

THE CADMIUM ELECTRODE

The cadmium electrode is designed for electrolyte immersion, to be held suspended while usually connected electrically to the negative terminal of a reliable voltmeter. The positive voltmeter terminal is connected to either the positive or negative cell post.

When preparing to use a new cadmium electrode, it should be soaking in sulfuric acid for several days until the surface becomes corroded. It can then be removed and kept in a dry state until needed. Still, the cadmium must be resoaked for at least 15 minutes before reliable readings can be taken. Always agitate the electrode to keep gas bubbles from forming that interfere with accuracy.

The cadmium readings indicates the plate potential with relation to the electrolyte. When the cadmium electrode is held suspended in the electrolyte and connected to the negative post of the voltmeter with the positive post connected through a suitable lead and prod to the positive terminal of the cell, the resultant reading is known as the positive cadmium reading.

Cadmium reading taken on charge when the battery is at the end of charge can be very helpful in determining internal trouble and will always show when the plates are completely charged.

Below is a representative sample of readings taken from a normal healthy cell on charge at the finish rate in a fully charged condition under normal temperature (70 to 85 degrees Fahrenheit).

Positive Cadmium	2.43
Negative Cadmium	<u>- 0.20</u>
Terminal Volts	2.63

It will be noted that the negative cadmium reading has gone into reverse or minus direction, which is normal.

If the meter used to read the negative cadmium on charge is not equipped with a minus scale, it will be necessary to reverse the leads on the voltmeter so that the cadmium electrode is on the positive and the negative lead is on the negative terminal of the cell. Also, it will be observed that because the negative cadmium reading is now in the minus direction, it will be added to the positive cadmium reading, Thus securing the high terminal voltage.

Positive cadmium readings taken under fully charged conditions at the finish rate will always be uniform in a normal battery. If the positive cadmium readings are more than .05 volts lower than the surrounding cells, it is sufficient reason to make on internal inspection.

To clarify, note the set of hypothetical readings on a standard 6-cell motive power battery.

<u>CELL NO.</u>	<u>CELL VOLTAGE</u>	<u>POS. CAD.</u>	<u>NEG. CAD.</u>	<u>SPECIFIC GRAVITY</u>	<u>TEMP.</u>
1	2.60	2.43	-.17	1.280	77 F.
2	2.60	2.42	-.18	1.280	77 F.
3	2.60	2.42	-.18	1.280	77 F.
*4	2.33	2.35	+.02	1.200	77 F.
** 5	2.45	2.42	-.03	1.265	77 F.
6	2.60	2.42	-.18	1.280	77 F.

* Cell number four has somewhat low terminal voltage that show's possible internal trouble. The positive cadmium is considerably below normal, leaving little doubt that the trouble exists. This cell should be opened and examined for internal shunts, such as a broken or missing separator.

** Cell number five also shows low terminal voltage. Still, the cadmium check shows normal; therefore, the low voltage is being caused by something other than an internal shunt. Because the negative cadmium is not normal, it is obvious that the negative plates are at fault.

This condition is usually caused by over discharging. Although, it could be the direct result of a leaking jar or over filling, since lost acid can result in over discharging. This is especially true if the discharge cycle is deep.