Pinpoint Test

Special Tool(s)

 ST3093-A	Fluke 77-IV Digital Multimeter FLU77-4 or equivalent
 ST2574-A	Flex Probe Kit 105-R025C
 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool

Pinpoint Test A: DTCs B1317, B1676 and/or P0563 — Battery/System Voltage High and/or Battery Pack Voltage Out of Range

Refer to Wiring Diagrams Cell 12 , Charging System for schematic and connector information.

NOTE: DTCs B1317 or B1676 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 a calibrated set point, a DTC will be set.

- DTC B1317 Battery Voltage High — Each module within the vehicle system monitors input voltage to the module. If the voltage rises above the module's calibrated set point (which varies by module), that module will set this DTC. This DTC may also be in memory as a Continuous Memory Diagnostic Trouble Code (CMDTC) if the vehicle has been recently jump started or has had a discharged battery.
- DTC B1676 Battery Pack Voltage Out of Range — Each module within the vehicle system monitors input voltage to the module. If the voltage rises above or drops below the modules calibrated set point, that module will set this DTC. This DTC may also be in memory (CMDTC) if the vehicle has been recently jump started or has had a discharged battery.
- DTC P0563 System Voltage High — If the module detects a voltage from the charging system higher than 15.2 volts, this DTC will be set. This DTC will not be set in the PCM unless the vehicle speed is above 5 mph (8 km/h).

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: DTCs B1317, B1676 AND/OR P0563 — BATTERY/ SYSTEM VOLTAGE HIGH AND/OR BATTERY PACK VOLTAGE OUT OF RANGE

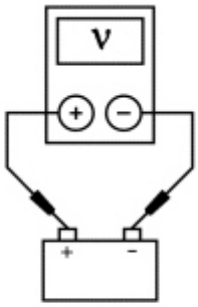
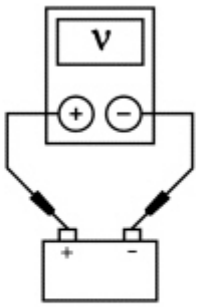
NOTE: Make sure battery voltage is greater than 12.2 volts prior to and during this pinpoint test.

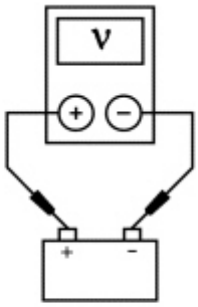
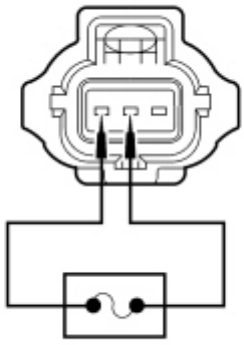
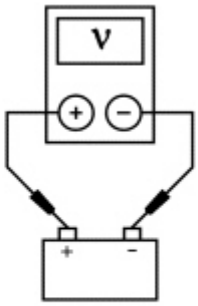
NOTE: Do not have a battery charger attached during vehicle testing.

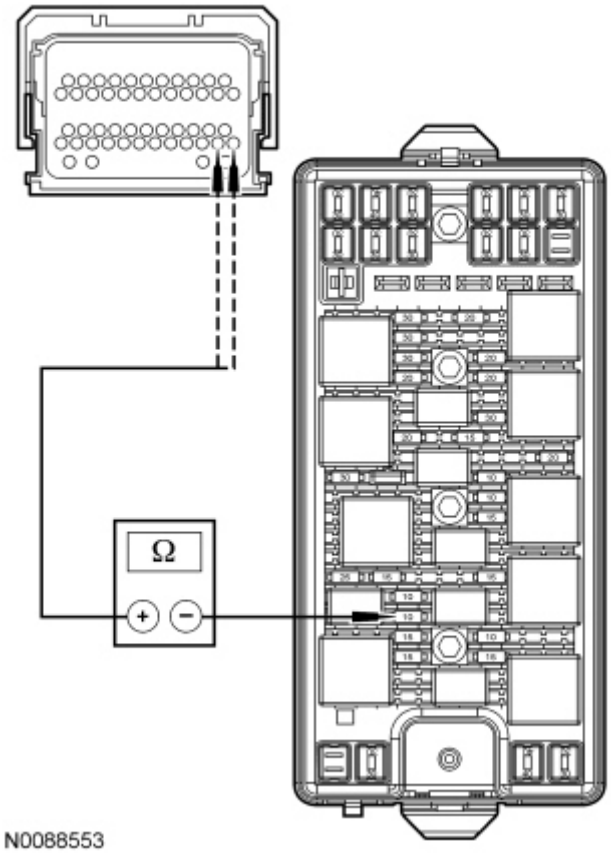
Test Step	Result / Action to Take
A1 CHECK BATTERY CONDITION • Carry out the Battery — Condition Test to determine if the battery can hold a charge and is OK for use. Refer to Section 414-01 . • **Does the battery pass the condition test?**	**Yes** GO to A2 . **No** INSTALL a new battery. REFER to Section 414-01 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
A2 CHECK FOR DTCs IN THE PCM • **NOTE:** Use the Integrated Diagnostic System (IDS) feature that retrieves all CMDTCs from all modules at one time. • Retrieve CMDTCs from all modules. • **Do any charging system DTCs other than B1317, B1676 or P0563 exist?**	**Yes** REFER to the DTC Chart for the correct pinpoint test and DIAGNOSE those DTCs first. **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
	INSTALL a new PCM. REFER to Section 303-14 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

A4 MONITOR PCM PID GENERATOR VOLTAGE DESIRED (GENVDSD) • With the engine still running at idle, measure battery voltage and record.	**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.

 AJ0210-A • Monitor the GENVDSD PID. • **Is battery voltage within ±0.6 volts of the PID GENVDSD?**	REPEAT the self-test. TEST the system for normal operation. **No** GO to A5 .
A5 CHECK THE A SENSE VOLTAGE	
• Ignition OFF. • Disconnect: Generator C102A. • Ignition ON. • With ignition ON, measure battery voltage and record. • Measure the voltage between generator C102A-3, circuit 35 (OG/LB), harness side and ground.  AJ0210-A • **Is the voltage equal to battery voltage?**	**Yes** GO to A6 . **No** VERIFY Bussed Electrical Center (BEC) fuse 43 (10A) is OK. If OK, REPAIR circuit 35 (OG/LB). 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	
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 glass bulb style 12-volt test lamp is required for this step. This circuit will not be loaded properly using an LED-style test lamp. • Using a 12-volt test lamp connected to ground, check for voltage at generator C102A-3, circuit 35 (OG/LB), harness side. • **Does the test lamp illuminate?**	**Yes** GO to A7 . **No** REPAIR corroded or loose connection on circuit 35 (OG/LB). INSPECT generator C102A-3, circuit 35 (OG/LB) for damage. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
A7 CHECK THE GENERATOR OUTPUT	
• Start the engine. • Increase engine rpm until generator starts to generate output. • With the engine running, measure battery voltage and record.	**Yes** INSTALL a new generator. REFER to Generator — 4.0L SOHC , Generator — 4.6L (3V) or Generator — 5.4L (4V) in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

 AJ0210-A • **Is the voltage above 14.5 volts?**	**No** GO to A8 .
A8 MONITOR PCM PIDs GENERATOR COMMAND (GENCMD), GENERATOR MONITOR (GENMON) AND GENERATOR VOLTAGE DESIRED (GENVDSD)	
• Ignition OFF. • Connect a fused jumper wire between generator C102A-1, 1817 (YE), harness side and generator C102A-2, circuit 1816 (YE/LB), harness side.  N0074142 • 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?**	**Yes** GO to A9 . **No** INSTALL a new PCM. REFER to Section 303-14 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
A9 COMPARE PCM MODULE SUPPLY VOLTAGE (VPWR) PID	
• 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 — 4.0L SOHC , Generator — 4.6L (3V) or Generator — 5.4L (4V) in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **No** GO to A10 .
A10 CHECK PCM MODULE SUPPLY VOLTAGE CIRCUITS	

• Ignition OFF. • Disconnect: PCM C175B. • Inspect the connector pins for damage. Measure resistance between C175B-35, circuit 1856 (GY/OG), PCM C175B-36, circuit 1856 (GY/OG), PCM power circuits and BEC fuse 42.  N0088553 • **Are the resistances less than 0.5 ohm?**	**Yes** INSTALL a new PCM. REFER to Section 303-14 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **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.

Pinpoint Test B: DTC B1318 and/or B1676 — Battery Voltage Low and/or Battery Pack Voltage Out of Range

Refer to Wiring Diagrams Cell 12 , Charging System for schematic and connector information.

NOTE: DTCs B1318 or B1676 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 vehicle and the various modules. Many modules monitor this voltage and if it drops below a calibrated set point, a DTC will be set.

- DTC B1318 Battery Voltage Low — Each module within the vehicle system monitors input voltage to the module. If the voltage drops below the modules calibrated set point (which varies between modules), that module will set this DTC.
- DTC B1676 Battery Pack Voltage Out of Range — Each module within the vehicle system monitors input voltage to the module. If the voltage rises above or drops below the modules calibrated set point that module will set this DTC. This DTC may also be set if the vehicle has been recently jump started or has had a discharged battery.

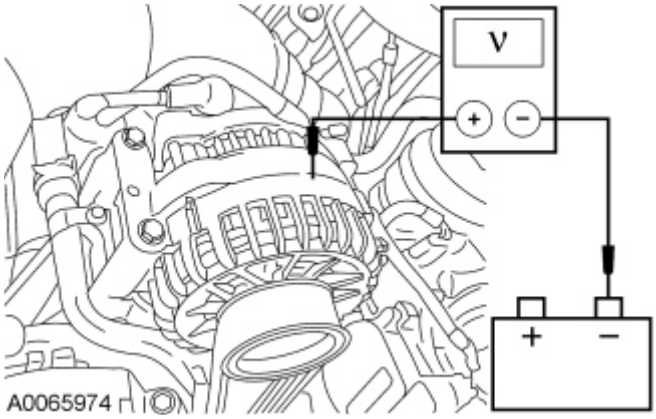
This pinpoint test is intended to diagnose the following:

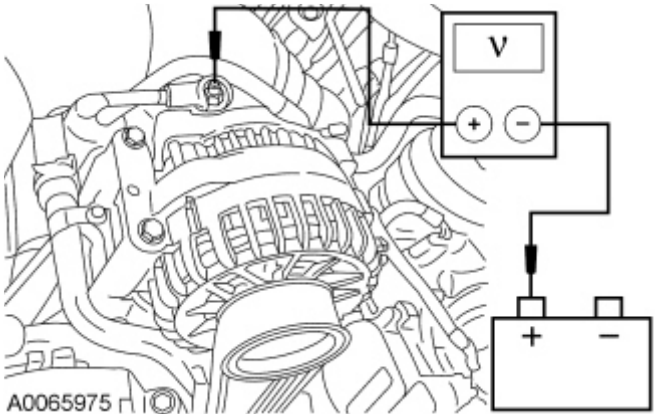
- Circuit high resistance
- Engine, generator and battery grounds
- Positive battery cable
- Battery
- High ignition-off current drain(s)
- Generator

PINPOINT TEST B: DTC B1318 AND/OR B1676 — BATTERY VOLTAGE LOW AND/OR BATTERY PACK VOLTAGE IS OUT OF RANGE

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 CHECK THE BATTERY CONDITION • Carry out the Battery — Condition Test to determine if the battery can hold a charge and is OK for use. Refer to Section 414-01 . • **Does the battery pass the condition test?**	**Yes** GO to B2 . **No** INSTALL a new battery. REFER to Section 414-01 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
B2 CHECK THE VEHICLE GROUNDS • Start the engine. • With the engine running at idle, headlamps on and heater blower on high, measure the voltage drop between the generator housing and the negative battery terminal.  • **Is the voltage drop less than 0.25 volt (250 mV)?**	**Yes** GO to B3 . **No** INSPECT and REPAIR the engine ground, generator ground or the battery ground for corrosion. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
B3 CHECK THE VOLTAGE DROP IN THE B+ CIRCUIT 2037 (RD) • With the engine running at idle, headlamps on and blower on high, measure the voltage drop between generator B+ C102B, circuit 2037 (RD) and the positive battery terminal.	**Yes** GO to B4 . **No** INSPECT and REPAIR any corrosion in the B+ 2037 (RD) or positive battery cable connections. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

 • **Is the voltage drop less than 0.5 volt?**	
B4 CHECK FOR CURRENT DRAINS	
• Carry out the Battery — Drain Testing. Refer to Section 414-01 . • **Are any circuits causing excessive current drains?**	**Yes** REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **No** No problems found at this time. CHECK with the customer to determine if any electrical system (s) may have been accidently left on. If nothing unusual is found, CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. GO to Pinpoint Test D to continue diagnosis of the charging system.

Pinpoint Test C: DTC P0620 — Generator Control Circuit

Refer to Wiring Diagrams Cell 12 , Charging System for schematic and connector information.

Normal Operation

The PCM monitors the generator output via the GENMON circuit. The PCM uses the 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 be unable to control the generators output. When the engine rises above approximately 2,000 rpm, the generator will default to a steady voltage of approximately 13.5 volts and the PCM will send a request to the Instrument Cluster (IC) to illuminate the charging system warning indicator lamp.

- DTC P0620 Generator Control Circuit — If the GENCOM circuit or A sense circuit are open or shorted to ground the PCM will set this DTC.

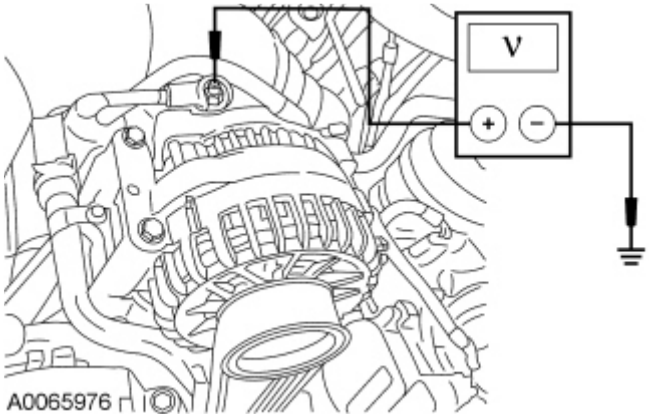
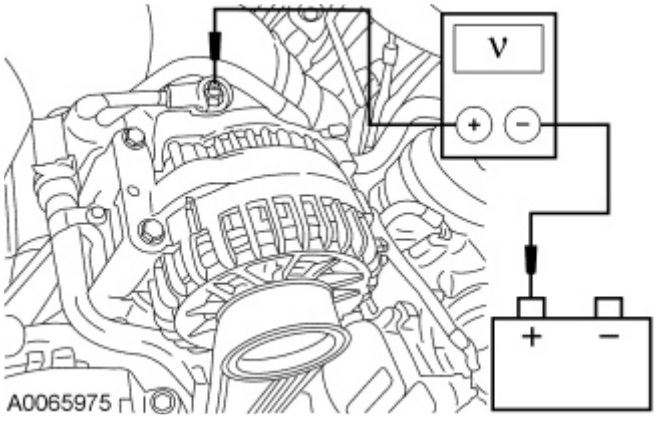
This pinpoint test is intended to diagnose the following:

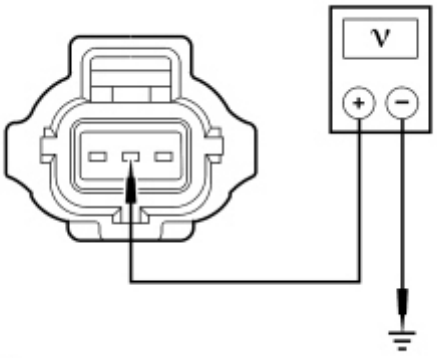
- Fuse
- Wiring, terminals or connectors
- Generator
- PCM

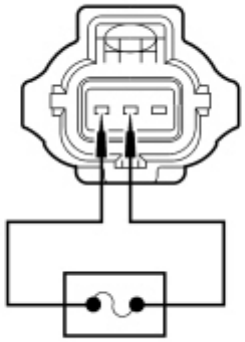
PINPOINT TEST C: DTC P0620 — GENERATOR CONTROL CIRCUIT

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	
• Carry out the Battery — Condition Test to determine if the battery can hold a charge and is OK for use. Refer to Section 414-01 . • **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 B+ CONNECTION	
• Ignition OFF. • Inspect generator C102A connection. Connector should be installed correctly and tight. Inspect the connector for bent and/or pushed out pins. • Inspect generator C102B, circuit 2037 (RD). Connection should be tight. • Measure the voltage between generator C102B, B+ circuit 2037 (RD) and ground.  • **Are the generator connections OK and does the generator B+ measure battery voltage?**	**Yes** GO to C3 . **No** REPAIR the generator connection or circuit. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
C3 CHECK THE VOLTAGE DROP IN THE B+ CIRCUIT 2037 (RD)	
• Ignition OFF. • 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 2037 (RD) and the positive battery terminal.  • **Is the voltage drop less than 0.5 volt?**	**Yes** GO to C4 . **No** REPAIR the circuit B+ 2037 (RD) and the positive battery cable for loose connections, physical damage or wire corrosion. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
C4 A SENSE CIRCUIT LOAD TEST	

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 glass bulb style test lamp is required for this step. This circuit will not be loaded properly using an LED-style test lamp. • Disconnect: Generator C102A. • Ignition ON. • Using a 12-volt test lamp connected to ground, check for voltage at generator C102A-3, circuit 35 (OG/LB), harness side. • **Does the test lamp illuminate?**	**Yes** GO to C5 . **No** VERIFY Bussed Electrical Center (BEC) fuse 43 (10A) is OK. If OK, REPAIR circuit 35 (OG/LB). 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.
C5 CHECK THE GENERATOR COMMAND LINE FAULT (GENCMD_LF) PID • **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 still running at idle, monitor the GENCMD_LF PID. • **Is the GENMON_LF PID ON?**	**Yes** GO to C6 . **No** GO to C9 .
C6 CHECK THE GENCOM CIRCUIT FOR A SHORT TO POWER • Ignition OFF. • Disconnect: Generator C102A. • Ignition ON. • Measure the voltage between generator C102A-2, circuit 1816 (YE/LB), 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 1817 (YE), harness side and generator C102A-2, circuit 1816 (YE/LB), harness side.	**Yes** GO to C8 . **No** GO to C12 .



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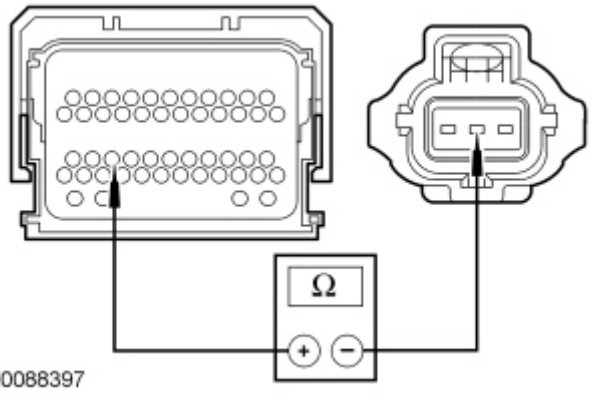
- Start the engine.
- Monitor the GENMON and GENCMD PIDs while performing a Wiggle Test on the generator harness.
- **Does the GENMON PID read within 5% of the GENCMD PID?**

C8 CHECK CIRCUIT 1816 (YE/LB) FOR DAMAGE OR AN OPEN	

• Ignition OFF.
• Disconnect: PCM C175B.
• Inspect the following harness connectors for damaged or pushed-out pins:
  ▪ PCM C175B-22, circuit 1816 (YE/LB).
  ▪ Generator C102B-2, circuit 1816 (YE/LB).
• Measure the resistance between PCM C175B-32, circuit 1816 (YE/LB), harness side and generator C102A-2, circuit 1816 (YE/LB), harness side.
 
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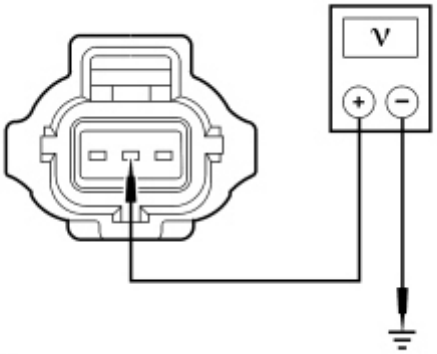
• **Are the connectors and pins free of damage and is the resistance less than 5 ohms?**
	Yes
	GO to C9 .
	
	No
	REPAIR circuit 1816 (YE/LB). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

C9 CHECK CIRCUIT 1816 (YE/LB) FOR SHORT TO GROUND	
• Ignition OFF. • Disconnect: Generator C102A (if not previously disconnected). • Measure the resistance between the generator C102A-2, circuit 1816 (YE/LB), harness side and ground. • **Is the resistance greater than 10,000 ohms?**	**Yes** GO to C10 . **No** REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
C10 CHECK THE CHARGING SYSTEM CIRCUITS FOR INTERMITTENT FAULTS	
• Connect: Generator C102A. • Connect: PCM C175B. • Ignition ON. • Clear all DTCs. • Start the engine and let the engine run for 5 minutes. • Retrieve Continuous Memory Diagnostic Trouble Codes (CMDTCs) from all modules.	**Yes** INSTALL a new generator. REFER to Generator — 4.0L SOHC , Generator — 4.6L (3V) or Generator — 5.4L (4V) procedure in this section. CLEAR the DTCs. REPEAT the

• **Did any charging system DTC get stored into memory?**	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.
C11 CHECK FOR SHORT TO VOLTAGE • Ignition OFF. • Disconnect: PCM C175B. • Ignition ON. • Measure the voltage between generator C102A-2, circuit 1816 (YE/LB), harness side and ground.  N0087307 • **Does voltage read 0 volt?**	**Yes** INSTALL a new PCM. REFER to Section 303-14 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **No** REPAIR circuit 1816 (YE/LB). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
C12 INSPECT GENERATOR CIRCUITS • Ignition OFF. • Disconnect: PCM C175B. • Inspect the following connector pins for damage and/or corrosion, PCM ground C175B-50, circuit 570 (BK/WH), generator C102A-1, circuit 1817 (YE) and generator C102A-2, circuit 1816 (YE/LB). • **Are the connectors OK?**	**Yes** INSTALL a new PCM. REFER to Section 303-14 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **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.

Pinpoint Test D: DTCs P0625 and P0626 — Generator Field Terminal Circuit Stuck Low/High

Refer to Wiring Diagrams Cell 12 , Charging System for schematic and connector information.

Normal Operation

The PCM monitors the generator output via the 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 rises above approximately 2,000 rpm, the generator will default to a steady voltage of approximately 13.5 volts and the PCM will send a request to the Instrument Cluster (IC) to illuminate the charging system warning indicator lamp.

- DTC P0625 Generator Field Terminal Circuit Low — If the GENMON circuit is shorted to ground or the A sense is open, the PCM will set this DTC. This DTC can also be set by a faulty PCM or generator.
- DTC P0626 Generator Field Terminal Circuit High — If the GENMON circuit is open or shorted to power, the PCM will set this DTC. This DTC can also be set by a poor engine ground or faulty PCM or generator.

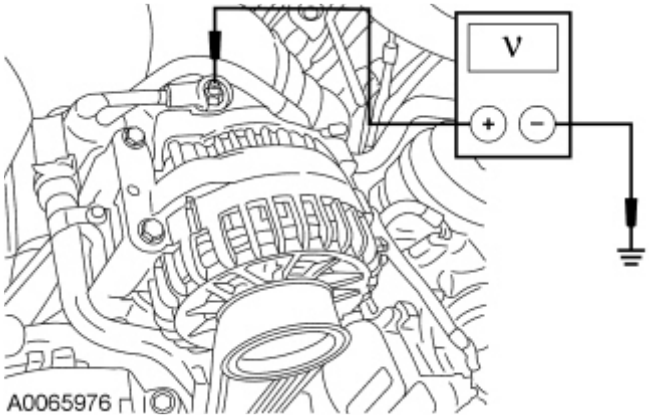
This pinpoint test is intended to diagnose the following:

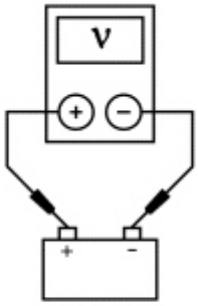
- Fuse
- Wiring, terminals or connectors
- Engine, generator and battery grounds
- Battery
- Generator
- PCM

PINPOINT TEST D: DTCs P0625 AND P0626 — GENERATOR FIELD TERMINAL CIRCUIT STUCK LOW/HIGH

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

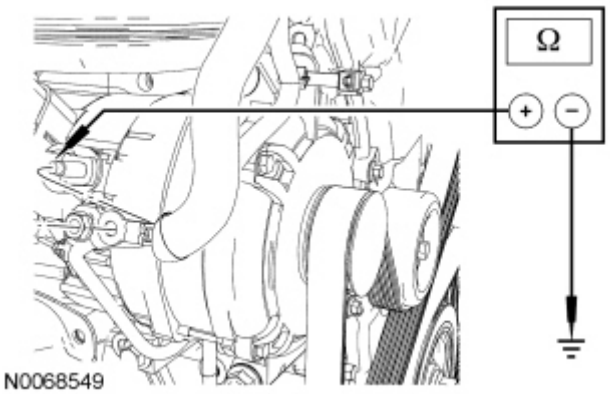
NOTE: Do not have a battery charger attached during vehicle testing.

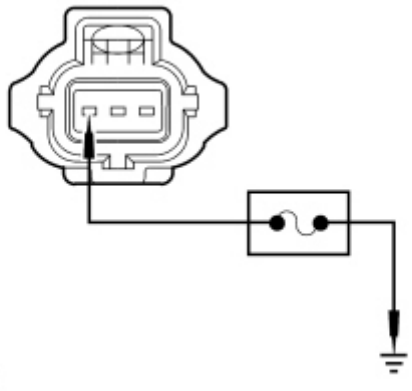
Test Step	Result / Action to Take
D1 CHECK THE BATTERY CONDITION • Carry out the Battery — Condition Test to determine if the battery can hold a charge and is OK for use. Refer to Section 414-01 . • **Does the battery pass the condition test?**	**Yes** GO to D2 . **No** INSTALL a new battery. REFER to 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 2037 (RD), harness side. Connection should be tight. • Measure the voltage between generator C102B, circuit 2037 (RD) and ground.  • **Is the generator C102B connection tight and does the generator B+ measure battery voltage?**	**Yes** GO to D3 . **No** REPAIR the generator B+ connection or circuit. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

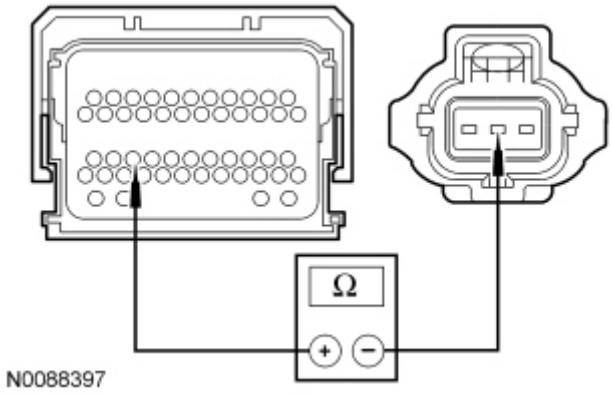
D3 CHECK THE A SENSE VOLTAGE	
• Disconnect: Generator C102A. • Ignition ON. • Measure battery voltage and record.  AJ0210-A • Measure the voltage between generator C102A-3, circuit 35 (OG/LB), harness side and ground. • **Is the voltage equal to battery voltage?**	**Yes** GO to D4 . **No** VERIFY Bussed Electrical Center (BEC) fuse 43 (10A) is OK. If OK, REPAIR circuit 35 (OG/LB). 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.
D4 MONITOR THE PCM PID GENERATOR MONITOR (GENMON) WITH IGNITION ON/ENGINE OFF	

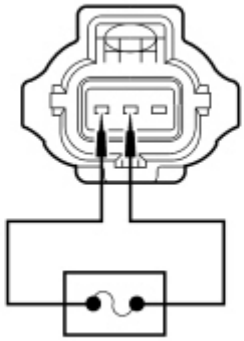
• Connect: Generator C102A.
• **NOTE:** Many of the PCM PIDs selected will be monitored later in this pinpoint test.
• Select and monitor the following PCM PIDs:
  ▪ Generator Monitor (GENMON).
  ▪ Generator Command (GENCMD).
  ▪ Generator Voltage Desired (GENVDSD).
  ▪ Engine Revolutions Per Minute (RPM).
  ▪ Module Supply Voltage (VPWR).
• Monitor the GENMON PID.
• **Does the GENMON PID read 0%?**
	Yes
	GO to D5 .
	
	No
	GO to D10 .

D5 MONITOR THE PCM PIDs GENERATOR MONITOR (GENMON) AND GENERATOR VOLTAGE DESIRED (GENVDSD) WITH ENGINE RUNNING AND NO LOADS	
• Start the engine and turn all electrical accessories (lights, blower motor, etc.) off. • With the engine at idle, wait at least 15 seconds for the GENVDSD PID to increase to greater than 13 volts. • Monitor PID GENMON at idle. • **NOTE:** On some vehicles equipped with a manual transaxle/transmission, the parking brake must be applied and the clutch pedal depressed in order to use the output state control RPM. • Using output state control PID RPM, increase the engine rpm to 3,000 rpm. • Monitor PID GENMON at 3,000 rpm. • **Does the GENMON PID read between 3% and 98% at engine idle speed and at 3,000 rpm?**	**Yes** GO to D6 . **No** GO to D11 .
D6 MONITOR THE PCM PIDs GENERATOR MONITOR (GENMON), GENERATOR VOLTAGE DESIRED (GENVDSD) WITH THE ENGINE AT IDLE LOADS ON	
• Decrease the engine speed to 500 rpm using active command PID RPM and monitor PIDs. • **NOTE:** On vehicles with low electrical loads, it is necessary to make sure that all of the vehicle's electrical loads are turned on to determine the maximum GENMON PID value. The GENMON PID value may not reach between the desired 95%-98% on a low load vehicle with minimal electrical accessories. As long as the GENMON PID increases significantly with all of the electrical loads on, answer YES to the question below.	**Yes** GO to D7 . **No** GO to D11 .

• Determine the maximum GENMON PID value by lowering engine idle rpm to 500 rpm or less using output state control PID RPM and turn on all electrical accessories until the module supply voltage (VPWR) PID is less than the GENVDSD PID by at least 0.7 volt. Under this condition the GENMON PID should read between 95% and 98%. • **Does the GENMON PID read between 95% and 98%?**	
D7 MONITOR THE PCM PIDs GENERATOR MONITOR (GENMON), MODULE SUPPLY VOLTAGE (VPWR) AND GENERATOR VOLTAGE DESIRED (GENVDSD) WITH THE ENGINE AT 3,000 RPM	
• Increase the engine speed to 3,000 rpm using active command PID RPM and monitor PIDs. • **NOTE:** If GENMON PID does not remain below 85%, make sure that the battery is at an acceptable state of charge and that all electrical accessories are off. • Monitor PIDs VPWR, GENVDSD and GENMON. • **Does the VPWR PID remain within ±0.5 volt of the GENVDSD PID when the GENMON PID is less than 85%?**	**Yes** GO to D8 . **No** GO to D11 .
D8 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.  • **Is the resistance greater than 25K ohms?**	**Yes** GO to D9 . **No** INSTALL a new generator. REFER to Generator — 4.0L SOHC , Generator — 4.6L (3V) or Generator — 5.4L (4V) in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
D9 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 1M/1,000K ohms 2 — Greater than 125K ohms 3 — Greater than 125K ohms • **Are the resistance values as indicated?**	**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** INSTALL a new generator. REFER to Generator —

	4.0L SOHC , Generator — 4.6L (3V) or Generator — 5.4L (4V) in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
D10 CHECK THE PCM PID GENERATOR MONITOR (GENMON) INPUT TO THE PCM	
• Ignition OFF. • Disconnect: Generator C102A. • Connect a fused jumper wire between generator C102A-1, circuit 1817 (YE), harness side and ground.  N0074141 • Ignition ON. • Monitor the GENMON PID while performing a Wiggle Test on the generator wiring harness. • **Does the GENMON PID read 0%?**	**Yes** GO to D14 . **No** GO to D15 .
D11 A SENSE CIRCUIT LOAD TEST	
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 glass bulb style 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 (if not previously disconnected). • Ignition ON. • Using a 12-volt test lamp connected to ground, check for voltage at C102A-3, circuit 35 (OG/LB), harness side. • **Does the test lamp illuminate?**	**Yes** GO to D12 . **No** VERIFY Bussed Electrical Center (BEC) fuse 43 (10A) is OK. If OK, REPAIR circuit 2037 (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.
D12 B+ CIRCUIT LOAD TEST	
NOTE: This step puts a load on the B+ circuit. If there are corroded or loose connections, loading the circuit may help show the fault. A glass bulb style test lamp is required for this step. This circuit will not be loaded properly using an LED-style test lamp. • Ignition OFF. • Disconnect: Generator C102b. • Using a 12-volt test lamp connected to ground, check for voltage at C102B-1, circuit 1817 (YE), harness side. • **Does the test lamp illuminate?**	**Yes** GO to D13 . **No** REPAIR circuit 1817 (YE) for high resistance. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
D13 CHECK CIRCUIT 1816 (YE/LB) FOR DAMAGE OR AN OPEN	
• Ignition OFF.	**Yes** GO to D14 .

• Disconnect: PCM C175B.
• Inspect the following harness connectors for damaged or pushed-out pins:
  ▪ PCM C175B-32, circuit 1816 (YE/LB).
  ▪ Generator C102A-2, circuit 1816 (YE/LB).
• Measure the resistance between PCM C175B-32, circuit 1816 (YE/LB), harness side and generator C102A-2, circuit 1816 (YE/LB), harness side.
 
 	
N0088397
• **Are the connectors and pins free of damage and is the resistance less than 0.5 ohm?**
	No
	REPAIR circuit 1816 (YE/LB). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

D14 COMPARE THE PCM PIDs GENERATOR MONITOR (GENMON) AND GENERATOR COMMAND (GENCMD)	
• Connect: Generator C102B. • Connect: PCM C175B. • Connect a fused jumper wire between generator C102A-1, circuit 1817 (YE), harness side and generator C102A-2, circuit 1816 (YE/LB), harness side.  N0074142 • Start the engine. • Using output state control, set the GENVDSD PID to 14.0 volts. • Monitor the GENMON and GENCMD PIDs while performing a Wiggle Test on the generator wiring harness. • **Does the GENMON PID read within 2% of the GENCMD PID?**	**Yes** INSTALL a new generator. REFER to Generator — 4.0L SOHC , Generator — 4.6L (3V) or Generator — 5.4L (4V) in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **No** GO to D16 .
D15 INSPECT GENERATOR CIRCUITS	
• Ignition OFF. • Disconnect: PCM C175E. • Inspect the following connector pins for damage and/or corrosion, generator C102A-1, circuit 1817 (YE) and PCM C175E-5. • **Are the connectors OK?**	**Yes** INSTALL a new PCM. REFER to Section 303-14 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **No** REPAIR the affected circuit(s). CLEAR the

	DTCs. REPEAT the self-test. TEST the system for normal operation.
D16 INSPECT PCM CIRCUITS • Ignition OFF. • Disconnect: PCM C175B. • Disconnect: PCM C175E. • Inspect the following connector pins for damage and/or corrosion, PCM C175B-32, circuit 1816 (YE/LB) and PCM C175E-5, circuit 1817 (YE) and the generator. • **Are the connectors OK?**	**Yes** INSTALL a new PCM. REFER to Section 303-14 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **No** REPAIR the affected circuit(s). CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

Pinpoint Test E: DTC P065B — Generator Control Circuit Range/Performance

Refer to Wiring Diagrams Cell 12 , Charging System for schematic and connector information.

Normal Operation

The PCM monitors the generator output via the GENMON circuit. The signal that is monitored by the PCM on the GENMON circuit is a controlled frequency range. If the signal is outside of this prescribed range, the PCM will be unable to read the signal. When the engine rises above approximately 2,000 rpm, the generator will default to a steady voltage of approximately 13.5 volts and the PCM will send a request to the Instrument Cluster (IC) to illuminate the charging system warning indicator lamp.

- DTC P065B Generator Control Circuit Range/Performance — If the input frequency was continuously less than 80 Hz or more than 200 Hz the PCM will set this DTC.

This pinpoint test is intended to diagnose the following:
- Wiring, terminals or connectors
- Generator
- PCM

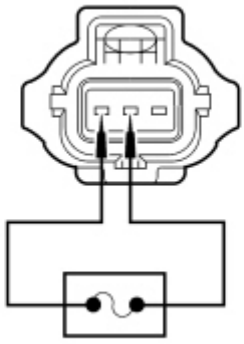
PINPOINT TEST E: DTC P065B — GENERATOR CONTROL CIRCUIT RANGE/PERFORMANCE

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 • Carry out the Battery — Condition Test to determine if the battery can hold a charge and is OK for use. Refer to Section 414-01 . • **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 PCM GENERATOR MONITOR FREQUENCY (GENMON_HZ) PID	

• 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 (GENVDSD).
  ▪ Generator Monitor Frequency (GENMON_HZ).
• Monitor the GENMON_HZ PID.
• **Is the PID below 80 Hz or above 200 Hz?**
	Yes
	GO to E3 .
	
	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.

E3 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 E5 . **No** GO to E4 .
E4 CHECK GENERATOR CIRCUITRY	
• Ignition OFF. • ***NOTICE:*** **Care must be taken when back probing the connector to prevent damage to the weather pack insulator.** • With the PCM connected, connect a fused jumper wire between PCM C175B-5, circuit 1817 (YE) and ground by carefully back probing the PCM. • Start the engine. • Monitor the GENMON_HZ PID. • **Does the PID read 0 Hz?**	**Yes** INSPECT the harness for wire to wire shorts or insulation chaffing, mis-pinned connectors and correct wire colors and REPAIR generator circuit 1817 (YE) as needed. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **No** INSTALL a new PCM. REFER to Section 303-14 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.
E5 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 1817 (YE), harness side and generator C102A-2, circuit 1816 (YE/LB), harness side.  N0074142 • Start the engine. • With the engine at idle, set the output state control GENVDSD PID to 14 volts.	**Yes** INSTALL a new generator. REFER to Generator — 4.0L SOHC , Generator — 4.6L (3V) or Generator — 5.4L (4V) in this section. CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation. **No** INSTALL a new PCM. REFER to Section 303-14 . CLEAR the DTCs. REPEAT the self-test. TEST the system for normal operation.

• Monitor the GENMON_HZ PID. • **Does the GENMON_HZ PID read between 120-130 Hz?**	

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 2 sources of generator noise: bearing noise and electrical fault noise. 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:

- Accessory drive 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. • **Is the accessory drive OK?**	**Yes** GO to F2 . **No** REPAIR as necessary. REFER to Section 303-05 for diagnosis and testing of the 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 MECHANICAL 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 — 4.0L SOHC , Generator — 4.6L (3V) or Generator — 5.4L (4V) procedure 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 audio unit 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 will self-excite. 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 after market 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 audio unit to a station where the interference is present. • Ignition OFF. • Disconnect: Generator C102B. • Start the engine and allow the engine to idle, determine if the interference is still present. • **Is the interference present with the generator disconnected?**	**Yes** REFER to Section 415-00 for diagnosis and testing of the in-vehicle entertainment system. **No** INSTALL a new generator. REFER to Generator — 4.0L SOHC , Generator — 4.6L (3V) or Generator — 5.4L (4V) in this section. TEST the system for normal operation.