

The Ammeter

by Tom Endy

The Model A ammeter is a fairly simple device, but it can tell you a lot if you pay attention to it. It is a center off type meter. The needle sits on zero in the center when no current is being drawn. When current is being drawn from the battery the needle points to the negative side. The reading depends on how much current is being drawn. When the generator (or alternator) is sending current to the battery to charge it, the needle points to the positive side. The reading depends on how much current is being passed to the battery.

Original ammeters have "bounce" to them. This is because they are un-damped. In this manner they quickly read any variations in current flow. Many reproduction ammeters are not made very well and are damped and move very sluggishly.

If the ignition circuit is wired to receive its power through the ammeter it provides a diagnostic tool. When starting the car the ammeter will bounce back and forth on either side of the zero mark before it starts. This is caused by the points opening and closing. If the car fails to start the bouncing ammeter needle is telling you that there is nothing wrong with the ignition primary circuit and the problem is somewhere else. If the needle is not bouncing, the problem is likely in the ignition primary circuit.

The original Model A generator is usually adjusted for a fixed 8-amp output. It will produce 8-amps regardless of the electrical load requirement or the status of the battery. When driving at night the generator cannot provide all the current demand from the headlights. The battery is then required to supply the balance and the ammeter will show a discharge. Over a long period of nighttime driving the battery will become discharged. When diving on a long trip during the day the continuous 8-amps may over charge the battery and boil the water out of it. Either case is not healthy for the battery.

Years ago it was quite common to see cars such as the Model A on a long stretch of open highway with their headlights on during the day to protect the battery by absorbing the excessive output current from the generator.

When a Model A is equipped with an alternator (either 6-volt or 12-volt) the ammeter becomes even more of a diagnostic tool and the battery remains fully charged most of the time.

The alternator has an internal regulator circuit that constantly looks at the status of the battery. If the battery needs charging the alternator sends the appropriate amount of current to it to bring it back up to full charge. This will occur right after start up when the starter has drawn a significant amount of current out of the battery. The ammeter will then show a high charging rate going to the battery. A few miles down the road and the ammeter will move toward zero indicating the battery is almost fully charged. On a long trip the ammeter should be sitting at zero indicating the battery is fully charged and no current is going to it.

When the headlights are turned on the alternator immediately picks up the load and the ammeter remains at zero indicating that no current is being drawn from the battery to power the headlights.

On a relatively long drive if the ammeter does not return to zero it is telling you that there is a defective cell in the battery that is preventing it from becoming fully charged. The ammeter is telling you it is time to have the battery checked.



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