



N O S T R U M

H I G H P E R F O R M A N C E



BMW S55 Twin Standard Bore High Pressure Fuel Pump Kit

Part Sku#: H186-1171

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.

**BMW S55 TWIN STANDARD BORE:
HIGH PRESSURE FUEL PUMP KIT INSTALLATION
GUIDE** PART #: H086-0865

TOOLS REQUIRED

- 10MM DEEP SOCKET
- 11MM DEEP SOCKET
- 14MM SOCKET
- 7MM DEEP SOCKET
- E6 ETORX
- 17MM WRENCH
- TRIM REMOVAL TOOL
- T30 BIT
- T45 BIT
- FLUID CATCHING DRAIN
- STRAIGHT PICK
- FLAT HEAD SCREWDRIVER
- 6-INCH EXTENSION WITH SWIVEL
- 4MM ALLAN KEY
- EXTENDED 6MM ALLAN KEY
- 18MM CROW FOOT
- 10MM WRENCH
- BUCKET
- SERVICE MANUAL (FOR YOUR SPECIFIC VEHICLE)

EXPENDABLES NEEDED

- 2X GENUINE BMW COOLANT
(82141467704)
- 5-10X SHEETS OF PIG MATS
(47131901) OR COMPARABLE
- 1X CRC GDI VALVE CLEANER (05319)
- 6-10X SCOTT SHOP TOWELS

DISSASSEMBLY

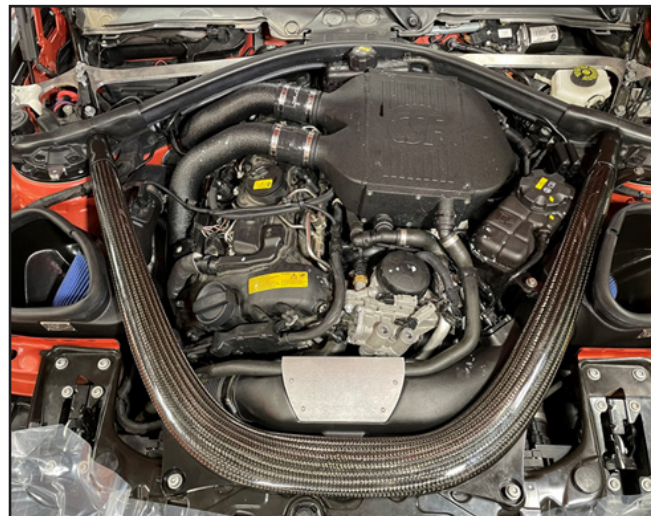
1. Park the vehicle in the area you will be doing the full installation and wait for the vehicle to be cool to the touch to avoid burns when installing. Use safety glasses during installation to prevent gasoline, or coolant from getting in your eyes. Gather the needed tools and expendables needed to complete the install.
2. Disconnect the battery ground with a deep 10mm socket



3. Remove wiper cowl covers with 10mm Socket and a trim removal tool



4. Remove the carbon sway bar using a T45 and 14mm Socket

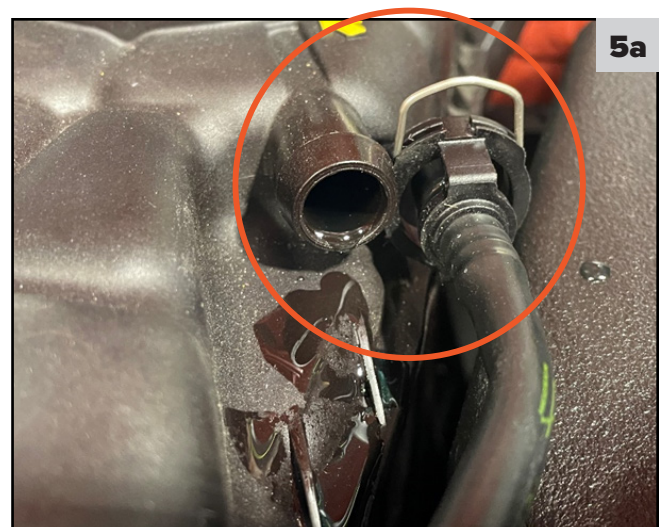




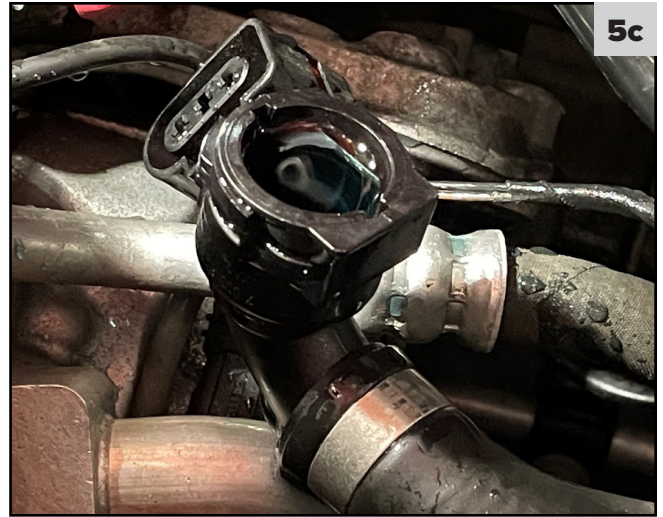
5. Remove the Factory coolant reservoir bottle. This will leak lots of coolant, use absorption pads and or a drain under the vehicle to capture runaway coolant and prevent spill over to other components in the engine.

a. Disconnect the pressure line from the top of the bottle. Pull the metal pin up to release the tube from the bottle using a straight pick.

b. Pull up on the bottle and release the bottle from the rubber grommet underneath the bottle.



c. Now you should have access to the coolant connection at the bottom of the bottle (circled above in blue). Remove the metal pin using a straight pick. Next, pull the quick connect away from the bottle.



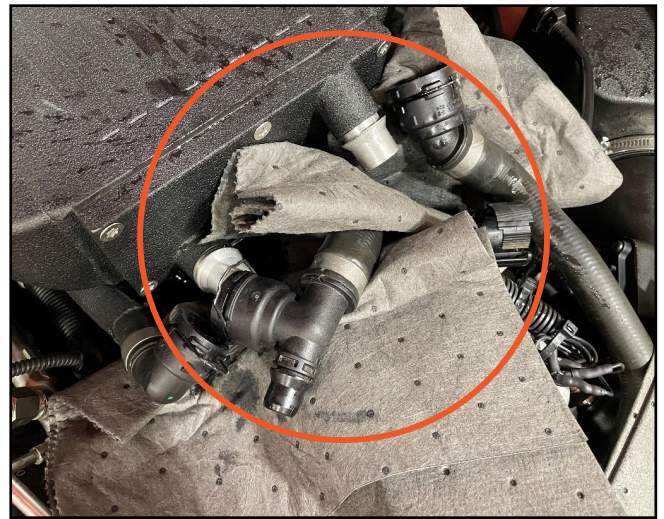
d. Remove the electrical connector from the bottom of the coolant reservoir.



e. Remove the coolant reservoir from the engine bay and place it in a bucket to prevent spillage.

6. Remove the charge air cooler from the engine. Like the coolant reservoir, this will leak coolant. Use adsorption pads to contain coolant spillage.

a. Remove the intercooler pipes attached to the front facing side of the intercooler. Pull the metal rings out of each quick connect using a straight pick. Then remove each connection.



b. Remove the MAF Sensor from the charge air cooler near the right strut tower using the straight pick.

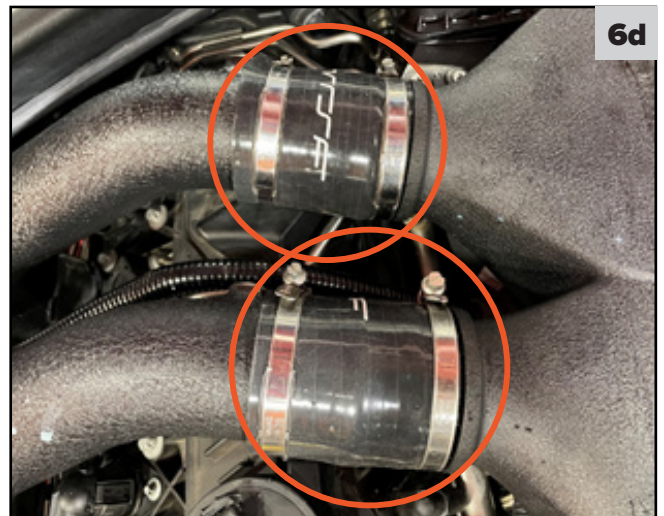


6b

c. Remove the hose clamps from the charge air pipe on both sides of the charge air cooler using a 7mm deep socket or a flathead screwdriver.



6c



6d

e. Remove the MAF sensor wiring from the routing clip underneath the charge air cooler.

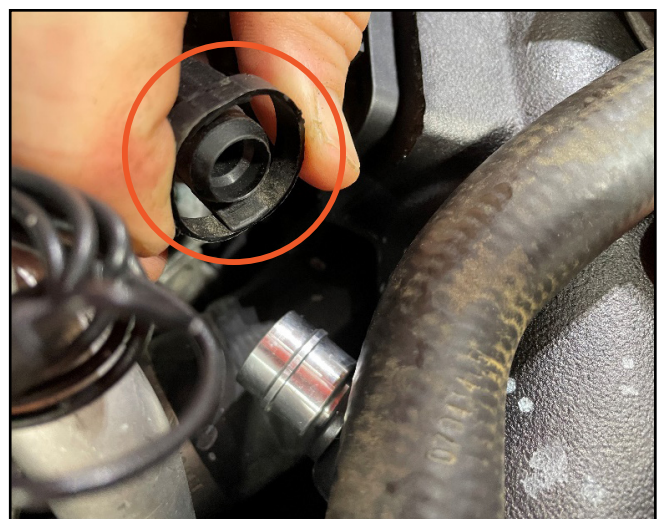


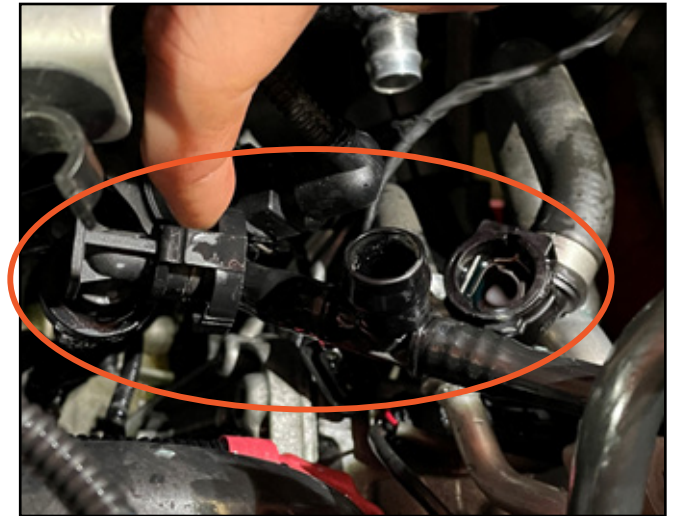
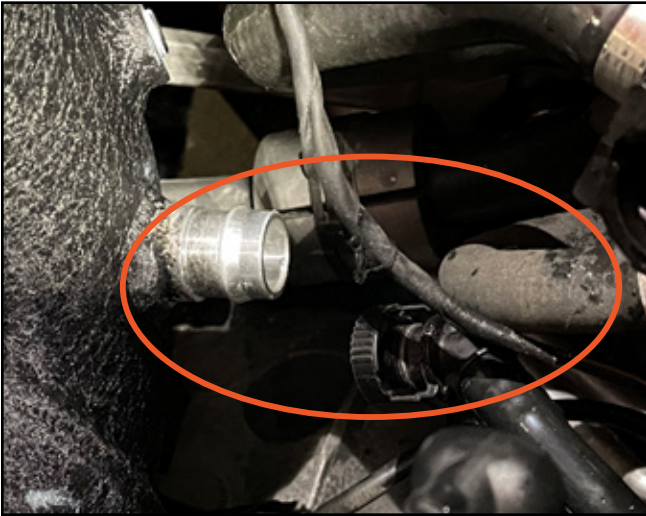
f. Remove the charge air cooler from the engine by pulling directly up and away from the bay. This will leak coolant so make sure to place it in a bucket to contain spillage.



7. Remove the intake manifold

a. Remove the PCV Charge tubing by squeezing the two short sides of the connector together as shown in the image below. These connections connect the inter-cooler and the cold air intake. There are three connections on this tubing.





b. Remove the electrical connector from the evap. purge solenoid using a straight pick to pull up the metal clip and then pull on the connection.



c. Pull the purge solenoid off the hanging bracket.

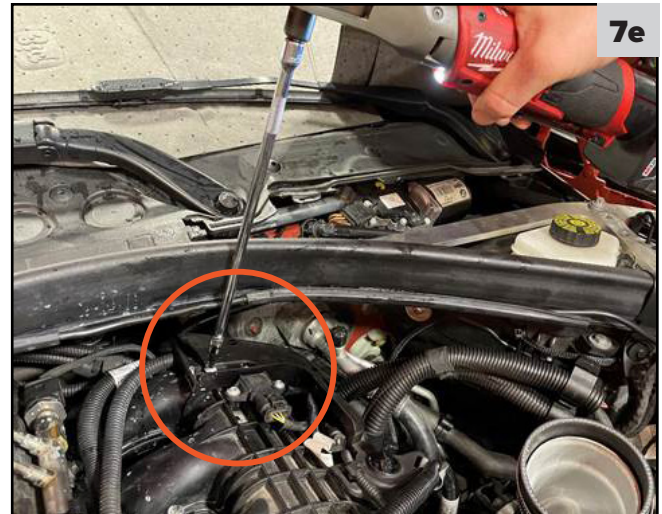


d. Remove the electrical connector from the cold air intake and the oil sensor using the straight pick.



7d

e. Remove the electrical connector bracket near the back of the engine on the intake manifold using the T25 bit with a 6-inch extension with swivel.



7e

f. Remove the electrical harness routing connections from the bracket mentioned in the previous step

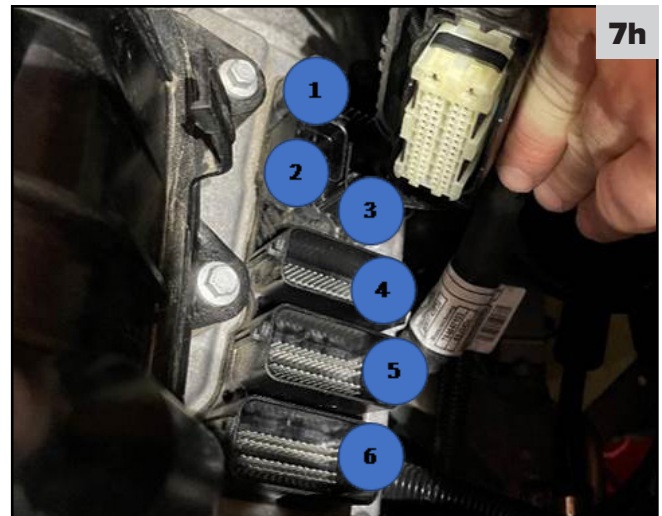


7f

g. Remove the map sensor electrical plug from the intake manifold near the back of the motor.



h. Remove the ECU bulk connectors. Follow the order numbered in the image below when disconnecting the connectors.



i. For the bulk connector numbered one above, reach around the intake to get access to the ECU and use a prying tool to pull out the U-clip. When the U-clip is fully pulled out to the position (shown below circled in blue), pull up on the connector to remove it from the ECU.



ii. Remove connector two and three by squeezing the sides of the connector then pulling up.



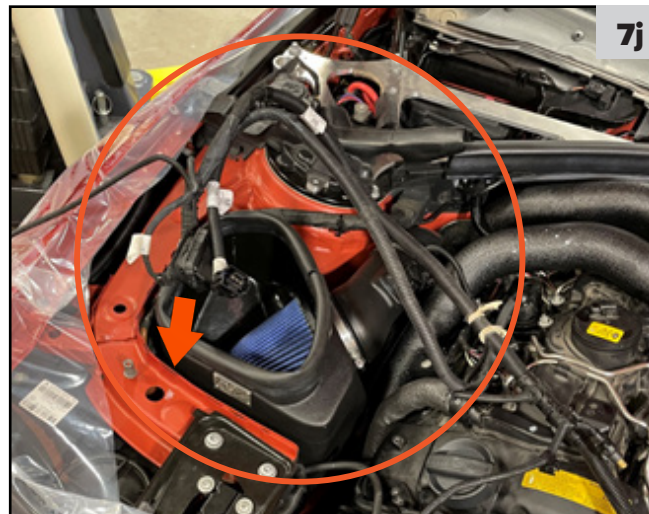
iii. For connectors 4, 5, and 6, depress the locking clip and push the “basket handle” down to release the connector.



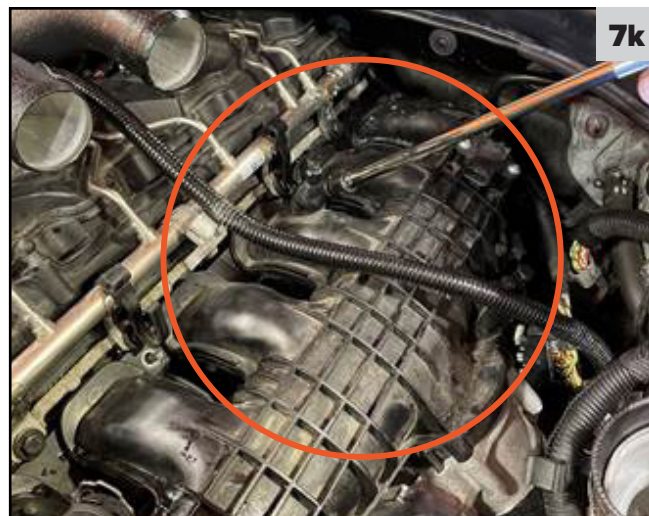
iv. Remove the electrical connector on the high-pressure fuel sensor located on the fuel rail towards the back of the engine. Squeeze on opposite sides of the connector on the wider portion to release it.



j. Remove the wiring harness out of the way of the intake manifold over towards the left of the car.



k. Remove the bolts for the intake manifold using a 11mm deep socket there will be some bolts and some nuts on the intake manifold.

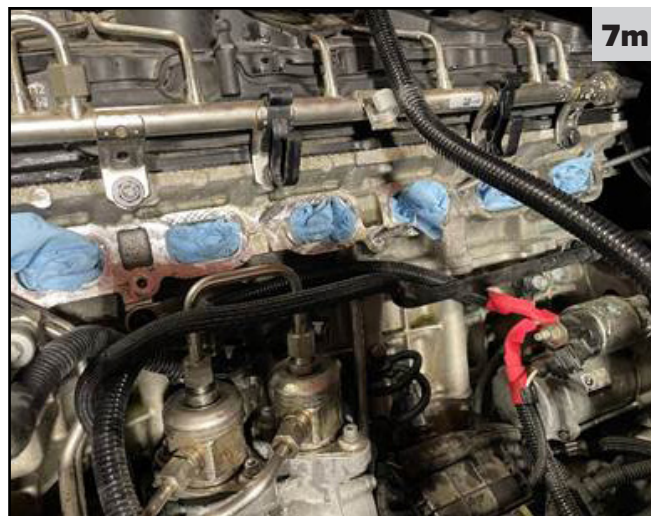


l. Start pulling the intake away from the engine straight out. Then once it clears the studs out towards the front of the car. Remove the throttle body connector while pulling and the evap. purge solenoid line. It helps to flip the manifold over to do this.





m. Fully remove the intake from the engine and place towels in the runners to prevent debris from getting in during install.



8. When the intake is out of the vehicle, check for dried coolant on the intake ports or intake manifold. This indicates a faulty charge air cooler. Make sure to replace it before proceeding with installation. BMW part number is 17517846235.





9. Check the valves for carbon build up. DI exclusive engines will leave carbon deposits on the back sides of the valves because no fuel is spraying on the back of the valves. Use CRC GDI Valve Cleaner. A tutorial on how to use the product can be found at the following link.

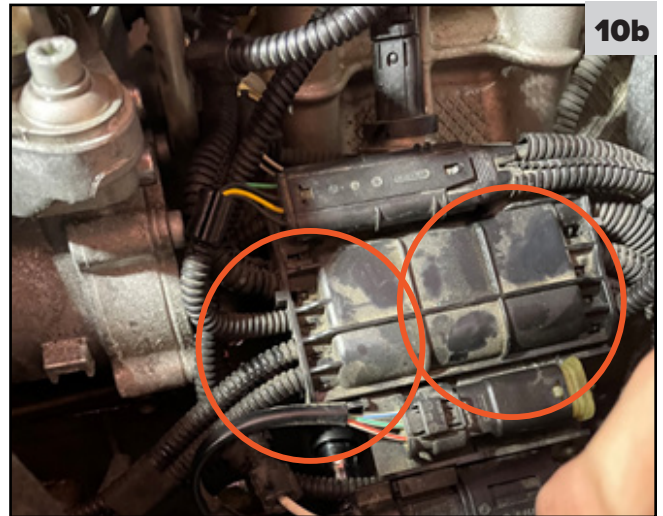
<https://www.crcindustries.com/how-to-use-crc-gdi-ivd-intake-valve-turbo-cleaner/>



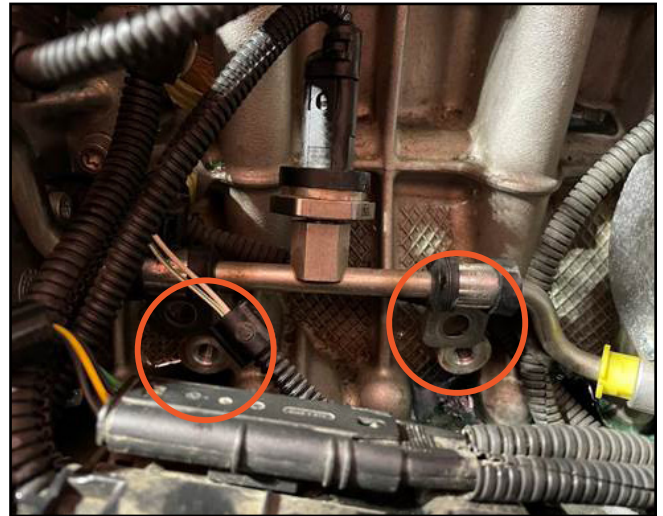
10. Remove the low-pressure fuel line.
 a. Fully loosen the low-pressure fuel line using a 17mm wrench on the locknuts. Note: it is likely that the fuel rail still has pressure. Make sure that you have absorption towels ready underneath the fittings as they are removed to catch any fuel.



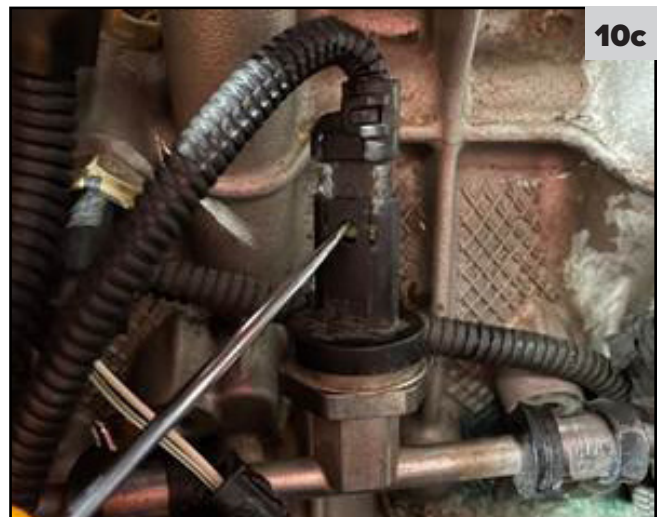
b. Remove the two bolts that are under the electrical housing that is right under the low-pressure sensor using a 14mm socket. Note: It will help if the socket is magnetic to avoid dropping the bolt into the undertray.



10b



c. Remove the electrical connection from the low-pressure fuel sensor.



10c

d. Remove the fuel line from the portion of the tube under the starter motor. To remove the fuel line, push the yellow tab firmly down into the collar of the fuel line and push the line in. When it seats into the collar, pull the fuel line out.

e. Fully remove the fuel line from the engine bay.



10d



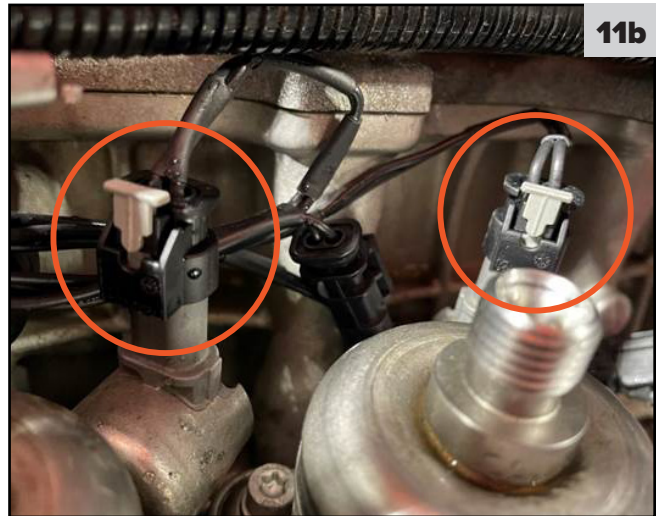
10e

11. Remove the high-pressure fuel lines
 a. Loosen and remove the locknuts on both ends of each high-pressure fuel line using a 17mm wrench.



b. Remove the high-pressure lines from the engine.

12. Remove the electrical connectors from the solenoids of the high-pressure fuel pump. **Make sure to note which connector went to which pump.**



11b

13. Remove the high-pressure fuel pumps
 a. Remove the bolts holding the high-pressure fuel pumps down using a T30 and 6-inch extension. Make sure to evenly remove each set of two bolts, alternating between each bolt each couple of turns to prevent damage to existing components.



b. Remove both high-pressure pumps from the vehicle.



13b

14. Remove the stock intake manifold studs using a E6 ETorx.



15. Remove the starter power cable routing bracket using a 11mm socket.

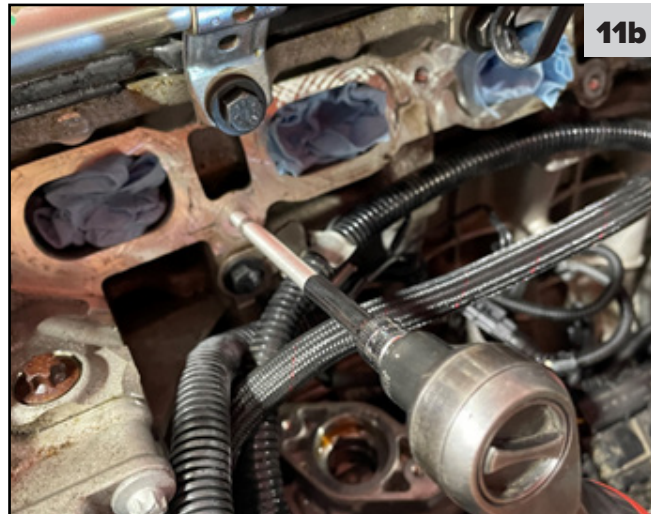


16. Remove the bolts that attach a mounting bracket to the back of the vacuum and pump housing using T30. **You will need those bolts for installation of the upgraded high-pressure fuel pumps.**



INSTALLATION

1. Install the included extended studs using an E6 Etorx

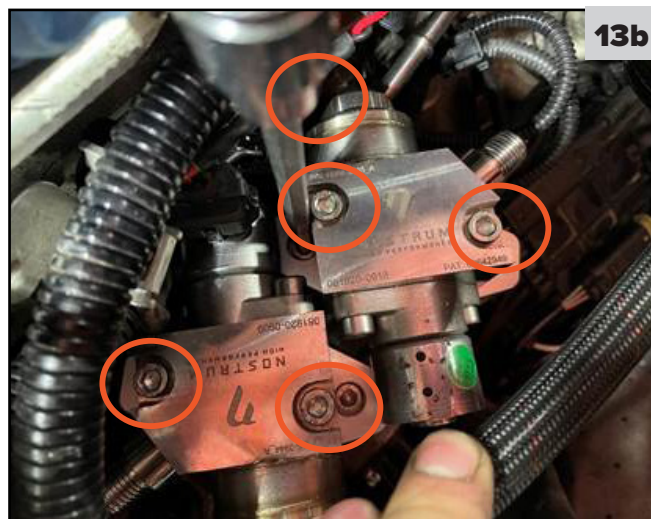


11b

2. Install the Nostrum HPFPs



a. Place each pump into the engine. Begin with the front pump then install the rear pump. Using an extended 5mm Allen key, alternate between the two bolts fixing the flange to the engine to avoid damage. Once the bolts are seated down, torque the bolts that attach the flange to the engine to 8.8 ft – lbs.



13b

3. Assemble the low-pressure split assembly.

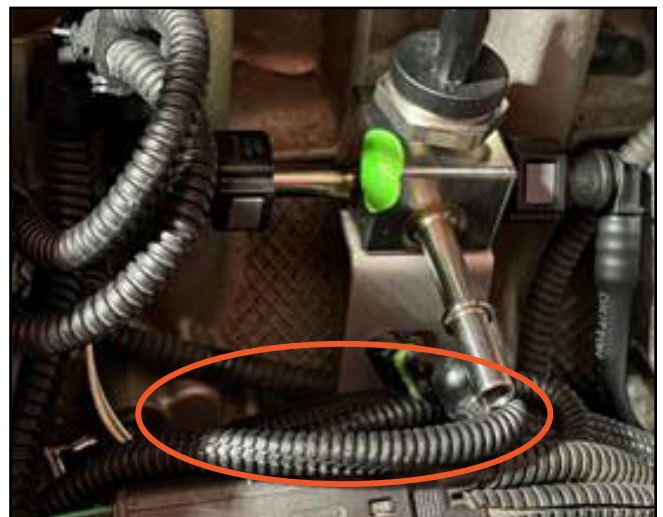
a. Attach L066-0945 to the split assembly bracket using the supplied M6x1 10mm bolts using a 4mm Allan key.



b. Attach two low pressure lines, the fuel feed tube and the tube that will connect to high-pressure fuel pump number two. Use the image below as reference.

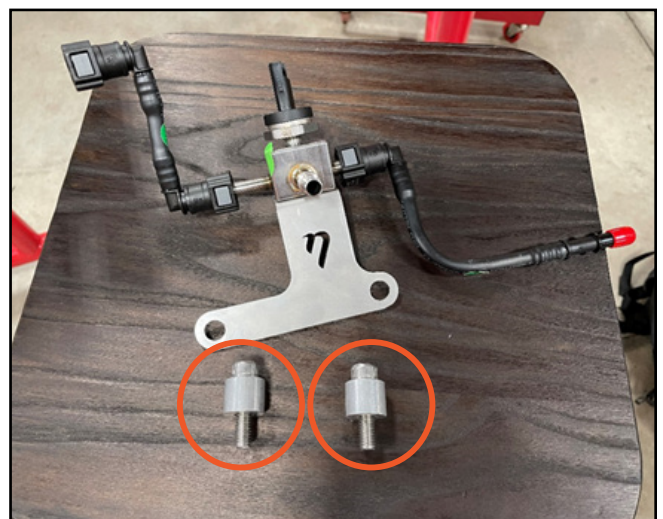


4. On the top of the wire housing underneath where the low-pressure feed tube was removed, there is a small wire housing. Separate it from the larger housing and tuck it beneath the larger wire housing by pulling it away and around the bottom of the harness. This gains clearance for the low-pressure line that will go to the first high-pressure fuel pump.



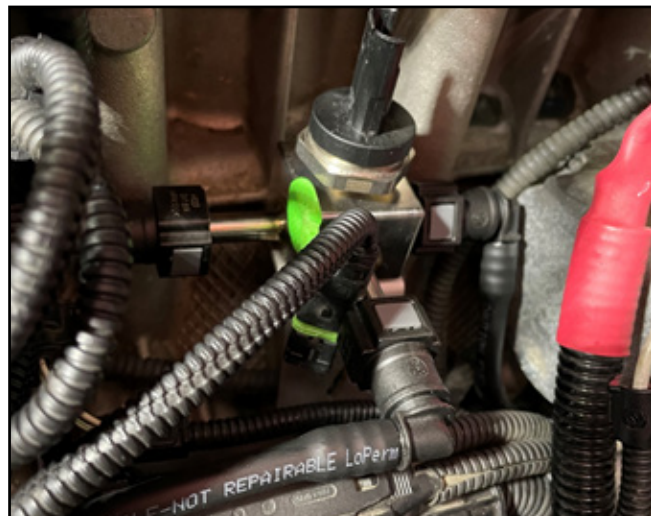


5. Install the t-split assembly into the vehicle
 a. Take two of the supplied M8 Spacers and the supplied M8 bolts (circled in blue below) and install the t-split assembly into the vehicle behind the electrical housing on top of the two spacers. This will use the same bolt holes where you removed the original low-pressure feed tube. The order of parts from the block out should be engine block, spacer, split assembly, then wiring harness box. Connect the pump tube to the high-pressure fuel pump number two before bolting everything in. You will need a 6mm hex key to install the M8 Bolts. Be careful to start the bolts first before torquing them in to prevent stripping the block, the bolt hole locations are very difficult to access.



5. Install the t-split assembly into the vehicle

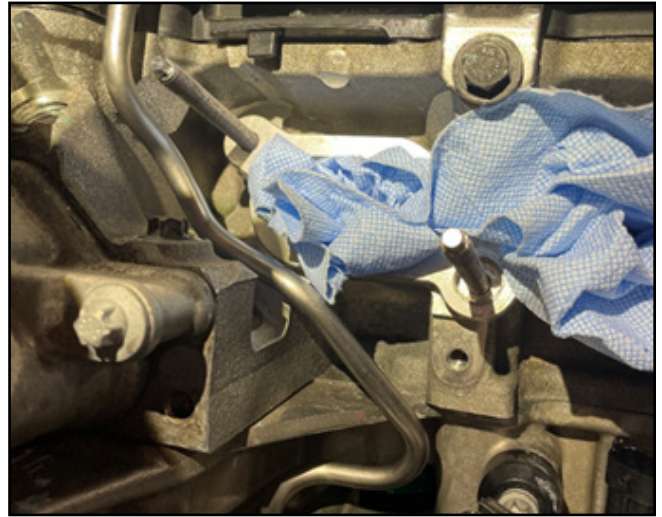
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b. Install the low-pressure tube that connects the t-split to high-pressure fuel pump number one.



6. Install the high-pressure tube from pump one to the fuel rail. Place both globe fittings into the fuel rail then tighten each side finger tight. The globes should be seated but the tube should still be able to articulate.

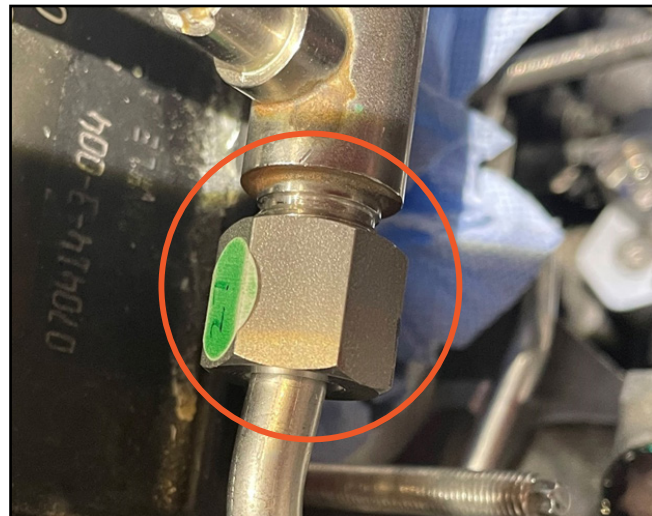
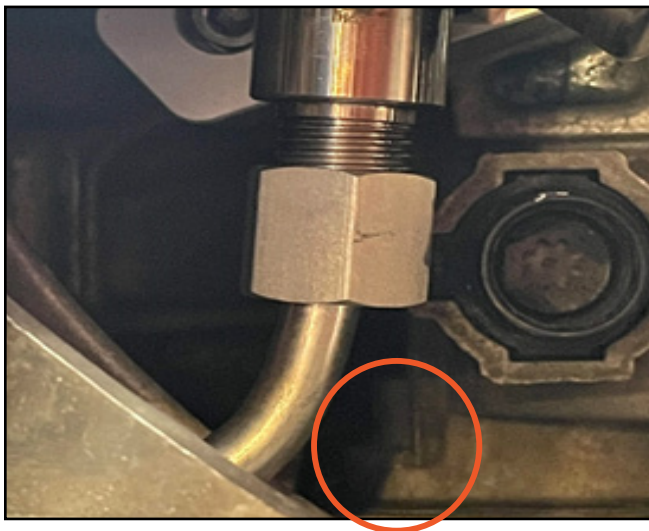


7. Once the tube is lightly in place, articulate the tube until there is no contact with the block or head of the engine. Once the tube is in place, tighten both lock nuts 20 ft-lbs using a 18mm crow's foot on a torque wrench.

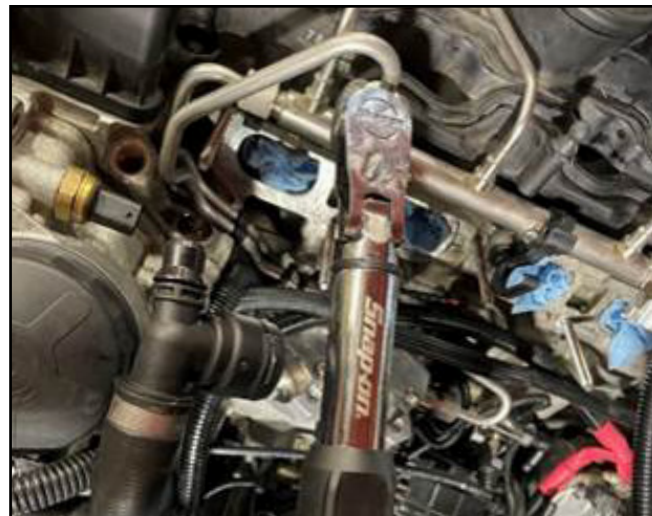


8. Ensure that once it is tightened, there is still no contact of the tube with the head or block of the motor. Circling in red is the most critical area for potential contact with the block but make sure to check the entire length of the tube. If you find an area of contact, repeat step 7, and reposition the tube. It is okay for the tube to not be exactly parallel to the high-pressure port on the high-pressure fuel pump and high-pressure fuel rail. Reference images of acceptable misalignment can be seen below.





9. Install the high-pressure tube from pump two to the fuel rail. Place the bottom globe fitting in first. Make sure that the tube is tucked behind the wire harnesses. Once the globe fittings are both in place tighten the tubes finger tight then torque to 20 ft-lbs. using a 18mm crow foot on a torque wrench.



10. Install one M8 spacer, p-clamp, and a M7 bolt into the tapped hole where you removed the routing bracket for the starter cable. This clamp will help to route the high-pressure tube from pump two to the fuel rail.



11. Install the W clip on the two tubes where they pass through the head to prevent the tubes from being able to contact the head during operation of the vehicle.



12. Install the feed line to vehicle fuel supply.



13. Install the low-pressure sensor connector to the new low-pressure sensor on the t-split.



14. Install the low-pressure routing bracket using to factory T30 bolts using the T30 bit. These bolts were previously removed from the pump and vacuum housing.



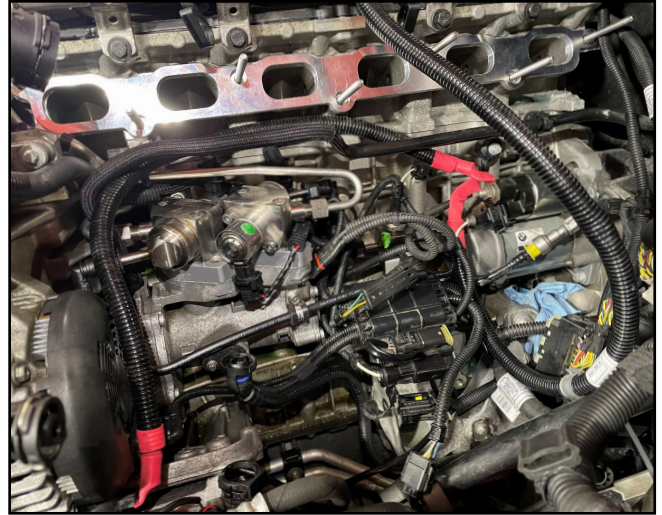
15. Attach the P-clamp onto the fuel line and to the bracket using the serrated nut and short M6 bolt using a 4mm hex key. You may need to hold the serrated nut with a 10mm wrench.



16. Install the six intake spacer gaskets into the intake spacer and install the intake spacer onto the head of the car.



17. The upgraded Nostrum Fuel System is done with installation. Now re-install the components that you removed in the disassembly portion of this installation guide and reference the stock service manual for torque specifications. Refill the coolant and bleed the system. It is recommended to clean the engine bay due to coolant leakage during disassembly.



18. Installation Completed



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 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 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! **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)



N O S T R U M
HIGH PERFORMANCE



BMW S55 Stage 1 and 2 Injector Installation Guide

SKU#: H703-1257-1/H710-1164-1

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BMW S55 H703-1257-1 H710-1164-1 Install Guide Rev 2 | 1145 Oak Valley Drive, Suite B,
Ann Arbor, MI 48108 | 734-548-8677 | support@nostrumshop.com | **Page 1**

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Required Tools:

- Socket Wrench
- 10mm Socket
- 13mm Socket
- 16mm Socket
- 6mm Socket
- Trim Tool
- 8mm Socket
- 11mm Socket
- T27 Torx
- Allen 5mm
- 18mm Wrench
- 14mm Crows Foot
- Pick
- Injector Removal Tool
- Compression Tool

Expendables:

- Dielectric Grease
- Absorbent Mats

1. Lift trunk floor cover and disconnect negative battery terminal with a 10mm socket.

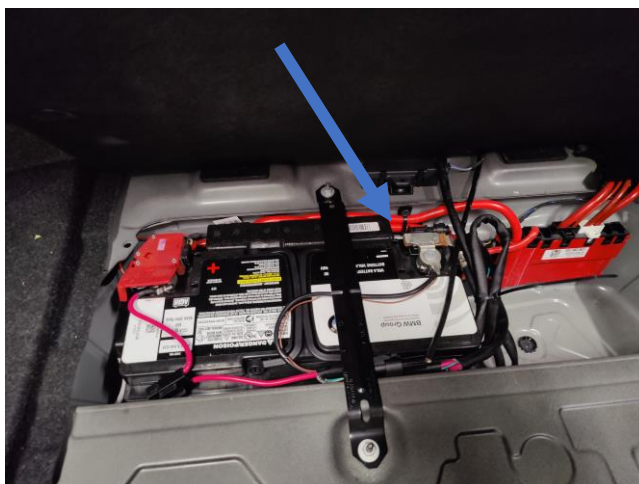


Figure 1

2. Use 10mm socket to remove the plastic clips holding the windshield wiper cowl. Remove the passenger and driver cowl.



Figure 2

3. Remove retainment cable from the rubber insulator between the wiper cowl and the engine.



Figure 3

4. Remove retainment clips on the strut towers using a trim tool. Then remove rubber cover.



Figure 4

5. Remove retainment clips to remove the fender edge trim.



Figure 5

6. Remove 7 bolts that secure the cross bar using a 13mm socket. Then remove the crossbar. (Torque Spec: 28 Nm)



Figure 6

7. Remove bolts from the driver and passenger side strut tower using a 13mm socket. **(Torque Spec: 56 Nm)**



Figure 7

8. Remove bolts on each side of the strut bracket in the upper engine bay using a 16mm socket. **(Torque Spec: 56 Nm)**

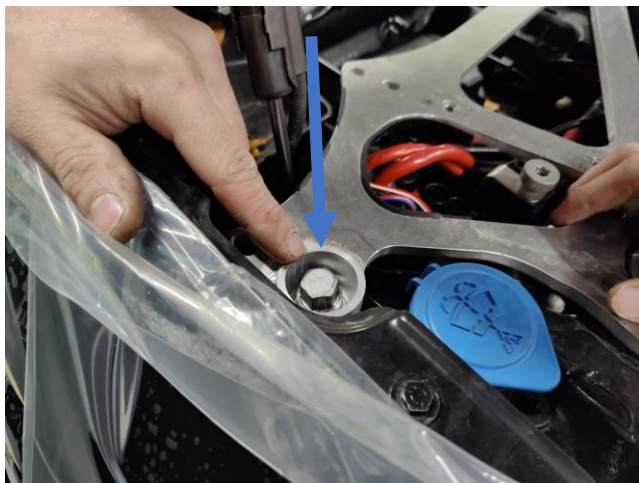


Figure 8

9. Remove covers over the wiper cowl bracket bolts.

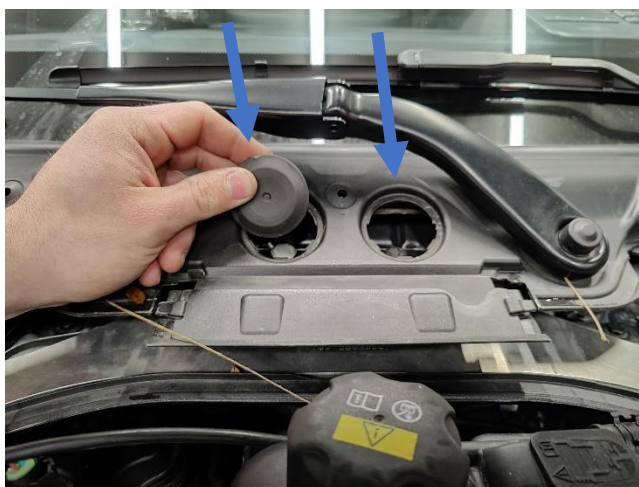


Figure 9

10. Remove wiper cowl bracket bolts using a 16mm socket.



Figure 10

11. Remove the strut bracket from the engine bay.



Figure 11

12. Remove the bolts holding the lower section of the wiper cowl using a 10mm socket. Remove it from the engine bay.



Figure 12

13. Drain coolant from the intercooler to prevent any coolant leaking once the intercooler is removed.



Figure 13

14. Disconnect the charge pipes from the intercooler by loosening the hose clamps with an 8mm socket.



Figure 14

15. Disconnect the charge tube at the bottom of the intercooler by loosening the hose clamps with a 6mm socket.



Figure 15

16. Remove the manifold absolute pressure sensor at the back of the intercooler.



Figure 16

17. Remove the coolant lines at the front of the intercooler. Use a pick to pull the latch out of the fitting to free it from the intercooler.



Figure 17

18. Remove hose clamp connecting the charge tube to the airbox using a 6mm socket.



Figure 18

19. Remove the bolt holding the charge tube bracket to the engine using a 10mm socket.

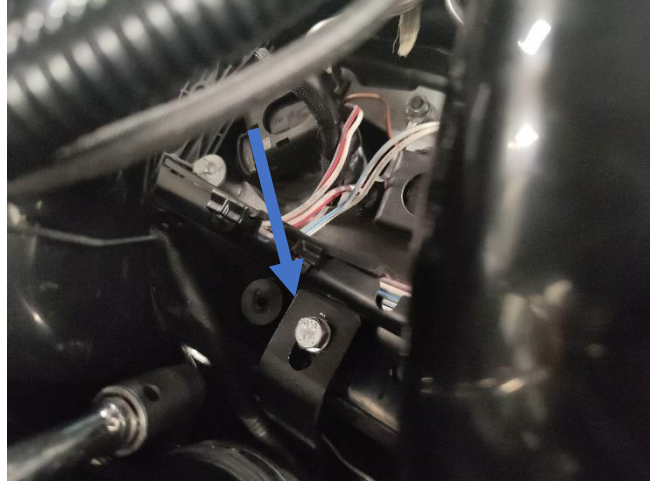


Figure 19

20. Remove charge tube leading from the airbox to the engine block.



Figure 20

21. Remove the bolt holding the front charge tube on the passenger side of engine to the engine block using a T27 Torx. It is the charge tube leading to the intercooler. **(Torque Spec: 10 Nm)**



Figure 21

22. Use an Allen 5mm to remove the back charge tube on the passenger side of the engine. **(Torque Spec: 10 Nm)**



Figure 22

23. Remove the electrical wires that are retained parallel to the fuel rail.



Figure 23

24. Once the wires are free, remove the connector for the variable vanos lift control valve and pull it away from the fuel rail.



Figure 24

25. Disconnect pressure sensor connector on the back of the fuel rail.



Figure 25

26. Loosen the compression nuts for both high-pressure fuel lines that feed into the fuel rail using a 18mm wrench. Use a rag or absorbent towel to catch any fuel that may exit the lines. (**Torque Spec: 30 Nm**)

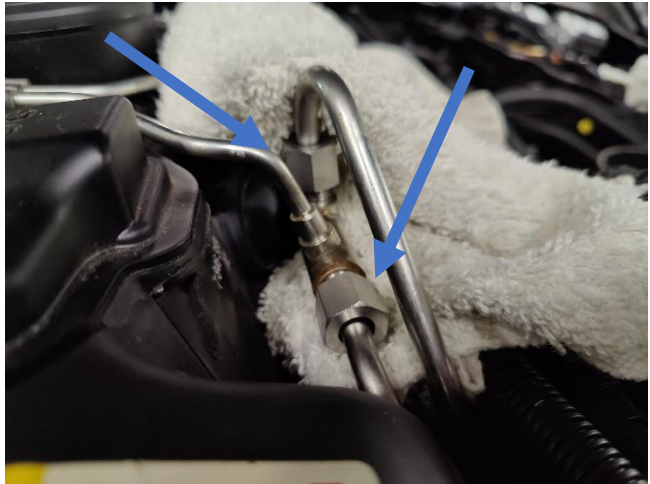


Figure 26

27. Remove the wire loom holders off the rail by pulling them back and then down.



Figure 27

28. Use an 8mm socket to remove the bolt holding the electrical wires for the injectors in place.



Figure 28

29. Pull the latch up on the injector coil packs.

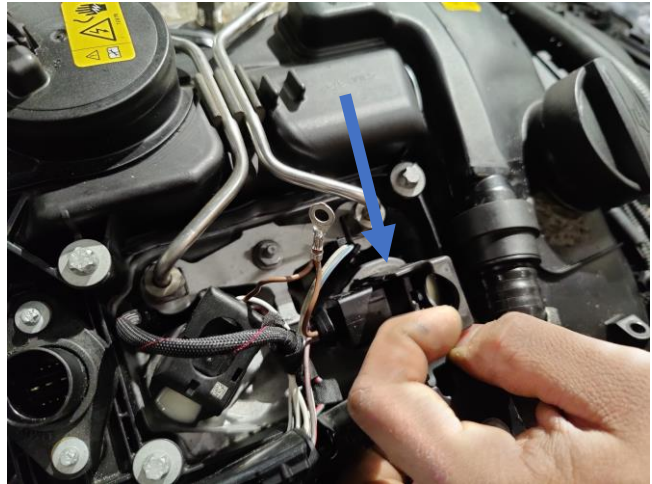


Figure 29

30. Remove the coil pack electrical connector from the end of each coil pack.



Figure 30

31. Pull the coil packs out by hand.

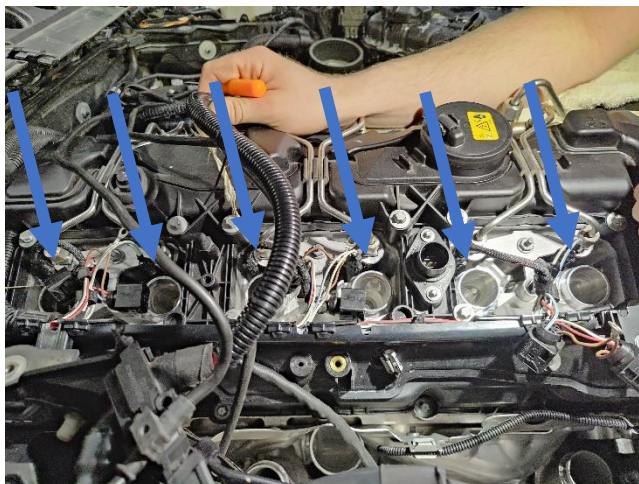


Figure 31

32. Remove the injector connectors by using a pick to disconnect tabs and lightly pulling on the connector



Figure 32

33. Loosen the compression nuts that lead from the fuel rail to each individual injector with a 14mm crow foot. (**Torque Spec: 23 Nm**)



Figure 33

34. Remove the bolts holding the rail in place using a 11mm socket. **(Torque Spec: 13 Nm)**



Figure 34

35. Remove the fuel rail from the engine bay.



Figure 35

36. Remove the bolts holding the Injector bracket over the injectors using a 10mm socket. **(Torque Spec: 13 Nm)**



Figure 36

37. Pull the brackets off the injectors.

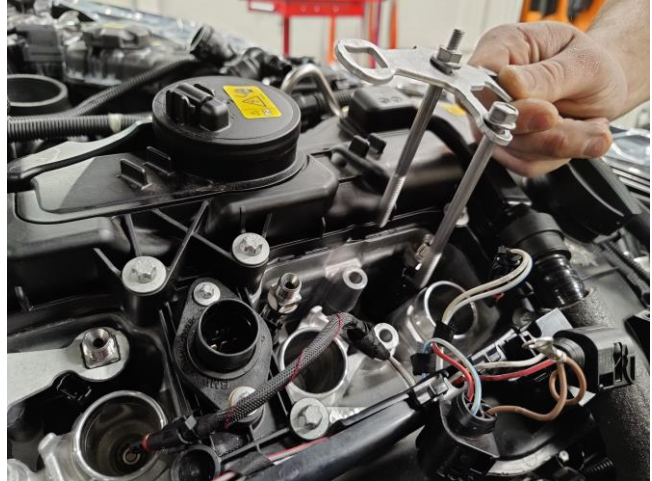


Figure 37

38. Grab the threads on the top of the injector and pull it out of its seated position.

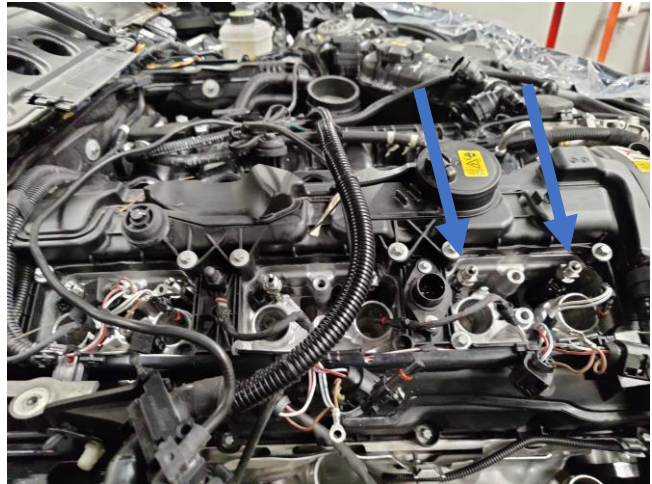


Figure 38

39. If you are unable to pull the injectors out, you can use an injector removal tool to remove the injectors. Tighten down over the injectors first by hand using the circle grips on the top of the tool on either side. Next tighten the 2 middle bolts on the tool. Next tighten down the Brass bolts on either side of the tool to remove the injectors. Finally loosen the middle 2 bolts to remove the tool with the injectors attached. Repeat for all remaining injectors



Figure 39

40. Place the injector on an absorbent mat in a clean space. Keep them aside. Installation of the new Nostrum injectors can now take place.



Figure 40

41. Record the flow numbers and cylinder assignments of each new injector. The flow number can be found printed on the threaded stud on the back of the injector. You will need this information when it's time to code the injectors. Place engine oil onto the stem of the new Nostrum injectors by using your finger to spread the oil across the stem.



Figure 41

42. Place the compression tool over the stem twisting clockwise as you press. Press to stop.
43. Once the compression tool is on the injector pull it off while twisting clockwise after 15 seconds.



Figure 42

44. Install each injector within 20 seconds of pulling the compression tool off the stem of the injector. Place the Nostrum injector with the connector facing to the left of the coil pack socket. There is space for the solenoid connector in its seating location. This will make it easier to seat correctly.



Figure 43

45. Press the injector bracket over the 2 injectors with the bolts for the bracket also in the correct slots. The square openings in the injector bracket should be over the injectors.



Figure 44

46. Once the Injectors have been installed reassembly of the vehicle can begin. Repeat steps in reverse starting with step 36. 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 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 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!! (Refer to Injector Coding Procedure)**

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.

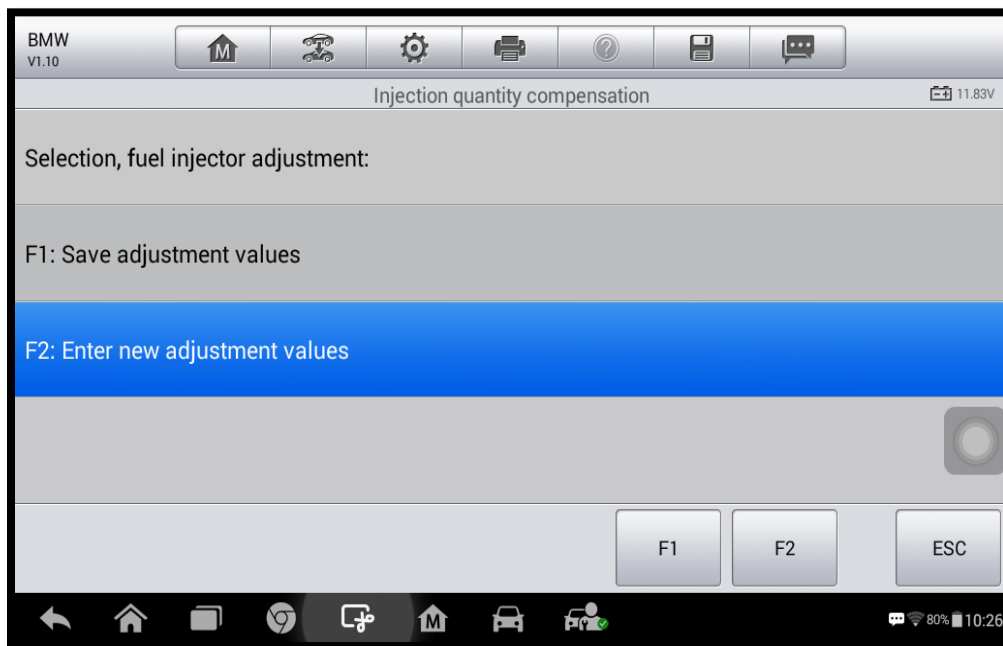
NOTE: After driving the car and letting it cool, next day, check for fuel leaks again (from thermal expansion and contraction). Retighten fittings if needed.

Injector Coding Procedure:

The Nostrum Stage 1 and Stage 2 injectors take advantage of the BMW injector coding system where the individual flow variance of each injector is coded into the DME to improve the consistency of startup and idle. The injectors can be coded using multiple scan tools such as ISTA+ or Autel MaxiSys. Lastly, the process of injector coding also erases adaptation for the old injectors.

Procedure for Autel MaxiSys:

- 1.) Connect the service tool to the OBDII port and launch the diagnostics program
- 2.) Read the vehicle information from OBDII port (recommended) or manually enter it
- 3.) After the vehicle data has loaded select "hot function" then "injectors" icon shown to the right
- 4.) Select "Injector Quantity Compensation" and you should see a menu similar to what is shown below
- 5.) Enter the new Injector adjustment value for each injector that you recorded prior to installation
- 6.) Finally save the new adjustment values, close out of the program, and key off to let the ECU go to sleep



**For
additional
technical &**

software support please contact:

Email: support@nostrumshop.com

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Revision	Notes	Date
Rev 1	Production Release	11/29/21
Rev 2	Injector Coding Procedure	4/6/22