# SECTION 10-I

# INSTRUMENTS AND CLOCK

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## SERVICE BULLETIN REFERENCE

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## 10-65 CHARGE INDICATOR, TEMPERATURE GAUGE, OIL PRESSURE GAUGE

### a. Charge Indicator (Ammeter)

The AC charge indicator located in the instrument cluster is similar to an ammeter; however, the scale is not graduated in amperes, therefore the indicator does not show the amount of current flowing. The current required to move the pointer against the stop is 15 amperes for both charge and discharge. The pointer is provided with a dampener, consisting of Silicon-Jell on the front pivot, to reduce pointer fluctuation when the voltage regulator is functioning.

The charge indicator will indicate "charge" when the battery is being charged and "discharge" when the battery is being discharged. It gives an indication of the state of charge of the battery, since it shows a relatively high charging rate when the battery is low, and a low charging rate when the battery is near full charge. Immediately after cranking the engine, the charge indicator will be well over on the "charge" or plus (+) side for a short time, if lights and accessories are turned off. As the energy used in cranking is restored to the battery the pointer will move back toward zero but will stay slightly on the plus (+) side. If the battery is low, however, the charge indicator will show a high charging rate for a considerable period of time.

*The charge indicator does not indicate charging rate of the generator* since energy supplied by generator to electrical units other than the battery and horns does not pass through the indicator. At speeds above 15 MPH, with lights and accessories turned on, the indicator may show a low reading on the discharge side. The indicator should never show a high discharge reading; if it does, the generator and regulator should be tested.

### b. Temperature Gauge

The AC temperature gauge, located in the instrument cluster below the charge indicator, is not an electrical instrument. The heat indicator is a vapor pressure type which makes use of a sealed-in liquid, the expansion of which creates a pressure which moves the pointer on the gauge.

The temperature gauge is a unit assembly consisting of a pressure gauge connected by a capillary tube to a vapor bulb. The vapor bulb is attached by a plug to the right rear corner of the engine cylinder head so that it extends into the cooling water. The heat of the water causes the sealed-in liquid in bulb to expand in proportion to temperature and exert pressure on the gauge in instrument cluster. The gauge is marked "COLD" and "HOT" and does not show temperature in degrees.

The capillary tube is supported by a clip on the dash near its connection to cylinder head. A loop is formed in tube between clip and cylinder head to absorb vibration, and allow for

movement of engine on its mountings. When a new unit is installed this loop must be carefully formed and the tube must be supported in the clip. The tube must never be sharply bent or kinked, and must not be permitted to rub against the spark plug cover.

#### c. Oil Pressure Gauge

The AC oil pressure gauge is not an electrical instrument. The gauge is the pressure expansion type which makes use of pressure developed by the oil pump acting directly on the mechanism of the gauge in the instrument cluster. The gauge is connected by a small pipe to the main oil passage in the crankcase near the distributor. Connected at this point, it registers the full pressure of the oil pump.

## 10-66 ELECTRIC CLOCK

The electric clock, either Borg or New Haven, is mounted in the instrument panel to right of the radio speaker grille. The clock wiring circuit is protected by the "clock" fuse on the fuse block under the cowl. The clock light is controlled by the rheostat in the lighting switch and is protected by the thermo circuit breaker.

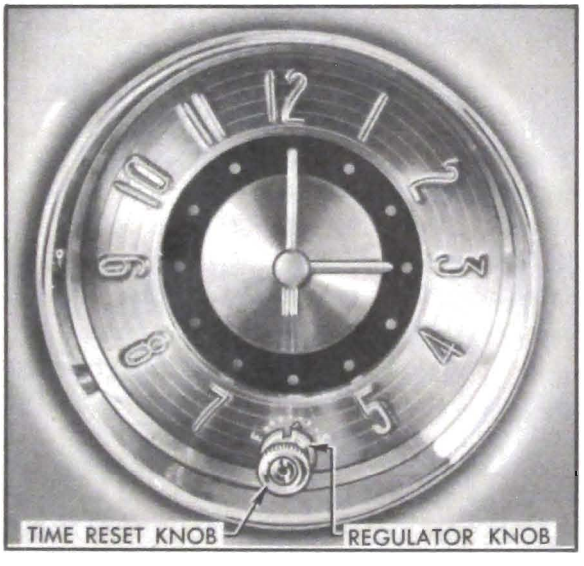


Figure 10-107—Clock Time Reset and Regulator Knobs

#### a. Clock Time Reset and Regulator Adjustments

The time reset knob extends through the glass on front of clock. To reset time, pull knob out and turn as required. See figure 10-107.

The regulator knob is located under the reset knob which extends through the glass. The regulator knob has a small notch on the edge in which a thin key or similar tool may be used to turn knob. The knob extends through the glass and has a small pointer on the inner end to align with graduations on the numeral ring of clock. See figure 10-107.

If clock loses time the regulator pointer should be moved toward "F"; if clock gains time pointer should be moved toward "S." One division on the regulator scale is equivalent to approximately 6 minutes per day. More accurate regulation can be obtained by moving the pointer only a fraction of one division at a time and noting the results after clock has run at least 24 hours.

#### b. Winding Clock When Connecting Clock Wiring or Battery

*The electric clock requires special attention when reconnecting a battery that has been disconnected for any reason, a clock that has been disconnected, or when replacing a blown clock fuse.* IT IS VERY IMPORTANT THAT THE INITIAL WIND BE FULLY MADE. To be certain of this, reconnect battery cables as follows:

1. Make sure that all other instruments are off.
2. Connect one cable (preferable positive) to battery.
3. Before connecting the *last* cable to battery, press the terminal to its post on battery. Immediately afterward strike the terminal against battery post to see if there is a spark. If there is, allow the clock to run down until it stops ticking, and repeat as above until there is no spark. Then immediately make the permanent connection before the clock can again run down. The clock will run down in approximately 2 minutes.
4. Reset clock after all connections are made.

NOTE: *The above procedure should also be followed when reconnecting the clock after it has been disconnected, or if it has stopped because of a blown fuse. Be sure to disconnect battery cable before installing a new fuse.*

#### d. Clock Service

The clock manufacturers have established Authorized Service Stations in many cities throughout the United States and Canada. These service stations are prepared to carry out terms of the manufacturer's warranty and also to perform any repairs made necessary through use of clock.

When a clock requires warranty service or repairs other than regulation, it should be removed by the Buick dealer and sent to the nearest authorized service station. *The manufac-*

*turer's warranty is void if repairs have been attempted outside of an authorized service station.*

## 10-67 GASOLINE GAUGE—DASH AND TANK UNITS

The AC gasoline gauge consists of two units; the dash unit located in the instrument cluster, and the tank unit located in the gasoline tank One terminal of the dash unit is connected to the ignition switch so that the unit registers only when the ignition switch is turned on. The other terminal of the dash unit is connected by a single wire to the tank unit, which is grounded on the tank to complete the circuit.

The dash unit pointer is moved by changing the magnetic pull of two coils in the unit. The magnetic pull is controlled by action of the tank unit which contains a variable rheostat, the value of which varies with movement of a float and arm. The tank unit is mounted in the tank so that the float rises and falls on the surface of the gasoline near the middle of the tank. The float is adjusted to provide approximately 1 gallon reserve when the dash unit pointer is at the dot next to the "E" position.

If the gasoline gauge does not operate properly, the dash unit, tank unit wiring, and tank unit should be separately tested to determine which is at fault. The units and wiring may be tested with AC Gas Gauge Tester HMO 204 (AC #1516000).

If Tester HMO 204 is not available, a similar tester may be made from a new gasoline gauge tank unit. Attach a 5-foot piece of red colored insulated wire (#16) to binding post of tank unit, and attach a similar piece of black wire to the flange of unit. Attach spring clips to the free ends of both wires.

### a. Test of Dash Unit

1. With ignition switch turned off, disconnect the tank wire (white with black parallel tracers) from dash unit terminal. Connect the red tester wire to this terminal and connect black tester wire to any convenient ground on car. Make sure that the other wire attached to dash unit has a tight connection.

2. Turn ignition switch on, then move tester arm up and down against the stops. If dash unit is okay, the pointer will move freely from "Empty" to "Full" with movement of tester arm, indicating that the trouble is in wiring or tank unit. If pointer does not move, or only moves part way, the dash unit is faulty and should be replaced.

3. Turn ignition switch off. If dash unit is okay, reconnect wire to terminal stud, being careful that the terminal of this wire does not come in contact with the other dash unit terminal, which would result in damage to tank unit rheostat.

### b. Test of Tank Unit Wiring

1. With ignition switch turned off, disconnect tank unit wire (black, parallel tracers) at connector in luggage compartment. Connect the red tester wire to the wire running to dash unit and ground the black tester wire on car.

2. Turn ignition switch on, then move tester arm up and down against stops while dash unit is being observed. If wiring is okay, dash unit pointer will move freely from "Empty" to "Full" with movement of tester arm, indicating that the trouble is in tank unit or the short wire leading to it.

3. If, on the test, dash unit reads "Empty" at all times or the reading is noticeably lower than during the test of dash unit, look for a ground in the wiring between dash unit and bayonet connector. If dash unit reads above "Full" at all times or if its reads higher at "Empty" and "Full' than readings obtained on dash unit test, look for points of high resistance such as dirty connections, broken wire strands, or open circuit.

### c. Test of Tank Unit

1. If tests given above indicate that the trouble is in the tank unit, remove the gasoline tank (par. 3-13) so that the tank unit may be cleaned and tested.

2. Before removing unit from gasoline tank clean away all dirt that has collected around the tank unit, and note whether the insulation was in proper position over the terminal and wire. Road dirt, particularly calcium chloride, may have caused an electrical leak that threw the tank unit out of calibration.

3. After thorough cleaning and removal of tank unit, connect it to ground and to wire leading to dash unit, and test in the same manner as when using tester. If tank unit tests okay it should be reinstalled in tank, otherwise it should be replaced with a new unit. When installing tank unit make certain that insulation is folded over the terminal and snapped over wire.

## 10-68 SPEEDOMETER

The AC pointer type speedometer head, located in the center of instrument cluster, has a magnetic type speed indicator and a gear driven odometer. The total mileage odometer incorporates five figure wheels, and the trip odometer incorporates four figure wheels, the right hand wheel indicating in one-tenths of a mile.

The trip odometer reset knob is located on the lower edge of instrument panel just to right of steering column. A quick reset may be obtained by pushing knob up and turning it to the right. Turning the knob to the left resets one-tenth mile at a time.

The speedometer head is driven by a flexible cable, inclosed in a casing, which is driven by worm gears in the transmission rear bearing retainer.

### a. Test of Speedometer Head

Most cable breakages are caused by tightness in the speedometer head. Tightness or binding in the head may also cause wavering of the pointer. The speedometer head may be tested for tightness or binding as follows:

1. Obtain a short piece of speedometer cable (3" to 4" long) with a tip to fit the speedometer head. A piece of broken cable may be used.

2. With speedometer head in place but with the cable and casing disconnected, insert the test cable in the speedometer socket.

3. Spin the test cable between thumb and finger three or four turns. If test cable turns hard or shows any tendency to bind at all, there is trouble in the head and it should be removed for repairs by an authorized AC Speedometer service station. If test cable turns freely, the head is okay; look for sharp bends in cable casing. A casing radius of not less than 5" must be maintained at all bends.

### b. Inspection and Lubrication of Speedometer Cable

If the speedometer cable is noisy, or the speedometer pointer wavers, the cable should be inspected for kinks or lack of lubrication.

The AC speedometer cable is factory lubricated with a special high-low temperature grease which will last the lifetime of car under normal operating conditions. In extremely hot and dusty climates, relubrication of the cable may be necessary at intervals of approximately 20,000 miles or two years of service. When a cable is replaced, the cable must be lubricated.

1. Disconnect speedometer cable casing at the speedometer head, then pull cable out of upper end of casing.

2. Inspect cable for breaks or worn spots and kinks which indicate lack of lubrication or sharp bends in casing. To check cables for kinks, hold one end vertically in each hand and slowly turn the cable; if cable is kinked the loop will "flop". Replace cable if kinked, and also the casing if it is distorted or broken.

3. Spread a thin layer of special high-low temperature grease, AC Spark Plug type ST-640, over the lower two-thirds of the cable. As cable is inserted into casing from upper end the lubricant will be spread over its entire length. *Do not overgrease.*

4. Connect casing to speedometer head, making sure that cable tip seats properly in the speedometer socket.

### c. Replacement of Speedometer Cable

Replacement cables are furnished in a kit, under Group 4.342, consisting of a cable, cable tip, and staking tool. The cable must be cut to required length and the tip must be installed, as follows:

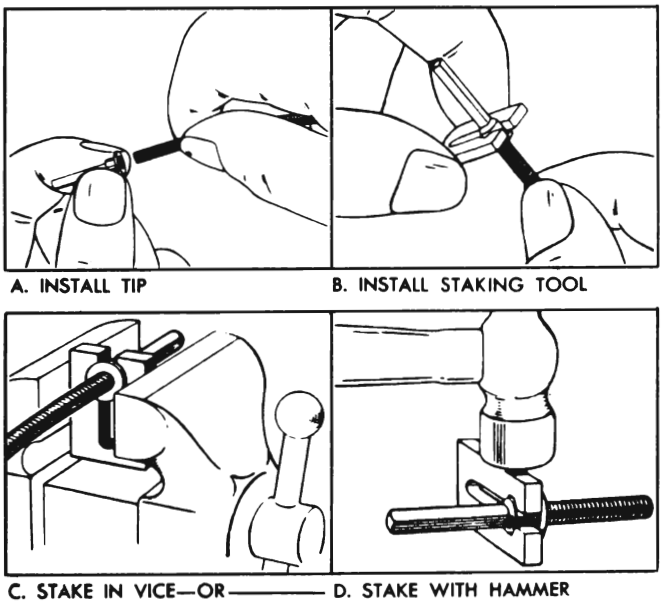


**Figure 10-108—Installation of Speedometer Cable Tip**

| *Series* | *Cutting Length* | *Overall Length Tip Installed* |
|---|---|---|
| 40-50 | 68⅛" | 68⅝" |
| 70 | 73⅛" | 73⅝" |

1. After cutting cable to specified length, fit the correct shape new tip to the cut end of cable, then insert cable and tip between the jaws of staking tool. See figure 10-108, views A and B.

2. Squeeze staking tool edgewise in a vise, or strike the upper edge of staking tool one or two sharp blows with a hammer. See figure 10-108, view C or D. Either method will fasten tip and cable together permanently.

3. Check overall length, which must be as specified above.

4. Lubricate cable and install it (subpar. *b*, above).