

SECTION 414-00: Charging System
DIAGNOSIS AND TESTING

2014 F-150 Workshop Manual
 Procedure revision date: 10/25/2013

Pinpoint Test

Special Tool(s)

 ST3104-A	Backprobe Pins POM6411 or equivalent
 ST2574-A	Flex Probe Kit NUD105-R025D or equivalent
 ST3093-A	Fluke 77-IV Digital Multimeter FLU77-4 or equivalent
 ST3285-A	GR 1 190 V3.0 Intelligent Diagnostic Charger 162-00036 or equivalent
 ST3094-A	Test Light SGT27000 or equivalent 250-350 mA incandescent bulb test lamp SGT27000
 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool

Pinpoint Test A: System Voltage High

Refer to Wiring Diagrams Cell [12](#), Charging System for schematic and connector information.

NOTE: DTC P1397 can be set if the vehicle has been recently jump started, the battery has been recently charged or the battery has been discharged. The battery may become discharged due to excessive load(s) on the charging system from aftermarket accessories or if vehicle accessories have been operating for an extended period of time without the engine running.

Normal Operation

With the engine running, the charging system supplies voltage to the battery and the vehicle electrical system through the battery B+ cable. The voltage that is supplied to the vehicle electrical system is used for the operation of the various vehicle systems and modules. Many modules monitor this voltage and if it rises above or below their calibrated setpoints, a DTC sets.

DTC Description	Fault Trigger Condition
P0563 — System Voltage High	If the module detects a voltage from the charging system higher than 15.2 volts, this DTC sets. This DTC does not set in the PCM unless the vehicle speed is above 8 km/h (5 mph).
P1397 — System Voltage Out of Self-Test Range	If the voltage rises above or drops below the calibrated set point, the PCM sets this DTC. This DTC may also be set if the vehicle has been recently jump started or has had a discharged battery.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Engine, generator and battery grounds
- Battery
- Generator
- PCM

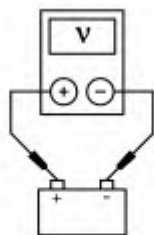
PINPOINT TEST A: SYSTEM VOLTAGE HIGH

NOTE: Make sure battery voltage is greater than 12.2 volts prior to and during this pinpoint test.

NOTE: Do not have a battery charger attached during vehicle testing.

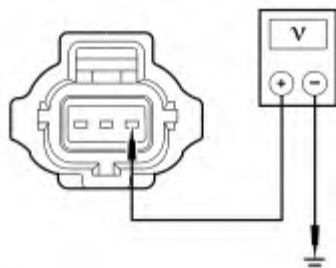
Test Step	Result / Action to Take
A1 CHECK BATTERY CONDITION	
- Refer to Section 414-01 and carry out Pinpoint Test A: Battery Condition Test to determine if the battery can hold a charge and is OK for use. Does the battery pass the condition test?	Yes GO to A2. No INSTALL a new battery. REFER to Section 414-01. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
A2 RETRIEVE PCM DTCs	
Enter the following diagnostic mode on the scan tool: Self-	Yes

Test — PCM . Is DTC P0620, P0625, P0626 or P065B present?	For DTC P0620 , GO to Pinpoint Test C . For DTCs P0625 and P0626 , GO to Pinpoint Test D . For DTC P065B , GO to Pinpoint Test E . No GO to A3 .
A3 MONITOR PCM PID GENERATOR VOLTAGE DESIRED (GENVDSD) - Start the engine. NOTE: Many of the PCM PIDs selected will be monitored later in this pinpoint test. - Select and monitor the following PCM PIDs: - Generator Monitor (GENMON) - Generator Command (GENCMD) - Generator Voltage Desired (GENVDSD) - Module Supply Voltage (VPWR) - Monitor the GENVDSD PID. - Does the GENVDSD PID indicate 15.1 volts or less?	Yes GO to A4 . No GO to A12 .
A4 MONITOR PCM PID GENERATOR VOLTAGE DESIRED (GENVDSD) - With the engine still running at idle, measure battery voltage and record. AJ0210-A - Monitor the GENVDSD PID. - Is battery voltage within ± 0.5 volt of the PID GENVDSD?	Yes The fault is not present at this time. This may indicate an intermittent fault. CARRY OUT a wiggle test on the charging system circuits to try and RECREATE the concern. CHECK generator connections for corrosion, loose connections and/or bent terminals. REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. No GO to A5 .
A5 MEASURE THE "A" SENSE VOLTAGE - Ignition OFF. - Disconnect: Generator C102A . - Ignition ON. - Measure battery voltage and record.	Yes GO to A6 . No For 3.5L, 3.7L and 5.0L engines , VERIFY Battery Junction Box (BJB) fuse 45 (10A) is OK. If OK, REPAIR circuit SBB45 (GY/RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs.



AJ0210-A

- Measure the voltage between:
 - **For 3.5L, 3.7L and 5.0L engines**, generator C102A-3, circuit SBB45 (GY/RD), harness side and ground.
 - **For 6.2L engines**, generator C102A-3, circuit SDC14 (RD), harness side and ground.



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- Is the "A" sense voltage equal to battery voltage?

REPEAT the self-test. TEST the system for normal operation.

For 6.2L engines, VERIFY fusible links are OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

A6 "A" SENSE CIRCUIT LOAD TEST

NOTICE: The following step uses a test light to simulate normal circuit loads. Use only the test light recommended in the Special Tools table at the beginning of this section. To avoid connector terminal damage, use the Flex Probe Kit for the test light probe connection to the vehicle. Do not use the test light probe directly on any connector.

NOTE: This step puts a load on the "A" sense circuit. If there are corroded or loose connections, loading the circuit may help show the fault. A 250-350 mA incandescent 12-volt test lamp is required for this step. This circuit cannot be loaded correctly using an LED-style test lamp.

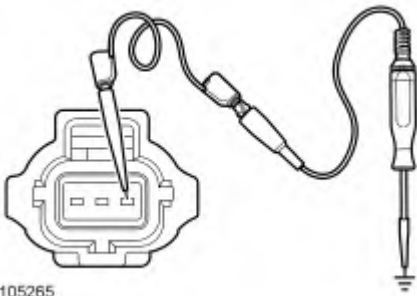
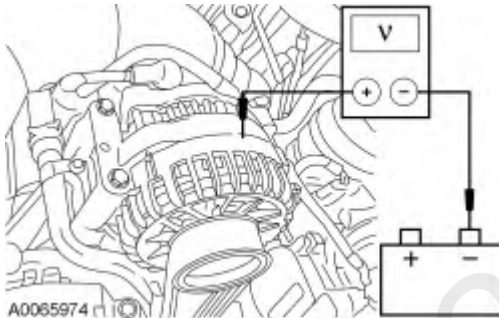
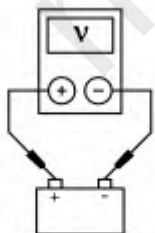
- Using a 12-volt test lamp connected to ground, while performing a wiggle test on the generator harness, check for voltage at:
 - **For 3.5L, 3.7L and 5.0L engines**, generator C102A-3, circuit SBB45 (GY/RD), harness side.
 - **For 6.2L engines**, generator C102A-3, circuit SDC14 (RD), harness side.

Yes

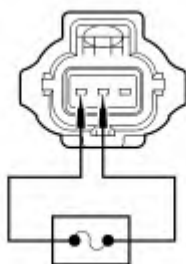
GO to [A7](#).

No

REPAIR corroded or loose connection on circuit SDC14 (RD). INSPECT generator C102A-3, circuit SDC14 (RD) or SBB45 (GY/RD) for damage. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

 N0105265 Does the test lamp illuminate?	
A7 CHECK THE VOLTAGE DROP IN THE VEHICLE GROUNDS - Connect: Generator C102A . - Start the engine. - With the engine running at idle, headlamps on and blower on high, measure the voltage drop between generator case, and the negative battery terminal.  A0065974 - Is the voltage drop less than 0.25 volt (250mV)?	Yes GO to A8. No INSPECT and REPAIR the engine ground, generator ground or the battery ground for corrosion as required. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
A8 CHECK THE GENERATOR OUTPUT - With the engine still running at idle, increase engine rpm until generator starts to generate output. - With the engine running, measure battery voltage and record.  AJ0210-A - Is the voltage above 15.2 volts?	Yes INSTALL a new generator. REFER to Generator — 3.5L GTDI, Generator — 3.7L, Generator — 5.0L or Generator — 6.2L in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. No GO to A9.
A9 MONITOR PCM PIDs GENERATOR COMMAND (GENCMD), GENERATOR MONITOR (GENMON) AND GENERATOR VOLTAGE DESIRED (GENVDS) - Ignition OFF. - Disconnect: Generator C102A . - Connect a fused jumper wire between generator C102A-1, CDC15 (VT), harness side and generator C102A-2, circuit	Yes GO to A10. No

CDC10 (BU/OG), harness side.



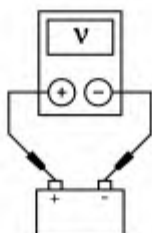
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- Start the engine.
- Monitor the GENVDSD, GENMON and GENCMD PIDs.
- Using the active command, set GENVDSD PID to 14 volts.
- **Does the GENCMD PID read within 5% of GENMON PID?**

GO to [A12](#).

A10 COMPARE PCM SUPPLY VOLTAGE (VPWR) PID TO BATTERY VOLTAGE

- With the engine still running at idle, measure the battery voltage at the battery and monitor the PCM VPWR PID.



AJ0210-A

- **Does PCM VPWR PID accurately display battery voltage within ± 0.5 volt?**

Yes

INSTALL a new generator. REFER to [Generator — 3.5L GTDI](#), [Generator — 3.7L](#), [Generator — 5.0L](#) or [Generator — 6.2L](#) in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

No

GO to [A11](#).

A11 CHECK PCM SUPPLY VOLTAGE CIRCUITS

- Ignition OFF.
- Disconnect: Fused Jumper Wire .
- Disconnect: BJB fuse 75 .
- Disconnect: PCM C1551B (3.5L) .
- Disconnect: PCM C175B (3.7L) .
- Disconnect: PCM C1381B (5.0L and 6.2L) .
- **For 3.5L equipped vehicles** , measure resistance between BJB and PCM, harness side as follows:

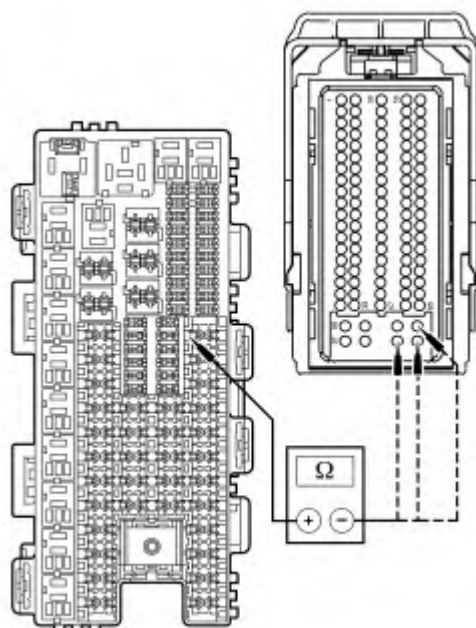
PCM Connector-Pin	BJB Fuse	Circuit
C1551B-101	75 (25A)	CBB75 (YE/GY)
C1551B-102	75 (25A)	CBB75 (YE/GY)
C1551B-103	75 (25A)	CBB75 (YE/GY)

Yes

GO to [A12](#).

No

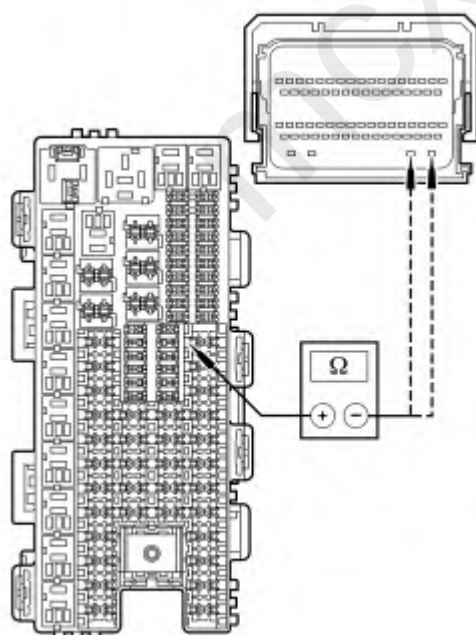
REPAIR high resistance or loose connections in the affected circuit(s). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.



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- **For 3.7L equipped vehicles**, measure the resistance between the BJB and the PCM, harness side as follows:

PCM Connector-Pin	BJB Fuse	Circuit
C175B-67	75 (15A)	CBB75 (YE/GY)
C175B-68	75 (15A)	CBB75 (YE/GY)

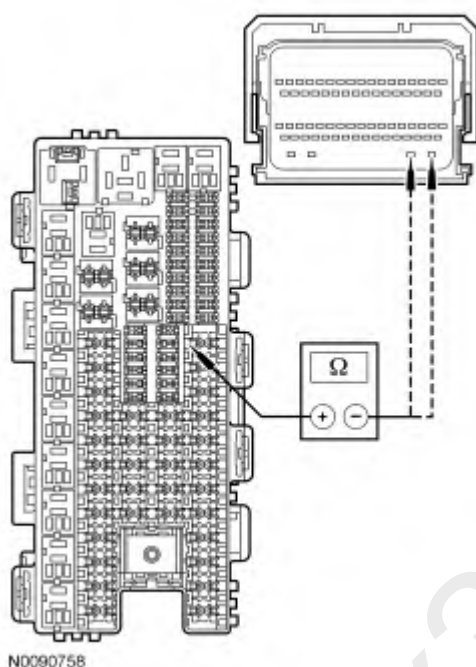


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- **For 5.0L and 6.2L equipped vehicles**, measure the resistance between the BJB and the PCM, harness side as

follows:

PCM Connector-Pin	BJB Fuse	Circuit
C1381B-67	75 (15A)	CBB75 (YE/GY)
C1381B-68	75 (15A)	CBB75 (YE/GY)



- Are the resistances less than 0.5 ohm?

A12 CHECK FOR CORRECT PCM OPERATION

- Ignition OFF.
- Reinstall BJB fuse 75.
- Disconnect all the PCM connectors.
- Check for:
 - corrosion
 - damaged pins
 - pushed-out pins
- Connect the PCM connectors and make sure they seat correctly.
- Operate the system and determine if the concern is still present.
- Is the concern still present?

Yes

INSTALL a new PCM. REFER to [Section 303-14](#). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

No

The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

Pinpoint Test B: System Voltage Low or Battery is Discharged

Refer to Wiring Diagrams Cell [12](#), Charging System for schematic and connector information.

NOTE: DTC P0562 or P1397 can be set if the vehicle has been recently jump started, the battery has been recently charged or the battery has been discharged. The battery may become discharged due to excessive

load(s) on the charging system from aftermarket accessories or if vehicle accessories have been operating for an extended period of time without the engine running.

Normal Operation

With the engine running, the charging system supplies voltage to the battery and the vehicle electrical system through the battery B+ cable. The PCM monitors this voltage through the battery positive post through the Battery Junction Box (BJB). If voltage drops 1.5 volts or more below the generator voltage desired, this DTC sets after 30 seconds.

DTC Description	Fault Trigger Condition
P0562 — System Voltage Low	If the PCM detects voltage from the charging system that is 1.5 volts lower than the generator voltage desired, this DTC sets.
P1397 — System Voltage Out of Self-Test Range	If the voltage rises above or drops below the calibrated set point, the PCM sets this DTC. This DTC may also be set if the vehicle has been recently jump started or has had a discharged battery.

This pinpoint test is intended to diagnose the following:

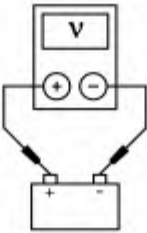
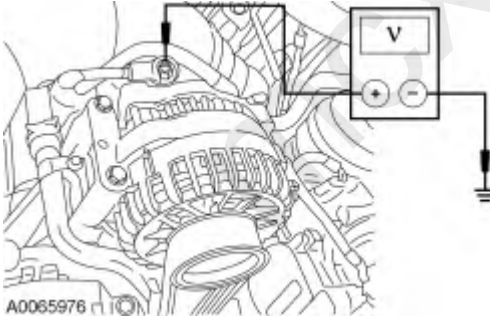
- Fuse
- Fusible link
- Wiring, terminals or connectors
- Engine, generator and battery grounds
- Abnormal ignition-off current drain(s)
- Radial arm adapter
- Battery
- Generator
- PCM

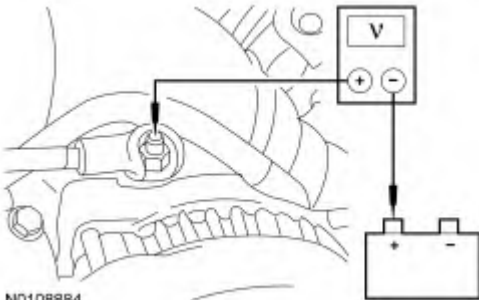
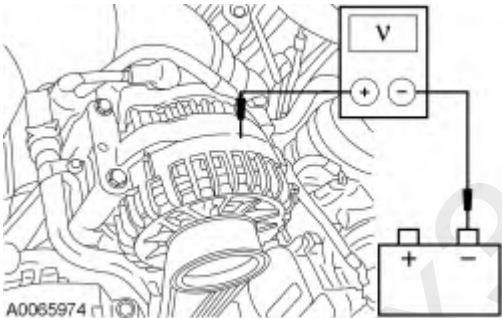
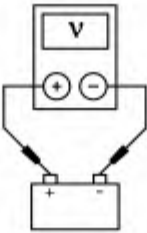
PINPOINT TEST B: SYSTEM VOLTAGE LOW OR BATTERY IS DISCHARGED

NOTE: Make sure battery voltage is greater than 12.2 volts prior to and during this pinpoint test.

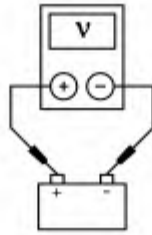
NOTE: Do not have a battery charger attached during vehicle testing.

Test Step	Result / Action to Take
B1 RETRIEVE PCM DTCs	
- Enter the following diagnostic mode on the scan tool: Self-Test — PCM . - Is DTC P0620, P0625, P0626 or P065B present?	Yes For DTC P0620 , GO to Pinpoint Test C . For DTCs P0625 and P0626 , GO to Pinpoint Test D . For DTC P065B , GO to Pinpoint Test E . No GO to B2 .
B2 CHECK BATTERY CONDITION	

- Refer to Section 414-01 and carry out Pinpoint Test A: Battery Condition Test to determine if the battery can hold a charge and is OK for use. Does the battery pass the condition test?	Yes GO to B3. No INSTALL a new battery. REFER to Section 414-01. TEST the system for normal operation.
B3 CHECK THE GENERATOR CONNECTIONS - Ignition OFF. - Inspect generator C102A connection. Connector should be installed correctly and tight. - Disconnect: Generator C102A . - Inspect generator C102A for bent and/or pushed-out pins. - Inspect generator C102B, B+ circuit SDC14 (RD). Connection should be tight. - Measure the battery voltage.  AJ0210-A NOTE: 6.2L shown, others similar. - Measure the voltage between generator C102B, B+ circuit SDC14 (RD) and ground.  A0065976 Is generator C102B connection tight and does the generator B+ measure battery voltage?	Yes GO to B4. No For 3.5L, 3.7L and 5.0L engines , TIGHTEN or INSTALL a new C102B (B+ nut) and/or radial arm adapter as needed. REFER to Specifications in this section. VERIFY high current BJB 250A fuse is OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. For 6.2L engines , TIGHTEN or INSTALL a new C102B (B+ nut) and/or radial arm adapter as needed. REFER to Specifications in this section. VERIFY the fusible link is OK. If the fusible link is OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
B4 CHECK THE VOLTAGE DROP IN THE B+ CIRCUIT - Connect: Generator C102A . - Start the engine. - With the engine running at idle, headlamps on and blower on high, measure the voltage drop between generator B+ C102B, circuit SDC14 (RD) and the positive battery terminal.	Yes GO to B5. No INSPECT circuit SDC14 (RD), radial arm adapter and the positive battery cable for loose connections, physical damage or wire corrosion. REPAIR as required. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

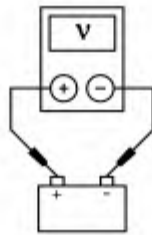
 N0108884 • Carry out a wiggle test of the generator wiring and connections while measuring voltage drop. • Is the voltage drop less than 0.5 volt?	
B5 CHECK THE VOLTAGE DROP IN THE VEHICLE GROUNDS • Connect: Generator C102A . • Start the engine. • With the engine running at idle, headlamps on and blower on high, measure the voltage drop between generator case, and the negative battery terminal.  A0065974 • Is the voltage drop less than 0.25 (250mV) volt?	Yes GO to B6. No INSPECT and REPAIR the engine ground, generator ground or the battery ground for corrosion as required. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
B6 COMPARE PCM MODULE SUPPLY VOLTAGE (VPWR) PID • With the engine still running at idle, headlamps on and blower on high, measure the battery voltage at the battery and monitor the PCM VPWR PID.  AJ0210-A • Does PCM VPWR PID display battery voltage within ± 0.5 volt?	Yes GO to B7. No REPAIR high resistance or loose connections in the affected PCM power circuit(s). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
B7 CHECK PCM GROUND FOR HIGH RESISTANCE • Monitor PCM VPWR PID. • With the engine still running at idle, turn off all	Yes GO to B8.

accessory loads, measure the battery voltage at the battery and note the PCM VPWR PID.



AJ0210-A

- With the engine still running at idle, turn headlamps on and blower on high, measure the battery voltage at the battery and monitor the PCM VPWR PID.



AJ0210-A

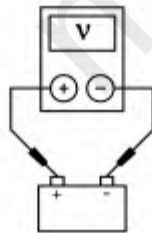
- Does the VPWR PID read within ± 0.5 volt with accessory loads on as compared to accessory loads off?

No

REPAIR the affected PCM ground circuits. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

B8 MONITOR PID VPWR AT WOT

- With the engine still running at idle, turn off all accessory loads, measure the battery voltage at the battery and monitor the PCM VPWR PID.



AJ0210-A

- Monitor the VPWR PID and momentarily accelerate the engine to Wide Open Throttle (WOT) and release. Repeat this step 4-5 times while continuing to monitor the VPWR PID.
- Does the VPWR PID stay within 1.5 volt of battery voltage when the engine rpms are increased?

Yes

GO to [B9](#).

No

GO to [B10](#).

B9 CHECK FOR CURRENT DRAINS

- With the engine still running at idle, measure the

Yes

battery voltage at the battery. • Monitor PCM PIDs generator voltage desired (GENVDSD) and generator monitor (GENMON). • Does GENMON PID frequently rise above 90% and battery voltage drop below GENVDSD PID by 0.5 volt or more?	CARRY OUT the Component Test, Battery — Drain Test. REFER to Section 414-01. No For 3.5L, 3.7L and 5.0L engines , VERIFY high current <u>BJB</u> 250A fuse is OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. For 6.2L engines , VERIFY fusible links are OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
B10 CHECK FOR CORRECT PCM OPERATION • Ignition OFF. • Disconnect all the PCM connectors. • Check for: ■ corrosion ■ damaged pins ■ pushed-out pins • Connect the PCM connectors and make sure they seat correctly. • Operate the system and determine if the concern is still present. • Is the concern still present?	Yes INSTALL a new PCM. REFER to Section 303-14 . TEST the system for normal operation. No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

Pinpoint Test C: DTC P0620

Refer to Wiring Diagrams Cell [12](#), Charging System for schematic and connector information.

Normal Operation

The PCM monitors the generator output via the generator monitor (GENMON) circuit. The PCM uses the generator command (GENCOM) circuit to command the generator to either increase or decrease output. If the GENCOM circuit (generator control circuit) or the "A" sense circuit are open or shorted to ground, the PCM will not be able to control the generator output. When the engine speed is greater than approximately 2,000 rpm, the generator defaults to a steady voltage output of approximately 13.5 volts and the PCM sends a request to the Instrument Panel Cluster (IPC) to illuminate the charging system warning indicator. A GENCOM circuit fault can be confirmed by viewing the PCM PID generator command line fault (GENCMD_LF) (YES status indicator fault).

- DTC P0620 (Generator Control Circuit) — The PCM sets this DTC if the GENCOM circuit or "A" sense circuit are open or shorted to ground.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors

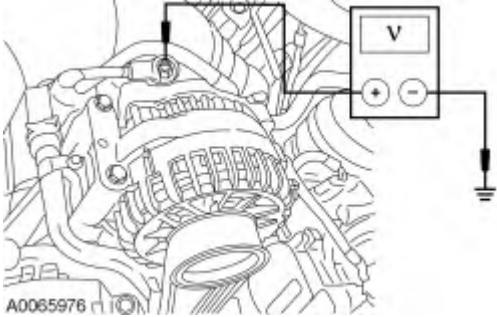
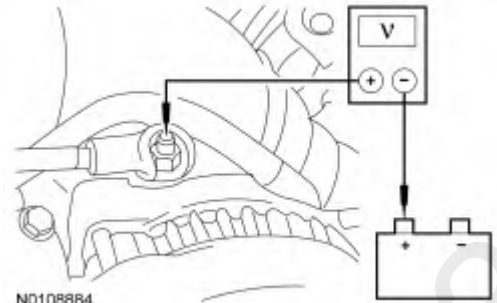
- Radial arm adapter
- Generator
- PCM

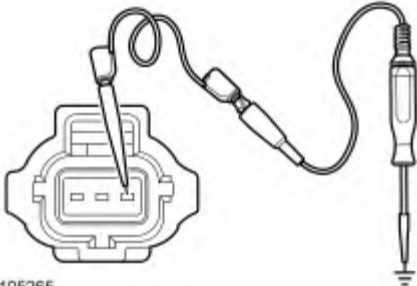
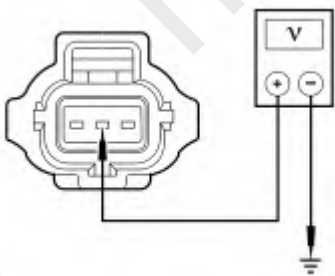
PINPOINT TEST C: DTC P0620

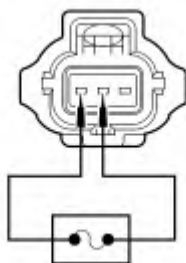
NOTE: Make sure battery voltage is greater than 12.2 volts prior to and during this pinpoint test.

NOTE: Do not have a battery charger attached during vehicle testing.

Test Step	Result / Action to Take
C1 CHECK THE BATTERY CONDITION • Refer to Section 414-01 and carry out Pinpoint Test A: Battery Condition Test to determine if the battery can hold a charge and is OK for use. • Does the battery pass the condition test?	Yes GO to C2. No INSTALL a new battery. REFER to Section 414-01. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
C2 CHECK THE GENERATOR CONNECTIONS • Ignition OFF. • Inspect generator C102A connection. Connector should be installed correctly and tight. • Disconnect: Generator C102A . • Inspect generator C102A for bent and/or pushed-out pins. • Inspect generator C102B, B+ circuit SDC14 (RD). Connection should be tight. • Measure the battery voltage. AJ0210-A • NOTE: 6.2L shown, others similar. • Measure the voltage between generator C102B, B+ circuit SDC14 (RD) and ground.	Yes GO to C3. No For 3.5L, 3.7L and 5.0L engines , VERIFY high current BJB 250A fuse is OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. For 6.2L engines , VERIFY fusible links are OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

 A0065976 Is generator C102B connection tight and does the generator B+ measure battery voltage?	
C3 CHECK THE VOLTAGE DROP IN THE B+ CIRCUIT - Connect: Generator C102A . - Start the engine. - With the engine running at idle, headlamps on and blower on high, measure the voltage drop between generator B+ C102B, circuit SDC14 (RD) and the positive battery terminal.  ND108884 - Carry out a wiggle test of the generator wiring and connections while measuring voltage drop. - Is the voltage drop less than 0.5 volt?	Yes GO to C4. No INSPECT circuit SDC14 (RD), radial arm adapter and the positive battery cable for loose connections, physical damage or wire corrosion. REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
C4 "A" SENSE CIRCUIT LOAD TEST NOTICE: The following step uses a test light to simulate normal circuit loads. Use only the test light recommended in the Special Tools table at the beginning of this section. To avoid connector terminal damage, use the Flex Probe Kit for the test light probe connection to the vehicle. Do not use the test light probe directly on any connector. NOTE: This step puts a load on the "A" sense circuit. If there are corroded or loose connections, loading the circuit may help show the fault. A 250-350 mA incandescent 12-volt test lamp is required for this step. This circuit will not be loaded properly using an LED-style test lamp. - Ignition OFF. - Disconnect: Generator C102A . - Ignition ON. - Using a 12-volt test lamp connected to ground, while performing a wiggle test on the generator harness, check for voltage at: - For 3.5L, 3.7L and 5.0L engines , generator C102A-3, circuit SBB45 (GY/RD), harness side. - For 6.2L engines , generator C102A-3, circuit SDC14	Yes GO to C5. No For 3.5L, 3.7L and 5.0L engines , VERIFY high current BJB_250A fuse is OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. For 6.2L engines , VERIFY fusible links are OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs.

(RD), harness side.  N0105265 • Does the test lamp illuminate?	REPEAT the self-test. TEST the system for normal operation.
C5 CHECK THE GENERATOR COMMAND LINE FAULT (GENCMD_LF) PID • Ignition OFF. • Connect: Generator C102A . • Start the engine. • NOTE: Many of the PCM PIDs selected will be monitored later in this pinpoint test. • Select and monitor the following PCM PIDs: ■ Generator Monitor (GENMON) ■ Generator Command (GENCMD) ■ Generator Command Line Fault (GENCMD_LF) • With the engine running at idle, monitor the GENCMD_LF PID. • Does the GENMON_LF PID indicate FAULT?	Yes GO to C6. No GO to C9.
C6 CHECK THE GENERATOR COMMAND CIRCUIT FOR A SHORT TO POWER • Ignition OFF. • Disconnect: Generator C102A . • Ignition ON. • Measure the voltage between generator C102A-2, circuit CDC10 (BU/OG), harness side and ground.  N0087307 • Does voltage read 1 volt or less?	Yes GO to C7. No GO to C11.
C7 COMPARE THE PCM PIDs GENERATOR MONITOR (GENMON) AND GENERATOR COMMAND (GENCMD) • Ignition OFF. • Connect a fused jumper wire between generator C102A-1, circuit CDC15 (VT), harness side and generator C102A-2, circuit CDC10 (BU/OG), harness side.	Yes GO to C12. No GO to C8.

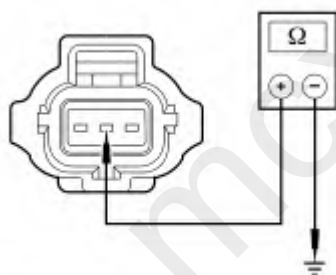


N0074142

- Start the engine.
- Monitor the GENMON and GENCMD PIDs while performing a wiggle test on the generator harness.
- **Does the GENMON PID read within 5% of the GENCMD PID?**

C8 CHECK THE GENERATOR COMMAND CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect: Generator C102A (if not previously disconnected) .
- Disconnect: PCM C1551B (3.5L) (if not previously disconnected) .
- Disconnect: PCM C175B (3.7L) (if not previously disconnected) .
- Disconnect: PCM C1381B (5.0L and 6.2L) (if not previously disconnected) .
- Measure the resistance between the generator C102A-2, circuit CDC10 (BU/OG), harness side and ground.



N0105265

- **Is the resistance greater than 10,000 ohms?**

YesGO to [C9](#).**No**

REPAIR circuit CDC10 (BU/OG).
CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

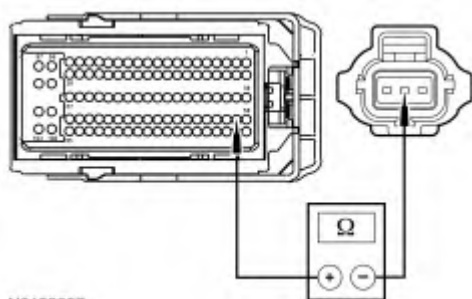
C9 CHECK THE GENERATOR COMMAND CIRCUIT FOR DAMAGE OR AN OPEN

- Ignition OFF.
- Disconnect: Fused Jumper Wire .
- Disconnect: PCM C1551B (3.5L) .
- Disconnect: PCM C175B (3.7L) .
- Disconnect: PCM C1381B (5.0L and 6.2L) .
- Inspect the following harness connectors for damaged or pushed-out pins:
 - PCM C1551B-59, circuit CDC10 (BU/OG) (3.5L)
 - PCM C175B-53, circuit CDC10 (BU/OG) (3.7L)
 - PCM C1381B-53, circuit CDC10 (BU/OG) (5.0L and 6.2L)
 - Generator C102A-2, circuit CDC10 (BU/OG)
- **For 3.5L equipped vehicles** , measure the resistance

YesGO to [C10](#).**No**

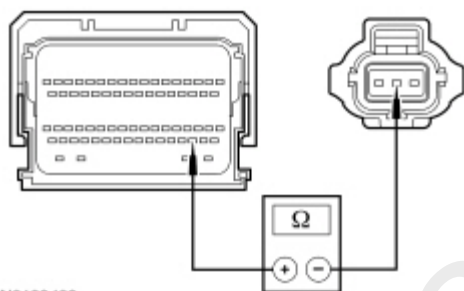
REPAIR circuit CDC10 (BU/OG).
CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

between PCM C1551B-59, circuit CDC10 (BU/OG), harness side and generator C102A-2, circuit CDC10 (BU/OG), harness side.



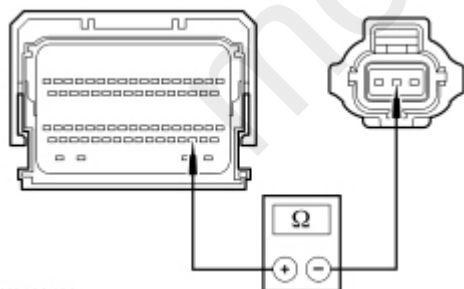
N0122687

- **For 3.7L equipped vehicles**, measure the resistance between PCM C175B-53, circuit CDC10 (BU/OG), harness side and generator C102A-2, circuit CDC10 (BU/OG), harness side.



N0103402

- **For 5.0L and 6.2L equipped vehicles**, measure the resistance between PCM C1381B-53, circuit CDC10 (BU/OG), harness side and generator C102A-2, circuit CDC10 (BU/OG), harness side.



N0103402

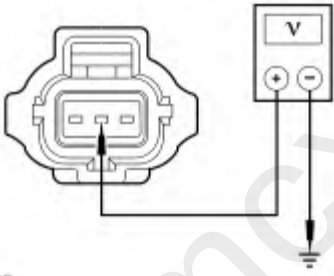
- **Are the connectors and pins free of damage and is the resistance less than 5 ohms?**

C10 CHECK THE CHARGING SYSTEM CIRCUITS FOR INTERMITTENT FAULTS

- Connect: Generator C102A .
- Connect: PCM C1551B (3.5L) .
- Connect: PCM C175B (3.7L) .
- Connect: PCM C1381B (5.0L and 6.2L) .
- Ignition ON.
- Clear all DTCs.
- Start the engine and let the engine run for 5 minutes.

Yes

INSTALL a new generator.
REFER to [Generator — 3.5L GTDI](#), [Generator — 3.7L](#), [Generator — 5.0L](#) or [Generator — 6.2L](#) in this section. CLEAR the DTCs. REPEAT the self-test.

• Retrieve Continuous Memory Diagnostic Trouble Codes (CMDTCs) from all modules. • Did any charging system DTC get stored into memory?	TEST the system for normal operation. No The fault is not present at this time. This may indicate an intermittent fault. CARRY OUT a wiggle test on the charging system circuits to try and RECREATE the concern. CHECK generator connections for corrosion, loose connections and/or bent terminals. REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
C11 CHECK GENERATOR COMMAND CIRCUIT FOR SHORT TO VOLTAGE • Ignition OFF. • Disconnect: Generator C102A . • Disconnect: PCM C1551B (3.5L) . • Disconnect: PCM C175B (3.7L) . • Disconnect: PCM C1381B (5.0L and 6.2L) . • Ignition ON. • Measure the voltage between generator C102A-2, circuit CDC10 (BU/OG), harness side and ground.  N0087307 • Is any voltage present?	Yes REPAIR circuit CDC10 (BU/OG). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. No GO to C12.
C12 INSPECT GENERATOR CONNECTORS AND CIRCUITS • Ignition OFF. • Disconnect: PCM C1551B (3.5L) . • Disconnect: PCM C175B (3.7L) . • Disconnect: PCM C1381B (5.0L and 6.2L) . • Inspect the following connector pins for damage and/or corrosion: ■ PCM C1551B-96, circuit GD113 (BK/YE) (3.5L) ■ PCM C1551B-97, circuit GD113 (BK/YE) (3.5L) ■ PCM C1551B-98, circuit GD113 (BK/YE) (3.5L) ■ PCM C1551B-99, circuit GD113 (BK/YE) (3.5L) ■ PCM C175B-50, circuit GD113 (BK/YE) (3.7L) ■ PCM C175B-69, circuit GD113 (BK/YE) (3.7L) ■ PCM C175B-70, circuit GD113 (BK/YE) (3.7L) ■ PCM C1381B-50, circuit GD113 (BK/YE) (5.0L and 6.2L) ■ PCM C1381B-69, circuit GD113 (BK/YE) (5.0L and 6.2L)	Yes GO to C13. No REPAIR high resistance or loose connections in the affected circuit(s). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

■ PCM C1381B-70, circuit GD113 (BK/YE) (5.0L and 6.2L) ■ Generator C102A-1, circuit CDC15 (VT) ■ Generator C102A-2, circuit CDC10 (BU/OG) ● Are the connectors and circuits OK?	
C13 CHECK FOR CORRECT PCM OPERATION	
● Ignition OFF. ● Disconnect all the PCM connectors. ● Check for: ■ corrosion ■ damaged pins ■ pushed-out pins ● Connect the PCM connectors and make sure they seat correctly. ● Operate the system and determine if the concern is still present. ● Is the concern still present?	Yes INSTALL a new PCM. REFER to Section 303-14. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

Pinpoint Test D: DTC P0625 or P0626

Refer to Wiring Diagrams Cell [12](#), Charging System for schematic and connector information.

Normal Operation

The PCM monitors the generator output via the generator monitor (GENMON) circuit (generator field terminal circuit). If the PCM cannot read the GENMON circuit due to an open or short to ground, when the engine speed is greater than approximately 2,000 rpm, the generator defaults to a steady voltage of approximately 13.5 volts and the PCM sends a request to the Instrument Panel Cluster (IPC) to illuminate the charging system warning indicator. A GENMON duty cycle of 3% or less indicates a short to ground fault is present and results in DTC P0625 setting in the PCM. A GENMON duty cycle of 98% or more indicates an open or short to voltage fault is present and results in DTC P0626 setting in the PCM.

- DTC P0625 (Generator Field Terminal Circuit Low) — The PCM sets this DTC if the GENMON circuit is shorted to ground, the "A" sense circuit is open or the B+ circuit is open. This DTC also sets by a faulted PCM or generator.
- DTC P0626 (Generator Field Terminal Circuit High) — The PCM sets this DTC if the GENMON circuit is open or shorted to power. This DTC can also be set by a faulted PCM or generator.

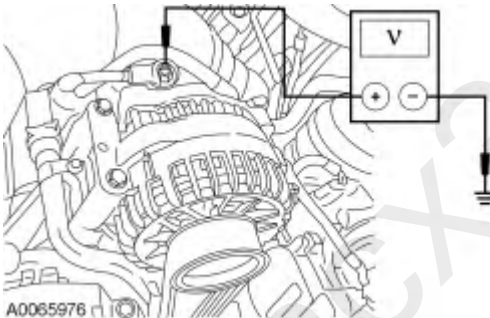
This pinpoint test is intended to diagnose the following:

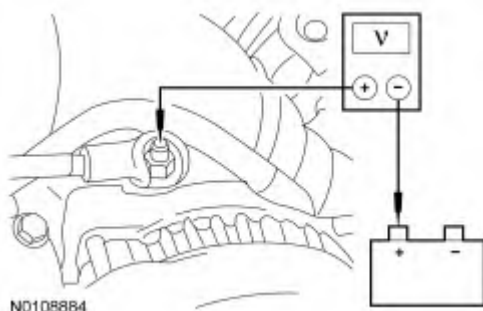
- Fuse
- Wiring, terminals or connectors
- Radial arm adapter
- Engine, generator and battery grounds
- Battery
- Generator
- PCM

PINPOINT TEST D: DTC P0625 OR P0626

NOTE: Make sure battery voltage is greater than 12.2 volts prior to and during this pinpoint test.

NOTE: Do not have a battery charger attached during vehicle testing.

Test Step	Result / Action to Take
D1 CHECK THE BATTERY CONDITION - Refer to Section 414-01 and carry out Pinpoint Test A: Battery Condition Test to determine if the battery can hold a charge and is OK for use. Does the battery pass the condition test?	Yes GO to D2. No INSTALL a new battery. REFER to Section 414-01. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
D2 CHECK THE GENERATOR B+ CONNECTION - Ignition OFF. - Inspect generator C102B, circuit SDC14 (RD), harness side. Connection should be tight. - Inspect generator radial adaptor connection on rear of generator. Connection should be tight. - Measure the voltage between generator C102B, circuit SDC14 (RD) and ground.  Are the generator C102B connections tight and does the generator B+ measure battery voltage?	Yes GO to D3. No For 3.5L, 3.7L and 5.0L engines, TIGHTEN or INSTALL a new C102B (B+ nut) and/or radial arm adapter as needed. REFER to Specifications in this section. VERIFY high current BJB 250A fuse is OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. For 6.2L engines, TIGHTEN or INSTALL a new C102B (B+ nut) and/or radial arm adapter as needed. REFER to Specifications in this section. VERIFY the fusible link is OK. If the fusible link is OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
D3 CHECK THE VOLTAGE DROP IN THE B+ CIRCUIT - Start the engine. - With the engine running at idle, headlamps on and blower on high, measure the voltage drop between generator B+ C102B, circuit SDC14 (RD) and the positive battery terminal.	Yes For DTC P0625, GO to D4. For DTC P0626, GO to D6. No INSPECT circuit SDC14 (RD),



- Carry out a wiggle test of the generator wiring and connections while measuring voltage drop.
- **Is the voltage drop less than 0.5 volt?**

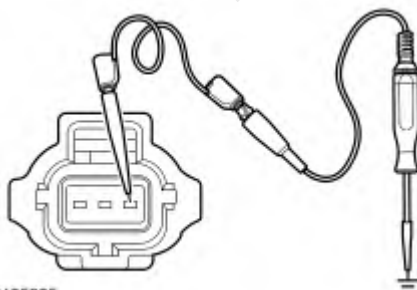
radial arm adapter and the positive battery cable for loose connections, physical damage or wire corrosion. REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

D4 "A" SENSE CIRCUIT LOAD TEST

NOTICE: The following step uses a test light to simulate normal circuit loads. Use only the test light recommended in the Special Tools table at the beginning of this section. To avoid connector terminal damage, use the Flex Probe Kit for the test light probe connection to the vehicle. Do not use the test light probe directly on any connector.

NOTE: This step puts a load on the "A" sense circuit. If there are corroded or loose connections, loading the circuit may help show the fault. A 250-350 mA incandescent 12-volt test lamp is required for this step. This circuit will not be loaded properly using an LED-style test lamp.

- Ignition OFF.
- Disconnect: Generator C102A .
- Ignition ON.
- Using a 12-volt test lamp connected to ground, while performing a wiggle test on the generator harness, check for voltage at:
 - **For 3.5L, 3.7L and 5.0L engines** , generator C102A-3, circuit SBB45 (GY/RD), harness side.
 - **For 6.2L engines** , generator C102A-3, circuit SDC14 (RD), harness side.



- **Does the test lamp illuminate?**

Yes

GO to [D5](#) .

No

For 3.5L, 3.7L and 5.0L engines , VERIFY high current BJB 250A fuse is OK. If OK, REPAIR circuit SBB45 (GY/RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

For 6.2L engines , VERIFY fusible links are OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

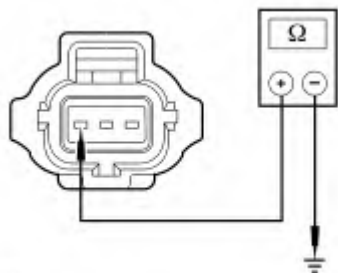
D5 CHECK GENMON CIRCUIT FOR DAMAGE OR A SHORT TO GROUND

- Ignition OFF.
- Disconnect: PCM C1551B (3.5L) .
- Disconnect: PCM C175B (3.7L) .

Yes

GO to [D10](#) .

- Disconnect: PCM C1381B (5.0L and 6.2L) .
- Inspect the following harness connectors for damaged or pushed-out pins:
 - PCM C1551B-26, circuit CDC15 (VT) (3.5L)
 - PCM C175B-14, circuit CDC15 (VT) (3.7L)
 - PCM C1381B-14, circuit CDC15 (VT) (5.0L and 6.2L)
 - Generator C102A-1, circuit CDC15 (VT)
- Measure the resistance between generator C102A-1, circuit CDC15 (VT), harness side and ground.



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- Are the connectors and pins free of damage and is the resistance greater than 10,000 ohms?

No

REPAIR the connector(s) and/or circuit CDC15 (VT). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

D6 CHECK THE GENERATOR B+ RESISTANCE

- Ignition OFF.
- **NOTE:** Failure to disconnect the battery will result in false resistance readings.
- Disconnect the battery. Refer to [Section 414-01](#) .
- Disconnect: Generator C102B .
- Measure the resistance between generator C102B, component side and the generator housing.



N0068549

- Is the resistance greater than 25K ohms?

Yes

GO to [D7](#) .

No

INSTALL a new generator. REFER to [Generator — 3.5L GTDI](#) , [Generator — 3.7L](#) , [Generator — 5.0L](#) or [Generator — 6.2L](#) in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

D7 CHECK THE RESISTANCE OF THE VOLTAGE REGULATOR INTERNAL CIRCUITS TO GROUND

- Disconnect: Generator C102A .
- Measure the resistance between generator C102A, component side and ground. Refer to the following table.

Pin	Expected Resistance
1	Greater than 10K ohms
2	Greater than 10K ohms

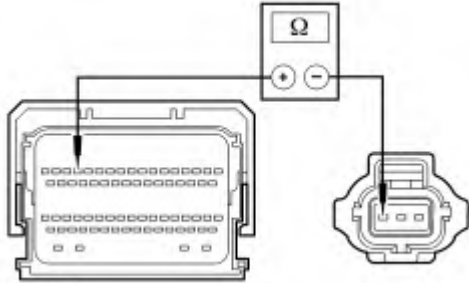
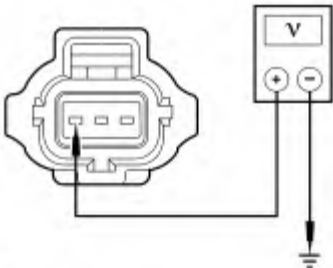
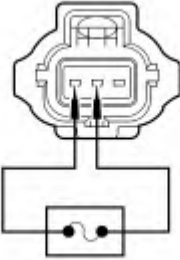
Yes

GO to [D8](#) .

No

INSTALL a new generator. REFER to [Generator — 3.5L GTDI](#) , [Generator — 3.7L](#) , [Generator — 5.0L](#) or [Generator — 6.2L](#) in this section. CLEAR the DTCs. REPEAT the self-test. TEST the

3 Greater than 10K ohms • Are the resistance values as indicated?	system for normal operation.
D8 CHECK THE GENMON CIRCUIT FOR DAMAGE OR AN OPEN • Disconnect: PCM C1551B (3.5L) . • Disconnect: PCM C175B (3.7L) . • Disconnect: PCM C1381B (5.0L and 6.2L) . • Inspect the following harness connectors for damaged or pushed-out pins: ■ PCM C1551B-26, circuit CDC15 (VT) (3.5L) ■ PCM C175B-14, circuit CDC15 (VT) (3.7L) ■ PCM C1381B-14, circuit CDC15 (VT) (5.0L and 6.2L) ■ Generator C102A-1, circuit CDC15 (VT) • For 3.5L equipped vehicles , measure the resistance between PCM C1551B-26, circuit CDC15 (VT), harness side and generator C102A-1, circuit CDC15 (VT), harness side. N0122688 • For 3.7L equipped vehicles , measure the resistance between PCM C175B-14, circuit CDC15 (VT), harness side and generator C102A-1, circuit CDC15 (VT), harness side. N0103403 • For 5.0L an 6.2L equipped vehicles , measure the resistance between PCM C1381B-14, circuit CDC15 (VT), harness side and generator C102A-1, circuit CDC15 (VT), harness side.	Yes GO to D9. No REPAIR the connector(s) and/or circuit CDC15 (VT). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

 N0103403 • Are the connectors and pins free of damage and is the resistance less than 5 ohms?	
D9 CHECK THE GENMON CIRCUIT FOR A SHORT TO POWER • Connect the battery. Refer to Section 414-01. • Ignition ON. • Measure the voltage between generator C102A-1, circuit CDC15 (VT), harness side and ground.  N0105272 • Is there any voltage present?	Yes REPAIR the connector(s) and/or circuit CDC15 (VT). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. No GO to D10.
D10 COMPARE THE PCM PIDs GENERATOR MONITOR (GENMON) AND GENERATOR COMMAND (GENCMD) • Ignition OFF. • Connect: PCM C1551B (3.5L). • Connect: PCM C175B (3.7L). • Connect: PCM C1381B (5.0L and 6.2L). • Connect a fused jumper wire between generator C102A-1, circuit CDC15 (VT), harness side and generator C102A-2, circuit CDC10 (BU/OG), harness side.  N0074142 • Start the engine. • Using the active command, set the GENVDSD PID to 14.0 volts. • Monitor the GENMON and GENCMD PIDs while carrying	Yes INSTALL a new generator. REFER to Generator — 3.5L GTDI, Generator — 3.7L, Generator — 5.0L or Generator — 6.2L in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. No GO to D11.

out a wiggle test on the generator wiring harness. • Does the GENMON PID read within 2% of the GENCMD PID?	
D11 CHECK FOR CORRECT PCM OPERATION	
- Ignition OFF. - Disconnect all the PCM connectors. - Check for: - corrosion - damaged pins - pushed-out pins - Connect the PCM connectors and make sure they seat correctly. - Operate the system and determine if the concern is still present. Is the concern still present?	Yes INSTALL a new PCM. REFER to Section 303-14 . TEST the system for normal operation. No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

Pinpoint Test E: DTC P065B

Refer to Wiring Diagrams Cell [12](#), Charging System for schematic and connector information.

Normal Operation

With the engine running, the PCM monitors and expects to receive a valid generator monitor (GENMON) signal with a duty cycle greater than 5% and less than 98%. The PCM also monitors the state of the generator command (GENCMD) signal line to make sure it is not stuck high or stuck low. A DTC sets if the GENMON or GENCMD signal fluctuates between out-of-valid range, stuck high, stuck low, or some combination and normal. When the engine speed is greater than approximately 2,000 rpm, the generator defaults to a steady voltage of approximately 13.5 volts and the PCM sends a request to the Instrument Panel Cluster (IPC) to illuminate the charging system warning indicator lamp.

- DTC P065B (Generator Control Circuit Range/Performance) — The PCM sets this DTC if the input frequency was continuously less than 80 Hz or more than 200 Hz. Additionally, if the signal shows a faulted condition that is happening in a fluctuating manner, the PCM tracks the fluctuations between faulted and normal conditions. This DTC can also set if the fluctuations occur frequently within a short amount of time.

This pinpoint test is intended to diagnose the following:

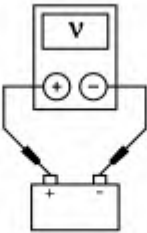
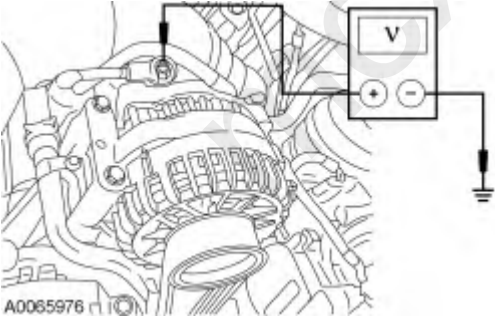
- Wiring, terminals or connectors
- Radial arm adapter
- Generator
- PCM

PINPOINT TEST E: DTC P065B

NOTE: Make sure battery voltage is greater than 12.2 volts prior to carrying out this pinpoint test.

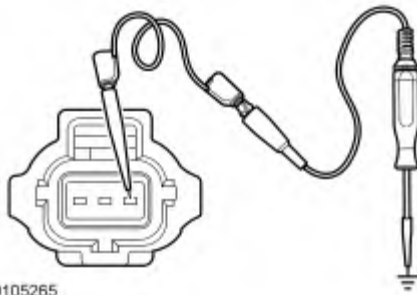
NOTE: Do not have a battery charger attached during vehicle testing.

Test Step	Result / Action to Take
E1 CHECK THE BATTERY CONDITION	

- Refer to Section 414-01 and carry out Pinpoint Test A: Battery Condition Test to determine if the battery can hold a charge and is OK for use. Does the battery pass the condition test?	Yes GO to E2. No INSTALL a new battery. REFER to Section 414-01. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
E2 CHECK THE GENERATOR CONNECTIONS - Ignition OFF. - Inspect generator C102A connection. Connector should be installed correctly and tight. - Disconnect: Generator C102A . - Inspect generator C102A for bent and/or pushed-out pins. - Inspect generator C102B, B+ circuit SDC14 (RD). Connection should be tight. - Measure the battery voltage.  AJ0210-A NOTE: 6.2L shown, others similar. - Measure the voltage between generator C102B, B+ circuit SDC14 (RD) and ground.  A0065976 Is generator C102B connection tight and does the generator B+ measure battery voltage?	Yes GO to E3. No For 3.5L, 3.7L and 5.0L engines , TIGHTEN or INSTALL a new C102B (B+ nut) and/or radial arm adapter as needed. REFER to Specifications in this section. VERIFY high current BJB 250A fuse is OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. For 6.2L engines , TIGHTEN or INSTALL a new C102B (B+ nut) and/or radial arm adapter as needed. REFER to Specifications in this section. VERIFY the fusible link is OK. If the fusible link is OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
E3 "A" SENSE CIRCUIT LOAD TEST NOTICE: The following step uses a test light to simulate normal circuit loads. Use only the test light recommended in the Special Tools table at the beginning of this section. To avoid connector terminal damage, use the Flex Probe Kit for the test light probe connection to the vehicle. Do not use the test light probe directly on any connector. NOTE: This step puts a load on the "A" sense circuit. If there are corroded or loose connections, loading the circuit may help	Yes GO to E4. No For 3.5L, 3.7L and 5.0L engines , VERIFY high current BJB 250A fuse is OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring

show the fault. A 250-350 mA incandescent 12-volt test lamp is required for this step. This circuit will not be loaded properly using an LED-style test lamp.

- Ignition ON.
- Using a 12-volt test lamp connected to ground, while performing a wiggle test on the generator harness, check for voltage at:
 - **For 3.5L, 3.7L and 5.0L engines**, generator C102A-3, circuit SBB45 (GY/RD), harness side.
 - **For 6.2L engines**, generator C102A-3, circuit SDC14 (RD), harness side.



- Does the test lamp illuminate?

Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

For 6.2L engines, VERIFY fusible links are OK. If OK, REPAIR circuit SDC14 (RD). If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

E4 CHECK THE PCM GENERATOR MONITOR FREQUENCY (GENMON_HZ) PID

- Ignition OFF.
- Connect: Generator C102A .
- Start the engine.
- **NOTE:** Many of the PCM PIDs selected will be monitored later in this pinpoint test.
- Select and monitor the following PCM PIDs:
 - Generator Voltage Desired (GENVDS)
 - Generator Monitor Frequency (GENMON_HZ)
- Monitor the GENMON_HZ PID.
- Does the PID read between 80-200 Hz?

Yes
GO to [E8](#).

No
GO to [E5](#).

E5 CHECK THE PCM GENERATOR MONITOR FREQUENCY (GENMON_HZ) PID WITH GENERATOR C102A DISCONNECTED

- Ignition OFF.
- Disconnect: Generator C102A .
- Start the engine.
- Monitor the GENMON_HZ PID.
- Does the PID read between 0-2 Hz?

Yes
GO to [E7](#).

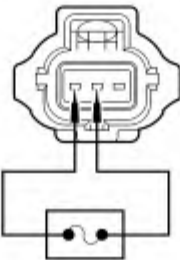
No
GO to [E6](#).

E6 CHECK GENERATOR CIRCUITRY

NOTICE: This pinpoint test step directs testing circuits using a back-probe method. Use the special back-probe tool specified in the tool list in this section. Do not force test leads or other probes into connectors. Adequate care must be exercised to avoid connector terminal damage while making sure that good electrical contact is made with the circuit or terminal. Failure to follow these instructions may cause damage to wiring, terminals, or connectors and subsequent electrical faults.

- Ignition OFF.

Yes
INSPECT the harness for wire to wire shorts or insulation chaffing, mis-pinned connectors and correct wire colors and REPAIR generator circuit CDC15 (VT) as needed. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

• For 3.5L equipped vehicles , with PCM C175B connected, connect a fused jumper wire between PCM C1551B-26, circuit CDC15 (VT) and ground by carefully back probing the connector. • For 3.7L equipped vehicles , with PCM C175B connected, connect a fused jumper wire between PCM C175B-14, circuit CDC15 (VT) and ground by carefully back probing the connector. • For 5.0L and 6.2L equipped vehicles , with PCM C1381B connected, connect a fused jumper wire between PCM C1381B-14, circuit CDC15 (VT) and ground by carefully back probing the connector. • Start the engine. • Monitor the GENMON_HZ PID. • Does the PID read 0 Hz?	No GO to E9.
E7 MONITOR THE PCM PID GENERATOR MONITOR FREQUENCY (GENMON_HZ) WHILE ACTIVATING THE GENERATOR VOLTAGE DESIRED (GENVDSD) PID • Ignition OFF. • Connect a fused jumper wire between generator C102A-1, circuit CDC15 (VT), harness side and generator C102A-2, circuit CDC10 (BU/OG), harness side.  N0074142 • Start the engine. • With the engine running at idle, set the active command GENVDSD PID to 14 volts. • Monitor the GENMON_HZ PID while performing a wiggle test on the generator harness. • Does the GENMON_HZ PID read between 120-130 Hz?	Yes INSTALL a new generator. REFER to Generator — 3.5L GTDI, Generator — 3.7L, Generator — 5.0L or Generator — 6.2L in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. No GO to E9.
E8 CHECK THE PCM GENERATOR COMMAND LINE FAULT (GENCMD_LF) PID • With the engine running and all selectable loads OFF, monitor the PCM PID GENCMD_LF. • Does the PCM PID GENCMD_LF fluctuate from YES FAULT to NO FAULT?	Yes INSTALL a new generator. REFER to Generator — 3.5L GTDI, Generator — 3.7L, Generator — 5.0L or Generator — 6.2L in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. No The fault is not present at this time. This may indicate an intermittent fault. CARRY OUT

	a wiggle test on the charging system circuits to try and RECREATE the concern. CHECK generator connections for corrosion, loose connections and/or bent terminals. REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
E9 CHECK FOR CORRECT PCM OPERATION	
• Ignition OFF. • Disconnect all the PCM connectors. • Check for: ■ corrosion ■ damaged pins ■ pushed-out pins • Connect the PCM connectors and make sure they seat correctly. • Operate the system and determine if the concern is still present. • Is the concern still present?	Yes INSTALL a new PCM. REFER to Section 303-14. TEST the system for normal operation. No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

Pinpoint Test F: The Generator is Noisy

Refer to Wiring Diagrams Cell [12](#), Charging System for schematic and connector information.

Normal Operation

The generator is belt-driven by the engine accessory drive system. There are several sources of generator noise which include bearing noise, electrical fault noise, generator or belt pulley misalignment. A generator with certain types of diode or stator failures may also produce an audible noise.

This pinpoint test is intended to diagnose the following:

- Front End Accessory Drive (FEAD) belt
- Loose bolts/brackets
- Generator/pulley

PINPOINT TEST F: THE GENERATOR IS NOISY

Test Step	Result / Action to Take
F1 CHECK FOR ACCESSORY DRIVE BELT NOISE AND LOOSE MOUNTING BRACKETS	
• Ignition OFF. • Check the accessory drive belt and tensioner for damage and correct installation. Refer to Section 303-05. • Check the accessory mounting brackets and generator pulley for looseness or misalignment.	Yes GO to F2. No REPAIR as necessary. REFER to Section 303-05 for diagnosis and testing of the

• Is the accessory drive OK?	accessory drive system. TEST the system for normal operation.
F2 CHECK THE GENERATOR MOUNTING	
• Check the generator mounting for loose bolts or misalignment. • Is the generator mounted correctly?	Yes GO to F3. No REPAIR as necessary. TEST the system for normal operation.
F3 CHECK THE GENERATOR FOR NOISE	
• With the engine running, use a stethoscope or equivalent listening device to probe the generator and the accessory drive area for unusual mechanical noise. • Is the generator the noise source?	Yes INSTALL a new generator. REFER to Generator — 3.5L GTDI, Generator — 3.7L, Generator — 5.0L or Generator — 6.2L in this section. No REFER to Section 303-00 to diagnose the source of the engine noise.

Pinpoint Test G: Radio Interference

Refer to Wiring Diagrams Cell [12](#), Charging System for schematic and connector information.

Normal Operation

The generator radio suppression equipment reduces interference transmitted through the speakers by the vehicle electrical system.

This pinpoint test is intended to diagnose the following:

- Generator
- Wiring, terminals or connectors
- In-vehicle entertainment system

PINPOINT TEST G: RADIO INTERFERENCE

NOTE: If the OEM ACM has been replaced with an aftermarket unit, the vehicle may not pass this test. Return the vehicle to OEM condition before following this pinpoint test.

NOTE: If the engine is operated at greater than 2,000 rpm momentarily, the generator self-excites. Make sure when the generator is disconnected the engine rpm stays below 2,000 rpm. If it does rise above 2,000 rpm, turn the ignition to the OFF position and start the test over again.

NOTE: Inspect for any aftermarket accessories that have been added to the vehicle. Check the wiring for these accessories and be sure they have not been attached to the generator circuits and are positioned away from the generator wiring.

Test Step	Result / Action to Take
G1 VERIFY THE GENERATOR IS	

THE SOURCE OF THE RADIO INTERFERENCE	
• Start the engine and allow the engine to idle. • Tune the <u>ACM</u> to a station where the interference is present. • Ignition OFF. • Disconnect: Generator C102B . • Start the engine and allow the engine to idle. • Is the interference present with the generator disconnected?	Yes Refer to the appropriate section in Group 415 for the procedure.. Refer to Diagnosis and Testing of the In-Vehicle Entertainment System. No INSTALL a new generator. REFER to Generator — 3.5L GTDI, Generator — 3.7L, Generator — 5.0L or Generator — 6.2L in this section. TEST the system for normal operation.

Pinpoint Test H: DTC P0A5A, P0A5B, P0A5C

Refer to Wiring Diagrams Cell [13](#), Power Distribution/BCM for schematic and connector information.

Normal Operation

The generator current sensor is a Hall-effect sensor attached to the generator B+ cable. It is supplied a 5 volt reference and ground from the PCM. The PCM reads the generator current sensor feedback voltage to determine how much current is flowing through the generator B+ cable.

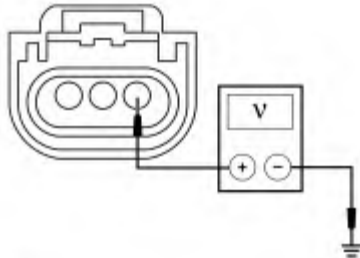
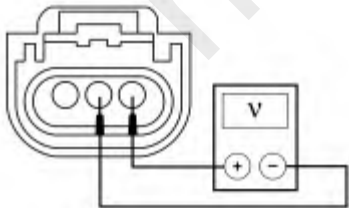
- DTC P0A5A (Generator Current Sensor Circuit Range/Performance) — The PCM does not detect current through the generator current sensor and there are no generator current sensor circuit DTCs are set.
- DTC P0A5B (Generator Current Sensor Circuit Low) — The PCM senses lower than expected voltage on the generator current sensor feedback circuit, indicating an open or a short directly to ground.
- DTC P0A5C (Generator Current Sensor Circuit High) — The PCM senses higher than expected voltage on the generator current sensor feedback circuit, indicating a short directly to voltage.

This pinpoint test is intended to diagnose the following:

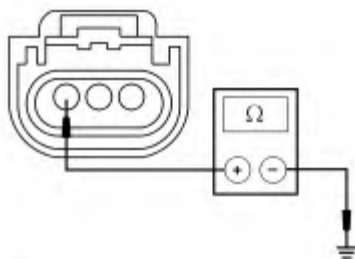
- Wiring, terminals or connectors
- Battery current sensor
- BCM

PINPOINT TEST H: DTC P0A5A, P0A5B, P0A5C

Test Step	Result / Action to Take
H1 CHECK THE PCM DTCs	
• Ignition ON. • Enter the following diagnostic mode on the scan tool: Self-Test — PCM . • Check the PCM DTCs. • Is DTC P0A5A present?	Yes GO to H2. No For DTC P0A5B , GO to H3 . For DTC P0A5C , GO to H7 .
H2 CHECK THE GENERATOR CURRENT SENSOR	

- Inspect the generator current sensor for the following: - Physical damage - Corrosion - Disconnected electrical connector - Disconnected from generator B+ cable - Debris between the generator current sensor and the generator B+ cable Are any of these conditions found during inspection?	Yes REPAIR as necessary or INSTALL a new generator current sensor. REFER to Section 414-01. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. No GO to H9.
H3 CHECK THE PCM OUTPUT VOLTAGE - Ignition OFF. - Disconnect: Generator Current Sensor C1645 . - Ignition ON. - Measure the voltage between ground and generator current sensor C1645-1, circuit LE424 (YE/GN), harness side.  N0122689 Is the voltage between 4.7 and 5.1 volts?	Yes GO to H4. No If the voltage is less than 4.7 volts, REPAIR circuit LE424 (YE/GN) for an open or high resistance. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. If the voltage is greater than 5.1 volts, REPAIR circuit LE424 (YE/GN) for a short to voltage. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
H4 CHECK THE GENERATOR CURRENT SENSOR GROUND CIRCUIT - Measure the voltage between generator current sensor C1645-2, circuit RE407 (YE/VT), harness side and generator current sensor C1645-1, circuit LE424 (YE/GN), harness side.  N0122690 Is the voltage between 4.7 and 5.1 volts?	Yes GO to H5. No REPAIR circuit RE407 (YE/VT) for an open or high resistance. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
H5 CHECK THE FEEDBACK CIRCUIT FOR A SHORT TO GROUND - Ignition OFF. - Disconnect: PCM C1551B (3.5L) . - Disconnect: PCM C175B (3.7L) . - Disconnect: PCM C1381B (5.0L) . - Measure the resistance between ground and generator	Yes GO to H6. No REPAIR circuit VDC61 (VT/GN)

current sensor C1645-3, circuit VDC61 (VT/GN), harness side.



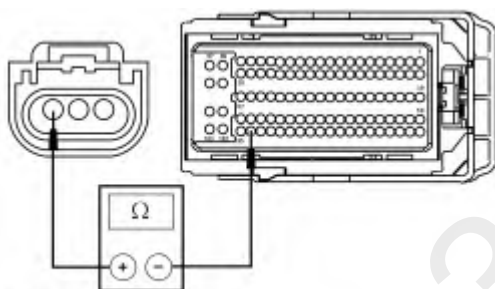
N0122691

- Is the resistance greater than 10,000 ohms?

for a short to ground. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

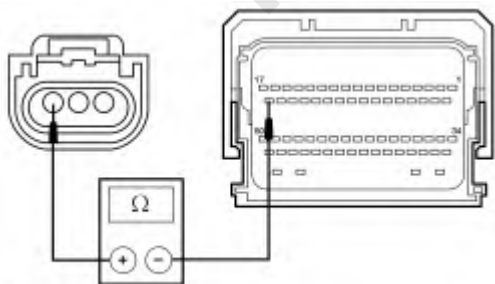
H6 CHECK THE FEEDBACK CIRCUIT FOR AN OPEN

- **For 3.5L engines**, measure the resistance between generator current sensor C1645-3, circuit VDC61 (VT/GN), harness side and PCM C1551B-94, circuit VDC61 (VT/GN), harness side.



N0122692

- Measure the resistance between generator current sensor C1645-3, circuit VDC61 (VT/GN), harness side and:
 - **For 3.7L engines**, PCM C175B-33, circuit VDC61 (VT/GN), harness side.
 - **For 5.0L engines**, PCM C1381B-33, circuit VDC61 (VT/GN), harness side.



N0122693

- Is the resistance less than 5 ohms?

Yes
GO to [H7](#).

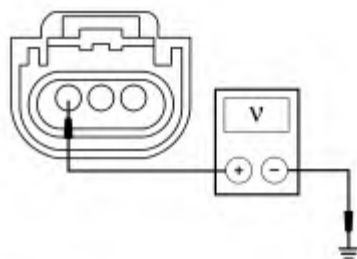
No
REPAIR circuit VDC61 (VT/GN) for an open or high resistance. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

H7 CHECK THE FEEDBACK CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Generator Current Sensor C1645.
- Disconnect: PCM C1551B (3.5L).

Yes
REPAIR circuit VDC61 (VT/GN) for a short to voltage. CLEAR the

- Disconnect: PCM C175B (3.7L) .
- Disconnect: PCM C1381B (5.0L) .
- Ignition ON.
- Measure the voltage between ground and generator current sensor C1645-3, circuit VDC61 (VT/GN), harness side.



N0122694

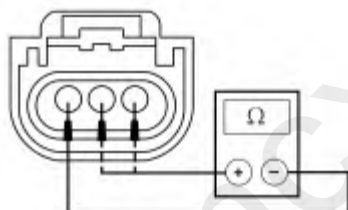
- Is any voltage present?

DTCs. REPEAT the self-test. TEST the system for normal operation.

No
GO to [H8](#).

H8 CHECK THE FEEDBACK CIRCUIT FOR A SHORT TO THE SIGNAL RETURN OR REFERENCE CIRCUIT

- Ignition OFF.
- Measure the resistance between generator current sensor C1645-3, circuit VDC61 (VT/GN), harness side and:
 - generator current sensor C1645-1, circuit LE424 (YE/GN), harness side.
 - generator current sensor C1645-2, circuit RE407 (YE/VT), harness side.



N0122695

- Is the resistance greater than 10,000 ohms?

Yes
GO to [H9](#).

No
REPAIR circuit VDC61 (VT/GN) for a short to circuit LE424 (YE/GN) or RE407 (YE/VT). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

H9 CHECK THE GENERATOR CURRENT SENSOR CONNECTION

- Ignition OFF.
- Disconnect the generator current sensor connector.
- Inspect the generator current sensor connector for:
 - corrosion
 - pushed-out terminals
 - damaged terminals
- Connect and correctly seat the generator current sensor connector.
- Ignition ON.
- Clear the DTCs.
- Enter the following diagnostic mode on the scan tool: Self-Test — PCM .
- Did the DTC return?

Yes
REPAIR as necessary or INSTALL new generator current sensor. REFER to [Section 414-01](#). CLEAR the DTCs. REPEAT the self-test. If the DTC returns, GO to [H10](#).

No
The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

H10 CHECK FOR CORRECT PCM OPERATION	
• Ignition OFF. • Disconnect all the PCM connectors. • Check for: ■ corrosion ■ damaged pins ■ pushed-out pins • Connect the PCM connectors and make sure they seat correctly. • Operate the system and determine if the concern is still present. • Is the concern still present?	Yes INSTALL a new PCM. REFER to Section 303-14. TEST the system for normal operation. No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

Pinpoint Test I: DTC U1007:31

Refer to Wiring Diagrams Cell [13](#), Power Distribution/BCM for schematic and connector information.

Normal Operation

The battery current sensor is a Hall-effect sensor attached to the battery ground cable. It is supplied a 5 volt reference and ground from the Body Control Module (BCM). The BCM reads the battery current sensor feedback voltage to determine how much current is flowing through the battery ground cable.

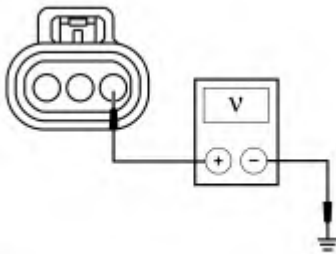
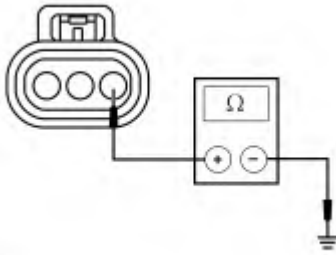
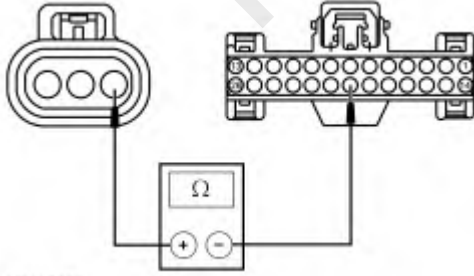
- DTC U1007:31 (Lost Communication With Battery Monitoring Sensor "A": No Signal) — The BCM does not indicate current from the battery current sensor.

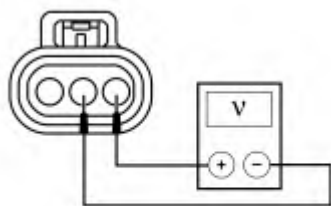
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Battery current sensor
- BCM

PINPOINT TEST I: DTC U1007:31

Test Step	Result / Action to Take
I1 CHECK THE BATTERY CURRENT SENSOR • Inspect the battery current sensor for the following: ■ Physical damage ■ Corrosion ■ Disconnected electrical connector ■ Disconnected from battery ground cable ■ Debris between the battery current sensor and the battery ground cable • Are any of these conditions found during inspection?	Yes GO to I12. No GO to I2.
I2 CHECK THE <u>BCM</u> OUTPUT VOLTAGE • Ignition OFF. • Disconnect: Battery Current Sensor C1646 . • Ignition ON. • Measure the voltage between ground and battery current sensor C1646-1, circuit SDC57 (BU/OG), harness side.	Yes GO to I5. No If the voltage is less than 4.7 volts, GO to I3.

 N0117807 Is the voltage between 4.7 and 5.1 volts?	If the voltage is greater than 5.1 volts, REPAIR circuit SDC57 (BU/OG) for a short to voltage. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
I3 CHECK THE REFERENCE VOLTAGE CIRCUIT FOR A SHORT TO GROUND - Ignition OFF. - Disconnect: Body Control Module (BCM) C2280F . - Measure the resistance between ground and battery current sensor C1646-1, circuit SDC57 (BU/OG), harness side.  N0117808 - Is the resistance greater than 10,000 ohms?	Yes GO to I4. No REPAIR circuit SDC57 (BU/OG) for a short to ground. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
I4 CHECK THE REFERENCE VOLTAGE CIRCUIT FOR AN OPEN - Measure the resistance between battery current sensor C1646-1, circuit SDC57 (BU/OG), harness side and Body Control Module (BCM) C2280F-20, circuit SDC57 (BU/OG), harness side.  N0117809 - Is the resistance less than 5 ohms?	Yes GO to I12. No REPAIR circuit SDC57 (BU/OG) for an open or high resistance. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
I5 CHECK THE <u>BCM</u> SENSOR GROUND Measure the voltage between battery current sensor C1646-2, circuit RDC59 (GY/BN), harness side and battery current sensor C1646-1, circuit SDC57 (BU/OG), harness side.	Yes GO to I8. No GO to I6.

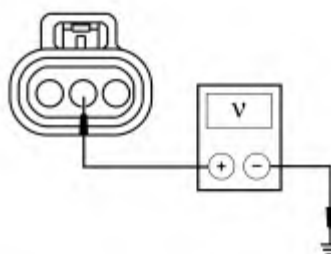


N0117810

- Is the voltage greater than 4.7 volts?

I6 CHECK THE SIGNAL RETURN CIRCUIT FOR VOLTAGE

- Measure the voltage between ground and battery current sensor C1646-2, circuit RDC59 (GY/BN), harness side.



N0117811

- Is any voltage present?

Yes

If the voltage is 5.1 volts or less, REPAIR circuit RDC59 (GY/BN) for a short to circuit SDC57 (BU/OG). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

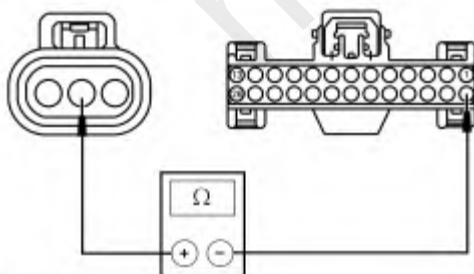
If the voltage is greater than 5.1 volts REPAIR circuit RDC59 (GY/BN) for a short to voltage. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

No

GO to [I7](#).

I7 CHECK THE SIGNAL RETURN CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect: Body Control Module (BCM) C2280F .
- Measure the resistance between battery current sensor C1646-2, circuit RDC59 (GY/BN), harness side and BCM C2280F-14, circuit RDC59 (GY/BN), harness side.



N0117812

- Is the resistance less than 5 ohms?

Yes

GO to [I12](#).

No

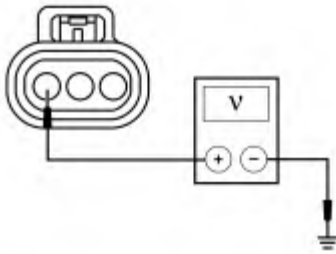
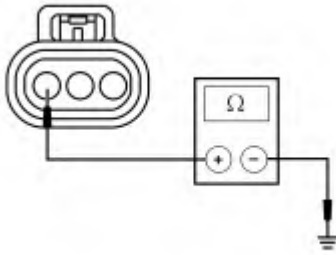
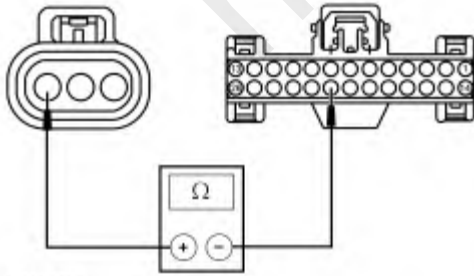
REPAIR circuit RDC59 (GY/BN) for an open or high resistance. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

I8 CHECK THE FEEDBACK CIRCUIT FOR A SHORT TO VOLTAGE

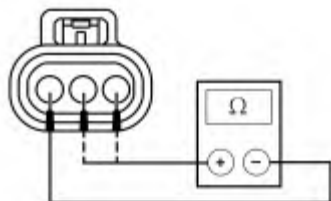
- Ignition OFF.
- Disconnect: Body Control Module (BCM) C2280F .
- Ignition ON.
- Measure the voltage between ground and battery current sensor C1646-3, circuit LDC59 (BU/WH), harness side.

Yes

REPAIR circuit LDC59 (BU/WH) for a short to voltage. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal

 N0117813 Is the voltage greater than 11 volts?	operation. No GO to I9.
I9 CHECK THE FEEDBACK CIRCUIT FOR A SHORT TO GROUND - Ignition OFF. - Measure the resistance between ground and battery current sensor C1646-3, circuit LDC59 (BU/WH), harness side.  - Is the resistance greater than 10,000 ohms?	Yes GO to I10. No REPAIR circuit LDC59 (BU/WH) for a short to ground. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
I10 CHECK THE FEEDBACK CIRCUIT FOR AN OPEN - Disconnect: <u>BCM</u> C2280F . - Measure the resistance between battery current sensor C1646-3, circuit LDC59 (BU/WH), harness side and <u>BCM</u> C2280F-21, circuit LDC59 (BU/WH), harness side.  N0117815 - Is the resistance less than 5 ohms?	Yes GO to I11. No REPAIR circuit LDC59 (BU/WH) for an open or high resistance. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
I11 CHECK THE FEEDBACK CIRCUIT FOR A SHORT TO THE SIGNAL RETURN OR REFERENCE CIRCUIT - Measure the resistance between battery current sensor C1646-3, circuit LDC59 (BU/WH), harness side and: - battery current sensor C1646-2, circuit RDC59 (GY/BN), harness side. - battery current sensor C1646-1, circuit SDC57	Yes GO to I12. No REPAIR circuit LDC59 (BU/WH)

(BU/OG), harness side.



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- Is the resistance greater than 10,000 ohms?

for a short to circuit RDC59 (GY/BN) or SDC57 (BU/OG). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

I12 CHECK THE BATTERY CURRENT SENSOR CONNECTION

- Ignition OFF.
- Disconnect the battery current sensor connector.
- Check for:
 - corrosion
 - damaged pins
 - pushed-out pins
- Connect and correctly seat the battery current sensor connector.
- Connect and correctly seat the BCM (if previously disconnected).
- Ignition ON.
- Clear the DTCs.
- Enter the following diagnostic mode on the scan tool: Self-Test — BCM.
- Did the DTC return?

Yes

REPAIR as necessary or INSTALL a new battery cable assembly. REFER to [Section 414-01](#). CLEAR the DTCs. REPEAT the self-test. If the DTC returns, GO to [I13](#).

No

The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

I13 CHECK FOR CORRECT BCM OPERATION

- Ignition OFF.
- Disconnect all the BCM connectors.
- Check for:
 - corrosion
 - damaged pins
 - pushed-out pins
- Connect the BCM connectors and make sure they seat correctly.
- Operate the system and determine if the concern is still present.
- Is the concern still present?

Yes

INSTALL a new BCM. REFER to [Section 418-01](#). TEST the system for normal operation.

No

The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

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