

THE FORGOTTEN AMMETER

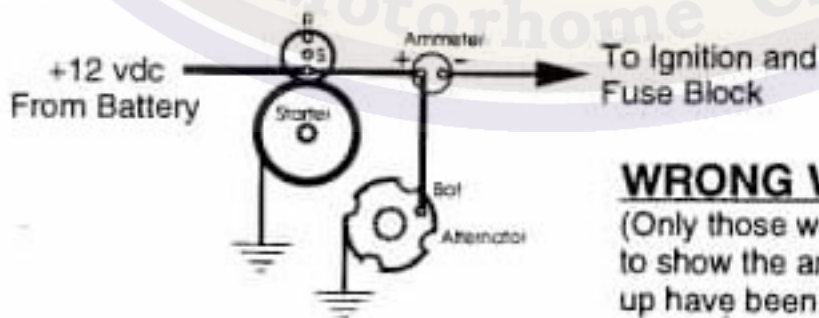
The ammeter has been all but forgotten gauge in almost all vehicles. Detroit and Tokyo have almost exclusively gone to volt meters. The premise was that people working under the dash and who inadvertently touched the hot ammeter wire with a wrench thought something blew up. Auto makers have worked to keep high amperage wiring out of the cockpit using relays and remote switching; the high amp lines remain in the engine compartment and/or protected from accidental contact. So, to introduce an ammeter into the cockpit area means running a high amp line to and from the dash nullifying that added safety.

Enter the volt meter. As a replacement for the ammeter, the volt meter will also tell us something about the condition of the electrical system while only requiring very small amount of amperage to work. The ammeter is safe and more informative than the idiot light.

AMMETER HOOK UP

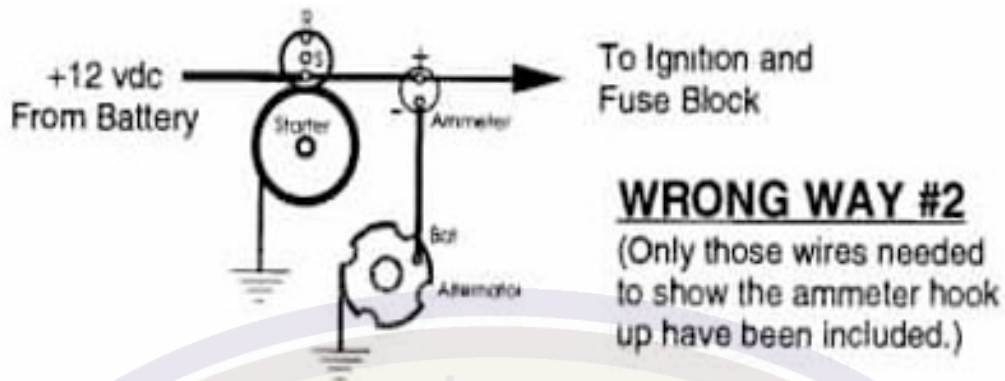
Two wrong ways and the right way

WRONG WAY #1 is to connect the ammeter with both the battery/solenoid and the alternator output connected to the same side. This approach will show the discharge caused by Ignition and/or Fuse Block circuits but will NOT show charging of the battery by the alternator.



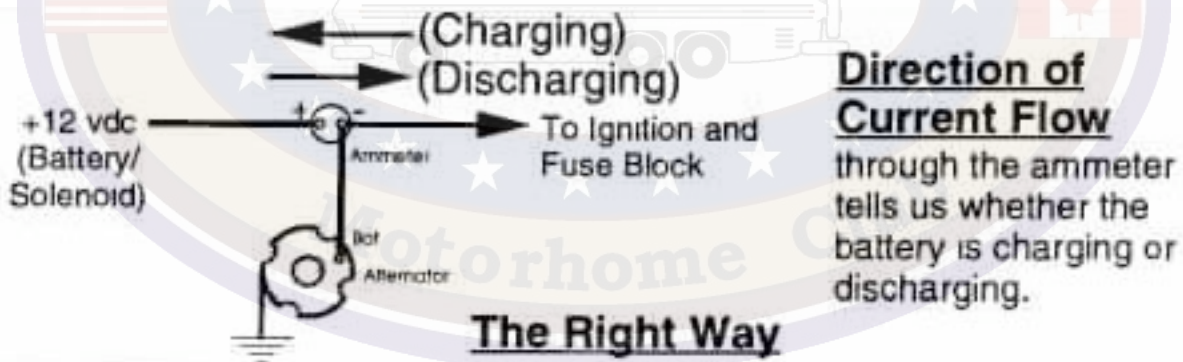
WRONG WAY #1
(Only those wires needed to show the ammeter hook up have been included.)

WRONG WAY #2 is to put the ammeter in the alternator feed line with both the battery/solenoid line and the feed to the Ignition and Fuse Block connected to the same terminal. This approach will show that the alternator is charging, that is, that it is providing current to the battery and/or (?) the loads but it will NOT show battery discharge to the Ignition/Fuse Block



For any of these hook ups, right or wrong, reversing the polarity of the ammeter connections (+ and-) will cause the meter to read backwards and just confuse everything!

THE RIGHT WAY - You can see from the three drawings that for the correct hook up the battery feed line from the battery and starter solenoid must be the only wire connected to the (+) terminal of the ammeter.



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READING AN AMMETER

An Ammeter measures the direction and quantity of electricity flowing through it. With the ammeter correctly installed (in the feed line from the battery/solenoid), it will tell us whether electricity is flowing out of the battery (discharge) or into the battery (charge).

When a state of DISCHARGE exits, we know that the battery is providing electricity to either the Ignition/Fuse Block circuits or into the alternator feed line. But the alternator

line does not use electricity (unless a short exists) it provides it. Discharge is normal when any load circuit is “on” while the engine is “off”. Too high a discharge might indicate a problem in a circuit.

Discharge while the engine is running tells us that the alternator is not providing all the electricity needed by the load circuits and is still being helped by the battery (thus the battery is still discharging). If you are sitting at a light, slow idling with the A.C. blasting and a couple of other circuits “on” then a little discharge while running could be OK. But if it does not correct itself with slightly higher RPM, check your charging system

When a state of charge exists, we know that the alternator is putting out charge and is “back feeding” electricity back into the battery to recharge it to full level. This is common right after starting the Vehicle. The amount of charging (gauge deflection and length of time) should parallel the amount of electricity that it took to start the vehicle. Typically the gauge should be back to normal within a few minutes at most.

Under normal use the ammeter needle should hover right on top of zero or very slightly to the side of charge. Get used to your vehicle/ammeter/battery/charging system combination and you will be able to tell when something is not right.

*This article was compiled by Frank Folkmann from Street Works Rod & Custom Products' **Basic Auto Electricity** book (by phone at 860-859-0513 or on the web at www.watsons-streetworks.com). Permission was granted by Steve Watson, owner of Street Works. The book, **Basic Auto Electricity** by Steve, is informative on a vehicle's electrical system and is available from Street Works.*