



Technical Service Information

GENERAL MOTORS ELECTRICAL MALFUNCTIONS WITH MULTIPLE DTCs

COMPLAINT: A number of full size GM trucks, SUVs (C/K Body) and some cars (Y Body) with gasoline engines and 6L80/90 or Hybrid 2ML70 Transmissions may exhibit the following complaints:

- The transmission may not shift or defaults to 2nd gear.
- The Malfunction Indicator Lamp (MIL) is illuminated.
- Various instrument cluster warning lamps may be illuminated
- The door locks may cycle by themselves.
- The engine may not crank intermittently.
- A Driver Information Center (DIC) message may be displayed.
- Instrument panel gauges may fluctuate.
- Applying the brakes may cause the instrument panel to become erratic and chimes to operate simultaneously.
- Loss of High Speed GMLAN Communications.

CAUSE: Depending on the vehicle and its equipment, any of the following diagnostic trouble codes may be stored as current or in history:

- P0700 - Transmission MIL Request.
- U0073 - Control Module Communications Bus OFF.
- U0100 - Lost Communication With ECM/PCM.
- U0101 - Lost Communication With TCM.
- U0102 - Lost Communication With TCCM.
- U0109 - Lost Communication With Fuel Pump Control Module.
- U0121 - Lost Communication With ABS Module.
- U0140 - Lost Communication With BCM.
- U186B - Lost Communication With TCM.
- U0293 - Lost Communication With HP2 PCM.
- U1862 - Battery Energy Control, Module Lost Communications With Communications Gateway Module.
- U1886 - Battery Energy Control, Module Lost Communications With ECM.
- U1888 - Hybrid Powertrain Control Module Lost Communication With Starter/Generator Control Module.

These conditions may be caused by, but not limited to, any of the following:

- The terminal(s) for the High Speed GMLAN Serial Data Bus has backed out of the 16 pin transmission case connector.
- The Terminal Position Assurance (TPA) Lock in the transmission 16 pin transmission case connector is not fully seated.
- The High Speed GMLAN Serial Data Bus circuits are open or shorted to ground or chafed, damaged, pinched.
- Corrosion in a Control Module connector.
- Intermittent or poor connections in the inline connectors containing the High Speed GMLAN Serial Data Bus circuits.
- Water intrusion in a Control Module connector.
- A shorted or open Termination Resistor.

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- CORRECTION:** · When diagnosing a “BUS OFF” code, use a scan tool to see which modules on the BUS are able to communicate. If no module on the BUS has communication, then it is possible that there is a serious computer data wiring problem or the biasing module for the system is down. In some cases a bad module can stop communications on the entire system in which case the modules on the BUS will have to be disconnected one at a time unless the scan program can indicate that.
- Wiring will have to be checked for open or shorted circuits. Wiring can come into harms way in places in the vehicle that are hard to see or access. Load tests are one way to check for wiring problems. Resistance checks will show an open circuit.*
 - Check all terminal pins that are relevant to insure none are bent broken or pushed back.
 - Make certain that the transmission case connector TPA lock is fully seated.
 - Check relevant connectors for corrosion, especially for “Fretting Corrosion” which is sometimes hard to see.
 - Since the data bus wires are routed throughout the vehicle, there may be numerous inline connectors that may be the problem.
 - Check for water intrusion in modules and connectors.
 - Locate faulty Termination Resistors and replace them.

*Voltage carrying circuits shorting to ground can cause the following fuses to blow:

60A MBEC1 (#72) - Underhood Fuse Box

30A AMP (#40) - Underhood Fuse Box

15A RDO (#41) - Underhood Fuse Box

10A IPC (#46) - Underhood Fuse Box

15A AIR BAG BATT (#51) - Underhood Fuse Box

10A DSM - Driver Side Under Dash Fuse Box

- Inspect transmission case connector harness for damage by heat shield, retaining clips or heat damage from exhaust and nearby components, Figures 1 and 2.
- Inspect transmission case connector wiring for unseated terminal ends, fluid leakage or water intrusion, Figures 3 and 4.
- Inspect the condition of the Terminal Position Assurance (TPA) Lock in the transmission case connector, Figures 5, 6 and 7.
- Inspect the transmission control unit connector pins for damage, Figure 8.
- Inspect the instrument panel wiring harness for incorrect routing and retention causing various contact points that result in chafing damage, Figures 9, 10, 11, 12, 13 and 14.
- Inspect wire harness routing around the adjustable pedal motor to insure there is no contact point that can cause chafing, Figure 15.
- Inspect wire harness routing where it travels over the top of the transmission bellhousing and up the rear of the engine and over the intake manifold for any contact points, Figures 16, 17 and 18.
- Inspect wire harness routing where it passes between the driver side body mount and chassis rail, Figure 19.
- When loss of communication is present, test for an open or shorted Termination Resistor, Figure 20.
- Inspect the C109 underhood fuse box connector for corrosion and that it is fully seated and locked, Figure 21.
- Inspect the C115 Connector located above the driver side shock tower beneath the underhood fuse box for corrosion or terminal end damage, Figure 22.

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CORRECTION

Continued:

- Inspect engine wire harness where it is routed around the engine oil stand pipe for metal retaining clip damage, Figure 23.
- Locate the Electronic Suspension Control (ESC) Module and inspect the connector. Check any unused cavities for missing weather plug seals which will permit water intrusion, Figure 24.
- The Instrument Panel Junction Block Jumper Harness when damaged will cause a number of DTCs to set, replace the jumper loop using GM part number **15127940**, Figure 25, **Hybrid Applications Only**.
- Inspect the Instrument Panel Junction Block Jumper Harness for contact with the I/P steel support brace, Figure 26, **Hybrid Applications Only**.

SERVICE INFORMATION:

Termination Resistors that have become shorted or open will cause loss of communications. The resistors are difficult to find due to the fact that they are located within the vehicles framework. A good Termination Resistor will have a resistance of between 110 to 130 Ohms. If the resistor is open then the bus circuit that is affected will be open at some point in the harness but not else where in that circuit. A good tool for this purpose would be an audible circuit fault tester sometimes referred to as the "Fox & Hound" Tester.

Typically the Termination Resistors are located on the rear most or the second rear most cross member. They can also be located on the inner frame rail towards the rear of the vehicle. It differs between model line so it will be necessary to consult an O.E. information source for resistor locations.

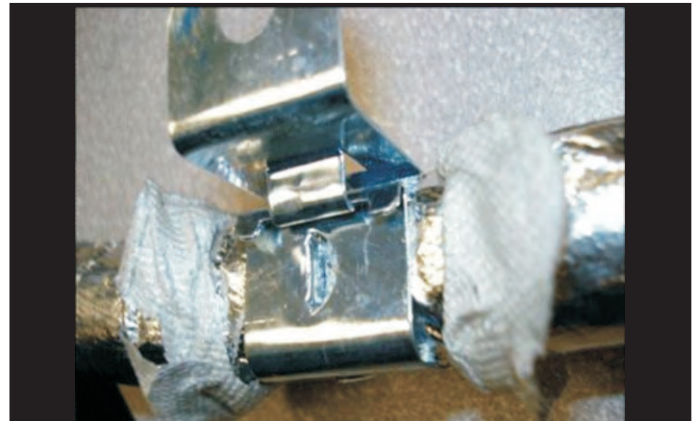
CAUTION: This bulletin includes a high voltage hybrid vehicle, all high voltage safety practices should be observed during any repair that puts the technician in close proximity to high voltage components.

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Locate the transmission case connector wiring harness and inspect the harness for chafing at heat shield or hold down bracket or heat damage from exhaust system components.

Figure 1



Inspect transmission wire harness for damage where it is clamped by the metal hold down bracket. After wire repairs be sure to wrap wires with a heat resistant material.

Figure 2



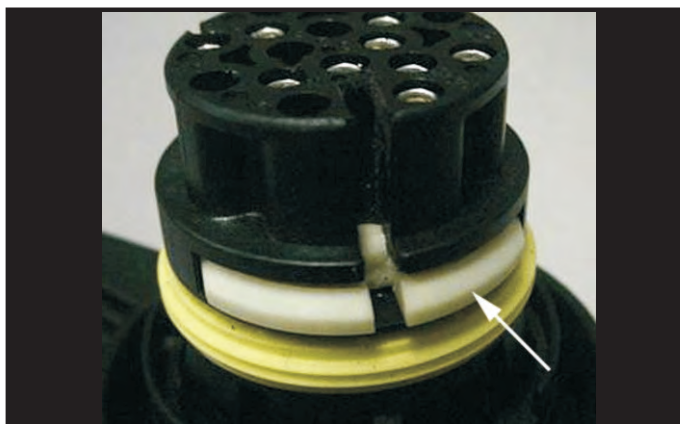
Before disconnecting the 16 pin transmission connector, inspect the wire entry points for poor weather seals or backed out wire terminals.

Figure 3



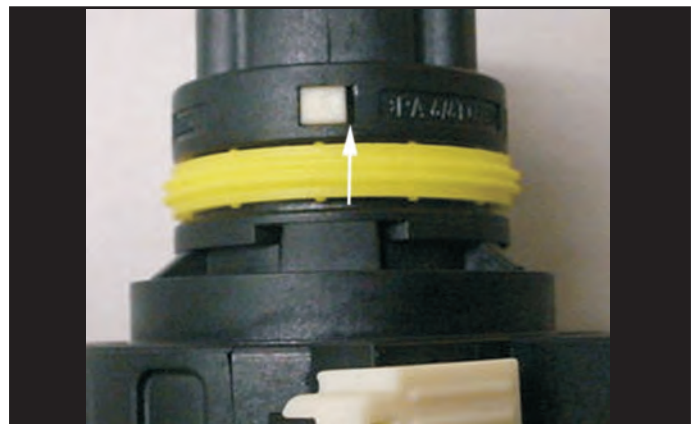
Inspect wire insulation for damage or the presence of transmission fluid bleeding out of the connector.

Figure 4



When the TPA Lock sticks out as shown by the arrow, the TPA Lock is not seated. It can be reseated with a small bladed screwdriver. Also check pin cavity fit.

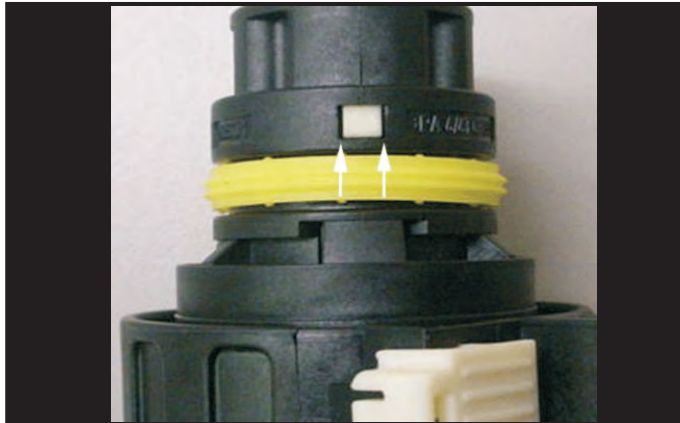
Figure 5



If the Terminal Position Assurance (TPA) Lock is off center in the connector check window as shown by the gap at the arrow, then it is only partially seated.

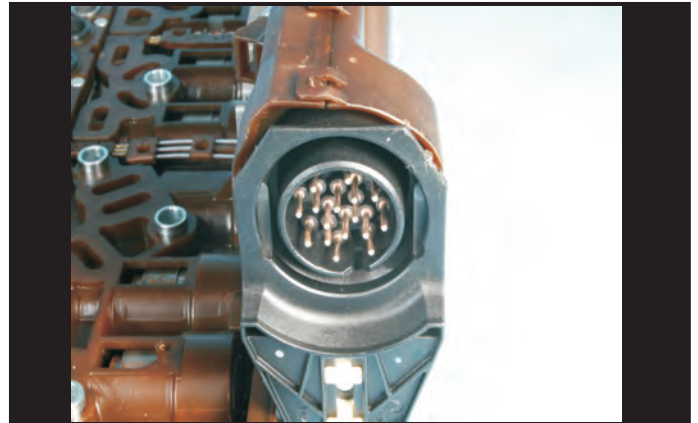
Figure 6

GM ELECTRICAL MALFUNCTIONS WITH MULTIPLE DTCs



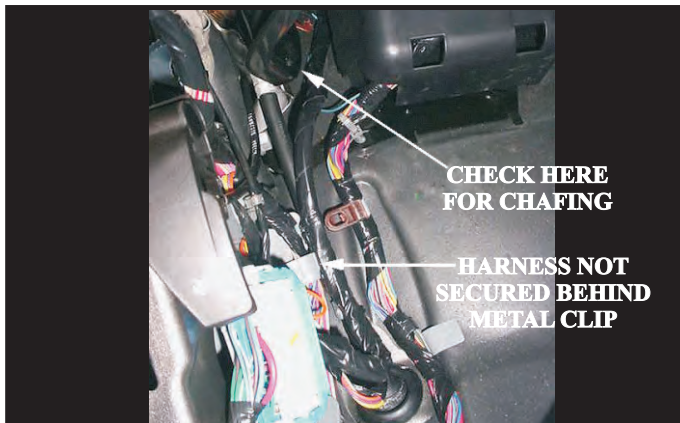
When the TPA Lock is centered in the check window as indicated by the arrows, the lock is fully seated.

Figure 7



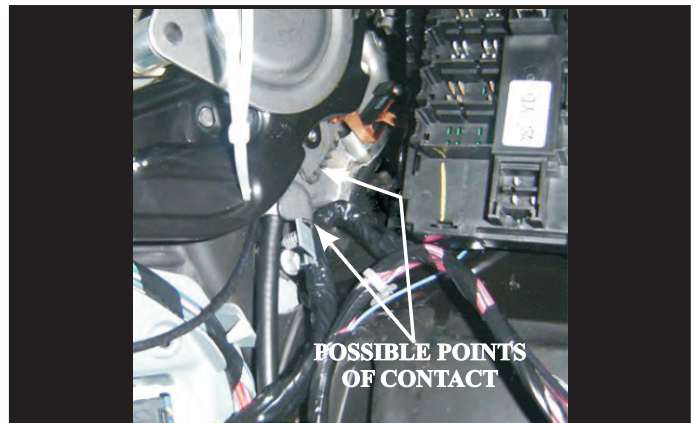
Check the pin condition in the transmission control unit connector.

Figure 8



The instrument panel wiring harness has been routed outboard of the metal harness retaining clip which can cut into the wiring. The incorrectly routed harness creates a possible chafe point.

Figure 9



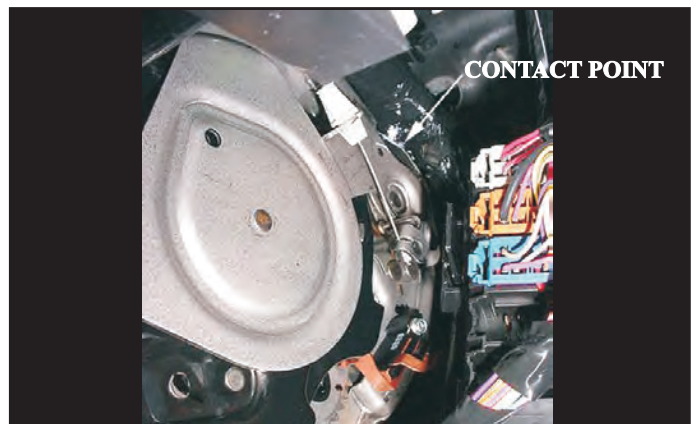
The instrument panel wire harness may be pushed up & forward until contact with the parking brake bracket, check for blown fuses.

Figure 10



The instrument panel wire harness is secured by a Gray retaining clip which snaps closed, the clip has been left open creating a possible harness contact point.

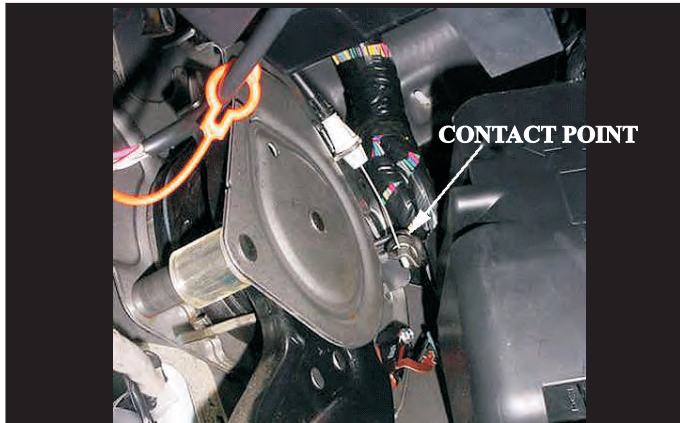
Figure 11



The instrument panel harness may be in hard contact with the top rear edge of the parking brake assembly.

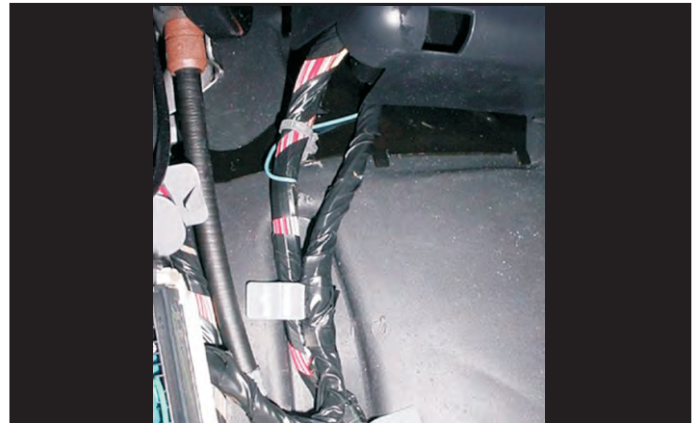
Figure 12

GM ELECTRICAL MALFUNCTIONS WITH MULTIPLE DTCs



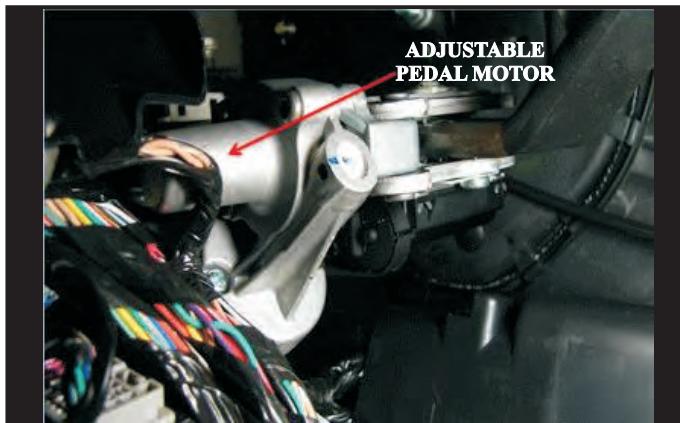
When releasing the parking brake pedal, the moving part at the end of the parking brake cable can come into hard contact with the instrument panel wire harness.

Figure 13



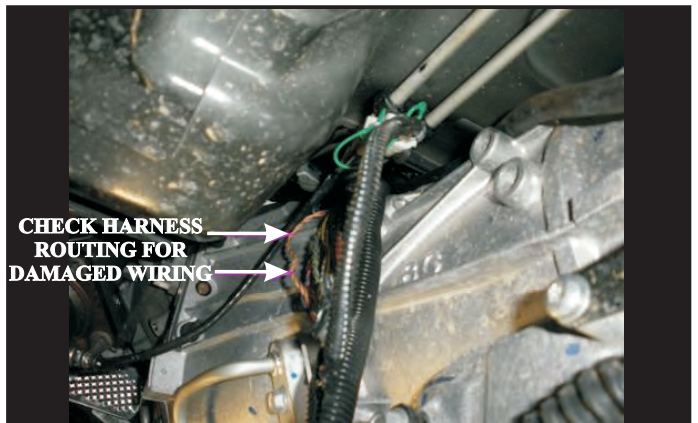
This is the correct routing path of the instrument panel wire harness which insures that it is not close to anything that can create a contact point resulting in wire harness damage.

Figure 14



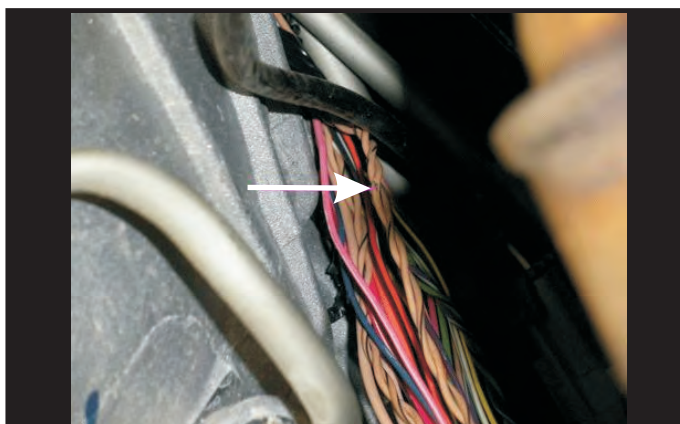
Inspect for chafed, damaged or pinched wires at the adjustable pedal motor as shown above.

Figure 15



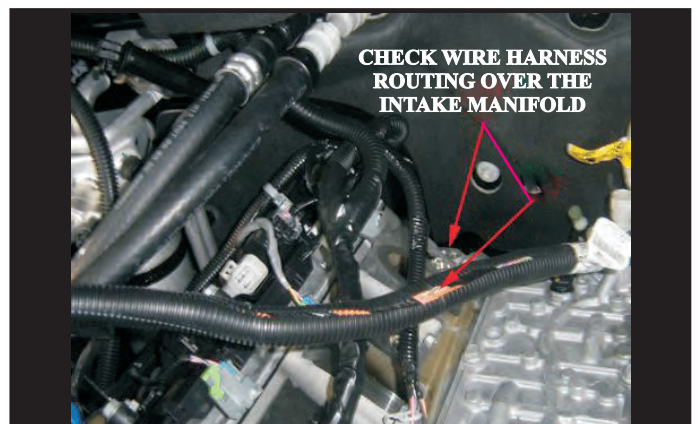
Inspect for chafed, damaged or pinched wires that are outside the conduit where the harness is routed over the top of the transmission towards the top of the engine.

Figure 16



Inspect for chafed, damaged or pinched wires in areas where the protective conduit shows signs of damage by removing the wires from the plastic conduit.

Figure 17



Inspect for chafed, damaged or pinched wires that are outside the conduit where the harness is routed over the intake manifold which has been removed for clarity.

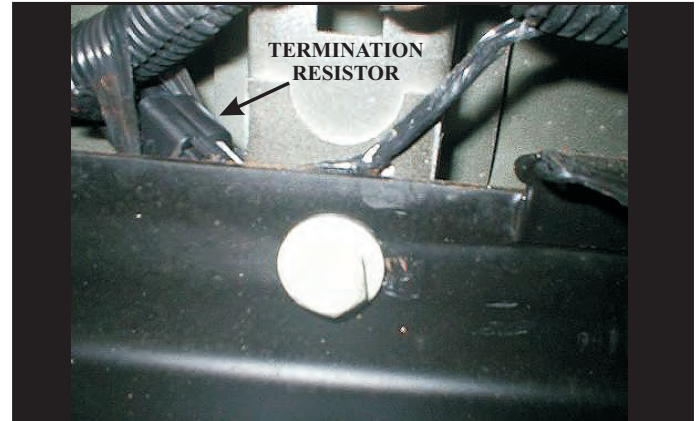
Figure 18

GM ELECTRICAL MALFUNCTIONS WITH MULTIPLE DTCs



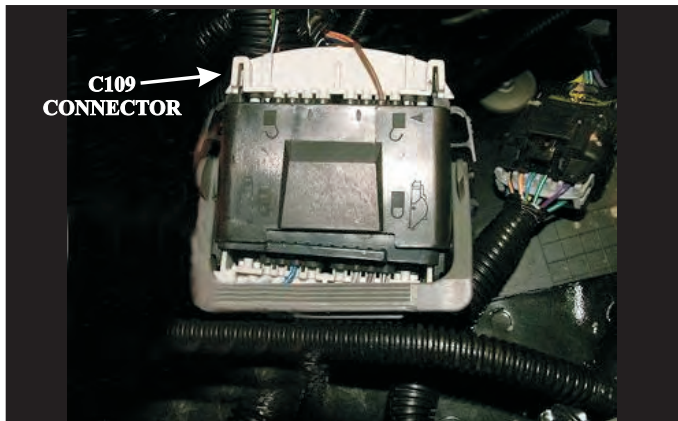
Inspect for chafed, damaged or pinched wires where the wire harness passes through the body mount on the left side of frame rail.

Figure 19



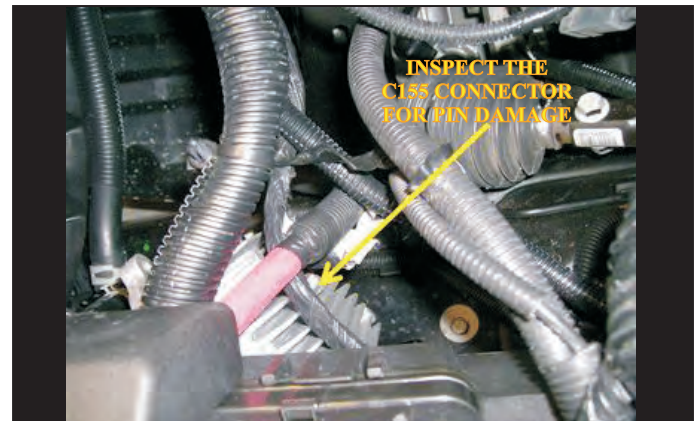
The Termination Resistor is very difficult to locate because it is typically located somewhere in the vehicle framework. Typically it is located on the rear cross member or inside frame rail.

Figure 20



Check for corroded or damaged terminal ends in the C109 connector located beneath the underhood fuse box. Check that the connector is fully seated even though the lever is locked down.

Figure 21



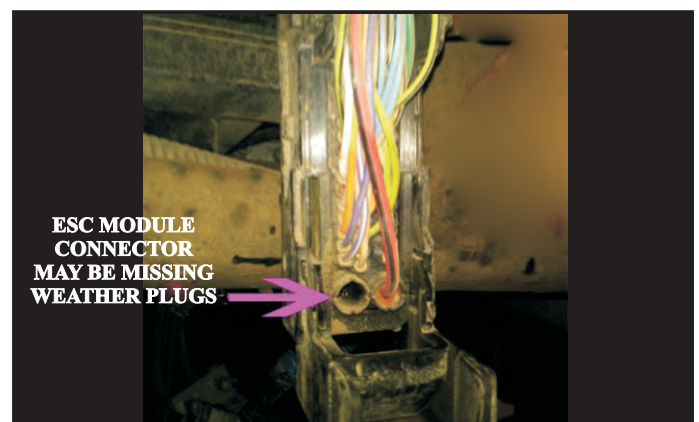
Inspect the C115 Connector located above the driver side shock tower beneath the underhood fuse box for corrosion or other types of terminal end damage.

Figure 22



Where the engine harness is routed around the engine oil fill stand pipe, inspect the harness for damage caused by the metal retaining clip.

Figure 23

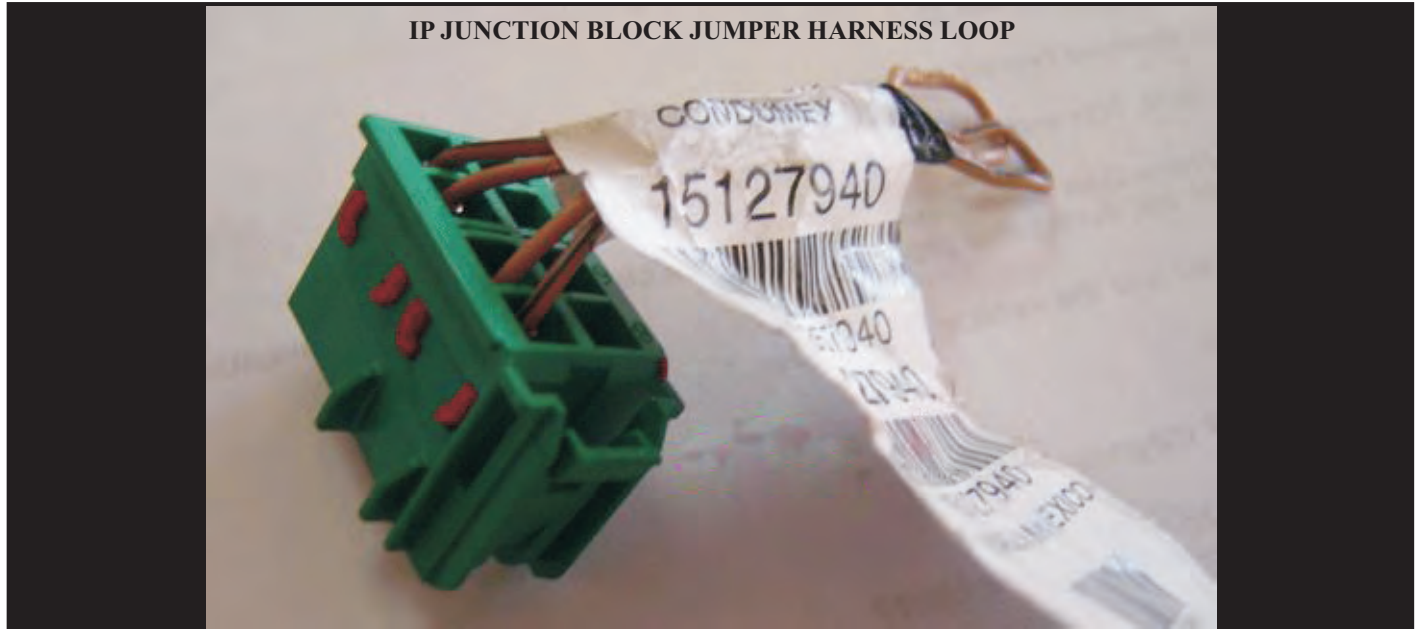


Locate the Electronic Suspension Control Module (ESC) under the rear of the vehicle, above the spare tire carrier & check for missing weather plugs which permit water intrusion.

Figure 24

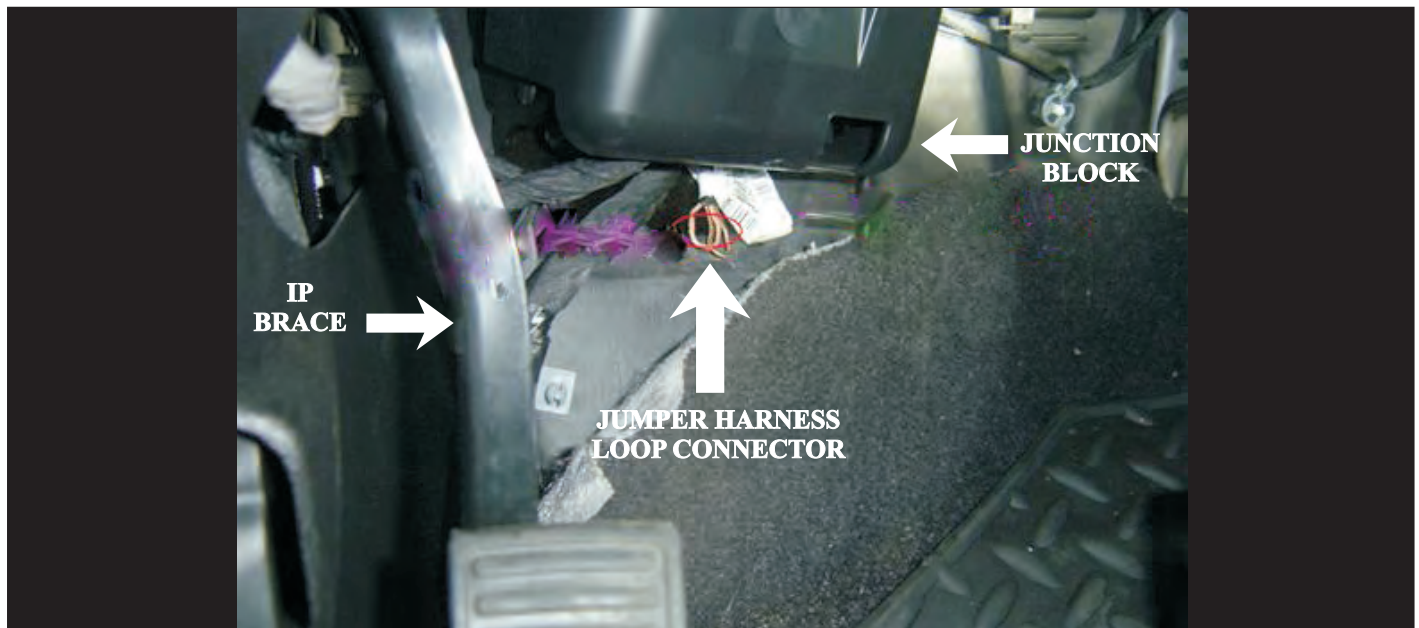
HYBRID APPLICATIONS ONLY

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When the Instrument Panel Jumper Harness Loop Connector (PN 15127940) is faulty it can cause DTCs C0242, P0700, P0AC4, U0293, U0100, U0109, U0129, U0140 U1862, U186B, U1886 or U1888 to set. The loop connector will require replacement using the above listed GM part number.

Figure 25



Inspect the Junction Block Jumper Harness Loop Connector for chafing on the instrument panel brace. The loop connector connects to the lower rear of the junction block and is routed to the harness at the instrument panel steel support brace.

Figure 26