Issue Date:	10-25-2021
Subject:	**800 Volt 2170 CMB6 Pack Cell Balancing Retrofit**
VINs or Models Affected:	Service Specified Buses
Complete By:	Next Service Opportunity
Service Bulletin #:	SC-21-149
Labor Operation Code:	HB43Z

NOTE: This process will require up to one (1) hour per battery pack. Please schedule appropriately to minimize vehicle downtime.

Description:

This procedure describes the process of updating the target voltage value for cell balancing. Battery packs have a built-in function to balance modules internally, which is critical for proper performance. Currently the battery packs have an incorrect configuration setting that in some packs results in all modules discharging indefinitely, causing a significant degradation of bus range the longer the incorrect discharging occurs. To resolve this problem, the configuration can be set to remove this problem and allow the battery to properly use the balancing function without reduction in range. After completion of this change and manual balancing of packs within affected strings, any lost range due to this issue will be regained and the bus will operate normally.

Tools/Parts Required:

- Customer Service Laptop with PCAN Explorer 5 Installed
  NOTE: (If PCAN Explorer 5 is not currently installed, search TKB for "PCAN Explorer Installation and Setup" and follow the instructions.)
- Peak PCAN-USB Adaptor
- Octopus Cable (018759)
- DEM055_Fix.peproj
- 800v_BCAN_200507_3s3p.dbc

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Procedure:

1. Connect the CAN side of the PCAN-USB Adaptor Octopus Cable to the system's BCAN network. Then connect the USB side of the PCAN-USB adaptor to the laptop.

2. Ensure that Switched and Unswitched 12/24-volt DC power is supplied to the battery pack(s).

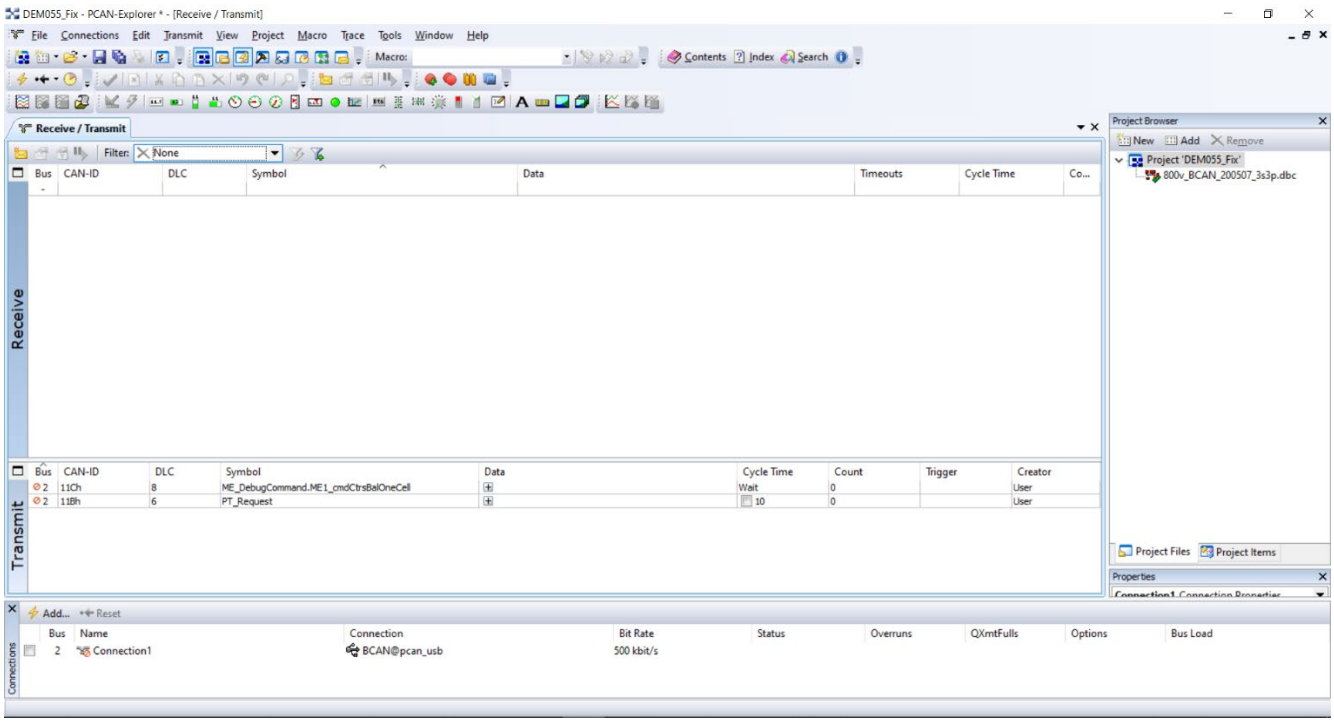
3. Ensure that an Ignition/Key signal is being supplied to the battery pack(s).

4. Download the service campaign files in Service Max onto the laptop.

5. Start the PCAN Explorer 5 program.

6. Click on "File" in the upper left corner of the program. Select "Open" in the drop-down menu. Navigate to the Battery Debug folder that was saved to the desktop.
Double click on the DEM055_Fix.peproj file shown highlighted in yellow.

7. The DEM055_Fix file will open and the following screen will appear. Once connected, CAN traffic received by the BMS will be decoded and displayed.



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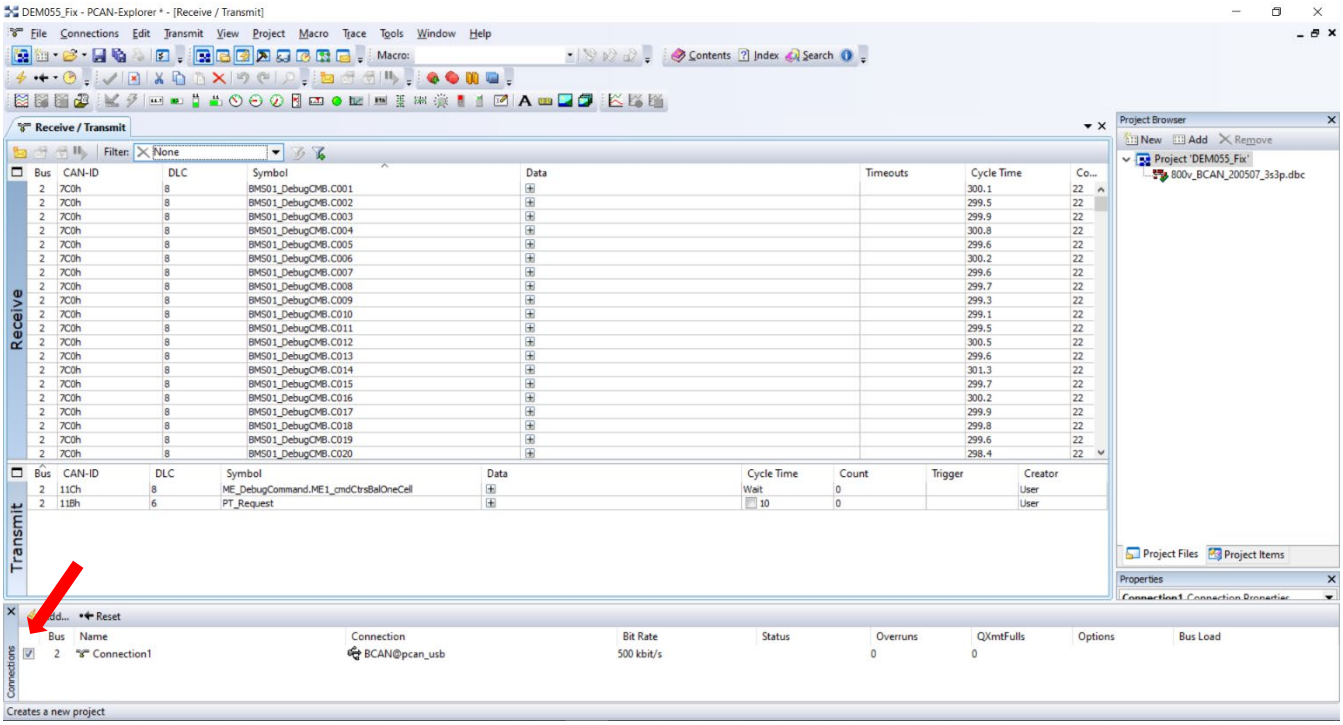
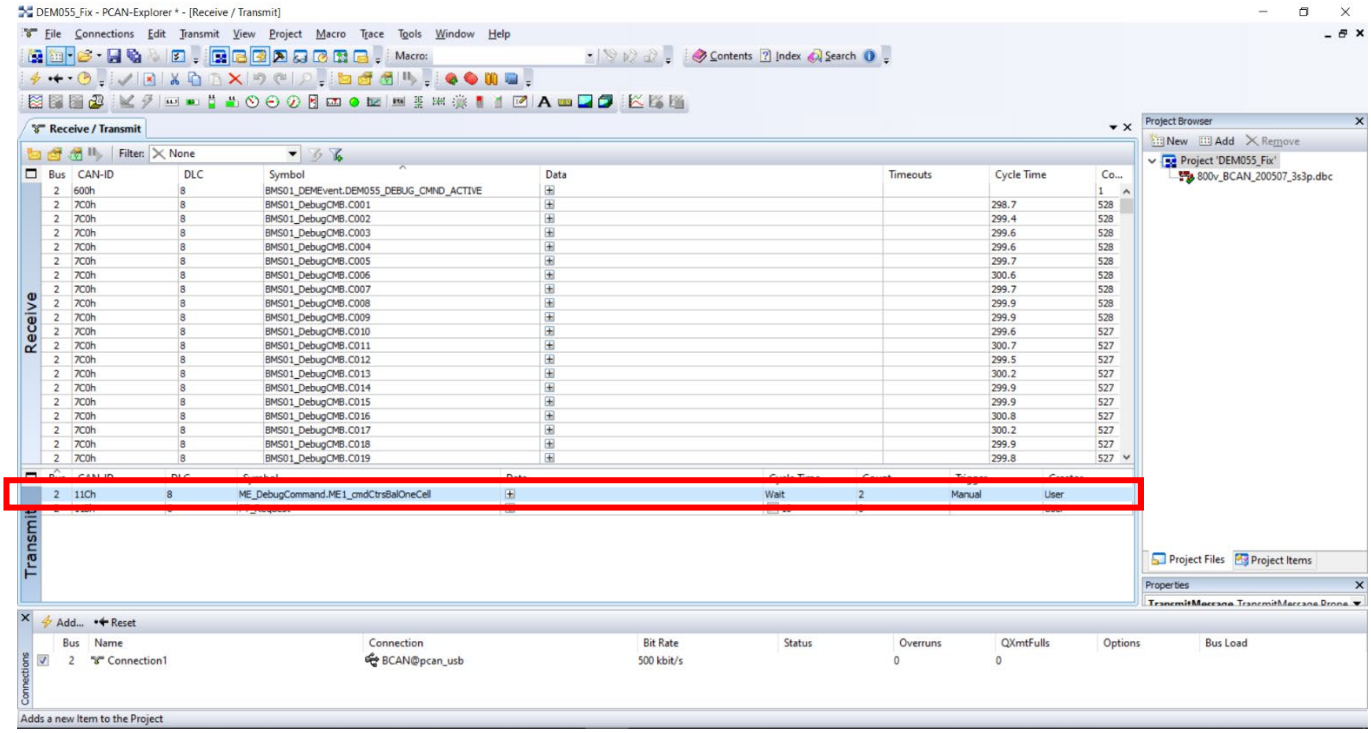
8. Click the checkbox to the left of bus 2 to enable communications. Data should start to show in the Receive window.



9. In the Transmit window, click on the Symbol "ME_DebugCommand.ME1_cmdCtrsBalOneCell" and then press the space bar twice. Count column to the right will increase to 2.



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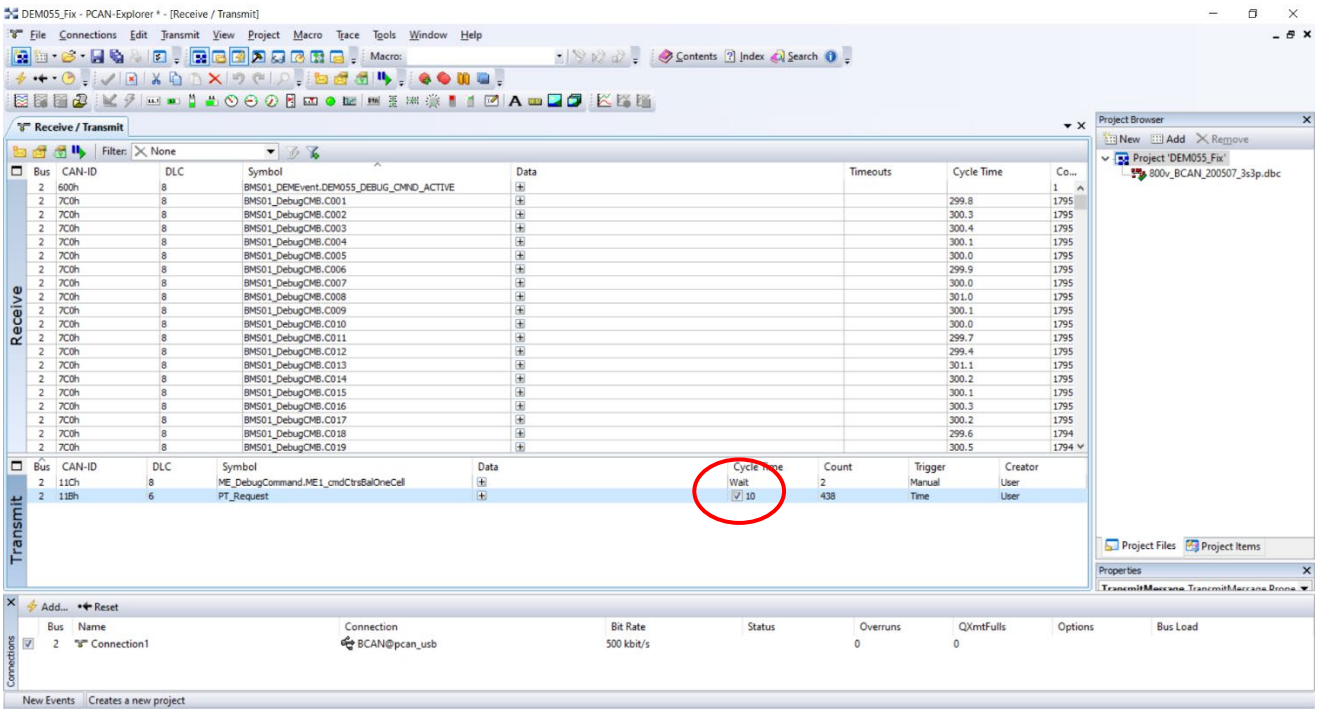
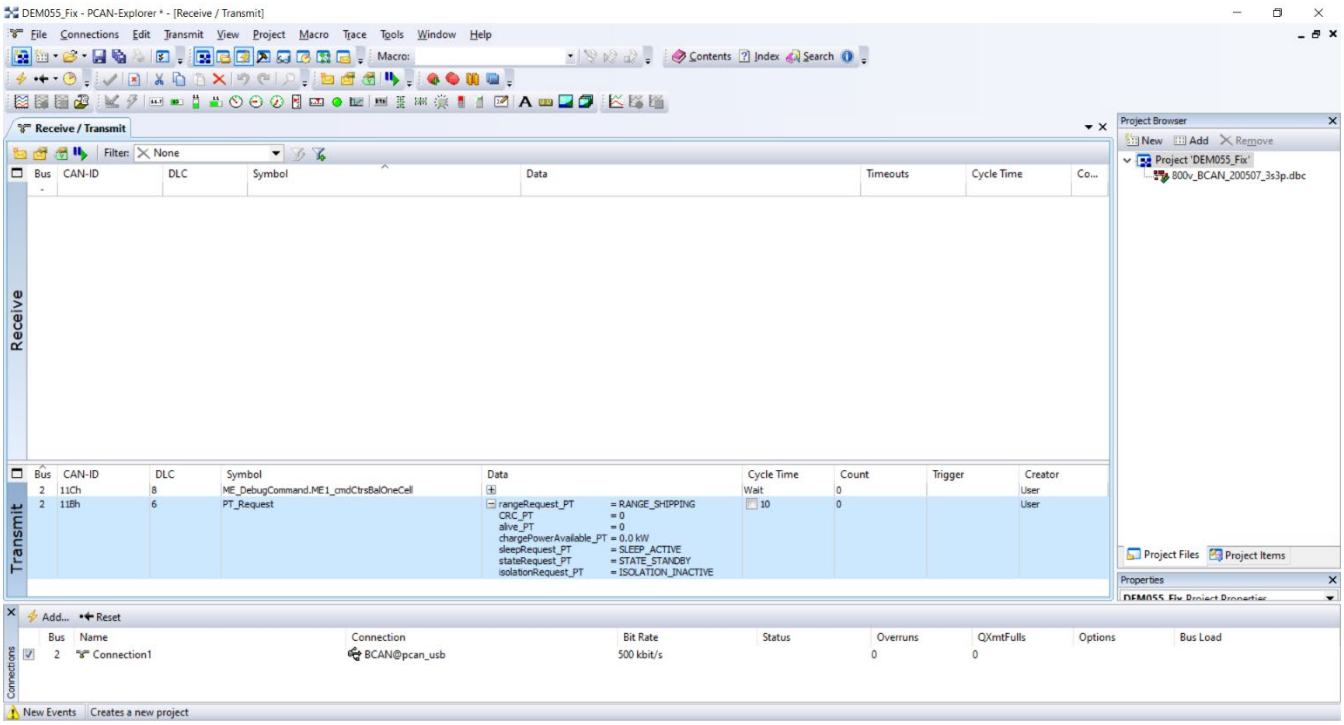
10. Click on the checkbox for the Symbol "PT_Request" under the cycle time box.



11. Turn the Master Switch to the OFF position.

12. Uncheck the checkbox for the symbol "PT_Request" under the cycle time box. Then press "\" to clear the screen. The receive window should be cleared and no new messages received.



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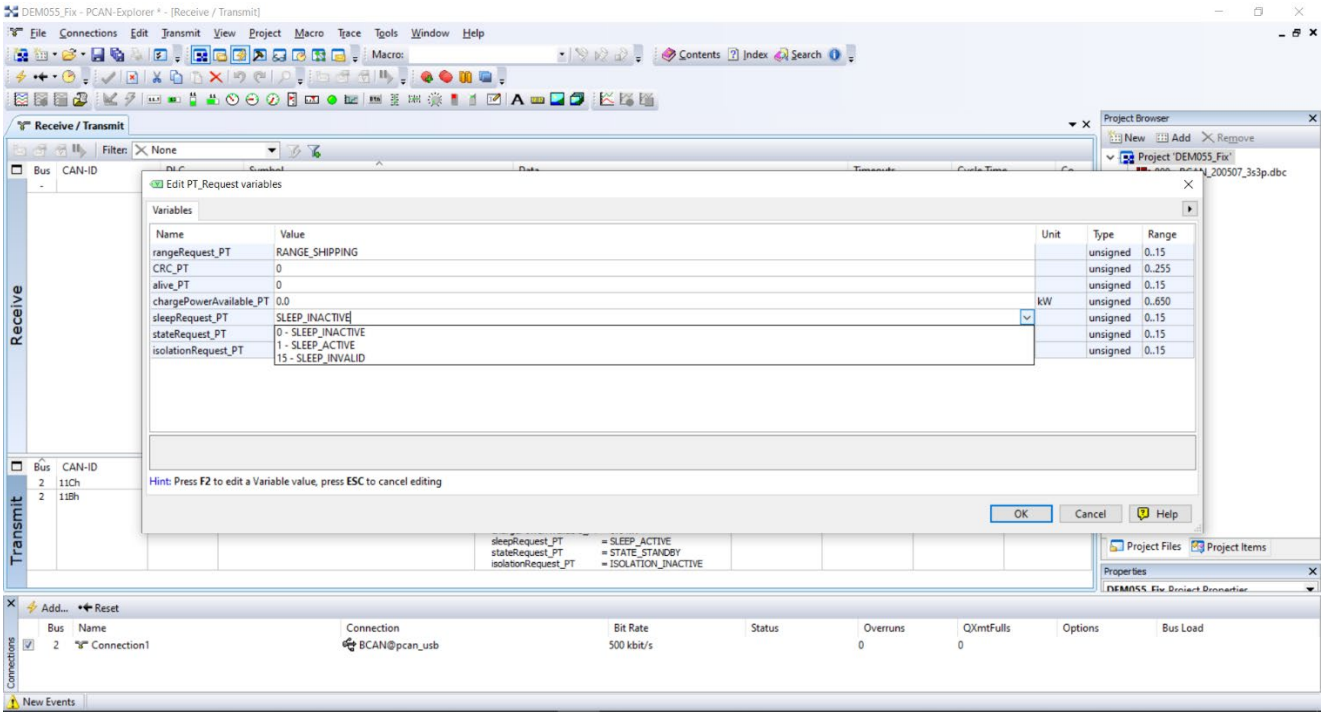
13. Right click on symbol name "PT_Request" and select Edit Variables. Double click on the value box containing "SLEEP_ACTIVE" and then choose "SLEEP_INACTIVE" from the dropdown box. Click okay, then check the cycle time box for the "PT_Request" symbol.



14. Turn the Master Switch to the ON position. The BMS will resume communications. Uncheck the cycle time checkbox on the PT_Request symbol.

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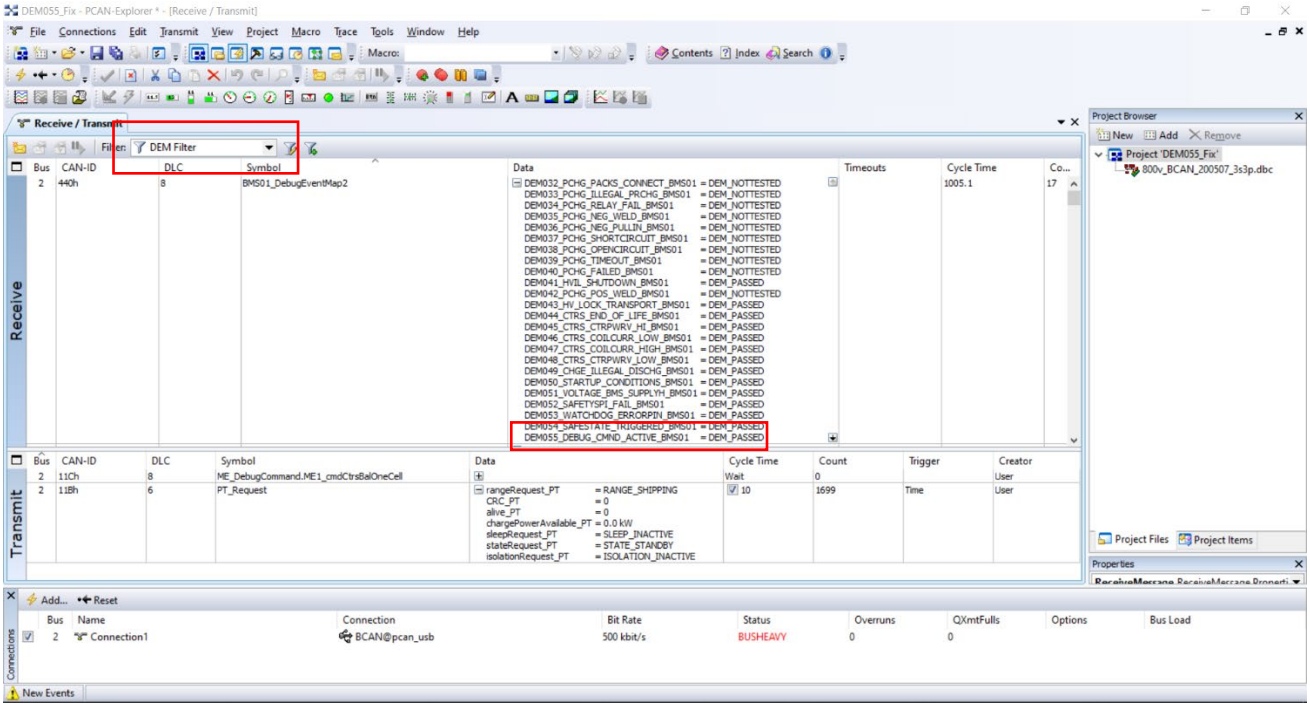
15. To verify, ensure data is transmitting in the Receive window. At the top of the receive window, select the filter drop down and select "DEM Filter". Press the "\" button on the keyboard and the data should filter to only BMSxx_DebugEventMap2. For each BMS installed on the bus, click the "+" button under the data column and ensure "DEM055_DEBUG_CMD_ACTIVE_BMSxx" = "DEM_PASSED". If passed, the campaign is complete. If any message reads "DEM_FAILED" then the procedure was not done correctly. Close out of PCAN Explorer (Do not save the project) and restart this campaign.



16. Disconnect the Service Laptop from the BCAN Network.

17. If there are any fault codes for "String Imbalance" or if one string will not come online, attempt to balance the strings by plugging a charger into the bus with master switch in the off position. This will allow the bus to balance strings automatically. If the bus cannot balance the strings automatically then a Field Service Discharger will be needed to manually discharge the pack to within 3v of the other pack(s) in a string.

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