



**Countries:** AUSTRALIA, BAHAMAS, BOLIVIA, BRAZIL, 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, NEW ZEALAND, PANAMA, SOUTH AFRICA

**Document ID:** IK0800080

**Revision:** 27

**Major System:** ELECTRICAL SYSTEM

**Created:** 8/22/2007

**Current Language:** English

**Last Modified:** 1/22/2018

**Other Languages:** [Portuguese](#), [Français](#), [Español](#)

**Author:** Charles Schroeder

**Viewed:** 121336

[Less Info](#)

Hide Details

Coding Information

|                      |                               |  |                             |                  |                             |                             |                                |
|----------------------|-------------------------------|--|-----------------------------|------------------|-----------------------------|-----------------------------|--------------------------------|
| <b>Copy Link</b><br> | <b>Copy Relative Link</b><br> | <b>Bookmark</b><br><br><a href="#">View My Bookmarks</a> | <b>Add to Favorites</b><br> | <b>Print</b><br> | <b>Provide Feedback</b><br> | <b>Helpful</b><br><br>10755 | <b>Not Helpful</b><br><br>7045 |
|----------------------|-------------------------------|--|-----------------------------|------------------|-----------------------------|-----------------------------|--------------------------------|

**Title:** J1939 Data Link Troubleshooting

**Applies To:** All Models with 250k Baud Data Link (Black 9-Pin Diagnostic Connector); Overview information for 500k Baud Data Link

### Change Log

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

- 01/22/2018 - Added link to IK1200921 for private data link troubleshooting based on dealer feedback
- 08/11/2017 - Updated 500k Baud (Phase 2) Vehicle Architecture to show the Switch Pack(s) are part of the HMI data link backbone.
- 08/09/2017 - Updated steps 12-15 to clarify what resistance measurement is being referenced based on dealer feedback.
- 06/28/2017 - Added graphic to Step 1 for power and ground at diagnostic 9-Pin connector based on dealer feedback.
- 04/27/2017 - Updated diagnostic software to Navistar Engine Diagnostics™.
- 01/12/2017 - Added French and Spanish translations.

**NOTE:**

- This article is for general J1939 troubleshooting on 250k baud data link vehicles. They will have a black 9-pin diagnostic connector. The information provided applies to all models. Check the Fault Code Action Plan for the faults you are diagnosing, there may be model specific FCAP diagnostic information available.
- You **MUST** review the "Service Information (Known Issues)" section of this iKNOW article **PRIOR** to troubleshooting anything on the truck.
- [IK1200921](#) - ISX, N13, and N9 / N10 Aftertreatment Private Data Link Troubleshooting

[Click Here for a printable PDF version of this article.](#)

### Table of Contents

|   |  |  |
|---|--|--|
| <a href="#">Description</a>                 | <a href="#">Service Part(s) Information</a>        | <a href="#">500k Baud (Phase 1) Vehicle Architecture</a> |
| <a href="#">Symptom(s)</a>                  | <a href="#">Additional Resources</a>               | <a href="#">500k Baud (Phase 2) Vehicle Architecture</a> |
| <a href="#">Special Tool(s) or Software</a> | <a href="#">Connector Views</a>                    |  |
| <a href="#">Diagnostic Steps</a>            | <a href="#">Service Information (Known Issues)</a> |  |

### Description

There are a few things that you need to understand before troubleshooting the 1939 data link.

1. First, the drivetrain J1939 data link, J1939 body builder data link, and J1939 engine data link are three completely separate data links.

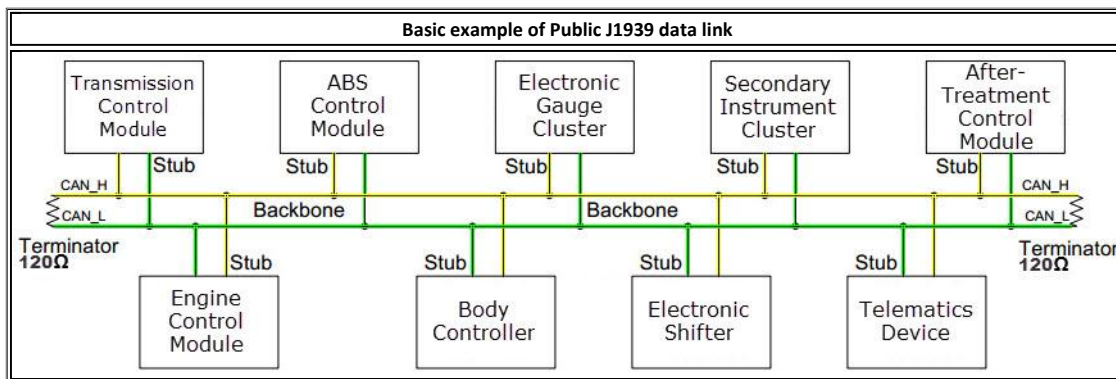
- For specific examples of modules on each different data link [Click Here](#)
- 2. The different J1939 data links work the same way, but the wiring for them is not connected.
- 3. The troubleshooting below is geared towards the drive train J1939 data link, but the same principles apply to the body builder and engine data link.
- 4. The J1939 data link consists of a twisted pair of yellow and green wires that all the modules on the truck use to communicate with each other.
- 5. Two 120 ohm terminating resistors are wired in parallel on the data link. Total resistance on a properly working data link is 60 ohms.
- 6. When you are checking the data link, if the problem is not present, the data link will show good.
- 7. The J1939 data link may be referred to as data bus, or CAN as well.
- 8. A module is capable of being connected to the public and private data link, but the information remains separate.
  - Example: The Body Controller communicates on the public drivetrain data link, but also has the private body builder data link wired to it.
  - Example: The EIM communicates on the drivetrain data link, but also communicates with the ECM and ACM on the engine private data link.

**NOTE:**

**The MaxxForce 7 TMV (Thermal Management Valve) is on the Public data link. This module will not show up on the sniffer. The ECM Engine and Chassis connector's data link terminals are connected internally to the module. E13 and C53 are internally connected. E14 and C54 are internally connected.**

For Post-2007 vehicle 1939 troubleshooting, click on the appropriate link below:

- The troubleshooting cards give a good overview of the data link. This will help show you the backbone of the data link (main data link wiring between 1st terminating resistor to 2nd terminating resistor) and the stubs of the data link (wiring from the backbone to each possible module)



- The J1939 Splice Adapters (1024, 1025, 1026) are part of the backbone of the data link (The backbone will come in on 2 terminals and leave on 2 different terminals). The wiring from the connector to each module is a stub.
  - [HPV \(medium duty\) 1939 Troubleshooting Card](#)
  - [CE / BE Bus 1939 Troubleshooting Card](#)
  - [ProStar 1939 Troubleshooting Card](#)

**NOTE:**

**These cards are 11" x 17" so they may not print well on regular size paper.**

There are the most current troubleshooting cards that are available for printing. For more information specific to ProStar and LoneStar refer to the [Data Link Service Procedure](#) found in the [2010–2016 ProStar® Technician Manual 0000863170](#). If you wish to order the above cards, you can order them through the [Navistar Print Portal](#) from the Service Portal - Dealer Menu. The part numbers are:

| Vehicle Model                      | Part Number |
|------------------------------------|-------------|
| ProStar Card                       | S00153      |
| DuraStar, TranStar & WorkStar Card | S00155      |
| CE / BE Bus Card                   | S00154      |

( [Back to Top](#) )

## Symptoms

### Diagnostic Trouble Code(s) & Dashboard Indicator Light(s):

| SPN    | FMI  | Module and Source Address (SA)            | Description   |
|--------|------|---|---|
| PRO100 | 0    | Synthetic Fault Code                      | ProStar/LoneStar J1939 Fault Code Combination Occurred      |
| PRO100 | 1    | Synthetic Fault Code                      | ProStar/LoneStar J1939 Fault Code Combination Occurred      |
| GEN100 | 0    | Synthetic Fault Code                      | A combination of J1939 Fault Codes Occurred                 |
| GEN100 | 1    | Synthetic Fault Code                      | A combination of J1939 Fault Codes Occurred                 |
| GEN100 | 2    | Synthetic Fault Code                      | A combination of J1939 Fault Codes Occurred                 |
| 639    | 9    | Body Controller (33)                      | Drivetrain message timeout                                  |
| 639    | 14   | Body Controller (33)                      | Drivetrain message timeout                                  |
| 2000   | 19   | Body Controller (33)                      | PTC1 (PGN 64892) not Received from Engine                   |
| 2023   | 9    | Body Controller (33)                      | EGC data link communication failure                         |
| 2000   | 9    | Gauge Cluster (23) / Body Controller (33) | Loss of data link from the Engine Controller                |
| 2003   | 9    | Gauge Cluster (23) / Body Controller (33) | Loss of data link from the Transmission Controller          |
| 2011   | 9    | Gauge Cluster (23) / Body Controller (33) | Loss of data link from the ABS Controller                   |
| 2023   | 14   | Gauge Cluster (23)                        | Gauge cluster lost communication with the ESC               |
| 2023   | 14   | Gauge Cluster (23)                        | Gauge cluster lost communication with the Engine Controller |
| 2033   | 9    | Gauge Cluster (23)                        | Loss of data link from the ESC                              |
| 560    | 19   | Engine (0)                                | Transmission driveline engaged not detected on J1939        |
| 609    | 19   | Engine (0)                                | ACM not detected on J1939                                   |
| 639    | 14   | Engine (0)                                | J1939 data link error (ECM unable to transmit)              |
| 639    | 19   | Engine (0)                                | J1939 data link error (ECM unable to transmit)              |
| 751    | 8,11 | Transmission (3)                          | J1939 Shift Control Device                                  |
| 563    | 9,14 | Transmission (3)                          | ABS CAN Message   |
| 639    | 2    | Transmission (3)                          | J1939 Communication Link                                    |
| 639    | 14   | Transmission (3)                          | J1939 Engine Message  |
| 639    | 2    | Anti-Lock Brake System (ABS) (11)         | Drivetrain message timeout                                  |
| 639    | 12   | Anti-Lock Brake System (ABS) (11)         | J1939 Serial Link   |
| 639    | 14   | Anti-Lock Brake System (ABS) (11)         | Loss of Data Link from Engine Controller                    |
| 2853   | 14   | Primary Shifter (5)                       | Drivetrain message timeout                                  |
| 886    | 14   | Headway Controller (Forward Radar) (40)   | Drivetrain message timeout                                  |

### Customer Complaint(s):

- Gauges inoperative (Constant or Intermittent)
- Transmission will not go into gear
- Warning Lights
- Check Electrical Message

( [Back to Top](#) )

## Special Tool(s) or Software

| Tool Description | Tool Number | Comments |
|------------------|-------------|----------|
|                  |             |          |

|                              |             |   |
|------------------------------|-------------|---|
| INTUNE                       |             | EZ-Tech Software  |
| Helios                       |             | EZ-Tech Software  |
| Diamond Logic Builder (DLB)  |             | EZ-Tech Software  |
| Navistar Engine Diagnostics™ |             | EZ-Tech Software  |
| Fluke DVOM                   | ZTSE4357    | Digital Multimeter  |
| Electrical Tester            | ZTSE4858    |   |
| 180-Pin Breakout Box         | 00-00956-08 | Breakout box allows for testing engine control module and body control module systems |
| Breakout Harness Kit         | Multiple    | Use breakout harness that is applicable to the system you are testing                 |
| Terminal Test Kit            | ZTSE4435C   | Kit, Int. Elec. Eng. Terminal Test  |
| Terminal Test Kit            | 77066-nav   | Hickok Break-Out Tee Builder And Pin-Out Tool   |

[\( Back to Top \)](#)

### Diagnostic Steps

**NOTE:**

- The problem must be present when taking these readings!!
- If the problem is NOT present, the reading will be within spec every time!!

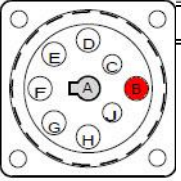
**NOTE:**

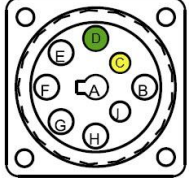
The diagnostic checks listed below can be performed at any module connector

- Making checks at each module connector can help isolate a voltage drop / increase in resistance / short to power or ground
- Use the worksheet below to identify which modules, connectors and terminals you have checked

[Connector Terminal Worksheet](#)

- This can also help identify if the J1939\_High and J1939\_Low wires are pinned incorrectly at a connector
- Due to the many configurations and options available, the **terminating resistor** can be found in multiple locations (250k only vehicles)
  - Near the top of the transmission in the Powertrain Harness
  - Left frame rail (could be as far forward as the steer tire in some applications) in the Center Chassis Harness
  - Left frame rail (near the radiator bracket) in the Forward Chassis Harness (\*if equipped with Forward Radar)
  - Under the bunk in the sleeper (when factory pre-wired for telematics)
  - Near the ACM
- Be aware there are multiple data links on the truck. You must ensure the terminating resistor is part of the public drivetrain data link, and not one of the private data links (body builder or engine/aftertreatment)
  - For Engine Private Data Link Troubleshooting please reference [IK1200921](#)

| Step |  | Decision   |
|------|--|--|
| 1    |  <p>A - Ground<br/>B - Battery Voltage</p> <ul style="list-style-type: none"> <li>• Install a comm. device (Nexiq USB, NavCom, NavLink) the Power LED should be illuminated.</li> </ul> | <p>Yes: Continue to Step 2</p> <p>No: Verify proper power and ground to the 9-pin ATA diagnostic connector</p> |
| 2    | <p><b>Is the Power LED illuminated?</b></p> <ul style="list-style-type: none"> <li>• Install a scan tool.</li> <li>• Turn the ignition key on, engine off (KOEO).</li> <li>• Attempt to establish communication with INTUNE.</li> </ul>                                    | <p>Yes: Obtain screen shot or record all modules. Continue to Step 3</p> <p>No: Continue to Step 6</p>         |

|   |  |   |
|---|--|---|
|   | <p><b>Are you able to communicate with any of the modules?</b></p> <p>Note: Refer to <a href="#">IK0800351</a> to identify the module to the source address.</p>   |   |
| 3 | <ul style="list-style-type: none"> <li>Evaluate modules detected on the sniffer.</li> </ul> <p><b>Can you identify a module that is NOT communicating?</b></p>   | <p>Yes:</p> <ul style="list-style-type: none"> <li>Check the fuse for that module.</li> <li>Load test the battery power, ignition power, ground circuits at the module connector.</li> <li>If ALL power and ground circuits test okay, test the data link circuits at that module connector using the information starting at Step 6.</li> <li>Repair wiring as needed to allow the module to communicate on the data link and re-test the system.</li> </ul> <p>No: Continue to Step 4</p>   |
| 4 | <ul style="list-style-type: none"> <li>Check for Diagnostic Trouble Codes (DTCs)</li> </ul> <p><b>Are communication DTCs present in any of the modules?</b></p>  | <p>Yes: Obtain a screen shot of the DTCs in ALL modules (ECM, ABS, TCM, BC, etc....). Continue to Step 5</p> <p>No: Evaluate complaint to determine if a data link issue is present. Determine if faults were previously cleared.</p>   |
| 5 | <ul style="list-style-type: none"> <li>Evaluate fault counts by modules</li> </ul> <p><b>Do one (or more) modules show high fault counts of loss of communication fault (Other modules would have low counts)?</b></p>   | <p>Yes:</p> <ul style="list-style-type: none"> <li>Load test the battery power, ignition power and ground circuits at the module connector.</li> <li>If ALL power and ground circuits test okay, inspect the stub wiring from the module connector to the backbone of the data link.</li> <li>Ensure all terminals are properly seated and fully locked in the connector.</li> <li>Inspect for spread terminals using a terminal test kit to pin drag test the terminals.</li> <li>Verify the wires are pinned properly in the connector for High(+) and Low(-).</li> <li>If wiring goes to splice connector (heat shrink) cut open and inspect, tug on each end and check for proper weld. You will need to recrimp, solder and heat shrink after making this inspection.</li> <li>Use the information starting at Step 6 to assist.</li> <li>If an issue is identified and repaired, re-test for the complaint.</li> <li>If no issue is identified, continue to Step 6</li> </ul> <p>No: Continue to Step 6</p> |
| 6 | <div style="text-align: center;">  <p>ATA Diagnostic Connector</p> <p>C - J1939 CAN (High) Yellow<br/>D - J1939 CAN (Low) Green</p> </div> <ul style="list-style-type: none"> <li>Measure the voltage at the ATA Diagnostic Connector Terminal C to Gnd and D to Gnd.</li> </ul> <p><b>Is there approximately 2.5 Vdc at each terminal?</b></p> | <p>Yes: Continue to Step 7</p> <p>No: Continue to Step 8</p>  |
| 7 | <p><b>Does the voltage on C and D match?</b></p> <p>Note: Terminal C should have slightly higher voltage than Terminal D.</p> <p>Note: The voltages should not match</p>   | <p>Yes:</p> <ul style="list-style-type: none"> <li>A module not communicating can put 2.5Vdc on each data link wire.</li> <li>Monitor voltage at the 9 pin diagnostic connector while unplugging modules</li> <li>If the voltage changes and communication resumes suspect an issue at that module</li> </ul>   |

|    |  |  |
|----|--|--|
|    |  | <ul style="list-style-type: none"> <li>◦ Load test the battery power, ignition power and ground wiring to that module</li> <li>◦ Inspect the data link stub from the module connector to the backbone</li> <li>◦ If no wiring issue is located suspect a faulty module</li> <li>• If no change in voltage is noted when modules are unplugged inspect for data link High(+) and Low(-) shorted together</li> </ul> |
|    |  | No: Continue to Step 10  |
| 8  | Does either terminal have abnormally high voltage?   | Yes: Check wiring for a Short to Power   |
|    |  | No: Continue to Step 9   |
| 9  | Does either terminal have abnormally low voltage?  | Yes: Check wiring for a Short to Ground  |
|    |  | No: Return to Step 6 and re-test.  |
| 10 | Is the voltage on Terminal C (+) higher than Terminal D (-)?   | Yes: Continue to Step 11   |
|    |  | No: <ul style="list-style-type: none"> <li>• Verify the wire is in the correct terminal location.</li> <li>• Verify the wiring is spliced to the correct wire of the backbone.</li> </ul>  |
| 11 | <ul style="list-style-type: none"> <li>• Disconnect the batteries.</li> <li>• All truck harnesses should be connected for this step.</li> <li>• Only the batteries should be disconnected.</li> <li>• Measure the resistance from Terminal C to D.</li> <li>• <math>60\Omega \pm 5\%</math></li> </ul> | Yes: Continue to Step 16   |
|    |  | No: Continue to Step 12  |
| 12 | Do you have 57 - 63 ohms?<br>Was the resistance measured at Step 11 (C to D) approximately 120 ohms?   | Yes: Continue to Step 18   |
|    |  | No: Continue to step 13  |
| 13 | Was the resistance measured at Step 11 (C to D) reading O.L (Open)?  | Yes: Inspect stub wiring from the module connector to the backbone of the data link. Repair wiring as needed and re-test.  |
|    |  | No: Continue to step 14  |
| 14 | Was the resistance measured at Step 11 (C to D) near 40 ohms?  | Yes: Inspect for body builder components that may have installed a 3rd terminating resistor  |
|    |  | No: Continue to Step 15  |
| 15 | Was the resistance measured at Step 11 (C to D) < 40 ohms  | Yes: Inspect data link wiring for High(+) and Low(-) shorted together  |
|    |  | No: Return to Step 11 (Resistance out of range has not been detected)  |
| 16 | <ul style="list-style-type: none"> <li>• Measure the resistance from Terminal C to Gnd</li> </ul> Does resistance measure > 1000 ohms?   | Yes: Continue to Step 17   |
|    |  | No: Inspect data link wiring for a short to ground.  |
| 17 | <ul style="list-style-type: none"> <li>• Measure the resistance from Terminal D to Gnd</li> </ul> Does resistance measure > 1000 ohms?   | Yes: Continue to Step 18   |
|    |  | No: Inspect data link wiring for a short to ground.  |
| 18 | <ul style="list-style-type: none"> <li>• Measure resistance on connector 1702 (Male Terminals) <ul style="list-style-type: none"> <li>◦ Note: This wiring harness runs outside the cab</li> </ul> </li> <li>• <math>120\Omega \pm 5\%</math></li> </ul> Is the resistance 114 - 126 ohms?              | Yes: Continue to Step 19   |
|    | NOTE:  | No: Continue to Step 20  |
| 19 | It is recommended not to exceed $\pm 1\%$ tolerance between the two identical resistors.<br>• Measure resistance on connector 1702 (Female Terminals)  | Yes: Wiring issue not detected. Re-evaluate the complaint and troubleshooting. Is the issue present?   |

|    |   |   |
|----|---|---|
|    | <p>over to the 1701 connector on the left side of the cab</p> <ul style="list-style-type: none"> <li>• 120Ω ± 5%</li> </ul> <p><b>Is the resistance 114 - 126 ohms?</b></p> <p><b>NOTE:</b> Locate Terminating Resistor #1.</p> <ul style="list-style-type: none"> <li>• Unplug the terminating resistor and measure the resistance from terminal A to B on the resistor.</li> </ul>  | <p>If the issue is present, and the wiring checks okay, remove modules from the data link, one module at a time until communication is restored.</p>  |
| 20 | <p>It is recommended not to exceed ± 1% tolerance between the two identical resistors.</p> <ul style="list-style-type: none"> <li>• Compare this to the resistance measured at Step 18</li> <li>• 120Ω ± 5%</li> </ul> <p><b>Is the resistance 114 - 126 ohms?</b></p> <p><b>NOTE:</b> Locate Terminating Resistor #2.</p> <ul style="list-style-type: none"> <li>• Unplug the terminating resistor and measure the resistance from terminal A to B on the resistor.</li> </ul> | <p>No: Continue to Step 21</p> <p>Yes: Locate and repair open wire in the circuit between the 1702 connector and the terminating resistor.</p> <p>No: Replace the terminating resistor and re-test.</p> |
| 21 | <p>If this resistance does not closely match the resistance measured at the 1702 connector at Step 18, it may indicate high resistance in the circuits.</p> <ul style="list-style-type: none"> <li>• Compare this to the resistance measured at Step 18</li> <li>• 120Ω ± 5%</li> </ul> <p><b>Is the resistance 114 - 126 ohms?</b></p> <p><b>NOTE:</b></p>   | <p>Yes: Locate and repair open wire in the circuit between the 1702 connector and the terminating resistor.</p> <p>No: Replace the terminating resistor and re-test.</p>                                |

If this resistance does not closely match the resistance measured at the 1702 connector at Step 19, it may indicate high resistance in the circuits.

**Service Part(s) Information**

| Description          | Part Number |
|----------------------|-------------|
| Bulk Data Link Cable | 3519281C2   |
| Terminating Resistor | 3519178C91  |

( [Back to Top](#) )

**Additional Resources**

- [SFN 02-94](#) - J1939 Troubleshooting
- [Advanced Electrical Guide](#)
- [Master Service Information Page](#)

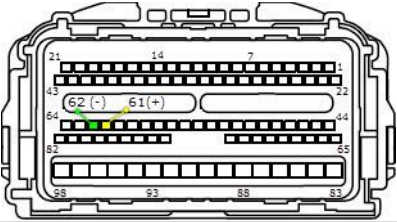
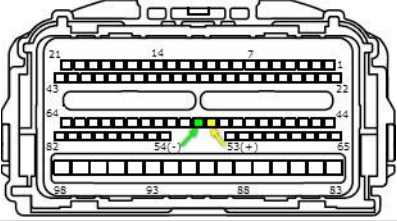
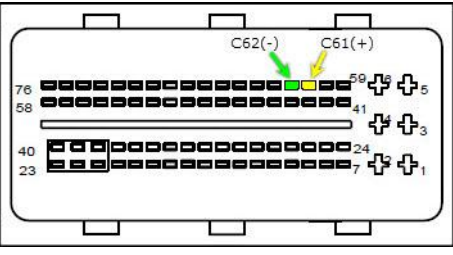
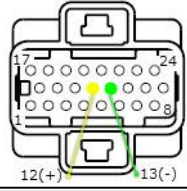
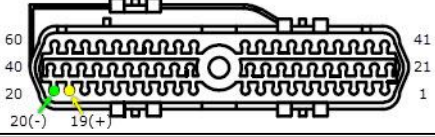
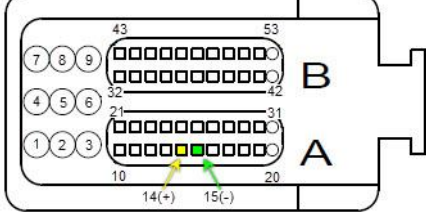
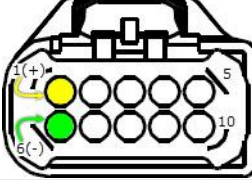
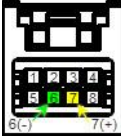
( [Back to Top](#) )

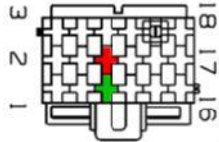
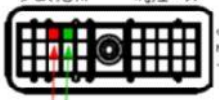
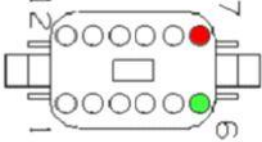
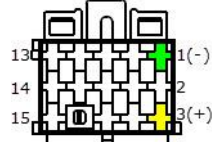
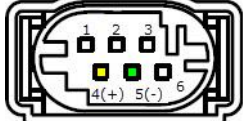
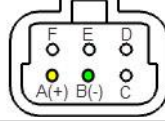
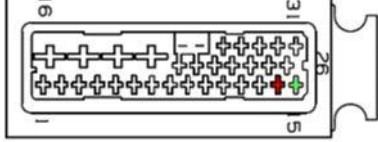
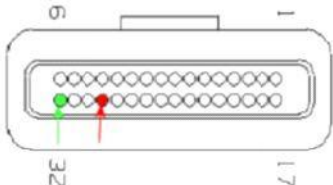
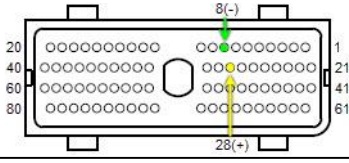
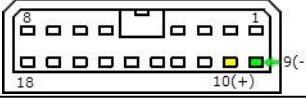
**Connector Views**

- Always refer to the wiring schematic book for the vehicle you are working on
- Verify which specific engine you are working with. This will help ensure you are viewing the correct schematic with the correct terminal locations on the ECM connector

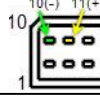
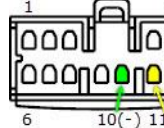
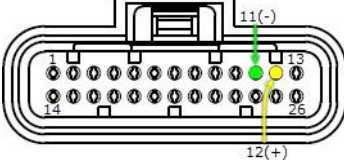
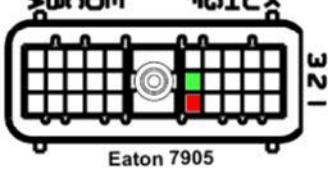
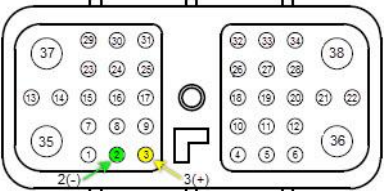
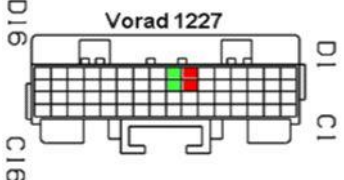
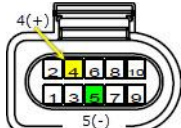
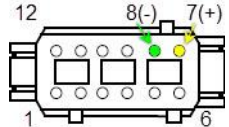
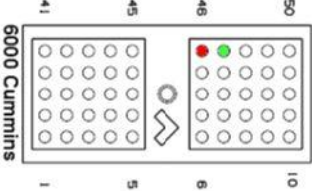
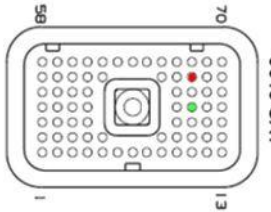
| J1939 Data Link (CAN) Pin out at major connectors<br>(Public Data Link Only) |              |   | J1939 Pins |         | Connector View |
|--|--------------|---|------------|---------|----------------|
| Module   | Connector    | Location  | Pin (+)    | Pin (-) |                |
| Diagnostic Connector   | 1650         | Dash panel left of steering wheel<br>(Bus-under dash right of steering wheel) | C(+)       | D(-)    |                |
| J1939 Splice Adapter<br>Note: There is no terminal "I"                       | 1024<br>1025 | Center of dash panel  | G→M        | A→F     |                |


|  |       |   |       |       |  |
|--|-------|---|-------|-------|--|
|  | 1026  |   |       |       |  |
| 1702 - Male Terminals Goes to Engine   | 1702  | Attached to wiper bracket Above valve cover | 11(+) | 17(-) |  |
| 1702 - Female Terminals Goes to Cab  | 1702  | Attached to wiper bracket Above valve cover | 11(+) | 17(-) |  |
| ECM<br><ul style="list-style-type: none"> <li>o N13</li> <li>o MaxxForce 15</li> <li>o MaxxForce 13 / 11 (EPA 10)</li> </ul> | 6018  | Engine ECM                                  | 34(+) | 47(-) |  |
| ECM - ISX 15L  | 6000  | Engine ECM                                  | 22(+) | 46(-) |  |
| ECM - ISB  | 6000  | Engine ECM                                  | 22(+) | 46(-) |  |
| EIM - MaxxForce 11 / 13 (EPA 07)<br>(Engine Interface Module)  | 6020  | Left side of engine                         | 12(+) | 13(-) |  |
| ECM - N9 / N10   | 6020M | Right side of engine                        | 61(+) | 62(-) |  |

|  |           |  |         |         |   |
|--|-----------|--|---------|---------|---|
|  |           |  |         |         |    |
| ECM - MaxxForce 7 (EPA 10)   | 6020M     | Right side of engine<br>Mounted on air filter bracket                  | 53(+)   | 54(-)   |    |
| ECM<br><ul style="list-style-type: none"> <li>MaxxForce DT / 9 / 10 (EPA 07 / EPA 10)</li> <li>MaxxForce 7 (EPA 07)</li> <li>MaxxForce 5 (EPA 07)</li> </ul> | 6020M     | Left side of engine<br>76 Pin Chassis connector (Grey)                 | C61 (+) | C62 (-) |     |
| DLCII Engine ECM   | X3 - 6020 | Left side of engine above starter (I6)<br>Top of left valve cover (V8) | 12(+)   | 13(-)   |   |
| DLC NavPak Engine ECM  | 6007      | Engine ECM - Black   | 19(+)   | 20(-)   |   |
| Engine DCU - Doser Control Unit<br><ul style="list-style-type: none"> <li>MaxxForce DT / 9 / 10 (EPA 10)</li> <li>N9 / N10 (EPA 10)</li> </ul>               | 6340      |  | 14(+)   | 15(-)   |   |
| Collision Avoidance - Bendix Wingman   | 8903      | Front bumper   | 1(+)    | 6(-)    |  |
| Bendix Wingman DIU (Driver Interface Unit)   | 1943M     |  | 7(+)    | 6(-)    |  |
| ABS - Bendix Air EC60  | 1400      | In cab - Right kick panel  | 8(+)    | 7(-)    |   |

|   |              |                                       |       |       |   |
|---|--------------|---------------------------------------|-------|-------|---|
|   |              |                                       |       |       |    |
| ABS - Bendix Air EC30                     | 4024         | Brake ECU                             | C3(+) | D3(-) |    |
| ABS - Wabco Air                           | 9513         | Wabco ECU Grey                        | 7(+)  | 6(-)  |    |
| ABS - Wabco Air                           | 1420         | In cab - Right kick panel             | 3(+)  | 1(-)  |    |
| Collision Avoidance - Wabco OnGuard       | 8902         | Front bumper                          | 4(+)  | 5(-)  |    |
| Wabco OnGuard DIU (Driver Interface Unit) | 1944         |                                       | A(+)  | B(-)  |   |
| Wabco Hydraulic Full Power Brakes         | 9511         | ECU is mounted on HCU Left Frame Rail | 14(+) | 15(-) |  |
| Allison LCT TCM                           | 7305         | TCM Grey                              | 29(+) | 32(-) |  |
| TCM - Allison LCT Gen 4                   | 7150<br>7151 | Under cab                             | 28(+) | 8(-)  |  |
| TCM - Allison                             | 1503         | In cab                                | 10(+) | 9(-)  |  |
| Allison MD / HD 3000                      | 7204F        | TCM Black                             | 13(+) | 29(-) |   |

|  |           |  |       |       |  |
|--|-----------|--|-------|-------|--|
|  |           |  |       |       |  |
| Allison MD / HD 3000 Gen 4                                 | 7151      | TCM  | 28(+) | 8(-)  |  |
| Allison TC10 Shift Selector<br>Allison WTEC Shift Selector | 1852      |  | 8(+)  | 15(-) |  |
| ESC - Electrical System Controller                         | 1600      | In cab - Left kick panel                                   | 34(+) | 35(-) |  |
| BC - Body Controller                                       | 1602 (J5) | In cab - Left kick panel                                   | F3(+) | F2(-) |  |
| EGC - Electronic Gauge Cluster                             | 1500      | Left side of dash  | 4(+)  | 5(-)  |  |
| EGC - Electronic Gauge Cluster                             | 1501      | Left side of dash  | 12(+) | 11(-) |  |
| Compass Module   | 1912      | Behind fuse panel (HPV)<br>Center of headliner (5000/9000) | 2(+)  | 3(-)  |  |
| SART Module  | 1610      | In dash - behind EGC                                       | C(+)  | D(-)  |  |
| SIC (Secondary Instrument Cluster)                         | 1502      | Center dash  | 7(+)  | 4(-)  |  |

|                                     |                      |                                  |       |       |   |
|-------------------------------------|----------------------|----------------------------------|-------|-------|---|
| Optional Gauge Pack                 | 1510                 |                                  | 11(+) | 10(-) |    |
| AGSP (Aux Gauge Switch Pack)        | 1512                 | Right side dash                  | 11(+) | 10(-) |    |
| TPMS (Tire pressure monitor system) | 8993F                | Near radiator crossmember        | 12(+) | 11(-) |    |
| Eaton Autoshift / Ultrashift DM2    | 7905                 | At Gear Shift Selector           | G2(+) | G3(-) |    |
| Eaton Autoshift / Ultrashift DM3    | 7105<br>7909<br>7910 | TCM                              | 3(+)  | 2(-)  |    |
| Eaton Vorad                         | 1227                 |                                  | D7(+) | D8(-) |  |
| Eaton Vorad VS-400                  | 8901                 | Center of bumper support bracket | 4(+)  | 5(-)  |  |
| PAM Pyro - AMP Meter Module         | 4087                 | Cowl                             | 7(+)  | 8(-)  |  |
| Cummins ISM Engine ECM              | 6000<br>6014         | Engine ECM                       | 46(+) | 47(-) |  |
| CAT Engine ECM                      | 6013                 | Engine ECM                       | 50(+) | 34(-) |  |

|                                  |      |     |      |      |   |
|----------------------------------|------|-----|------|------|---|
| Meritor Freedomline Trans<br>TCM | 7103 | TCM | A(+) | B(-) |  |
|----------------------------------|------|-----|------|------|---|

[\( Back to Top \)](#)

**Service Information (Known Issues) - Potential failure location based on case file information**

- 05/12/2016 - The EZ-Tech Launcher can slow down data link traffic causing fault codes to set when no issue is present.
- Typically these faults are **INACTIVE**, and have very low counts when they are caused by the service tool.
- Do not diagnose these inactive faults without a driver complaint.

◦ **Possible DTCs**

| SPN     | FMI | Module                    | Description   |
|---------|-----|---------------------------|---|
| 2000    | 9   | Body Controller Cluster   | ECM Data Link Comm. Failure<br>Loss of data link from the Engine Controller       |
| 2003    | 9   | Body Controller Cluster   | TCM Data Link Comm. Failure<br>Loss of data link from the Transmission Controller |
| 2011    | 9   | Body Controller Cluster   | ABS Data Link Comm. Failure<br>Loss of data link from ABS Controller              |
| 2000    | 19  | Body Controller           | PTC1 (PGN 64892) not received from Engine   |
| 2023    | 9   | Body Controller           | EGC Data Link Comm. Failure   |
| 639     | 2   | Brakes, System Controller | Loss of data link from Engine Controller  |
| 639     | 14  | Brakes, System Controller | Loss of data link from Engine Controller  |
| SID 231 | 2   | Brakes, Power Unit        | SAE J1939 Data Link   |
| SID 231 | 14  | Brakes, Power Unit        | SAE J1939 Data Link   |

**NOTE:** For a screen shot of this occurring on the Launcher Screen [CLICK HERE](#)

- 6/9/2014 - Recent information from the field has shown a potential failure location
- A poor connection on the splice the ties the ABS module into the Back-bone of the data link was found on multiple units
  - This splice is in the cab, and the harness is common between multiple chassis and engine platforms
  - At this time (6/9/2014) the earliest build date affected is 09/23/2013
  - Anything built after this date is suspect for splice issues

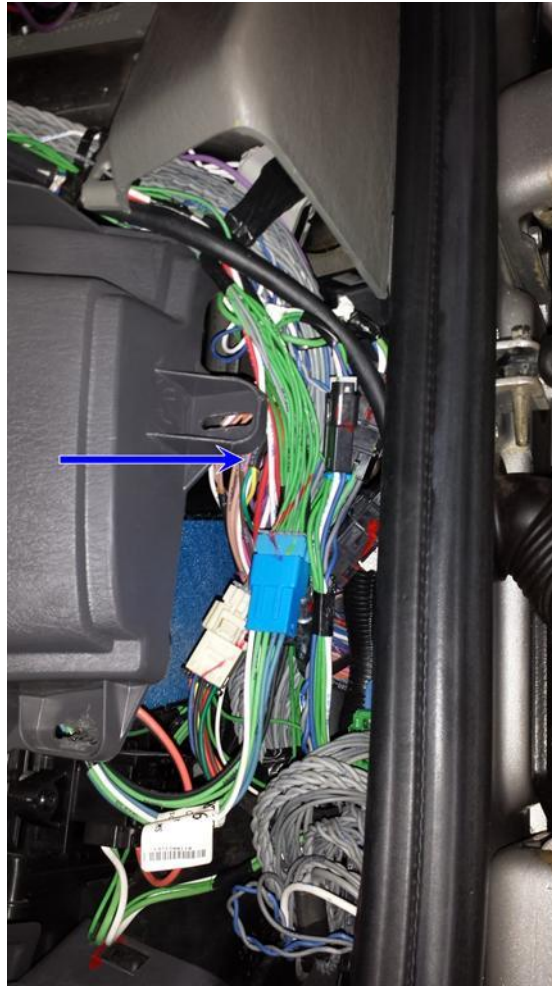
◦ **Possible DTCs**

| SPN  | FMI | Module             | Description  |
|------|-----|--------------------|--|
| 639  | 9   | ECM                | Drivetrain Message Timeout                         |
| 639  | 9   | Body Controller    | J1939 Drivetrain Data Link Lost                    |
| 2011 | 9   | Body Controller    | ABS Data Link Comm. Failure                        |
| 2000 | 9   | Body Controller    | ECM Data Link Comm. Failure                        |
| 2023 | 9   | Body Controller    | EGC Data Link Comm. Failure                        |
| 2003 | 9   | Body Controller    | TCM Data Link Comm. Failure                        |
| 2000 | 19  | Body Controller    | PTC1 (PGN 64892) not received from Engine          |
| 2000 | 9   | Instrument Cluster | Loss of Data Link from Engine Controller           |
| 2011 | 9   | Instrument Cluster | Loss of Data Link from ABS Controller              |
| 2003 | 9   | Instrument Cluster | Loss of Data Link from the Transmission Controller |
| 2033 | 9   | Instrument Cluster | Loss of Data Link from the ESC                     |

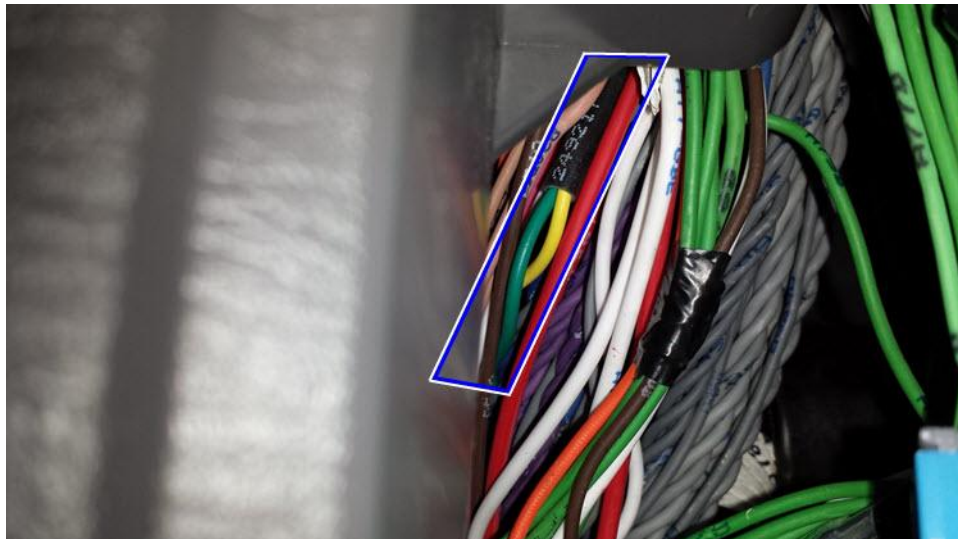
- If you have these faults and the vehicle build date is near August 2013 or Newer you will need to troubleshoot this splice in the data link if no obvious failures are found
- Follow the harness from the ABS module to the Data Link Backbone. Once you locate the splice, wiggle test that connection (also twist the splice in your fingers) while monitoring the data link resistance. (If a resistance check does not show any fault, repeat this test monitoring data link voltage as well)
- Cab temperature was effecting the data link behavior in one of the vehicles found to have this issue

- Inspecting the splice is destructive, you will need to remove the splice section use a closed barrel butt connector to crimp, solder and heat shrink the splice location. Use proper wire repair techniques as outlined in [IK0800269 - Proper Wire Repair](#)

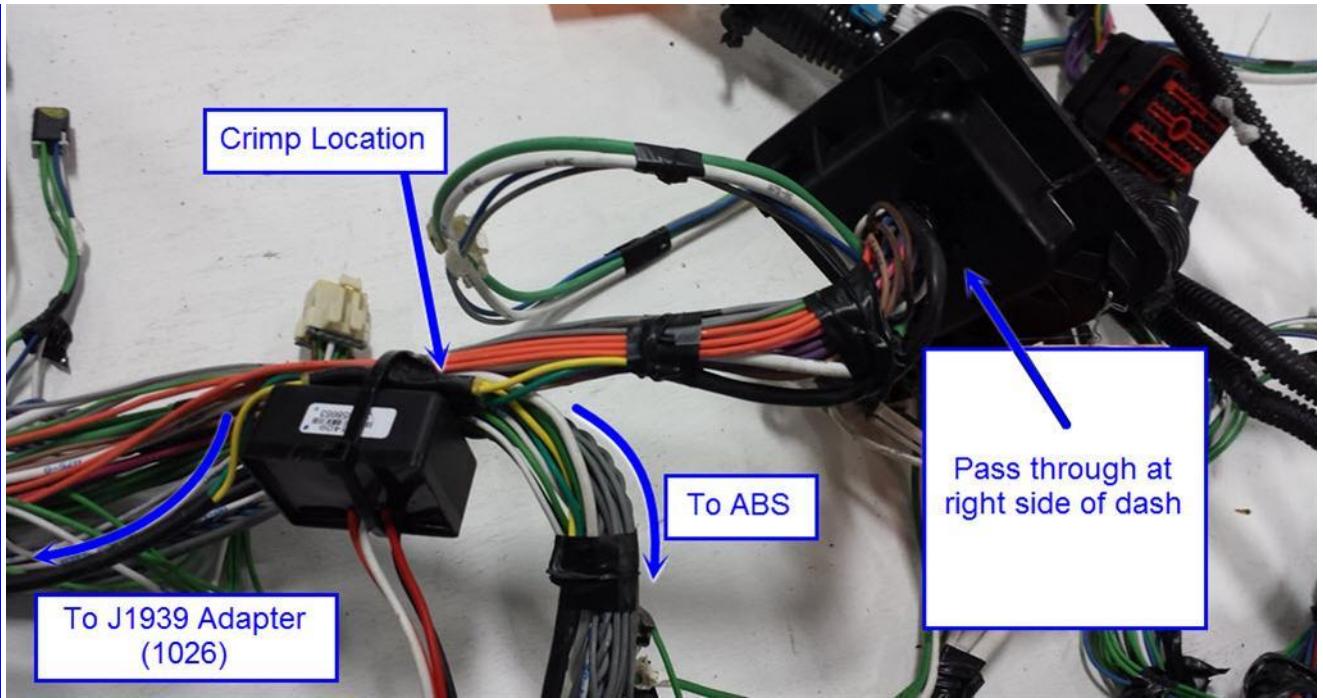
**Crimp location:** Right side of cab above the ABS module, next to the HVAC box. The condensation module (if installed) will be zip tied to or near the splice.



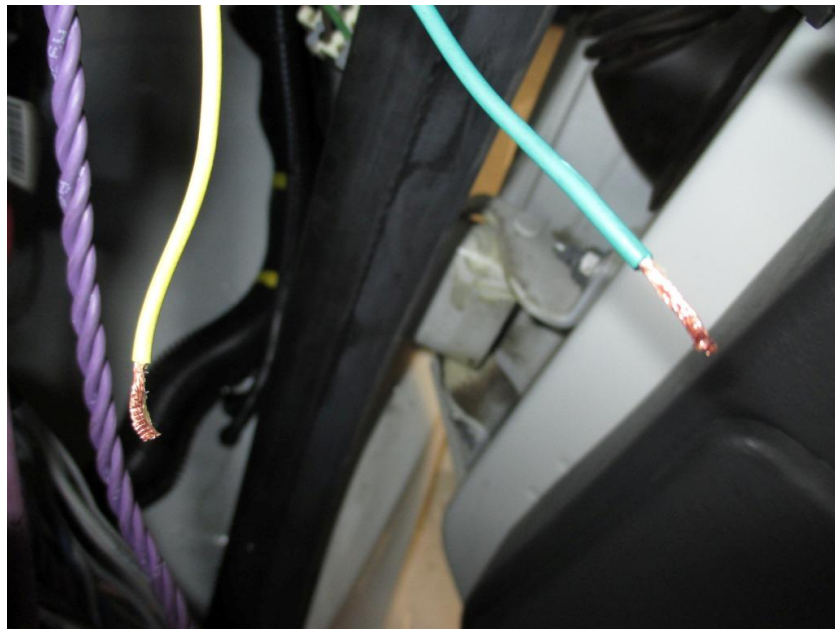
Close view of crimp location



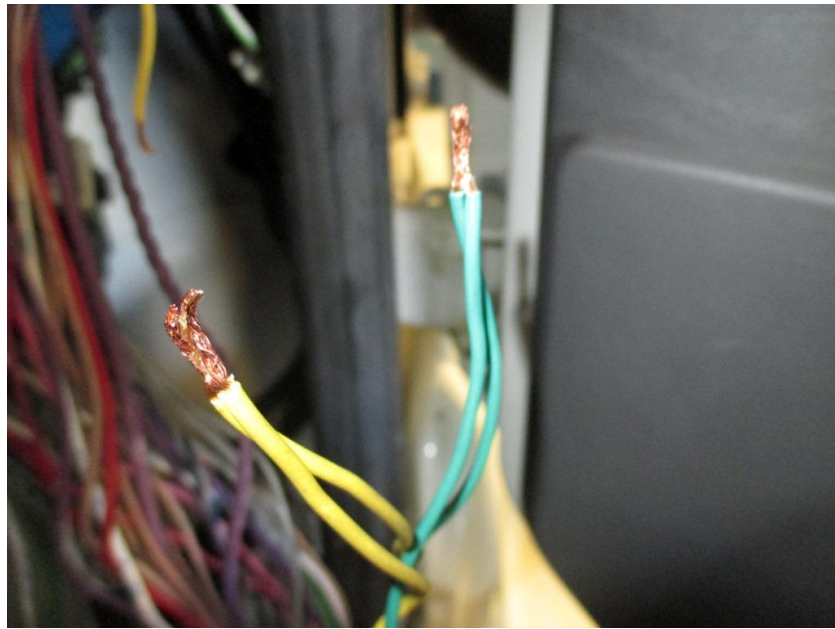
Harness removed from truck for identification



Wire condition at crimp to ABS module



Wire condition at crimp to ABS module (2nd photo)



( [Back to Top](#) )

**Examples of Modules for 250k Baud**

- The **250k Baud Drivetrain data link** is a Public data link which consists of any module that is present on the data link when you plug into the ATA diagnostic connector.
- Examples:

|     |   |
|-----|---|
| ECM | Body Controller                               |
| TCM | Instrument Cluster                            |
| ABS | Collision Avoidance System (Wingman, OnGuard) |

**NOTE:**  
 The MaxxForce 7 TMV (Thermal Management Valve) is on the Public data link. This module will not show up on the sniffer. The ECM Engine and Chassis connector's data link terminals are connected internally to the module. E13 and C53 are internally connected. E14 and C54 are internally connected.

- The **Body Builder data link** is a Private data link which consists of modules communicating to each other. You cannot use a diagnostic tool to communicate with this private data link.
- Examples:

|  |
|--|
| Body Controller (This module is on the public and private data link independently) |
| Sleeper HVAC (Standard and No-Idle systems)  |
| RPM (Remote Power Module)  |

- The **Engine data link** is a Private data link which consists of engine related modules communicating to each other. You cannot use a diagnostic tool to communicate with this private data link.
- Examples:

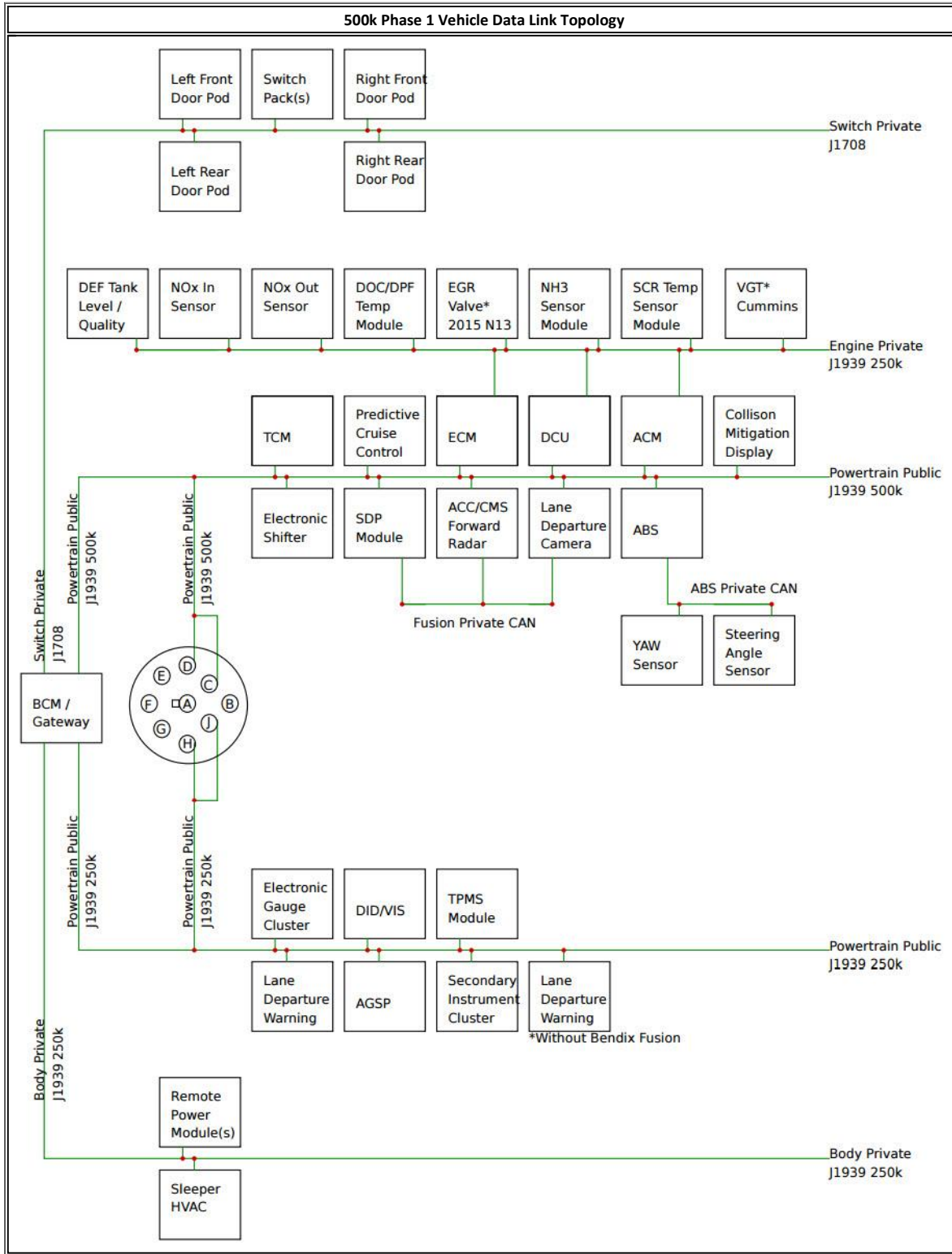
| EPA07 MaxxForce 11 / 13 | EPA10 N13 SCR         | EPA10 ISX15 SCR       |
|-------------------------|-----------------------|-----------------------|
| ECM                     | ECM                   | ECM                   |
| EIM                     | ACM                   | VGT                   |
| ACM                     | AFT Modules / Sensors | AFT Modules / Sensors |

( [Back to Top](#) )

### 500k Baud Vehicle Architecture - Phase 1

This can be properly identified by looking in the components tab of the vehicle and looking for a GREEN 9-Pin connector and feature:

0508095 - ELECTRICAL SYSTEM ENHANCED VCM FUNCTIONS for VCM Enhanced Functions



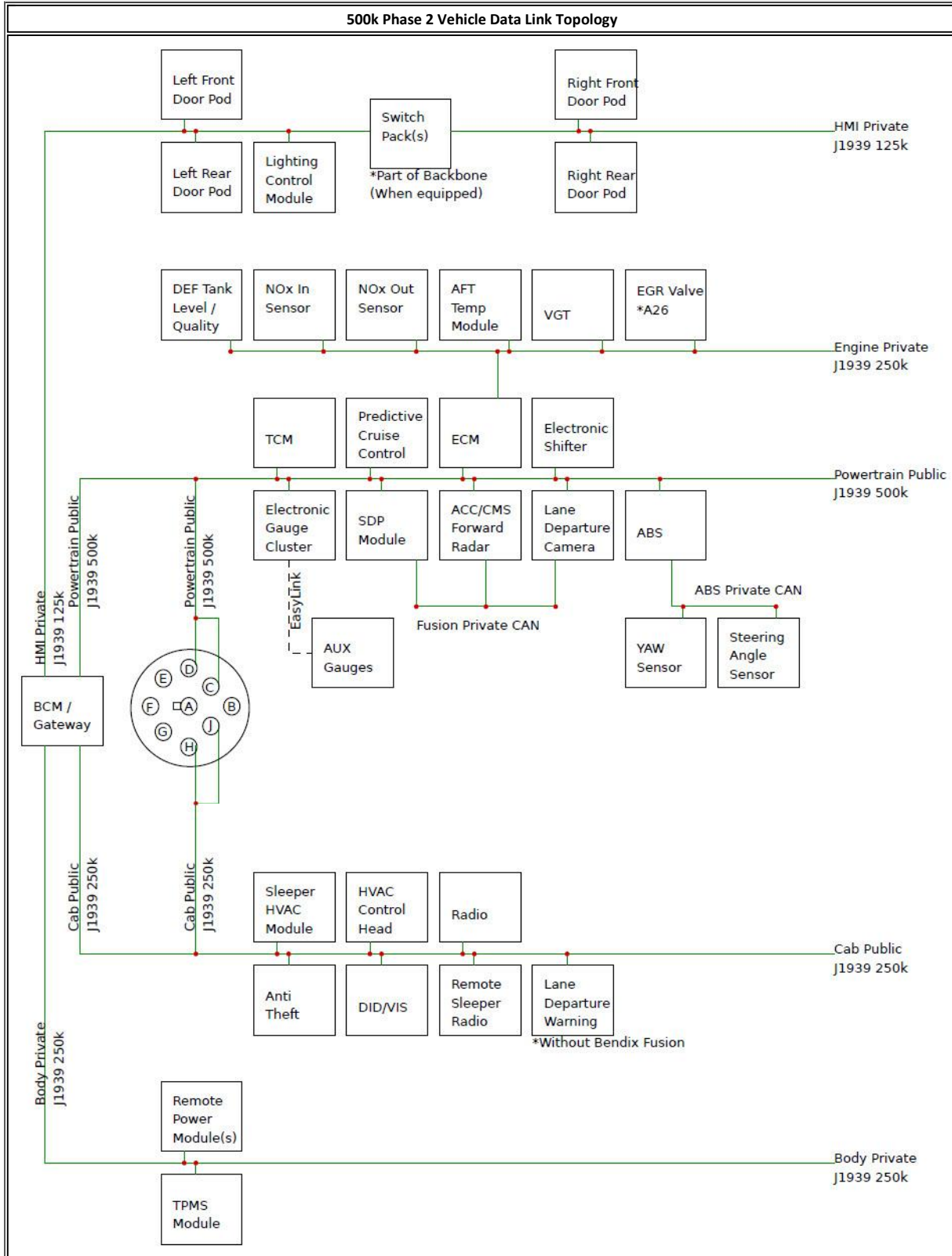
( [Back to Top](#) )

### 500k Baud Vehicle Architecture - Phase 2

This can be properly identified by looking in the components tab of the vehicle and looking for a GREEN 9-Pin connector and feature:

0508097 - ELEC SYS MUX COMMON ARCHITECTURE for Electrical Common Architecture System

- This feature and vehicle architecture launched with the LT Model



( [Back to Top](#) )

 Hide Details

Feedback Information

Viewed: 121335  
Helpful: 10755  
Not Helpful: 7045

No Feedback Found

Copyright © 2018 Navistar, Inc.