



**IMPORTANT SERVICE
INFORMATION FOR:**

- ✓ SERVICE MANAGER
- ✓ SERVICE ADVISOR
- ✓ TECHNICIAN
- ✓ PARTS DEPARTMENT
- ✓ WARRANTY PERSONNEL

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GROUP:

ELECTRICAL

ON-VEHICLE ALTERNATOR DIAGNOSTICS AND BATTERY CHARGING PROCEDURES AND TIPS

AFFECTED VEHICLES

- 2018MY to current Isuzu FTR
- All Isuzu N-Series
Equipped with Gasoline and Diesel Engines
- 2010MY and Prior GMC/Chevrolet W-Series

This bulletin supersedes bulletin IB09-N-001H. This bulletin is being revised to update Models and bulletin information. Please discard previous bulletin IB09-N-001H.

INFORMATION

CONDITION

Many of the alternator cores returned by dealers have been determined to have No Problem Found after testing. All warranty cores returned to the CV Warranty Parts Center are inspected and tested for quality improvement purposes, including both OEM and remanufactured cores.

The information set forth in this bulletin is intended to aid technicians in properly testing the batteries and alternators in the affected Isuzu vehicles. It is important to confirm the battery is in good condition prior to diagnosis of the alternator and charging system. Never replace an alternator before testing the battery's condition. Batteries must be fully charged for the ECM and/or starter relay to fully engage with the starter. If the battery voltage is low, the ECM will not engage or may partially engage the starter. Replace the alternator **ONLY** if it fails the On-Vehicle Testing Procedure.

COMMON SYMPTOMS

- Battery discharge warning light on.
- Dim headlights.
- Noisy operation (such as squealing belts or worn bearings).
- No crank/no start.
- Battery voltage is below 11.6 volts – the starter will cycle back and forth into the flex-plate, which can be inaccurately diagnosed as a starter issue.

BATTERY CHARGING AND TESTING DIAGNOSTIC TIPS

The diagnostic tips set forth below can aid technicians in properly charging and testing a battery. Replace the battery only when a battery fails one of the tests discussed in this bulletin.

COMMON CAUSES

The following are some common causes that may contribute to a weak or dead battery:

- The vehicle headlights and accessories are left on for an extended period of time:
- A fault or flaw in the vehicle charging system.
- The electrical load of the vehicle exceeds the alternator capacity (such as Bodybuilder add-on power equipment).
- Extended slow speed driving with many accessories turned on.
- Loose or poor battery cable to post connection or corrosion.
- High parasitic drain (greater than 50mA).
- Loose belt.
- A fault or flaw in the vehicle's electrical system (such as shorted or pinched wires).
- There may be a faulty starter or cranking circuit.
- Slow, extended or no engine cranking.
- Vehicle stored for a long period of time (See the Service Policy and Procedure Manual (SP&P), Article 2.15 and 2.16).

Caution: Batteries produce explosive gases, contain corrosive acid and supply levels of electrical current high enough to cause skin burns. Therefore, to reduce the risk of personal injury when working near a battery, always shield your eyes and avoid leaning over the battery whenever possible. Do not expose the battery to open flames or sparks. Avoid spilling battery fluid (electrolyte). Flush any contacted area with water immediately and get medical help if eyes are affected.

CHARGING AND TESTING BATTERIES WITH STUD TERMINALS

Do not charge or test batteries with threaded stud terminals by clamping the tester/charger clamps directly to the studs. (See Figure 1.) Instead, install a set of threaded terminals (Figure 2) onto the studs to charge or test the battery. (See Figure 3.)

		
Figure 1	Figure 2	Figure 3

BATTERY CHARGING TIPS

If the vehicle is equipped with more than one battery, disconnect the cables to inspect/charge/test each battery separately in a well-ventilated area.

- Many batteries are maintenance-free and have a Hydrometer built in for a visual check.
 - Green dot = 65% or above state-of-charge; sufficient for load test.
 - Dark = below 65% state-of-charge; charging required.
 - Clear or Light Yellow = Low fluid level. This may have been caused by excessive or prolonged charging, a broken/damaged case, a seal leak, the battery tipping over or normal battery wear-out. Replace the battery. Do not attempt to charge, test or jump start the battery.

NOTE: Built in hydrometers only read one cell in a battery and are not an accurate method to determine a battery's state of charge or health status.

- Charging rates between 3 and 50 amps are satisfactory as long as there is no spewing of fluid and the battery does not feel excessively hot over 51°C (125°F). If any of these conditions occur while charging, it will be necessary to reduce amperes or temporarily stop to cool down.

An automatic charger will monitor the charger output based on the battery status to protect the battery from overcharging/overheating, but the battery still should be checked every 30 minutes to ensure it is not overcharging and/or overheating.

- The time required for a charge will vary. This is usually measured in hours. For instance, charging at a rate of 25 amperes for two hours would provide the battery with a 50 ampere-hour charge.
 - Battery Size — A completely discharged large, heavy-duty battery would require charging more than twice as long as a small passenger car battery.
 - Temperature — More time will be needed to charge any battery at 17°C (0°F) than at 21°C (70°F). A warmer battery will accept more charging current.
 - State-of-Charge — A completely discharged battery will require charging more than twice as much as a half-charged battery.
 - Charger Capacity — A charger that can supply only 5 amps will take much longer to charge a battery than will a 30-amp charger.

ABSORBED GLASS MATT (AGM) BATTERY CHARGING

NOTE: AGM batteries require a battery charger designed for AGM batteries (a Smart Charger). Using a regular charger can damage AGM batteries and lead to reduced capacity, shorter lifespan, and potential failure of the AGM battery over time.

Caution: Overcharging an AGM battery can lead to gas venting, which poses safety risks, including the potential for explosion if the gas ignites.

- Always use a Smart Charger when charging AGM Batteries. Ensure the charger is on “AGM” or “Deep Cycle”.
- Monitor the charging voltage and do not allow it to exceed 14.8 volts.
- Charging current should be 10 – 30% of the battery’s total amp-hour (Ah) rating.
- Charging an AGM battery with a Smart Charger may take 4 to 8 hours to complete.
- Refer to the battery manufacturer specifications for charging whenever available.

BATTERY TESTING

If the vehicle is equipped with more than one battery, disconnect the cables to inspect/charge/test each battery separately in a well-ventilated area. Be sure that the battery is properly charged, and the Hydrometer has a green dot visible before testing.

Test the battery using a Vehicle Charging/Starting System Tester, commonly known as VAT40 or Snap-On MT1552, or equivalent.

1. Connect the positive lead of the tester to the positive (+) post of the battery, and the negative lead of the tester to the negative post of the battery.
2. Monitor the battery voltage with the key OFF. Battery voltage should range between 12V and 13V. If the voltage is within this range, the battery circuit is good. Voltages below this range indicate that the battery needs to be charged before testing. Voltages above this range indicate a failed battery that needs to be replaced.

NOTE: A battery that has been recently charged may have a surface charge. Use a load tester to remove a possible surface charge before determining the battery is bad.

3. Connect the round current-probe cable of the tester onto either of the load tester power leads to measure the current draw through the load tester.
4. Determine the Cold Cranking Amps (CCA) rating of the battery.
5. Apply a load of 1/2 the CCA rating for 15 seconds and take a voltage reading at the end of the load test from the load tester itself (if equipped with voltmeter) or by connecting a digital multi-meter to the battery positive and negative posts, before releasing the load. (See Figure 4.) Turn off load and wait for 15 seconds to allow the battery to recover before repeating test, if necessary.

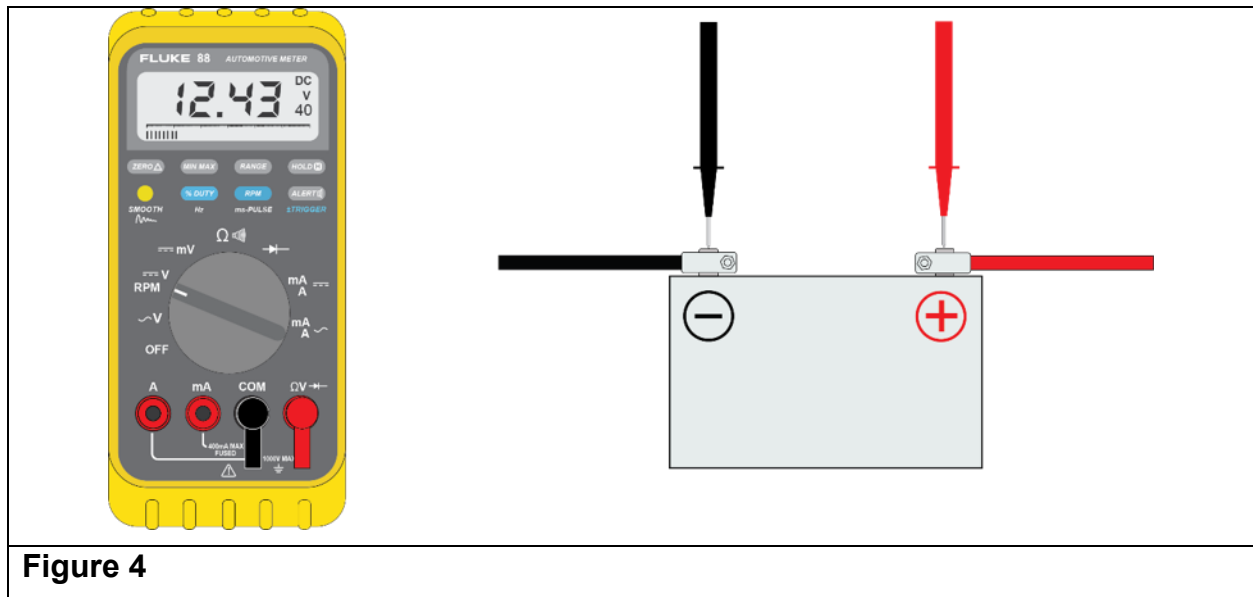


Figure 4

- Depending on the battery temperature, if the voltage does not drop below the minimum voltage as shown in the reference table below, then the battery is good and should be returned to service. If the voltage does drop below the referenced voltage, charge the battery until fully charged and then retest the battery.

Temperature	Minimum Voltage
21°C (70°F)	9.6
10°C (50°F)	9.4
-1°C (30°F)	9.1
-10°C (14°F)	8.8
-18°C (0°F)	8.5

NOTE: AGM batteries should be tested with a digital load tester.

TESTING FOR PARASITIC DRAIN

A parasitic drain is when an electrical device is using battery power when the vehicle is off, and the key is in the "OFF" position and removed. Therefore, when testing, make sure the key is OFF and removed for at least 5 minutes and all other electrical devices, like the dome light, are OFF, and IDSS disconnected from the data link OBDII connector.

- Turn the key OFF and remove. Inspect the vehicle for any other electrical devices that may still be drawing current and turn them off.
- Install Isolation switch on Battery Negative post and close the switch contacts.
- Road test the truck to complete a drive cycle.
- Allow sufficient time for the truck to sit with the key in the off position (amount of time depends on vehicle).
- Install a 10A fused jumper across the isolation switch that was installed at the negative battery cable and the negative battery terminal.

6. With the fused jumper connected, open the isolation switch and wait for one minute. If the 10A fuse does not fail, close the switch and replace the fused jumper with an ammeter set to measure amperage. (See Figure 5.)

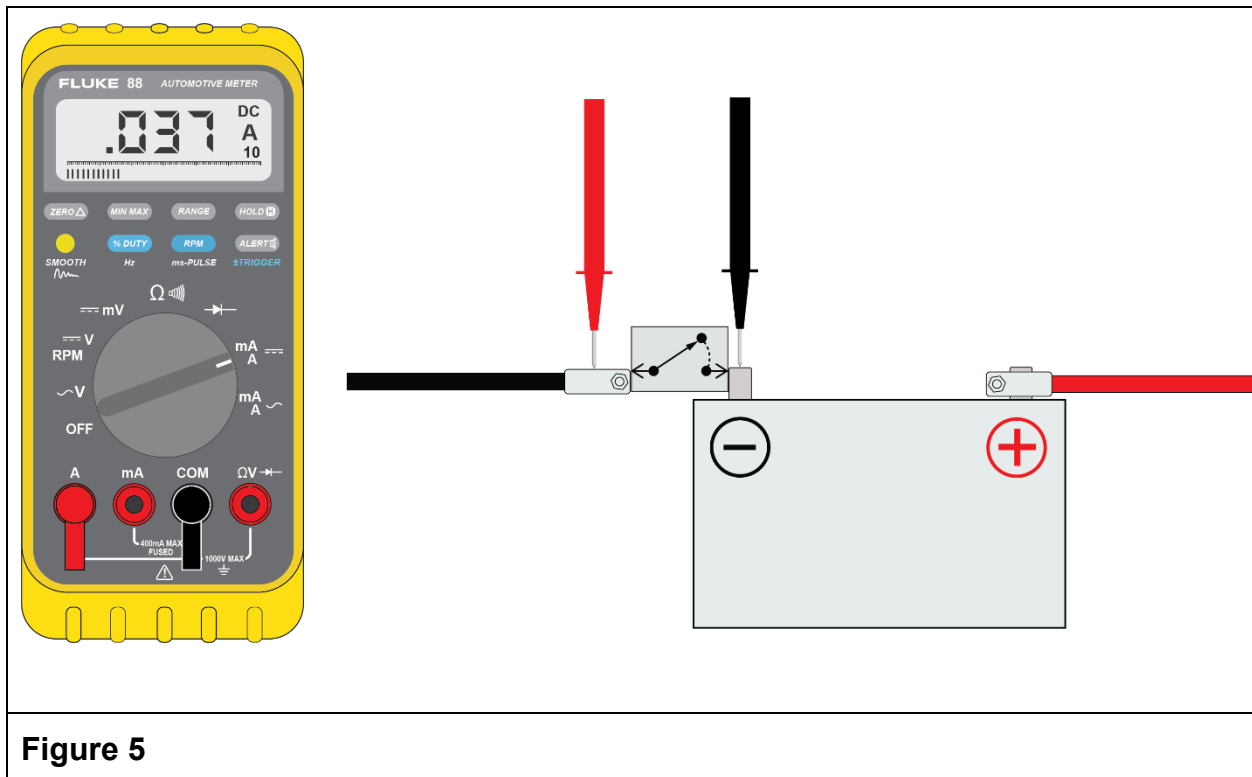


Figure 5

7. With the ammeter connected and set to the correct setting, open the isolation switch.
8. Monitor the amperage for a few minutes after the amperage reading stabilizes. If the amperage is under 50mA the current drain is considered normal.

NOTE: Current drain over 50mA is caused by a continuous electrical load. Locate the system or component generating the excessive load by removing one fuse at a time, beginning with fuses inside the cab, identify the suspect fuse and repair the component relying on the suspect fuse's power supply as necessary. Be sure to isolate the body application for potential causes.

ON-VEHICLE ALTERNATOR TESTING PROCEDURE

Be sure that the belts are not slipping, and the battery is fully charged for a valid test. Also all other electrical problems must be corrected prior to testing. Refer to the applicable Workshop Manual (WSM) for specific electrical wiring schematics.

Test the alternator using a Charging/Starting System Tester, commonly known as VAT40 or Snap-on MT1552, or equivalent.

1. Connect the positive lead of the tester to the positive post of the vehicle's battery, and the negative lead of the tester to the negative post of the vehicle's battery.
2. Place the round current-probe cable of the tester onto the battery cable closest to the B-terminal of the alternator.

- Test #1 — Under no electrical load and cold condition with all accessories off (A/C, headlights, radio, wipers), the regulating voltage should be between 13V and 15V with the engine running at 2,000 rpm.
- Test #2 — Begin the test under no electrical load and in a cold condition, with all accessories still off and the engine running at 2,000 rpm. Apply an electrical load by turning the tester's Load Control knob clockwise until a reading of 50% of the battery's CCA rating is displayed. (See Figure 6.)
 - For an alternator rated 80 Amp, the output current should be more than 50A.
 - For an alternator rated 110 Amp, the output current should be more than 70A.
 - For an alternator rated 140 Amp, the output current should be more than 88A.
 - For an alternator rated at 145 Amps, the output current should be more than 105A.

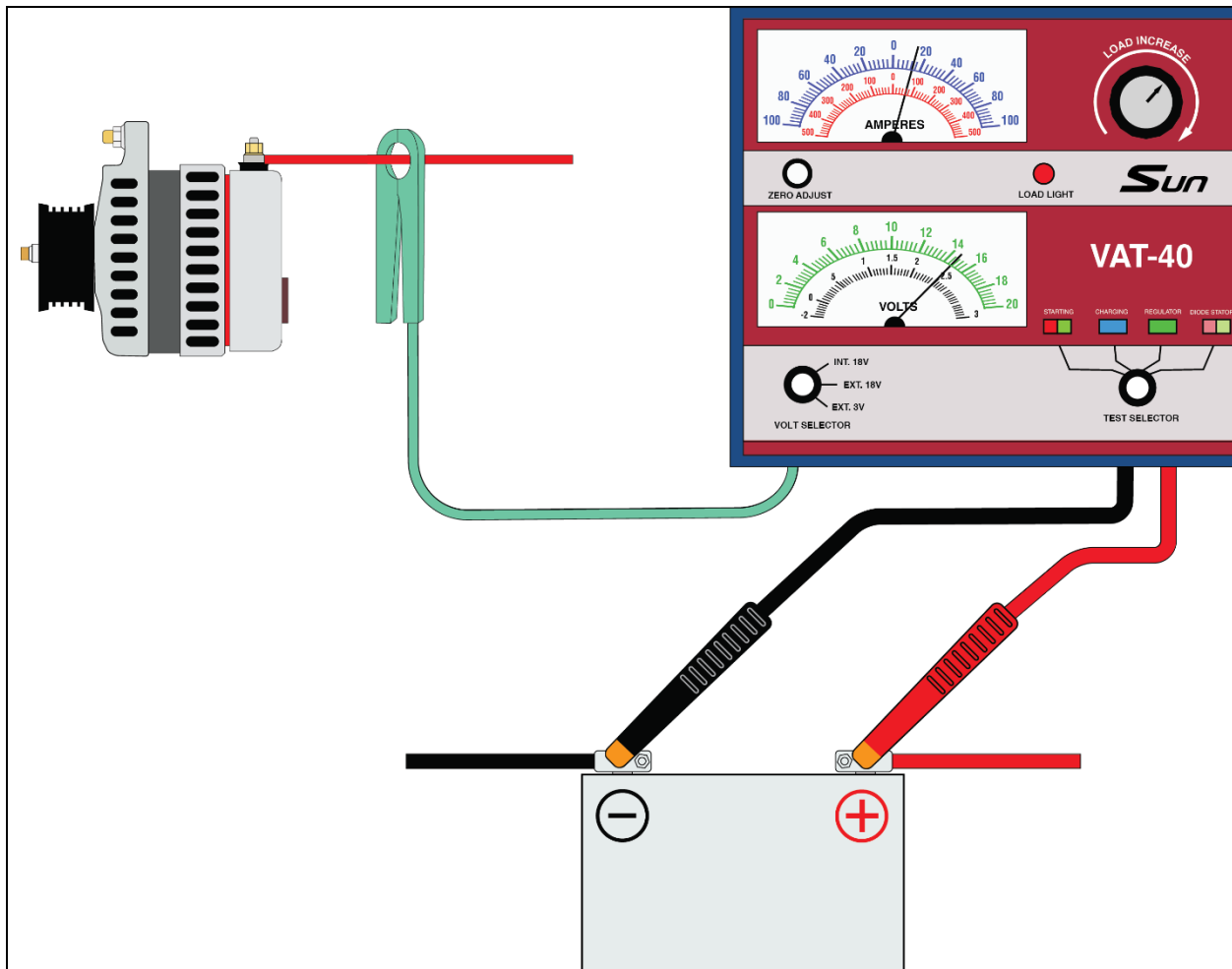


Figure 6

