



Countries: BAHAMAS, BOLIVIA, BELIZE, CANADA, CHILE, TAIWAN, COLOMBIA, COSTA RICA, DOMINICAN REPUBLIC, ECUADOR, EL SALVADOR, TRINIDAD AND TOBAGO, UNITED STATES, URUGUAY, VENEZUELA, MEXICO, ARUBA, NICARAGUA, PERU, PUERTO RICO, Curaçao, GUAM, GUATEMALA, GUYANA, HAITI, HONDURAS, JAMAICA, KOREA, SOUTH KOREA, PANAMA
Document ID: IK0800092
Revision: 13
Availability: ISIS, Bus ISIS, FleetISIS, Body Builder, IsSIR
Created: 8/22/2007
Major System: ELECTRICAL SYSTEM
Last Modified: 11/1/2017
Current Language: English
Other Languages: [Français](#), [Español](#)
Author: Charles Schroeder
Viewed: 49809

[Less Info](#)

Hide Details

Coding Information

Copy Link 	Copy Relative Link 	Bookmark View My Bookmarks	Add to Favorites 	Print 	Provide Feedback 	Helpful 6426	Not Helpful 4113
----------------------	-------------------------------	--	-----------------------------	------------------	-----------------------------	----------------------------	--------------------------------

Title: The First Check to make when Troubleshooting any Body Controller or ESC Issue

Applies To: All Vehicles with ESCs or Body Controllers

Change Log

Please refer to the change log text box below for recent changes to this article:

11/01/2017 - Added note at Step 6 to check for telematics that could cause unusual vehicle behavior.
 09/28/2016 - Updated Figure 1 to show the checkmark may not be present on 4044470C1 250k Baud body controllers.
 05/24/2016 - Added feature information for 500k grid control.
 05/19/2016 - Updated ESC connector information based on dealer feedback. Added additional information for Gen 4 with 500k Baud and associated fault codes.
 12/14/2015 - Added Gen4 BCM information.

Description

This outlines how to verify BCM/ESC is receiving proper voltage and ground inputs to power up.

- 2015 - Current Body Control Module (BCM)
 - Gen 4 BCMs on trucks with 500k Baud data link, utilize enhanced grid control that monitors the key switch
 - Fault codes are present when a signal is missing
- 2007 - 2015 Body Control Module (BCM)
- Pre-2007 Electronic System Controller (ESC)

Symptoms

NOTE:

Do not diagnose these faults when *INACTIVE* without a driver complaint

Faults apply to Gen 4 Body Controllers with 500k Baud Only			
SPN	FMI	Module and Source Address (SA)	Description
520981	14	Body Controller (33)	Only Ignition input is being detected (status of Key_Switch_State = 1)
520982	5	Body Controller (33)	Accessory Grid Undercurrent
520982	6	Body Controller (33)	Accessory Grid Overcurrent
520983	14	Body Controller (33)	Only Starter input is being detected (status of Key_Switch_State = 4)
520984	14	Body Controller (33)	Starter input and Accessory input are detected (status of Key_Switch_State = 6)
520985	14	Body Controller (33)	Starter input, Accessory input, and Ignition input are detected (status of Key_Switch_State = 7)

Below are the only conditions the Body Controller should observe for Key_Switch_State:

- Accessory Only
- Ignition and Accessory (Key on Engine Off or Key On Engine Running)
- Ignition and Starter input (Crank) - (Accessory signal is removed during cranking)

If any other combinations of key switch state are observed a fault will be set. If the Accessory circuits are undercurrent or overcurrent a fault will be set. The Body Controller will not supply power to the output when overcurrent or undercurrent faults are active. You must troubleshoot the output wiring.

Troubleshooting (All)

1. Hook up DLB and monitor these pins in DLB. There should be a check mark next to both the **ignition, accessory** and **power feed** signals. Don't go by the voltage number reading in DLB, it isn't accurate. Only look for the check marks. You will probably see that one of these three signals is not getting a check mark beside it.
2. Hook up your break out box to the 1600 connector of the Body Controller and check the voltage on all 3 power pins with a multimeter. For pin numbers, see below.
3. If both 1600 connector pins have voltage, but the problem persists, then you need to load test the two 1600 connector pins through the breakout box with a headlamp using the Body Controller ground circuits.
4. Load test the main battery circuit to the Body Controller J8 (Gen 4 BCM) or J6 (Gen II BCM or ESC) power feed stud.
5. Remove Mega-Fuse. Clean it thoroughly and inspect for cracks. Ohm the fuse end to end to insure it is not cracked internally as this has been known to be a problem.
- 6.

NOTE:

If you have found the BCM is powered up properly, there is potential for improperly installed devices on the data link could cause unusual behavior. Any aftermarket device installed on the data link should be checked to verify it is not causing an issue with the vehicle.

- The device could cause issues on the data link
- The method the device was installed onto the data link could cause issues.
- Removing the device and inspecting the installation method/splice is recommended

Troubleshooting specific to 500k Baud Vehicles

- Make a session in DLB from feature 0595KAG
 - If you need assistance making a session in DLB please use [IK2600008 - How to Diagnose Electrical Problems with Diamond Logic® Builder](#)

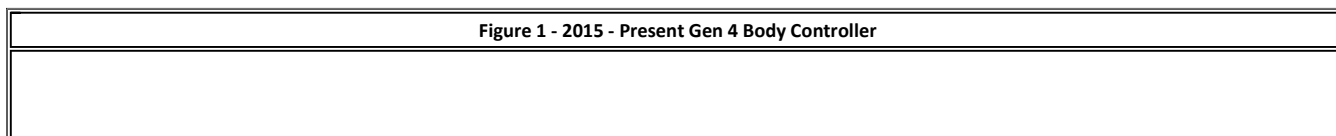
Accessory Grid Control output:	1605-A	Maximum Current: 20 Amps
Ignition Grid Control output:	1605-B	Maximum Current: 10 Amps
Starter Grid Control output:	1605-T	Maximum Current: 10 Amps

ESC Signals					
Signal	Pins	Unit	Signal Type	Description	
Acc_Grid_Cmd	1605-A	On/Off	Digital Output	Accessory Grid Power Output Command signal. (Output of Virtual F...	
Ign_Grid_Cmd	1605-B	On/Off	Digital Output	Ignition Grid Power Output Command signal. (Output of Virtual Fu...	
Str_Grid_Cmd	1605-T	On/Off	Digital Output	Starter Grid Power Output Command signal. (Output of Virtual Fus...	

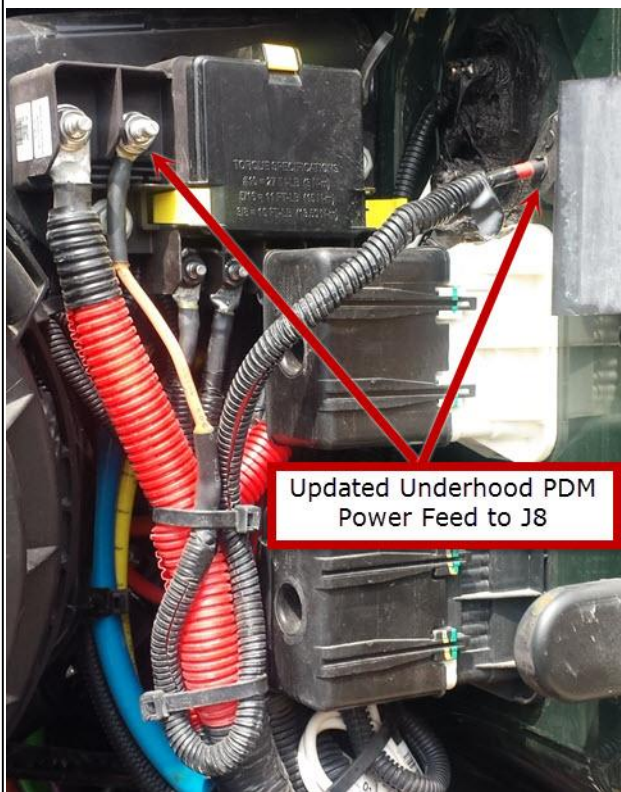
NOTE:

The Body Controller will disable these outputs when an overcurrent/undercurrent fault is Active. Do not replace the Body Controller for this issue. Troubleshoot the outputs for those circuits.

Gen 4 Body Controller Signals to Watch



The screenshot shows the International Diamond Logic Builder interface. On the left is a wiring diagram for the ESC (Electronic Suspension Control) system, highlighting connector J8 (Power_Feed) with a yellow box. Other connectors shown include J4 (1601) Cab, J6 (1605) J6, J7 (1606) J7, J5 (1602) Engine, J1 (1603) Hood, J2 (1604) Chassis, and J3 (1600) Inside. On the right, a 'Power_Feed (ESC J8) Mating View Shown' diagram shows a connector with a terminal labeled '1' and 'Power_Supply_1_Signal', also highlighted in yellow. A red arrow points from the text below to this terminal. To the right of the mating view, red text reads: 'When in Diagnostic Mode - Key ON'. Below the mating view, red text states: 'Some Gen 4 Body Controllers on 250k Buad trucks (Black 9 Pin Diagnostic Connector) may not have a check mark on the J8. If a check mark is not present, manually verify the voltage to the terminal. This issue applies to the BCM 4044470C1. This does not cause an issue with the performance of the BCM and the BCM should not be replaced for this concern.'



- The updated PDM is only used with Navistar Engine on ProStar models
- The updated PDM is used on all LT/RH models

International® Diamond Logic® Builder

File Edit View Advanced Logic Tools Diagnostics Help

Select Advanced Logic Features Faults Connectors Signals Center Panel Cluster Campaign Messages

ESC RPM 1 RPM 2 RPM 4 RPM 7

ESC

1600 (ESC J3) Mating View Shown

You must be in Diagnostic Mode with the Key ON to check this

[B1]	Primary_Air_Pressure [B2]	[A1] <input checked="" type="checkbox"/> Accessory_Signal_Input
[B2]	Secondary_Air_Pressure [B3]	[A2] <input type="checkbox"/> AC_Request
[B3]	Clutch_Switch_Signal [B4]	[A3] <input type="checkbox"/> RCD_HVAC_Ctrl_Head_Diag_Signal
[B4]	HVAC_Low_Pressure_Switch [B5]	[A4] <input type="checkbox"/> Highbeam_Signal
[B5]	Right_Fuel_Sensor_Signal [B8]	[A5] <input type="checkbox"/> Elec_City_Horn_SW_Signal
[B6]	Left_Fuel_Sensor_Signal [B9]	[A6] <input type="checkbox"/> Right_Turn_Signal_Switch
[B7]	AC_High_Side_Pressure [B12]	[A7] <input type="checkbox"/> Left_Turn_Signal_Switch
[B8]	HVAC_Freeze_Protect [B13]	[A8] <input type="checkbox"/> Wiper_0_Signal
[B9]	Cruise_Switch_Signal [B16]	[A9] <input type="checkbox"/> Wiper_1_Signal
[B10]		[A10] <input type="checkbox"/> Wiper_2_Signal
[B11]		[A11] <input type="checkbox"/> Park_Brake_Switch_Signal
[B12]		[A12] <input type="checkbox"/> Door_Switch
[B13]		[A13] <input type="checkbox"/> Flash_To_Pass_Signal
[B14]		[A14] <input type="checkbox"/> Washer_Pump_Signal
[B15]		[A15] <input type="checkbox"/> Ignition_Signal_Input
[B16]		[A16] <input checked="" type="checkbox"/> Ignition_Signal_Input

International® Diamond Logic® Builder

File Edit View Advanced Logic Tools Diagnostics Help

Select Advanced Logic Features Faults Connectors Signals Center Panel Cluster Campaign Messages

ESC RPM 1 RPM 2 RPM 4 RPM 7

ESC

1604 (ESC J2) Mating View Shown

Ground circuits to use when load testing

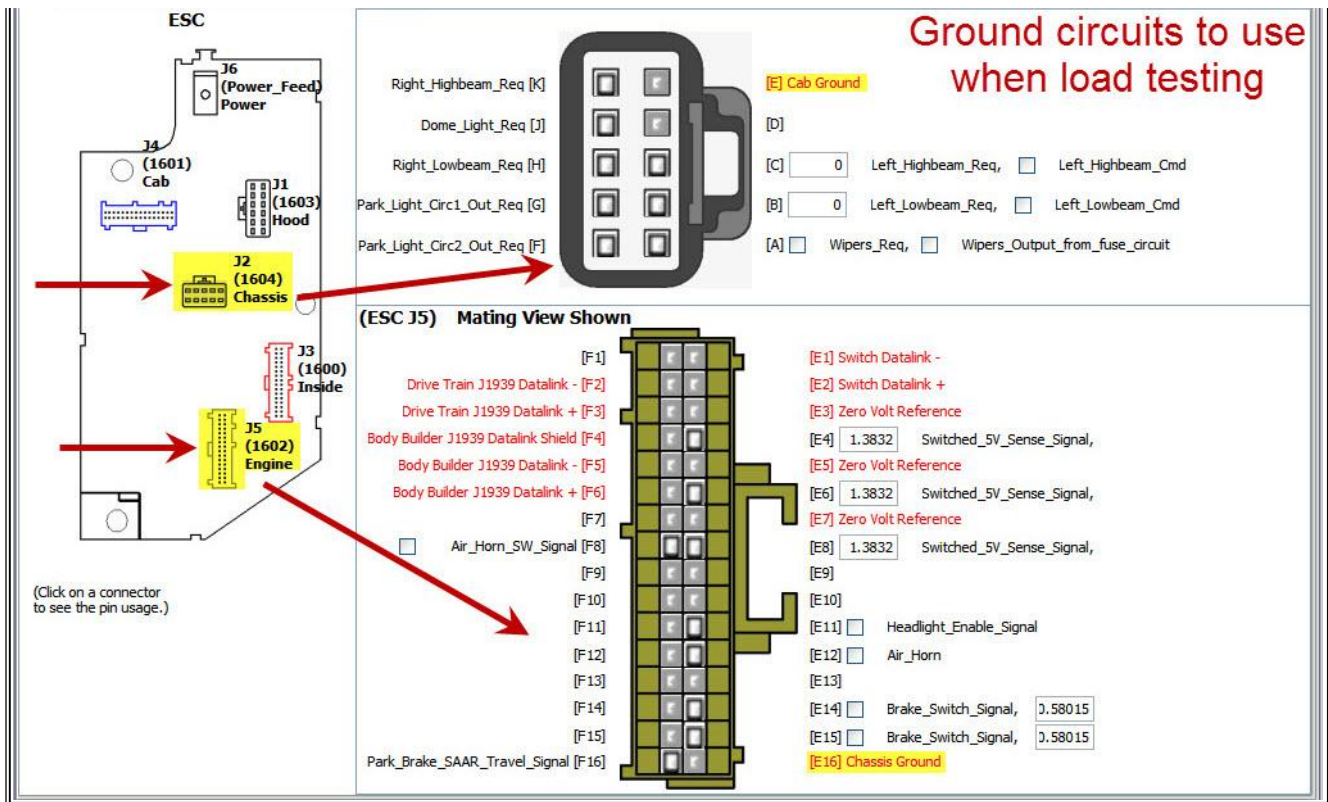
[K]	Right_Highbeam_Cmd [K]	[E] Cab Ground
[J]	Dome_Light [J]	[D]
[H]	Right_Lowbeam_Cmd [H]	[C] Left_Highbeam_Cmd
[G]	Park_Lights_Circ1 [G]	[B] Left_Lowbeam_Cmd
[F]	Park_Lights_Circ2 [F]	[A] Wipers_Output_from_fuse_circuit

1602 (ESC J5) Mating View Shown

[F1]	Drive Train J1939 Datalink - [F2]	[E1] Switch Datalink -
[F2]	Drive Train J1939 Datalink + [F3]	[E2] Switch Datalink +
[F3]	Body Builder J1939 Datalink Shield [F4]	[E3] Zero Volt Reference
[F4]	Body Builder J1939 Datalink - [F5]	[E4] Switched_5V_Sense_Signal
[F5]	Body Builder J1939 Datalink + [F6]	[E5] Zero Volt Reference
[F6]		[E6] Switched_5V_Sense_Signal
[F7]		[E7] Zero Volt Reference
[F8]		[E8] Switched_5V_Sense_Signal
[F9]		[E9]
[F10]		[E10]
[F11]		[E11] <input type="checkbox"/> Headlight_Enable_Signal
[F12]		[E12] /N4 Susp_Dump_Solenoid_A_Cmd
[F13]		[E13]
[F14]		[E14] <input type="checkbox"/> Brake_Switch_Digital_Input
[F15]		[E15] <input type="checkbox"/> Brake_Switch_Digital_Input
[F16]		[E16] <input checked="" type="checkbox"/> Chassis Ground

(Click on a connector to see the pin usage.)

Gen II Body Controller Signals to Watch

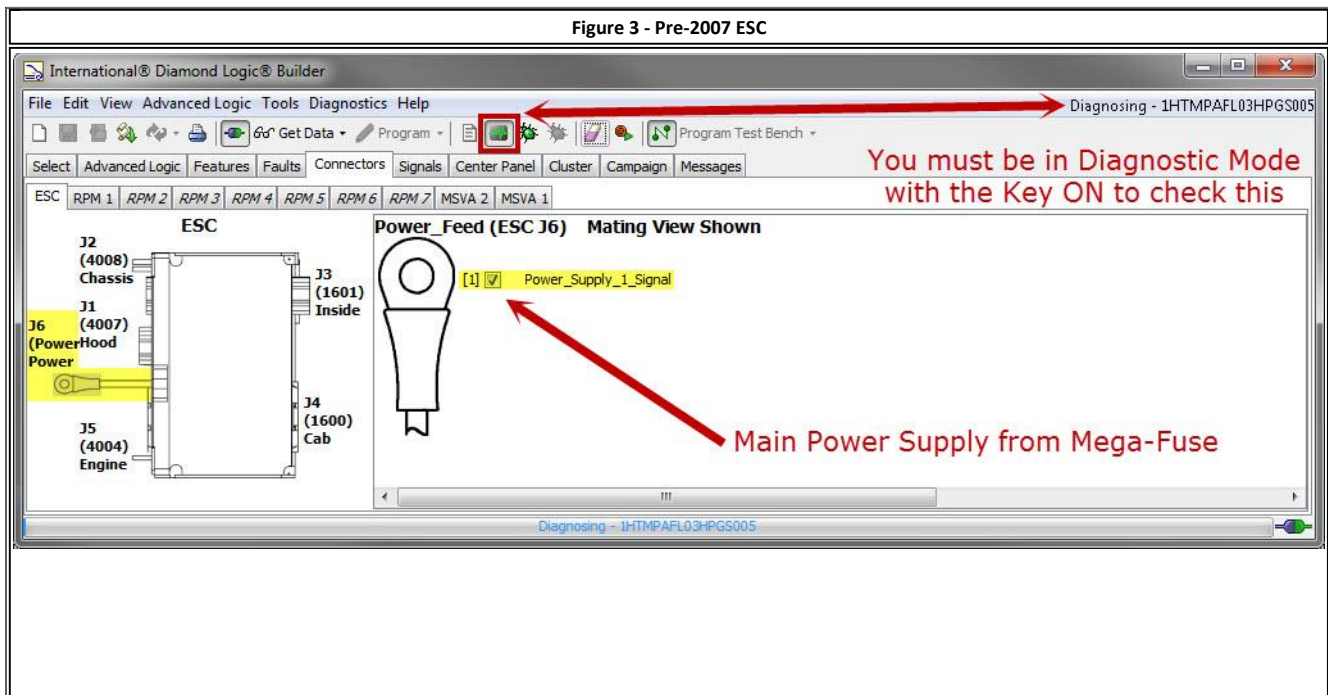


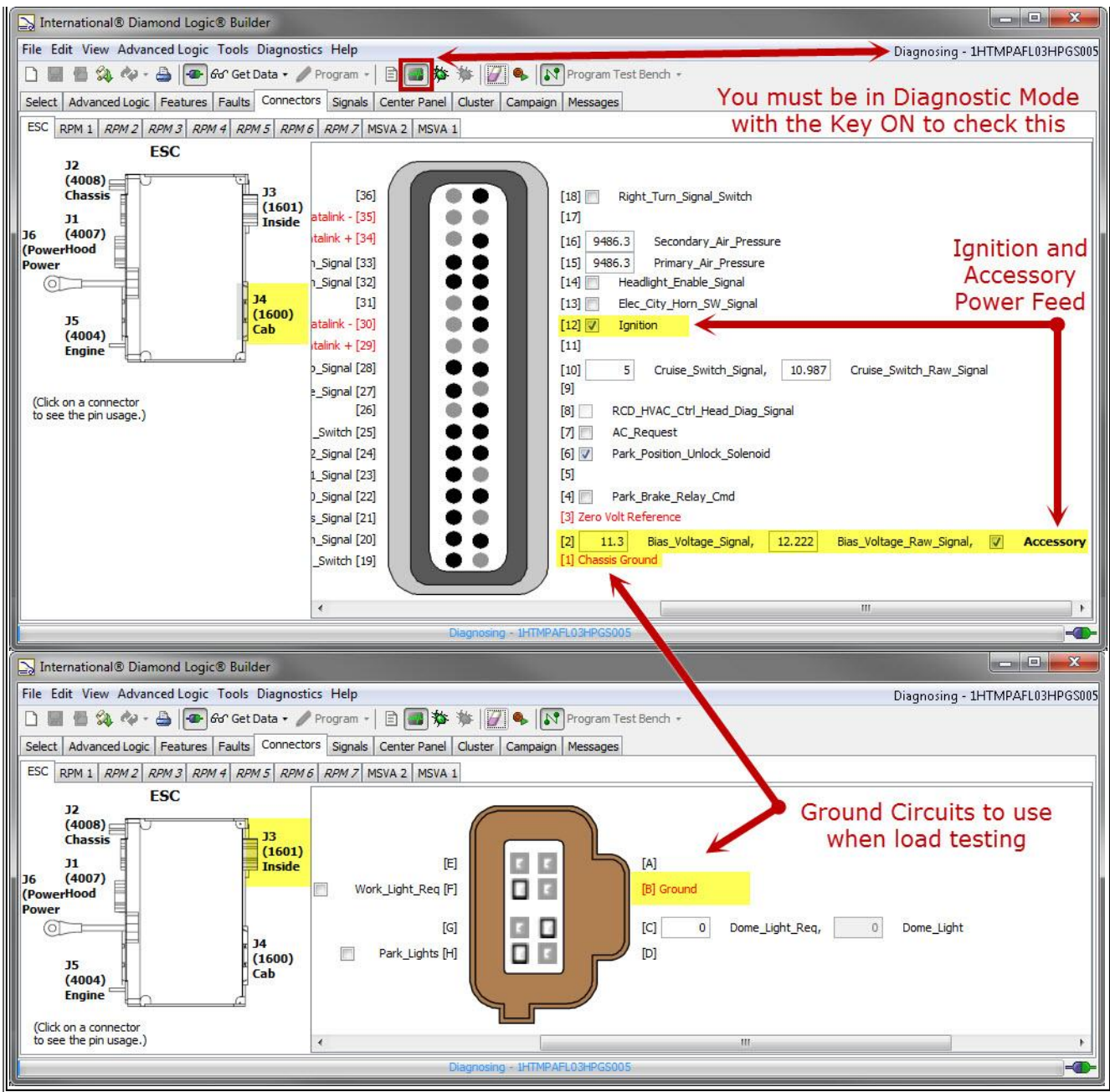
Body Controller Circuit Diagrams

- [ProStar / LoneStar](#)
- [DuraStar / WorkStar / TranStar](#)
- [TerraStar](#)

ESC Signals to Watch

- The ESC works the same way as the Body Controller. Here are the Connector and Pin locations for the ESC





ESC Circuit Diagrams

- [All Models with ESC](#)

Hide Details

Feedback Information

Viewed: 49808
 Helpful: 6426
 Not Helpful: 4113

No Feedback Found