



INSTRUCTION TO SERVICE

ITS: 58508

SECTION:	219 ENGINE & TRANSMISSION.
WRITTEN BY:	Michael Rooney
SUBJECT:	Retrofit new PEM Motor mounting & Fuel Cell mounting hardware.

ITS58508

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PROCEDURE:

1. Review and perform the steps in the High Voltage Service Preparation Section #4 1.6 of the Service Manual before beginning work on the bus. Ensure that personnel have the appropriate High Voltage training and High Voltage protective (PPE) equipment.
2. Open the curbside rear access door and locate the 24/12 volt battery switch and high voltage interlock switch.
 - a. Review the De-energizing Procedure section #4 1.6.4.1 of the Service Manual.
 - b. Rotate the 24/12 volt battery switch to the OFF position. Lock and tag the switch and retain key.
 - c. Switch the High Voltage Interlock Switch to the HV OFF position. Lock and tag the switch and retain key.
 - d. Ensure the Energy Storage System (ESS) Manual Service Disconnect cap is removed per the following steps and stowed in a locked location to which you only have access.
 - 1) Using the clamp-on current probe and DMM, ensure that there is no current flowing in the cables connecting to the ESS Manual Disconnect Plug.

⚠ WARNING: NEVER remove the ESS Manual Disconnect Plug while current is flowing through it. The High Voltage may create a long enough ionized gas path, during circuit interruption, to bridge the contacts of the switch base and therefore continue current flow. This ionized gas is very hot and can cause burns, fire & electrical shock.
 - 2) Remove the manual Service Disconnect (MSD) cap from receptacle by pressing on tabs and pulling.

NOTE: For removal of MSD press on tabs located on side and pull – up half way and press on tab located mid-way and pull up.
 - 3) Install a color-coded insulating cover, that is open circuited, in the Manual Disconnect receptacle.

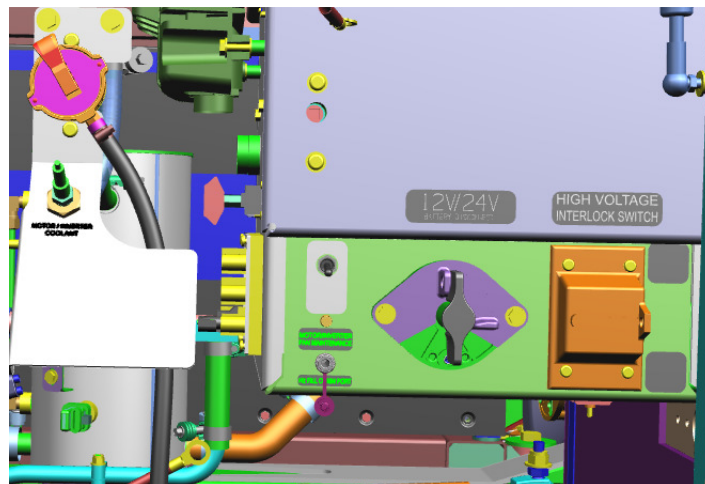


Figure 1: Location of 12/14 Volt & High Voltage Interlock Switches.

3. Raise the bus in accordance with the procedures in the NF Maintenance Manual.
4. Locate the electric drive motor (PEM) located centrally behind the rear suspension.

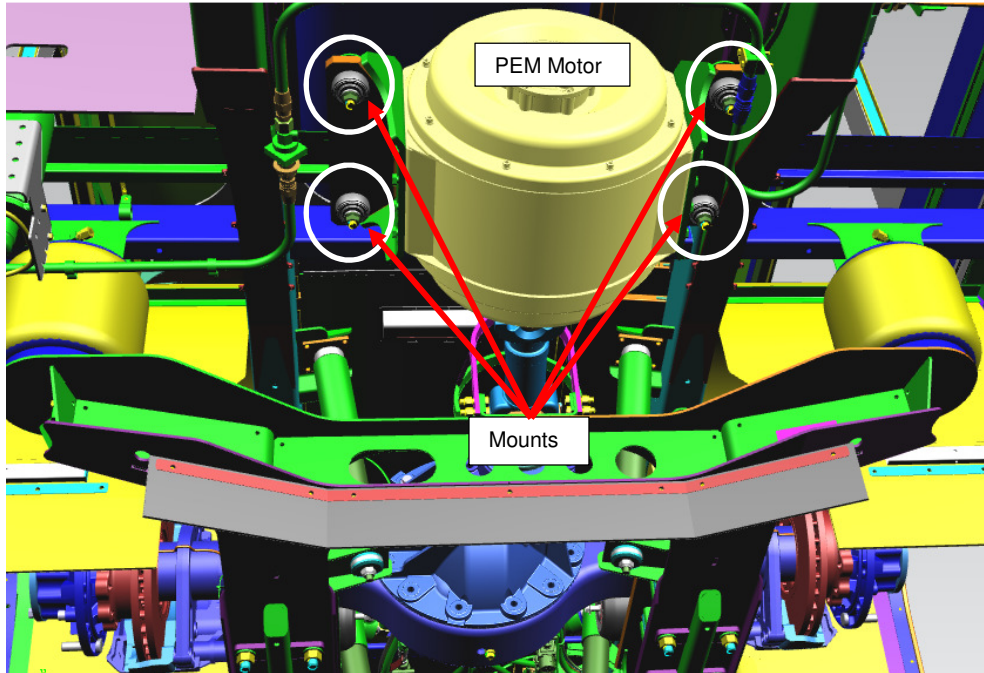


Figure 2: PEM Motor Mounts.

5. One at a time, replace the four PEM Motor mounting bolts and nuts using the following procedure at each mounting location.
 - a. Remove the 5/8" nut and washer on the underside of the mount. Set the washer aside for reinstallation later.
 - b. Remove the 5/8" x 4.5" bolt from the top. Do not lose the 66 MM washer on top of the rubber isolator under the bolt head.
 - c. Insert a new 5/8" x 4.5" bolt NF P/N 10B10072 from the top.
 - d. Reinstall the washer set aside earlier then install a new 5/8" nut NF P/N 40N10000. Torque the nut to 160 ± 10 FT-LBS (DRY).

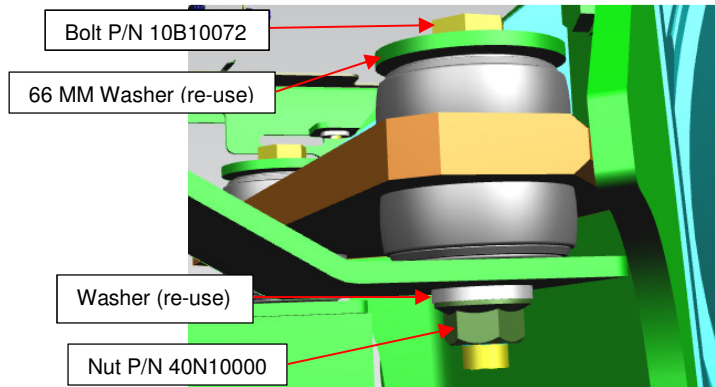


Figure 3: PEM Motor Mount Bolt

6. Locate the fuel cell power plant at the center rear of the bus. There are two rubber isolated mounts at the front of the fuel cell and two more at the rear of the fuel cell.

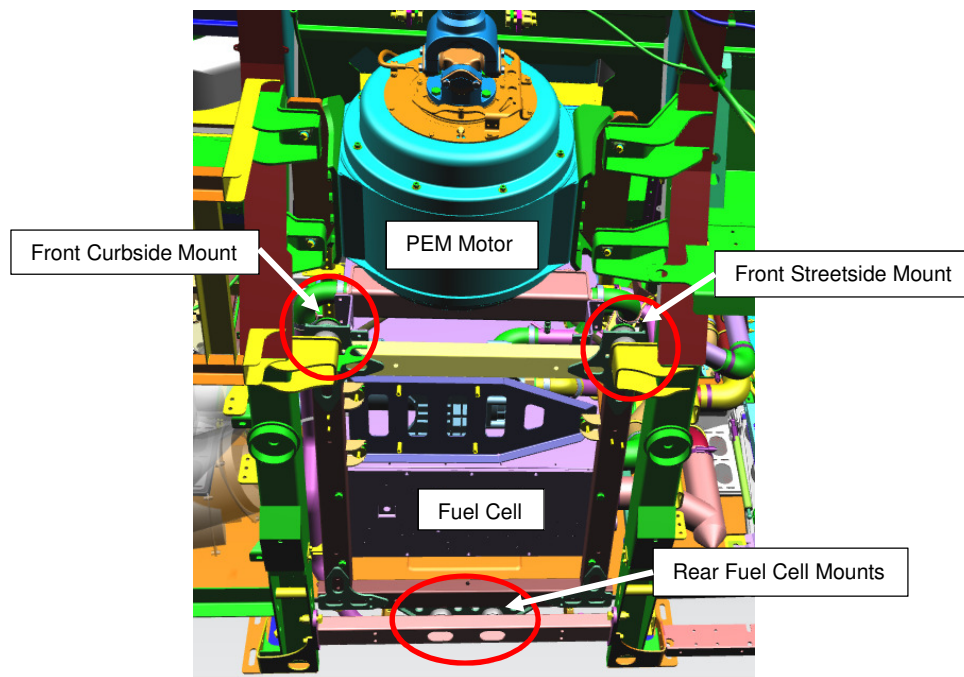


Figure 3: Fuel Cell Mounts.

7. Remove and replace the front mount hardware one at a time using the following procedure on each mount.
 - a. Remove the 5/8" nut and washer on the underside of the mount. Discard both.
 - b. Remove the 5/8" x 4.25" bolt from the top. Do not lose the 66 MM washer on top of the rubber isolator under the bolt head.
 - c. Insert a new 5/8" x 4.50" Bolt NF P/N 10B10072 from the top.



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- d. Install a new hardened Washer NF P/N 20W10000 and a new 5/8" Nut NF P/N 40N10000. Torque the nut to 106 FT-LBS (DRY).

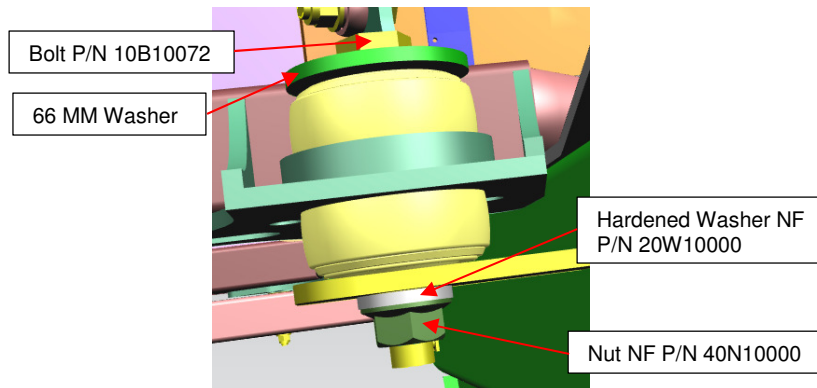


Figure 4: Front Fuel Cell Mount (Part of Bracket Removed for Clarity).

8. Remove and replace the rear mount hardware one at a time using the following procedure on each mount.
 - a. Remove the 5/8" nut on the top of the mount. Remove the 66 MM washer and set it aside for reuse.
 - b. Remove the 5/8" x 4.25" bolt from the bottom through the opening in the cross member. Discard the bolt and the washer under the bolt head.
 - c. Install a new Hardened Washer NF P/N 20W10000 on a new Bolt NF P/N 10B10072 then insert the bolt through the cross member and isolators from the bottom.
 - d. Reinstall the 66 MM washer removed earlier and then install a new Hardened Washer NF P/N 20W10000 and new Nut NF P/N 40N10000. Torque the nut to 106 Ft – LBS (DRY).

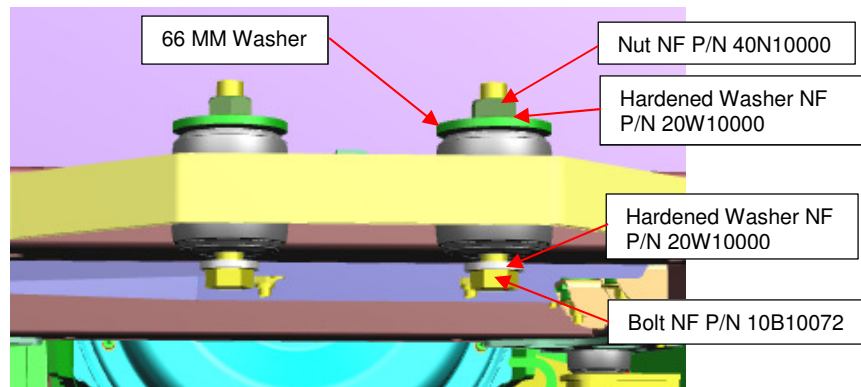


Figure 5: Rear Fuel Cell Mounts (Chassis Cross Member Removed for Clarity).

9. Lower the bus in accordance with the procedure in the NF Maintenance Manual.
10. Use the following Energizing Procedure (Section #4 1.6.4.2 in Service Manual) to re-establish power to the bus.



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⚠ WARNING: DO NOT touch cable terminations until checking to ensure there is no voltage between any of these cables and with respect to vehicle chassis.

While connecting HV cables continuously monitor with the DMM for the inadvertent appearance of HV. If HV appears, dress in PPE and trouble shoot why the HV appeared and resolve.

- a. Remove the color coded insulating cover.
 - b. Install the ESS Manual Disconnect cap.
 - c. Close all HV access panels, doors, enclosures.
 - d. Remove the lock/tag from the 24/12 volt Battery Disconnect Switch. Rotate the 24/12 volt battery switch to the ON position.
 - e. Remove the lock/tag from the High Voltage Interlock Switch. Rotate the HV Interlock to the ON position.
 - f. Remove Safety barricade with warning lights and “Danger High Voltage” signs around the vehicle perimeter.
11. Close and secure the outside access doors.



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LABOUR ESTIMATE

	Operation	Men	Hours	Labour Time M X HR
1	Retrofit new PEM Motor mounting & Fuel Cell mounting hardware.	1	1.5	1.5

PARTS REQUIRED

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	10B10072	BOLT – HEX 5/8 UNC X 4.50	8	EA	
2	40N10000	NUT – HEX LOCK 5/8 UNC	8	EA	
3	20W10000	HARDENED WASHER – 5/8	6	EA	

SPECIAL TOOLS REQUIRED

Item	Part Number	Description	Qty. per Coach	Units	Notes
1		No Special Tools Required			