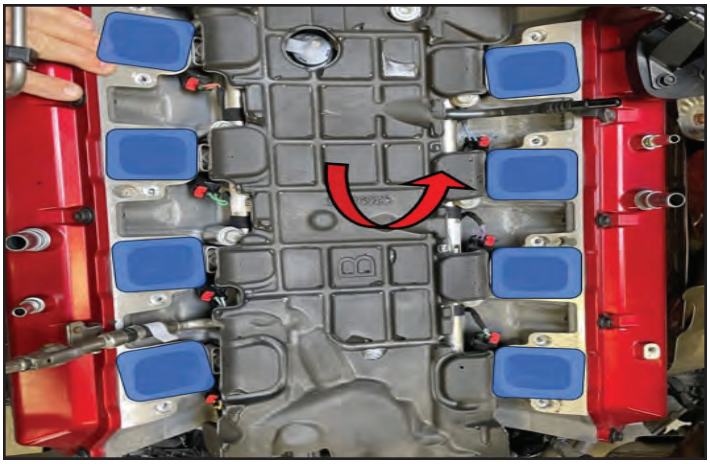
    Remove the intake from engine.



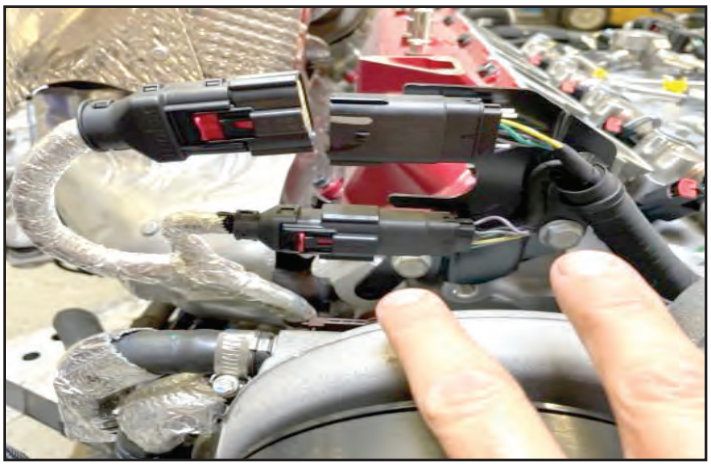
50. Wipe the intake ports with a clean rag and brake kleen.

    Tape off the ports to prevent contamination from entering the engine.

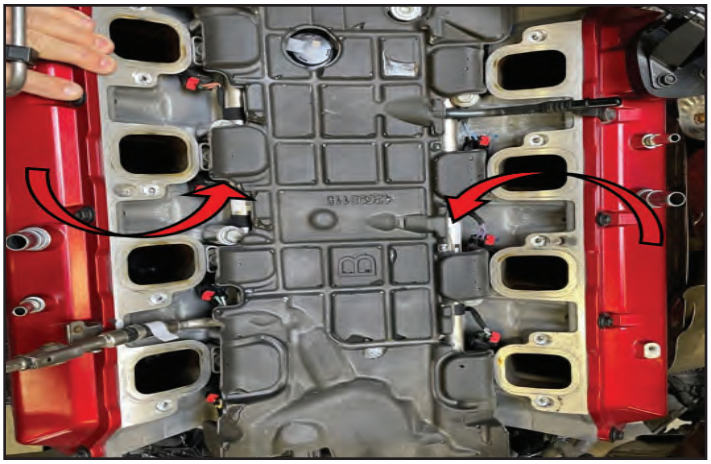
    Remove the NVH foam blanket from engine valley.



51. Disconnect harnesses @ hardshell connectors and remove wiring harness bracket @ RH front of engine.



52. If valve springs are being upgraded, refer to the GM procedure to remove and re-install this hardware.



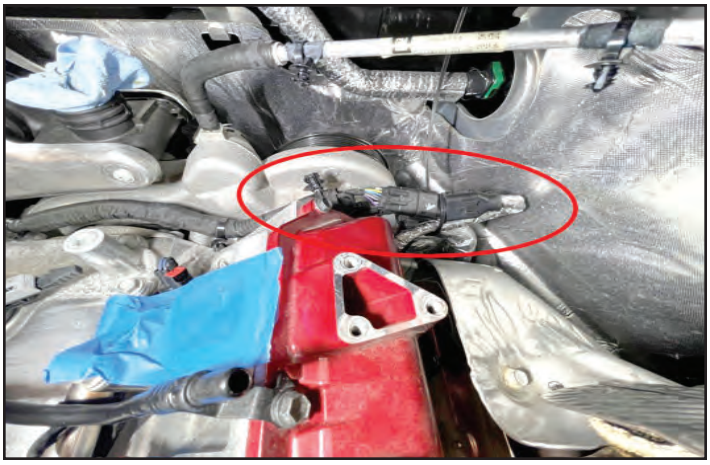
53. Remove 2 fir tree connectors holding coolant degas tube to oil fill tube.
Remove the bolts securing the dipstick and oil fill tube.
Remove the dipstick and oil fill tube.
Harvest the seal from the oil fill tube @ dry sump side as indicated in the bottom photo.
Set the seal aside.
The factory oil fill tube and cap will not be re-used.

54. Disconnect (2) hardshell connectors from the bracket at the RH front of the engine.

Remove the bracket from the engine.

Route the factory wiring/hard shell connectors behind the water pump as shown.

Zip tie the wires away from the exhaust system as necessary.



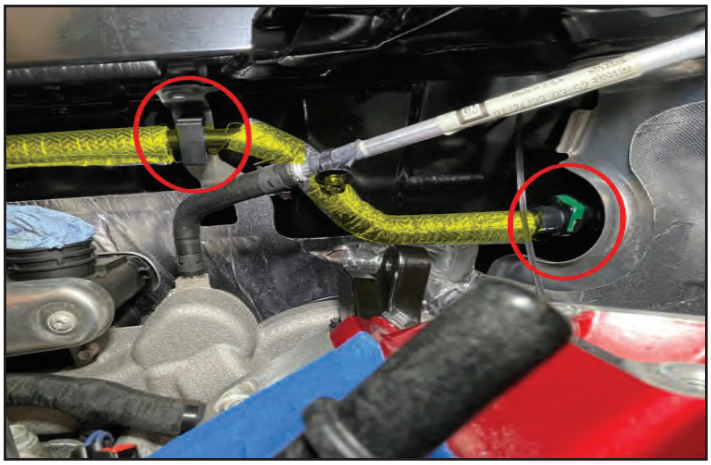
55. **Fuel Tank Vent Crossover Re-route**

Remove the plastic OE crossover line from the RH front corner of the engine compartment. The green secondary locking clip must be removed before the primary lock can be cycled to allow the crossover line to be removed from the RH tank. Take care not to drop the green lock down inside the heat shields. Stuff a rag or paper towel in behind the aluminum panel to prevent it from falling inside.

Remove the clamp used to secure the crossover line to the vehicle using a fork tool.

Carefully remove the 2 heat shields highlighted in yellow from the crossover line by peeling back the adhesive tape.

Set them aside as they will be reused.



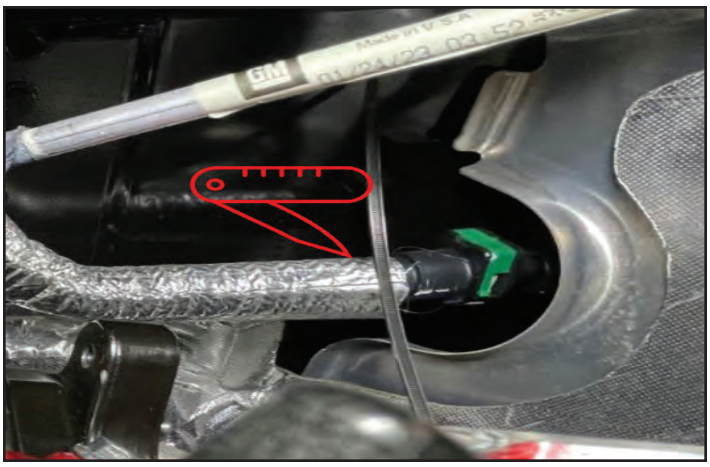
56. **087K Fuel Tank Vent Crossover**

Carefully cut the factory crossover tube in the location shown using a sharp knife or hose cutter.

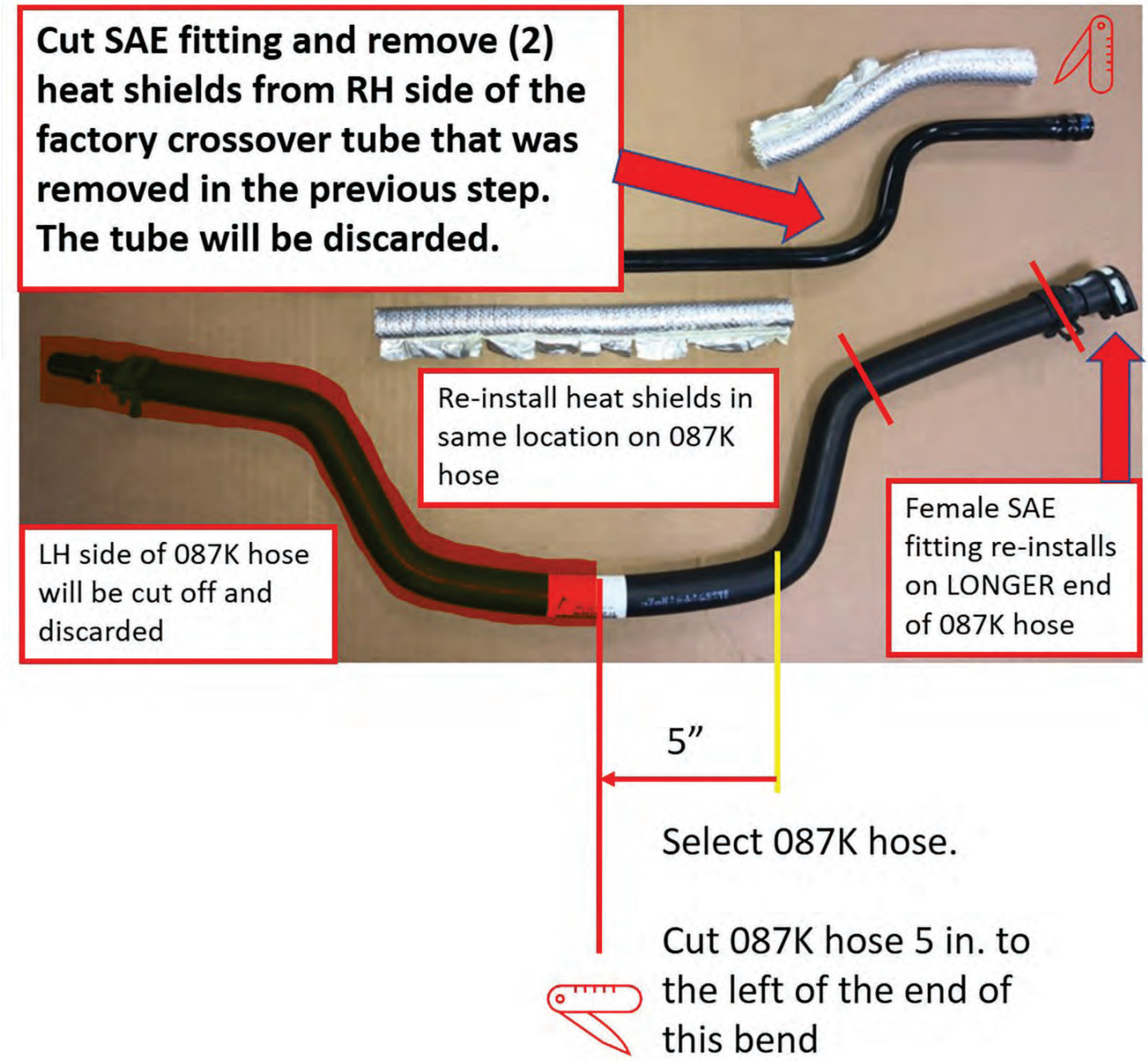
The location is in the straight section of the tube, approximately 3 inches to the left of the S-bend (near the middle of the vehicle).

57. Carefully cut the SAE connector off the section of factory tubing that was removed from the vehicle. Use a razor blade or sharp knife to cut through the tubing, ensuring you do not cut too deep, as there is an o-ring on the barbed end of the connector.

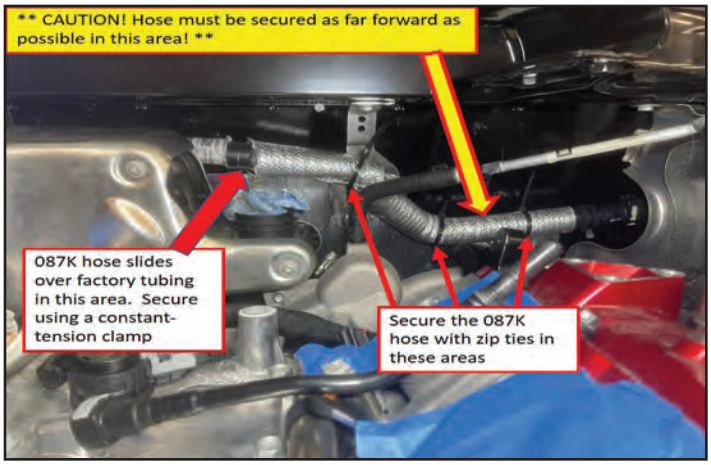
The following step provides additional detail.



58. Select the revised pre-formed cross-over hose P/N 31-26-62-087K from the hose kit.
    Cut the 087K hose to fit in place of the section of factory tubing that was removed, as shown in the photo.
    Slide a 5/8” (MU26) constant tension clamp over both ends of the cut 087K pre-formed hose.
    The LH side of the 087K hose can be discarded.
    Re-install the SAE fitting that was harvested from the RH side of the OE tube to the end of the 087K hose as shown. Secure it using the clamp.
    Re-install the OE heat shields over the 087K hose in the same locations.



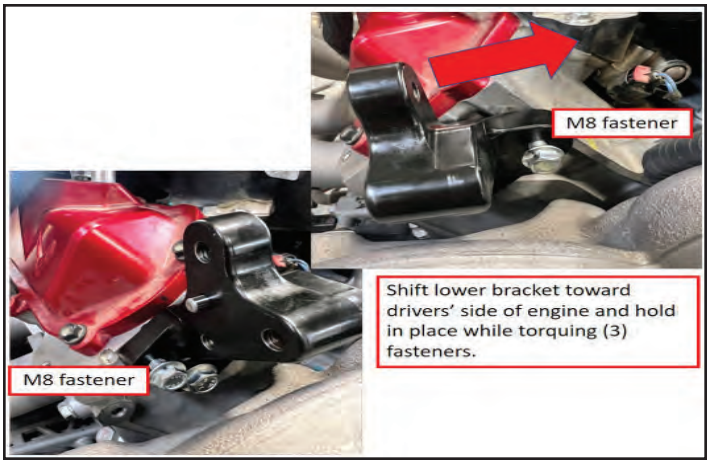
59. Install the new 087K hose assembly back into the vehicle, securing the SAE fitting back into the RH fuel tank first, then installing the green locking clip.
Route the 087K hose toward the remaining section of factory tubing. Trim it to length if needed so it will install onto the factory tubing with approximately 2 inches of overlap, then secure it with the constant tension clamp.
Install a zip tie through the hole on the aluminum bracket to secure it as far forward as possible.
Punch holes in the heat shield panel as necessary then fasten the hose to the heat shield using additional zip ties as shown.
Trim the zip ties.
IMPORTANT: This hose must be secured as far forward as possible to ensure it does not rub on the pulleys.



60. **FEAD Drive Installation**
Pre-install (1) P/N 71-10-15-025 (M10 X 25mm long) fastener into RH front cylinder head in the location shown.

Note: Due to water pump casting variance, the bolt may have to be ground slightly shorter to allow engagement into the cylinder head threads.

61. 2-Piece Jackshaft Installation
Slip the jackshaft lower bracket PN 65-26-62-079 onto the bolt that was pre-installed in the previous step.
Orient and align the lower bracket with the holes in the RH cylinder head.
Install (2) M8 X 30mm long bolts through the lower bracket into the cylinder head. After all (3) fasteners have been installed by hand, shift the lower bracket toward the drivers' side of the engine, hold in place, then torque the fasteners.
Note: a crow foot wrench may be required.
Tighten M8 bolts to 21 ft-lbs.
Tighten M10 bolt to 41 ft-lbs



62. Select the upper jackshaft bracket assembly PN 31-26-62-081.

63. Sub-assemble the following items to the upper bracket:
    Pre-install coolant hose 087F (found inside the hose kit bag) through the hole in the middle of the upper bracket, in the orientation shown. **Note:** all hoses have an inkjet part # identification on them.
    Pre-install a 5/16” constant tension clamp from the kit onto the end of the 087F hose at the U-shaped end.
    Sub-assemble (2) P/N 56-06-01-054 idler pulleys onto the upper bracket bosses.
    Apply blue Loctite to (2) M10 X 35mm long idler pulley fasteners P/N 71-10-15-035.
    Install the fasteners through each of the -054 idler pulleys. Torque the fasteners to 41 ft-lbs.
    Install drive pulley P/N 57-00-06-130-BL to the jackshaft hub on the same side as the idlers.
    Apply blue Loctite to (4) M6 X 12mm long bolts P/N 71-06-10-012. Install the bolts and torque them to 106 in-lbs in a criss-cross pattern.

64. Install the upper jackshaft sub-assembly onto the lower bracket, aligning the dowel pin(s) and the 3 holes.
    Apply blue Loctite 242 and install (3) M8 X 30mm long fasteners through the upper jackshaft bracket. Ensure the dowel(s) engage the bracket and the two halves fully seat against each other as the bolts are tightened.

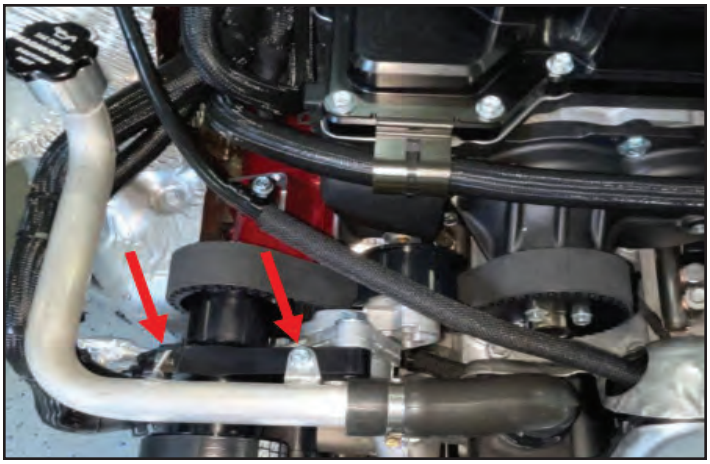
    Torque the (3) fasteners to 21 ft-lbs.

65. Ensure the engine is cool. Temporarily remove then re-install the cap from the coolant fill bottle to relieve any pressure in the system.
Remove the factory coolant vent hose from the top of the water pump casting spigot (highlighted yellow). Temporarily plug the spigot to prevent coolant from leaking.
Temporarily secure the factory hose up above the rear deck lid to prevent coolant loss.
Install the U-shaped end of the 087F hose onto the water pump spigot, ensuring it is fully seated (see photo).
Secure it using the clamp that was pre-installed in the previous slide.
Temporarily secure the opposite end of the 087F hose up above the rear deck lid together with the factory hose to prevent coolant loss. It will be connected in a later step.

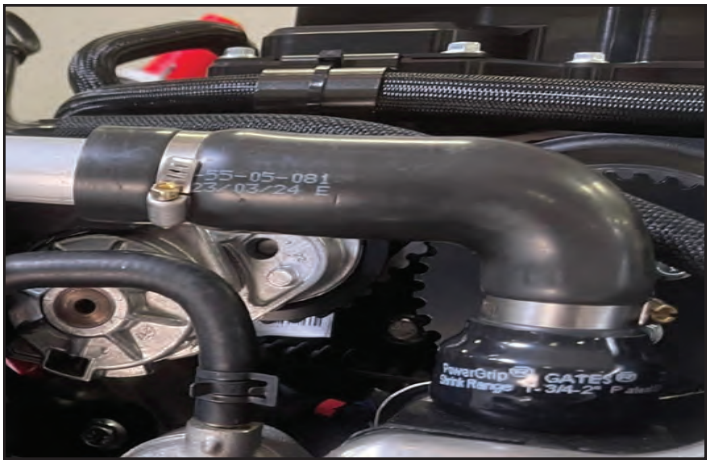
66. Select the billet reservoir adaptor from the kit. Harvest the o-ring from the original oil fill tube and install it onto the adaptor.
Lubricate the o-ring with oil and install the adaptor into the top of the dry sump tank.

67. Install the Gates Powergrip heat shrink tube P/N 32948 over the end of the adaptor where it connects into the dry sump tank.
Lift the heat shrink tube up approx. 1/8” to center it over the joint then heat shrink it over the joint between the billet adaptor and factory reservoir.
Select the 1” diameter 90-degree section of hose from the kit. Install a #16 gear clamp from the kit over the short end of the hose then install the hose onto the reservoir adaptor as shown. Tighten the clamp securely.

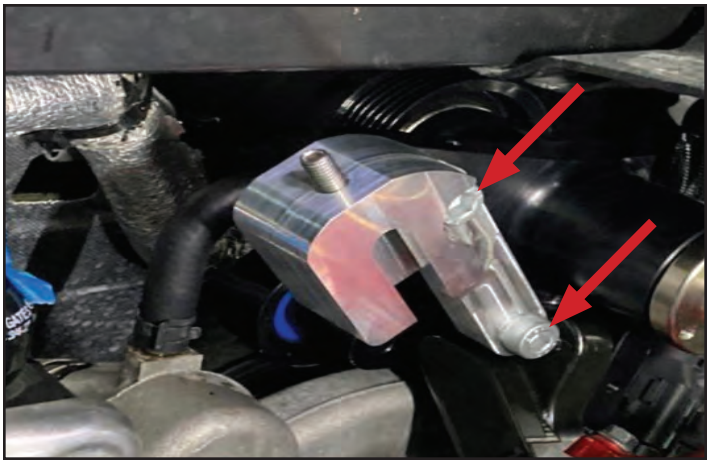
68. Select the oil fill tube PN 35-26-62-089 from the kit.
Slip another #16 gear clamp over the end of the hose then install the oil fill tube as shown. Position it so that the bolt holes in the tube align with those in the jackshaft bracket. Select (2) M6 X 16mm long fasteners, apply blue Loctite, hand-start and zero-torque them through the oil fill tube brackets into the jackshaft bracket.
Torque both M6 fasteners to 106 in-lbs.



69. Position the gear clamp over the tube to hose interface then tighten it to secure the hose. Install the oil fill cap.

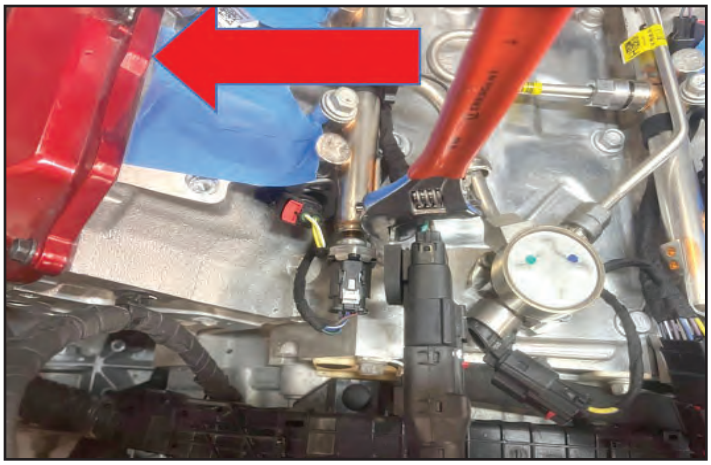


70. **Static tensioner installation:**
The static tensioner is installed to the rear of the upper bracket using (2) M10 X 35 mm long socket head cap screws, PN 72-00-10-036 and (2) 10mm ID washers from the kit. Install the washers onto the fasteners then apply blue Loctite 242 to the fasteners.
Install and torque to 41 ft-lbs.

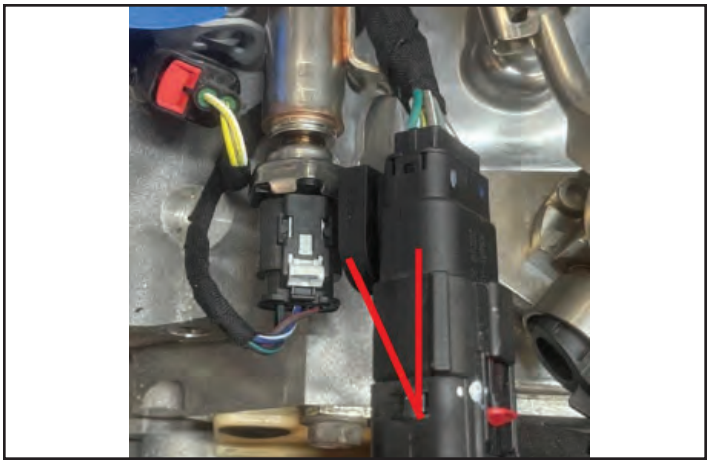


71. Select the M8 X 25mm long set screw, apply blue Loctite 242 and pre-install it only a couple of turns, into the billet tensioner as shown.
The static tensioner pulley is secured to the billet bracket using a slide nut P/N 77-10-15-010, idler post P/N 69-90-47-008 and idler P/N 56-30-01-062-BL.

72. Using a small adjustable wrench, bend the bracket that secures the hardshell connector toward the LH side of the engine.

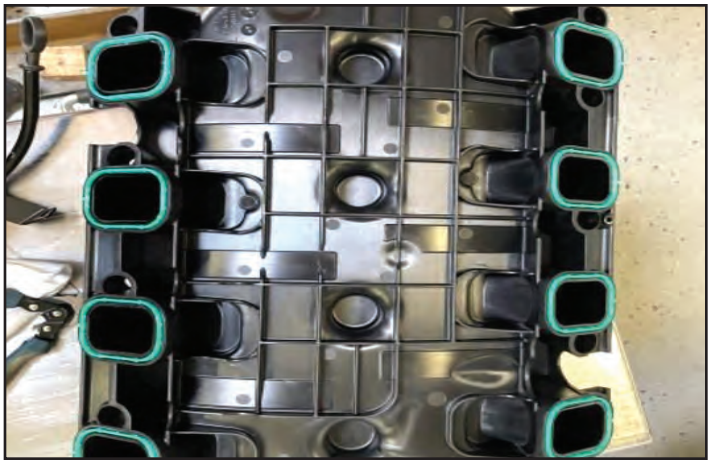


73. Here is the final position of the bracket from the last step.

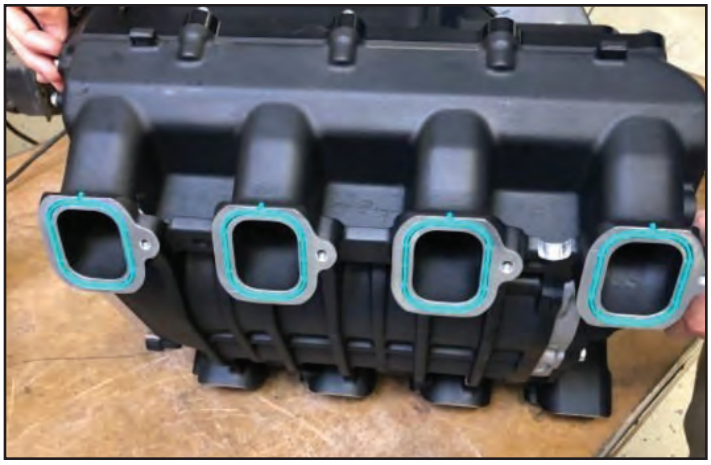


74. Harvest (8) seals from OE intake ports.

    Wipe the seals down and inspect them for any damage. They will be re-installed onto the supercharger in the following step.



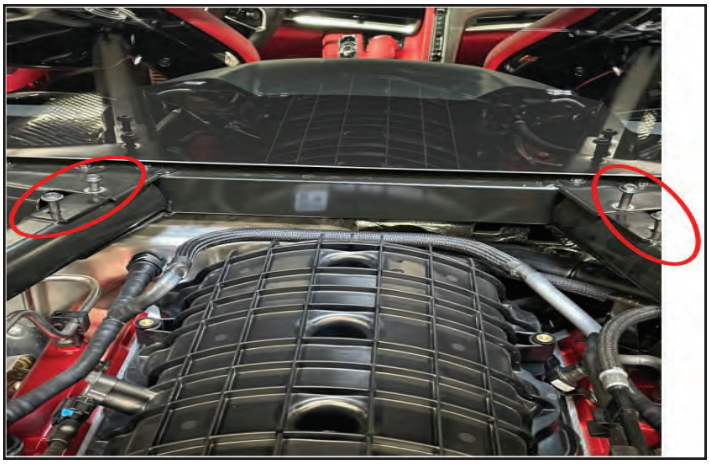
75. Re-install (8) OE PIP gaskets into SC head unit (RH side shown, LH side similar).



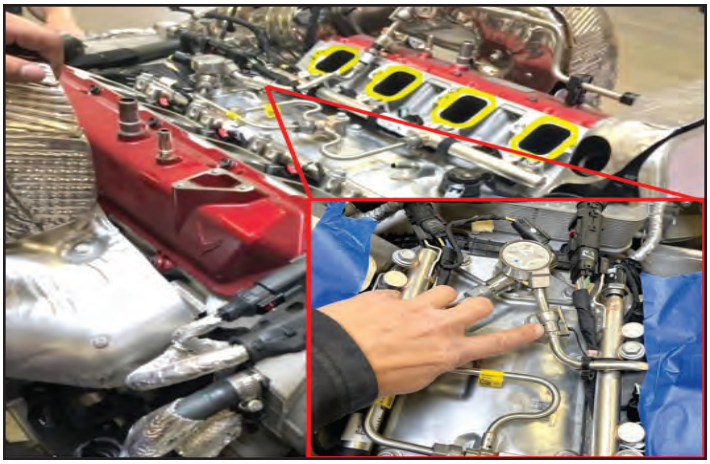
76. The engine bay struts must be re-installed prior to supercharger installation.

    Secure them with revised M8X1.25-60mm long flanged fasteners P/N 71-08-12-060 (8 places). from the kit.

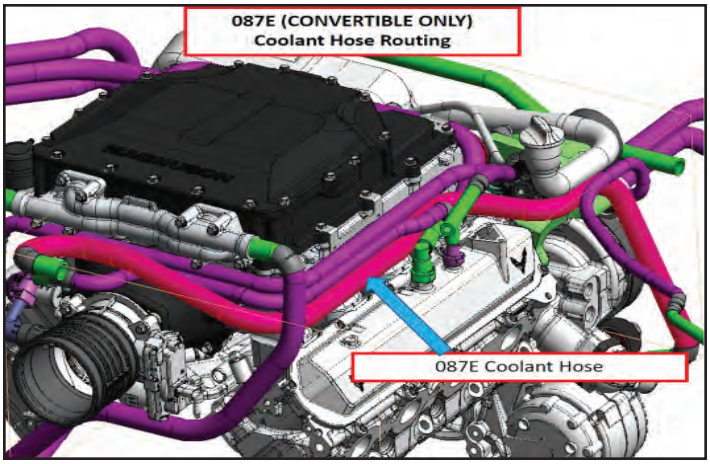
    Torque the fasteners to 22 ft-lbs.



77. Rotate fuel line lock in valley by DI pump so it faces horizontally.



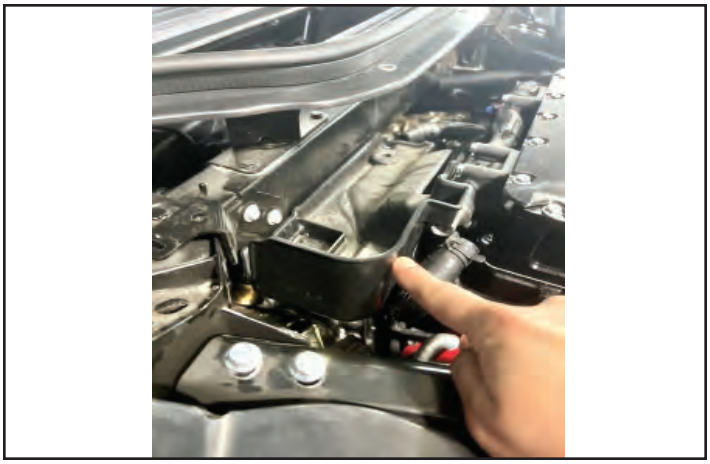
78. 087E Hose (Convertible Only): Hose 087E is provided for convertible models only. This hose replaces the factory coolant hose.
    Note: this hose is NOT used on C8 coupe models.
    Appendix B provides detailed hose routing diagrams for the entire vehicle.
    Route coolant hose 087E along RH side of engine as shown. It will be secured to a bracket along the RH side of the supercharger in a subsequent step.
    Pre-install a ¾" constant tension clamp to each end.
    Remove the factory coolant hose from the connection point by the thermostat housing @ RH front corner of the engine. Install the 087E hose in its place.
    Secure the hose using the constant tension clamp.
    The connection point at the opposite end will be made in a subsequent step.With the aid of a helper, install the supercharger head unit onto the engine.



79. Convertible Only: Remove the factory hose from the highlighted location then remove the coolant reservoir from its mounting location.

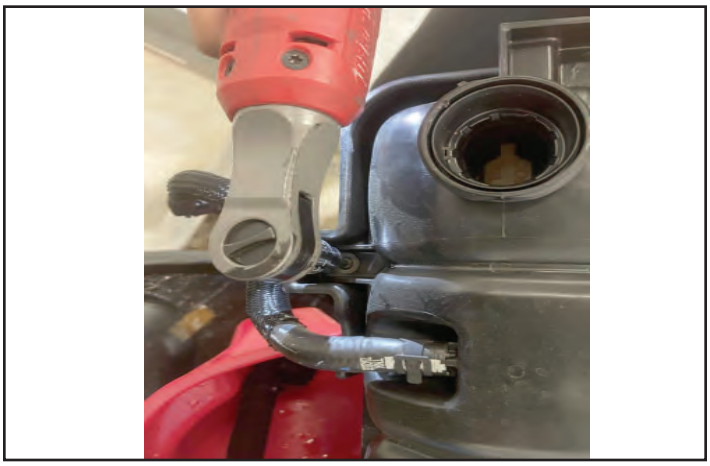
80. Convertible Only: Remove the under tray from the coolant reservoir.

    The following steps will detail modifications required to be made to the tray on convertible models to alleviate contact with the supercharger hoses.



81. Convertible Only: Remove (1) Torx fastener securing the reservoir to the tray from underneath.

82. Convertible Only: Remove (1) Torx fastener securing the reservoir to the tray from the top.



83. Convertible Only: Remove the factory hose from the reservoir in the location shown.

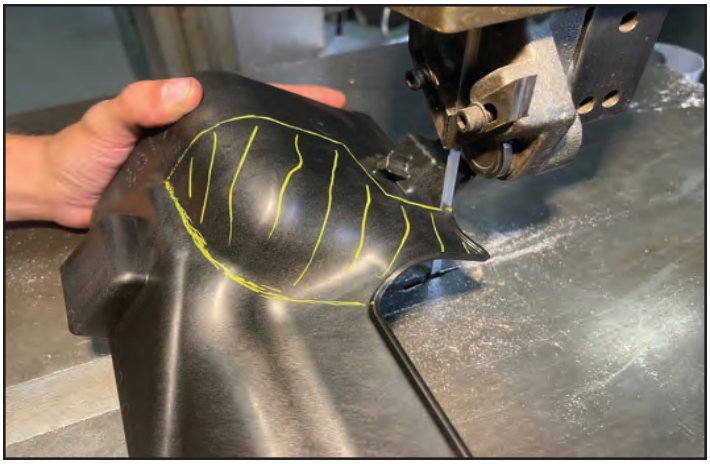
    This hose will not be re-used.

84. Convertible Only: Remove the drip tray from the vehicle.

    Mark the area shown for removal in the next step.

85. Convertible Only: Using a band saw or cut off wheel, carefully remove the section of plastic shown in the photo.

    Radius and blend the edges as required to eliminate any sharp edges.



86. Convertible Only: Reinstall the modified drip tray back onto the factory coolant reservoir, securing it using the original Torx fasteners.
    The 087E hose was pre-installed in a previous step.
    Route and connect the 087E hose (highlighted in red) to the bottom port of the coolant reservoir, securing it with a ¾" constant tension clamp from the kit. See Appendix B for hose routing diagrams.
    Re-install the reservoir sub-assembly into the vehicle and secure it using the original fasteners.

87. Convertible Only: The 087F hose was installed into the top of the water pump spigot in a previous step and was temporarily stowed above the rear deck lid.
Route and install the 087F coolant hose onto the top port of the factory coolant reservoir. Secure it using a constant tension clamp from the kit.
The 087F hose will secure to the support bracket on the RH side of the supercharger in a later step.
Keep the hose tied over toward the RH exhaust manifold for now while the supercharger is installed.

88. Remove the tape from the intake ports.

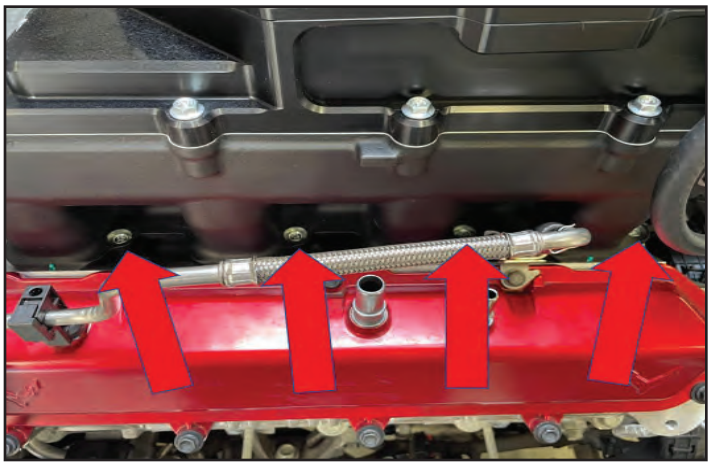
Clean the mating surfaces and carefully inspect all 8 intake ports for anything that may have dropped inside.
Smear a light coat of the supplied Lubriplate grease around the perimeter of all 8 intake ports to minimize the seals from rolling when the supercharger is installed.

89. Use of a forklift or engine hoist is strongly recommended to install the supercharger.
Use a helper to slowly and carefully guide the supercharger head unit onto the engine.

Ensure the intake gaskets do not roll or become displaced during installation.

90. Apply blue Loctite 242 then install (8) intake bolts P/N 71-06-10-035 through the intake into cylinder heads.
Zero torque all bolts starting from the center out, in a criss-cross pattern.
Ensure the intake seats uniformly against both heads as the gaskets compress.
Pre-torque (8) intake bolts to 71 in-lbs in sequence.

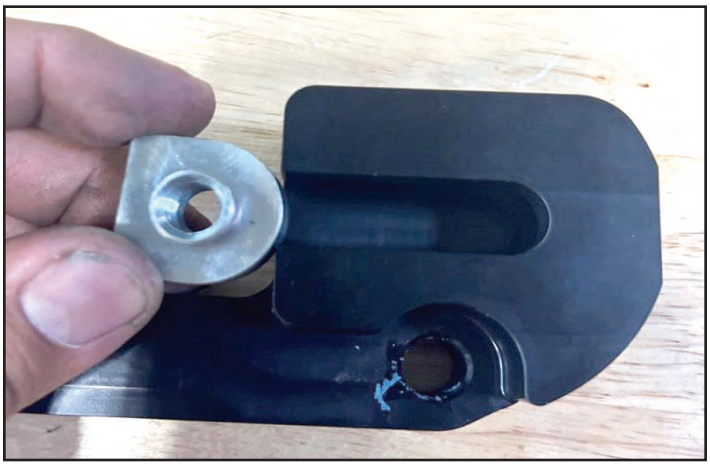
Final torque (8) intake bolts to 106 in-lbs. in sequence.



91. Select the idler post P/N 69-90-47-008 and idler P/N 56-30-01-062-BL.

    Install the post onto the idler as shown.

92. Select the tensioner slide nut PN 77-10-15-010 and prepare to install it into the bracket in the orientation shown.



93. Select the M10-1.5 X 45mm long fastener from the kit. Apply blue Loctite to the threads.

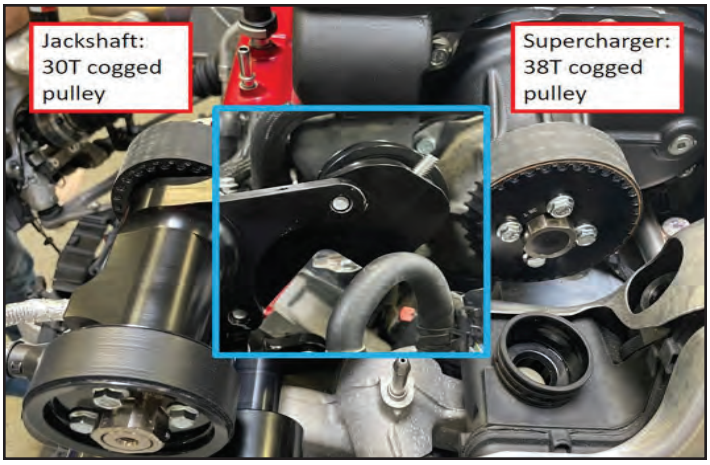
    While holding the slide nut in place, hand-start the fastener through the idler and into the slide nut.

    Slide the idler to the top of its' travel in the bracket to allow for sufficient clearance to install the cog belt. Snug the bolt to keep the idler in place. This will provide for the most belt clearance.

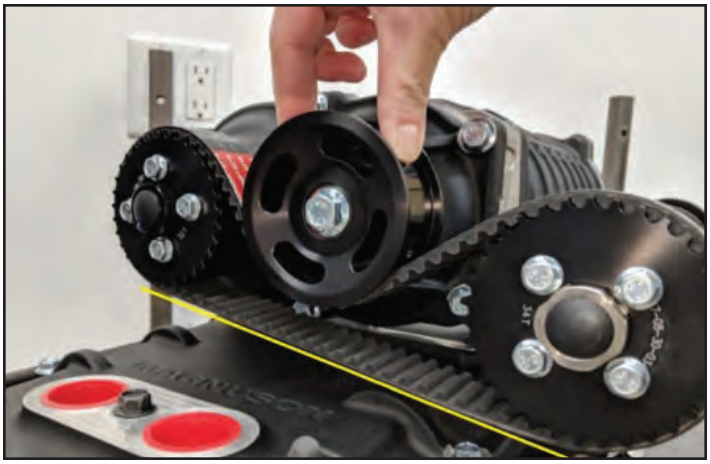
94. Install the 30T cogged pulley to the rear of jackshaft. Apply blue Loctite 242 and install/ torque (4) M6 X 16mm long bolts to secure the cogged pulley. Torque to 106 in-lbs.

    Ensure the cogged pulley on supercharger is 38mm diameter.

    Static Tensioner design: the latest version is shown in the inset photo. See the following steps for belt installation detail.

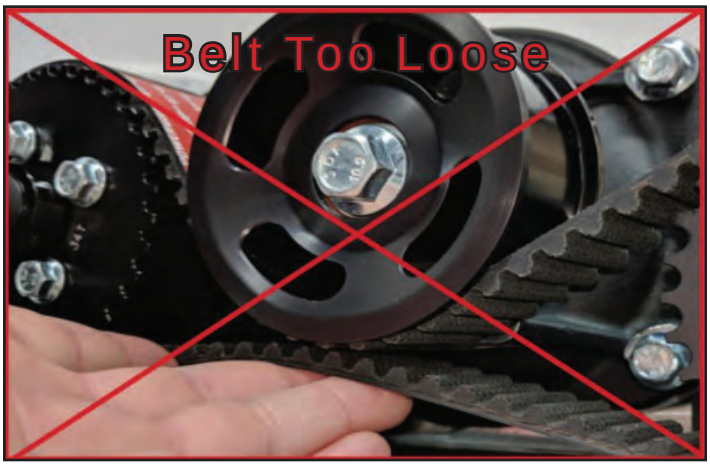


95. Install the cogged belt PN 79-83-00-720 over the cogged pulleys and under the idler pulley as shown.
    Ensure the belt seats fully into the grooves of the cogs.
    With the idler pulley bolt just loosened enough to allow it to slide, push down on the pulley until the lower span of the cogged belt just starts to create a straight line as shown with the yellow line. Tighten the set screw until it just contacts the slide nut to keep the idler in this position.
    Torque the idler bolt to 25 ft-lbs.



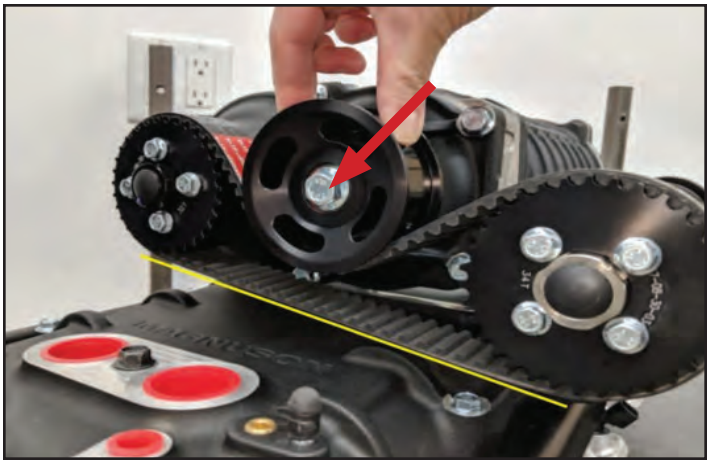
96. Inspect for proper belt tension:
    Press up on the lower belt span to ensure that it does not make contact with the upper belt. The upper and lower belt teeth should be about 4mm apart.

97. If the lower belt overlaps the upper one, as shown here, further adjustments will be needed.



98. In this image the belt is too tight. Space between the upper and lower cog teeth is greater than 4mm.

99. Double-check the idler pulley bolt torque, ensuring it is torqued to 25 ft-lbs.



100. We will now move to working from under the vehicle.

The lower exhaust heat shields can be removed to gain additional clearance for spark plug installation if needed.

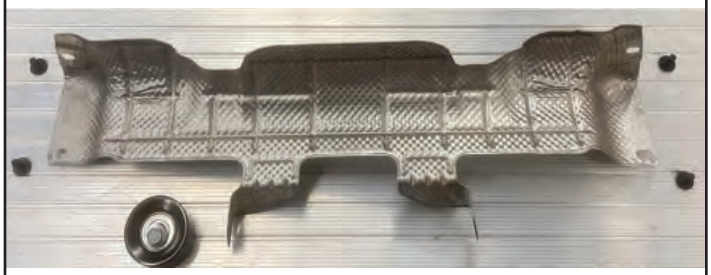
Install revised NGK LTR7IX-11 spark plugs.

Gap to 0.032 – 0.035 inch. Torque spark plugs to 15 ft-lbs.

101. Working from under the vehicle, remove the following components to gain additional clearance for bracket installation:

Fuel cross-over heat shield

Tensioner pulley (highlighted blue area shown removed at bottom right of the photo in the next step.

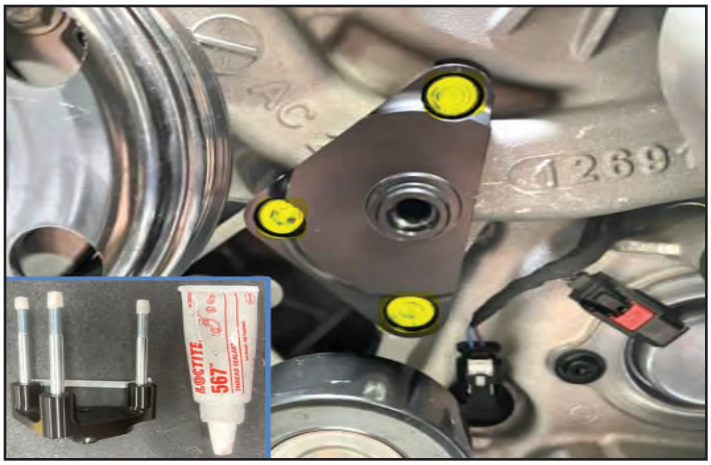


102. Remove (3) factory fasteners from the base of the water pump casting at the yellow highlighted locations shown.

103. Select the idler bracket P/N 65-26-62-085 and sub-assemble (3) socket-head cap screws P/N 72-00-08-100.

IMPORTANT: Apply thread sealant (such as Loctite 567) to all (3) of these fasteners.

Install the idler bracket onto the front of the water pump, hand start (3) fasteners, zero torque the fasteners then final torque them to 18 ft-lbs.



104. Install 56-50-47-001 Dayco pulley and (1) 71-10-15-030 bolt onto the idler bracket.

Torque the bolt to 41 ft-lbs.

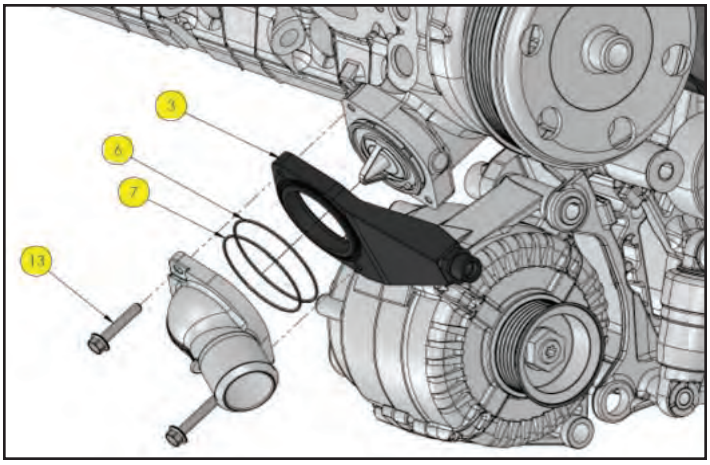
105. **Accessory Drive Belt Addendum:**

Your kit may come with 2 belts and some accessory drive hardware which is no longer used. The following slides will detail the latest accessory drive assembly procedure which simplifies installation.

Use the supplied *optional* serpentine drive belt **(Gates Part # K060710)** for your installation. This will allow you to skip several of the following steps, and draining of the coolant system is not required. This optional belt can also be used on convertible models, however, as noted in previous slides, the coolant system must be drained on those models due to the required modifications to the coolant reservoir, which were already detailed.

106. ***If your kit includes the hardware highlighted in the photo, you can discard it as it is no longer used.***

PIP seal P/N 80-59-10-561
PIP seal P/N 80-59-10-566
T-stat adaptor (billet) P/N 65-26-62-083
(2) Fasteners M6 X 35mm P/N 71-06-10-035
Gates belt P/N K060722 (not shown).

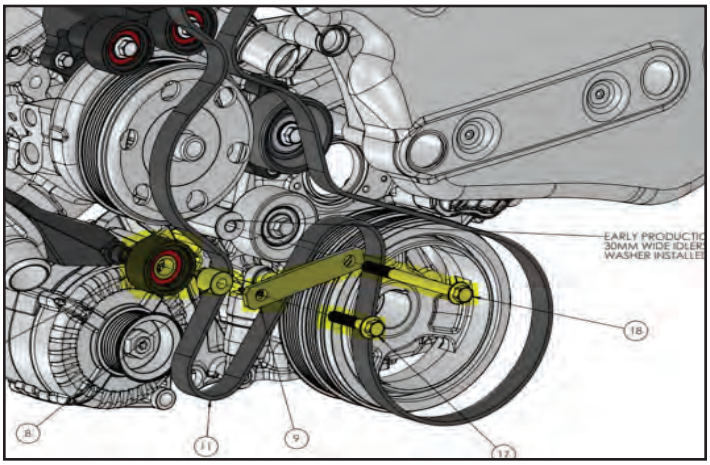


107. Ensure the OE tensioner pulley bolt is tight.

Tighten the bolt until the tensioner cycles to the end of its travel.

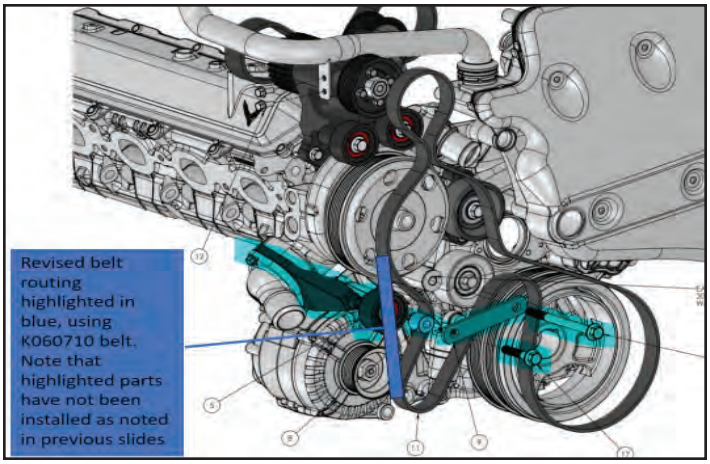
108. **<u>Accessory Drive Belt Addendum B:</u>**
Your kit may include the following items:
Idler P/N 56-06-01-054
Spacer P/N 69-05-00-038
Support Bar P/N 65-26-62-087
Fastener M10 X 50mm P/N 71-10-15-050
Fastener M10 X 120mm P/N 71-10-15-120

We have simplified installation of the kit and these items are no longer required to be installed.



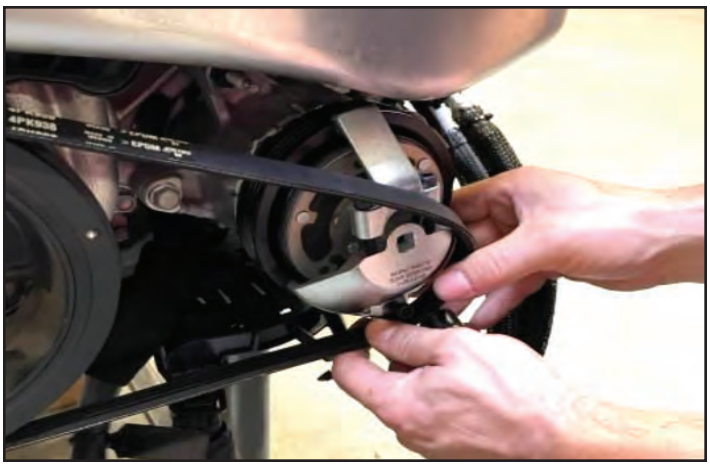
109. Cycle the tensioner and install the FEAD belt PN K060710 with revised routing as shown in blue over all pulleys, ensuring the belt is properly seated around each.

Note: all items highlighted in blue are no longer installed.



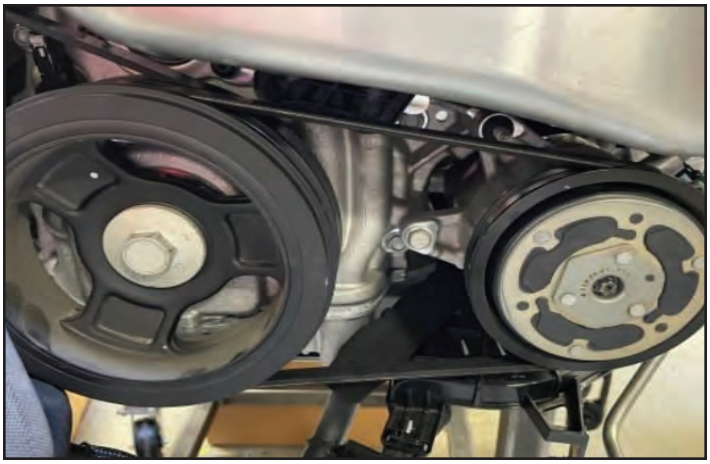
110. Install a stretch belt installation tool (Freedom Racing shown) onto the front of the A/C compressor pulley, or use other suitable means to install the stretch belt.

Install a new A/C stretch belt (GM P/N 12660187) from the kit over the crank pulley and onto the installation tool. Rotate the crankshaft clockwise and install the stretch belt over the A/C compressor.



111. Verify the belt is seated properly around both pulleys.

Remove the installation tool.



112. **Hose Installation**

The following 11 steps provide an overview of how each of the hoses routes throughout the vehicle to assist you with installation.

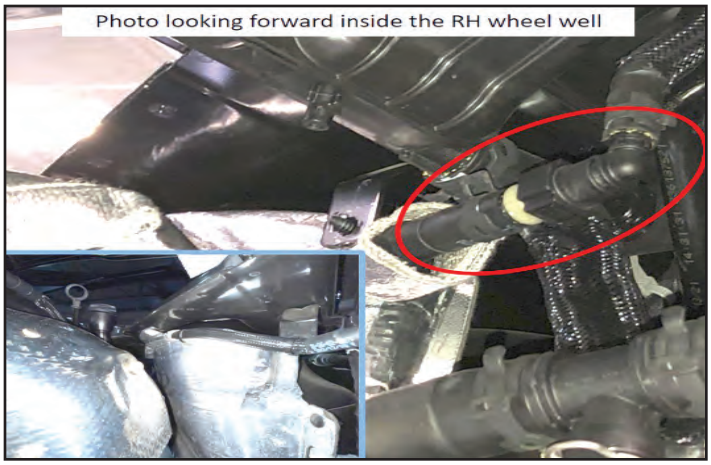
All hoses are identified with an inkjet part # as shown in the adjacent photo.

This manual will provide installation detail for each hose separately, in subsequent slides.

113. Coupe Only: Find the end of the previously installed 087F coolant hose that was connected to the water pump spigot and stowed above the decklid. The opposite end of this hose will route toward the female quick connector located in the front of the RH wheel well (shown in photo).

Disconnect the factory coolant hose at the quick connector. Use a suitable method to temporarily plug the ends of the lines to minimize coolant loss.

Remove the factory hose from the vehicle and harvest the white connector off the end by carefully cutting the hose.



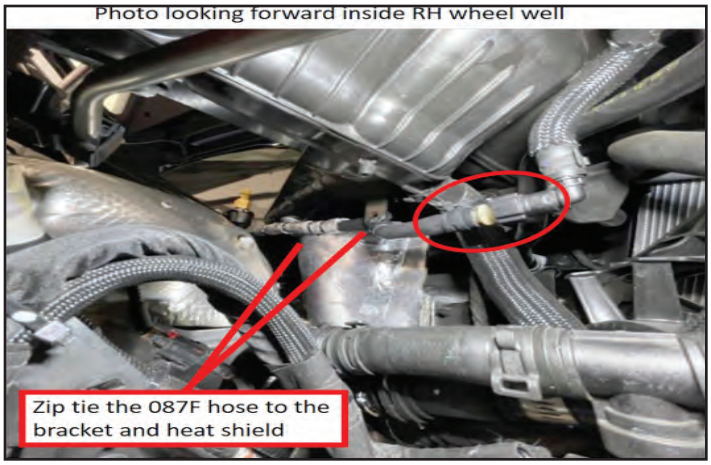
114. Remove the constant tension clamps from the OE hose then slide the silver heat shield off and install it over the new 087F hose so it protects it by the exhaust system.
The factory hose can now be discarded.

Cut the 087F hose to length as necessary so it routes as shown in the photo.

Install a 5/16” constant-tension clamp from the kit onto the end of the 087F hose, followed by the OE factory male connector that was harvested. Secure the connector using the clamp.

Re-connect the 087F hose sub-assembly to the OE 90-degree female connector inside the RH wheel well. Ensure it is fully seated. Zip tie the 087F hose to the bracket and along the firewall to secure it as necessary.

Ensure the hose does not come into contact with any rotating or hot parts.



115. **087F Coolant Bleed Hose**

Convertible Only: The 087F hose will be installed onto the top of the factory coolant reservoir later on. It does not need to be shortened. Lay it along the RH side of the engine for now.

116. Remove the factory purge valve hose from the valve on the factory intake. A disconnect tool or a small pick can be used to cycle the lock and disconnect the hose.

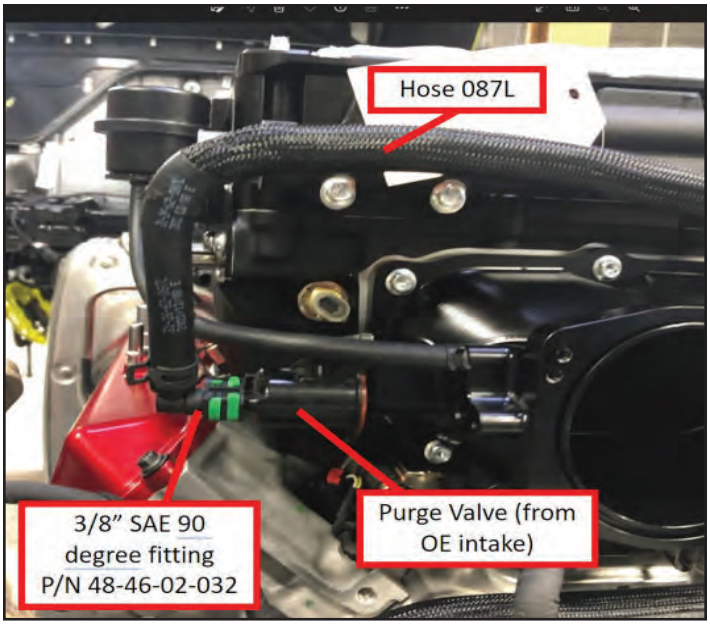
117. **Purge Valve and Hose**

Install the purge valve into the port on the LH side of the supercharger inlet. Secure it using the factory bolt.

Torque the purge valve fastener to 89 in-lbs.

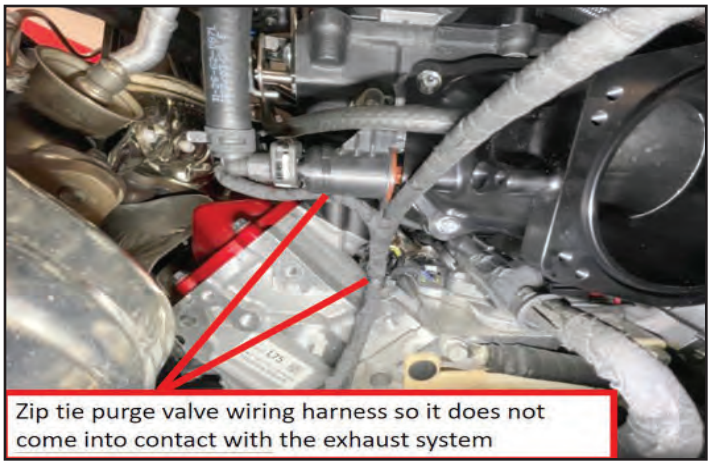
Select Hose P/N 31-26-62-087L. Install a 3/8" constant tension clamp onto each end. Install a 3/8" 90-degree SAE fitting P/N 48-46-02-032 from the kit onto Hose 087L. The 90-degree fitting goes on the end of the hose as shown in the photo.

Install the 087L hose sub-assembly onto the purge valve nipple. Engage the lock on the fitting to secure it. Route the hose per the diagram on pages 95-103. The opposite end of this hose will be installed onto a body line connection at a later step.



118. **Purge Valve and Hose**

Re-install the purge valve electrical connector.
Remove the fir tree connector securing this wiring harness to the back of the LH cylinder head. Re-route the wiring away from the exhaust manifold, securing it with zip ties as required.

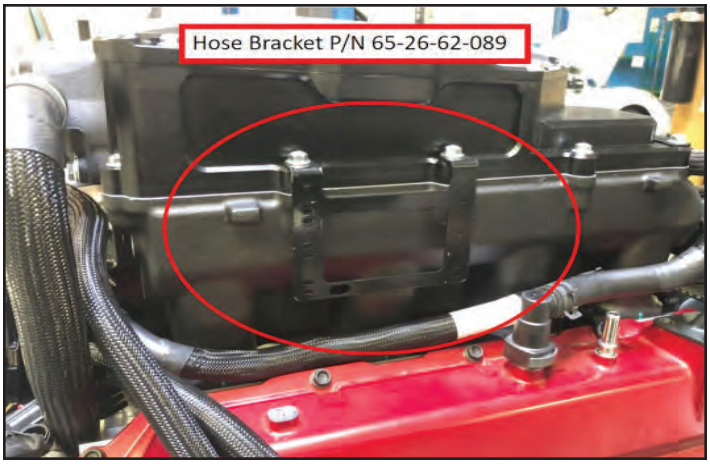


119. Remove (2) SC cover fasteners from the RH side of the supercharger, in the locations noted in the photo.

Pre-install zip ties into Hose Bracket P/N 65-26-62-089

Install the hose bracket to the RH side of the supercharger, then re-install the 2 fasteners.

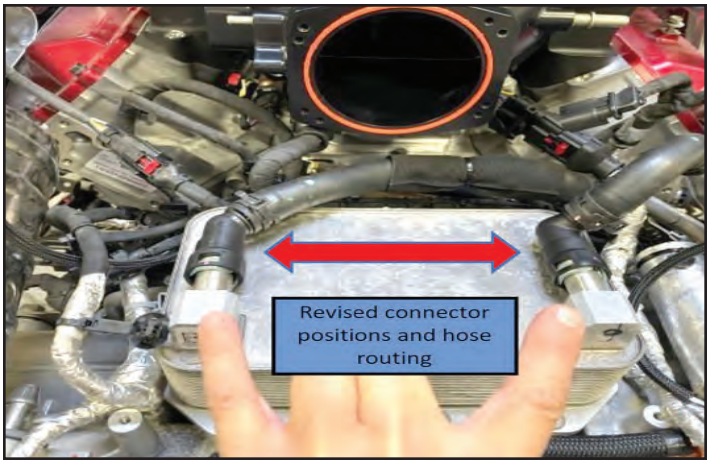
Torque the fasteners to 18 ft-lbs.



120. **Trans Cooler Fittings / Line Routing**

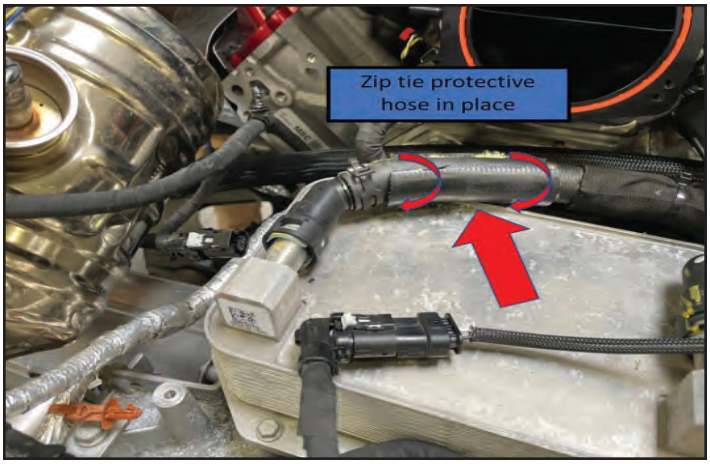
Remove both trans cooler fittings and swap them side for side.

Re-install constant-tension clamps over hose connections.
Ensure the fittings are fully seated and locked onto the trans cooler tubes.

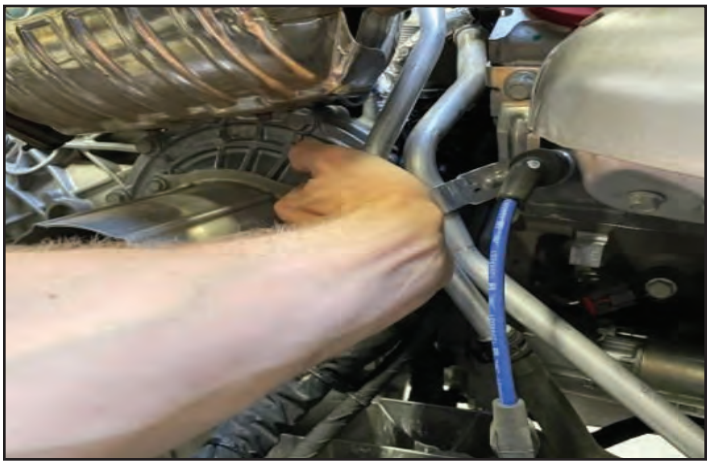


121. Add a 4 inch piece of rubber hose (not included in kit) between the LH trans cooler line and trans cooler to protect the hose from abrasion against the cooler.

Zip tie both ends to the OE hose.



122. Bend trans cooler lines inboard toward engine.

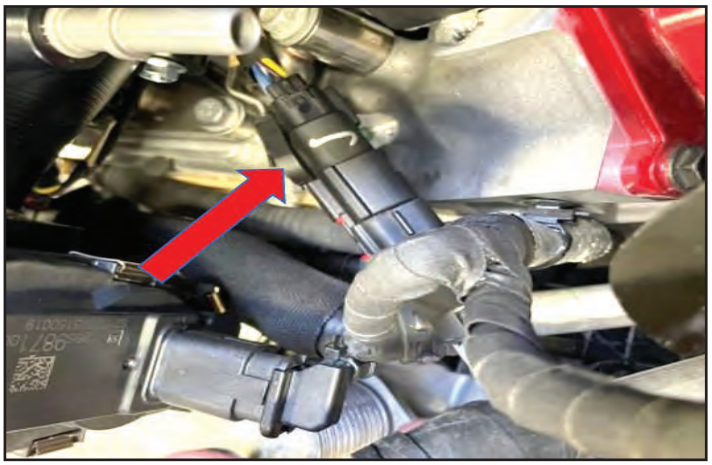


123. Pre-install (4) LONG zip ties through holes in Oil Reservoir Bracket P/N 65-26-62-088.

Install the coolant hose bracket to the dry sump tank at LH front of engine in the location and orientation shown, using the original fasteners.

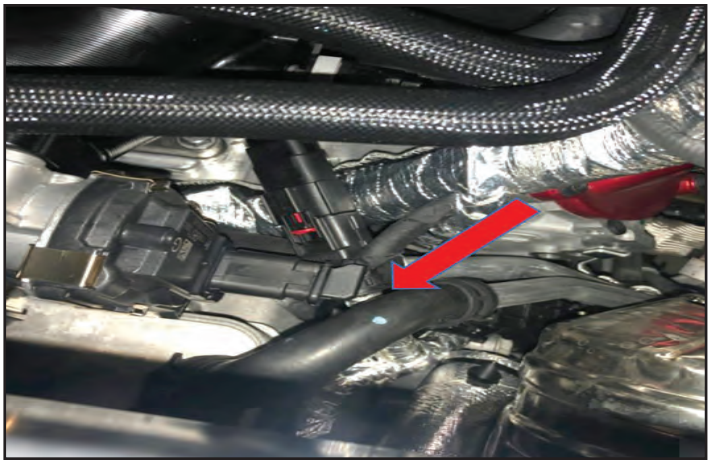
124. Remove the wiring harness @ RH rear of engine from the mounting bracket.

Disconnect the harness @ hard shell connector and loop it in between the two trans cooler lines. The lower aluminum line may need to be bent downward to allow for additional wiring harness clearance.



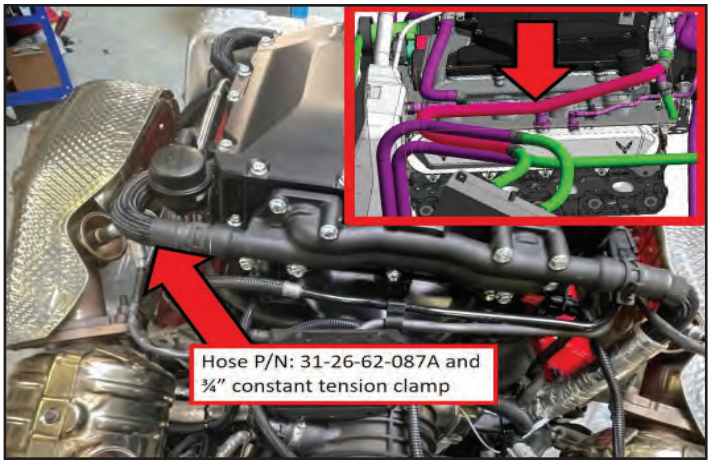
125. Re-connect the hard-shell connector.

Ensure the oil cooler hoses are not kinked.

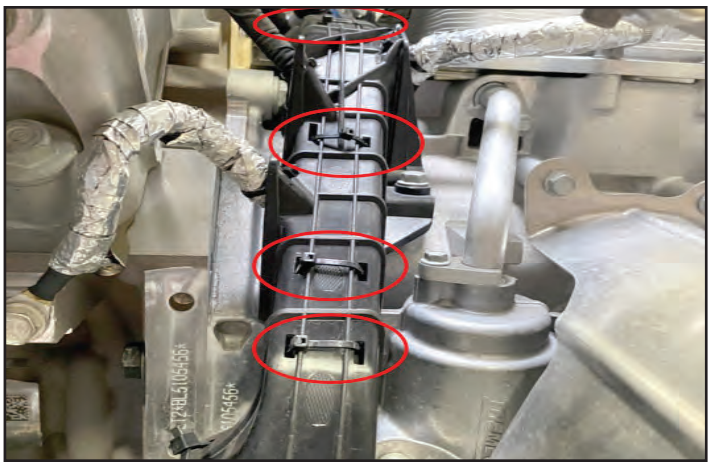


126. Install and route the LH CAC hose at the rear of supercharger.

Hose **31-26-62-087A** installs onto the LH (drivers) side port at the rear of the supercharger. Secure the hose using a ¾" constant tension clamp.
Route the LH 087A hose along the LH side of the supercharger toward the front of the engine. The opposite end of this hose will connect to the low temp radiator (forward connection) later on.



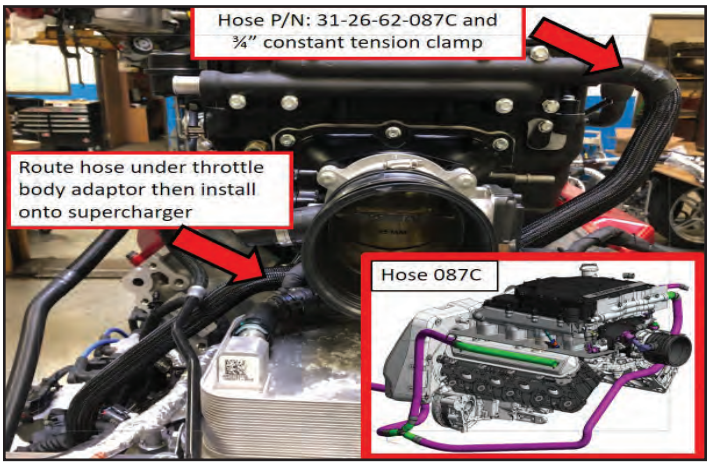
127. Zip ties secure the factory wiring harness inside a plastic trough across the back of the engine. Trim the tops of the zip ties with flush cut pliers so they do not stick up and rub on the coolant lines after they have been installed.



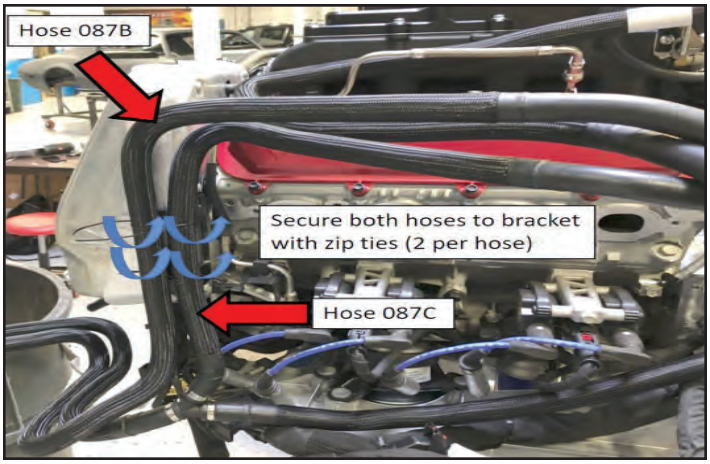
128. Install and route the RH CAC hose at the rear of supercharger.

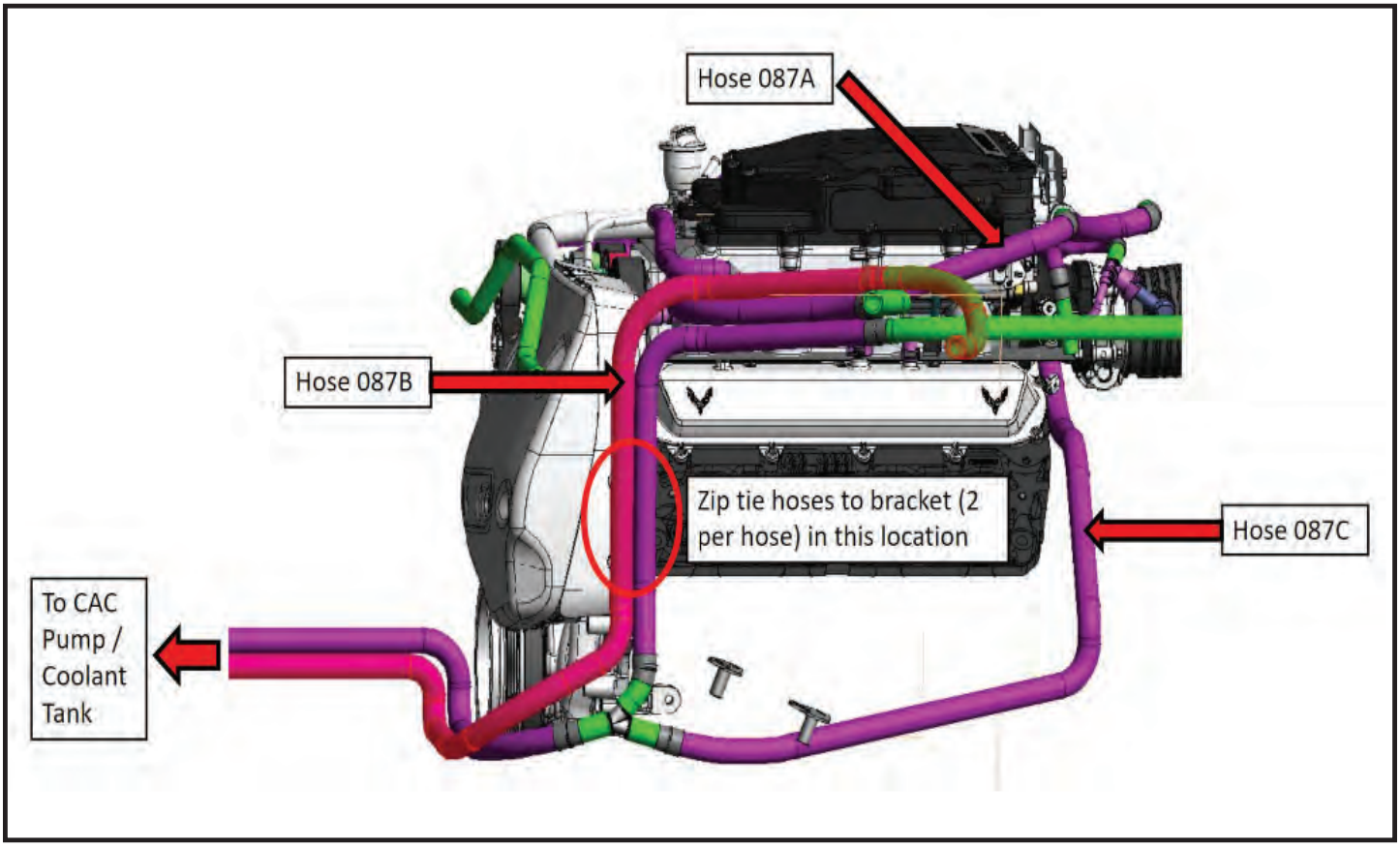
Hose **087C** installs onto the RH (passenger) side using a ¾" constant tension clamp.

Route the hose under the throttle body adaptor and over to LH front corner of the engine. The opposite ends will connect to the underbody coolant tank and to the fill bottle inside the engine compartment in later steps.



129. Select Hose 087B and loosely secure it to the forward position of the dry sump tank bracket using (2) zip ties as shown in the photo.
The 087B hose will install between the rear low temp radiator connection and the intercooler pump under the vehicle in later steps.
Use (2) zip ties to loosely secure hose 087C to the rear most position of the previously installed dry sump tank bracket.
Hose routing detail can be found on the following diagram.





130. A factory LT5 throttle body (GM PN 12669871) and gasket (GM PN 12669870) are provided in the kit.

Select the throttle body gasket and install it to the supercharger inlet adaptor. Install the throttle body, securing it using the original fasteners from the OE unit.
Torque the fasteners in a criss-cross pattern to 106 in-lbs.

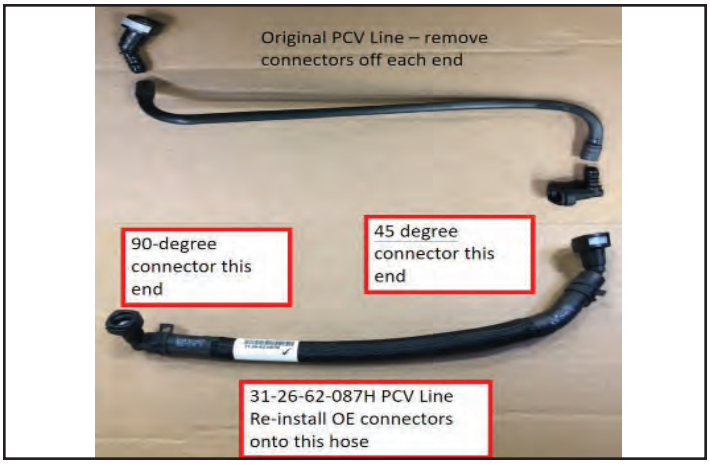
131. Re-install the ETB electrical connector, ensuring that it is fully seated and the lock has been cycled on the hardshell connector.

132. Remove the OE MAP sensor (PN 12711681) from original intake and install it to the LH side of throttle body adaptor.

Secure the sensor to the adaptor using an M6 X 1 - 25mm long fastener P/N 71-06-10-025, from the supercharger kit.

Torque the sensor bolt to 106 in-lbs.
Re-install the OE MAP sensor plug into the sensor, ensuring the blue tab has slid to the locked position

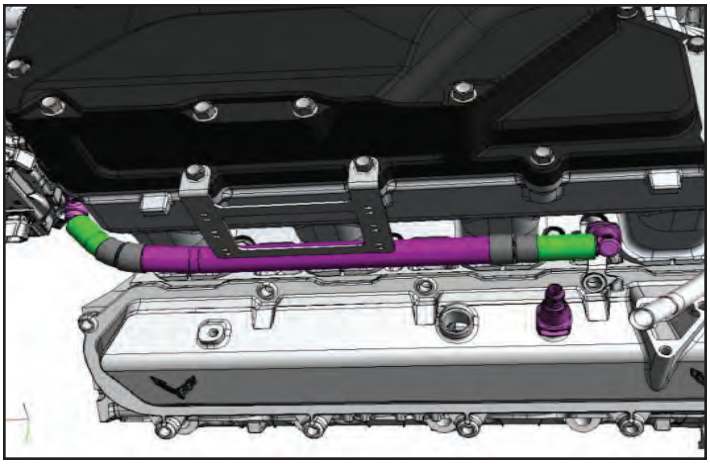
133. Carefully cut the 45 and 90 female fittings off the original PCV line with a knife, ensuring you do not cut the o-ring that is internal to the barbed fitting.
Select new PCV line P/N 31-26-62-087H from the hose kit.
Install 3/8” clamps on each end then re-install the original hose ends as shown in the photo.
Secure the connectors to the hose with the clamps.
Orient the hose ends and install onto the engine as shown in the following slide.



134. **<u>087H PCV hose orientation as shown</u>**

45-degree female connector attaches to the fitting on the throttle body adaptor.

90-degree female connector attaches to hose in between cylinder 2 and 4 intake ports.



135. Remove (2) fasteners from the RH front corner of the supercharger cover.

Install PCV Crossover Hose bracket P/N 65-26-62-090 onto the corner of the cover then pre-install the original (2) fasteners.

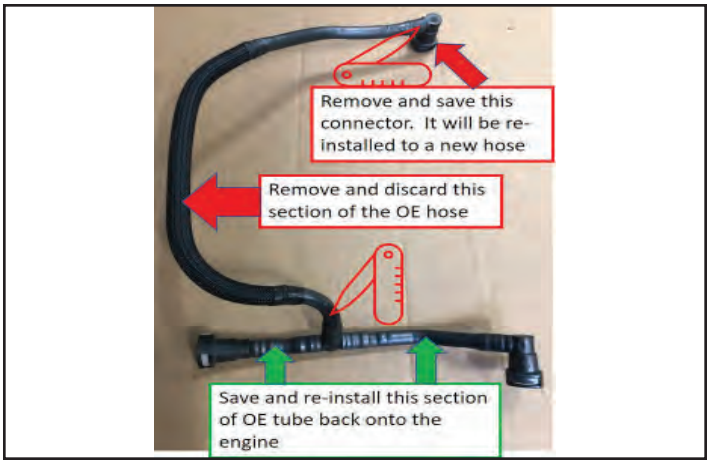
DO NOT TIGHTEN THE FASTENERS - the revised PCV hose assembly will be tucked under this bracket during installation in a subsequent step).

136. **<u>PCV Tube Fabrication:</u>**

Carefully cut the 90-degree quick connector off the factory PCV tube assembly as shown in the photo.

Carefully cut the opposite end of the hose off the T connector. Discard the section of OE hose.

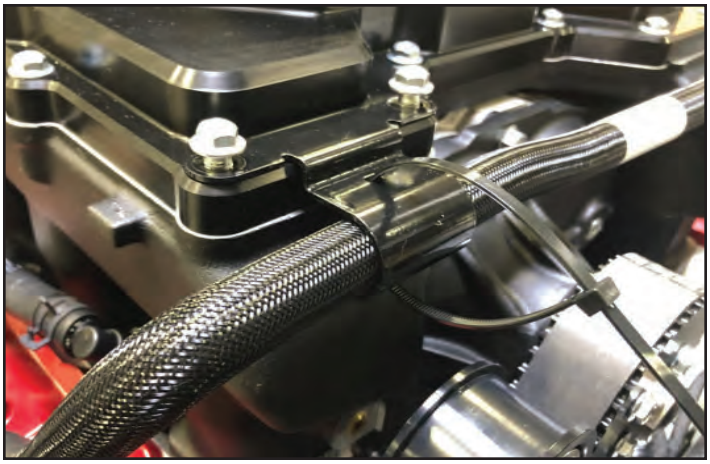
Re-install the remaining section of the factory tube that has the T connector, back onto the engine, between the dry sump tank and the LH valve cover, with the 'T' facing up and out at a 45-degree angle. Ensure the connectors are fully seated at each end.



137. Select Hose 31-26-62-087J.

Install a ½" constant tension clamp onto the hose then install the hose onto the Tee fitting of the OE PCV line that goes between the dry sump tank and the LH valve cover.

138. Tuck the 087J PCV hose under the previously installed bracket.
Loop a zip tie through the bracket and around the hose.
Rundown and torque the SC cover bolts to 18 ft-lbs to secure the bracket.
Secure the 087J hose to the bracket using the zip tie. Cut off any excess material.



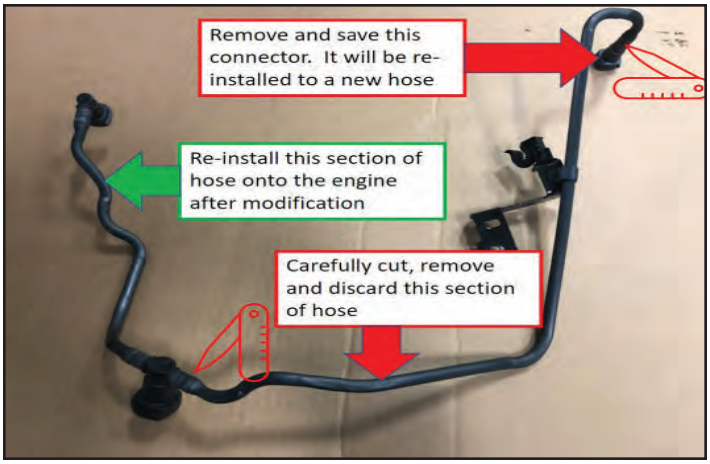
139. Route the opposite end of the 087J hose around the RH front corner of the supercharger, and toward the PCV connector on the RH valve cover.

Install a ½" constant tension clamp over the end of the hose, then install the 90-degree quick connector harvested from the OE PCV hose, onto the end of the 087J hose. Secure the hose using the constant tension clamp.

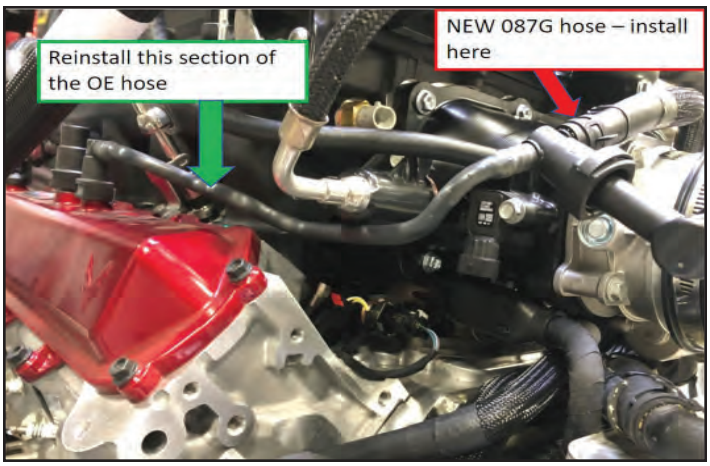
140. **PCV Fresh Air Hose Assembly Modification**

Cut and remove the hose from the RH side of the Tee connector as shown.

Cut and remove the straight quick connector from the opposite end of the hose as shown.

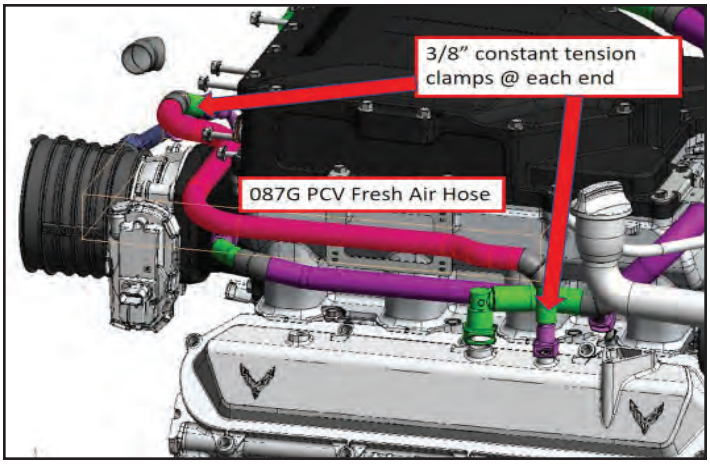


141. **PCV Fresh Air Hose Assembly Modification**
Re-install the original section of the fresh air hose assembly back onto the engine, between the LH valve cover and the rubber throttle body adaptor fitting as shown.
Select hose 31-26-62-087G and route it between the 'T' connector and the fitting on the passenger side valve cover as shown.
Install 3/8" constant tension clamps onto both ends of the hose, then install the straight quick connector previously removed onto the opposite end at the valve cover.
*Hose routing detail is shown on next step.

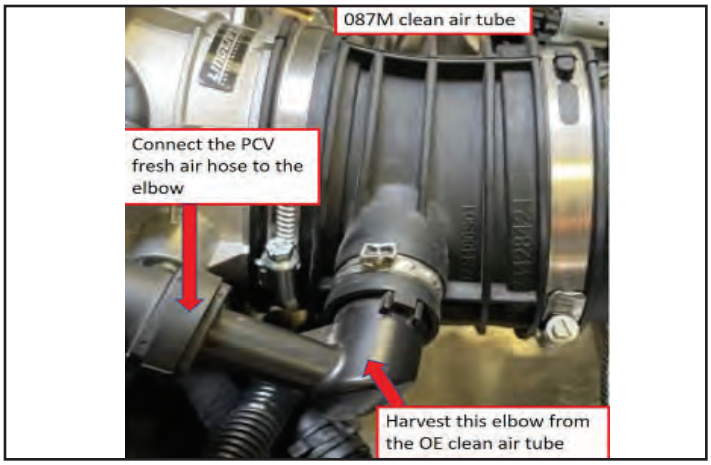


142. <u>087G PCV Fresh Air Hose Routing Overview</u>

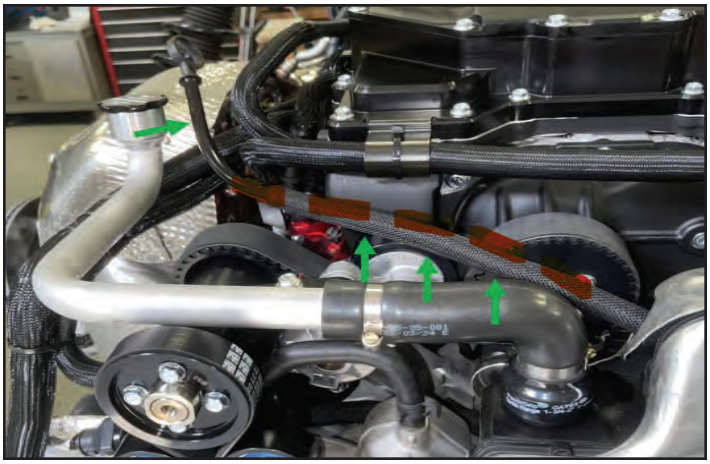
Install 3/8” constant tension clamps at both ends of the 087G hose.
This hose will be installed onto the ‘T’ fitting at throttle body adaptor in the next step.
Install the female quick connector harvested from the OE hose assembly onto the opposite end of the 087G hose.
Slide constant tension clamps over hose ends to secure the fittings at each end.



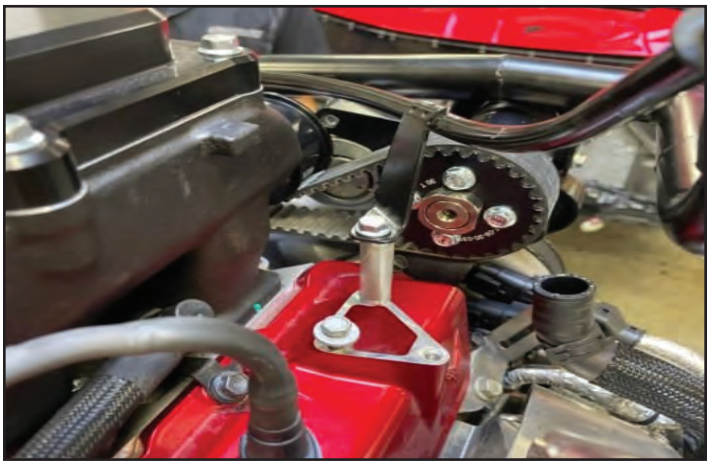
143. Harvest the OE plastic 90-degree elbow from the OE clean air tube and re-install/ orient it onto the new Magnuson Clean Air Tube P/N 31-26-62-087M.
Secure it with an Oetiker clamp from the kit.
Install the Magnuson clean air tube to the throttle body and tighten the gear clamp.
Connect the factory PCV fresh air hose to the 90-degree elbow, ensuring it is fully seated and locked.



144. Carefully bend the OE dipstick tube in the areas shown to allow it to clear the pulleys and be installed back into the dry sump tank.
A 1 1/2” standoff P/N 69-05-00-007 will install between the dipstick tube bracket and the RH valve cover.
Ensure the tube does not come into contact with any of the supercharger pulleys or other hardware after it has been installed.
Bend the tube bracket as necessary so that it is located over the hole in the valve cover.
See next photo for final installation.



145. Select the 1 1/2” stand-off P/N 69-05-00-007 from the kit and install it between the oil dipstick tube bracket and the RH valve cover in the location shown.
Install (1) M6 X 50mm long fastener P/N 71-06-10-050 through the oil dipstick tube bracket, stand-off and into RH valve cover in the location shown.
Torque the fastener to 106 in-lbs



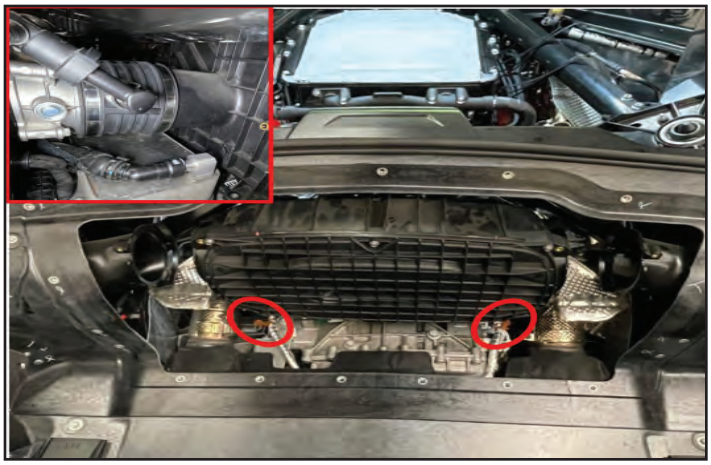
146. Install push pin for LH oxygen sensor wiring harness takeout into the rear of the LH cylinder head.

Loop the harness and/or use zip ties as required, ensuring it stays away from the exhaust system.

147. Install a gear clamp to the end of the clean air tube then re-install the factory airbox, securing it using the (4) original fasteners.

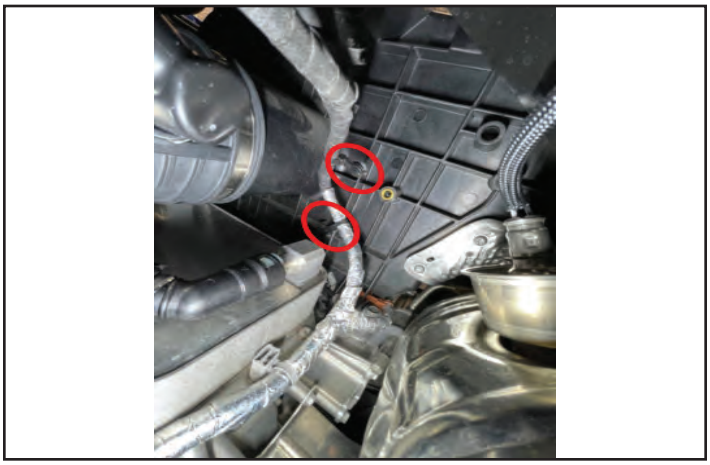
Secure the airbox to the clean air tube using the gear clamp.

Re-secure the (2) wiring harnesses to the rear of the airbox at the bottom.



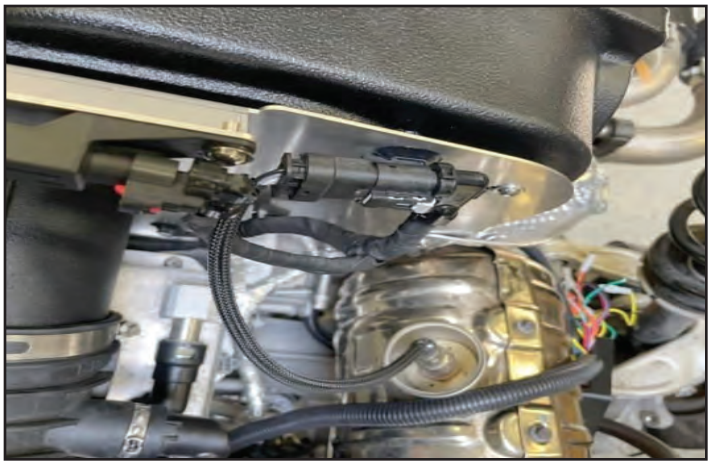
148. Re-install the temp sensor into the hole in the RH rear bottom corner of the airbox.

149. Re-secure the wiring harness fir tree connectors into the front of the airbox (LH side shown, RH side similar).



150. Re-secure the transmission vent line to the front of the airbox.

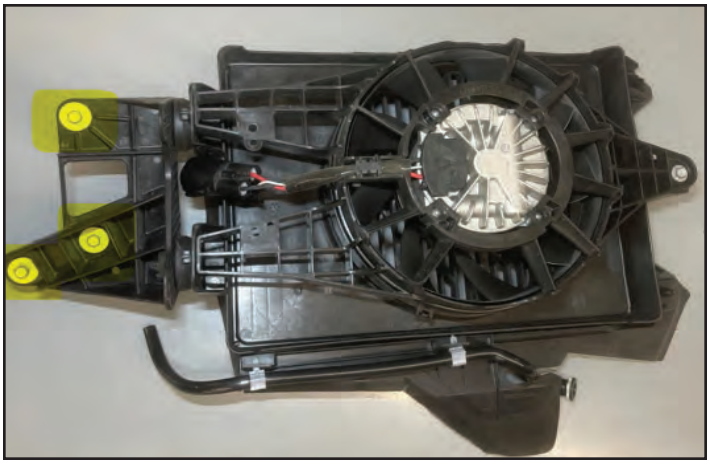
151. Re-secure the oxygen sensor harness takeouts onto the airbox retention clips (LH side shown, RH side similar).



152. Re-install the remote keyless entry sensor harness into the sensor at the top of the airbox. Ensure the red lock is cycled.

153. Convertible Only: Apply blue Loctite to (4) black button head screws included in the kit. Fasten the supplied mounting bracket to the fill reservoir using the screws.
Locate the factory-installed riv nuts on the LH side of the rear structural panel inside the engine bay. Install the fill reservoir sub-assembly into this location using the supplied M6 fasteners.
Coupe Only: The fill reservoir will use an alternate mounting location and be installed in a subsequent step. Disregard this page.

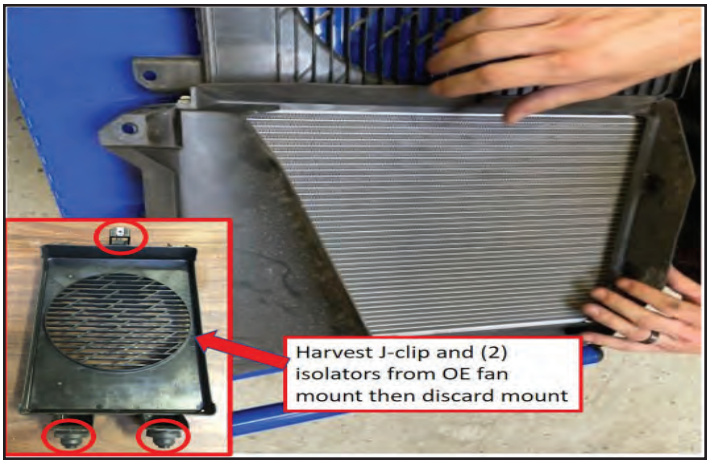
154. Remove stock fan/shroud mounting assembly from inside LH rear wheel well by disconnecting all fir tree connectors that secure wiring harnesses to it, removing (3) fasteners securing the lower bracket to the vehicle (highlighted), and disconnecting the fuel drain tube (through the front vent and shown in the next step).



155. Here is the fuel drain tube connections for the stock fan/shroud mounting assembly shown in the last step.

156. Remove the fan and shroud from the mount by removing (1) fastener and (2) push pins. Remove J-clip and (2) rubber isolators from the OE fan mount (see inset photo). If using an OE radiator, install the shroud to the front side and re-fasten it using the OE hardware.

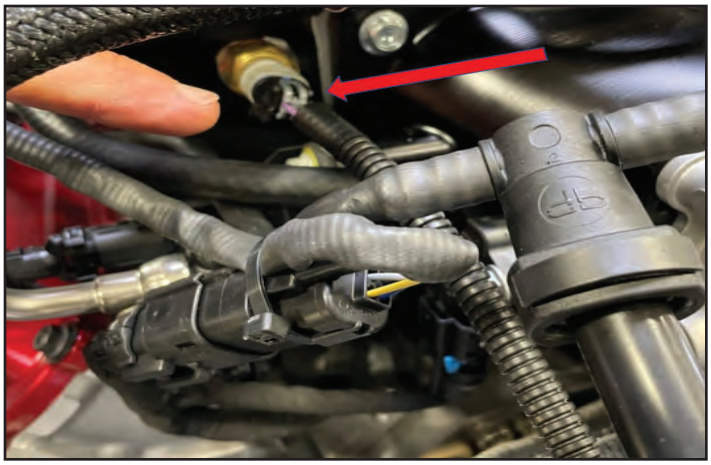
If using aftermarket (Magnuson) radiator P/N 68-01-00-198, install the J-clip onto the upper radiator mounting tab, install (2) OE isolators onto the lower radiator pins, then install the OE shroud to the rad as noted above.
Do not re-install the fan yet.



157. Re-install the new rad/shroud assembly into LH wheel well. Fasten it using the OE hardware. Connect all fir tree connectors that secure wiring harnesses, re-install the (3) fasteners securing the lower bracket to the vehicle. Re-connect the fuel drain tube inside the air duct.
Re-install the fan onto the rad. **Note: the OE fan fastener MUST be replaced with a shorter M6 fastener** (16mm long) from the kit (Fastener P/N 71-06-10-016) or it will contact the radiator tank.
Re-connect the fan electrical plug and secure it to the fan housing with the fir tree connector.

158. An IAT break-out box is provided for this application.
The following slides detail the installation of this module to the vehicle.
It can be mounted to the front of the airbox, or as shown here, on the rear cross brace above the clean air tube.
Clean the mating surfaces and use double-faced tape to secure it.
Once all wiring connections have been made, zip tie any extra wiring together by the air inlet.

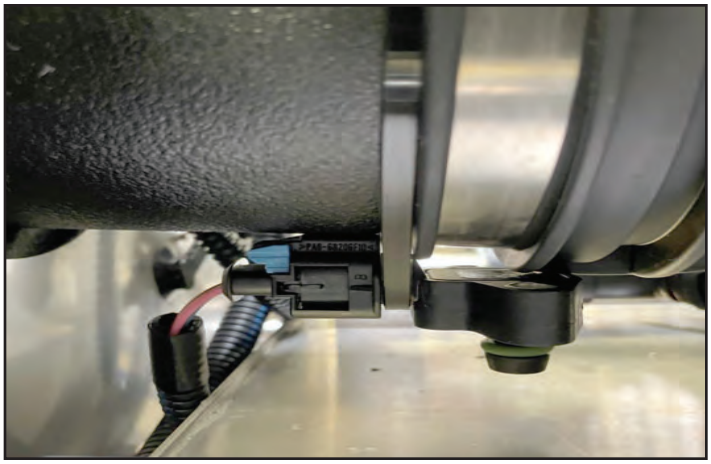
159. Connect the 2-wire IAT wiring pigtail from the break-out box to the gold-colored sensor by the supercharger inlet.



160. Connect the wiring pig tail with the blue lock from the break-out box to the GM MAP sensor P/N 12711681 provided in the kit.

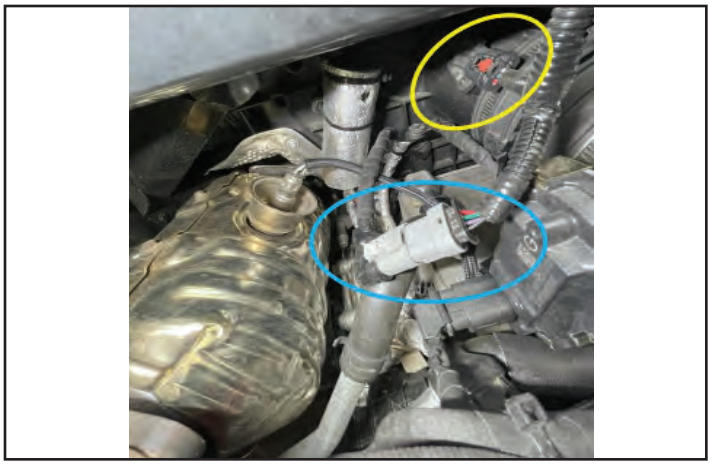
Zip tie this sensor to the underside of inlet tube as shown in the photo.

IMPORTANT: Ensure that the opening of the sensor faces down so that moisture will not enter the sensor.



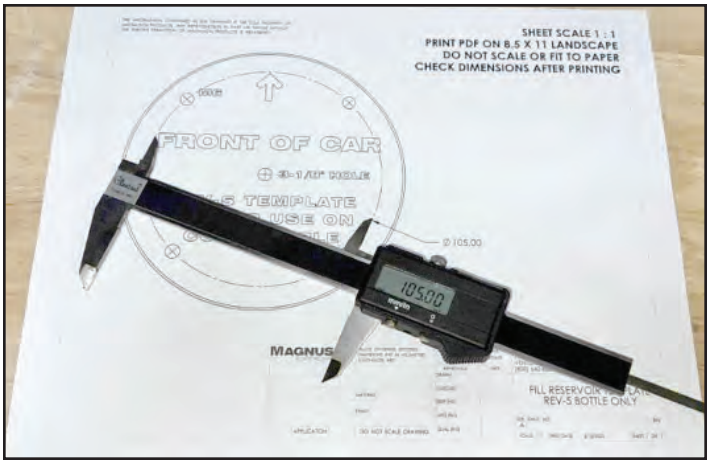
161. Connect the black hardshell connector from the break-out box shown in the top right of the photo, to the factory MAF sensor (circled in yellow).

Connect the grey hardshell connector from the break-out box to the factory GM connector as shown (circled in blue).



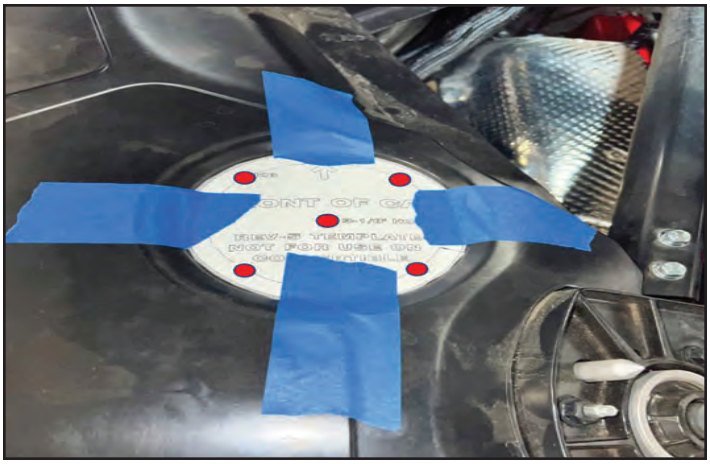
162. Coupe Only: Print the Fill Reservoir template found in Appendix E at the back of the manual.

IMPORTANT: Ensure your print settings are set to **Actual Size** before printing this page. Use calipers or a ruler to verify the 105mm reference dimension is actual size on the printed copy. If it is not, your print settings are incorrect.



163. Coupe Only: Place the template into the center of the recessed area in the fiberglass panel on the LH side of the engine, with the arrow pointing toward the front of the vehicle. It can be taped in place to secure it.

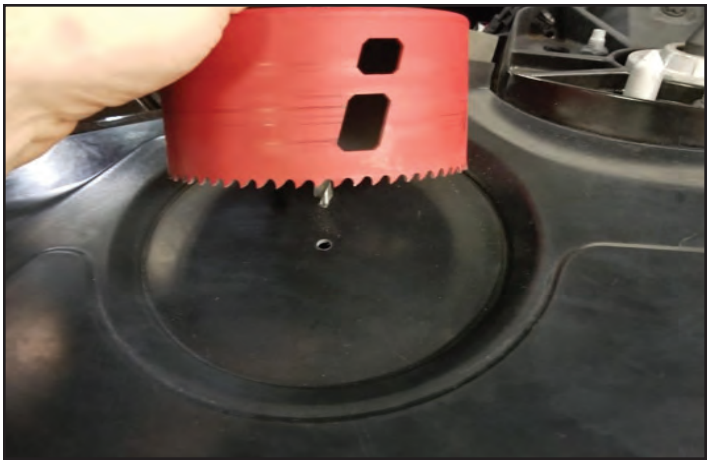
While holding the template stationary, use a 11/64” drill to pre-drill all 5 holes through the body panel. Finish drill the 4 outer holes with a 15/64” drill.



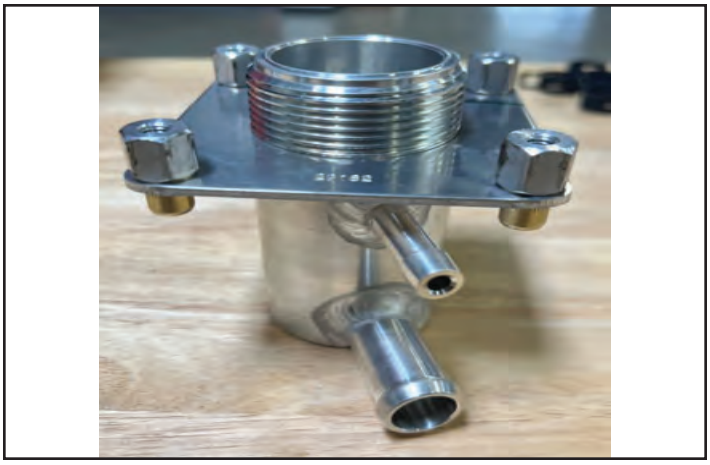
164. Coupe Only: Using a 3 1/8” hole saw, cut a hole in the center location as shown.

Use a vacuum while cutting to minimize airborne dust.

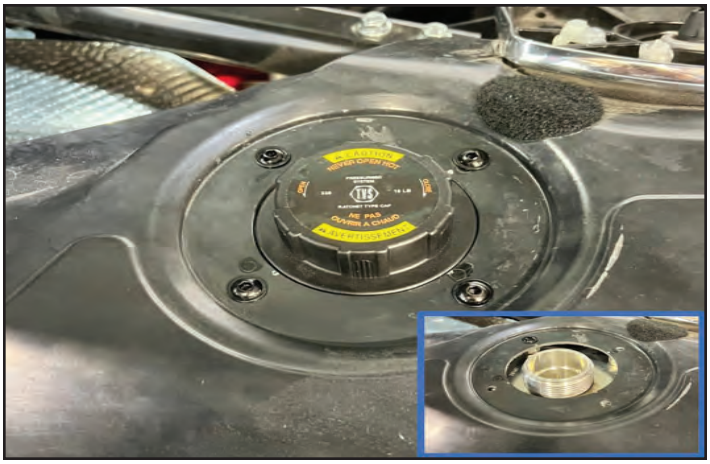
Sand the circumference of the hole as necessary to smooth out the surface.



165. Coupe Only: Apply blue Loctite and install (4) threaded hex adaptors PN 77-89-06-012 into the rivet inserts in the fill reservoir bracket as shown.



166. Coupe Only: Pre-install the fill reservoir cap onto the reservoir then install the reservoir sub-assembly from inside the LH rear wheel well with the hose nipples pointing toward the front.
Center the reservoir cap in the hole then secure the reservoir to the vehicle body using (4) black button head fasteners PN 72-06-10-021.
Apply blue Loctite 242 to the fasteners prior to installation.
Ensure the reservoir cap does not contact the edge of the fiberglass panel. Grind or sand the hole as necessary so the gap is uniform around the circumference of the cap.



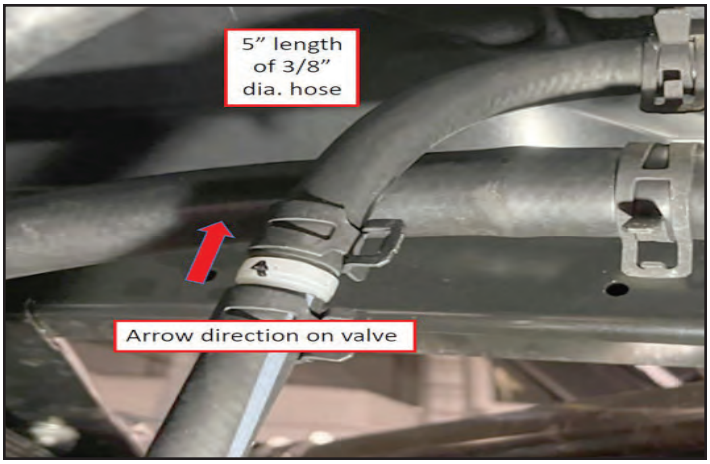
167. **Intercooler Tank Vent Hose Sub-Assembly**

Cut a 5-inch long section of 3/8” coolant hose from the supplied 10-foot section.

168. **Intercooler Tank Vent Hose**

Install the hose onto the check valve P/N 68-12-57-107, ensuring the arrow on the valve is pointing TOWARD the hose end.

Secure the hose to the valve with a 19mm constant tension clamp from the kit.

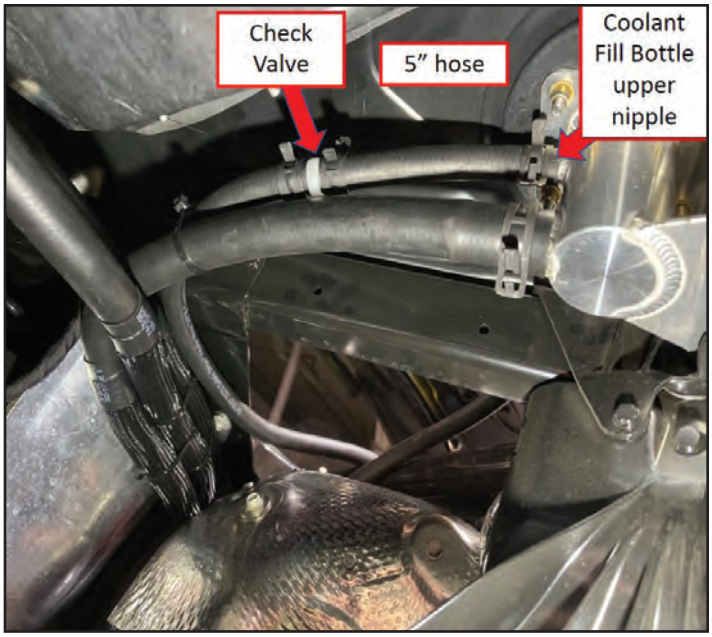


169. Working from inside the LH rear wheel well, route the remaining length of 3/8" coolant hose together with the other ¾" hoses, inboard and down toward the tunnel. Secure it to the other hoses with zip ties, ensuring it is routed away from the exhaust system.

    Install the check valve / hose sub-assembly that was fabricated in a previous slide onto the end of the long coolant bleed hose. Secure the hose to the check valve with a 19mm constant tension clamp from the kit.

    The opposite end of the 5" hose installs onto the upper nipple on the coolant fill bottle. Secure the hose to the bottle with another 19mm constant tension clamp.

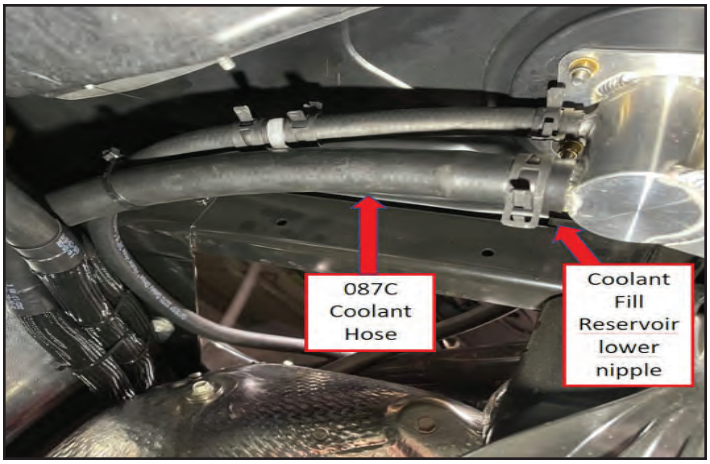
    Ensure the hose does not dip and has a constant upward travel towards the reservoir. Zip tie/secure as necessary.



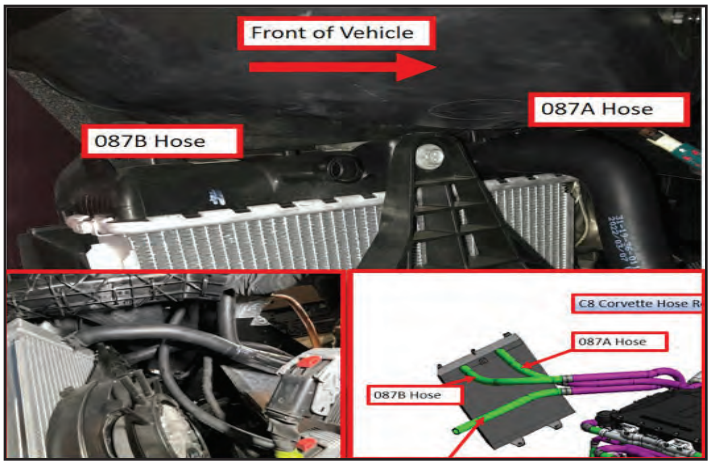
170. Route the 087C hose toward the lower nipple on the coolant fill reservoir. Cut the hose to length as necessary so that it will route cleanly from the bottle, toward the heat shield at the front of the engine compartment. Install a 27mm constant tension clamp onto the end of the 087C hose. Install the hose to the lower nipple of the fill bottle.

    Secure the hose using the clamp.

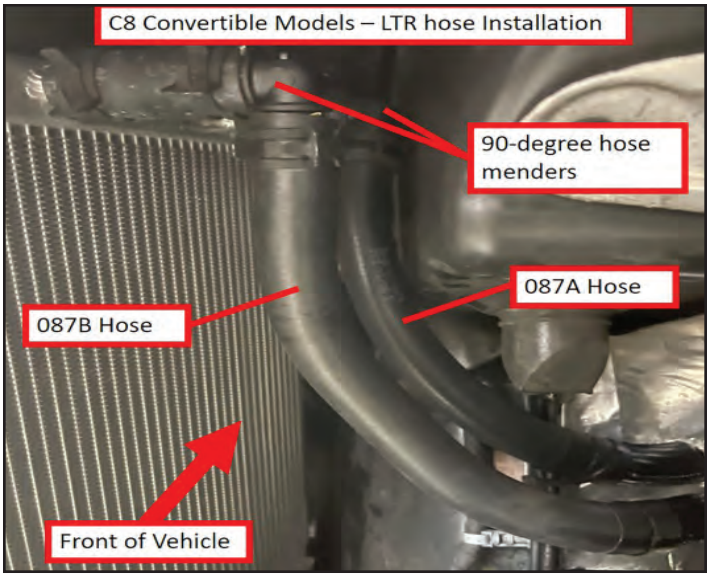
    Zip tie the hoses together as shown.



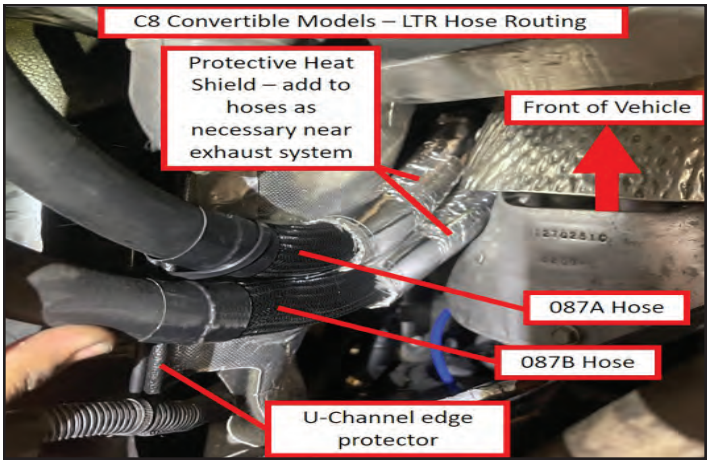
171. Inside the LH wheel well: Route, secure and install the 087A and 087B hoses onto the Low-temp radiator and secure with ¾" constant tension clamps.
    Note: the hoses can be trimmed to length as needed to help keep them away from the exhaust heat shields.
    IMPORTANT: Track applications require reflective heat shields on all hoses in this area.
    Note: Hose 087A installs onto the FRONT fitting.
    ** **Convertible models:** see following step for unique hose routing and installation detail **



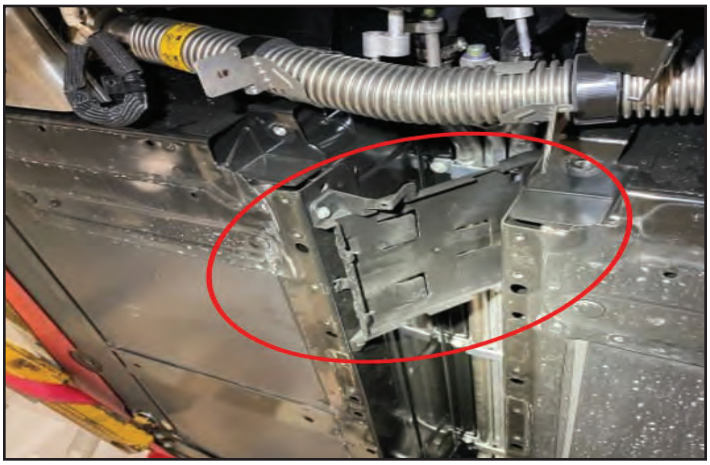
172. Convertible Only: Install a ¾" constant tension clamp and 90 degree mender from the kit to the end of the 087A and B hoses. Secure the clamps in place.
Cut (2) short pieces of leftover ¾" hose approximately 3 inches long. Secure each hose to the opposite end of the 90 degree mender, then install the hose sub-assemblies onto the low-temp radiator, securing them with ¾" constant tension clamps.
Note: Hose 087A installs onto the FRONT fitting.
See the following slide for convertible hose routing detail.



173. Convertible Only: Route the 087A and B hoses as shown.
Install heat shielding material (not included in kit) in any areas that come in close proximity to the exhaust system as needed to protect the hoses from excessive heat.
Install the piece of protective U-channel molding from the kit to the sharp body edge as shown to keep the hoses from chaffing.
Tuck the hoses as close to the fire wall as possible. Use zip ties as necessary to hold them in place. **ENSURE THEY DO NOT CONTACT THE EXHAUST HEAT SHIELDS.**

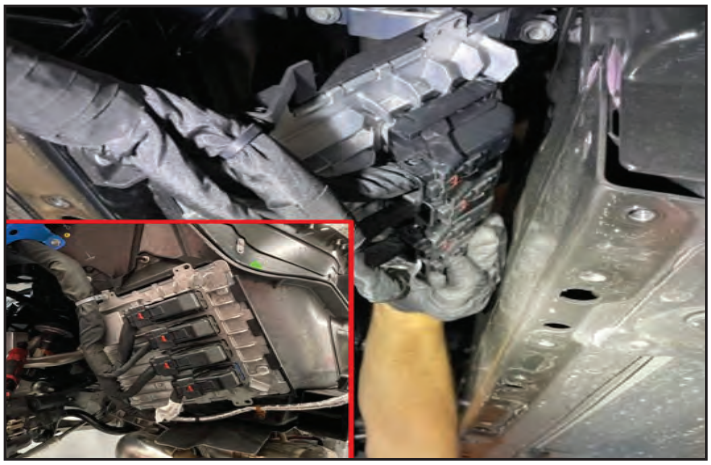


174. Re-install the ECM bracket into the tunnel (early model vehicles).

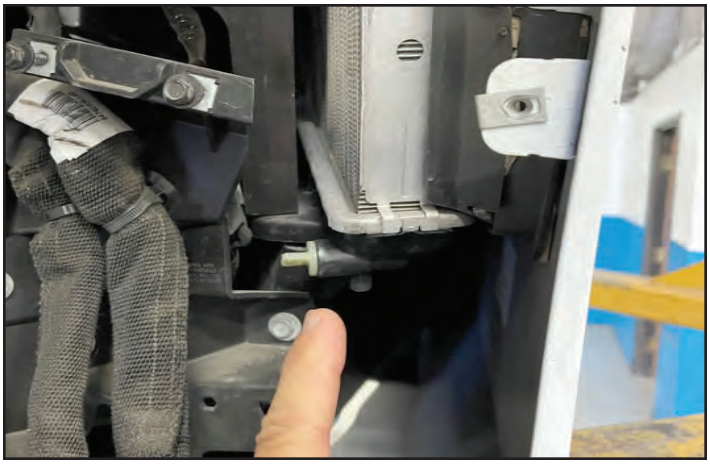


175. Re-install the ECM into the bracket (location is dependent on vehicle model year).

Re-connect (4) electrical connectors @ ECM.

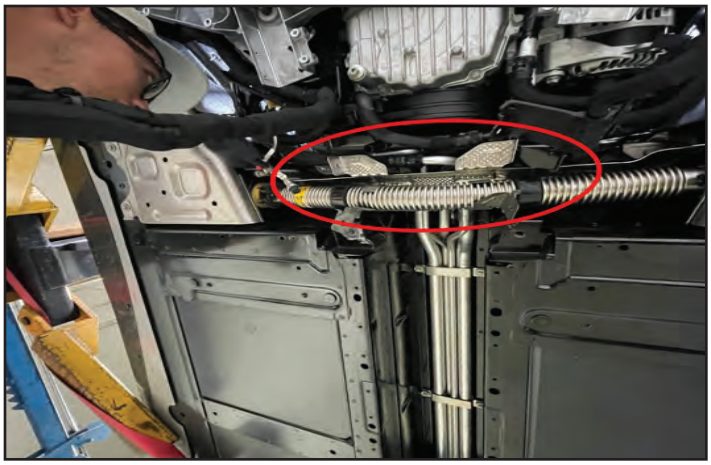


176. Inside RH fender, ensure the radiator drain plug has been installed and tightened (if coolant has been drained).

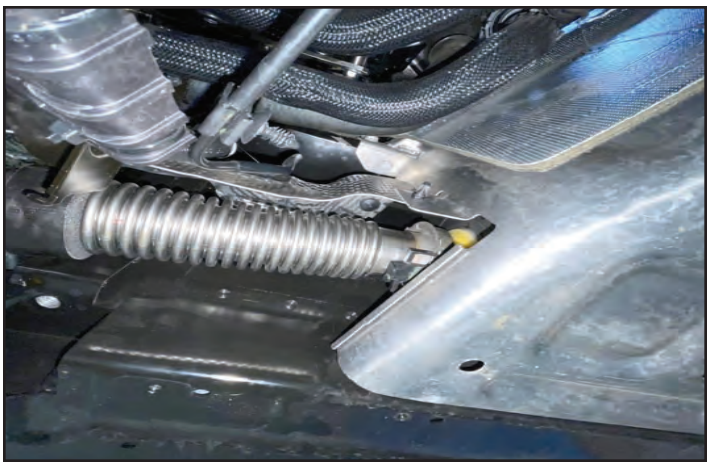


177. Pre-install fuel cross-over heat shield up into tunnel.

The supercharger coolant system hoses that were pre-installed earlier, run above the heat shield. Ensure they route cleanly toward the tunnel in the center of the vehicle and are not kinked or crushed.

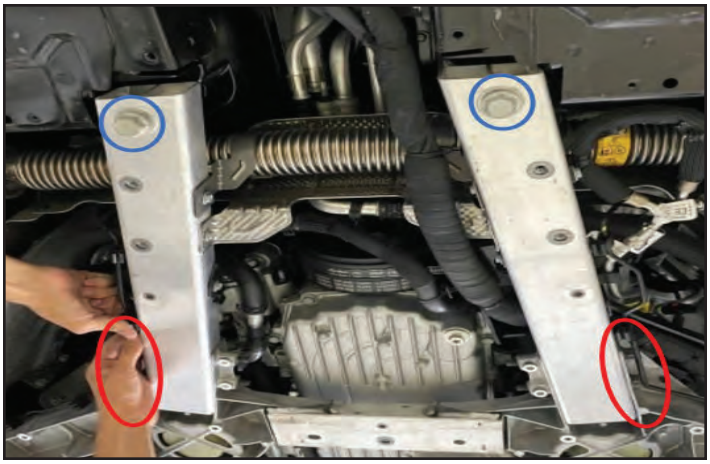


178. Install crossover heat shield push pins through heat shield into aluminum fuel tank shield.

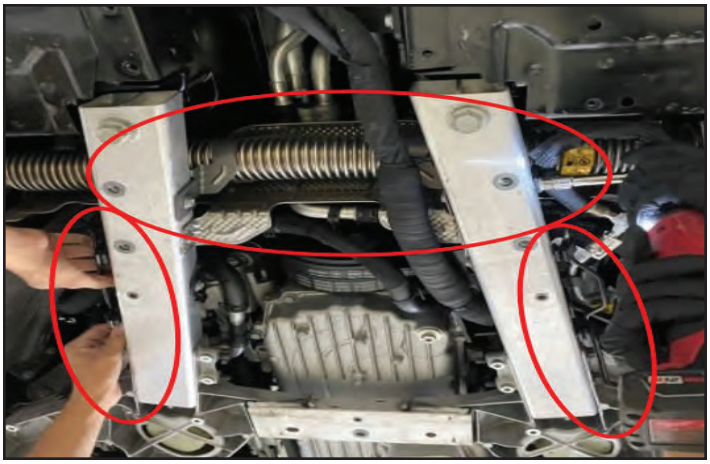


179. Apply blue Loctite to all bolts.
Re-install the LH and RH frame braces into the vehicle. Re-install and zero torque all frame brace bolts. Pre-torque all horizontal bolts (red circles) to 43 ft-lbs. then apply + 100 degrees final angle.

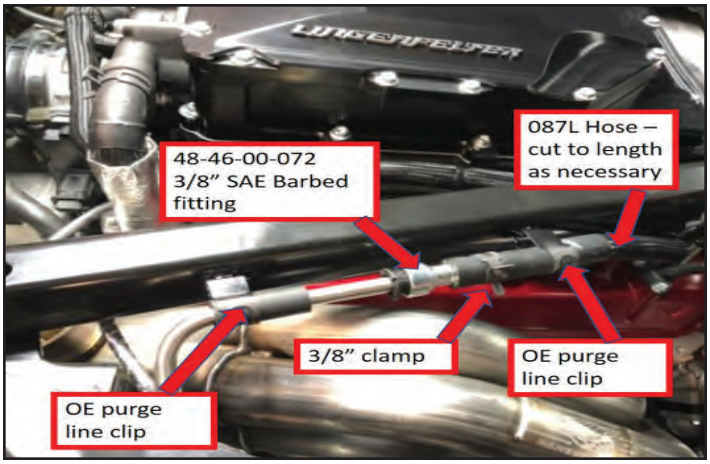
Large vertical bolts (blue circles) are to be pre-installed and run up to within ½ inch of contact with brace. They will be final torqued to 118 ft-lbs. after the underbelly covers have been installed.



180. Re-install fasteners holding the brake line brackets and heat shields into the LH and RH aluminum frame braces by the fuel cross-over.
Re-secure the brake lines into the frame braces.
Re-install the remaining push pins securing the fuel cross-over heat shield.
Re-secure the battery cable bracket to the frame brace.



181. Route the 087L fuel vapor line along the RH engine brace, toward the OE connection point at the frame brace.
Cut the 087L hose to length as necessary, then install a 3/8" constant tension clamp over the hose, followed by a 3/8" SAE metal barbed fitting (P/N 48-46-00-072).
Slide the clamp up the hose to secure the barbed fitting.
Harvest the spring clamp from the OE fuel vapor hose and install it over the 087L hose, then into the brace as shown.
Re-install the purge line clips and secure them back into the body brace.

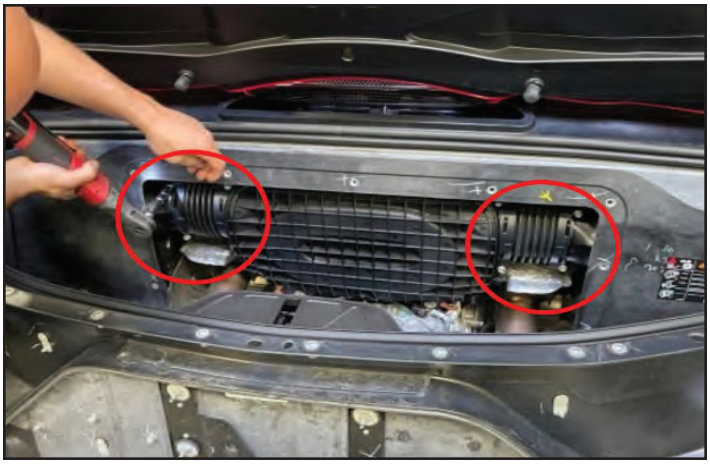


182. Convertible Only: Re-install (2) nuts securing fuel line above RH exhaust manifold. Torque to 88 in-lbs.

183. Convertible Only: Route the 087E hose across the back of the supercharger as shown. Ensure it is attached and clamped to the bottom port on the LH side of the factory reservoir.

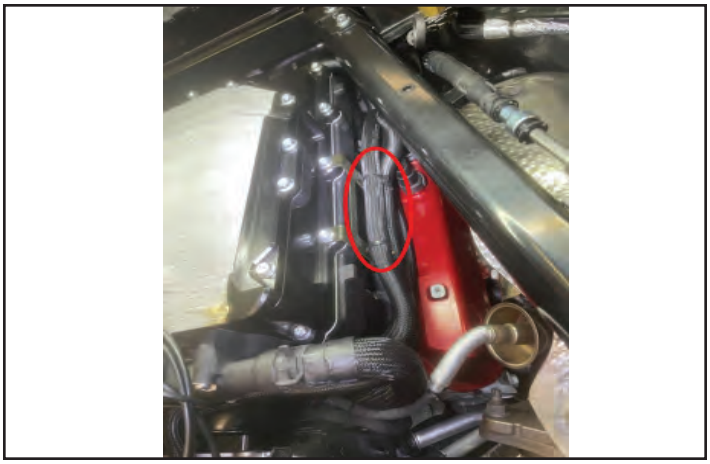
    Use zip ties to secure the hose along the RH side of the supercharger.

184. Re-install the LH / RH air inlet ducts (4 fasteners per side) and tighten the fasteners.

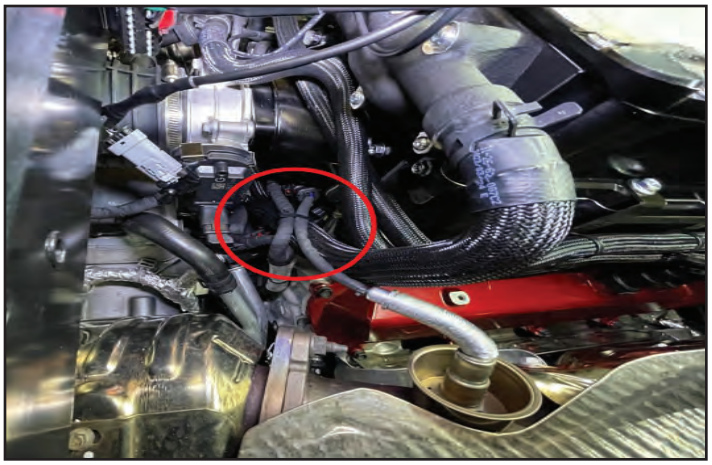


185. Zip tie the PCV lines onto the bracket along the RH side of the supercharger.

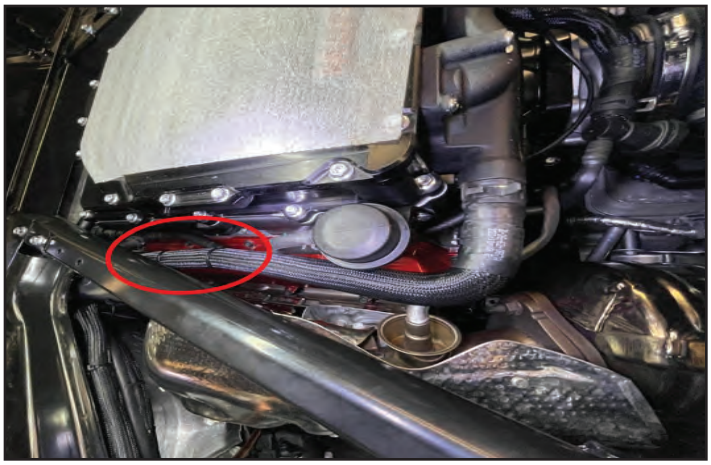
    Convertible models will have one additional coolant hose (not shown) to secure at this location.



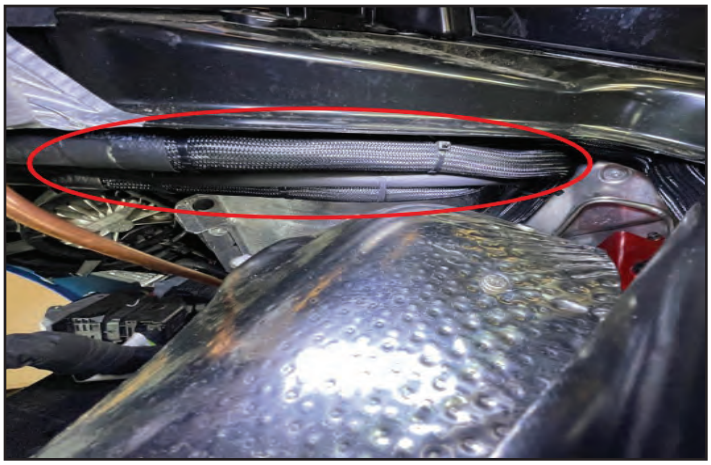
186. Zip tie the RH oxygen sensor wiring to the 087C hose at the RH rear corner of the supercharger.



187. Zip tie the 087A hose above the fuel line along the LH side of the supercharger.



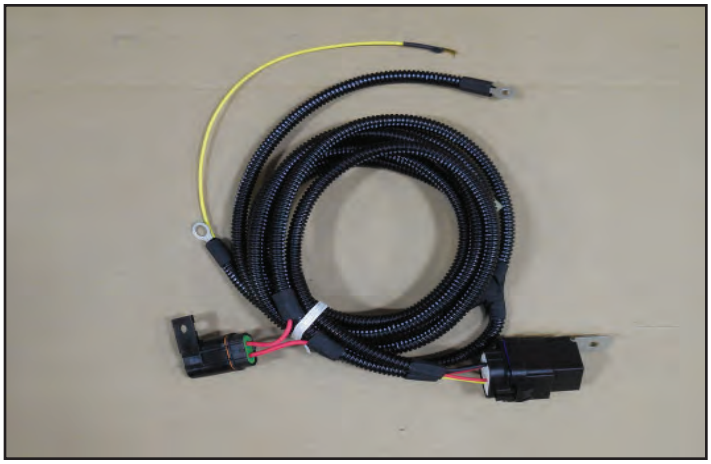
188. Finish securing all the hoses to the bracket at the dry sump tank at the LH front corner of the engine. Ensure all hoses are kept as far away from the exhaust system as possible. Use a small screwdriver or pick to make holes in the factory heat shield at appropriate locations. Zip ties can be used to secure the hoses to the heat shield as needed.



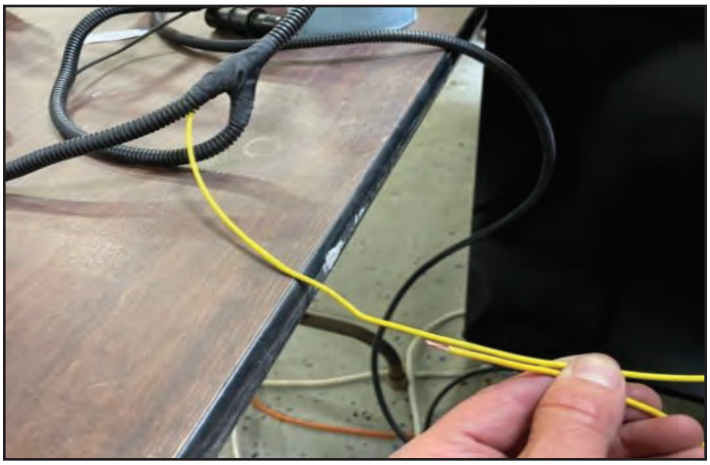
Section 3: Charge Air Cooler Pump/ Electrical Upfit

189. The following slides detail the electrical upgrades required to support the operation of the CAC electrical pump.

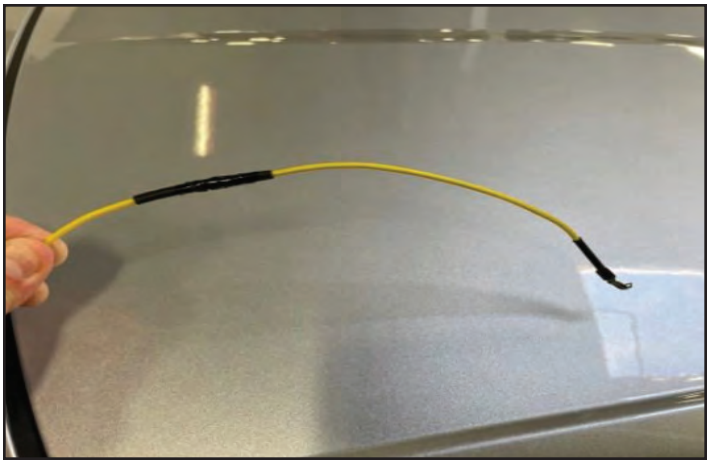
    Gather the relay harness assembly P/N 82-55-80-078 shown here.



190. **<u>Intercooler Relay Harness Modification:</u>** Install the 15A fuse inside the fuse holder of the relay harness assembly from the last step. Pull the yellow wire out of the existing convolute and cut the existing fuse tap lead off. Add 6.5 feet of additional yellow wire to the existing harness.(Completed wire modifications shown in the next step.)

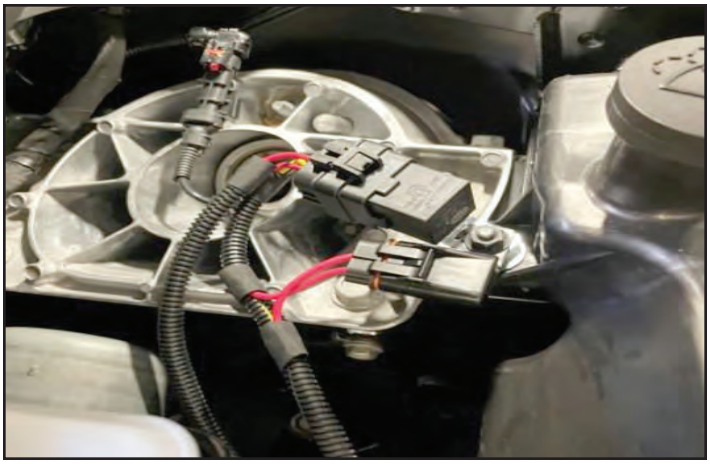


191. Solder and heat shrink the connection, then install the supplied convolute tubing over the yellow wire.
Re-install the fuse tap lead to the end of the 6.5-foot wire extension and solder/heat shrink the end.



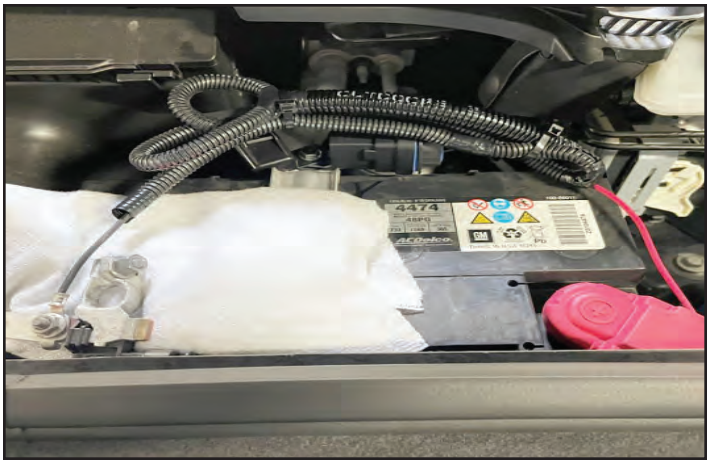
192. Install the intercooler pump relay and fuse under hood in the area shown at the front of the vehicle.

Secure both components to the fastener that secures the windshield washer bottle.

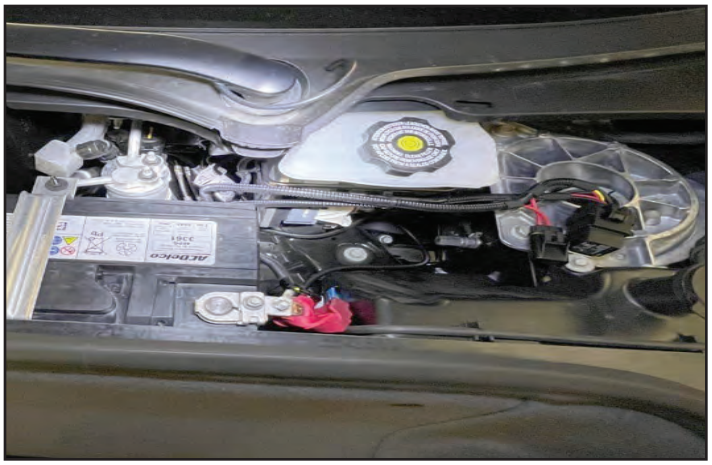


193. Route the intercooler pump harness and yellow relay trigger wires behind the battery and down toward the tunnel.

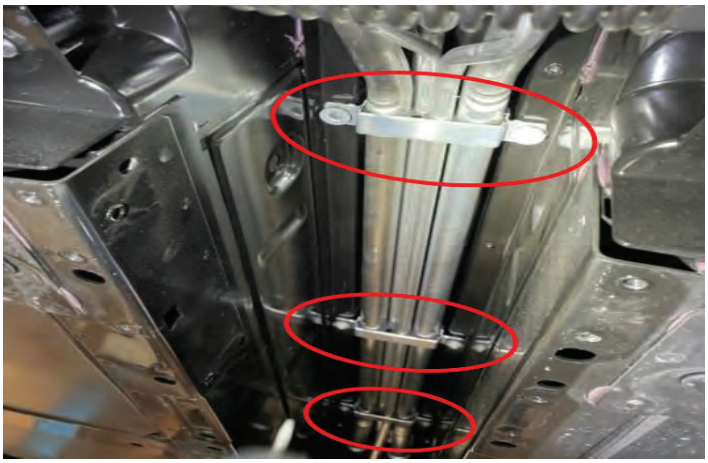
Ensure the 15A fuse has been installed into the fuse holder.



194. Route the positive and negative CAC pump relay wires toward the battery.
Crimp ring terminals onto the positive and negative wires (if not installed).
Fasten the red (+) wire to the red positive battery terminal by installing an M6 flanged nut from the kit to the factory stud.
Remove the factory nut from the negative (black) battery terminal then install the black wire onto the stud and re-secure with the factory nut.
Install wire loom over the red and black wires and secure as necessary with zip ties. Re-secure the battery terminal covers.



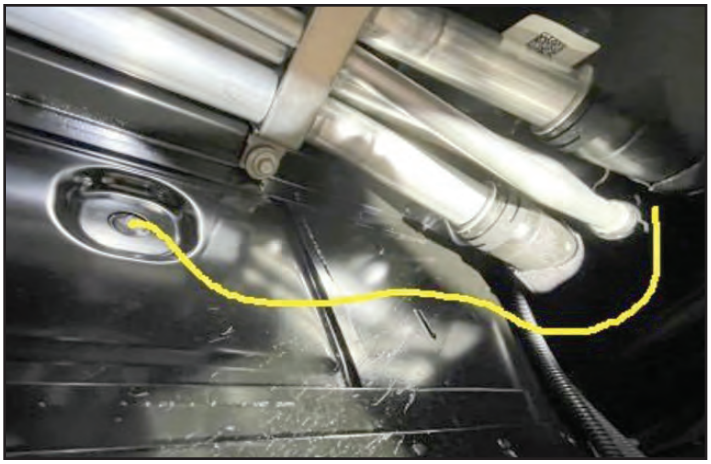
195. Ensure the (3) tunnel tube brackets are installed. Re-install into top of tunnel as necessary.



196. Route the yellow wire down through the tunnel and into the body plug located along the LH vertical face of the tunnel. A small pick can be used to make a hole to allow the wire to pass through.

    Push the yellow wire through the hole and into the passenger compartment.

    Zip tie the wire along the coolant lines ensuring it does not rub on any sharp surfaces.

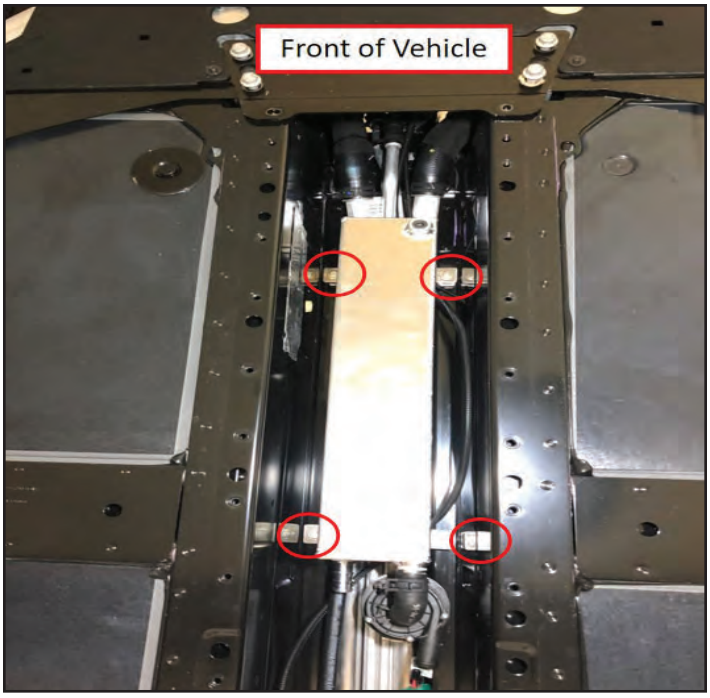


Section 4: Tunnel Reservoir Installation

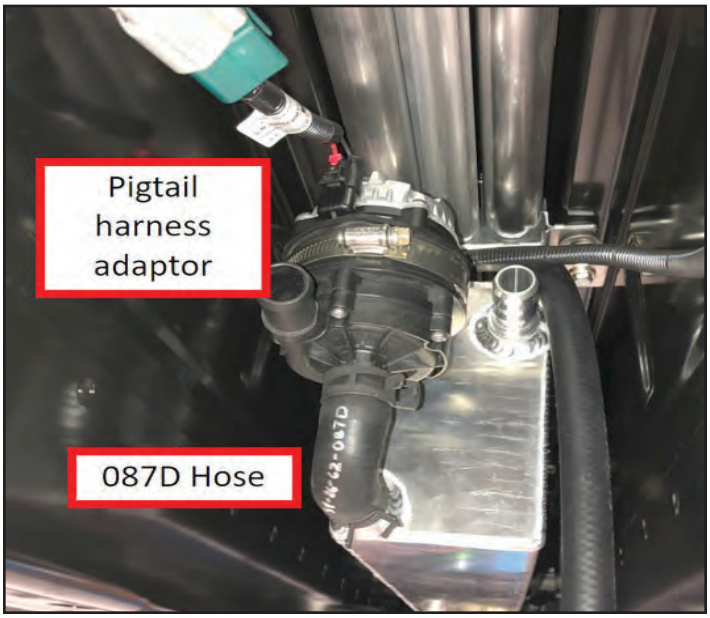
197. **Tunnel Reservoir (Intercooler Tank) Sub-Assembly**

    Select Tunnel Reservoir P/N 68-01-03-083.
    Apply pipe sealant and install a 1/8” NPT to 3/8” barb fitting P/N 48-46-00-009 onto the reservoir.
    Install the remaining 9 ½ foot long piece of 3/8” hose onto the intercooler tank barbed fitting and secure with a 3/8” constant tension clamp.
    Route the hose along the top of the tank as shown below.

198. Route the intercooler pump wiring harness and the coolant bleed hose above the tank, toward the back of the car, in between the intercooler tank stand-offs. Ensure the pump wiring and coolant line do not become pinched as you install the tank into the vehicle.
Apply blue Loctite and secure the tank to the vehicle using the original fasteners.
Secure the hose and all wiring in place with zip ties. Loop any extra length of wire in front of the reservoir and secure to the OE tunnel tubes with a zip tie.



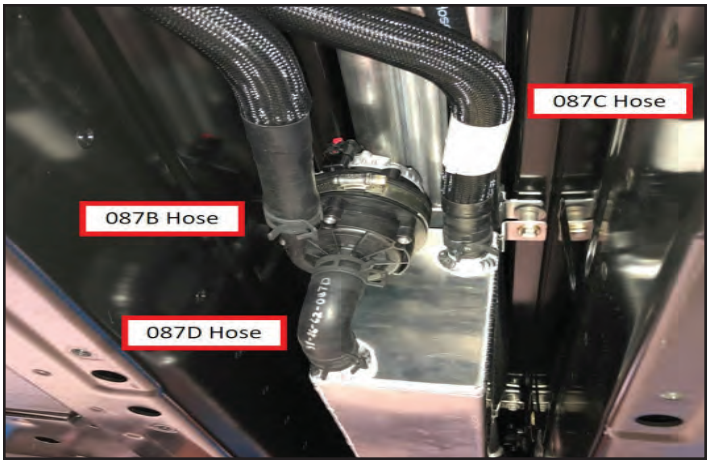
199. Install intercooler pump P/N 68-14-59-005 onto rear of tank using worm gear clamp P/N 48-46-10-018, with the pump oriented as shown in the photo.
Tighten the clamp securely over the rubber isolator.
Install ¾" constant tension clamps over both ends of Hose P/N 31-26-62-087D, then install the hose between the pump and tank as shown. Slide the constant tension clamps toward the hose ends to secure the hose to the tubes.
Select the wiring harness pigtail adaptor P/N 82-55-80-087 and connect it to the pump, then connect harness P/N 82-55-80-077 to the adaptor.
Secure the pump wiring with zip ties along the tunnel as required.



200. Route, secure and install hoses 087B and 087C toward the intercooler pump and reservoir. Cut the hoses to length as necessary so that they route cleanly within the tunnel.

Hose 087B installs onto the intercooler pump. Secure with a ¾" constant tension clamp.

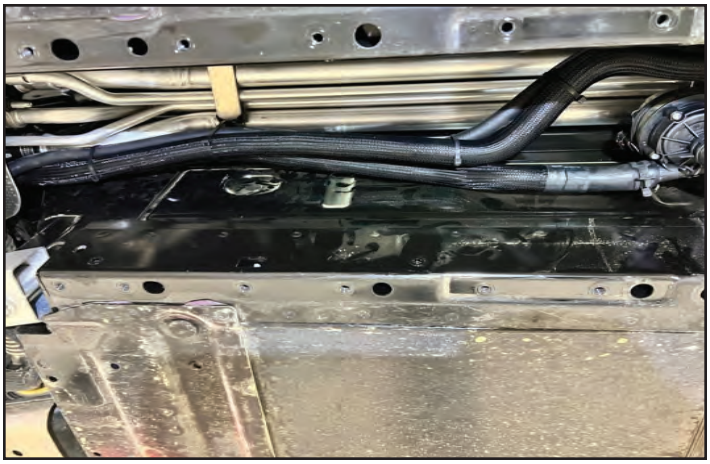
Hose 087C installs onto the intercooler reservoir. Secure with a ¾" constant tension clamp.



201. Secure the intercooler pump hoses to the factory tubes by using zip ties along the length of the tunnel as shown.

Ensure none of the lines rub on any mating components.

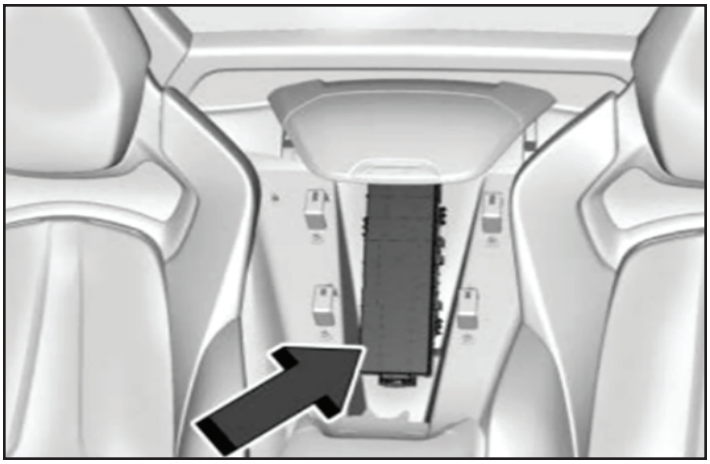
When you are satisfied with the routing of all hoses, go back and re-secure the (4) zip ties securing the hoses to the dry sump tank bracket at the LH front of the engine.



202. Working from inside the vehicle:
Pull the LH side console trim panel outward toward the drivers' seat to gain access for routing the yellow wire.
Find the yellow wire that was pushed through the tunnel in the earlier step.
Install convolute tubing over the yellow wire (if not pre-installed), tape the ends then carefully route the yellow wire rearward inside the trim panel toward the fuse box located below the center speaker.

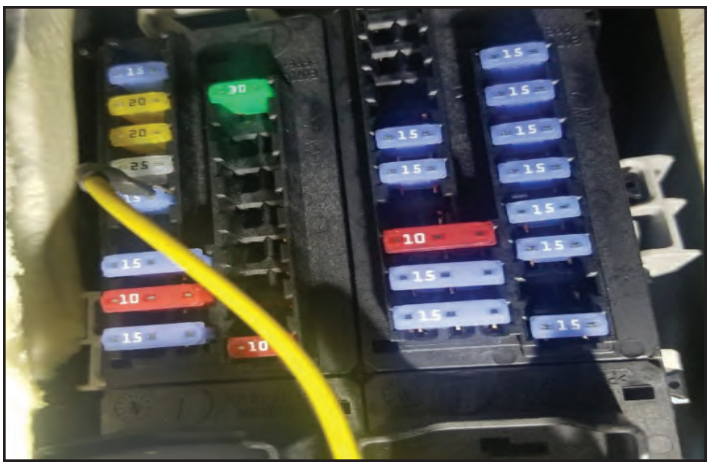
203. Locate the rear compartment fuse block in between the seats.

Remove the speaker cover followed by the fuse box cover. The fuse box cover will need to be modified in the following slides.



204. Remove the 15A fuse at location 35 (ECM/MAF/02/AC feed) then install the fuse tap for the CAC pump into the inboard side of the fuse at this location.

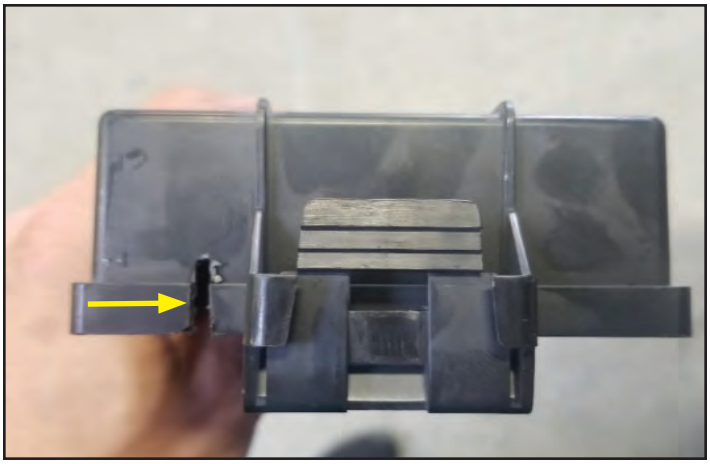
Re-install the original fuse into the fuse block tap.



205. Carefully route the CAC pump wire through the fuse box as shown.

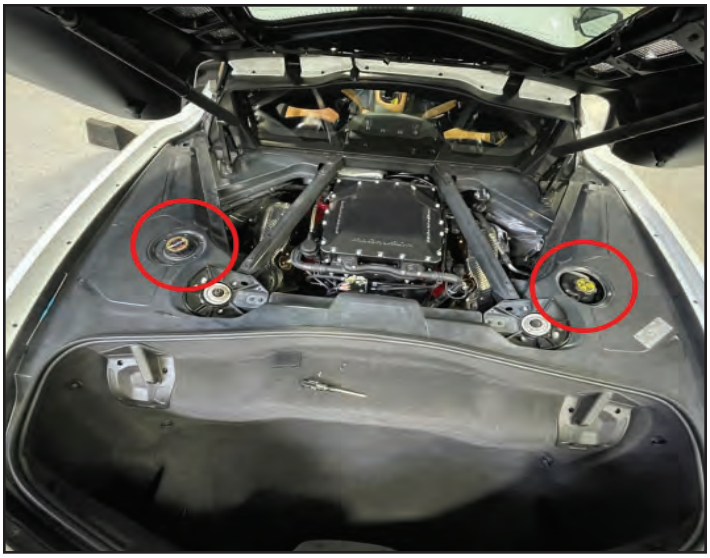
206. Grind a notch in the fuse box cover in the location shown to allow the CAC pump wire to pass through.

Re-install the cover and all interior trim as necessary.



Section 5: Coolant System Evac and Fill

207. **Coolant Systems Evac and Fill:**
Verify all coolant hose connections then proceed to evacuate and fill the engine and charge air coolant systems using Snap-On SVTSRAD272A vacuum/fill tool.



Fill the engine and CAC coolant systems with AC Delco Dexcool 50/50 Premix Antifreeze (GM P/N 10-5027 or 12378390).

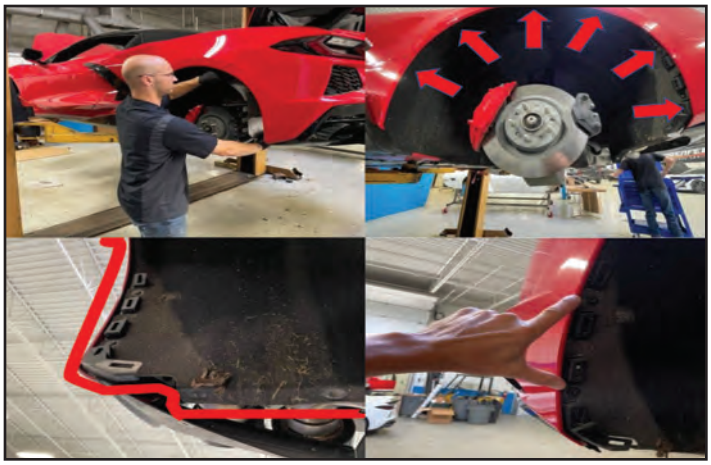
IMPORTANT: the engine and charge air coolant systems MUST be vacuum bled in order to remove sufficient trapped air. Failure to use vacuum bleeding equipment may result in engine damage due to entrapped air.

In addition, the intercooler pump includes an internal fail-safe to prevent operation if it senses excessive cavitation or is run in a dry environment.

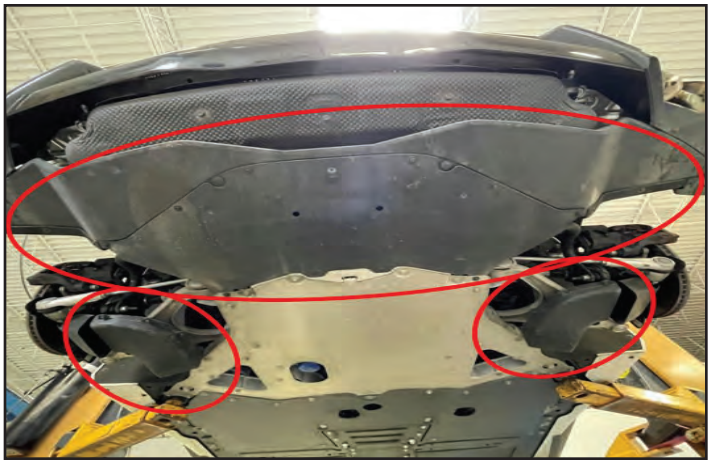
208. Verify battery cable connection is clean, re-connect and tighten the negative battery cable under the hood.

209. Re-install the LH / RH rear inner fender panels. Secure using the original Torx T15 screws. Torque to 22 in-lbs. Install push pins.

Re-install the plastic rock guards onto the LH / RH rear corners of wheel wells (bottom right photo).



210. Re-install rear lower under body valence and rear brake cooling ducts, if applicable.



211. Re-install rear wheels.

Torque lug nuts to 140 ft-lbs.

212. Re-install front closure panel then install and tighten fasteners around perimeter of panel.

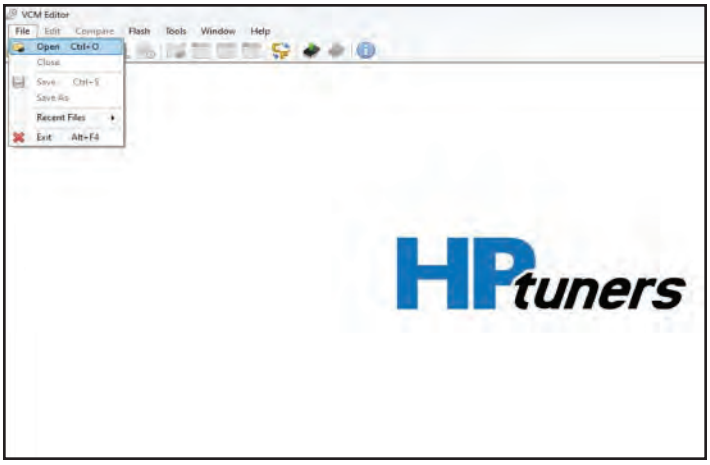
Re-install carpet in trunk.

213. Prepare to flash the new Magnuson calibration file to the vehicle.
It is strongly recommended to connect a battery charger to the vehicle whenever flashing a calibration file.
If the flash process is interrupted at any point, you could permanently damage your ECM.

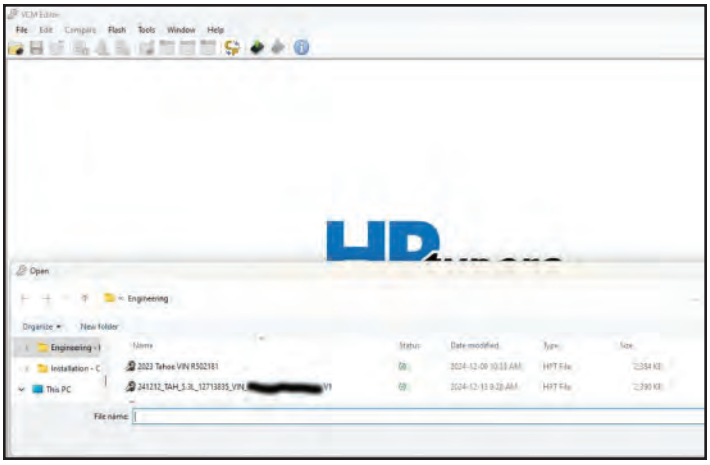
Connect your MPVi3 to the OBDII port on your vehicle. Connect the USB cable between the MPVi3 and your laptop.

214. Launch the HP Tuners VCM Editor software.

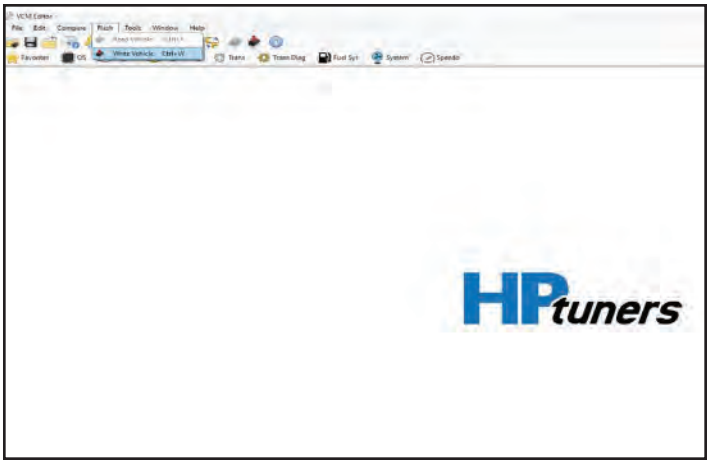
Click the File tab, then Open.



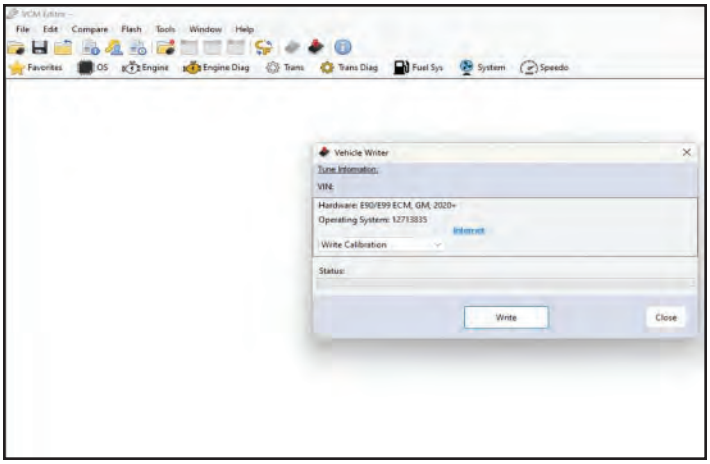
215. Navigate to the file folder where you saved the cal file that you have received from Magnuson for your specific application.



216. Click the Flash tab, then Write Vehicle.



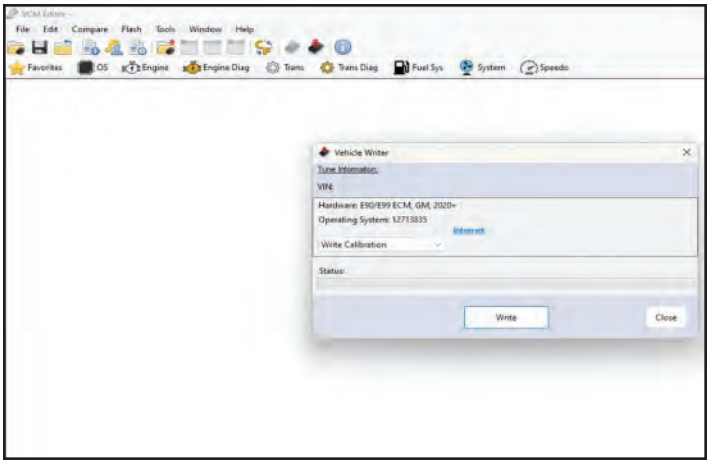
217. When the pop-up appears, click Write to begin flashing the vehicle.
* At this point, HP Tuners will ask you to license the VIN. You are responsible to purchase the credits required to flash the calibration file to your vehicle.
Do not disturb the laptop or cables while the file is being uploaded to the vehicles' ECM.
Allow the software to finish the process.
Follow the on-screen prompts to cycle the ignition as requested.



218. At this point your ECM should now have the revised calibration file loaded and the vehicle should be ready to start.

***A throttle body relearn is recommended. This can be done with some aftermarket service tools or the GM factory service tool.

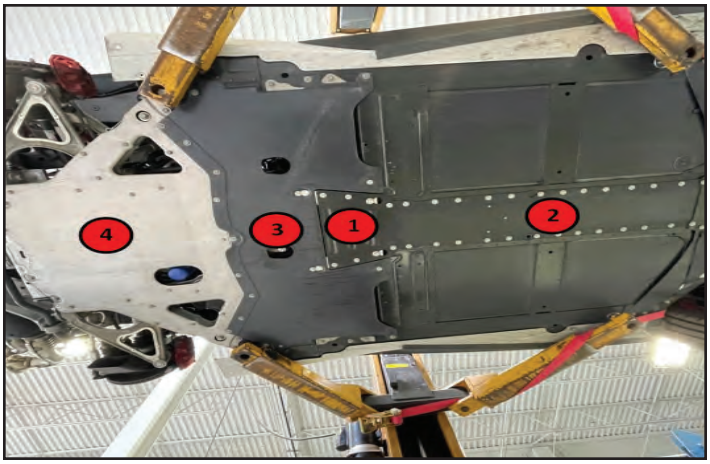
Make one final inspection of the entire under hood area, ensuring you have completed all steps of this manual, all tools have been cleared away and both coolant systems have been evacuated and filled.



219. Make any final checks to vehicle as necessary.
Ensure a revised engine calibration has been uploaded to the ECM.
Start vehicle and check for any leaks or abnormal noises.

Perform final audit checks of coolant fill levels and wheel torques before driving or testing the vehicle.

220. If you choose, the under body panels can now be re-installed, however it is recommended to road test / dyno the vehicle first so that a detailed inspection can be performed afterward.
Refer back to this slide as necessary when re-installing these items.
Working from under the vehicle, re-install (4) under body panels in the center of chassis, in the order shown in the photo.
Hand-start ALL under-body fasteners first.



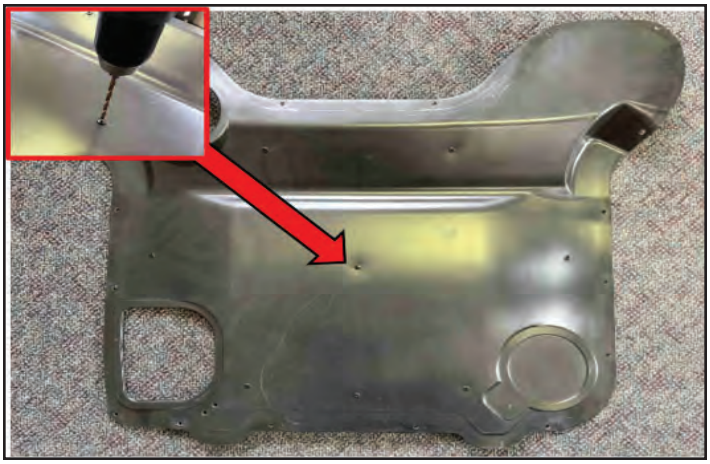
Torque under body bolts, starting from the center and working your way outboard to the ends.
M6 bolts are torqued to 80 in-lbs.
M8 bolts are torqued to 16 ft-lbs.

IMPORTANT: tunnel panel reinforcement plate (steel plate) bolts (encircled in blue) are to be torqued to 118 ft-lbs.

Section 6: Convertible Model Addendum

221. Convertible Only: Prior to re-installation of the factory engine bay cover, the following modifications need to be made:

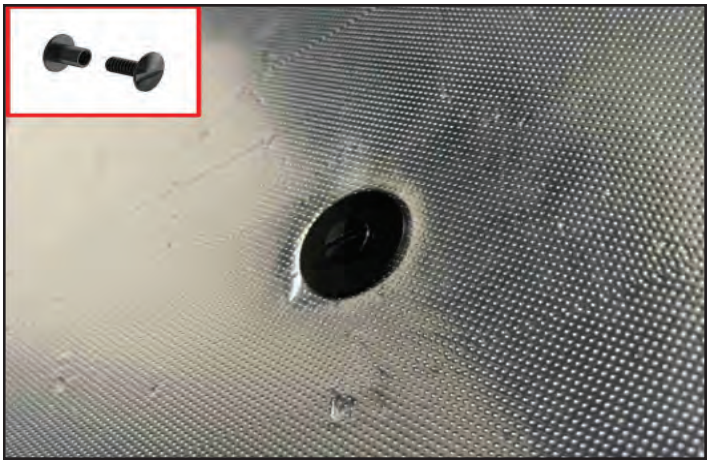
Drill out the factory-installed rivet in the center of the engine bay cover using a 3/16” drill.
See next step.



222. Convertible Only: Apply red Loctite and install a barrel nut assembly and 1-inch washer from the kit.

Install the nut end of the assembly into the hole from the top side of the engine bay cover.
Thread the screw/washer sub-assembly into the nut from the underside (heat shield) of the cover.
Using a flat blade screwdriver, gently tighten the screw, ensuring the washer centers and engages onto the barrel nut.

Tighten the screw only until the top surface of the washer becomes flush with the heat shield material.



223. Convertible Only: If installed, remove all badges from the supercharger lid prior to re-installation of the factory convertible engine bay cover.

The badges have insufficient clearance to the heat shield and will result in contact during engine operation.

224. Convertible Only: With a helper, re-install the closure cover.

Re-install the fasteners around the perimeter of the engine access cover.

225. Print and install this hang tag inside the vehicle notifying customer they must DECLINE any future over-the-air (OTA) software updates from GM on this vehicle.

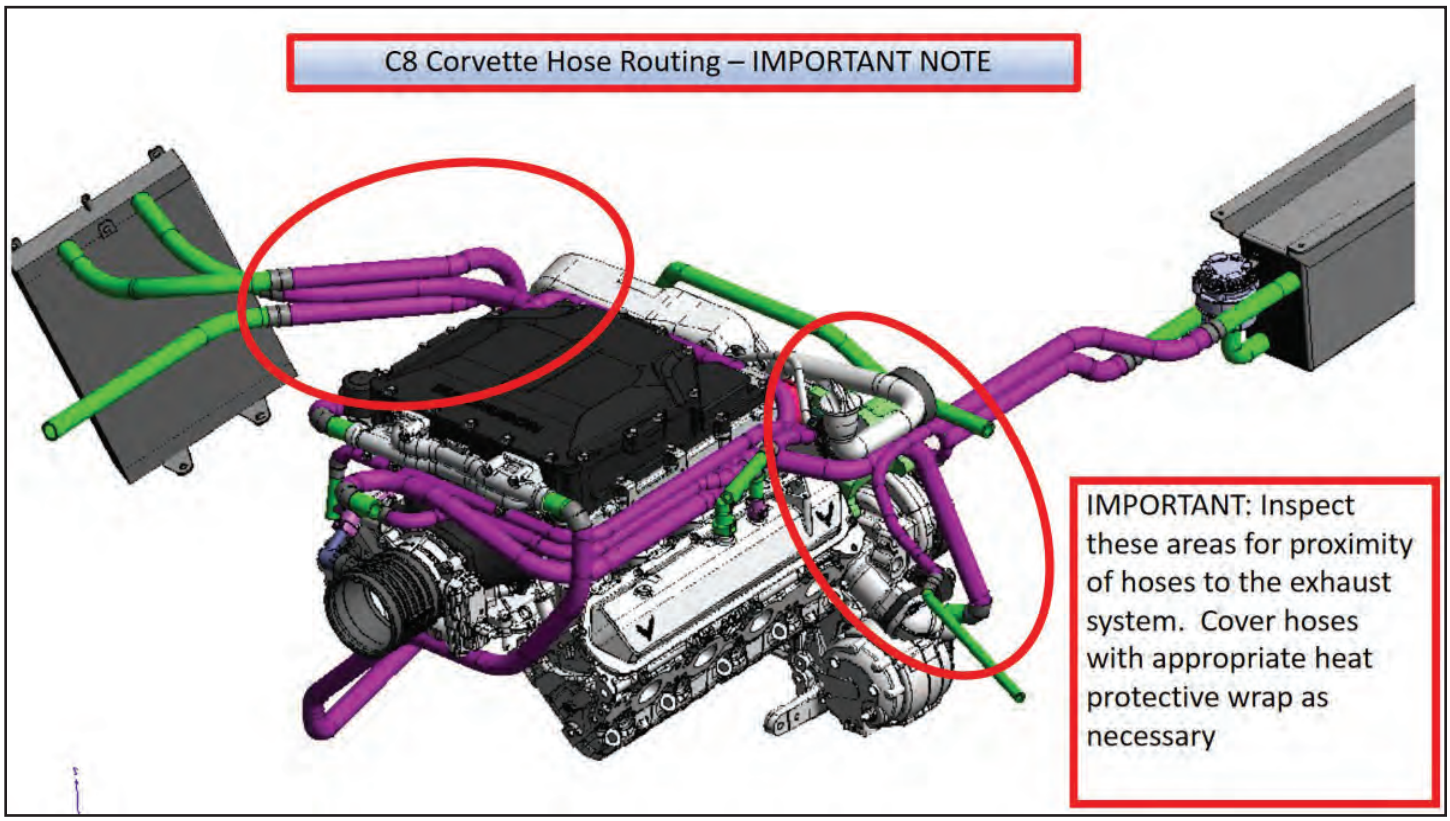
226.

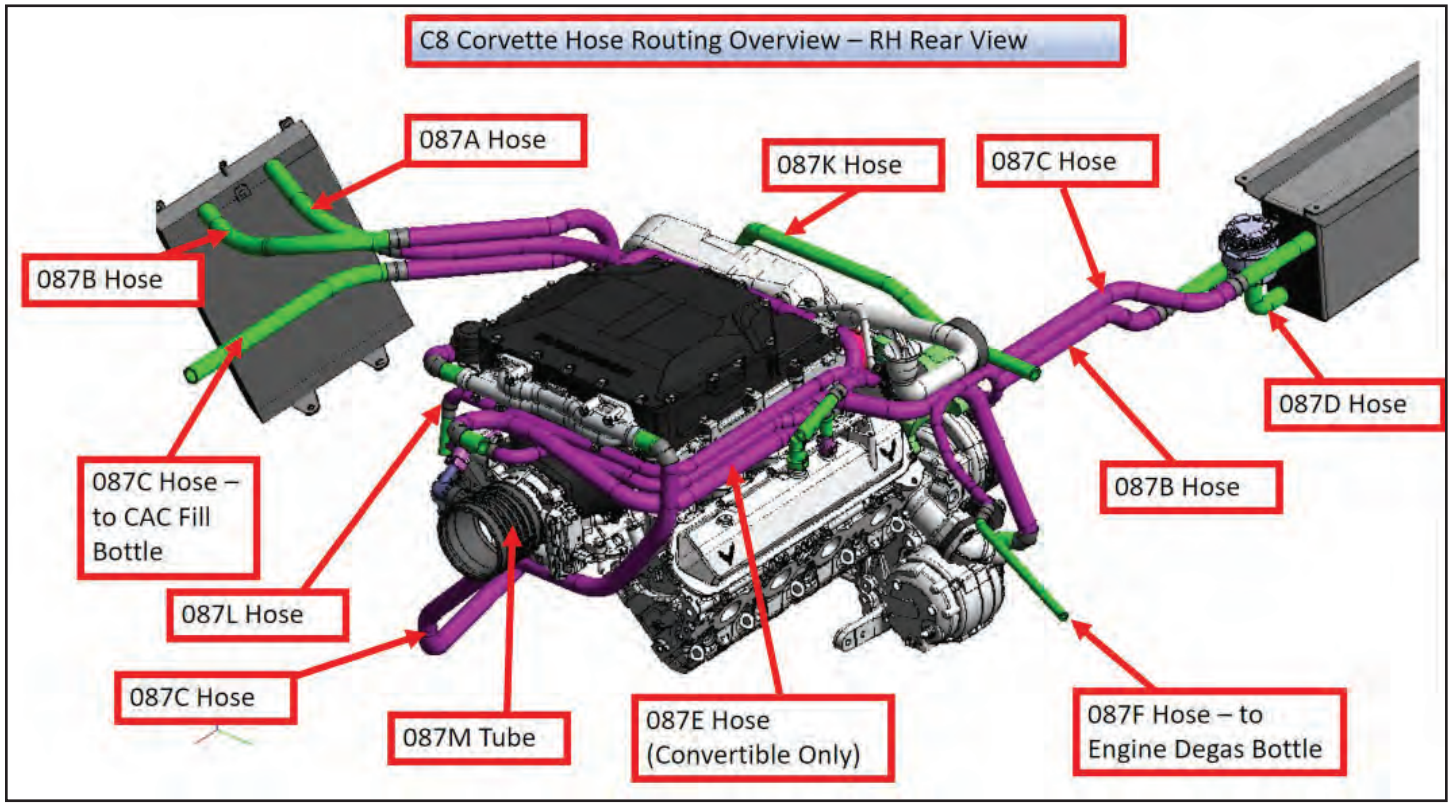
Appendix A: Hose Part # Matrix

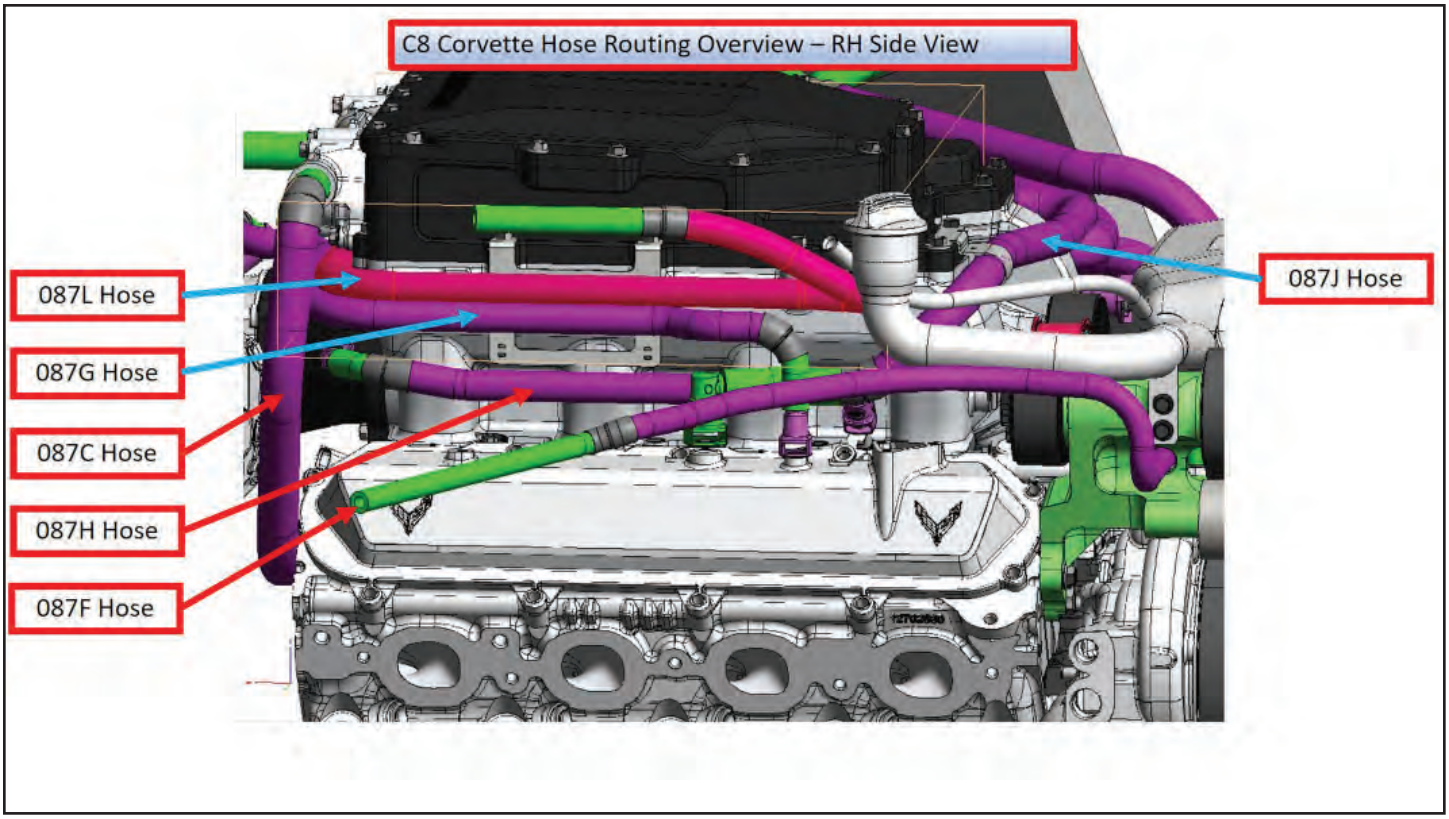
C8 Corvette Hose Part # Matrix

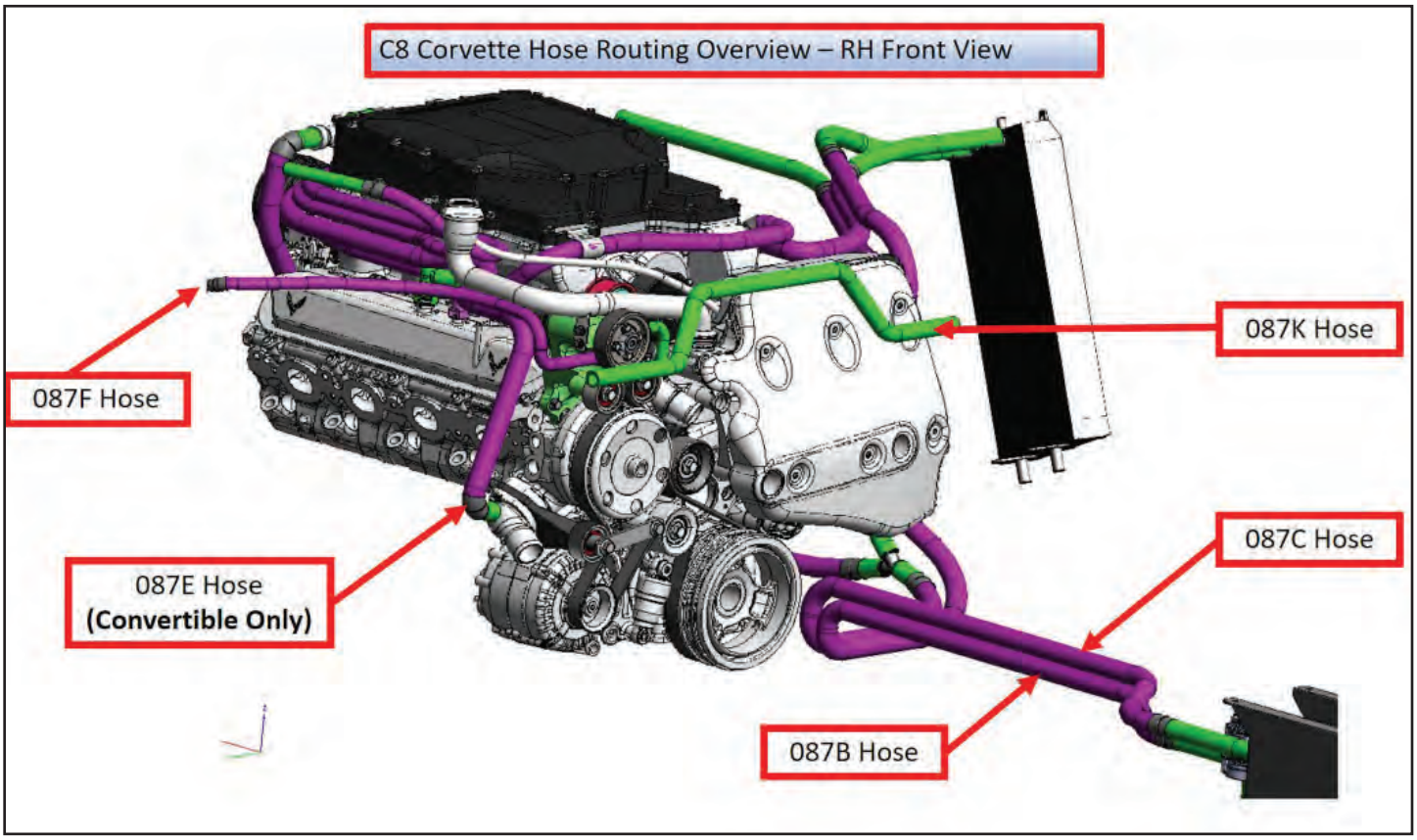
COOLANT HOSES	PART #	CLAMP SIZE / QTY.
IC HOSE – LOW TEMP RAD TO SC INLET	31-26-62-087A	3/4 INCH / QTY. 2
IC HOSE – PUMP TO LOW TEMP RAD	31-26-62-087B	3/4 INCH / QTY.2
IC HOSE ASSY – SERVICE FILL/SC OUTLET TO RESERVOIR (3-PC. HOSE)	31-26-62-087C	3/4 INCH / QTY. 3
IC HOSE – RESERVOIR TO PUMP	31-26-62-087D	3/4 INCH / QTY. 2
HOSE – BTM DEGAS TO WTR PUMP (CONV. ONLY)	31-26-62-087E	3/4 INCH / QTY. 2
HOSE – WATER PUMP BREATHER TO DEGAS BOTTLE	31-26-62-087F	5/16 INCH / QTY. 2
PCV HOSES	**PART #**	**CLAMP SIZE / QTY.**
FRESH AIR SIDE	31-26-62-087G	3/8 INCH / QTY. 2
VACUUM, DIRTY SIDE	31-26-62-087H	3/8 INCH / QTY. 2
FRONT CROSSOVER	31-26-62-087J	1/2 INCH / QTY. 2
FUEL VAPOR HOSES		**CLAMP SIZE / QTY.**
FUEL TANK VAPOR CROSSOVER	31-26-62-087K	5/8 INCH / QTY. 2
VMV – BODY LINE TO VALVE	31-26-62-087L	3/8 INCH / QTY. 2
CLEAN AIR TUBE		**CLAMP SIZE / QTY.**
CLEAN AIR TUBE	31-26-62-087M	1.25” OETIKER AND 120mm WORM DRIVE

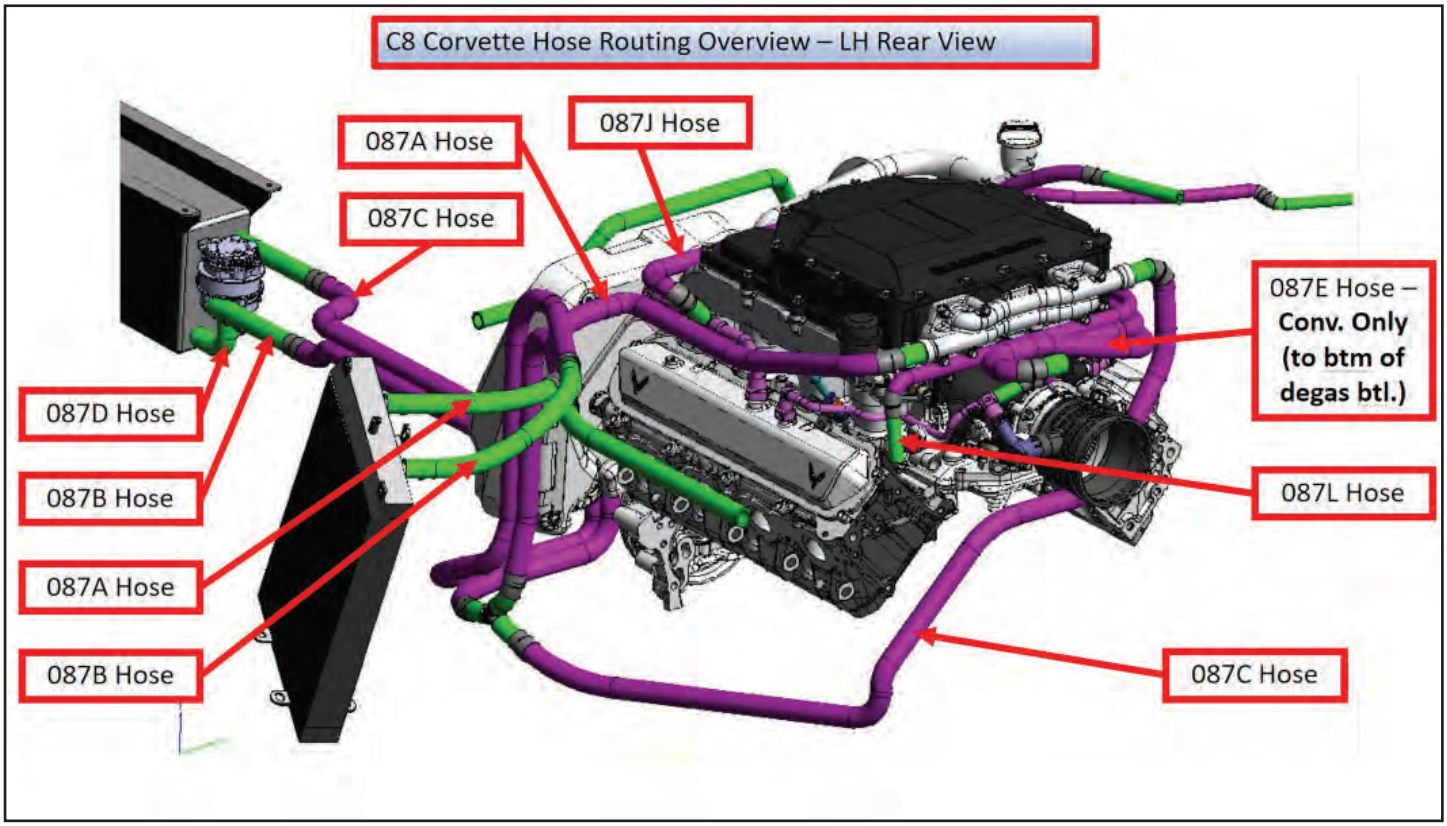
Appendix B: Hose Routing Detail

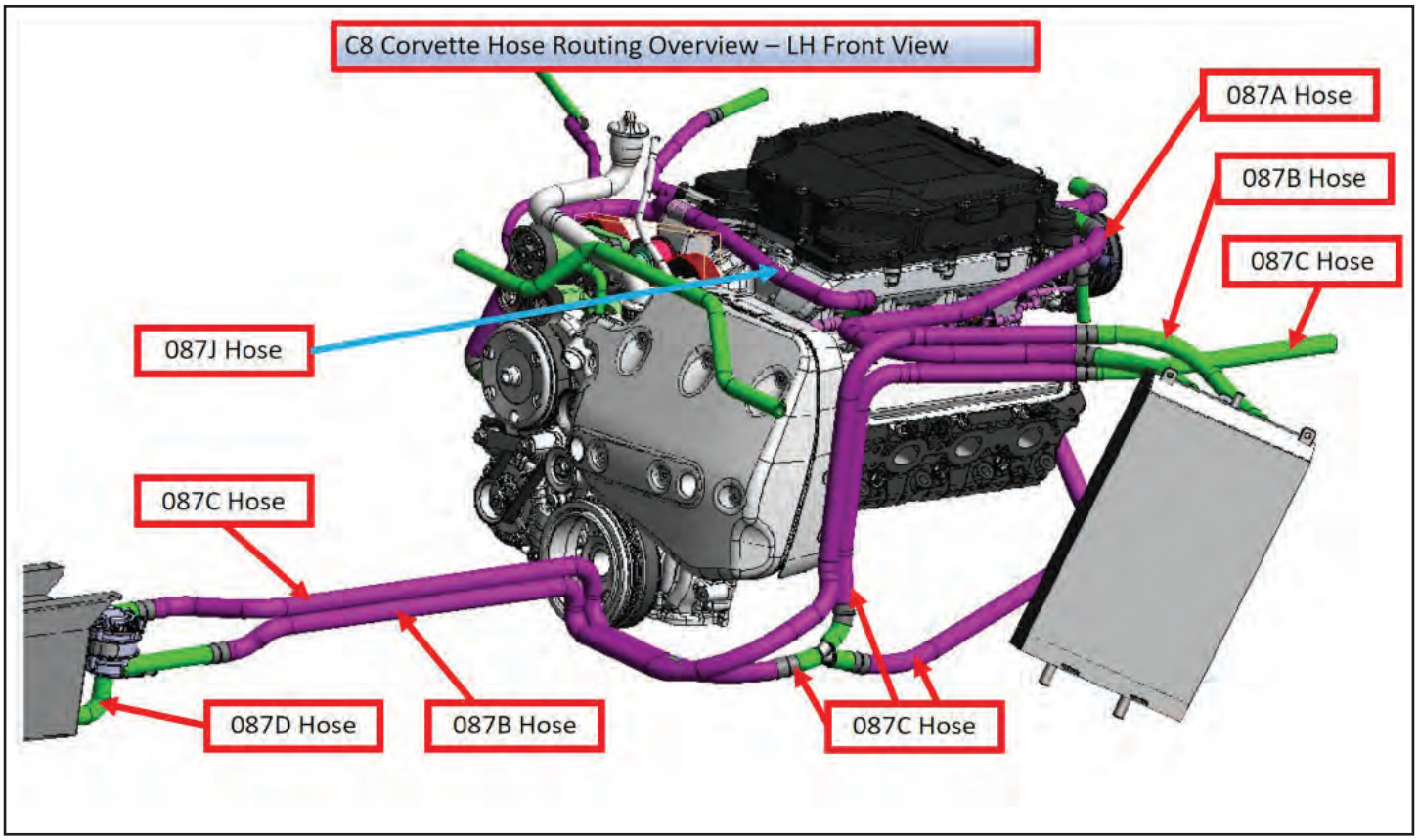


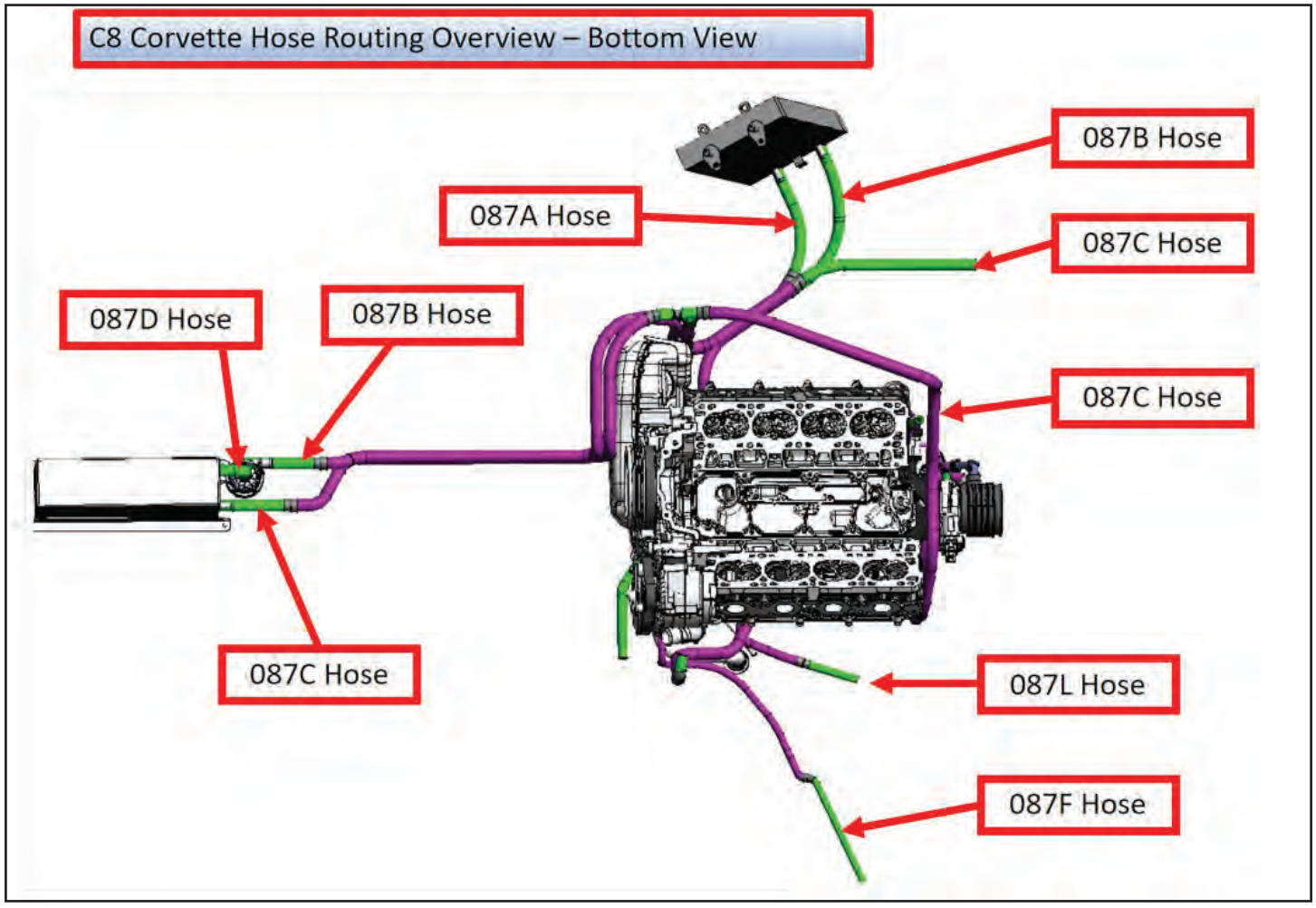


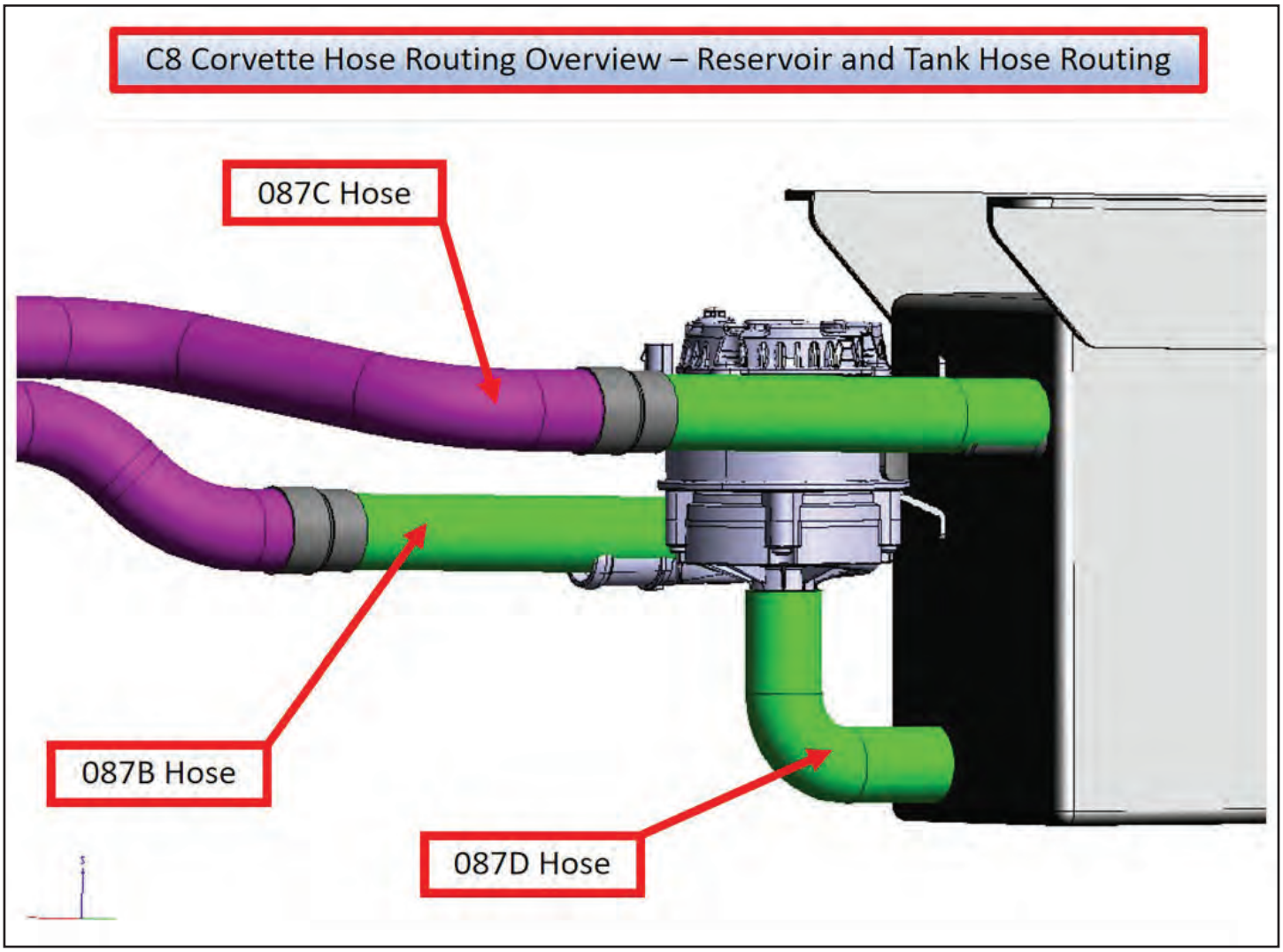

C8 Corvette Hose Routing Overview – RH Side View
087L Hose
087G Hose
087C Hose
087H Hose
087F Hose
087J Hose

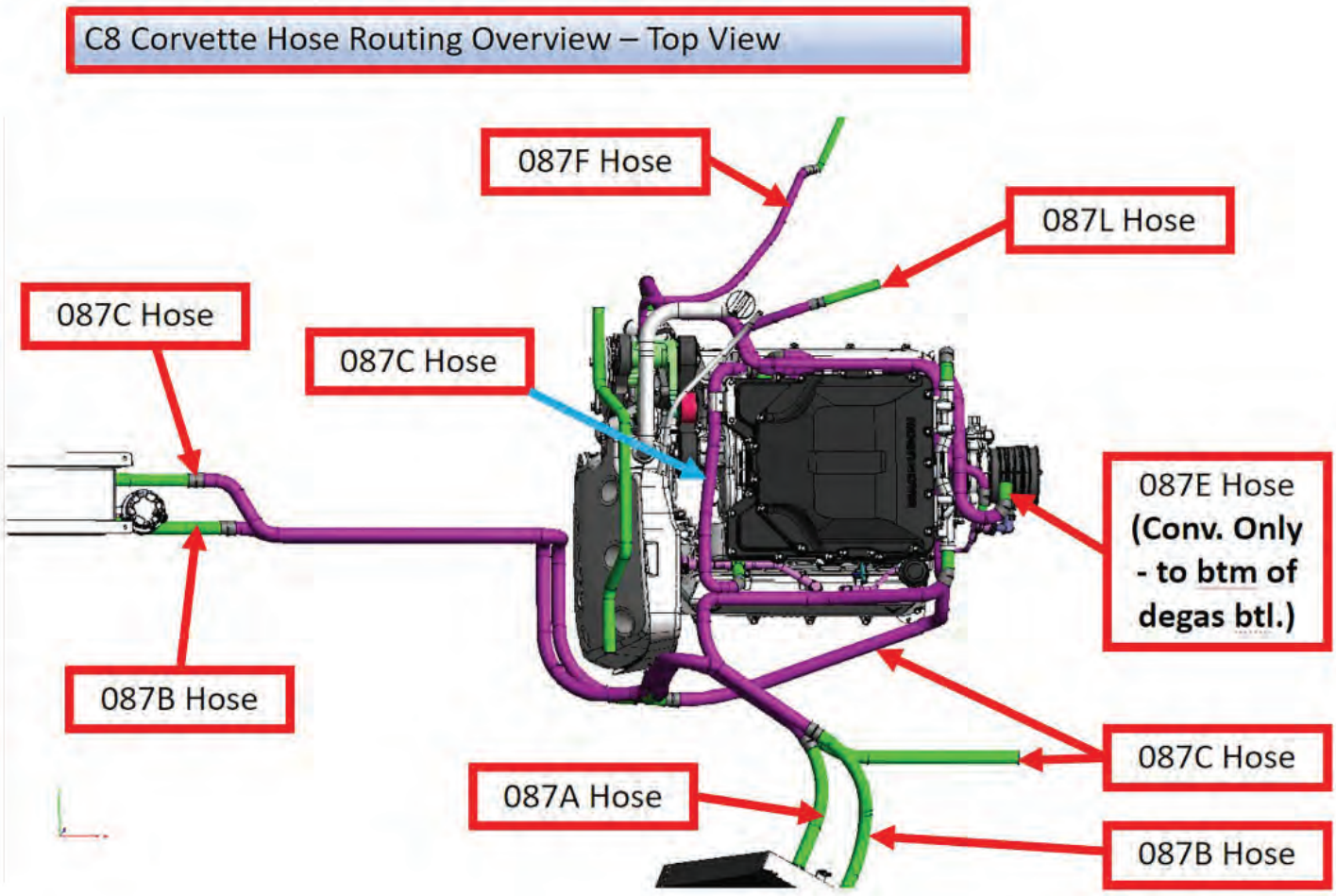

C8 Corvette Hose Routing Overview – RH Front View
087F Hose
087E Hose
(Convertible Only)
087K Hose
087C Hose
087B Hose


C8 Corvette Hose Routing Overview – LH Rear View
087A Hose
087J Hose
087C Hose
087E Hose – Conv. Only (to btm of degas btl.)
087D Hose
087B Hose
087L Hose
087A Hose
087B Hose
087C Hose


C8 Corvette Hose Routing Overview – LH Front View
087A Hose
087B Hose
087C Hose
087J Hose
087C Hose
087D Hose
087B Hose
087C Hose


C8 Corvette Hose Routing Overview – Bottom View
087B Hose
087A Hose
087C Hose
087D Hose
087B Hose
087C Hose
087C Hose
087L Hose
087F Hose


C8 Corvette Hose Routing Overview – Reservoir and Tank Hose Routing
087C Hose
087B Hose
087D Hose


C8 Corvette Hose Routing Overview – Top View
087F Hose
087L Hose
087C Hose
087C Hose
087E Hose
(Conv. Only
- to btm of
degas btl.)
087B Hose
087C Hose
087A Hose
087B Hose

Appendix C: ECM Removal

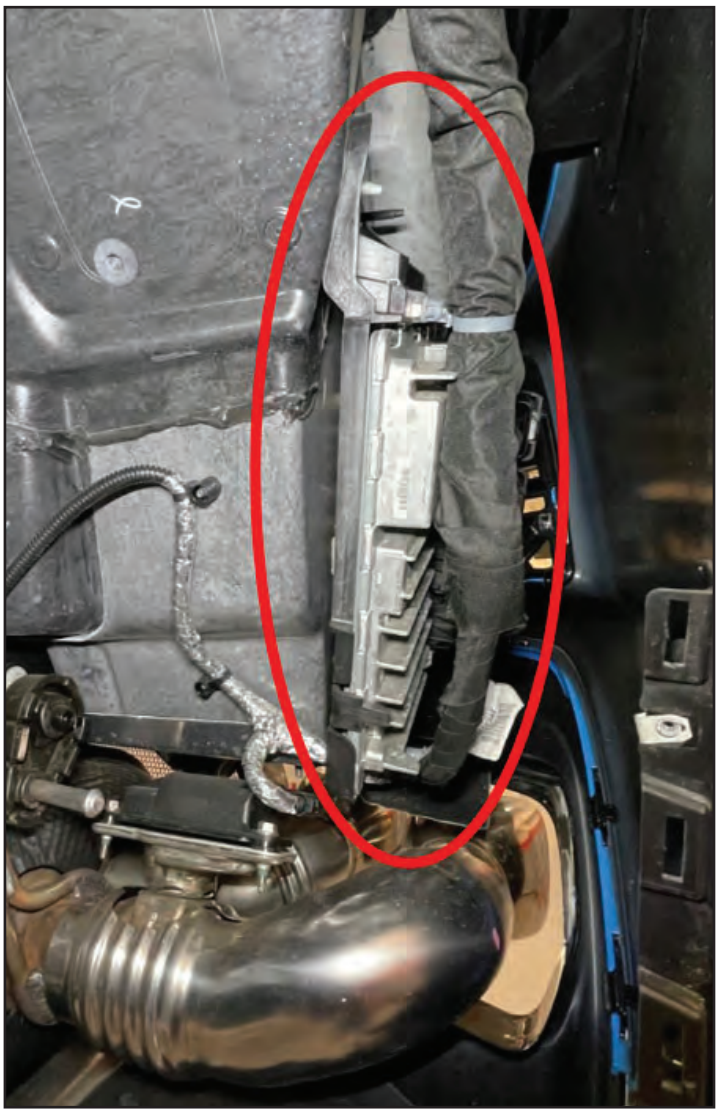
IMPORTANT: Disconnect the battery before proceeding! See step 19.

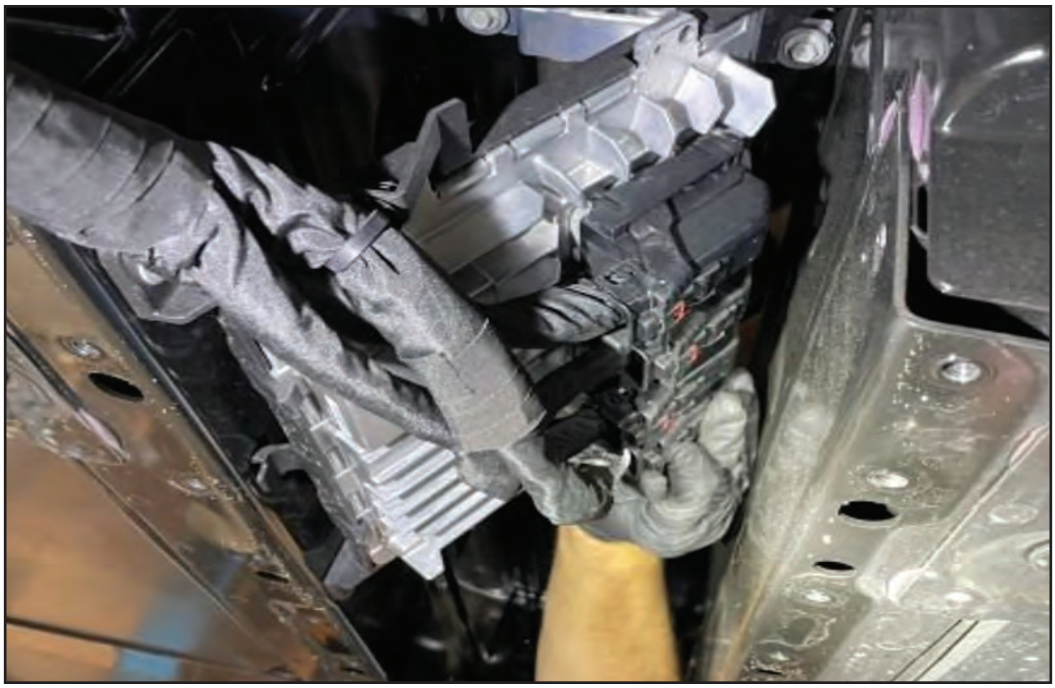
Depending on the model year of the vehicle you are working on, the ECM will either be located in the center tunnel area, or behind the LH rear wheel. Locate the ECM and prepare to remove it from the vehicle.

Disconnect (4) electrical connectors @ ECM in vehicle tunnel.

Push tabs down at bottom of ECM bracket then remove the ECM from the bracket.

Carefully package the ECM and send it out to be unlocked as per the instructions on the HP Tuners website.





Appendix D: Fastener Torque Specifications

Frunk:

Battery Post clamp nuts: 4.5 Nm (40 lb in)

Exhaust System

Exhaust Manifold bolts: 20 lb. ft, loosen 180 degrees, then re-torque 17 lb. ft.
Catalytic convertor nuts: 58 Nm (43 lb ft)
Exhaust System Rear nuts: 22 Nm (16 lb ft)
Muffler Hanger Bracket bolts: 22 Nm (16 lb ft)
Exhaust Manifold Heat Shield bolts: 10 Nm (89 lb in)
HEGO Sensors: 42 Nm (31 lb ft)

Intake

Intake Air Duct Bolt: 9 Nm (80 lb in)
Air Cleaner Bolt: 9 Nm (80 lb in)
Air Cleaner Outlet Duct Clamp: 3.5 Nm (31 lb in)
Evap Canister Purge Solenoid Valve bolt: 10 Nm (89 lb in)

Underhood

Upper Frame Cross Brace bolts (under hood): 23 Nm (17 lb ft)

Powertrain / Underbody

Rear Body Compartment Bolts: 2.5 Nm (22 lb in)
Rear Wheel Protective Bumper bolts (Crash bars): 9 Nm (80 lb in)
Upper Control Arm bolts: 58 Nm (43 lb ft)
Rear Suspension Cradle Bolts: 160 Nm (118 lb ft)
Brake Hose Bracket bolts: 9 Nm (80 lb in)
Rear Cradle Brace bolts: First pass 58 Nm. Second pass: rotate clockwise additional 90 – 105 degrees
Fuel Tank Crossover Pipe bolts: 9 Nm (80 lb in)
Fuel Feed Front Hose Clip bolt: 9 Nm (80 lb in)
A/C Line nuts: 22 Nm (16 lb ft)
Radiator Inlet Hose clamp: 5 Nm (44 lb in)
Alternator B+ cable nuts: 15 Nm (11 lb ft)
Trans Control Module bolts: 2.5 Nm (22 lb in)
Fuel Pipe Shield bolts: 9 Nm (80 lb in)
Underbody Rear Air Deflector bolts (M6): 9 Nm (80 lb in) (M8): 22 Nm (16 lb ft)
Tunnel Panel Reinforcement Plate: 22 Nm (16 lb ft)
Tunnel Plate to Rear Cradle Brace bolts: 160 Nm (118 lb ft)
Rear Wheelhouse Liner/Air Deflector/Bumper Fascia bolts and screws: 2.5 Nm (22 lb in)

Fastener Torque Requirements (cont'd):

Rear Cradle Shear Plate bolts: M8 6-Lobe: 29 Nm (21 lb in). M8 regular bolts: 22 Nm (16 lb ft)

Rear Wheel Driveshafts bolts: First Pass 50 Nm criss-cross pattern. Second Pass Rotate clockwise 40-50 degrees

Rear Wheel Driveshaft Shield bolts: 9 Nm (80 lb in)

Strut Top Mount nuts: (22 lb ft)

Oil Filler Tube bolt: 10 Nm (89 lb in)

Oil Drain plug: 25 Nm (18 lb ft)

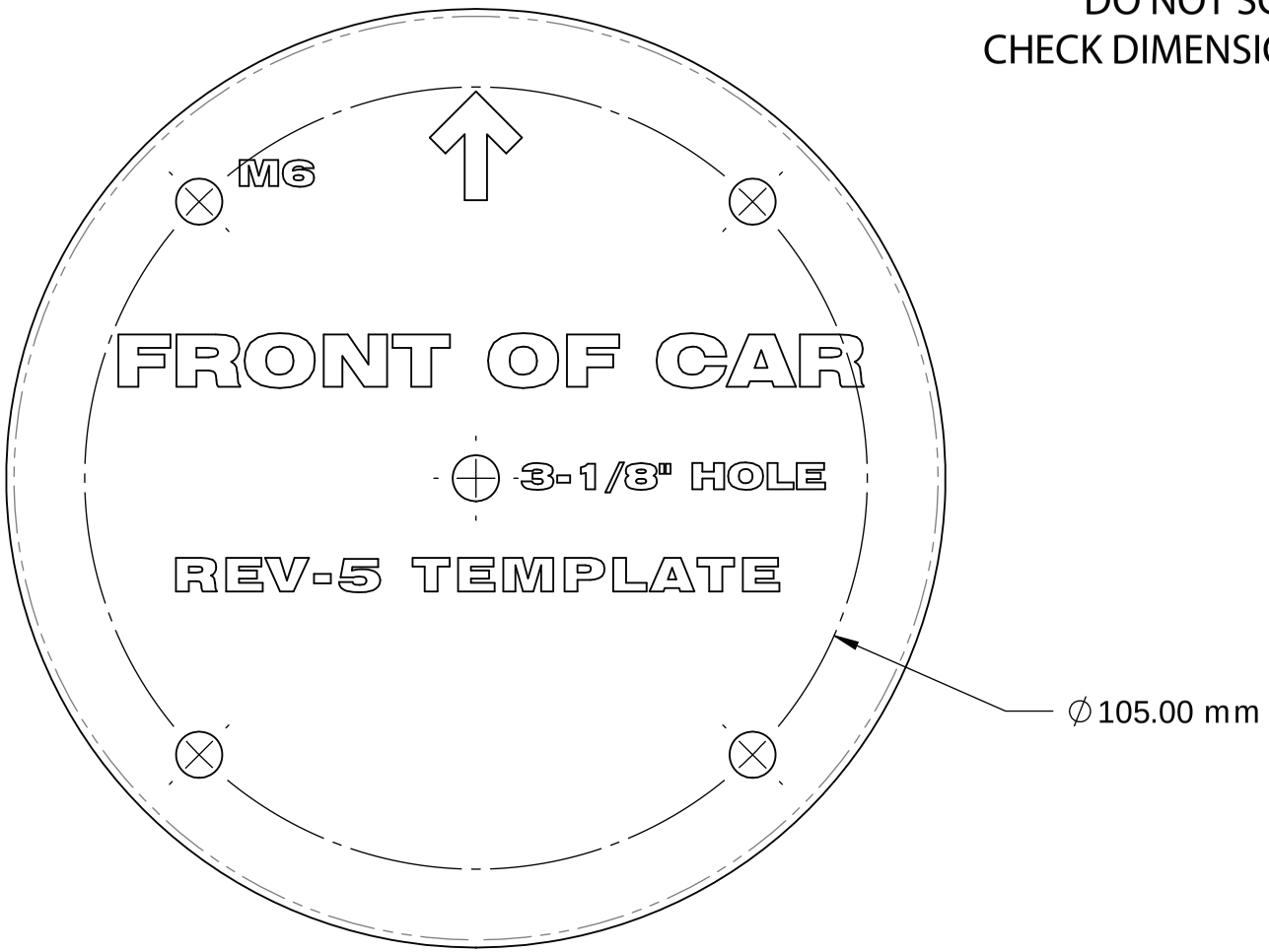
Oil Capacity: 7.5 quarts (with filter)

SHEET SCALE 1 : 1

PRINT PDF ON 8.5 X 11 LANDSCAPE

DO NOT SCALE OR FIT TO PAPER

CHECK DIMENSIONS AFTER PRINTING



Appendix E: Fill Reservoir Template

C8 TVS2650 (Powertrain In)

MAGNUSON SUPERCHARGERS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

MATERIAL

FINISH

APPLICATION

DO NOT SCALE DRAWING

CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE

APPROVALS	DATE
DRAWN	
CHECKED	
RESP ENG	
MFG ENG	
QUAL ENG	

MAGNUSON PRODUCTS
1990 KNOLL DRIVE
VENTURA, CA 93003
(805) 642-8833

FILL RESERVOIR TEMPLATE
REV-5 BOTTLE ONLY

SIZE	DWG. NO.	REV.
A		

SCALE : 1/1 | PRINT DATE: 2/14/2023 | SHEET 1 OF 1

Notes

Please enjoy your “Magnuson SuperCharged” performance responsibly.

*** PREMIUM 91 OCTANE GASOLINE FUEL REQUIRED ***

MAGNUSON
SUPERCHARGERS