

LAB - Battery Service



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 BATTERIES: **1 LAB**

BATTERY IDENTIFICATION

MAKE:		Model/Part#:		Cold Cranking Amps (CCA):	
-------	--	--------------	--	---------------------------	--

SAFETY

DO NOT REMOVE THE BATTERY YET

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



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
- DISCONNECT NEGATIVE (-) FIRST
 - Negative will connect DIRECTLY to the metal chassis/frame/body
- RECONNECT NEGATIVE (-) LAST
- NEVER CONNECT THE BATTERY BACKWARDS
 - VERY EXPENSIVE MISTAKE

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

STOP!!! INSTRUCTOR'S INITIALS:

INSPECTION

DO NOT REMOVE THE BATTERY YET.	
Battery Condition	Use a VOLTMETER to record the voltage between POS and NEG (A fully charged battery should be 12.6V): _____ V
	Use a VOLTMETER to record the highest voltage between ONE post and the DIRT on the battery (Ideal = none): _____ V
	Battery top, terminals and clamps free of corrosion? (circle) (Corrosion is white and powdery – it is acidic, don't touch it) (Ideal = clean) [YES] [NO]
	Battery hold down is (circle) (Ideal = secure and solid): [Secure] [Corroded] [Rusty] [Missing]

CLEANING

A Clean Battery is a Happy Battery

Use a WRENCH to disconnect the NEGATIVE terminal from the battery FIRST

Now disconnect the POSITIVE terminal

Now remove the battery hold-down and remove the battery.

Carry the battery to the shop sink, and wash thoroughly with a Baking-Soda/Water mix

In the car, clean the Battery terminals, battery hold down and battery tray with the Baking-Soda/Water mix.

Treat any rust (the acid from a leaky battery will eventually eat a hole through the car.



Battery Carrying Strap



Baking Soda – mix with water



Battery Post & Terminal Cleaner

INVESTIGATION

Cell Condition

Cell condition is determined by checking SPECIFIC GRAVITY with a BATTERY HYDROMETER

Remove the battery caps (not all batteries allow this – ask your instructor)

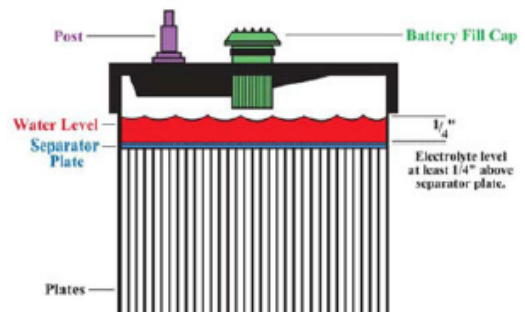
Record the readings below:

Cell #1: _____ Cell #4: _____
 Cell #2: _____ Cell #5: _____
 Cell #3: _____ Cell #6: _____

If any cells are low, they should be topped up with DISTILLED water.



100% Charged:	1.280 - 1.260
50% Charged:	1.180 - 1.170
Dead:	1.070 - 1.080
Water:	1.000



STOP!

INSTRUCTOR'S INITIALS:

LOAD TESTING

CAUTION: Lead-Acid Batteries generate **EXPLOSIVE** gasses during normal operation.

AVOID ALL SOURCES OF SPARKS - ENSURE GOOD CLAMP CONNECTION

1. Hook up the Batter Load Tester :

- **RED** clamp to POS (+)
- **BLACK** clamp to NEG (-)

Record the No-Load Voltage:

List Battery CCA rating (on Battery Label):

2. Press the **TEST** button for **NO MORE THAN 10 SECONDS** to get a stable reading. This machine **LOADS** the battery (sucks life out of it); **MORE** is NOT merrier.

Record load-tested Voltage Reading:

Record tested CCA Reading:



Sure, it might be charged, but is it any good?

THAT is what a **LOAD TEST** is for!



Demo

Does this battery pass?

LOAD TEST	BATTERY CONDITION
Good (Green)	The battery capacity is OK. The battery may or may not be fully charged. Check the specific gravity of the battery to determine the state of charge, check for an electrical drain or possible charging system trouble. Recharge the battery to a full level.
Weak or Bad, But Needle Remains Steady (Yellow or Red)	The battery capacity is not satisfactory. The battery may be either defective or not fully charged. Check the specific gravity to determine which condition exists. If charging does not bring the specific gravity to the full charge level, the battery should be replaced.
Weak or Bad, But Needle Continues to Fall (Yellow or Red)	The battery may be defective or very run down. Release the load switch and note the volt meter reaction. Voltage recovery to 12 volts or above within a few seconds indicates a defective battery. A slow voltage recovery indicates a run down condition. For best results, check the specific gravity.

STOP!

INSTRUCTOR'S INITIALS: