Computers and Control Systems: Pinpoint Tests
Test HY: Generator/Regulator System

HY: GENERATOR / REGULATOR SYSTEM

HY1 DTC P0620, P0622, P1244, P1245, P1246: VERIFY GENERATOR DRIVE FUNCTION

- CHECK that the output cable is clean at the generator/regulator assembly.
- CHECK that the output cable nut and battery sense line is tightened at the generator/regulator assembly.
- CHECK the generator drive belt condition.
- CHECK the generator drive belt tension.
- Start the engine, verify generator is turning.

Does the generator turn?

Yes	No
REPAIR the output cable and nut as necessary. GO to HY2 .	KEY OFF. REFER to Charging System.

HY2 CHECK THE GENERATOR CHARGING VOLTAGE

- All accessories OFF (no load on engine).
- Key ON Engine RUN.
- Ensure that the engine is idling.
- Connect a voltmeter across the battery terminals.
- Accelerate the engine speed to 2,000 RPM and observe the voltage reading across the battery terminals.

Is the battery voltage between 13 and 16 volts?

Yes	No
GO to HY4 .	GO to HY3 .

HY3 CHECK GENERATOR OUTPUT TO THE BATTERY

- Ensure that the engine is idling.
- Measure the voltage between the generator output cable and the generator outer shell (for ground) at the generator/regulator assembly.

Is the voltage reading between 12.5 and 15 volts?

Yes	No
KEY OFF. REPAIR open circuit. CLEAR the DTCs and REPEAT Self-Test.	KEY OFF. GO to HY4 .

HY4 CHECK THE BATTERY SENSE VOLTAGE AT THE BATTERY

- Battery output cable at generator/regulator assembly connected.
- The battery terminals are connected.
- Disconnect the generator/regulator harness connector.
- Key ON Engine OFF.
- Measure the battery sense voltage from the B+ pin at the generator harness connector and GND.

Is the battery sense voltage within plus or minus 0.5 volt of the battery voltage?

Yes	No
KEY OFF. **For LS, and** **Thunderbird** GO to HY9 . **For Focus,** **Escape 2.0L,** **Taurus,** **Sable,** **Town Car,** **F-150,** **Crown Victoria,** **Grand Marquis,** **Freestar/Monterey, and** **Marauder** GO to HY7 . **For Aviator,** **Explorer, and** **Mountaineer** GO to HY5 . **For Expedition, and** **Navigator** GO to HY6 .	KEY OFF. REPAIR the open battery sense (B+) circuit.

HY5 CHECK THE ILC CIRCUIT THROUGH THE PCM

- PCM connected.
- Measure the resistance between:

(+)GEN-REG Connector, Harness Side	(-)
ILC	Ground

Is the resistance between 100 ohms - 150 ohms?

Yes	No
KEY OFF. REFER to Charging System.	KEY OFF. GO to HY9 .

HY6 CHECK THE ILC CIRCUIT THROUGH THE PCM

- PCM connected.
- Measure the resistance between:

(+)12V vehicle battery	(-)GEN-REG Connector, Harness Side
Positive terminal	ILC

Is the resistance between 1.55K ohms - 1.65K ohms?

Yes	No
KEY OFF. REFER to Charging System.	KEY OFF. GO to HY9 .

HY7 CHECK THE GENERATOR/REGULATOR VOLTAGE OUTPUT

- Reconnect the generator/regulator harness connector.
- Key ON Engine RUN.
- Accelerate the engine speed to 2,000 RPM and then back to idle.
- Access the VOLTDSD PID using a scan tool.
- Record the PID voltage.
- Measure the voltage between the generator output cable and the generator outer shell (for ground) at the generator/regulator assembly.

Is the voltage reading taken at the generator/regulator output cable within plus or minus 0.5 volt of the VOLTDSD PID reading?

Yes	No
KEY OFF. GO to HY8 .	KEY OFF. GO to HY10 .

HY8 CHECK THE GENERATOR MONITOR SIGNAL

- Reconnect the PCM.
- Reconnect the generator/regulator harness connector.
- Key ON Engine RUN.
- Ensure that the engine is idling.
- Access the PCM-GFS PID.

Is the duty cycle between 5% - 97%?

Yes	No
KEY OFF. The generator/regulator function is OK. Go To Pinpoint Test Z for intermittent circuit failure diagnosis. GO to Z1 .	KEY OFF. GO to HY10 .

HY9 CHECK THE ILC, ALI AND ALF CIRCUITS FOR A SHORT TO PWR

Note: The voltage measurements in this test step are to be taken between the PCM signal harness pin and chassis ground. LS and Thunderbird have ALI and ILC circuits. Expedition/Navigator has ALF and ILC circuits. Aviator and Explorer/Mountaineer only have an ILC circuit.

- Disconnect the generator/regulator harness connector.
- Disconnect the PCM.
- Key ON Engine OFF.
- Measure the voltage between:

(+)GEN-REG Connector, Harness Side	(-)
ILC	Ground
ALI	Ground
ALF	Ground

Are the voltages less than 0.5 V?

Yes	No
KEY OFF. GO to HY11 .	KEY OFF. REPAIR short circuit to PWR.

HY10 CHECK THE GEN-MON AND GEN-COM CIRCUITS FOR A SHORT TO PWR

Note: The voltage measurements in this test step are to be taken between the PCM signal harness pin and chassis ground.

- Disconnect the generator/regulator harness connector.
- Disconnect the PCM.
- Key ON Engine OFF.
- Measure the voltage between:

(+)GEN-REG Connector, Harness Side	(-)
GEN-MON	Ground
GEN-COM	Ground

Are the voltages less than 0.5 V?

Yes	No
KEY OFF. GO to HY12 .	KEY OFF. REPAIR short circuit to PWR.

HY11 CHECK THE ILC, ALI AND ALF CIRCUITS FOR A SHORT TO GND

Note: The resistance measurements in this test step are to be taken between the PCM signal harness pin and chassis ground. LS and Thunderbird have ALI and ILC circuits. Expedition/Navigator has ALF and ILC circuits. Aviator and Explorer/Mountaineer only have an ILC circuit.

- Measure the resistance between:

(+)GEN-REG Connector, Harness Side	(-)
ILC	Ground
ALI	Ground
ALF	Ground

Are the resistances greater than 10K ohms?

Yes	No
For LS, and Thunderbird GO to HY17 . **For Aviator, Explorer, and Mountaineer** GO to HY15 . **For Expedition, and Navigator** GO to HY15 .	REPAIR short circuit to GND.

HY12 CHECK THE GEN-MON AND GEN-COM CIRCUITS FOR A SHORT TO GND

Note: The resistance measurements in this test step are to be taken between the PCM signal harness pin and chassis ground.

- Measure the resistance between:

(+)GEN-REG Connector, Harness Side	(-)
GEN-MON	Ground
GEN-COM	Ground

Are the resistances greater than 10K ohms?

Yes	No
GO to HY13 .	REPAIR short circuit to GND.

HY13 CHECK THE GEN-MON CIRCUIT SHORT TO GEN-COM CIRCUIT IN THE HARNESS

- Measure the resistance between:

(+)GEN-REG Connector, Harness Side	(-)GEN-REG Connector, Harness Side
GEN-MON	GEN-COM

Is the resistance greater than 10K ohms?

Yes	No
GO to HY14 .	REPAIR short circuit.

Test HY12 - HY13

HY14 CHECK THE GEN-MON AND GEN-COM CIRCUITS FOR AN OPEN

- Measure the resistance between:

(+)GEN-REG Connector, Harness Side	(-)PCM Connector, Harness Side
GEN-MON	GEN-MON
GEN-COM	GEN-COM

Are the resistances less than 5 ohms?

Yes	No
GO to HY16 .	REPAIR open circuit.

HY15 CHECK THE ALF AND ILC CIRCUITS FOR AN OPEN

Note: Expedition/Navigator has ALF and ILC circuits. Aviator and Explorer/Mountaineer only have an ILC circuit.

- Measure the resistance between:

(+)PCM Connector, Harness Side	(-)GEN-REG Connector, Harness Side
ILC	ILC
ALF	ALF

Are the resistances less than 5 ohms?

Yes	No
REPLACE the PCM. REFER to Flash Electrically Erasable Programmable Read Only Memory (EEPROM)).	REPAIR open circuit.

HY16 CHECK THE GENERATOR MONITOR SIGNAL

- Reconnect the PCM.
- Reconnect the generator/regulator harness connector.
- Key ON Engine RUN.
- Ensure that the engine is idling.
- Access the PCM-GFS PID.

Is the duty cycle between 5% - 97%?

Yes	No
KEY OFF. REPLACE the PCM. REFER to Flash Electrically Erasable Programmable Read Only Memory (EEPROM)).	KEY OFF. REPLACE the generator/regulator assembly

HY17 CHECK THE ALI AND ILC CIRCUITS FOR AN OPEN

Note: LS and Thunderbird have ALI and ILC circuits.

- Measure the resistance between:

(+)PCM Connector, Harness Side	(-)GEN-REG Connector, Harness Side
ALI	ALI
ILC	ILC

Are the resistances less than 5 ohms?

Yes	No
REFER to Charging System.	REPAIR open circuit.

Test HY17