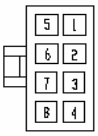
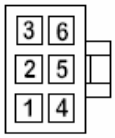
GRD502-B Flow Chart 02/05/09

PINPOINT TEST A: NO PROVE OUT OF ANY LEDs

No prove out (all LED's light up) of the LED's when module power is applied or module "wakes up", indicates that:
- the Guardian module does not have power.
- the LED display or harness damaged.

Estimated Time To Complete: 12 Minutes

Test Step	Result/Action to Take
A1 Ensure that all connectors are installed correctly	
▪ Carefully inspect module and harness(es). ▪ Refer to schematics in Guardian documentation to verify correct harness connector is in the correct module plug. ▪ Are all harness connectors properly installed into module?	Results_____ Yes Go to A2 No Review install instructions, reinstall all connectors in their proper position. Test system for normal operation.
Test Step	**Result/Action to Take**
A2 Check voltage at "Data Link 1" connector at the module.	
▪ Using a Digital Multimeter measure voltage by back probing the Data Link 1 connector. ▪ Measure the voltage by back probing the Data Link 1 connector Pin # 1Red wire (Red Digital Mutimeter test lead) and Ground (Black Digital Mutimeter test lead). ▪ Is the voltage greater than 11.5 Volts?	Results _____ Yes Go to A6 No go to A4
Test Step	**Result/Action to Take**
A4 Check the voltage at Guardian's Data Link Connector (DLC)	
▪ Using a Digital Multimeter, measure voltage between pin 16 (Red Digital Mutimeter test lead) and pin 4 (Black Digital Mutimeter test lead) of Data link connector. ▪ Is the voltage greater than 11.5 Volts?	Results_____ Yes Contact InterMotive for assistance with the InterMotive Data Link harness. No Go to A5
Test Step	**Result/Action to Take**
A5 Check the voltage at Data Link Connector (DLC)	
▪ Disconnect Guardian Data link harness from the OEM Data Link connector. Measure the voltage at OEM Data link connector between pin 16 (Red Digital Mutimeter test lead) and pin 4 (Black Digital Mutimeter test lead). ▪ Is the voltage greater than 11.5 Volts?	Results_____ Yes Contact InterMotive for assistance with the InterMotive Data Link harness No Check the OEM fuse for the DLC (Data Link Connector). If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.

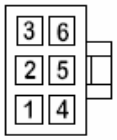
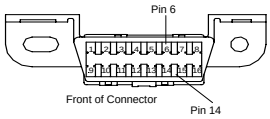
Test Step	Result/Action to Take
A6 Check voltage from the module at the "LED" connector	
▪ At the Guardian module, Back probe the connector labeled "LED". ▪ Using a Digital Multimeter, measure voltage between "LED" connector pin #1 Yellow wire (Red Digital Mutimeter test lead) and Ground (Black Digital Mutimeter test lead).  Back of "LED" connector ▪ Is the voltage greater than 4.5 Volts?	Results_____ Yes Go to A7 No Contact InterMotive for assistance with Guardian module
Test Step	Result/Action to Take
A7 Check voltage at "LED" display connector	
▪ Using a Digital Multimeter, measure voltage at the "LED" Display connector. Back probe the "LED" Display connector Pin #1Yellow wire (Red Digital Mutimeter test lead) and Ground (Black Digital Mutimeter test lead) .  Back of Harness connector at the display panel ▪ Is the voltage greater than 4.5 Volts?	Results _____ Yes Contact InterMotive for assistance with the LED Panel. No Contact InterMotive for assistance with the "LED" Display harness

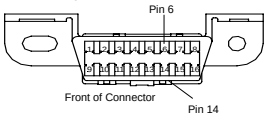
PINPOINT TEST B: LED INDICATORS ALTERNATE

Alternating LED's (LED's lighting up one after another) indicates that:

- the Guardian module cannot communicate with the OEM vehicle communications network

Estimated Time To Complete: 12 Minutes

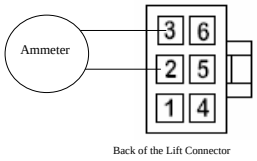
Test Step	
B1 Ensure that all connectors are installed correctly	
▪ Carefully inspect module and harness(es). ▪ Verify correct harness connector in the correct module plug. ▪ Refer to schematics in Guardian documentation. ▪ Are all harness connectors properly installed into module?	Yes Results_____ Go to B2 No Review install instructions, reinstall all connectors in their proper positions. Test system for normal operation.
Test Step	Result/Action to Take
B2 Ensure that all wires are in their correct connector cavity	
▪ Carefully inspect all harness connectors. ▪ Verify that each connector has the correct wires in the correct connector pin cavity. ▪ Refer to schematics in Guardian documentation for wire colors and pin locations. ▪ Are all wires secure, and in their correct connector pin cavity?	Yes Results_____ Go to B3 No Contact InterMotive for assistance with harness and connectors
Test Step	Result/Action to Take
B3 Check for data communication	
▪ At the Guardian module, Back probe the connector labeled "Data Link 1". ▪ Using a Digital Multimeter, measure voltage the at Pin # 3 Yellow wire (Digital Multimeter Red Lead) at the back of the harness connector and (Digital Multimeter Black Lead) chassis ground, and between pin # 6 Brown wire (Digital Multimeter Red Lead) at the back of the harness connector and (Digital Multimeter Black Lead) chassis ground.  Back of Connector Data Link 1 ▪ Are the two voltage readings 2.4-2.6 Volts?	Results_____ Yes Go to B6 No Go to B4
Test Step	Result/Action to Take
B4 Check voltage at Guardian's Data Link Connector (DLC).	
▪ Measure voltage at data link connector between pin 6 and chassis ground and between pin 14 and chassis ground.  ▪ Are both voltage readings 2.4-2.6 Volts?	Results_____ Yes Contact InterMotive for assistance with the InterMotive Data Link harness No Go to B5

Test Step	Result/Action to Take
B5 Check voltage at the OEM Data Link Connector.	
▪ Disconnect Guardian's Data Link Connector (DLC) T harness from the OEM data link connector, measure voltage at the OEM data link connector between pin 6 and chassis ground and between pin 14 and chassis ground.  ▪ Are both voltage readings 2.4-2.6 Volts?	Results_____ Yes Contact InterMotive for assistance with the InterMotive Data Link harness No Contact OEM dealer
Test Step	Result/Action to Take
B6 Check for CAN-Communication	
▪ Disconnect Guardian's Data Link Connector (DLC) "T" harness from OEM data link connector. ▪ Using a Scan Tool, or InterMotive "Canalyzer", insert into OEM data link connector, attempt to communicate with the PCM by retrieving fault codes or reading data. ▪ Is communication with PCM successful?	Results_____ Yes Contact InterMotive for assistance with the InterMotive Data Link harness No Contact OEM dealer for network communication concerns

PINPOINT TEST C: All LED'S FLASH

Flashing of the LED indicators on the LED display indicates that:
-there is excessive current draw on the lift output circuit

Estimated Time To Complete: 12 Minutes

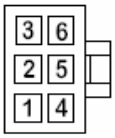
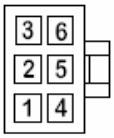
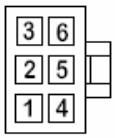
Test Step	Result/Action to Take
C1 Ensure that all connectors are installed correctly	
▪ Carefully inspect module and harness(es) ▪ Verify correct harness connector in the correct module plug ▪ Refer to schematics in Guardian documentation ▪ Are all harness connectors properly installed into module?	Yes Results_____ Go to C2 No Review install instructions, reinstall all connectors in their proper positions. Test system for normal operation.
Test Step	Result/Action to Take
C2 Ensure that all wires are in their correct connector cavity	
▪ Carefully inspect all harness connectors ▪ Verify that each connector has the correct wires in the correct connector pin cavity ▪ Refer to schematics in Guardian documentation for wire colors and pin locations ▪ Are all wires secure, and in their correct connector pin cavity?	Yes Results_____ Go to C3 No Contact InterMotive for assistance with harness and connectors
Test Step	Result/Action to Take
C3 Check for over current condition	
▪ Disconnect 6-pin "Lift" connector at the module. ▪ Using a jumper wire of 18 gauge or larger, jumper the RED wire PIN # 3 to the RED wire pin # 2 at the back of the 6-pin "LIFT" harness connector. (This jumper is used to temporarily bypass Guardian operation to check lift operation). ▪ Place an inductive ammeter, capable of measuring down to 0.1 amps DC, around the jumper wire. (An inductive ammeter should be used since most internal shunt ammeters cannot handle amperages exceeding 10 amps without meter damage). ▪ Activate lift. NOTE: **If the meter is hooked up properly, there should be a reading of more than 0.0 Amps with the lift operating.** ▪ Is the current draw greater than 10 amps during lift activation?	 Results_____ Yes It will be necessary to install a relay on the lift output circuit. No Contact InterMotive for assistance with Guardian module.

PINPOINT TEST D: ONE OR MORE LEDS NOT ILLUMINATED, WHEN CONDITION(S) MET

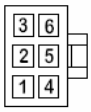
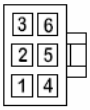
If a LED indicator fails to light when its associated condition(s) are met:
- there is a problem with an input and/or input circuit.
- there is a problem with the OEM electrical system.
- the Guardian module may have an issue.

Estimated Time To Complete: 18 Minutes

Test Step	Result/Action to Take
D1 Ensure that all connectors are installed correctly.	
▪ Carefully inspect module and harness(es). ▪ Verify correct harness connector in the correct module plug. ▪ Refer to schematics in Guardian documentation. ▪ Are all harness connectors properly installed into module?	Yes Results_____ Go to D2. No Review install instructions, reinstall all connectors in their proper position. Test system for normal operation.
Test Step	**Result/Action to Take**
D2 Ensure that all wires are in their correct connector cavity	
▪ Carefully inspect all harness connectors ▪ Verify that each connector has the correct wires in the correct connector pin cavity ▪ Refer to schematics in Guardian documentation for wire colors and pin locations ▪ Are all wires in their correct connector pin cavity?	Results _____ Yes Go to D3 No Contact InterMotive for assistance with harness and connectors
Test Step	**Result/Action to Take**
D3 Check LED indicators	
Reminder: Prove out of LED's on the display panel (all status indicator LED's light up) occurs whenever the module comes out of "Idle Mode" or power is initially applied. The icons do not light up until after the status indicator LED's prove out. ▪ Disconnect the "Data Link 1" connector briefly, then reconnect it, to initiate LED prove out. ▪ Do all LED's on the display panel light up during the prove out cycle after "Data Link 1" is reconnected?	Results_____ Yes Go to D4 No Go to K3
Test Step	**Result/Action to Take**
D4 Observe LED display panel	
Note: Please review system operation before trying to identify faulty status indicator LED operation. ▪ Key in the ON position. ▪ Perform each function; set park brake, transmission in PARK, open the lift door. ▪ Which Status Indicator LED does not illuminate properly (stays off with conditions met, or always on)?	Results_____ PB Park Brake - Go to D5 P PARK - Go to D6 Door Open - Go to D7

Test Step	Result/Action to Take
D5 Check park brake operation	
▪ Key in the ON position ▪ Alternately release and apply the parking brake. ▪ Back probe "Park Brake" connector, to check voltage from Pin #3 (Digital Multimeter Red Lead) to Ground (Digital Multimeter Black Lead). ▪ Does the voltage alternate between 0v and 11.5v? (0v with Park Brake applied.)	Results_____ Yes Contact InterMotive for assistance with Guardian module. No Contact OEM dealer or check park brake switch and circuits.
Test Step	Result/Action to Take
D6 Check park operation	
▪ Verify that the vehicle transmission range selector is in the PARK position. ▪ Using a scan tool, monitor the transmission range sensor data. ▪ Does the gear selector correlate to the Transmission Range sensor data on scan tool?	Results_____ Yes Contact InterMotive for assistance with Guardian module. No Contact OEM dealer concerning Transmission Range sensor and network communication issues
Test Step	Result/Action to Take
D7 Check Lift Door Switch circuit operation	
▪ Using a Digital Multimeter, measure the voltage from the back of pin #6 (Black wire) at the connector labeled "Lift" on the Guardian Module to chassis ground. ▪ Alternately activate and deactivate the lift door switch by manually pushing the switch.  Back of the Lift Connector ▪ Does the voltage on pin #2 measure higher than 4.5 Volts with the lift door closed, then drop to less than 0.2 Volts with the lift door open?	Results_____ Yes Contact InterMotive for assistance with Guardian module. No The voltage does not change when the lift door is open or not - Go to D8.
Test Step	Result/Action to Take
D8 Check Lift Door Switch circuit operation	
▪ Open the lift door. ▪ Disconnect the "Lift" connector. ▪ With the Digital Multimeter set to resistance, measure between the "Lift" harness Pin #2 and chassis ground. ▪ Activate Lift door switch by hand.  ▪ Does resistance alternate between ∞ (open) and closed? Back of the Lift Connector	Results_____ Yes - Lift door switch needs adjustment. No - The resistance stays high (Open) - Go to D9 The resistance stays low (Short) - Go to D10
Test Step	Result/Action to Take
D9 Check Lift Door Switch circuit operation	
▪ Disconnect the connector labeled "Lift" on the Guardian module (leave all other connectors in place). ▪ Using a Digital Multimeter, in resistance mode, measure the resistance between the "Lift" harness Pin #2 and the wire connection at the lift door switch. (Not the chassis ground wire.)  ▪ Is the resistance near 0 ohms? Back of the Lift Connector	Results_____ Yes Lift door switch needs replacing. No Contact InterMotive for assistance with Guardian harness.
Test Step	Result/Action to Take
D10 Check Lift Door Switch Circuit	
▪ Disconnect the "Lift" harness at the lift adaptor. ▪ Measure the resistance at the lift harness Pin #2 to chassis ground. Is the resistance < 2 ohms?	Results_____ Yes Harness is shorted. Contact InterMotive for assistance. No If open circuit, Lift Door Switch needs replacement.

PINPOINT TEST E: LEDS PROPERLY ILLUMINATED, BUT LIFT NOT OPERATING
If the lift does not operate with the lift power LED indicator lit:
- there is a problem with the wiring harness to the lift
- there is a problem with the lift
- the Guardian module have an issue. **Estimated Time To Complete: 12 Minutes**

Test Step	Result/Action to Take
E1 Ensure that all connectors are installed correctly	
▪ Carefully inspect module and harness(es) ▪ Verify correct harness connector in the correct module plug ▪ Refer to schematics in Guardian documentation ▪ Are all harness connectors properly installed into module?	Yes Results_____ Go to E2 No Review install instructions, reinstall all connectors in their proper position. Test system for normal operation.
Test Step	**Result/Action to Take**
E2 Ensure that all wires are in their correct connector cavity	
▪ Carefully inspect all harness connectors ▪ Verify that each connector has the correct wires in the correct connector pin cavity ▪ Refer to schematics in Guardian documentation for wire colors and pin locations ▪ Are all wires secure, and in their correct connector pin cavity?	Yes Results_____ Go to E3 No Contact InterMotive for assistance with harness and connectors
Test Step	**Result/Action to Take**
E3 Check for vehicle secure.	
▪ Key in the ON position, Park Brake applied, and the transmission in Park. ▪ Using a Digital Multimeter, measure the voltage between pin # 2 (Red wire) at the back of the "Lift" connector at the Guardian module, and chassis ground.  Back of the Lift Connector ▪ Is the measured voltage 11.5 volts or greater?	Yes Results_____ Go to E5 No Go to E4
Test Step	**Result/Action to Take**
E4 Check for lift power	
▪ Key in the ON position, Park Brake applied, and the transmission in Park. ▪ Using Digital Multimeter measure voltage between "Lift" connector Pin #3 (Red wire) and chassis ground.  Back of the Lift Connector ▪ Is the measured voltage 11.5 volts or greater?	Results_____ Yes Contact InterMotive for assistance with Guardian module. No Check lift power source at the lift adaptor or harness.
Test Step	**Result/Action to Take**
E5 Check for lift operation	
▪ Disconnect lift interlock connector from lift ▪ Jumper 12 Volt battery power to the lift power wire at the lift connector (Note: you may need to match up which wire on the lift connects to the "lift power" (Red wire from the module) wire on the harness in order to determine which lift wire to power up) ▪ Does the lift operate?	Results_____ Yes Repair lift interlock harness from Guardian module to lift connector (Red wire from the module) No Check lift circuits and system. Contact lift manufacturer if still no lift operation.

PINPOINT TEST F: LIFT OPERATES WHEN SAFETY CONDITIONS NOT MET

If the lift operates even though the lift output LED indicator is not lit:
- there is a problem with the wiring harness to the lift.
- there is a problem with the lift.
- the Guardian module may have an issue. **Estimated Time To Complete: 6 Minutes**

Test Step	Result/Action to Take
F1 Ensure that all connectors are installed correctly	
▪ Carefully inspect module and harness(es) ▪ Verify correct harness connector in the correct module plug ▪ Refer to schematics in Guardian documentation ▪ Are all harness connectors properly installed into module?	Yes Results_____ Go to F2 No Review install instructions, reinstall all connectors in their proper position. Test system for normal operation.
Test Step	Result/Action to Take
F2 Ensure that all wires are in their correct connector cavity	
▪ Carefully inspect all harness connectors ▪ Verify that each connector has the correct wires in the correct connector pin cavity ▪ Refer to schematics in Guardian documentation for wire colors and pin locations ▪ Are all wires secure, and in their correct connector pin cavity?	Yes Results_____ Go to F3 No Contact InterMotive for assistance with harness and connectors
Test Step	Result/Action to Take
F3 Check lift operation	
▪ Disconnect "Lift" connector from Guardian module and attempt to operate lift ▪ Does the lift operate?	Results_____ Yes Check for bypass jumper wires or short to power on lift circuit or at the lift No Contact InterMotive for assistance with Guardian module

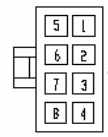
PINPOINT TEST G: LIFT OPERATES INTERMITTENTLY **Estimated Time To Complete: 6 Minutes**

Test Step	Result/Action to Take
G1 Check lift operation	
▪ Observe LED's when lift won't operate ▪ What does the LED panel display?	Refer to the symptom chart for diagnosis based on the LED display indicators during faulty operation

PINPOINT TEST H: SHIFTER NEVER LOCKS	**Estimated Time To Complete: 12 Minutes**
Test Step	Result/Action to Take
H1 Ensure that all connectors are installed correctly	
▪ Carefully inspect module and harness(es) ▪ Verify correct harness connector in the correct module plug ▪ Refer to schematics in Guardian documentation ▪ Are all harness connectors properly installed into module?	Results_____ Yes Go to H2 No Review install instructions, reinstall all connectors in their proper position. Test system for normal operation.
Test Step	Result/Action to Take
H2 Ensure that all wires are in their correct connector cavity	
▪ Carefully inspect all harness connectors ▪ Verify that each connector has the correct wires in the correct connector pin cavity ▪ Refer to schematics in Guardian documentation for wire colors and pin locations ▪ Are all wires in their correct connector pin cavity?	Results_____ Yes Go to H3 No Contact InterMotive for assistance with harness and connectors
Test Step	Result/Action to Take
H3 Observe LED display panel	
▪ Key in the ON or OFF position. ▪ Perform each function; set park brake, transmission in park, lift door open. ▪ Which status indicator LED does not illuminate properly? (Stays off with condition met or always on.)	Results_____ PB Park Brake - Go to D5. P PARK - Go to D6 Door Open - Go to D7 All LEDs are ON with conditions met - Contact InterMotive for assistance with Guardian module and/or OEM shift lock mechanism.

PINPOINT TEST J: CANNOT SHIFT OUT OF PARK	**Estimated Time To Complete: 12 Minutes**
Test Step	Result/Action to Take
J1 Ensure that all connectors are installed correctly	
▪ Carefully inspect all harness connectors ▪ Verify that each connector has the correct wires in the correct connector pin cavity ▪ Refer to schematics in Guardian documentation for wire colors and pin locations ▪ Are all wires in their correct connector pin cavity?	Results_____ Yes Go to J2 No Review install instructions, reinstall all connectors in their proper position. Test system for normal operation.
Test Step	Result/Action to Take
J2 Ensure that all wires are in their correct connector cavity	
▪ Carefully inspect all harness connectors ▪ Verify that each connector has the correct wires in the correct connector pin cavity ▪ Refer to schematics in Guardian documentation for wire colors and pin locations ▪ Are all wires secure, and in their correct connector pin cavity?	Results_____ Yes Go to J3 No Contact InterMotive for assistance with harness and connectors
Test Step	Result/Action to Take
J3 Remove Guardian Data Link 1	
▪ Disconnect data link 1 connector at module. ▪ Turn ON ignition, Release Parking Brake, and Press on Service Brake. ▪ Can you shift out of park?	Results_____ No Contact OEM for shift lock repair. Yes Contact InterMotive for assistance with Guardian module

PINPOINT TEST K: SOME, but not all, DISPLAY PANEL LEDs DO NOT PROVE OUT PROPERLY
If an LED indicator does not light when the ignition key is initially turned to ON or power is initially applied to the module.
- there is a problem with the LED indicator display and/or circuit.
- the Guardian module may have an issue. **Estimated Time To Complete: 12 Minutes**

Test Step	Result/Action to Take
K1 Ensure that all connectors are installed correctly	
▪ Carefully inspect module and harness(es) ▪ Verify correct harness connector in the correct module plug ▪ Refer to schematics in Guardian documentation ▪ Are all harness connectors properly installed into module?	Results_____ Yes Go to K2 No Review install instructions, reinstall all connectors in their proper position. Test system for normal operation.
Test Step	**Result/Action to Take**
K2 Ensure that all wires are in their correct connector cavity	
▪ Carefully inspect all harness connectors ▪ Verify that each connector has the correct wires in the correct connector pin cavity ▪ Refer to schematics in Guardian documentation for wire colors and pin locations ▪ Are all wires secure, and in their correct connector pin cavity?	Results_____ Yes Go to K3 No Contact InterMotive for assistance with harness and connectors
Test Step	**Result/Action to Take**
K3 Check LED Drive Circuit	
▪ With the Digital Multimeter back probe the Pin, relating to the failed LED, at the "LED" connector during Prove Out. ▪ Pin # 3 if a Park Brake failure. (PB) ▪ Pin # 6 if a "Door Open" failure. (L) ▪ Pin # 7 if a Park failure. (P) ▪ Measure voltage at failed pin (Red Digital Multimeter Lead) to chassis ground. (Black Digital Multimeter Lead) ▪ Is the voltage between 2 and 4 volts? (Typical 3.1v) ▪ Prove out lasts about 2 sec. at the beginning when module is first powered up. To cause this, disconnect the "Data Link 1" connector momentarily and reconnect it.  "LED" connector receptacle	Results_____ Yes Contact InterMotive for assistance with LED display panel No Voltage = 5v. Contact InterMotive for assistance with Guardian Module. Voltage = 0v. Open circuit in harness or LED display. Contact InterMotive for assistance with LED harness or LED display panel.