HONDA

Job Aid

October 2019 Version 3

Fuel Cell Service Equipment Kit and Portable Vent Stack

AFFECTED VEHICLES

Year	Model
2017 Series	Clarity Fuel Cell

INTRODUCTION

The following procedures in the service information require the Fuel Cell Service Equipment Kit (T/N VSBHONFCVKT1) and the Portable Vent Stack (T/N FEFPVS).

- Preparation Before Component Removal
- Hydrogen Leak Check

This job aid provides details on these tools and how to use them. It should also be used as a supplement to the procedures listed in the service information. Be sure to review the entire job aid first before starting the procedures.

FUEL CELL SERVICE EQUIPMENT KIT (T/N VSBHONFCVKT1)

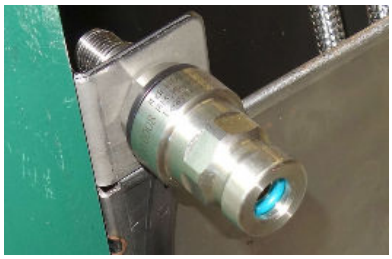
PORTABLE VENT STACK (FEFPVS)

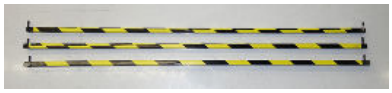
The fuel cell service equipment kit and the portable vent stack will be shipped on a special crate. Make sure to uncrate the equipment according to the instructions, "Uncrating Instructions" attached to the outside of the crate.

KIT CONTENTS

The following table shows all the contents of the Fuel Cell Service Equipment Kit (T/N VSBHONFCVKT1).

Tool Image	Tool Description	Tool Number	Quantity	Remarks
	Helium Leak Detector	VSBHONFC100	1	Manufactured by GL Sciences.
	Hydrogen Leak Detector	VSBHONFC200	1	Manufactured by Cosmos.
	Torque Wrench	QL2N-MH	1	Manufactured by Tonichi. Used to close the manual valve on the hydrogen tanks.
	Torque Wrench	QD1R50NA	1	Manufactured by Snap-On. Used to open the manual valves on the hydrogen tanks.
	Socket Driver, Metric, Stubby Hex, 3 mm	BLPHSM143	1	Manufactured by Blue-Point.
	High Purity Regulator Assembly	VSBHONFCV300	2	Manufactured by Matheson.
	Fill Nozzle / Hose Assembly	VSBHONFCV400	1	Includes Hose Assembly (T/N VSBHONFCV410 and Fill Nozzle (T/N VSBHONFCV420).

	Depressurizing Port	VSBHONFCV500	1	
	Vent Hose	VSBHONFCV700	1	Includes three, 10-foot stainless steel braided hoses equipped with a quick-connect valve on each end.
	Ground Strap, 50 feet	VSBHONFCV900	1	

Tool Image	Tool Description	Tool Number	Quantity	Remarks
	Case	TE-TPC-100	1	
	Tripod	NA	1	Contact the supplier if a replacement is needed. Contact information is provided on page 3.
	Support Beams	TE-TLB-LB1	3	
	Upper Vent Pipe	TE-TP-V1	1	

	Middle Vent Pipe	TE-TP25-.75	1	In addition, order 2, Swagelock ¾" couplings (P/N SS-1210-6).
	Safety Cone	TE-5901T27	6	
	Water Weight	MIDPAPC2	3	

To order replacement items for the fuel cell service equipment kit, contact the Honda Tool Equipment Program at 888-424-6857.

To order replacement items for the portable vent stack, contact Tera Engineering Co. by phone at 562-888-0060 or by email at *info@teraengineering.com*.

FEATURES OF THE FUEL CELL SERVICE EQUIPMENT KIT

Cylinder Platform

The platform holds one cylinder of helium and a cylinder of nitrogen. In addition, two chains are provided to secure the cylinders when placed in the cart and must be used to help prevent the cylinders from tipping over.

Locking Front Casters

Locking casters are provided on the front of the cart and must be used when the cart is stored, while changing cylinders and while in use.

Depressurize Port

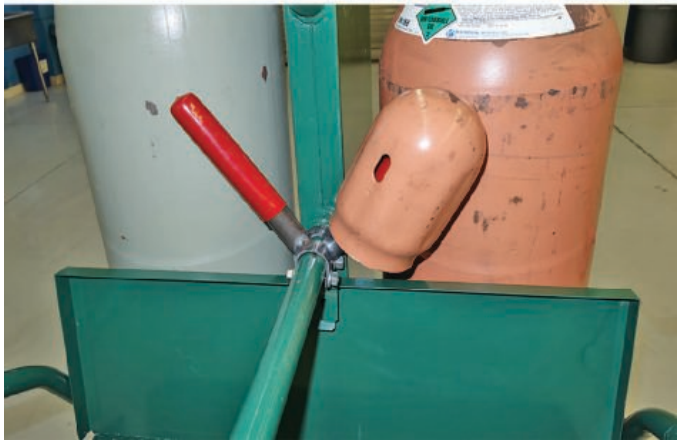
Mounted on the left side of the cart, this port is used for bleeding the air from the fill nozzle / hose assembly, depressurizing the fill hose before removing the fill hose from the regulator, and changing cylinders. Always keep the tethered cover installed when not in use.

Cylinder Cap Holders

Two holders are available right above the tool box to hold the cylinder caps, while using the cart.

NOTE

Always keep the cylinder cap installed when moving or loading the cylinder.



Tool and Attachment Storage

All of the tools and attachments should be stored in the cart's tool box and the hose compartment as shown. In addition, store all instruction manuals included with the kit inside the tool box. It is recommended that it be locked so that only certain personnel who are trained to service the Clarity Fuel Cell have access to it.

NOTE

The service information procedure of **Preparation Before Component Removal** requires the use of the Defuel Joint Assembly (T/N 07AAK-TRTA201). Although it is not part of the fuel cell service equipment kit, it should be kept in the tool box when not in use.

FEATURES OF THE PORTABLE VENT STACK

Ground Attachment Lug

This lug is used in conjunction with the ground strap, VSBHONFCV900.

Moisture Drain Valve

This valve allows any moisture built up to be released. It is spring-loaded so it will close on its own.

SPACE REQUIREMENTS AND GROUND LOCATION

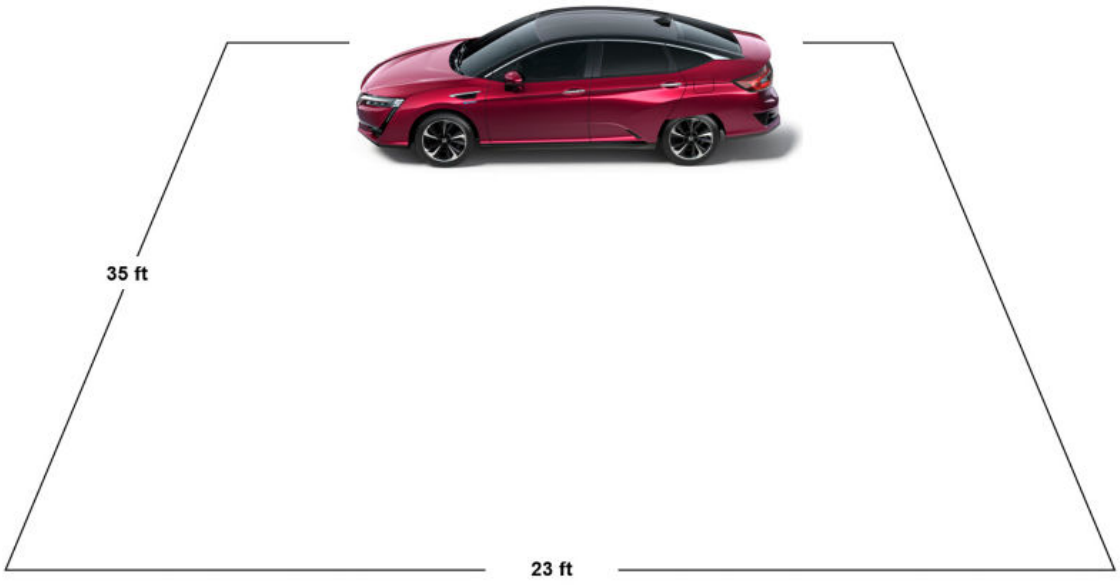
Before setting up the fuel cell service equipment kit, portable vent stack, and the vehicle, you must arrange a suitable space outside in order to safely vent the hydrogen. In addition, you need to find a suitable ground location meeting requirements of NFPA 70 and 780 and California Fire Code section 2309.6 and 2311.8. Consult your local contractor for additional information.

NOTE

According to the California Fire Code, the amount of hydrogen in the hydrogen tanks and fuel lines must be less than 0.5kg (200c.f / 5.6c.m.). before the vehicle is brought inside the shop for repairs related to the hydrogen system that do not involve welding or an open flame. In addition, no work may be done on either hydrogen fuel storage tank or associated valve. The vehicle must be outside when discharging and purging the hydrogen according to the procedures outlined in the service information and other available service information. In addition, if you are going to remove and replace one or both of the two hydrogen tanks, the hydrogen concentration must be less than 1%. The requirement to reduce the amount of hydrogen in the tanks and fuel lines to an amount less than 0.5 kg does not apply to the service or repair of non-hydrogen components such as brakes, suspension, SRS, etc. so long as the work does not involve welding or the use of an open flame. American Honda cannot guarantee that your local fire authority will approve your dealership's use of the fuel cell service equipment.

Space Requirements

- 23 feet by 35 feet
- Level ground
- Away from any possible ignition sources
- Withing 50 feet of the ground attachment



Ground Location

You need to find a suitable ground location meeting requirements of NFPA 70 and 780 and California Fire Code section 2309.6 and 2311.8. Consult your local contractor for additional information.

SETTING UP THE FUEL CELL SERVICE EQUIPMENT KIT

Preparing the Helium and Nitrogen

1. Obtain at minimum, one cylinder each of helium and nitrogen that complies with the minimum requirements below.
   - Size = 300
   - Rated at 2,400psi
   - Equipped with CGA580 connector

   The helium and nitrogen bottles can be obtained through your local gas supplier or by contacting any of the following distributors.

Distributor	Contact Information
Airgas	(866) 935-3370
Matheson	(877) 684-4427
Praxair	(800) 225-8247

NOTES

- When ordering helium and nitrogen, you must specify that the gas content has a carbon monoxide (CO) level less than 0.2 ppm to avoid damaging the fuel cell stack catalyst.

- If you are not familiar with safe practices and handling of compressed gas cylinders, contact your local gas supplier for information.
- You must confirm that your dealership has all necessary permits to use, handle and store compressed gases and is in compliance with all applicable regulations and ordinances related thereto.

2. Load one cylinder each of nitrogen and helium to the cart with the help of an assistant. Never attempt to load the cylinders without assistance. Once the cylinders are loaded, secure them with the chains equipped on the cart. Store any extra nitrogen and helium cylinders in a secure storage area.

NOTE

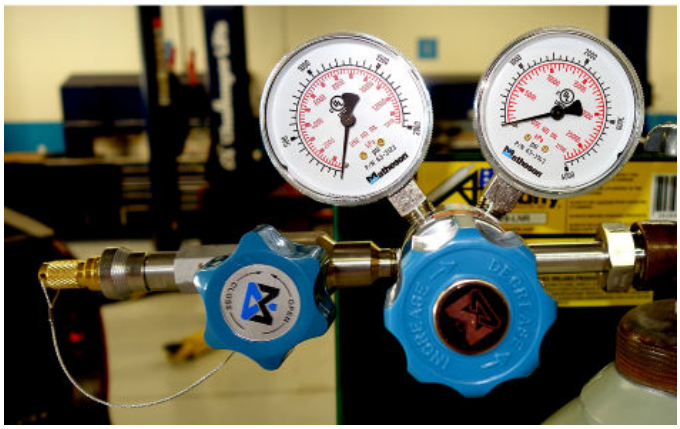
Always keep the cylinder cap installed when moving or loading the cylinder.

Attaching the High Purity Regulator Assemblies (T/N VSBHONFCV300)

Refer to the instructions provided by Matheson included in the fuel cell Service equipment kit.

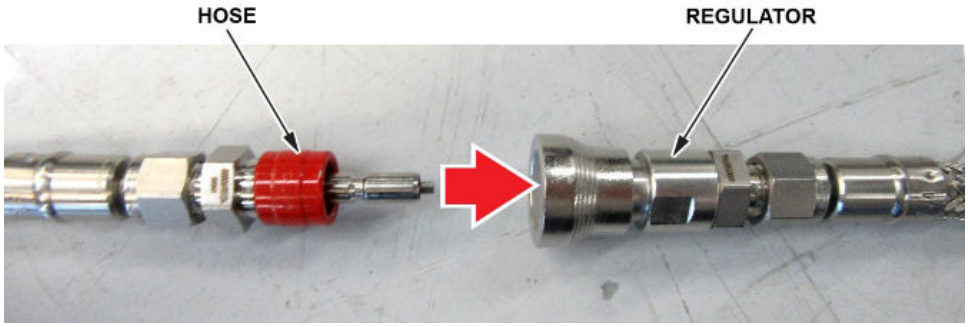
NOTES

- Before starting this procedure, make sure you also carefully review any safety and safe handling information on compressed gases provided by your gas distributor.
- When the fill hose is not connected to the regulators, always connect the tethered quick-connect protector onto the regulator to keep out dust and debris.



Attaching the Fill Nozzle / Hose Assembly (T/N VSBHONFCV400)

Remove the quick-connect protector from both the hose and regulator, and connect them together by pushing the male end of the hose into the regulator until you hear a click. Lightly tug on the hose end to make sure it is securely connected.



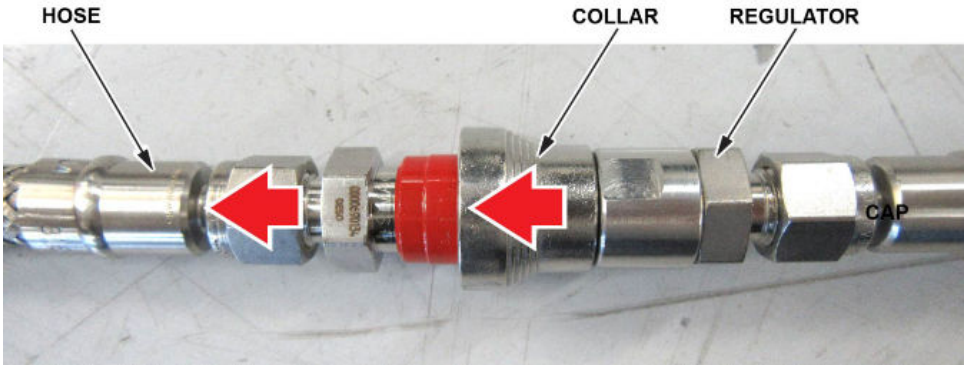
Attaching the Vent Hose (T/N VSBHONFCV700) and Defuel Joint Assembly (T/N 07AAK-TRTA201)

1. Connect the two out of the three vent hoses together by pushing the male end into the female end until you hear a click. Lightly tug on both ends of the vent hose to make sure they are secure.

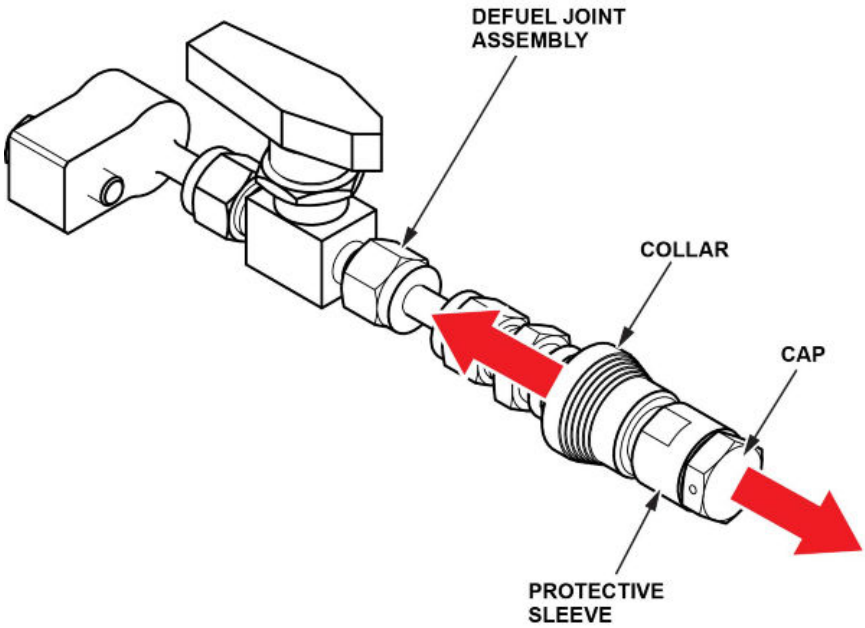
   NOTES

   - The third vent hose is left as a spare and can be used if additional length is needed.
   - The defuel joint assembly is a required special tool for the Honda Fuel Cell but it is not part of the fuel cell service equipment kit. However, it is recommended that the tool is stored in the fuel cell service equipment kit's tool box when not in use.

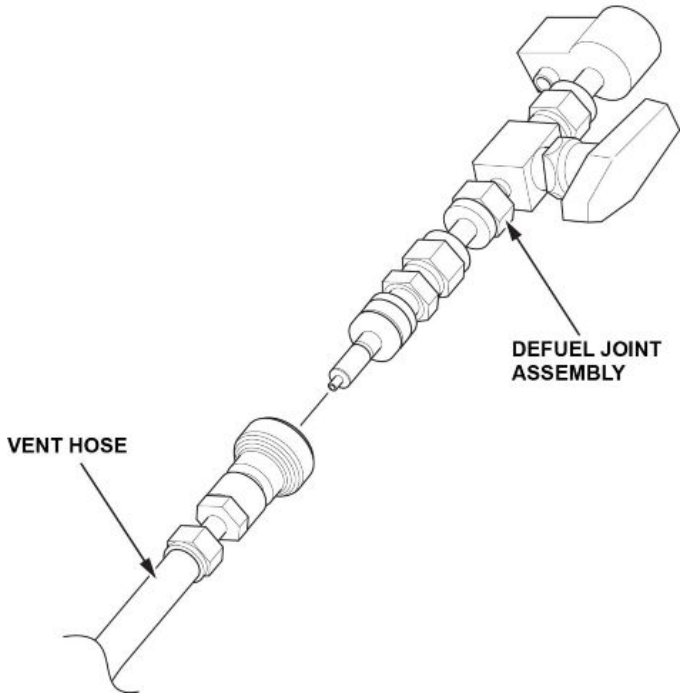
   To detach the hose ends, simply slide the collar up on the female end while pulling the male end out.



2. Remove the protective sleeve from the defuel joint assembly by sliding the collar up and pulling out the cap.



3. Attach the vent hose to the defuel joint assembly by pushing the vent hose into the defuel joint assembly until you hear a click.



4. Apply a piece of tape on the opened end of the defuel joint assembly to keep dust and debris out until you are ready to attach the defuel joint to the vehicle. Keep the defuel hose and the defuel joint assembly in a secure place until you are ready to use it.

SETTING UP THE PORTABLE VENT STACK

1. Remove the tripod from the case and set it upright.
2. Lift up the three locking tabs to unlock it, and raise the tripod while sliding the three stand legs all the way out to their full extension.

3. Make sure that all three legs are at their full extension, and push down on the three locking tabs to lock it.

4. Swing out all three legs of the tripod so it can sit upright. Take care not to bend the lower vent pipe or damage the moisture drain valve.

5. Install a support beam by placing the support beam pin into the hole of the leg base at each end as shown below. Repeat this for the remaining two support beams.

6. Remove the protective caps, connect the upper and middle vent pipes together, then snug the lock nuts with a wrench.

NOTES

- Do not over tighten the lock nuts as the vent pipes will be damaged.
- Keep the removed protective caps in a secure area so you do not lose them.
- Keep the protective cap on the upper and middle vent pipe threads when not in use.

7. Remove the protective cap from the lower vent pipe, connect the upper / middle vent pipe to the lower vent pipe, then tighten the lock nuts to a quarter turn.

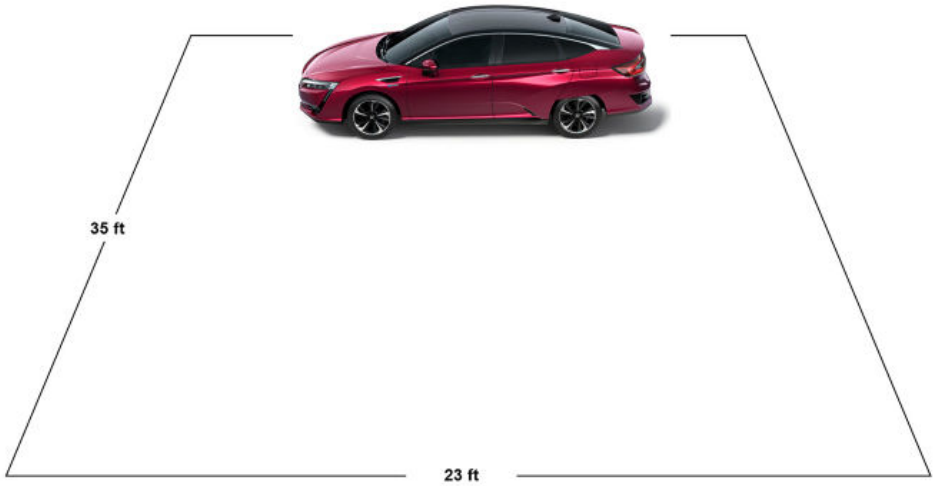
NOTES

- Do not over tighten the lock nuts as the vent pipes will be damaged.
- Keep the protective cap on the lower vent pipe threads when not in use.

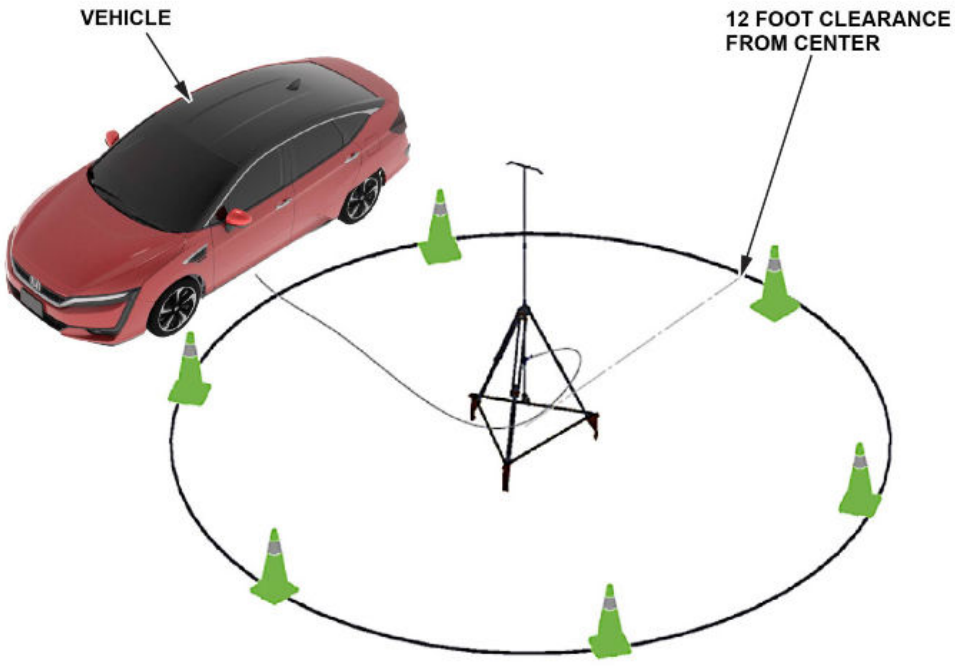
8. Fill the three water weights with water, and place them at each base of the tripod as shown.

SETTING UP THE VEHICLE AND VENT AREA

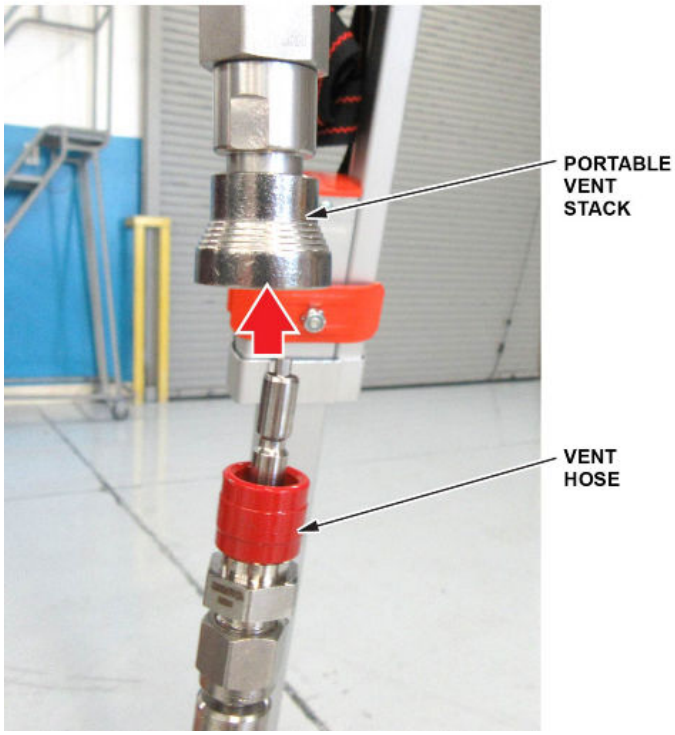
1. Once you have determined the location to vent the vehicle under instructions listed in SPACE REQUIREMENTS AND GROUND LOCATION, park the vehicle towards the outside of the allotted space.



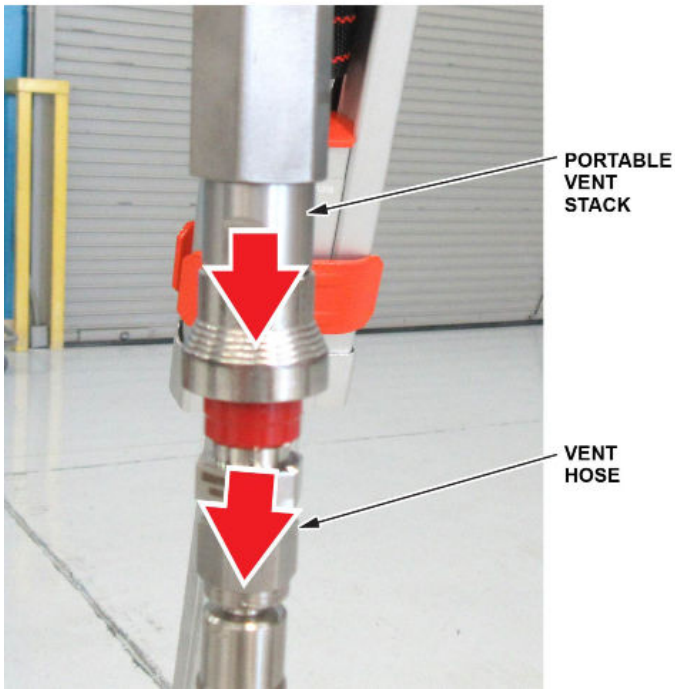
2. Place the portable vent stack roughly 13 feet from the left side of the vehicle.



3. Using the safety cones (T/N TE-5901T27), set up a safety perimeter with a 12-foot radius from the portable vent stack.
4. Place the fuel cell service equipment kit behind the vehicle, and lock the two front casters.
5. Attach the 50-foot ground strap to the ground lug located on the lower pipe of the vent stack and the other end to your facility's ground connection. Refer to instructions, SPACE REQUIREMENTS AND GROUND LOCATION for the grounding requirements for your facility.
6. Connect the vent hose set to the portable vent stack by pushing in the male end of the vent hose to the receptacle of the portable vent stack until you hear a click.



To remove the vent hose, pull down the collar on the lower vent pipe while pulling down on the vent hose.



7. The setup is now complete. Inform all surrounding personnel that you are going to be venting hydrogen and that they should keep out of the vent area unless it is necessary.

USING THE FUEL CELL SERVICE EQUIPMENT KIT AND THE PORTABLE VENT STACK

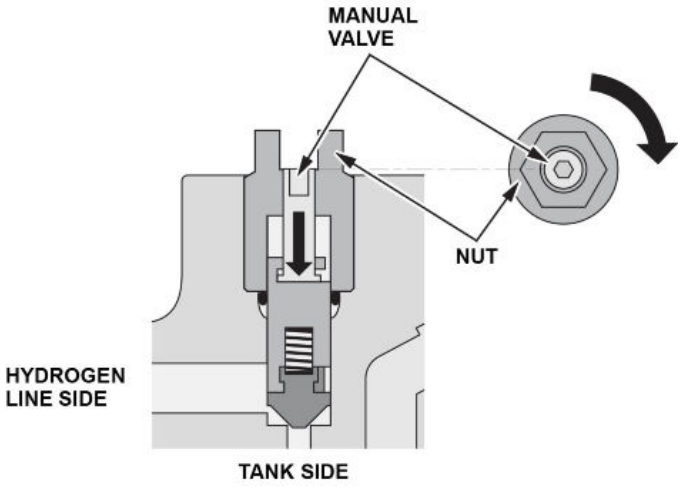
⚠ WARNING

- Compressed hydrogen gas is flammable and highly explosive. You could be killed or seriously injured if leaking hydrogen gas is ignited.
- Keep heat, sparks, and flames away. In additions, keep electronic devices that can emit static discharge away.
- Hydrogen burns very quickly and radiates less heat than gasoline or other fuels; its flames are invisible.
- Always, have a fire extinguisher (dry powder type or carbon dioxide gas type) at the work location at all times.

Use these instructions to supplement the procedures listed under Preparation Before Component Removal and Hydrogen Leak Check in the service information.

Closing the Manual Valves on the Hydrogen Tanks

Where instructed, use the torque wrench (T/N QL2N-MH) with the 3mm stubby hex socket driver (T/N BLPHSM143) to close the manual valves on the sub and main hydrogen tanks. Refer to the service information for details and torque specifications.

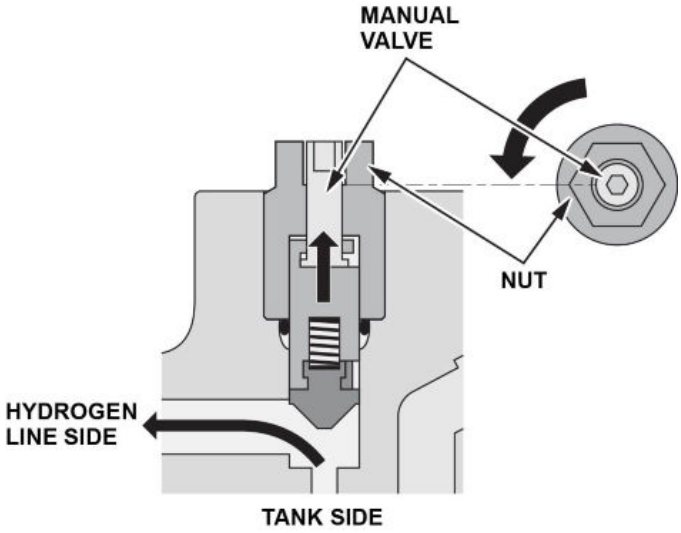


NOTES

- Pay close attention to the click on the torque wrench. Tightening the manual valve over the specified value will damage the valve, requiring a tank replacement.
- Make sure to turn the manual valve and not the nut.

Opening the Manual Valves on the Hydrogen Tanks

Where instructed, use the torque wrench (T/N QD1R50NA) with the 3mm stubby hex socket driver (T/N BLPHSM143) to open the manual valves on the sub and main hydrogen tanks. Refer to the service information for details and torque specifications.



NOTE

Make sure to turn the manual valve and not the nut.

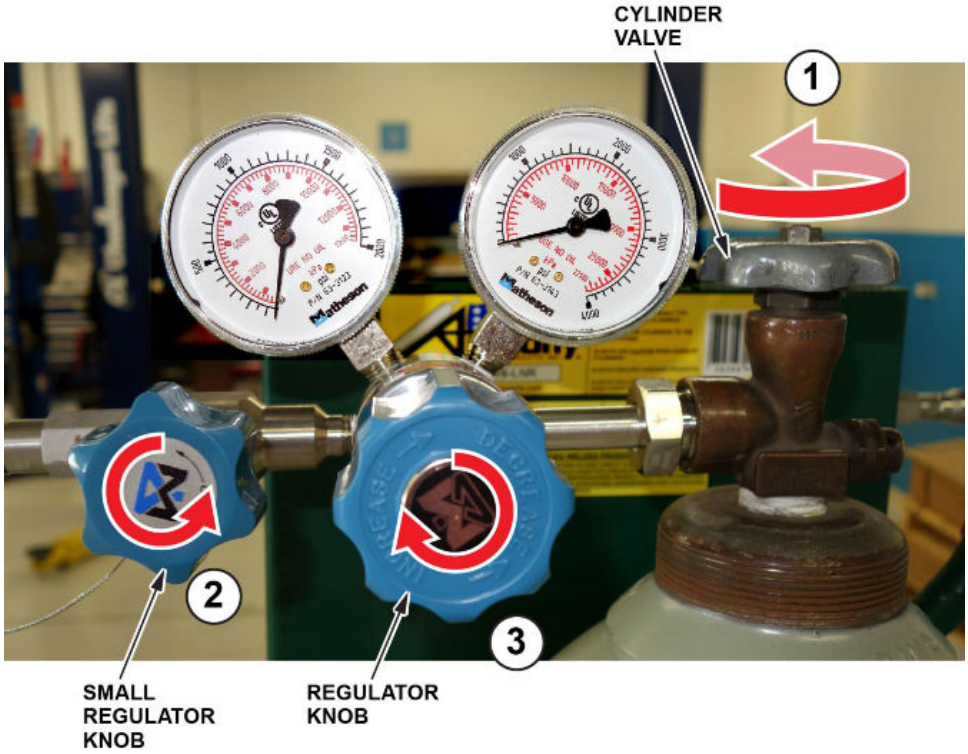
Filling the Vehicle with Helium or Nitrogen

NOTE

Steps 1-5 is only required when you initially connect the fill nozzle / hose assembly to the regulator to purge any air trapped between the nitrogen or helium cylinder to the fill nozzle.

1. Connect the fill nozzle to the depressurizing port on the cart, and turn the fuel nozzle valve to the ON position.
2. Open the cylinder valve by turning it counterclockwise.
3. Set the regulator pressure to 500 psi by the turning the regulator pressure adjustment knob clockwise.
4. Open the regulator flow control knob by turning it counterclockwise, allow the gas to flow for about 3 seconds, then close it.

Reference	Component
1	Cylinder Valve
2	Regulator Flow Control Knob
3	Regulator Pressure Adjustment Knob



5. Turn the valve on the fill nozzle to the OFF position, and disconnect it from the depressurizing port.

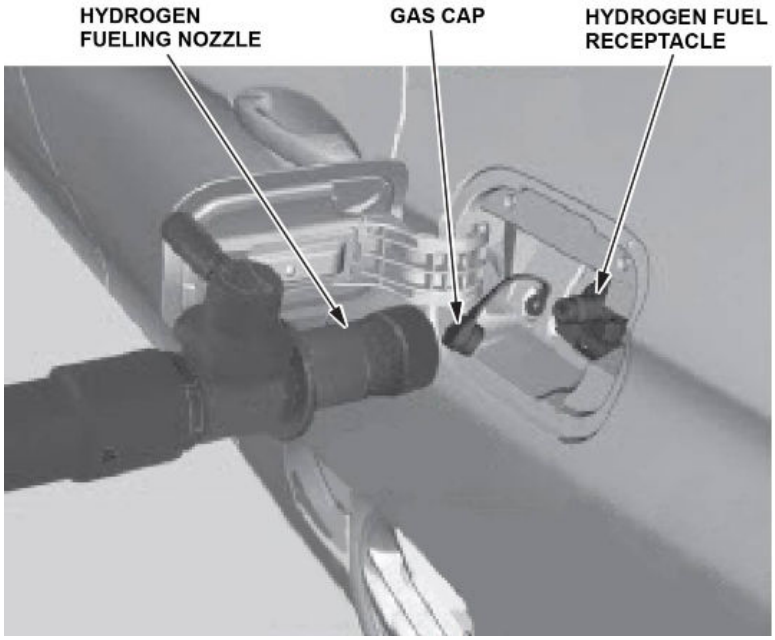
NOTE

Steps 1-5 are only required when you initially connect the fill nozzle / hose assembly to the regulator.

6. Remove the dust cap, insert the fill nozzle into the hydrogen fuel receptacle of the vehicle, and turn the fill nozzle valve to the ON position.

NOTES

- Make sure that the regulator is closed by turning the regulator flow control knob clockwise before connecting the H2 nozzle to the hydrogen fuel receptacle.
- Make sure the sure the nozzle is securely attached to the receptacle. Failure to do so can cause a small leak, causing the specified i-HDS function to stop.



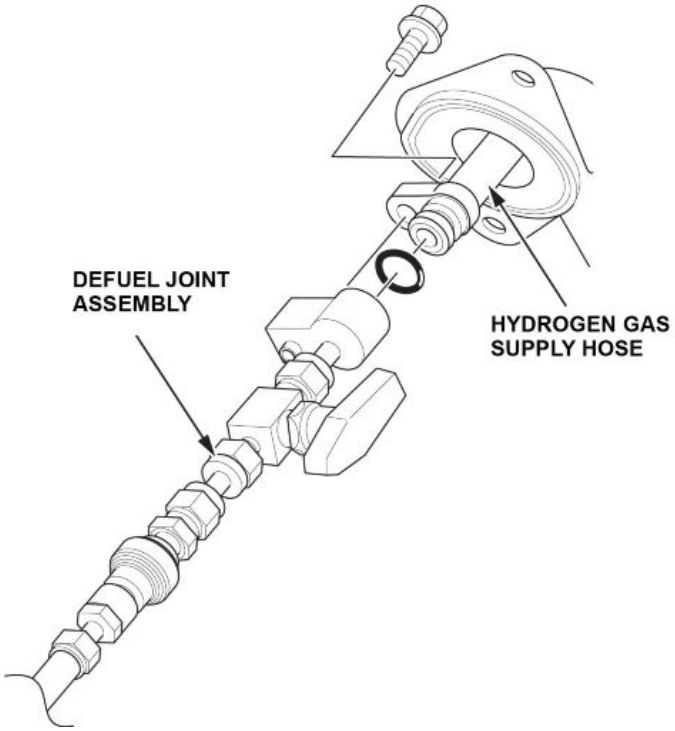
7. Open the small regulator knob by turning it counterclockwise. Referring to the service information procedure for the required pressure, slowly open the regulator as necessary to the specified pressure.

Venting the Helium, Nitrogen or Hydrogen

1. When instructed in the service information procedure, attach the defueling joint assembly, 07AAK-TRTA201, to the hydrogen gas supply hose.

NOTES

- Before starting the venting procedure, make sure that there are no unauthorized personnel around area of the vent stack.
- Use fender covers as necessary to keep the defueling joint assembly from damaging the painted surfaces of the vehicle.
- Keep the vent hose away from moving traffic.
- Always use a new O-ring when connecting the defuel joint assembly to the hydrogen gas supply hose.



After Completing the Procedure, Preparation Before Component Removal

Depressurizing the Fill Hose

1. Make sure the regulator is closed by turning the regulator flow control knob clockwise.
2. Remove the fill nozzle from the vehicle, attach it to the depressurizing port, and slowly turn the fill nozzle valve to the ON positon. The helium or nitrogen will depressurize any remaining helium or nitrogen from the fill hose.

NOTE

This step should also be done when switching the H2 nozzle from a helium to nitrogen fill and vice versa.

Removing any Moisture from the Portable Vent Stack

Prior to disassembling the portable vent stack, drain any moisture that is built up in the vent pipe by turning the moisture drain valve down. The valve is spring-loaded so it will close on its own.

Using the Helium and Hydrogen Leak Detectors

To use and maintain the helium and hydrogen leak detectors, refer to the instructions provided in the fuel cell service equipment kit.

END