NOSTRUM
HIGH PERFORMANCE

Nostrum Ford 1.6L EcoBoost GDI Fuel Injector Installation Guide

PRODUCT PART SKU#: H720-1806 (set)

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.

Please note that this product does require vehicle calibration. Please ensure provisions are made prior to installation, Nostrum Tuning Guides are available upon request. If you are already in touch with a tuner, please have them reach out to support@nostrumshop.com or access the Tuning Guide via the dealer portal on the Nostrum website. If you do not currently have a tuner, we will gladly connect you with someone within the Nostrum dealer network.

Required Tools:

- Socket wrench
- Torque wrench (1-25 Nm / 10-221 in-lb range)
    - **NOTE: Imperial units are in inch-lb NOT foot-lb**
- 7 mm socket
- 8 mm socket
- 10 mm socket
- 12 mm socket
- 12 mm wrench
- 17 mm wrench
- 17mm crow's foot or equivalent open ended torque wrench tool
- Pick tools
- Magnet tool
- Trim removal tools
- Flat-head screwdriver
- Combustion seal compression tool: Bosch 0 986 616 097 or equivalent
- Injector removal tool: T10133B or equivalent
- ECU reprogramming interface or other calibration delivery method
- Safety glasses
- Fire extinguisher (Class B minimum)

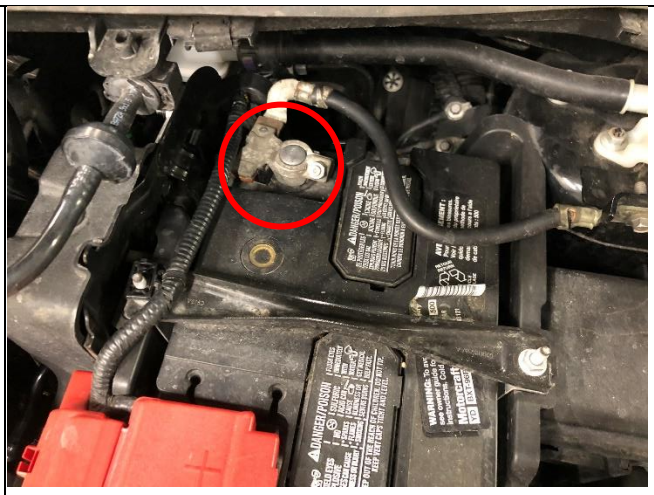
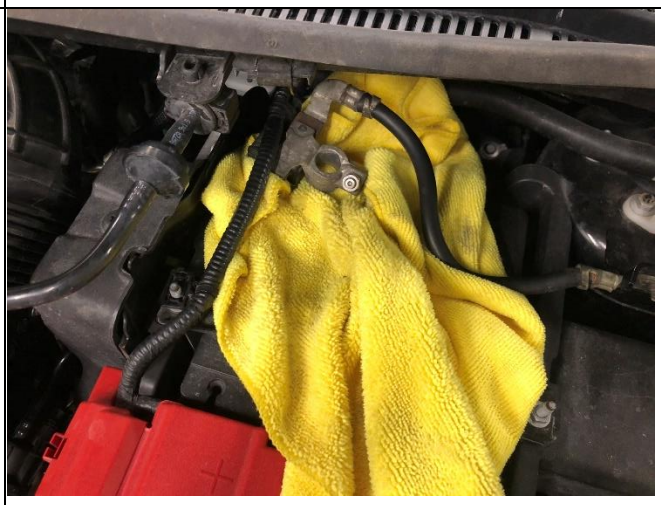
Consumables:

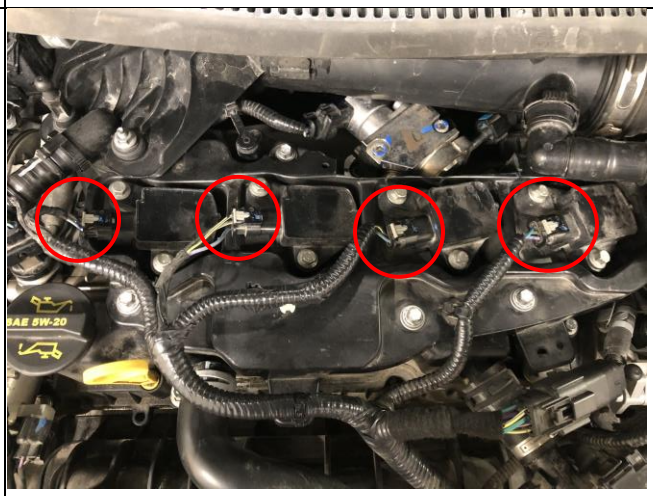
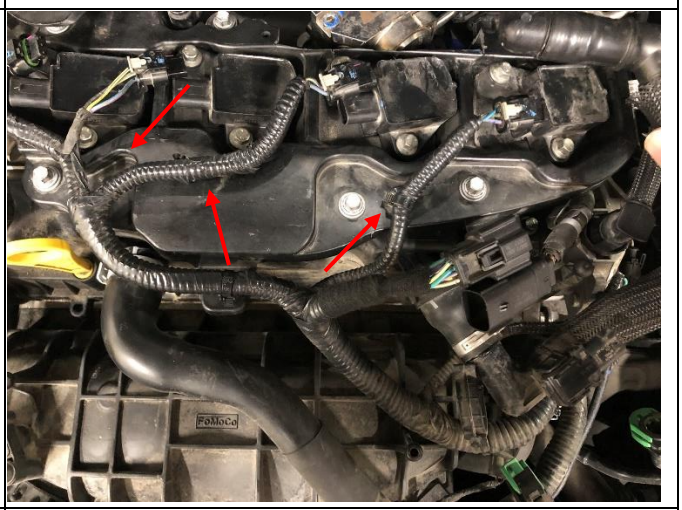
- Clean engine oil
- Lint-free absorbent towels
- Disposable rubber gloves

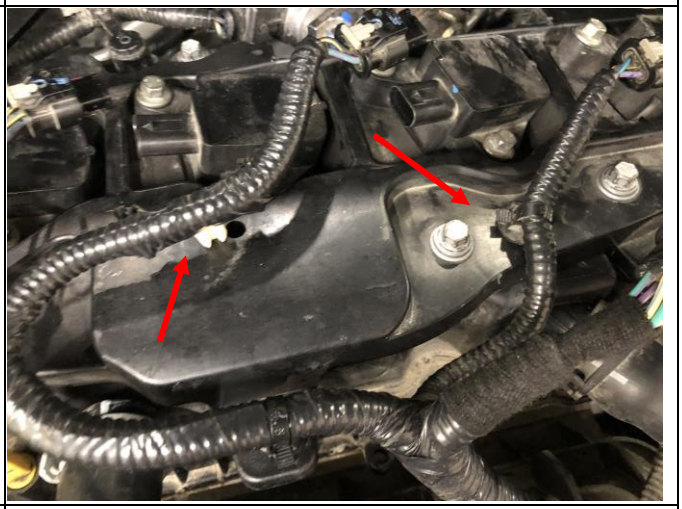
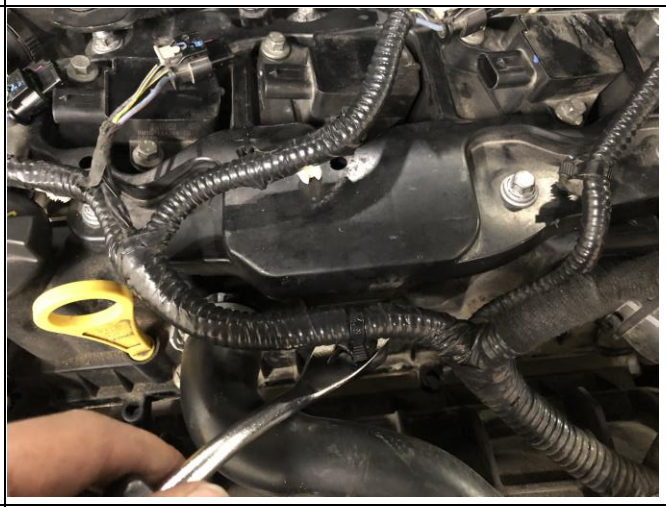
The following components are considered to be one-time use parts by Ford. They are not included with the injectors but are required to perform the installation properly. We recommend you obtain these parts from your Ford dealer prior to beginning the installation process:

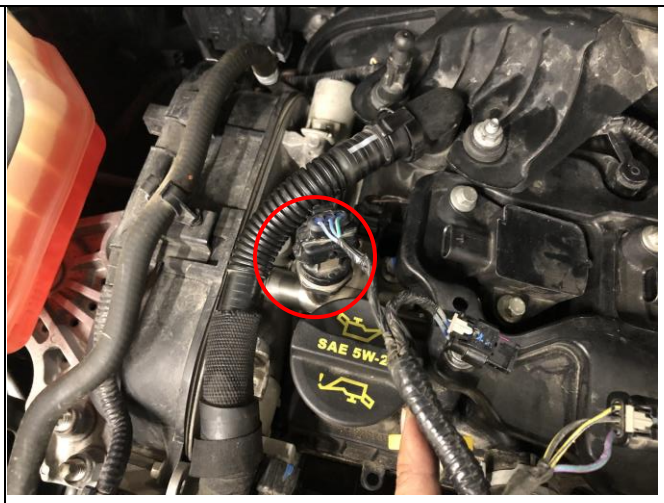
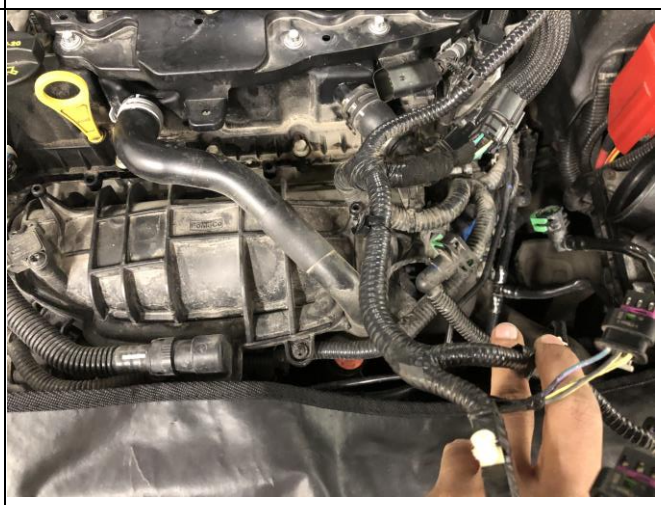
- Fuel injector clip/bracket, 4 pieces required, Ford part # AG9Z9P847A
- High pressure fuel line, 1 piece required, Ford part # BM5Z9D354A

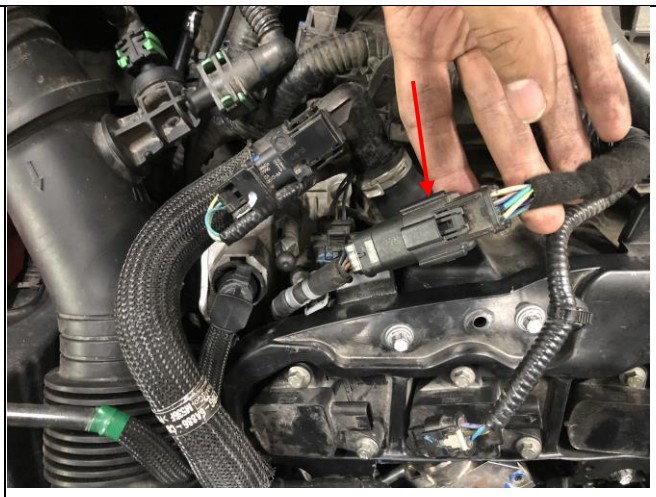
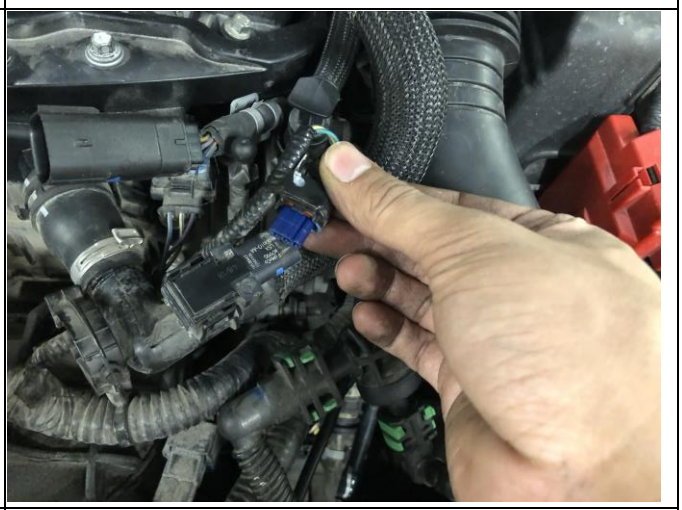
WARNING - be very careful with all of the high pressure and low pressure fittings and connections to avoid any contamination from dirt or other debris. GDI systems are very sensitive to debris. Keep caps on the pump and fuel lines until you are ready to make the connections and only use clean, lint-free towels and rags.

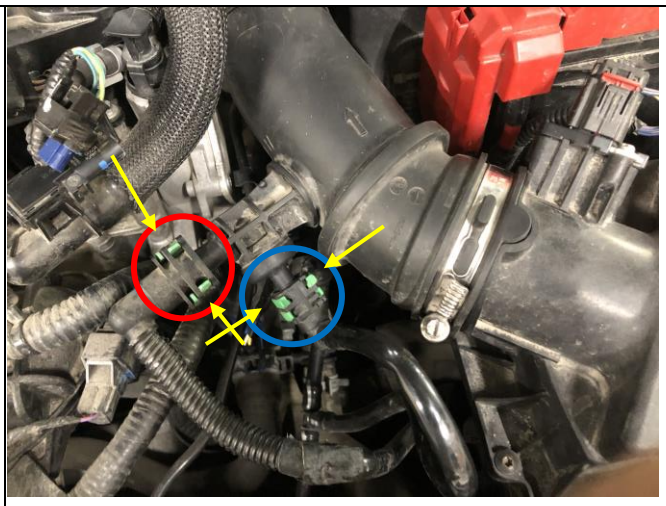
1. If you have been driving the vehicle allow it to fully cool. This is to make the underhood temperatures lower for a safer & more comfortable installation process and to allow the fuel pressure in the system to bleed down. Using a 10 mm socket disconnect the negative battery terminal.	
	Figure 1
2. Insulate the terminal with a rag to prevent the negative cable from contacting it and restoring power to the vehicle.	
	Figure 2
3. Remove engine appearance cover by pulling up on each corner, releasing them from their plastic mounting studs.	
	Figure 3

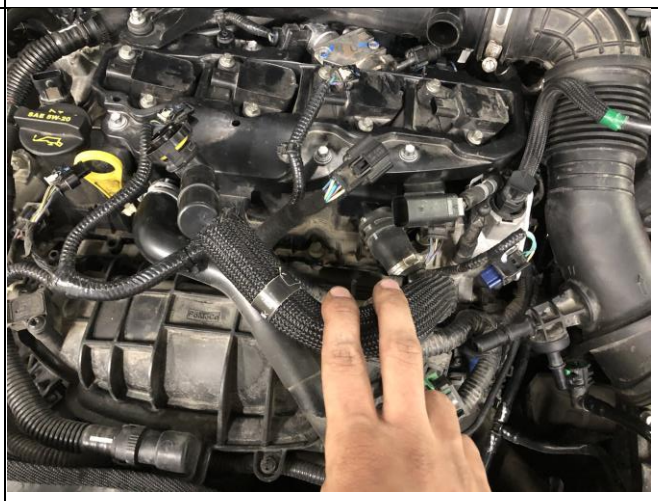
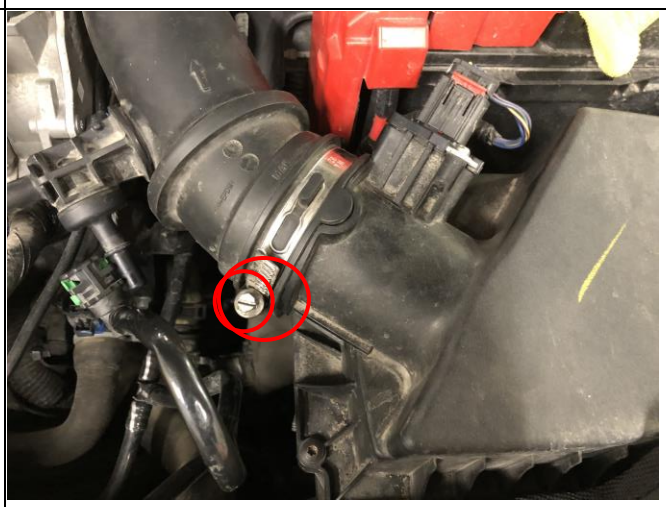
4. Engine with appearance cover removed.	
	Figure 4
5. Unlock the 4 coil pack electrical connectors by sliding the grey locking tabs to the left. Then push down on the locking tabs and pull the connectors out of each coil pack.	
	Figure 5
6. Using a trim tool, pry up on the plastic retainers to remove the coil pack harness from the mounting bracket. Figures 7, 8, and 9 show additional views of removing the retaining clips.	
	Figure 6

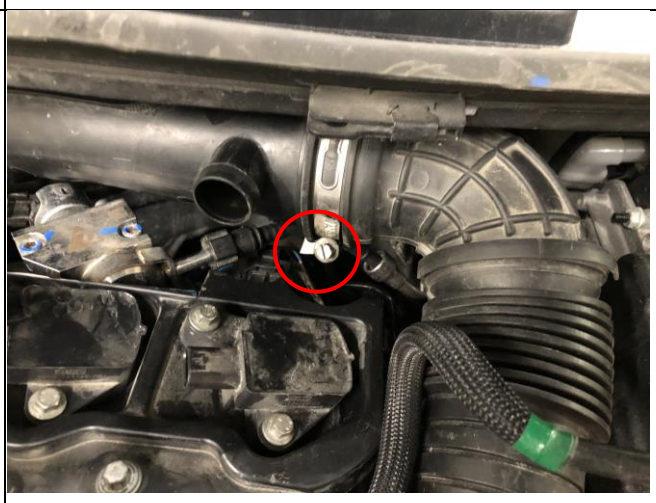
7. Slide the trim tool under the retaining clips then pry upwards.	
	Figure 7
8. Arrows show retaining clips removed from the mounting bracket.	
	Figure 8
9. Additional retaining clip on harness at the front of the bracket as shown.	
	Figure 9

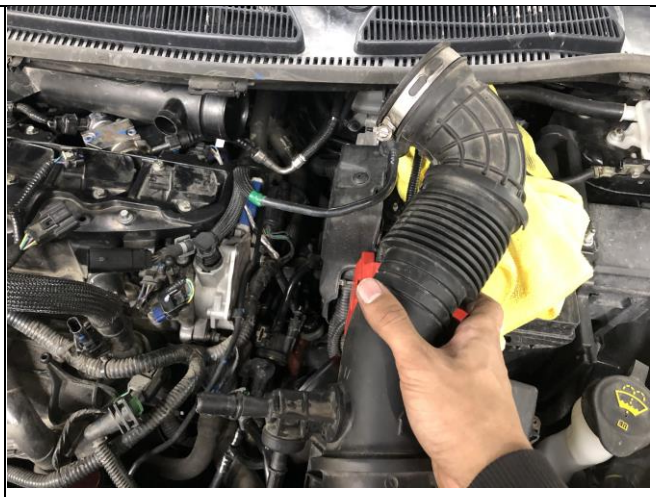
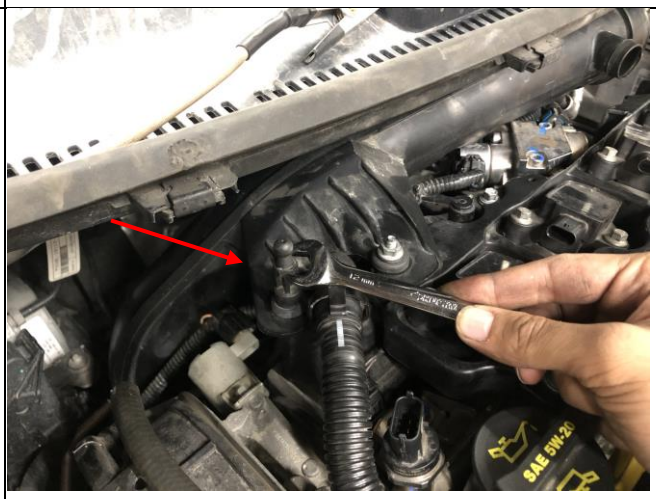
10. Locate the fuel rail pressure sensor next to the oil fill cap (sensor shown in red circle).	
	Figure 10
11. Remove the fuel rail pressure sensor connector by pulling back on the black tab then pulling up on the connector (do not pull from the wires).	
	Figure 11
12. Set the coil pack connector and fuel rail pressure sensor harness aside. This should be placed to the driver side in the front of the intake manifold.	
	Figure 12

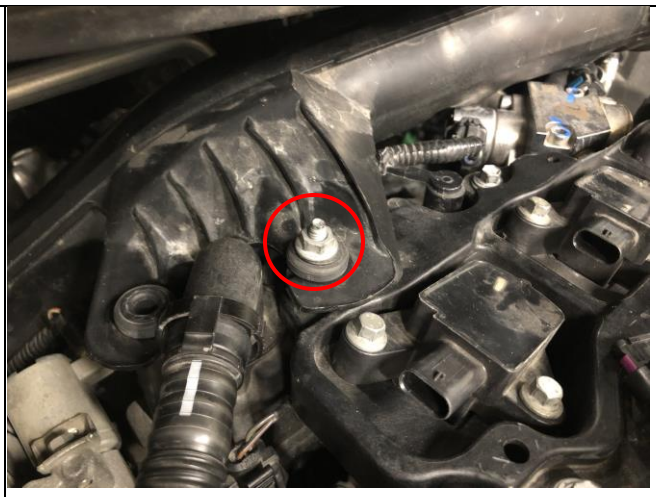
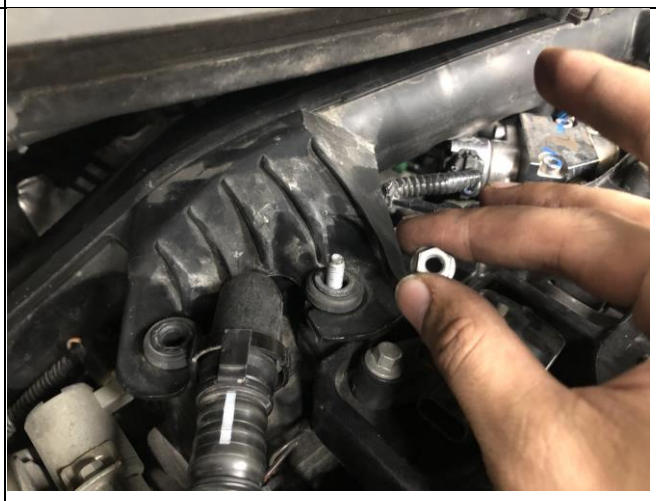
13. Disconnect the fuel injector harness by pushing down the black tab and pulling the two connectors away from each other.	
	Figure 13
14. Disconnect the electrical connector from the PCV hose by pushing down on the tab and pulling out the connector.	
	Figure 14
15. Tuck harness beneath the PCV hose.	
	Figure 15

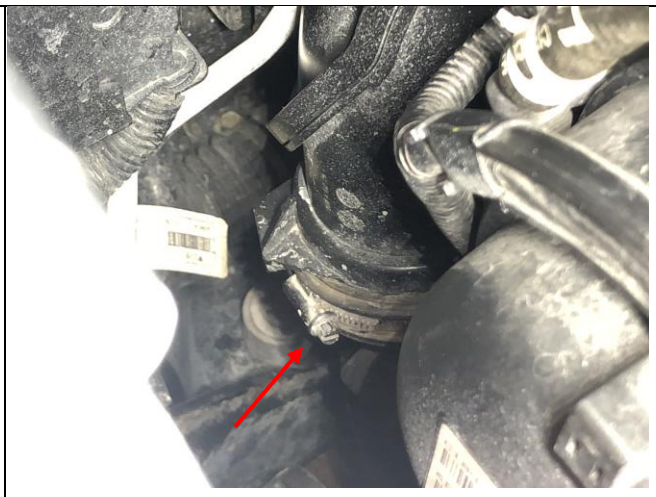
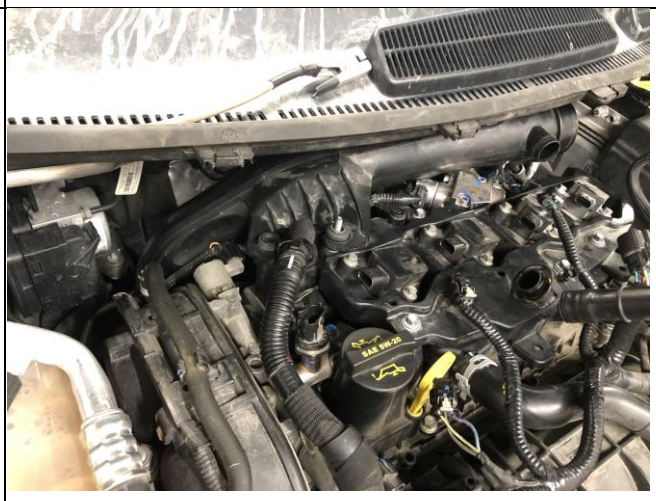
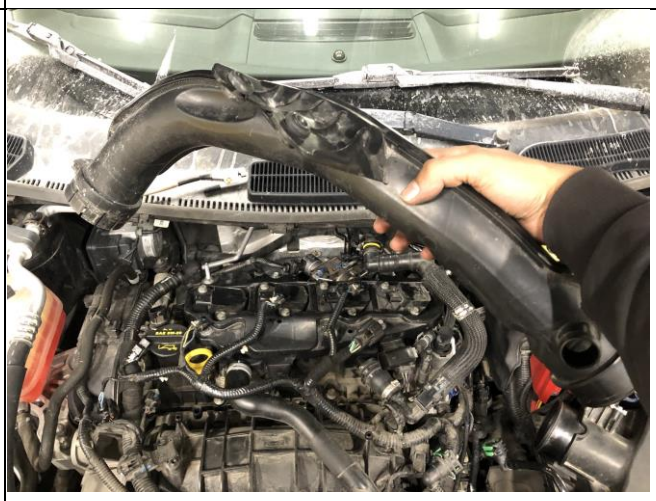
16. Release both quick connects from the intake duct. The yellow arrows indicate the locking tabs. The red circled quick connector is released by squeezing the two green protruding tabs together then pushing them down to release the hose from the fitting. The blue circled quick connector is released by pushing the two green protruding tabs away from each other then pushing them down to release the hose from the fitting.	
	Figure 16
17. After the tabs have been unlocked pull the hoses off the fittings in the intake duct.	
	Figure 17
18. Disconnect PCV hose from the air inlet by pinching the two textured areas of the PCV hose connection then twisting and pulling off the hose.	
	Figure 18

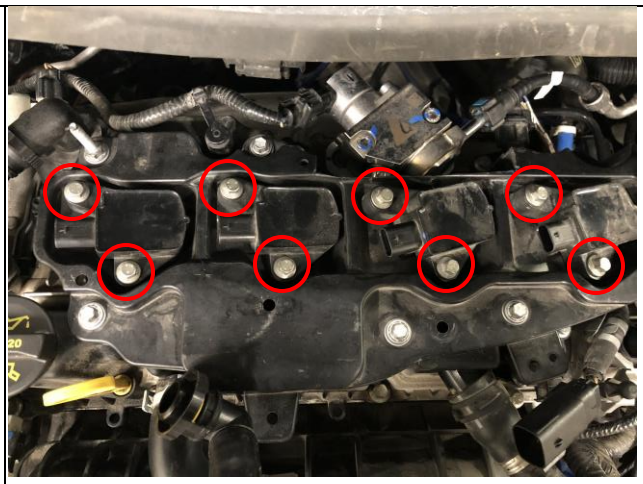
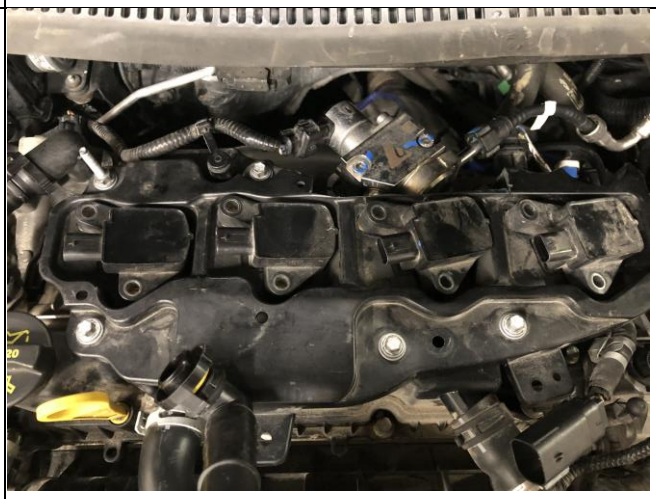
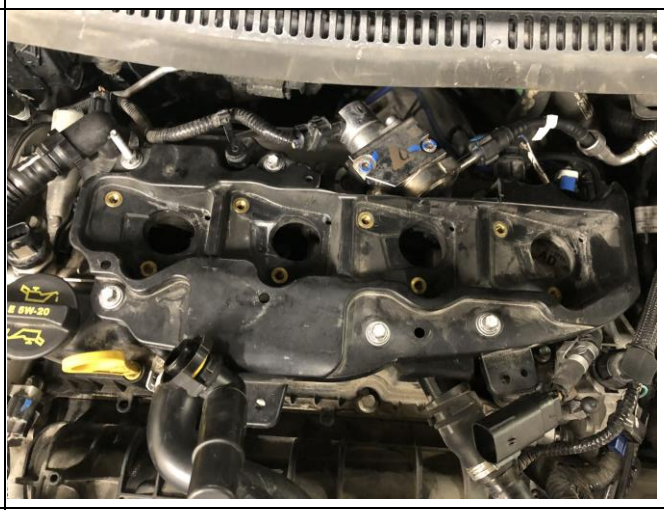
19. Image showing the PCV hose disconnected from the air duct.	
	Figure 19
20. Twist the PVC tube towards the intake manifold.	
	Figure 20
21. Loosen the worm gear clamp connecting the intake duct to the airbox.	
	Figure 21

22. Pull the intake duct off the airbox by sliding it up towards the firewall.	
	Figure 22
23. Loosen the worm gear clamp connecting the intake duct to the rubber 90 degree air inlet duct.	
	Figure 23
24. Slide the intake duct off the air inlet tube by pulling it towards the driver side of the vehicle.	
	Figure 24

25. Remove intake duct from the vehicle.	
	Figure 25
26. Using a deep well 12 mm socket or wrench remove the appearance cover mounting stud. This stud also holds the inlet tube in place.	
	Figure 26
27. Image showing mounting stud removed.	
	Figure 27

28. Using a 10 mm socket remove the nut securing the air inlet tube.	
	Figure 28
29. Image showing the nut removed.	
	Figure 29
30. Using a 7 mm socket loosen the worm gear clamp connecting the air inlet tube to the turbo. The clamp is very difficult to see. See the next step (Figure 31) for a better view of the hose clamp position.	
	Figure 30

31. Air inlet tube duct showing worm gear clamp that must be loosened.	
	Figure 31
32. Disconnect the inlet tube from the turbo by pulling up on the tube and then removing the tube from the vehicle. **Moderate force may be required.**	
	Figure 32
33. Image showing the inlet tube removed from the vehicle.	
	Figure 33

34. Using an 8 mm socket remove the 8 bolts securing the coil packs to the mounting cover.	
	Figure 34
35. Image showing the 8 fasteners removed from the coil packs.	
	Figure 35
36. To remove the coil packs from the engine grasp each coil pack and slowly pull up to disconnect the coil pack from the spark plug below it.	
	Figure 36

37. Using an 8 mm socket loosen the 6 bolts securing the coil pack mounting bracket to the valve cover.

The location of four of the fasteners is shown in Figure 38 on the right. Figure 39 in the next step shows the location of the two remaining bolts.

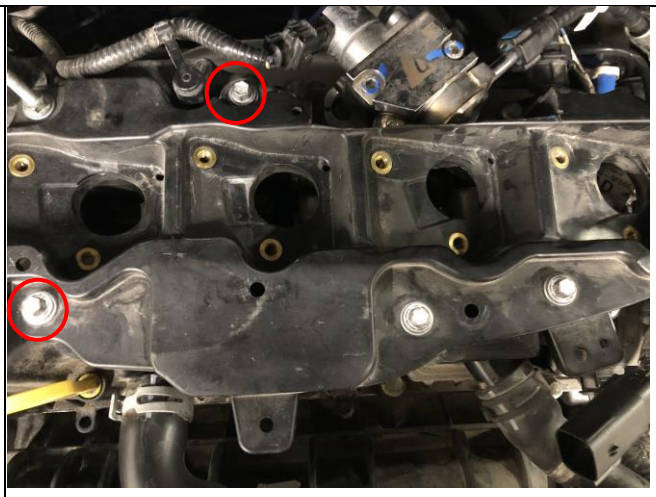


Figure 37

38. Two remaining bolts are located near the GDI fuel pump, as shown by the red circles in the image on the right.

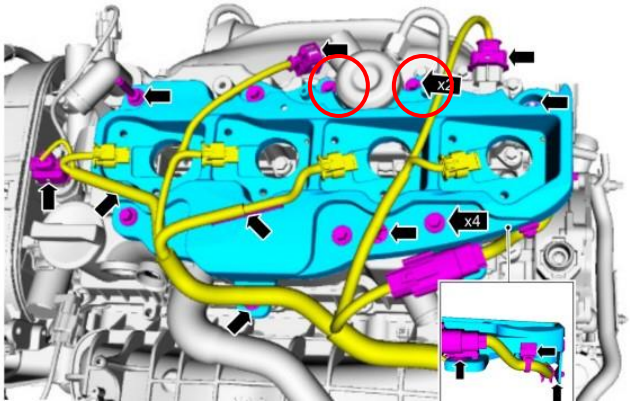


Figure 38

39. These bolts cannot be removed from the bracket once loosened. They are attached to the bracket.

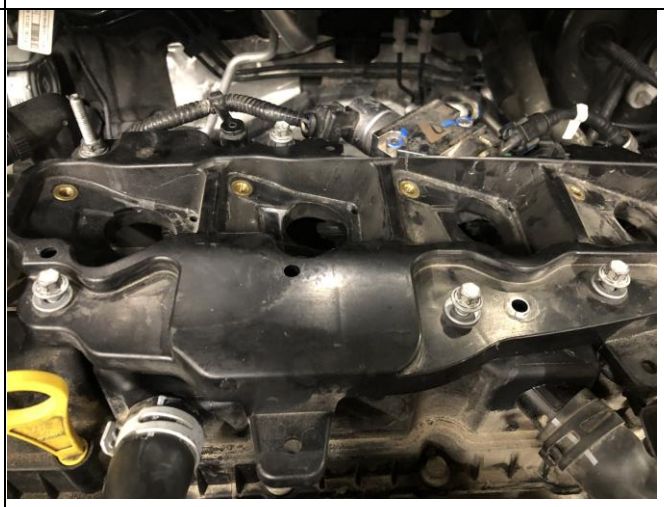
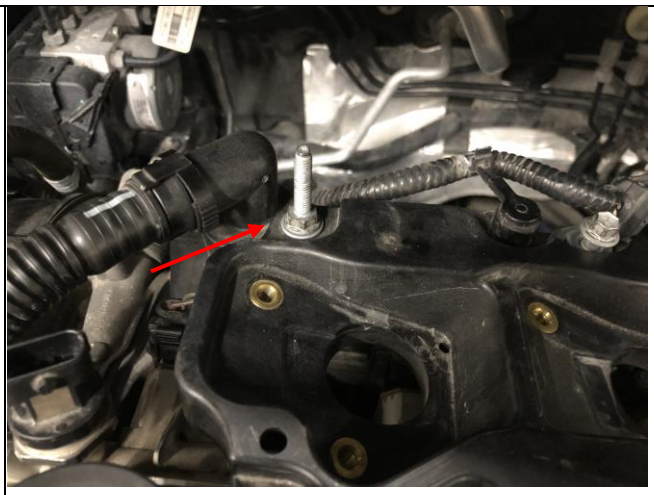
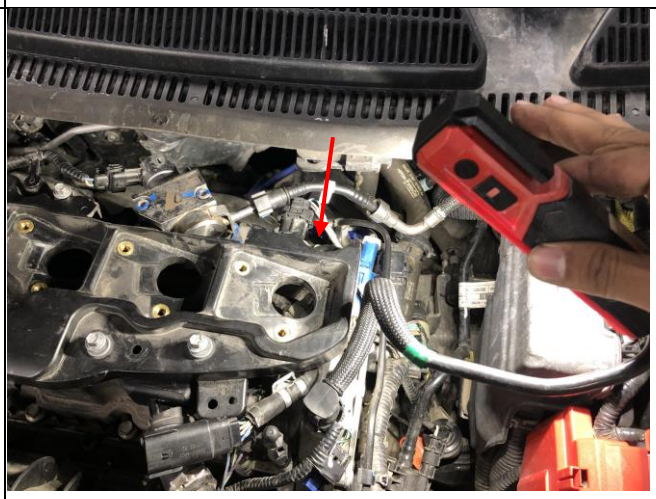
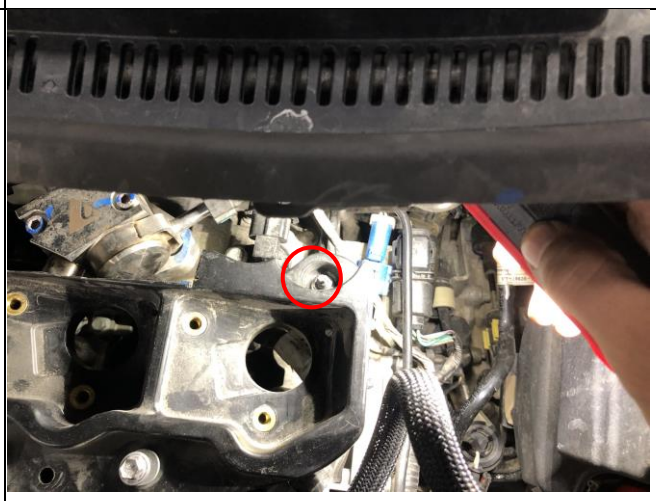
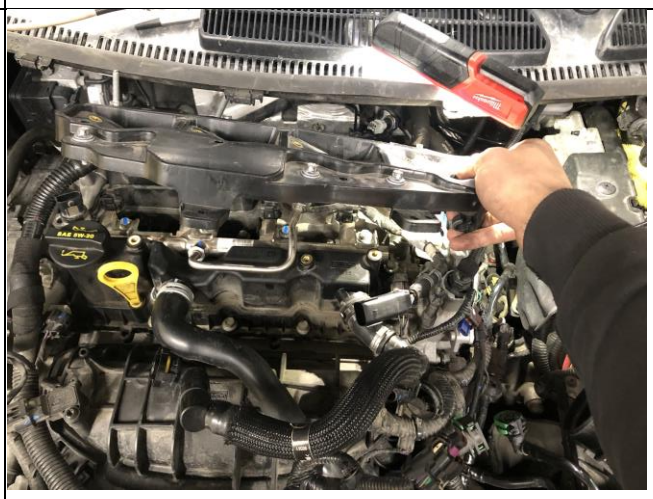
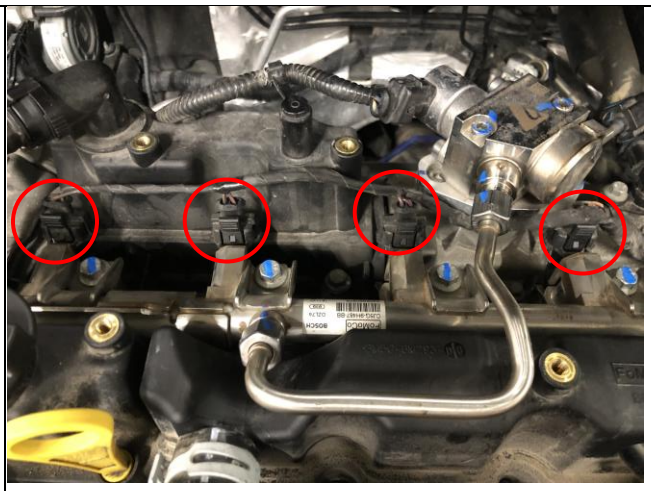
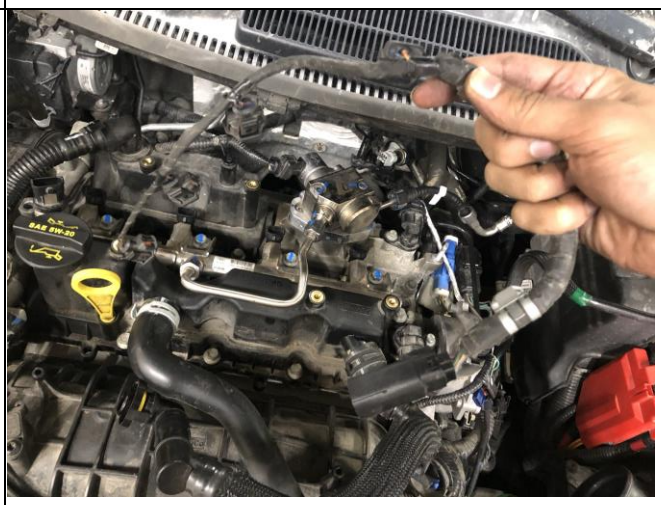


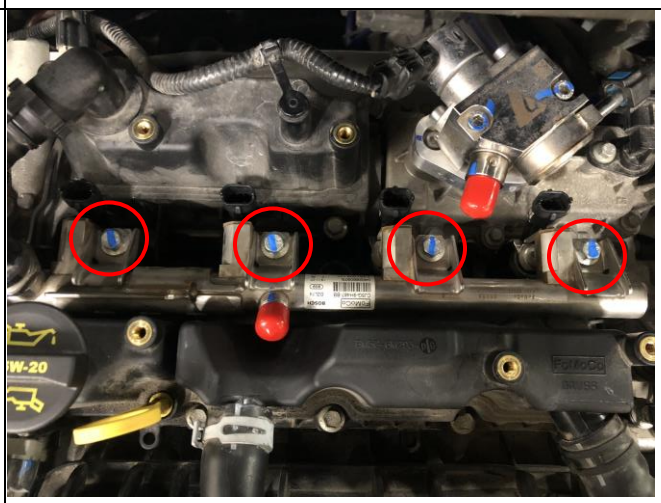
Figure 39

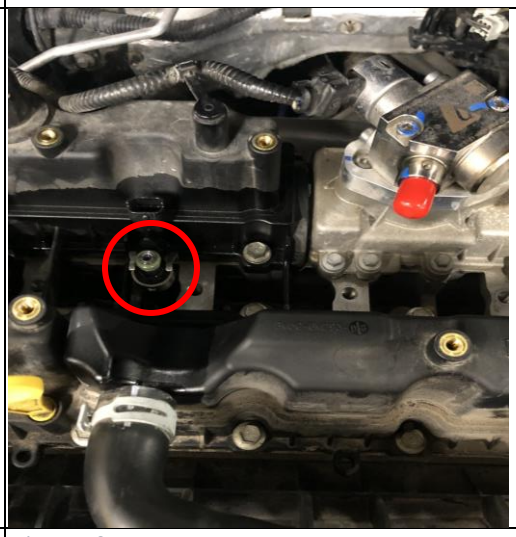
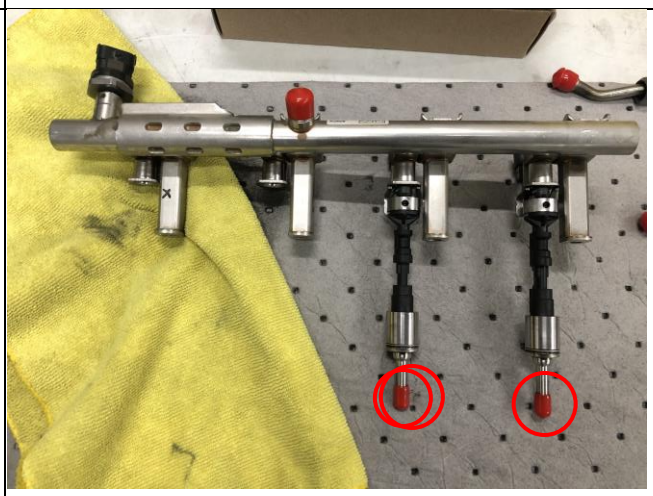
40. Using a 10 mm socket loosen the stud securing the coil pack mounting bracket to the valve cover (see red arrow to the right). Note - this stud cannot be removed from the bracket once loosened. It is attached to the bracket.	
	Figure 40
41. Remove the 10 mm nut securing the coil pack mounting bracket to the valve cover, then remove the bracket. The next two steps, Figures 43 and 44, show the location of the nut.	
	Figure 41
42. Location of 10 mm nut that must be removed.	
	Figure 42

43. Close up image showing nut that must be loosened and removed.	
	Figure 43
44. A magnet tool may be needed to make it easier to remove the nut from the recessed pocket.	
	Figure 44
45. Remove the coil pack mounting bracket.	
	Figure 45

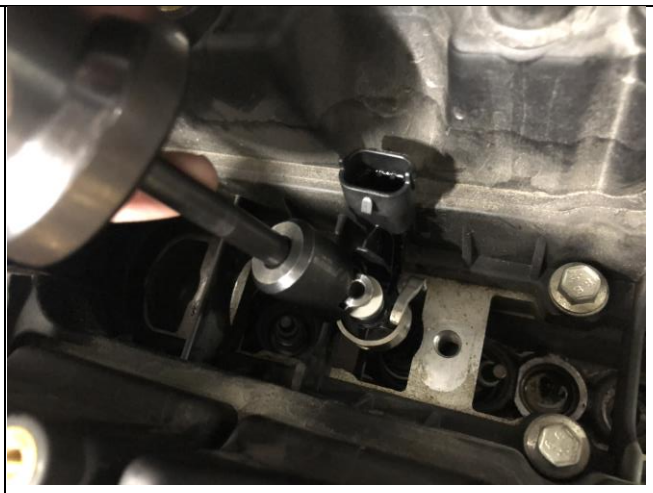
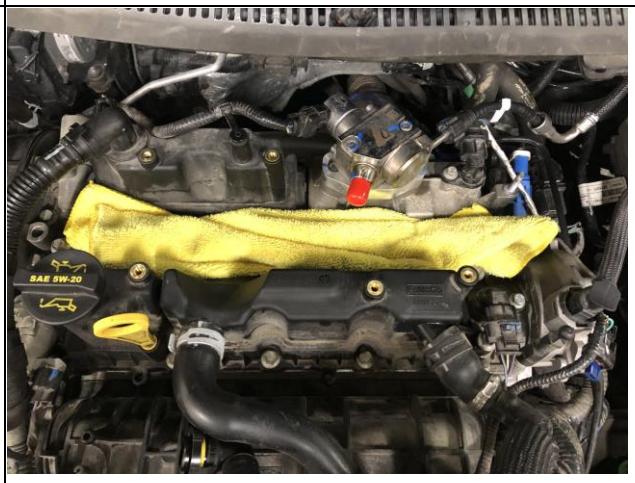
46. Disconnect the four fuel injector electrical connectors by squeezing the tabs on top of the connectors and then pulling the connectors off the injectors.	
	Figure 46
47. Remove the injector harness by sliding it beneath the high-pressure fuel line.	
	Figure 47
48. Set the injector harness aside.	
	Figure 48

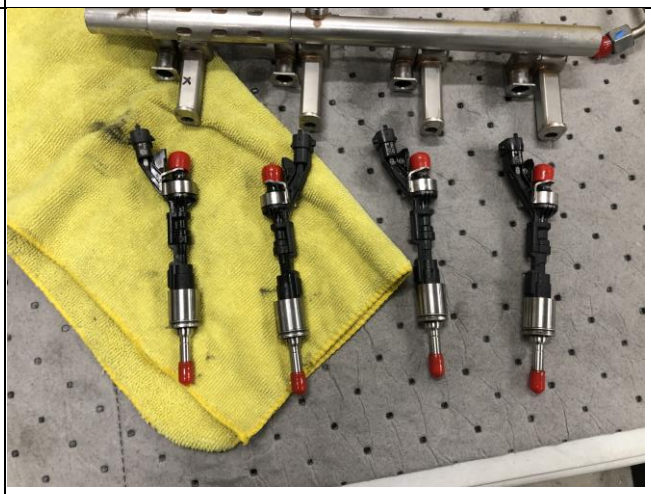
49. Using a 17 mm wrench loosen the nut on the high-pressure fuel line that is connected to the high-pressure fuel pump. Use rags or towels to absorb spilled fuel. Note that high pressure fuel may be present and proper safety precautions should be taken. **Safety glasses and rubber gloves are recommended.**	
	Figure 49
50. Slide the nut away so it does not re-engage with the pump.	
	Figure 50
51. Using a 17 mm wrench loosen the nut on the high-pressure fuel line that is connected to the fuel rail, then remove the high-pressure line.	
	Figure 51

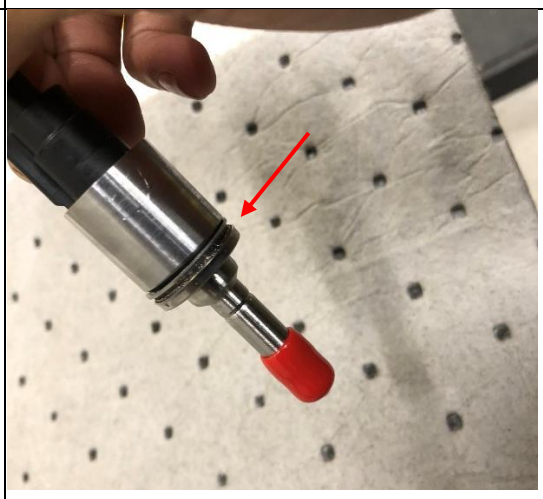
52. **WARNING! THIS LINE IS ONE TIME USE! FORD RECOMMENDS A NEW REPLACEMENT LINE BE INSTALLED WHEN REMOVED!** **The Ford part number for this high pressure fuel line is BM5Z9D354A.**	
	Figure 52
53. Cover or cap off the high-pressure pump and fuel rail to prevent contamination. **Be very careful with all of the high pressure and low pressure fittings and connections to avoid any contamination from dirt or other debris. GDI systems are very sensitive to debris. Keep caps on the pump and fuel lines until you are ready to make the connections.**	
	Figure 53
54. Using a 10 mm socket remove the 4 bolts securing the fuel rail to the cylinder head.	
	Figure 54

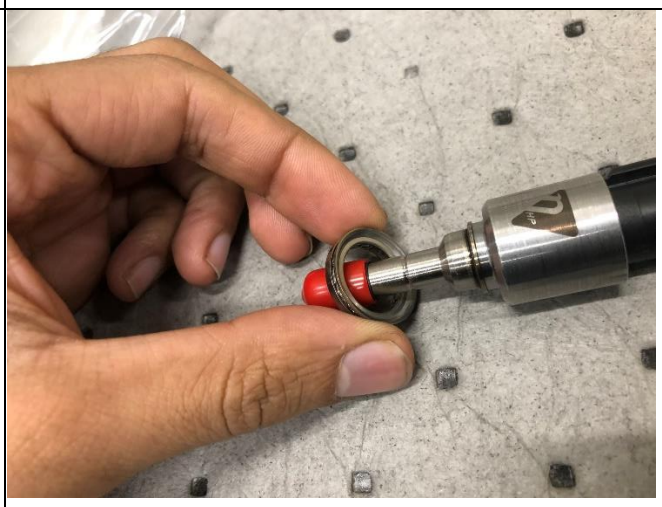
55. Remove the fuel rail and injectors by pulling up on both corners of the rail. The injectors may not come out with the rail. See the next steps (Step 58 to 65) for stuck injector removal process.	
	Figure 55
56. The red circle indicates a stuck injector.	
	Figure 56
57. Cap the injector tips to prevent contamination or damage to the spray nozzle.	
	Figure 57

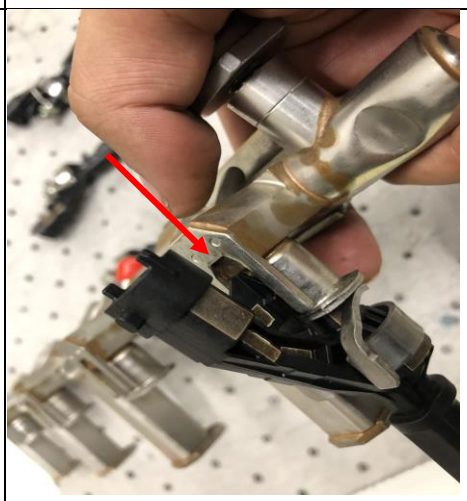
58. If the injectors are stuck, use an injector removal tool to extract them. Section 1 highlighted in yellow. Section 2 highlighted in green. **Injector removal tool: T10133B**	
	Figure 58
59. Thread section 2 onto section 1.	
	Figure 59
60. This image shows the tool when properly assembled.	
	Figure 60

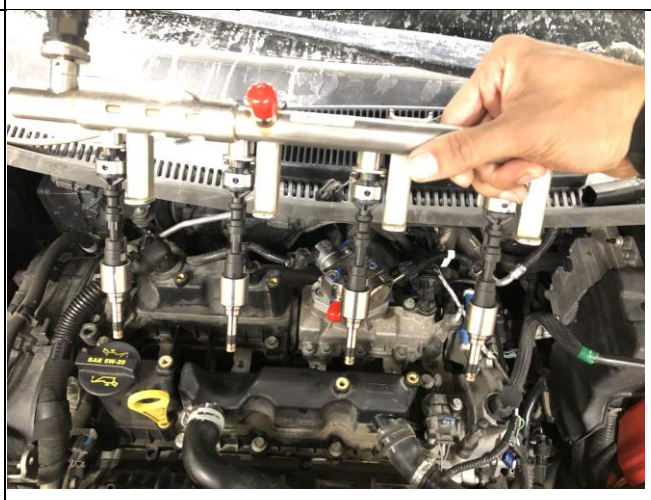
61. Remove the O-ring from the top of the injector, then slide the assembled tool on the inlet of the injector.	
	Figure 61
62. Use an up and down sliding motion with the tool to remove the injector from the cylinder head. Be careful not to bend the connection to the rail. Carefully remove the injector. It is important that it does not fall out of the tool. **Moderate force may be required.**	
	Figure 62
63. Cover cylinder head to prevent debris from entering the combustion chamber.	
	Figure 63

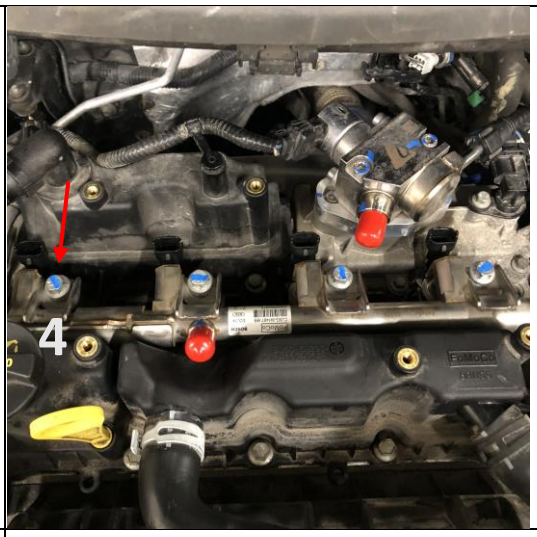
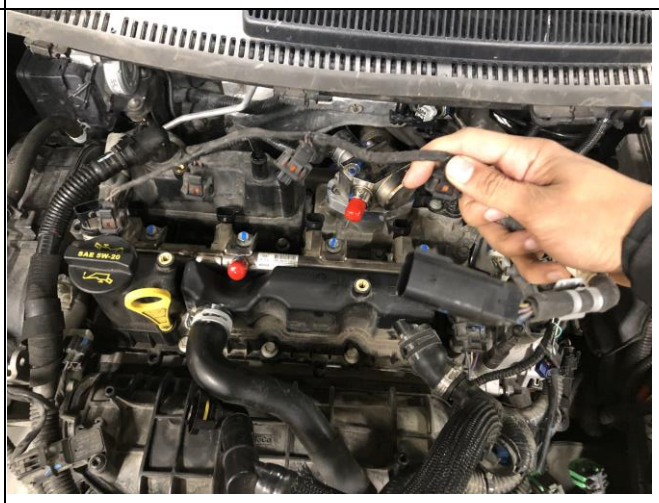
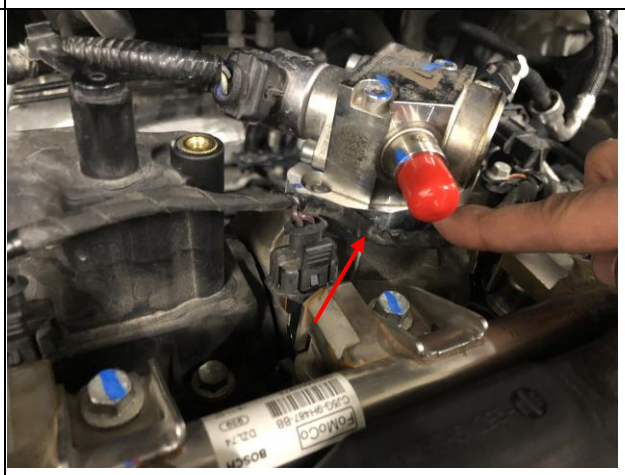
64. Remove injectors from fuel rail by twisting and pulling them out of the rail. Cap the injector inlets after removal to prevent them from being contaminated.	
	Figure 64
65. Image showing inlet and outlet of existing injectors capped to prevent damage and/or contamination. We recommend saving your old injectors. Do not discard any components until installation is complete – some parts will need to be removed from the stock injectors. Make sure you are using clean, lint free towels and rags. Make sure contamination does not enter the fuel rail either. Be especially careful of any built-up dirt and debris that may exist on the outside of the rail to make sure it does not get in the rail or injectors.	
	Figure 65
66. Remove injector clips from the old injectors. Lift the clips up and over the injector inlet to remove them. **NOTE - FORD RECOMMENDS REPLACEMENT OF THE INJECTOR CLIPS AFTER REMOVAL (ONE TIME USE). The clips are Ford part # AG9Z9P847A.**	
	Figure 66

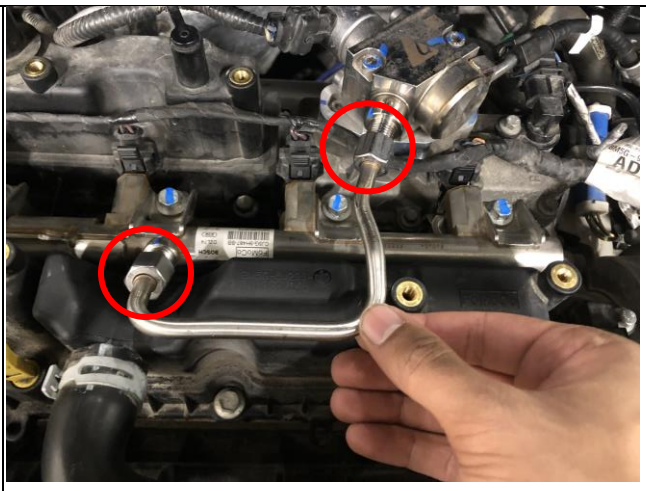
67. Install the new injector clips on your Nostrum injectors.	
	Figure 67
68. Be sure that the fingers on the spacers are pointing upwards.	
	Figure 68
69. Remove the decoupling rings from your old injectors. Note the orientation of the decoupling ring on the injector. You will be installing them on the new injectors in the same orientation.	
	Figure 69

70. Place a thin flathead screwdriver between the injector body and the decoupling ring. Very lightly pry against the ring with the screwdriver. Be careful not to damage the rings. **Minimal force is required for this step.**	
	Figure 70
71. Remove the decoupling ring.	
	Figure 71
72. Place the decoupling rings onto the Nostrum injectors. **This step will require some force.**	
	Figure 72

73. This image shows how the injector will look with the decoupling ring properly installed.	
	Figure 73
74. Remove the red caps on the inlet end of the injectors and then lubricate the O-rings using clean engine oil.	
	Figure 74
75. Install the injectors into the fuel rail by placing the inlet into the circular bore on the rail. The injector will line up with the slot at the back of the rail. The protruding finger from the injector body will go into the slot in the rail in order to properly orient the rotation of the injector.	
	Figure 75

76. Use combustion seal compression tool to compress the combustion seals on the tip of the injectors. Note that the Nostrum 1.6L EcoBoost injectors have a double seal design for improved sealing in the cylinder head. Allow the seals on each injector to compress for at least 15 seconds. **Combustion seal compression tool set: Bosch 0 986 616 097** **WARNING! FAILING TO DO THIS STEP CAN RESULT IN DAMAGED AND/OR SMEARED COMBUSTION SEALS WHICH MAY RESULT COMBUSTION LEAKS!**	
	Figure 76
77. This is how the combustion seal compression tool will look when is it full seated on the injector. The fuel rail with injectors attached must be installed immediately after the combustion seals have been compressed.	
	Figure 77
78. Place rail with injectors attached back into the engine.	
	Figure 78

79. Torque the four previously removed 10 mm fuel rail bolts. These bolts have a 2-step torquing procedure. Tightening Sequence: 4-2-1-3 Step 1: 5 Nm (44 in-lb) Step 2: 23 Nm (204 in-lb)	
	Figure 79
80. Reconnect injector electrical connectors.	
	Figure 80
81. **Note: Be sure that the harness is routed beneath the high-pressure fuel line.**	
	Figure 81

82. Hand tighten the high-pressure fuel tube nuts to the fuel rail and high-pressure pump. This has a three-step torque procedure. Step 1: 21 Nm (186 in-lb) Step 2: Wait 5 minutes Step 3: 21 Nm (186 in-lb)	
	Figure 82
83. Image of the high pressure fuel line properly connected to the pump and fuel rail.	
	Figure 83
84. Reverse the remainder of the steps to re-assemble the vehicle. Start at Step 47 and work your way back.	

Hardware installation is complete.

Calibration

Do not start your vehicle, this product requires calibration. Please contact your Nostrum dealer or refer to the Nostrum tuning guide for this product to make the necessary changes prior to starting the vehicle. Once calibration is complete, please proceed to the next step.

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 service manual.

2. Key cycle the vehicle into the "Accessory On" position (do not go to Ignition position). The low-pressure fuel pump will 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 no leaks are found, proceed to Step 3.

3. Cycle the key to the ignition position 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, go on to the next step. 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 no leaks are found, proceed to Step 4.

4. Key cycle one more time all the way to Ignition. Engine should start-up and idle. If not, repeat 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 extended cranking 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: Please check for fuel leaks after driving the car and letting it cool for an extended period of time, fittings may loosen after the first heat cycle due to 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
1.1	Initial public release document	3-6-2024