GAUGES

INSTRUMENT PANEL GAUGES

HOW TO IDENTIFY GAUGES

There are four general types of instrument panel gauges. Bourdon Tube, Resistance type electric, Bi-metal type electric and the Warning Light.

BOURDON TUBE TYPE

This gauge can be distinguished by the small copper tube running from the dash unit to the engine unit. This type of gauge is used to indicate oil pressure or water temperature.

RESISTANCE TYPE ELECTRIC

This gauge can be distinguished from the Bi-metal electric by observation. When the key is turned "ON" the resistance type gauge will "snap" to its position rather than move slowly. There is a single wire connecting the dash unit, called the receiving unit, to the engine or gas tank unit, called the sending unit. This type of gauge is used to indicate oil pressure, water temperature and gasoline supply.

BI-METAL TYPE ELECTRIC

This gauge can be distinguished from the resistance type by observation.

When the key is turned ON the Bi-metal gauge will move slowly to its gauging position.

The Warning Light Type is readily identified by the light. This type of gauge is used to indicate oil pressure and generator operation. Sometimes it is also used to indicate temperature.

TROUBLE SHOOTING GAUGES

Bourdon Tube Types

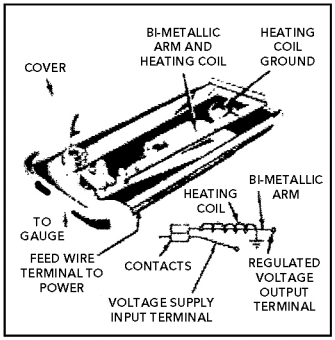
FOR WATER TEMPERATURE

These gauges cannot be repaired. If the unit does not seem to be working correctly, remove the bulb assembly from the engine, being careful not to kink the small tube.

Place the bulb in boiling water. The dash gauge should respond to show hot. Now substitute cold water. If the gauge follows to read cool, the assembly is OK. If it does not, the whole assembly must be replaced.

FOR OIL PRESSURE

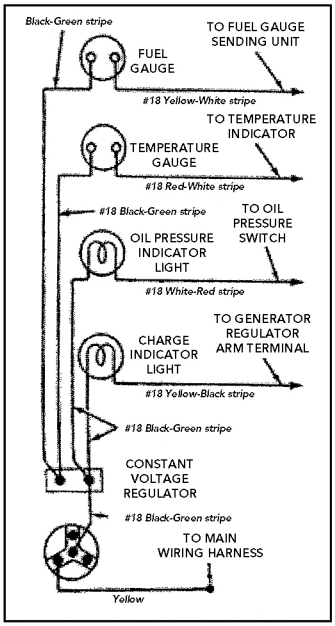
If the oil pressure gauge fails to operate, shut the engine down immediately on the assumption that the



Constant Voltage Regulator.

gauge is accurate and that the oil pump itself has failed. This is the safest thing to do since, if the gauge is functioning properly and there is no oil pressure, the engine will burn up in a few short minutes.

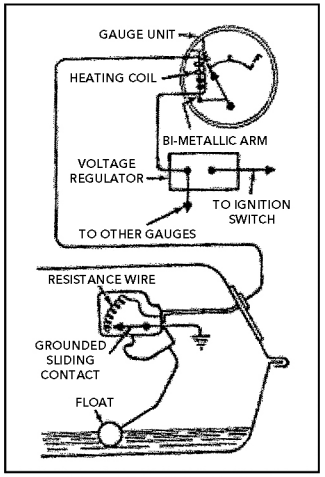
After shutting the engine down, disconnect the tiny oil line from its fitting on the engine block and then start up the engine and see if oil comes out of the hole in which the tube is connected. If oil comes out of this hole in a steady flow, there is actually oil pressure in the engine



Typical Gauge Circuit (Tel-Tail Light for Charge Indicator, Oil Pressure)

and it is reasonably safe to run it slowly until it is found out definitely if the gauge or the oil pump is bad.

Connect up the tube to the engine and disconnect it at the pressure gauge and again start the engine. See



Fuel Gauge Circuit-King Seeley

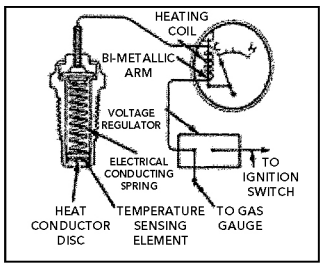
if oil comes out of the little tube in back of the gauge in a steady but small flow, which would indicate that the oil pump in the engine is functioning and the gauge on the dash is failing to register.

Next, remove the gauge from the dash and make sure the tiny hole in the gauge fitting is open. Prod it with a pin or needle to make sure it is not stopped up or blocked in any way. After being sure the hole is open, reconnect the gauge; it is not necessary to remount it on the dash panel, simply connect it to the end of the tube and again run the engine. If the gauge now registers properly the fault was with a blocked-up metering hole in the oil gauge itself. If the gauge still does not function, it must be replaced with a new one.

When a new pressure gauge is being installed, examine the tiny copper line carefully for kinks and worn spots. It is sound economy to replace the little tube as well as the gauge when any time the gage itself is being replaced.

Resistance Type Electric Gauges

No matter what this type of gauge



Temperature Gauge Circuit-King Seeley

is used for, the checking procedure is the same, when used to indicate oil pressure the following procedure should be applied first.

GAUGE READS ZERO OIL PRESSURE

If the oil pressure gauge on the dash fails to register, immediately shut the engine down as a safety precaution since the gauge may be reading properly and there may be no oil pressure in the engine. Running the engine without oil pressure will shortly damage it considerably.

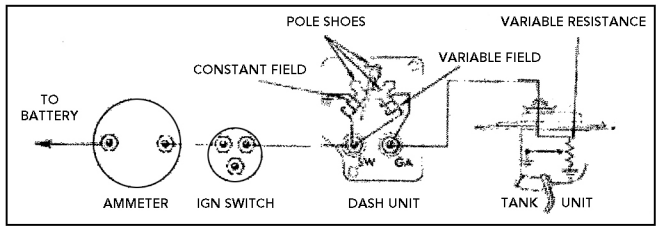
In an emergency a quick check can be made by first determining that there is plenty of oil in the engine and then disconnect the wire from the sending unit on the engine and remove the sending unit from its hole in the engine block. Now start the engine and if the pump is operating oil will come out of the mounting hole in a steady flow. If no oil comes out of the hole it means that the oil pump in the engine is not working and should be attended to before any further check is made on the gauges themselves.

GAUGE READS ZERO AT ALL TIMES

Disconnect the wire at the sending unit on the engine (or gas tank) and ground this wire against the frame or engine. If the gauge being tested now reads "full on," replace the sending unit.

If grounding the wire to the sending unit does not cause the gauge to read "full on," then check further by disconnecting at the gauge the wire which runs to the sending unit. Now connect a jumper wire from this terminal and ground the jumper wire right at the dash. If the gauge now reads "full on," the wire leading to the sending unit is broken.

If grounding right at the dash unit does not make the gauge read "full on," check to determine if current is reaching the gauge from the ignition switch. If it is, and the gauge still does not read "full on," the dash unit should be replaced.



WIRING CIRCUIT OF THE MAGNETIC FUEL GAUGE.

GAUGE READS FULL AT ALL TIMES

Again disconnect the wire from the sending unit and if this causes the gauge to read "full off," the sending unit either on the tank or engine is defective and should be replaced.

If disconnecting the wire from the sending unit has no effect on the gauge, disconnect the wire at the gauge. If it now shows "full off," the wire between the gauge and the sending unit is grounded and the ground should be corrected.

If disconnecting the wire at the gauge does not cause it to read "full off," the dash unit has an internal ground and should be replaced.

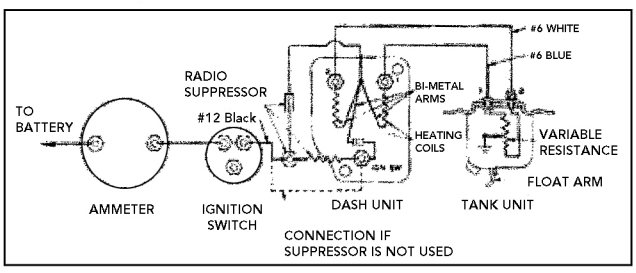
GAUGE READS TOO HIGH AT ALL TIMES

By this is meant that the gas tank gauge may read ¾ full when it is known there is only ¼ of a tank full of gas. Or the temperature gauge may read boiling when the operator knows that the temperature is probably not more than 160 degrees.

This condition is generally caused by the wire from the sending unit to the receiving unit being partially grounded.

The only accurate check that can be made for this condition is to use a rheostat in place of the sending unit to determine if the gauge on the dash is in good condition.

If after making certain that there is no partial ground on the wire between the sending and receiving unit, the sending unit should be replaced.



WIRING CIRCUIT OF THE THERMAL FUEL GAUGE.

GAUGE READS TOO LOW AT ALL TIMES

This is almost always caused by a high resistance connection in one or more of the wires.

The wire, for instance, to the gauge on the gas tank is usually a bayonet connection and frequently it develops high resistance because of water in the trunk of the car, etc.

To cure a too low reading gauge, clean up all of the connections in the gauge circuit including that of the gauge itself. If this fails to make the gauge read properly, it will have to be checked with the rheostat to determine which of the units is defective.

Bi-Metal Type Electric Temperature Gauge

If the dash gauge reads low temperature at all times even when the engine is known to be warm, check first to find out if the wire from the gauge on the dash to the gauge on the engine block is grounded in some way. If this wire is grounded the gauge will read cold.

An open circuit in this type gauge will cause the gauge to read hot.

To check to see if the instrument on the dash is functioning properly, first ground the wire which goes to the sending unit to the cylinder head. This should cause the gauge to read extreme cold. In fact, it should go all the way down to the stop pin.

To determine if the gauge is operating properly, remove the ground and immediately and quickly the needle should register maximum temperature. If the dash instrument responds to these two tests when the gauge is not functioning properly, the sending unit in the engine block should be replaced.

The Warning Light Type

The light should light when the engine is not running but the switch is turned on. If it does not, try a new bulb. If still no light, check the wire from the light to the ignition switch. If still no light, disconnect the wire at the sending unit and ground it. If the light now lights, the sending unit is faulty.