

LAB - Alternator Test



Students: 1. _____
 2. _____
 3. _____

Fill in each box with the appropriate information.
 Each team member may need to answer questions to receive credit for this lab.
STOP when it says **STOP** - this is to ensure everything is done **SAFE** and **CORRECT**

LAB CREDITS

ALL ALTERNATORS: **1 LAB**

SPECS FROM ALLDATA, MITCHELL ON-DEMAND, or SERVICE MANUAL

VEHICLE MAKE:		MODEL:		ENGINE:	
RATED ALTERNATOR OUTPUT:				[Amps]	

This lab is to inspect and test the charging system. The tester in this lab cannot test current output.

SAFETY

- Your safety is important.
- Always wear eye protection – battery acid will burn!
- Where is the closest emergency eyewash station??



ANSWER:

- Batteries provide more current than most welding machines
- Batteries give off HYDROGEN
- Avoid ALL SPARKS
- NEVER rest tools on the battery!!

- NEVER TRUST CABLE OR CLAMP COLOURS
- TRUST THE BATTERY MARKINGS FOR + and -
- Negative will connect DIRECTLY to the metal chassis/frame/body NEVER CONNECT THE BATTERY BACKWARDS
 - VERY EXPENSIVE MISTAKE

(NOTE: Some British cars run POSITIVE to ground....)



Adapted from Schumacher BT-100 Owner's Manual

STOP!!!

INSTRUCTOR'S INITIALS:

INSPECTION

Battery Cable Condition

Many times, charging and starting problems are caused by a poor battery cable connection.

Since that is an easy and cheap fix, always check that first.

Connections should be clean and tight. Describe:

At battery:

At alternator:



TESTING

Connect the positive (red) clamp to the positive (POS, P, +) battery post.

Connect the negative (black) clamp to the negative (NEG, N, -) battery post.

Rock the clamps back and forth to ensure a good electrical connection.

Start the engine and run it at 1200 to 1500rpm. CAUTION: Stay clear of moving engine parts. Turn off ALL accessories.

Note the meter reading with all of the electrical accessories off. It should be in the green "good" band in the "charging system" scale.

Results: _____ Volts

Turn ON the headlights, and put the heater motor on HIGH (these are the highest current drawing components).

The meter should remain in the green "good" band.

Results: _____ Volts



Most vehicles charge at about 14 Volts.

The charging system should be able to maintain 14 Volts with the vehicles typical accessories on.

Causes for low voltage:

- Slipping alternator belt
- Corroded/loose battery terminals
- Poor alternator/regulator ground
- "open" or "grounded" stator windings
- Defective voltage regulator
- Poor regulator ground
- No positive voltage to regulator

Causes for no voltage:

- "Open" in rectifier diodes
- "Open" in Stator windings
- "Open" in charging circuit
- Worn brushes or slip rings
- Defective voltage regulator

STOP!

INSTRUCTOR'S INITIALS:

RESULTS

Check one:

Alternator is operating satisfactorily

Alternator is NOT operating satisfactorily

Return any tools and test equipment to the tool room, and clean up your work area.

What did you learn about alternator testing during this lab?

Assume a charging system is tested and passes, but the battery fails to charge, or remains dead. What do you think the problem might be??