TECH TIPS

Voltage Drop Testing

Voltage drop testing is a vital test when doing any type of electrical work, when done properly voltage drop testing can be used to identify faulty wiring, relays/solenoid and connections. Voltage drop is simply the loss of energy in a system due to wiring resistance, connections and corrosion. A comparison would be water in a garden hose. If the connections are good and there are no kinks the water flows freely, there is no build up of pressure and there are no leaks. What does an electrical “leak” look like? Heat! Some loss is normal and depending on the source of the information anywhere between the unattainable 0V and 0.5V would be considered acceptable.

To do a voltage drop test a digital voltmeter is required (preferably with a hold feature but not a must) an additional set of hands also makes testing easier… just make sure its someone you trust. The battery must be charged as the engine will require cranking to check the starter wiring and it must be able to run to check the alternator wiring.

- Set the digital voltmeter to the DC voltage setting.
- With the engine off connect one probe to the positive battery post (not to the wire terminal). Connect the other probe to the starter positive battery post.
- Here is where the trust thing comes in… Have an assistant crank the engine with both test leads connected (shown as Starter Test 1).
- If the reading is less then 0.2 volts then the positive side is fine. If the reading is more then 0.2 volts the source of the drop must be determined. Look for loose connections, frayed wires, feel for hot spots and swelling (wires that have pin holes or nicks in the insulation may allow water inside and will swell up while corroding).
- Perform the same test from the starter housing to the negative battery post. If the reading is higher then 0.2 volts check for dirty/corroded contact surfaces from the starter to the engine and for corroded engine grounding cables (shown as Starter Test 2).
- To do the voltage drop test on the alternator wiring start the vehicle, allow the system to stabilize, turn on all the accessories and measure the voltage from the positive post of the alternator to the positive post of the battery (shown as Alternator Test 1). Anything over 0.2 volts should be analyzed and corrected (wires, terminals, connections etc.).
- Perform the same test on the alternator grounding by connecting one probe to the alternator frame and the other to the battery negative post (shown as Alternator Test 2). Again, anything over 0.2 volts should be checked and rectified.

TIP: If you get a high voltage drop reading do the same test on a portion of the path to determine the problem. Start with the most probable cause, the battery

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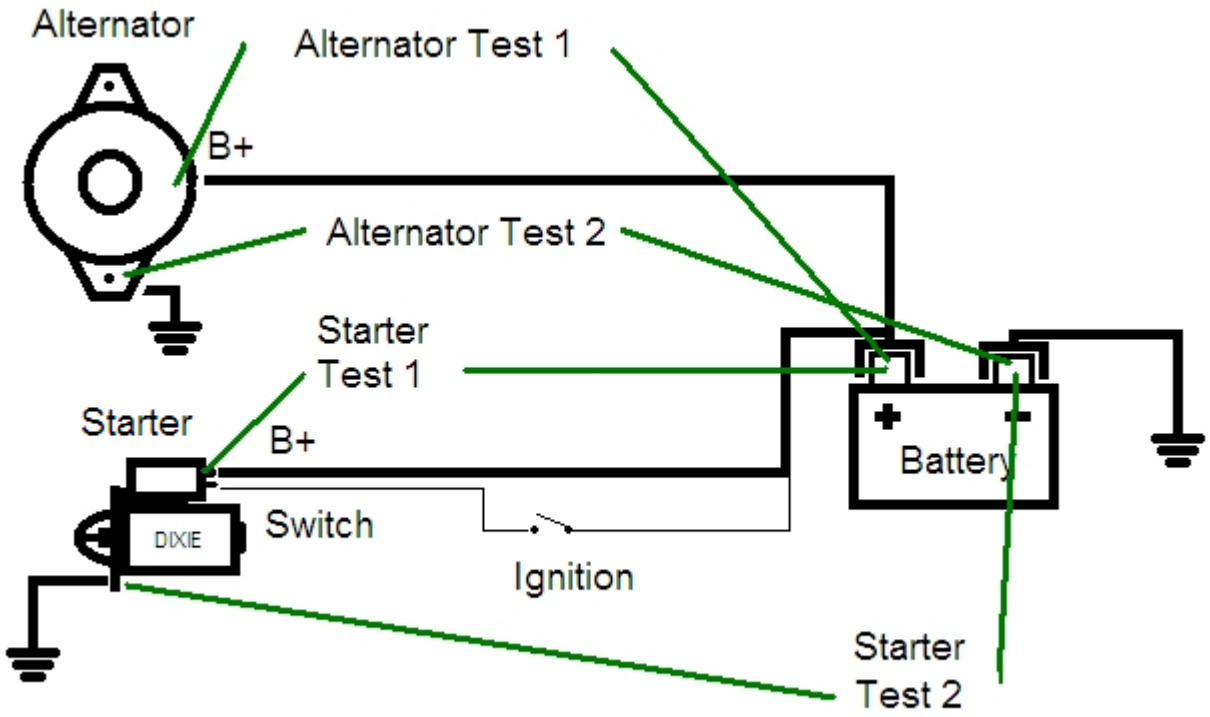
terminal connection and then work your way through the system. Attached is a simplified wiring diagram and the test points.

Voltage Drop Test Points



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