



Technical Service Bulletin

GROUP

RECALL

NUMBER

23-01-038H

DATE

April 2023

MODEL(S)

NEXO (FE)

SUBJECT: HYDROGEN RECEPTACLE INSPECTION AND REPLACEMENT
(RECALL 224)

This TSB supersedes 22-01-072H to increase Hydrogen fuel sublet from \$100 to \$150.

★ IMPORTANT

Vehicle repairs related to safety recalls are critically important and must be performed properly in accordance with TSB procedures. Review this bulletin in its entirety prior to beginning any repair work.

As required by federal law, dealer must not deliver new vehicles for sale or for lease to customers until all open recalls have been performed. Dealers must also perform all open recalls on used vehicles, demo, and rental vehicles prior to placing them into customer use and whenever an affected vehicle is in the shop for any maintenance or repair.

Access the "Vehicle Information" screen (VIS) via WEBDCS to identify open recalls.

Description: Certain 2019MY NEXO (FE) vehicles may exhibit hydrogen gas leakage in the fuel injection line receptacle caused by parts out of specification. This bulletin outlines the procedures to inspect and replace the receptacle and fuel-line related parts if receptacle measurement is outside of specifications.

STUI



This TSB includes STUI pictures as a requirement. Where indicated, please include a copy of the RO or last 6 digits of the VIN and date of repair on a piece of paper. Ensure the VIN and date of repair are clearly visible. Finally, please ensure all captured pictures are completed according to the steps in this TSB and uploaded to STUI. All claims submitted that have illegible, incomplete, missing, or incorrect picture(s) are subject to debit.

Applicable Vehicles: Certain 2019MY NEXO (FE) vehicles.

NOTICE




The TSB repair procedure **MUST** be performed at an authorized Hyundai NEXO fuel cell vehicle dealer and by an Hyundai Expert (or above level) technician who has successfully completed the Fuel Cell Electric Vehicle Training Instructor Led Training course (SVCHFCEVTRAIN222_1097).

Refer to OSHA standard 1910.137 - Electrical Protective Equipment for PPE inspection and testing requirements and the NEXO shop manual for PPE usage.

SUBJECT:

HYDROGEN RECEPTACLE INSPECTION AND REPLACEMENT (RECALL 224)



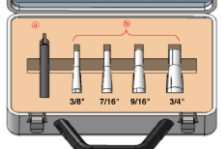
If the receptacle inspection is out of specification, then replace the charge receptacle assembly and the 9 related parts listed below (10 total parts).

PART NAME	FIGURE	PART NUMBER	REMARKS
Charge Receptacle Assembly		35950-M5000QQH	1 each
Check Valve Manifold		35909- M5000QQH	1 each
High Pressure Fuel Lines		35916-M5000QQH	Regulator (1 each)
		35961-M5000QQH	Front Tank (1 each)
		35962-M5000QQH	Center Tank (1 each)
		35963-M5000QQH	Rear Tank (1 each)
High Pressure Regulator Assembly		35982-M5001QQH	(1 each)
O-Ring: High Pressure Sensor 15.8mm Outside Diameter		359C3-M5000	Available via regular parts order (1 each / 3 in total)
O-Ring: High Pressure Sensor 8.1mm Outside Diameter		359B1-M5000	
O-Ring: Middle Pressure Sensor 12.5mm Outside Diameter		359C1-M5000	
O-Ring Lubricant	No Image	Molykote HP-300 100-gram container	Directly supplied. Quantity sufficient for 1,000 vehicles

Special Service Tools (SST) Information

SUBJECT:

HYDROGEN RECEPTACLE INSPECTION AND REPLACEMENT (RECALL 224)

TOOL NAME	FIGURE	TOOL NUMBER	REMARKS
Hydrogen Receptacle Depth Gauge Kit		Depth Gauge (Z0033) Adapter Kit (TE-HMA-FRA)	SST directly supplied Contact hyundaitools@hma-usa.com for additional kits
Hydrogen supply tube release tool		09356-4W110	Contained in previously Supplied Nexo dealer SST kit Contact hyundaitools@hma-usa.com for additional kits.
O-ring Installation Tool		09356-4W270	

Warranty Information:

MODEL	OP CODE	OPERATION	OP TIME	CAUSAL PART	NATURE CODE	CAUSE CODE
NEXO (FE)	21D051R2	Receptacle Inspection Only	0.3 M/H	35950-M5000Q QH	B21	ZZ1
	21D051R3	Receptacle Inspection & Parts Replacement: Fuel Level < 11%	2.4 M/H			
	21D051R4	Receptacle Inspection & Parts Replacement: Fuel Level ≥ 11%	3.2 M/H			

NOTE 1: Op codes 21D051R3 and 21D051R4 require defueling and refueling of the vehicle. Both include the following:

- Labor time for the defueling process as outlined in a separate TSB 22-FL-005H (or latest)
- \$200 sublet (\$50 to transport the vehicle to the fueling station + \$150 for fuel to refuel)

Please **DO NOT** submit a separate claim with duplicate labor or sublet for the items outlined above.

NOTE 2: Submit claim on Campaign Claim Entry Screen.

NOTE 3: If a part that is not covered by this recall needs replacement while performing this recall, and the affected part is still under warranty, submit a separate claim using the same repair order. If the part is out of warranty, submit a prior approval request for goodwill consideration prior to the work.

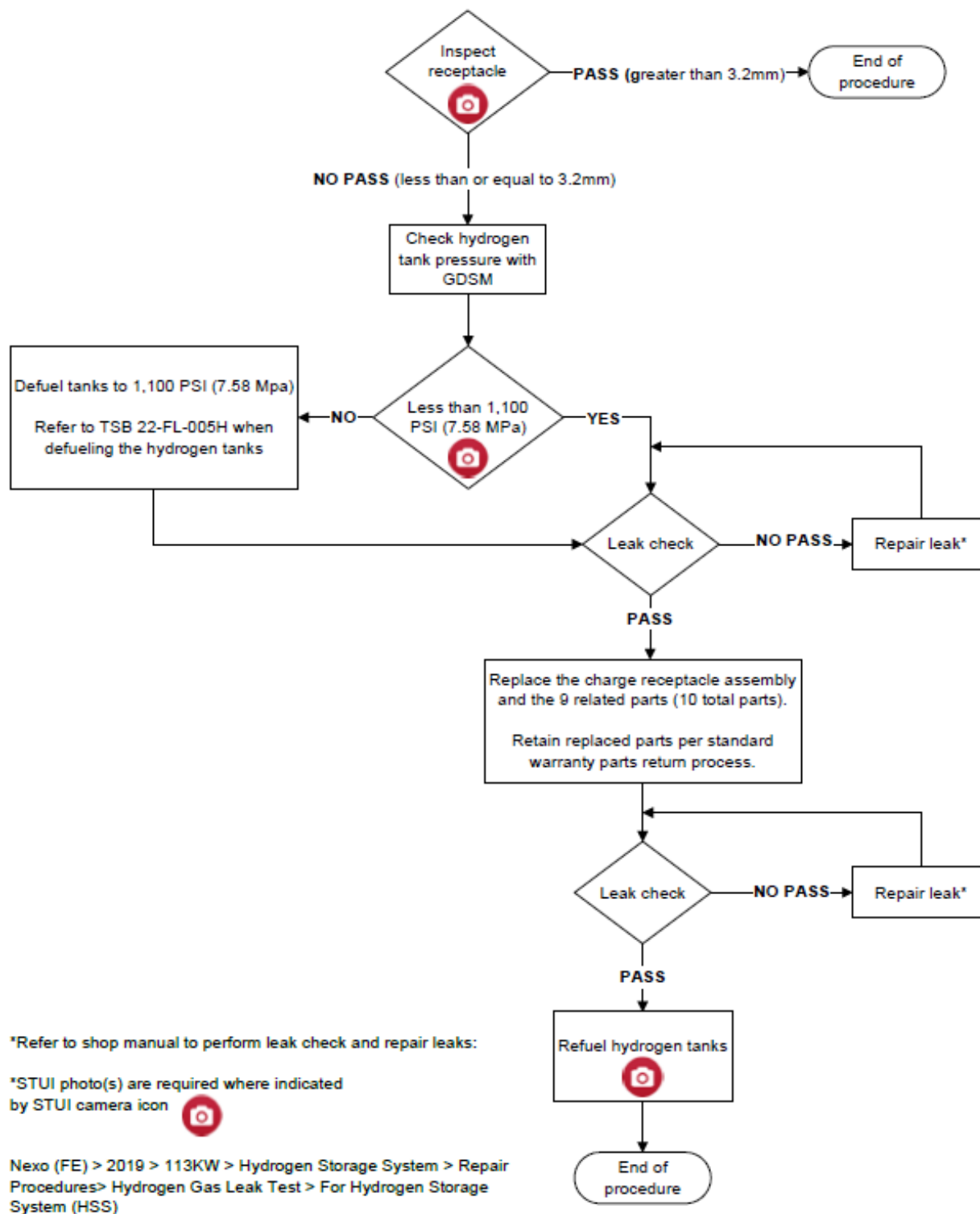
NOTE 4: The incident parts are subject to callback through the normal Warranty Technical Center (WTC) parts return process. **Claim is subject to debit if the part is requested and not returned.**

NOTE 5: Claim must include a STUI picture of the inspection procedure's measurement that is clearly visible along with a piece of paper displaying the last 6 digits of the VIN and date of the measurement. If replacement of parts is required, please also include STUI picture as instructed prior to defueling and after refueling the vehicle.

NOTICE

Be sure to check vehicle for outstanding campaigns requiring defueling and perform all repairs together.

Hydrogen Receptacle Inspection and Replacement Flow Chart



Service Procedure:

Refer to the QR code or link below for guided video information:

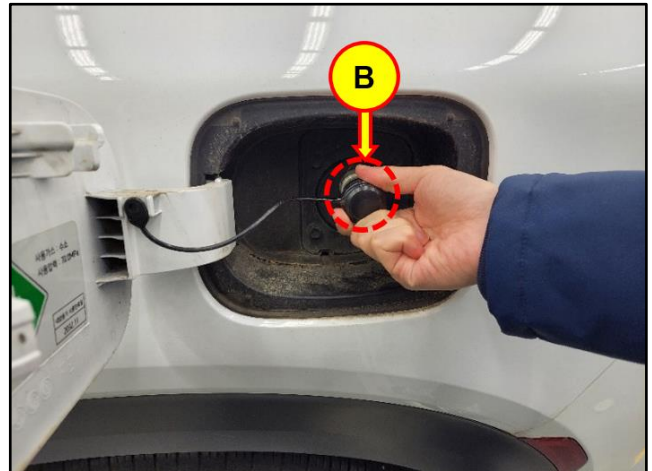
<https://vimeo.com/747838771/375a8140ea>

**Inspection Procedure:**

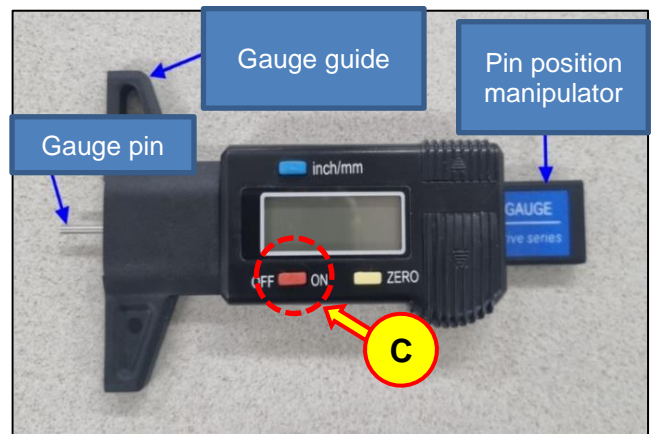
1. Turn off the vehicle.
2. Release the fuel door (A).



3. Remove the receptacle cap (B).



4. Press the hydrogen receptacle depth gauge power switch (C) to turn it **ON**.



5. Insert the depth gauge into the measurement adapter and place the adapter against the surface of the GDS glass.

Push the pin position manipulator in until the gauge pin touches the surface of the GDS glass and then press the **ZERO** button.

Remove the adapter from the digital depth gauge.



6. Insert the measurement adapter into the fill receptacle until it stops.



7. Insert the digital depth gauge pin into the adapter.

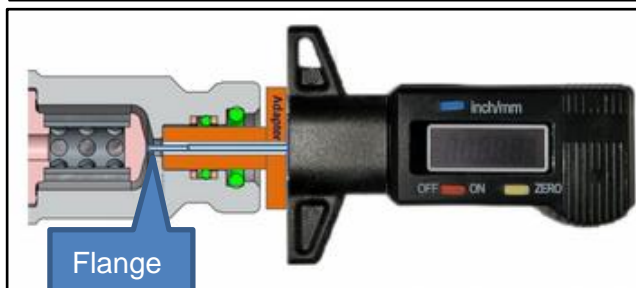
With firm pressure, hold the adapter and depth gauge against the flange inside the receptacle.

Push in the pin position manipulator and record the measurement on the digital display.



NOTICE

If the gauge and adapter are not firmly held against the inner flange in the receptacle, then a measurement error will occur.



8. Photograph the measurement and a paper showing the last **6 digits** of the VIN or RO #, and the date of measurement.

STUI

Using STUI, photograph the measurement on the gauge digital display. Include in the photos a piece of paper containing the last 6 digits of the VIN or the RO #, and the date of measurement. Ensure the digital display and note are captured and in focus. Upload the photo to STUI.

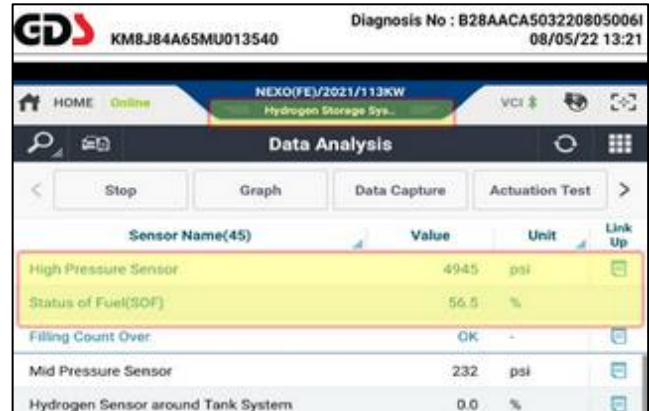


9. If the measurement is **greater than 3.2mm**, the inspection procedure is complete. **NO OTHER WORK IS REQUIRED.** Submit OP Code 21D051R2.

If the measurement is **less than or equal to 3.2mm**, then replace the parts identified on page 2 using the following procedures.

Determine Hydrogen Storage Tank Pressure Using GDS-M

1. Connect the GDS-M, select the **HMU**, and then confirm the storage tank pressure.



2. Place the vehicle in **READY** mode using the **START / STOP** push button. Photograph the fuel gauge level and a paper showing the last **6 digits** of the VIN or RO #, and the date of defueling.

STUI



Using STUI, photograph the fuel gauge. Include in the photos a piece of paper containing the last 6 digits of the VIN or the RO #, and the date of the defueling. Ensure the fuel gauge display, odometer, and note are captured and in focus. Upload the photo to STUI.



Vehicle is in **READY** mode when Indicator is illuminated.

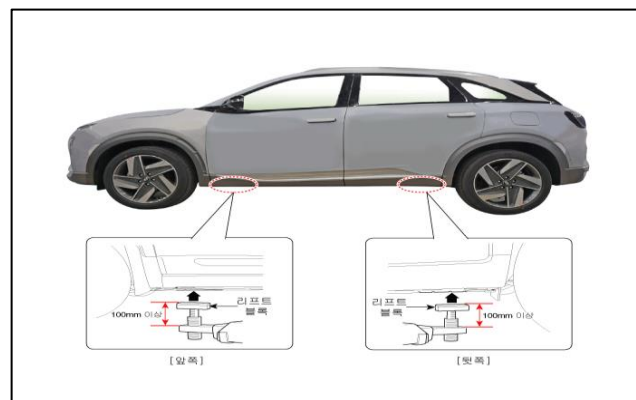
3. If storage tank pressure is **less than 1,100 PSI**, then go to **Depleting Residual Fuel Supply Using GDS-M** below.
4. If storage tank pressure is **greater than 1,100 PSI**, then refer to **TSB 22-FL-005H—VENTING NEXO FUEL CELL ELECTRIC VEHICLES (FCEV)** or the latest version.

Defuel (vent) the hydrogen storage tanks to a final pressure of **1,100 PSI** before continuing with the service procedures on the following pages.

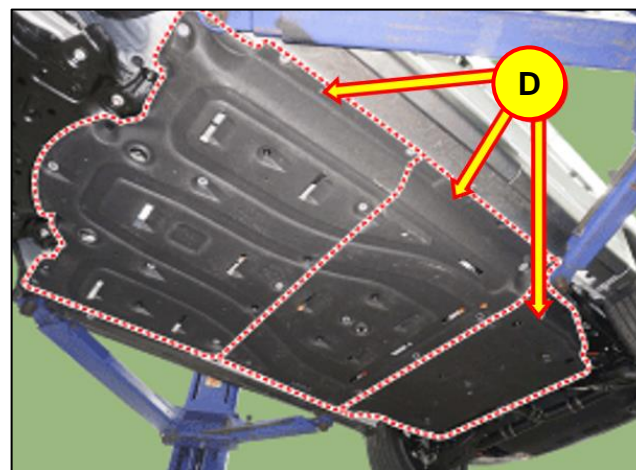
Depleting Residual Fuel Supply Pressure Using GDS-M:

1. Storage tank pressure must **be at or below 1,100 PSI**.

Raise the vehicle on a lift.



2. Remove the mounting bolts and floor undercover (D).



- Close the manual valves on all **3** hydrogen tanks using a **6 mm** Allen wrench turning the valve clockwise. **DO NOT** tighten past the torque specification.

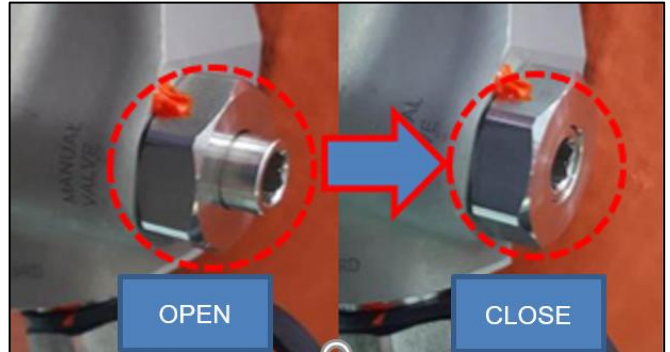
Tightening Torque:

3.6 – 7.2 lb-ft (4.9 – 9.8 Nm)

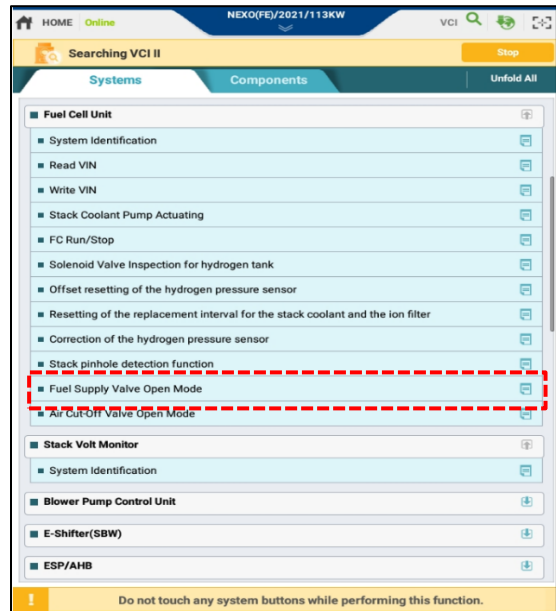
NOTICE

Some components of the manual valve may be damaged if over-torqued.

Manual valves must be closed before performing release of residual hydrogen in the fuel supply piping.



- Turn off the ignition switch.
- Connect the GDS to Data Link Connector (DLC).
- Turn on the ignition switch.
- Select "Vehicle, Model Year, Engine, System".
- Select " Vehicle S/W Management".
- Select "Fuel Supply Valve Open Mode".
- Perform the operation as directed by GDS-M.



- Proceed to Preparation for Replacement of Hydrogen Components on page 12.

NOTICE

If the "Fuel Supply Valve Open Mode Using GDS-M" procedure cannot be performed, then refer to the "Manually Depleting Residual Fuel Supply Pressure" below, to release the residual pressure in the fuel supply line.

Manually Depleting Residual Fuel Supply Pressure:

1. Manually depleting residual hydrogen from the fuel supply line must be performed at an approved outdoor venting location.
2. Refer to **TSB 22-FL-005H—VENTING NEXO FUEL CELL ELECTRIC VEHICLES (FCEV)** or the latest version and follow procedures to manually deplete the residual fuel supply pressure.
3. Proceed to Preparation for Replacement of Hydrogen Components below.

Preparation for Replacement of Hydrogen Components

1. In the rear cargo area, remove the floorboard and cargo tray to access the 12 volt battery connector and high voltage battery Safety Plug.



2. Disconnect the 12 volt battery negative (-) connector.



!WARNING

Refer to the shop manual - Battery Control System > High Voltage Battery Handling Guide and follow the High Voltage Shut-off Procedure. Before performing the service procedure, ensure proper Personal Protection Equipment (PPE) is worn to prevent injury. Verify PPE is not expired and in proper working condition.

- Remove the metal shield to access the High Voltage Safety Plug.

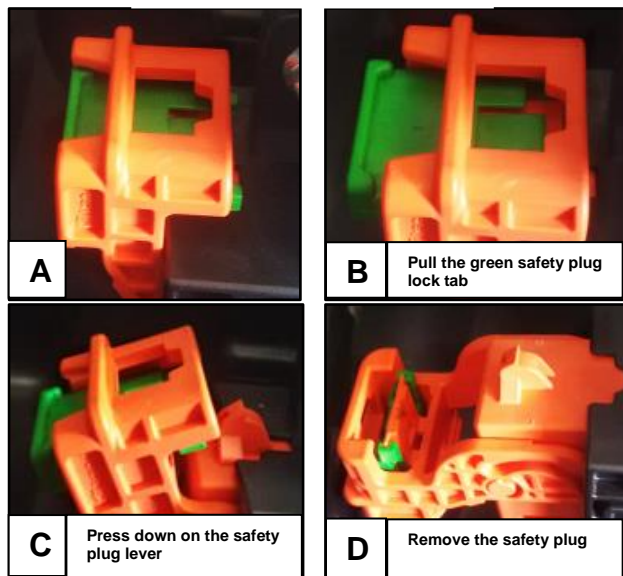


- Follow A-D below to remove the orange high voltage safety plug. Store the removed safety plug in a secure location outside and away from the vehicle.

Safety Plug Removal



Safety Plug Removal

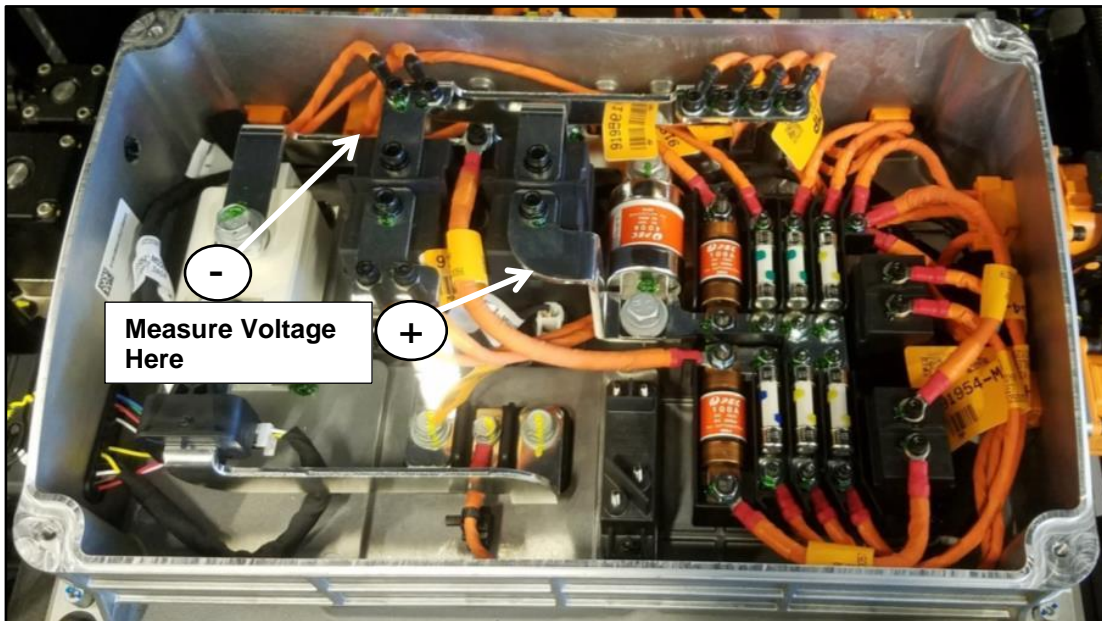


5. Wait 5+ minutes to allow the high voltage system capacitor to discharge.
6. Open the hood. Remove the junction box trim and cover.



High voltage junction box cover: Assembly bolt torque. 9.8 - 11.8 N.m (1.0 - 1.2 kgf.m, 7.2 - 8.7 lb-ft)

7. Using a Digital Volt Ohm Meter (DVOM), measure the voltage across the inverter positive and negative bus bar terminals to inspect for capacitor discharge. If the measured voltage is below 30V, the High Voltage Circuit is properly shut down.



⚠ DANGER

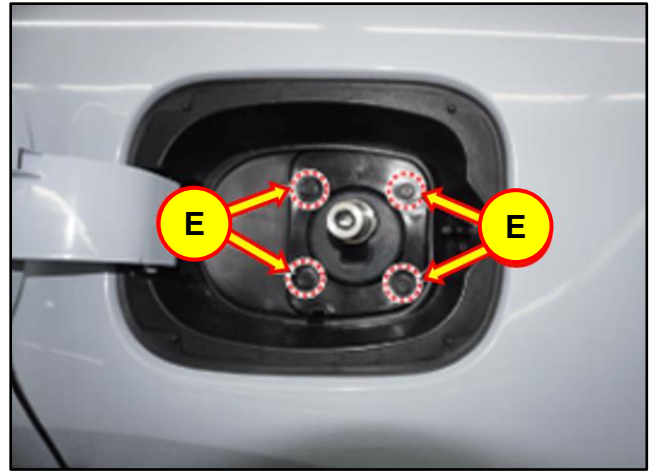
The High Voltage Junction Box (HVJB) may be electrically energized up to 450 volts.

Component Replacement Procedure

1. Open the fuel charging door and remove the inlet receptacle assembly mounting bolts (E).

Tightening Torque:

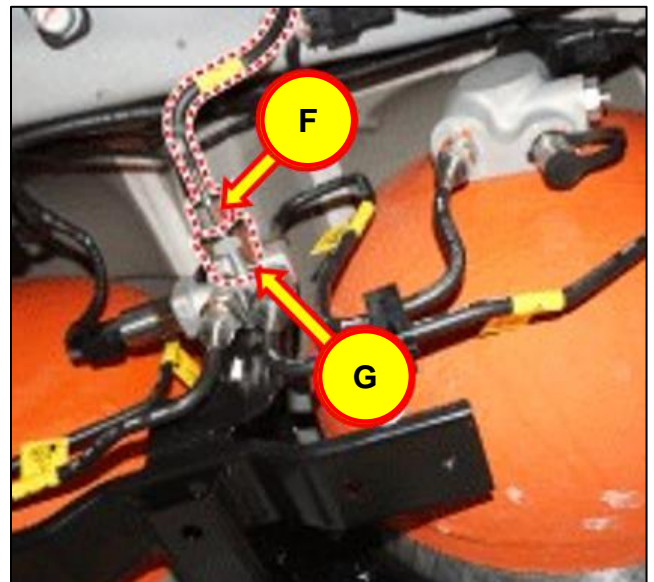
5.4 – 7.3 lb-ft (7.4 – 9.9 Nm)



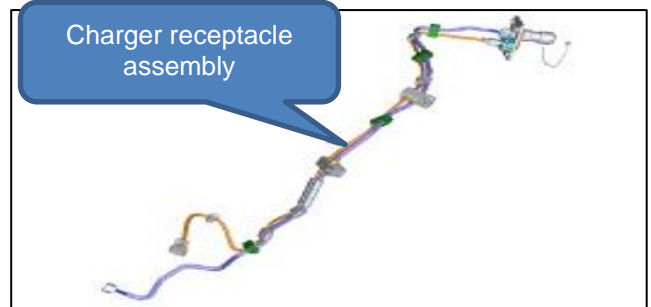
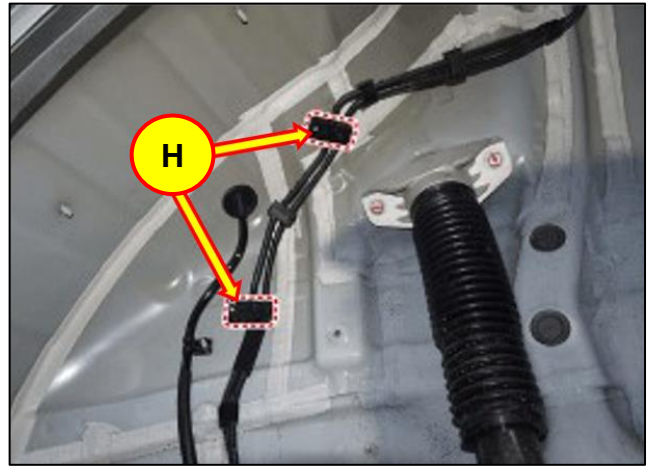
2. Remove the wheel liner to access the receptacle assembly.



3. Use a wrench to keep the check valve (F) in place and loosen the fuel filler tube flange nut (G).



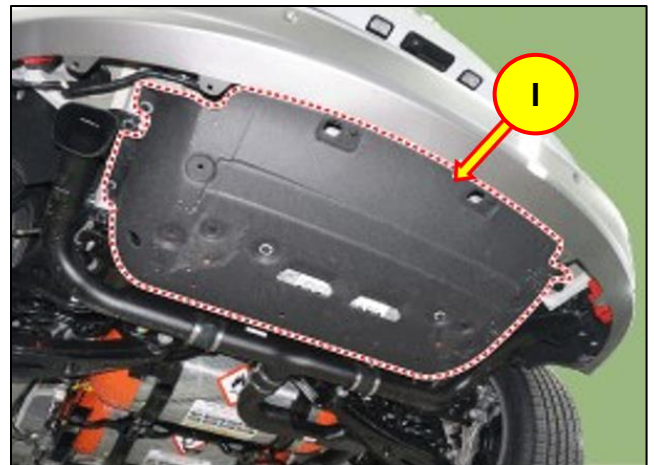
4. Separate the receptacle brackets (H) from their mounting studs, unplug connector, and then remove the charger receptacle assembly from the vehicle.



5. Remove the rear vehicle undercover (I).

Tightening Torque:

5.1 – 8.0 lb-ft (6.8 – 10.8 Nm)

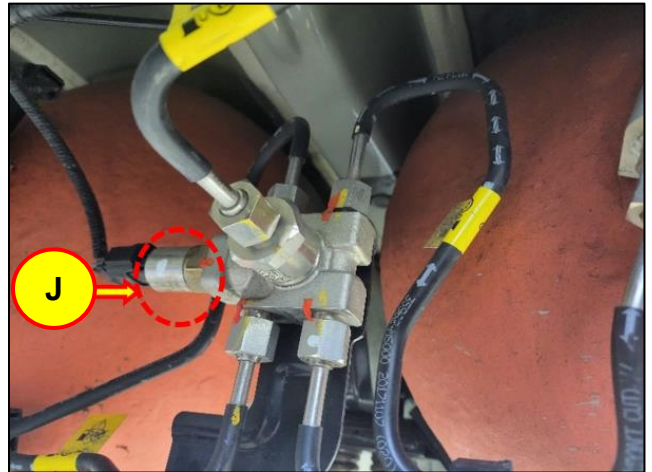


- Remove the high-pressure sensor connector and the high-pressure sensor (J) connected to the manifold.

Tightening Torque High Pressure Sensor:
28.9 - 40.5 lb-ft (39.2 - 54.9 Nm)

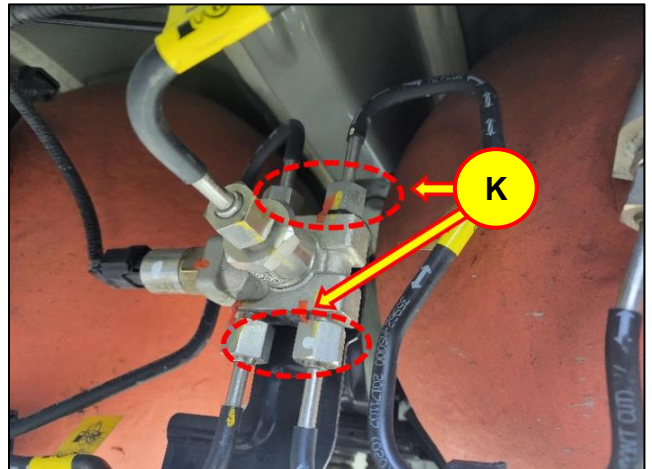
NOTICE

High-pressure sensor O-rings must be replaced before reinstalling the high-pressure sensor. Refer to step 15 on page 21.



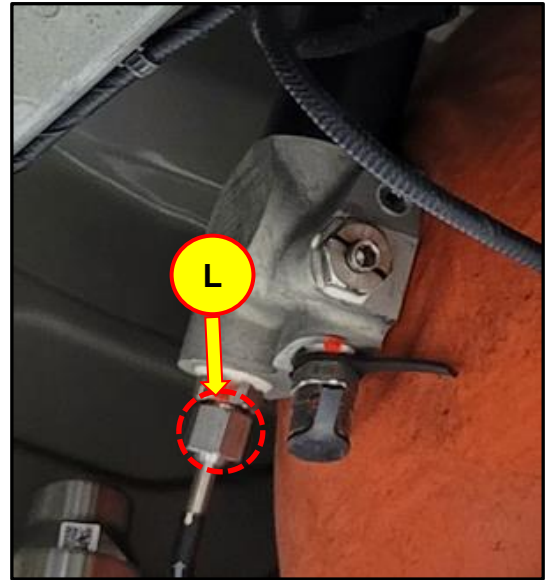
- Loosen the flange nuts on the 4 fuel tubes (K) connected to the check valve manifold and remove the manifold.

Tightening Torque (Manifold Side):
20.3 – 24.6 lb-ft (27.5 – 33.4 Nm)

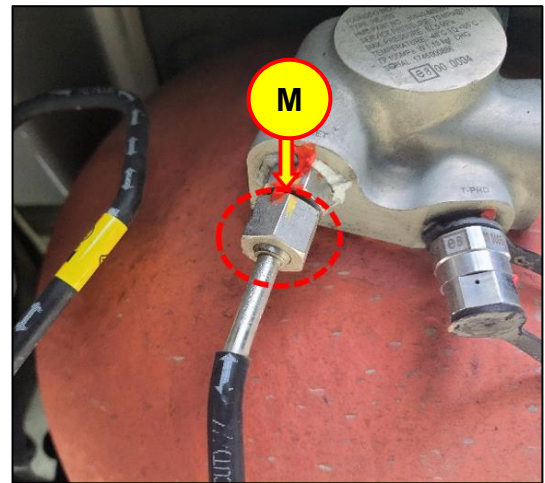


8. Remove the 3 fuel tubes (L, M, and N) connected to each hydrogen tank solenoid valve.

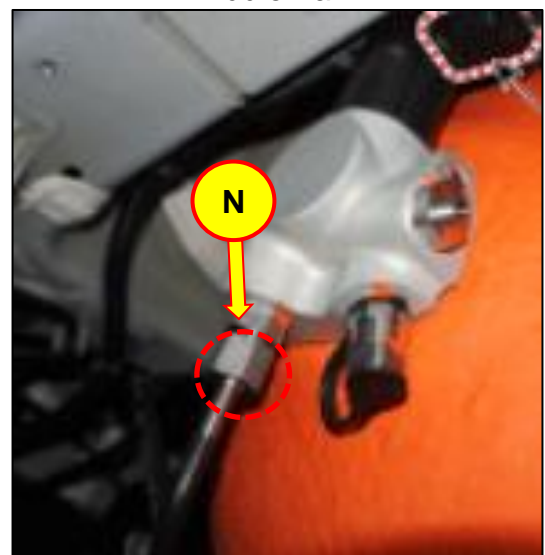
Tightening Torque (Hydrogen Tank Side):
23.9 – 28.2 lb-ft (32.4 – 38.3 Nm)



Front Tank



Middle Tank



Rear Tank

9. Carefully remove the rear tank tube by maneuvering the tube above the rear suspension frame and toward the front of the vehicle.



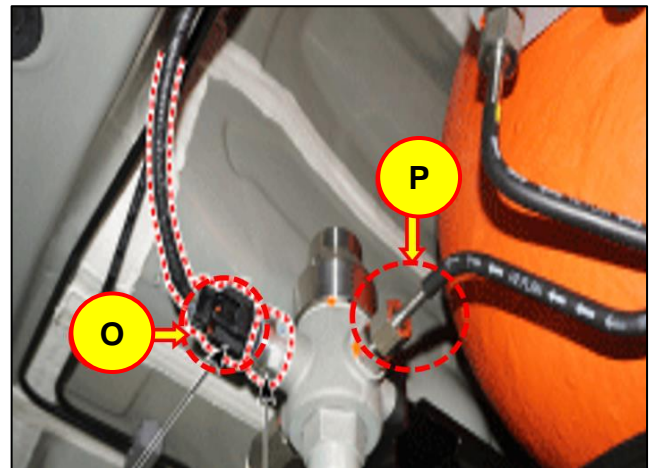
10. Remove the middle pressure sensor connector, the middle pressure sensor (O), and the fuel tube (P).

Tightening Torque Middle Pressure Sensor:
7.38 - 10.27 lb-ft (10.0 - 13.93 Nm)

NOTICE

Middle-pressure sensor O-ring must be replaced before reinstalling the middle-pressure sensor.

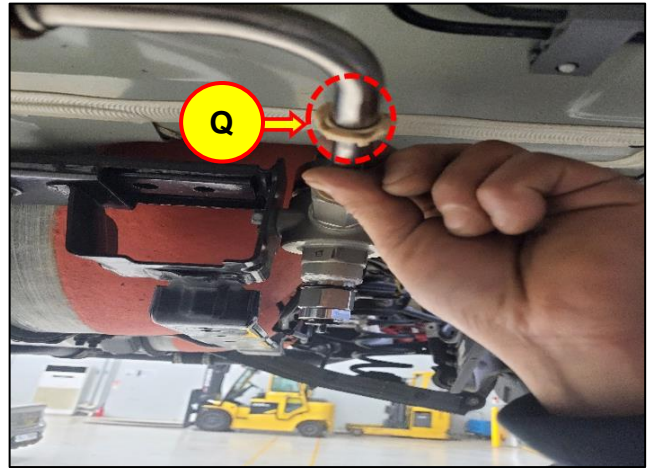
Refer to step 16 on page 25.



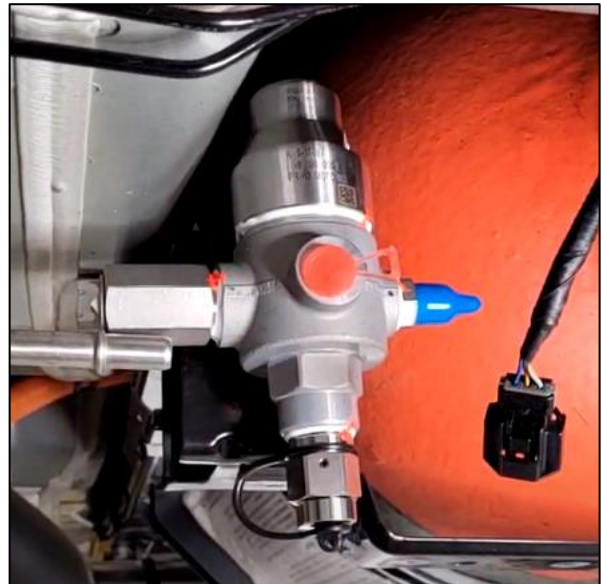
11. Disconnect the middle pressure fuel tube (Q) using the tube remover SST.

NOTICE

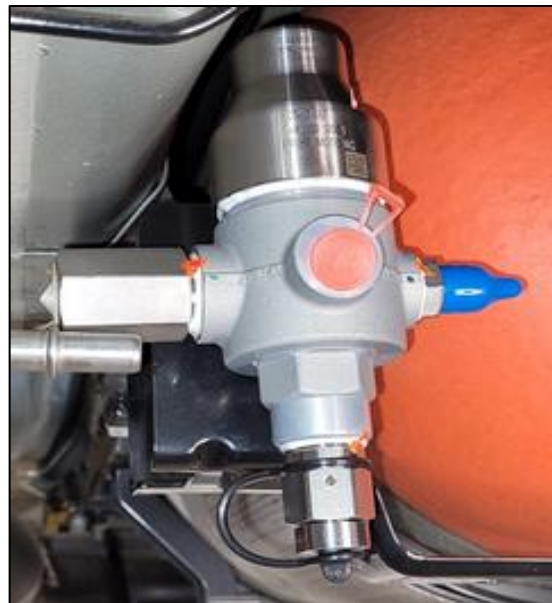
Tube Remover SST: 09356-4W110



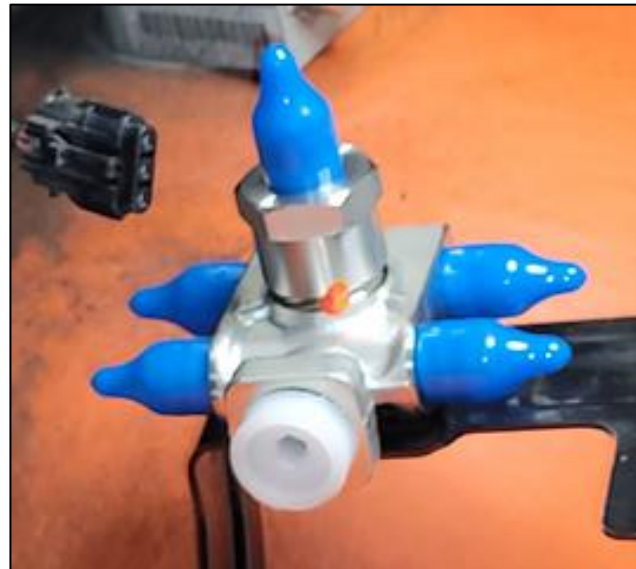
12. Remove the high-pressure regulator assembly.



13. Install the supplied high pressure regulator assembly and remaining parts in the reverse order of a removal.

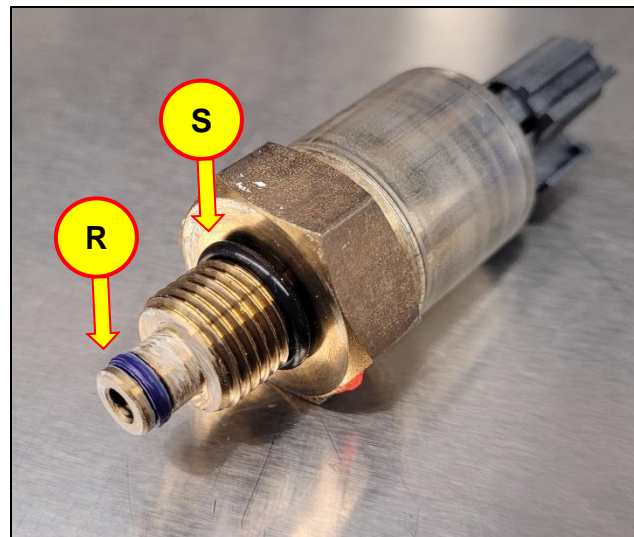
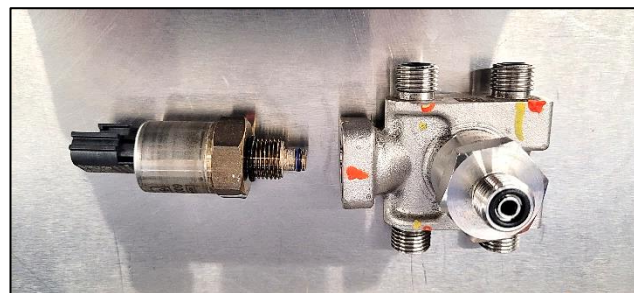


14. To keep the sealing surfaces clean and prevent debris intrusion, keep the protective caps and plugs on the junction block and high-pressure regulator until the moment lines and sensors are connected.



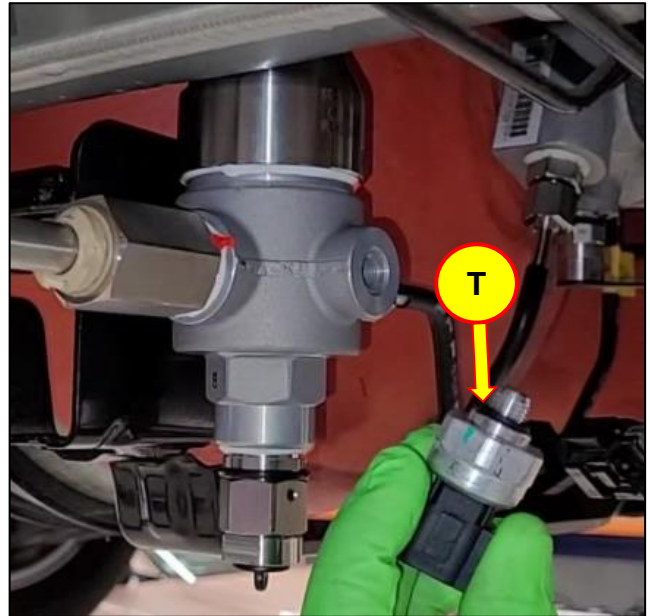
15. High-Pressure Sensor Installation:

- I. Replace and lubricate the smaller O-ring (R) with Molykote HP-300.
- II. Replace the larger O-ring (S), but **DO NOT** lubricate.
- III. Refer to Nexo shop manual: NEXO(FE) > 2019 > 113KW > Hydrogen Storage System > Repair Procedures > Hydrogen Storage System O-ring Replacement Procedure



16. **Middle-Pressure Sensor Installation:**

- I. Replace the O-ring (T) but **DO NOT** lubricate.
- II. Refer to Nexo shop manual: NEXO(FE) > 2019 > 113KW > Hydrogen Storage System > Repair Procedures > Hydrogen Storage System O-ring Replacement Procedure



17. To keep the sealing surfaces clean and prevent debris intrusion, ensure the protective caps remain on the fuel lines until the moment they connect.

Ensure all tube nuts are connected and torqued to specification.



18. Rear Tank Tube Installation:

To install the rear tank tubing, prepare the replacement tube by sliding the tube nut (tank end) approximately 3 inches away from end of tube. Use tape to hold the nut in position and tape the protective cover in position. This will facilitate maneuvering the rear tank tubing around and above the rear suspension. Ensure the rear tank tubing is in the same position as when it was removed.

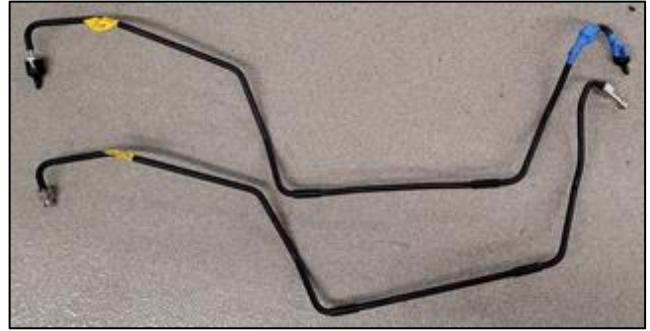
The images show where to tape the tube nut and end protective cap. The replacement tube is at the top of the image and the removed tube is at the bottom of the image.

NOTICE

DO NOT to force or bend tubing while maneuvering the rear tank tubing into position.

Failure to do so may damage the tubing and make it difficult to attach the tubing to the fitting.

Ensure all tube nuts are connected and torqued to specification.



19. Open the manual valves on all **3** hydrogen tanks.

Using a **6mm** Allen wrench turn the manual valve counter-clockwise until it stops then rotate manual valve one half turn clockwise.

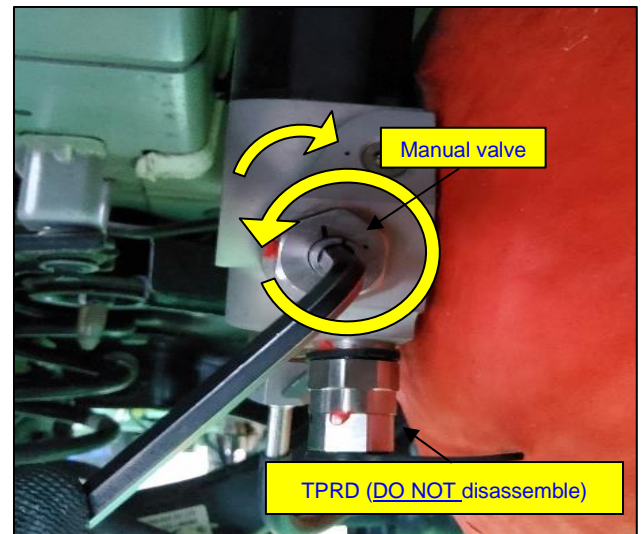
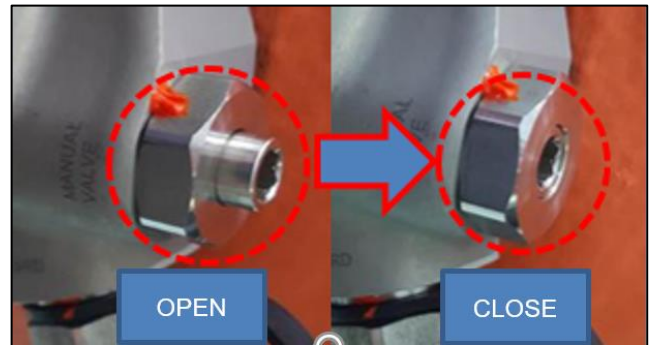
Exceeding opening torque specification, may damage the manual valve.

Opening Torque:

3.6 – 7.2 lb-ft (4.9 – 9.8 Nm)

NOTICE

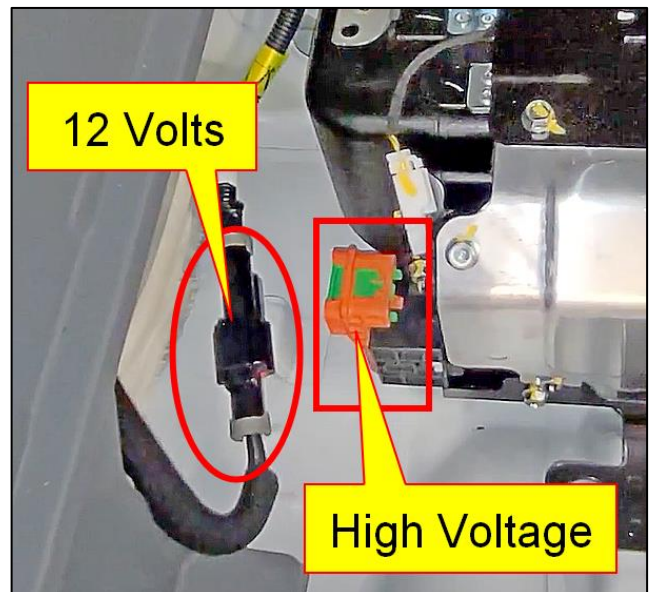
Some components of the manual valve may be damaged if over-torqued.



20. Refer to **Preparation for Replacement of Hydrogen Components** on pages 12-13 and follow steps 1-4 in reverse order of disassembly to re-connect the high voltage safety plug and the 12-volt auxiliary battery.

WARNING

Before performing the service procedure, ensure proper Personal Protection Equipment (PPE) is worn to prevent injury. Verify PPE is not expired and in proper working condition.



21. Place the vehicle **READY** mode using the **START / STOP** push button.

22. Perform a leak check of fittings on components replaced. Using a Hydrogen leak detector.

Refer to shop manual:

Nexo (FE) > 2019 > 113KW > Hydrogen Storage System > Repair Procedures > Hydrogen Gas Leak Test > For Hydrogen Storage System (HSS)

If no leak is found, then replace the undercovers and proceed to the next step.

If a leak is found. Perform the **Depleting Residual Fuel Supply Pressure Using GDS-M** on pages 10-12 and Preparation for Replacement of Hydrogen Components on page 12.

Repair leaks, then perform steps 19-22 on pages 23-25.

23. Refuel hydrogen storage tanks to full at a local hydrogen station.

Refer to the station websites below to confirm station availability before driving or towing vehicle to the station:

- <https://cafcp.org/stationmap>
- <https://h2-ca.com/>

24. After refueling the vehicle, with the key in the ON position, photograph the fuel gauge level and a paper showing the last six digits of the VIN or RO #, and the date of refueling.



STUI



Using STUI, photograph the fuel gauge. Include in the photo a piece of paper containing the last 6 digits of the VIN or the RO #, the date of the refueling. Ensure the fuel gauge display, odometer, and note are captured and in focus. Upload the photo to STUI.