



Countries: CANADA, UNITED STATES **Document ID:** IK0800403
Availability: ISIS **Revision:** 5
Major System: ELECTRICAL SYSTEM **Created:** 11/1/2012
Current Language: English **Last Modified:** 11/30/2012
Other Languages: NONE **Author:** Ken Fogelstrom
Viewed: 445

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Coding Information

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Title: Alternator Diagnostics and Warranty Claim Documentation

Applies To: U.S and Canadian Dealers; All Warranty Alternator Replacements

DESCRIPTION

The following information details the procedure that need to be followed to assure proper Alternator Diagnosis and requirement to empower dealer to perform correct repairs.

The program requires the use of the MidTronics EXP tester, and the Alternator Diagnostic Worksheet when performing alternator diagnostics. Benefits of using this procedure are:

- Increased customer confidence that the vehicle is fixed right the first time.
- Increased productivity, through accuracy of diagnosis.
- Reduced in bay shop time, vehicle down time, and shop come backs.
- Correct diagnosis to protect Dealer from No Problem Found Charge backs after part is reviewed and tested.
- Built-in repair documentation to provide with a Warranty Claim.

EFFECTIVE

November 1, 2012

WARRANTY AND CLAIM INFORMATION

While beginning testing for an Alternator/Battery related failure, the technician should utilize the **Midtronics EXP Tester** and proper [diagnostic worksheet](#). Critical diagnostic testing values are to be recorded and submitted with the claim.

A copy of the completed [diagnostic worksheet](#) should be retained with the warranty claim repair order. For better understanding of failures, the worksheet must be attached to the claim documentation.

NOTE:

Dealers must attach a copy of the alternator worksheet to all iClaim submissions.

All Alternators replaced under Warranty (warranty codes 01,03,39,55 and 98) may be requested back to be reviewed and tested. Any which are found non-defective or unnecessarily replaced, may be charged back to the dealer.

This diagnostic process is being utilized to provide the tools and ability to empower the dealer to make the correct diagnosis/repair without the need of a iApproval.

REPAIR PROCEDURE

Alternator Diagnostic Procedure:

Step 1: Inspect tensioner, belt, and belt condition.

CAUTION :

Verify the Engine is turned OFF.

1. Inspect belt for cracks, missing or torn ribs, edge wear, excessive rib wear, or contamination. A worn or damaged belt should be replaced.

2. Check belt auto-tensioner:

- The Auto Tensioner Pulley should turn freely without binding
- Tensioner arm should move smoothly through its entire range of motion
- Should feel significant spring tension through range of motion
- When installed with proper belt length the tensioner should be in mid-travel (approximately 50%)

3. Ensure proper pulley nut torque, per vehicle/alternator specification.

Step 2: Battery State of Charge.

Battery Test Engine OFF Load OFF
Failed Midtronics Test? Record Battery Code Charge or replace battery.

1. Remove surface charge from batteries--Engine OFF.
 - Use one of these methods:
 - a) Attach carbon pile and load batteries at 25% of total CCA rating for 15 seconds,
OR
 - b) Switch headlamps on high beam for 2 to 3 minutes per battery, then switch off head lamps.
2. After removing surface charge- allow batteries to recover for 30 seconds.
 - a) Follow the procedure for testing the battery pack; as described in the [Midtronics EXP Instruction Manual](#).
 - b) Continue by selecting 'Break pack down', and test each battery individually as described in the manual.

Step 3: Battery voltage verification at alternator terminals.

Voltage at Alternator Engine OFF Load OFF
Below Battery Voltage? If more than 0.5V below battery voltage, do Step 4. Otherwise, skip to Step 5.

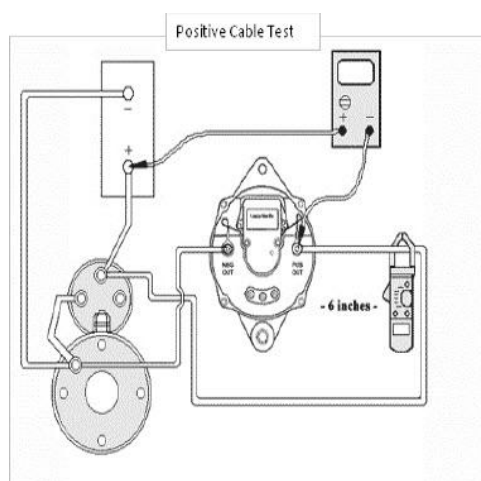
1. Ensure that battery voltage is present when measured at the alternator's:
 - a) Positive (+) and negative (-) output terminals.
 - b) Negative (-) and "S" Remote Sense Terminal.
2. Check to see that the engine OFF and all electrical accessories is in the OFF position.
 - This voltage should be the same as battery voltage measured in the above step.
 - If the volt meter indication is more than 0.50 volts below battery voltage, complete individual cable voltage drop test in Step 4.Otherwise, proceed to Step 5.

Step 4: Cable Test

If you have the cable test accessories for your Midtronics EXP, perform the cable test as described in the tool's instruction manual.

If you cannot perform the cable test using the tool, follow the proceeding instructions:

Positive Cable Test:



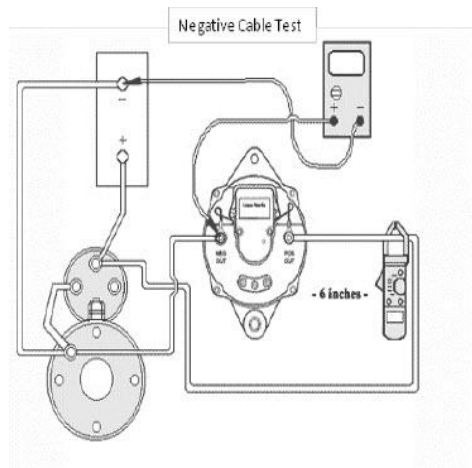
1. Connect ammeter to positive alternator cable.
2. Make sure ammeter is at least 6 inches (15 cm) away from alternator, to eliminate possibility of faulty readings.
3. Connect voltmeter's negative lead to positive terminal of alternator.
4. Connect positive lead to positive terminal on battery.
5. Start engine and set engine 1500 RPMs.
6. Turn on vehicle loads until 75% of alternator's rated output is achieved on ammeter display.
7. If necessary, use a carbon pile tester to apply load on alternator.
8. Record measured voltage to checklist.
9. Turn off engine.

NOTE:

If reading was less than 0.25 volts in 12 volt circuit (or 0.50 volts in a 24 volt circuit) cables are good.

NOTE:

If reading was greater than 0.25 volts in a 12 volt circuit (or 0.50 volts in a 24 volt circuit), check all wire connections and cable connections. Correct voltage drop before proceeding.

Negative Cable Test:

1. Connect ammeter to positive alternator cable.
 - Verify the ammeter is at least 6 inches (15 cm) away from alternator, to eliminate possibility of faulty readings.
3. Connect voltmeter's negative lead to negative terminal of battery.
4. Connect positive lead to negative output terminal on alternator.
5. Start engine and set engine 1500 RPMs.
6. Turn on vehicle loads until 75% of alternator's rated output is achieved on ammeter display. If necessary, use a carbon pile tester to apply load on alternator.
7. Record measured voltage to checklist.
8. Turn off engine.

NOTE:

If reading was less than 0.25 volts in 12 volt circuit (or 0.50 volts in a 24 volt circuit) cables are good.

NOTE:

If reading was greater than 0.25 volts in a 12 volt circuit (or 0.50 volts in a 24 volt circuit), check all wire connections and cable connections. Correct voltage drop before proceeding.

Step 5: Alternator Performance Test

Alternator Performance Midtronics Tester
Failed Midtronics Test? Record alternator code. Replace alternator.

Alternator Test:

Pre-Test:

1. If the alternator incorporates an ignition (IGN) terminal this terminal must have battery voltage present above 12.4 volts.
2. If not, inspect circuit for open and repair.

Test:

Using Midtronics Intellect EXP:

1. Connect positive (+) and negative (-) test leads to batteries.
2. Select 'System Test' and follow instructions on system test menu.
3. 'System Test' will repeat the battery pack test. When complete, continue with 'Starter Test'.
4. When prompted, choose 'Amp Clamp Available' option.
5. Record alternator code to checklist.

If replacing alternator:

Perform the following inspections and correct any related problems before installing new alternator.

NOTE:

Some problems may impact warranty on this and future claims.

Action	Corrections and Warranty Determination
1. Record alternator date code	Part label must be intact. If label is missing or destroyed, a justifiable reason must be presented and accepted by a representative before a claim process is initiated. A missing or intentionally destroyed label may void the warranty. If date code is newer than vehicle manufacture or in-service date, this is a replacement part. The date code must coincide with the date of invoice when the part was purchased, or be validated by an "install date".
2. Inspect for excessive dirt, grease, or oil	Excessive dirt, grease, or oil soaked/saturated condition: Oil and grease on surface and/or interior of alternator will prevent unit from cooling properly, causing premature failure. This may also create a low voltage condition on the vehicle. Check and correct any sources of excessive oil, grease, and dirt. Check for missing shields, leaking hoses, or fraying belts.
3. Inspect for rust and corrosion.	Alternators can become rusted or corroded such that they cannot function, or function intermittently. This is normally caused by road salt, also by harsh chemicals unfriendly to aluminum and metals. Examples are positive side rectifiers shorted to case by a "corrosive bridge", the rotor rusted and seized to the stator, or electrical connections open due to corrosion. Rotate rotor shaft with hand and inspect that it rotates freely.
4. Inspect for damaged shaft, mounting bosses, housing	Bent, broken, cracked or elongated mounting holes, impact marks or cracked housings render all products unacceptable for warranty.

5. Inspect for signs of arcing or shorts to housing or connection points.	Signs of arcing or direct shorts to housing or connection points, including hardware dropped or loose inside of alternator housing, improperly connected or modified electrical connectors, or cut/severed wires will void warranty.
6. Inspect mounting brackets	Make sure charging system components are securely mounted to their applicable brackets. Brackets, in turn, must be bolted securely to the engine. Poorly mounted charging system components lead to vibration damage and diminished drive belt performance.

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