NOSTRUM
HIGH PERFORMANCE

2.0L Subaru FA20DIT Stage 1 Injector Installation Guide

PRODUCT PART SKU#: H703-1254-1

WARNING! PLEASE FOLLOW ALL WARNINGS AND INSTRUCTIONS FOUND IN YOUR VEHICLE OWNER'S 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.

Required Tools:

- Socket wrench
- Screwdriver
- 12mm socket
- Channel locks
- 8mm socket
- Pliers
- 10mm socket
- 17mm wrench

Expendables:

- Absorbent towels
- Dielectric grease
- Engine oil

1. Disconnect negative battery terminal using 8mm socket.

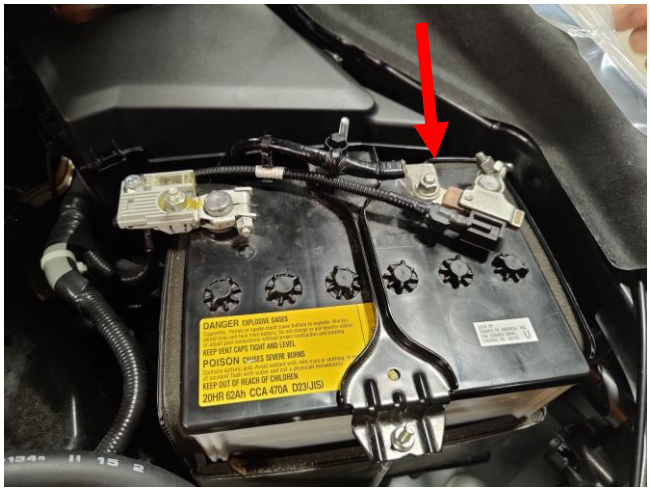

Figure 1

2. Pull the wire connected to the negative battery terminal off the bolt holding it in place.

Figure 2

3. Use a screwdriver to unlatch the plastic retainers from the back of the engine cover.

Figure 3

4. Pull engine cover from the front by hand to remove it from the rubber grommets that hold it in place.

Figure 4

5. Remove air box intake by remove plastic retainers holding it to the front of the engine bay using a screwdriver.

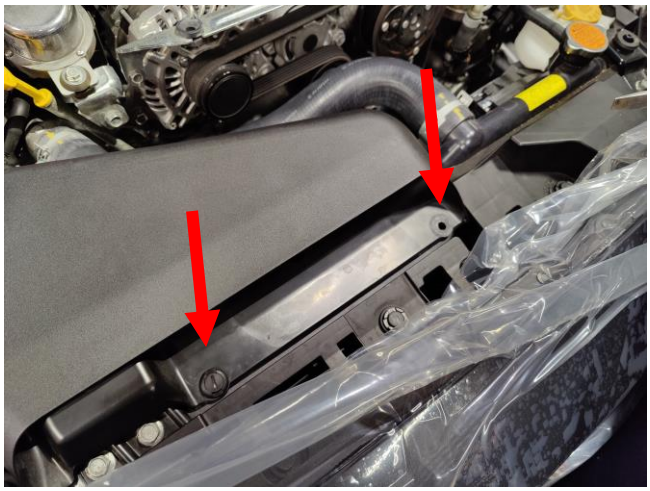

Figure 5

6. Pull the airbox out of the engine bay by hand.

Figure 6

7. Remove plastic retaining bolts that hold the catch cam hose at the front of the intake manifold using a screwdriver.

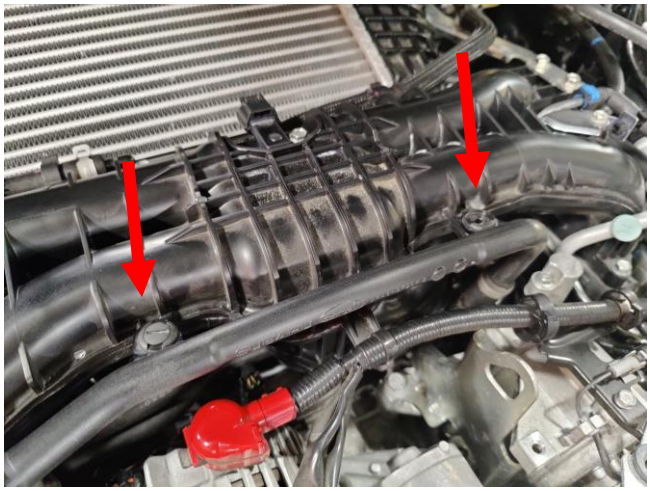

Figure 7

8. Remove bracket holding the intercooler to the intake manifold using a 12mm socket.

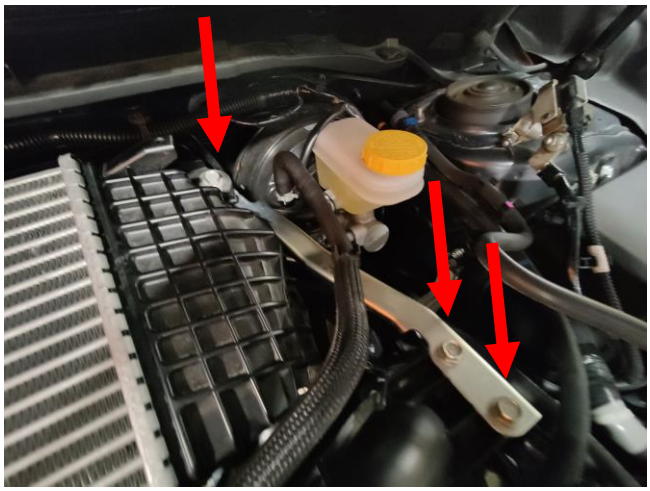

Figure 8

9. Pull the bracket from the hose clamp before removing the bracket from the engine bay.

Figure 9

10. Remove hose clamp from the fitting on the end of the vacuum line by pulling it down the tube using channel locks. Pull the hose off the fitting.

Figure 10

11. Pull the vacuum hose out of the clips holding it in place on the intake manifold.

Figure 11

12. Pull the hose clamp on the manifold end of the vacuum hose off its fitting using channel locks. Pull the hose off its fitting.

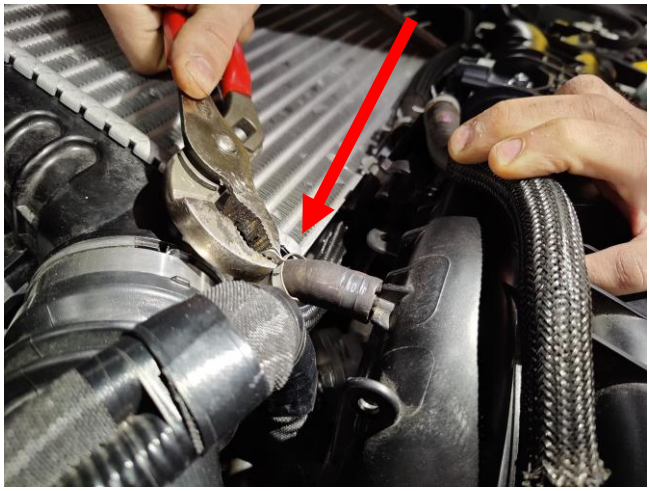

Figure 12

13. Pull the vacuum hose off to the side of the engine on the passenger's side so that it won't get in the way when remove additional components.

Figure 13

14. Use 8mm socket to loosen the hose clamp on the charge tube outlet.

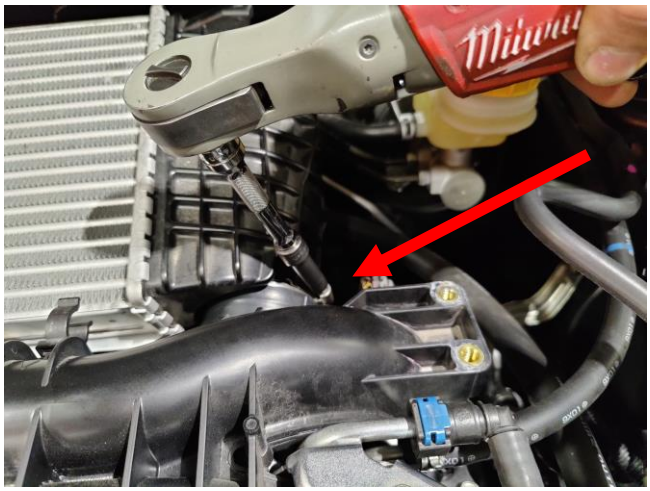

Figure 14

15. Use 8mm socket to loosen the hose clamp on the charge tube inlet.

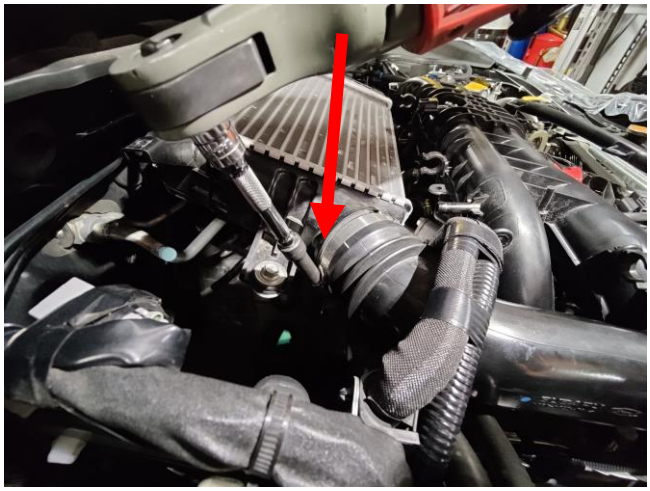

Figure 15

16. Use 12mm socket on a U joint with an extension to reach the bolt hold the intake charge tube at the front of the engine near the bottom of the engine.

Figure 16

17. Use a 12mm socket to remove the bolt on the passenger side of the intercooler holding it in place.

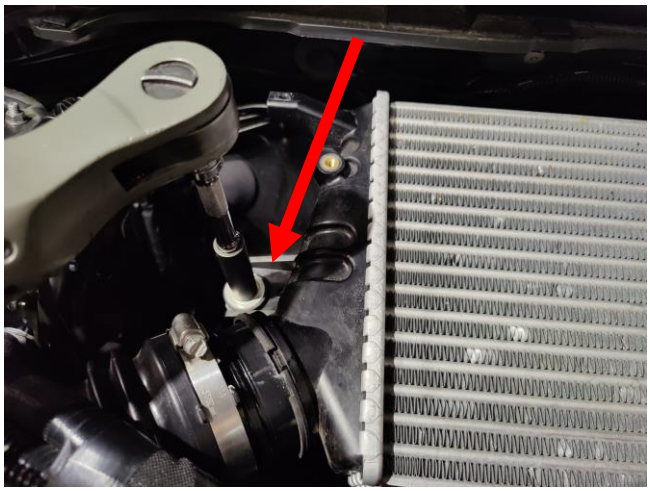

Figure 17

18. Pull the intercooler away from the outlet charge tube and remove it from the engine bay.

Figure 18

19. Remove manifold absolute pressure connect from the back of the manifold on top.

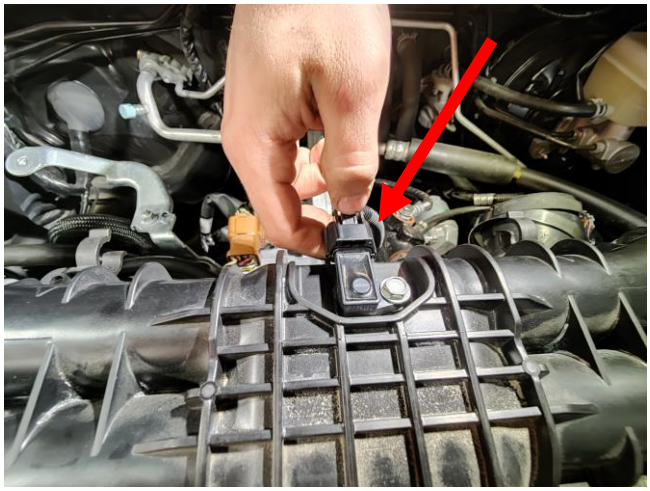

Figure 19

20. Use a screwdriver to pull up the blue tab on the low-pressure fuel line quick connect on the driver's side of the manifold. Use pliers to remove the back on the fuel line so that the line can be disconnected from the manifold. Place absorbent towels underneath the line to catch any fuel that may exit the line.

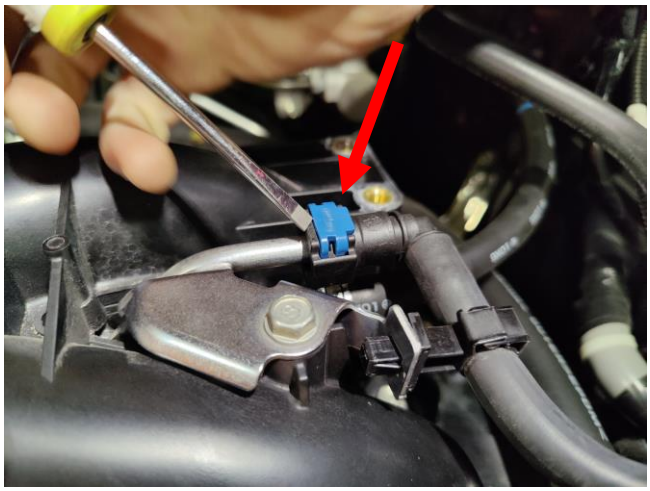

Figure 20

21. Use channel locks to pull the hose clamp off its fitting then pull the lower fuel line on the driver's side of the manifold to disconnect it from the manifold. Place absorbent towels underneath the line to catch any fuel that may exit the line.

Figure 21

22. Use a 12mm socket to remove the bolts holding the EGR Pipe at the back of the manifold towards the cabin of the vehicle. **(Torque Spec: 19 Nm)**

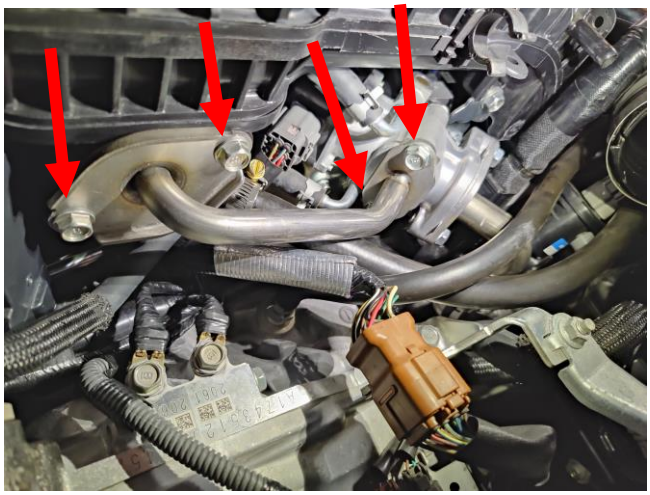

Figure 22

23. The end of the pipe on the passenger's side of the vehicle will have a gasket underneath the bracket and will need to be preserved during disassembly.

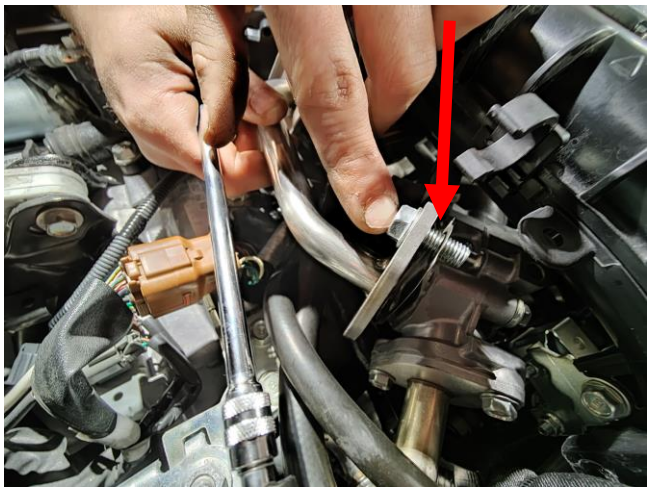

Figure 23

24. Use an 8mm socket to loosen the hose clamp on the end of the catch cam hose at the back of the manifold.

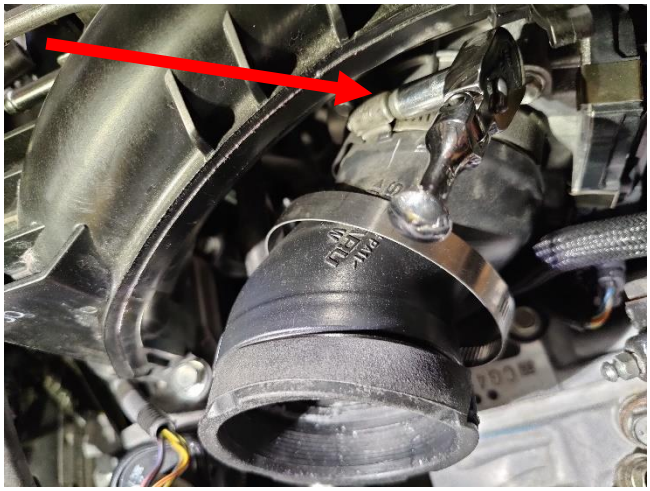

Figure 24

25. Pull the hose off its fittings to disconnect it from the manifold.

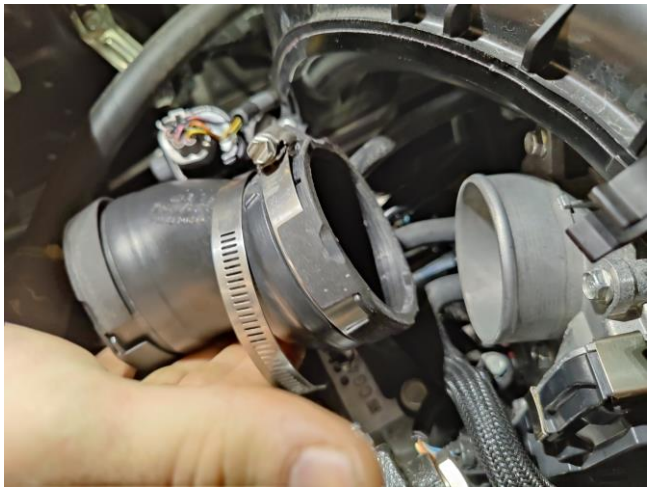

Figure 25

26. Use pliers to pull the vacuum hoses at the bottom of the manifold accessible from the front of the manifold.

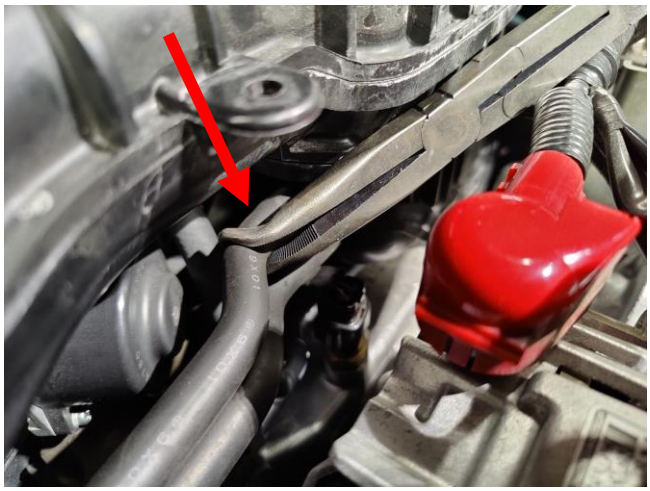

Figure 26

27. Remove 10mm bolt to remove the bracket for the low-pressure fuel line on the driver's side of the intake manifold. **(Torque Spec: 6.4 Nm)**

Figure 27

28. Disconnect the throttle body connect behind the manifold next to the throttle body on the passenger side of it.

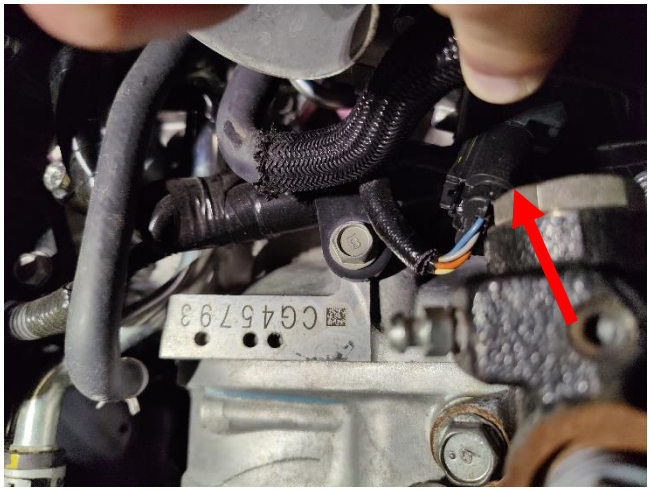

Figure 28

29. Remove the 4 bolts holding the Throttle body to the manifold with a 10mm socket. **(Torque Spec: 8 Nm)**

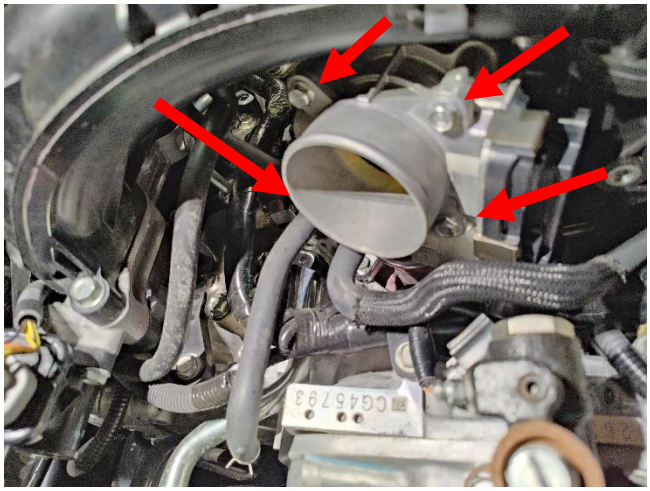

Figure 29

30. Remove the intake manifold by removing all 8 bolts holding it in place with a 12mm socket. Remove the 2 bolts in the middle on either side of the manifold before removing the 2 outer bolts on either side of the manifold. Stagger removal of the bolts on either side as to not put any stress on the remaining bolts. **(Torque Spec: 25 Nm)**

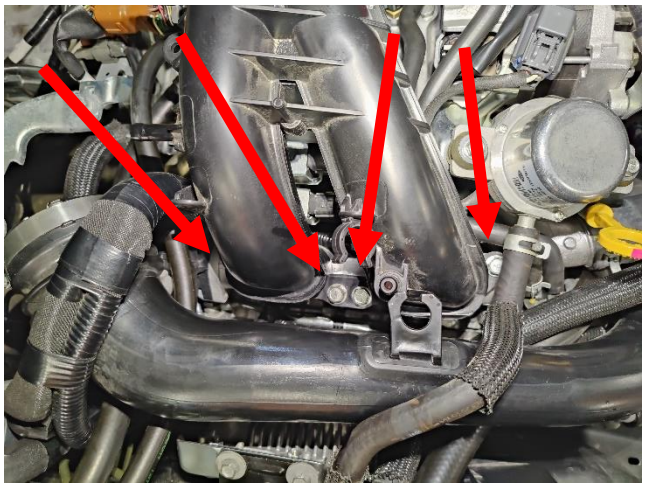

Figure 30

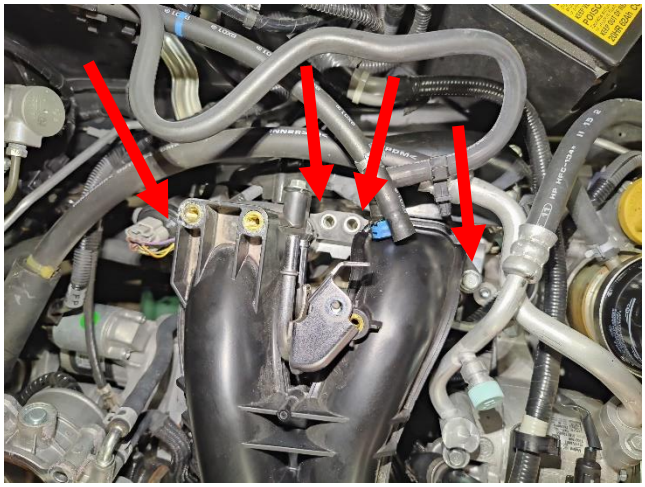

Figure 31

31. Use a 12mm wrench or socket to remove the bolt holding the crash bracket for the high-pressure fuel pump to the intake manifold. **(Torque Spec: 19 Nm)**

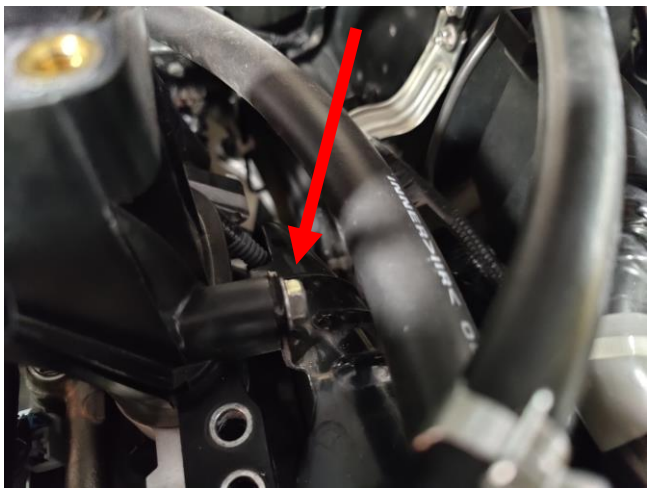

Figure 32

32. Remove bolt holding the bracket in place on the passenger side of the intake manifold. **(Torque Spec: 6.4 Nm)**

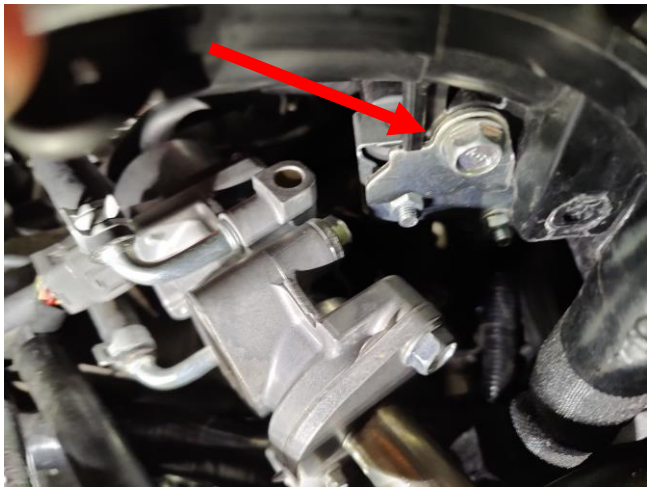

Figure 33

33. Pull manifold out of the engine bay.

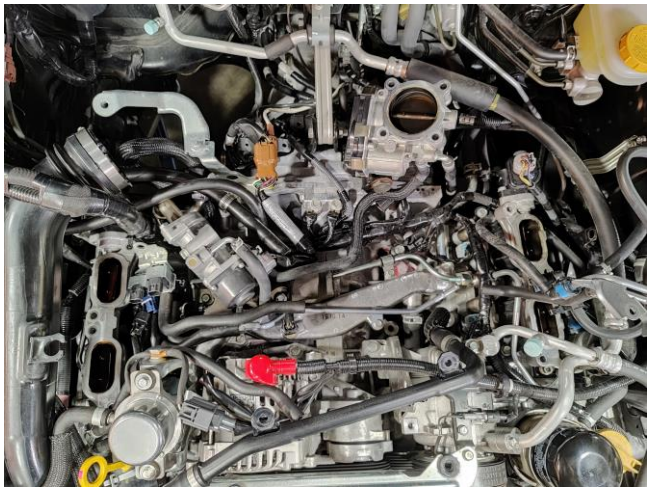

Figure 34

34. Remove the compression nut holding the high-pressure line that connects to 2 fuel rails on either side of the engine using a 17mm wrench. **(Torque Spec: 25 Nm)**

Figure 35

35. Remove the compression nut holding the fuel line that leads to the fuel pump from the fuel rail using a 17mm wrench. **(Torque Spec: 25 Nm)**

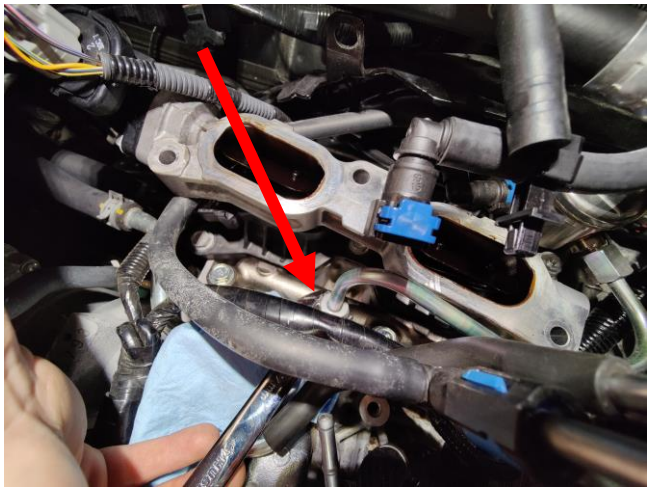

Figure 36

36. Remove the compression nut of the fuel pump side of the line using a 17mm wrench. **(Torque Spec: 25 Nm)**

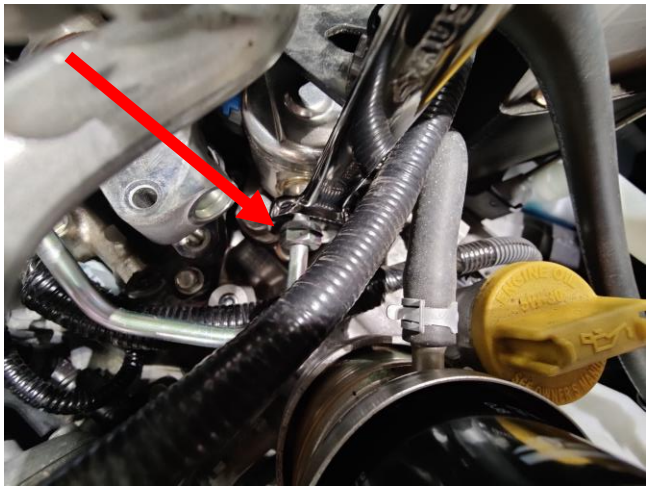

Figure 37

37. Remove both P clamps that hold the fuel line that connects the individual fuel rails using a 10mm socket.

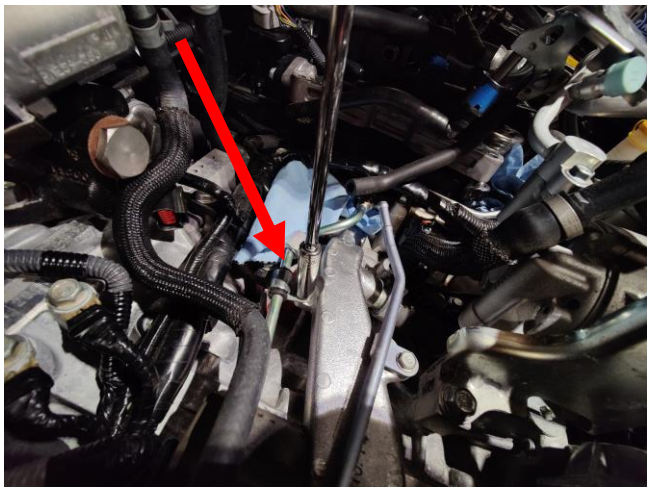

Figure 38

38. When removing one of the P clamps, you may need to pull back the foam cushioning that protects the fuel line to access the bolt on the p-clamps.

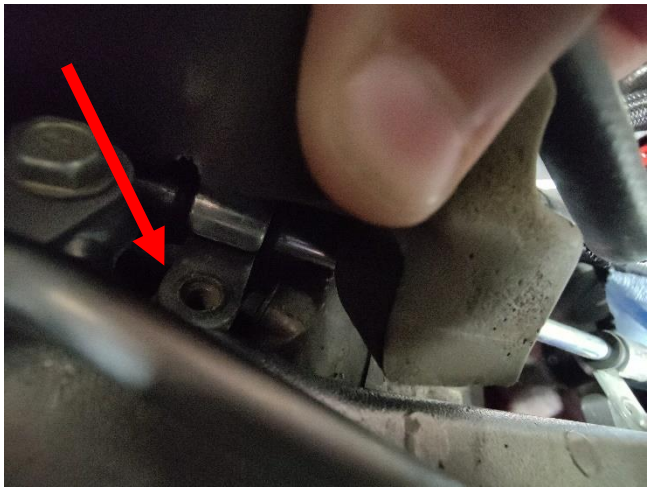

Figure 39

39. Pull hose out of the way so that you can access the compression nut on the passenger side fuel rail. Remove nut with a 17mm wrench so that the line is no longer connected to the rails fitting. **(Torque Spec: 25 Nm)**

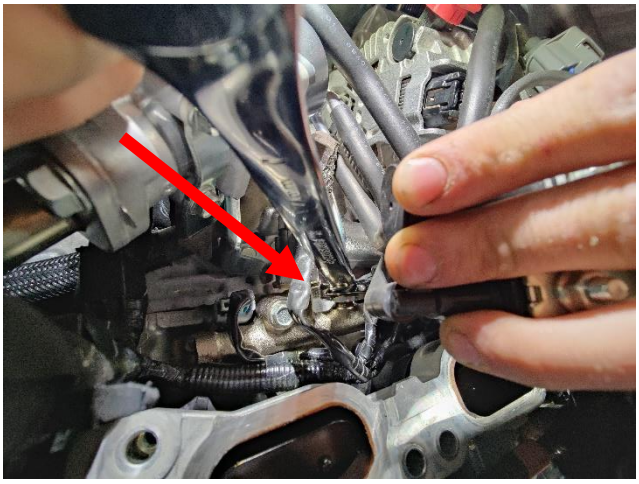

Figure 40

40. Remove injector connects on either side that are preventing the rail from being removed. They have blue tabs.
41. Remove the fuel rails pressure sensor connector on the passenger side fuel rail.

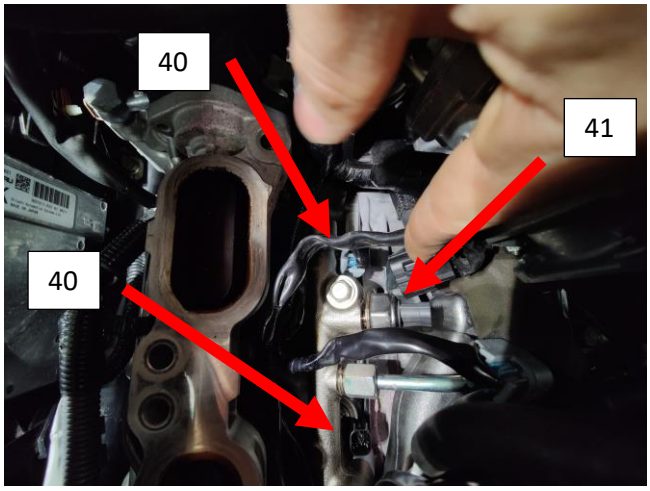

Figure 41

42. Use a 12mm socket to remove the 2 bolts holding the fuel rail in place. Remove the fuel rail on either side of the engine in this way. **(Torque Spec: 19 Nm)**

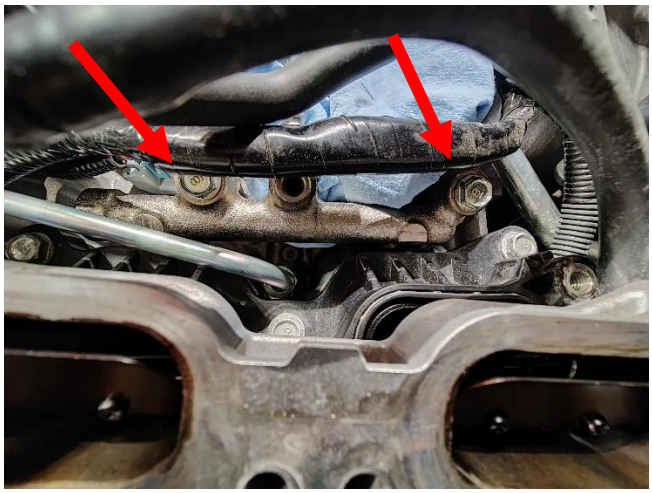

Figure 42

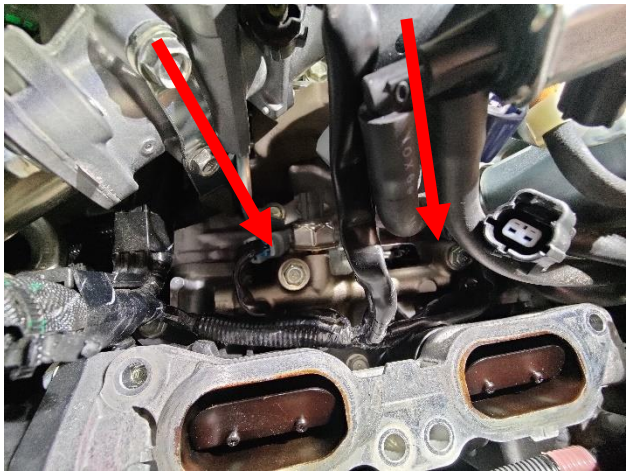

Figure 43

43. Put both fuel rails on an absorbent mat in a clean workspace. Make sure to mark with rail goes where and which injector went where on the mat.

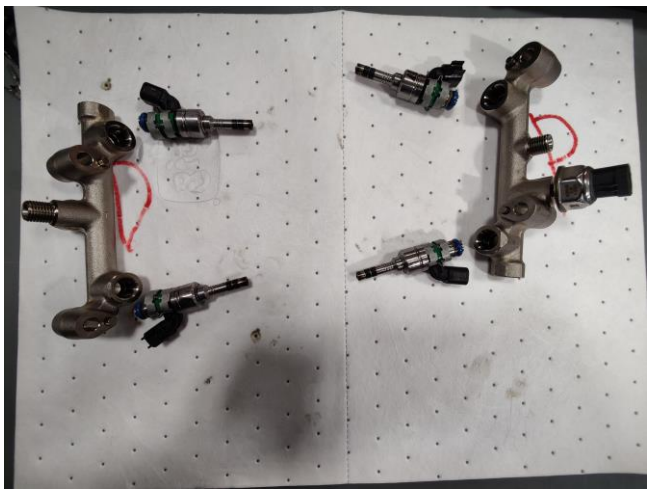

Figure 44

44. Remove the stock rubber boot from the back of the injectors.

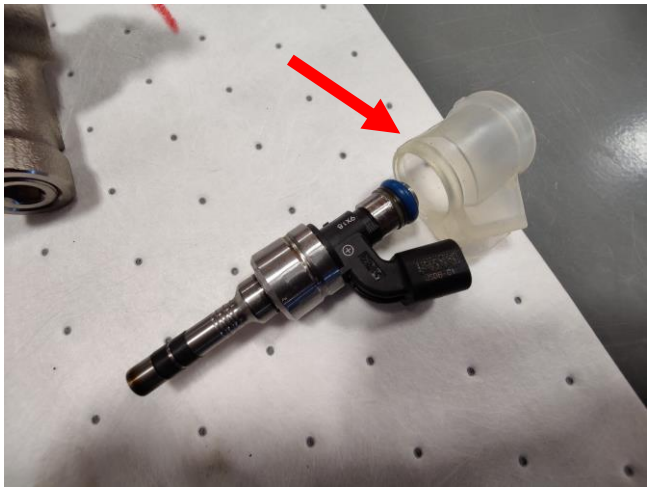

Figure 45

45. Remove the gray retainer that lies towards the back of the injectors next to the solenoid connector. Pull the retainer up and off the stock injector.

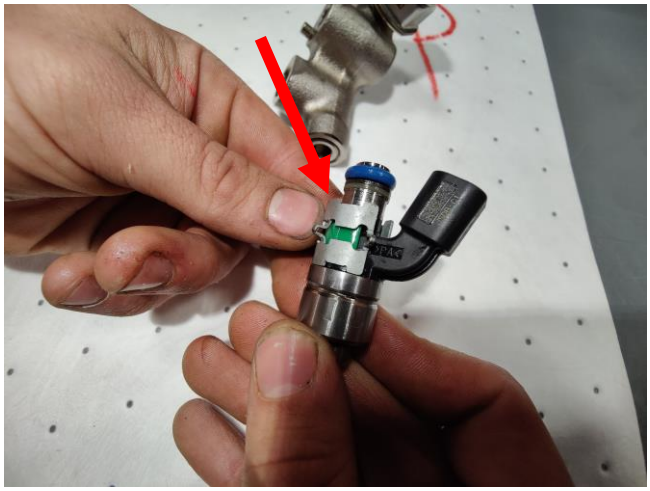

Figure 46

46. Once the grey retainer is removed pull the green retainer off from the side injector by pulling away from the solenoid connector.

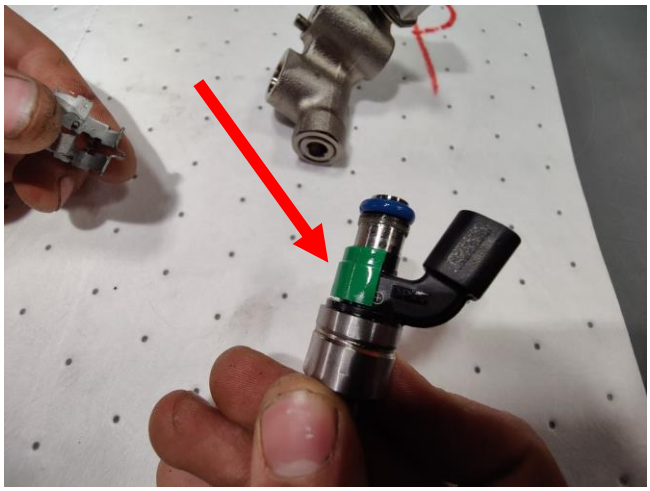

Figure 47

47. Once all the retainers have been removed from all the injectors you can begin installation of the new injectors into the fuel rails.
48. Pull the Nostrum injectors out of their packaging remove the red caps on either end of the injectors.

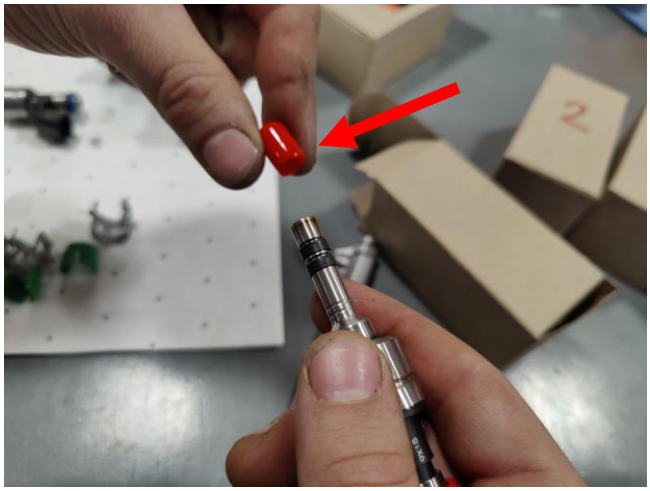

Figure 48

49. Place engine oil on the stem of each injector to lubricate them.

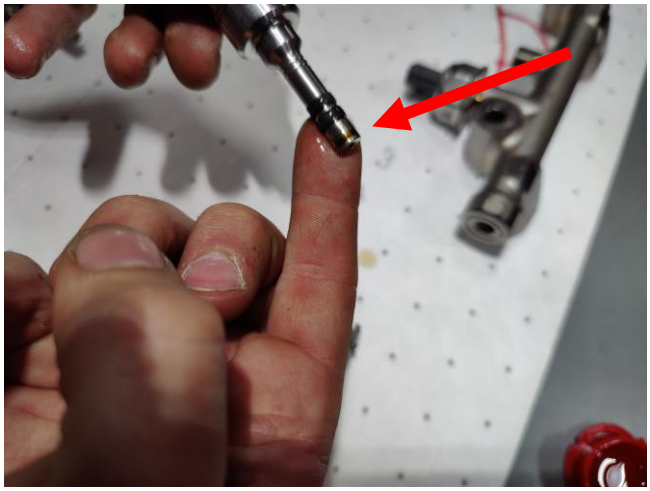

Figure 49

50. Place the compression tool over the stem of the injectors and push the injector into the tool while twisting side to side as you pull. Once the tool is on remove it in the same way by pulling and twisting until it comes off. Repeat this for all the injectors.

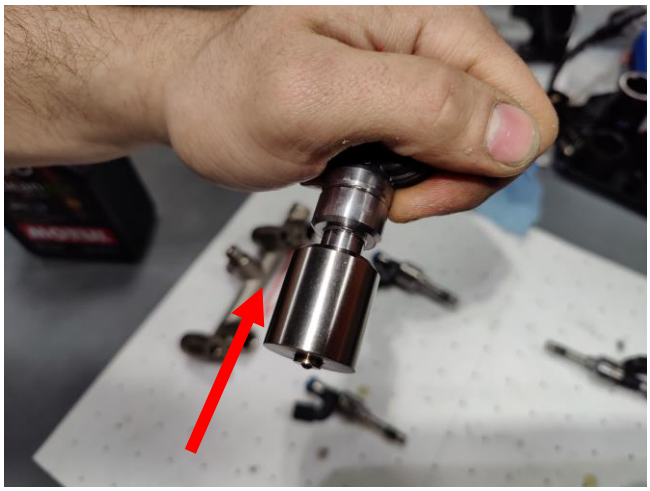

Figure 50

51. Push the green retainer back onto the injectors with the lip of the facing up.

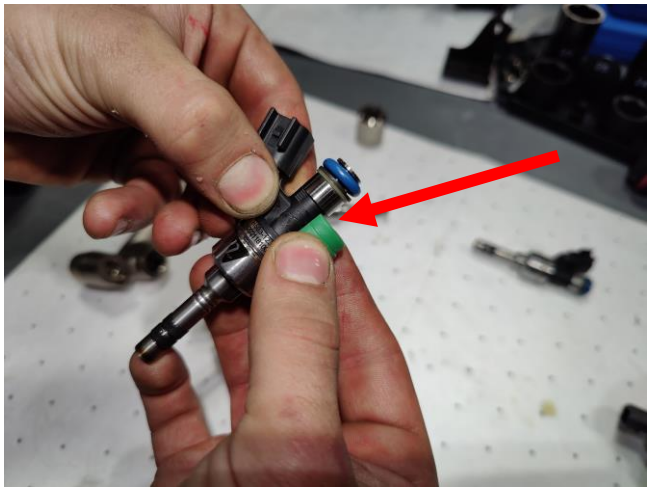

Figure 51

52. Place the grey retainer over the green one from the top of the injectors the opening in the retainer should line up with the green one. Push until it slides in place.

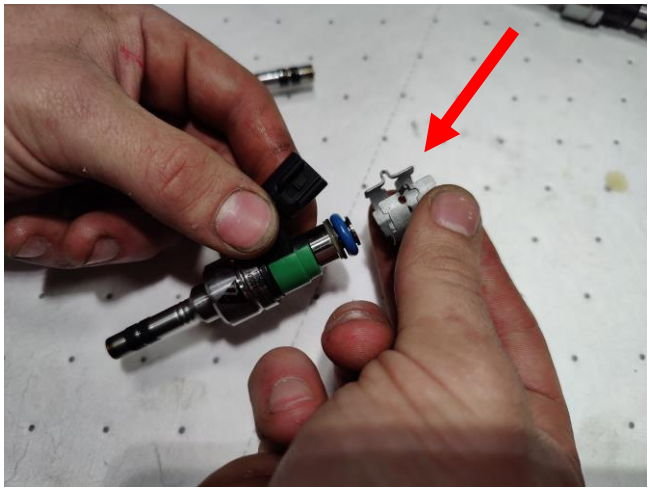

Figure 52

53. Use dielectric grease or oil to lubricate the O-ring on the fuel rail side of the injectors. Repeat this for all the injectors.

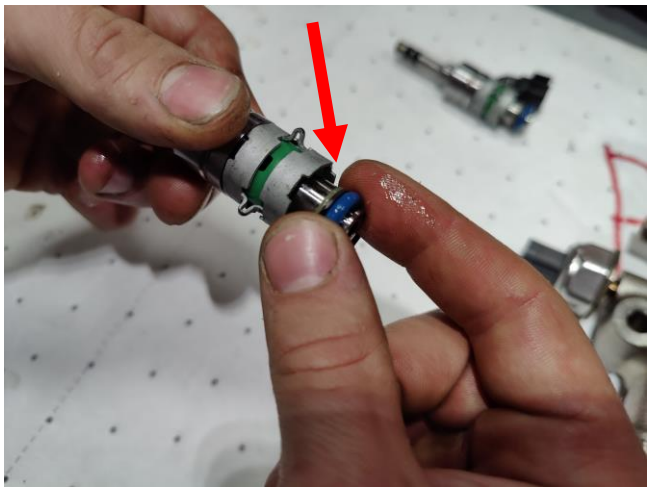

Figure 53

54. Seat the injector into the fuel rail in its mounting location. Ensure that the connector lines up with the chamfer on the side of the fuel rails seating position for the injectors.

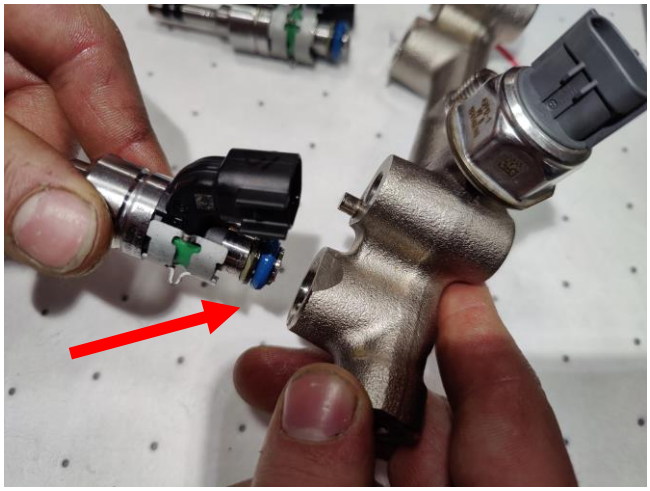

Figure 54

55. Seat the fuel rail with the injectors back into the vehicle where the injectors were originally placed. Once the Injectors and fuel rail have been installed, reinstallation of all remaining components can begin. Follow the steps of disassembly listed above in reverse to re-install components starting with step 42. 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
Rev 2	Title Image Update	5/17/22

NOSTRUM
HIGH PERFORMANCE

SUBARU FA20DIT HPFP Big Bore Kit Installation Guide

Part #: H136-0571

WARNING! PLEASE FOLLOW ALL WARNINGS AND INSTRUCTIONS FOUND IN YOUR VEHICLE OWNER'S 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.

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SUBARU FA20DIT HPFP

HIGH FLOW BIG BORE HIGH PRESSURE FUEL PUMP
HIGH PRESSURE FUEL PUMP INSTALLATION
PART #: H136-0571

ALWAYS REFER TO FACTORY SERVICE MANUAL BEFORE COMPLETING INSTALL OF NEW PUMP

The Nostrum Subaru FA20 High Pressure Fuel Pump (HPFP) provides a ~40% increase in fuel capacity vs. the stock pump. It is ethanol compatible up to E100, capable of 600+ whp on E85. To take advantage of your new pump's increased fuel capacity, you must also upgrade your vehicle's intank (low pressure) pump. Fuel system limitations due to the low-pressure pump frequently are seen at high RPMs and high-power levels. The HPFP needs a constant supply of fuel pressure (around 4 bar) at its inlet in order to avoid cavitation. If the in-tank pump cannot supply sufficient fuel pressure/flow, it will starve the HPFP at higher RPMs. Functionally, your vehicle does not require calibration changes to operate with the Nostrum HPFP. With the Nostrum HPFP it is possible to request higher fuel rail pressures at higher RPMs, however Nostrum does not recommend requesting more that 170 bar of pressure.

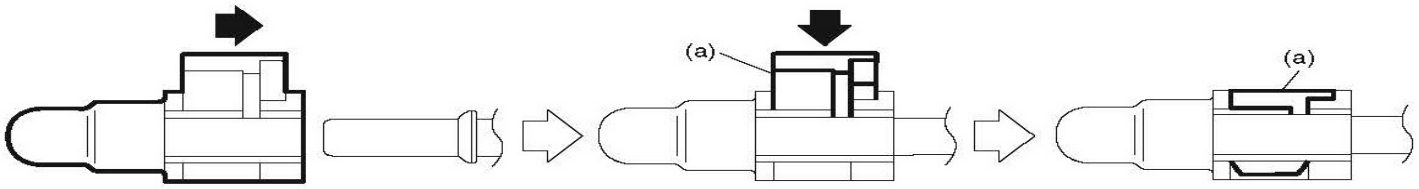
Removal of the OEM high pressure fuel pump

1. Disconnect low pressure fuel line from pump (catch excess fuel with rag)
2. Disconnect high pressure fuel line (Catch excess fuel with rag)
3. Disconnect pump wiring connector
4. Use TORX plus bit to remove bolts securing pump to base
5. Carefully remove pump

High Pressure Fuel Pump

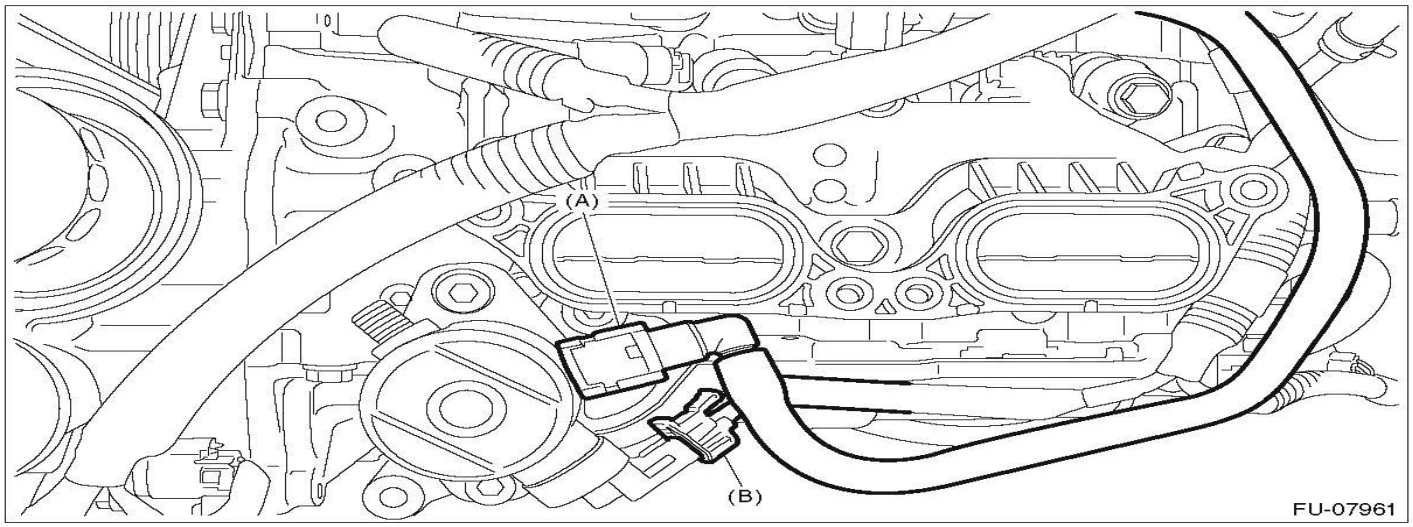
1. Be careful not to spill fuel!
2. Disconnect high pressure fuel line (Catch excess fuel with rag)
3. Disconnect the ground terminal from battery sensor.
<Ref. to NT-6, BATTERY, NOTE
4. Remove the high-pressure fuel delivery pipes. <Ref. to FU(w/o STI)-78, HIGH-PRESSURE FUEL
DELIVERY PIPE, REMOVAL, High Pressure Fuel Delivery Pipe.>
5. Remove the fuel delivery pipe (A) from the high-pressure fuel pump, and disconnect the connector (B)
from the high-pressure fuel pump.

NOTE: Disconnect the quick connector as shown in the figure.



(A) Slider

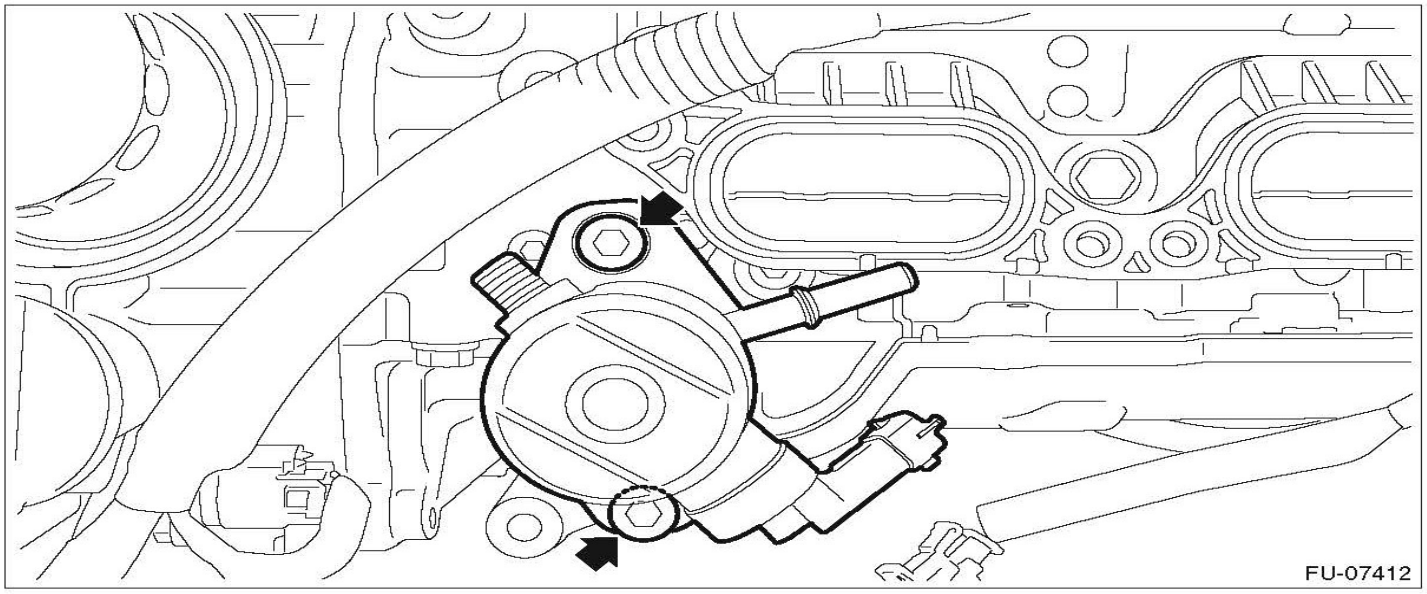
3) Remove the high-pressure fuel pump case from the cam carrier assembly LH.



(A) Slider

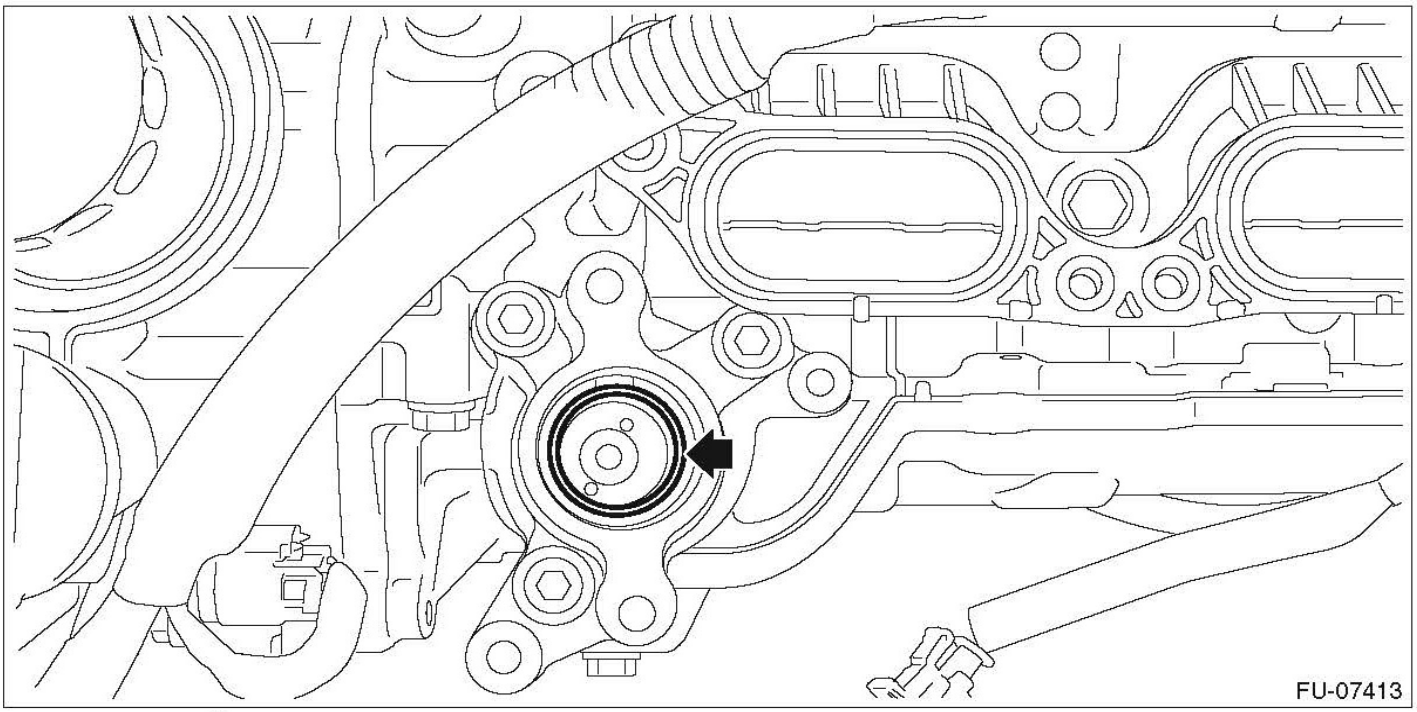
FUEL INJECTION (FUEL SYSTEMS)

4) Using TORX PLUS® bit 40IP, remove the high-pressure fuel pump.



FUEL INJECTION (FUEL SYSTEMS)

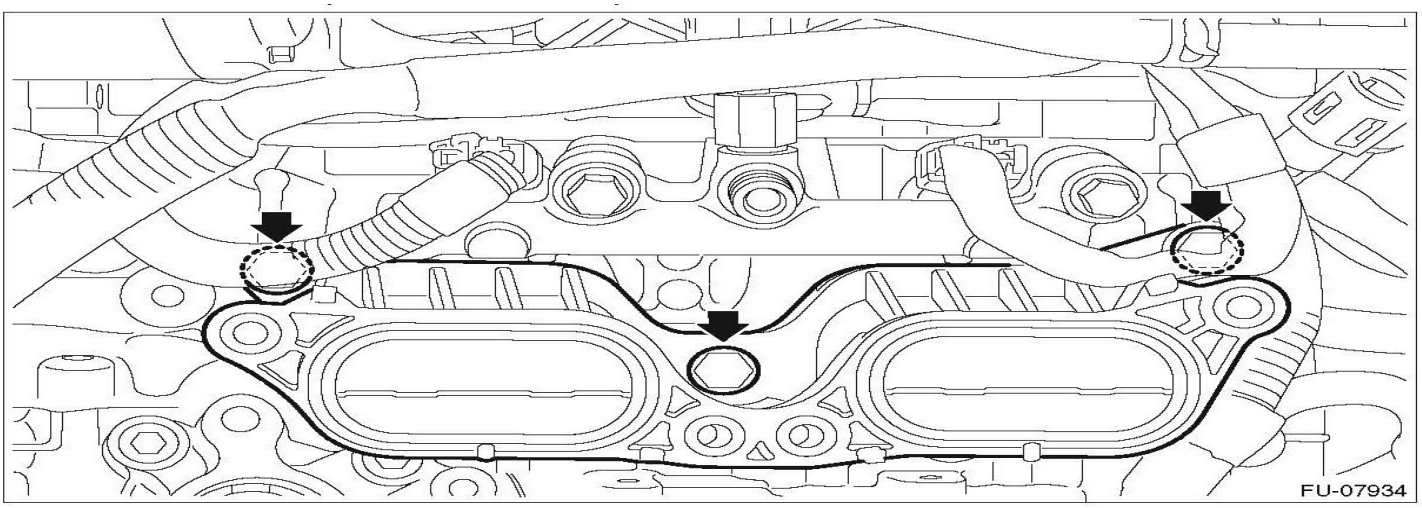
5) Remove the fuel pump lifter from the fuel pump case.



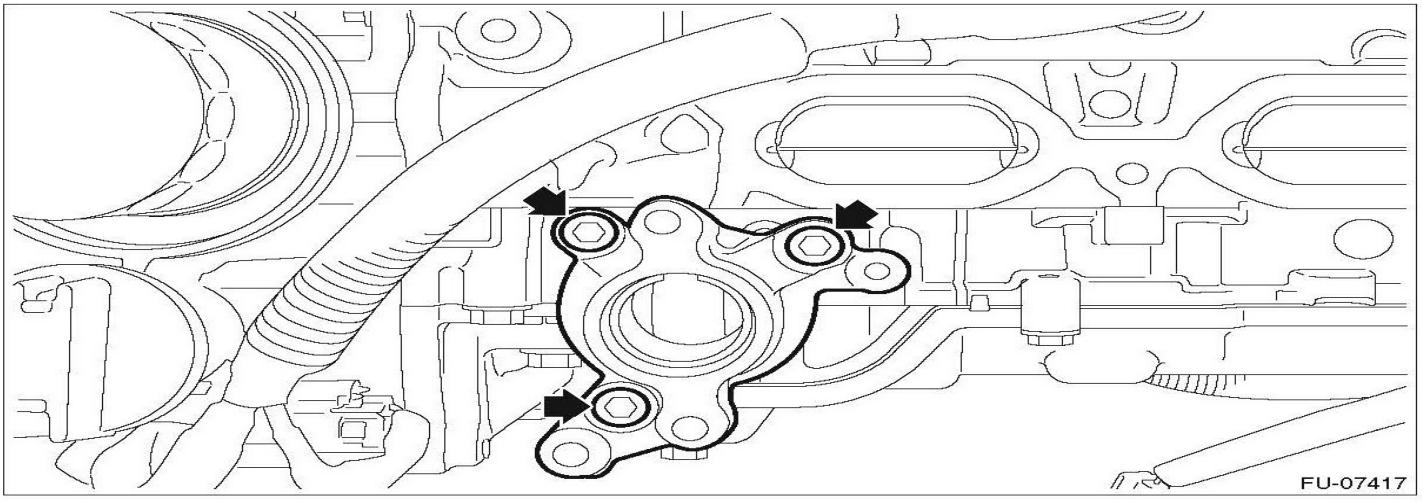
2. HIGH-PRESSURE FUEL PUMP CASE

1) Remove the high- pressure fuel pump. <Ref. to FU(w/o STI)-69, HIGH PRESSURE FUEL PUMP REMOVAL, High Pressure Fuel Pump.>

2) Remove the air intake adapter LH from the cylinder head.



3. Remove the high-pressure fuel pump case from the cam carrier assembly LH.



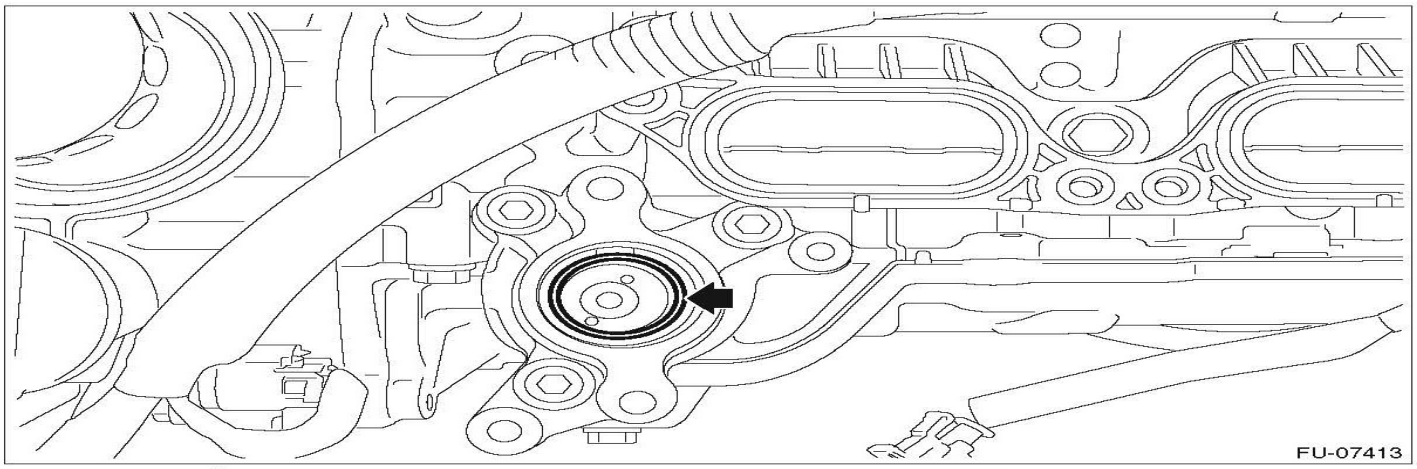
Installation of NEW Nostrum High Pressure Fuel Pump
1. Carefully guide new pump into bore
2. Install pump to head flange bolts and torque to (21NM, 15.5FT-LBS)
3. Carefully thread high pressure fitting back on until fully seated and torque to (6.4NM, 4.7FT-lbs)
4. Re-install low pressure fuel line making sure the locking clip is fully seated.
5. Re-install fuel pump wiring connector

B. INSTALLATION

1. HIGH-PRESSURE FUEL PUMP

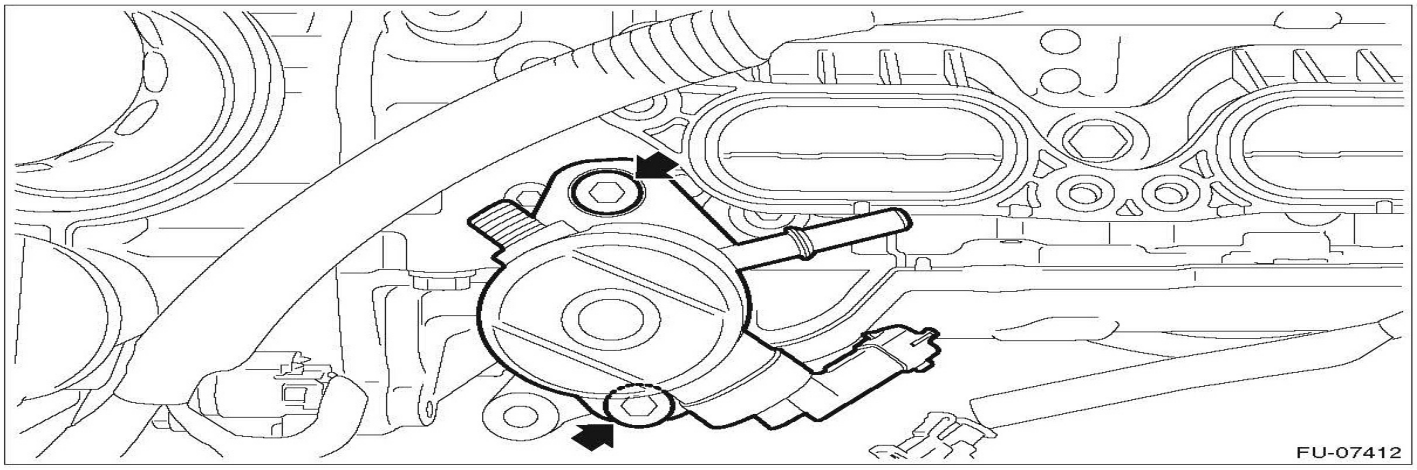
1) Install the fuel pump lifter to the high-pressure fuel pump case.

NOTE: Apply engine oil to the side of the high-pressure fuel pump case and to the bottom surface of the fuel pump lifter.



2. Using TORX PLUS® bit 40IP, install the high-pressure fuel pump.

NOTE: Use new O-Rings. Tightening torque. 21 N-m (2.1 kgf-m, 15.5 ft-lb)



3. Connect the connector (B) to the high-pressure fuel pump, and install the fuel delivery pipe (A) to the high-pressure fuel pump.

CAUTION: Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe. When connecting the quick connector, make sure to insert it all the qay in before locking the slider. When it is difficult to lock the slider, check again that the quick connector is securely connected.

NOTE: Connect the quick connector as shown in the figure below.

4. Install the high-pressure fuel delivery pipe. <Ref. to FU(w/o STI)-79, HIGH PRESSURE FUEL PUMP REMOVAL, High Pressure Fuel Pump.>

5. Connect the ground terminal to battery sensor. <Ref. to NT-6, BATTERY, NOTE, Note.>

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.

6. Installation is complete!

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. T his 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)