NOSTRUM
HIGH PERFORMANCE

GM LTG 2.0 Ecotec High Pressure Fuel Pump Kit Installation Guide

Standard Bore + Kit - Part Sku#: H086-1514
Big Bore Kit - Part Sku#: H086-0684

WARNING! PLEASE FOLLOW ALL WARNINGS AND INSTRUCTIONS FOUND IN YOUR VEHICLE OWNERS MANUAL. THE FOLLOWING INSTRUCTIONS MUST BE READ AND FULLY UNDERSTOOD BEFORE BEGINNING INSTALLATION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN VEHICLE DAMAGE, PERSONAL INJURY OR DEATH. IF THESE INSTRUCTIONS ARE NOT FULLY UNDERSTOOD, DO NOT ATTEMPT INSTALLATION.

GM LTG 2.0L ECOTEC

HIGH FLOW SMALL BORE HPFP INSTALLATION GUIDE
HIGH FLOW BIG BORE HPFP INSTALLATION GUIDE
STANDARD BORE KIT PART #: H086-0676
BIG BORE KIT PART #: H086-0684

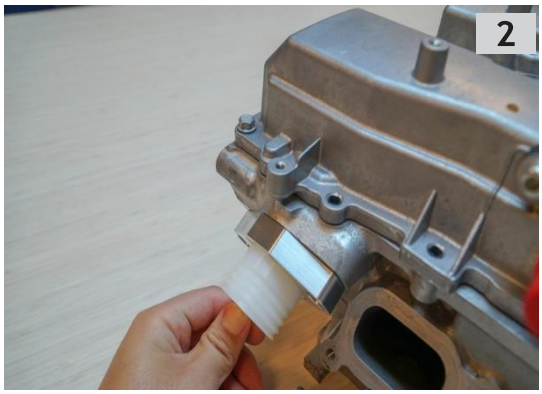
Disassembly
Please reference your OEM service instructions for removing the factory high pressure fuel pump.

Flange Installation
1. Your kit from Nostrum includes a white plastic installation tool, the fuel pump flange, and the flange sealing O-ring (black). The first step will be to install this flange on your LTG.

2. Insert the installation tool into the pump bore on the cylinder head. Be sure to gently slide into the bore. The installation tool will align the flange and the O-ring into proper orientation and concentric alignment with the pump bore on the cylinder head. This prevents O-ring damage, pump damage, and pump installation problems. Push into the bore until the flange and O-ring are seated against the pump mounting face on the cylinder head.

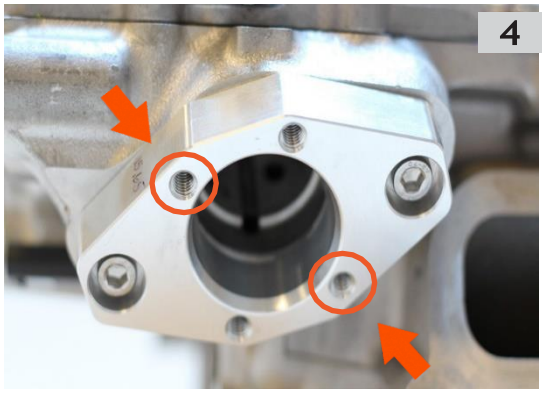
TIP: Be sure to clean the cylinder head mounting surface for a clean O-ring seal to prevent possible leaks

3. With the installation tool still in the bore, rotate the flange to align the flange bolt holes with the tapped holes on the cylinder head. Hand start the supplied stainless steel M6 x 25mm length bolts in each of the two bolt holes (5mm Allen key). Then proceed to screw the bolts in until bottoming. Follow your factory torque specification and torque the bolts.



TIP: Rotate the installation tool while seating the two fasteners. This will assist in preventing the installation tool from becoming trapped and difficult to remove.

4. Proceed to remove the plastic installation tool and set it aside. The flange and O-ring are now aligned for the pump installation. The flange will guide the pump to the cylinder head bore without damage to the O-ring. You should not see any O-ring deformities or flange gross miss-alignments to the cylinder head bore. You will notice 2 sets of tapped holes on your flange, make sure to use the correct ones for installing LTG HPFP. ***(In orange above)***



Pump Installation

1. Remove the pump assembly from packaging and check the pump O-ring (red), mating face and diameter. Ensure that they are clean and ready for installation. Place the pump in position to insert the pump into the flange main bore with the orientation shown below.

Note: On high mileage vehicles, it may be a good idea to replace the cam follower with a new OEM unit.

2. Proceed to gently insert the pump into the bore, keeping attention to the parallel alignment of the pump body diameter to the flange bore. **(It is a tight fit due to the O-ring compression.)** Push the pump in until it stops against the O-ring (red). Do not rock the pump off center of the bore excessively because you can damage the flange. You may rotate lightly to get the pump to seat into the bore.

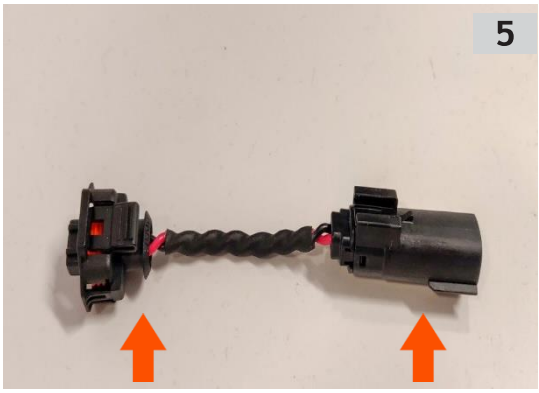
3. Obtain the two stainless steel M6 x 45mm long Allen bolts from the kit and align the pump main body bolt holes to the threaded holes on the flange. Insert the bolts and hand start them.

4. Push the pump deep into the flange until it seats against the flange face. Since your camshaft might not be at its base circle, you may need to gradually “walk” your pump in to load the return spring.

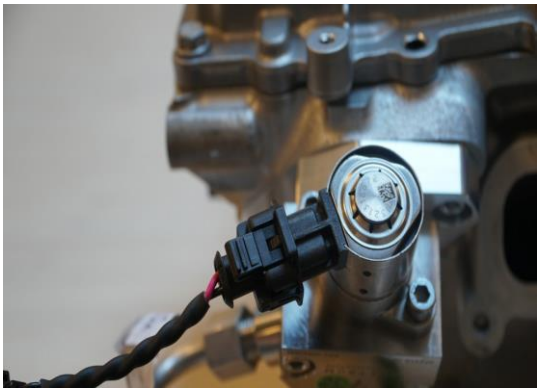
Alternate tightening each pump bolt by applying 2-3 rotations at a time, this will ensure the pump is installed evenly.

Note: DO NOT tighten one bolt completely without "walking" the pump to preload position. You will damage the flange. Proceed to secure the pump bolts to the flange. Torque to 15 lb-ft.

5. Obtain the electrical connector jumper from the kit. Plug the Molex male into the engine wire harness. Plug the Bosch Compact female to the male on the pump. Be sure, in both cases, that both connectors lock into the mating connector (you should hear a click). Check by pulling on the connectors. **Do not pull on the wires!!!**



BOSH COMPACT

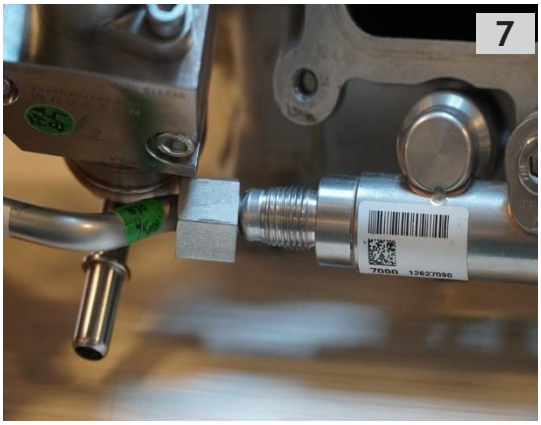


MOLEX

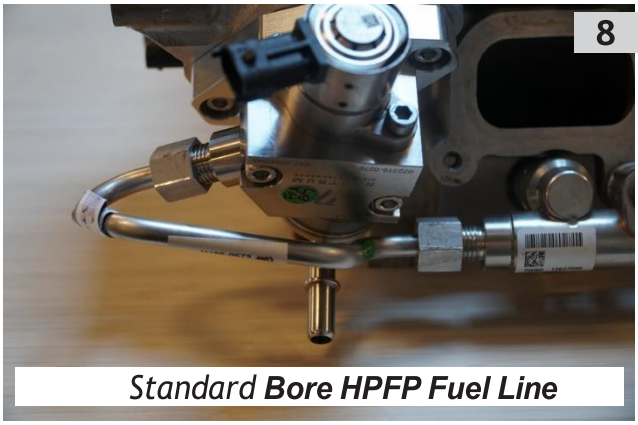
6. Obtain the high pressure hard line from the kit, it must be oriented correctly before installation. Rotate the hard line so that the U-shaped end aligns with the high pressure outlet on the HPFP.

Ensure that the spherical fitting on the hard line mates into the female cone on the fuel pump.

7. Next, ensure the spherical fitting is seated and aligned on the fuel pump side. While holding the fuel pump fitting in place, align the other end of the hard line spherical fitting to the fuel rail female cone. Do not start engaging threads on the compression nut until both spherical fittings are securely seated.

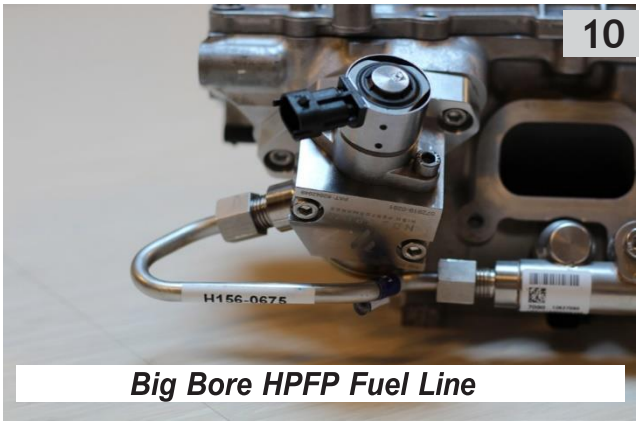


8. Thread the nut onto the fitting while continuing to hold the line in position with the spherical end seated into the female cone on center. **DO NOT USE THE NUT TO "CENTER"** the spherical tube fitting because it may damage the fitting, damage the thread, or miss-align the fitting and result in a leak. The nuts should spin freely and without resistance. If there is resistance, ensure the spherical fittings are straight and centered, and try again. Tighten compression nuts all the way until seated and secured. After both the fuel pump & fuel rail nuts are seated by hand, torque to **20 lb-ft.**



9. Attempt to move or shake the high-pressure hard line at both ends near the fittings. They should not move inside the compression nut. If they do move, remove the tube and go back to Step 7.

10. Low Pressure: Standard bore pumps have integrated **3/8”** male fitting. Reinstall your low pressure fuel line to the **3/8”** quick connect male fitting. Make sure it is secure.



Big Bore HPFP Fuel Line

NOTE: Standard bore kits and Big Bore Kits have different High Pressure tubes and Low Pressure adapters.

Factory ***3/8”*** *LP QC*

11. Big bore kits are supplied with two AN fittings. These are for the low pressure fuel line connections. Install the 6AN female to 6AN female 90 degrees ftitting to the pump and then the 6AN male to **3/8”** *QC male.*

12. Install as shown in the images below to obtain the correct orientation for routing your low-pressure fuel line. Torque to 13-ft.

13. Reinstall your low-pressure fuel line to the **3/8”** quick connect male fitting. Make sure it is secure.

Hardware installation is complete.

First Start-Up

1. Be sure to remove all installation tools and loose items from the engine compartment. Follow good, safe practices when working on your vehicle. Be sure to reassemble all parts and components according to your OE maintenance manual.

2. Key cycle the vehicle into the "Accessory On" position (do not go to Ignition position). The low- pressure fuel pump with activate and the low-pressure side of the pump will pressurize. Check the high-pressure fuel pump and the low-pressure side for leaks. If OK, proceed to step 3.

3. Key cycle to ignition and let the car attempt several start cycles. Remember that the fuel lines, pump and part of the fuel rail are filled with air, therefore this step is necessary to evacuate that air and get the system charged. If it starts, OK. If it doesn't, key off the vehicle. Check the high- pressure lines to the fuel rail, to the pump and the pump itself for leaks. If OK, proceed to step 4.

4. Key cycle one more time all the way to ignition. Engine should start-up and idle. If not, proceed with steps 2-4 again.

5. Let the car idle for a few minutes. Check for leaks on low and high-pressure portions again.

7. Installation is complete! **Time for a Tune!!**

NOTE: a fault code may appear at the first key cycle due to the long ignition time or the low pressure in the fuel rail, both due to the air in the fuel system.
This code should self-clear after the OEM defined quantity of key cycles.

NOTE: After driving the car and letting it cool, next day, check for fuel leaks again (from thermal expansion and contraction). Retighten fittings if needed.

For more information or specific support questions:
email **support@nostrumshop.com** or call 734-548-8677 (during normal business hours)

Revision	Notes	Date
Rev 1	SB+ P/N	1/31/23

NOSTRUM
HIGH PERFORMANCE

LTG Stage 1 Injector Install Guide

PRODUCT PART SKU#: H703-1256-1

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DO NOT ATTEMPT INSTALLATION.

Required Tools:

- 10mm Socket
- Trim removal
- Pick
- 15mm Socket
- 13mm Socket
- Channel Locks
- 3/8th Quick Connect Removal Tool
- Allen 5
- 11m Socket
- 18mm Wrench
- Flathead Screwdriver
- Vice
- Compression Tool

Expendables:

- Dielectric Grease
- Engine Oil
- Absorbent Towels

1. Disconnect negative battery terminal in the trunk of the car on the left side with a 10mm socket.

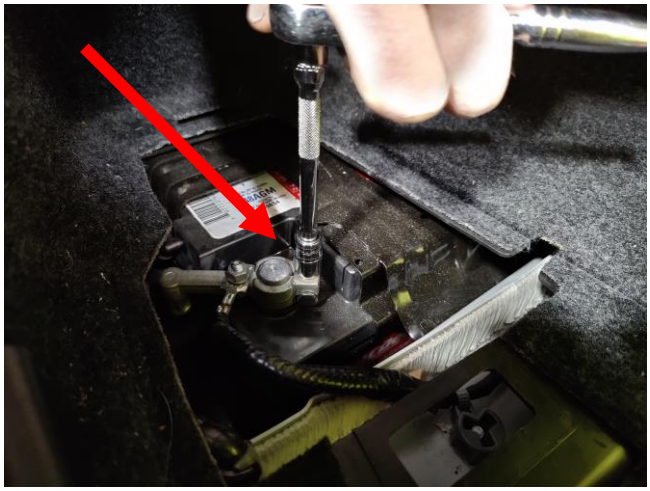

Figure 1

2. Pull the plastic retainer up on the engine cover and remove the engine oil cap.

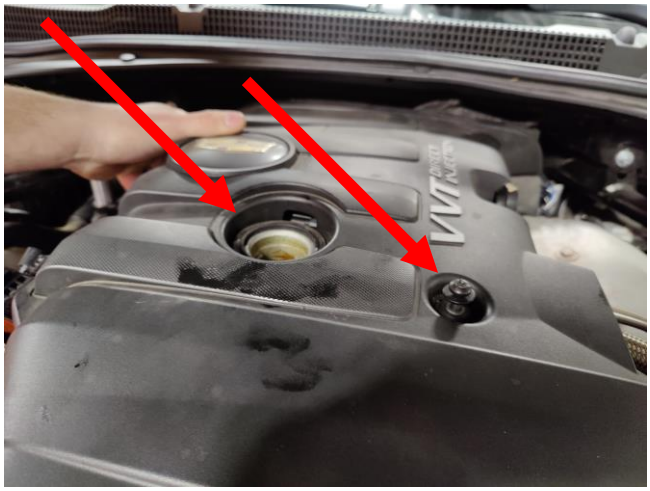

Figure 2

3. Pull the engine cover off the engine by hand and remove it from the engine bay.

Figure 3

4. Use a pick to pry up the trim fasteners on the wiper cowl. Use a trim removal tool to remove the clips and free the wiper cowl.

Figure 4

5. Pull the covers off the windshield wipers with a pick.

Figure 5

6. Use a 15mm socket to remove the bolts holding each wiper in place. Remove the wiper from the vehicle.

Figure 6

7. Disconnect the windshield wiper line on the passenger side of the engine bay just behind the strut tower.

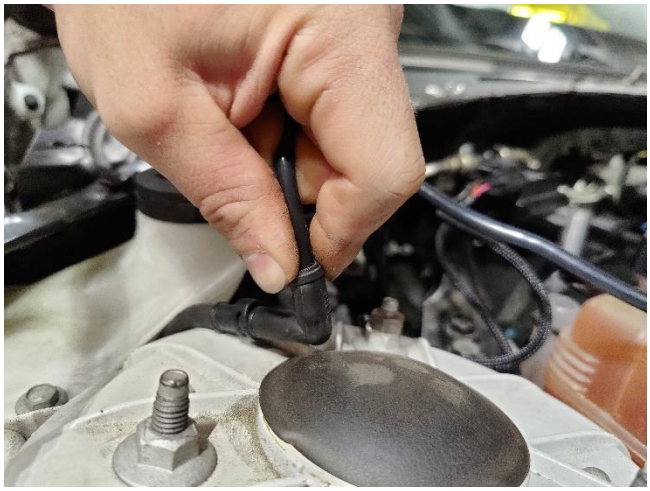

Figure 7

8. Disconnect the wiper motor connect.

Figure 8

9. Use a trim removal tool to disconnect the bracket holding the wiper connector wire in place.

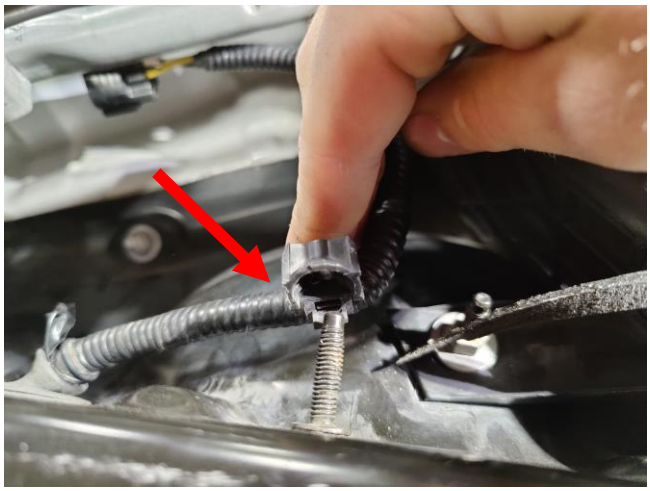

Figure 9

10. Feed the wiper connector wire through the hole with the rubber gromet in the cowl support structure.

Figure 10

11. Disconnect the 2 wire clips guiding the wire across the surface of the structure.

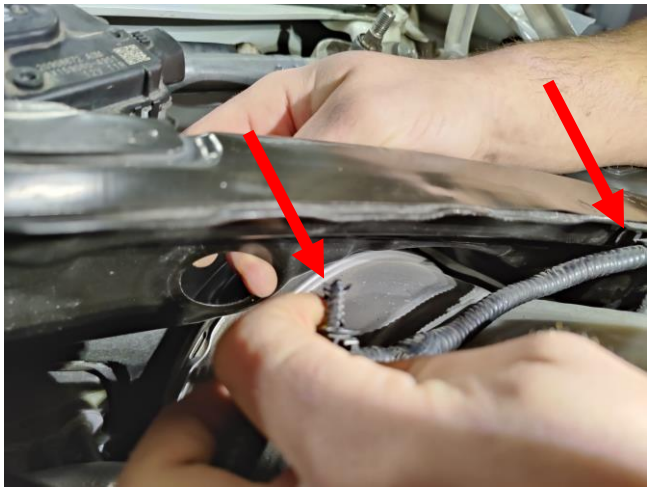

Figure 11

12. Remove the passenger and driver side cowl brackets by removing the 3 bolts securing it in place with a 10mm socket.

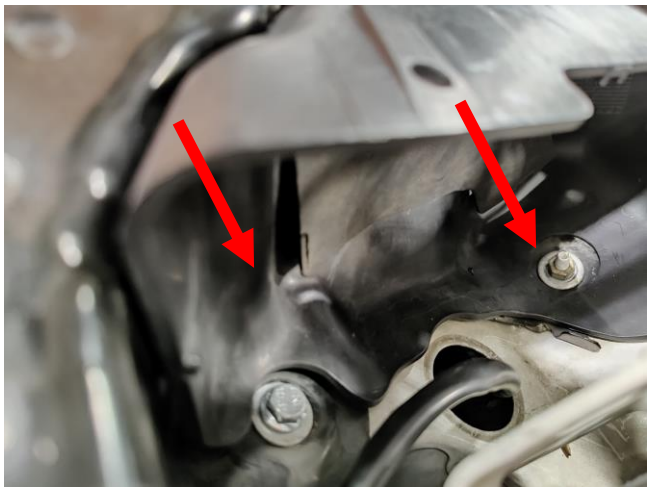

Figure 12

Figure 13

13. The passenger side bracket will require the removal of a trim retainer to free it from another cowl trim piece.

Figure 14

14. Remove another trim retainer, using a trim removal tool, towards the middle of the cowl to remove the addition cowl section from the vehicle.

Figure 15

15. With a 10mm socket remove the 2 bolts holding the wiper transmission in place. Pull the motor out of the rubber gromet holding it underneath and then remove it from the engine bay. **(Torque Spec: 8 Nm)**

Figure 16

Figure 17

16. Use a 10mm socket to remove the bolts holding the cowl supper structure in place.

Figure 18

Figure 19

17. Remove the 2 bolts on the bottom of the wiper cowl structure using a 10mm socket, one on each side of the engine.

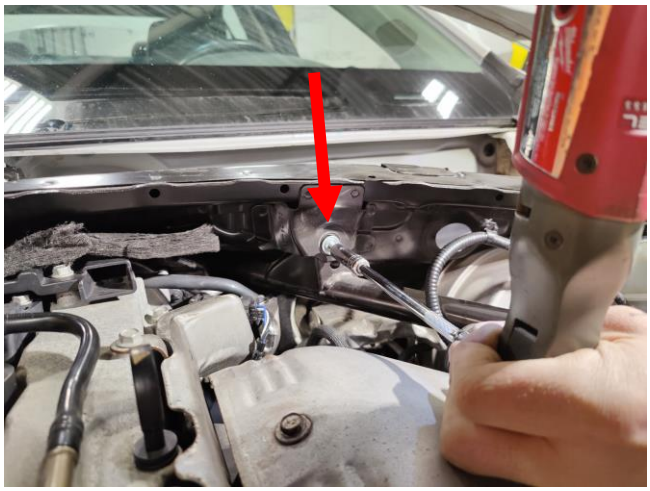

Figure 20

18. Using a 13mm socket remove the 3 bolts holding in the passenger side cross bar that sits underneath the wiper cowl.

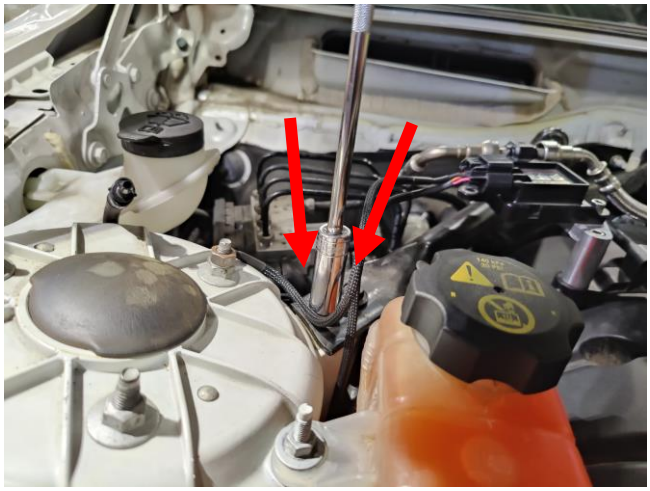

Figure 21

Figure 22

19. Drain the coolant in the upper level of the coolant reservoir so that it can be disconnected from the engine without leaking.

Figure 23

20. Disconnect the 2 bolts holding the coolant reservoir to the engine bay using a 10mm.

Figure 24

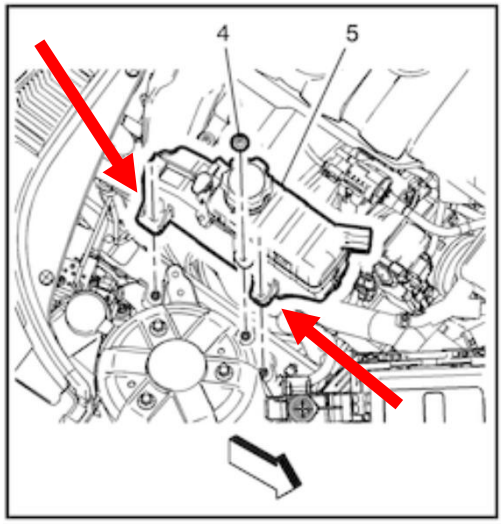

Figure 25

21. Disconnect the coolant line on the back of the reservoir by pulling the hose clamp off its fitting with channel locks.

Figure 26

22. Once the reservoir is disconnected from the back coolant line you can move the reservoir in front of the engine where it will be out of the way for future steps.

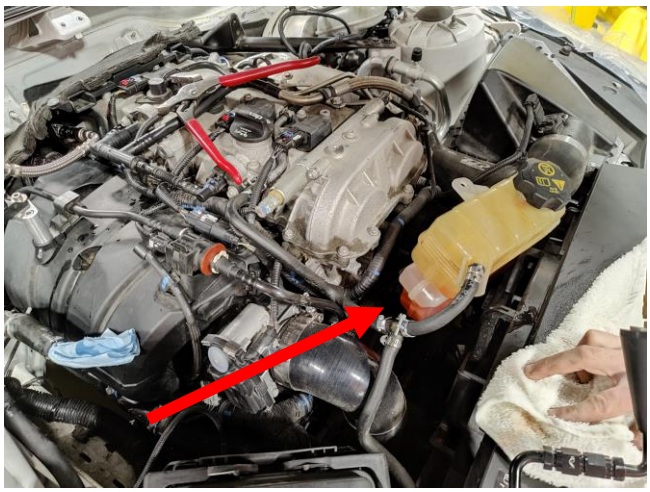

Figure 27

23. Disconnect the low-pressure fuel line quick connect at the back of the engine on the passenger side. Use a specialty 3/8th quick connect removal tool to separate the line.

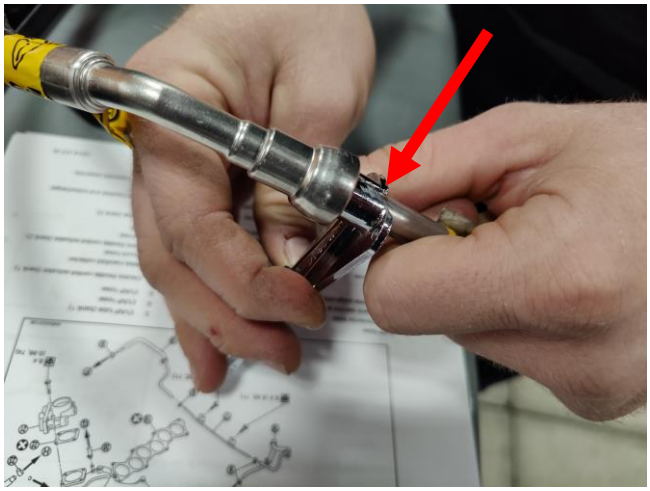

Figure 28

24. Remove the fuel pump insulator on the top of the intake manifold. Disconnect the EVAP canister valve pipe from the fuel pump insulator from both sides. Pull the insulator off the manifold and pull it to the side and out of the way.

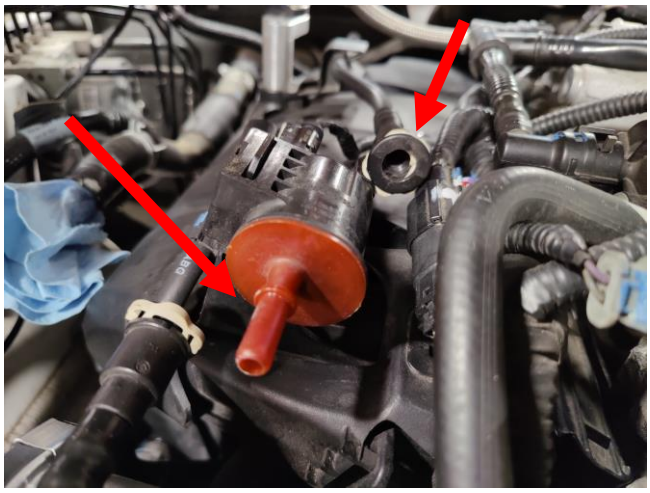

Figure 29

25. Pull the clip to disconnect the air bag line from the intake manifold using a pick.

Figure 30

26. Disconnect the wire harness connector for the fuel rail at the top of the intake manifold.

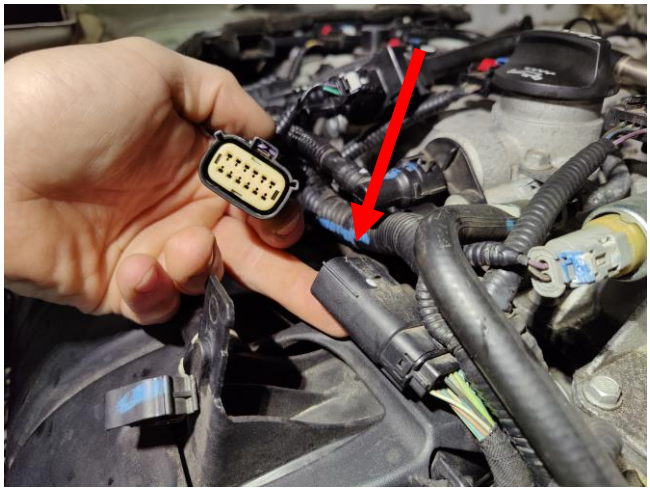

Figure 31

27. Use an Allen 5 to remove the hose clip bracket on the front of the intake manifold.

Figure 32

28. Disconnect the emissions lines on the top of the intake manifold.

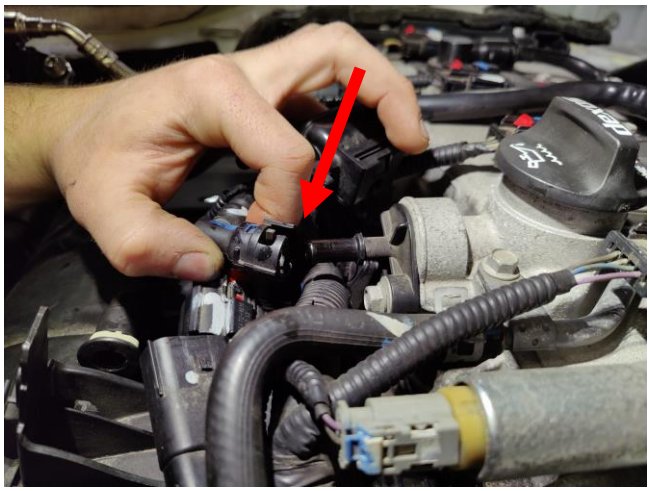

Figure 33

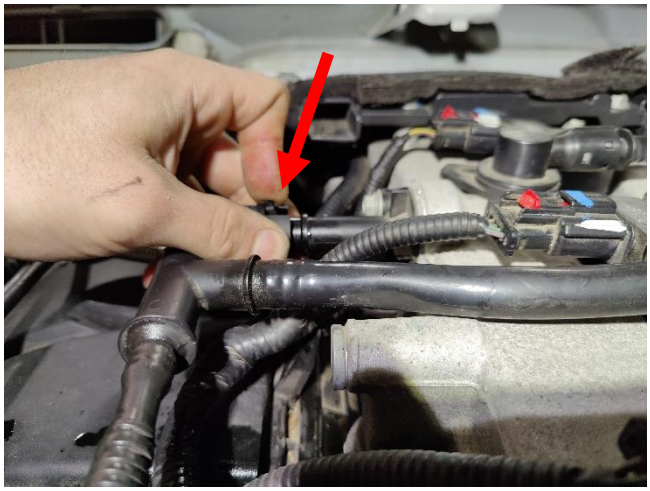

Figure 34

29. Using a 10mm socket disconnect the P-clamp from the emissions line to allow the line to be moved out of the way.

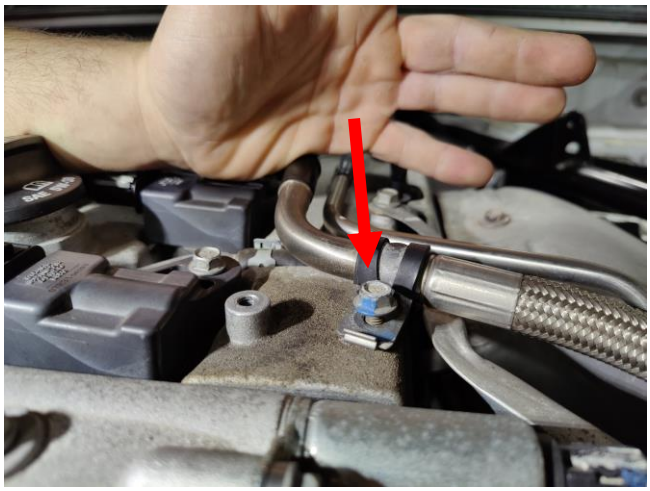

Figure 35

30. Loosen the V-band clamp on the charge tube connected to the throttle body, using a 11mm socket.

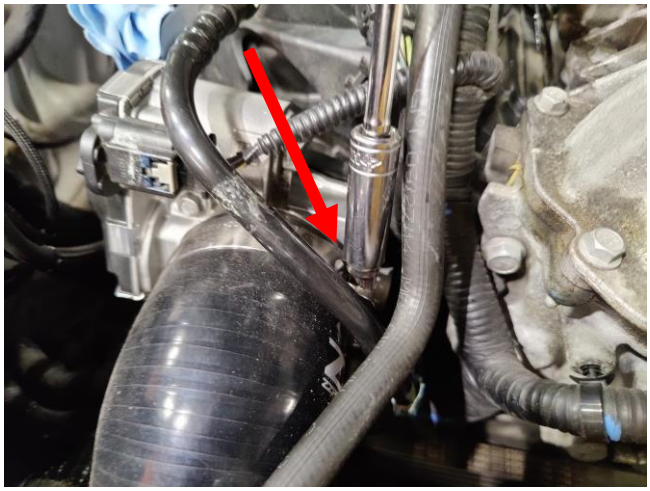

Figure 36

31. Disconnect the throttle body connector.

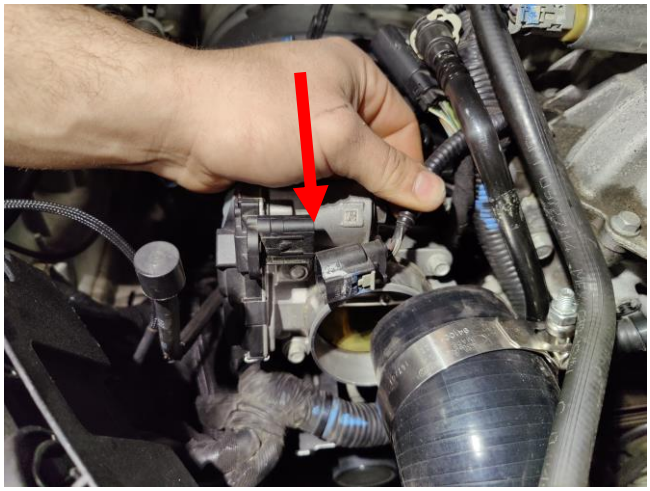

Figure 37

32. Disconnect the manifold absolute pressure connector.

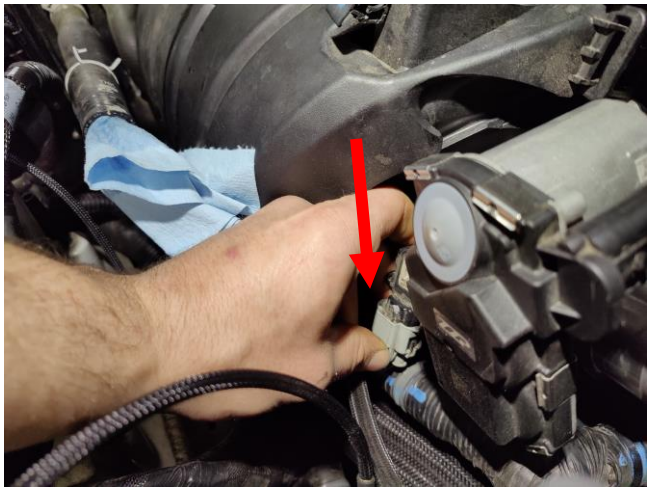

Figure 38

33. Using a 10mm socket remove the 5 bolts that hold in the intake manifold. Remove the intake manifold from the engine bay. **(Torque Spec: 12 Nm)**

Figure 39

Figure 40

34. Using a 18mm wrench loosen the compression nuts on the hard fuel line. Loosen the nut on the end of the fuel rail, and the high-pressure fuel pump. Remove the high-pressure fuel line from the engine bay. (Torque Spec: 15 Nm, then 30 Nm)

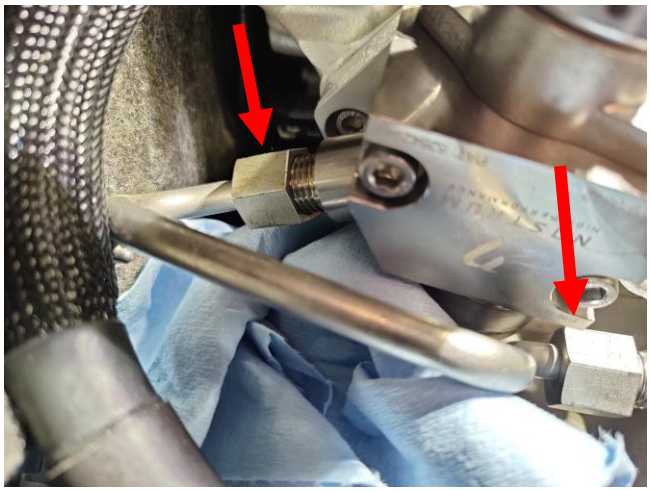

Figure 41

35. Using a 13mm socket, remove the 4 bolts that secure the fuel rail in place. **(Torque spec: 25 Nm)**

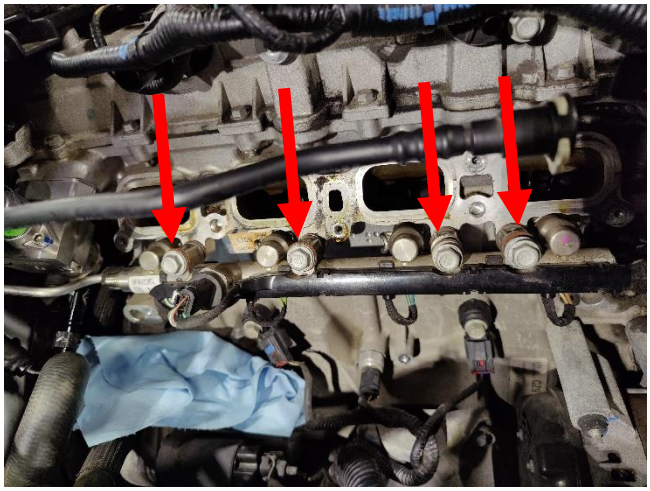

Figure 42

36. Remove the fuel rail and injectors from the engine bay.

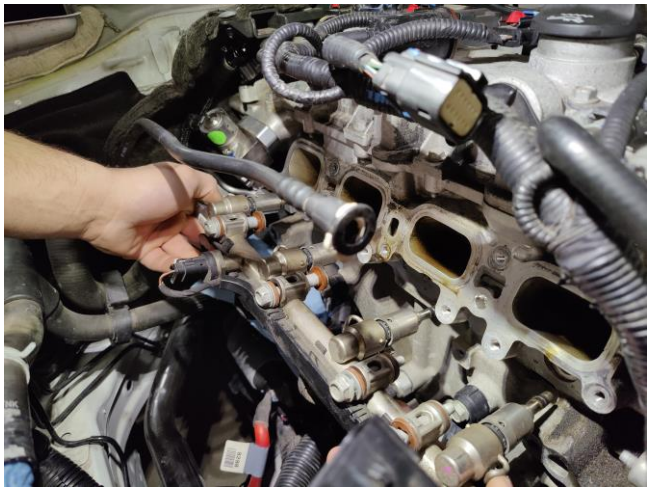

Figure 43

37. Place the fuel rail on an absorbent mat in a clean area.

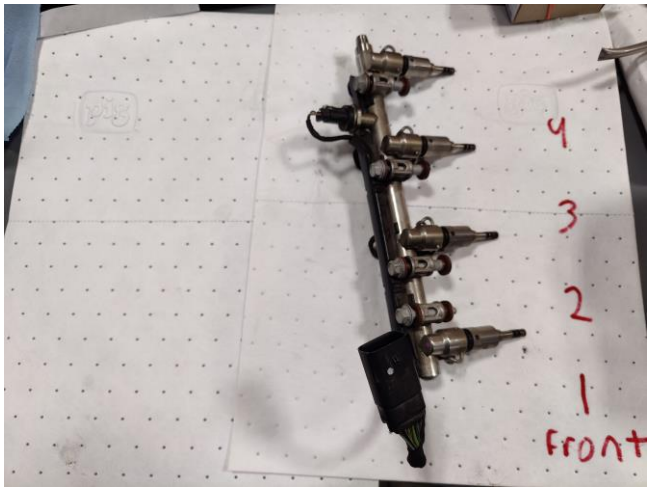

Figure 44

38. Use a flat head screwdriver to pry the retainment clip holding the injectors in place, out of the fuel rail.

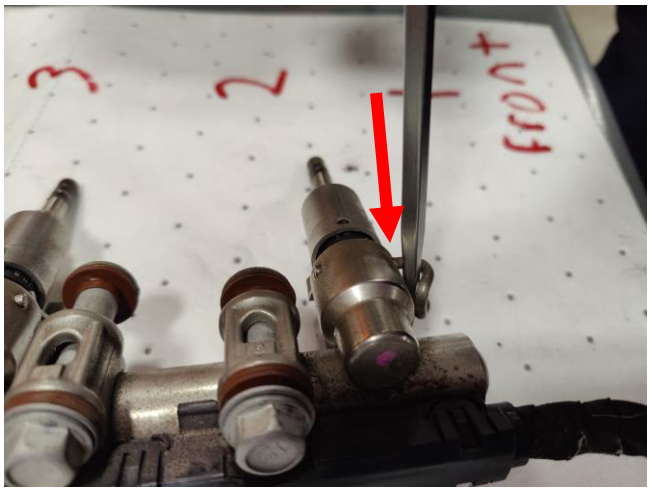

Figure 45

39. Disconnect the injector solenoid connectors for each injector. Pull the red tabs out on the connector then press the black tab and pull on the connector to disconnect.

Figure 46

40. Pull the injectors out of their seats on the rail by hand.

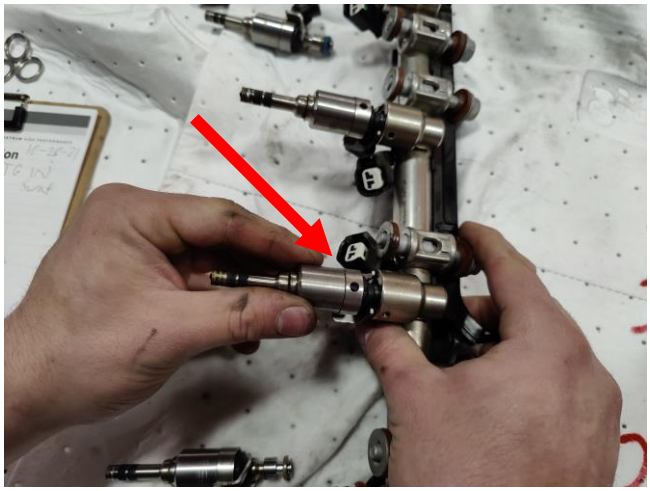

Figure 47

41. Check the seat on the injector for any O-rings that may be left behind. Use a pick to pull the O-rings out of the seat if there are any left.

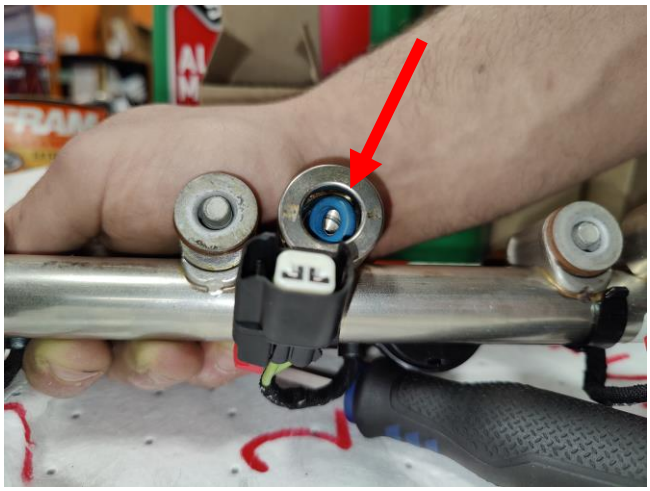

Figure 48

42. Remove the retainers above the solenoid on each injector by pulling up on the retainer.

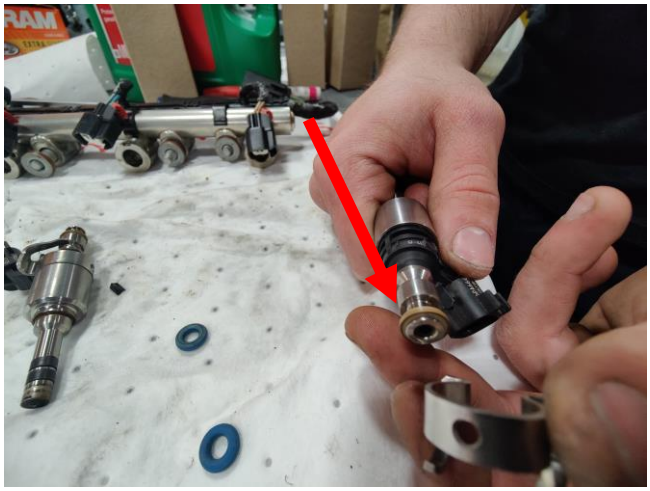

Figure 49

43. Place the retainers on the back of the new injectors line up the opening on the injector with the solenoid connector.

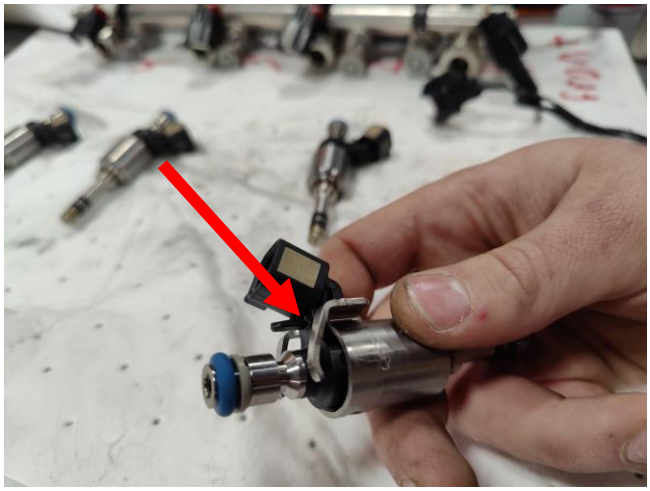

Figure 50

44. Rub dielectric grease onto the back O-ring that will seat into the rail for each injector.

Figure 51

45. Seat the Nostrum injector back into the fuel rail by hand. Line up the notch on the fuel rail seat with the plastic tab on the injector by the solenoid connector.

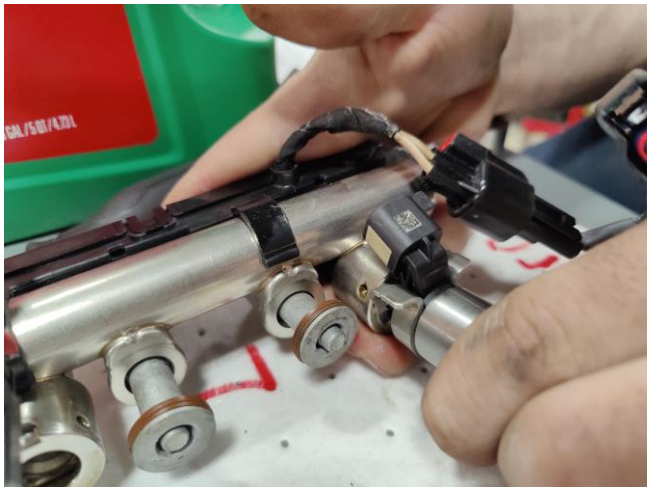

Figure 52

46. To reinstall the retainment clips, press the injectors into the seat of the rail. It will take force to compress the injectors use of a C-clamp or vice is recommended. Place the vice between the lip of the injector at the base of the stem and the back of the fuel rail seat. Make sure the injector is straight on against the vice and apply only a little bit of pressure.

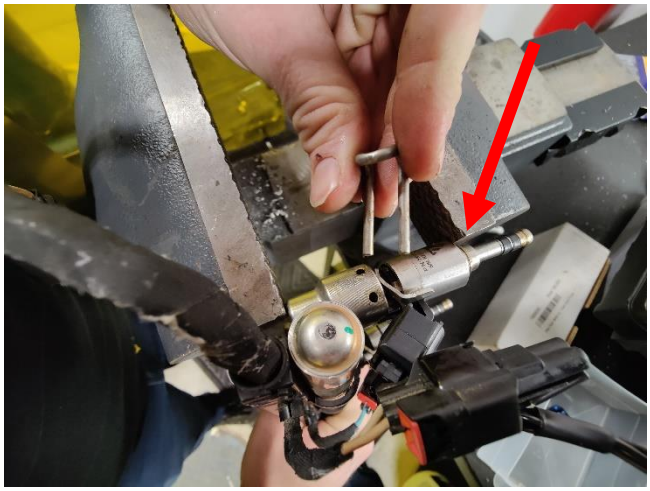

Figure 53

47. Once a little bit of pressure has been applied to the injector and rail. Slip the retainment clip in by hand pushing all the way until it stops.

Figure 54

48. Place engine oil around each stem before using the compression tool on the injectors.

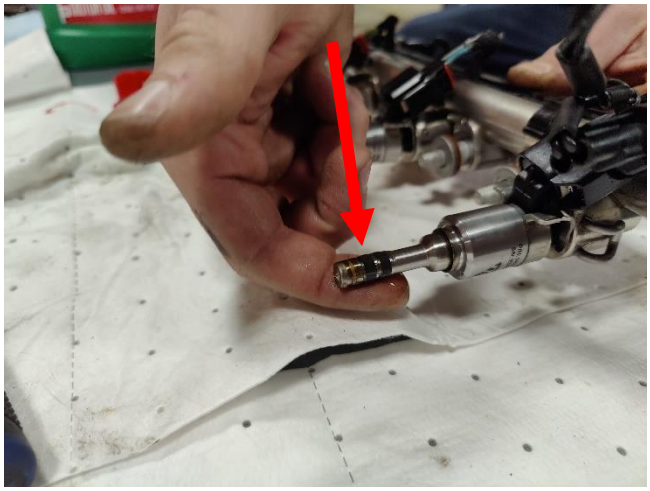

Figure 55

49. Use the Compression tool to compress the stem of each injector before installing back in the vehicle. Press the compression tool onto the stem of the injector. As you press, twist the tool clockwise until the end of the tool is flush with the tip of the injector. Leave the tool on for 15 seconds. Pull the compression tool off while twisting clockwise.

Figure 56

50. After all the injectors have been compressed place the fuel rail and injectors back into their seated position in the engine. Once the rail has been reinstalled, reassembly of the vehicle can begin. Repeat steps in reverse starting with step 34. Follow all torque specs that are included in each step where applicable. If torque spec is not included in a step where it seems applicable assume snug fit with a wrench or socket wrench.

Hardware installation is complete.

First Start-Up

1. Be sure to remove all installation tools and loose items from the engine compartment. Follow good, safe
practices when working on your vehicle. Be sure to reassemble all parts and components according to your OE maintenance manual.

2. Key cycle the vehicle into the "Accessory On" position (do not go to Ignition position). The low- pressure fuel pump with activate and the low-pressure side of the pump will pressurize. Check the high-pressure fuel pump and the low-pressure side for leaks. If OK, proceed to step 3.

3. Key cycle to ignition and let the car attempt several start cycles. Remember that the fuel lines, pump and part of the fuel rail are filled with air, therefore this step is necessary to evacuate that air and get the system charged. If it starts, OK. If it does not, key off the vehicle. Check the high- pressure lines to the fuel rail, to the pump and the pump itself for leaks. If OK, proceed to step 4.

4. Key cycle one more time all the way to ignition. Engine should start-up and idle. If not, proceed with steps 2-4 again.

5. Let the car idle for a few minutes. Check for leaks on low and high-pressure portions again.

6. Installation is complete! **Time for a Tune!!**

NOTE: a fault code may appear at the first key cycle due to the long ignition time or the low pressure in the fuel rail, both due to the air in the fuel system.
This code should self-clear after the OEM defined quantity of key cycles.

NOTE: After driving the car and letting it cool, next day, check for fuel leaks again (from thermal expansion and contraction). Retighten fittings if needed.

For additional technical & software support please contact:

Email: support@nostrumshop.com
Phone: **734-548-8677 (during normal business hours)**

Revision	Notes	Date
Rev 1	Production Release	11/29/21