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DESCRIPTION & OPERATION

GENERATOR

The AD-244 generator is non-repairable. The generator feature the following major components:

- The delta stator
- The rectifier bridge
- The rotor with slip rings and brushes
- A conventional pulley
- Dual internal fans
- A voltage regulator

The pulley and the fan cool the slip ring and the frame. The AD stands for Air-cooled Dual internal fan; the 2 is an electrical design designator; the 44 denotes the outside diameter of the stator laminations in millimeters, over 100 millimeters. The generator is rated at 150 amperes. The generator features permanently lubricated bearings. Service should only include the tightening of mounting components. Otherwise, the generator is replaced as a complete unit.

REGULATOR

The voltage regulator controls the field current of the rotor in order to limit system voltage. The regulator switches the current on and off at a rate of 400 cycles per second in order to perform the following functions:

- Radio noise control
- Obtain the correct average current needed for proper system voltage control

At high speeds, the on-time may be 10 percent with the off-time at 90 percent. At low speeds, the on-time may be 90 percent and the off-time 10 percent.

CHARGING SYSTEM INDICATOR

Battery

The Instrumental Panel Cluster (IPC) illuminates the battery indicator when the following occurs:

- The Powertrain Control Module (PCM) detects that the generator output is less than 11 volts or greater than 16 volts. The IPC receives a class 2 message from the PCM requesting illumination.
- The IPC determines that the system voltage is less than 11 volts or greater than 16 volts. The IPC receives a class 2 message from the Body Control Module (BCM) indicating the system voltage.
- The IPC performs the displays test at the start of each ignition cycle. The indicator illuminates for

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approximately 3 seconds.

• The ignition is on, with the engine off.

BATTERY NOT CHARGING

The IPC illuminates the battery not charging indicator in the driver information center when the following occurs:

- The PCM detects that the generator output is less than 11 volts or greater than 16 volts. The IPC receives a class 2 message from the PCM requesting illumination.
- The IPC determines that the system voltage is less than 11 volts or greater than 16 volts. The IPC receives a class 2 message from the body control module (BCM) indicating the system voltage.

COMPONENT LOCATION

Information is not available from the manufacturer.

TROUBLE SHOOTING

Information is not available from the manufacturer.

SELF- DIAGNOSTIC SYSTEM

DIAGNOSTIC STARTING POINT

4.2L

For the diagnostic starting point, see **<u>DIAGNOSTIC STARTING POINT -- ENGINE CONTROLS</u>** in SELF-DIAGNOSTICS - 4.2L article in ENGINE PERFORMANCE.

5.3L

For the diagnostic starting point, see **<u>DIAGNOSTIC STARTING POINT -- ENGINE CONTROLS</u>** in SELF-DIAGNOSTICS - 5.3L article in ENGINE PERFORMANCE.

DIAGNOSTIC SYSTEM CHECK

4.2L

For the diagnostic system check, see **<u>DIAGNOSTIC SYSTEM CHECK -- ENGINE CONTROLS</u>** in SELF-DIAGNOSTICS - 4.2L article in ENGINE PERFORMANCE.

5.3L

For the diagnostic system check, see **<u>DIAGNOSTIC SYSTEM CHECK -- ENGINE CONTROLS</u>** in SELF-DIAGNOSTICS - 5.3L article in ENGINE PERFORMANCE.

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DIAGNOSTIC TROUBLE CODE DEFINITIONS

DIAGNOSTIC TROUBLE CODE DEFINITIONS

DTC	Description
<u>P0562</u>	Low System Voltage
<u>P0563</u>	High System Voltage
<u>P0621</u>	Generator "L" Terminal Circuit
<u>P0622</u>	Generator Field Circuit
<u>P1637</u>	High Turn On Signal Circuit Voltage
<u>P1638</u>	Out Of Range PWM Signal

CONNECTOR IDENTIFICATION

POWERTRAIN CONTROL MODULE

For Powertrain Control Module (PCM), see **<u>POWERTRAIN CONTROL MODULE PIN</u> <u>IDENTIFICATION</u>** in PIN VOLTAGE CHARTS article in ENGINE PERFORMANCE.

DIAGNOSTIC TESTS

DTC P0562: LOW SYSTEM VOLTAGE

Description

The PCM monitors the system voltage to ensure that the voltage stays within the proper range. If the PCM detects an excessively low system voltage, DTC P0562 will set. When the charging system detects a fault, the IPC displays a message or the charge indicator will light.

Conditions For Running DTC

- Engine run time more than 20 seconds and above 1200 RPM.
- Vehicle speed above 5 mph (8 km/h).

Conditions for Setting the DTC

The PCM detects an improper voltage below 11 volts for 5 seconds.

Action Taken When DTC Sets

- The PCM stores the DTC information into memory when the diagnostic runs and fails.
- The PCM will store conditions which were present when the DTC set as failure records data only.
- The PCM disables most outputs.
- The transmission defaults to a predetermined gear.
- The Torque Converter Clutch (TCC) operation is inhibited.

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- The IPC displays a message.
- The Malfunction Indicator Lamp (MIL) will not illuminate.

Conditions For Clearing DTC

- The conditions for setting the DTC are no longer present.
- A history DTC will clear after 40 malfunction free ignition cycles.
- The PCM receives the clear code command from the scan tool.

Diagnostic Procedure

- 1. Did you perform the Diagnostic System Check? If yes, go to next step. If no, see **<u>DIAGNOSTIC</u>** <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM.
- 2. With the scan tool monitor the ignition 1 signal voltage in the PCM data list. Does the scan tool display ignition 1 voltage greater than 11 volt? If yes, go to step 4 . If no, go to next step.
- 3. Test the ignition feed circuit to the PCM for high resistance or open. Did you find and correct the condition? If yes, go to step 7 . If no, go to step 5 .
- 4. Inspect for poor connections at the PCM. If you find a poor connection, repair the condition as necessary. Did you find and correct the condition? If yes, go to step 7 . If no, go to step 6 .
- 5. Repair the ignition feed circuit to the PCM for an open or a short to ground. Is the action complete? If yes, go to step 7.
- 6. Replace the PCM. See **<u>POWERTRAIN CONTROL MODULE</u>** in REMOVAL INSTALLATION article in ENGINE PERFORMANCE. Did you compete the replacement? If yes, go to next step.
- Select the DTC option and the clear DTC Information option using the scan tool. See <u>CONDITIONS</u> <u>FOR CLEARING DTC</u>. Operate the vehicle within the <u>CONDITIONS FOR RUNNING DTC</u> as specified in the supporting text, if applicable. Does the DTC reset? If yes, go to step 2. If no, the system is OK.

DTC P0563: HIGH SYSTEM VOLTAGE

Description

The PCM monitors the system voltage to ensure that the voltage stays within the proper range. If the PCM detects an excessively high system voltage, DTC P0563 will set. A high voltage condition may cause a stalling condition or other driveability concerns.

Conditions For Running DTC

- Engine run time more than 20 seconds and above 1200 RPM.
- Vehicle speed above 5 mph (8 km/h).

Conditions for Setting the DTC

• The PCM senses the system voltage is above 19 volts.

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• All of the conditions are present for 5 seconds.

Action Taken When DTC Sets

- The PCM stores the DTC P0563 in the PCM memory when the diagnostic runs and fails.
- The PCM will store operating conditions at the time the diagnostic fails. The PCM stores this information in failure records.
- The PCM disables most outputs.
- The transmission defaults to a predetermined gear.
- The TCC operation is inhibited.
- The IPC displays a message.
- The MIL will not illuminate.

Conditions For Clearing DTC

- The conditions for setting the DTC are no longer present.
- A history DTC will clear after 40 malfunction free ignition cycles.
- The PCM receives the clear code command from the scan tool.

Diagnostic Procedure

- 1. Did you perform the Diagnostic System Check? If yes, go to next step. If no, see **<u>DIAGNOSTIC</u>** <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM.
- 2. Turn OFF all the accessories. Measure the battery voltage at the battery using the DMM. Operate the engine speed above 2000 RPM. Is the battery voltage less than 19 volt? If yes, go to step 4. If no, go to next step.
- 3. Replace the generator. See <u>GENERATOR</u> under REMOVAL & INSTALLATION. Is the action complete? If yes, go to step 5.
- 4. Replace the PCM. See <u>POWERTRAIN CONTROL MODULE</u> in REMOVAL & INSTALLATION article in ENGINE PERFORMANCE. Did you compete the replacement? If yes, go to next step.
- Select the DTC option and the clear DTC information option using the scan tool. See <u>CONDITIONS</u> <u>FOR CLEARING DTC</u>. Operate the vehicle within the <u>CONDITIONS FOR RUNNING DTC</u> as specified in the supporting text, if applicable. Does the DTC reset? If yes, go to step 2. If no, the system is OK.

DTC P0621: GENERATOR "L" TERMINAL CIRCUIT

Description

The PCM uses the generator turn on signal circuit to control the load of the generator on the engine. A high side driver in the PCM applies a voltage to the voltage regulator. This signals the voltage regulator to turn the field circuit ON and OFF. When the PCM turns ON the high side driver, the voltage regulator turns ON the field circuit. When the PCM turns OFF the high side driver, the voltage regulator turns OFF the field circuit. The PCM monitors the state of the generator turn on signal circuit. The PCM should detect a low generator turn on

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signal circuit voltage when the key is ON and the engine is OFF, or when the charging system malfunctions. With the engine running, the PCM should detect a high generator turn on signal circuit. The PCM performs key ON and RUN tests to determine the status of the generator turn on signal circuit. During the key ON test, if the PCM detects a high generator turn on signal circuit voltage, DTC P0621 will set. DTC P0621 will also set if, during the RUN test, the PCM detects a low generator turn on signal circuit. When the DTC sets, the PCM will send a class 2 serial data message to the IPC to illuminate the charge indicator.

Conditions For Running DTC

- The ignition is ON.
- The engine speed is more than 1000 RPM.

Conditions for Setting the DTC

- The PCM detects the GEN L-Terminal active with the ignition ON.
- The PCM detects the GEN L-Terminal inactive with the engine operating.
- The above conditions are present for 6 seconds.

Action Taken When DTC Sets

- The PCM will store operating conditions presents when the DTC set as failure records.
- The IPC displays a message.
- The MIL will not illuminate.

Conditions For Clearing DTC

- The conditions for setting the DTC are no longer present.
- A history DTC will clear after 40 malfunction free ignition cycles.
- The PCM receives the clear code command from the scan tool.

Diagnostic Procedure

- 1. Did you perform the Diagnostic System Check? If yes, go to next step. If no, see **<u>DIAGNOSTIC</u>** <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM.
- 2. Install a scan tool. Start the engine. With a scant tool, monitor the DTC information for DTC P0621 in Engine Electrical. Does the scan tool indicate that DTC P0621 has passed? If yes, there is a possible poor connection. Perform DIAGNOSTIC SYSTEM TEST. If no, go to next step.
- 3. Test the generator turn on signal circuit for a short or open. Did you find and correct the condition? If yes, go to step 6. If no, go to next step.
- 4. Inspect for poor connections at the harness connector of the PCM. Did you find and correct the condition? If yes, go to step 6. If no, go to next step.
- 5. Replace the PCM. See <u>POWERTRAIN CONTROL MODULE</u> in REMOVAL & INSTALLATION article in ENGINE PERFORMANCE. Did you complete the replacement? If yes, go to next step.
- 6. Review and record the scan tool fail records data. Clear DTC codes. See CONDITIONS FOR

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<u>CLEARING DTC</u>. Operate the vehicle within the fail records conditions as noted. Using a scan tool, monitor the specific DTC information for this DTC. Does the scan tool indicate that this DTC failed this ignition? If yes, go to step 2. If no, the system is OK.

DTC P0622: GENERATOR FIELD CIRCUIT

Description

The PCM uses the generator field duty cycle signal circuit to monitor the duty cycle of the generator. The generator field duty cycle signal circuit connects to the high side of the field winding in the generator. A Pulse Width Modulated (PWM) high side driver in the voltage regulator turns the field winding ON and OFF. The PCM uses the PWM signal input to determine the generator load on the engine. This allows the PCM to adjust the idle speed to compensate for high electrical loads.

The PCM monitors the state of the generator field duty cycle signal circuit. When the key is in the RUN position and the engine is OFF, the PCM should detect a duty cycle near 0 percent. However, when the engine is running, the duty cycle should be between 5 percent and 100 percent. The PCM monitors the PWM signal using a key ON test and a RUN test. During the tests, if the PCM detects an out of range PWM signal, DTC P0622 will set. When the DTC sets, the PCM will send a class 2 serial data message to the IPC to illuminate the charge indicator.

Conditions For Running DTC

Key ON Test:

- No generator, CKP sensors, or CMP sensor DTCs are set.
- The key is in the RUN position.
- The engine is not running.

Run Test:

- No generator, CKP sensors, or CMP sensor DTCs are set.
- The engine is less than 3000 RPM.

Conditions for Setting the DTC

- During the ignition ON test, the PCM detects a PWM signal is out of range.
- During the RUN test, the PCM detects a PWM signal less then 5 percent for more than 6 seconds.

Action Taken When DTC Sets

- The PCM stores the conditions present when the DTC set as fail records data only.
- The MIL will not illuminate.

Conditions For Clearing DTC

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- The conditions for setting the DTC are no longer present.
- A history DTC will clear after 40 malfunction free ignition cycles.
- The PCM receives the clear code command from the scan tool.

Diagnostic Procedure

- 1. Did you perform the Diagnostic System Check? If yes, go to next step. If no, see **<u>DIAGNOSTIC</u>** <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM.
- 2. Install a scan tool. Start the engine. With a scan tool, observe the GEN F Terminal parameter in the PCM data list. Does the scan tool indicate that the GEN F Terminal parameter is within specified range (The Gen F Terminal parameter range is 5-95 percent)? If yes, go to next step. If no, go to step 4.
- 3. With the scan tool, command the generator OFF. Does the GEN F Terminal equal the specified value (The Gen F Terminal parameter value is 0 percent)? If yes, there is a possible poor connection. Perform DIAGNOSTIC SYSTEM TEST. If no, go to next step.
- 4. Turn OFF the ignition. Disconnect the generator connector. Connect test lamp to battery positive voltage. Turn ON the ignition, with the engine OFF. Probe the F-Terminal in the generator connector. Observe the GEN - F Terminal signal parameter in the PCM data list. Is the GEN - F Terminal signal parameter near the specified value (The Gen - F Terminal signal parameter value is 100 percent)? If yes, test charging system output. If no, go to next step.
- 5. Test the generator field duty cycle signal circuit for a short or open. Did you find and correct the condition? If yes, go to step 8 . If no, go to next step.
- 6. Inspect for poor connections at the harness connector of the PCM. Did you find and correct the condition? If yes, go to step 8 . If no, go to next step.
- 7. Replace the PCM. See **<u>POWERTRAIN CONTROL MODULE</u>** in REMOVAL & INSTALLATION article in ENGINE PERFORMANCE. Did you complete the repair? If yes, go to next step.
- 8. Review and record the scan tool fail records data. Clear any DTCs. Operate the vehicle within the fail records conditions as noted. Using a scan tool, monitor the specific DTC info for this DTC. Does the scan tool indicate that this DTC failed this ignition? If yes, go to step 2. If no, system is OK.

DTC P1637: HIGH TURN ON SIGNAL CIRCUIT VOLTAGE

Description

The PCM uses the generator turn on signal circuit to control the load of the generator on the engine. A high side driver in the PCM applies a voltage to the voltage regulator. This signals the voltage regulator to turn the field circuit ON and OFF. When the PCM turns ON the high side driver, the voltage regulator turns ON the field circuit. When the PCM turns OFF the high side driver, the voltage regulator turns OFF the field circuit.

The PCM monitors the state of the generator turn on signal circuit. The PCM should detect a low generator turn on signal circuit voltage when the key is ON and the engine is OFF, or when the charging system malfunctions. With the engine running, the PCM should detect a high generator turn on signal circuit. The PCM performs key ON and RUN tests to determine the status of the generator turn on signal circuit. During the key ON test, if the PCM detects a high generator turn on signal circuit voltage, the DTC will set. The DTC will also set if, during the RUN test, the PCM detects a low generator turn on signal circuit. When the DTC sets, the PCM will send a class 2 serial data message to the IPC to illuminate the charge indicator.

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Conditions For Running DTC

- The ignition is ON.
- The engine speed is more than 1000 RPM.

Conditions for Setting the DTC

- The PCM detects the GEN L-Terminal active with the ignition ON.
- The PCM detects the GEN L-Terminal inactive with the engine operating.
- The above conditions are present for 6 seconds.

Action Taken When DTC Sets

- The PCM will record the operating conditions presents when the DTC set as failure records data only.
- The IPC displays a message.
- The MIL will not illuminate.

Conditions For Clearing DTC

- The conditions for setting the DTC are no longer present.
- A history DTC will clear after 40 malfunction free ignition cycles.
- The PCM receives the clear code command from the scan tool.

Diagnostic Procedure

- 1. Did you perform the Diagnostic System Check? If yes, go to next step. If no, see **<u>DIAGNOSTIC</u>** <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM.
- 2. Install a scan tool. Start the engine. With a scan tool, monitor the DTC information for DTC P1637 in engine electrical. Does the scan tool indicate that DTC P1637 has passed? If yes, there is a possible poor connection. Perform DIAGNOSTIC SYSTEM TEST. If no, go to next step.
- 3. Test the generator turn on signal circuit for a short or open. Did you find and correct the condition? If yes, go to step 6. If no, go to next step.
- 4. Inspect for poor connections at the harness connector of the PCM. Did you find and correct the condition? If yes, go to step 6. If no, go to next step.
- 5. Replace the PCM. See **<u>POWERTRAIN CONTROL MODULE</u>** in REMOVAL & INSTALLATION article in ENGINE PERFORMANCE. Is the action complete? If yes, go to next step.
- 6. Review and record the scan tool fail records data. Clear any DTCs. Operate the vehicle within the fail records conditions as noted. Using a scan tool, monitor the specific DTC information for this DTC. Does the scan tool indicate that this DTC failed this ignition? If yes, go to step 2 . If no, system is OK.

DTC P1638: OUT OF RANGE PWM SIGNAL

Description

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The PCM uses the generator field duty cycle signal circuit to monitor the duty cycle of the generator. The generator field duty cycle signal circuit connects to the high side of the field winding in the generator. A pulse width modulated PWM high side driver in the voltage regulator turns the field winding ON and OFF. The PCM uses the PWM signal input to determine the generator load on the engine. This allows the PCM to adjust the idle speed to compensate for high electrical loads.

The PCM monitors the state of the generator field duty cycle signal circuit. When the key is in the RUN position and the engine is OFF, the PCM should detect a duty cycle near 0 percent. However, when the engine is running, the duty cycle should be between 5 percent and 100 percent. The PCM monitors the PWM signal using a key ON test and a RUN test. During the tests, if the PCM detects an out of range PWM signal, DTC P1638 will set. When the DTC sets, the PCM will send a class 2 serial data message to the IPC to illuminate the charge indicator.

Conditions For Running DTC

Key On Test:

- No generator, CKP sensors, or CMP sensor DTCs are set.
- The key is in the RUN position.
- The engine is not running.

Run Test:

- No generator, CKP sensors, or CMP sensor DTCs are set.
- The engine is less than 3000 RPM.

Conditions for Setting the DTC

- During the ignition ON test, the PCM detects a PWM signal is out of range.
- During the RUN test, the PCM detects a PWM signal less then 5 percent for more than 6 seconds.

Conditions For Clearing DTC

- A last test failed, or current DTC, clears when the diagnostic runs and does not fail.
- A history DTC will clear after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Use a scan tool in order to clear the DTC. The conditions for setting the DTC are no longer present.

Diagnostic Aids

- DTCs P1637 and P1638 may set at the same time depending on the failure.
- Use a scan tool in order to diagnosis the generator circuits. The scan tool should display inactive for the L terminal and 10-40 percent for the F terminal when the ignition is ON. When the engine is operating, the display should indicate that the L terminal is active and the F terminal is more than 10 percent.
- A generator fault, such as a shorted output diode, malfunctioning regulator, open or shorted rotor, or open

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sense lead or battery feed may cause a low battery charge. Test charging system output.

Diagnostic Procedure

- 1. Did you perform the Diagnostic System Check? If yes, go to next step. If no, see **<u>DIAGNOSTIC</u>** <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM.
- 2. Install a scan tool. Start the engine. With a scan tool, observe the GEN F Terminal parameter in the PCM data list. Does the scan tool indicate that the GEN F Terminal parameter is within the specified range (The Gen F Terminal parameter range is 5-95 percent)? If yes, there is a possible poor connection. Perform DIAGNOSTIC SYSTEM TEST. If no, go to next step.
- 3. Turn ON the ignition, leaving the engine OFF. Connect a test lamp to battery positive voltage and repeatedly probe the generator field duty cycle signal circuit in the harness connector while monitoring the generator PWM on the scan tool. Is the Generator PWM display affected? If yes, go to step 8. If no, go to step 7.
- 4. Test the generator field duty cycle signal circuit for a short or open. Did you find and correct the condition? If yes, go to step 8 . If no, go to step 6 .
- 5. Inspect for poor connections at the harness connector of the generator. Did you find and correct the condition? If yes, go to step 8 . If no, test charging system output.
- 6. Inspect for poor connections at the harness connector of the PCM. Refer to Connector Repairs in Wiring Systems. Did you find and correct the condition? If yes, go to step 8 . If no, go to next step.
- 7. Replace the PCM. See **<u>POWERTRAIN CONTROL MODULE</u>** in REMOVAL & INSTALLATION article in ENGINE PERFORMANCE. Is the action complete? If yes, go to next step.
- 8. Review and record the scan tool failure records data. Clear any DTCs. Operate the vehicle within the failure records conditions as noted. Using a scan tool, monitor the specific DTC information for this DTC. Does the scan tool indicate that this DTC failed this ignition? If yes, go to step 2. If no, system is OK.

SYMPTOM TEST

INTRODUCTION

CAUTION: The following steps must be completed before using the symptom tables.

- Perform <u>DIAGNOSTIC SYSTEM CHECK</u> before using the symptom tables in order to verify that all of the following are true.
 - 1. There are no DTCs set.
 - 2. The control module(s) can communicate via the serial data link.
- Review the system operation in order to familiarize yourself with the system functions. See <u>DESCRIPTION & OPERATION</u>.

CHARGE INDICATOR ALWAYS ON

1. Did you perform the Diagnostic System Check? If yes, go to next step. If no, see **<u>DIAGNOSTIC</u>** <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM.

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- 2. Turn ON the ignition, with the engine OFF. Observe the charge indicator on the instrument cluster. Does the charge indicator illuminate? If yes, go to next step. If no, problem is intermittent. Retest the system.
- 3. Turn OFF the ignition. Disconnect the generator connector. Turn ON the ignition, with the engine OFF. Does the charge indicator illuminate? If yes, go to next step. If no, test charging system output.
- 4. Test the charge indicator control circuit for a short to ground. Did you find and correct the condition? If yes, go to step 6. If no, go to next step.
- 5. Replace the PCM. See **<u>POWERTRAIN CONTROL MODULE</u>** in REMOVAL & INSTALLATION article in ENGINE PERFORMANCE. Did you complete the replacement? If yes, go to next step.
- 6. Operate the system in order to verify the repair. Did you correct the condition? If yes, system is OK. If no, go to step 3.

CHARGE INDICATOR INOPERATIVE

- 1. Did you perform the Diagnostic System Check? If yes, go to next step. If no, see **<u>DIAGNOSTIC</u>** <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM.
- 2. Turn ON the ignition, with the engine OFF observe the charge indicator on the instrument cluster. Is the charge indicator illuminated? If yes, there is a possible poor connection. Perform DIAGNOSTIC SYSTEM TEST. If no, go to next step.
- 3. Replace the IPC. See IPC REPLACEMENT in appropriate INSTRUMENT PANEL article in ACCESSORIES & EQUIPMENT. Did you complete the replacement? If yes, go to next step.
- 4. Operate the system in order to verify the repair. Did you correct the condition? If yes, system is OK? If no, go to step 2.

BENCH TESTING

Information is not available from the manufacturer.

REMOVAL & INSTALLATION

DRIVE BELT (ACCESSORY)

Removal (5.3L)

- 1. Loosen the air cleaner outlet duct clamps at the following locations:
 - The throttle body
 - The mass airflow/intake air temperature (MAF/IAT) sensor
- 2. Remove the outlet duct bolt.
- 3. Remove the air cleaner outlet duct. See **<u>Fig. 1</u>**.
- 4. Install a breaker bar with hex-head socket to the drive belt tensioner bolt.
- 5. Rotate the drive belt tensioner clockwise in order to relieve tension on the belt.
- 6. Remove the belt from the pulleys and the drive belt tensioner.
- 7. Slowly release the tension on the drive belt tensioner.

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- 8. Remove the breaker bar and socket and from the drive belt tensioner bolt. See <u>Fig. 2</u>.
- 9. Clean and inspect the belt surfaces of all the pulleys.



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Fig. 1: Removing Air Cleaner Outlet Duct Courtesy of ISUZU MOTOR CO.

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G00351543

Fig. 2: Removing Braker Bar & Socket From Drive Belt Tensioner Bolt Courtesy of ISUZU MOTOR CO.

Installation (5.3L)

- 1. Route the drive belt around all the pulleys except the idler pulley.
- 2. Install the breaker bar with hex-head socket to the belt tensioner bolt.
- 3. Rotate the belt tensioner clockwise in order to relieve the tension on the tensioner.
- 4. Install the drive belt under the idler pulley.
- 5. Slowly release the tension on the belt tensioner.

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- 6. Remove the breaker bar and socket from the belt tensioner bolt.
- 7. Inspect the drive belt for proper installation and alignment. See Fig. 2.
- 8. Install the air cleaner outlet duct.
- 9. Install the outlet duct bolt. See <u>Fig. 1</u>. See <u>TORQUE SPECIFICATIONS</u>.
- 10. Tighten the air cleaner outlet duct clamps at the following locations:
 - The throttle body
 - The MAF/IAT sensor. Tighten the screws to the specifications. See <u>TORQUE</u> <u>SPECIFICATIONS</u>.

DRIVE BELT

Removal (4.2L)

- 1. Install 3/8" breaker bar on the drive belt tensioner arm and turn the breaker bar clockwise enough to relieve the tension on the drive belt.
- 2. Remove the drive belt.
- 3. Release the tension on the tensioner arm.

Installation (4.2L)

- 1. Route the drive belt over all the pulleys except the drive belt tensioner pulley.
- 2. Install the 3/8 inch breaker bar on the drive belt tensioner arm and turn the breaker bar clockwise.
- 3. Install the drive belt over the drive belt tensioner pulley.
- 4. Slowly release the tension to the drive belt tensioner arm.
- 5. Inspect for proper installation of the drive belt on the pulleys. See <u>Fig. 3</u>.

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Fig. 3: Identifying Drive Belt Routing Courtesy of ISUZU TRUCK OF AMERICA, INC.

GENERATOR

Removal (4.2L)

- 1. Disconnect the battery negative cable.
- 2. Remove the drive belt. See **<u>DRIVE BELT</u>**.
- 3. Disconnect the battery positive cable nut (1) on the generator. See <u>Fig. 4</u>.
- 4. Remove the A/C line mounting bracket bolt at the engine life hook. See Fig. 5.
- 5. Remove the right engine lift hook bolts and remove the lift hook. See <u>Fig. 6</u>.
- 6. Remove the 3 generator mounting bolts and remove the generator. See $\underline{Fig. 7}$.

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Fig. 4: Disconnecting Battery Positive Cable Nut On The Generator Courtesy of ISUZU MOTOR CO.

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Fig. 5: Removing A/C Line Mounting Bracket Bolt Courtesy of ISUZU MOTOR CO.

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Fig. 6: Removing Light Hook Courtesy of ISUZU MOTOR CO.

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<u>Fig. 7: Removing Generator</u> Courtesy of ISUZU MOTOR CO.

Installation (4.2L)

- 1. Install the generator and secure the generator with 3 bolts. Tighten the generator bolts to the specification. See <u>TORQUE SPECIFICATIONS</u>.
- 2. Connect the battery positive cable to the generator and secure the positive cable with the nut. Tighten the generator positive cable nut to the specification. See <u>Fig. 4</u>.
- 3. Install the engine lift hook and secure the lift hook with 2 bolts. Tighten the bolts to the specification. See **<u>Fig. 6</u>**.
- 4. Install the A/C line bracket to the lift hook and secure the bracket with the bolt. Tighten the A/C line bracket bolt to the specification.
- 5. Install the drive belt. See **DRIVE BELT**.
- 6. Connect the battery negative cable. See Fig. 5.

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Removal (5.3L)

- 1. Disconnect the negative battery cable.
- 2. Remove the accessory drive belt. See **DRIVE BELT- ACCESSORY**.
- 3. Disconnect the generator electrical connector. See **<u>Fig. 8</u>**.
- 4. Remove the generator cable (3) from the generator. See **<u>Fig. 9</u>**. Perform the following:
 - Slide the boot (1) down revealing the terminal stud.
 - Remove the generator cable nut (2) from the terminal stud.
 - Remove the generator cable (3).
- 5. Remove the generator bolts.
- 6. Remove the generator. See <u>Fig. 10</u>.



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Fig. 8: Disconnecting Generator Electrical Connector Courtesy of ISUZU MOTOR CO.

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Fig. 9: Removing Generator Cable Courtesy of ISUZU MOTOR CO.

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<u>Fig. 10: Removing Generator</u> Courtesy of ISUZU MOTOR CO.

Installation (5.3L)

- 1. Install the generator.
- 2. Install the generator bolts. See **<u>TORQUE SPECIFICATIONS</u>**. See **<u>Fig. 10</u>**.
- 3. Install the generator cable (3) to the generator. See **<u>Fig. 9</u>**. Perform the following:
 - Install the generator cable (3).
 - Install the generator cable nut (2) to the terminal stud.
 - Slide the boot (1) over the terminal stud.
- 4. Connect the generator electrical connector.
- 5. Install the accessory drive belt. See **DRIVE BELT- ACCESSORY**.

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6. Connect the negative battery cable. See **<u>Fig. 8</u>**.

OVERHAUL

Information is not available from the manufacturer.

GENERATOR SPECIFICATIONS

GENERATOR SPECIFICATIONS

Application	Specification
Load Test Output	105A
Rated Output	150A

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Generator Bolt	37 (50)
Lift Hook Bolt	37 (50)
	INCH Lbs. (N.m)
A/C Line Bracket Bolt	88 (10)
Generator Positive Cable Nut	80 (9)
MAF/IAT Sensor Screw	62 (7)
Outlet Duct Bolt	88 (10)

WIRING DIAGRAMS

For wiring diagrams on 2003 Ascender models, see <u>STARTING/CHARGING</u> in SYSTEM WIRING DIAGRAMS article in ELECTRICAL.