

An ammeter gives you early warning of problems developing in the charging system. It is wired into the charging circuit between the generator and the battery and measures the current flowing in to, or out of, the battery, registering it on the dial as a plus or minus reading. If the charging circuit is working normally, the needle stays at its zero position. If the current flows out of the battery it moves to minus, if it flows in it moves to plus. So you can see instantly whether the generator is charging properly.

Types of ammeter

There are two basic types of ammeter: the in-line ammeter and the shunt type. The in-line ammeter is wired directly into the circuit between generator and battery. All the current (except for the starter motor) has to flow through the ammeter. As a result the wiring to the gauge must be thick.

The shunt-type ammeter takes only a small amount of current. This removes the need for thick wiring

and makes the ammeter much easier to fit. But shunt ammeters are more expensive than in-line types.

Which scale?

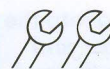
Ammeters come in three ranges of scales and your choice depends on what type of generator is fitted to the car. Most dynamos generate less than 30 amps, so the gauge to fit is one with a 30-0-30 scale.

An alternator produces more current than a dynamo, so you need to buy an ammeter with a 40-0-40 or 60-0-60 scale.

Limitations

Some car manufacturers do not recommend fitting an in-line ammeter in their cars because it can damage the generator components, and, if there is an accidental short-circuit, there is the risk of a fire being started.

In such cases, it is best to fit a shunt-type gauge or fit a voltmeter (often called a battery condition indicator).



intermediate

Tools and materials

- Ammeter
- Heavy gauge wiring (check instructions for size)
- Spanners and screwdrivers
- Crimping pliers
- Rubber grommets
- Insulating tape

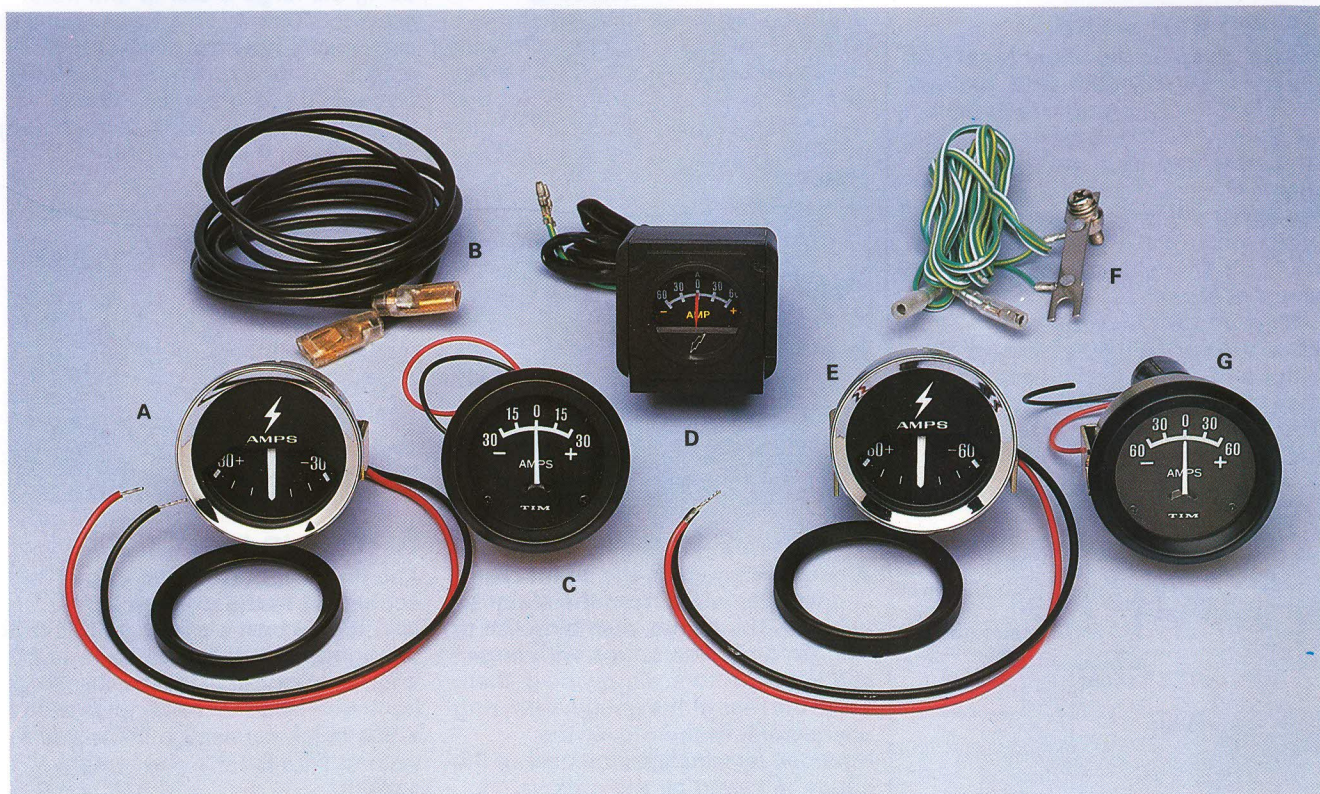


The wrong way

When you start the engine, the gauge will show a plus reading until the generator recharges the battery. If it shows a minus reading, you have connected the wires on the back of the ammeter the wrong way round. Swapping them over will cure the fault.

Ammeters

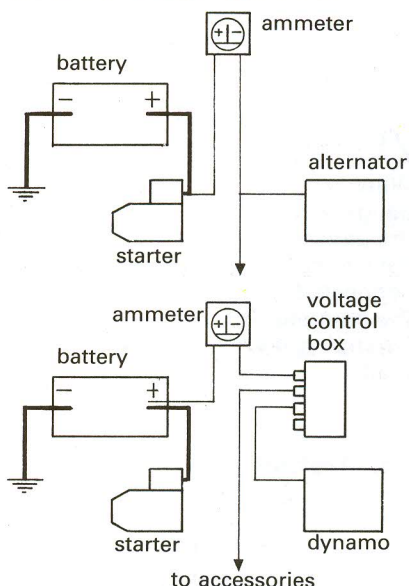
Gauges **A** and **C** are for dynamos; **D**, **E** and **G** for alternators. Gauge **D** is a shunt ammeter with its shunt **F**. Gauges **A**, **C**, **E** and **G** are in-line ammeters wired with heavy gauge wire **B**.



Wiring in

The in-line ammeter is wired into the circuit between the generator and accessories and the battery (below). On an alternator the connection is at the starter solenoid (as here) or at the battery terminal.

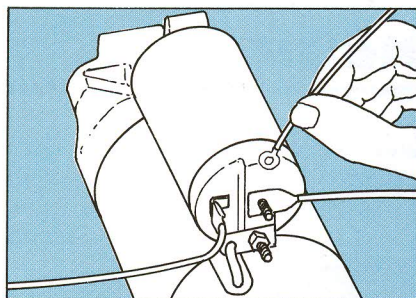
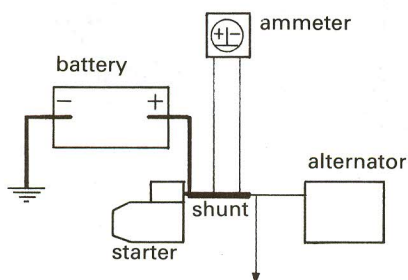
On a dynamo, the connection is made at the voltage control box (also called the voltage regulator).



Wiring in a shunt

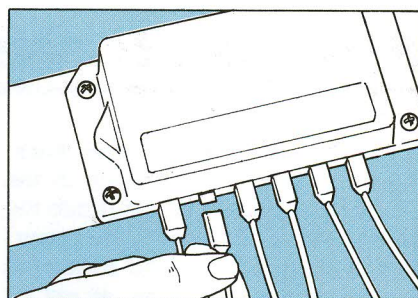
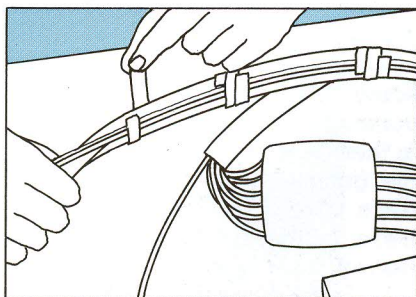
If your gauge is the shunt type, it is wired up slightly differently (below). First find the charging circuit wires where they fit to the starter solenoid or battery terminal, and disconnect them. Then slide the forked end of the shunt under the securing nut in place of the wires you have just taken off. Do up the nut to secure the shunt in place.

Now attach the wires you disconnected to the terminal at the other end of the shunt – ensure that they cannot short out on anything. The rest of the job is the same as for the in-line ammeter (steps 2-5).



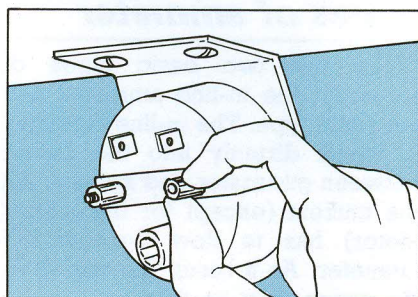
1a Wire-up – alternator

Find the terminal on the starter solenoid or battery connector where the main charging cable fits (usually a thick brown wire). Disconnect and attach it to one of your ammeter wires. Connect the other ammeter wire to the terminal you disconnected the charging cable from, and do up the terminal nut.



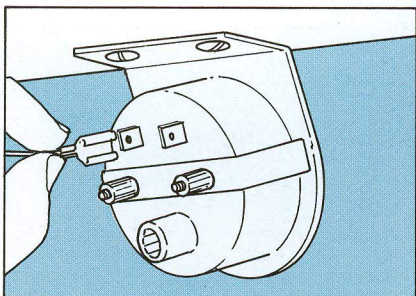
1b Wire up – dynamo

On a car with a dynamo, you wire up to the voltage control box. Disconnect the wire from the terminal on the box marked A, B or 51. Connect one of your ammeter wires to the disconnected wire. Now connect your other ammeter wire to the vacant terminal on the control box. Ensure all terminals are firm.



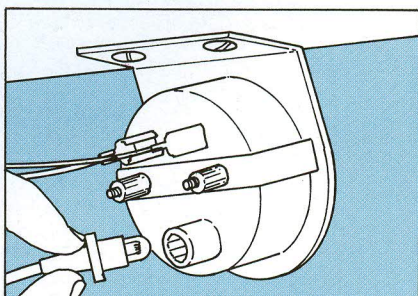
2 Run the wires

Run the wires through from the engine bay to the dashboard, following the route of the main wiring loom and securing them with insulating tape. Try to pass the wires through an existing grommet at the rear of the engine bay. If that is not possible, drill a new hole and fit a grommet.



3 Mount the gauge

Fit the gauge into its bracket or pod using the large U-clamp and nuts provided. Check in the instructions to see exactly how the bracket and plastic insulators (where supplied) fit. Push the U-bracket over the threaded studs, then fit the securing nuts and do them up tight.



4 Wire up to gauge

Where the gauge is the shunt type, connect the wires from the shunt to those on the gauge, matching like to like. On an in-line gauge with large spade connectors, simply push them on to the rear of the gauge. With ring connectors, fit them over the back of the threaded terminals on the back of the gauge followed by the nuts.

5 Wire up panel light

The panel light wire has to be connected to the existing light circuit. The best place to do this is at the lighting switch or at the rear of another instrument. Splice the gauge light wire into this existing wire with a Scotchlok connector. If there is a second wire for the gauge light, earth it.