AMMETER GAUGE INSTALLATION INSTRUCTIONS

FOR CARS, TRUCKS, TRACTORS, MARINE AND INDUSTRIAL ENGINES

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AMMETER GAUGE INSTALLATION INSTRUCTIONS

GENERAL

The Alternator/Generator system used in modern motor vehicles is designed to provide sufficient electrical power to restore battery power lost in starting the vehicle while at the same time supplying current to operate the vehicle's electrical system. The electrical system's voltage regulator prevents over or undercharging of the battery.

Most vehicle manufacturers use a system of electrical indicating lights to warn the driver of impending electrical system failure. While adequate for use as an indicator of component or system complete failure, these lights do not allow the driver to monitor the system during operation or to spot impending trouble before it happens. The Ammeter Gauge is an improvement over the light system in that it allows the driver to maintain a constant check on the performance of his vehicles' electrical system and to identify and repair or replace worn or defective units before failure.

Become familiar with your Ammeter's normal readings as applicable to your particular vehicle. You may expect the Ammeter to show a higher than normal charging rate for a short period immediately after starting a cold engine as the battery power used during starting is restored. Duration of this higher reading is directly proportional to the battery's condition and the amount of "cranking" required before the engine starts. Conversely, the Ammeter will show a discharge reading whenever electrical accessories are being used and the engine is off. It should be remembered that whenever the Ammeter shows a discharge condition, battery power is being used and if allowed to continue for an extended period of time, the battery will become completely discharged.

CAUTION: The Ammeter should NEVER show a discharge while the engine is running and all accessories are off. If the Ammeter indicates discharge under these conditions, stop and determine cause immediately. Check for loose or broken wiring, loose or broken fan belt, defective voltage regulator or Alternator/Generator. How long you may operate the vehicle under these conditions depends on your battery's condition since all electrical power is being supplied directly by the battery alone.

Installation of the Ammeter Gauge is the same for all vehicles whether equipped with an Alternator or a Generator. The only noticeable difference in these systems is that an Alternator is capable of providing power and will show a charge (+) reading on the Ammeter even at slow engine speeds when a Generator equipped system would be completely ineffective. Generators require higher engine speeds

before producing current.

INSTALLATION PROCEDURE

For an accurate indication of the amount and direction of current flow, the Ammeter is installed so as to show current usage of all of the vehicle's electrical system except starter motor current and horn current. Due to the "excessive" current required by the starter motor, this unit is "by passed" to prevent Ammeter damage.

1. Figure 1 illustrates **typical** wiring connections required for different automobile manufacturers' equipment. Physical location of components will vary from vehicle to vehicle. If in doubt, contact your vehicle manufacturer's dealer service center.

NOTE: Since the Ammeter is normally installed between the battery and the various fuses, fusible links and other protective devices used by most vehicle manufacturers to prevent overload damage, it is advisable to install a suitable device between the battery connection and the Ammeter. Individual fuse holders or circuit breakers may be obtained from your auto parts dealer who will also be able to assist you in selecting the proper capacity fuse for your particular vehicle's electrical system. This device, when installed in series with the Ammeter will also provide additional protection for the entire system.

CAUTION: For safety, always disconnect the grounded battery cable to open the electrical circuit before performing any work on any portion of the electrical system.

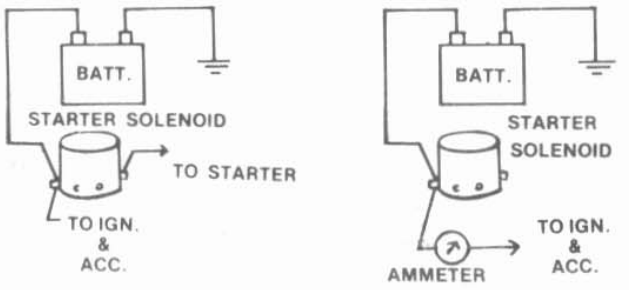
2. Make electrical wiring connections to components in the engine compartment as described in Figure 1, being certain to follow the precautions given in the Caution Note.
3. Route wiring through engine compartment following existing wire harness runs, to vehicle firewall.
4. Pass wires through firewall into vehicle interior using an existing hole if possible.

NOTE: If no convenient hole through the firewall exists, drill a ½-inch diameter hole using care to prevent damage to under-dash components. Use a small file to remove any sharp edges in the hole to prevent wire chafing. It is good practice to protect the wires where they pass thru the hole by wrapping with tape or using a grommet.

5. Route wires under dash area to vicinity of Ammeter Gauge installation.
6. Cut wires to proper length, carefully strip insulation from wire end and install heavy-duty terminal lugs. Be sure to observe precautions given in Caution Note in Figure 1 when installing lugs.
7. Install Ammeter Gauge in desired location in vehicle.

NOTE: The Ammeter may be installed in, or on or under the vehicle dash as desired. In-dash installation requires a 2-1/16-inch diameter hole be drilled through the dash panel. Use care to prevent

FORD & EARLY MODEL CHRYSLER



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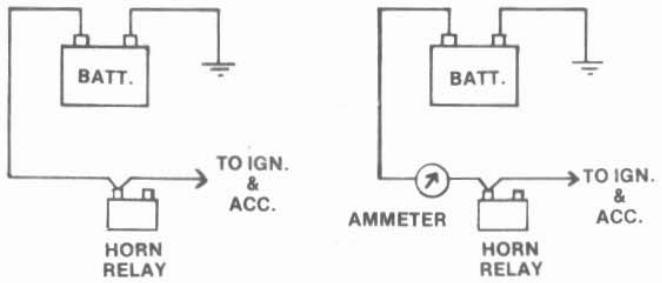
EARLY MODEL GENERAL MOTORS



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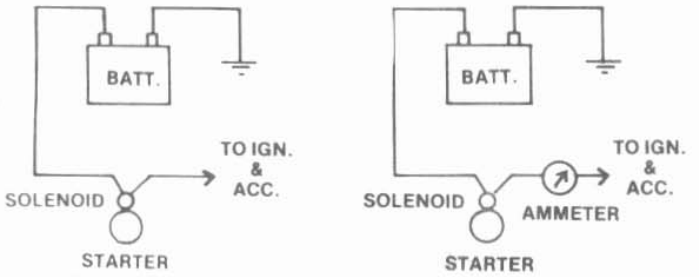

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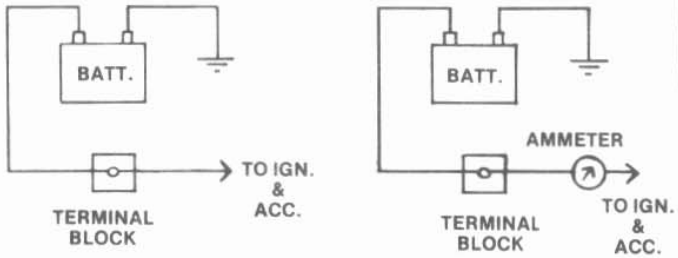
LATE MODEL GENERAL MOTORS PRODUCTS



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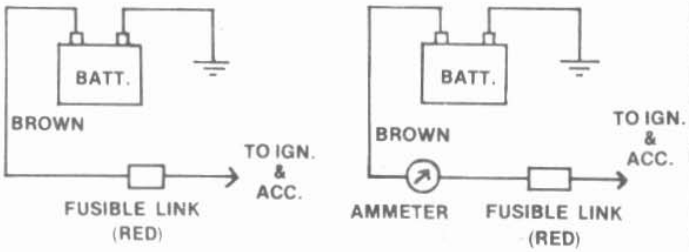

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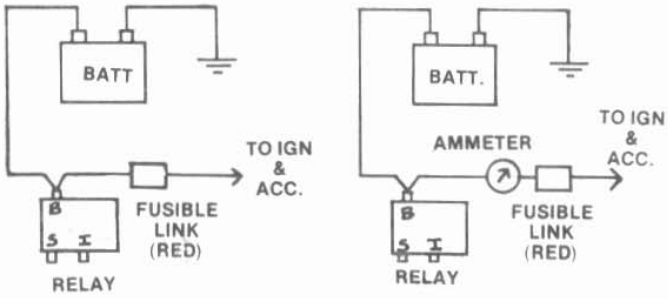

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FIGURE 1 TYPICAL WIRING DIAGRAM

CAUTION: To assure proper operation, all added wiring must be the same, or larger gauge than the existing charging system wire in the vehicle. This will normally be #10 AWG wire which is available through your auto parts dealer. To aid in identifying the positive (+) and negative (-) terminal wires, the wire connected to the battery positive (+) lead should be marked with tape at each end, or if desired, two different colored wires may be used. This will simplify matching terminal connections between the battery and the Ammeter. As with any high current installation, the quality of associated wiring and the electrical connections is of extreme importance. Care should be taken when removing insulation from wire ends that none of the wire conductor strands are cut or badly "nicked". Use care when installing wire terminal lug to be certain all strands of wire fit into terminal. Use heavy-duty "eye" or "ring" type terminal lugs and crimp and solder wire to lug to prevent possible overheating or damage.

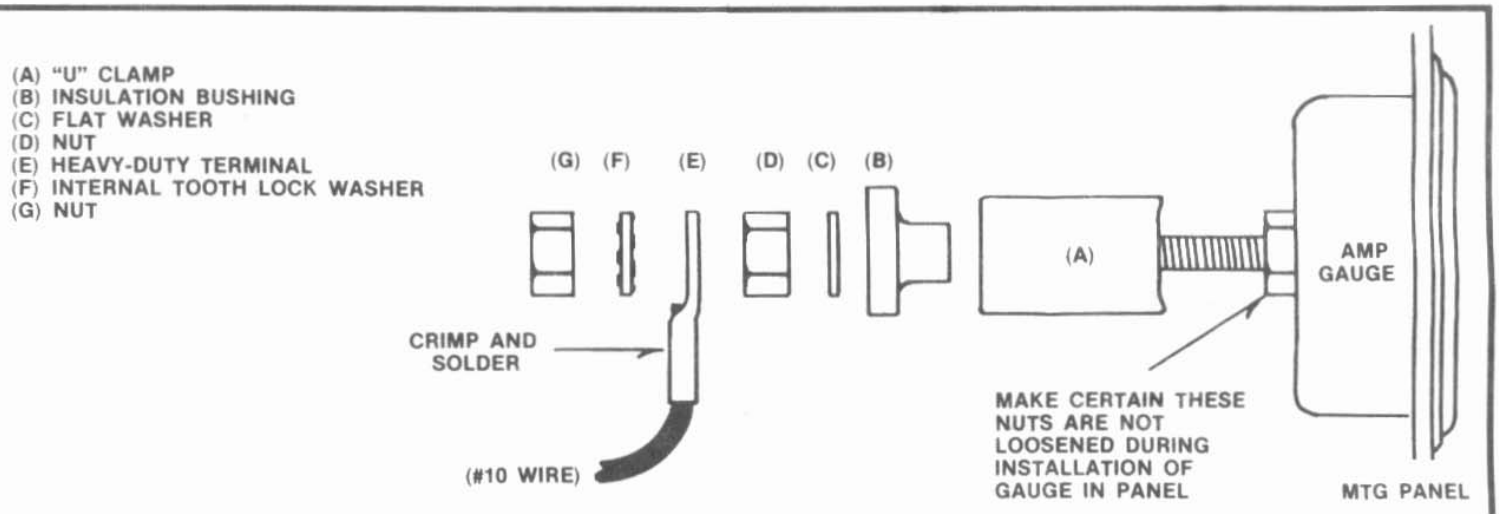

FIGURE 2 INSTALLATION SEQUENCE

damage to any components located behind the panel. Installation above or below the dash can be accomplished using mounting panels or housings which are available from your auto parts dealer.

8. Install plastic insulation bushings (B, figure 2) firmly into the two holes in "U"-clamp (A).
9. Position Ammeter Gauge in panel (or dash) as shown in Figure 2.

NOTE: Make certain terminal nuts on Ammeter terminals are tight before installing gauge in panel. If needed, tighten nuts using a 3/8-inch "box-end" wrench or "spin-tight" driver.

10. Slide "U"-clamp and bushing assembly (A & B) over Ammeter Gauge terminals as shown in Figure 2 and install washers (C) and nuts (D). Tighten nuts (D) securely using a 3/8-inch box wrench or spin-tight driver.
11. Install wires on Ammeter terminals. See Figure 1 for correct polarity.

CAUTION: Make certain to connect the Ammeter wire that was previously taped, or otherwise coded, from the positive (+) battery lead, to the positive (+) terminal on the Ammeter. Improper connections will result in the Ammeter indicating reversed readings.

12. Place the #10 wired terminal lugs (E), one at a time, on the Ammeter terminals and install lockwasher (F) and nut (G) to secure. Repeat procedure for second terminal lug and wire assembly.
13. Tighten each terminal connection securely. Use a wrench of suitable size to hold nut (D) to prevent its turning while tightening nut (G) against terminal lug (E) and lockwasher (F). This will "jam" both nuts tightly against the lug and lockwasher and assure a good connection.

CAUTION: Failure to hold nut (D) while tightening nut (G) will result in the lockwasher, terminal lug, and both nuts all turning together and prevent their tightening against each other to make the required tight connection. These connections MUST be tight to eliminate the possiblity of a "loose connection" causing improper system operation.

14. Double check entire installation to assure proper connections.
15. Connect battery cable and turn ignition switch to "ON" position while observing Ammeter Gauge pointer indications.

- With vehicle engine "off", gauge pointer should show a slight discharge (-).

16. Start engine and again observe Ammeter Gauge pointer indication.

- When the engine starts, and while running at "fast idle", the gauge pointer will show a charge (+) condition. After a short period of time, the gauge pointer will move towards the "O" (gauge center) as the Alternator/Generator restores battery voltage.

NOTE: If gauge pointer indicates charge (+) with the engine off and discharge (-) while engine is running, connection to Ammeter terminals have been reversed. Stop engine, disconnect battery cable and switch (reverse) wire connections at the Ammeter. Repeat steps 11 through 16 to assure correct operations.

CAUTION: If, during day-to-day operation, the Ammeter consistently indicates a charging (+) rate of half-scale or greater (or example 30 or more amps indicated on a 60-0-60 Ammeter) and it is determined with certainity that is indication is normal for your vehicle's electrical system, an Ammeter of higher range should be installed. Ammeters are available for 30, 60 or 100 amperes and may be obtained from your auto parts dealer.

Vehicle electrical systems which require high current while operating normally are usually equipped with special, heavy-duty Alternators which may, under certain conditions, supply higher current than a lower range Ammeter can safely pass without overloading. This could result in failure of the Ammeter or in extreme cases, failure of some portion of the vehicle's electrical system.