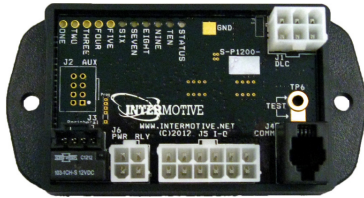


ECO501/506/507/515/550/601/805/809 Symptom Flow Chart



ECO501/506/507/515/601/805/809 Module

The Eco Star 501/506/507/515/601/805/809 is an automatic engine stop/start system that provides lower vehicle emissions and improved fuel economy by forcing an idling engine to shutoff. The system accepts user inputs that allow the operator to control engine stop/start from a remote location (i.e. a work truck boom). An idle shutoff timer is also added as an additional means to minimize engine run time. Restarts are triggered automatically by low battery voltages or the user restart request. For more information on the specific operating conditions, go to ww.intermotive.net/Instructions and download the Eco Star App Note.

Technician knowledge base and testing procedures

These diagnostic instructions are designed to help a qualified technician diagnose a potential issue with the InterMotive Eco Star system. The technician should have a basic electrical understanding of current flow, be able to read NEMA standard wiring diagrams, and know how to use a Digital Volt/Ohm Meter. (DVOM) They should be familiar with the Eco Star system and may need to contact InterMotive Customer Care for wiring schematics prior to starting any diagnostics. The Estimated Time To Complete times at the top of each pinpoint test are to help guide the technician and are not authorization for any warranty repair labor claims.



USING A TEST LIGHT OR POWER PROBE TO DIAGNOSE ANY INTERMOTIVE PRODUCT MAY GIVE INCORRECT DIAGNOSTIC INFORMATION AND RESULT IN DAMAGING THE SYSTEM.

Testing connector outputs and harness continuity

Using a Digital Volt/Ohm Meter (DVOM) back probe the Eco Star system connector on the harness side to read connector inputs, outputs, and check for harness continuity.



Index

Page	
1	Description of system / Testing connector outputs
2	Performing the system post installation test.
3	Fault Code Chart
4	Pin Point Tests

Acronyms

CAN - Controller Area Network	PB - Parking Brake
DLC - Data Link Connector	SB - Service Brake (Brake Pedal)
DVOM - Digital Volt/Ohm Meter	Vbat - Battery Voltage
ECO - Eco Star Stop/Start System	
ECT - Engine Coolant Temp.	
LIN - Local Information Network	
LCO - Low Current Output	
OEM - Original Equipment Manufacture	

ECO501/506/507/515/550/601/805/809 Installation Instructions and Vehicle Configuration Documentation are available from:

**InterMotive Customer Care
530-823-1048 Ext. 159**



Contact InterMotive to ensure you are using the latest ECO-DIAG revision.




ECO501/506/507/515/550/601/805/809 Symptom Flow Chart

Begin diagnosis by performing the system post installation test.

1. Turn the ignition ON to wake up and initialize the ECO module.
2. If the circuit board LEDs are scrolling sequentially it indicates that the VIN has either not been found or is not valid. Cycle the key off then back on. If the circuit board LEDs continue scrolling sequentially please contact InterMotive.



The following checks must be made to ensure correct and safe operation of the system. If any of the checks do not pass, recheck all connections as per the ECO501/506/507/515/550/601/805/809 installation instructions.



CAUTION

All electronic products are susceptible to damage from Electrostatic Discharge or ESD. Ground yourself before handling or working with the module and harnessing by first touching chassis ground, such as the barrel of the cigarette lighter.

Setting module into Installation Test Mode

The installation test mode can be entered by connecting the silver pad on the module labeled "TEST". With the key in the on position, bridge the two test pads using a piece of stranded copper wire.

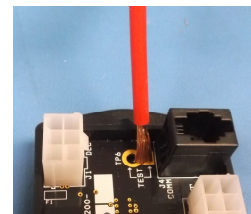
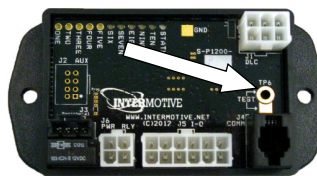
When test mode activates, the status LED will start blinking;

the ECO module now functions without monitoring the following pre-conditions: Engine Temp, Battery Voltage, or Ambient Air Temp(when applicable).

This allows for easier testing/troubleshooting for the installer.

Several conditions will prevent ECO module from auto-shutdown in test mode:

- Trans Range Not in Park or Neutral,
- Service Brake Pedal Applied,
- Hood Open (Open = Not Grounded),
- Vehicle Speed not 0,
- Shutdown Inhibit Input Active (Grounded).



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Transit System Post Installation Test

- Test 1.** With engine running, transmission in Park or Neutral, hood closed, activate the Engine Off Request input. Engine will shut off and Ignition will go off for several seconds before Run/Start Output is restored.
- Test 2.** Apply the Service Brake. The Engine will automatically restart.
- Test 3.** Release the Service Brake and confirm the module shuts off the engine after 15 seconds. Note: Applying the Service Brake resets and prevents the timer from counting down and shutting off the engine.
- Test 4.** With the engine still auto-stopped, open the hood and repeat test 2. As a safety feature, the ECO module **MUST NOT** start or stop the engine when the hood is open. If applying the Service Brake starts the engine with hood open, check hood switch wiring.

Work Truck System Post Installation Test

- Test 1.** With engine running, transmission in Park, hood closed, activate the Engine Off Request switch input. Engine will shut off, ignition will go off and stay off (acts like key off).
- Test 2.** Release the Engine Off Request. Ignition power will be restored, loads that are powered with key in Run will be restored. Engine will not start (low battery could cause a restart).
- Test 3.** Activate the Engine Start Request. The Engine will automatically restart.
- Test 4.** Release the Engine Start Request and confirm the module shuts off the engine after 15 seconds. Applying the Service Brake will prevent the timer from counting down and shutting off the engine.
- Test 5.** Repeat test 3 with hood open. As a safety feature, the ECO module must NOT start or stop the engine when the hood is open. If the Engine Start Request starts engine with hood open, check hood switch wiring.

NOTE: The ECO system will not shut off the engine for 5 seconds after the engine is started. Do not put vehicle in service unless hood open disables Eco Star from auto restarting engine. If the system fails any of the above tests, check the related wiring.

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Fault Code Chart

Observing the operation of the LED's on the Eco Star module while in diagnostic mode is the primary tool for diagnosis of the InterMotive EcoStar system.

Choose the condition from the chart below that best fits with the symptom identified.

Condition	Possible Causes	Action
<ul style="list-style-type: none"> No system function. No circuit board LED function in diagnostics. 	<ul style="list-style-type: none"> Connections Power/Ground Harness(es) Module 	<ul style="list-style-type: none"> Go to Pinpoint Test A.
<ul style="list-style-type: none"> No system function. Able to enter diagnostics on the Eco-Star module. 	<ul style="list-style-type: none"> Connections Harness(es) Module 	<ul style="list-style-type: none"> Go to Pinpoint Test B.
<ul style="list-style-type: none"> No idle shut off timer functions, engine shuts down immediately when in park. 	<ul style="list-style-type: none"> Connections Module Harness(es) Inputs 	<ul style="list-style-type: none"> Go to Pinpoint Test C.
<ul style="list-style-type: none"> No idle shut off functions, engine never shuts down. 	<ul style="list-style-type: none"> Connections Harness(es) Module Inputs 	<ul style="list-style-type: none"> Go to Pinpoint Test D.
<ul style="list-style-type: none"> Engine shuts down, but does not restart. 	<ul style="list-style-type: none"> Connections Harness(es) Module Inputs 	<ul style="list-style-type: none"> Go to Pinpoint Test E.
<ul style="list-style-type: none"> Engine shuts down when shifted out of park. 	<ul style="list-style-type: none"> Connections Harness(es) Module Inputs 	<ul style="list-style-type: none"> Go to Pinpoint Test F.
<ul style="list-style-type: none"> Engine does not restart when configured ambient hot / cold temperature is reached. 	<ul style="list-style-type: none"> Connections Harness(es) Thermistor Module 	<ul style="list-style-type: none"> Go to Pinpoint Test G.
<ul style="list-style-type: none"> Un-interrupted loads do not stay powered when system is active. 	<ul style="list-style-type: none"> Connections Module Harness(es) 	<ul style="list-style-type: none"> Go to Pinpoint Test H.
<ul style="list-style-type: none"> Equipment enable output loads do not stay powered when system is active. 	<ul style="list-style-type: none"> Connections Harness(es) Module 	<ul style="list-style-type: none"> Go to Pinpoint Test I.

USING A TEST LIGHT OR POWER PROBE TO DIAGNOSE ANY INTERMOTIVE PRODUCT MAY GIVE INCORRECT DIAGNOSTIC INFORMATION AND RESULT IN DAMAGING THE SYSTEM.



Testing connector outputs and harness continuity

Using a Digital Volt/Ohm Meter (DVOM) back probe the Eco Star system connector on the harness side to read connector inputs, outputs, and check for harness continuity.



The following is necessary for proper diagnosis:

- Minimum system voltage (battery voltage) of 12.4 volts.**
- Digital Volt/Ohm Multimeter (do not use test lamp as circuit damage will result).**
- ECO501/506/507/515/550/601/805/809 documentation as per the application.**

**Documentation available at:
InterMotive Customer Care
530-823-1048 Ext. 159**

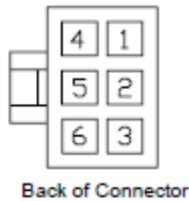
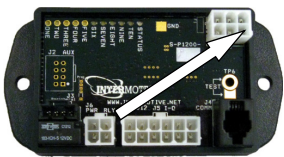
PINPOINT TEST A: No system function. No circuit board LED function in diagnostics.

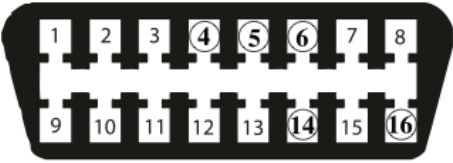
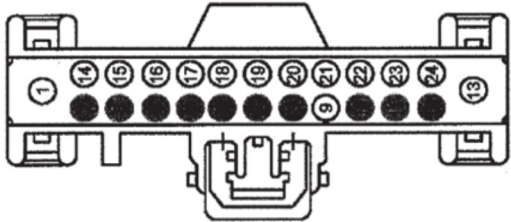
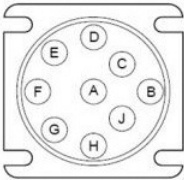


indicates that:
 - the ECO501/506/507/515/550/601/805/809 module is not powered up.

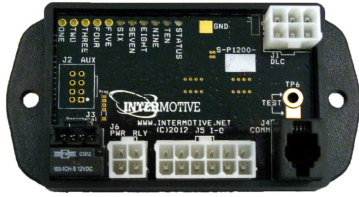
Estimated Time To Complete: 15 Minutes

Test Step	Result/Action to Take
<p>A1 Ensure that all connectors are installed correctly.</p> <ul style="list-style-type: none"> Carefully inspect the ECO501/506/507/515/550/601/805/809 module and harness(es). Verify harness connectors are fully seated into the ECO501/506/507/515/550/601/805/809 module. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation. Are all harness connectors properly installed into module? 	<p>Results _____</p> <p>Yes Go to A2</p> <p>No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>
<p>A2 Ensure that all wires are in their correct connector cavity.</p> <ul style="list-style-type: none"> Carefully inspect all harness connectors. Verify that each connector has the correct wires in the correct connector pin cavity. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation for wire colors and pin locations. Are all wires in their correct connector pin cavity? 	<p>Results _____</p> <p>Yes Go to A3</p> <p>No Contact InterMotive for assistance with harness and connectors.</p>
<p>A3 Check voltage at the White 6 Pin J1 DLC connector at module.</p> <ul style="list-style-type: none"> Disconnect the white 6 pin J1 DLC connector at module. Using a digital multimeter measure the voltage between the red wire pin 1 and the gray wire pin 4 of J19 DLC connector. Is the voltage greater than 11.5 Volts? 	<p>Results _____</p> <p>Yes Contact InterMotive for assistance with further diagnostic steps.</p> <p>No ECO501/506/507/515/550/601 Go to A4 B-ECO507 Go to A5 ECO805/809 Go to A6</p>



Test Step	Result/Action to Take																				
<p>A4 Check voltage at the OEM Data Link Connector. (DLC)</p> <ul style="list-style-type: none"> • Disconnect the Red data link connector at the OEM DLC. • Using a digital multimeter, measure voltage between pin 4 and pin 16 of OEM Data Link Connector.  <ul style="list-style-type: none"> • Is the voltage greater than 10 Volts? 	<p>Results _____</p> <p>Yes Contact InterMotive for assistance with the InterMotive Data Link harness.</p> <p>No Check the fuse for the DLC (Data Link Connector). Refer to the owner's guide or service publications for the location of this fuse.</p> <p>If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.</p>																				
<p>A5 Check voltage at the OEM Data Link Connector. (DLC)</p> <ul style="list-style-type: none"> • Disconnect the OEM white 24 pin connector from the ECO data link harness at the back of the OEM EcoStar module. • Using a digital multimeter, measure voltage between pin 1 and pin 13 of OEM 24 pin Data Link Connector.  <ul style="list-style-type: none"> • Is the voltage greater than 10 Volts? 	<p>Results _____</p> <p>Yes Contact InterMotive for assistance with the InterMotive Data Link harness.</p> <p>No Check the fuse for the DLC (Data Link Connector). Refer to the owner's guide or service publications for the location of this fuse.</p> <p>If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.</p>																				
<p>A6 Check voltage at the OEM Data Link Connector. (DLC)</p> <ul style="list-style-type: none"> • Disconnect the OEM J1939 9 pin connector from the ECO data link harness. • Using a digital multimeter, measure voltage between pin A and pin B of OEM 9 pin Data Link Connector. <table border="1" data-bbox="175 1507 483 1734"> <thead> <tr> <th>Pin</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>+12V</td> </tr> <tr> <td>B</td> <td>Ground</td> </tr> <tr> <td>C</td> <td>CAN Shield</td> </tr> <tr> <td>D</td> <td>CAT Data Link (CDL) Hi</td> </tr> <tr> <td>E</td> <td>CAT Data Link (CDL) Lo</td> </tr> <tr> <td>F</td> <td>CAN/J1939 Lo</td> </tr> <tr> <td>G</td> <td>CAN/J1939 Hi</td> </tr> <tr> <td>H</td> <td>ATA/J1587/J1708 Lo</td> </tr> <tr> <td>J</td> <td>ATA/J1587/J1708 Hi</td> </tr> </tbody> </table>  <p>9-Pin Deutsch – CAT Industrial Connector (J1708/J1587, J1939, CAT Data Link)</p> <ul style="list-style-type: none"> • Is the voltage greater than 10 Volts? 	Pin	Value	A	+12V	B	Ground	C	CAN Shield	D	CAT Data Link (CDL) Hi	E	CAT Data Link (CDL) Lo	F	CAN/J1939 Lo	G	CAN/J1939 Hi	H	ATA/J1587/J1708 Lo	J	ATA/J1587/J1708 Hi	<p>Results _____</p> <p>Yes Contact InterMotive for assistance with the InterMotive Data Link harness.</p> <p>No Check the fuse for the DLC (Data Link Connector). Refer to the owner's guide or service publications for the location of this fuse.</p> <p>If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.</p>
Pin	Value																				
A	+12V																				
B	Ground																				
C	CAN Shield																				
D	CAT Data Link (CDL) Hi																				
E	CAT Data Link (CDL) Lo																				
F	CAN/J1939 Lo																				
G	CAN/J1939 Hi																				
H	ATA/J1587/J1708 Lo																				
J	ATA/J1587/J1708 Hi																				

PINPOINT TEST B: No system function. Able to enter diagnostics on the Eco-Star module.

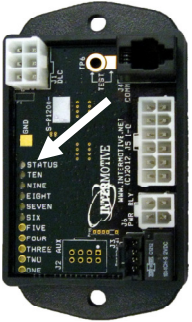


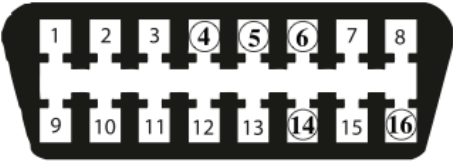
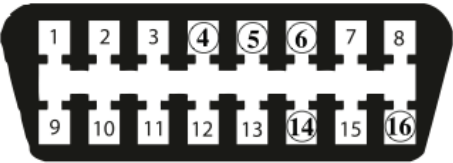
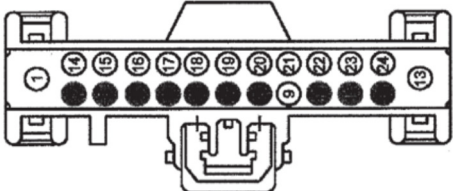
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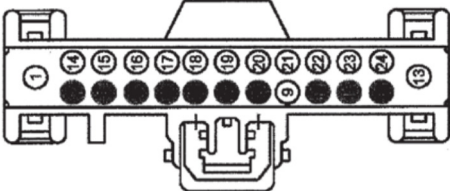
- there is a problem with the OEM electrical system.
- the ECO501/506/507/515/550/601/805/809 module may be incorrectly configured or needs replacement.

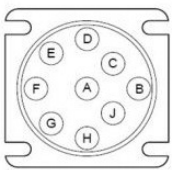
Estimated Time To Complete: 10 Minutes

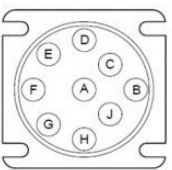
Test Step	Result/Action to Take
<p>B1 Ensure that all connectors are installed correctly.</p> <ul style="list-style-type: none"> • Carefully inspect the ECO501/506/507/515/550/601/805/809 module and harness(es). • Verify harness connectors are fully seated into the ECO module. • Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation. • Are all harness connectors properly installed into module? 	<p>Results _____</p> <p>Yes Go to B2</p> <p>No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>
<p>B2 Ensure that all wires are in their correct connector cavity.</p> <ul style="list-style-type: none"> • Carefully inspect all harness connectors.. • Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation for wire colors and pin locations. • Verify that each connector has the correct wires in the correct connector pin cavity. • Are all wires in their correct connector pin cavity? 	<p>Results _____</p> <p>Yes Go to B3</p> <p>No Contact InterMotive for assistance with harness and connectors</p>
<p>B3 Putting module into diagnostic mode.</p> <ul style="list-style-type: none"> • Locate the TP6 test pads on the ECO module circuit board. • With the key in the on position, bridge the two test pads using a piece of stranded copper wire. • What is the 2 digit code the status LED is flashing out? <div data-bbox="116 1696 438 1871" data-label="Image"> </div> <div data-bbox="545 1562 875 1856" data-label="Image"> </div>	<p>Results _____</p> <p>1-1 Status OK Go to B4</p> <p>5-1 CAN1 Contact InterMotive for assistance with ECO module.</p> <p>5-2 CAN2 Contact InterMotive for assistance with ECO module.</p> <p>5-3 Output Error Contact InterMotive for assistance with ECO module.</p> <p>15-15 General Fault Contact InterMotive for assistance with ECO module.</p>

Test Step	Result/Action to Take																								
<p>B4 Checking LEDs in diagnostic mode.</p> <ul style="list-style-type: none"> In diagnostic mode the circuit board LEDs will determine the condition of each input. <table border="1" data-bbox="115 321 462 678"> <thead> <tr> <th>LED</th> <th>Test Mode</th> </tr> </thead> <tbody> <tr><td>1</td><td>ES State Machine</td></tr> <tr><td>2</td><td>CAN1</td></tr> <tr><td>3</td><td>CAN2</td></tr> <tr><td>4</td><td>Engine Off Request</td></tr> <tr><td>5</td><td>Engine On Request</td></tr> <tr><td>6</td><td>Hood Open</td></tr> <tr><td>7</td><td>Security Disable</td></tr> <tr><td>8</td><td>No Thermistor</td></tr> <tr><td>9</td><td>Output Fault (U5)</td></tr> <tr><td>10</td><td>Output Fault (U4)</td></tr> <tr><td>STATUS</td><td>Code Flash</td></tr> </tbody> </table>  <ul style="list-style-type: none"> Are LEDs lit correctly for conditions met? 	LED	Test Mode	1	ES State Machine	2	CAN1	3	CAN2	4	Engine Off Request	5	Engine On Request	6	Hood Open	7	Security Disable	8	No Thermistor	9	Output Fault (U5)	10	Output Fault (U4)	STATUS	Code Flash	<p>Results _____</p> <p>LED 1 Lit - Ok Not Lit - Contact InterMotive for assistance with ECO module.</p> <p>LED 2 Dimly lit (flashing rapidly) - Ok Not lit - Go to B5.</p> <p>LED 3 Not used.</p> <p>LED 4 Lit with condition met - Ok Not lit with condition met - Go to C1.</p> <p>LED 5 Lit with condition met - Ok Not lit with condition met - Go to D1.</p> <p>LED 6 Lit with condition met - Ok Not lit with condition met - Go to E1.</p> <p>LED 7 Lit with condition met - Ok Not lit with condition met - Go to F1.</p> <p>LED 8 Lit with Thermistor condition met - Ok Not lit with Thermistor condition met - Go to G1. Flashing - Engine should restart. If not - Go to G4.</p> <p>LED 9 Contact InterMotive for assistance with ECO wiring.</p> <p>LED 10 Contact InterMotive for assistance with ECO wiring.</p>
LED	Test Mode																								
1	ES State Machine																								
2	CAN1																								
3	CAN2																								
4	Engine Off Request																								
5	Engine On Request																								
6	Hood Open																								
7	Security Disable																								
8	No Thermistor																								
9	Output Fault (U5)																								
10	Output Fault (U4)																								
STATUS	Code Flash																								
<p>B5 Checking CAN1 High input.</p> <ul style="list-style-type: none"> Disconnect the white 6 pin J1 DLC connector at module. Using a digital multimeter measure the voltage between the yellow wire pin 2 and the gray wire pin 4 of J19 DLC connector. Is the voltage between 1 and 3 Volts? 	<p>Results _____</p> <p>Yes Go to B6.</p> <p>No ECO501/506/507/515/550/601 Go to B7. B-ECO507 Go to B9. ECO805/809 Go to B11.</p>																								
<p>B6 Checking CAN1 Low input.</p> <ul style="list-style-type: none"> Disconnect the white 6 pin J1 DLC connector at module. Using a digital multimeter measure the voltage between the brown wire pin 5 and the gray wire pin 4 of J19 DLC connector. Is the voltage between 1 and 3 Volts? 	<p>Results _____</p> <p>Yes Contact InterMotive for assistance with ECO module.</p> <p>No ECO501/506/507/515/550/601 Go to B7. B-ECO507 Go to B9. ECO805/809 Go to B11.</p>																								

Test Step	Result/Action to Take
<p data-bbox="110 128 699 191">B7 Checking CAN1 High output at the OEM Data Link Connector. (DLC)</p> <ul data-bbox="110 212 808 317" style="list-style-type: none"> • Disconnect the Red data link connector at the OEM DLC. • Using a digital multimeter, measure voltage between pin 6 and pin 4 of OEM Data Link Connector.  <ul data-bbox="110 562 578 594" style="list-style-type: none"> • Is the voltage between 1 and 3 Volts? 	<p data-bbox="1175 233 1442 264">Results_____</p> <p data-bbox="829 296 943 359">Yes Go to B8.</p> <p data-bbox="829 390 1451 506">No Check the fuse for the DLC (Data Link Connector). Refer to the owner's guide or service publications for the location of this fuse.</p> <p data-bbox="829 537 1451 600">If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.</p>
<p data-bbox="99 726 683 789">B8 Checking CAN1 Low output at the OEM Data Link Connector. (DLC)</p> <ul data-bbox="110 810 808 915" style="list-style-type: none"> • Disconnect the Red data link connector at the OEM DLC. • Using a digital multimeter, measure voltage between pin 14 and pin 4 of OEM Data Link Connector.  <ul data-bbox="110 1161 578 1192" style="list-style-type: none"> • Is the voltage between 1 and 3 Volts? 	<p data-bbox="1159 831 1425 863">Results_____</p> <p data-bbox="829 894 1468 989">Yes Contact InterMotive for assistance with the InterMotive Data Link harness.</p> <p data-bbox="829 1020 1425 1136">No Check the fuse for the DLC (Data Link Connector). Refer to the owner's guide or service publications for the location of this fuse.</p> <p data-bbox="829 1167 1386 1230">If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.</p>
<p data-bbox="99 1325 683 1388">B9 Checking CAN1 High output at the OEM Data Link Connector. (DLC)</p> <ul data-bbox="110 1409 797 1577" style="list-style-type: none"> • Disconnect the OEM white 24 pin connector from the ECO data link harness at the back of the OEM Gateway module. • Using a digital multimeter, measure voltage between pin 1 and pin 20 of OEM 24 pin Data Link Connector.  <ul data-bbox="110 1822 578 1854" style="list-style-type: none"> • Is the voltage between 1 and 3 Volts? 	<p data-bbox="1175 1430 1442 1461">Results_____</p> <p data-bbox="829 1493 943 1556">Yes Go to B10.</p> <p data-bbox="829 1587 1425 1703">No Check the fuse for the DLC (Data Link Connector). Refer to the owner's guide or service publications for the location of this fuse.</p> <p data-bbox="829 1734 1386 1797">If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.</p>

Test Step	Result/Action to Take
<p>B10 Checking CAN1 Low output at the OEM Data Link Connector. (DLC)</p> <ul style="list-style-type: none"> • Disconnect the OEM white 24 pin connector from the ECO data link harness at the back of the OEM Gateway module. • Using a digital multimeter, measure voltage between pin 1 and pin 19 of OEM 24 pin Data Link Connector.  <p>Is the voltage between 1 and 3 Volts?</p>	<p>Results_____</p> <p>Yes Contact InterMotive for assistance with the InterMotive Data Link harness.</p> <p>No Check the fuse for the DLC (Data Link Connector). Refer to the owner's guide or service publications for the location of this fuse.</p> <p>If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.</p>

<p>B11 Checking CAN1 High output at the OEM Data Link Connector. (DLC)</p> <ul style="list-style-type: none"> • Disconnect the OEM J1939 9 pin connector from the ECO data link harness. • Using a digital multimeter, measure voltage between pin D and pin B of OEM 9 pin Data Link Connector. <table border="1" data-bbox="138 955 422 1165"> <thead> <tr> <th>Pin</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>A</td><td>+12V</td></tr> <tr><td>B</td><td>Ground</td></tr> <tr><td>C</td><td>CAN Shield</td></tr> <tr><td>D</td><td>CAT Data Link (CDL) Hi</td></tr> <tr><td>E</td><td>CAT Data Link (CDL) Lo</td></tr> <tr><td>F</td><td>CAN/J1939 Lo</td></tr> <tr><td>G</td><td>CAN/J1939 Hi</td></tr> <tr><td>H</td><td>ATA/J1587/J1708 Lo</td></tr> <tr><td>J</td><td>ATA/J1587/J1708 Hi</td></tr> </tbody> </table>  <p>9-Pin Deutsch – CAT Industrial Connector (J1708/J1587, J1939, CAT Data Link)</p> <ul style="list-style-type: none"> • Is the voltage between 1 and 3 Volts? 	Pin	Value	A	+12V	B	Ground	C	CAN Shield	D	CAT Data Link (CDL) Hi	E	CAT Data Link (CDL) Lo	F	CAN/J1939 Lo	G	CAN/J1939 Hi	H	ATA/J1587/J1708 Lo	J	ATA/J1587/J1708 Hi	<p>Results_____</p> <p>Yes Go to B12.</p> <p>No Check the fuse for the DLC (Data Link Connector). Refer to the owner's guide or service publications for the location of this fuse.</p> <p>If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.</p>
Pin	Value																				
A	+12V																				
B	Ground																				
C	CAN Shield																				
D	CAT Data Link (CDL) Hi																				
E	CAT Data Link (CDL) Lo																				
F	CAN/J1939 Lo																				
G	CAN/J1939 Hi																				
H	ATA/J1587/J1708 Lo																				
J	ATA/J1587/J1708 Hi																				

<p>B12 Checking CAN1 Low output at the OEM Data Link Connector. (DLC)</p> <ul style="list-style-type: none"> • Disconnect the OEM J1939 9 pin connector from the ECO data link harness. • Using a digital multimeter, measure voltage between pin E and pin B of OEM 9 pin Data Link Connector. <table border="1" data-bbox="138 1585 422 1795"> <thead> <tr> <th>Pin</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>A</td><td>+12V</td></tr> <tr><td>B</td><td>Ground</td></tr> <tr><td>C</td><td>CAN Shield</td></tr> <tr><td>D</td><td>CAT Data Link (CDL) Hi</td></tr> <tr><td>E</td><td>CAT Data Link (CDL) Lo</td></tr> <tr><td>F</td><td>CAN/J1939 Lo</td></tr> <tr><td>G</td><td>CAN/J1939 Hi</td></tr> <tr><td>H</td><td>ATA/J1587/J1708 Lo</td></tr> <tr><td>J</td><td>ATA/J1587/J1708 Hi</td></tr> </tbody> </table>  <p>9-Pin Deutsch – CAT Industrial Connector (J1708/J1587, J1939, CAT Data Link)</p> <ul style="list-style-type: none"> • Is the voltage between 1 and 3 Volts? 	Pin	Value	A	+12V	B	Ground	C	CAN Shield	D	CAT Data Link (CDL) Hi	E	CAT Data Link (CDL) Lo	F	CAN/J1939 Lo	G	CAN/J1939 Hi	H	ATA/J1587/J1708 Lo	J	ATA/J1587/J1708 Hi	<p>Results_____</p> <p>Yes Contact InterMotive for assistance with the InterMotive Data Link harness.</p> <p>No Check the fuse for the DLC (Data Link Connector). Refer to the owner's guide or service publications for the location of this fuse.</p> <p>If the DLC fuse is okay, contact OEM dealer for OEM electrical system service.</p>
Pin	Value																				
A	+12V																				
B	Ground																				
C	CAN Shield																				
D	CAT Data Link (CDL) Hi																				
E	CAT Data Link (CDL) Lo																				
F	CAN/J1939 Lo																				
G	CAN/J1939 Hi																				
H	ATA/J1587/J1708 Lo																				
J	ATA/J1587/J1708 Hi																				

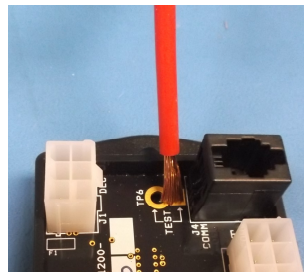
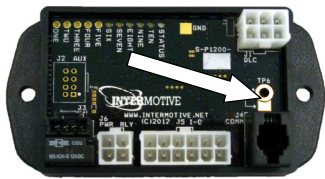
PINPOINT TEST C: No idle shut off timer functions, engine shuts down immediately when in park.


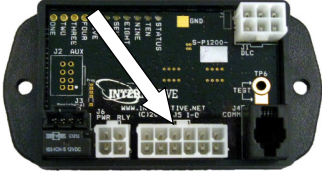


- there is a problem with the Engine Off Request Input wiring to the module.
- the ECO501/506/507/515/550/601/805/809 module may be incorrectly configured or needs replacement.

Estimated Time To Complete: 5 Minutes

Test Step	Result/Action to Take
C1 Ensure that all connectors are installed correctly.	
<ul style="list-style-type: none"> Carefully inspect ECO501/506/507/515/550/601/805/809 module and harness(es). Verify harness connectors are fully seated into the module. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation. Are all harness connectors properly installed into module? 	<p>Results _____</p> <p>Yes Go to C2.</p> <p>No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>
C2 Ensure that all wires are in their correct connector cavities.	
<ul style="list-style-type: none"> Carefully inspect all harness connectors. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation for wire colors and pin locations. Verify that each connector has the correct wires in the correct connector pin cavity. Are all wires in their correct connector pin cavity? 	<p>Results _____</p> <p>Yes Go to C3.</p> <p>No Contact InterMotive for assistance with harness and connectors</p>
C3 Putting module into diagnostic mode.	
<ul style="list-style-type: none"> Locate the TP6 test pads on the ECO module circuit board. With the key in the on position, bridge the two test pads using a piece of stranded copper wire. Is LED 4 lit on the circuit board? 	<p>Results _____</p> <p>Yes Go to C4.</p> <p>No Contact InterMotive for assistance with further diagnostic steps.</p>



Test Step	Result/Action to Take
<p>C4 Checking Engine Off Request Input circuit operation.</p> <ul style="list-style-type: none"> Check for voltage at the J5 white 12 pin connector pin 2 white wire.  <p>Back of the J5 Connector</p>  <ul style="list-style-type: none"> Is the voltage lower than .5 volts? 	<p>Results _____</p> <p>Yes Check for proper signal switching from the request engine off switch or OEM system that triggers engine off request.</p> <p>No Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p>

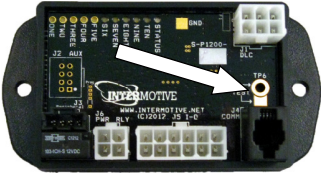
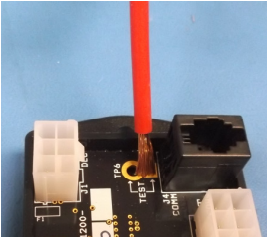


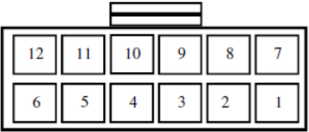
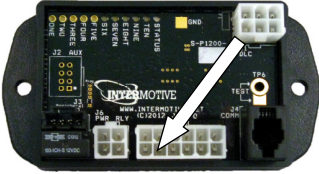
PINPOINT TEST D: No idle shut off functions, engine never shuts down.

- there is a problem with the Engine On Request Input wiring to the module.
- the ECO501/506/507/515/550/601/805/809 module may be incorrectly configured or needs replacement.

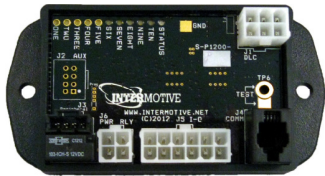
Estimated Time To Complete: 5 Minutes

Test Step	Result/Action to Take
<p>D1 Ensure that all connectors are installed correctly.</p> <ul style="list-style-type: none"> Carefully inspect the ECO501/506/507/515/550/601/805/809 module and harness(es). Verify harness connectors are fully seated into the ECO module. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation. <p>Are all harness connectors properly installed into module?</p>	<p>Results _____</p> <p>Yes Go to D2.</p> <p>No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>
<p>D2 Ensure that all wires are in their correct connector cavity.</p> <ul style="list-style-type: none"> Carefully inspect all harness connectors.. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation for wire colors and pin locations. Verify that each connector has the correct wires in the correct connector pin cavity. Are all wires in their correct connector pin cavity? 	<p>Results _____</p> <p>Yes Go to D3.</p> <p>No Contact InterMotive for assistance with harness and connectors.</p>

Test Step	Result/Action to Take
<p data-bbox="99 107 586 138">D3 Putting module into diagnostic mode.</p> <ul data-bbox="99 149 841 359" style="list-style-type: none"> • Locate the TP6 test pads on the ECO module circuit board. • With the key in the on position, bridge the two test pads using a piece of stranded copper wire. • Is LED 5 lit on the circuit board? <div data-bbox="180 390 500 562">  </div> <div data-bbox="581 281 846 516">  </div>	<p data-bbox="1094 254 1360 285">Results _____</p> <p data-bbox="911 285 1032 342">Yes Go to D2.</p> <p data-bbox="911 380 1451 468">No Contact InterMotive for assistance with further diagnostic steps.</p>

<p data-bbox="99 613 773 644">D4 Checking Engine On Request Input circuit operation.</p> <ul data-bbox="99 663 773 726" style="list-style-type: none"> • Check for voltage at the J5 white 12 pin connector pin 5 green wire. <div data-bbox="134 758 440 888">  </div> <p data-bbox="131 926 454 957">Back of the J5 Connector</p> <ul data-bbox="99 972 513 1003" style="list-style-type: none"> • Is the voltage lower than .5 volts? <div data-bbox="509 743 826 915">  </div>	<p data-bbox="1114 680 1382 711">Results _____</p> <p data-bbox="911 743 959 774">Yes</p> <p data-bbox="911 812 1503 903">Check for proper signal switching from the request engine on / thermistor switch or OEM system that triggers engine on request.</p> <p data-bbox="911 940 1474 1031">No Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p>
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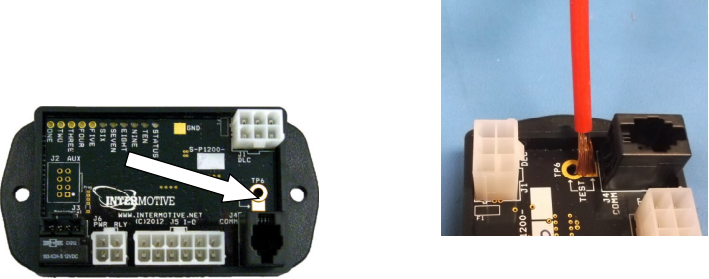
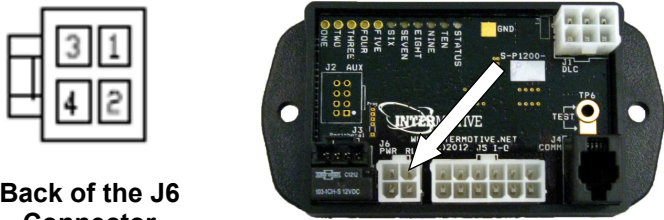
PINPOINT TEST E: Engine does not shut down.



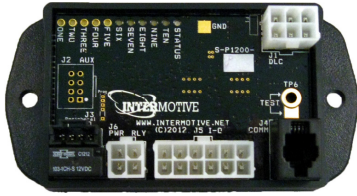
- there is a problem with the hood switch Input wiring to the module.
- the ECO501/506/507/515/550/601/805/809 module may be incorrectly configured or needs replacement.

Estimated Time To Complete: 5 Minutes

Test Step	Result/Action to Take
<p data-bbox="99 1411 716 1442">E1 Ensure that all connectors are installed correctly.</p> <ul data-bbox="99 1461 846 1776" style="list-style-type: none"> • D1 Ensure that all connectors are installed correctly. • Carefully inspect the ECO501/506/507/515/550/601/805/809 module and harness(es). • Verify harness connectors are fully seated into the ECO module. • Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation. • Are all harness connectors properly installed into module? 	<p data-bbox="1105 1562 1373 1593">Results _____</p> <p data-bbox="924 1593 1045 1650">Yes Go to E2.</p> <p data-bbox="924 1688 1508 1778">No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>

Test Step	Result/Action to Take
<p>E2 Ensure that all wires are in their correct connector cavities.</p> <ul style="list-style-type: none"> Carefully inspect all harness connectors. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation for wire colors and pin locations. Verify that each connector has the correct wires in the correct connector pin cavity. Are all wires in their correct connector pin cavity? 	<p>Results_____</p> <p>Yes Go to E3.</p> <p>No Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809Harness.</p>
<p>E3 D3 Putting module into diagnostic mode</p> <ul style="list-style-type: none"> Locate the TP6 test pads on the ECO module circuit board. With the key in the on position, bridge the two test pads using a piece of stranded copper wire. Is LED 6 lit on the circuit board? 	<p>Results_____</p> <p>Yes Go to E4.</p> <p>No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>
<p>E4 Checking Hood Switch Input circuit operation.</p> <ul style="list-style-type: none"> Check for voltage at the J6 white 4 pin connector pin 3 brown wire.  <p>Back of the J6 Connector</p> <ul style="list-style-type: none"> Is the voltage lower than .5 volts? 	<p>Results_____</p> <p>Yes Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p> <p>No Check for ground output from the hood switch. Repair/Replace the hood switch.</p>

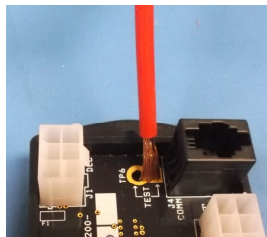
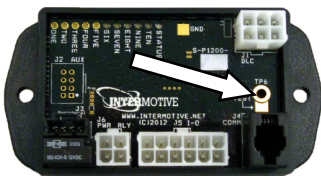
PINPOINT TEST F: Engine shuts down when shifted out of park.

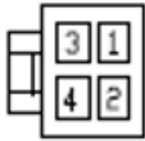
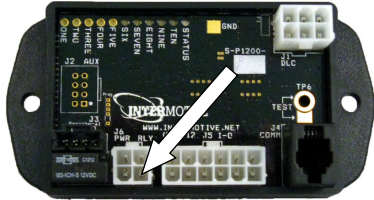


- there is a problem with the Security Switch Input circuit.
- the ECO501/506/507/515/550/601/805/809 module may be incorrectly configured or needs replacement.

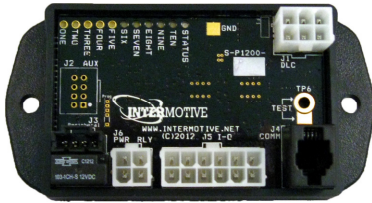
Estimated Time To Complete: 5 Minutes

Test Step	Result/Action to Take
<p>F1 Ensure that all connectors are installed correctly.</p> <ul style="list-style-type: none"> Carefully inspect the ECO501/506/507/515/550/601/805/809 module and harness(es). Verify harness connectors are fully seated into the module. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation. Are all harness connectors properly installed into module? 	<p>Results _____</p> <p>Yes Go to F2.</p> <p>No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>
<p>F2 Ensure that all wires are in their correct connector cavities.</p> <ul style="list-style-type: none"> Carefully inspect all harness connectors. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation for wire colors and pin locations. Verify that each connector has the correct wires in the correct connector pin cavity. Are all wires in their correct connector pin cavity? 	<p>Results _____</p> <p>Yes Go to F3.</p> <p>No Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 Harness.</p>
<p>F3 Putting module into diagnostic mode.</p> <ul style="list-style-type: none"> Locate the TP6 test pads on the ECO module circuit board. With the key in the on position, bridge the two test pads using a piece of stranded copper wire. Is LED 7 lit on the circuit board? 	<p>Results _____</p> <p>Yes Go to F4.</p> <p>No Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p>



Test Step	Result/Action to Take
<p>F4 Checking Security Switch Input circuit operation.</p> <ul style="list-style-type: none"> Check for voltage at the J6 white 4 pin connector pin 1 output.   <ul style="list-style-type: none"> Is the voltage lower than .5 volts? 	<p>Results _____</p> <p>Yes Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p> <p>No Check for ground output from the security switch. Repair/Replace the security ground switch.</p>

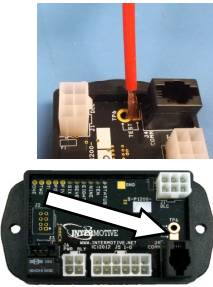
PINPOINT TEST G: Engine does not restart when configured thermistor hot/cold temperature is reached.



- there is a problem with the thermistor input.
- the ECO 505/506/605/805 module may be incorrectly configured or needs replacement.

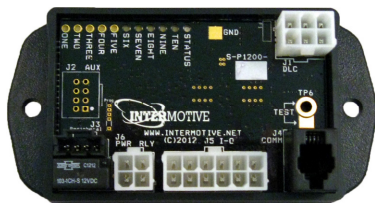
Estimated Time To Complete: 15 Minutes

Test Step	Result/Action to Take
<p>G1 Ensure that all connectors are installed correctly.</p> <ul style="list-style-type: none"> Carefully inspect the ECO501/506/507/515/550/601/805/809 module and harness(es). Verify harness connectors are fully seated into the ECO module. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation. <p>Are all harness connectors properly installed into module?</p>	<p>Results _____</p> <p>Yes Go to G2.</p> <p>No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>
<p>G2 Ensure that all wires are in their correct connector cavity.</p> <ul style="list-style-type: none"> Carefully inspect all harness connectors.. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation for wire colors and pin locations. Verify that each connector has the correct wires in the correct connector pin cavity. Are all wires in their correct connector pin cavity? 	<p>Results _____</p> <p>Yes Go to I3.</p> <p>No Contact InterMotive for assistance with harness and connectors.</p>

Test Step	Result/Action to Take
<p>G3 Putting module into diagnostic mode.</p> <ul style="list-style-type: none"> • Locate the TP6 test pads on the ECO module circuit board. • With the key in the on position, bridge the two test pads using a piece of stranded copper wire. • Confirm the Hot /Cold condition is met for restart using the ECO501/506/507/515/550/601/805/809 configuration information. • Is LED 8 on solid or flashing on the circuit board? 	<p>Results_____</p> <p>Yes On solid -Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p> <p>Flashing - Engine should restart. If it does not Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p> <p>No Go to G4.</p>

<p>G4 Checking Thermistor Input circuit operation.</p> <ul style="list-style-type: none"> • Unplug the J5 white 12 pin connector from the module. • Check resistance from the J5 white 12 pin connector pin 5 green wire to ground. • Is the resistance value correct for the current ambient temperature? <div data-bbox="483 783 820 934" style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Ambient Temperature 32 degrees - 115k ohms 73 degrees - 48k ohms 95 degrees - 35k ohms</p> </div>	<p>Results_____</p> <p>Yes Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p> <p>No Repair/replace the wiring and/or ECO501/506/507/515/550/601/805/809 thermistor.</p>
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PINPOINT TEST H: Un-interrupted loads do not stay powered when system is active.

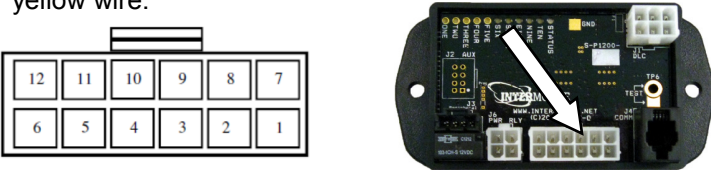


- there is a problem with the Un-interrupted loads wiring, control relay, or output circuit.
- the ECO 505/506/605/805 module may be incorrectly configured or needs replacement.

Estimated Time To Complete: 10 Minutes

Test Step	Result/Action to Take
<p>H1 Ensure that all connectors are installed correctly.</p> <ul style="list-style-type: none"> • Carefully inspect the ECO501/506/507/515/550/601/805/809 module and harness(es). • Verify harness connectors are fully seated into the ECO module. • Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation. • Are all harness connectors properly installed into module? 	<p>Results_____</p> <p>Yes Go to H2.</p> <p>No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>

Test Step	Result/Action to Take
<p>H2 Ensure that all wires are in their correct connector cavities.</p> <ul style="list-style-type: none"> Carefully inspect all harness connectors. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation for wire colors and pin locations. Verify that each connector has the correct wires in the correct connector pin cavity. Are all wires in their correct connector pin cavity? 	<p>Results_____</p> <p>Yes Go to H3.</p> <p>No Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809Harness.</p>

<p>H3 Checking Un-interrupted load output.</p> <ul style="list-style-type: none"> Activate the ECO501/506/507/515/550/601/805/809 system and allow the engine to shut down. Check for voltage at the J5 white 12 pin connector pin 9 yellow wire.  <ul style="list-style-type: none"> Is the voltage greater than 11.5 volts? 	<p>Results_____</p> <p>Yes Check the Un-interrupted loads wiring, function of the control relay, or control relay output circuit.</p> <p>No Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p>
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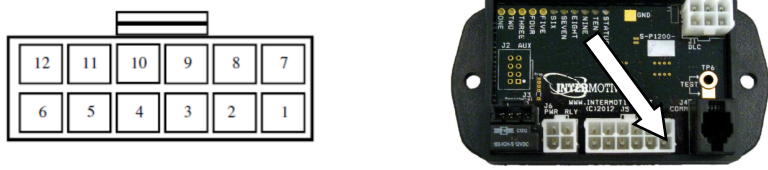
PINPOINT TEST I: With the Engine Off request active the equipment enable output loads do not stay powered.



- there is a problem with the equipment enable output wiring, control relay, or output circuit.
- the ECO501/506/507/515/550/601/805/809 module may be incorrectly configured or needs replacement.

Estimated Time To Complete: 10 Minutes

Test Step	Result/Action to Take
<p>I1 Ensure that all connectors are installed correctly.</p> <ul style="list-style-type: none"> ECO501/506/507/515/550/601/805/809 module and harness(es). Verify harness connectors are fully seated into the ECO501/506/507/515/550/601/805/809 module. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation. Are all harness connectors properly installed into module? 	<p>Results_____</p> <p>Yes Go to I2.</p> <p>No Review install instructions, reinstall all connectors in their proper position. Test system operation.</p>

Test Step	Result/Action to Take
<p>I2 Ensure that all wires are in their correct connector cavity.</p> <ul style="list-style-type: none"> Carefully inspect all the ECO501/506/507/515/550/601/805/809 harness connectors.. Refer to the schematics in the ECO501/506/507/515/550/601/805/809 documentation for wire colors and pin locations. Verify that each connector has the correct wires in the correct connector pin cavity. Are all wires in their correct connector pin cavity? 	<p>Results_____</p> <p>Yes Go to I3.</p> <p>No Contact InterMotive for assistance with harness and connectors.</p>
<p>I3 Check the Equipment enable output.</p> <ul style="list-style-type: none"> Activate the ECO501/506/507/515/550/601/805/809 system and use the request off input to shut down the engine. Check for voltage at the J5 white 12 pin connector pin 1 pink wire.  <ul style="list-style-type: none"> Is the voltage greater than 11.5 volts? 	<p>Results_____</p> <p>Yes Check the Equipment enable output wiring, function of the control relay, or control relay output circuit.</p> <p>No Contact InterMotive for assistance with ECO501/506/507/515/550/601/805/809 module.</p>

Technician knowledge base and testing procedures

These diagnostic instructions are designed to help a qualified technician diagnose a potential issue with the InterMotive Eco Star system. The technician should have a basic electrical understanding of current flow, be able to read NEMA standard wiring diagrams, and know how to use a Digital Volt/ Ohm Meter. (DVOM) They should be familiar with the Eco Star system and may need to contact InterMotive Customer Care for wiring schematics prior to starting any diagnostics. The Estimated Time To Complete times at the top of each pinpoint test are to help guide the technician and are not authorization for any warranty repair labor claims.

ECO501/506/507/515/550/601/805/809
Installation Instructions and Vehicle Configuration Documentation
 are available from:

InterMotive Customer Care
530-823-1048 Ext. 159