

## SERVICE MANUAL – SYMPTOM BASED DIAGNOSIS

# No Crank, No Start

### DESCRIPTION

A “No Crank, No Start: condition exists when the motor will not turn on and has no response when the key is turned to the cranking position. Possible causes are Drive Away Protection (DAP) system failure, electrical failure, or component failure. The following diagnostic steps are designed to systematically identify the root cause(s) of the lack of power and point to corresponding repair procedures.

### Warning messages used in this procedure

#### **WARNING**

*Personal injury or death may occur if procedures are not followed.*

#### **CAUTION**

*Damage to equipment, fuel system or vehicle is possible if instructions are not followed.*

#### **WARNING**

1. *Verify service facility is well ventilated for possible CNG fumes being present.*
2. *Secure vehicle with wheel chocks.*
3. *ALWAYS wear appropriate personal protective equipment (PPE) when working around pressurized fuel systems. Residual pressure ALWAYS will be present in the lines.*

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1. Verify Fill Cap is installed completely on Fuel Fill Panel (FFM) and spring is inside cap. Remove cap and reinstall until “click” is felt.



Figure 1. Fuel fill panel (FFM) (1), Fill cap with DAP cover (2)

Does vehicle start?

- a. Yes – Complete
- b. No – Go to step 2

2. Check battery voltage.

Is battery voltage 12v or higher?

- a. Yes – Go to step 3
- b. No – Charge battery and retest

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3. Connect orange wires from start request and crank confirm together.

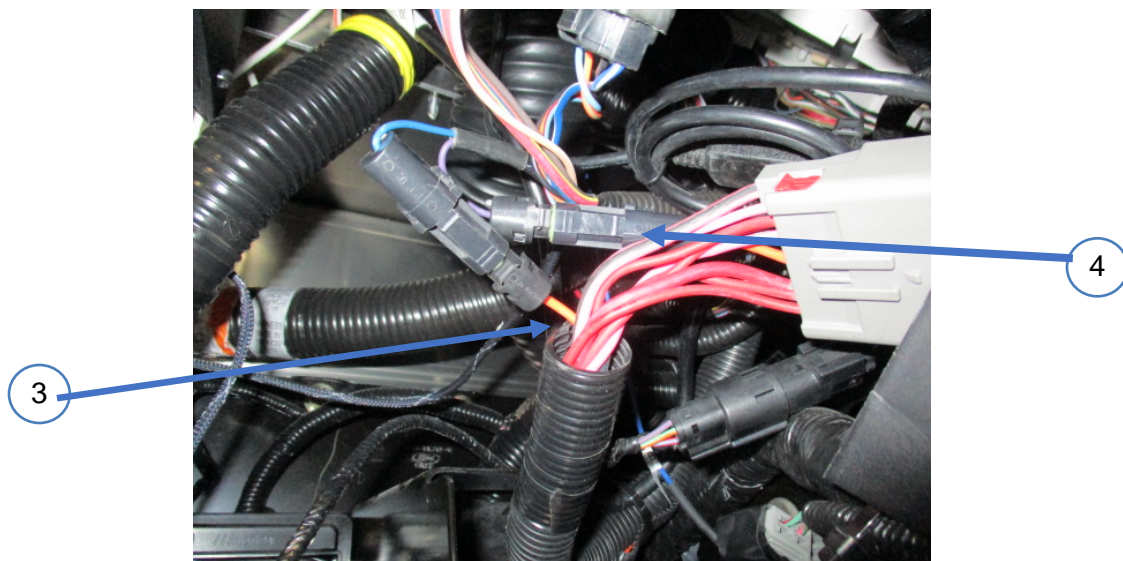


Figure 2. Drive away protection bypass connectors (3&4)

Does vehicle start?

- a. Yes- Go to Step 4
- b. No – Issue is on Chassis Manufacturer side. Consult their service manual.

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### 4. Verify Fill Cap is connected to chassis harness

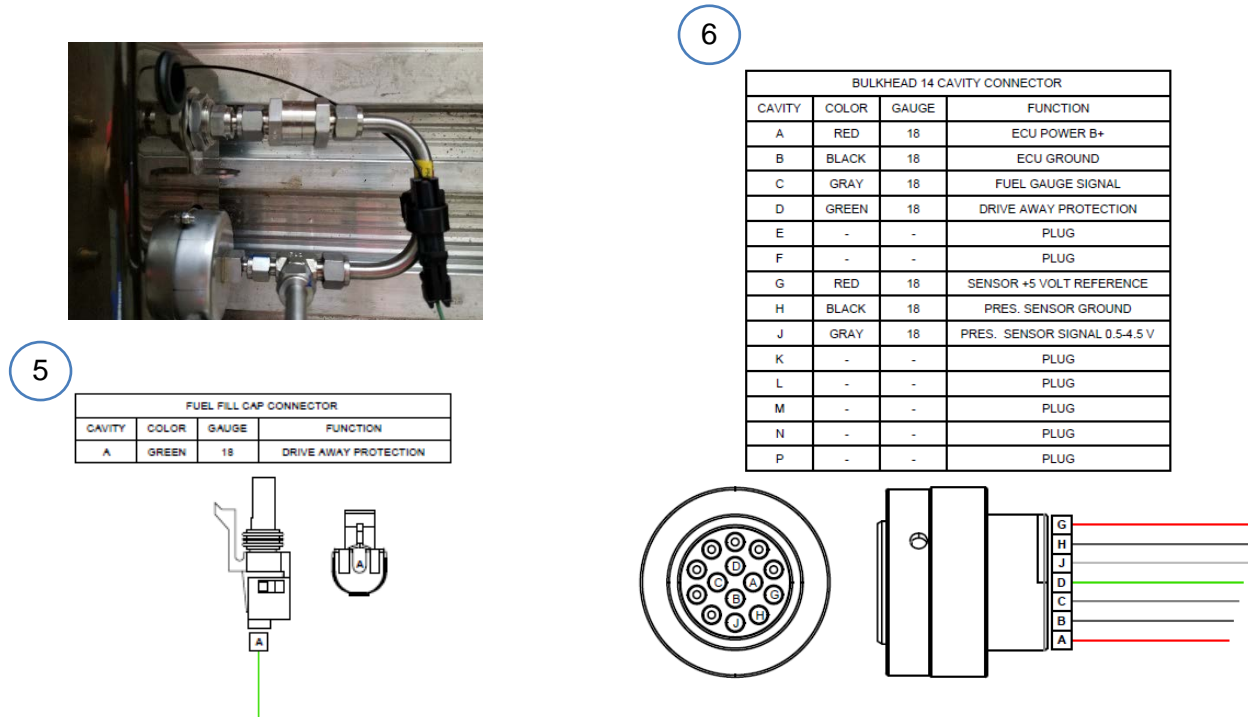


Figure 3. Fill cap connector (5), Firewall Bulkhead connector (6).

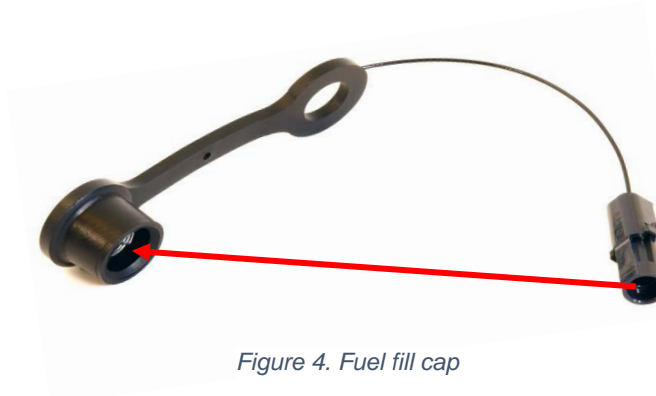
Connect ohmmeter between center of cap and pin D of Firewall Bulkhead Connector B.  
Continuity should be present.

Connected and continuity present?

- Yes – Go to step 7
- No - Go to step 5

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5. Disconnect Cap connector. Test for continuity between cap and female end of connector.



*Figure 4. Fuel fill cap*

Is continuity present?

- a. Yes – Go to step 6
- b. No – Replace fill cap. See Agility shop manual for replacement procedure.

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6. Test for continuity between male connector of fill/kill cap and pins D of Firewall Bulkhead Connector.

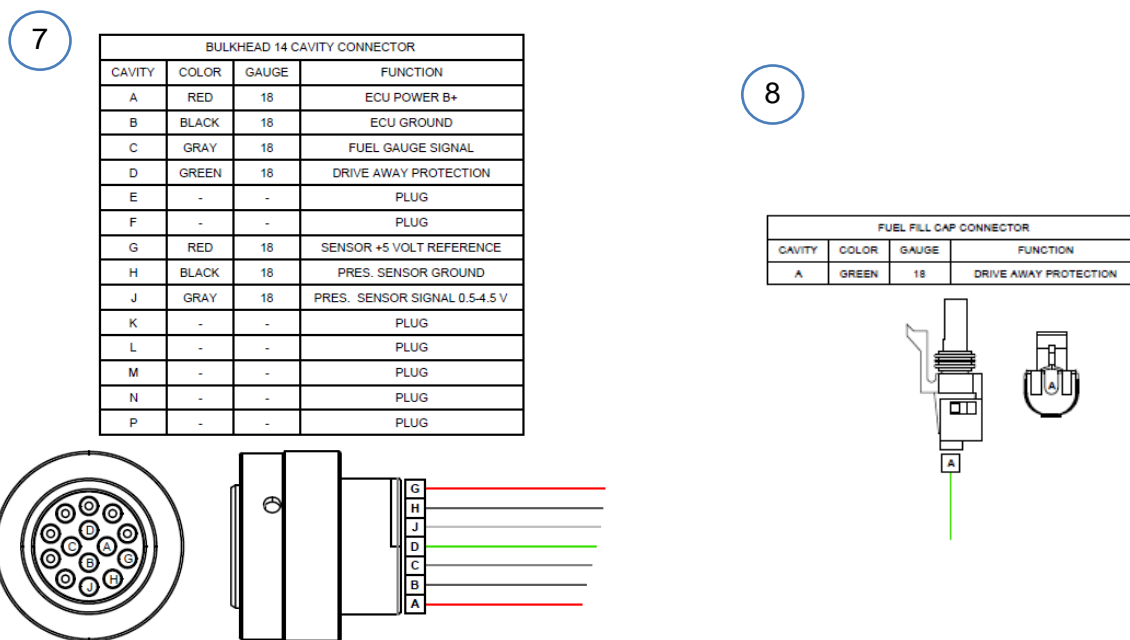


Figure 5. Firewall Bulkhead (7), DAP connector (8).

Is continuity present?

- Yes – Go to step 7
- No – Perform wiring repair as needed.

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7. Check continuity from bulkhead connector to Agility ECU. Continuity should be present.  
 PIN D to Pin 7  
 Pin D to Pin 14  
 Pin D to Pin 15

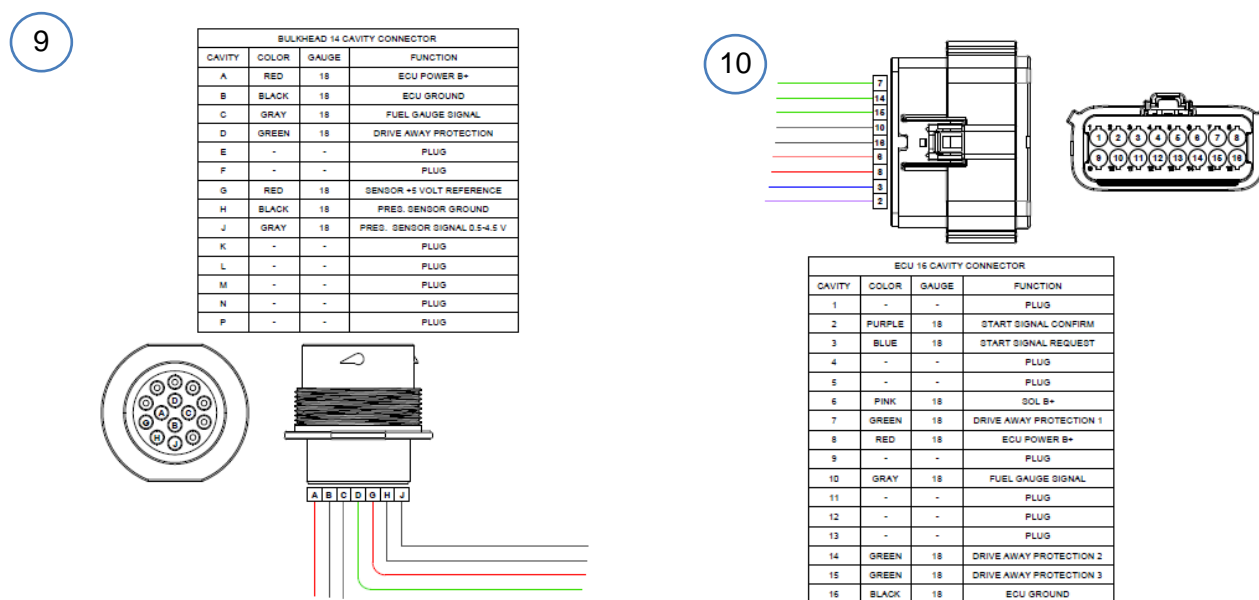


Figure 6. Firewall Bulkhead connector (9), Agility ECU connector (10).

Is continuity present?

- Yes – Go to step 8
- No – Perform wiring repair as needed.

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8. Disconnect Start Request Connector (Blue wire) and check for continuity to Pin 3 of Agility ECU.

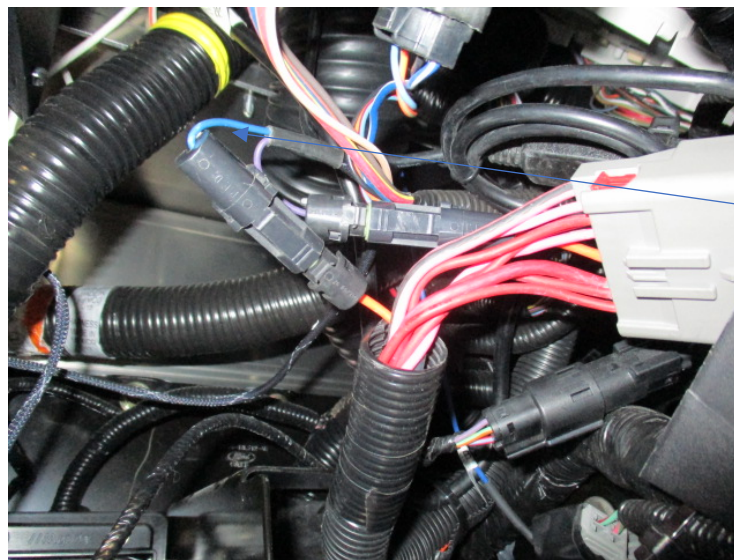
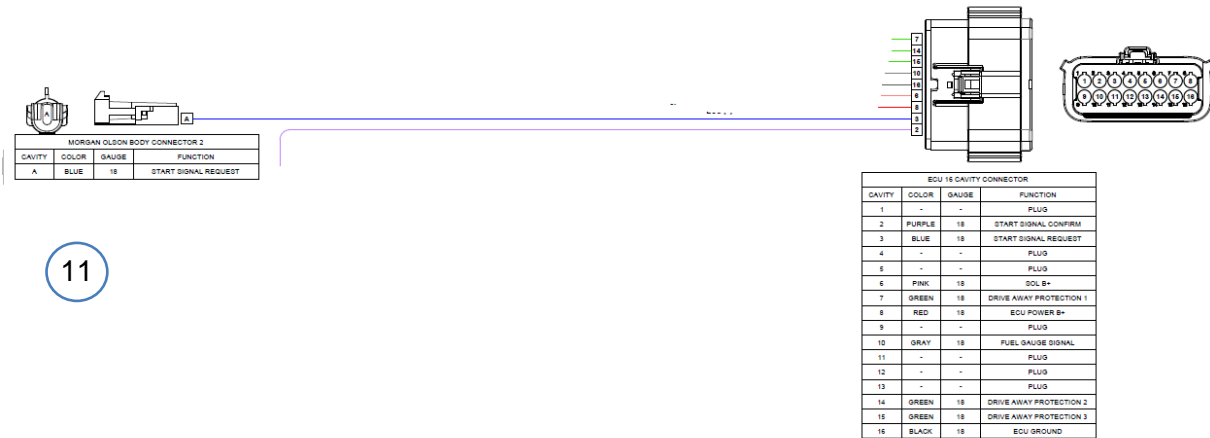


Figure 7. Start Request schematic connector (11), Start request connector (12).

Is continuity present?

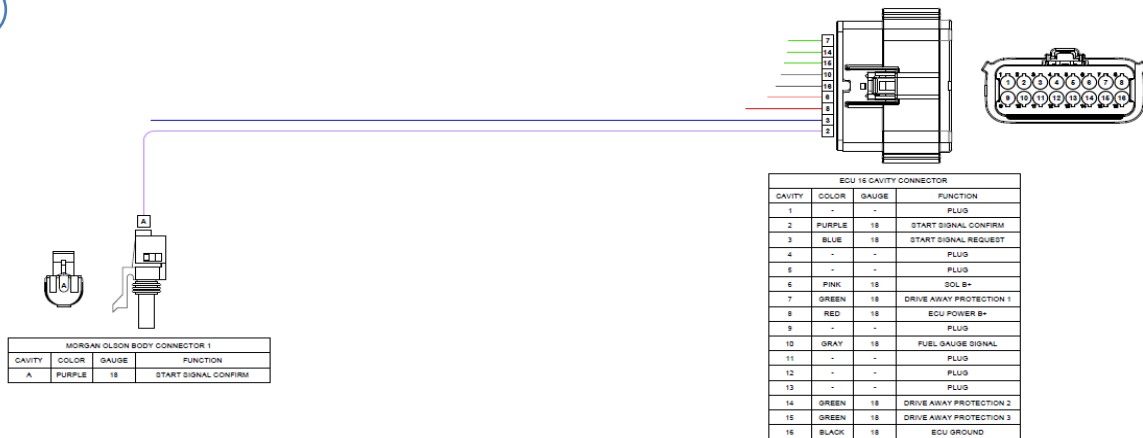
- a. Yes – Go to step 9
- b. No – Perform wiring repair as needed.



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9. Disconnect Crank Confirm Connector (Purple wire) and check for continuity to Pin 2 of Agility ECU.

13



14

Figure 8. Crank Confirm Schematic (13), Crank confirmation connector (14).

Is continuity present?

- a. Yes – Record Cal ID and CVN and call Agility Technical support.
- b. No – Perform wiring repair as needed.

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# Crank, No Start

### DESCRIPTION

A “Crank, No Start” condition exists when ignition power is present to turn the engine via the starter, the engine cranks but the engine will not fire. Possible causes are a blown fuse or relay, a closed fuel system valve, a restricted fuel system hose, a clogged fuel filter, a faulty component or circuit. The following diagnostic steps are designed to systematically identify the root cause(s) of the Crank, No Start and point to corresponding repair procedures.

### Warning messages used in this procedure

#### **WARNING**

*Personal injury or death may occur if procedures are not followed.*

#### **CAUTION**

*Damage to equipment, fuel system or vehicle is possible if instructions are not followed.*

#### **WARNING**

1. *Verify service facility is well ventilated for possible CNG fumes being present.*
2. *Secure vehicle with wheel chocks.*
3. *ALWAYS wear appropriate personal protective equipment (PPE) when working around pressurized fuel systems. Residual pressure ALWAYS will be present in the lines.*

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1. Check CNG tank high pressure gauge. Pressure should be >500 PSI (3.44MPa)



Figure 1. Fuel fill panel (FMM) (1), HP gauge (2)

Is pressure >500 PSI?

- a. Yes – Go to step 2
- b. NO – Fill tank to at least 500 PSI and recheck.

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2. Verify valves on front of both cylinders are in the OPEN position by turning the handle counterclockwise until the handle stops.

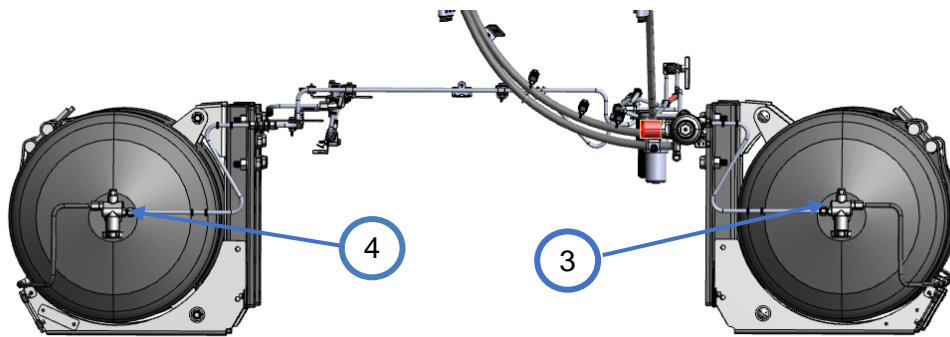


Figure 2. Driver side valve (3), Passenger side valve (4)

Are valves turned on?

- a. Yes – Go to step 3
- b. No – Turn on and retry.

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3. Verify the CNG tank manual shut off valve (1/4 turn valve) is in the open position.



Figure 3. 1/4 turn manual shutoff valve (5)  
OPEN valve position (6)

Was valve turned on?

- a. Yes – Go to step 4
- b. No – Turn valve on and retry.

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4. Using a Digital Multi Meter and an assistant, check power and ground at fuel pressure regulator.

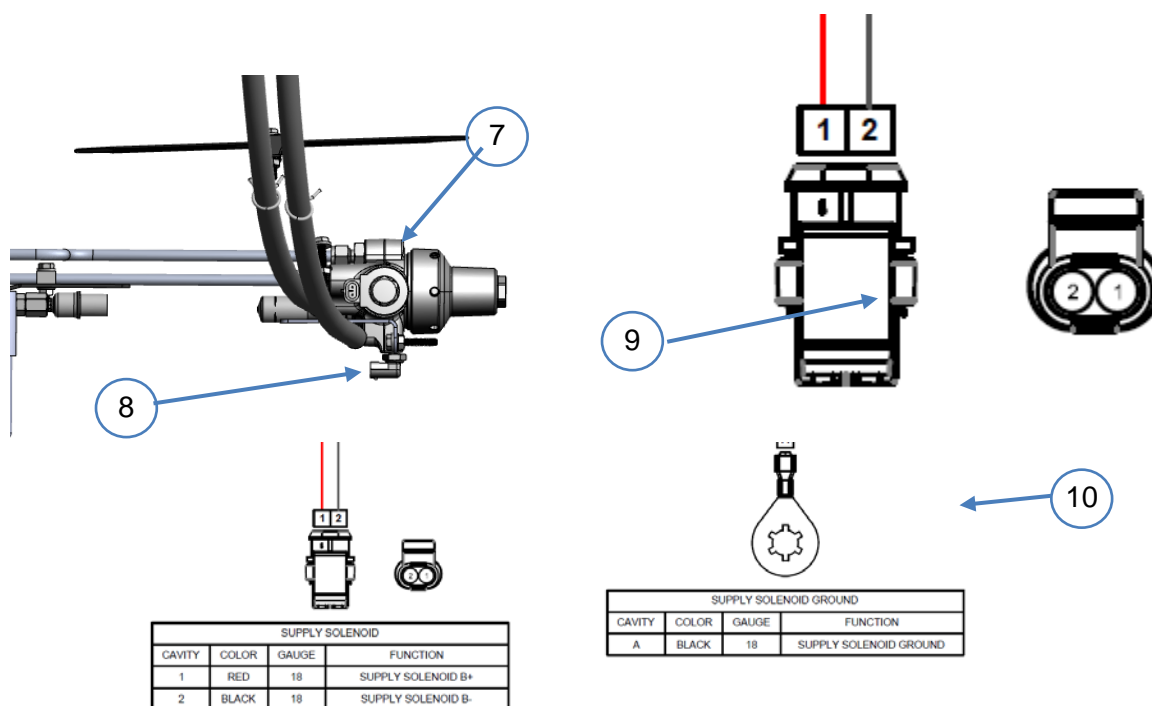


Figure 4. Pressure regulator (7), Pressure regulator solenoid connection (8), Solenoid connector body harness side (9), Solenoid connector pin out (10).

Are power and ground present?

- Yes – Go to step 5
- No – Go to step 9

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### **WARNING**

***Never attempt to open a fitting or cut a line on a pressurized fuel system.***

5. Depressurize low pressure system (*refer to Fuel system depressurization procedure.*)
  - a. Check fuel pressure at the driver side (DS) fuel rail.
  - b. Remove plug on front of the fuel rail.
  - c. Install fuel pressure tester fitting 69000518.
  - d. Activate fuel system.
  - e. Attempt to start vehicle. Pressure should be between 120 psi (827 kPa) and 130 psi (896 kPa).

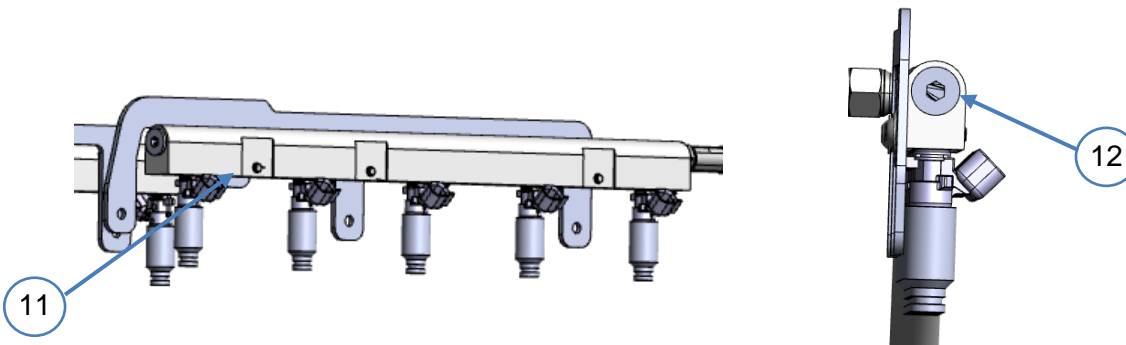


Figure 5. Driver side fuel rail (11), Fuel rail plug (12)

Is pressure within 120 psi (827 kPa) and 130 psi (896 kPa)?

- a. Yes – Use a scan tool and check for diagnostic trouble codes (DTCs) and refer to OEM service manual.
- b. No – Go to step 6

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### **WARNING**

*Never attempt to open a fitting or cut a line on a pressurized fuel system.*

6. Depressurize low pressure system (see shop manual). Check fuel pressure after LP fuel filter at the fuel rail using pressure test adaptor 69500016. Activate fuel system. Attempt to start vehicle. Pressure should be between 132 PSI and 142 PSI.

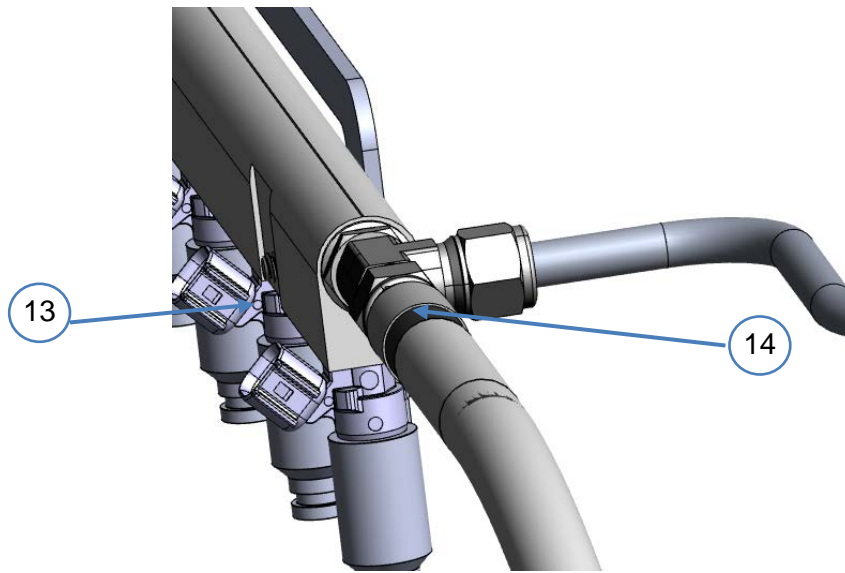


Figure 6. Fuel Rail Fitting (13), Fuel pressure test point (14).

Is pressure within specification?

- a. Yes – Go to step 8
- b. No – Go to step 7

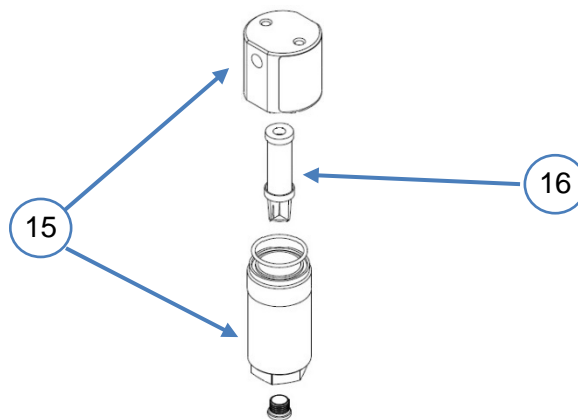


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### **⚠ CAUTION**

***Never attempt to open a fitting or cut a line on a pressurized fuel system.***

7. Depressurize low pressure system (see shop manual). Remove LP fuel filter element. Inspect LP fuel filter for clogging or restrictions.



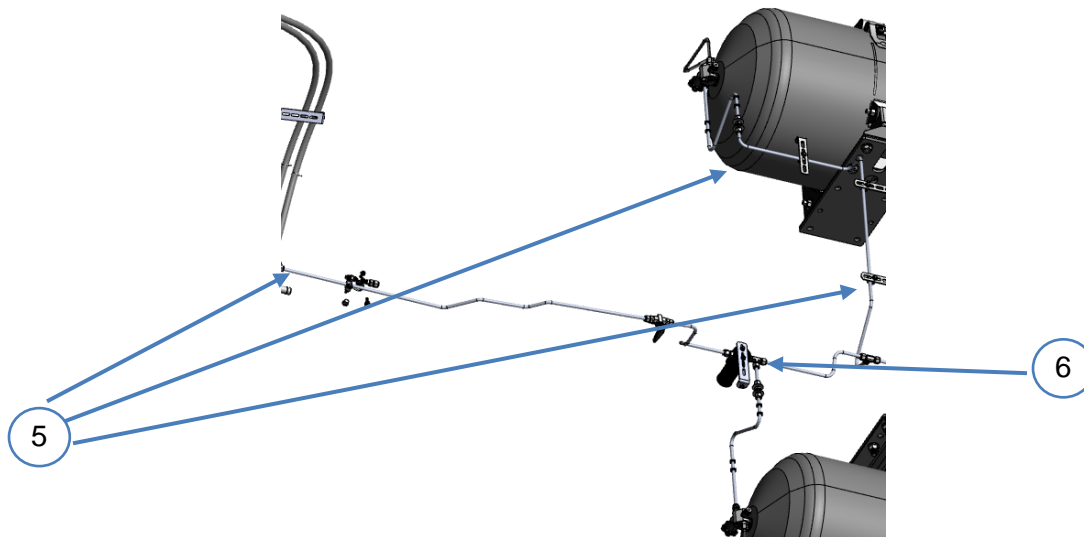
*Figure 6. Low pressure fuel filter assembly (15), Low pressure filter element (16).*

Was any debris or restriction found?

- a. Yes – Replace LP fuel filter element (see shop manual).
- b. No – Go to step 8

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8. Check for any clogs in High Pressure system. (Filter and lines to the fuel pressure regulator).



*Figure 7. High pressure fuel lines (5), High Pressure Fuel Filter (6)*

*Figure 8. Low pressure line from filter to fuel rail*

Were any blockages found?

- a. Yes – Replace line (see shop manual) and recheck system operation.
- b. No – Replace Fuel Regulator assembly. See shop manual for procedure.

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9. Check fuel pump relay (R6) in relay box 2.

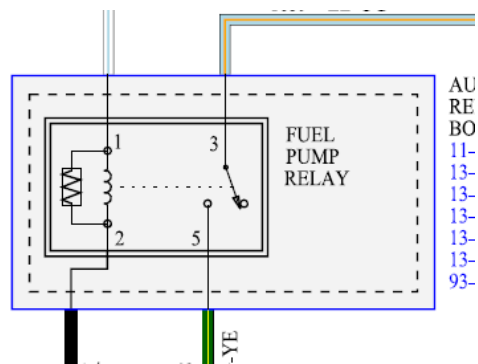


Figure 9. Fuel pump relay diagram

Does relay function properly?

- a. Yes- Go to step 11
- b. No – Go to step 10

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10. Check fuel pump power fuse J2 (20A) and Fuel Pump Relay Diode in battery junction box

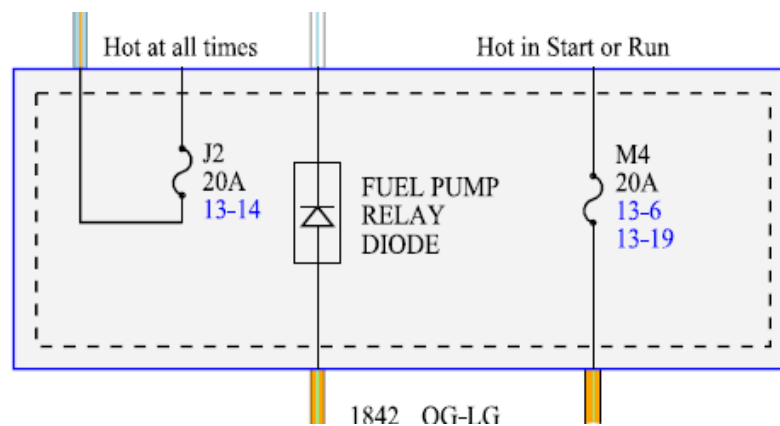


Figure 10. Fuel pump fuse and diode diagram

Are fuse and diode good?

- a. Yes – Go to step 11
- b. No – Continue with manufacturer diagnosis.

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11. Check power and ground from Ford fuel pump harness to the Agility fuel pump harness interface.

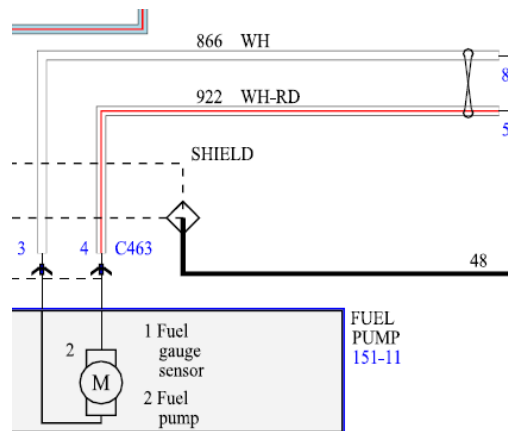


Figure 11. Fuel pump wiring diagram

Are power and ground present to agility interface?

- a. Yes – Go to step 12
- b. No – Continue with Manufacturer wiring diagnosis and repair.

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12. Check continuity of power wire from solenoid (pin 1) to fuel harness interface (pin 4)

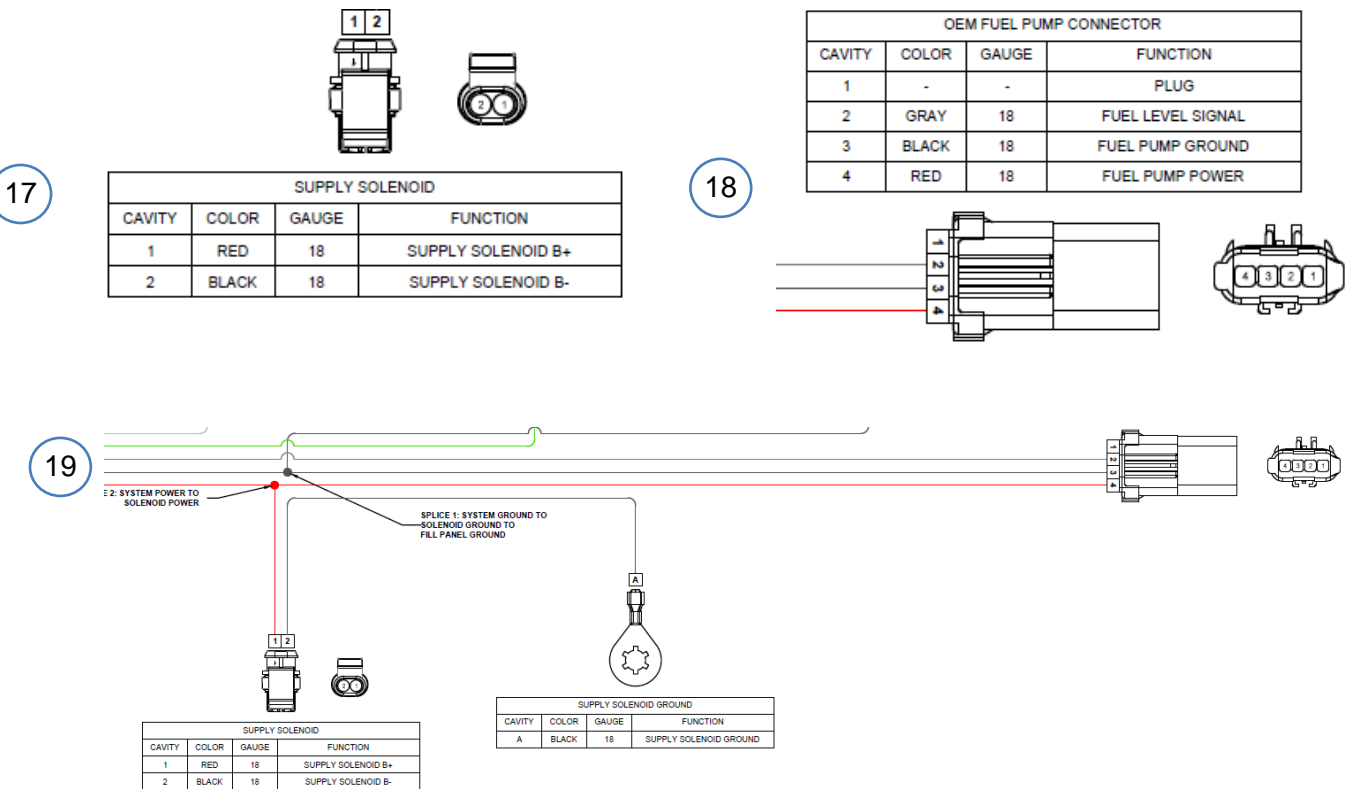


Figure 12. Fuel regulator solenoid connector (17), Fuel pump interface harness connector pin-out (18), fuel pump interface to fuel harness wiring diagram (19).

Is continuity present?

- Yes – Go to step 13
- No – Repair wiring as needed.

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13. Check continuity of ground wire from fuel supply solenoid (pin 2) to the dedicated ground eyelet.

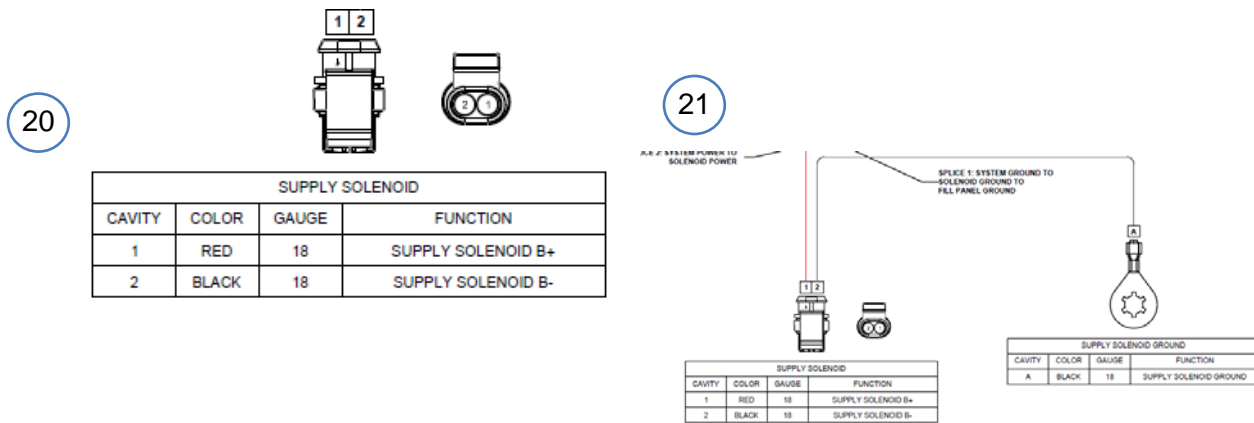


Figure 13. Fuel pressure regulator connector (20), Fuel solenoid connector to ground schematic (21)

Is continuity present?

- Yes – Go to step 14
- No – Repair wiring as needed.

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14. Test continuity between fuel pump interface (pin 4) to firewall bulkhead connector (pin A)

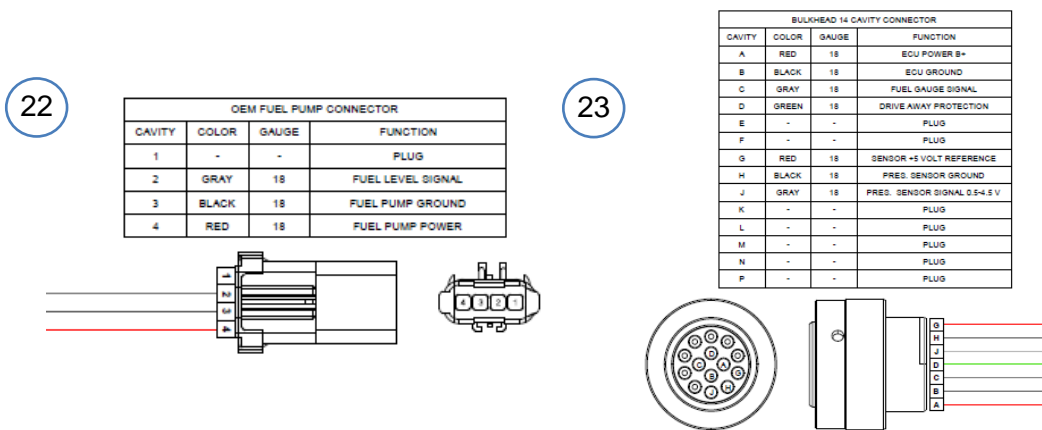


Figure 14. Fuel pump interface connector to OEM fuel pump connector (22), Bulkhead connector (23).

Is continuity present?

- Yes – Go to step 15
- No – Repair wiring as needed.



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15. Check continuity between Inner firewall bulkhead (pin A) to Agility ECU connector (pin 8)

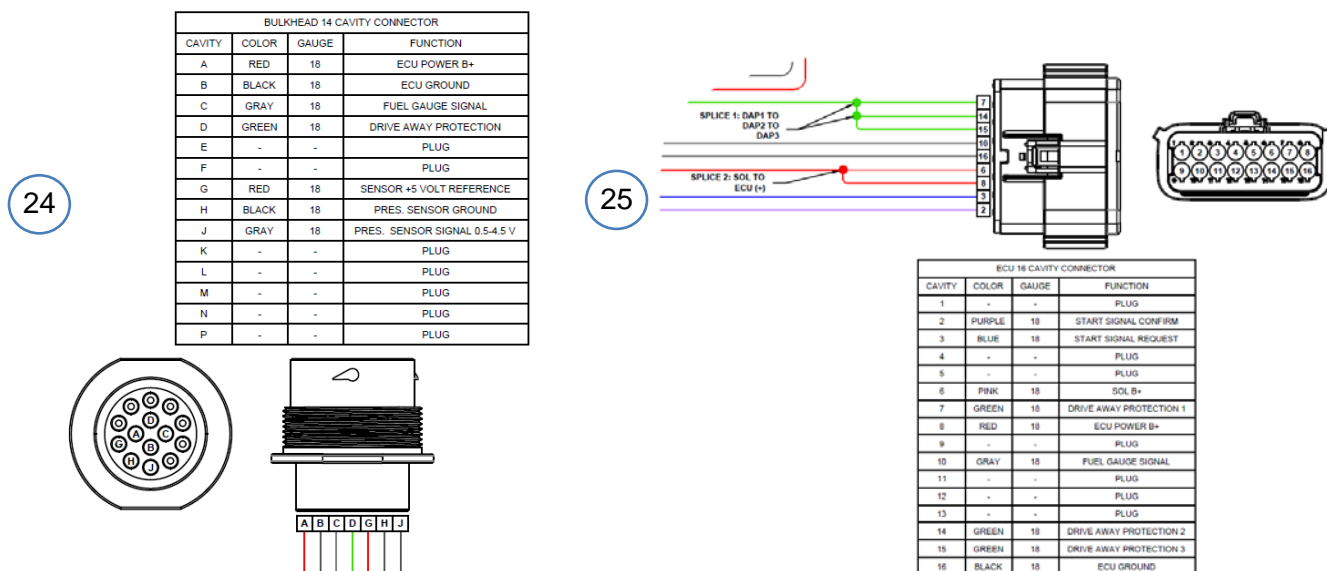


Figure 15. Bulkhead connector (24), Agility ECU connector (25).

Is continuity present?

- Yes – Go to step 16
- No – Repair wiring as needed.

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16. Check continuity between firewall bulkhead A (pin B) and Agility ECU connector (pin 16)

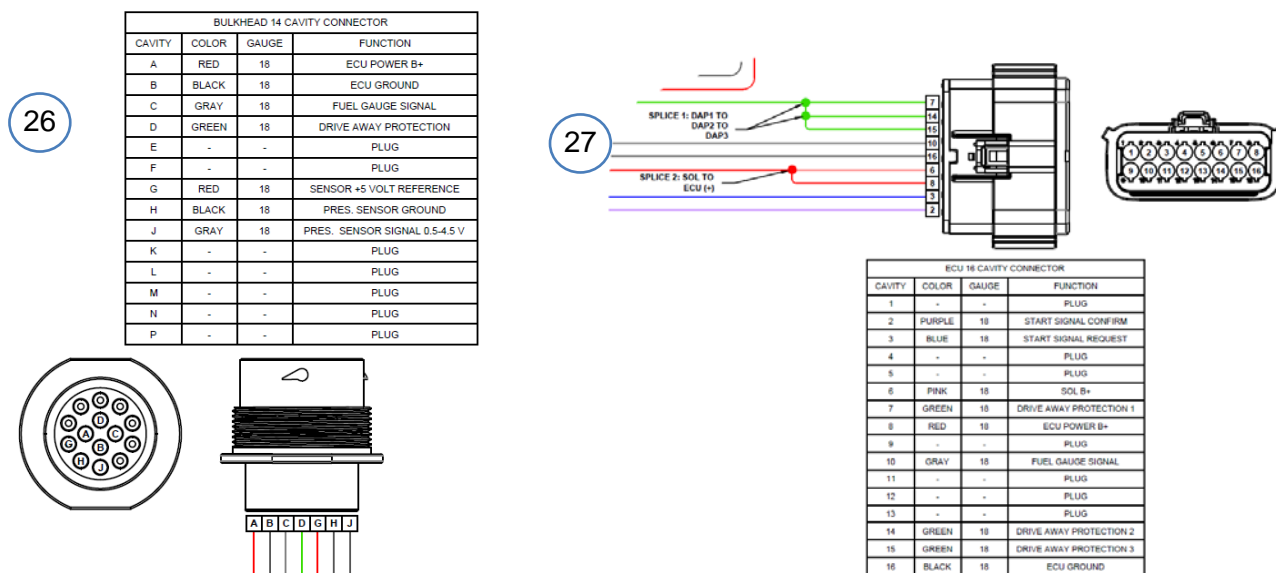


Figure 156. Bulkhead connector (28), PCM connector (29).

Is continuity present?

- Yes – Record Cal ID and CVN and call Agility Technical support.
- No – Repair wiring as needed.

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# Rough Idle

### DESCRIPTION

A “Rough Idle” condition exists when the vehicle runs rough and does not have a smooth idle and may be accompanied by Diagnostic Trouble Codes (DTCs). Possible causes are a stuck open injector, a stuck closed injector, a restricted fuel system hose, a clogged fuel filter, a faulty component or circuit. The following diagnostic steps are designed to systematically identify the root cause(s) of the Rough Idle and point to corresponding repair procedures.

### Warning messages used in this procedure

#### **WARNING**

*Personal injury or death may occur if procedures are not followed.*

#### **CAUTION**

*Damage to equipment, fuel system or vehicle is possible if instructions are not followed.*

#### **WARNING**

1. *Verify service facility is well ventilated for possible CNG fumes being present.*
2. *Secure vehicle with wheel chocks.*
3. *ALWAYS wear appropriate personal protective equipment (PPE) when working around pressurized fuel systems. Residual pressure ALWAYS will be present in the lines.*

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1. Are any DTCs present?
  - a. Yes – Follow Chassis Manufacturer DTC diagnostic(s)
  - b. No – Go to step 2

2. Check Mode \$6 data for preliminary misfires.

Are any misfires present?

- a. Yes – Note cylinders and go to step 3
- b. No – Go to step

3. Perform Injector balance test.

Does engine idle change when injectors are turned off?

- a. Yes – Injectors are working properly. Go to step 4
- b. NO – Note which cylinder does not change idle and check injector for proper electrical connection.
  - i. Is injector plugged in?
    1. Yes – Perform wiring testing to injector per manufacturer manual.
    2. No – Securely attach connector to injector and recheck

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### **WARNING**

***Never attempt to open a fitting or cut a line on a pressurized fuel system.***

4. Depressurize low pressure system (*refer to Fuel system depressurization procedure.*)
  - a. Check fuel pressure at the driver side (DS) fuel rail.
  - b. Remove plug on front of the fuel rail.
  - c. Install fuel pressure tester fitting 69000518.
  - d. Activate fuel system.
  - e. Attempt to start vehicle. Pressure should be between 120 psi (827 kPa) and 130 psi (896 kPa).

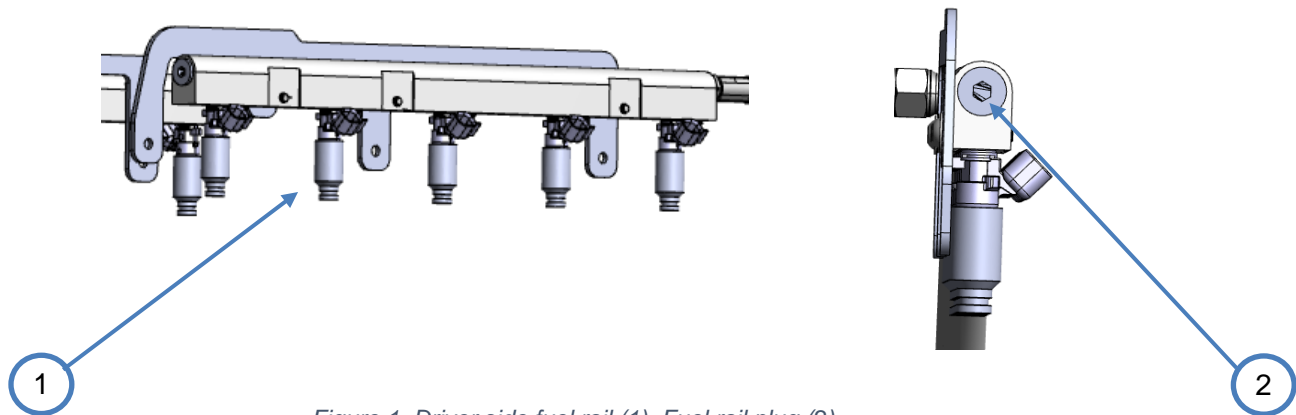


Figure 1. Driver side fuel rail (1), Fuel rail plug (2)

Is pressure within 120 psi (827 kPa) and 130 psi (896 kPa)?

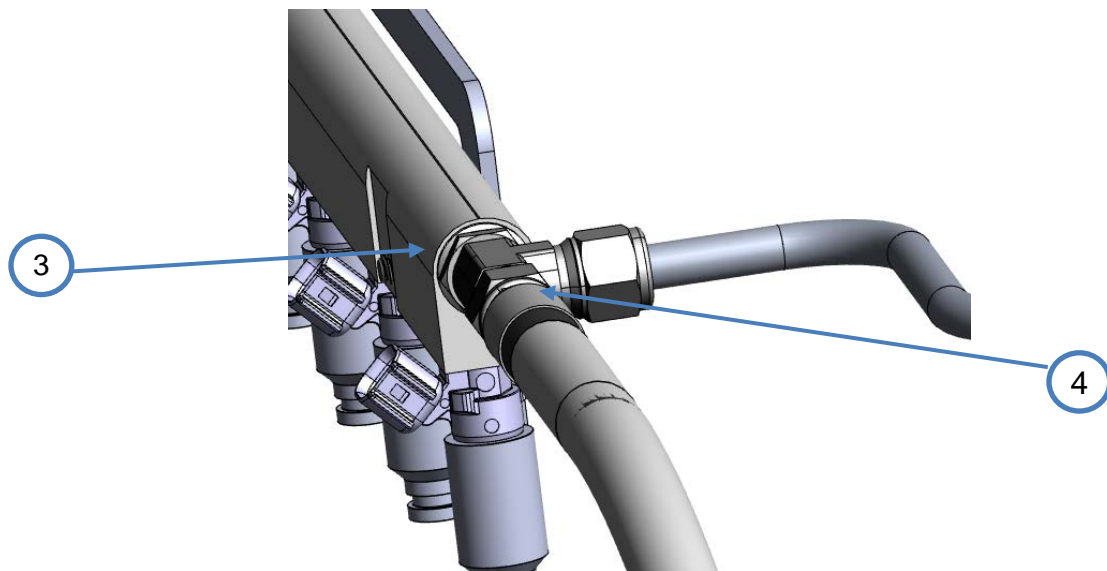
- a. Yes – Check for DTCs and refer to vehicle specific shop manual.
- b. No – Go to step 5

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### **WARNING**

***Never attempt to open a fitting or cut a line on a pressurized fuel system.***

5. Depressurize low pressure system (see shop manual).
  - a. Check fuel pressure reading after LP fuel filter at the fuel rail using pressure test adaptor 69500016.
  - b. Activate fuel system.
  - c. Attempt to start vehicle.
  - d. Pressure should be between 132 PSI (910 kPa) and 142 PSI (979 kPa).



*Figure 2. Driver side fuel rail (3), pressure test location (4)*

Is pressure within 132 PSI (910 kPa) and 142 PSI (979 kPa)?

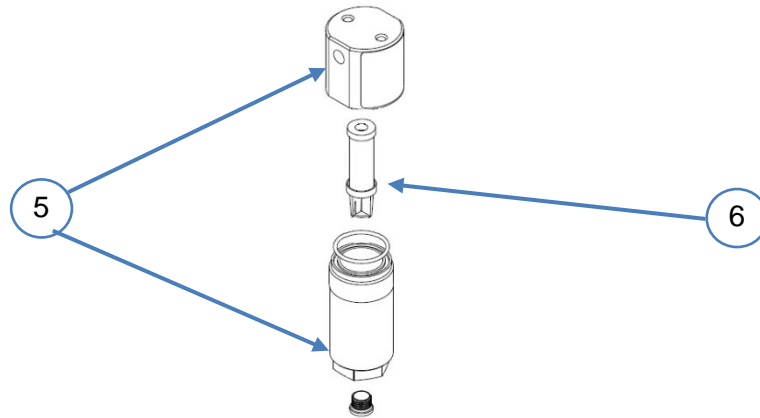
- a. Yes – Go to step 7
- b. No – Go to step 6

## SERVICE MANUAL – SYMPTOM BASED DIAGNOSIS

### **⚠ CAUTION**

***Never attempt to open a fitting or cut a line on a pressurized fuel system.***

6. Depressurize low pressure system (see shop manual). Remove LP fuel filter. Inspect LP fuel filter for clogging or restrictions.



*Figure 3. Low pressure fuel filter assembly (5), Low pressure filter element (6).*

Was any debris or restriction found?

- a. Yes – Replace LP fuel filter (see shop manual).
- b. No – Go to step 7

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7. Check for any clogs in High Pressure system. (Filter and lines to the fuel pressure regulator).

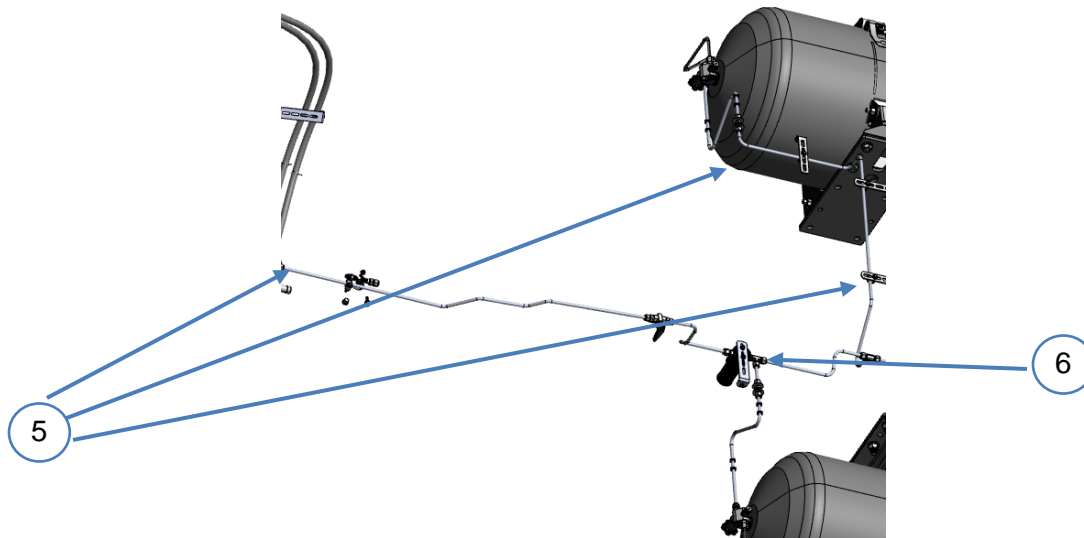


Figure 4. High pressure fuel lines (7),  
High Pressure Fuel Filter (8)

Were blockages found?

- a. Yes – Replace component (see shop manual) and recheck system operation.
- b. No – Record Cal ID and CVN from PCM and contact Agility Technical Support.



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# Lacks Power

### DESCRIPTION

A “Lacks Power” condition exists when the truck will feel under powered and feel like it is “laboring” under acceleration. Possible causes are Engine is operating in *de-rate mode due to an Active Fault Code*, *there is an induction or exhaust system restriction*, or *the engine is starving for fuel*. The following diagnostic steps are designed to systematically identify the root cause(s) of the lack of power and point to corresponding repair procedures.

### Warning messages used in this procedure

#### **WARNING**

*Personal injury or death may occur if procedures are not followed.*

#### **CAUTION**

*Damage to equipment, fuel system or vehicle is possible if instructions are not followed.*

#### **WARNING**

1. *Verify service facility is well ventilated for possible CNG fumes being present.*
2. *Secure vehicle with wheel chocks.*
3. *ALWAYS wear appropriate personal protective equipment (PPE) when working around pressurized fuel systems. Residual pressure ALWAYS will be present in the lines.*

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1. Use a scan tool and check for diagnostic trouble codes (DTCs) Are Codes present?
  - a. Yes – Refer to OEM service manual for diagnosis and repair.
  - b. No – Go to step 2
  
2. Check Brake adjustment for excessive drag.

Are brakes adjusted properly?

  - a. Yes – Go to step 3
  - b. No – Adjust and recheck

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3. Inspect for clogged air intake and air filter.

Any clogs or damage found?

- a. Yes- Repair as needed
- b. No – Go to step 4

4. Refer to OEM service manual to check for plugged exhaust.

Any clogs found?

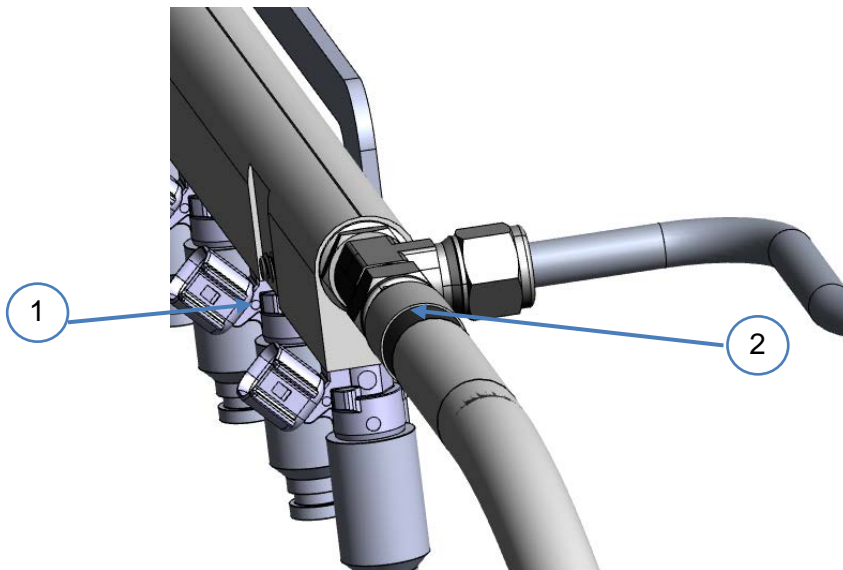
- a. Yes – repair per manufacturer direction
- b. No – Go to step 5

## SERVICE MANUAL – SYMPTOM BASED DIAGNOSIS

### **WARNING**

*Never attempt to open a fitting or cut a line on a pressurized fuel system.*

5. Depressurize low pressure system (see shop manual). Check fuel pressure after LP fuel filter at the fuel rail using pressure test adaptor 69500016. Activate fuel system. Attempt to start vehicle. Pressure should be between 132 PSI and 142 PSI.



*Figure 1. Fuel Rail Fitting (1), Fuel pressure test point (2).*

Is pressure within specification?

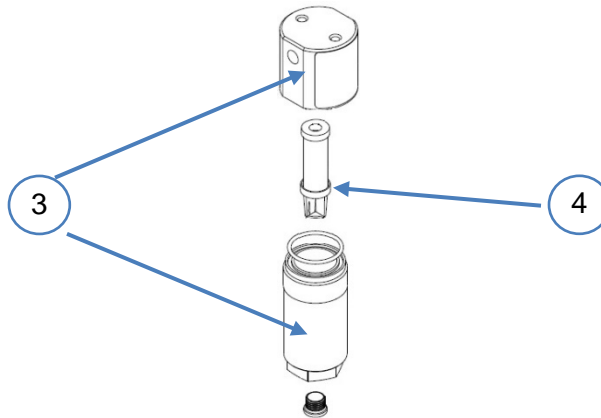
- a. Yes – Go to step 7
- b. No – Go to step 6

## SERVICE MANUAL – SYMPTOM BASED DIAGNOSIS

### **⚠ CAUTION**

***Never attempt to open a fitting or cut a line on a pressurized fuel system.***

6. Depressurize low pressure system (see shop manual). Remove LP fuel filter. Inspect LP fuel filter for clogging or restrictions.



*Figure 2. Low pressure fuel filter housing (3), Low pressure fuel filter element (4).*

Was any debris or restriction found?

- a. Yes – Replace LP fuel filter (see shop manual).
- b. No – Go to step 7

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7. Check for any clogs in High Pressure system. (Filter and lines to the fuel pressure regulator).

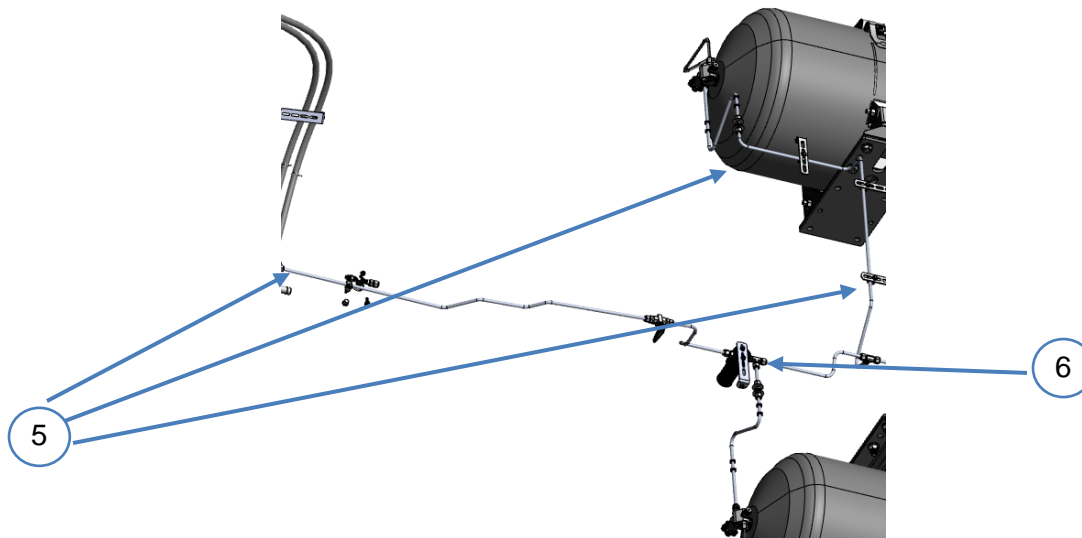


Figure 3. High pressure fuel lines (5),  
High Pressure Fuel Filter (6)

Were blockages found?

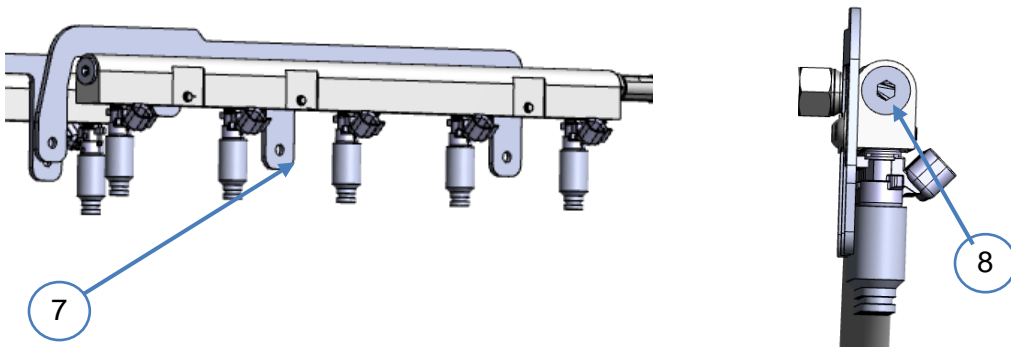
- a. Yes – Replace component (see shop manual) and recheck system operation.
- b. No – Go to step 8

## SERVICE MANUAL – SYMPTOM BASED DIAGNOSIS

### **WARNING**

***Never attempt to open a fitting or cut a line on a pressurized fuel system.***

8. Depressurize low pressure system (*refer to Fuel system depressurization procedure.*)
  - a. Check fuel pressure at the driver side (DS) fuel rail.
  - b. Remove plug on front of the fuel rail.
  - c. Install fuel pressure tester fitting 69000518.
  - d. Activate fuel system.
  - e. Attempt to start vehicle. Pressure should be between 120 psi (827 kPa) and 130 psi (896 kPa).



*Figure 4. Fuel injector rail (7), Driver side rail and testing point (8).*

Is pressure within specification?

- a. Yes – Recheck for DTCs and refer to vehicle specific shop manual.
- b. No – Remove fuel rails and inspect for blockages and repair as needed.