

jump started or the battery has been recently charged. 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 and Fault Conditions

With the engine running, the charging system supplies voltage to the battery and the vehicle electrical system through the high current BJB and 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.

Diagnostic Trouble Code (DTC) Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0563	System Voltage High	This DTC sets in the PCM when the PCM detects voltage from the charging system greater than 15.9-volts with vehicle speed 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.

Possible Sources

- Battery
- Generator
- Engine, generator or battery ground
- PCM
- Wiring, terminals or connectors

Visual Inspection and Diagnostic Pre-checks

- Inspect BJB fuse 38 (10A).
- Inspect grounds G105, G106, and G107 for loose, damaged or corroded connections.
- Inspect the high current BJB for loose or corroded connections.

DIAGNOSIS AND TESTING > CHARGING SYSTEM - 3.5L DURATEC (209KW/284PS)/3.5L ECOBOOST (209KW/284PS)/5.0L 32V TI-VCT > PINPOINT TESTS > PINPOINT TEST A : SYSTEM VOLTAGE HIGH > 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.

A1 PERFORM INSPECTION AND VERIFICATION

Perform Inspection and Verification .

Was an obvious cause for an observed or reported concern found?

Yes	CORRECT the cause as necessary.
No	GO to A2

A2 RETRIEVE THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

Ignition ON.

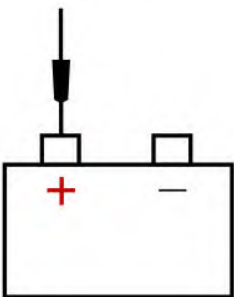
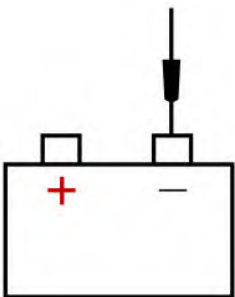
Using a diagnostic scan tool, perform the PCM self-test.

Is DTC P0620, P0625 or P0626 present?

Yes	For DTC P0620, GO to Pinpoint Test F For Diagnostic Trouble Codes (DTCs) P0625 and P0626, GO to Pinpoint Test G
No	GO to A3

A3 COMPARE THE GENERATOR VOLTAGE DESIRED (GENVDSD) PID (PARAMETER IDENTIFICATION) WITH BATTERY VOLTAGE

With the engine running at idle, measure and record:

Positive Lead	Measurement / Action	Negative Lead
 E148840		 E148841

Using a diagnostic scan tool, view the PCM PID GENVDSD.

Is the recorded battery voltage within ± 0.5 volt of the PID?

Yes	GO to A6
No	GO to A4

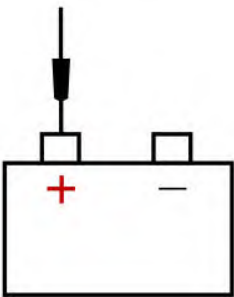
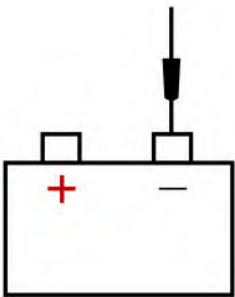
A4 MEASURE THE "A" SENSE VOLTAGE

Ignition OFF.

Disconnect Generator C102A .

Ignition ON.

Measure and record:

Positive Lead	Measurement / Action	Negative Lead
 E148840	 E148841	 E148841

Measure:

Positive Lead	Measurement / Action	Negative Lead
C102A-3		Ground

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

Yes	GO to A5
No	VERIFY the BJB fuse 38 (10A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the SYSTEM WIRING DIAGRAMS article to identify the possible causes of the circuit short.

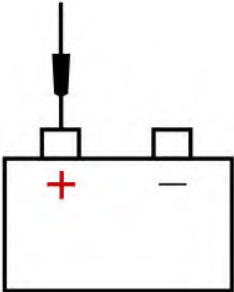
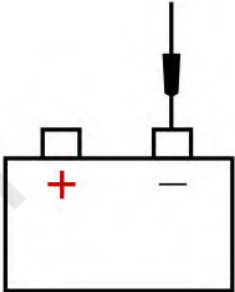
A5 "A" SENSE CIRCUIT LOAD TEST

 **NOTE:** The following step uses a test light to simulate normal circuit loads. Use only the test light recommended. 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.

Ignition ON.

Measure and record:

Positive Lead	Measurement / Action	Negative Lead
 E148840		 E148841

Connect the load to each circuit and measure:

Positive Lead	Measurement / Action	Negative Lead
C102A-3		Ground

Is the "A" sense voltage within ± 0.5 volt of the recorded battery voltage?

Yes	GO to A6
No	VERIFY the BJB fuse 38 (10A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the SYSTEM WIRING DIAGRAMS article to identify the possible causes of the circuit short.

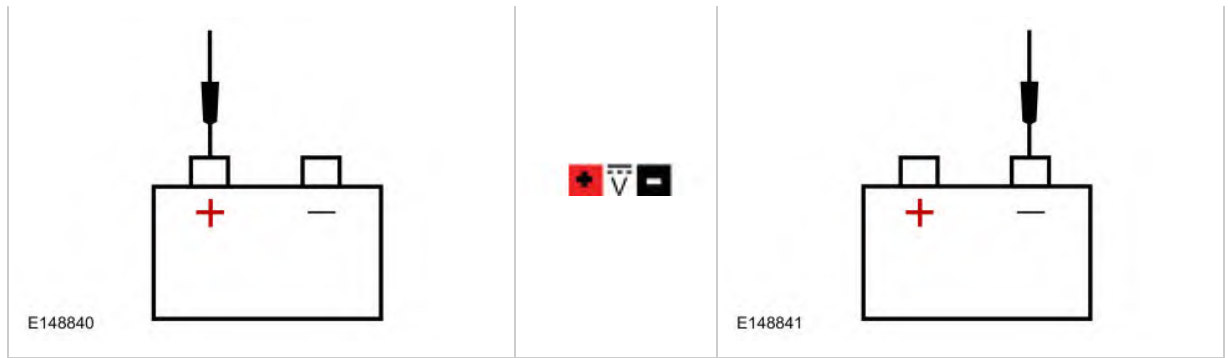
A6 CHECK FOR INTERMITTENT IN THE REGULATOR CIRCUIT

Connect Generator C102A .

Start the engine.

With the engine running at idle, headlamps on and heater blower on high, measure:

Positive Lead	Measurement / Action	Negative Lead



Perform a wiggle test on the generator wiring and following connections while measuring voltage:

Generator C102A

Inline C146

Does battery voltage change more than 0.5 volt?

Yes	INSPECT and REPAIR any corrosion in the generator B+ circuit, positive battery cable and C102A connections.
No	GO to A7

A7 CHECK THE VOLTAGE DROP IN THE VEHICLE GROUNDS

Connect Generator C102A .

Start the engine.

With the engine running at idle, headlamps on and heater blower on high, measure:

Positive Lead	Measurement / Action	Negative Lead
Generator case		E148841

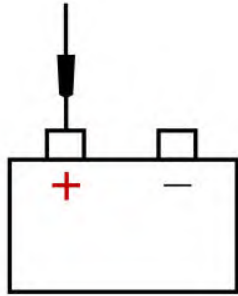
Is the voltage drop less than 0.5 volt?

Yes	GO to A8
No	INSPECT and REPAIR the engine ground, generator ground or the battery ground for corrosion.

A8 CHECK THE GENERATOR OUTPUT

Increase the engine rpm until the generator starts to generate output.

With the engine running, measure and record:

Positive Lead	Measurement / Action	Negative Lead
 E148840		Ground

Is the voltage above 15.2-volts?

Yes	INSTALL a new generator. With 3.5L Duratec engine, Refer to: Generator - 3.5L Duratec (209kW/284PS) . With 3.5L EcoBoost engine, Refer to: Generator - 3.5L EcoBoost (272kW/370PS) . With 5.0L engine, Refer to: Generator - 5.0L 32V Ti-VCT .
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No	GO to A9
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A9 MONITOR THE GENERATOR COMMAND (GENCMD), GENERATOR MONITOR (GENMON) AND GENERATOR VOLTAGE DESIRED (GENVDSD) PARAMETER IDENTIFICATIONS (PIDS)

Ignition OFF.

Disconnect Generator C102A .

Connect a fused jumper wire:

Positive Lead	Measurement / Action	Negative Lead
C102A-1		C102A-2

Start the engine.

Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).

Using the active command, set the PID GENVDSD to 14-volts.

Monitor the PCM Parameter Identifications (PIDs) GENMON and GENVDSD.

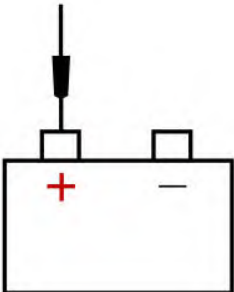
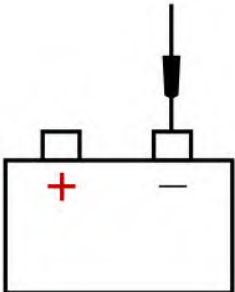
Do the Parameter Identifications (PIDs) read within 5% of each other?

Yes	GO to A10
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No	GO to A13
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A10 COMPARE THE PCM (POWERTRAIN CONTROL MODULE) SUPPLY VOLTAGE PID (PARAMETER IDENTIFICATION) TO BATTERY VOLTAGE

With the engine running at idle, measure and record:

Positive Lead	Measurement / Action	Negative Lead
 E148840		 E148841

Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).

Monitor the PCM PID VPWR.

Does the PID accurately display battery voltage within ± 0.5 volt of the recorded battery voltage?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new generator. With 3.5L Duratec engine, Refer to: Generator - 3.5L Duratec (209kW/284PS) . With 3.5L EcoBoost engine, Refer to: Generator - 3.5L EcoBoost (272kW/370PS) . With 5.0L engine, Refer to: Generator - 5.0L 32V Ti-VCT .
No	GO to A11

A11 CHECK PCM (POWERTRAIN CONTROL MODULE) SUPPLY VOLTAGE CIRCUITS

Turn the headlamps and heater blower off.

Ignition OFF.

Remove the fused jumper wire.

Disconnect BJB PCM power relay.

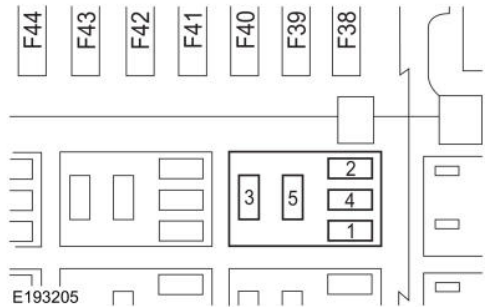
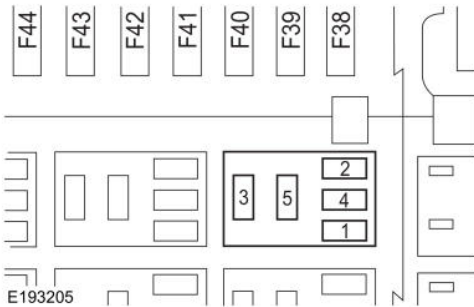
Disconnect PCM C175B (3.5L EcoBoost engine).

Disconnect PCM C1551B (3.5L Duratec engine).

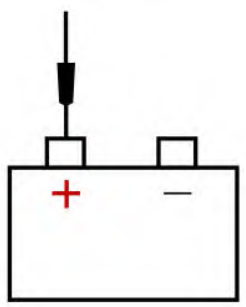
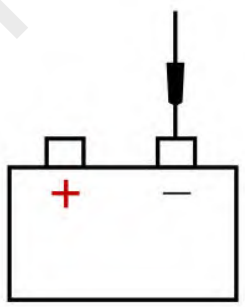
Disconnect PCM C1381B (5.0L engine).

Connect a fused jumper wire:

Positive Lead	Measurement	Negative Lead
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	/ Action	
 BJB PCM Relay pin 3		 BJB PCM Relay pin 5

Measure and record:

Positive Lead	Measurement / Action	Negative Lead
 E148840		 E148841

 **NOTE:** The following step will load test the circuit. A headlamp bulb would be an effective load. To avoid connector terminal damage, use the Flex Probe Kit for connector connections.

Connect the load to a suitable ground connection.

With the 3.5L EcoBoost engine, connect the load to each circuit and measure:

Positive Lead	Measurement / Action	Negative Lead
C175B-101		Ground
C175B-102		Ground
C175B-103		Ground

With the 3.5L Duratec engine, connect the load to each circuit and measure:

Positive Lead	Measurement / Action	Negative Lead
C1551B-97		Ground
C1551B-99		Ground

With the 5.0L engine, connect the load to each circuit and measure:

Positive Lead	Measurement / Action	Negative Lead
C1381B-97		Ground
C1381B-99		Ground

Are the voltages within 0.5 volt of the recorded battery voltage?

Yes	REMOVE the fused jumper wire and GO to A12
No	REPAIR the affected circuit(s).

A12 CHECK PCM (POWERTRAIN CONTROL MODULE) GROUND FOR HIGH RESISTANCE

 **NOTE:** The following step will load test the circuit. A headlamp bulb would be an effective load. To avoid connector terminal damage, use the Flex Probe Kit for connector connections.

Connect the load to a suitable 12 volt power connection.

With the 3.5L EcoBoost engine, connect the load to each circuit and measure:

Positive Lead	Measurement / Action	Negative Lead
C175B-96		Ground
C175B-97		Ground
C175B-98		Ground
C175B-99		Ground

With the 3.5L Duratec engine, connect the load to each circuit and measure:

Positive Lead	Measurement / Action	Negative Lead
C1551B-5		Ground
C1551B-100		Ground
C1551B-102		Ground
C1551B-103		Ground

With the 5.0L engine, connect the load to each circuit and measure:

Positive Lead	Measurement / Action	Negative Lead
C1381B-5		Ground