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- Never disconnect the battery while the engine is running.
- Alternators are designed to maintain batteries, not recharge them from dead. THIS WILL OVERDRAW AND BURN UP A NEW ALTERNATOR
- Keep hands and test-leads away from belts, fans and other moving parts.
- Be sure belts are not worn and adjusted properly.
- Start all test with a fully charged battery.
- Clean and inspect all wires and connections.
- Be sure all grounding surfaces are cleaned to bare metal.
- Verify that alternator amperage is adequate for the vehicle loads.
- Be sure all mounting surfaces are tight.
- Do not over tighten alternator or battery cable connections.  
(many units are returned with busted B+ post from over tightening)
- Ensure automatic tensioners operate properly.
- Disconnect the battery before removing the starter or alternator.
- When removing the alternator, always disconnect the voltage-regulator plug first and reconnect it last
- Always disconnect battery negative before battery positive and install in reverse order.
- When replacing a starter motor, always inspect the ring gear for worn or damaged teeth.
- Always clean the starter mounting surface to ensure the starter mounts properly.
- Some applications require the electronic control module codes to be cleared and reset before a replacement alternator will work properly. If the proper scan tool is not available, this will require A trip to the dealer or a well equipped electrical shop.
- If you are purchasing parts for a shop or dealer to install, check on their policy about bringing ‘your own part’

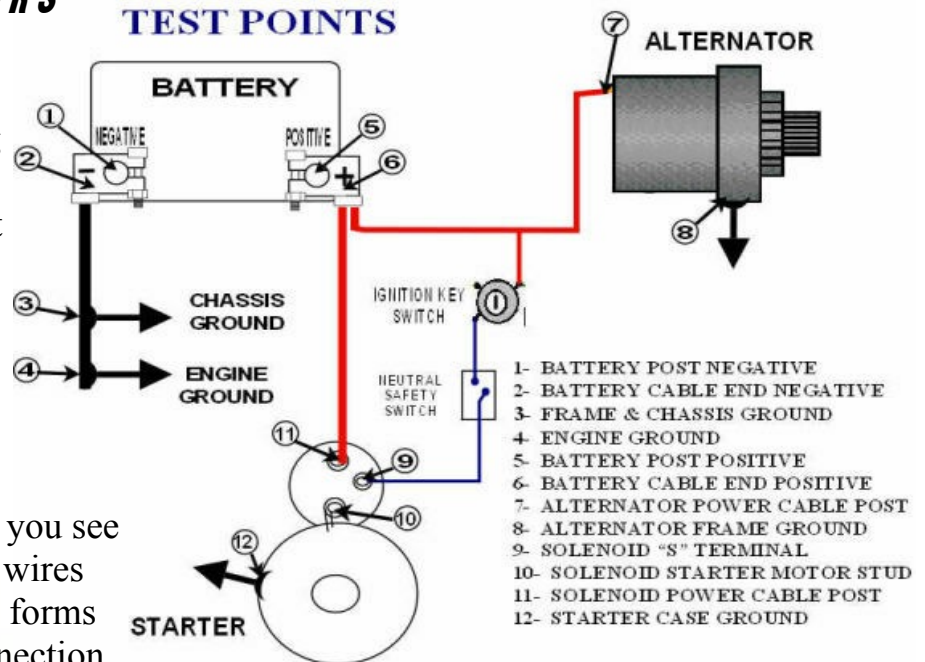
The Battery, the Alternator, and the Starter are the major components of the Automotive Starting and Charging System. When your engine cranks slowly or not at all and/or your battery wont stay charged, but these components check out fine, where do you check next?

You need to check for Voltage-Drop in these high amperage circuits. It may be obvious when you see bad corroded connections where wires or cables attach. When corrosion forms inside a cable or wire or at a connection that looks okay on the outside, a voltage-drop test will quickly find it.

If you have added accessories that require more amperage, undersized wiring may be creating high resistance. This keeps the circuit from carrying required amperage. Additional accessories require upgraded wiring. Maybe you need additional power with an Alternator Upgrade -High Output Alternator. Call us for your High Amp Alternator.

Voltage-Drop Testing is easy but use caution and safety around hot and moving engine parts. With your voltmeter use test leads with alligator clips to hold leads in place at the test points keeping your hands out of the engine compartment while testing. And most Testing will not produce accurate results unless you "Load The Circuit". Current flowing through the circuit needs to be near maximum for that circuit.

## TEST POINTS



- 1- BATTERY POST NEGATIVE
- 2- BATTERY CABLE END NEGATIVE
- 3- FRAME & CHASSIS GROUND
- 4- ENGINE GROUND
- 5- BATTERY POST POSITIVE
- 6- BATTERY CABLE END POSITIVE
- 7- ALTERNATOR POWER CABLE POST
- 8- ALTERNATOR FRAME GROUND
- 9- SOLENOID "S" TERMINAL
- 10- SOLENOID STARTER MOTOR STUD
- 11- SOLENOID POWER CABLE POST
- 12- STARTER CASE GROUND

HOW TO LOAD CIRCUIT	TEST LEAD POSITION	READINGS	COMPONENTS OR LEADS BEING TESTED	ACTION TO TAKE
No Load Required	1 and 5	12.66V	Battery Voltage with engine off	At 12.45V 75% State of Charge
No Load Required	1 and 5	13.6V TO 15.1V	Charging Voltage with engine running	If Higher or lower & "5 to 7" good replace alternator and recheck
-Engine running -Headlights on -Heater fan on high -Engine RPM at 2000	1 and 5	13.6V to 15.1V	Charging Voltage under Load	If Higher or Lower & "5 to 7" good replace alternator and recheck
As starter cranks the engine	5 and 6	0.1V max	Drop between battery post and cable end	If higher, clean or replace cable end or cable and retest
As starter cranks the engine	1 and 3	0.1V max	Drop between negative battery post and chassis	If higher, clean or replace cable end or cable and retest
As starter cranks the engine	1 and 4	0.1V max	Drop between negative battery post and engine	If higher, clean or replace cable end or cable and retest
As starter cranks the engine	5 and 11	0.2V max	Drop between positive battery post and battery stud on solenoid	If higher, clean or replace cable end or cable and retest
As starter cranks the engine	1 and 12	0.1V max	Drop between negative battery post and starter ground	Clean or replace ground cable, clean starter case. Clean starter-to-engine ground and retest
As starter cranks the engine	1 and 9	10V min	Voltage at solenoid ignition switch terminal	Check wiring & connections to & from ignition switch, neutral switch, and/or alarm system or starter relays. Replace as necessary
As starter cranks the engine	1 and 10	9.6V to 10.5V	Voltage at starter while cranking	
As starter cranks the engine	10 and 11	0.3V max	Voltage drop across solenoid while cranking	Replace solenoid and retest. If still over 0.3V, replace starter
-Engine running -Headlights on -Heater fan on high -Engine RPM at 2000	5 and 7	0.3v max	Drop between positive batter post and alternator	Clean or replace cable end at alternator. Follow cable back to battery checking all connections
-Engine running -Headlights on -Heater fan on high -Engine RPM at 2000	1 and 8	0.2v max	Voltage drop on ground side of alternator while charging	Clean or replace ground lead and clean alternator to engine contact and retest.