ISSUE DATE:	05/15/2023
SERVICE BULLETIN SUBJECT:	800v RR Duopower Spring Software Release
VINs or MODELS AFFECTED:	Service Specified Buses
COMPLETE BY:	Next Service Opportunity
SERVICE BULLETIN #:	SC-23-079
Labor Operation Code:	PP57Z

NOTICE! It is expected that this process may require up to 1.5 hours per bus. Please schedule appropriately to minimize vehicle downtime.

800v RR Duopower Spring Software Release

Description

This procedure describes the process for updating the DuoPower Body, Vehicle and Powertrain Controllers software to the latest version.

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Summary of Software Changes:

1. HV Faulted Shutdown improvement to prevent Fuse Clearing
    - Increased VIC HV sensing and robustness to prevent closing contactor under load on startup after faulted shutdown.
2. Overhead Charging Robustness Improvements
    - Added time outs and state resets to avoid getting stuck waiting in certain overhead charge process states.
    - Added robustness to no WIFI connection.
3. Compressor Diagnostic Robustness improvements
    - SPN 1351 FMI 7 false failure fix
4. Power steering Diagnostic Robustness improvements
    - Power steering compressor RPM target and diagnostic maturity time change to prevent false failure during normal operation.
5. Compressor Faulted Audible Alert Improvement.
    - Change to make air compressor faulted Dash display constantly drive buzzer to prevent being ignored.
6. Dash saturating and showing “0” at high value.
    - Update to only send highest value the dash is capable of displaying.
7. Radiator Fan Fault Robustness improvement
    - Fix to remove false failure diagnostic setting tied to reverse speed on startup.
8. Push Button Door Button lights with door closed while moving.
    - Issue noticed in final validation mileage testing.
    - Verified that push button doors no longer light when not able to open and operate appropriately.

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Tools/Programs Required

Tools Required:

- Laptop Computer
- Nexiq USB-Link 2

Programs Required:

- Proterra Diagnostics Tool

Software Files Required / Preparation

IMPORTANT! NEVER access the software from the USB memory device, ALWAYS copy the software files to your computer hard drive and access the software from this location. Secure the bus with the Vehicle Master Disconnect in the rear ON.

Component	Part Number	Version
Vehicle Controller	064390	4.9.3
Powertrain Controller	064360	4.0.0
Body Controller	064579	6.14.0

It is recommended that you copy the files from ServiceMax campaign page to your local machine in order to more effectively keep track of the software versions you are deploying: https://proterra.lightning.force.com/lightning/r/P_Service_Campaign__c/a7V8W000000slCXUAY/view

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BODY SOFTWARE UPDATE PROCEDURE

Preparing the Vehicle to be Programmed

When programming a vehicle, it is critical that the low-voltage batteries remain connected throughout the process. Ensure that the LV batteries are fully charged before starting the process. If they are low you can use the vehicle to recharge them by turning on high-voltage, or you can place the bus on a low-voltage charger for the duration of the process.

Connecting to the Vehicle

This process will guide the user to connect to the vehicle with the Proterra Diagnostics Tool.

1. Power on and login to the Proterra-Supplied laptop or a comparable PC that has the Proterra Diagnostics Tool software installed with a valid license.

2. Turn on the 12/24V rear Vehicle Master Disconnect located at the curbside rear charge port access panel.

Vehicle Master Disconnect

3. Connect the Nexiq USB Link2 device to the laptop and to the OBD-II Diagnostic Port located in the streetside wheel well box. Use the J1939 port if the OBD-II port is unavailable.

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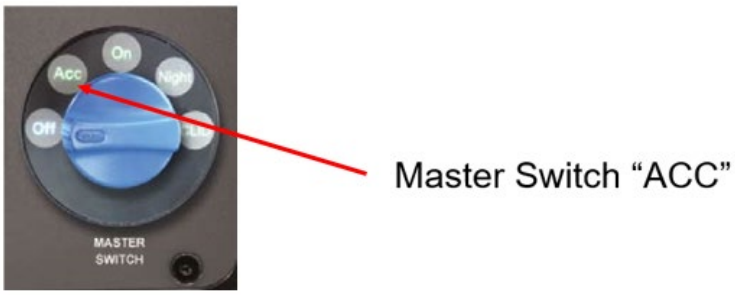
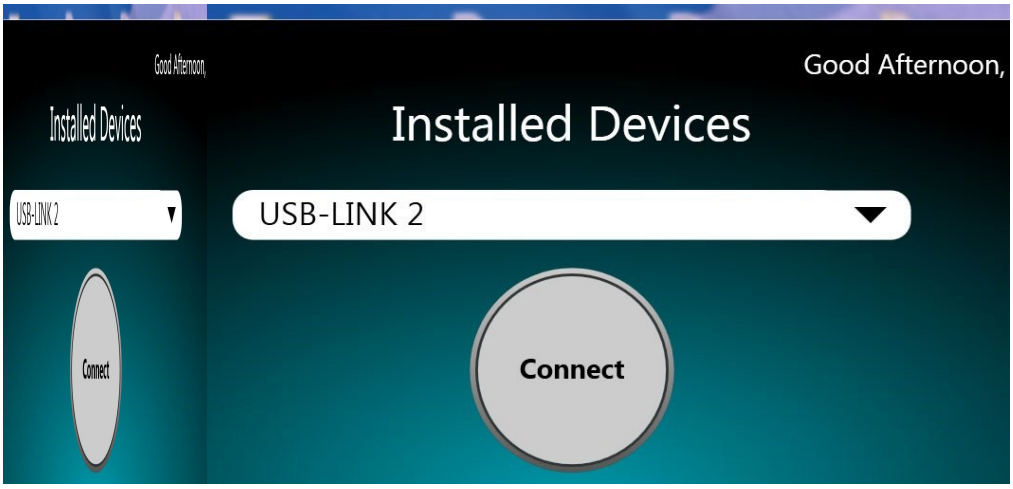
4. Turn the Driver's Master Switch to the "ACC" position.



5. On the laptop, double-click on the Proterra Diagnostics Tool software icon to start the software.

6. When the program opens, read and click "OK" for the high-voltage safety prompt.

7. On the Home tab, select the appropriate device from the drop-down menu and click "Connect".



8. Once the Proterra Diagnostics Tool has connected to the vehicle, you will have a VIN number and connection status displayed on the Home screen, and tabs available to navigate. If you do not, double check that the low-voltage batteries are connected and that the Nexiq tool is plugged in.

Download and Store Existing Parameters

Sometimes you might want to download and store the customer specific parameters from the vehicle. This can be useful when comparing two vehicles that are behaving differently, or if you are replacing the ZR32A controller on a vehicle.

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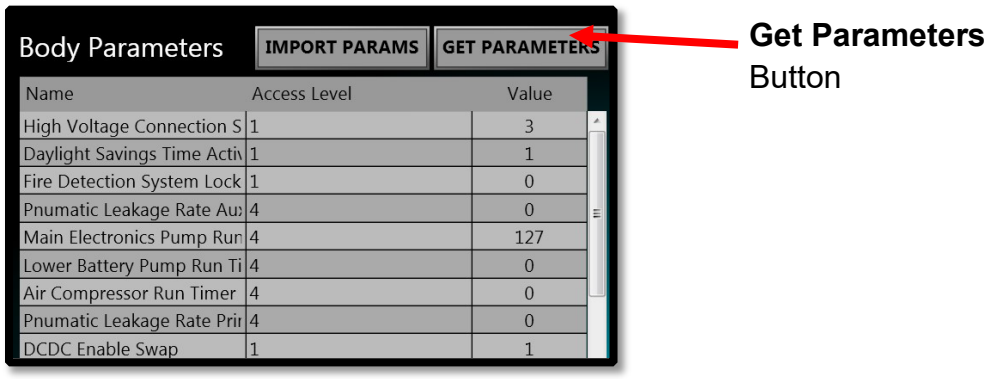
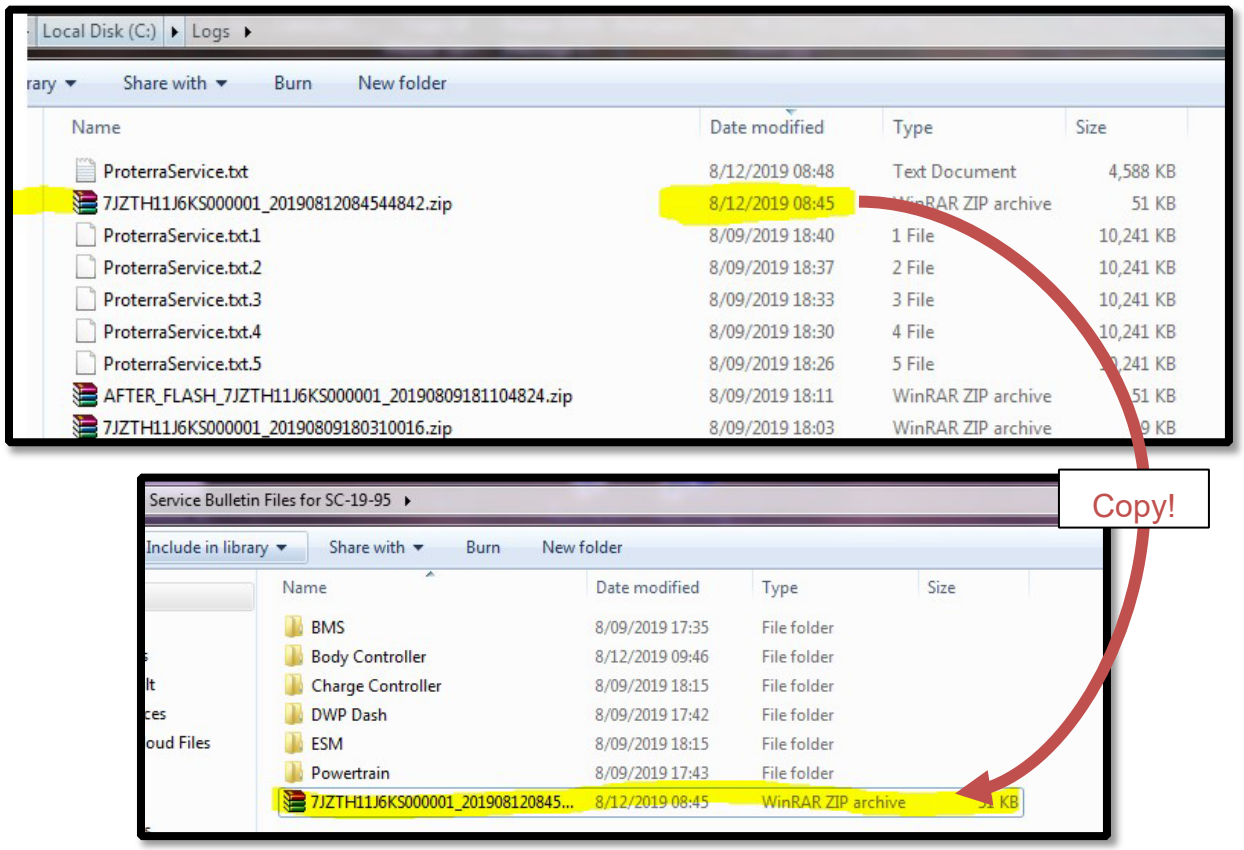
1. After the first vehicle has been completed and verified, disconnect the Proterra Diagnostics Tool and then reconnect.

2. Navigate to the Configuration tab and click the “Get Parameters” button. This will download the latest parameter set to the “C:\Logs” folder on your machine.



Get Parameters Button

3. In windows file explorer, navigate to the “C:\Logs” folder. Copy the latest downloaded *.zip file to a folder for the specific customer and vehicle.



4. Do not rename the file as the tool will follow the naming convention when reloading the file.

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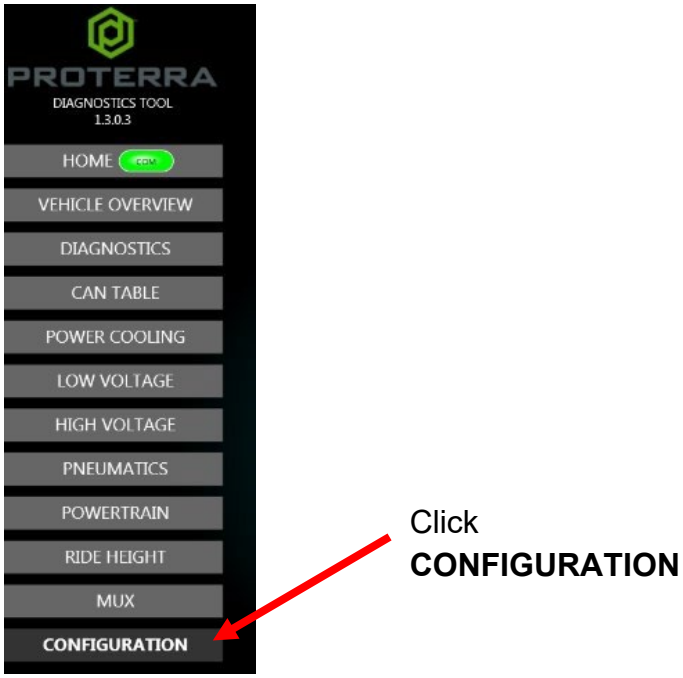
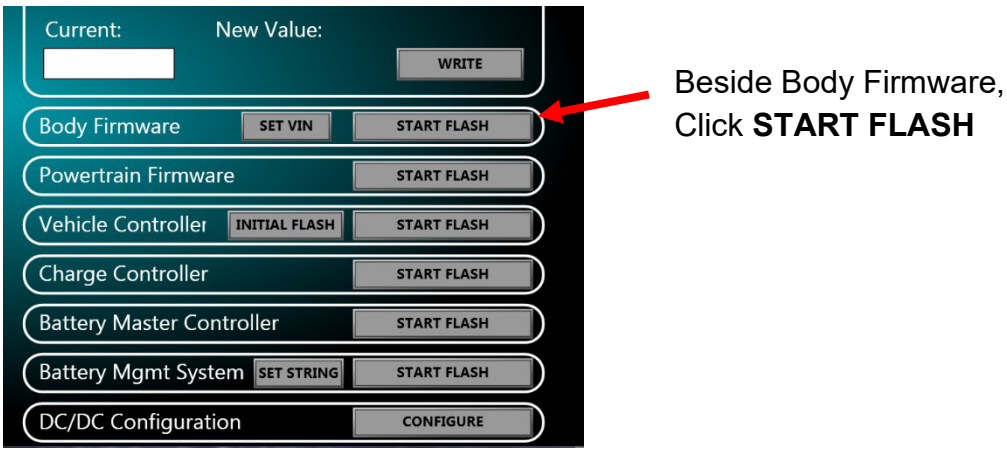
Update Using the Proterra Diagnostic Tool

1. Navigate to the CONFIGURATION tab in the left menu.



2. If this is a replacement controller, select the “SET VIN” and program the controller to match the vehicle VIN, then proceed to step 3. If not a replacement controller, proceed to step 3.

3. Select the option for Body Firmware “START FLASH”.



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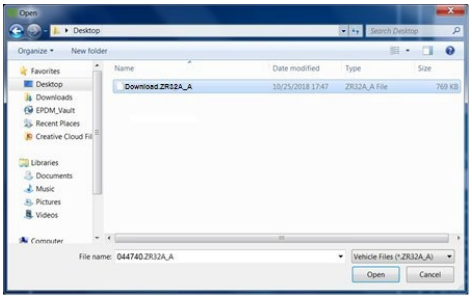
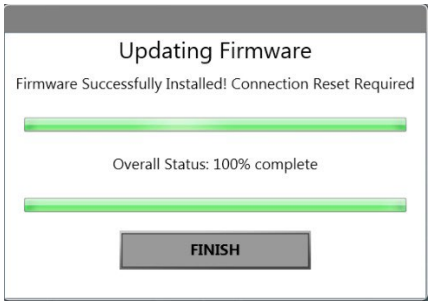
4. In the pop-up window, select the software flash file to load to the controller. The correct file is named “Body_6_14_0_064579”



5. The Programming window will come up and will take a few minutes to complete. The process will flash five different files to the controller.

6. After the controller is updated the tool will automatically try to copy the original configuration to the new software. Since there is a possibility that configuration options change it is important to check the configuration after restarting the vehicle.



7. Once the process has finished, cycle power to the bus by moving the Driver’s Master Switch back to the “OFF” position before continuing.

8. Shut down the PDT software program. This allows the cache to clear from the system.

9. Return the bus to service.

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VEHICLE SOFTWARE UPDATE PROCEDURE

Description

This section contains the necessary information to update the Proterra Vehicle Integration Controller. This controller provides the electrical integration of ancillary systems on 800V models. It owns the vehicle operational state control, startup and shutdown, steering, pneumatics, thermal management, and brake interlock controls.

Preparing the Vehicle to be Programmed

When programming a vehicle, it is critical that the low-voltage batteries remain connected throughout the process. Ensure that the LV batteries are fully charged before starting the process. If they are low, use the vehicle to recharge them buy turning on high-voltage or place the bus on a low-voltage charger for the duration of the process.

Connecting to the Vehicle

1. Power up and login to the Proterra-Supplied laptop or a comparable PC that has the Proterra Diagnostics Tool software installed with a valid license.

2. Turn ON the 12/24V rear Vehicle Master Disconnect located at the curbside rear charge port access panel.

Vehicle Master Disconnect

3. Connect the Nexiq USB Link2 device to the laptop and to the OBD-II Diagnostic Port located in the streetside wheel well box. Use the J1939 port if OBD-II is unavailable.

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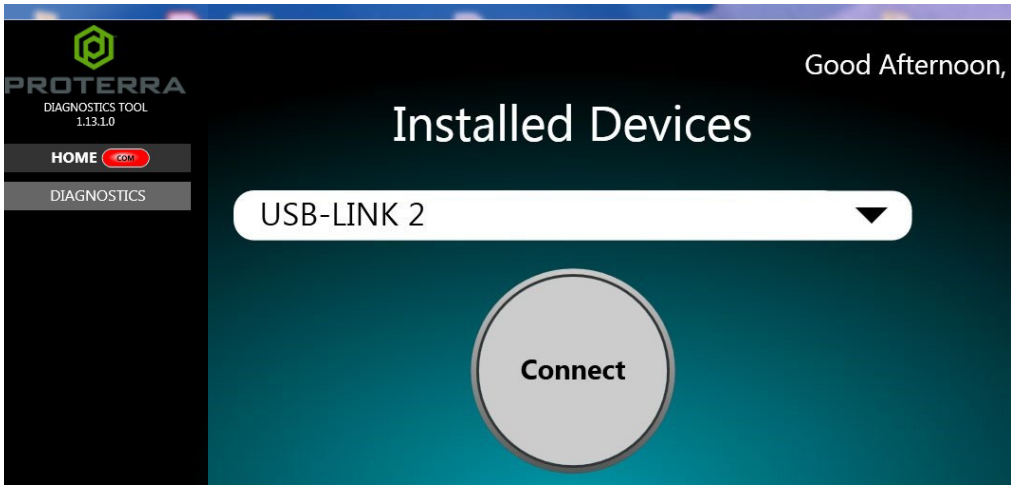
4. Press and hold the streetside wheel well WORK LIGHT switch until the work lights turn on.

5. On the laptop, double-click on the Proterra Diagnostics Tool software icon to start the software.

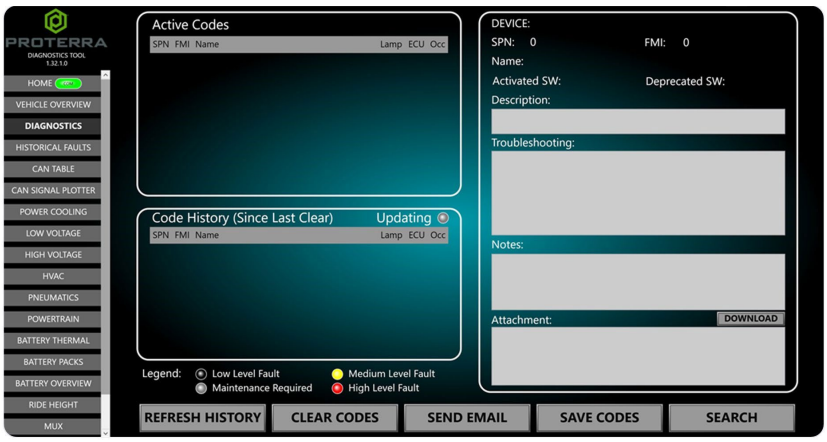
6. When the program opens, read and click “OK” for the high-voltage safety prompt.

7. On the Home tab, select the appropriate device from the drop down and click “Connect”.



8. Once the diagnostic tool has connected to the vehicle, a VIN number and connection status will be displayed on the Home screen, and tabs available to navigate. If you do not see the Home Screen, check that the low-voltage batteries are connected and that the Nexiq tool is plugged in.
   NOTE: 800V Proterra vehicles are equipped with an automatic battery disconnect that will protect the low-voltage batteries from a deep discharge.

9. Before beginning the programming process, check the bus for existing faults by clicking on the “Diagnostics” button below and make a note of any found.



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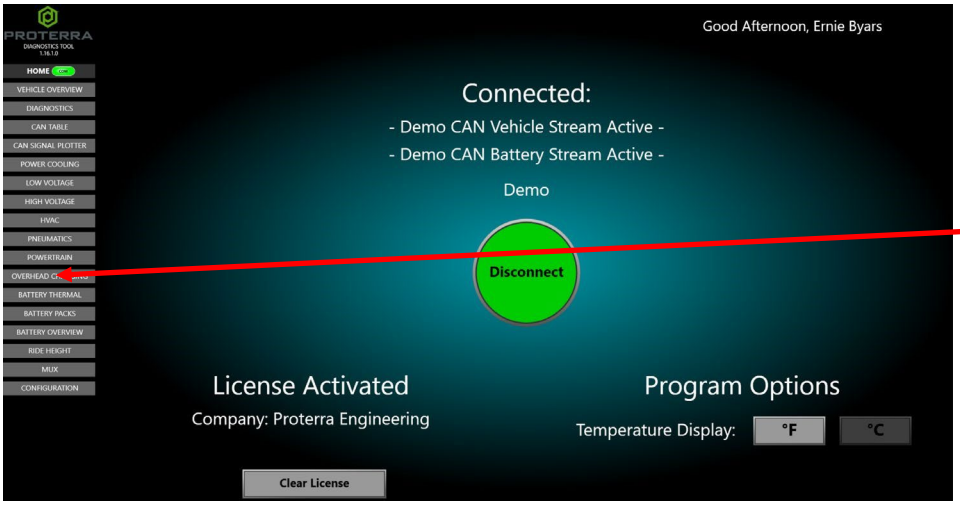
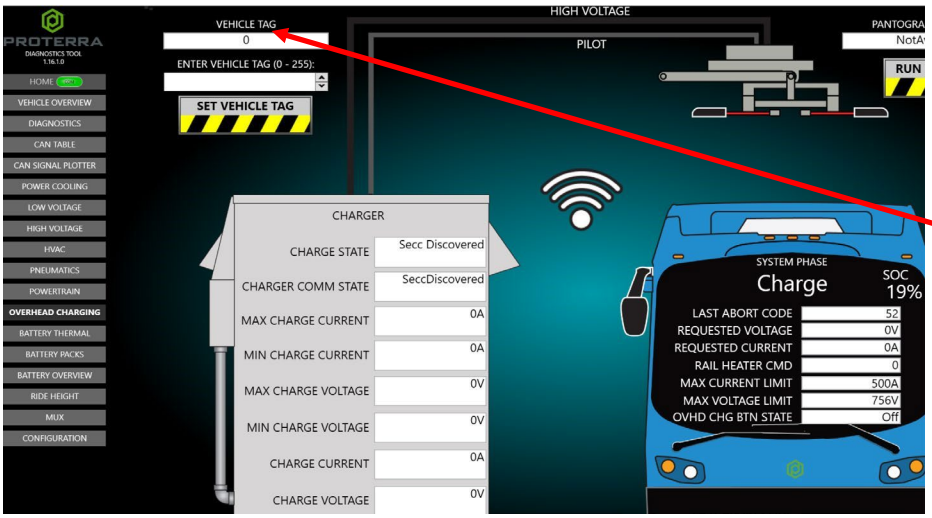
Update Using the Proterra Diagnostic Tool

1. Click on the “Overhead Charging” button on the left side of the screen.
   NOTE: If the bus that you are working on is not capable of overhead charging, skip to step 3 below.



Click “Overhead Charging”

2. Record the value displayed in the “Vehicle Tag” data field. This will be re-entered into the controller after the software update.



Record Vehicle Tag

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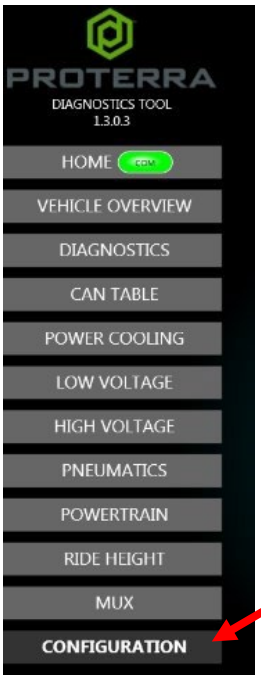
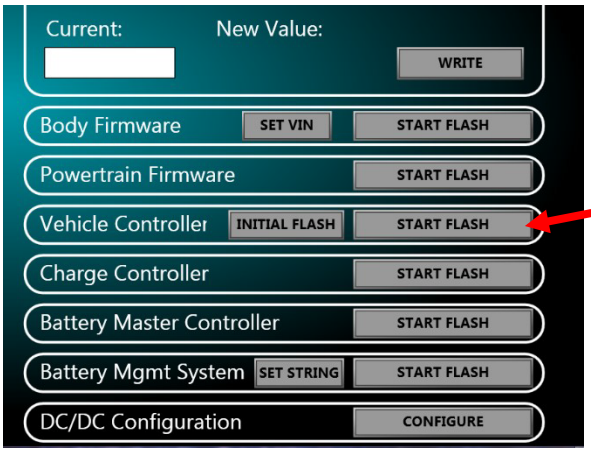
3. Navigate to the CONFIGURATION tab in the left menu.



Click
CONFIGURATION

4. Select the option for Vehicle Controller “START FLASH”.
   NOTICE: The “INITIAL FLASH” button is only for offline programing of the Vehicle Controller with an Offline Programming Kit.



Beside Vehicle Controller,
Click **START FLASH**

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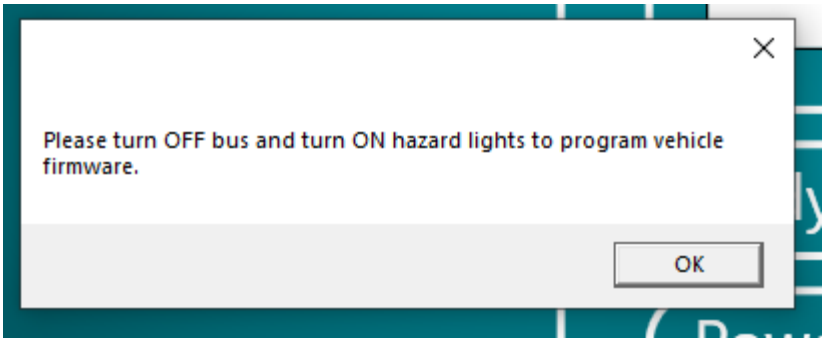
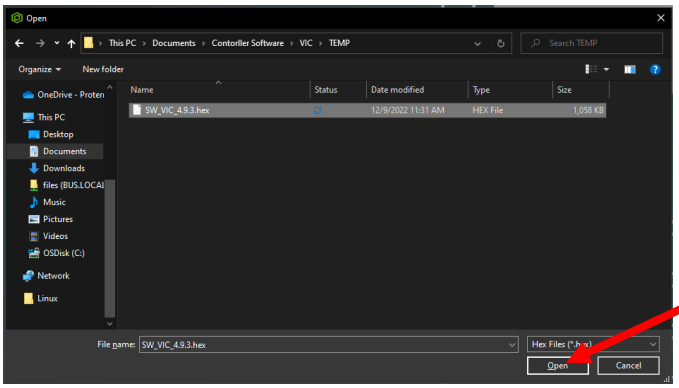
5. The PDT will instruct to turn the bus off with the hazard lights on. Set the bus to this mode. This will put the bus into Flashing Mode.



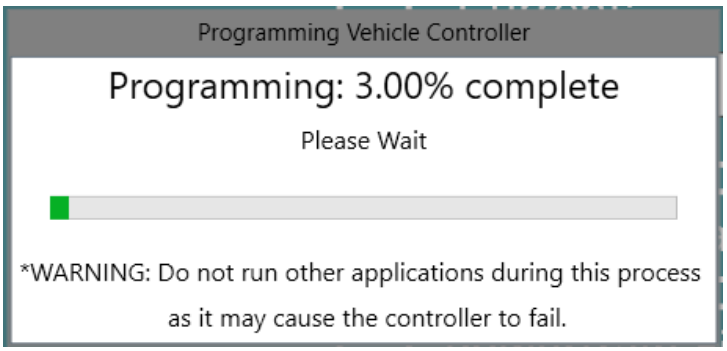
6. Click on the START FLASH button again to flash the controller.

7. In the pop-up window, select the software flash file to load the controller. The correct file is named SW_VIC_4.9.3.hex



Select the file and Click Open

8. The Programming window will come up and may take a few minutes to complete.



9. After completing the software update, a bus key cycle is required.

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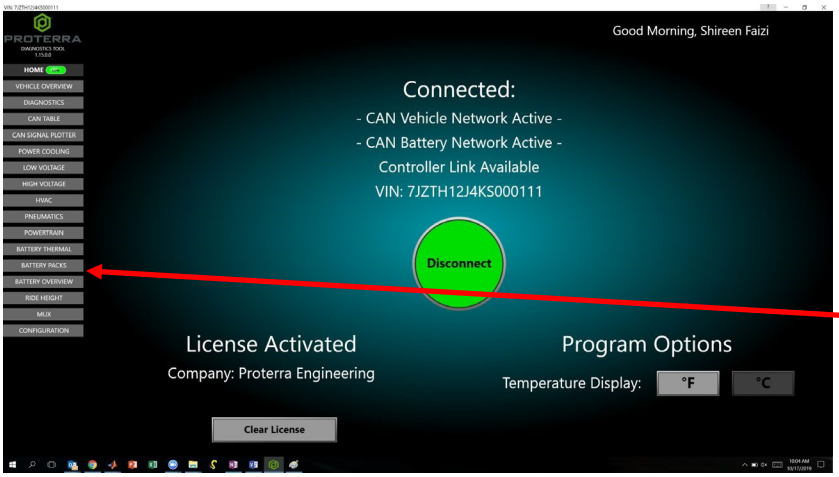
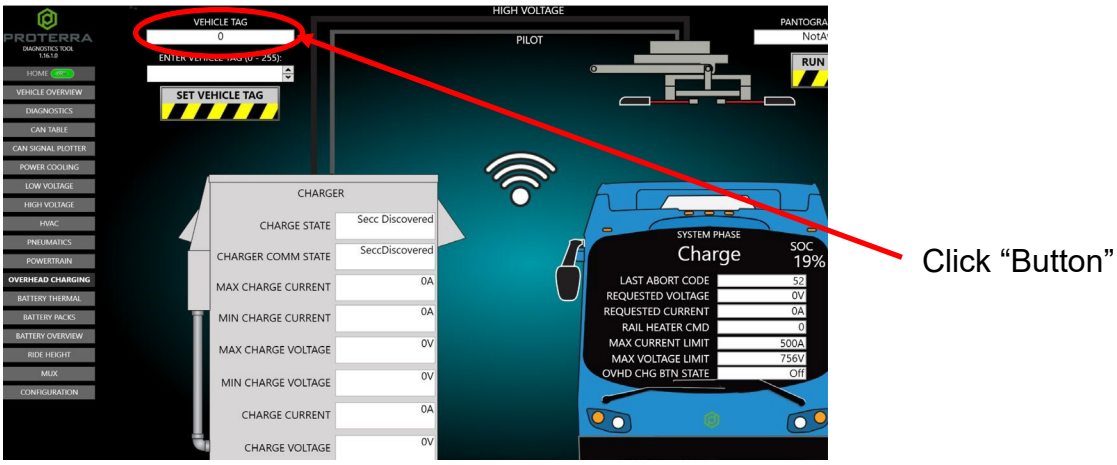
10. Click on the “Overhead Charging” button on the left side of the screen.
    NOTE: If the bus that you are working on is not capable of overhead charging, skip to step 10 below.



11. The following screen will appear. Enter the “Vehicle Tag” that you recorded previously into the field circled in red below. Click the button under the field. This will populate the “Vehicle Tag” into the field above and into the controller.



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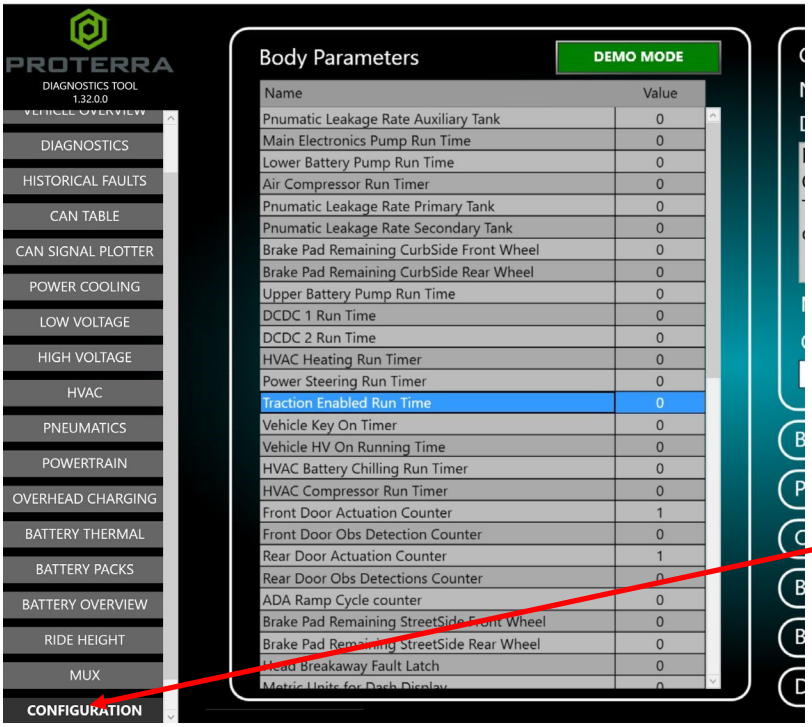
12. Click on the “Configuration” button at the bottom left of the screen.



13. Scroll through the list of “Body Parameters” on this screen.

14. Turn OFF the 12/24V rear Vehicle Master Disconnect located behind the vehicle curbside rear charge port access panel, wait ten seconds, and then turn back to ON.

15. Verify that the vehicle turns on with no faults and that it is capable of charging.

16. Shut down the PDT software program. This allows the cache to clear from the system.

17. Return the vehicle to service.

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POWERTRAIN SOFTWARE UPDATE PROCEDURE

Description

This procedure updates the Duopower Powertrain software to the latest version for improved powertrain performance.

Connecting to the Vehicle

This process will guide the user to connect to the vehicle with the Proterra Diagnostics Tool.

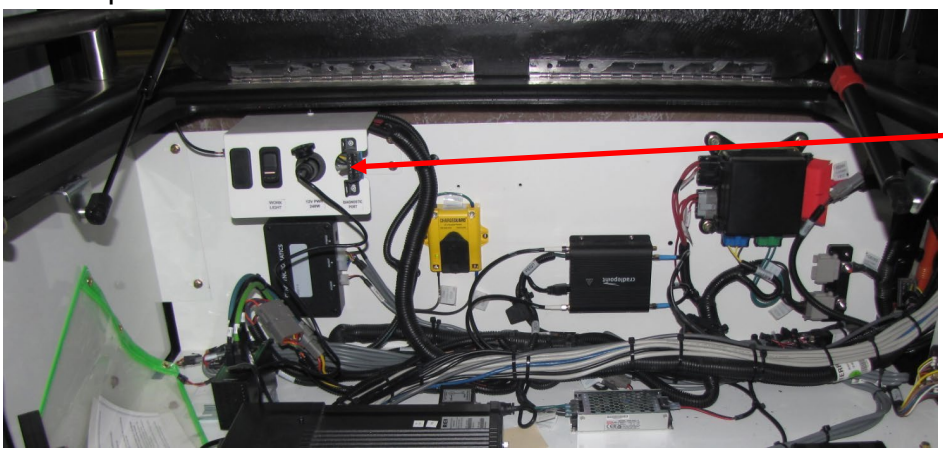
1. Turn on the 12/24V rear Vehicle Master Disconnect located behind the vehicle curbside rear charge port access panel.

2. Turn on the bus “Master Switch” at the Driver's Workplace and ensure the Dash screen is on to display “KEY ACC”.

Master Switch
“ACC”

3. Silence dash alarm.

4. Open the streetside wheel well box to access to the OBD-II Port. Use the J1939 port if the OBD-II port is unavailable.



OBD-II Port

5. Power up (boot) the Proterra-supplied laptop containing the Proterra Diagnostic Tool.

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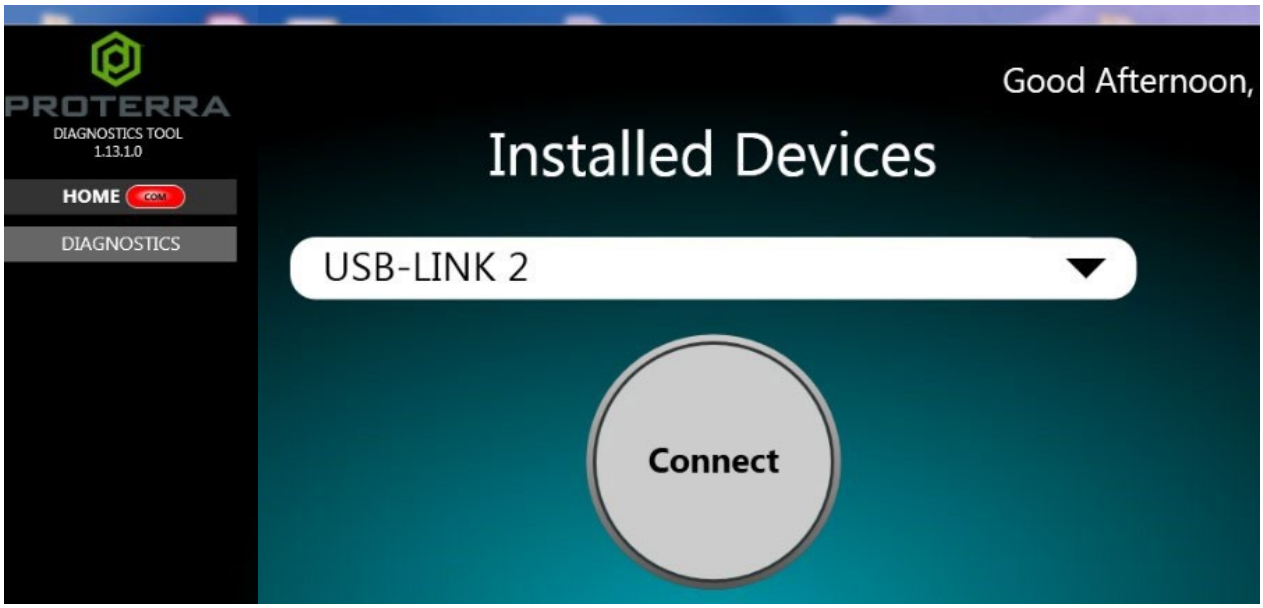
6. Connect the Nexiq USB Link2 device to the laptop and to the appropriate OBD-II Diagnostic Port. Use the J1939 port if the OBD-II port is unavailable.

7. On the laptop, double-click on the Proterra Diagnostics Tool software icon to start the software.

8. When the program opens, read and click “OK” for the prompt.

9. On the Home tab, select the appropriate device from the drop down and click “Connect”.



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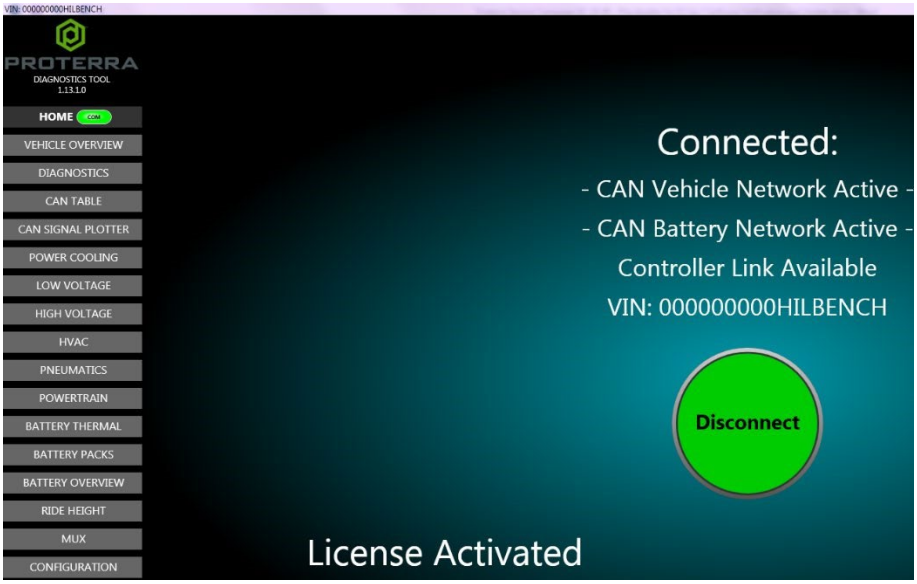
10. Once the diagnostic tool has connected to the vehicle, a VIN number and connection status will appear on the home screen, along with selectable tabs to navigate.



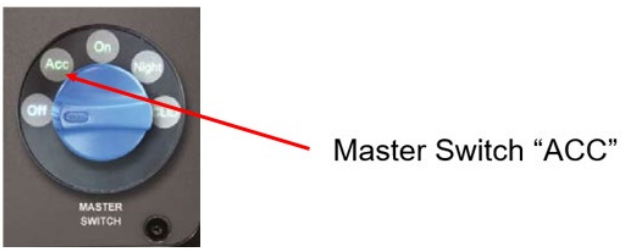
Update Powertrain Software

This procedure updates the Powertrain software version and maintains the Powertrain parameter configuration data across the flash download of new software.

1. Ensure you have the latest software file **064360.hex** in a known location on the service technician's computer (Folder or Desktop).
   IMPORTANT! NEVER access the software from a remote server or from a USB memory device. ALWAYS copy the software files to your computer hard drive and access the software from this location. It is recommended that you copy the files from ServiceMax campaign page to your local machine in order to more effectively keep track of the software versions you are deploying:
   https://proterra.lightning.force.com/lightning/r/P_Service_Campaign__c/a7V8W000000slCXUAY/view

2. Turn on the 12/24V rear Vehicle Master Disconnect located behind the vehicle curbside rear upper access panel.

3. Turn on the bus Master Switch at the Driver's Workplace and ensure the dash screen is ACC.



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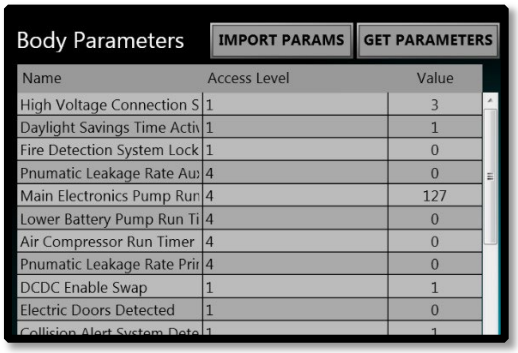
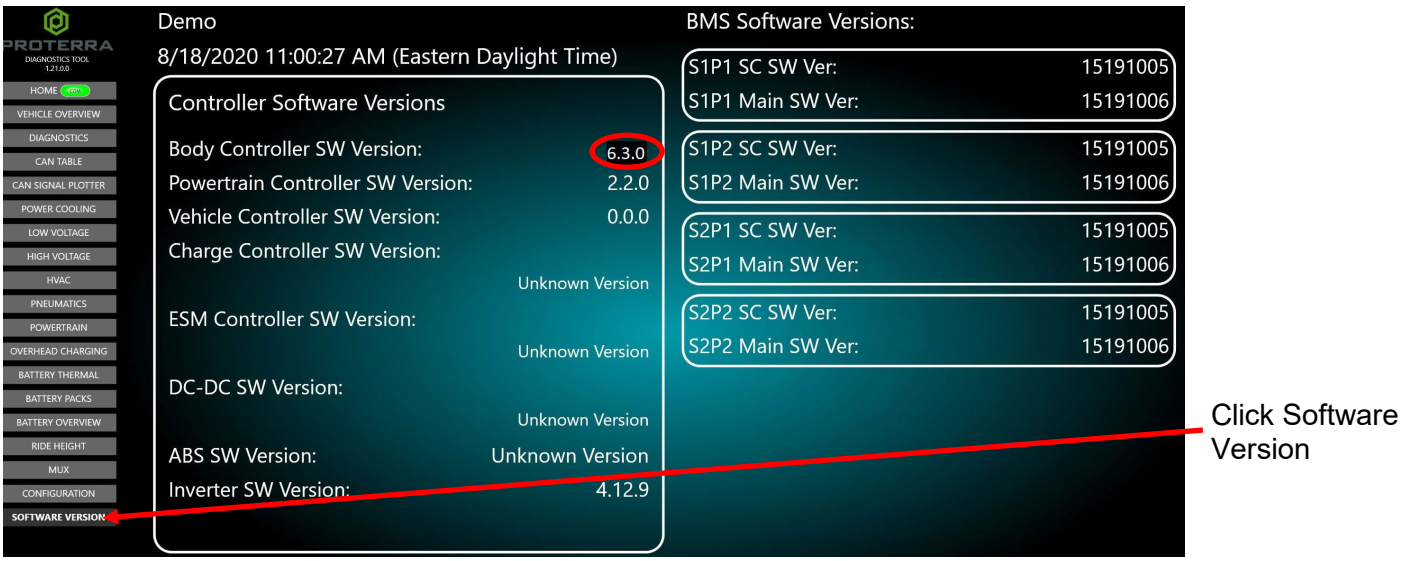
4. After connecting to the vehicle using the Proterra Diagnostic tool at the **front OBD-II Port (SSWW Box)**, navigate to the “Configuration Tab”.

5. Wait at least 10 seconds after starting the tool, then click the “Get Parameters” button at the top of the page.
    a. **NOTE: This ensures that a backup copy of the original configuration parameters stored in a “zip” file, contained in the C:/Logs folder on your computer in case we need to refer to it later.**



6. Click on the “SOFTWARE VERSION” button at the bottom left of the screen. Verify that the Body Controller Software is version 6.3.0. or later.



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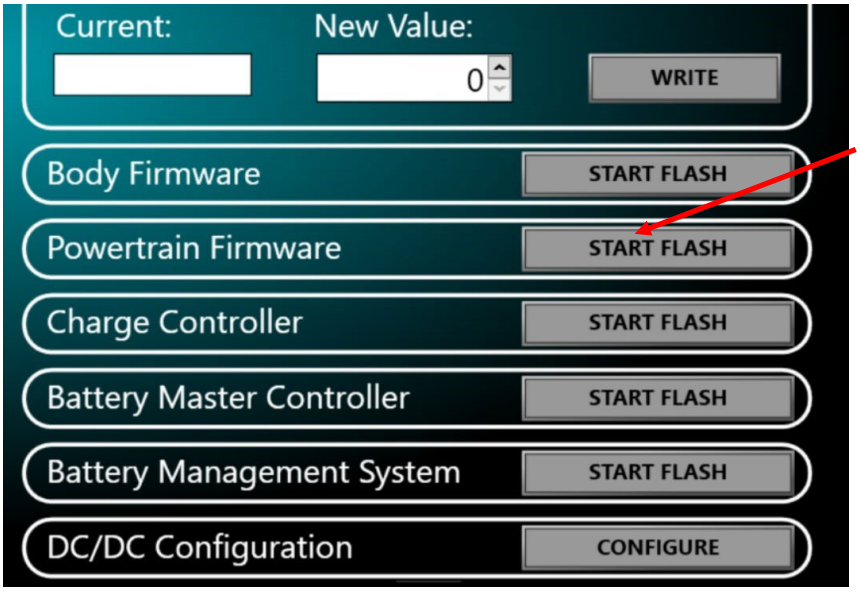
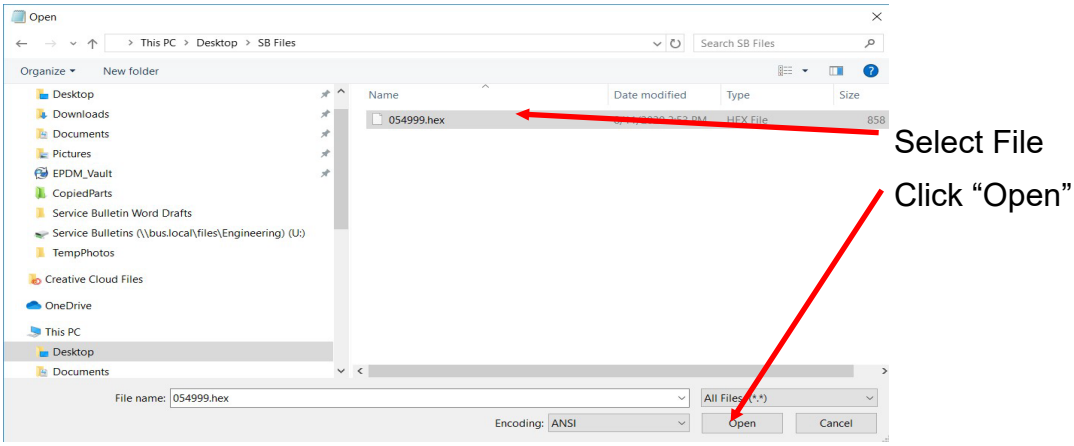
7. Next, click the Powertrain Firmware “Start Flash” button.



8. The following screen will be displayed. Navigate to the location where you stored the configuration file earlier. Select the software file downloaded previously and click “Open” to load the file.
   NOTE: The file name displayed should be 064360.hex.



9. The Proterra Diagnostic Tool will attempt to connect to the device.

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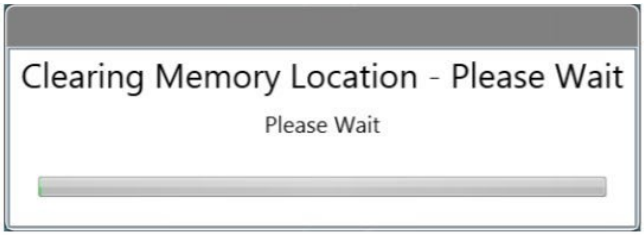
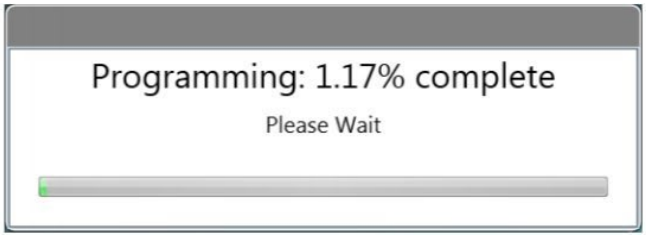
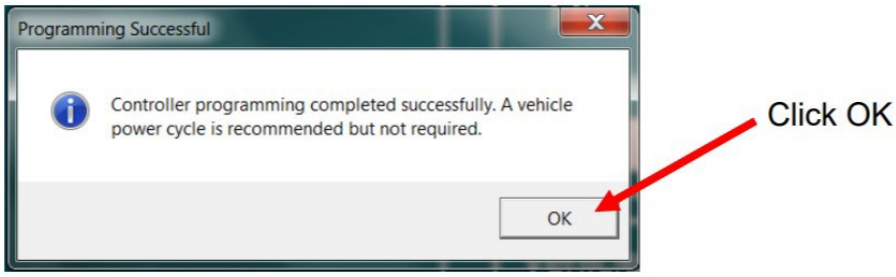
10. When the software update begins, the following screens will be displayed.





11. The software update may take several minutes to complete. When the update is complete the following will be displayed. Click the “OK” button to complete the update process.



12. Power off the bus by selecting off on the Master Switch.

13. The software update is now complete.

14. Disconnect the cable from the OBD-II port or J1939 port.

15. Shut down the PDT software program. This allows the cache to clear from the system.

16. Close the streetside wheel well box.

17. Re-enable the dash alarm that was silenced.

18. Power down the bus by opening the main disconnect at the Curbside rear of the bus.

19. Turn the main disconnect back on before returning the bus to service.

PROTERRA
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