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GROUP: 18 - Vehicle Performance

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This bulletin supersedes Technical Service Bulletin (TSB) 18-054-21 REV. A, date of issue December 21, 2021, which should be removed from your files. All revisions are highlighted with **asterisks**** and include adding supplier part numbers, additional figure, note and repair steps.**

SUBJECT:

Diesel Fuel Pump Failure and System Contamination

OVERVIEW:

This bulletin involves inspecting for fuel pump failure and fuel system contamination. Also fuel system cleaning and fuel system kit replacement.

MODELS:

2019	(DD)	RAM 3500 Cab Chassis
2019	(DP)	RAM 4500/5500 Cab Chassis
2019	(D2)	RAM 3500 Pickup
2019	(DJ)	RAM 2500 Pickup

NOTE: This bulletin applies to vehicles within the following markets/countries: North America.

NOTE: This bulletin applies to vehicles equipped with a 6.7L I6 Cummins Turbo Diesel Engine (Sales Code ETN and ETL) or 6.7L I6 Cummins HO Turbo Diesel Engine (Sales Code ETM).

SYMPTOM/CONDITION:

Customers may experience a Malfunction Indicator Lamp (MIL) illumination. Upon further investigation the technician may find that one or more of the following Diagnostic Trouble Codes (DTCs) have been set:

- P0087-00 - Fuel Rail Pressure Too Low.
- P008A-00 - Low Pressure Fuel System Pressure - Too Low.
- P0201-00 - Fuel Injector 1 Circuit/Open.
- P0202-00 - Fuel Injector 2 Circuit/Open.
- P0203-00 - Fuel Injector 3 Circuit/Open.
- P0204-00 - Fuel Injector 4 Circuit/Open.
- P0205-00 - Fuel Injector 5 Circuit/Open.
- P0206-00 - Fuel Injector 6 Circuit/Open.

The customer may also notice the following:

- Engine will not start.

DIAGNOSIS:

Using a Scan Tool (wiTECH) with the appropriate Diagnostic Procedures available in DealerCONNECT/Service Library, verify all related systems are functioning as designed. If DTCs or symptom conditions, other than the ones listed above are present, record the issues on the repair order and repair as necessary before proceeding further with this bulletin.

NOTE: Foreign contaminants are typically not covered under warranty. Please be sure to follow all published warranty repair guidelines regarding repairs to fuel systems contaminated with foreign contaminants.

If the customer describes the symptom/conditions listed above or if the technician finds the DTCs, perform the Inspection Procedure.

INSPECTION:

1. Remove the Fuel Quantity Solenoid (FQS) from the injection pump. Refer to Service Library Service Information Section: 14 - Fuel System / Fuel Delivery, Diesel / Solenoid, Fuel Quantity / Removal.
2. Inspect the FQS screen as well as the FQS bore for signs of metal contamination (Fig. 1) .
3. Was any signs of metal found?
 - YES>>> Proceed to [Step 4](#) of the Inspection Procedure.
 - NO>>> This service bulletin does not apply. Further diagnosis is required. Proceed to [Step 6](#) of the Inspection Procedure to reinstall the FQS.



Fig. 1

Metal Contamination On The FQS And In The FQS Bore

4. Take an appropriate fuel sample, and inspect for signs of foreign contaminants (e.g. DEF, gas, rust, dirt, or other foreign debris). Refer to Service Library, Service Information Section 14 - Fuel System > Fuel Delivery, Diesel > Standard Procedure > Diesel Fuel Contamination Testing Procedure.

NOTE: Foreign contaminants are typically not covered under warranty. Please be sure to follow all published warranty repair guidelines regarding repairs to fuel systems contaminated with foreign contaminants.

5. Were any foreign contaminants (e.g. DEF, gas, rust, dirt, or other foreign debris) found in the fuel sample?
 - YES>>> Please refer to all **warranty repair guidelines** before continuing with fuel system repair. Proceed to [Step 1](#) of the Repair Procedure.
 - NO>>> Proceed to [Step 1](#) of the Repair Procedure.
6. Install the Fuel Quantity Solenoid (FQS) from the injection pump. Refer to Service Library Service Information Section: 14 - Fuel System / Fuel Delivery, Diesel / Solenoid, Fuel Quantity / Installation.

PARTS REQUIRED:

NOTE: Before ordering any Fuel System Kits make sure there are no parts restrictions. If there is a parts restriction, make sure to follow the instructions to order the kits.

Qty.	Part No.	Description
1 (A/R)	68579319AA	Pump, Fuel Upfit Kit (HO and SO)
1 (A/R)	R8583897AA	Fuel System Kit (HO) (Sales Code ETM)
1 (A/R)	R8583898AA	Fuel System Kit (SO) (Sales Code ETN or ETL)

Parts NOT Included In The Kit.

NOTE: Order In-Tank lift pump based on the parts catalog using the VIN

Qty.	Part No.	Description
1	05145571AA	Pump - In-Tank Module (Lift Pump) DJ/D2 28 Gallon (Sales Code NGC), 32 Gallon (Sales Code NFX) and 31 Gallon (Sales Code NFT)
1	68490266AA	Pump - In-Tank Module (Lift Pump) DJ/D2 50 Gallon (Sales Code NFC)
1	04560227AB	Pump - In-Tank Module (Lift Pump) DD/DP 22 Gallon (Sales Code NFA)
1	68084721AA	Pump - In-Tank Module (Lift Pump) DD/DP 52 Gallon (Sales Code NFH)
1	68002992AA	Washer, Banjo Bolt
1	68005162AA	Gasket CC

Parts Included In The Fuel System Repair Kit.

Qty.	Part No.	Description
6	R8444790AA	Injector - Fuel (HO Sales code ETM)
1	68447760AA	Rail - Fuel
1	68479996AA	Line 1 - Fuel
1	68479997AA	Line 2 - Fuel
1	68479998AA	Line 3 - Fuel
1	68479999AA	Line 4 - Fuel
1	68480000AA	Line 5 - Fuel
1	68480003AA	Line 6 - Fuel
1	68417030AA	Connector - High Pressure Tube Kit (6 Tubes)
1	68157291AA	Filter - Fuel (Engine Mounted)
1	68436631AA	Filter - Fuel (Chassis Mounted)

Parts Included In The Fuel Pump Upfit Kit.

Qty.	Mopar Part No.	**Supplier Part No.**	Description
1	68573988AA	**5683562	Pump - Fuel
1	68573990AA	5684299	Adapter - Pilot
1	68573989AA	5684301	Adapter Plate - Fuel Pump
1	68573991AA	5683566	Harness - Jumper
1	68573993AA	5684303	Support - Fuel Pump
1	68573994AA	5685063	Spacer - Threaded
1	68573995AA	5684069	Tube - Injector Fuel Supply
1	68573996AA	5687735	Tube - Fuel Supply
1	68573997AA	5684067	Tube - Fuel Drain
1	68573999AA	5688160	Plug - Rail
1	68574000AA	5684423	Bracket - ECM
1	68573998AA	5688063	Connector - Quick Disconnect
1	68578594AA	5689139	Mount - Swivel Tie
1	68359768AF	5708745	Hose - Power Steering
2	68578595AA	5689141	Bolt - Low Profile
2	4638665	3900678	Screw - Hex Flange Head
1	4429446	3901446	Screw - Hex Flange Head
2	68578596AA	3420835	Screw - Socket Head Cap
1	4429114	3902114	Screw - Hex Flange Head
1	4429630	3900630	Screw - Hex Flange Head
1	68444371AA	5362113	Seal - O-Ring

Qty.	Mopar Part No.	**Supplier Part No.**	Description
1	68086175AA	5256193	Washer - Spring
1	68533229AA	5624797	Inlet - Quick Disconnect Fuel Pump
1	05086769AA	4890634	Nut - Hex
3	68038172AA	3062329	Tie - Wire
1	4429689	3900589**	Nut

REPAIR PROCEDURE:

1. Remove the fuel tank. Refer to Service Library Service Information Section 14-Fuel System > Fuel Delivery, Diesel > Tank, Fuel > Removal.
2. Using appropriate storage and/or disposal methods, in accordance with your local regulations drain, and dispose of all of the contaminated fuel from the fuel tank.

NOTE: Do not attempt to flush any of the fuel components (high or low pressure) using Brakleen™ or similar harsh solvent cleaners. This may cause damage to any internal coatings. For an effective repair, all high pressure fuel system components should be replaced.

3. Thoroughly clean, and flush the fuel tank using fresh, clean, diesel fuel.

NOTE: The In-tank fuel pump (lift pump) is not part of the Fuel System Kit and must be ordered separately based on the VIN.

4. Replace the in-tank fuel pump module.

NOTE: In some vehicle applications, leave the fuel tank partially installed to allow access to the fuel return line fitting.

5. Reinstall the fuel tank, leaving the chassis fuel return line disconnected at the tank.
6. Fill the tank with 10 gallons of fresh fuel.
7. Remove the chassis mounted fuel filter element.
8. Place an appropriate catch basin under the fuel filter housing to capture all fuel expelled during the next steps.
9. Turn the ignition to run, and allow the in-tank fuel pump to run a complete cycle (approx. 15 seconds). Capture all of the fuel expelled from the filter housing.
10. Using wiTECH, navigate to the PCM "Actuators" tab, and perform the Lift Pump Relay routine to activate the in-tank fuel pump. This routine will run the pump for 20 seconds. Capture all fuel expelled from the fuel filter housing.
11. Repeat [Step 10](#), two additional times.
12. Install a new chassis mounted fuel filter element.
13. Place an appropriate catch basin under the engine mounted fuel filter housing to capture all fuel expelled during the next steps.
14. Open the drain valve, and drain the engine mounted fuel filter housing.
15. Remove the filter element. Leave the drain valve open at this time.
16. Thoroughly clean the filter housing bowl of all debris.
17. Using wiTECH, perform the Lift Pump Relay routine to activate the in-tank fuel pump. The fuel filter housing will begin to fill. If necessary, stop the routine before the housing begins to overflow.

18. Allow the housing to fully drain, and clean out any additional debris that is present.
19. Repeat [Step 16](#), [Step 17](#) and [Step 18](#), two additional times.
20. Install a new fuel filter element, and tighten the cap to specifications.
21. Close the fuel filter housing drain valve.
22. Disconnect the fuel supply hose from the high pressure fuel injection pump.
23. Connect a suitable hose to the fuel supply hose, and route it into a suitable container.
24. Using wiTECH, perform the Lift Pump Relay routine to activate the in-tank fuel pump for 1 complete cycle to flush any contaminants out of the supply line.
25. Replace the High Pressure Fuel Injection Pump. The pump has been updated and requires additional steps to install. Please refer to the **High Pressure Fuel Injection Pump Installation procedure** in [Step 1](#) below.
26. Replace the High Pressure Fuel Rail. Refer to Service Library, Service Information Section 14-Fuel System > Fuel Delivery, Diesel > Rail, Fuel > Removal and Installation.
27. Replace all 6 fuel injectors, and injector connector tubes. Refer to Service Library, Service Information Section 09 – Engine, 6.7L Diesel > Fuel Injection > Injector(s), Fuel > Removal, and Installation.
28. Install new high pressure fuel rail to injector connector tube fuel lines.

NOTE: Ensure that the provided fuel line isolators (PN 68447788AA) are properly secured onto the #3 and #4 fuel rail to injector connector tube fuel lines as shown ([Fig. 2](#)).

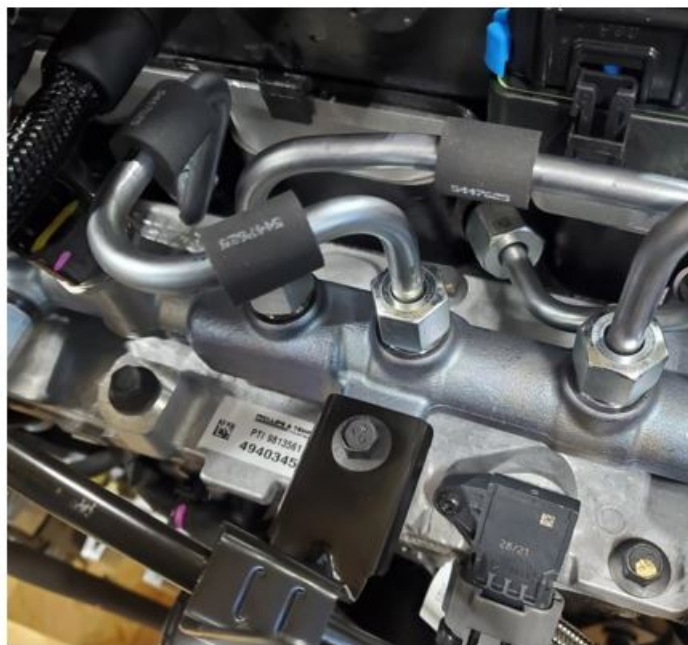


Fig. 2
Fuel Lines With Isolators

29. Install new high pressure fuel injection pump to rail supply lines.
30. Attach a suitable hose to the fuel return line fitting left disconnected at the tank in [Step 5](#).
31. Route the hose into a suitable container.

CAUTION! The PCM **MUST** be programmed with the correct calibration to support the new High Pressure Fuel Injection pump. If the correct PCM calibration with the CP3.3 injection pump description is not showing in wiTECH, “STOP” and contact Star.

NOTE: Install a battery charger to ensure battery voltage does not drop below 13.2 volts. Do not allow the charging voltage to climb above 13.5 volts during the flash process.

NOTE: If this flash process is interrupted/aborted, the flash should be restarted.

32. Reprogram the PCM with the correct calibration for the new High Pressure Fuel Injection Pump. Ensure that the calibration being selected is labeled with CP3.3 in the calibration description.
33. Clear all DTCs that may have been set in any module due to reprogramming. The wiTECH application will automatically present all DTCs after the flash and allow them to be cleared.
34. Using wiTECH, perform the “Oil Life Restore” procedure located in the ECM “Misc Functions”.
35. Prime the fuel system. Refer to Service Library, Service Information Section 14 – Fuel System > Fuel Delivery, Diesel > Standard Procedure > Fuel System Priming, Diesel.
36. Start the engine, and allow it to run until approximately 2-3 gallons of fuel has been captured from the fuel return line. This ensures that any debris in any of the remaining fuel return system components, including the cylinder head, has been fully expelled from the system.
37. Reconnect the chassis fuel return line at the tank.
38. Install the fuel tank. Refer to Service Library Service Information Section 14-Fuel System > Fuel Delivery, Diesel > Tank, Fuel > Installation.
39. Top off the fuel tank with fresh fuel if necessary, and verify the repair.

HIGH PRESSURE FUEL INJECTION PUMP INSTALLATION:

1. Remove the High Pressure Fuel Injection Pump. Refer to Service Library, Service Information Section 14-Fuel System > Fuel Delivery, Diesel > Pump, Fuel Injection > Removal.
2. Remove the ECM and existing ECM support bracket. Refer to Service Library, Service Information Section 08-Electrical > Electronic Control Modules >Module, Powertrain Control, (PCM) 6.7L Diesel > Removal. **Discard the original support bracket.**
3. Remove all three fuel pump mounting studs in the front gear housing and discard them (Fig. 3) .

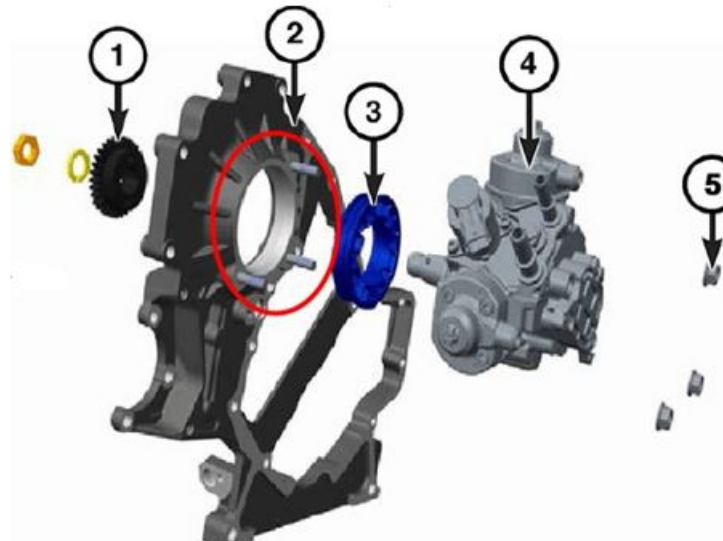


Fig. 3
Remove Stud Location

- 1 - Fuel Pump Gear
- 2 - Pump Mounting Studs
- 3 - Pilot Adapter
- 4 - Fuel Pump
- 5 - Fuel Pump Mounting Nuts

4. Use a M8 x 1.25 tap to clean out all three holes where the studs were removed.
5. Install the fuel pump adapter plate **** (Mopar PN 68573989AA /Supplier PN 5684301)**** with the flattened side pointing down so there is clearance for the cam positioning sensor and counterbores facing the fuel pump.
6. Loosely install both of the 25mm, M8 bolts **** (Mopar PN 68578596AA /Supplier PN 3420835)**** into the 2 bolt holes near the engine (**Fig. 4**) .



Fig. 4
Fuel Pump Mounting Adapter Plate

- 1 - New Fuel Pump Faster location
- 2 - Adapter Plate Faster

7. Loosely install bolt **** (Mopar PN 4429446 /Supplier PN 3901446)**** in location (1) (**Fig. 4**) to help properly align the adapter before tightening bolts **** (Mopar PN 68578596AA /Supplier PN 3420835)**. Tighten both bolts to 24 N·m (17.7 ft.lbs.).
8. Remove the loosely installed bolt in location (1) (**Fig. 4**) . This will be used in a later step.

9. Before assembling the fuel pump, check and clean all mounting surface for nick, cuts or damage. Also check pump shaft and gear. Clean all surfaces of dirt and grease.

NOTE: Do not use a hammer or press to install the pilot adapter on to the pump. The pilot adapter can be install by hand.

10. Lubricate **new** O-ring ******(Mopar PN 68444371AA /Supplier PN 5362113)****** on the pump body with engine oil and then install the pilot adapter onto the pump body with the smaller diameter side towards the fuel pump (Fig. 5) .

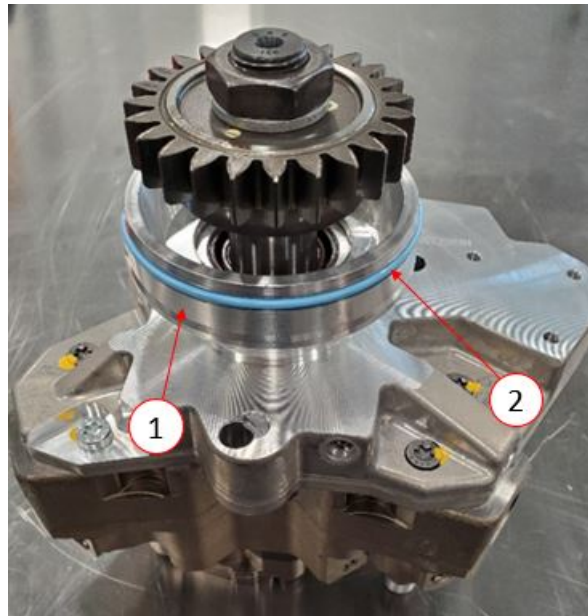


Fig. 5
Pilot Adapter on Fuel Pump

- 1 - Pilot Adapter
 - 2 - Pilot Adapter O-ring
-

11. Install the fuel pump gear onto the fuel pump shaft.
12. Using a **new** fuel pump washer ******(Mopar PN 68086175AA /Supplier PN 5256193)****** Install washer and original nut to pump shaft and tighten the nut finger tight only.
13. Use the Fuel Pump Gear Holder to hold the fuel pump gear in place while tightening the fuel pump gear mount nut to 105 N·m (77.4 ft.lbs.).

14. Install the supply and return quick disconnect fittings onto the pump as shown below and tighten to 24 N·m (17.7 ft lbs) (Fig. 6) .

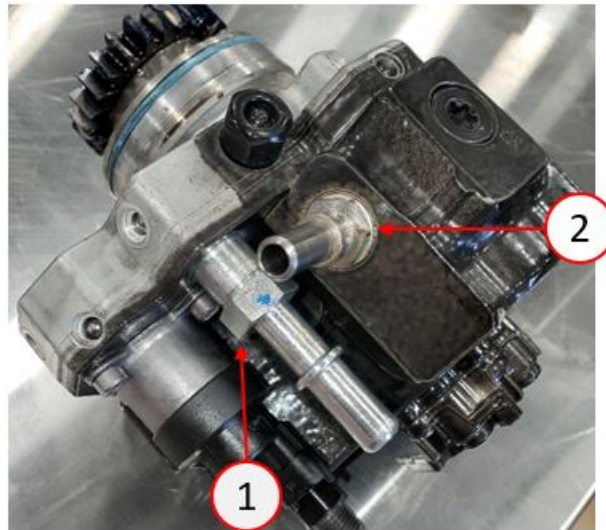


Fig. 6

Supply and Return Fitting Location

- 1 - Return Quick Connect Fitting
2 - Supply Quick Connect Fitting

15. **Fuel Injection Pump Phasing:** Perform the following phasing procedure anytime the injection pump has been removed and reinstalled.
16. Make sure engine cylinder 1 is at Top Dead Center (TDC) position.
17. Locate the end of the fuel injection pump shaft. Two numbers ****067 and 0**** are stamped into the end of the shaft.
18. Rotate the injection pump shaft until the number ****6** (located in the center of number 067 and 0) is positioned at 9 o'clock (Fig. 7) .

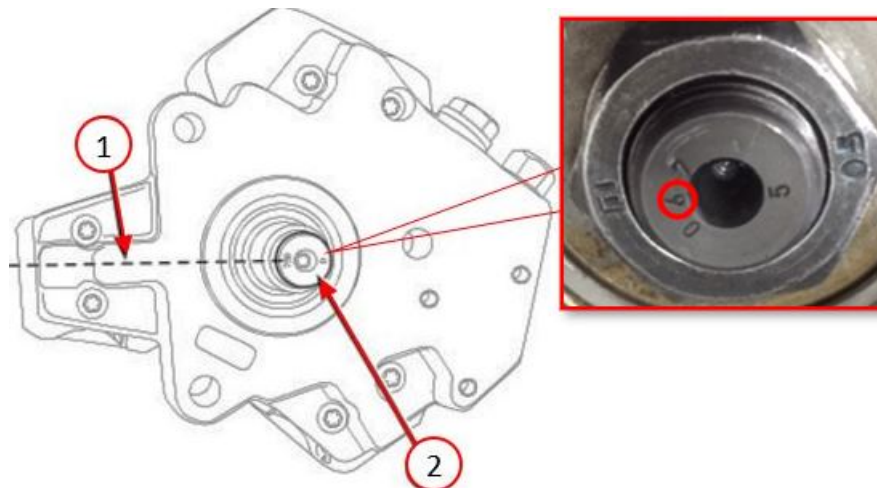


Fig. 7

Fuel Pump Shaft

- 1 - 9 O-Clock Position
2 - Shaft With ****067**** Markings

NOTE: **It may be easier to remove the bolt from the CCV Breather Adapter. (Fig. 8) .**



Fig. 8
CCV Breather Adapter Bolt

1 - Adapter Bolt**

19. Position the injection pump to mounting flange on gear housing while aligning injection pump shaft through back of injection pump gear. Be sure the number **6** is still at the 9 o'clock position.
20. Before installing the pump use a clean rag, wipe the back side of the camshaft gear to remove residual oil. It is only necessary to wipe the portion of the camshaft gear which is accessible through the fuel pump bore in the gear housing.
21. The pump will need to be rotated to fit correctly in the space claim.
22. Install the long 60 mm cap screw **** (Mopar PN 4429446 /Supplier PN 3901446). ** (Fig. 9)** first loosely (yellow bolt in picture below).
23. Then install the two shorter 40 mm cap screws **** (Mopar PN 4638665 /Supplier PN 3900678). ** (Fig. 9)** (blue bolt in picture below).

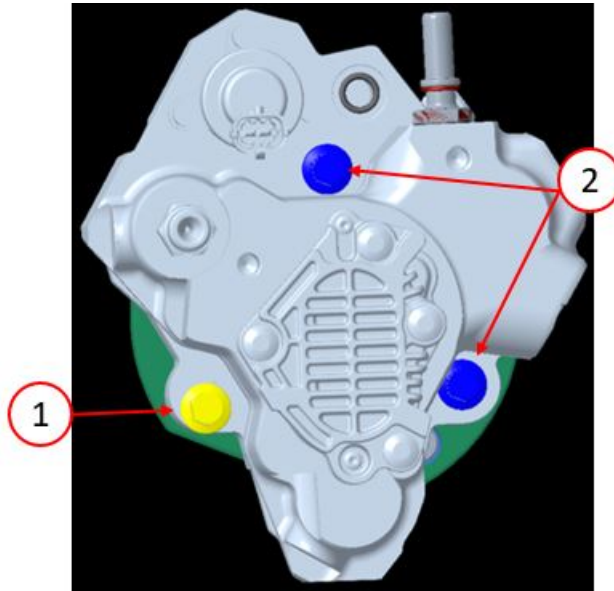


Fig. 9
Fuel Pump Faster Location

- 1 - 60 mm cap screw ******(Mopar PN 4429446 /Supplier PN 3901446)******
 - 2 - 40 mm cap screws ******(Mopar PN 4638665 /Supplier PN 3900678)******
-

- 24. Ensure that the fuel pump is sitting flush to the adapter face.
- 25. Ensure that there is adequate clearance to the cam position sensor and the paint cap is removed if needed.
- 26. Tighten the fuel pump cap screws to 24Nm (17.7 ft.lbs.).
- 27. ******Remove and discard old harness retainer stud (Fig. 10) .

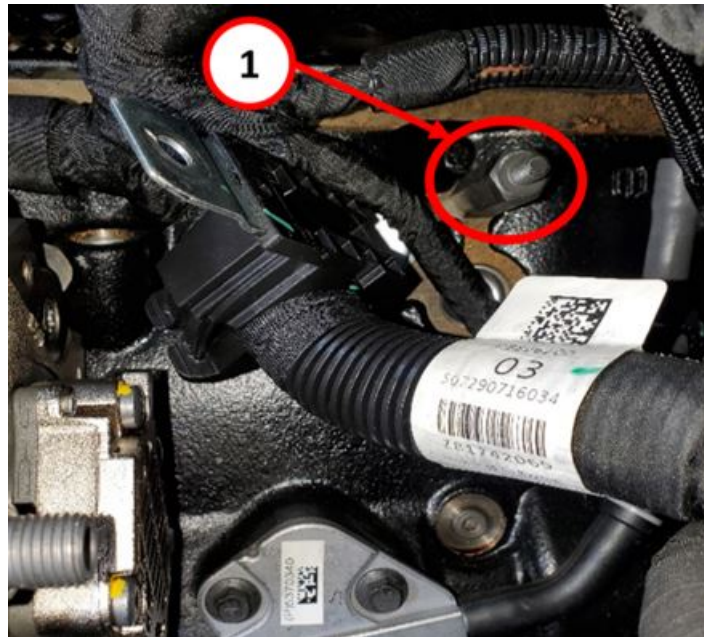


Fig. 10
Harness Retainer Stud Location

- 1 - Harness Retainer Stud.
-

28. Install the fuel pump tail support bracket to fuel pump. Loosely install the tail support bracket on the fuel pump using **30mm M8 bolt (Mopar PN 4429114 /Supplier PN 3902114)**(Fig. 11) .

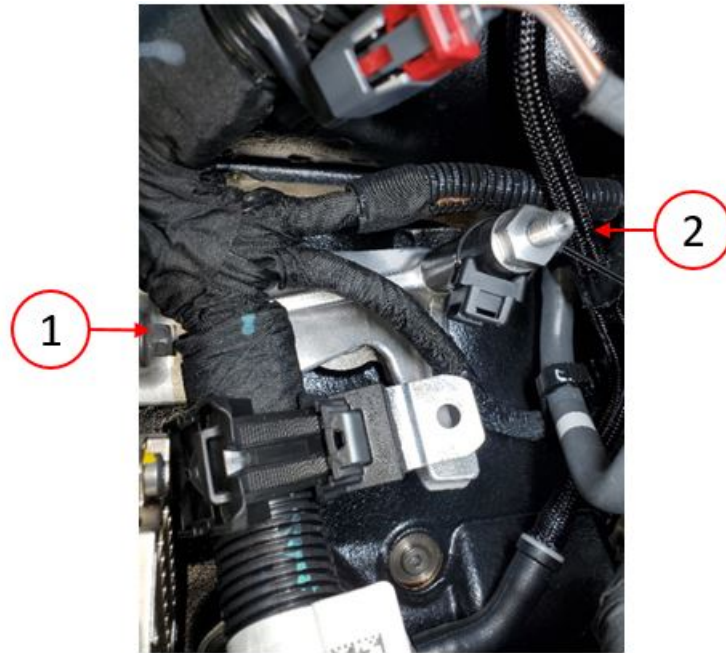


Fig. 11
Fuel Pump Tail Support Bracket Location

- 1 - Tail Support Bracket Mounting Bolt
2 - Fuel Line Stand off Tail Support
-

29. Loosely install the fuel line standoff to block through the tail support **(Mopar PN 68573994AA /Supplier PN 5685063)**.
30. Tighten both ends of the fuel pump tail support to 24 N·m (17.7 ft.lbs.).
31. The tie down bracket **Must** be loosened so it can be rotated and positioned to be secured to the leg of the fuel pump tail support to ensure there is no twisting of the main engine harness. The tie down bracket can be loosened by inserting a small flat head screwdriver or pic, into a slot in the tie down (Fig. 12) .



Fig. 12
Main Harness Tie down Bracket

1 - Slot Location to Loosen Tie Down

32. With the tie down bracket still loose around the main engine harness, secure the tie down bracket to the tail of the fuel pump tail support using bolt ******(Mopar PN 4429630 /Supplier PN 3900630)****** and tighten bolt to 10 N·m (7.3 ft.lbs.). Tighten the tie down bracket around the main engine harness using the zip closure (Fig. 13) .



Fig. 13
Main Engine Harness Tie down Bracket

1 - Harness Bracket and FASTER

33. Finger tighten both fuel tube union nuts at the pump and the fuel rail. Make sure the bracket slot aligns to the standoff, slide bracket along the tube to align if slightly off.
34. Finger tighten on the M8 nut ******(Mopar PN 4429689 /Supplier PN 3900589)******
35. Tighten the union nut at the pump first then the fuel rail to proper tighten 55 N·m (40.5 ft.lbs.) (Fig. 14) .

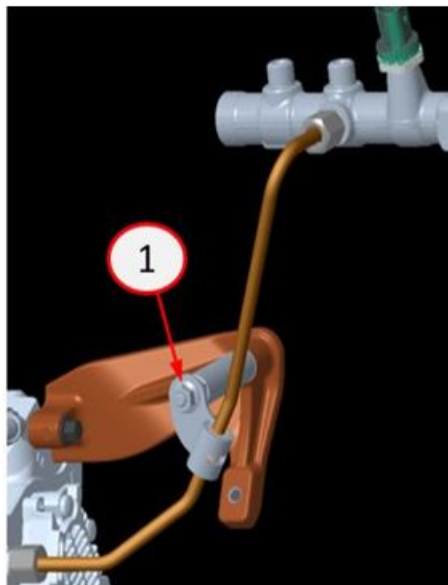


Fig. 14
Fuel Rail FASTER

1 - Union Nut

36. Tighten the High-Pressure Pump to Fuel Rail Supply line bracket **bracket M8, 115 mm bolt (Mopar PN 68573994 /Supplier PN 5685063)** to proper tighten 20 N·m (14.7 ft.lbs.).
37. Ensure there is no interference with the breather hose, pull the breather hose away from the High-Pressure line if there is contact.

NOTE: There will only be 1 High-Pressure Pump to Fuel Rail Supply line.

NOTE: The rail block nut is a one time use part. If this nut is ever loosened or removed, it must be replaced with a new block of nut.

38. The second supply port in the rail will need to be blocked off using rail block off nut **(Mopar PN 68573999AA /Supplier PN 5688160)** and tighten to 55 N·m (40.5 ft.lbs.).
39. Install the **new** ECM mounting bracket **(Mopar PN 68574000AA /Supplier PN 5684423)** using the same top bolts that came out of the original mounting bracket install them in the new mounting bracket and tighten to 24 N·m (17.7 ft.lbs.).

40. Using the provided bottom bolts **** (Mopar PN 68578595AA /Supplier PN 5689141)**** install them into the new mounting bracket and tighten to 24 N·m (17.7 ft.lbs.) **(Fig. 15)** .

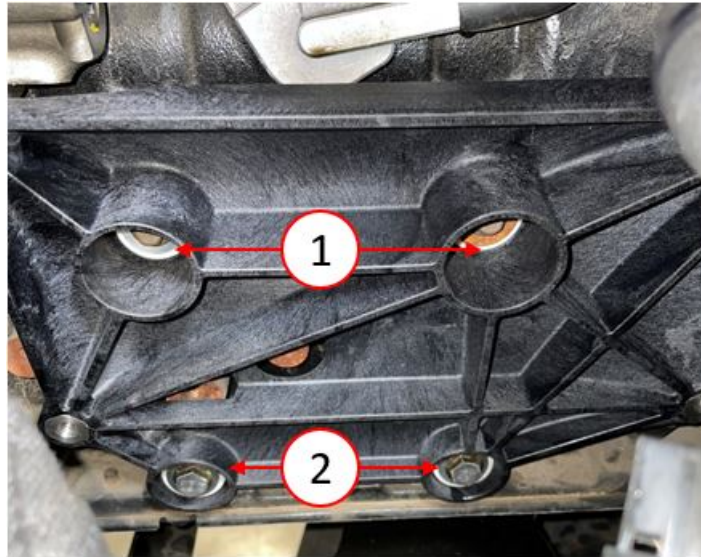


Fig. 15

New ECM Mounting Bracket and Faster Location

- 1 - Original Bracket Bolts
2 - New Bolts (PN 5689141)
-

41. Replace the power steering pressure hose **** (Mopar PN 68359768AF /Supplier PN 5708745)**** from pump to hydroboost with the line provide in the kit.
42. Install the ECM to the new mounting bracket with the same hardware from when it was originally removed. Tighten all bolts to 24 Nm (17.7 ft. lbs)
43. Connect the engine and transmission wire harness connector to the PCM and rotate the latches closed.
44. Install the fasteners securing the engine wire harness and the transmission wiring harness to the ECM and tighten them to 10 N·m (7.3 ft.lbs.).
45. Connect the low-pressure return line **** (Mopar PN 68573997AA /Supplier PN 5684067)**** to the fuel filter support bracket .
46. Connect the low-pressure supply line **** (Mopar PN 68573996AA /Supplier PN 5687735)**** to the fuel filter housing.
47. Connect the low-pressure supply and return lines to the fuel pump.
48. Reattach the standoff clip between the drain line and the harness.

49. Install and connect Engine Wiring Harness Jumper ******(Mopar PN 68573991AA /Supplier PN 5683566)****** to Fuel Quantity Solenoid. Connect the female side of the jumper harness to the engine wiring harness that originally attached to the Fuel Quantity Solenoid (Fig. 16) .

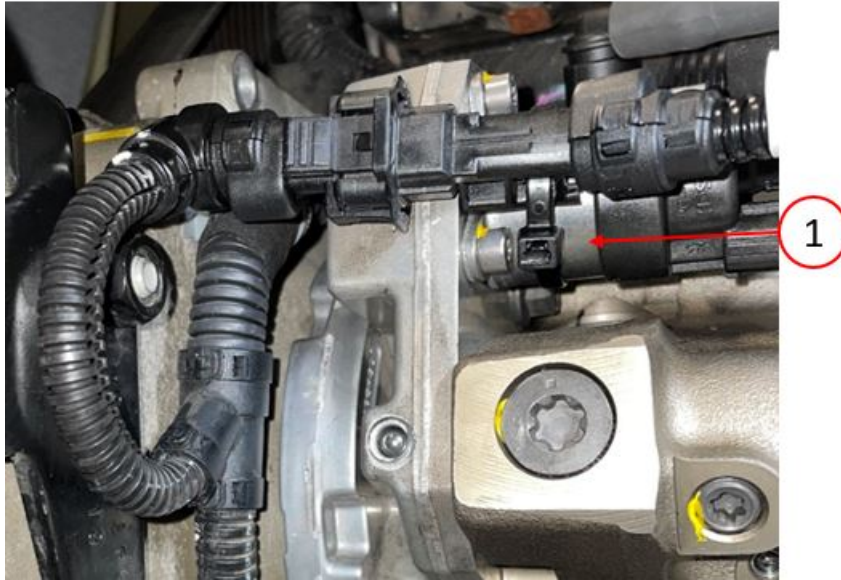


Fig. 16
Location of Tie down on Quantity Solenoid

1 - Tie Down

50. Connect the male side of the jumper to the Fuel Quantity Solenoid on the fuel pump.
51. Tie down the jumper using the provided zip-tie ******(Mopar PN 68038172AA / Supplier PN 3062329)****** (1) as shown in the picture below.
52. Using the provided zip-ties ******(Mopar PN 68038172AA / Supplier PN 3062329)****** attach the swivel bracket to the fuel line standoff and secure the wire harness pig tail to the swivel bracket (Fig. 17) .

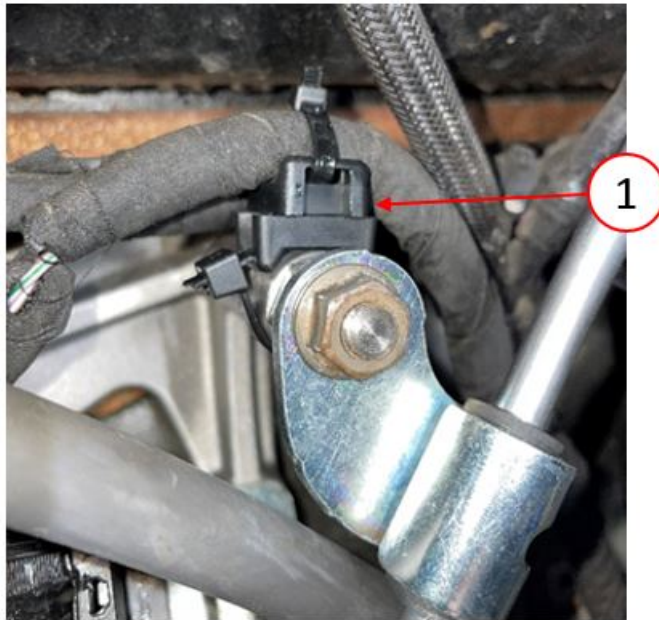


Fig. 17
Tie Down Location Swivel Bracket Tie Down Location

1 - Tie Down

53. Connect the negative battery cable(s).
54. Complete the fuel system repair. Go back to [Step 26](#) of the Repair Procedure.

POLICY:

Reimbursable within the provisions of the warranty.

TIME ALLOWANCE:

NOTE: The in-tank lift pump replacement is already part of the kit installation LOP.

NOTE: Dealers that are charged for a Fuel Disposal fee must enter the reimbursement request as a sublet repair in the Special Service section of the claim. The request for reimbursement must be supported with a copy of the Fuel Disposal Fee invoice when the claim is submitted for review.

Labor Operation No:	Description	Skill Category	Amount
14-45-01-97	Kit - Fuel System Install and Flush Fuel System (2 - Skilled)	10 - Diesel	10.3 Hrs.

OPTIONAL EQUIPMENT:

Labor Operation No:	Description	Skill Category	Amount
14-45-01-62	Dual Alternator Equipped (2 - Skilled)	10 - Diesel	0.5 Hrs.
14-45-01-63	Adaptive Steering System Equipped (Sales Code SJE) (2 - Skilled)	10 - Diesel	0.6 Hrs.

FAILURE CODE:

ZZ	Service Action
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