Agility® fuel solutions

SERVICE MANUAL – FUEL SYSTEM REPAIR INSTRUCTIONS

Ford F-59 CNG Service Procedure List

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Fuel line depressurization procedure

DESCRIPTION AND OPERATION

Agility® CNG fuel systems utilize pressurized fuel tubes and hoses which can be classified as high pressure (HP) or low pressure (LP) lines.

⚠CAUTION

1. ***ALWAYS wear eye protection and other appropriate PPE when working around pressurized fuel systems.***
2. ***Agility fuel lines are ALWAYS pressurized up to 3600 psi (24.8MPa) nominal pressure UNLESS the fuel system has been defueled. Additionally, after defueling residual pressure ALWAYS will be present in the lines.***
3. ***Additionally, system working pressure is up to 4500 psi (31.0MPa). Hot weather fill pressures commonly reach 4100 psi (28.3MPa).***

The high pressure HP portion of a CNG fuel system is capable of bi-directional fuel flow: fuel enters the system through the fuel fill receptacle and flows through the HP lines into the cylinders. Fuel flows back out from the cylinders via HP lines forward to the to 1/4-turn manual shut off valve through HP lines to the pressure regulator inlet. Fuel can also flow backward in the HP portion of the CNG system through a defuel valve which allows fuel to be removed from the system through a defuel receptacle.

The pressure regulator is the dividing between the HP and LP sides of the fuel system. The pressure regulator reduces fuel entering at a nominal pressure of 3600 psi (24.8MPa) to significantly reduced pressures ranging from 120 psi (827kPa) to 150 psi (1034kPa).

NOTICE

1. ***Pressure of fuel entering the pressure regulator inlet ranges from a high of 3600 psi (24.8MPa) to as low as zero if the system is empty.***
2. ***A minimum of 500 psi (3447 kPa) fuel pressure is required for engine operation.***

The low pressure (LP) portion of the CNG system begins at the outlet side of the pressure regulator and is comprised of fuel tubes and/or hoses which are essentially unidirectional, supplying fuel through an LP filter forward through additional fuel lines, fuel rails, and fuel injectors.

SERVICE MANUAL – FUEL SYSTEM REPAIR INSTRUCTIONS

PROCEDURE

1. Park vehicle outdoors in a well-ventilated area away from ignition sources.
2. Set parking brake and secure vehicle with wheel chocks.
3. Close manual shutoff valves (1) on all fuel cylinders by turning clockwise. *Figure 1*
4. Start vehicle and allow vehicle to run until it stalls.
5. Crank vehicle for 20 seconds to bleed as much fuel as possible from the lines.
6. Leave ignition key in the ON position.
7. Check high pressure gauge (2) on vehicle fuel fill panel. The gauge should read zero psi. *Figure 2*
8. Remove fuel fill panel cover (3) to access the defuel valve. *Refer to fuel fill panel cover replacement.*
9. Turn defuel valve handle (4) to the DEFUEL position. *Figure 4*
10. Follow printed instructions to open bleed valve and open bleed valve (5). *Figure 5*

NOTICE

A slight hiss of escaping fuel may be heard as remaining pressure exits the fuel system.

11. Turn ignition key to the OFF position.
12. *If service facility meets requirements for CNG vehicle repairs*, push vehicle into service bay.

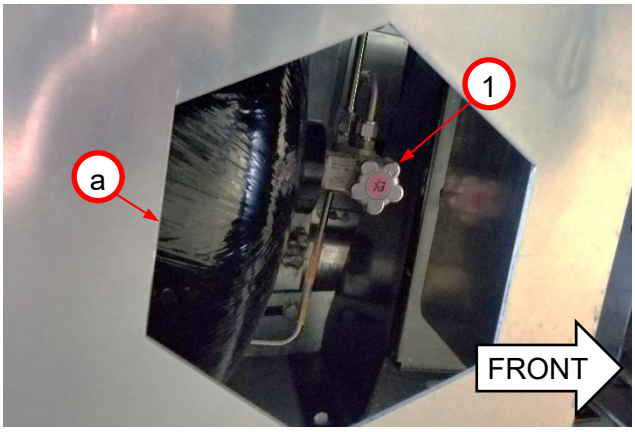

Figure 1:
Cylinder shutoff valve (1) inside cylinder shield access window (a). *NOTE: Driver side shown; verify passenger side cylinder shutoff valve is also closed.*

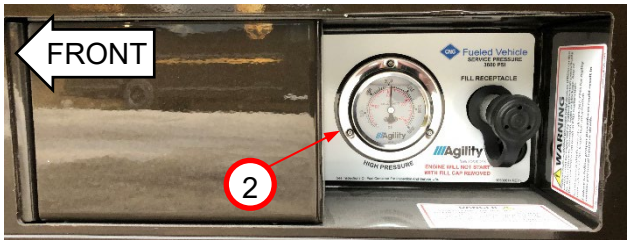

Figure 2:
HP fuel gauge (2) on fill panel at driver side rear of body.

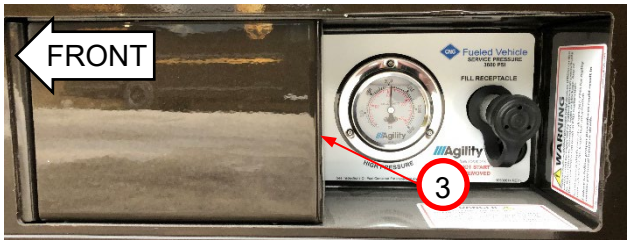

Figure 3:
Fill panel cover (3) limits access to defuel valve and bleed valve.

⚠CAUTION

If the facility is not equipped for CNG vehicle repairs, additional procedures must be performed outdoors per Step 1.

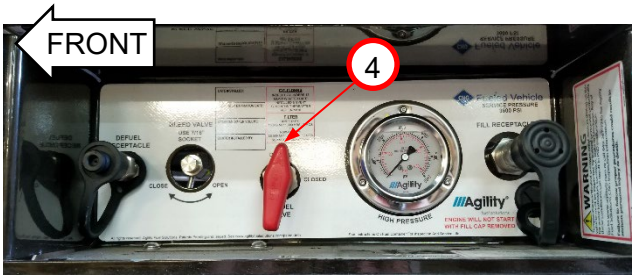

Figure 4:
Defuel valve (4) on fuel fill panel.

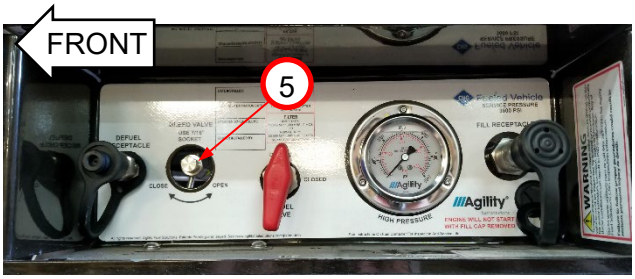

Figure 5:
Bleed valve (4) on fuel fill panel.

Fuel line replacement

DESCRIPTION AND OPERATION

Agility CNG fuel systems utilize pressurized fuel tubes and hoses which can be classified as high pressure (HP) or low pressure (LP) lines. The pressure regulator divides the HP and LP sides of the fuel system, reducing fuel entering at a nominal pressure of 3600 psi (24.8MPa) to significantly reduced pressures ranging from 120 psi (827kPa) to 150 psi (1034kPa).

NOTICE

***Pressure of fuel entering the pressure regulator inlet ranges from a high of* 3600 psi (24.8MPa) *to as low as zero if the system is empty. System working pressure is* 4500 psi (31.0MPa).**

⚠CAUTION

1. ***ALWAYS wear safety glasses and other appropriate personal protective equipment when working around pressurized fuel systems.***
2. ***Agility fuel lines are ALWAYS pressurized up to* 3600 psi (24.8MPa) *UNLESS the fuel system has been defueled. Additionally, after defueling residual pressure ALWAYS will be present in the lines. Refueling in high temperatures may reach* 4100 psi (28.2 MPa).**

REMOVAL PROCEDURE

1. Depressurize fuel lines. *Refer to fuel line depressurization procedure.*

   ⚠CAUTION

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

2. Use a wrench to loosen compression fitting nuts (a) and (c) securing each end of fuel tube (1) to fuel line junctions or system components. *Figure 1*
3. *If applicable:* Remove any tube clamps (b) securing fuel tube (1). *Figure 2*
4. Remove fuel tube (1). *Figures 1 and 2*

   NOTICE

   Fuel tube removal may require removal of adjacent components.

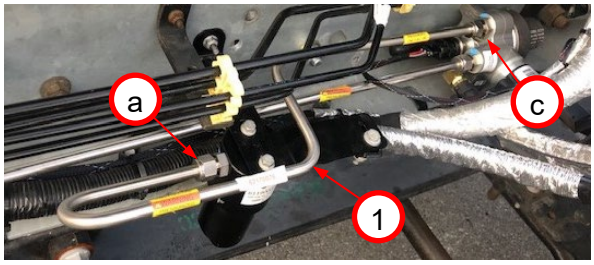

Figure 1:
Fuel line (1), compression fitting nuts (a).

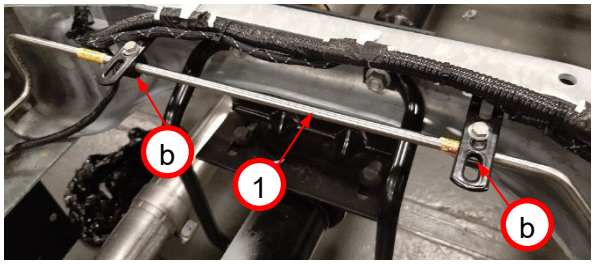

Figure 2:
Fuel line (1), tube clamps (b).

INSTALLATION PROCEDURE

1. **⚠CAUTION**

   Inspect new tube and fitting mating surfaces per TRD-019. *If necessary: replace damaged component(s).*
2. **IMPORTANT:** When installing a fuel line assembled using a combination of JIC and compression fittings, always install the compression fitting end first.
3. Position one end of fuel line (1) at fitting (a). *Figure 3*
4. Hand tighten fuel line (1) fitting nut (a). *Figure 3*
5. Repeat Steps 3 and 4 for fitting (c) at other end of fuel line. *Figure 3*
6. **⚠CAUTION**

   Verify fuel line is properly aligned and has proper clearance from other system and chassis/body components before torqueing fitting nuts.
7. Use a wrench to tighten fitting nuts (a) and (c). *Figure 3*

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.
8. Reinstall any tube clamps (b) and tighten any fasteners. *Figure 4*

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.

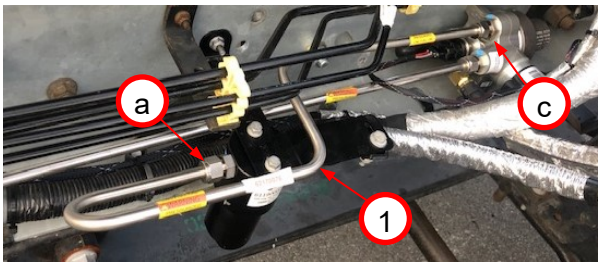

Figure 3:
Fuel line (1), compression fitting nuts (a) and (c).

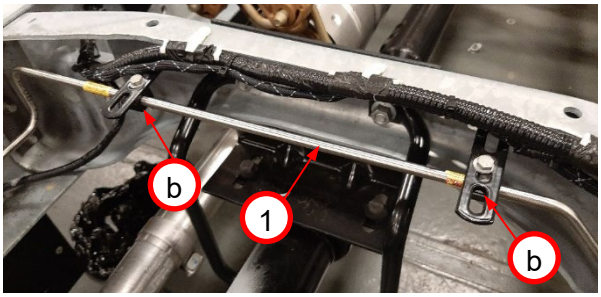

Figure 4
Fuel line (1), tube clamps (b).

Fuel fill panel replacement

DESCRIPTION AND OPERATION

The Ford F-59 CNG fuel fill panel is mounted at the rear driver side body. Although individual fill panel components may be replaced, an entire new panel assembly may also be obtained from Agility®.

REMOVAL PROCEDURE

1. Set parking brake and secure vehicle with wheel chocks.
2. Depressurize fuel system. *Refer to fuel system depressurization procedure.*
3. Remove road debris shield from rear driver side of chassis. *Refer to body builder procedure.*
4. Use a wrench to loosen HP fuel hose compression nut fitting (a) from fuel fill panel (6) main fitting body (5). *Figure 2*
5. Disconnect fuel system chassis harness from fuel fill panel. *Refer to fuel system chassis harness replacement.*
6. Remove fuel fill panel (3). *Figures 1 and 2*

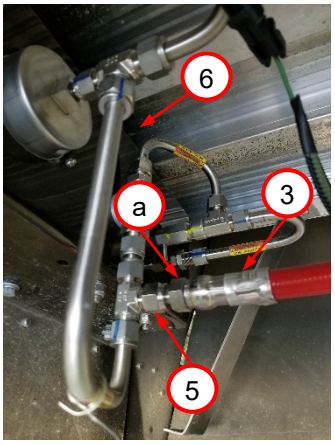

Figure 1:
HP flexible fuel hose (3), compression nut fitting (a), main fitting body (5), fuel fill panel (6).

INSTALLATION PROCEDURE

IMPORTANT: Inspect new and existing fitting mating surfaces.

1. Install fuel fill panel in driver side rear body using existing hardware. *Refer to body builder procedure.*
2. Hand tighten HP flexible fuel hose compression fitting nut (a) on fuel fill panel main fitting (5). *Figure 1*
3. Use a wrench to hold fill panel main fitting (5) body and a second wrench to tighten HP fuel hose compression fitting nut (a). *Figure 1*

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.
4. Connect fuel system chassis harness to fuel fill panel. *Refer to fuel system chassis harness replacement.*
5. Perform leak check. *Refer to leak check procedure*.
6. Replace road debris shield. *Refer to OEM body builder procedure.*
7. Verify proper operation.

Low pressure (LP) flexible fuel hose replacement

DESCRIPTION AND OPERATION

To compensate for engine movement, a flexible fuel hose certified for CNG use delivers fuel from the low pressure (LP) fuel filter to the rear of the driver side fuel rail. Compression fittings are used on each end of the LP fuel hose, and dual tie strap clips secure the hose to bracketry and fuel system coolant hoses.

REMOVAL PROCEDURE

1. Set parking brake and secure vehicle with wheel chocks.
2. Depressurize fuel system. *Refer to fuel system depressurization procedure.*
3. Remove engine doghouse cover. *Figure 1. Refer to OEM body builder procedure.*
4. Remove transmission to driveshaft cover. *Refer to OEM body builder procedure.*
5. Use a wrench to remove flange head bolt (a) and nut (b) and two washers *(not shown)* from single tie clip (2) securing low pressure (LP) flexible fuel hose (1) to LP filter bracket (3). *Figure 1a*
6. Use a wrench to remove flange head bolt (a) and nut (b) and two washers *(not shown)* from single tie clip (2) securing low pressure (LP) flexible fuel hose (1) to transmission bracket (13). *Figure 1b*
7. Use a wrench to loosen LP flexible fuel hose (1) compression nut fitting (7) from LP filter fitting (8). *Figure 2*
8. Use a wrench to hold driver side fuel rail (4) rear t-fitting body (5). *Figure 3*
9. Use a second wrench to loosen LP flexible fuel hose compression nut fitting (6) from driver side fuel rail (4) rear t-fitting body (5). *Figure 3*

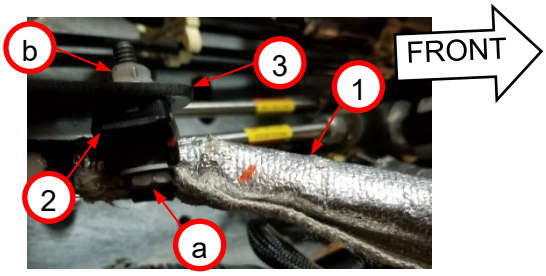

Figure 1a.
Low pressure (LP) flexible fuel hose (1), single tie clip (2), bolt (a), nut (b), LP filter bracket (3).

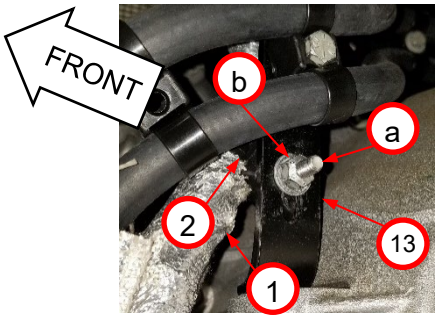

Figure 1b.
Low pressure (LP) flexible fuel hose (1), single tie clip (2) bolt (a), nut (b), transmission bracket (13).

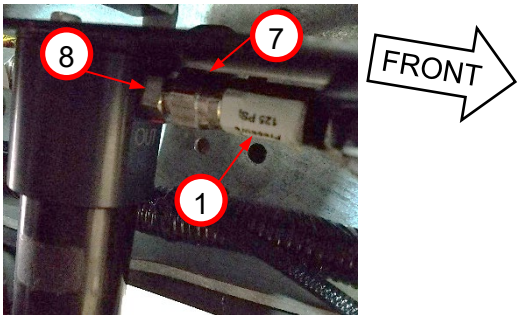

Figure 2.
LP flexible fuel hose (1), fitting nut (7), LP fitting (8).

10. Use side cutters to remove four dual tie strap clips (9), AKA “butterfly clips,” securing LP flexible fuel hose to fuel system coolant lines. *Figure 4*
11. Remove LP flexible fuel hose (1).

INSTALLATION PROCEDURE

IMPORTANT: Inspect new and existing fitting mating surfaces.

1. Verify heat sleeve (10), p/n 61270000, is installed on LP flexible fuel hose and is secured with zip ties (11). *If not present, obtain replacement from Agility®.*
2. Hand tighten LP flexible fuel hose (1) compression fitting nut (6) on driver side fuel rail t-fitting (5). *Figure 3*
3. Tighten compression fitting nut (6) at driver side fuel rail t-fitting (5) while using a wrench to hold t-fitting body. *Figure 3*

⚠CAUTION

Refer to Fuel System Torque and Tightening Specifications.

4. Hand tighten LP flexible fuel hose (1) compression fitting nut (7) on LP filter fitting (8). *Figure 2*
5. Tighten LP flexible fuel hose (1) compression fitting nut (7) at LP filter fitting (8) while using a wrench to hold fitting body. *Figure 3*

⚠CAUTION

Refer to Fuel System Torque and Tightening Specifications.

6. Perform leak check. *Refer to leak check procedure*.
7. Install four dual tie strap clips (), p/n 61090072, to secure LP flexible fuel hose. *Figure 4*

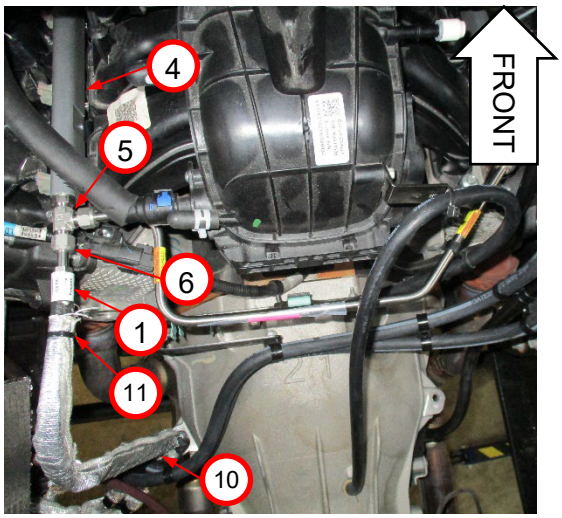

Figure 3.
LP flexible fuel hose (1), nut fitting (), heat sleeve (10), zip tie (11), t-fitting (5), fuel rail (4).

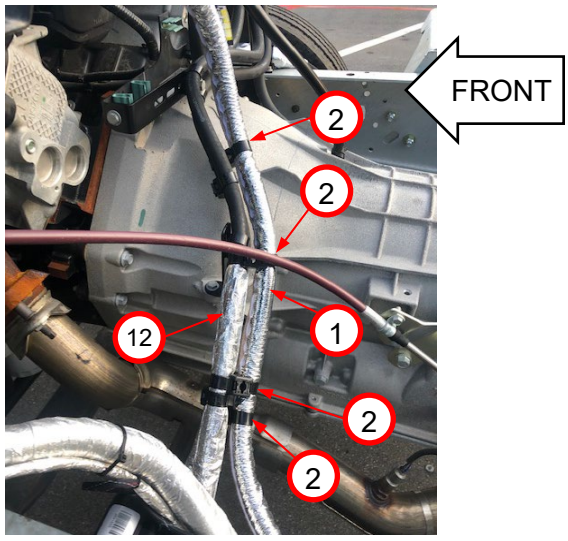

Figure 4.
LP flexible fuel hose (1), four dual tie clips (2), coolai hoses (12).

8. *If installing a new LP flexible fuel hose:* Install two single strap clips (2), p/n 61090092, on LP flexible fuel hose (1) at LP filter bracket (3) and transmission bracket (13). *Figures 1a and 1b*
9. Install single strap clip (2), on LP fuel filter bracket (3) using bolt (a) and nut (b) and two washers *(not visible). Figure 1*a
10. Install single strap clip (2), on transmission bracket (13) using bolt (a) and nut (b) and two washers *(not visible). Figure 1b*
11. Replace engine doghouse cover. *Refer to OEM body builder procedure.*
12. Replace transmission to driveshaft cover. *Refer to OEM body builder procedure.*

Cylinder shield replacement

DESCRIPTION AND OPERATION

Aluminum cylinder shields protect the fuel cylinders from damage from road debris. Cylinder shield windows on the fuel cylinder valve and PRD plug ends provide access for cylinder valve shutoff and ease of reading manufacturer cylinder labels.

Cylinder shields are supplied and serviced by the vehicle bodybuilder; Agility® provides these instructions as a convenience to technicians to allow access to fuel system components. Always refer to OEM bodybuilder service literature.

REMOVAL PROCEDURE

1. Set vehicle parking brake and secure with wheel chocks.
2. **RECOMMENDED:** *Raise vehicle on an approved hoist.*
3. Support cylinder shield (1) using a transmission jack (a). *Figure 1*

⚠CAUTION

Use a pad, shipping material or other non-marring item between jack head and shield to minimize scratches.

4. Remove four fasteners (2) securing cylinder shield to outside cylinder mount bracket clips *(not visible). Figure 2*

⚠CAUTION

Avoid contact with cylinders; impacts, abrasions, or other damage may cause a cylinder to fail inspection and be taken out of service.

5. Remove four fasteners securing cylinder shield to outside cylinder mount bracket clips *(not visible). Figure 2*
6. Lower cylinder shield (1) using the transmission jack (a). *Figure 1*

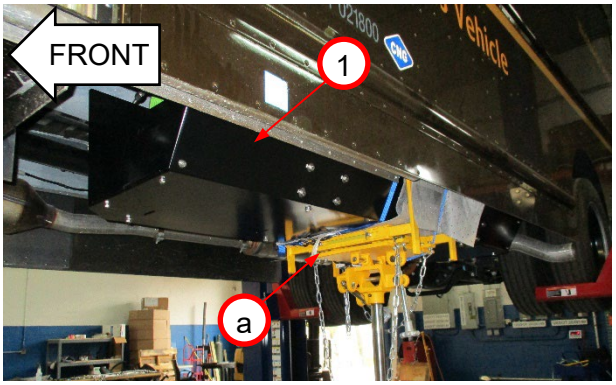

Figure 1:
Driver side cylinder shield (1) supported by transmission jack (a). *NOTE: Preproduction cylinder shield shown.*

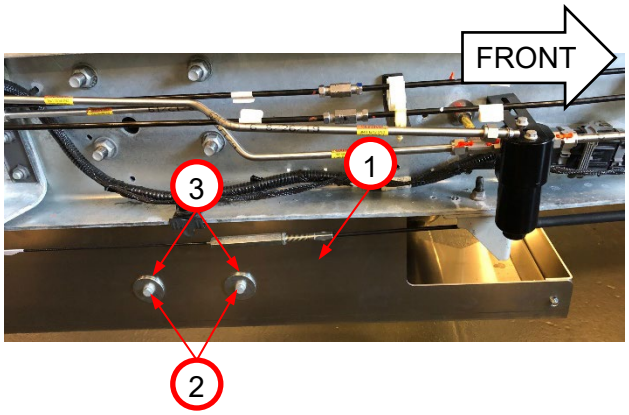

Figure 2:
Cylinder shield (1), front two bolts (2) and washers (3).
NOTE: *Driver side shown; passenger side similar.*

INSTALLATION PROCEDURE

1. Using a transmission jack, position cylinder shield mounting holes *(not shown)* to line up with corresponding clips (b) on outside of cylinder brackets. *Figures 3 & 4*
2. Install eight bolts (2) and eight washers (3) to secure cylinder shield (1) to cylinder mount bracket clips (not visible). *Figure 5*

⚠CAUTION

The shorter of the two bolt lengths provided must be used on the inside cylinder shield mounting points. Figure 6

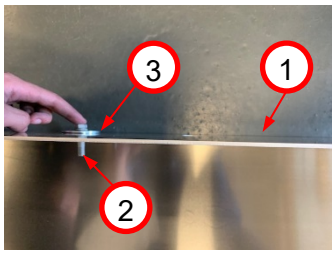

Figure 6:
Cylinder shield (1), cylinder shield bolt (2) and washer (3).

3. Torque cylinder shield fasteners to specifications.

⚠CAUTION

Refer to OEM bodybuilder procedure.

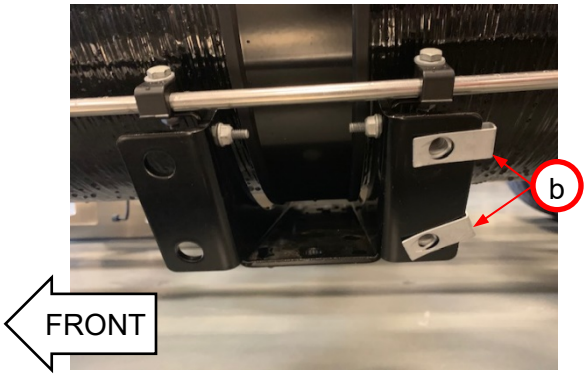

Figure 3:
Driver side outside rear cylinder bracket with mounting clips (b) for cylinder shield fasteners.

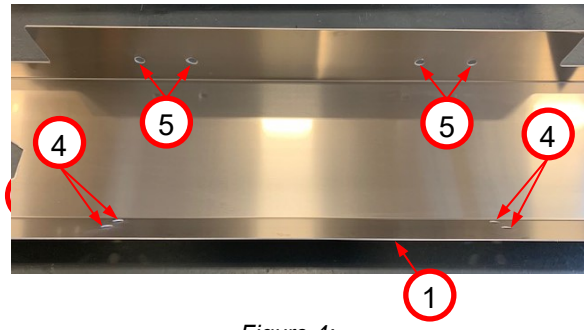

Figure 4:
Uninstalled cylinder shield (1) showing outside mounting holes (4), inside mounting holes (5).

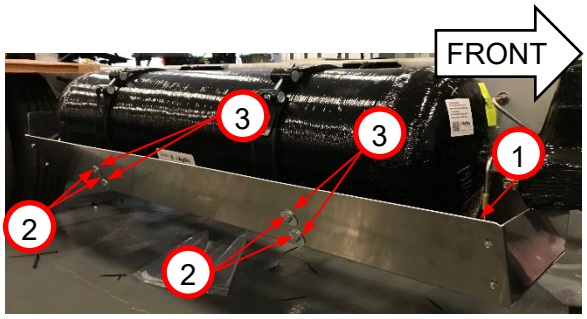

Figure 5:
Cylinder shield (1), cylinder shield mounting bolts (2) and washers (3). **NOTE**: *Outside passenger side fasteners shown; driver side similar.*

Agility® fuel solutions

SERVICE MANUAL – FUEL SYSTEM REPAIR INSTRUCTIONS

PRD vent line shield replacement

DESCRIPTION AND OPERATION

An aluminum shield protects Ford F-59 CNG fuel system PRD vent lines from road debris. The PRD vent line shield is supplied and serviced by the vehicle bodybuilder; Agility® provides these instructions as a convenience to technicians to allow access to fuel system components. Always refer to OEM bodybuilder service literature.

REMOVAL PROCEDURE

1. Set vehicle parking brake and secure using wheel chocks.
2. **RECOMMENDED:** *Raise vehicle on an approved hoist.*
3. Remove four fasteners securing PRD vent line shield to chassis.
4. Remove PRD vent line shield .

INSTALLATION PROCEDURE

1. Use four fasteners to install PRD vent line shield on chassis.
2. Torque PRD vent line shield fasteners to OEM specifications.

   ⚠CAUTION

   Refer to body builder procedure.

PRD vent line replacement

DESCRIPTION AND OPERATION

In the event that the temperature around the cylinder exceeds design specifications, pressure relief devices (PRDs) installed on the fuel cylinders open to release high pressure fuel to prevent cylinder rupture. Cylinder PRD valves are plumbed into PRD vent tubes to route fuel back and up away from the vehicle and away from curbside.

⚠CAUTION

Never operate vehicle if a PRD vent tube cap is missing.

NOTICE

PRD vent lines on the Agility® Ford F-59 CNG system are non-pressurized.

REMOVAL PROCEDURE

1. Use a wrench to loosen fitting nuts (2) securing each end of PRD vent tube (1) to respective fittings (a). *Figures 1 and 2*
2. *If equipped:* Loosen or remove any tube clamps (3) securing PRD vent tube (1). *Figures 1, 2 and 3*
3. *If equipped:* Use a side cutter to remove dual tie strap clip (4) securing the chassis harness (5) to the PRD vent tube (1). *Figure 3*

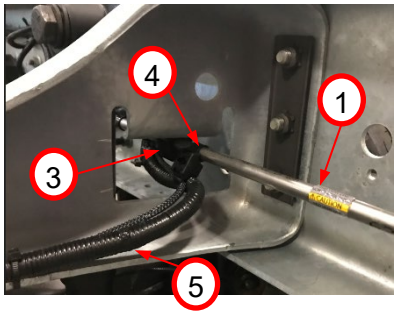

Figure 3:
PRD vent tube (1), tube clamp (3), dual tie strap clip (4), chassis harness (5).

4. Remove PRD vent tube (1).

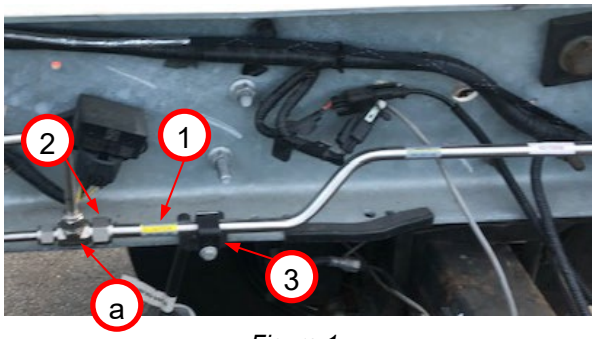

Figure 1:
PRD vent tube (1), fitting nut (2), t-fitting (a), tube clamp (2).

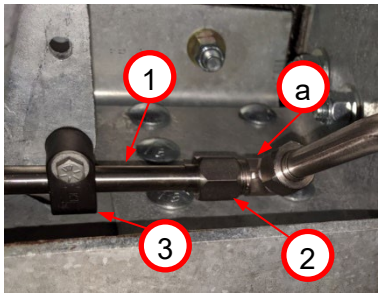

Figure 2:
PRD vent tube (1), fitting nut (2), union 90° elbow fitting (a), tube clamp (2).

INSTALLATION PROCEDURE

1. **⚠CAUTION**
   Inspect new tube and fitting mating surfaces per TRD-019. *If necessary: replace damaged component(s).*
2. **IMPORTANT:** *When installing a PRD vent tube assembly with both JIC and compression fittings, always install the compression fitting end first.*
3. Position one end of PRD vent tube (1) at fitting (a). *Figure 1*
4. Hand tighten fitting nut (2).
5. Position one end of PRD vent tube (1) at fittings (a). *Figures 1 and 2*
6. Hand tighten fitting nuts (2). *Figure 1*

   ⚠CAUTION

   Verify PRD vent line is properly aligned and has proper clearance from other system and chassis/body components before torqueing fittings.
7. Use a wrench to tighten fitting nuts (a).

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.

   NOTICE

   When connecting PRD vent tubes at junctions such as union fittings (not visible), use an additional wrench (d) to hold the fitting body while tightening the fitting nut (2). Figure 4
8. Reinstall any tube clamps (3) removed and/or tighten any associated fasteners loosened for tube removal.

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.

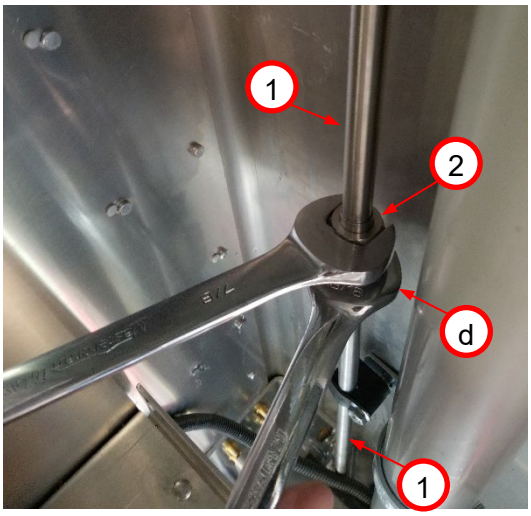

Figure 4:
When tightening fitting nut (2) on PRD vent tubes (1), hold union fitting (not visible) with a second wrench (d).

PRD vent outlet fitting replacement

DESCRIPTION AND OPERATION

In the event of a thermal event such as the heat of a fire, pressure relief devices (PRDs) installed on the fuel cylinders open to release high pressure fuel to prevent cylinder rupture. Cylinder PRDs are plumbed into a PRD vent lines to route escaping fuel back and up to the PRD vent outlet fitting and away from the vehicle towards road center.

The PRD vent outlet fitting attaches to the rest of the PRD vent system through a vehicle body bulkhead fitting. The PRD vent outlet fitting is covered with a heat shrink cap to prevent moisture or other environmental elements from compromising the PRD vent line system.

⚠CAUTION

Never operate the vehicle with a missing heat shrink PRD vent outlet cap. Obtain a replacement from Agility®.

NOTICE

PRD vent lines are non-pressurized.

REMOVAL PROCEDURE

1. Use a wrench to loosen PRD vent outlet fitting (1) nut (2) from PRD vent bulkhead fitting (3). *Figure 1*
2. Remove PRD vent outlet fitting (1). *Figure 1*

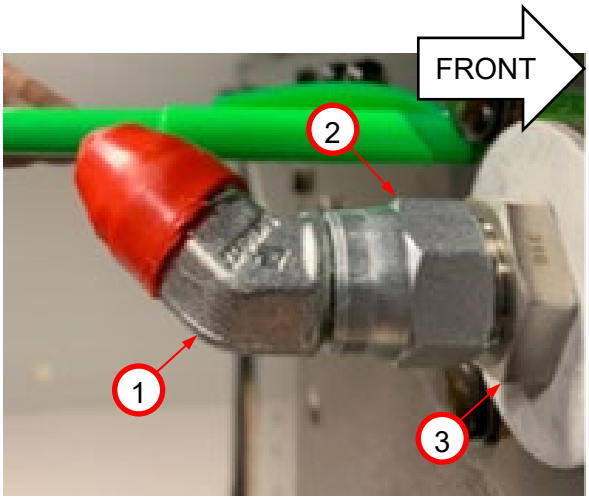

Figure 1:
PRD vent outlet fitting (1), fitting nut (2).

INSTALLATION PROCEDURE

IMPORTANT: Inspect new fitting mating surfaces.

1. Loosely attach PRD vent outlet fitting (1) to PRD vent bulkhead fitting (3). *Figure 1*

⚠ CAUTION

2. Rotate PRD vent outlet fitting (1) to 15°-20° angle toward road center. *Figure 2*
3. Hold bulkhead fitting (3) with a wrench and use another wrench to tighten PRD vent outlet fitting (1) nut fitting (2). *Figure 1*

⚠ CAUTION

A. Torque nut fitting to 45 ft-lbs (102Nm). Refer to Fuel System Torque and Tightening Specifications.

B. Avoid scratching vehicle paint.

4. Verify PRD vent outlet fitting (1) is angled 15°-20° toward road center. *Figure 2*
5. Verify PRD vent cap (4) is installed on PRD vent outlet fitting (1). *Figure 3*

⚠ CAUTION

If PRD vent cap (4) is not installed, obtain replacement from Agility and install on PRD vent outlet fitting using a heat gun.

6. Verify PRD vent warning decal (5) is installed; obtain replacement from Agility if missing. *Figure 2*

Figure 2:
PRD vent outlet fitting (1), must be angled 15°-20° toward road center.

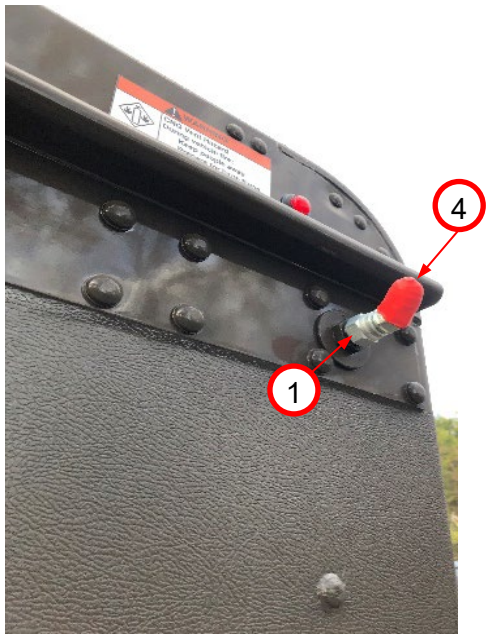

Figure 3:
PRD vent outlet fitting (1), PRD vent cap (4).

Fuel rail assembly replacement

DESCRIPTION AND OPERATION

Rugged billet aluminum fuel rails secure Agility® fuel injectors in the OEM position and orientation on the intake manifold above each cylinder bank. Fuel flows forward from the rear of each fuel rail to each injector and is returnless, i.e., separate fuel lines are not required to send fuel back to the cylinders

REMOVAL PROCEDURE

1. Depressurize fuel system.
2. Remove engine doghouse cover.
   Refer to OEM body builder procedure.
3. Thoroughly lean any debris or moisture from and around fuel rail (1) to be removed. *Figure 1*
4. Remove fuel rail cross over tube (2).
   Figure 1. Refer to *Fuel rail cross over tube replacement.*
5. *Driver side fuel rail only:* Remove LP flexible fuel hose (3) from t-fitting (4) on driver side fuel rail. *Figure 1.* Refer to *Low pressure flexible hose replacement.*
6. Use a wrench to remove two bolts (6) securing fuel rail (1) to fuel rail brackets (5).
7. Lift fuel rail straight up to release rail from the fuel injectors.
8. Walk rail backwards and remove fuel rail from vehicle.

⚠CAUTION

Do not allow debris or moisture to enter fuel rail or injectors.

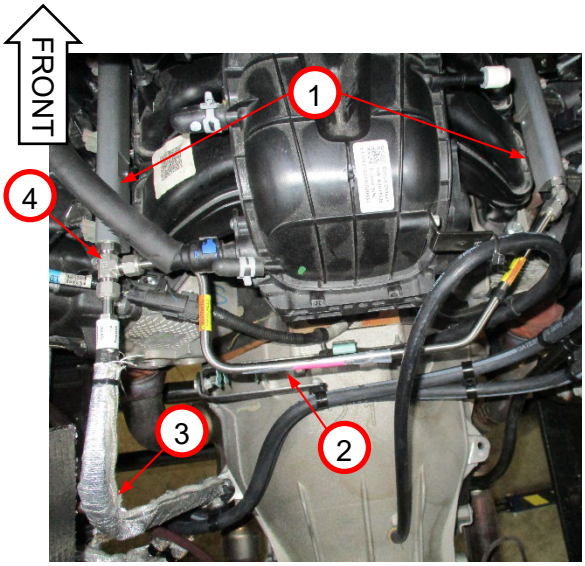

Figure 1:
Fuel rail (1), fuel rail crossover tube (2), LP flexible fuel hose (3), t-fitting (4).

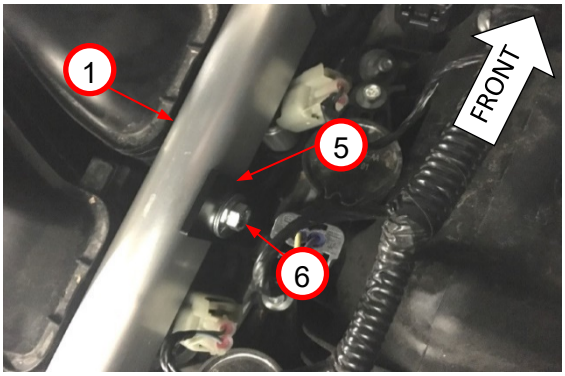

Figure 2:
Fuel rail (1), fuel rail bracket (5), bracket bolt (6).
NOTE: *Passenger side shown; driver side similar.*

INSTALLATION PROCEDURE

IMPORTANT: Inspect new and existing O-rings and fitting mating surfaces.

1. Clean all fuel rail to fuel injector mounting surfaces.
2. Apply a thin coat of clean Motorcraft 5W-20 engine oil to each fuel injector (7) O-ring (a) and each fuel injector spacer (8) O-ring (b). *Figure 3*
3. Install fuel rail on fuel injectors starting with the front injector and work it down on to all four remaining injectors.
4. Use a wrench to tighten two bolts (6) to secure fuel rail (1) to fuel rail brackets (5). *Figure 2*

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.
5. Install fuel rail cross over tube. *Figure 1*

   Refer to fuel rail crossover replacement.

   NOTICE

   Although the rear fuel rail fitting (c) should be clocked properly for installation, it may be necessary to adjust the orientation of the rear fuel rail fitting to align the fuel rail cross over tube properly. To do so, loosen the fitting nut (d) and rotate fitting to the desired angle prior to tightening the fitting. Figure 4

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.
6. Perform leak check.

   Refer to leak check procedure.
5. Replace engine doghouse cover.

   Refer to OEM body builder procedure.

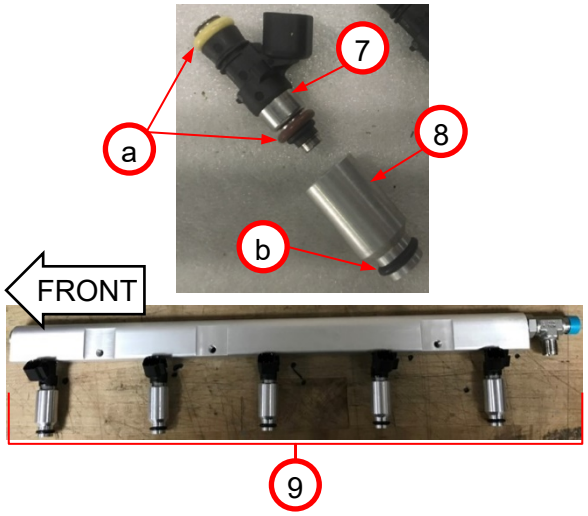

Figure 3:
Fuel injector (7), injector O-ring (a), spacer (8), spacer O-ring (b), driver side fuel rail assembly (9).

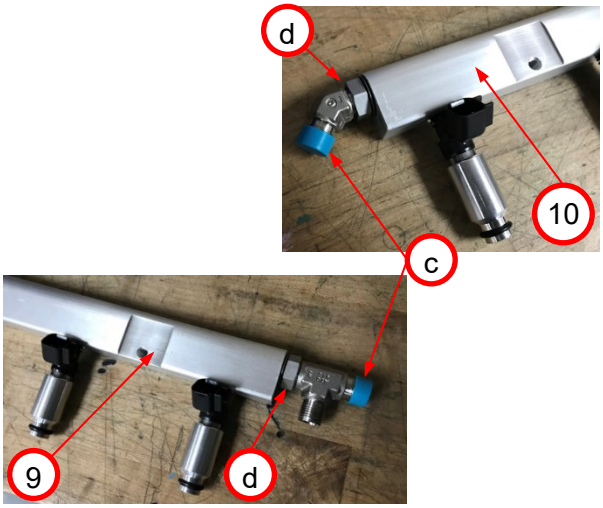

Figure 4:
Driver side fuel rail assembly (9), passenger side fuel rail assembly (10), rear fittings (c), jam juts (d).

Fuel injector replacement

DESCRIPTION AND OPERATION

Agility® Ford F-59 CNG fuel injectors are housed in two billet aluminum fuel rails and connect to the OEM intake manifold via individual spacers. O-rings at the fuel rail body and nozzle ends of the fuel injector are wear items, damage to which or the absence of which can result in a lean cylinder diagnostic code. Obtain replacement O-rings from Agility®.

REMOVAL PROCEDURE

1. Depressurize fuel system. *Refer to fuel system depressurization procedure.*
2. Remove engine doghouse cover. *Refer to OEM body builder procedure.*
3. Clean any debris or moisture from fuel rail(s) to be removed.
4. Remove fuel rail cross over tube. *Refer to fuel rail cross over tube replacement.*
5. Remove fuel rail housing the fuel injector(s) to be replaced. *Refer to fuel rail replacement.*
6. Disconnect fuel injector electrical connector(s) from fuel injector(s) to be replaced. *Figure 1*
7. Remove fuel injector(s) to be replaced from fuel injector spacer or fuel rail. *Figure 2*

⚠CAUTION

Do not allow debris or moisture to enter fuel rail or injector spacers.

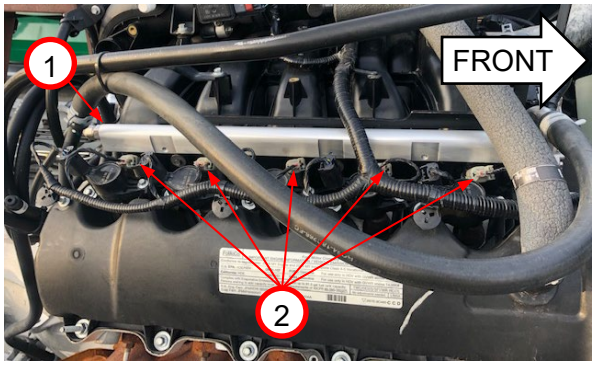

Figure 1:
Fuel rail (1), fuel injector connectors (2). NOTE: Passenger side shown; driver side similar.

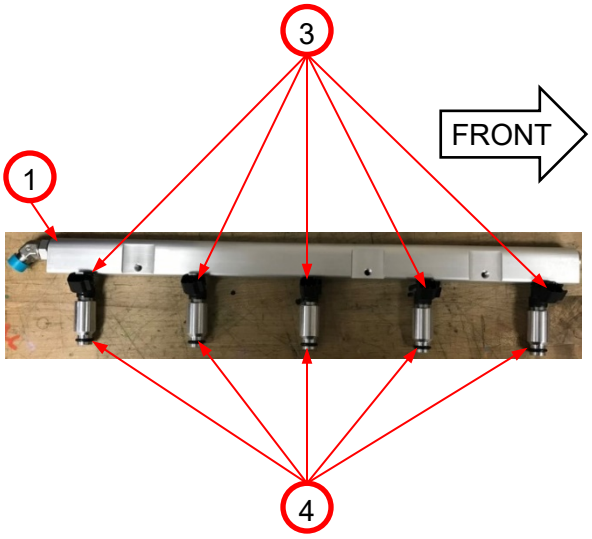

Figure 2:
Fuel rail (1), fuel injectors (3), fuel injector spacers (4). NOTE: Passenger side shown; driver side similar.

INSTALLATION PROCEDURE

IMPORTANT: Inspect new and existing O-rings and port surfaces.

1. Clean all fuel rail to fuel injector mounting surfaces.
2. Apply a thin coat of clean Motorcraft 5W-20 engine oil to each fuel injector body O-ring (5), each fuel injector nozzle O-ring (6), and each spacer O-ring (7). *Figure 3*
3. Install fuel injector(s).

   ⚠CAUTION

   Verify fuel injector is properly seated in the spacer and the spacer is installed in the intake port.
4. Connect fuel injector electrical connector(s). *Figure 1*
5. Install fuel rail. *Refer to fuel rail replacement.*
6. Install low pressure fuel line fuel rail cross over. *Refer to fuel rail crossover replacement.*
7. Perform leak check. *Refer to leak check procedure*.
8. Verify proper operation.
9. Replace engine doghouse cover. *Refer to OEM body builder procedure.*

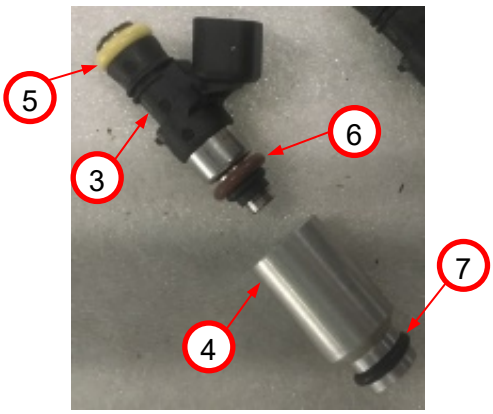

Figure 3.
Fuel injector (3), fuel injector body O-ring (5), fuel injector nozzle O-ring (6), fuel injector spacer (4), fuel injector spacer O-ring (7).

Low pressure filter assembly replacement

DESCRIPTION AND OPERATION

A low pressure (LP) filter serves as a further safeguard against fuel contamination. The low pressure filter is located on the driver side chassis frame rail.

The LP filter element is a regular maintenance item; please refer to *Filter element replacement procedure.*

REMOVAL PROCEDURE

1. Depressurize fuel system. *Refer to fuel system depressurization procedure.*
2. Set parking brake and secure vehicle with wheel chocks.
3. Remove engine doghouse cover.
   Refer to OEM body builder procedure.
4. Remove transmission to driveshaft cover.
   Refer to OEM body builder procedure.
5. Loosen compression fitting nut (a) at low pressure (LP) filter assembly IN port fitting (1). *Figure 1*
6. Loosen compression fitting nut (b) at LP filter assembly OUT port fitting (2). *Figure 2*

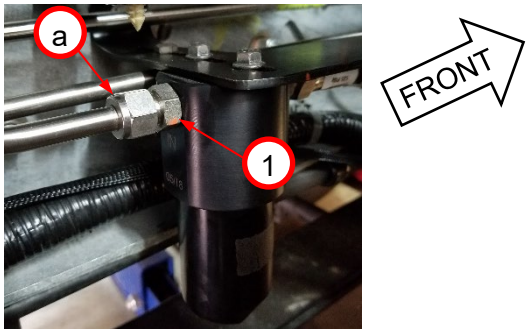

Figure 1:
LP filter IN port fitting (1),
compression fitting nut (a).

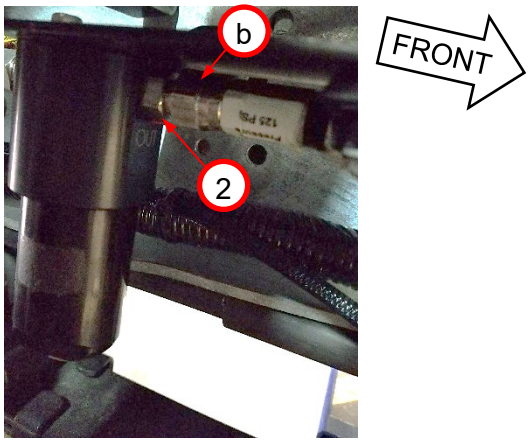

Figure 2:
LP filter OUT port fitting (2),
compression fitting nut (b).

7. Use a pair of wrenches to remove clamp (3) securing LP fuel hose (4) to LP filter bracket (5). *Figure 3*
8. Use a wrench to remove two bolts (c) securing LP filter assembly (6) to LP filter bracket (5). *Figure 4*
9. Remove LP filter assembly.

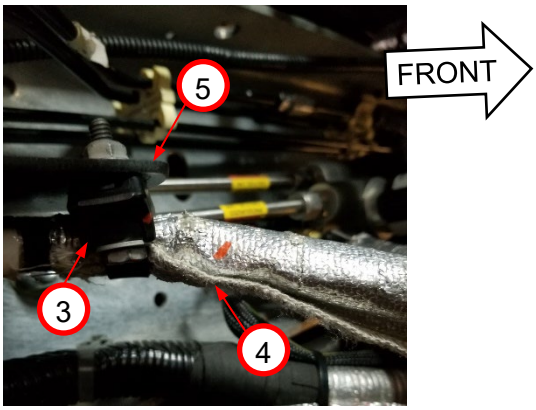

Figure 3:
LP filter bracket (5), clamp (5), LP fuel hose (4).

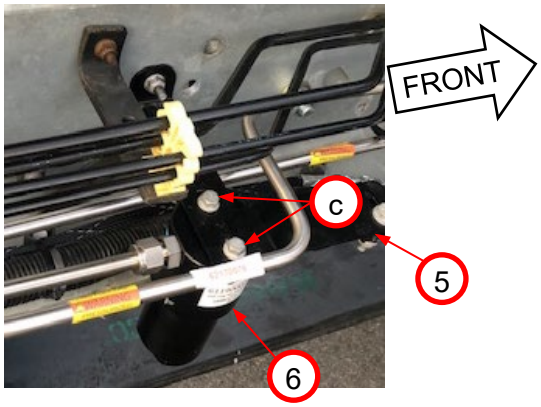

Figure 4:
LP filter bracket (5), bolts (5),
LP filter assembly (6).

INSTALLATION PROCEDURE

IMPORTANT: Inspect new and existing fitting mating surfaces.

1. Hand tighten compression fitting nuts (a) and (b) at LP filter inlet and outlet ports (1) and (2). *Figure 5*
2. Tighten compression fitting nuts (a) and (b) at LP filter inlet and outlet ports (1) and (2). *Figure 5*

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.
3. Install two bolts securing LP filter assembly (6) to LP filter bracket (5). *Figure 4*

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.
4. Use a pair of wrenches to install clamp (3) to secure LP fuel hose (4) to LP filter bracket (5). *Figure 3*
5. Perform leak check.

   Refer to leak check procedure.
6. Replace engine doghouse cover.

   Refer to OEM body builder procedure.
7. Replace transmission to driveshaft cover.

   Refer to OEM body builder procedure.

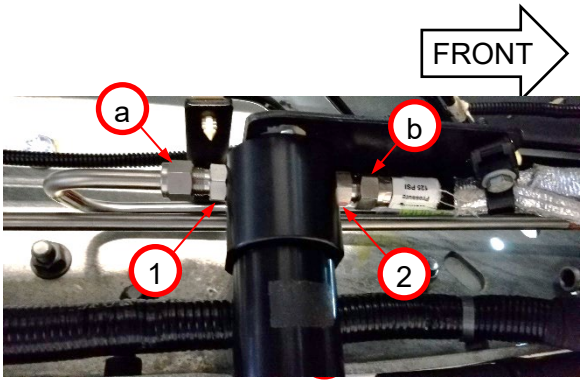

Figure 5:
LP filter OUT port (1) compression fitting nut (a), LP filter OUT port (2) compression fitting nut (b).

Fuel filter element replacement

DESCRIPTION AND OPERATION

Two fuel filters of the same design safeguard against fuel contamination on the low pressure (LP) and high pressure (HP) sides of the Agility® CNG fuel system. Both the HP and LP fuel filters are located on the driver side chassis frame rail; the HP filter is positioned just to the rear of the 1/4-turn manual shutoff valve, while the LP filter is behind the pressure regulator.

LP and HP filter elements are serviced using the procedure detailed below. Filter elements are regular maintenance items; please refer to Ford F-59 CNG operators manual for replacement intervals.

REMOVAL PROCEDURE

1. Depressurize fuel system. *Refer to fuel system depressurization procedure.*
2. Set parking brake and secure vehicle with wheel chocks.
3. **RECOMMENDED:** Raise vehicle on an approved hoist.
4. Use a wrench to remove filter plug (1) from filter bowl (2). *Figure 1*

⚠CAUTION

Position a catch pan to possible condensate draining from the filter.

5. Use a wrench to remove filter bowl (2) from filter head (3). *Figure 2*

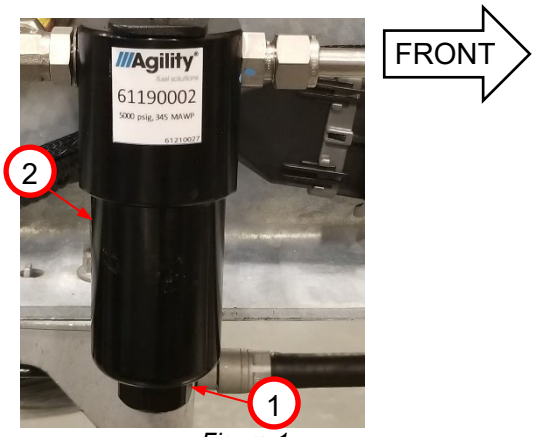

Figure 1:
Filter plug (1), filter bowl (2). NOTE: HP filter shown; LP filter similar.

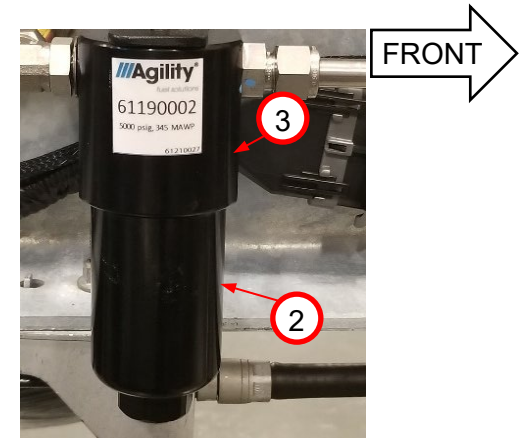

Figure 2:
Filter head (3), filter bowl (2). NOTE: HP filter shown; LP filter similar.

6. Remove filter element (4), filter bowl O-ring (5), and plug O-ring (6). *Figure 3*

⚠CAUTION

Discard filter element (4), filter bowl O-ring (5), and plug O-ring per facility environmental guidelines.

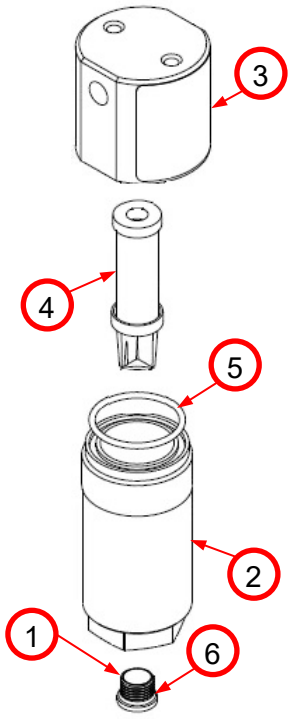

Figure 3:
Filter head (3), filter bowl (2), element (4), bowl O-ring (5), plug (1), plug O-ring (6).

INSTALLATION PROCEDURE

1. Apply a light coat of O-ring lube (7) *(included in Agility fuel filter element service kit)* to plug O-ring (6) and bowl O-ring (5). *Figure 4*
2. Install plug O-ring (6) on plug (1). *Figure 3*
3. Install filter bowl O-ring (5) in top groove of filter bowl (2). *Figure*
4. Install filter element (4) in bowl (2). *Figure 3*
5. Install filter bowl (2) on filter head (3). *Figure 2*

   ⚠CAUTION

   Torque filter bowl to 75 ft-lbs (101.7Nm).
6. Install filter plug. *Figure 1*

   ⚠CAUTION

   Torque filter plug to 25 ft-lbs (33.9Nm).
7. Perform leak check.

   Refer to leak check procedure.

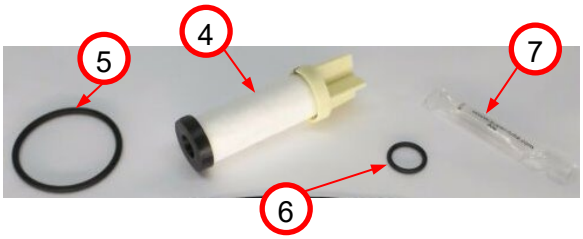

Figure 4:
Agility fuel filter element service kit contents: lube (7), element (4), bowl O-ring (5), plug O-ring (6).

Pressure regulator replacement

DESCRIPTION AND OPERATION

The pressure regulator is the division point between the high pressure (HP) and low pressure (LP) sides of the fuel system. The pressure regulator reduces fuel entering at a nominal pressure of 3600 psi (24.8MPa) to significantly reduced pressures ranging from 120 psi (827kPa) to 150 psi (1034kPa). The pressure regulator is mounted on the driver side chassis frame rail, and connects to the fuel system electrical chassis harness via a pressure transducer connector and a supply solenoid connector.

NOTICE

1. ***Pressure of fuel entering the pressure regulator inlet ranges from a high of 3600 psi (24.8MPa) to as low as zero if the system is empty.***
2. ***A minimum of 500 psi (3447 kPa) fuel pressure is required for engine operation.***

The LP portion of the CNG system begins at the outlet side of the pressure regulator and is comprised of fuel tubes and/or hoses which are essentially unidirectional, supplying fuel through an LP filter forward through additional fuel lines, fuel rails, and fuel injectors.

REMOVAL PROCEDURE

1. Depressurize fuel lines.
   Refer to fuel line depressurization procedure.

   ⚠CAUTION

   Never attempt to open a fitting or cut a line on a pressurized fuel system.
2. Set vehicle parking brake and secure with wheel chocks.
3. **RECOMMENDED:** *Raise vehicle on an approved hoist.*
4. Remove engine doghouse cover.
   Refer to OEM body builder procedure.
5. Remove transmission to driveshaft cover. *Refer to OEM body builder procedure.*
6. Disconnect pressure transducer (1) and supply solenoid electrical connectors (2) from pressure regulator (3). *Figure 1*

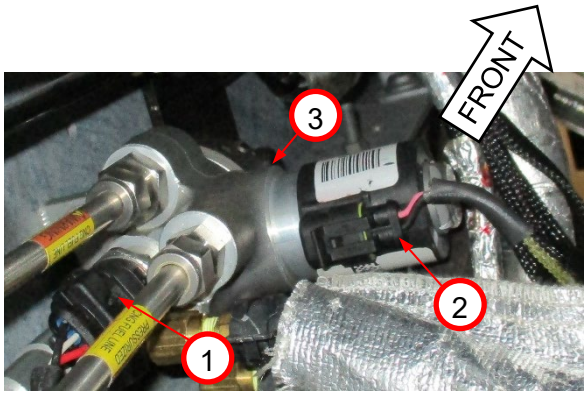

Figure 1:
Pressure transducer connector (1), supply solenoid connector (2), pressure regulator (3).

7. Loosen nut fittings (a) securing fuel tubes (4) to regulator (3). *Figure 2*
8. Use a socket wrench to remove two bolts (c) securing pressure regulator *(not visible)* to driver side chassis frame rail (6). *Figure 3*

NOTICE

Bolts securing pressure regulator may be accessed through driver side front wheel well.

9. Pull pressure regulator away from chassis frame rail and suspend regulator temporarily with a piece of wire.
10. Use two pairs of hose pinch off pliers to temporarily close coolant hoses (7) as near to the pressure regulator as possible.

NOTICE

Position a container below regulator to collect any coolant for inspection and possible reuse.

11. Use hose clamp pliers to remove spring hose clamps (8) securing coolant hoses to pressure regulator hose barb fittings (9). *Figure 4*
12. Remove pressure regulator.

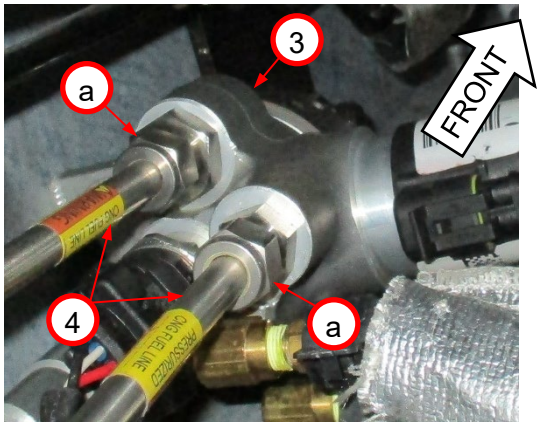

Figure 2:
Pressure regulator (3), fuel tube fitting nuts (a), fuel tubes (4).

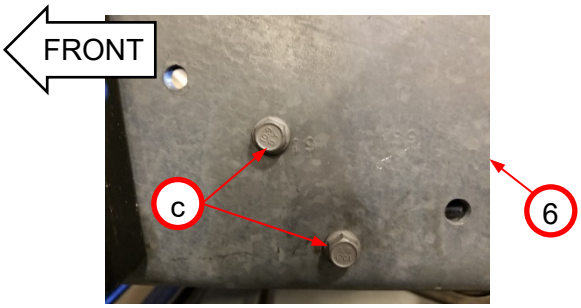

Figure 3:
Pressure regulator mounting bolts (c) on driver side cylinder frame rail (6).

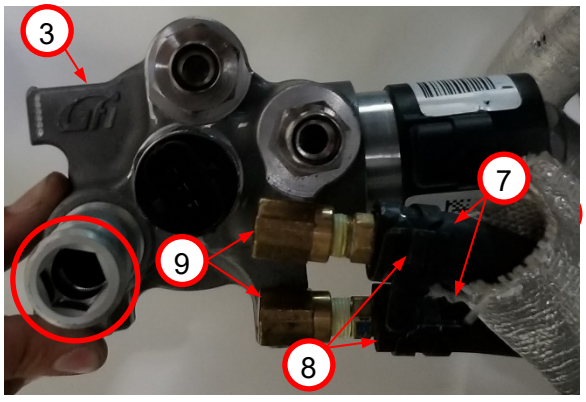

Figure 4:
Pressure regulator (3), coolant hoses (7), hose clamps (8), hose barb fittings (9). NOTE: Pressure regulator PRD cap not installed on PRD port (circled). If cap is missing, contact Agility for replacement.

INSTALLATION PROCEDURE

1. **⚠CAUTION**

   Inspect tube and fitting mating surfaces. *If necessary: replace damaged component(s).*
2. Use hose clamp pliers to connect coolant hoses to pressure regulator hose barb fittings. *Figure 4*

   NOTICE

   Position a container below regulator to collect any coolant.
3. Remove hose crimp pliers from coolant lines.
4. Align and hand tighten fuel line compression fitting nuts on pressure regulator fuel inlet and outlet fittings.
5. Reaching through the driver side front wheel well, insert a long screwdriver (8) in chassis frame rail oval window (d) to support pressure regulator while lining up regulator bolts with chassis frame rail mounting holes. *Figure 5*
6. Hand tighten bolts (c) securing pressure regulator to chassis frame rail. *Figure 5*
7. Tighten bolts securing pressure regulator. *Figure 5*

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.
8. Apply dielectric grease to pressure regulator pressure transducer and electrical connectors. *Figure 6*
9. Connect connectors to pressure regulator. *Figure 1*

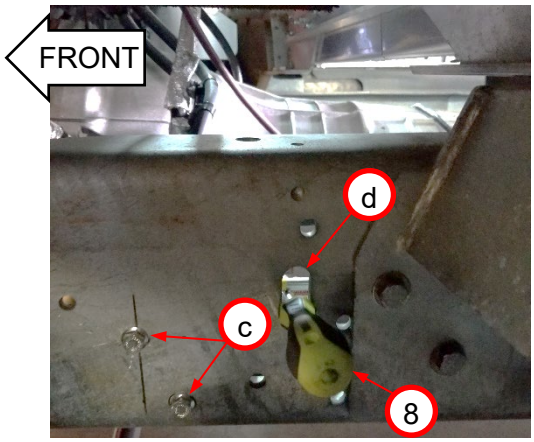

Figure 5:
Insert a long screwdriver (8) in chassis frame rail oval window (d) to support pressure regulator (not visible) while lining up mounting bolts (c).

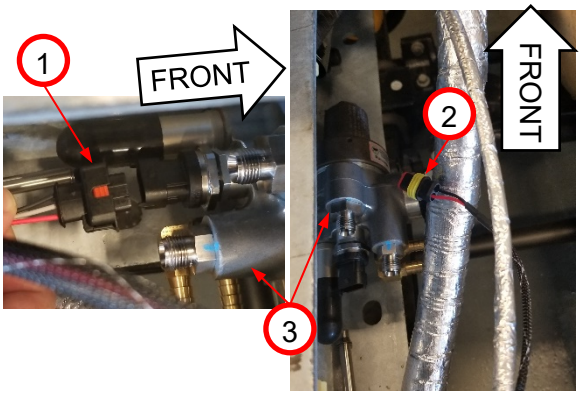

Figure 6:
Pressure transducer connector (1), supply solenoid connector (2), pressure regulator (3).

10. Use a wrench to tighten compression fittings on pressure regulator. *Figure 2*

    ⚠CAUTION

    Refer to Fuel System Torque and Tightening Specifications.

11. Perform leak check.

    Refer to leak check procedure.

Fuel fill panel replacement

DESCRIPTION AND OPERATION

The Ford F-59 CNG fuel fill panel is mounted at the rear driver side body. Although individual fill panel components may be replaced, an entire new panel assembly may also be obtained from Agility®.

REMOVAL PROCEDURE

1. Set parking brake and secure vehicle with wheel chocks.
2. Depressurize fuel system. *Refer to fuel system depressurization procedure.*
3. Remove road debris shield from rear driver side of chassis. *Refer to body builder procedure.*
4. Use a wrench to loosen HP fuel hose compression nut fitting (a) from fuel fill panel (6) main fitting body (5). *Figure 2*
5. Disconnect fuel system chassis harness from fuel fill panel. *Refer to fuel system chassis harness replacement.*
6. Use a wrench to remove four bolts retaining fuel fill panel (3) to vehicle body. *Refer to body builder procedure.*

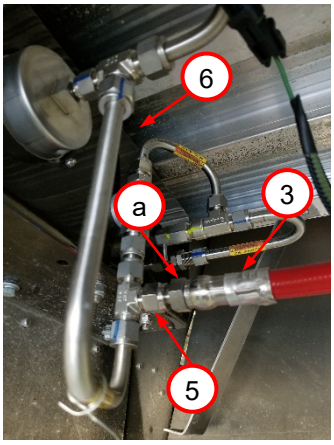

Figure 1:
HP flexible fuel hose (3), compression nut fitting (a), main fitting body (5), fuel fill panel (6).

INSTALLATION PROCEDURE

IMPORTANT: Inspect new and existing fitting mating surfaces.

1. Install fuel fill panel in driver side rear body using four bolts. *Refer to body builder procedure.*
2. Hand tighten HP flexible fuel hose compression fitting nut (a) on fuel fill panel main fitting (5). *Figure 1*
3. Use a wrench to hold fill panel main fitting (5) body and a second wrench to tighten HP fuel hose compression fitting nut (a). *Figure 1*

   ⚠CAUTION

   Refer to Fuel System Torque and Tightening Specifications.
4. Connect fuel system chassis harness to fuel fill panel. *Refer to fuel system chassis harness replacement.*
5. Perform leak check. *Refer to leak check procedure*.
6. Replace road debris shield. *Refer to OEM body builder procedure.*
7. Verify proper operation.

Fuel system electronic control unit (ECU) replacement

DESCRIPTION AND OPERATION

The Agility® Ford F-59 CNG fuel system uses an electronic control unit (ECU) to control and monitor system operation. The ECU is located inside the vehicle cabin on a bracket mounted to the right of the OEM PCM and to the left of the steering column.

REMOVAL PROCEDURE

1. Set parking brake and secure vehicle with wheel chocks.
2. Remove vehicle negative battery terminal(s).
   Refer to OEM procedure.
3. Disconnect cabin harness 16-pin connector (2) and 4-pin connector (3) from ECU (1). *Figure 1*
4. Remove four lock nuts, four bolts and four washers *(circled)* retaining ECU (1) to ECU bracket (4). *Figure 2*
5. Remove ECU (1).

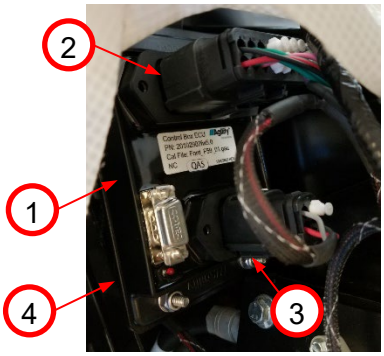

Figure 1:
Electronic control unit (1), cabin harness connector (2), cabin harness 4-pin connector (3), bracket (4).

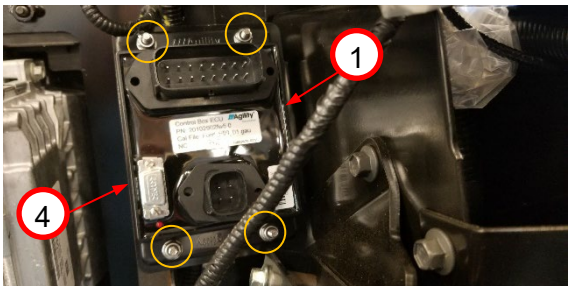

Figure 2:
ECU (1), four corner ECU fasteners (circled), ECU bracket (4).

INSTALLATION PROCEDURE

NOTICE

Verify the correct ECU has been obtained from Agility®. When calling or emailing, please supply the unit VIN and other vehicle details.

1. Use four lock nuts, four hex cap screws and four washers to secure ECU (1) to ECU bracket (4). *Figure 2* **⚠CAUTION** *Torque screws to* 8 ft-lbs (10.8Nm) *desired torque;* 7 ft-lbs (9.5Nm) *minimum,* 9-ft-lbs (12.2Nm) *maximum.* 2. Apply dielectric grease to ECU cabin harness 16-pin and 4-pin connectors. 3. Connect cabin harness 16-pin connector (2) and cabin harness 4-pin connector (3) to ECU (1). *Figures 1 and 2* 4. Connect negative battery terminal(s). *Refer to OEM procedure.* 5. Verify proper operation.	

Fuel system cabin harness replacement

DESCRIPTION AND OPERATION

The Agility® Ford F-59 CNG fuel system uses two electrical harnesses to allow the electronic control unit (ECU) to link and monitor components: a chassis harness and a cabin harness. The harnesses meet at a bulkhead connector located on the driver side engine compartment firewall.

REMOVAL PROCEDURE

1. Set parking brake and secure vehicle with wheel chocks.
2. Remove vehicle negative battery terminal(s).

   Refer to OEM procedure.
3. Disconnect cabin harness 16-pin connector (2) and cabin harness 4-pin connector (3) from ECU (1) located to the left of the steering wheel under instrument panel dash. *Figure 1*
4. Open vehicle hood. *Refer to OEM procedure.*
5. Disconnect chassis harness bulkhead connector (5) from driver side engine compartment firewall by loosening the connector nut (a). *Figure 2*
6. Remove cabin harness.

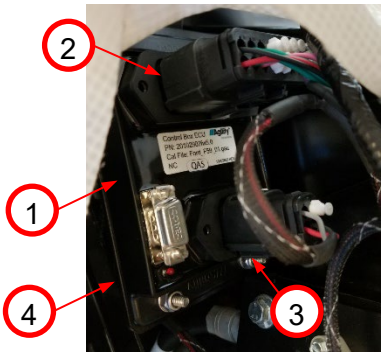

Figure 1:
Electronic control unit (1), cabin harness connector (2), cabin harness 4-pin connector (3), bracket (4).

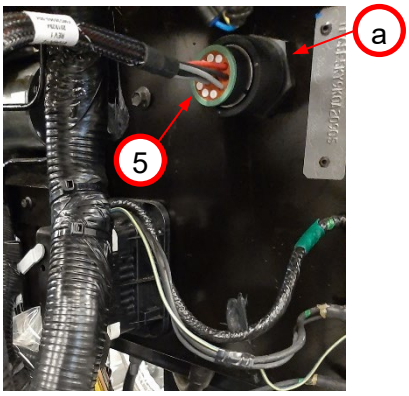

Figure 2:
Chassis harness (4), bulkhead connector (), bulkhead connector nut (a).

INSTALLATION PROCEDURE

1. Apply dielectric grease to cabin harness 16-pin and 4-pin connectors *(not shown).*
2. Connect cabin harness 16-pin connector (2) and cabin harness 4-pin connector (3) to ECU (1). *Figures 1 and 3*
3. Position cabin harness bulkhead connector (9) at inside driver side firewall bulkhead opening. *Figure 4*
4. Connect cabin harness bulkhead connector *(not visible)* to chassis harness bulkhead connector (5) at driver side engine compartment firewall by plugging it in the chassis harness bulkhead connector (5) and tightening the connector nut (a). *Figure 2*
5. Secure cabin harness (8) drive away protection (DAP) branch (10) to OEM wiring (11) using five zip ties (circled). *Figure 4*

   NOTICE

   Use a side cutter or dedicated zip tie tool to cut zip tie ends flush with tie head with no sharp edges.
6. Replace negative battery terminal(s). *Refer to OEM procedure.*
7. Verify proper operation.
8. Close and latch vehicle hood. *Refer to OEM procedure.*

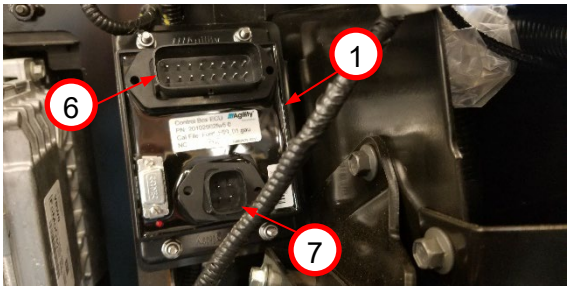

Figure 3:
ECU (1), 16-pin connector (6) and 4-pin connector (7).

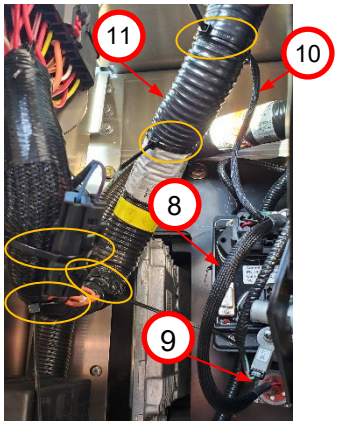

Figure 4:
Cabin harness drive away protection (DAP) branch (10), OEM harness (11), five zip ties (circled), cabin harness (8), cabin harness bulkhead connector (9).

Fuel system chassis harness replacement

DESCRIPTION AND OPERATION

The Agility® Ford F-59 CNG fuel system uses two electrical harnesses to enable the electronic control unit (ECU) to link and monitor components: a chassis harness and a cabin harness. The chassis harness extends from a bulkhead connector located on the driver side engine compartment firewall where it meets the cabin harness back to the fuel fill panel at the driver side rear of the body.

REMOVAL PROCEDURE

1. Set parking brake and secure vehicle with wheel chocks.
2. Remove vehicle negative battery terminal(s). *Refer to OEM procedure.*
3. Open vehicle hood. *Refer to OEM body builder procedure.*
4. Disconnect chassis harness (1) bulkhead connector (2) from driver side engine compartment firewall by loosening the connector nut (a) and unplugging the connector. *Figure 1*
5. Use side cutters to cut any zip ties securing chassis harness to OEM harness in the engine compartment.
6. Raise vehicle on an approved hoist.
7. Disconnect chassis harness (1) 3-pin pressure transducer connector (4) and 2-pin supply solenoid connector (5) from pressure regulator (3). *Figure 2*

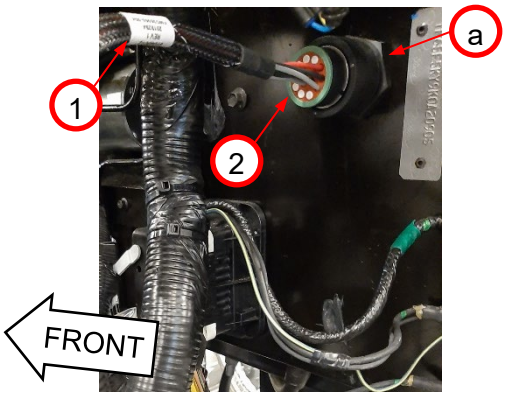

Figure 1.
Chassis harness (1), chassis harness 9-pin bulkhead connector (2), bulkhead connector nut

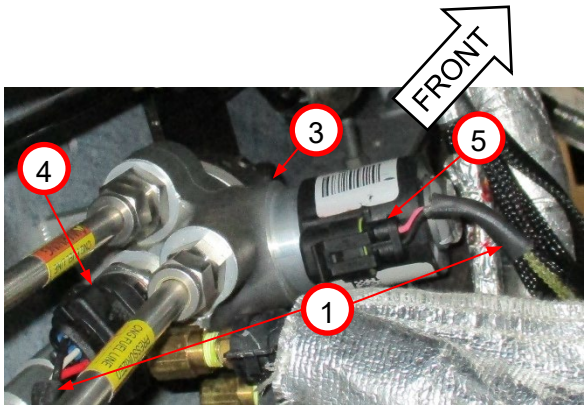

Figure 2.
Chassis harness (1), pressure regulator (3), pressure transducer connector (4), supply solenoid connector (5).

8. Work from the front of the vehicle to the back using side cutters to cut any zip ties securing chassis harness (1) to OEM chassis harness (6) along driver side chassis frame rail. *Figure 3*

⚠CAUTION

Avoid pulling or placing pressure on harness electrical connectors.

9. Use side cutters to cut any zip ties *(circled)* securing chassis harness (1) to OEM chassis harness (6) along chassis frame crossmember. *Figure 4*
10. Use side cutters to cut any zip ties securing chassis harness (1) to OEM chassis harness (6) along passenger side chassis frame rail. *Figure 5*

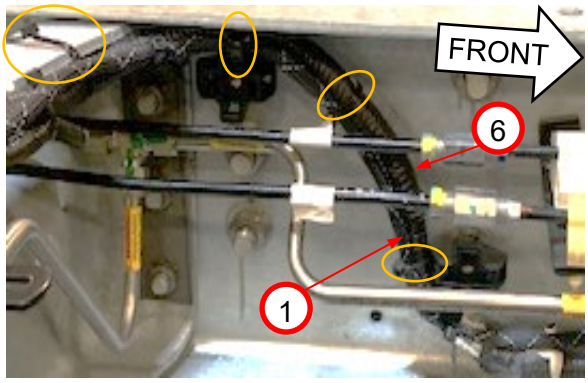

Figure 3.
Chassis harness (1), OEM chassis harness (6), zip ties (circled).

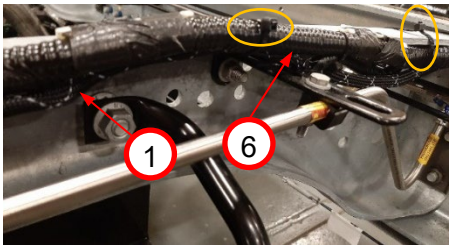

Figure 4.
Chassis harness (1), OEM chassis harness (6), zip ties (circled) along chassis frame crossmember.

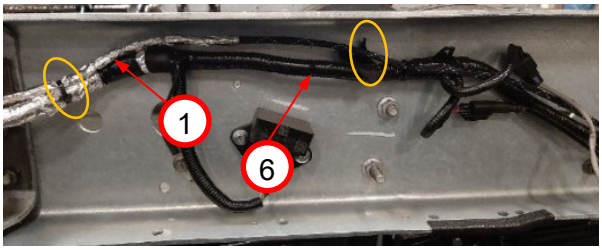

Figure 5.
Chassis harness (1), OEM chassis harness (6), zip ties (circled) along passenger side chassis frame.

11. Use side cutters to cut any zip ties securing chassis harness (1) to OEM chassis harness (6) along chassis frame crossmember. *Figure 6*
12. Unlock security tab on chassis harness 4-pin system connector (7) and disconnect from OEM 4-pin chassis harness connector (8). *Figure 6*
13. Remove road debris shield at driver side rear of chassis. *Refer to OEM body builder procedure.*
14. Use side cutters to cut all eight dual tie strap clips *(circled)* securing chassis harness (1) to high pressure flexible fuel hose (9) and one clip *(circled)* securing chassis harness to HP fuel tube (14). *Figure 7*
15. Use a wrench to remove fasteners to remove fuel system chassis harness ground eyelet *(not shown)* from fuel fill panel ground bracket (10). *Figure 8a*
16. Disconnect chassis harness drive away protection (DAP) circuit connector (25) from fuel fill panel (24) dust cap DAP circuit connector (20). *Figure 8b*

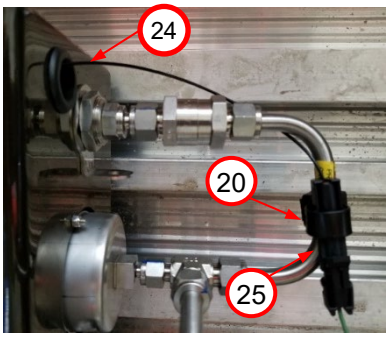

Figure 8b.
Chassis harness driveaway protection (DAP) circuit connector (25), fuel fill panel (24), dust cap DAP circuit connector (20).

17. Remove chassis harness.

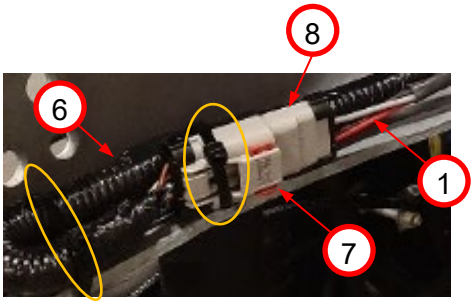

Figure 6.
Chassis harness (1), OEM chassis harness (6), zip ties (circled), fuel system connector (7), OEM harness connector (8) secured to chassis crossmember.

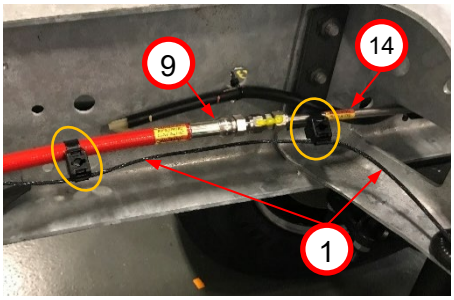

Figure 7.
Chassis harness (1), dual tie strap clips (circled), high pressure flexible fuel hose (9); HP fuel tube, hose to union (14), at rear driver side chassis frame rail.

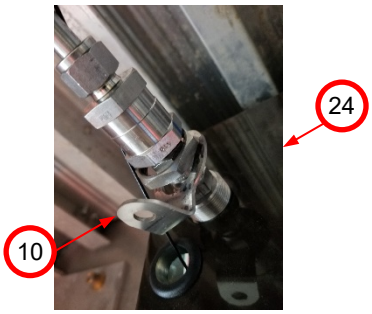

Figure 8a.
Chassis harness ground eyelet (not visible) attaches to fuel fill panel ground bracket (10) on inside rear of fuel fill panel (24).

INSTALLATION PROCEDURE

⚠ CAUTION

1. Zip ties must be pulled snug.

2. Use side cutters or dedicated zip tie tool to cut zip tie ends flush and minimize sharp edges.

1. Inspect chassis harness bulkhead gasket *(not visible)* p/n 62160000. *If gasket is worn or damaged, contact Agility® for replacement.*
2. Apply dielectric grease to chassis harness 9-pin bulkhead connector.
3. Connect cabin harness bulkhead connector *(not visible)* to chassis harness bulkhead connector (5) at driver side engine compartment firewall by plugging it in the chassis harness bulkhead connector (5) and tightening the connector nut (a). *Figure 1*
4. Use zip ties *(circled)* to secure chassis harness (1) to OEM wiring harness in engine compartment. *Figure 9*
5. Connect fuel system chassis harness 3-pin connector (5) to pressure transducer connector (b) and chassis harness 2-pin connector (4) to supply solenoid connector (d) on pressure regulator (3). *Figure 10*

⚠ CAUTION

Verify red security tab (e) on chassis harness pressure transducer connector (a) is locked into the pressure transducer connector (b) hook (m) on the regulator. *Figure 11*

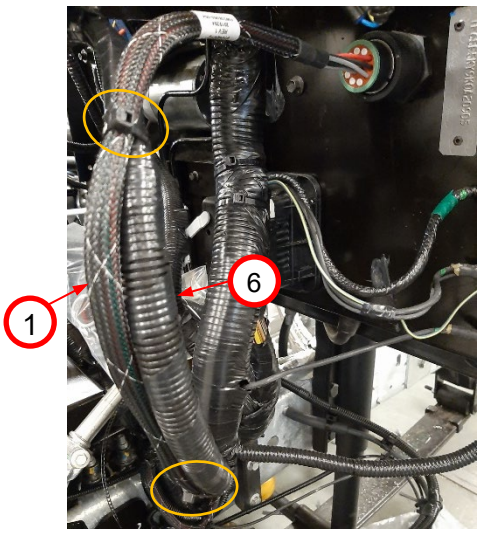

Figure 9.
Chassis harness (1), 9-pin bulkhead connector (6), zip ties (circles) in driver side engine compartment.

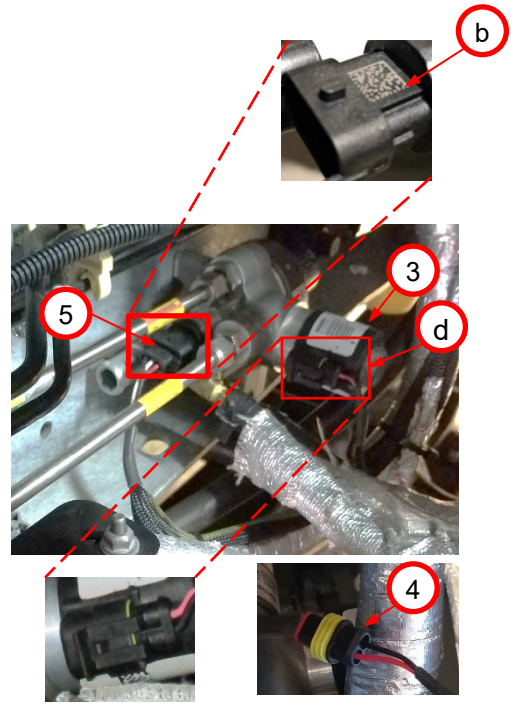

Figure 10.
Chassis harness 3-pin connector (5), pressure transducer connector (b),chassis harness 2-pin connector (4),supply solenoid connector (d), pressure regulator (3).

6. Route fuel system chassis harness (1) along OEM chassis harness (6) along DS chassis frame rail and secure using zip ties *(circled). Figures 12 and 13*

⚠ CAUTION

1. Zip ties must be pulled snug.

2. Use side cutters or dedicated zip tie tool to cut zip tie ends flush and minimize sharp edges.

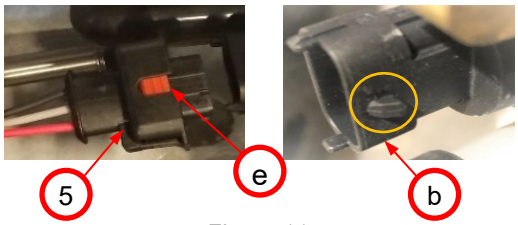

Figure 11.
Red security tab (e) on chassis harness 3-pin pressure transducer connector (5), must lock into hook (circled) on pressure transducer connector (b).

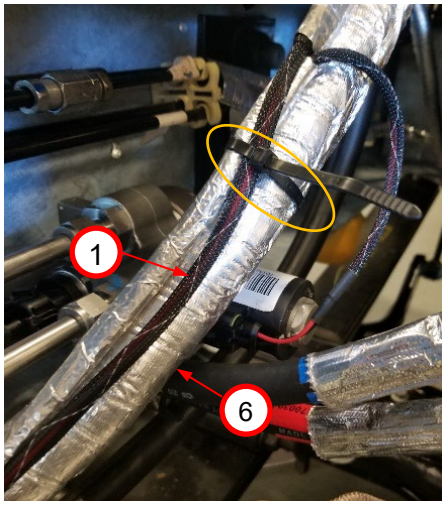

Figure 12.
Use zip tie (circled) to secure chassis harness (1) to OEM chassis harness (6).

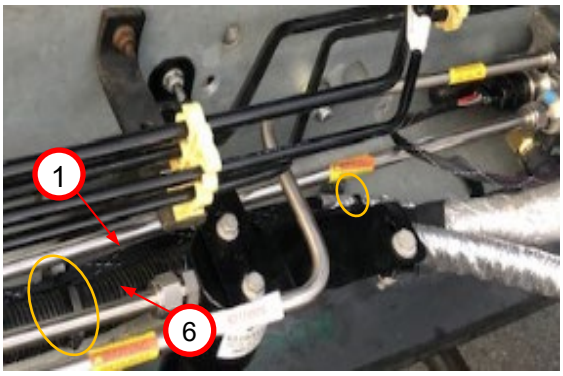

Figure 13.
Use zip ties (circled) to secure chassis harness (1) to OEM chassis harness (6).

7. Use zip ties to secure OEM chassis harness/fuel system chassis harness bundle (a) and at 4-way mounts (7). *Figure 14*
8. Route fuel system chassis harness (1) along OEM chassis harness (6) along chassis frame crossmember and use zip ties *(circled)* to secure to OEM chassis harness. *Figure 15*
9. Route fuel system chassis harness (1) along OEM chassis harness (6) along PS chassis frame rail and use zip ties *(circled)* to secure to OEM chassis harness. *Figure 16*

⚠ CAUTION

1. Zip ties must be pulled snug.

2. Use side cutters or dedicated zip tie tool to cut zip tie ends flush and minimize sharp edges.

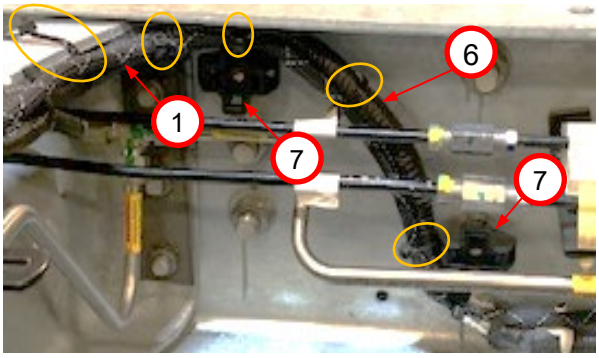

Figure 14.
Use zip ties (circled) to secure chassis harness (1) to OEM chassis harness (6) and to 4 way mounts (7).

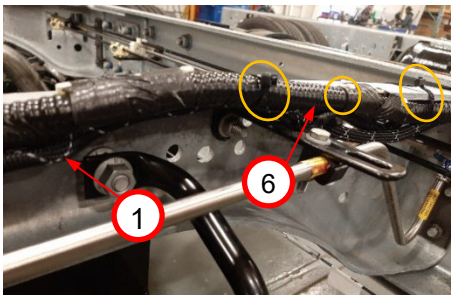

Figure 15.
Use zip ties (circled) to secure chassis harness (1) to OEM chassis harness (6) along frame crossmember.

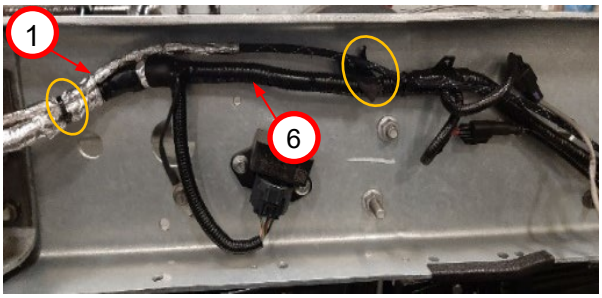

Figure 16.
Use zip ties (circled) to secure chassis harness (1) to OEM chassis harness (6) along passenger side chassis frame rail.

10. Route fuel system chassis harness/OEM harness bundle (a) along through chassis frame crossmember opening *(circled). Figure 17*
11. A) Connect fuel system chassis harness 4-pin connector red connect to OEM chassis harness 4-pin connector *(not visible). Figure 18*

    B) Verify fuel system chassis harness 4-pin connector red (f) security tab is locked into position. *Figure 18*

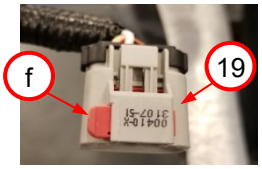

Figure 18.
Connect chassis harness 4-pin connector (19) to OEM chassis harness 4-pin connector (not visible).

12. A) Use zip ties *(small circles)* to secure chassis harness (1) to OEM chassis harness (6). *Figure 19*

    B) Use dual tie strap clip (12), p/n 61090072, to secure fuel system chassis harness/OEM chassis harness bundle (a) to PRD vent tube, tee to union (36), at frame crossmember opening *(large circle). Figure 19*
13. Secure fuel system chassis harness 4-pin connector (19) to OEM chassis 4-pin connector (23) with a zip tie *(circled). Figure 20*
14. Secure excess OEM chassis harness/ chassis harness bundle (a) to crossmember using zip ties *(circled). Figure 21*

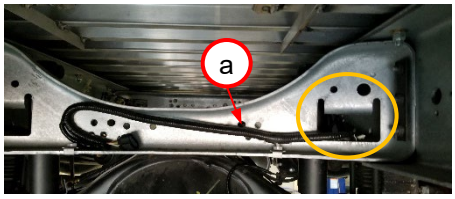

Figure 17.
Route chassis harness/OEM harness bundle (a) through chassis frame crossmember opening (circled).

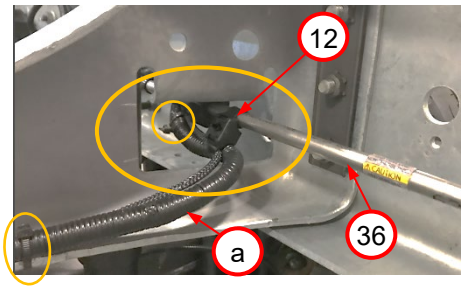

Figure 19.
Use zip ties (circled) and dual tie strap clip (12) to secure chassis harness/OEM harness bundle (a).

Figure 20.
Use a zip tie (circled) to secure chassis harness 4-pin connector (19) to OEM chassis harness 4-pin connector (23).

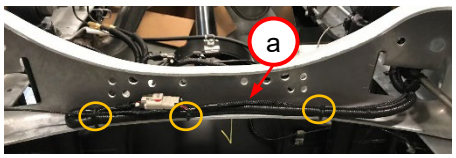

Figure 21.
Use zip ties (circled) to secure chassis harness/OEM chassis harness bundle (a) to chassis frame crossmember.

15. Secure fuel system chassis harness (1) to existing holes in chassis frame crossmember using zip ties (c). *Figure 22*
16. Secure fuel system chassis harness (1) to high pressure (HP) flexible fuel hose (21) and HP fuel tube, hose to union (14) along driver side chassis frame rail using eight dual tie strap clips, p/n 61090072. *Figure 7*
17. Attach chassis harness driveaway protection (DAP) circuit connector (25) to fuel fill panel (24) dust cap DAP circuit connector (20). *Figure 23*
18. Use fastener *(not visible)* to secure fuel system chassis harness ground eyelet *(not shown)* to fuel fill panel ground bracket (10). *Figure 8*
19. Replace road debris shield. *Refer to OEM body builder procedure.*
20. Replace negative battery terminal(s). *Refer to OEM procedure.*
21. Lower vehicle.
22. Close and latch vehicle hood. *Refer to OEM body builder procedure*
23. Verify proper operation.

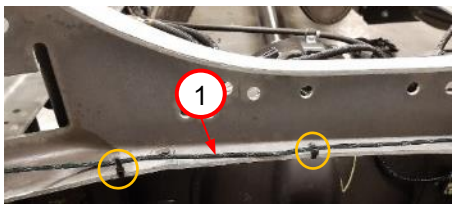

Figure 22.
Use zip ties (circled) to secure chassis harness (1) to chassis frame crossmember.

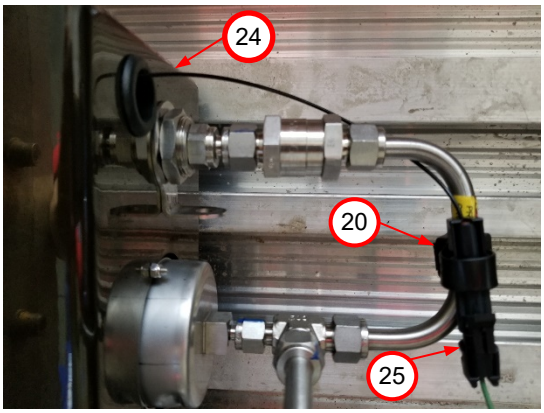

Figure 23.
Chassis harness driveaway protection (DAP) circuit connector (25), dust cap DAP circuit connector (20), fuel fill panel (24).

Agility® fuel solutions

SERVICE MANUAL – FUEL SYSTEM REPAIR INSTRUCTIONS

Fuel fill receptacle dust cover / drive away protection (DAP) cap replacement

DESCRIPTION AND OPERATION

The Agility® CNG fuel fill panel features a protective fuel receptacle dust cover which also doubles as a safety device to discourage leaving a fueling dispenser with the fuel hose still attached the vehicle. Known as drive away protection (DAP), the engine will not start if the DAP cap is not installed on the fuel fill receptacle. Replacement caps are available from Agility®.

REMOVAL PROCEDURE

1. Set parking brake and secure vehicle with wheel chocks.
2. Remove vehicle negative battery terminal(s). *Refer to OEM procedure.*
3. Remove fill receptacle dust cap (2) by gently pulling and rotating the retention loop (4) out of the retaining groove on the fuel receptacle (3). *Figures 1 and 2*
4. Raise vehicle on an approved hoist.
5. Remove road debris shield at driver side rear of chassis. *Refer to OEM body builder procedure.*
6. Disconnect chassis harness driveaway protection (DAP) connector (6) from fuel fill panel (1) dust cap DAP connector (5). *Figure 3*
7. Lower vehicle.
8. Gently pull dust cap DAP connector through grommet (7) on fill panel faceplate. *Figure 3*

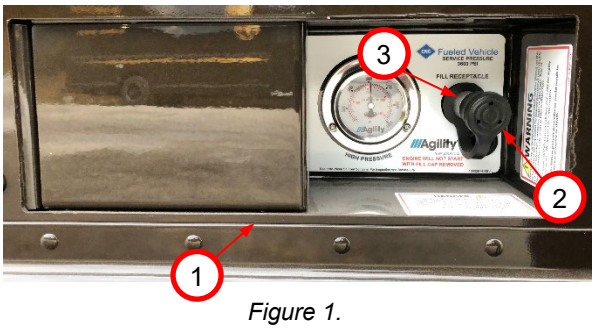

Figure 1.
Fuel fill panel (1), fuel receptacle (3), dust cap (2).

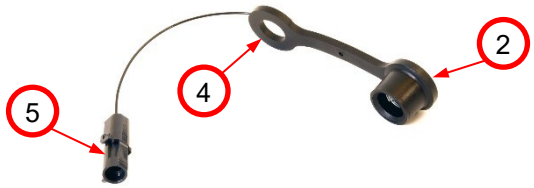

Figure 2.
Fuel receptacle dust cover DAP cap assembly: cap (2), retention loop (4), drive away protection (DAP) circuit connector (5).

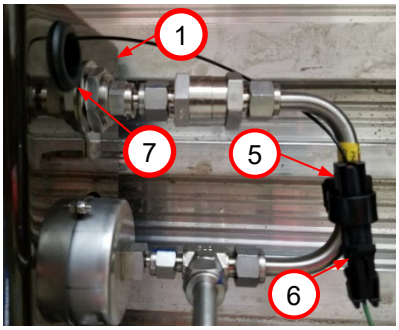

Figure 3.
Chassis harness driveaway protection (DAP) connector (6), fuel fill panel (1) dust cap DAP connector (5), grommet (7).

INSTALLATION PROCEDURE

1. Clean fuel fill receptacle and inspect receptacle O-ring for wear. *Obtain replacement O-ring from Agility® if O-ring is damaged or missing.*
2. Install dust cap retention loop (4) on fuel fill receptacle retaining slot *(not visible). Figure 4*
3. Install dust cap (2) on fuel fill receptacle (3). *Figure 4*
4. Insert dust cap DAP circuit connector (6) through grommet (7) on fill panel faceplate. *Figures 3 and 4*
5. Raise vehicle.
6. Connect chassis harness driveaway protection (DAP) connector (6) to fuel fill panel (1) dust cap DAP connector (5). *Figure 3*
7. Replace road debris shield. *Refer to OEM body builder procedure.*
8. Replace negative battery terminal(s). *Refer to OEM procedure.*
9. Lower vehicle.
10. Verify proper operation.

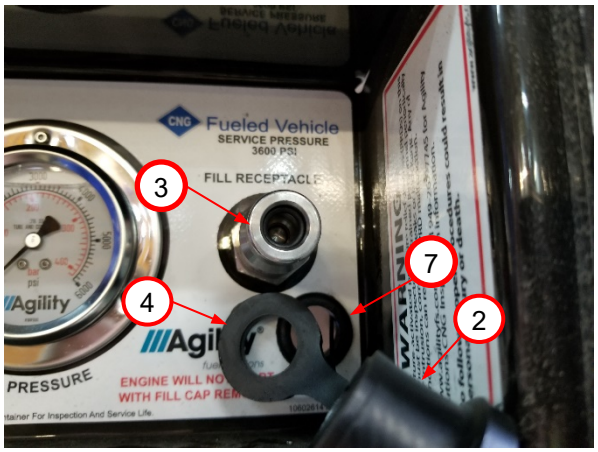

Figure 4.
Chassis harness driveaway protection (DAP) connector (6), fuel fill panel (1) dust cap DAP connector (5), grommet (7).