

CNG Gen 3 RM Refuse Fuel System PRD Retrofits

Affected Vehicles

Refuse vehicles equipped with Hexagon Agility® the following Gen 3 Roof Mount CNG fuel systems:

- | | |
|-----------------------------|-----------------------------|
| a) 20435000 and 20435000-WM | d) 20535000 and 20535000-WM |
| b) 20436000 and 20436000-WM | e) 20536000 and 20536000-WM |
| c) 20437000 and 20437000-WM | f) 20537000 and 20537000-WM |

Introduction

Agility Fuel Solutions LLC, a subsidiary of Hexagon Agility Inc. (Hexagon Agility®), has determined that certain OMB pressure relief devices (PRDs) have been observed to crack or fracture. The PRD failure mode—seen to occur at or near first fill—can result in a sudden release of the high-pressure gas contained in the CNG fuel system to the atmosphere.

Hexagon Agility® has created a PRD retrofit kit, p/n 20535030, to correct this issue on Hexagon Agility® Gen 3 roof mount (RM) refuse fuel systems.

This bulletin also provides instructions for authorized Hexagon Agility® personnel to install PRD retrofit kit, p/n 20535030.

Warning Statements Used in this Bulletin



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



NOTICE is used to address practices not related to physical injury, such as best practices or tips to help an operation or procedure go smoothly and prevent equipment damage.



CRITICAL CHARACTERISTIC – Product feature 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.

Required Tools and Materials

Item	Purpose
Safety glasses	Eye protection
Scaffolding	Safe access to fuel system
Fall restraints	Safe access to fuel system
Combination and socket wrenches	Remove and install fuel system fittings, fasteners, and components
Torque wrench	Accurately tighten fuel system fittings, fasteners, and components
Crow foot wrenches	Use with torque wrench
Swagelok® Snoop® leak detection fluid	Perform leak test
Battery powered impact w/ 7/32-in hex bit	Remove and install fuel system cover
Permanent marker	Mark compression fittings
Torque Seal marker	Indicate fittings and fasteners are tightened to specifications
Shop rags	Clean fuel system tubing before and after retrofit

Warranty Information

This procedure and the retrofit kits are covered under the provisions of the fuel system warranty.

Prior to Beginning Work

1. Verify contents of Retrofit Kit, Beta Valve PRD, Gen 3 RM, Hexagon Agility® p/n 20535030 is present in the correct quantities. **FIGURE 1**

Item	Part Number	Description	QTY
1	10200063	Fitting, Connector, Male	2
2	10200236	Fitting, Adapter, Male	2
3	10240625	Fitting, Straight, Male	2
4	10306997	PRD, Emer, Remote	2
5	20437408	Tube, Formed, Live PRD, 3/8-in x .049-in, Valve to Manifold	2
6	20535027	Tube Subassembly, 20535425, PRD to Vent	1
7	20535028	Tube Subassembly, 20535426, PRD to Vent	1
8*	10200250	Nut and Ferrule Set - <i>NOTE: use QTY: 2 with each (5)</i>	4

*Not shown

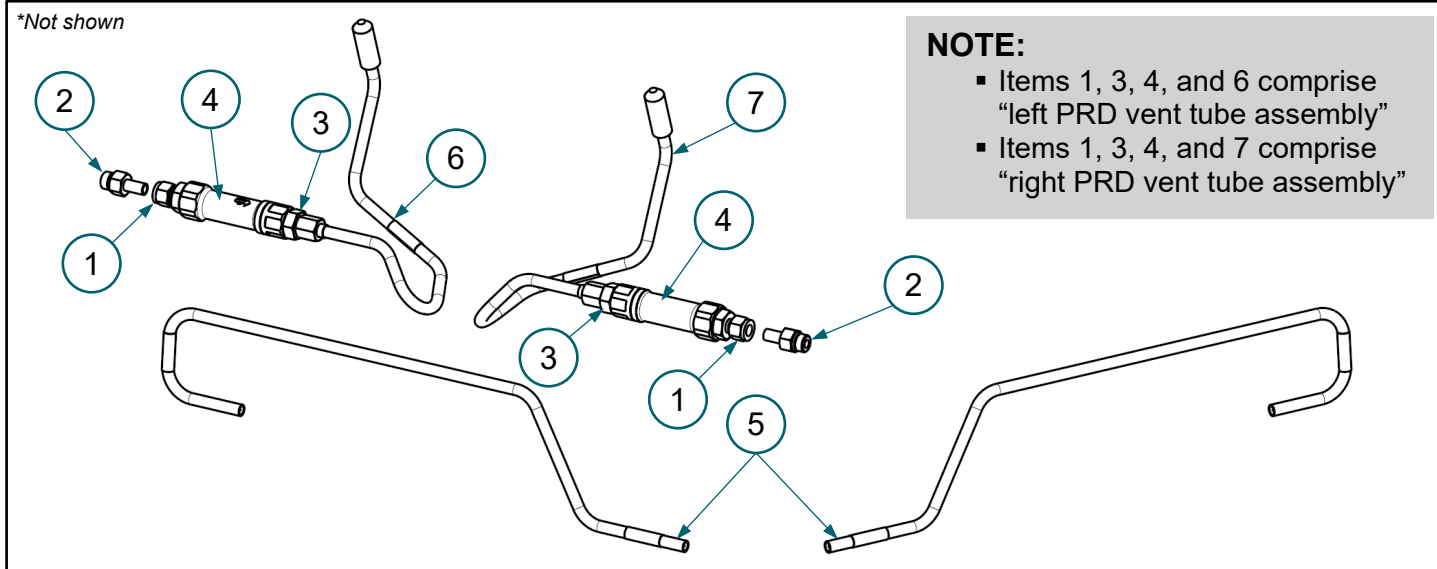


FIGURE 1. Parts List — Retrofit Kit, Beta Valve PRD, Gen 3 RM, Hexagon Agility® p/n 20535030

2. If any parts are missing or unusable, contact Hexagon Agility® Customer Care and Technical Services (CCTS) for replacement.

NOTICE

Do not remove components from original packaging until necessary. Any components to be reinstalled must be thoroughly cleaned, inspected and stored in a satisfactory manner until reinstallation.

⚠ WARNING

Wear approved personal protective equipment (PPE) including safety glasses.

Secure Vehicle**⚠ WARNING**

Set emergency brake.

⚠ WARNING

Place wheel chocks under vehicle tires.

⚠ WARNING

Use approved scaffolding and fall restraints.

Defuel Vehicle**⚠ WARNING**

Refer to defueling sections of *ENP-516, Truck and Tractor CNG Fuel System Operation, Maintenance & Inspection Manual*.

Install PRD Retrofit Kit, p/n 20535030

1. Use a battery powered impact tool and a 7/32-in hex bit to remove fuel system cover valve fasteners and set aside in a safe place. **FIGURE 2**

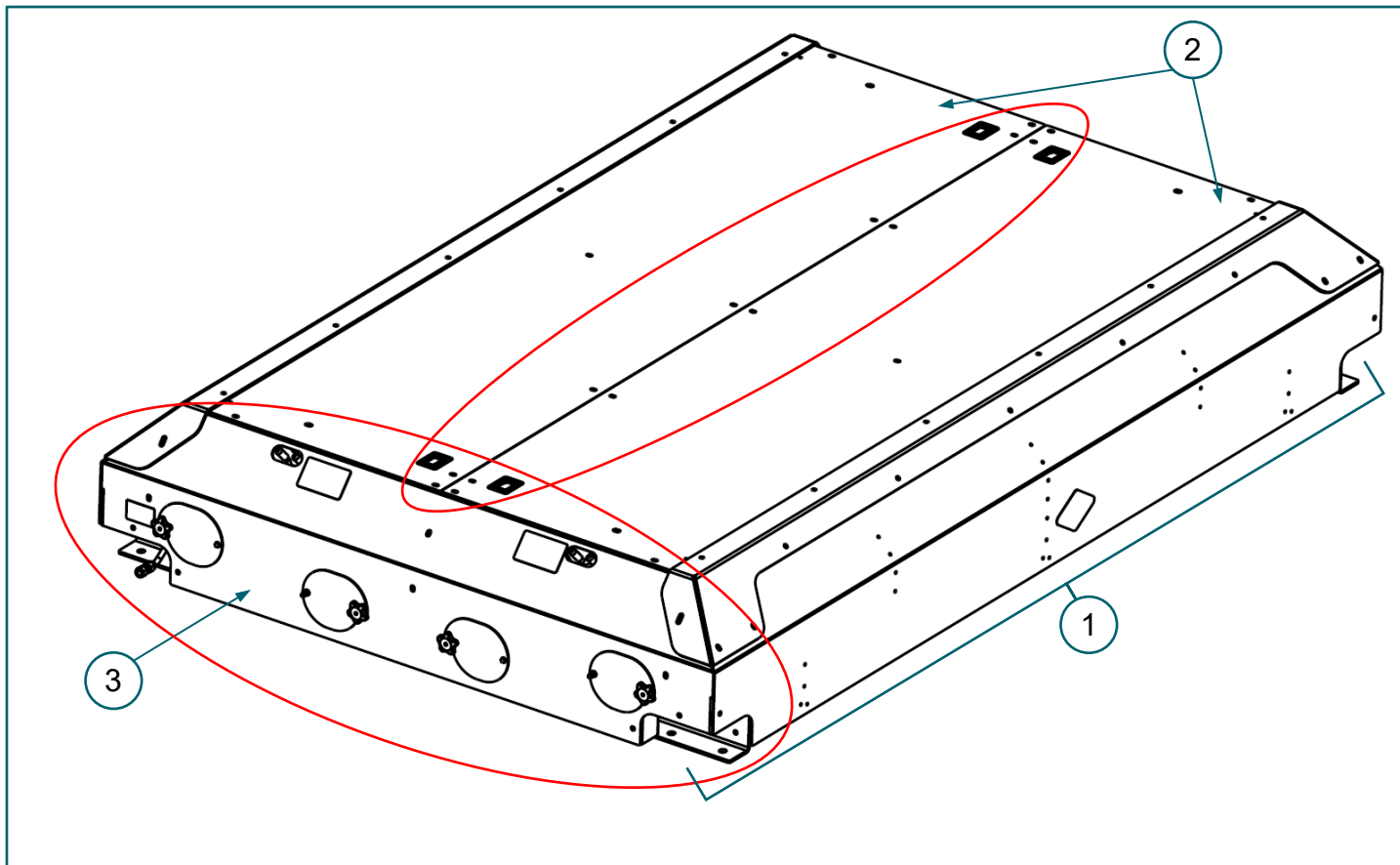


FIGURE 2. RM fuel system cover components

1 cover

2 doors

3 valve end panel

2. Open doors. **FIGURE 2**

3. Remove valve end panel to expose cylinder valve end plumbing. *Refer to OEM instructions.* **FIGURE 2**

⚠ WARNING

NEVER put a wrench on a fuel system fitting without first confirming the system has been depressurized.

4. Use a pair of 11/16-in wrenches to remove (3) left PRD vent tube from (5) left PRD. **FIGURE 3**

NOTE: Left valve details shown;
mirrors right valve.

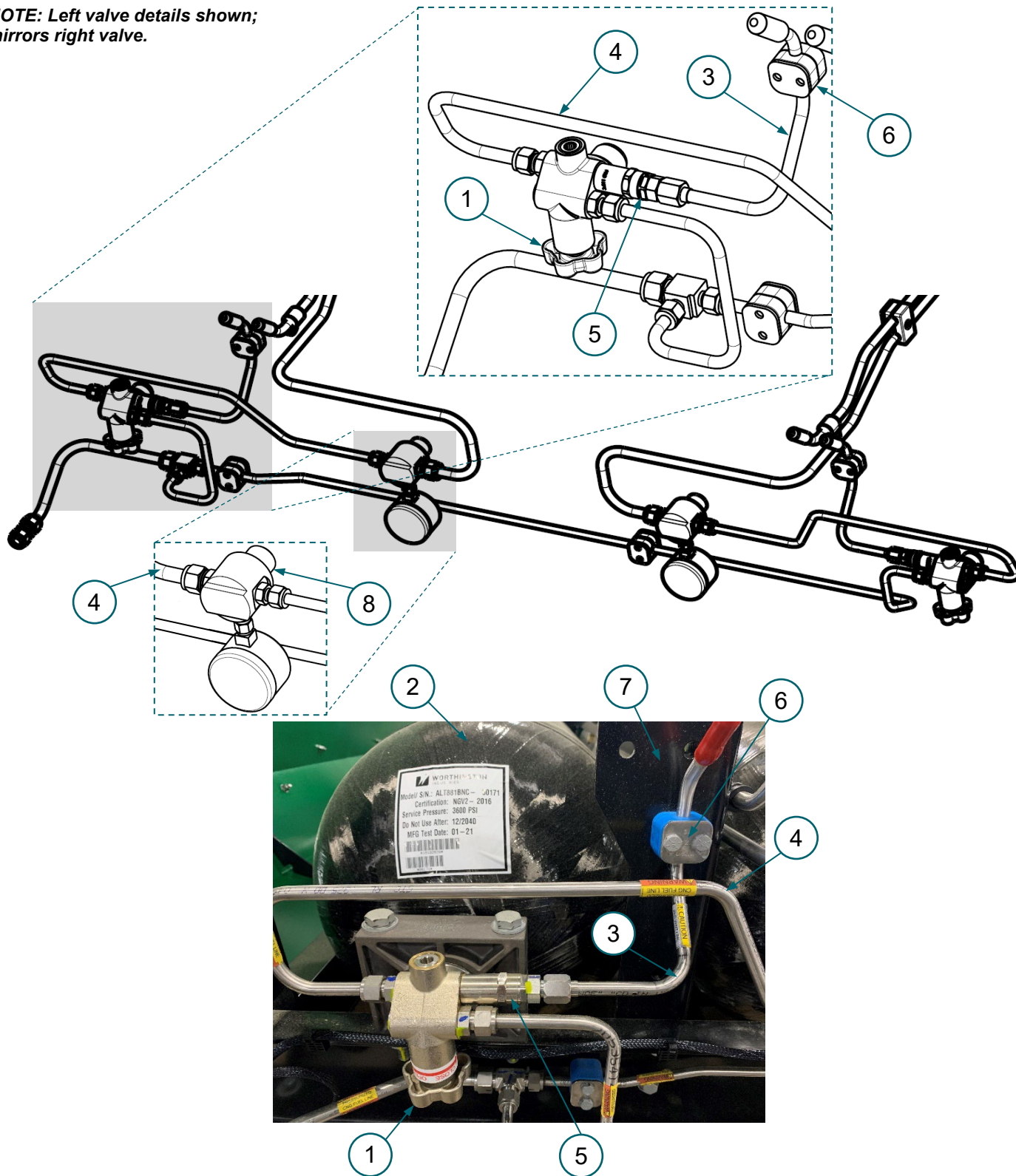


FIGURE 3. Left fuel system valve end plumbing components

1 left cylinder valve
2 cylinder
3 left PRD vent tube

4 left live PRD tube
5 left PRD
6 tube clamp

7 structure
8 left manifold

5. Use a pair of 11/16-in wrenches to remove (4) left live PRD tube from (1) left cylinder valve and (8) left manifold. **FIGURE 3**
6. Use a 7/16-in socket and a 7/16-in wrench to remove fasteners securing (6) tube clamp and (3) left PRD vent tube to (7) structure and set fasteners and clamp aside for reuse. **FIGURE 3**

NOTICE Reuse, recycle, or discard tube assemblies removed according to authority having jurisdiction (AHJ) and/or organizational guidelines.

7. Use a 7/8-in wrench to remove (5) left PRD from (1) left cylinder valve. **FIGURE 3**

NOTICE Reuse, recycle, or discard PRDs according AHJ and/or organizational guidelines.

8. Use a 9/16-in wrench to install (2) male adapter fitting, p/n 10200236, from retrofit kit on left cylinder valve (*not shown*). **FIGURE 4**

▼ Torque male adapter fitting to 26 ft-lbs (35.3 Nm).

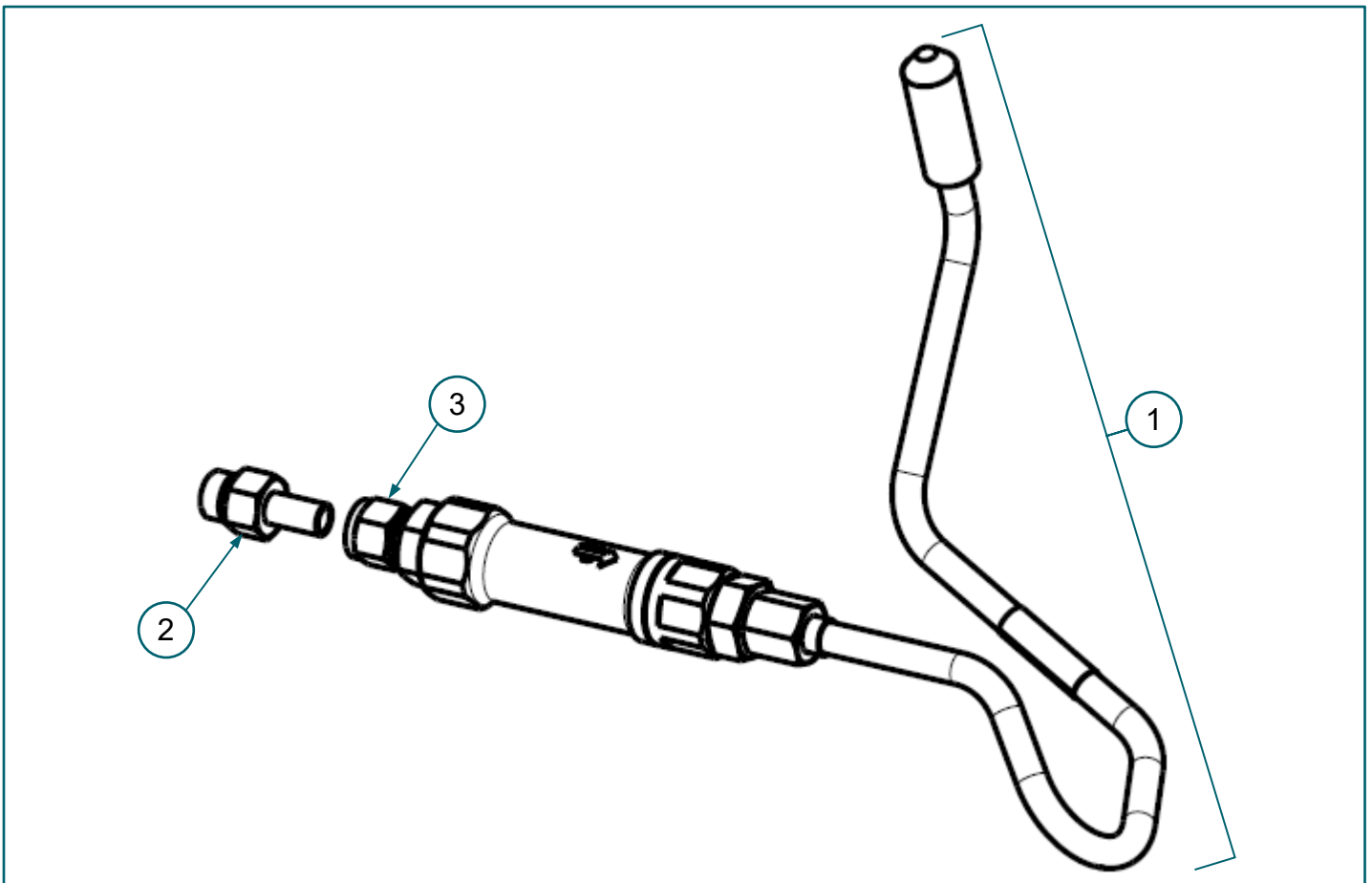


FIGURE 4. Left PRD vent tube assembly and male tube adapter fitting

1 left PRD vent tube assembly 2 male adapter fitting, p/n 10200236 3 male connector fitting, p/n 10240625

9. Use a 11/16-in wrench to install male connector fitting, p/n 10200063, of (1) left PRD vent tube assembly while using a 5/8-in wrench to hold (2) male tube adapter, p/n 10200236. **FIGURE 4** and **FIGURE 5**

▼ Tighten connector fitting nut per Appendix A: WI.0441 Tightening of Tube Fittings

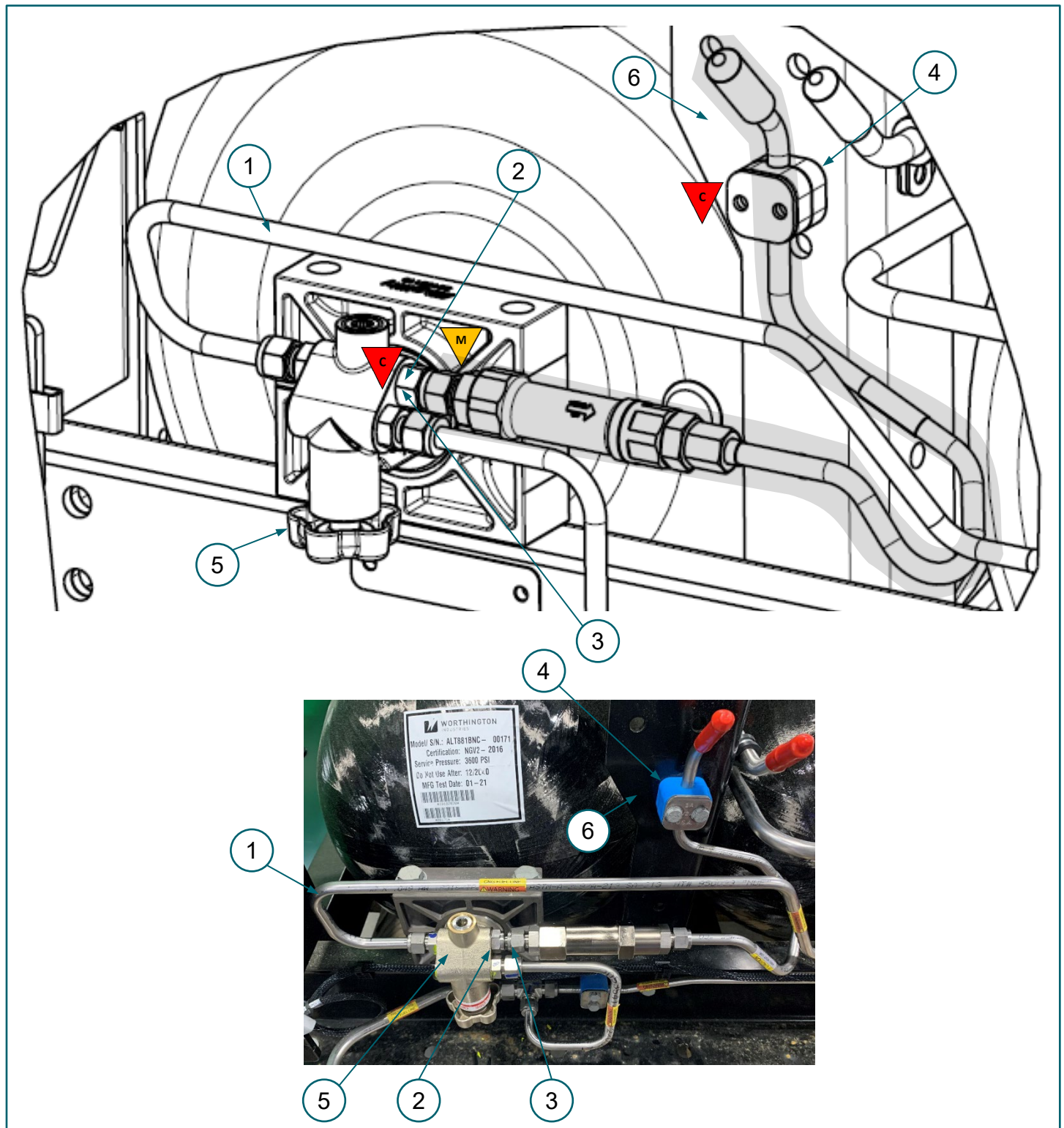


FIGURE 5: Left cylinder valve plumbing after installation of left PRD vent tube assembly and live PRD tube

- 1 left live PRD tube, p/n 20437408
- 2 male adapter fitting, p/n 10200236
- 6 structure

- shaded** left PRD vent tube assembly
- 3 male connector fitting, p/n 10240625

- 4 tube clamp
- 5 left valve

10. Install (1) live PRD tube, p/n 20437408, from retrofit kit on (5) left valve. **FIGURE 5**



Tighten nut fittings per Appendix A: WI.0441 Tightening of Tube Fittings.

11. Use 7/16-in socket and a 7/16-in wrench to secure (*shaded*) left PRD vent tube assembly to (6) structure using (4) tube clamp and fasteners. **FIGURE 5**



Tighten tube clamp fasteners to 8 ft-lbs (10.85 Nm) and mark bolts with Torque Seal.

12. Use a pair of 11/16-in wrenches to remove (3) right PRD vent tube nut fitting from (5) right PRD. **FIGURE 6**

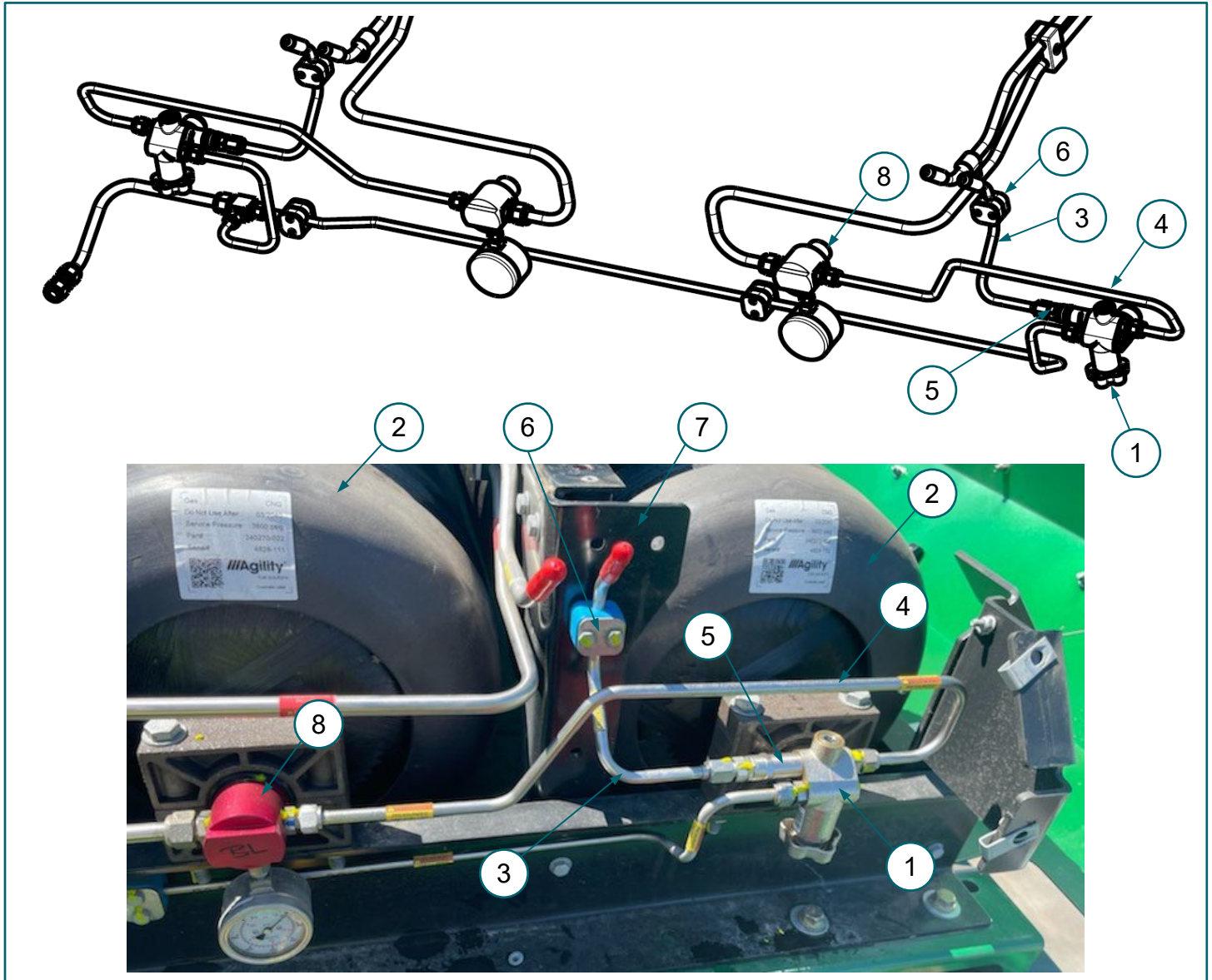


FIGURE 6. Right fuel system valve end plumbing components

- | | | |
|------------------------|-----------------|------------------|
| 1 right cylinder valve | 4 live PRD tube | 7 structure |
| 2 cylinder | 5 right PRD | 8 right manifold |
| 3 right PRD vent tube | 6 tube clamp | |

13. Remove (4) live PRD tube from (1) right cylinder valve and (8) right manifold. **FIGURE 6**

14. Remove (3) right PRD vent tube from (5) right PRD. **FIGURE 6**

15. Use a pair of wrenches to remove fasteners securing (6) tube clamp and (3) right PRD vent tube to (7) structure and set fasteners and clamp aside for reuse. **FIGURE 6**

NOTICE

Reuse, recycle, or discard tube assemblies removed according to authority having jurisdiction (AHJ) and/or organizational guidelines.

16. Remove (5) right PRD from (1) right cylinder valve. **FIGURE 6**

NOTICE

Reuse, recycle, or discard PRDs according AHJ and/or organizational guidelines.

17. Install (2) male adapter fitting, p/n 10200236, from retrofit kit on (5) right cylinder valve. **FIGURE 7**



Torque male adapter fitting to 26 ft-lbs (35.3 Nm).

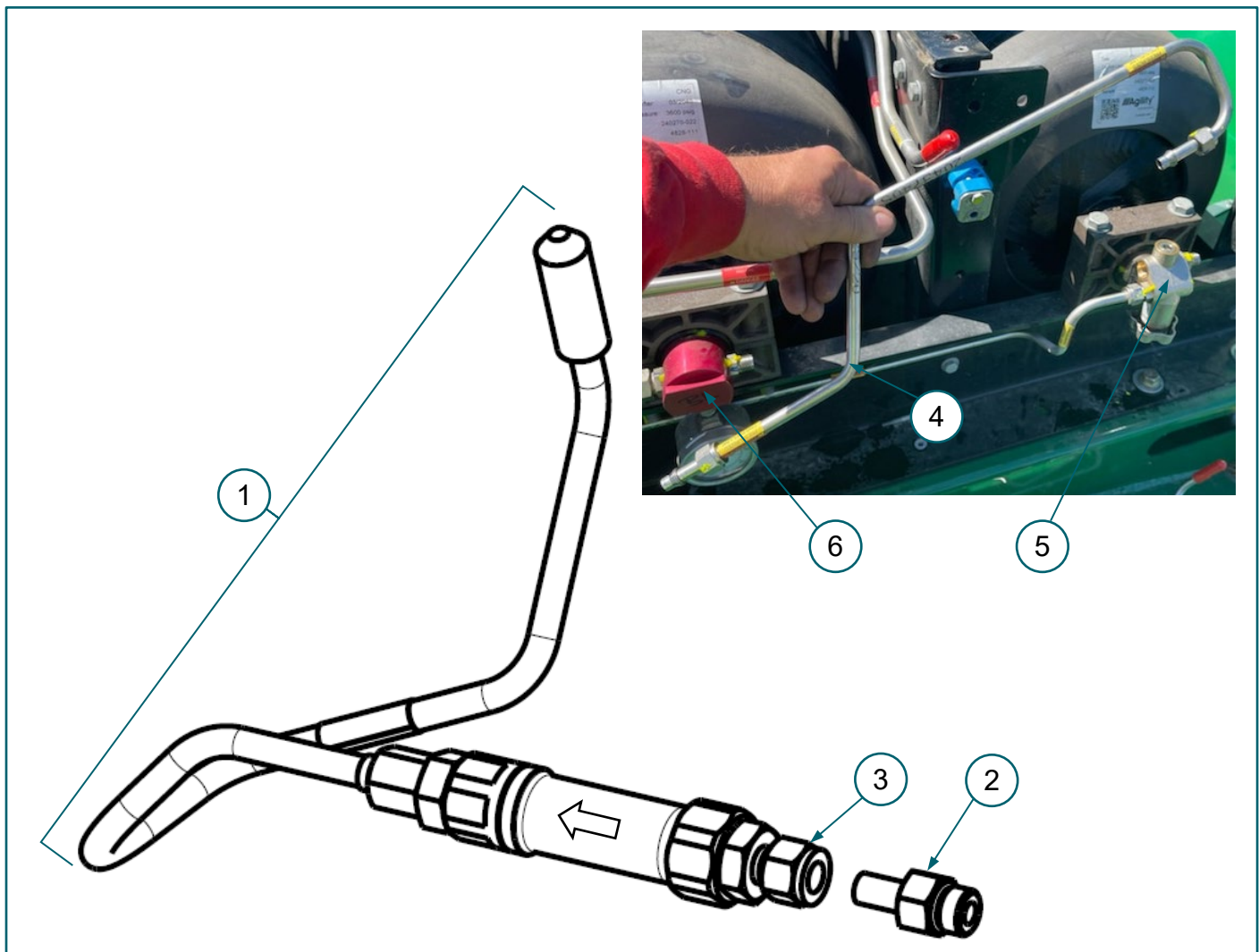


FIGURE 7. Right PRD vent tube assembly and male adapter fitting

1 right PRD vent tube assembly
2 male adapter fitting, p/n 10200236

3 male connector fitting, p/n 10200063
4 live PRD tube, p/n 20437408

5 right cylinder valve
6 right manifold

18. Use a 11/16-in wrench to install male connector fitting, p/n 10200063, of (1) right PRD vent tube assembly while using a 5/8-in wrench to hold (2) male tube adapter, p/n 10200236. **FIGURE 7** and **FIGURE 8**



Tighten connector fitting nut per Appendix A: WI.0441 Tightening of Tube Fittings.

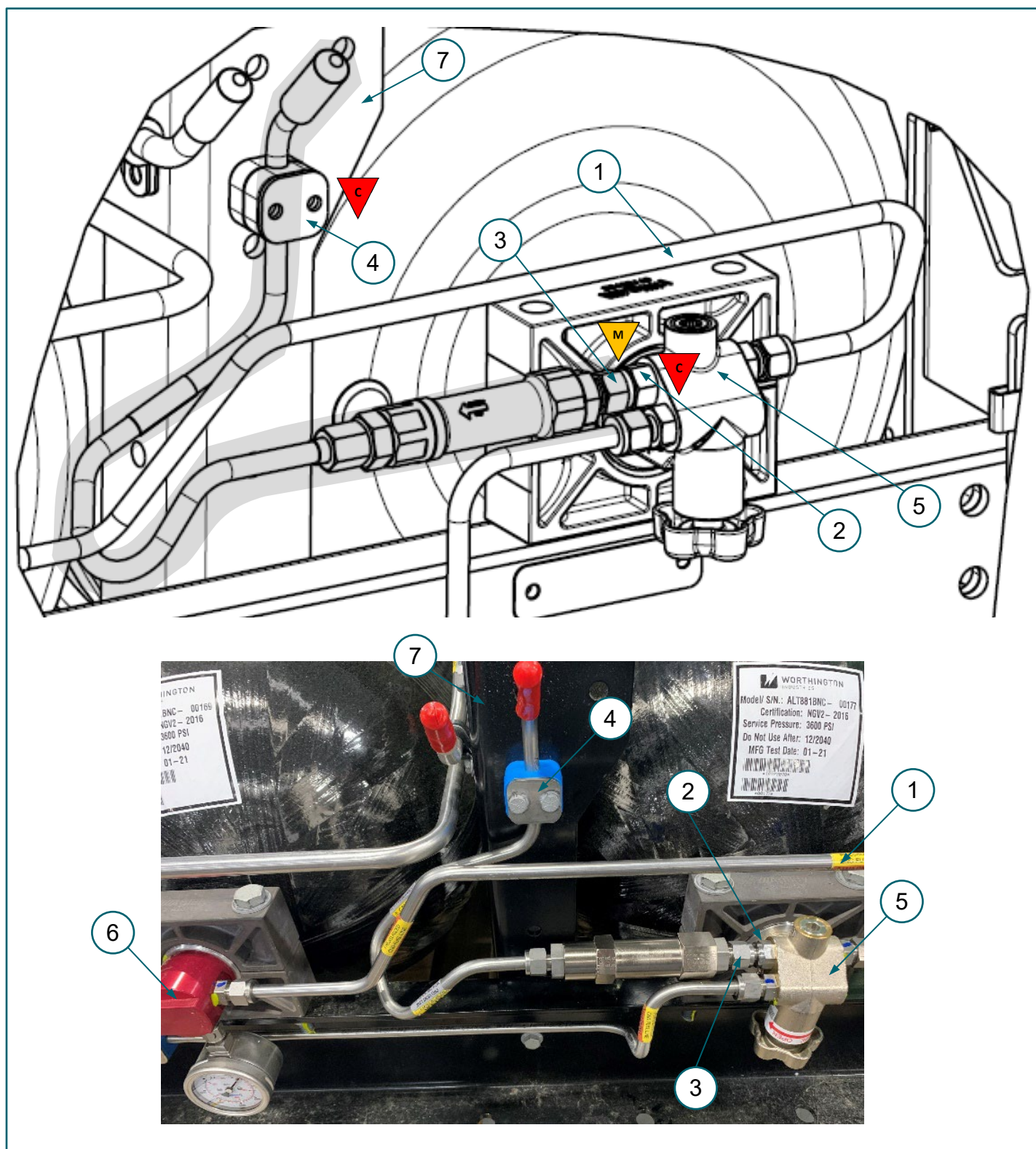


FIGURE 8: Right cylinder valve plumbing after installation of left PRD vent tube assembly and live PRD tube

- | | | |
|--|--|------------------|
| 1 right live PRD tube, p/n 20437408 | shaded right PRD vent tube assembly | 6 right manifold |
| 2 male adapter fitting, p/n 10200236 | 4 tube clamp | 7 structure |
| 3 male connector fitting, p/n 10200063 | 5 right cylinder valve | |

19. Install (1) live PRD tube, p/n 20437408, from retrofit kit on (5) right cylinder valve and (6) right manifold. **FIGURE 7** and **FIGURE 8**



Tighten nut fittings per Appendix A: WI.0441 Tightening of Tube Fittings.

20. Use a 7/16-in socket and 7/16-in wrench to secure (*shaded*) right PRD vent tube assembly to (7) structure using (4) tube clamp and fasteners. **FIGURE 8**



Tighten tube clamp fasteners to 8 ft-lbs (10.85 Nm) and mark bolts with Torque Seal.

21. Perform **Leak Test Procedure**.

Leak Test Procedure

1. Fuel vehicle to 500 psi (3.45 MPa). *Refer to ENP-516, Truck and Tractor CNG Fuel System Operation, Maintenance & Inspection Manual, "CNG System Fueling" section.*
2. Listen for hissing as a sign of a system leak.
3. Spray all fuel system connections with Swagelok® Snoop® leak detection solution and wait 10 minutes.
4. Inspect all fuel system junctions for bubbles as an indicator of a leak.
 - a. If no leaks are found, proceed to Step 5.
 - b. If a leak is found, depressurize fuel system. *Refer to ENP-516, Truck and Tractor CNG Fuel System Operation, Maintenance & Inspection Manual, "Depressurizing CNG Systems" section.*

⚠ WARNING

NEVER attempt to tighten fittings while system is pressurized.

- c. Repair leak(s). *Refer to ENP-516, Truck and Tractor CNG Fuel System Operation, Maintenance & Inspection Manual, "Leak Repair" section.*
5. Fuel vehicle to 3600 psi (24.6 MPa).
 6. Repeat Steps 2 through 4 until no leaks are present.
 7. When the system passes the leak test, use shop rags to clean all Swagelok® Snoop® from fuel system components.
 8. Use a Torque Seal marker to mark properly tightened fuel system fittings. **FIGURE 9**

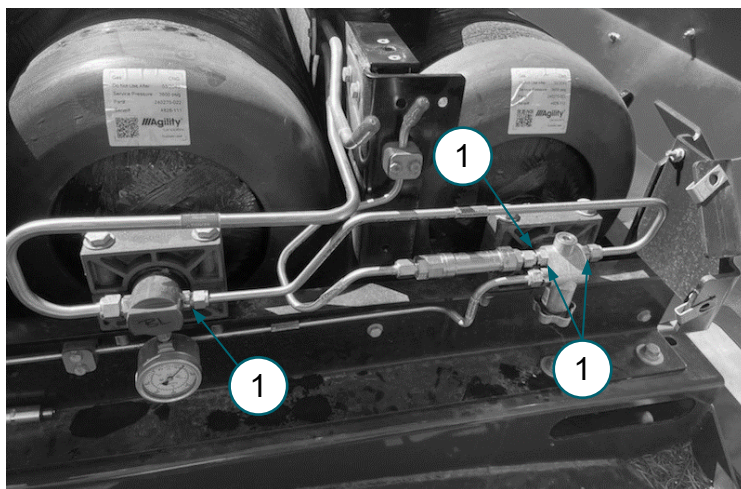
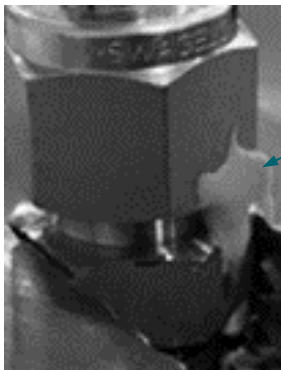


FIGURE 9. New fitting junctions marked with (1) Torque Seal. **NOTE:** right retrofit plumbing shown; left mirrors.

Finish Installation

1. Use a battery-powered impact wrench and 7/32-in hex bit to reinstall valve end panel using stainless steel fasteners. **FIGURE 10**

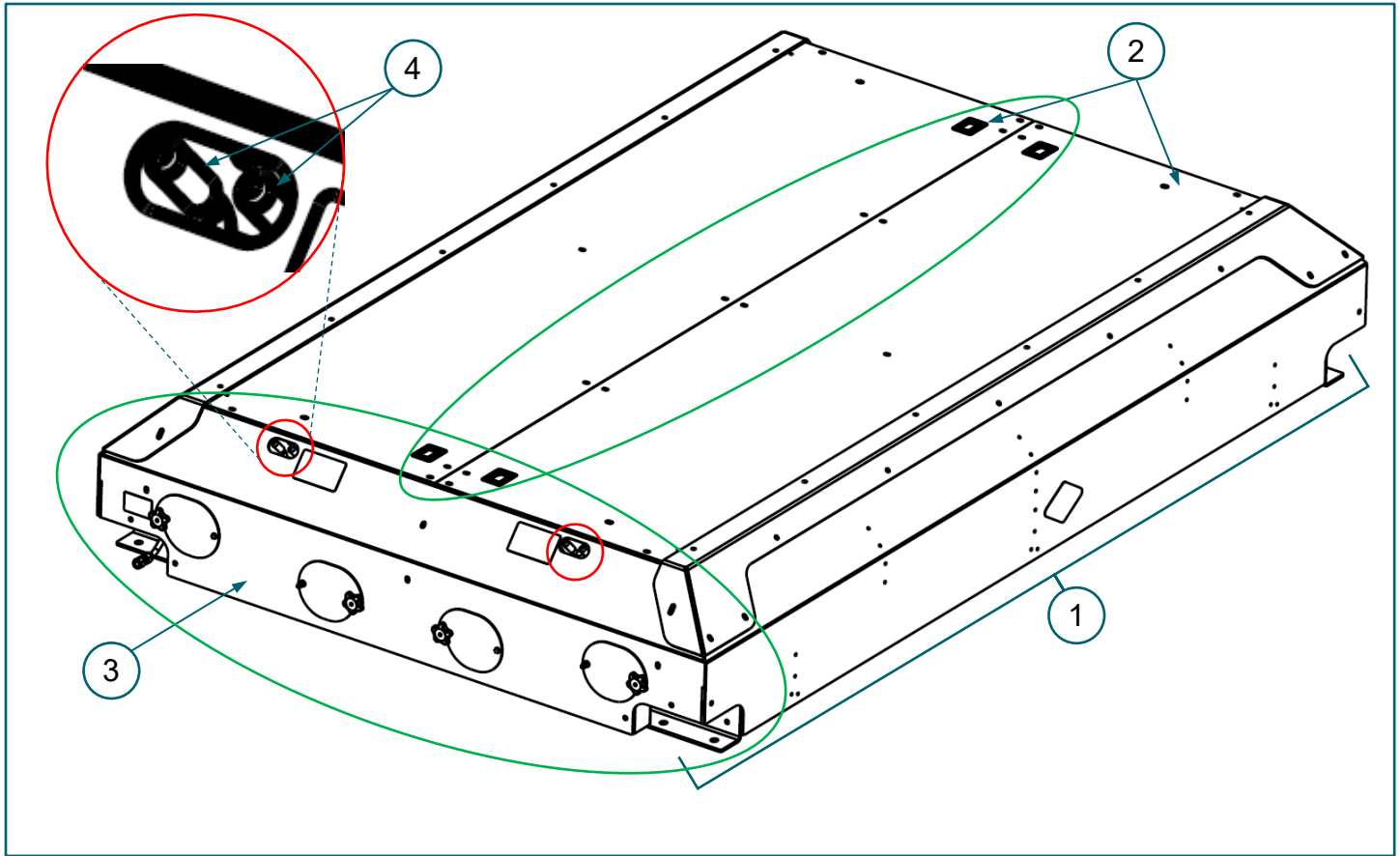


FIGURE 10. RM fuel system cover components

- 1 cover
- 2 doors

- 3 valve end panel
- 4 PRD vent tube caps

circled vent opening

NOTICE

Verify: 1) PRD vent tube caps do not touch valve end cover vent openings, and 2) vent cap tips are flush with the underside of the cover OR do not protrude more than 0.5-in (12.7 mm) above the cover. FIGURE 10

2. Close doors and use a battery-powered impact wrench and a 7/32-in hex bit to reinstall stainless steel fasteners. **FIGURE 10**
3. Road test vehicle using the procedure described below.

Road Test Procedure

1. Remove wheel chocks from tires.
2. Start engine and verify proper fuel system operation.
3. Road test the vehicle until it reaches operating temperature.
4. **If a fuel system fault appears**, contact Hexagon Agility® CCTS.
5. If the system is operating properly, release vehicle into service.
6. Update vehicle maintenance and repair records.

Appendix A: WI.0441 Tightening of Tube Fittings

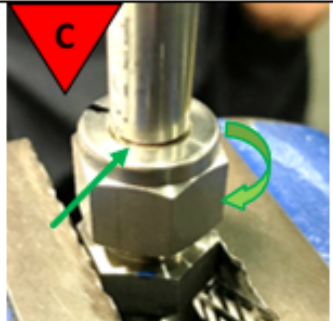
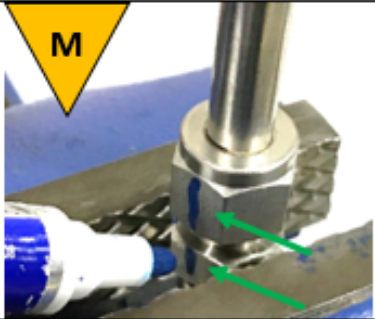
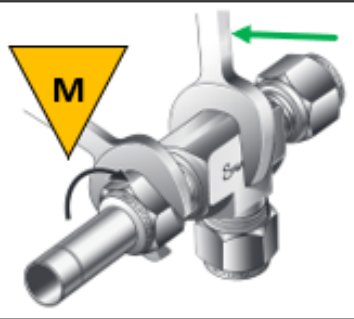
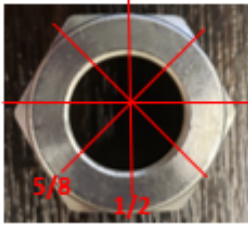
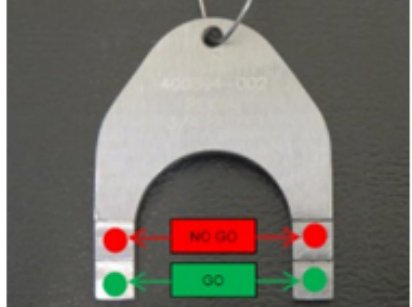


Tightening of Tube Fittings

Scope: Tightening of 1/2" Swagelok fittings, port connectors and port adaptors.

Note: "Substitute from WI.0198"

Standard Work Instruction

1	Install swaged tube into fitting. Verify that both nut and fitting have same manufacturer markings. 		2	Tighten nut (by hand or with wrench) until top of nut is aligned with the bottom of the DMT mark. 	
WHY	Swagelok/Parker fittings and nuts are NOT interchangeable.		WHY	This line shows the nut's correct starting location prior to tightening.	
3	Mark across nut and fitting with blue paint pen		4	Put a "backing wrench" on the adjacent fitting. Note: some products require holding a different component - this will be noted in the product-specific work instructions.	
WHY	The marks are needed for step 5 and inspection.		WHY	The backing wrench prevents the fitting from rotating. This ensures that the nut is NOT under-tightened.	
5	Using the blue marks as a visual reference, turn nut between 1/2 and 5/8 of a turn 	 	6	Check gap between nut and fitting with the GO-NOGO gap gage. If the GO section fits AND the NOGO section does not fit, the part is good. If the NO-GO section fits, then tighten the fitting and recheck. If the GO section does not fit, the tube must be removed and scrapped.	 
WHY	If the nut is turned less than 1/2 turn, it may pass a leak test, but leak later in the field.		WHY	The gap indicates how tightly the ferrules are seated against the fitting. Too much gap will allow a leak. Not enough gap indicates too much swaging or tightening.	

WI.0441, rev.1.0

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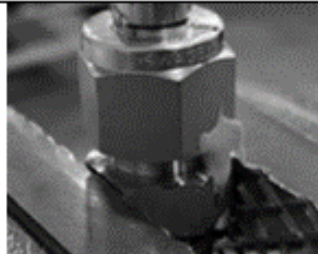
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**Tightening of Tube Fittings**

Scope: Tightening of 1/2" Swagelok fittings, port connectors and port adaptors.

Note: "Substitute from WI.0198"

Standard Work Instruction

7	WHAT	Add torque seal between nut and fitting (only when specifically required by customer).		8	WHAT	---
WHY		---		WHY		---

Equipment List:

Description	Manufacturer	Manufacturer's Part Number
1/4" gap inspection gage	Agility Fuel Solutions	TBD
3/8" gap inspection gage	Agility Fuel Solutions	TBD
1/2" gap inspection gage	Agility Fuel Solutions	TD 400394
Blue paint pen	Dykem	84001
Ultra-fine tip permanent black marker	Sharpie	37001
Yellow torque seal	Dykem	83317
Open-ended wrenches	Any	---
Vise	Any	---

Job Breakdown:

Important Steps	Key Points	Reasons Why
1. Tube into fitting	1. Same manufacturers	Swagelok and Parker fittings are not interchangeable.
	2. Tube bottomed out in fitting	The tube must be fully inserted into the fitting.
	3. DMT line fully showing	Provides correct starting point.
2. Mark parts	1. Across nut and fitting	Provides visual aid to start tightening.
3. Turn nut	2. Use backing wrench	Holds everything in place to prevent leaks.
	3. 1/2 turn	Incorrect turns could cause a leak.
	4. Marks on opposite sides	Provides visual aid to finish tightening.
	5. Verify gap	Verify tightening is complete, but not too much.
4. Torque seal	1. Across nut and fitting	Shows if fitting was loosened.

Hexagon Agility® Customer Care and Technical Services

Fuel system warranty or non-warranty product support may be obtained by calling or emailing Hexagon Agility® Customer Care and Technical Services (CCTS). Please provide **your name, phone number, email address, and complete vehicle information: VIN, year, make, model, mileage, unit number vehicle owner, and current vehicle location**. A service advisor will contact you to arrange vehicle repair or ship a part.

+1 855 500 2445
(toll-free, U.S. and Canada)

+1 949 267 7745

Support
support@hexagonagility.com

Parts Orders
parts@hexagonagility.com

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Hexagon Agility® 3335 Susan Street, Suite 100 Costa Mesa, CA 92626 USA

www.hexagonagility.com