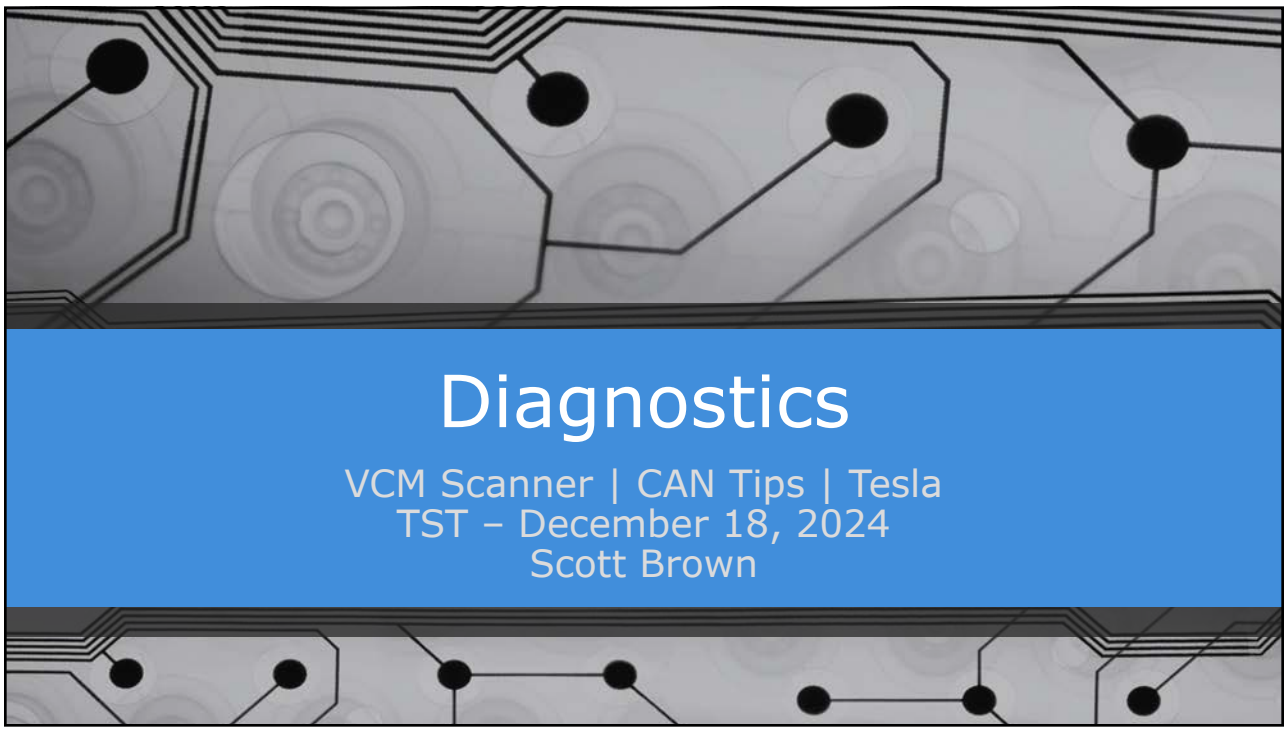


1

Lesson Plan

- Learn about the VCM Scanner and MPVI3 from HPTuners
- Learn how to measure CAN signals and identify which message IDs are being sent by whom
- Learn about the new technology found on the Cybertruck, service information and support tools found in toolbox and incorporated into the vehicle.

2

VCM Scanner

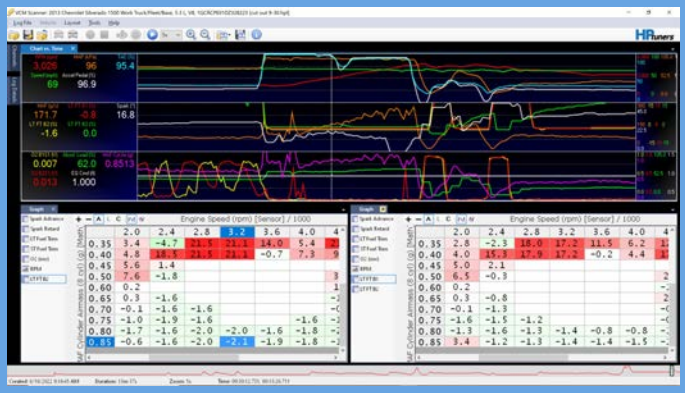
- Scantool software used with interfaces like the MPVI3 from HPTuners
- Heavily used in the “tuning world” (but that’s not why we’re here)
- Powerful tool on many carlines, exceptional on GM & Ford vehicles

3

VCM Scanner

- logging whenever scanning – always saves
- Read DTCs and monitor status on a single click
- Bi-directional controls on certain manufacturers
- Advanced graphing, math channels and more!

4



Data Logging

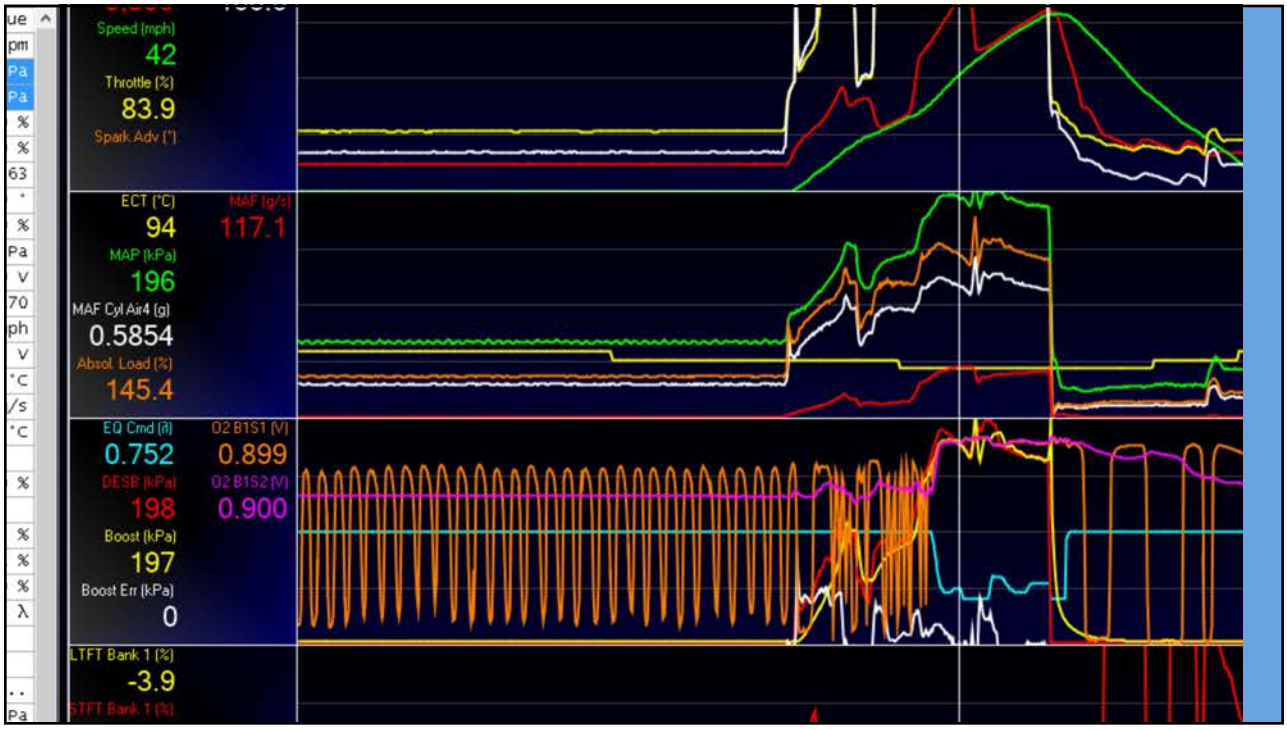
Customizable views

5

Use Case – Turbo Boost Errors - GM

Customizable views

6

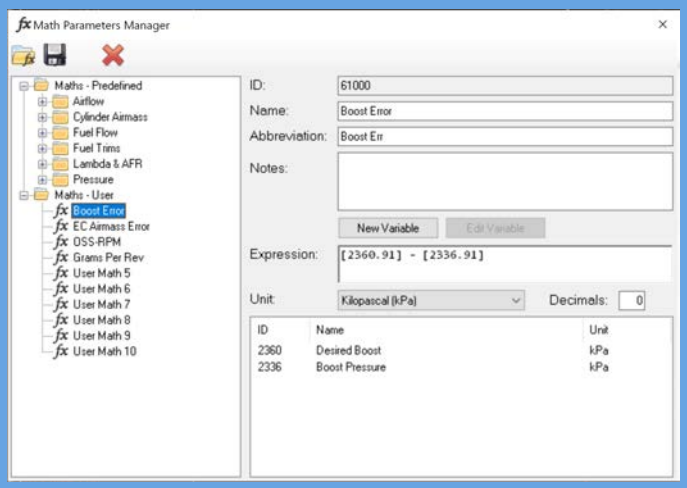


7

There is a better way

Let's explore

8

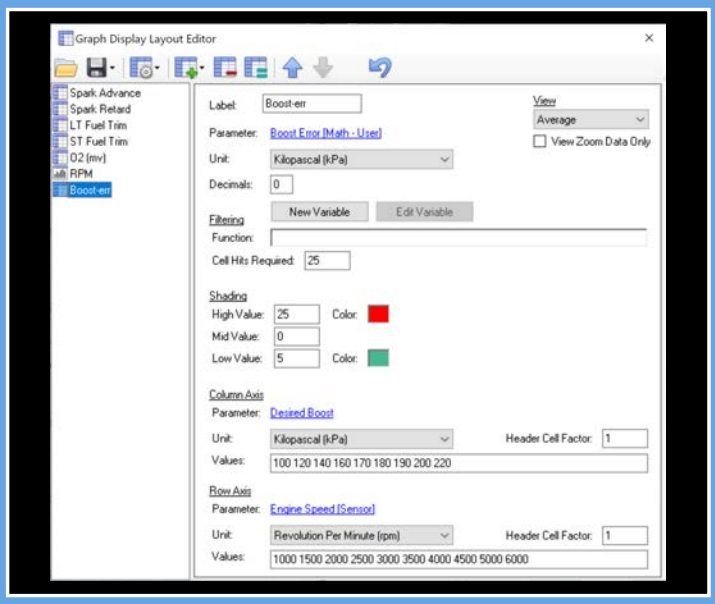


MATH Channels

Derived PIDs

Boost Error example shown for a 2013 Chevrolet Cruze

9

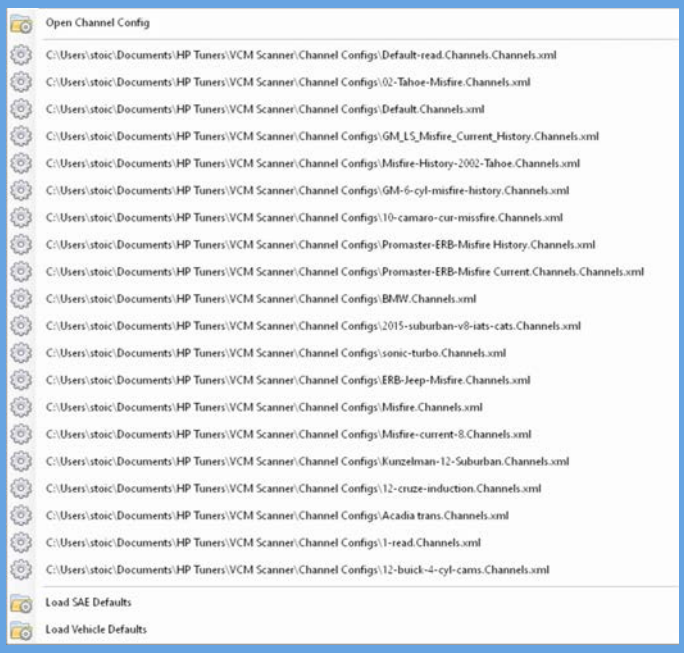


CUSTOM GRAPH

Boost Error

- Select your math pid and units
- Select averaging in view
- Cell hits required = >~5
- Shading range
- Define Column
- Define Row

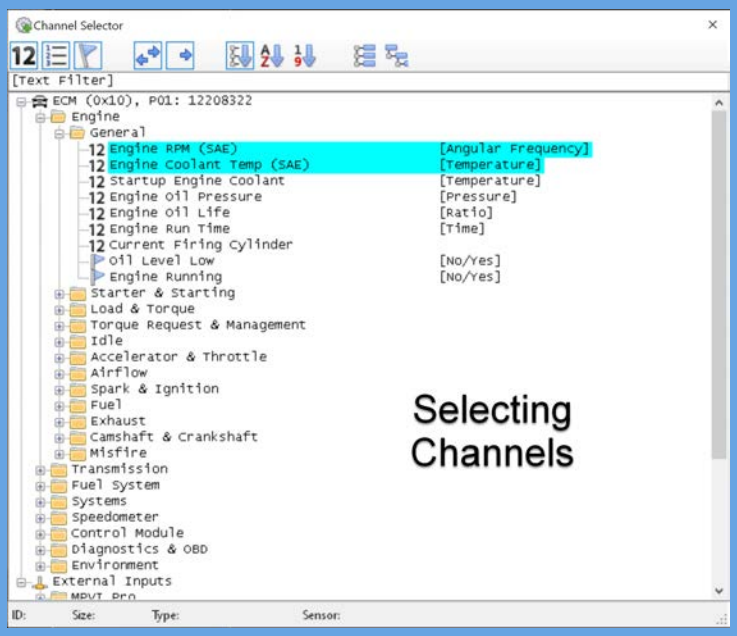
10



Channels

- Load Vehicle Defaults
- Load Custom Channel List

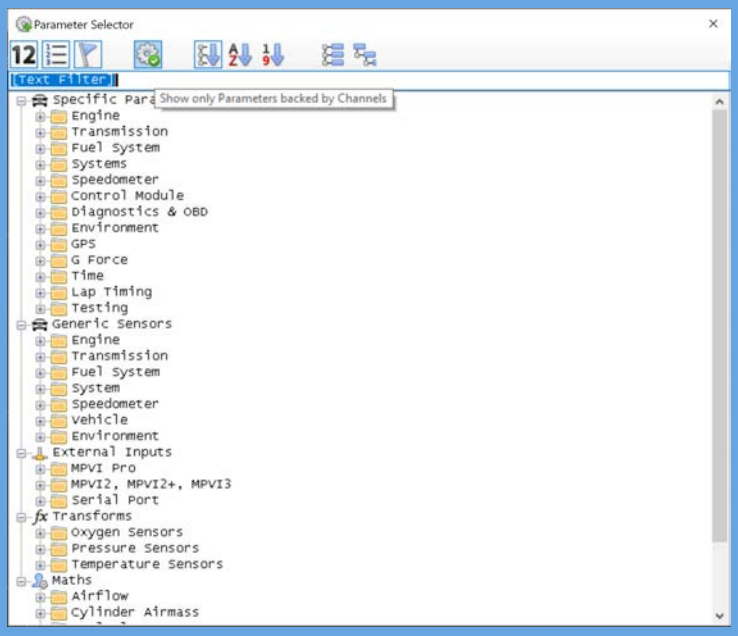
11



Channels

- Load Vehicle Defaults
- Load Custom Channel List

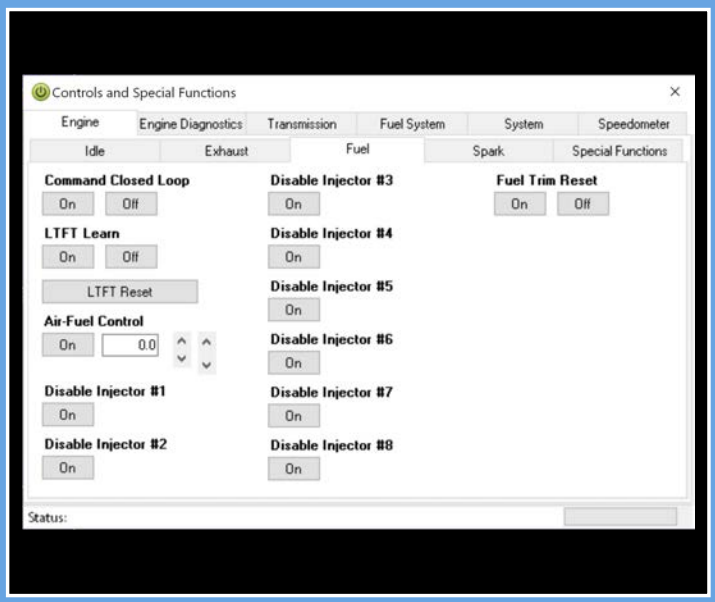
12



Parameter Selector

- Selecting PIDs base on your channel list
- Load Custom Channel List

13



Bi-Di

- Bidirectional controls
- Fuel
- Spark
- Speed
- Timing

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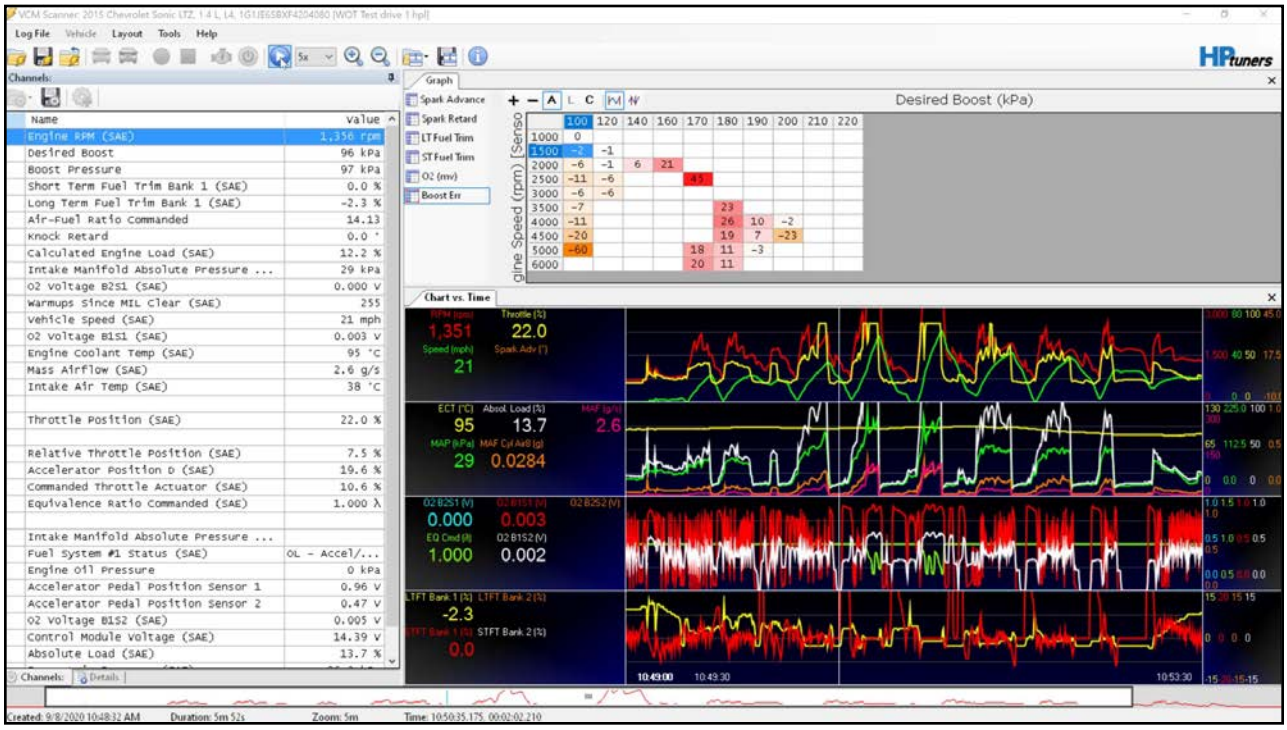

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VCM SCANNER USER GUIDE

HPtuners

Standalone Data Logging lets you log data directly to internal storage of your MPVI Pro, MPVI2/2+, or MPVI3 without being tethered to a laptop. It is now easier than ever to collect data while driving. Once the feature is configured, you can start and stop recording with the simple press of a button.

MPVI PRO STANDALONE DATA LOGGING

The standalone data logging feature of the MPVI Pro is available for late model GM vehicles only.

SETUP

Follow the steps below to set up the standalone datalogging feature for the first time on a new vehicle or when switching from another vehicle:

1. Put the vehicle's ignition in the ON/RUN state
2. Connect the MPVI Pro to your vehicle's OBD-II port and to your laptop's USB port.
3. Open VCM Scanner.
4. Click the icon in the toolbar.
5. Ensure that channels that you wish to log are listed in the Channel display (add or delete channels as necessary).
6. (Optional) Click to save your channel configuration for later use.
7. In the menu bar select **Vehicle > MPVI Pro Data Logging**. The MPVI Pro Standalone Data Logging Functions window appears.

HP Tuners, LLC
700 Eastwood Lane
Buffalo Grove, IL 60089, USA

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Stand-alone Data Logging

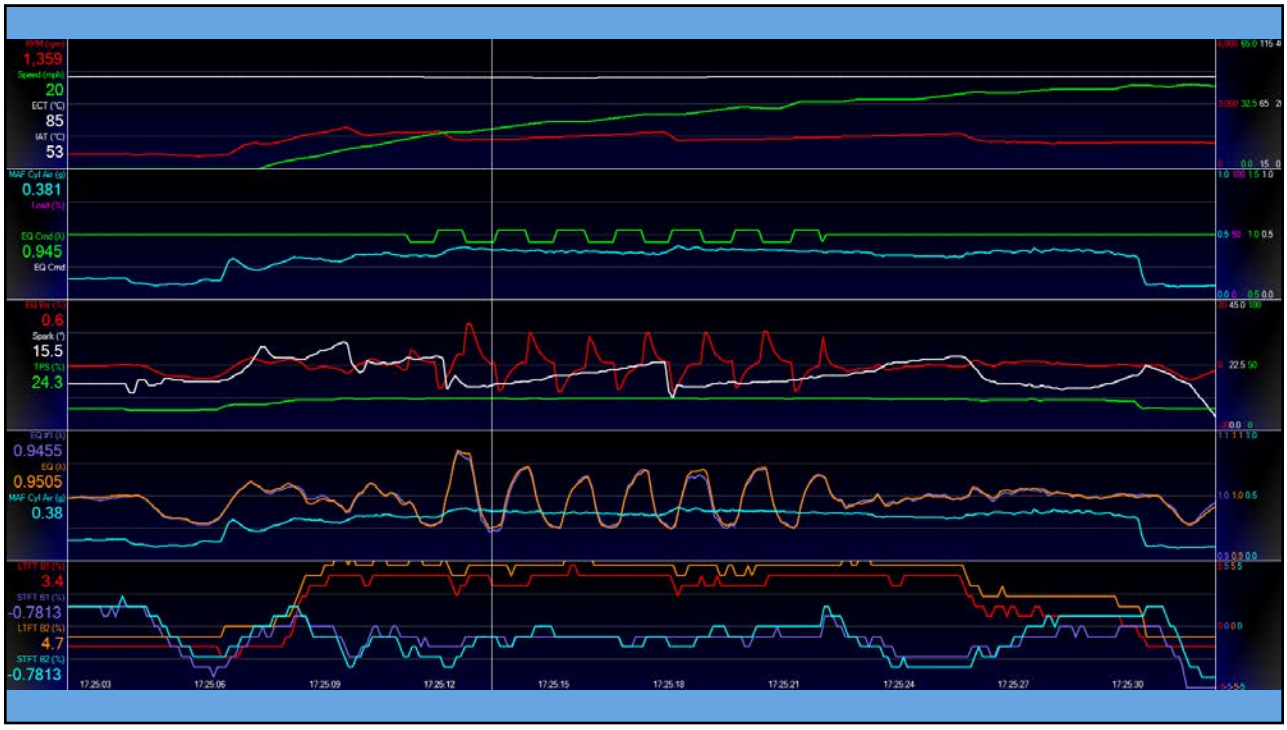
GM (gm) vehicles only

See help file at HPTuners.com

16

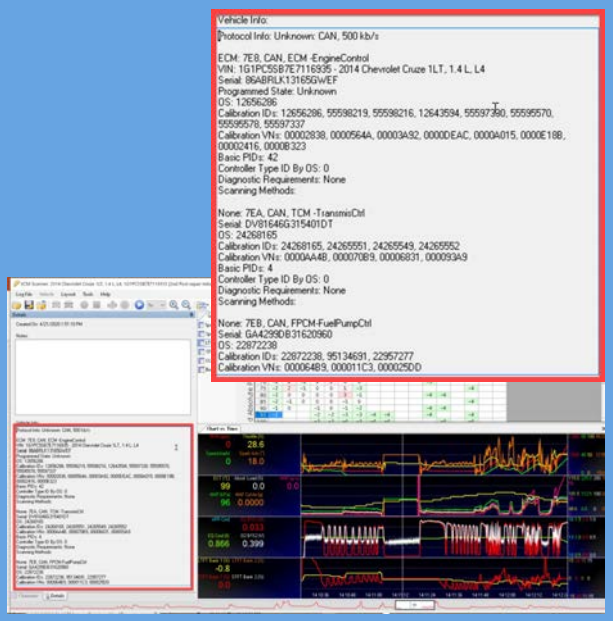

What is happening here?
680
0
86
55
0.163
1.000
0.3
16.0
16.5
1.0025
1.0023
0.16
-1.6
1.5625
-0.8
2.0991

17


1,359
20
85
53
0.381
0.945
0.6
15.5
24.3
0.9455
0.9505
0.38
3.4
-0.7813
4.7
-0.7813

18

Calibration Verification Numbers



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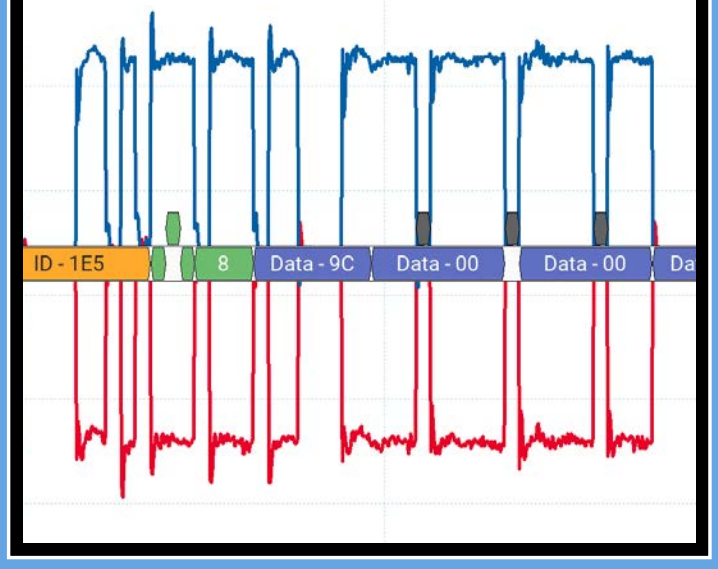
Segment 1 conclusion

20

CAN BUS

Exploring with current probes and message IDs

21



Message IDs

Why would you need to know?

How do you know a module is communicating?

Hunting down an anomaly?

22

Summary

- Basic analysis will solve 90% of communication problems
- Exploring new ways to conquer
- Questions

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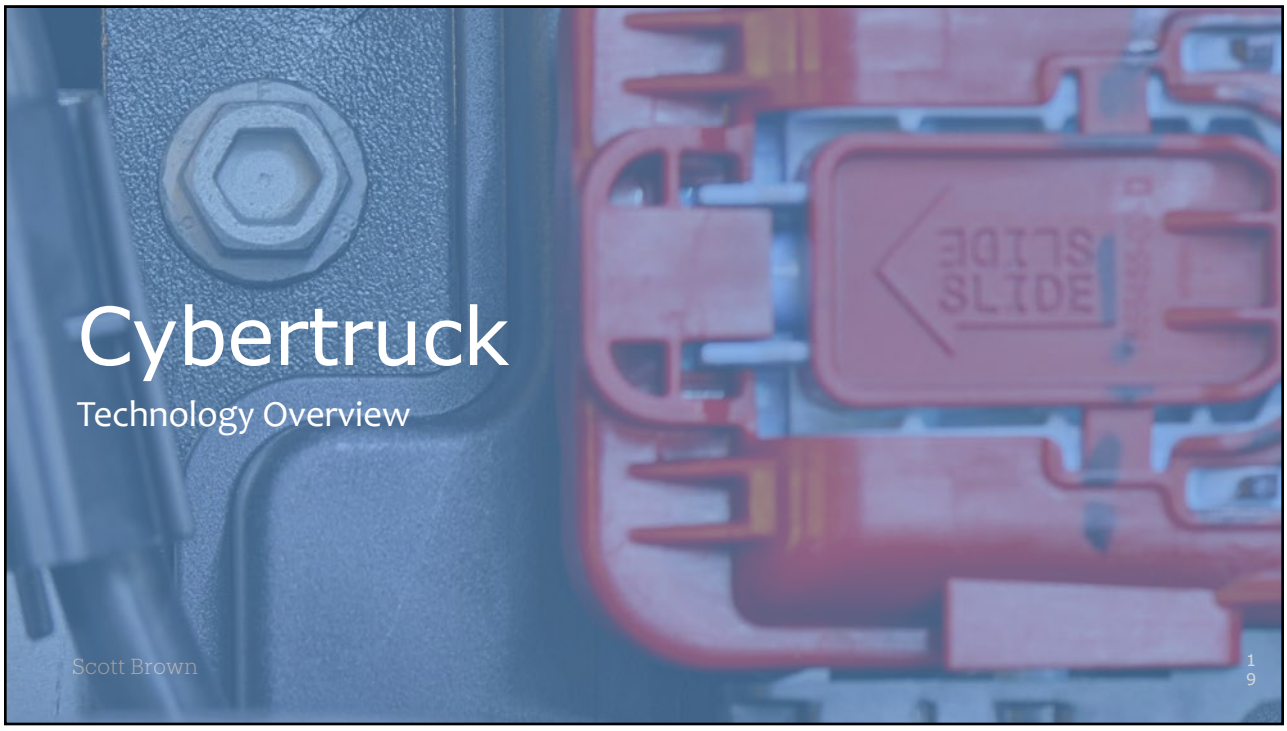

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Cybertruck

Technology Overview

- 800V Architecture
- 48V MV/LV
- Steer by Wire - 4 Wheel Steering - Redundancy, Service
- Comms: Etherloop, A2B, CAN, CANFD, LIN, LVDS, UART/CAN
- Modules: VCLEFT, INFO, APP, VCRIGHT, VCREAR, HVBATT
- Security, BLE, UWB,
- Service, Diagnostics, SI, EWD, Connectors and more!

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Safety – MV/LV Connections

- Light Blue tape = 48v (mid voltage)
- Follow Service Procedures

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Voltages

Low Voltage	Mid Voltage	High Voltage
15V	24-58V	400V+

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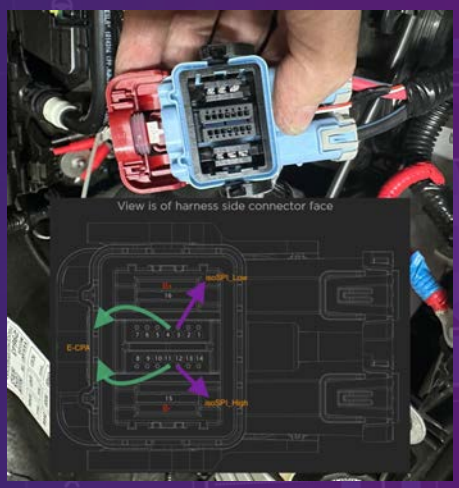
Safety - LV Connections



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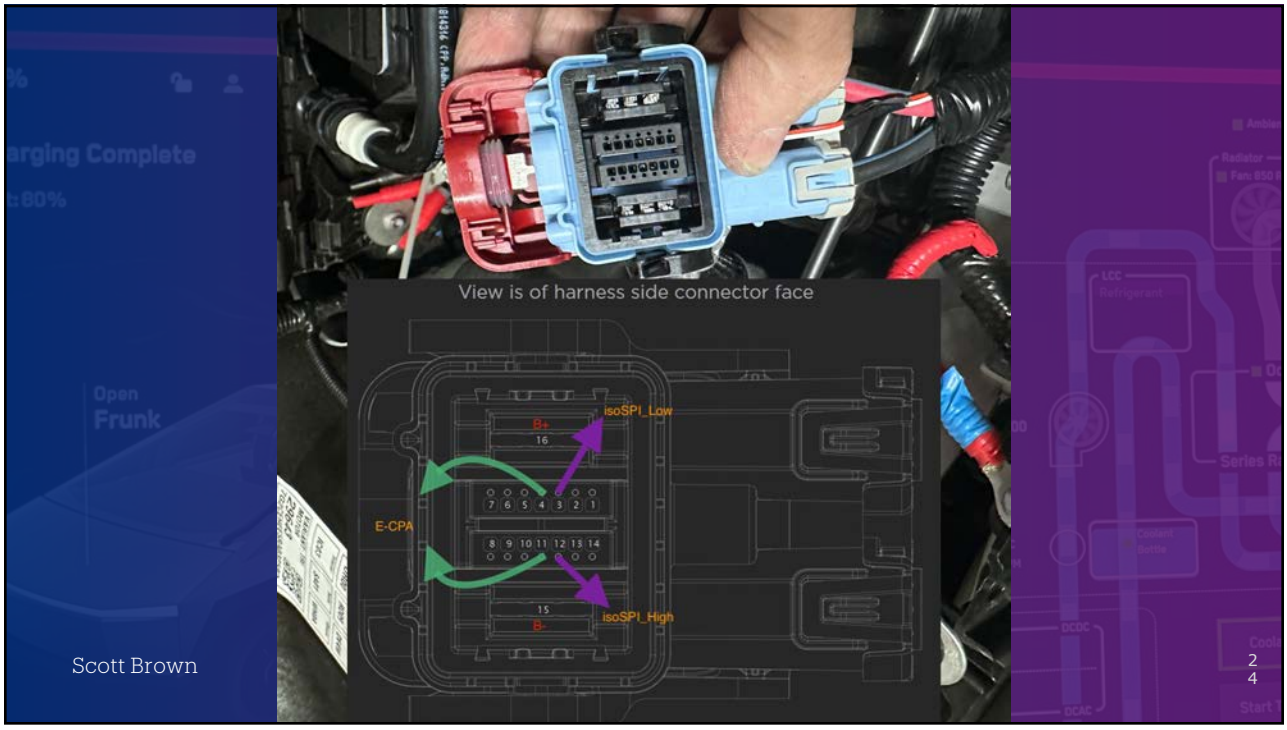

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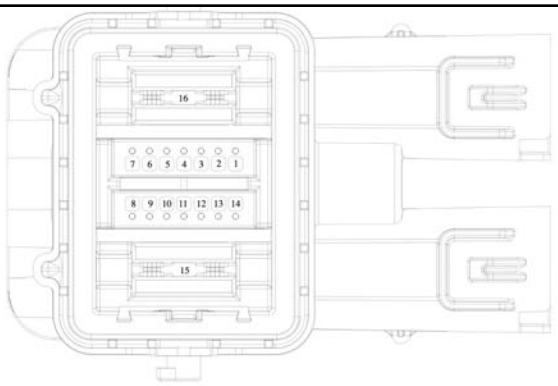
Pin	Purpose	Pin	Purpose
1	Spare	9	External charger interface
2	Spare	10	Spare
3	isoSPI_Low	11	E-CPA return / detect
4	E-CPA out	12	isoSPI_High
5	Factory Programming	13	Spare
6	Spare	14	Spare
7	Spare	15	Ground (Batt -)
8	Spare	16	Power In (Batt +)



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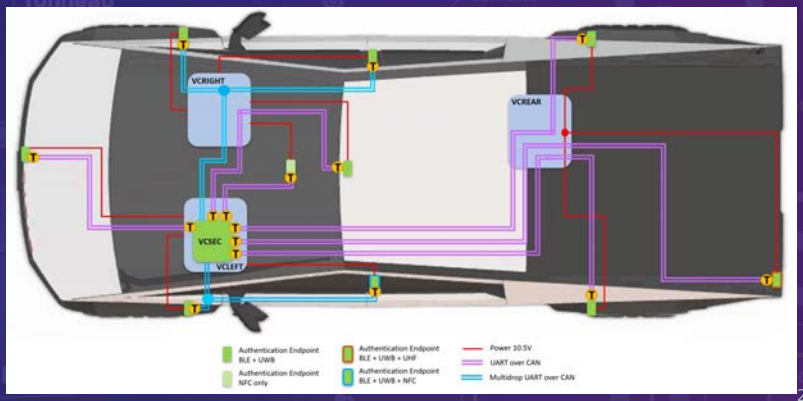
Security

Authentication

- VSEC = Domain - LF Vehicle Controller



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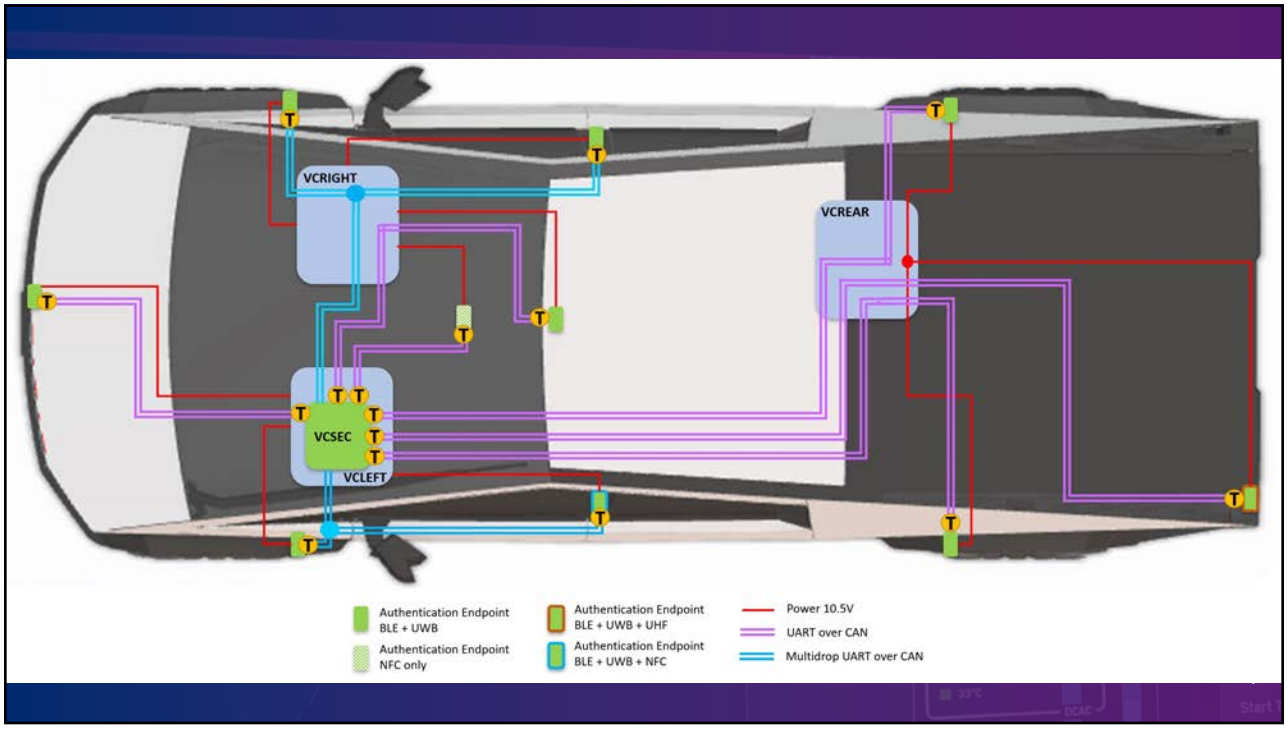

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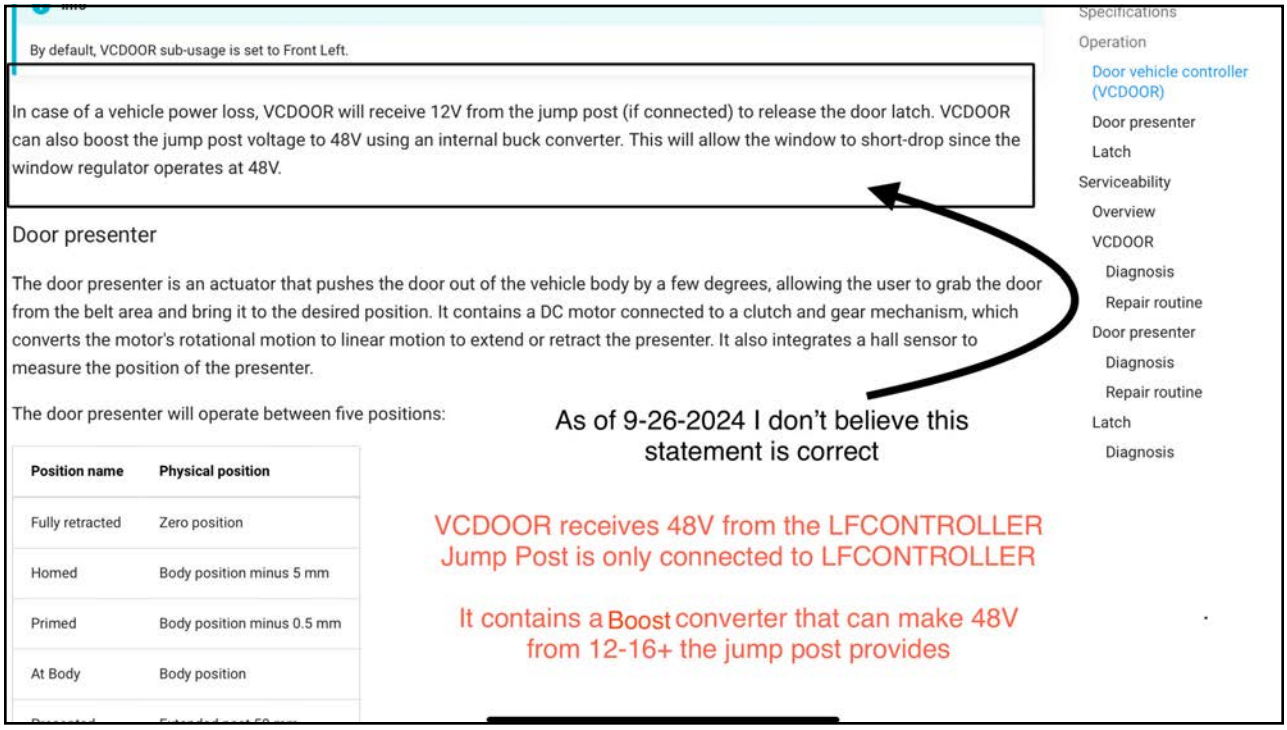
By default, VCDOOR sub-usage is set to Front Left.
In case of a vehicle power loss, VCDOOR will receive 12V from the jump post (if connected) to release the door latch. VCDOOR can also boost the jump post voltage to 48V using an internal buck converter. This will allow the window to short-drop since the window regulator operates at 48V.
Door presenter
The door presenter is an actuator that pushes the door out of the vehicle body by a few degrees, allowing the user to grab the door from the belt area and bring it to the desired position. It contains a DC motor connected to a clutch and gear mechanism, which converts the motor's rotational motion to linear motion to extend or retract the presenter. It also integrates a hall sensor to measure the position of the presenter.
The door presenter will operate between five positions:
Position name
Physical position
Fully retracted
Zero position
Homed
Body position minus 5 mm
Primed
Body position minus 0.5 mm
At Body
Body position
Specifications
Operation
Door vehicle controller (VCDOOR)
Door presenter
Latch
Serviceability
Overview
VCDOOR
Diagnosis
Repair routine
Door presenter
Diagnosis
Repair routine
Latch
Diagnosis
As of 9-26-2024 I don't believe this statement is correct
VCDOOR receives 48V from the LFCONTROLLER
Jump Post is only connected to LFCONTROLLER
It contains a Boost converter that can make 48V from 12-16+ the jump post provides

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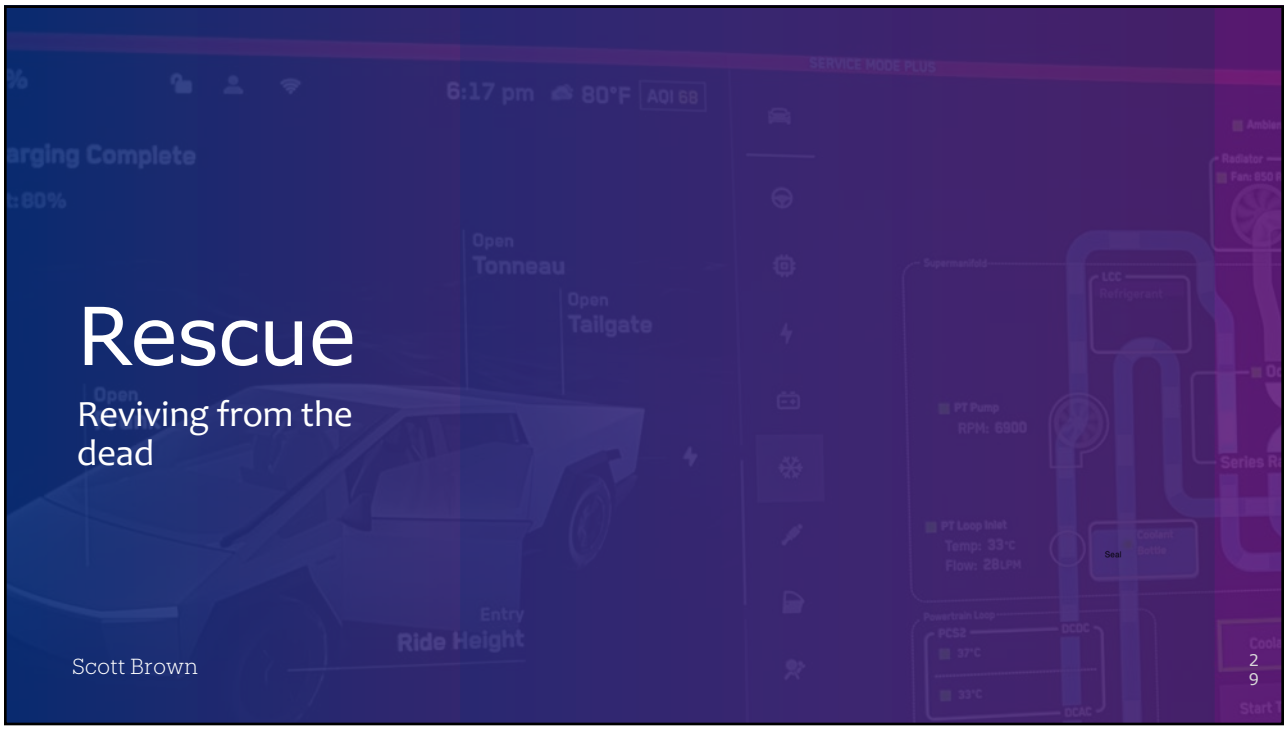
Rescue
Reviving from the dead
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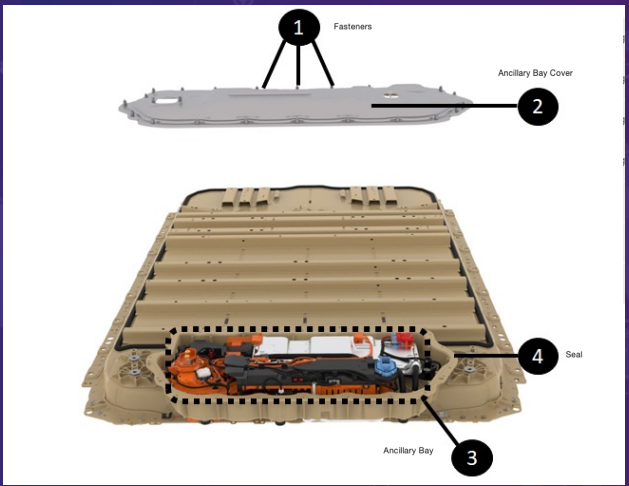
HVBATT

Structural - 800v
123kWh
4680

- Structural Battery Pack



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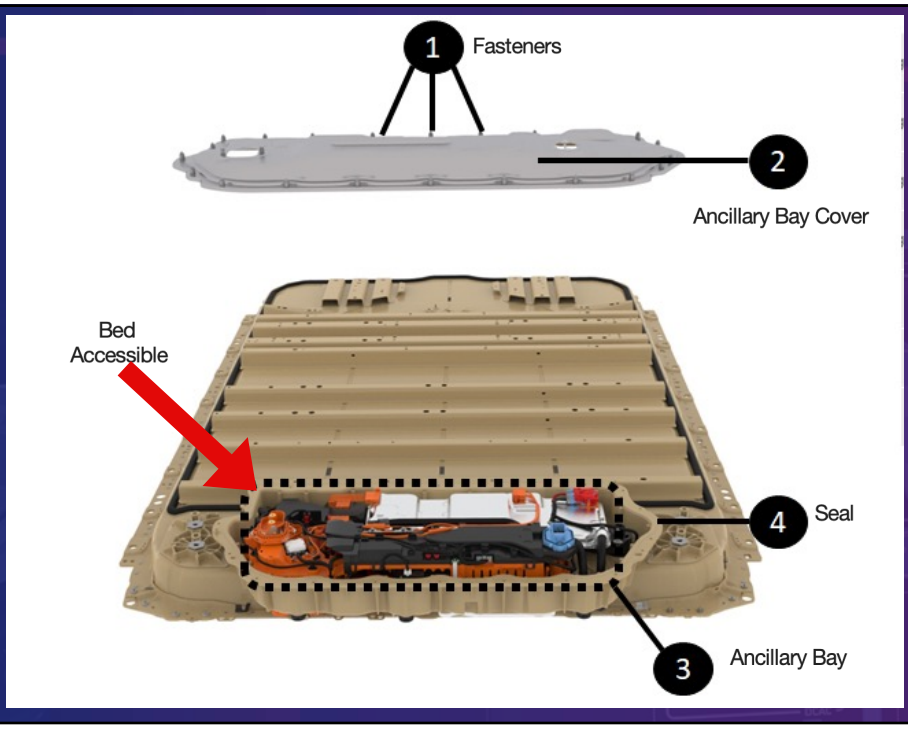

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CLOSURES

- 48v Window Motors
- Door Modules -> Departure from norm
- All modules are the same - LF Master
- Opening Servos -
- Frameless - Service Caution

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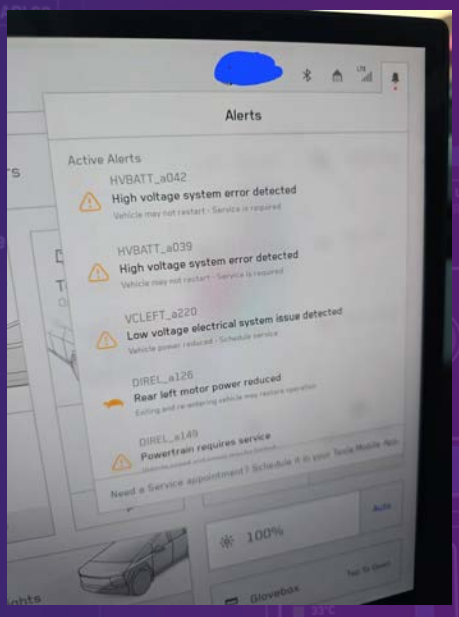
DIAGNOSTICS

2024 CT [BEAST]

HVBATT_a042
HVBATT_a039
DIREL_a126
DIREL_a149



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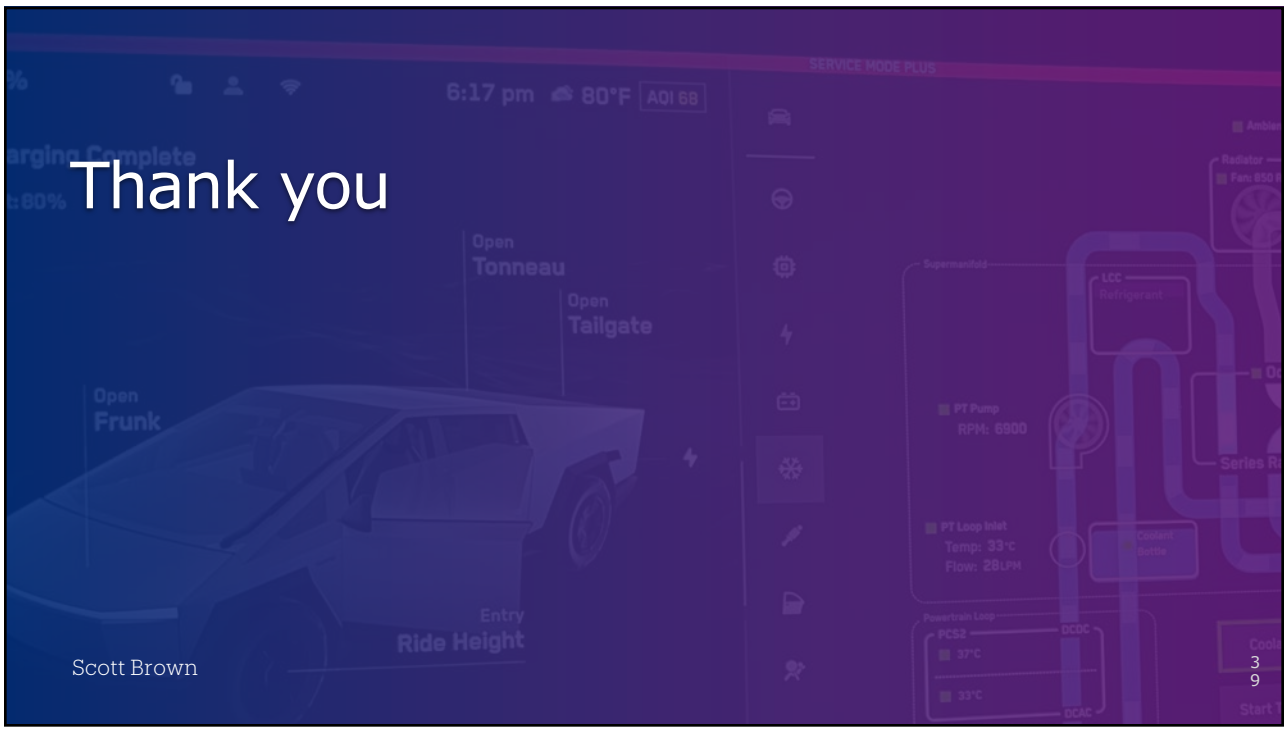

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