HYUNDAI **Technical Service Bulletin**	GROUP **CAMPAIGN**	NUMBER **22-01-080H**
	DATE **OCTOBER 2022**	MODEL(S) **NEXO (FE)**

SUBJECT: HMU UPDATE & PRESSURE RELIEF VALVE (PRV) REPLACEMENT (SERVICE CAMPAIGN T9A)

★ IMPORTANT

***** Dealer Stock and Retail Vehicles *****

Dealers must perform this campaign on all affected vehicles prior to customer retail delivery 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 campaigns.

Description: Some NEXO (FE) vehicles may exhibit charging interruptions during hydrogen charging due to sensitive leak detection logic diagnostic conditions. This bulletin outlines the procedure to update the HMU controller software and replace the PRV (Pressure Relief Valve).

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 ~ 2022MY NEXO (FE) vehicles.

NOTICE

- The TSB repair procedure MUST be performed at an authorized Hyundai NEXO fuel cell vehicle dealer and by a 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.

Parts Information:

PART NAME	IMAGE	PART NUMBER	REMARKS
Pressure Relief Valve (PRV)		35904-M5000QQH	1 Each
Sealant Threebond 1211		21451-33T02QQH	1 tube can be used for about 100 vehicles
Hydrogen Leak Detector	No Image	None	Part of Dealer Nexo SST Kit
SNOOP RC Leak check fluid		None	Only need if leak detector fails

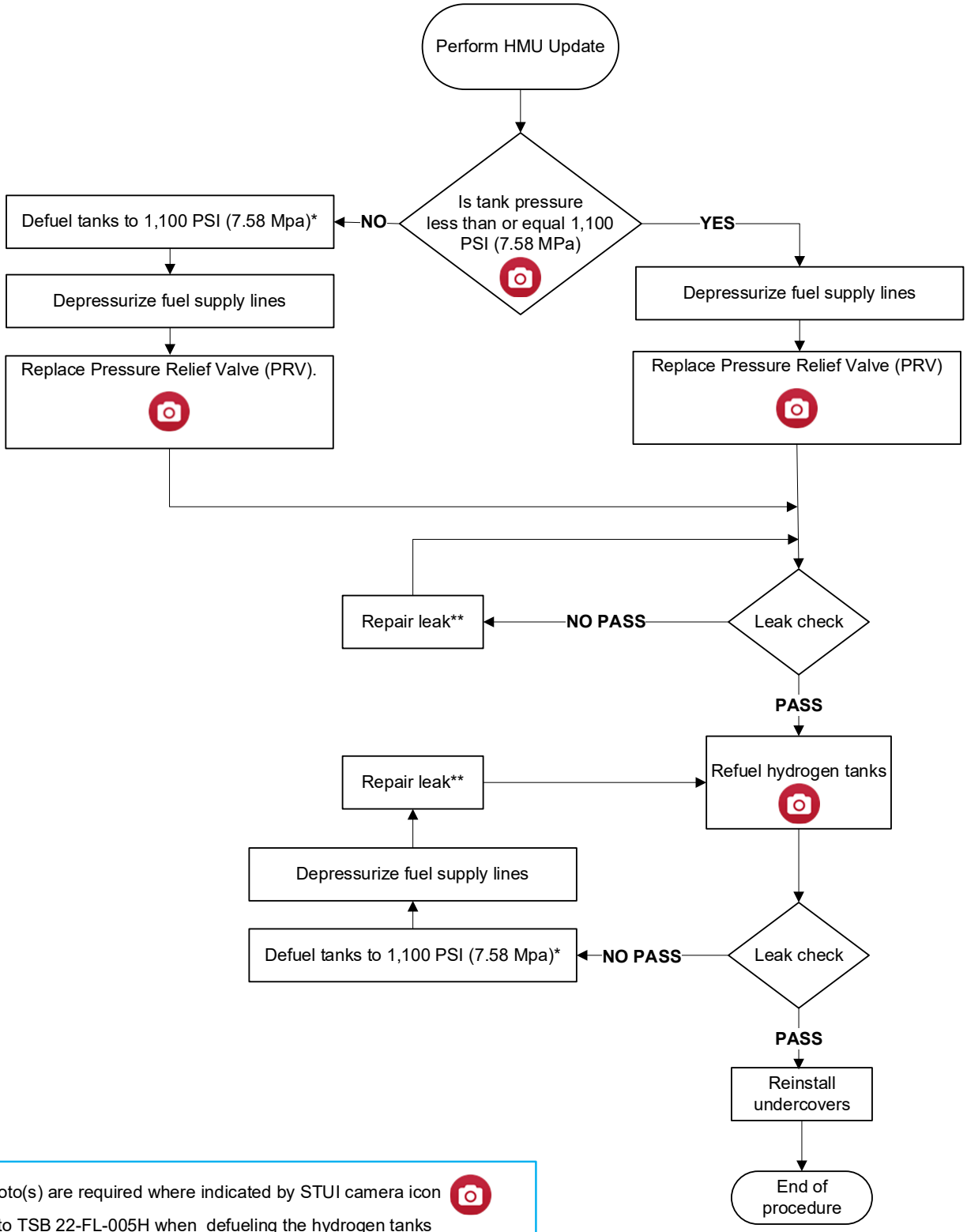
Warranty Information:

OP CODE	OPERATION & CONDITIONS	OP TIME	SUBLET	CAUSAL PART	NATURE CODE	CAUSE CODE
20D050R2	If - Hydrogen tank pressure is 1,100 PSI or less and fuel supply lines are depressurized (i.e., performed but claimed via separate repair or campaign TSB). Then – **HMU UPGRADE & PRV REPLACEMENT**	1.1 M/H	$0.29	35904-M5000 QQH	B21	ZZ1
20D050R3	If - Hydrogen tank pressure is 1,100 PSI or less (i.e. customer drove in with low fuel) and fuel supply lines need depressurization. Then – **DEPRESSURIZE FUEL SUPPLY LINES AND PERFORM HMU UPGRADE AND PRV REPLACEMENT**	1.5 M/H	$150.29			
20D050R4	If - Hydrogen tank pressure is 1,101 PSI or more Then – **DEFUEL (VENT) TANKS TO 1,100 PSI OR LESS, DEPRESSURIZE FUEL SUPPLY LINES AND PERFORM HMU UPGRADE AND PRV REPLACEMENT**	2.3 M/H	$150.29			

NOTE 1: Submit claim on Campaign Claim Entry Screen
NOTE 2: Op Code **20D050R2** accounts for the related defueling (venting), depressurizing fuel supply lines, and refueling of vehicle costs being covered via a separate repair claim outside of this TSB.
NOTE 3: Op Codes **20D050R3** and **20D050R4** include $150.00 for transportation of the vehicle to the fueling station ($50) and fuel to refuel vehicle ($100).
Please **DO NOT** submit a separate claim with duplicate labor or sublet. If defueling/refueling is required for overlapping repairs/campaigns, submit the applicable labor operation for defueling/refueling on ONLY ONE of the claims.
NOTE 4: All Op Codes include $0.29 for Threebond Sealant per vehicle.

NOTE 5: If a part that is not covered by this campaign needs replacement while performing this campaign, 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 6: 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 7: Claim must include STUI pictures that are clearly visible along with a piece of paper displaying the last 6 digits of the VIN and date of the procedure. **Claims submitted with illegible, incomplete, missing or incorrect pictures are subject to debit.**

HMU Update & Pressure Relief Valve (PRV) Replacement



STUI photo(s) are required where indicated by STUI camera icon

*Refer to TSB 22-FL-005H when defueling the hydrogen tanks

**Refer to shop manual to perform leak check and repair leaks

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

NOTICE

- Check vehicle for outstanding campaigns requiring defueling and perform all repairs

NOTICE

- Verify the vehicle is affected by checking the HMU control unit ROM ID version and referencing the ROM ID Information Table before updating the control unit software.

⚠ CAUTION

- Run the fuel cell a sufficient amount of time to ensure that the 12-volt auxiliary battery is sufficiently charged for the update. Turn off the vehicle after 12-volt auxiliary battery is charged.
- Ensure the 12-volt battery will not become discharged during the update by turning off all lights and accessories, heater/air conditioner, fan, audio, heated seats, rear defroster, etc.
- Do not leave the headlight switch in auto mode.
- Before performing the update, set the POWER button to the ON position. To set the POWER button to the ON position, press the button two times without pressing the brake pedal.
- Do not start the fuel cell.
- Do not turn OFF the POWER button during the update.
- Do not disconnect any cables connected to the vehicle or GDS-M during the update

NOTICE

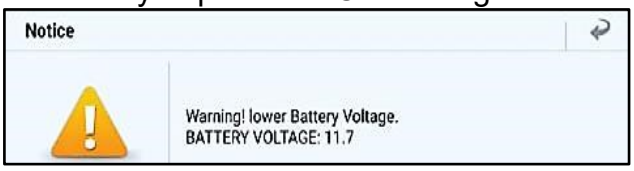
- Confirm your GDS-M has the most recent software version. If not, connect the GDS-M Mobile to an Internet port, open the GDS-M home page and select “Internet Update.” Refer to www.hyundaitechinfo.com if necessary.
- If you encounter GDS-M related problems, call the GIT Helpline at 888-437-0308.

NOTICE

- When the vehicle auxiliary 12-volt battery has low voltage, the GDS-M will trigger a Low Battery Voltage Warning. If this Warning occurs, then perform A or B as follows.

A. Connect the battery to a fully charged battery jump pack or GR8 charger using “Power Supply Mode” to continue the software update.

B. Select “BACK” to exit the SW update. Then, start the fuel cell and let it run with until the auxiliary 12-volt battery is sufficiently charged. Return to the software update after charging the battery to prevent ECM damage.



SERVICE PROCEDURE: HMU Update

Connect the VCI-II into the vehicle's driver side instrument panel OBD-II port and verify the device is operational.

Do not set up the trigger module.

NOTICE

- GDS-M control unit upgrading operates with wireless communication ad Wi-Fi direct. It is possible to perform the update via USB cable between the tablet PC and VCI-II.
- Ensure the tablet battery has reasonable charge before starting the update.

NOTICE

- You must initially perform GDS-M HMU Update in Auto Mode.
- If the ECM Update starts but then fails in Auto Mode, perform the update in Manual Mode to recover.

A. Automatic GDS-M Update Procedure

1. Enter the vehicle's information and on the next screen select ECU Upgrade.
2. Select Auto Mode and then select System, HMU.
3. Read information and select ID check.
4. GDS-M will read the current vehicle ROM ID and check for the newest update event.
5. Select the upgrade event.

   "816.FE REGULATOR COMPLEMENTARY LOGIC (HMU SOFTWARE)"

6. If the low battery warning message appears, then select the BACK arrow and run the fuel cell to ensure the battery is adequately charged for the update.

7. Update (1/2) will begin and progress will be displayed on the bar graph.
8. Update (2/2) will begin and progress will be displayed on the bar graph.
9. After update (2/2) is complete, turn off the ignition for 10 seconds.
10. Turn the ignition to the ON position and press OK to continue according to information displayed on the screen. **Do not start the fuel cell. Do not put into READY mode.**
11. Select OK on the final screen and the update is complete.

12. Check for any DTCs created by the update and clear the codes.
13. Start the fuel cell (READY Mode) to confirm if the vehicle is operating properly.

NOTICE

- Only perform the manual update if the automatic update fails.
- If automatic update fails, turn the ignition off for about 10 seconds. Place it back into the ON position to reset the control unit before performing the manual update

B. Manual GDS-M Update Procedure

1. Within the upgrade screen, select Manual Mode, then select upgrade event.
2. Select the control unit part number with reference to the ROM ID Information Table as listed below in this TSB. Then select Upgrade.

   816.FE REGULATOR COMPLEMENTARY LOGIC (HMU SOFTWARE)"
3. Enter the password from the password table located at the below in this TSB and press OK.
4. If the low battery warning message appears, then select the BACK arrow and run the fuel cell to ensure the battery is adequately charged for the update.

5. Update (1/2) will begin and progress will be displayed on the bar graph.
6. Update (2/2) will begin and progress will be displayed on the bar graph.
7. After update (2/2) is complete, turn off the ignition for 10 seconds.
8. Turn the ignition to the ON position and press OK to continue according to information displayed on the screen. **Do not start the fuel cell. Do not put into READY mode.**
9. Select OK on the final screen and the update is complete.
10. Check for any DTCs created by the update and clear the codes.
11. Put the vehicle into READY mode to confirm the vehicle is operating properly.

ROM ID Reference Table

DEL	HMU P/No.	ROM ID	
		OLD	NEW
FE	35908-M5000	3700R 3500R 3600R 3700R 3910R	4030R

Manual Mode Password Information Tables:

EVENT #	MENU	PASSWORD
816	FE HMU 35908-M5000	0304

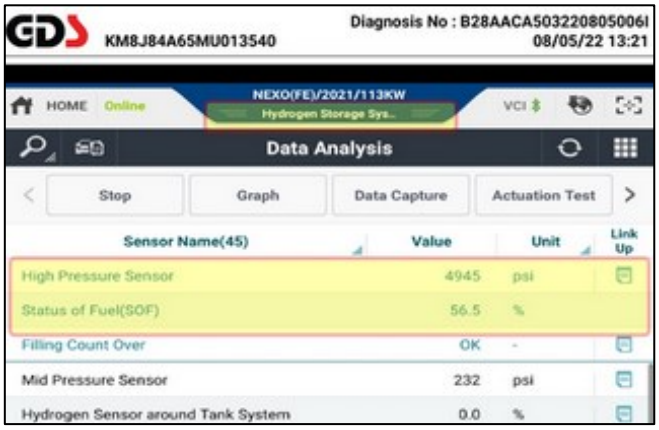
SERVICE PROCEDURE: Depleting Residual Fuel Supply Pressure & Defueling

1. 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. Similar to the photo to the right.

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 photo is in focus and captures the fuel gauge display, odometer, and note. Upload the photo to STUI.

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



3. If storage tank pressure is **less than or equal to 1,100 PSI**, then deplete residual fuel supply pressure by referring to **TSB 22-FL-005H—VENTING NEXO FUEL CELL ELECTRIC VEHICLES** or the latest version.

4. If storage tank pressure is **greater than 1,100 PSI**, then defuel storage tanks to less than 1,100 PSI and deplete residual fuel supply pressure by referring to **TSB 22-FL-005H—VENTING NEXO FUEL CELL ELECTRIC VEHICLES** or the latest version.

12 volt and High Voltage Circuit Disconnection

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.

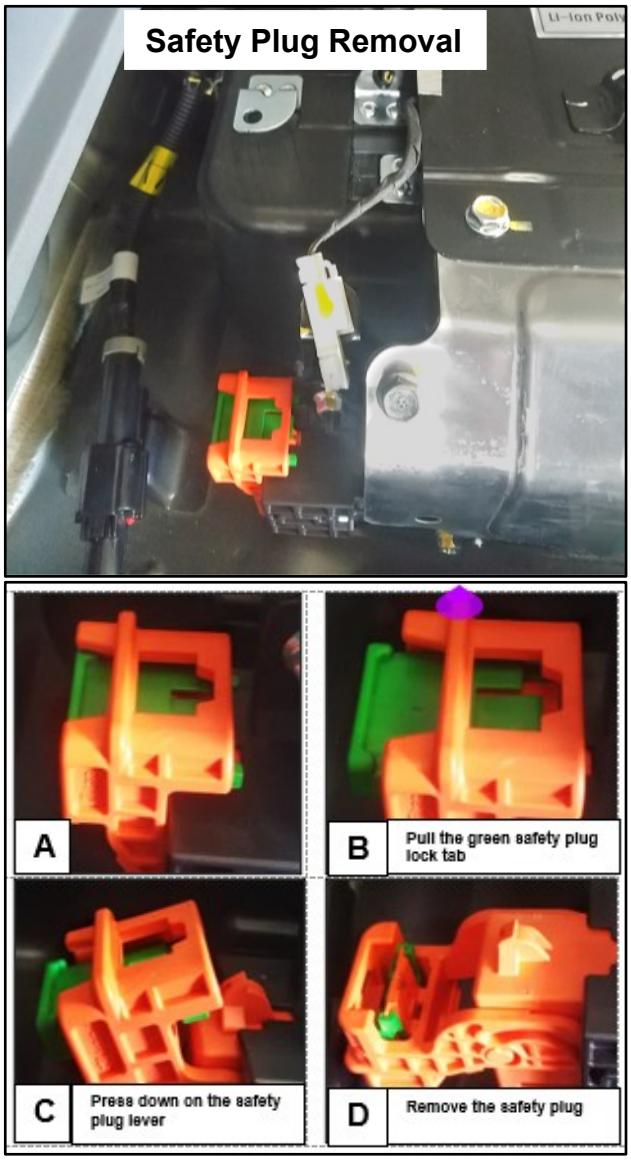
2. Disconnect the 12 volt battery negative (-) connector.

⚠ WARNING

- **Electrocution hazard - 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.**

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

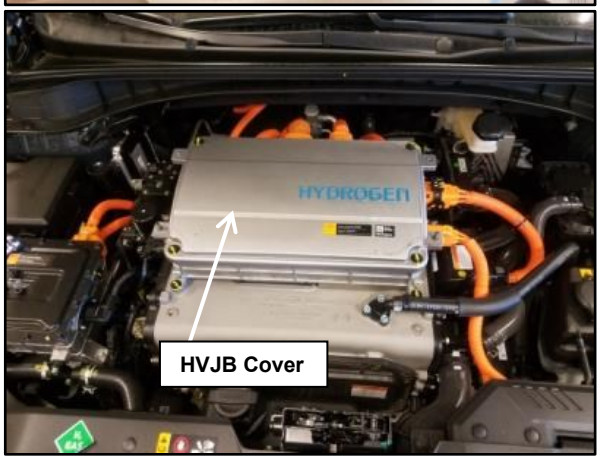
4. Follow A-D below to remove the orange high voltage safety plug.
   Store the removed safety plug in a secure location outside and away from the vehicle.



5. Wait 5+ minutes to allow the high voltage system capacitor to discharge.

6. Open the hood. Remove the junction box trim and cover.

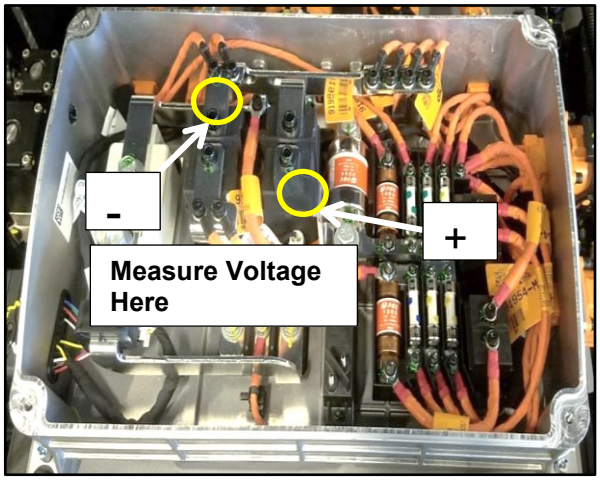
   High voltage junction box cover: Assembly bolt torque 7.2~8.7lb-ft
   (1.0 ~ 1.2 kgf.m, 9.8 ~ 11.8 N.m)



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 30 volts, the High Voltage Circuit is properly shut down.

⚠ DANGER

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



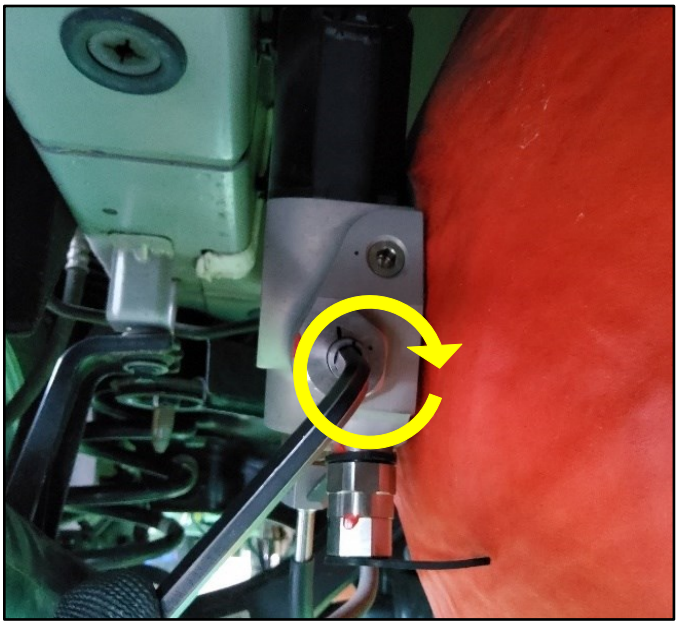
8. Close the manual valves on all **3** hydrogen tanks.

   Using a **6mm** Allen wrench turn the manual valve clockwise until it stops.

   Exceeding closing torque specification, may damage the manual valve.

   Closing Torque:

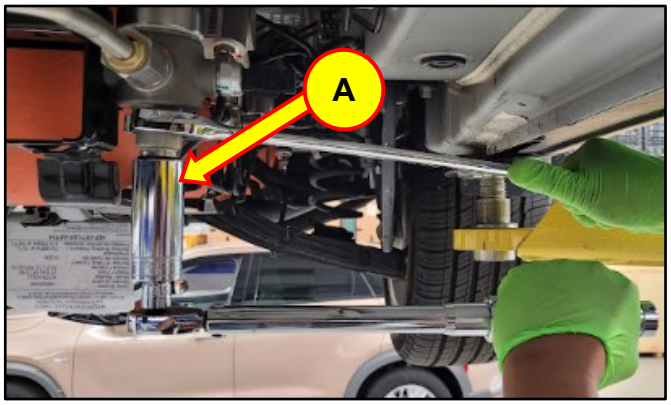
   3.6 ~ 7.2 lb-ft (4.9 ~ 9.8 Nm)



NOTICE

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

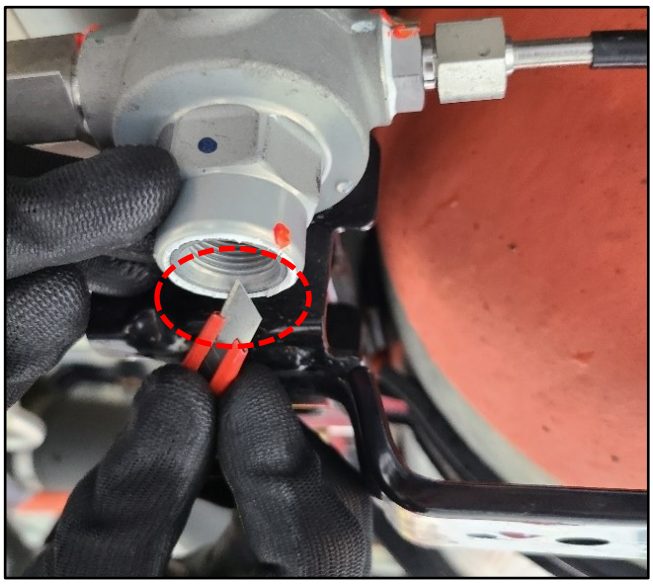
9. Remove the pressure relief valve (PRV) (A) using a 24mm socket & ratchet. Turn the PRV counterclockwise to remove. Use a 32mm wrench to hold the Regulator while removing the PRV.



NOTICE

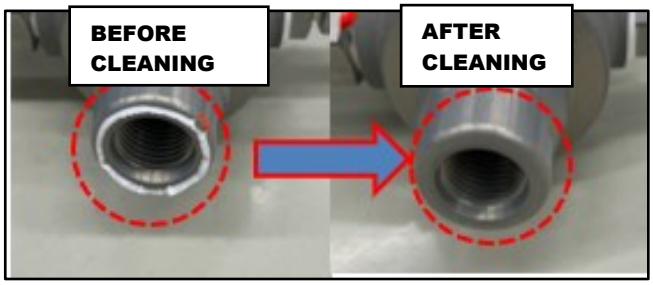
- Be careful not to damage the fuel supply tube and regulator mounting bracket.

10. Remove the PRV sealant using a razor blade.



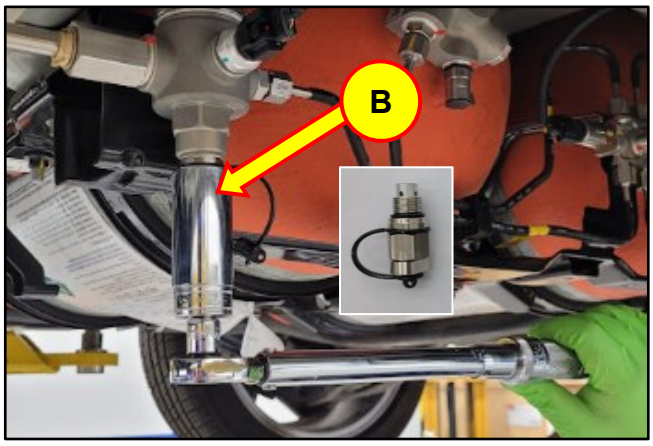
NOTICE

- Ensure work area cleanliness to prevent foreign substances from entering the PRV openings to prevent clogging the PRV.
- Do not use an air gun to remove foreign substances.



11. Install the new PRV (B) turning it clockwise.

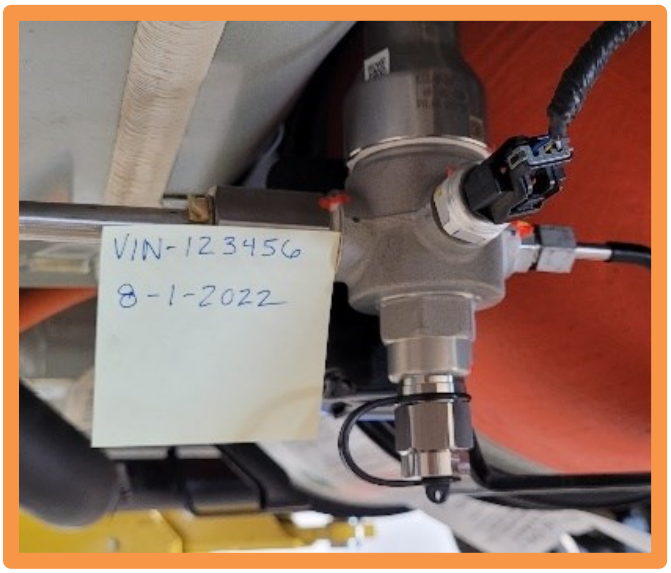
Tightening Torque:
54.2 ~65.8 lb-ft (73.5~89.2 Nm)



Information

- Keep the PRV vertical during installation so that internal components will not fall out of the PRV.

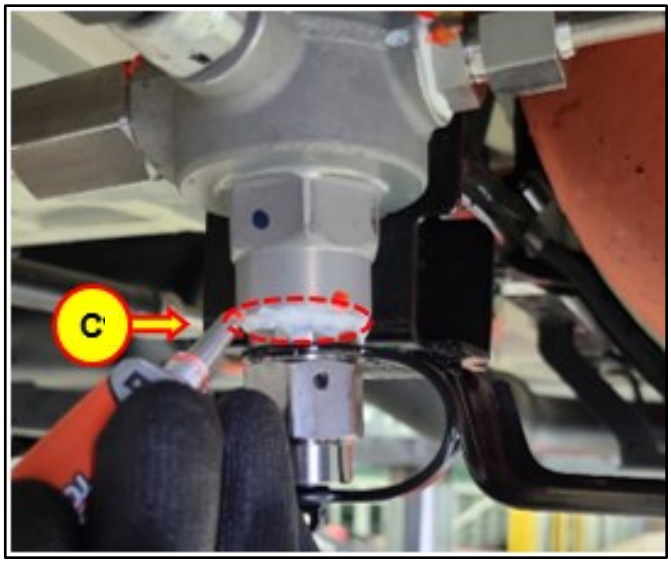
12. Before applying sealant in the next step, take a photograph of the newly installed PRV and a paper showing the last six digits of the VIN or RO #, and the date of installation. Similar to the photo to the right.



STUI

Using STUI, photograph the newly installed PRV. Include in the photo a piece of paper containing the last 6 digits of the VIN or the RO #, the date of the installation. Ensure the PRV, and note are captured and in focus. Upload the photo to STUI.

13. Apply the sealant (C) between the PRV and the body of the high-pressure regulator.



NOTICE

- Use gas detector or Snoop liquid leak detector to test if there is any gas leakage.
- Do not apply Snoop liquid on the part where the sealant is applied.
- If there is any leakage on the part where the sealant is applied, the sealant may inflate.
- Apply the sealant by using the nozzle included in the box.

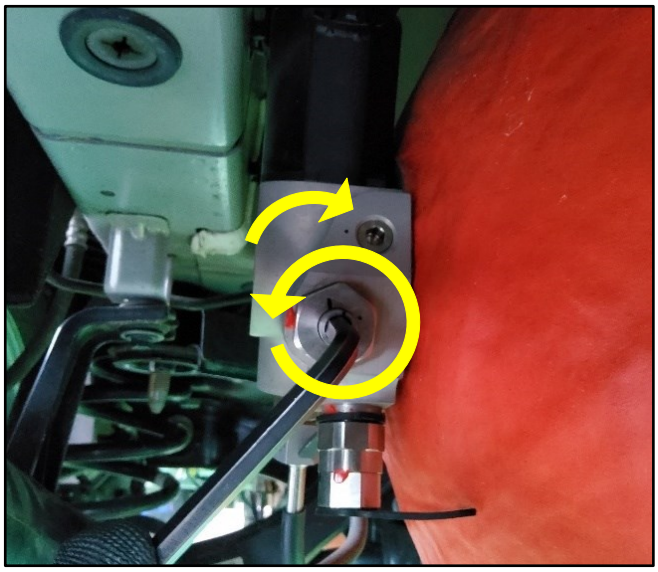
14. Open the manual valves on all **3** hydrogen tanks.

    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.

15. Reconnect 12-volt and high-voltage batteries. Refer to page 10.

16. With the vehicle in ready mode, perform a leak check of lines, fittings and components removed and/or replaced, using a Hydrogen leak detector.

    Refer to the shop manual:

    Nexo (FE) > 2019-2022 > 113KW > Hydrogen Storage System > Repair Procedures> Hydrogen Gas Leak Test > For Hydrogen Storage System (HSS)

    If no leak is found, then proceed to the next step. Do not reinstall the under covers until final leak check is performed.

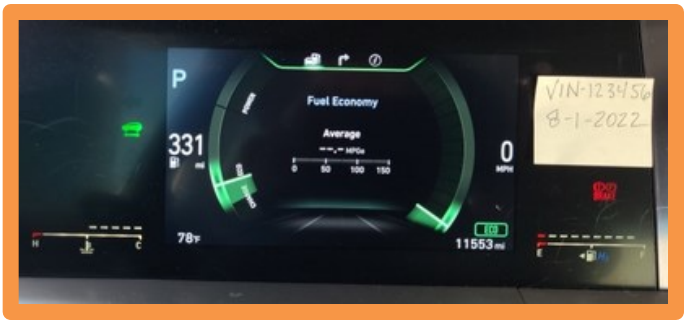
    If a leak is found. Refer to TSB 22-FL-005H—VENTING NEXO FUEL CELL ELECTRIC VEHICLES to perfom “Preparation for Replacement of Hydrogen Components” and “Depleting Residual Fuel Supply Pressure”. Repair the leak(s), then perform this step again until no leak is found.

17. 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/

18. After refueling the vehicle, use the Push Button Start Stop (PBSS) switch and place the vehicle systems into the READY mode. Photograph the fuel level gauge and a paper showing the last six digits of the VIN or RO #, and the date of refueling. Similar to the photo to the right.



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.

19. After the Hydrogen tanks have been refueled. Put the vehicle on a lift and place the vehicle into READY mode using the PBSS. Perform a leak check of hydrogen fuel components that were replaced, using a Hydrogen leak detector.

    Refer to the shop manual:

    Nexo (FE) > 2019-2022 > 113KW > Hydrogen Storage System > Repair Procedures> Hydrogen Gas Leak Test > For Hydrogen Storage System (HSS)

20. If a leak is found. defuel tanks to 1,100 PSI or less and Refer to TSB 22-FL-005H—VENTING NEXO FUEL CELL ELECTRIC VEHICLES “Preparation for Replacement of Hydrogen Components” and “Depleting Residual Fuel Supply Pressure”. Repair the leak(s), then perform steps 15 - 19 on pages 17 and 18 again until no leak is found.

21. If no leak is found, then replace the undercovers.

22. The procedure is complete.