RECALL

Issue Date	11/21/2024
Revision Date	12/12/2024
Subject	800V Prodrive 1.0 Inverter Thermal Paste Recall
Description	Certain Phoenix Transit buses may lose propulsion due to inverter IGBTs overheating. This instruction set below provides the necessary information to remove and replace the vehicles inverter.
Model Affected	Service Specified Buses
Complete By	Next Service Opportunity
Service Campaign Number	SC-24-007
Remedy Description	Phoenix will replace the Danfoss inverter at no charge to the customer.
NHTSA Recall Number	23V697
Transport Canada Recall Number	TC-2023-559
Part Number	R066653 or R198-0303
Labor Operation Code	PD55V

Labor Table				
	Operation	**Technicians**	**Hours**	**Labor Time (T x H)**
1	Steps 1-26 (Inverter R&R)	1	2.5	2.5 Hours
2	Step 27-40 (Inverter Software)	1	.5	.5 Hours
		Total Labor Time:		3 Hours

Contact the Phoenix Customer Service Team with any questions related to the following procedure.

909-987-0815
transitservice@phoenixmotorcars.com

Parts Required:

			Qty.	UOM
	R198-0303	INVERTER, MOTOR, 800V		EA
OR	R066653	Inverter, Motor, 800v, Loctite Thermal Paste		EA
				EA
				EA
				EA
				EA
			Qty.	UOM
		Coolant		
		Absorbent Towels		
		Torque Paint		
		Loctite 243		

Tools Required:

- Catch Pan
- 8mm Socket/Ratchet
- 10mm Socket/Ratchet
- 13mm Socket/Ratchet
- 15mm Socket/Ratchet
- 5mm Allen Wrench
- Hose Pinch Pliers
- Hose Clamp Pliers
- Torque Wrenches (rated from 28 in-lb to 48 ft-lb
- UQM Programming Harness (046580)
- Laptop
- UQM Program (UqmMotor-v41210P)
- USB to Serial Adapter (005329)
- MicroUSB to USB
- Phoenix Diagnostics Tool
- Nexiq USB Link 2

Notice:

It is required for removed part from the bus to be returned to Phoenix with in 30 days following the RMA process. Follow this link to submit the RMA request. https://app.smartsheet.com/b/form/bd30097f192f469a9f157415a0b787c4

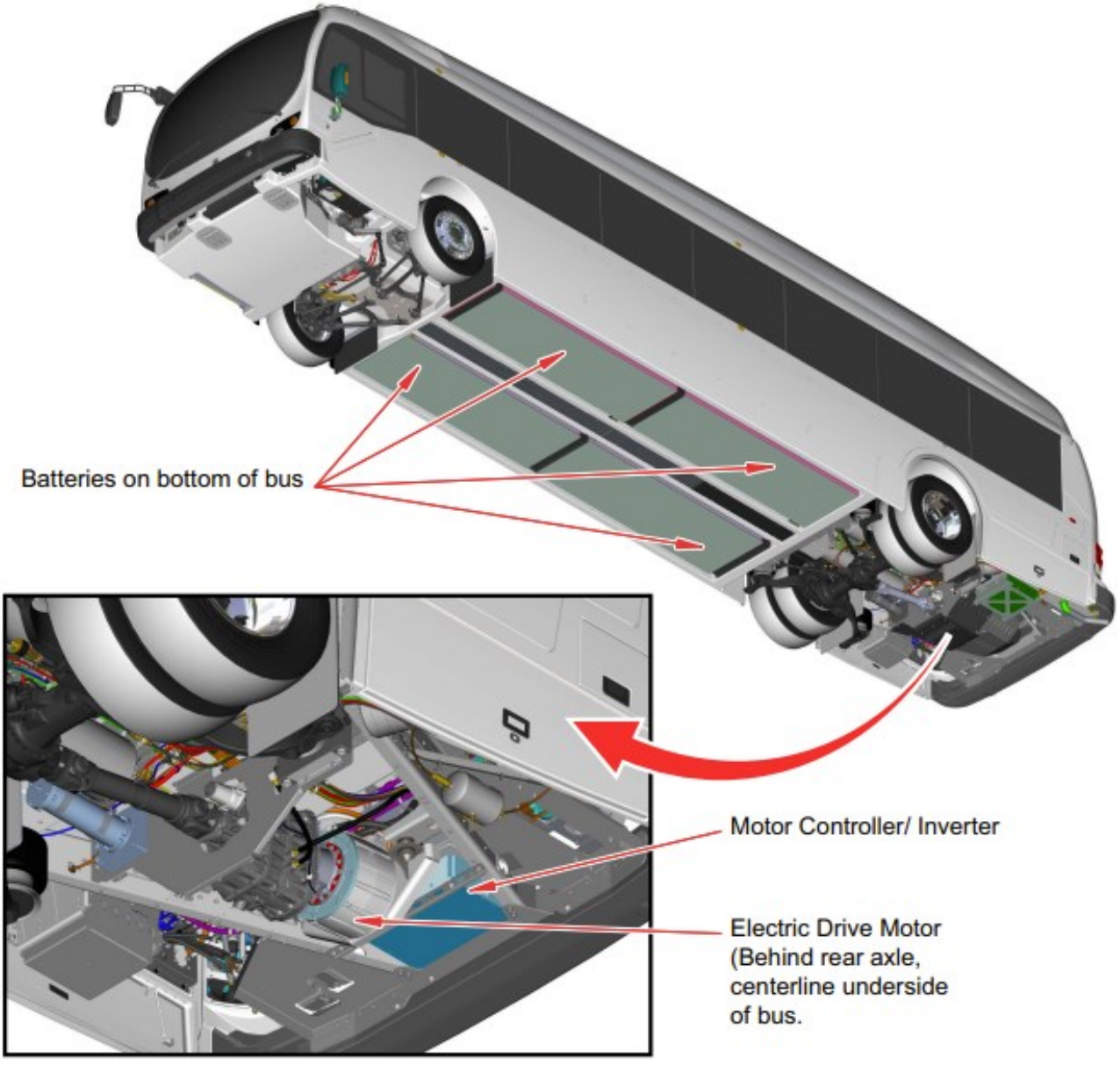
Reporting Work Completion:

The provided form MUST BE COMPLETED for each vehicle undergoing this procedure.

Perform the 800V Prodrive 1.0 Inverter Thermal Paste Recall procedure before reporting work completion. Please collect all relevant data regarding the repair as specified on the Verification Form and provide to transitservice@phoenixmotorcars.com.

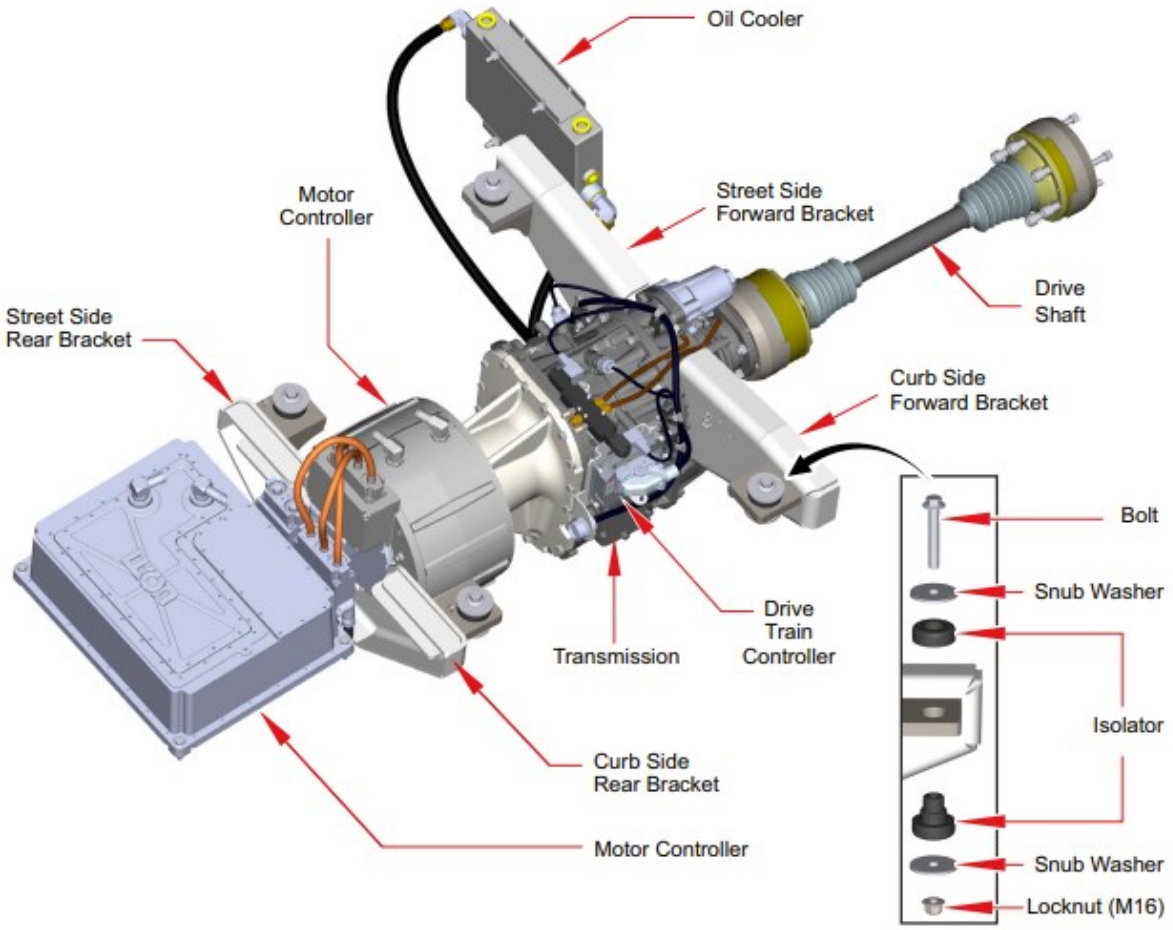
Overview:

This document outlines the procedure for the removal and replacement of the traction motor inverter for a 40’ and 35’ vehicles. This proactive measure will help maintain peak operational standards.



Step 1:

Please review the image below before starting work on the vehicle. Knowledge of this image will facilitate correct execution of the repair procedure.



Step 2

Park the vehicle in a bay with lifts.

Complete the Phoenix approved Lockout/Tagout procedure to ensure the bus is safe to work on.

Step 3:

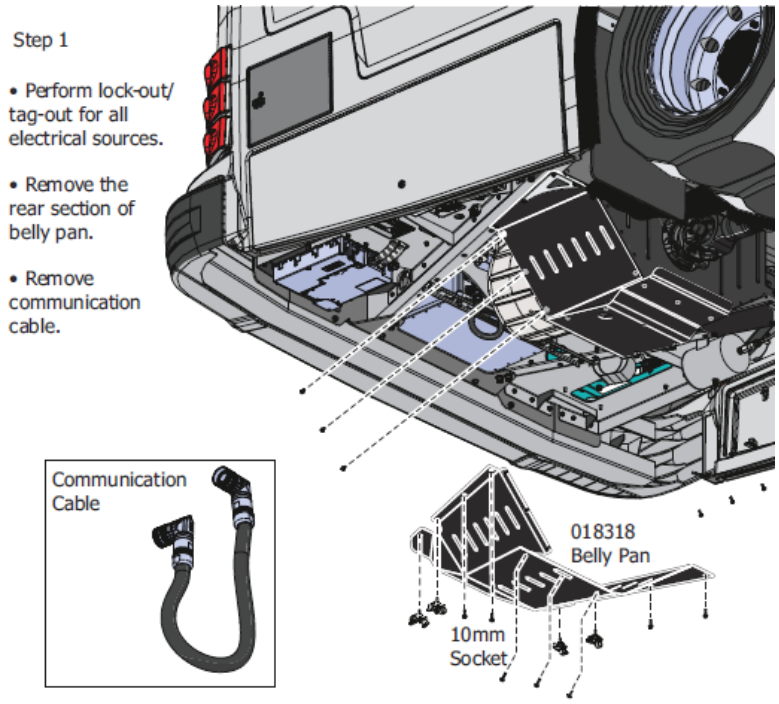
Drain the air from the bus using the valves in the rear lower streetside hatch.

Raise the vehicle into air using wheel lifts and place 4 jack stands on each of the jacking point.

Step 4:

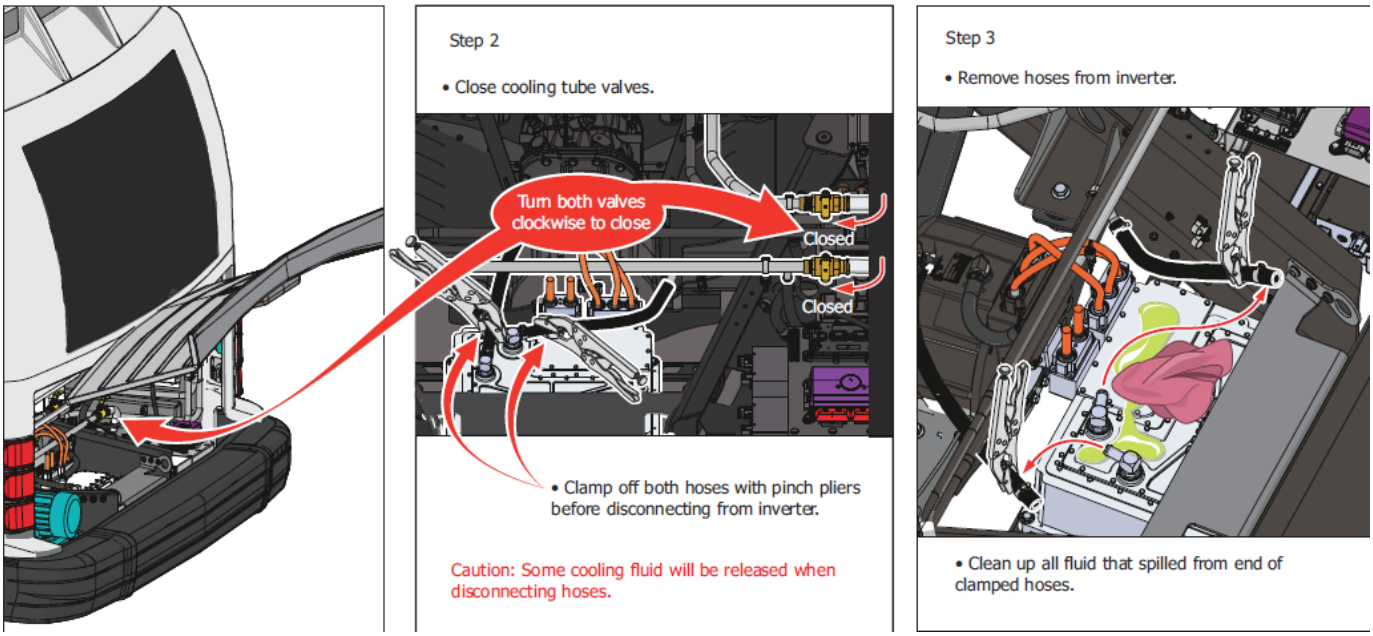
Remove the rear section of belly pan.

Remove the communication cable.



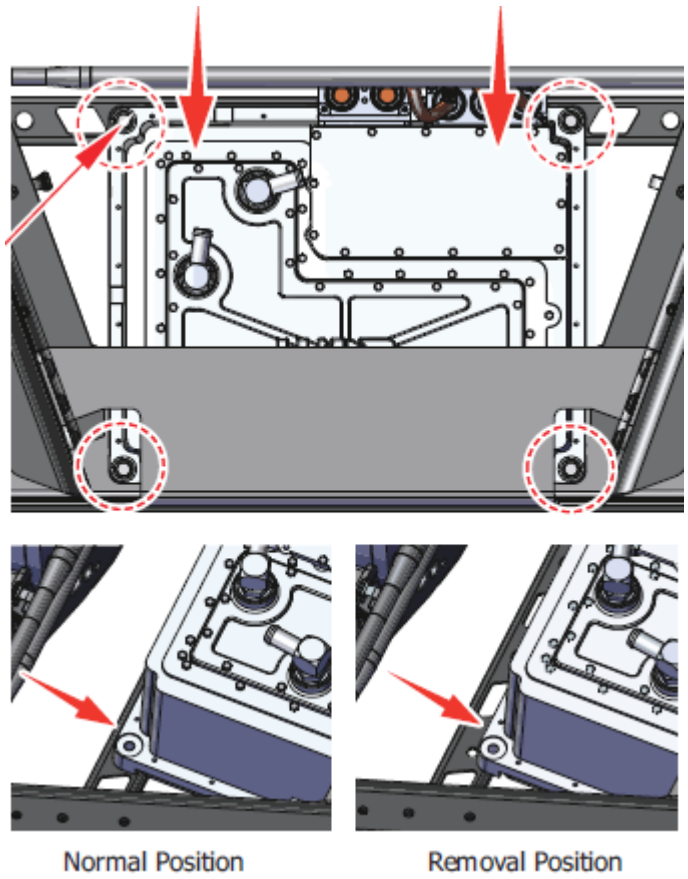
Step 5:

Close coolant lines and with pinch pliers clamp off hoses going to inverter. Remove coolant clamps and coolant lines from the inverter.



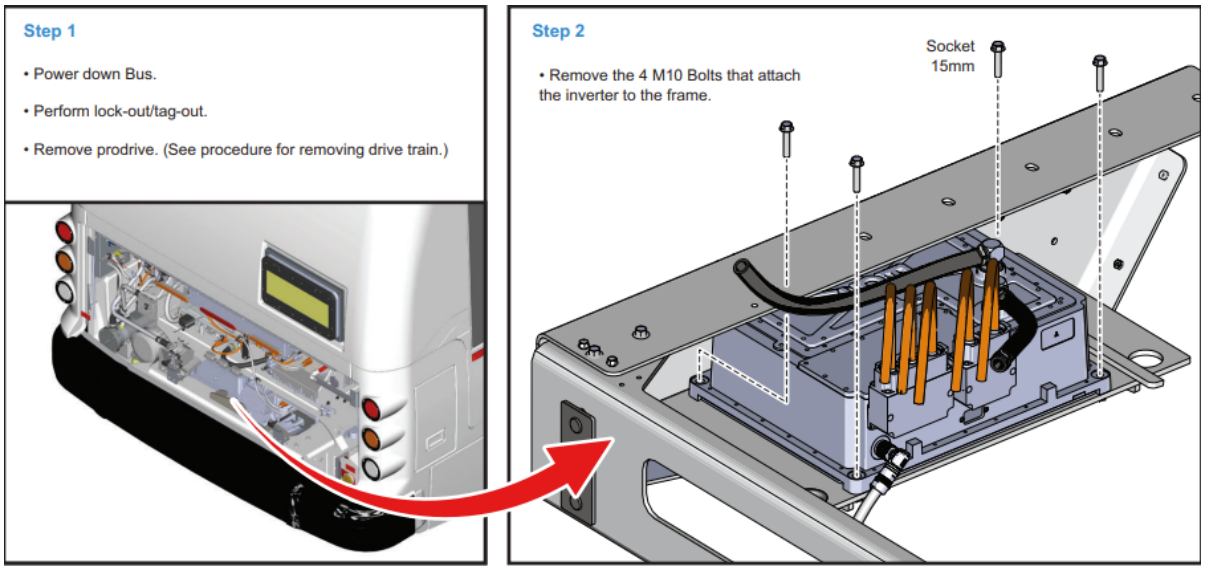
Step 6 (40 Foot Vehicle):

On a 40 foot bus remove the four fasteners circled in red using a 15mm wrench. Then pull the inverter towards the rear of the bus to access HV cables



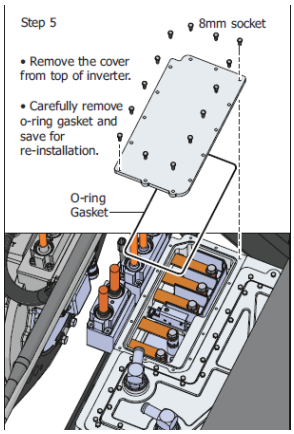
Step 7 (35 Foot Vehicle):

On a 35 Foot Vehicle notice the location of the inverter is different and remove the 4 M10 bolts using a 15mm socket.



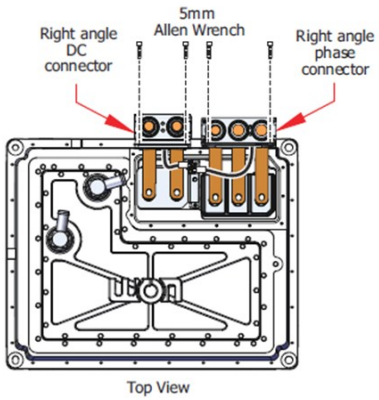
Step 8:

Remove the cover from the top of the inverter using an 8mm. Carefully remove the oring gasket from the cover.



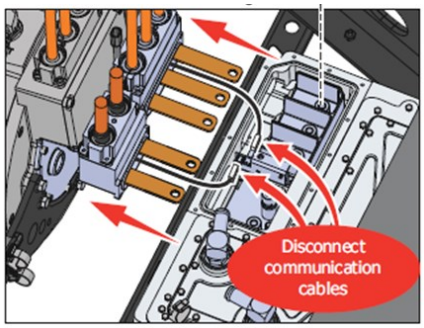
Step 9:

With a 5mm Allen Wrench remove the socket head cap screws that secure the right angle DC connector and phase cables to the inverter.



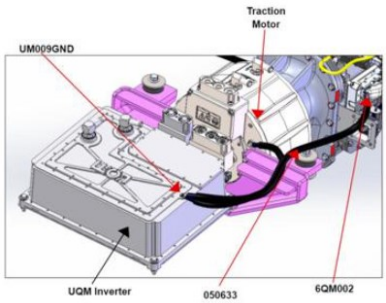
Step 10:

Disconnect bus bars using a 13mm socket then disconnect the communication cables.



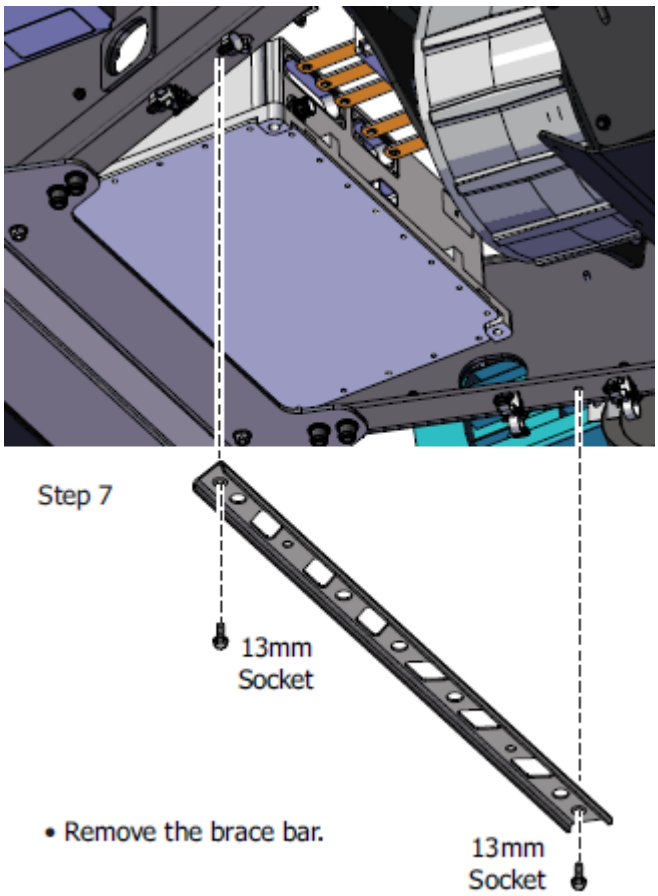
Step 11:

Remove ground cables.



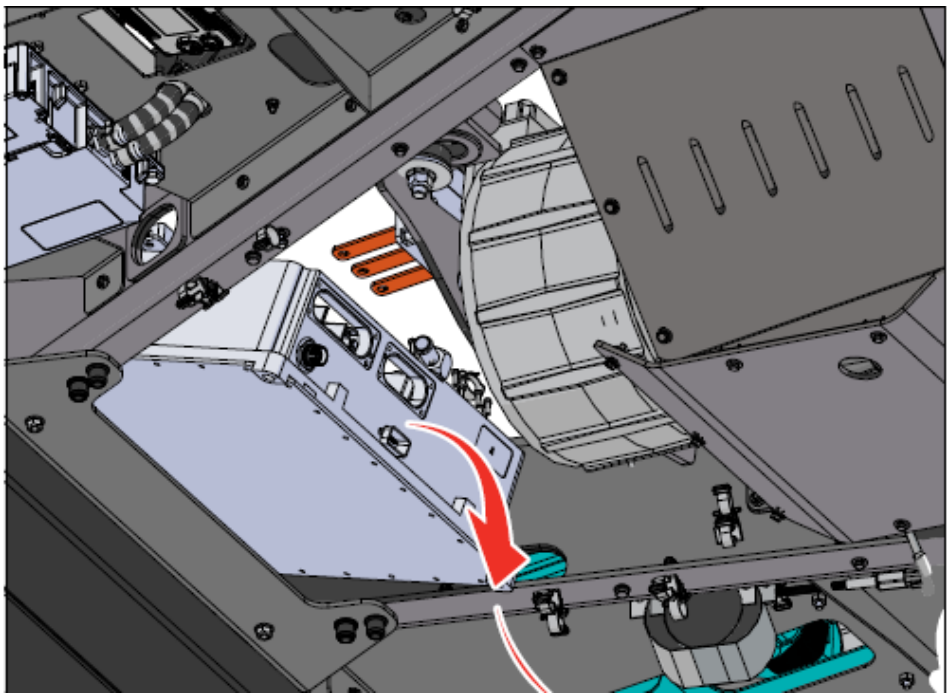
Step 12 (40 Foot Vehicle):

The 40 foot vehicle requires removing the bottom brace from rear frame.



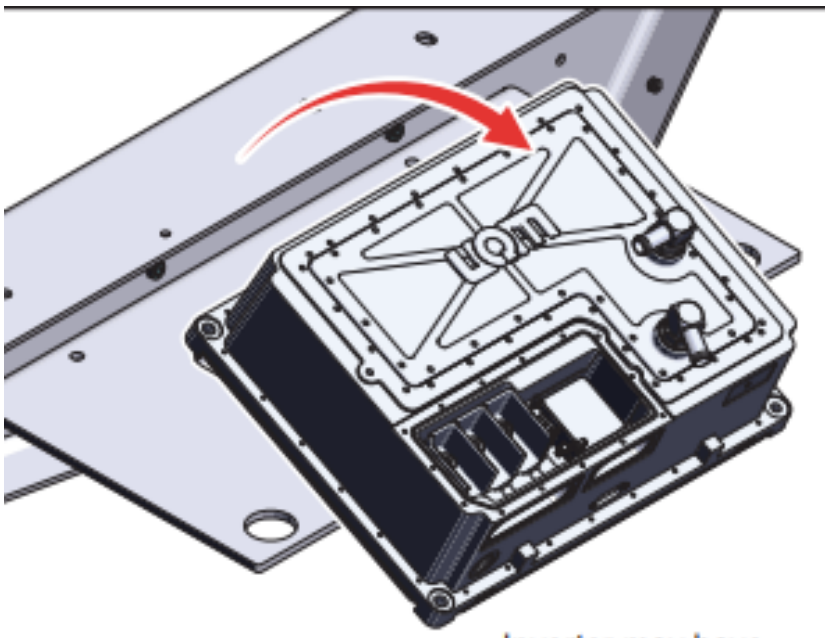
Step 13 (40 Foot Vehicle):

Then slide the inverter towards the front of the vehicle and rotate down to remove.



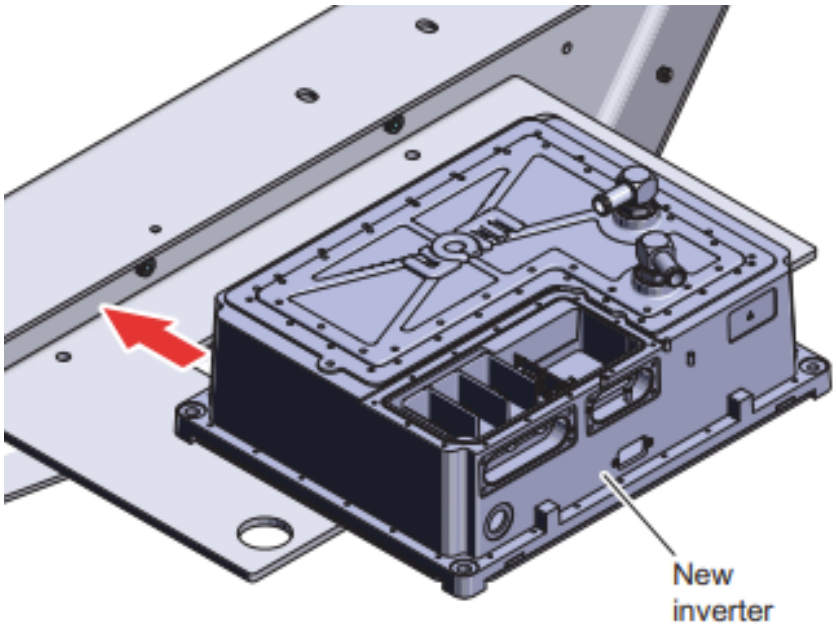
Step 14 (35 Foot Vehicle):

For the 35’ vehicle removal of the inverter, carefully slide the inverter off the shelf tilting down as more room comes available.



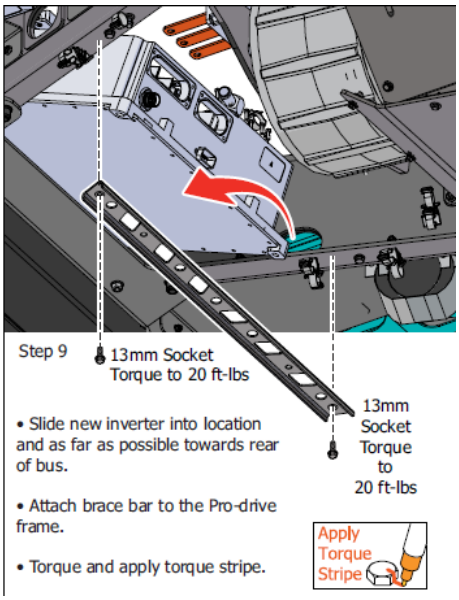
Step 15 (35 Foot Vehicle):

On 35’ vehicle installation, following the orientation of the unit that was just removed tilt the unit up then slide the inverter on to the shelf.



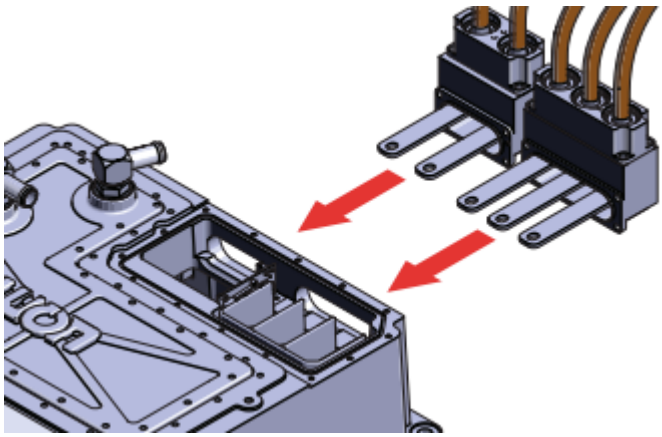
Step 16 (40 Foot Vehicle):

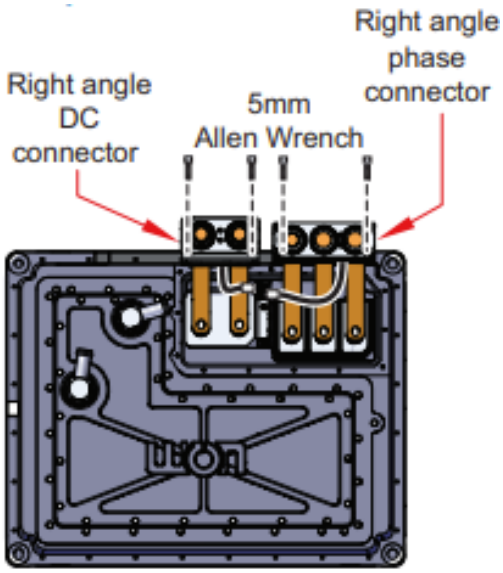
For the 40’ installation of a new inverter, follow the same orientation as the previous was removed. Install the brace bar with a 13mm and torque to 20FT-LBs. Torque paint the hardware.



Step 17:

Then install DC and Phase HV connectors into position using a 5mm allen on the qty 8 m6 socket head hardware, torque to 50-55 IN-LBs.

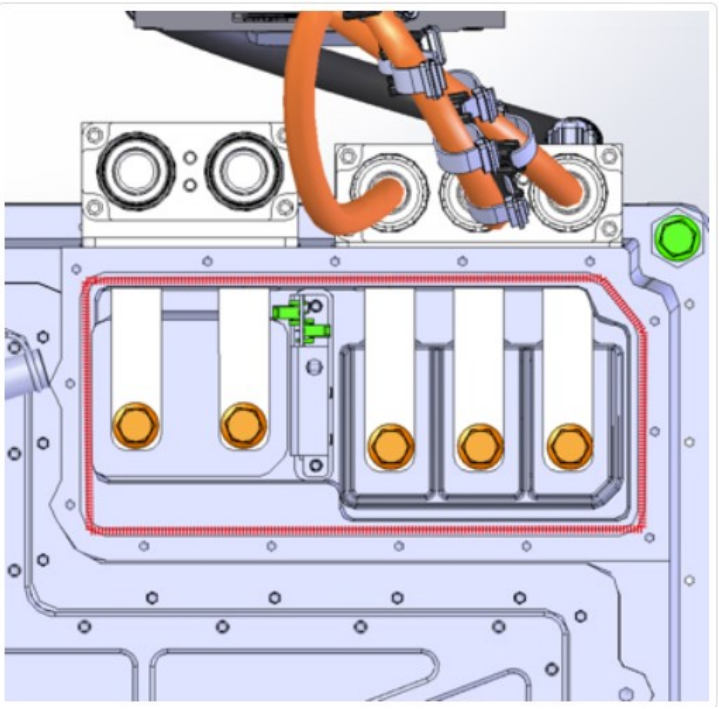




Top View

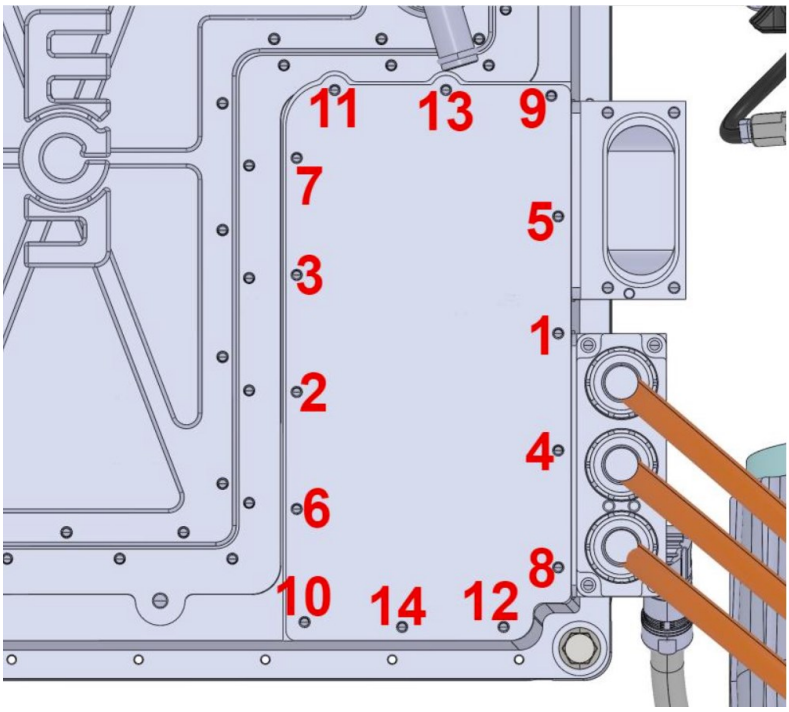
Step 18:

Reinstall hardware with a 13mm socket to secure bus bars to the inverter terminals. Torque to 20 FT -LBs. Reconnect the small communication cables.



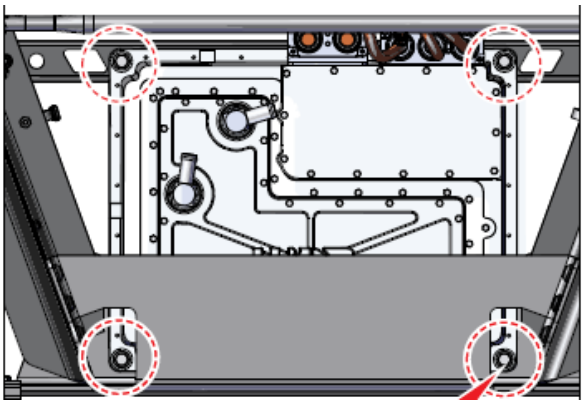
Step 19:

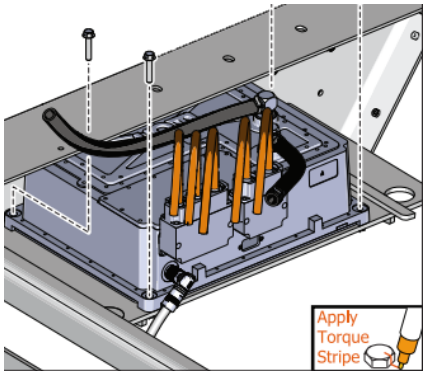
By hand reinstall the cover plate using an 8mm socket in the following sequence shown below. Verify gasket is installed and seated in the groove of the cover perimeter. Torque to 30 IN-LBs. Torque paint this hardware once complete.



Step 20:

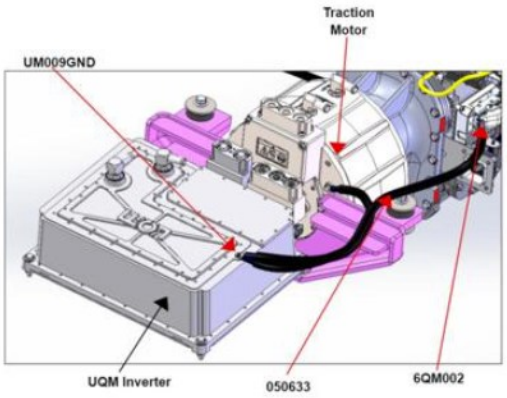
Align the inverter's mounting holes with the holes in the bracket. Apply Loctite 243 to the hardware and start threading the bolts by hand. Torque the mounting hardware as followed. If the mounting uses a through bolts torque to 44 FT-LBs and for vehicles with fixed nuts to back of mounting plate torque to 35 FT-LBs then apply torque paint.

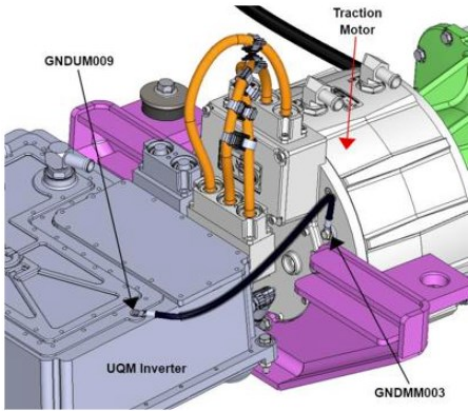




Step 21:

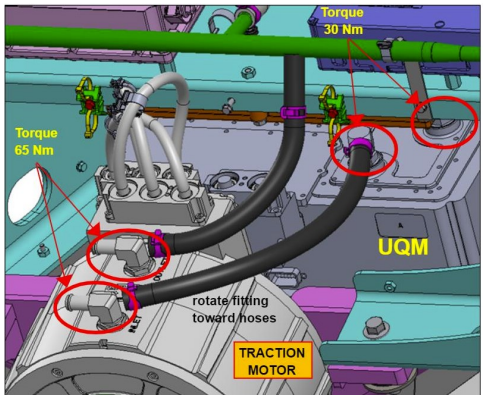
Reinstall both ground cables onto inverter. Torque to 9NM.





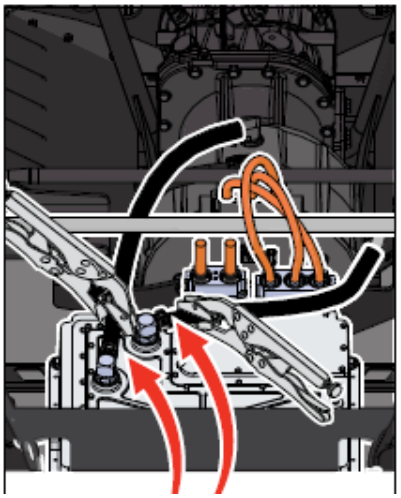
Step 22:

Install coolant lines and clamps. The coolant lines should be routed direct as possible If the inverter coolant fittings are clocked in the wrong orientation, loose the fitting, swivel to required position and torque fittings to 30NM. Compare to the recently removed inverter if needed.



Step 23:

Removed the coolant pinch clamps. Then open the coolant lines ball valves.

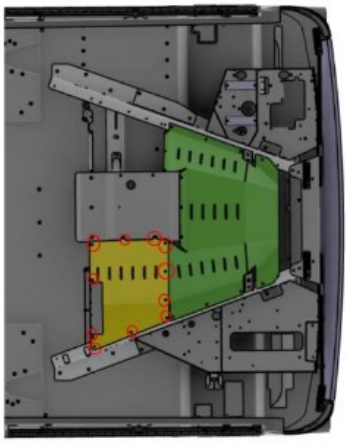


Step 24:

Install communication cable using a strap wrench. Torque to 28 IN-LBs.

Step 25:

Install Belly pans using the a 10mm with blue Loctite. Torque to 16Nm.



Step 26:

Remove the jack stands from below the bus and lower bus off wheel jacks.

Remove Lock out Tag Out equipment.

Step 27 (Inverter Programming):

Turn ON the rear master switch, and turn the dash switch to “ACC”, turn the hazards ON. Ensure the LV are charged and are able to run for 30 minutes with out high voltage turned on..

Step 28:

Gather necessary files from the .ZIP file attached in ServiceMax under the campaign documents. For this platform of vehicle you will need UQM Application “UqmMotor-v41210P” and PP250_rev2.qsc.

Step 29:

Gather the necessary harnesses and equipment. The required equipment to flash the vehicle is Interface (UQM Adapter) *PN 046580,* USB to Serial Converter *PN 005329,* and a MicroUSB to USB.

Step 30:

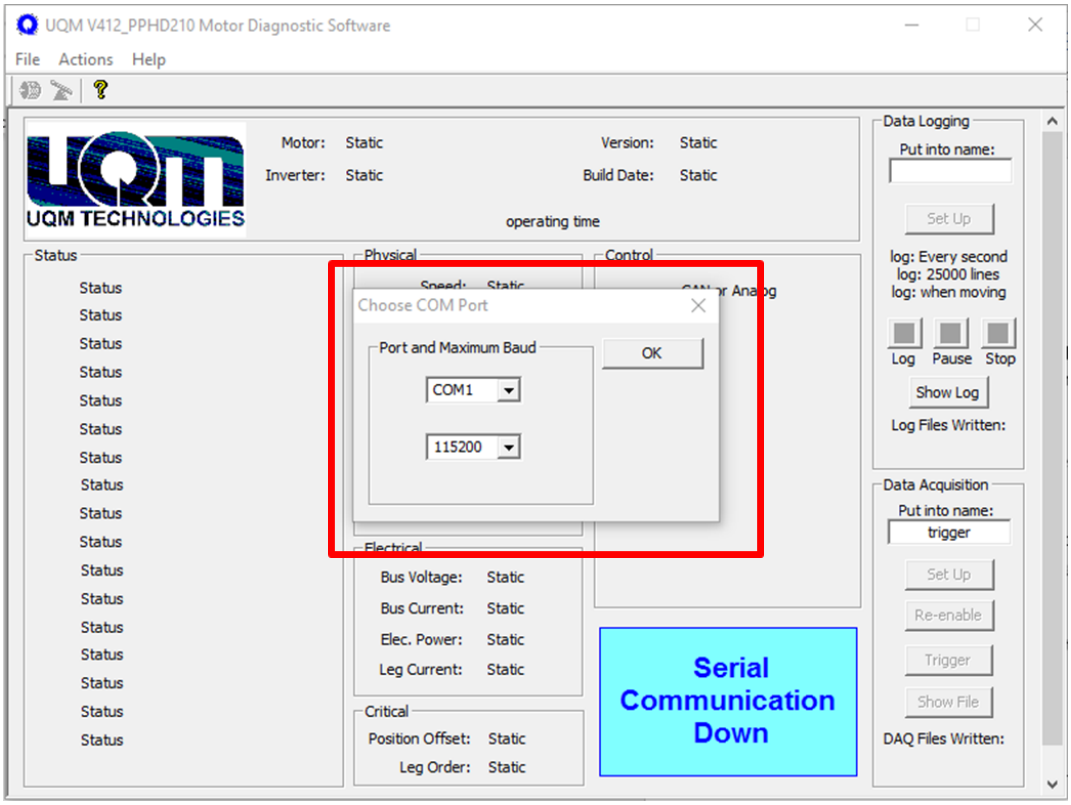
Locate the 3 pin Deutsch located under the rear hatch in the prodrive area of the vehicle. Install UQM Interface harness to the bus side 3 pin Deutsch. Then plug USB to Serial Converter into the UQM Interface harness. Finally plug the USB into the laptop.

Step 31:

With all other programs closed, open the UQM Application “UqmMotor-v41210P”.

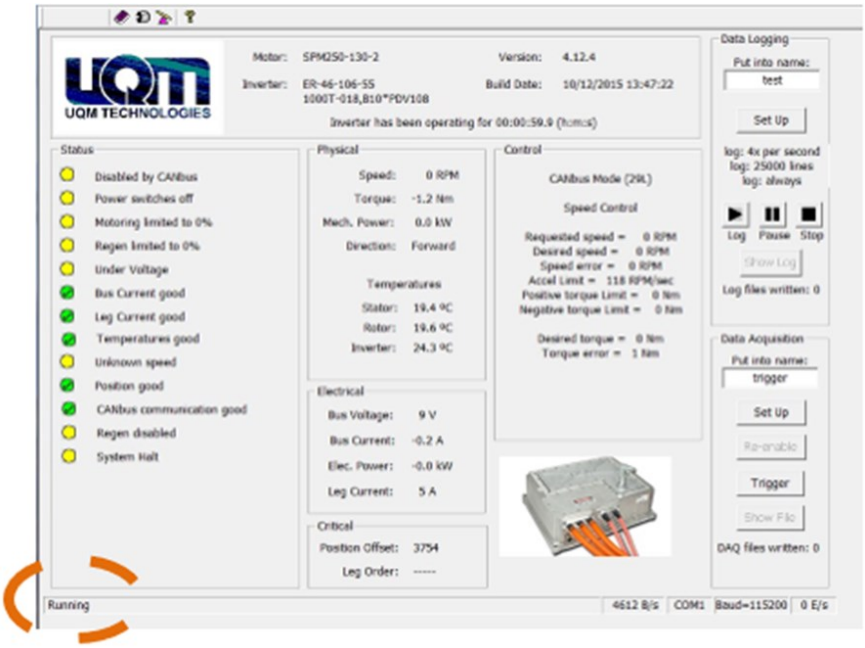
Step 32:

Once the UQM tool opens, select the USB COMM Port the USB Serial Converter is plugged into the laptop. Use the computer device manager if there is any question to which port is correct. Select the baud rate to be 115200.



Step 33:

Ensure the USB device is communicating with the inverter, the screen should look similar to the image below, with the word “running” appearing in the bottom-left corner.



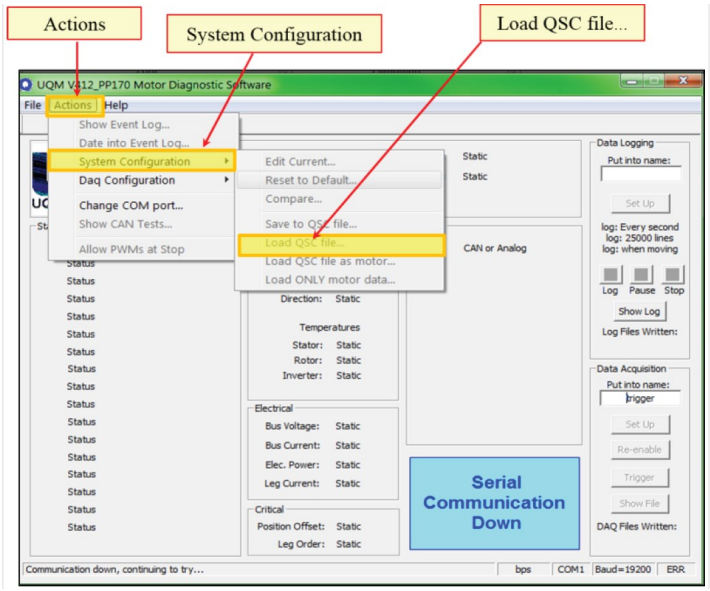
Step 34:

Loading the QSC file. Go to Actions, then System Configurations, then load QSC file.

This file “PP250_rev2.qsc” is the in the campaign file package. It is required the file is stored locally on your hard drive.

Select the file.

Once the program runs close out the tool.

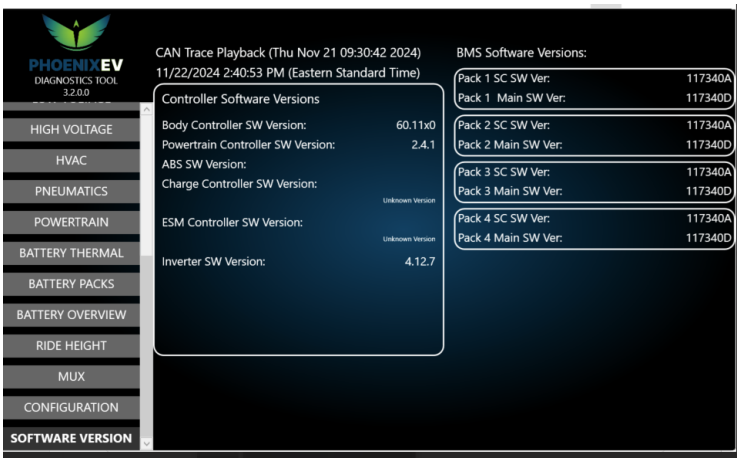


Step 35:

Perform a full power cycle of the vehicle.

Step 36:

Connect to the bus at the front OBD2 port using a Nexiq. Launch the PDT. Select connect. Go to the Software version Tab and verify a software version is listed.



Step 37:

Turn the drivers key to Run and allow for High Voltage to Engage verify no faults are on the dash or PDT.

Step 38:

With the brakes applied shift the vehicle into forwards and reverse then double check for no faults occur on the dash or PDT.

Step 39:

Return Vehicle to service.

Step 40:

It is required to submit an RMA for the replaced unit. Please Submit an RMA request https://app.smartsheet.com/b/form/bd30097f192f469a9f157415a0b787c4. Please provide the Phoenix Recall Work Order Number and Failure Work Order on the RMA Request.

Work Order #

Please provide Work Order or Warranty Claim #