

REFERENCE:	Nova Bus Manuals
SECTION:	10: LFSe High-Voltage batteries
RS N°:	MQR 7621-2648
EFFECTIVE IN PROD.:	LE91 2023MA
TC RECALL N°:	2023-247
NHTSA RECALL N°:	23V291

APPLICATION DEADLINES: N/A CLAIM REFERENCE NUMBER: SR5406

SUBJECT:	Akasol battery pack
JUSTIFICATION:	Certain affected vehicles may have the coolant line in the high-voltage battery pack not fully seated and locked, which can result in the loss of coolant and an electrical short circuit.

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	Take note of the SN on all HV battery packs and prepare the HV battery packs for inspection from an Akasol technician.	Nova Bus	-	8h20
2	Replace the defective HV battery pack; take note of the new battery's serial number. Return the defective batteries to supplier (<i>labor time allocated is 1.5h per battery replaced</i>).	Nova Bus*	Nova Bus	2h30

*The allocated time is 1h30 per battery pack. If more than one battery pack needs to be replaced, replacement time will be covered by this present campaign.

MATERIAL REQUIRED PER VEHICLE

QTY	PART N°	REV.	DESCRIPTION
LEVEL 1			
-	-	-	-
LEVEL 2 (only if required**)			
1*	24234513	-	HV battery pack

Materials will be available within 193 days once your order has been placed.

To order, please contact your Customer Support Manager.

* The number of HV battery pack required in level 2 may vary on each vehicle.

**The material identified in Level 2 is to be ordered only for vehicles that meet the criteria defined in Level 1.

DISPOSAL OF PARTS

REMOVED PARTS ARE:	DISCARDED	RETAINED *	* To be reimbursed, the parts must be retained and returned in accordance with the usual warranty procedure.
	-	Yes	

REVISION HISTORY

REV.	DATE	CHANGE DESCRIPTION	WRITTEN BY
NR	2023MA23	Initial release	Luc Carignan

APPROVED BY:

Irina

Negoescu

Signature numérique
de Irina Negoescu
Date : 2023.05.23
17:14:41 -04'00'

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
Milwaukee - Wisconsin	LE16	1000	1000	L82M4N97782	[REDACTED] L82M4N97782	1
Milwaukee - Wisconsin	LE17	1003	1004	L82M1N97785	[REDACTED] L82M3N97785	2
San Francisco California SFMTA	LE39	5010	5010	L82M2N97783	[REDACTED] L82M2N97783	1
Ames Transportation Agency - Iowa	LE52	7157	7158	L82M2N97784	[REDACTED] L82M4N97784	2
Guelph Ontario	LE69	285	285	L82M9N37536	[REDACTED] L82M9N37536	1
Houston - Texas	LE77	3000	3000	L82M3N97786	[REDACTED] L82M3N97786	1

**WARNING**

FOLLOW YOUR INTERNAL SAFETY PROCEDURES.

PROCEDURE

**WARNING**

This vehicle has an electrochemical power storage device and high-voltage cables that can cause fatal electric shock to personnel and damage to the vehicle. It is the customer's responsibility to read and understand the documentation about the risks associated with the maintenance, replacement, or repair of the system's components.

**NOTE**

Before starting the procedure included in this document, contact your customer support manager to schedule an Akasol representative inspection of the Akasol High-Voltage battery packs targeted by this campaign. Only a certified technician from Akasol should perform this inspection.

**WARNING**

LEVEL 1: PREPARE HV BATTERY PACKS FOR AN INSPECTION BY AN AKASOL TECHNICIAN.

- 1.1. Park the vehicle on an even and level surface with the transmission in neutral.
- 1.2. Apply the parking brake and set the master control switch to the **stop** position.
- 1.3. Decommission the vehicle.

**CAUTION**

This vehicle has an electrochemical power storage device composed of high-voltage (HV) batteries and cables that can cause fatal electric shock or chemical burns, and damage to the vehicle. It is the customer's responsibility to read the manufacturer's documentation to be aware of the risks associated with the system. It is required to decommission and lock out the vehicle according to section 16: **LFSE+ HIGH-VOLTAGE DECOMMISSIONING** of the Nova Bus maintenance manual before working on the high-voltage system or in the high risk and potential risk zones. As well, follow any transit authority, local, provincial/state, or federal safety procedures should these take precedence.

- 1.4. Open the two drain valves of the battery thermal management system (BTMS) coolant circuit located in the motor compartment and drain the coolant into a clean container. Retain the coolant. See Figure 1.

**CAUTION**

For information on coolant draining see section 10-710: *LFSE+ BTMS* of the Nova Bus maintenance manual.

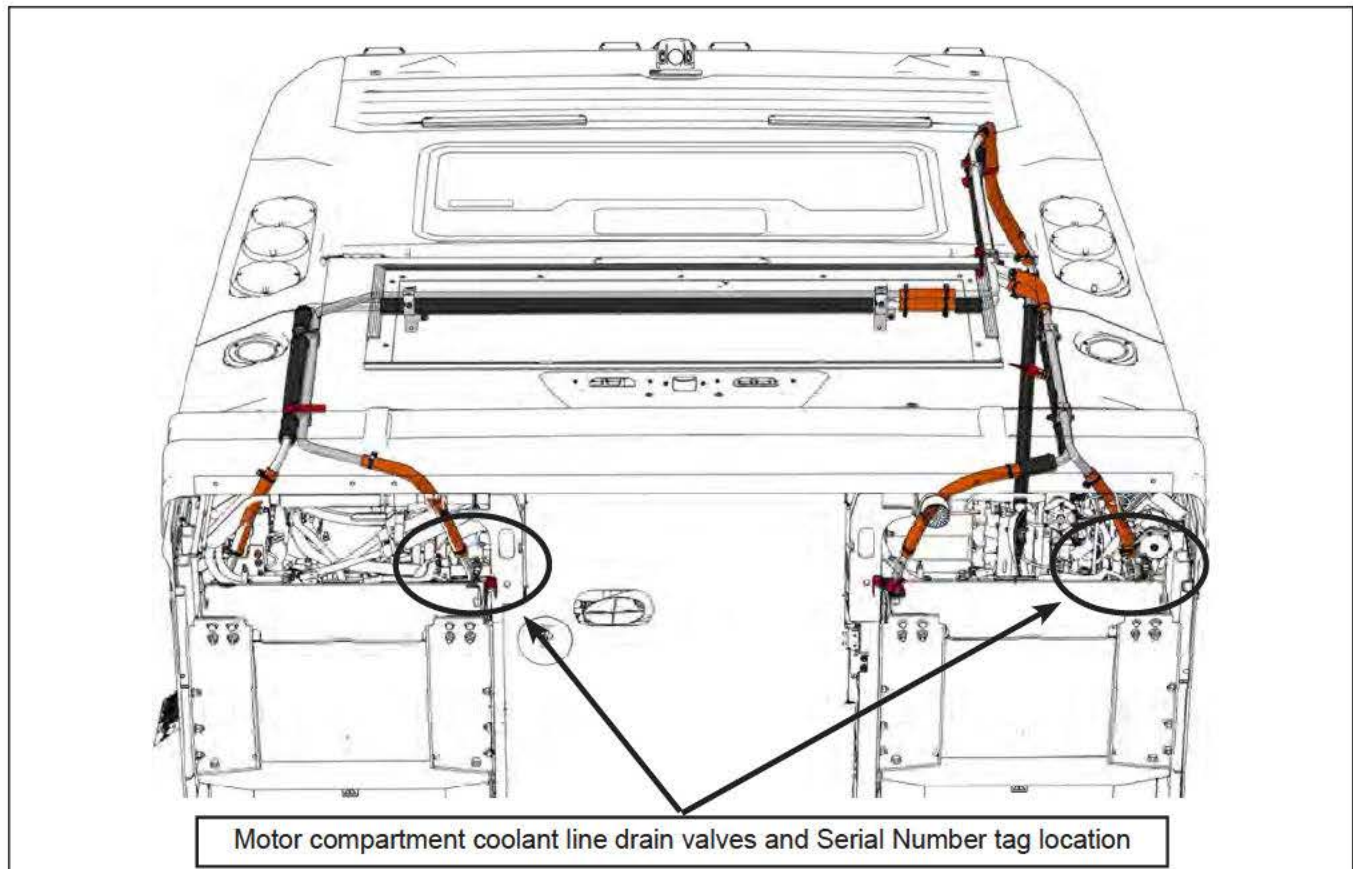


Figure 1 - Motor Compartment Coolant Line Drain Valves Location

- 1.5. Remove the two HV battery packs from the motor compartment using the recommended lifting support device. Follow heading **Removal** in section 10-704: *LFSE+ HVESS - LOWER REAR* of the Nova bus maintenance manual.

**NOTE**

Contact your Customer Support Manager for more information on the recommended lifting support device required for motor compartment HV battery pack removal.

- 1.6. Note the serial number of each removed HV battery pack and write this number on the **HV BATTERY PACK SERIAL NUMBER TABLE** available in the Annex of this document. See Figure 1.

- 1.7. Remove the curbside roof fairing. See section 10-701: **LFSE+ HVESS - UPPER REAR** and 10-705: **LFSE+ HVESS - UPPER FRONT** for information regarding roof fairing removal. Retain hardware and fairings. See Figure 2 for fairing to remove.

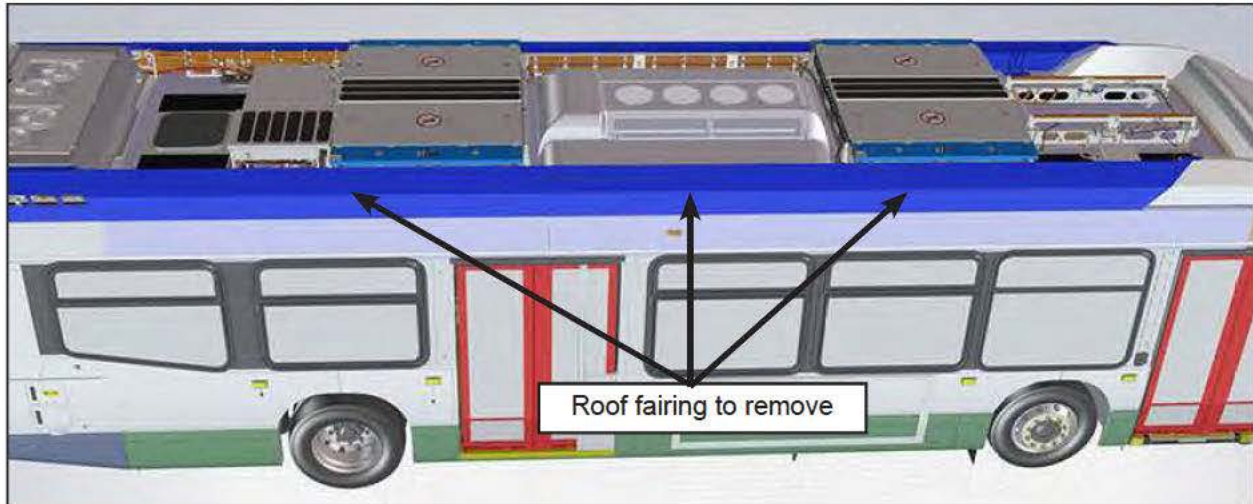


Figure 2 - Curbside Roof Fairing to Remove

- 1.8. Disconnect the inlet and outlet coolant lines from the upper front and upper rear HV battery packs. See Figure 3.

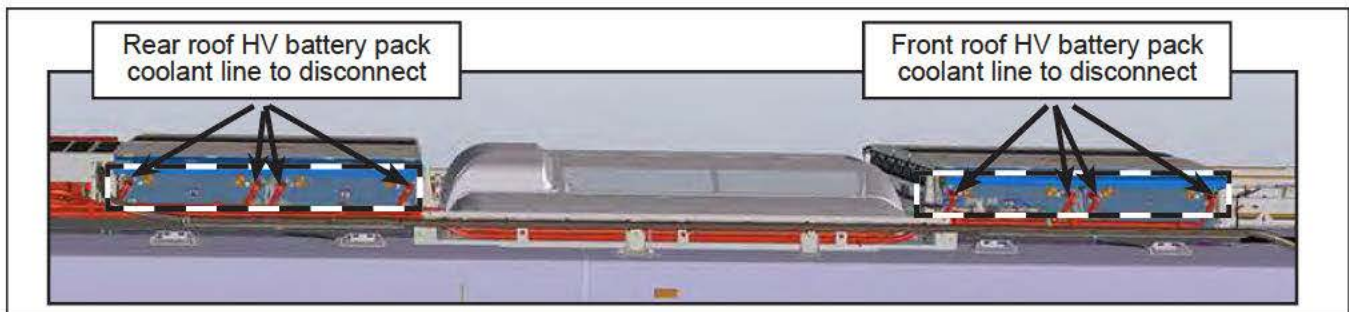


Figure 3 - Roof HV Battery Pack Coolant Line to Disconnect

- 1.9. Note the serial number of each HV battery pack located on the roof and write these numbers on the **HV BATTERY PACK SERIAL NUMBER TABLE** available in the Annex of this document. The serial number tag of each HV battery pack are located at the bottom right on the street side for each one. See Figure 4.

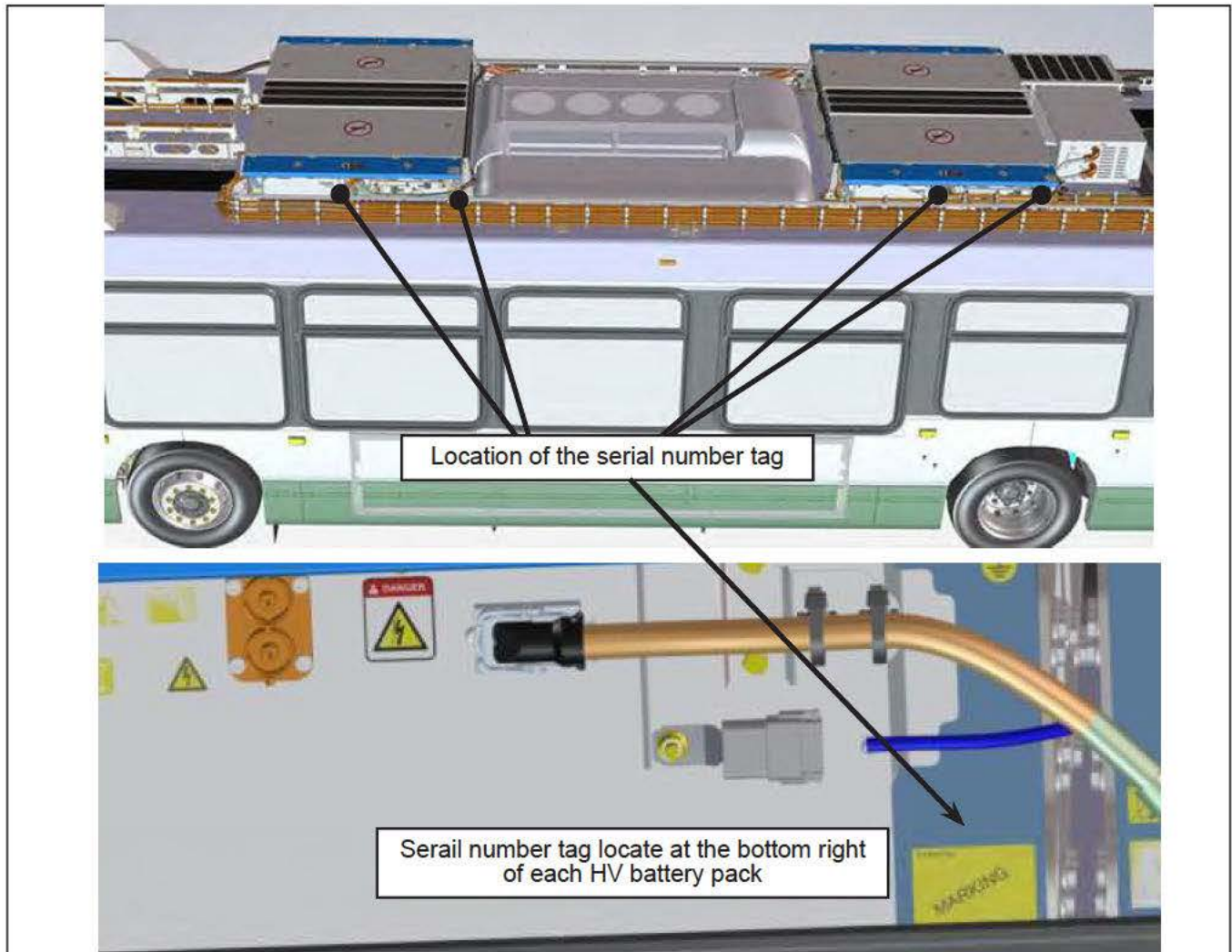


Figure 4 - HV Battery Pack Street Side Serial Number Tag location

- 1.10. Have the six HV battery packs of the vehicle inspected by the Akasol-certified technician.
 - a. If one or more HV battery packs failed the inspection test, proceed with the level two procedure.
- 1.11. Connect the inlet and outlet coolant lines to the upper front and upper rear HV battery packs. See Figure 3.
- 1.12. Install the removed curbside roof fairing using the retained hardware. See section **10-701: LFSE+ HVESS - UPPER REAR** and **10-705: LFSE+ HVESS - UPPER FRONT** for information regarding the roof fairing installation.
- 1.13. Install the motor compartment HV battery pack using the recommended lifting support device. Follow the heading **Installation** of section **10-704: LFSE+ HVESS - LOWER REAR** of the Nova bus maintenance manual for HV battery installation procedure.
- 1.14. Fill the HV battery pack cooling system with the retained coolant. Follow coolant filling instruction of section **10-710: LFSE+ BTMS** of the Nova Bus maintenance manual.
- 1.15. Commission the vehicle.

**CAUTION**

This vehicle has an electrochemical power storage device composed of high-voltage (HV) batteries and cables that can cause fatal electric shock or chemical burns, and damage to the vehicle. It is the customer's responsibility to read the manufacturer's documentation to be aware of the risks associated with the system. It is required to commission the vehicle according to section **16: LFSE+ HIGH-VOLTAGE DECOMMISSIONING** of the Nova Bus maintenance manual. As well, follow any transit authority, local, provincial/state, or federal safety procedures should these take precedence.

- 1.16. Return the vehicle in service

LEVEL 2: REPLACE THE DEFECTIVE HV BATTERY PACK AND RETURN DEFECTIVE BATTERIES TO SUPPLIER

**WARNING**

If one or more HV battery pack is replaced on the vehicle, it is possible that one or many batteries might have a state of charge (SoC) that is much higher or lower compared to the other batteries installed. This could prevent the bus from being driven. The vehicle will require a full charge of the batteries with a DC charger connected to one of the CCS charging ports to enable the drivability of the vehicle.

- 2.1. If an HV battery pack located on the roof fails the inspection performed by the Akasol-certified technician follow these steps:

- a. Remove the streetside roof fairing. See section **10-701: LFSE+ HVESS - UPPER REAR** and **10-705: LFSE+ HVESS - UPPER FRONT** for information regarding roof fairing removal. Retain hardware and fairings. See Figure 5.

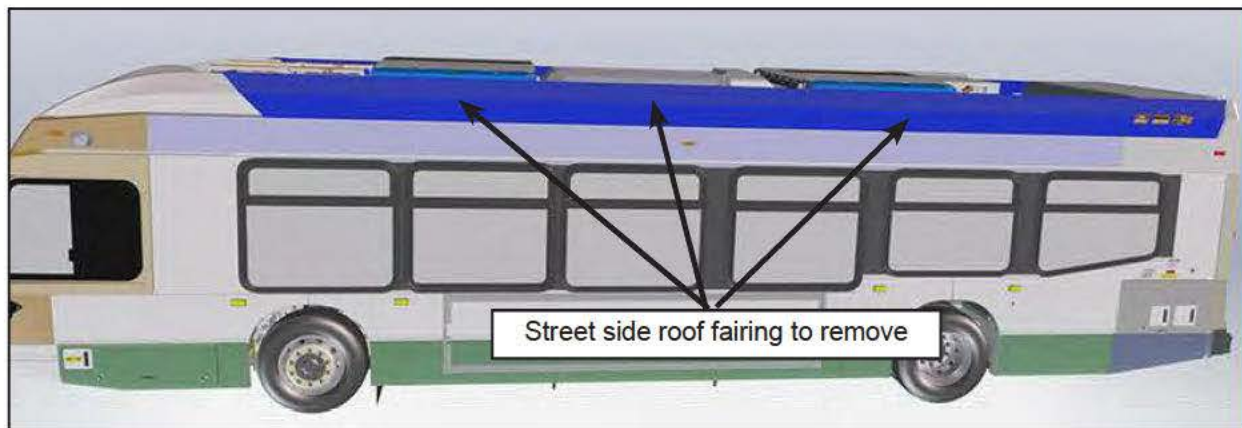


Figure 5 - Street Side Roof Fairing to Remove

- b. Remove the defective roof HV battery pack using the recommended lifting support device. Follow heading **Removal** of section **10-701: LFSE+ HVESS - UPPER REAR** and **10-705: LFSE+ HVESS - UPPER FRONT** of the Nova Bus maintenance manual for HV battery removal procedure.



NOTE

Contact your Customer Support Manager for more information on the recommended lifting support device required for motor compartment HV battery pack removal.

- c. Unpack and inspect the new HV battery pack 24234513 for any external damage that may have occurred during shipping. If external damage is visible on the battery, contact your customer support manager.
 - d. Note the serial number each new HV battery pack and write these numbers on the **HV BATTERY PACK SERIAL NUMBER TABLE** available in the Annex of this document.
 - e. Install a new 24234513 HV battery pack according to heading **Installation** of section **10-701: LFSE+ HVESS - UPPER REAR** and **10-705: LFSE+ HVESS - UPPER FRONT** of the Nova bus maintenance manual.
 - f. Install the streetside roof fairing using the retained hardware. See section **10-701: LFSE+ HVESS - UPPER REAR** and **10-705: LFSE+ HVESS - UPPER FRONT** for information of the roof fairing installation.
 - g. Return the defective HV battery pack to manufacturer.
- 2.2. If an HV battery pack located in the motor compartment fails the inspection performed by the Akasol-certified technician, follow these steps:
- a. Prepare and install the new 24234513 HV battery pack according to heading **Installation** of section **10-704: LFSE+ HVESS - LOWER REAR** of the Nova bus maintenance manual.
 - b. Note the serial number each new HV battery pack and write these numbers on the **HV BATTERY PACK SERIAL NUMBER TABLE** available in the Annex of this document.
 - c. Return the defective HV battery pack to manufacturer.

- 2.3. If one or more HV batteries were replaced in the previous step of level 2, proceed with step 1.9 of the level 1 procedure. If more than one HV battery pack was replaced in the previous step of level 2, follow these steps before proceeding to step 1.9 of level 1:
- Commission the vehicle

**CAUTION**

This vehicle has an electrochemical power storage device composed of high-voltage (HV) batteries and cables that can cause fatal electric shock or chemical burns, and damage to the vehicle. It is the customer's responsibility to read the manufacturer's documentation to be aware of the risks associated with the system. It is required to commission the vehicle according to section 16: **LFSE+ HIGH-VOLTAGE DECOMMISSIONING** of the Nova Bus maintenance manual. As well, follow any transit authority, local, provincial/state, or federal safety procedures should these take precedence.

- Put the vehicle in run mode and verify that there is no warning message on the driver display and that no fault codes are being reported by any of the batteries nor the electrical storage system (ESS) using the IDS tool.

**NOTE**

Erase all of the active codes before charging the vehicle. See section 16-100: **FAULT CODES** of the maintenance manual for information on error codes and perform the required actions to remove those fault. If required, contact your customer support manager for assistance.

- Connect the vehicle to CCS charger to perform a complete charge of the HV battery. Refer to heading **CHARGING** of section 11-702: **LFSE+ COMBINED CHARGING SYSTEM** of the Nova Bus maintenance manual. See Figure 6.

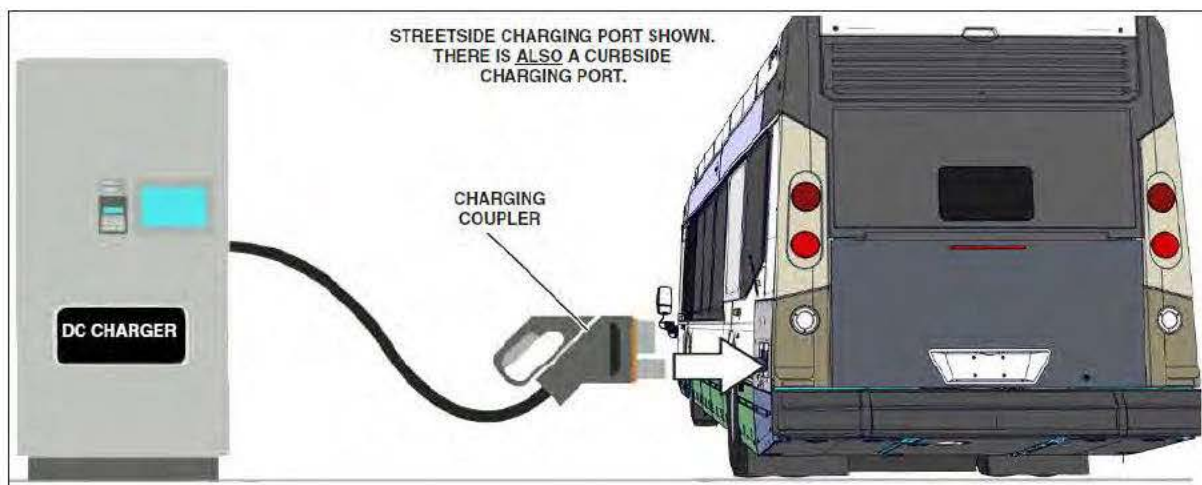


Figure 6 - CCS Charger Connection to the Vehicle

d. Verify that the green LED is flashing on the vehicle charging port. See Figure 7.

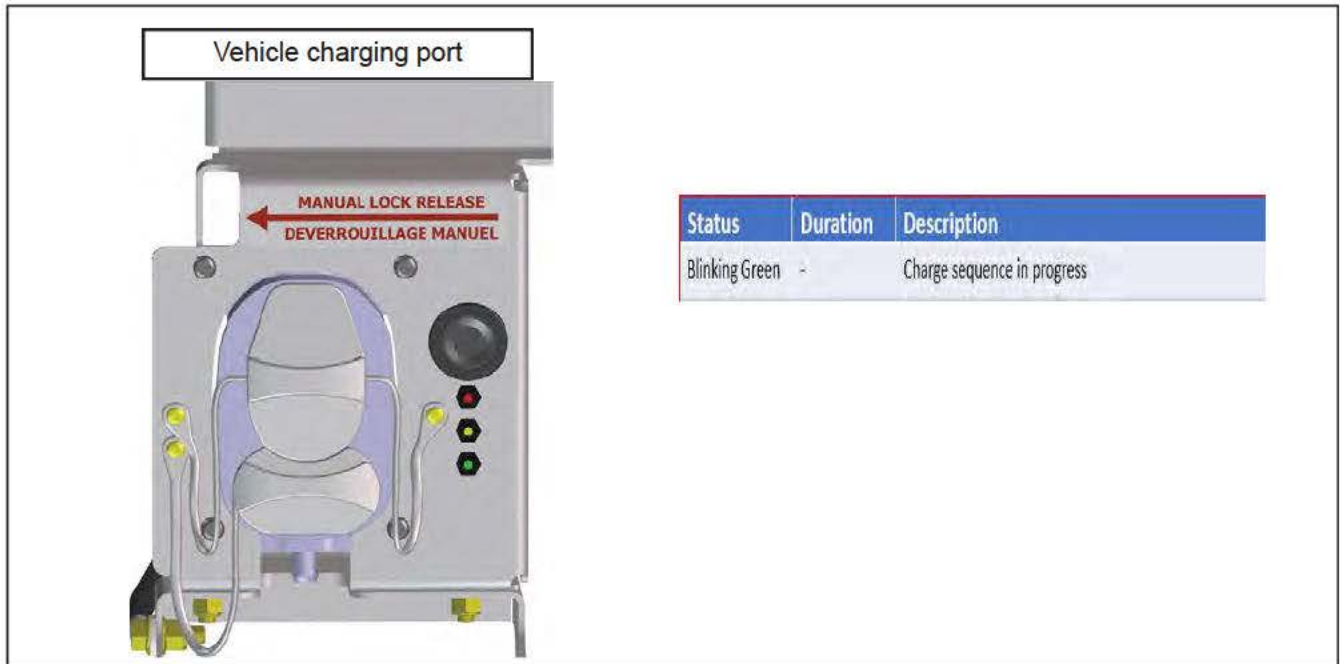


Figure 7 - Vehicule Charging Port

CAUTION

If the status on the charging port is not green, refer to section 11-702: LFSE+ COMBINED CHARGING SYSTEM of the Nova Bus maintenance manual for more information. If required contact your customer support manager for assistance.

2.4. Once the vehicle is fully charged, return the vehicle in service.



ANNEX

HV BATTERY PACK SERIAL NUMBER TABLE

FILL ONE TABLE PER VEHICLE AND RETURN THE COMPLETE TABLE TO YOUR CUSTOMER SUPPORT MANAGER

HV Battery Pack Serial Number Table			
Battery location	Original HV Battery S/N	New HV Battery S/N	Vehicle Identification Number
Motor compartment Curb side			
Motor compartment Street side			
1st Upper Frontr (Roof front)			
2nd Upper Frontr (Roof front)			
1st Upper Rear (Roof Rear)			
2nd Upper Rear (Roof Rear)			
Fill one table per affected vehicle			