



# **Emer PRD Replacement for Gillig CNG Fuel Systems with Type 3 Cylinders and Manual Cylinder Valves**

**ENP-734**

**May 27, 2020**

## 1. Introduction

Agility Fuel Solutions (Agility®) has determined that pressure relief devices (PRDs) manufactured by Emer™ may fail to operate as designed. This issue has been reported to the National Highway Traffic and Safety Administration (NHSTSA Recall No. 20E-019). Impacted parts include Emer™ cylinder plug PRD, p/n PRD2322T-001 (Agility® p/n 10301046), used in Agility® compressed natural gas (CNG) fuel systems produced from October 6, 2016, to April 1, 2020.

PRDs are essential for safe vehicle operation and must be replaced if non-compliant. Agility® personnel have identified fuel system top level part numbers supplied for Gillig buses containing recalled Emer™ PRDs as original equipment manufacturer (OEM) equipment.

Agility® created this instructional document to guide trained CNG fuel system service technicians in the removal, replacement, and reporting of affected Emer™ PRDs.

### 1.1. Warning Messages and Symbols used in this document



*Will cause death or severe injuries if procedures are not followed.*



*Could cause death or severe injuries if procedures are not followed.*



*Could cause minor or moderate injuries if procedures are not followed.*



*Practices not related to physical injury. Includes procedures to prevent vehicle damage as well as hints to help an operation or procedure go smoothly.*



#### **Critical Characteristic**

*Procedure directly affects safety of vehicle users, people nearby and maintenance personnel, or regulatory compliance.*



#### **Manufacturing Characteristic**

- *A product feature solely used to improve manufacturability or maintain process control .*
- *A process parameter or step that has a significant effect on achieving a Critical Characteristic or Significant Characteristic, or maintaining material identification/traceability.*

## 2. Affected Units

Agility® top level system part numbers as follows:

25512000 - Roof Mount, 144 DGE, 2036 L, 8 Tanks, Gillig, Type 3, manual valves

25516000 - Roof Mount, 126 DGE, 1657 L, 8 Tanks, Gillig, Type 3, manual valves

## 3. Tools and Supplies Required

Fall protection equipment	Safety glasses
Safety ladder	Defueling hose with nozzle**
NGV1 fuel receptacle adapter*	Microfiber towels
Socket wrenches	Combination wrenches
Torque Seal marker	Swagelok® Snoop® leak detection solution
Permanent marker	Agility® reporting form FT.0322
Blue paint marker	Flashlight
Camera / phone camera	Zip lock bag

\*may be required for defueling on some FMMs

\*\*If not provided at CNG fueling facility

### 3.1. PRD retrofit kits

## NOTICE

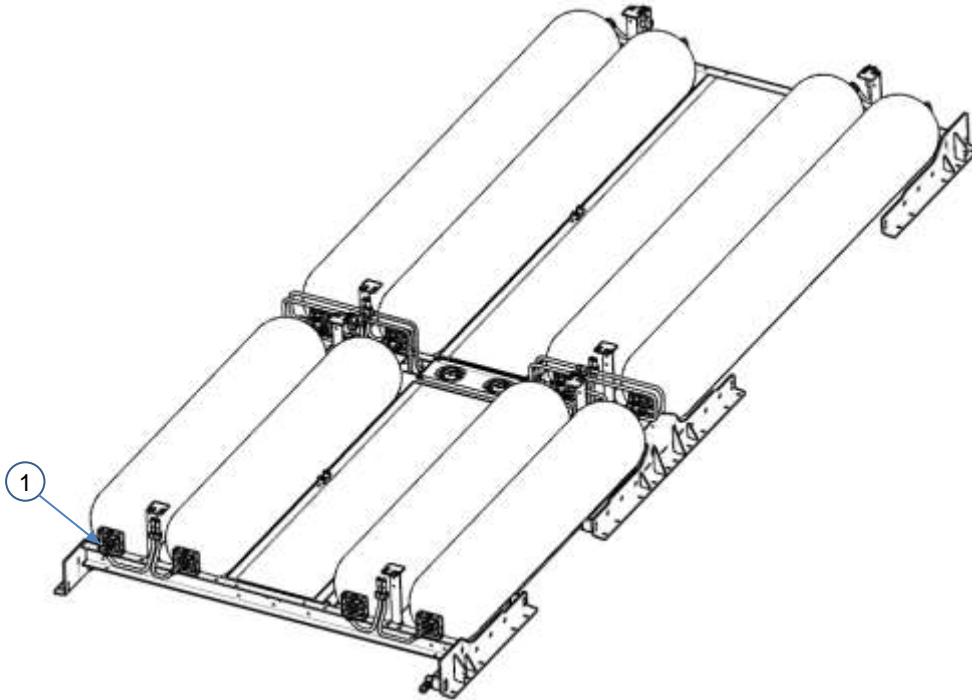
**Before beginning work, verify proper quantity of correct Agility® PRDs is on hand.**

Agility® PRD part number and corresponding fuel system quantities are as follows:

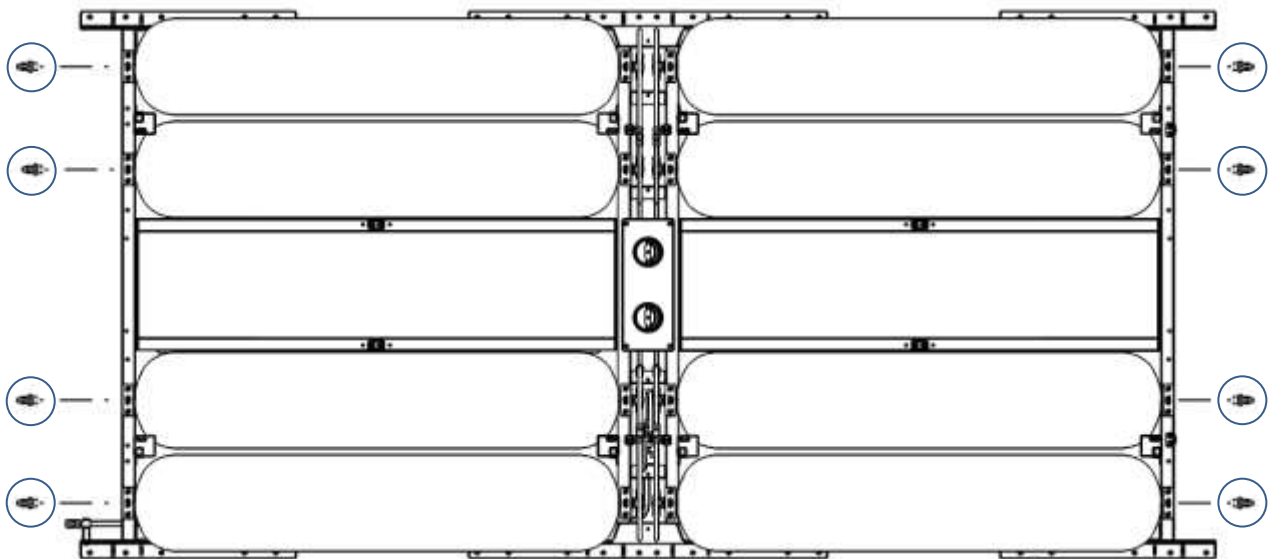
Agility® fuel system p/n	Emer™ PRD Agility® p/n 10301046 QTY required
25512000	8
25516000	8

#### 4. Parts Location Identification

Refer to the appropriate fuel system illustration to locate the affected Emer™ PRDs in fuel system plumbing. *Figures 1 and 2*






*Figure 1.*  
*Emer™ cylinder plug end PRD (1) in 25512000 fuel system plumbing. 25516000 system similar.*



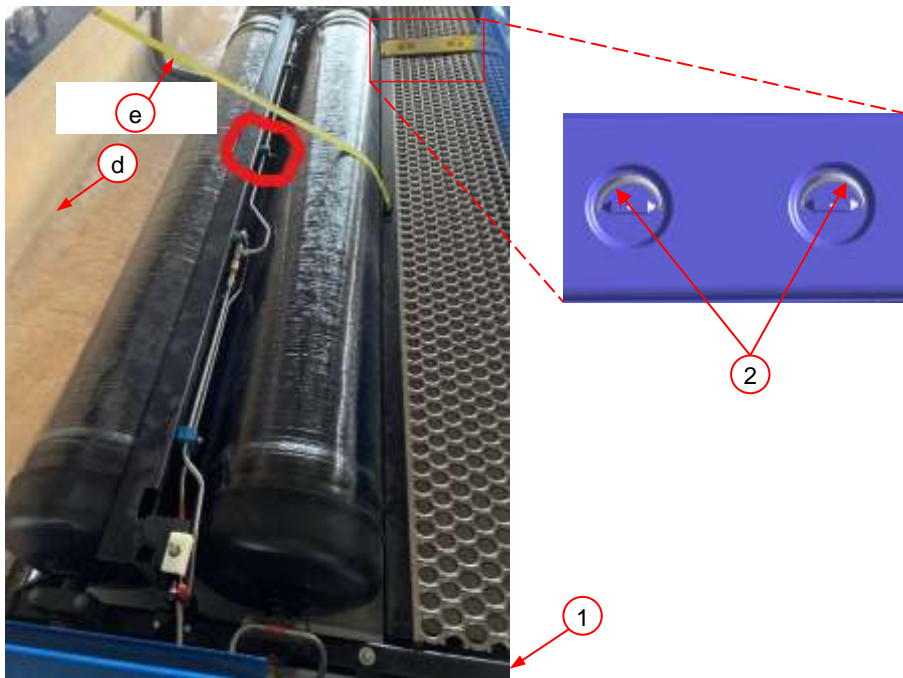
*Figure 2.*  
*Emer™ cylinder plug end PRDs (circled) in 25516000 fuel system plumbing. 25512000 system similar.*  
*NOTE: PRD vent tubes and elbow fittings not shown for clarity.*

## 5. Corrective Action / Procedure


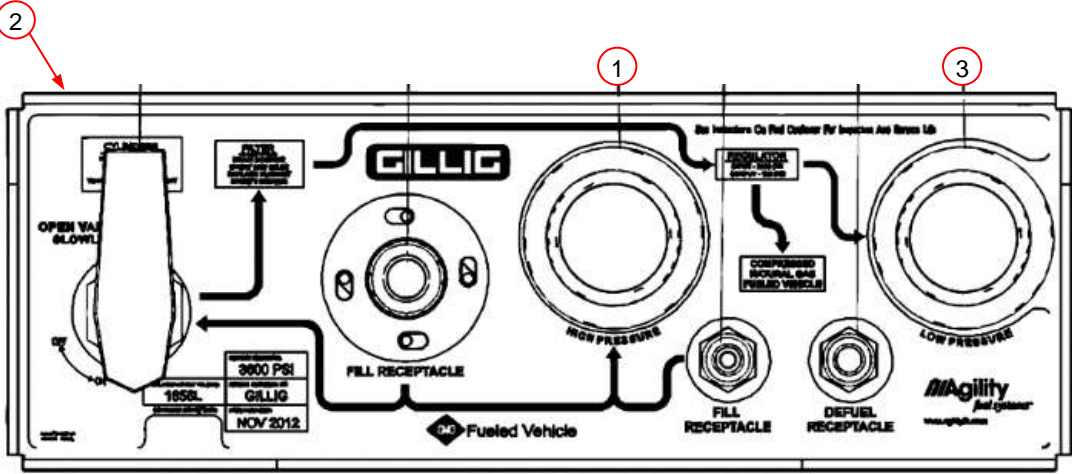
### 5.1. Preliminary Safety Preparation

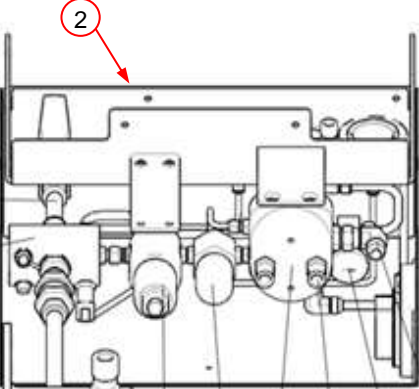
1	 <b>WARNING</b> Set parking brake and secure vehicle with wheel chocks ( <i>not shown</i> ).		2	 <b>WARNING</b> Attach a lock and tag ( <i>not shown</i> ) to block vehicle ignition.	
WHAT			WHAT		
WHY	Worker safety.		WHY	Prevent vehicle start during repair procedure.	
3	 <b>WARNING</b> Secure a safety ladder in either of the following locations: A. Inside bus hatch opening B. Rear of bus exterior				
WHAT					
WHY	Worker safety.				

4	<p>1. Open fuel system roof pod doors (d).</p> <p><b>⚠ WARNING</b></p> <p>2. Secure fall protection equipment (<i>not shown</i>) to facility fall protection apparatus or to fall restraint lanyard attachment points (2).</p> <p><b>⚠ WARNING</b></p> <p>3. Secure doors open with door retention strap (e). Refer to vehicle OEM instructions.</p> <p><b>⚠ WARNING</b></p> <p>4. Always reattach fall PPE when resuming work on the roof mount portion of the fuel system.</p>
WHAT	
WHY	Worker safety.



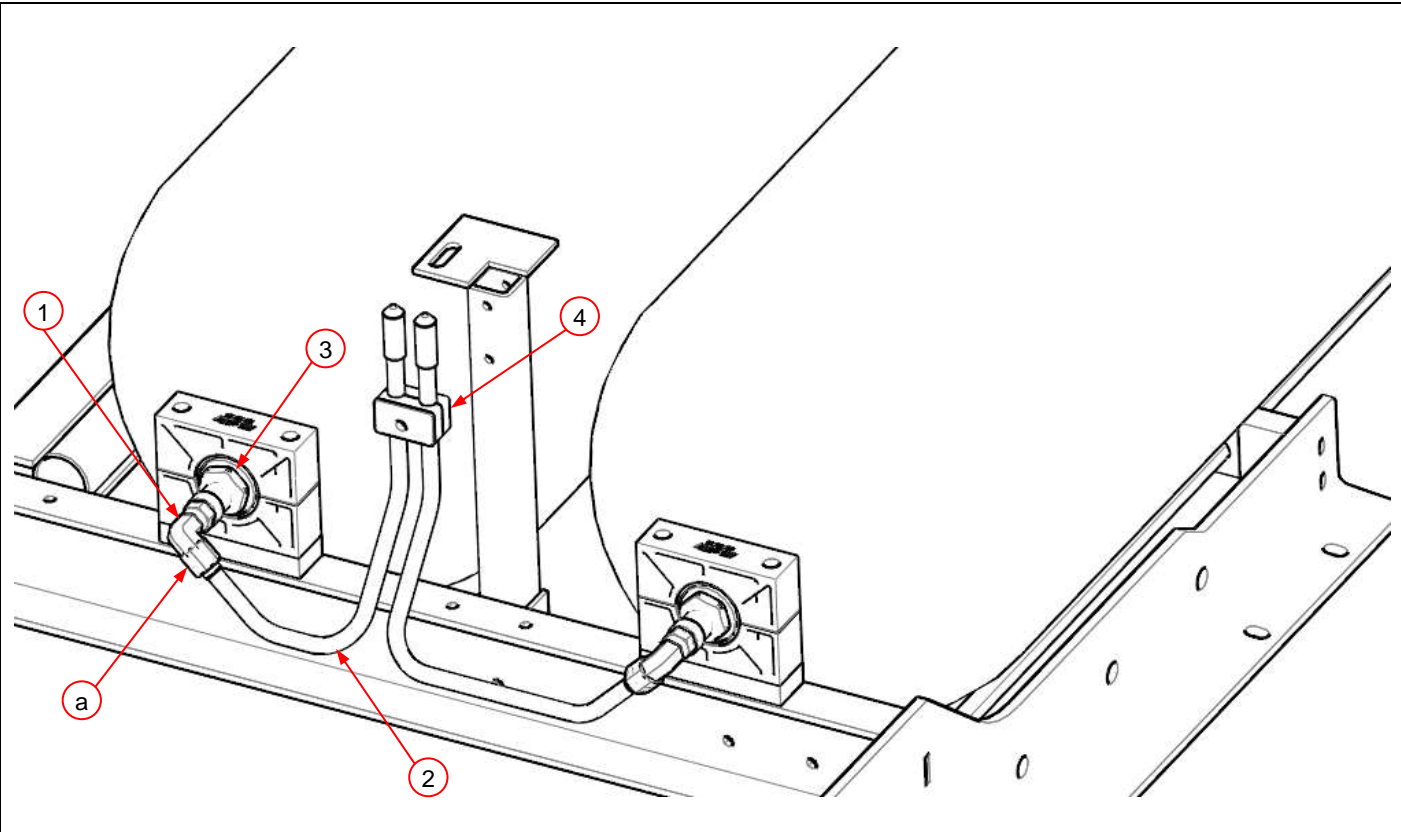
**5.2. Prior to defueling**

<p>1</p> <p>WHAT</p>	<p><b>⚠ WARNING</b></p> <p>Verify all eight cylinder valves (circled) are open.</p>	
<p>WHY</p>	<p>Ensure cylinders can be properly defueled.</p>	
<p>2</p> <p>WHAT</p>	<p>Check high pressure gauge (1) and low pressure gauge (3) on fuel management module (FMM) (2) to verify amount of fuel in the system.</p> <p><b>IMPORTANT:</b> If vehicle has no fuel onboard, proceed to Step 10.</p>	
<p>WHY</p>		

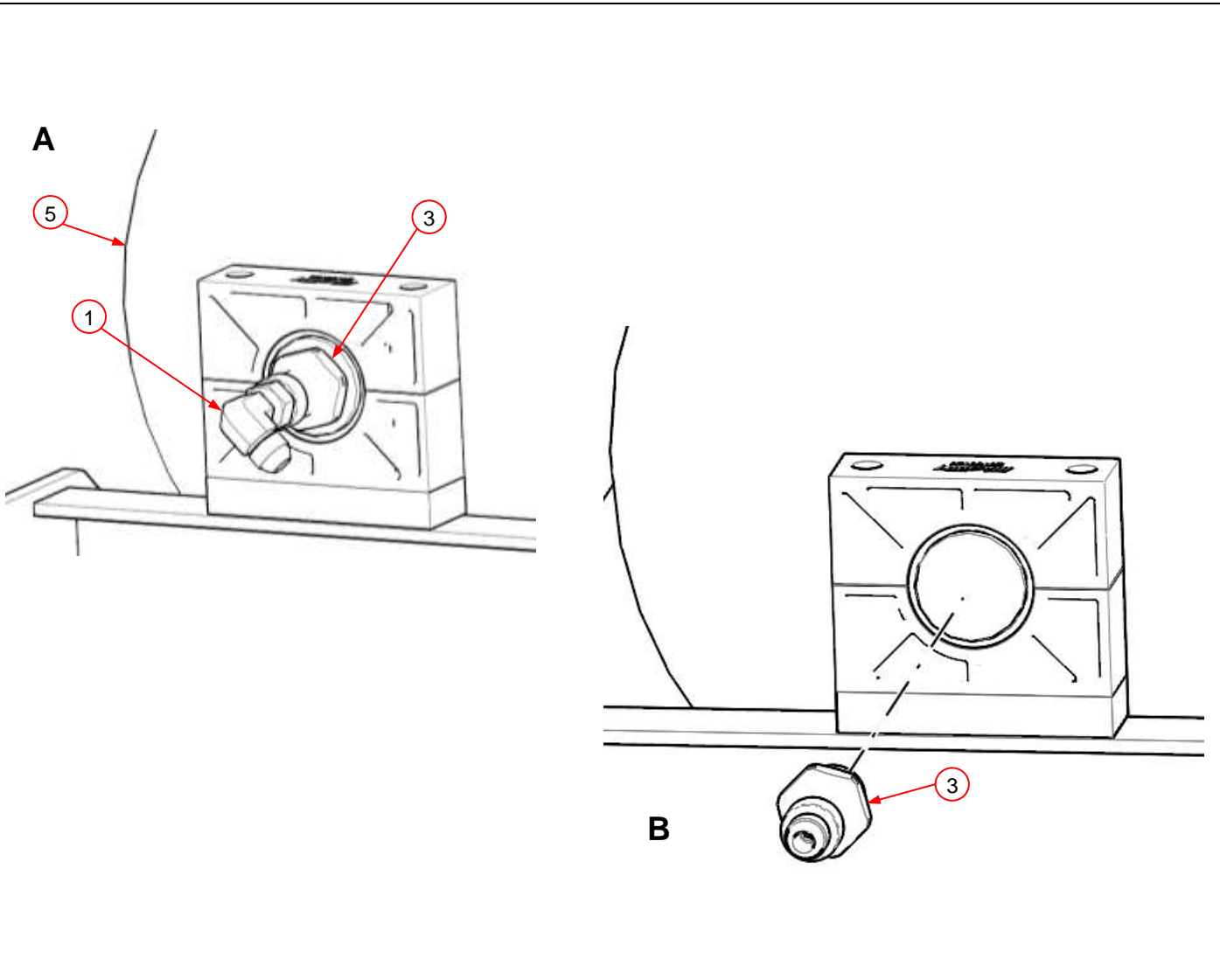
<p>3</p> <p>WHAT</p>	<p><i>If not already defueled:</i> Defuel bus according to local facility regulations and procedure. <i>If required:</i> use defuel hose kit.</p> <p><b>⚠ WARNING</b> <i>Only trained CNG fuel systems technicians may perform system defueling.</i></p> <p><b>NOTICE</b> <i>If required:</i> Use appropriate defuel nozzle adapter.</p>		<p>4</p> <p>WHAT</p>	<p><b>⚠ WARNING</b> Relieve any remaining system pressure by slowly opening the FMM (2) bleed valve (<i>not visible</i>). <i>NOTE: FMM rear view shown.</i></p>	
<p>WHY</p>	<p>PRD supply tubes to be removed are pressurized "live" lines.</p>		<p>WHY</p>	<p>Pressure remains in lines while gas is present in the system.</p>	

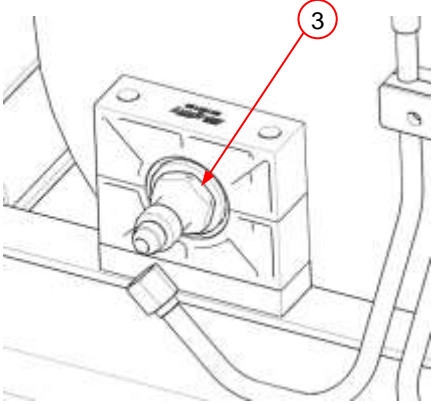
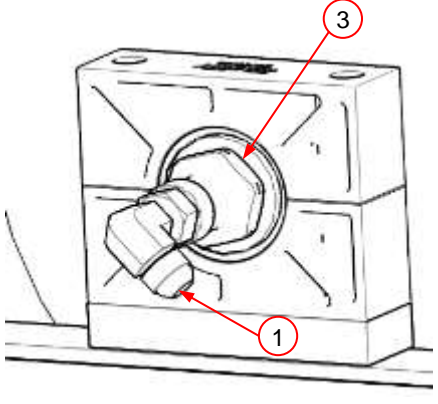
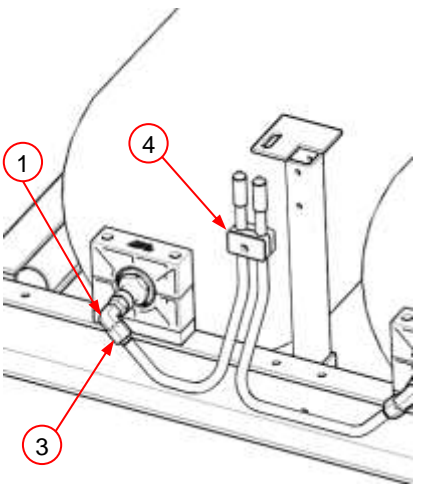


### 5.3. Remove and replace Emer PRDs

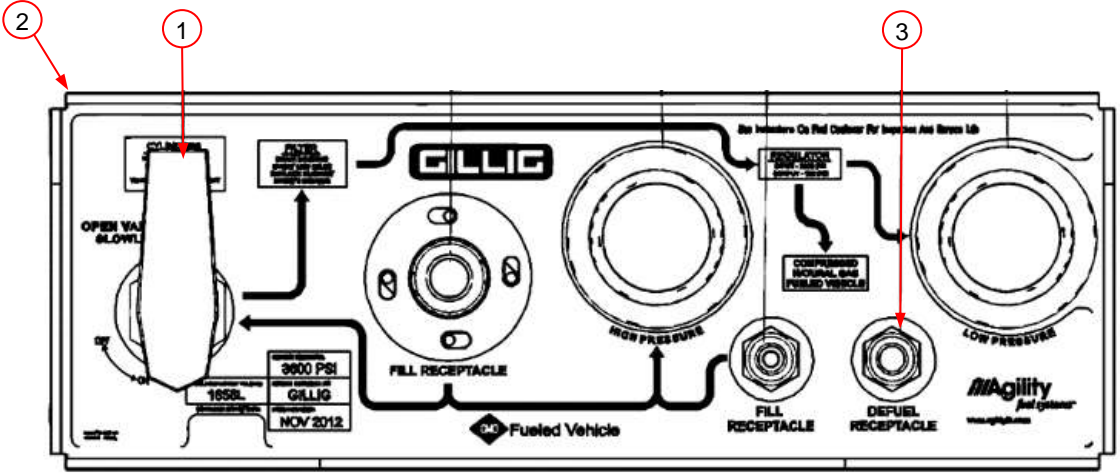
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">1</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">WHAT</p>	<ol style="list-style-type: none"> <li>1. Use a microfiber towel and Swagelok® Snoop® to clean PRD (3), elbow fitting (1), and nut fitting (a).</li> <li>2. Use a wrench to loosen PRD vent tube nut fitting (a) on elbow fitting (1).</li> <li>3. <i>If necessary:</i> Gently move PRD vent tube (2) to allow easier access to PRD (3).</li> <li>4. <i>If necessary:</i> Loosen bolt (<i>not visible</i>) securing dual tube clamp (4) to allow PRD vent tube (2) to move.</li> </ol>	 <p>The diagram shows a fuel system assembly with two PRD units. Callout 1 points to an elbow fitting on the left PRD. Callout 2 points to a PRD vent tube. Callout 3 points to the PRD unit. Callout 4 points to a dual tube clamp. Callout 'a' points to a nut fitting on the elbow fitting.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">WHY</p>	<p>Prevent debris from entering fuel system.</p>	


2	<ol style="list-style-type: none"> <li>1. Use two wrenches to remove elbow fitting (1) from PRD (3).</li> <li>2. Use a wrench to remove PRD (3).</li> </ol> <p><b>NOTICE</b> <i>Do not allow debris to enter cylinder (5).</i></p> <ol style="list-style-type: none"> <li>3. Place removed Emer™ PRD in zip lock bag provided with bulk retrofit kit shipment.</li> </ol> <p><b>NOTICE</b> <i>Place only PRDs from one vehicle in each zip lock bag.</i> <i>Bag must be labeled with the following:</i></p> <ol style="list-style-type: none"> <li>1. Fleet</li> <li>2. VIN</li> <li>3. Fuel system s/n</li> </ol>
WHAT	
WHY	<ol style="list-style-type: none"> <li>1. Bag helps prevent PRD contamination.</li> <li>2. Agility is collecting all PRDs removed; return material authorization (RMA) instructions appear below.</li> </ol>


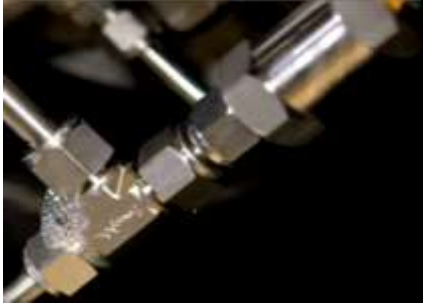
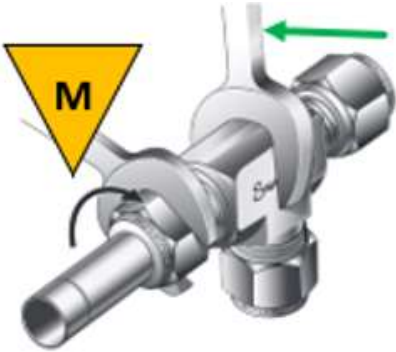







<p>3</p> <p>WHAT</p>	<p>Use a wrench to install replacement Emer™ PRD, p/n, (3).</p> <p><b>Torque PRD (3) to 140 ft-lbs (190Nm).</b></p>		<p>4</p> <p>WHAT</p>	<p>Use two wrenches to install elbow fitting (1) on PRD (3).</p> <p><b>Torque elbow fitting (1) to 45 ft-lbs (61Nm).</b></p>	
<p>WHY</p>			<p>WHY</p>		
<p>5</p> <p>WHAT</p>	<p>1. Use a wrench to tighten PRD vent tube nut fitting (a) on elbow fitting (1).</p> <p><b>Torque nut fitting (a) to 45 ft-lbs (61Nm).</b></p> <p>2. <i>If necessary:</i> Tighten bolt (not visible) securing dual tube clamp (4).</p> <p><b>Tighten bolt to 8 ft-lbs (11Nm).</b></p>		<p>6</p> <p>WHAT</p>	<p>Repeat Steps 1 through 5 until all eight Emer™ PRDs have been replaced.</p>	
<p>WHY</p>			<p>WHY</p>		

## 5.4. System Leak Check Procedure


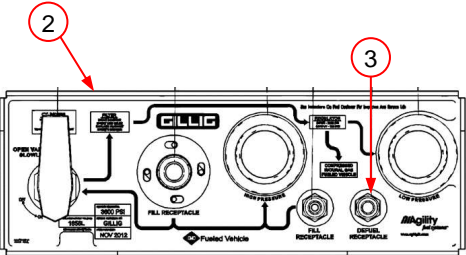
<p>1</p> <p>WHAT</p>	<p>1. Turn 1/4-turn manual shut off valve (1) on the FMM (2) to the OPEN position.</p> <p><b>⚠ WARNING</b></p> <p>2. Select the appropriate CNG fuel nozzle and/or adaptor for the FMM (2) defuel receptacle (3).</p> <p>3. Remove fuel fill receptacle dust cap (<i>not shown</i>).</p> <p>4. Begin fueling the vehicle with CNG using a regulated fuel supply.</p> <p><b>⚠ C</b></p> <p><i>Open nozzle valve slowly and regulate gas delivery to prevent connector from icing and reducing or blocking fuel flow.</i></p> <p><b>⚠ WARNING</b></p> <p><i>Follow all local and facility fueling regulations and procedures.</i></p>	 <p>The diagram illustrates the components of a GILIG CNG fueling station. On the left is a vertical manual shut-off valve (1) with an 'OPEN VALVE SLOWLY' label. Below it is a 'FUEL FILLER' with a '3900 PSI' rating and a 'NOV 2012' date. To the right of the valve is a 'FILL RECEPTACLE' (2) for high pressure. Further right is a 'DEFUEL RECEPTACLE' (3) for low pressure. The station is labeled 'GILIG' and 'Fueled Vehicle'. A warning label at the top right reads 'No Inlet to Co-Fed Outlets RV Inlet Air Screen 18". The Agility logo is in the bottom right corner.</p>
<p>WHY</p>	<p>Test fuel system integrity.</p>	

<p>2</p> <p>WHAT</p>	<p>Monitor FMM high pressure gauge to verify when system pressure reaches 500 psi to 510 psi (3.45MPa to 3.52MPa) and stop pressurization.</p> <p><b>⚠ WARNING</b></p> <p><b>1. If a hissing sound is heard coming from fuel system fittings during filling, stop the fill immediately.</b></p> <p><b>2. Try to isolate the sound and spray Swagelok Snoop<sup>®</sup> on the suspected location to check for bubble formation.</b></p>		<p>3</p> <p>WHAT</p>	<p><b>c</b></p> <p>Leak test all fuel and PRD tubes and fitting connections using Swagelok Snoop<sup>®</sup> leak detection solution or equivalent.</p>	
<p>WHY</p>	<p>Subjects fuel system to partial operating pressure.</p>		<p>WHY</p>	<p>Approved leak detection solution for visual inspection of system leaks.</p>	

<p>4</p> <p>WHAT</p>	<p>1. Begin at one end of the fuel system and work methodically to spray all fuel line fittings with Swagelok Snoop<sup>®</sup> or equivalent.</p> <p>2. Allow at least 10 minutes to elapse before checking the integrity of fitting connections.</p>		<p>5</p> <p>WHAT</p> <p>If a leak is audible or icing, condensation, foam, or bubbles appear at a fitting connection the fitting connection must be inspected.</p> <p><b>⚠ WARNING</b> <i>Fuel system must be defueled prior to investigating any leak. Refer to OEM procedure to defuel system.</i></p>	
<p>WHY</p>			<p>WHY</p>	
<p>6</p> <p>WHAT</p>	<p>Re-tighten leaking fitting(s) discovered during Step 5.</p> <p><b>⚠ c</b> <i>Refer to fitting type and size specific tightening specifications.</i></p>		<p>7</p> <p>WHAT</p> <p>Repeat Steps 1 and 2 to repressurize the system.</p>	
<p>WHY</p>			<p>WHY</p>	

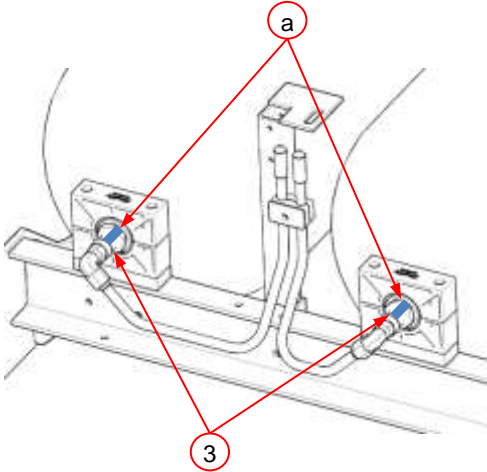
8	WHAT Spray leaking fitting again with Swagelok Snoop <sup>®</sup> or equivalent and allow at least 10 minutes to elapse before checking for bubble formation.		9	WHAT  If leaking fitting is fixed, proceed to test any remaining fitting connections.	
	WHY			WHY	
10	WHAT  <b>WARNING</b> If leak is not fixed, the fuel system must be defueled to replace the fitting.  <b>Perform OEM defuel procedure.</b>		11	WHAT Inspect tubing, fittings, ferrules, and nuts at the site of the leak for perforations, cracks, assembly defects, or other damage.  <b>Any damaged components must be replaced.</b>	
	WHY			WHY	
12	WHAT Replace any related components at the fitting junction as required.		13	WHAT Repressurize fuel system by repeating Step 1 and Step 2.	
	WHY			WHY	



<p>14</p> <p>WHAT</p>	<p><b>c</b></p> <p>Spray new fitting junction with Swagelok Snoop<sup>®</sup> or equivalent to retest for leaks.</p>		<p>15</p> <p>WHAT</p>	<p>Turn FMM 1/4-turn manual shut off valve (3) counterclockwise to the OPEN position.</p>	
<p>WHY</p>			<p>WHY</p>	<p>Allow fuel into system.</p>	
<p>16</p> <p>WHAT</p>	<p><b>c</b></p> <p>Repeat pressure test procedure stopping the fill when fuel system pressure reaches 2000 psi to 2100 psi (13.79MPa to 14.48MPa).</p>		<p>17</p> <p>WHAT</p>	<p><b>c</b></p> <p>Repeat pressure test procedure stopping the fill when fuel system pressure reaches 3600 psi to 3700 psi (24.8MPa to 25.5MPa) and repeat leak checking all connections until entire fuel system is confirmed leak free.</p>	
<p>WHY</p>	<p>Subjects fuel system to partial operating pressure.</p>		<p>WHY</p>	<p>Subjects fuel system to full operating pressure.</p>	
<p>18</p> <p>WHAT</p>	<p><b>c</b></p> <p>If fuel system is leak free or if defueling is required, close flow valve on CNG dispense nozzle (not shown) and carefully disconnect fill nozzle (not shown) from FMM (2) defuel receptacle (3).</p>		<p>19</p> <p>WHAT</p>	<p>Replace dust cap (not shown) on FMM defuel receptacle.</p>	
<p>WHY</p>			<p>WHY</p>	<p>Vehicle will not start if dust cap is not in place.</p>	



<p>20</p> <p>WHAT</p>	<p>If not open, turn FMM (2) 1/4-turn manual shut off valve (1) counterclockwise to the OPEN position.</p>		<p>21</p> <p>c</p> <p>Clean Swagelok® Snoop® or equivalent from the fuel system.</p>	
<p>WHY</p>	<p>Allow gas to flow throughout fuel system.</p>		<p>WHY</p> <p>Customer satisfaction.</p>	
<p>22</p> <p>WHAT</p>	<p>c</p> <p>When the pressure test is completed successfully, use form FT.0322 (c) to record the result and the date on which the fuel system passed the 3600 psi test.</p>	<p>c</p>	<p>23</p> <p>Apply Torque Seal to all fitting junctions.</p>	
<p>WHY</p>	<p>Verify safe and proper fuel system pressure specification.</p>		<p>System quality specification.</p>	

24	c			
WHAT	Use a blue paint marker to mark a stripe (a) on all eight PRDs (3) replaced.			
WHY	Easily identify replaced PRDs.			

## 5.5. Reporting and Return Procedure

1	<p><b>c</b> 1. Use form FT.0322 (c) to record the Date of Manufacture (a) and batch number (b) and the location of each replacement PRD (16), p/n 10301046, within the fuel system.</p> <p>2. Inspect fuel system repairs per the quality assurance criteria specified in FT.0322.</p> <p><b>NOTICE</b> Use a flashlight to aid serial number identification in low light.</p> <p>3. Use a camera or camera phone to take a photo of completed form FT.0322 (c).</p> <p>4. Submit photo of completed form FT.0322 (c) to the email address indicated on the form to receive a Return Material Authorization (RMA) shipping label.</p>
WHAT	
WHY	Required for retrofit kit component and repair tracking and, if applicable, installer reimbursement.



**Recall Data Sheet, FT.0322**

<b>Agility</b>		Post Retrofit Quality Inspection and Data Reporting Sheet	
Emer PRD Recall and Replacement Campaign - Gilly Type 3 w/ manual valves			
<b>Vehicle and Fuel System Data</b>		VIN #	
Vehicle make		Fleet (if applicable)	
Fuel system		Unit #	
Repair site			
<p><b>Before proceeding with PRD plug replacement, confirm PRD OEM. DO NOT REMOVE CIRCUIT PRD PLUGS.</b></p> <p>1) Record Date of Manufacture and Batch # / Serial # of each Circuit PRD plug of cylinder systems 1 through 5</p> <p>2) Circle "N/A" in the Replacement PRD Data columns for cylinder systems 1 through 5</p>			
<b>Recall PRD Data</b>			
PRD Date of Installation	Batch #/Serial #	PRD Date of Manufacture	Batch #
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
		<b>LEGEND</b> Cylinder PRD ID 	
<p><b>Post Retrofit Quality Assurance Criteria</b></p> <p>1. PRD supply and vent lines installed. fittings tightened and torque marked per work instruction</p> <p>2. Proximal kit fasteners tightened to specification and torque marked per work instruction</p> <p>3. Fuel system tested at 3600 psi? Yes/No (side view) If no, re-install form on date system passes:</p> <p>4. Fuel system passed 3600 psi pressure test with no leaks. Date passed: / /</p> <p>5. Fuel system is clean and free of debris</p>			
Technician 1		Technician 2	
Signature		Signature	
Date		Date	
Month / Day / Year		Month / Day / Year	
<p><b>Quality Inspection &amp; Release</b></p> <p>By signing this document, I certify all work has been completed per parts in stock, if at all, e.g., EBP vs REV A.x, inspected by me, and the vehicle is ready for release.</p>			
Inspected by		Date	
Signature		Month / Day / Year	
<p>To obtain a return shipping label for all removed PRDs, please take a photo of this document and email to <a href="mailto:EmerPRD1@agilityfs.com">EmerPRD1@agilityfs.com</a></p> <p>To report any issues, please email <a href="mailto:EmerPRD1@agilityfs.com">EmerPRD1@agilityfs.com</a></p>			
FT.0322 5/19/2020		Printed Copy is Uncontrolled	
		1 of 1	

<p style="text-align: center;">2</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">WHAT</p>	<p>Repeat Section 5. Corrective Action / Procedure for all vehicles subject to the Emer™ PRD recall on hand until all repairs are complete.</p>		<p style="text-align: center;">3</p> <p style="text-align: center;">c</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">WHAT</p>	<ol style="list-style-type: none"> <li>1. Pack all removed PRDs (still bagged by VIN), in one box. If the quantity of PRDs is too large for a single box, use additional boxes but ship them all using the same RMA. <i>If possible:</i> reuse the box in which the replacement PRDs were shipped.</li> <li>2. Apply RMA label obtained from Agility® to the box.</li> <li>3. Use a permanent marker to write RMA number on exterior of each shipping box.</li> </ol>	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">WHY</p>			<p style="writing-mode: vertical-rl; transform: rotate(180deg);">WHY</p>	<p>Required for repair return tracking and, if applicable, installer reimbursement.</p>	

## 6. Warranty Information

This procedure is covered under warranty. Standard repair time (SRT) is TBA. Please refer to Warranty Manual, ENP-067, for warranty reimbursement procedures.

For parts and support, contact Agility Fuel Solutions Customer Care:

+1 949 267 7745

toll free: +1 855 500 2445

parts@agilityfs.com

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Revision	Description	Author	Approved By	Date
--	Initial Release	C. Grasso	CCG Team	05/27/2020