

# SERVICE MANUAL

## SECTION XIII INSTRUMENTS



Packard Motor Car Company  
Detroit 32, Michigan

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## Instrument Cluster Removal

Disconnect the positive cable of the battery. Disconnect the speedometer cable at the rear of the speedometer. Remove the two screws from the front of the cluster at the top that attach it to the instrument panel. From underneath the instrument panel, remove the two nuts from the studs attaching the bottom of the instrument cluster to the instrument panel. From the rear of the instrument cluster, push outward on the top half of the cluster until access is gained to the instrument wiring. Disconnect the wiring on the rear of the cluster. Pull the signal and instrument lights free from the cluster. The instrument cluster may then be removed through the opening in the instrument panel.

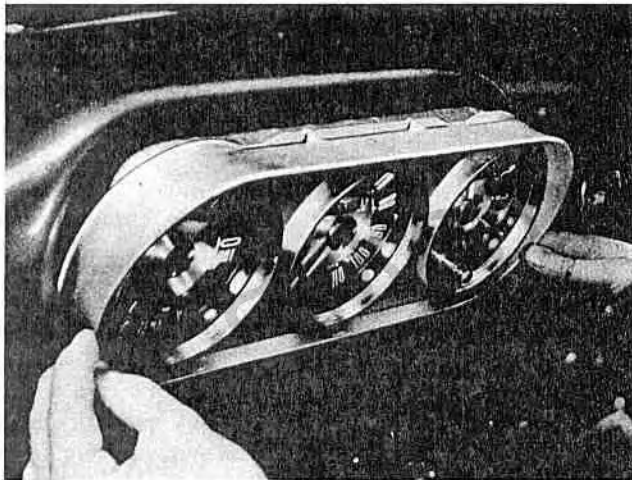


Figure 1—Removing the Instrument Cluster

## Instrument Cluster Installation

Position the instrument cluster in the instrument panel opening with the top half tilted outward. Connect the wiring to the terminals. Install the instrument lights. Push the instrument cluster into the instrument panel and line up the screw holes in the top of the cluster with those in the instrument panel. Install the attaching screws and nuts. Connect the speedometer cable at the speedometer. Connect the battery cable.

## Fuel Gauge and Temperature Gauge Removal and Installation

Disconnect the wiring at either of the gauges that is to be removed. Remove the attaching screws holding the temperature or fuel gauge retainer to the back of the instrument cluster and lift out the gauge.

To install, position the assembled gauge into the instrument cluster and install and tighten the attaching screws. Connect the wiring to the gauge terminals.

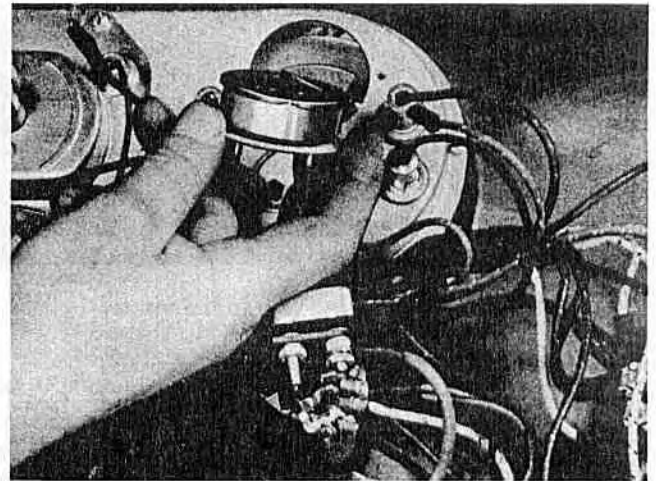


Figure 2—Installing the Fuel Gauge

## Speedometer Removal

Disconnect the positive cable of the battery. On "300" and Patrician "400" models, remove the trip mileage register stem. Disconnect the speedometer cable at the rear of the speedometer. Remove the two instrument lights for the speedometer.

Remove the two screws attaching the instrument voltage regulator, circuit breakers, and speedometer to the bottom of the instrument cluster. Remove the instrument voltage regulator. Loosen the screw at each end of the two circuit breakers on the instrument cluster and pull down on the circuit breakers to clear the speedometer. Remove the two screws at the top of the speedometer. Lift out the speedometer assembly. The speedometer when in need of servicing should be sent to the authorized King-Seeley Service Station for repairs.

## Speedometer Installation

Install the speedometer in the instrument cluster and install the upper attaching screws. Position the circuit breakers on the speedometer retainer with the hole lined up with the hole in the speedometer retainer and instrument cluster. Tighten the outer screw of the circuit breakers. Position the instrument cluster voltage regulator and install the screws attaching the voltage regulator, circuit breakers, and speedometer retainer to the instrument cluster. Install the speedometer instrument lights. Connect the speedometer cable. Connect the battery cable. On "300" and Patrician "400" models, position the trip mileage reset cable and install the attaching nut and reset knob.

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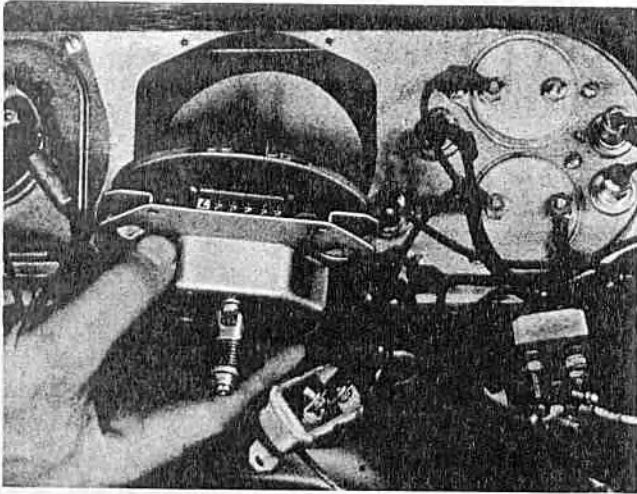


Figure 3—Installing the Speedometer

## Clock Removal

Remove the screw from the clock reset knob and remove the knob. Remove the clock instrument light. Disconnect the fuse holder from the clock wire and remove the fuse. Remove the screw attaching the circuit breaker and clock retainer to the instrument cluster. Loosen the screw attaching the instrument voltage regulator and circuit breaker to the cluster and rotate it away from the cluster. Remove the three screws attaching the clock assembly to the cluster and remove the clock.

The clock, when in need of servicing, should be taken to an authorized service station for repairs. It should first be made certain that a blown fuse is not the cause of the inability of the clock to run. If the clock runs too fast or too slow, the regulator knob on the back may be turned to regulate the clock operation.

## Clock Installation

Position the clock in the cluster and install the three outer and upper attaching screws. Rotate the circuit breaker to line up the hole in the plate on the bottom of the circuit breaker with the hole in the clock retaining plate and instrument cluster. Install the attaching screw and tighten both screws in the circuit breaker. Install the fuse in the fuse holder of the clock wire. Install the clock instrument light. Position the clock reset knob and install the attaching screw.

## Indicator and Gauge Testing

The oil pressure indicator *Telltale* light operates in conjunction with a sending unit in the cylinder block. This indicator sometimes will light up or will flicker when the engine is idling, even though the oil pressure is adequate; however, the light should go out when the engine is speeded up.

The water temperature and gasoline gauges operate in conjunction with a constant voltage regulator, attached to the back of the instrument cluster, and sending units in the cylinder head and gasoline tank.

If the battery discharge indicator shows a constant discharge when it normally should show a charge, the battery, regulator, generator, wiring, etc. should be checked to determine the cause.

If the indicator does not light at any time, the bulb should be replaced. The indicator should always light up when the ignition switch is turned on before starting the engine and also when the ignition key is turned to the left.

The oil pressure indicator should light up when the ignition key is turned. If it does not light, disconnect the wire from the sending unit and ground the wire to the frame or cylinder block. If the indicator still does not light up with the ignition switch on, replace the bulb.

If the indicator lights up when the wire is grounded to the frame or block, the sending unit should be checked for being loose and poorly grounded. If the unit is found to be tight and properly grounded, it should be removed and a new unit installed.

If the indicator remains lit when it normally should be out, replace the sending unit before proceeding further to determine the cause for a low pressure indication.

## Instrument Voltage Regulator

The voltage regulator is common to both the temperature and the fuel level systems. The regulator operates at a constant average value of 5.0 volts.

If both the temperature gauge and the fuel gauge read considerably too high at the same time, that is; if the temperature gauge reads up scale with a cold engine and the gas gauge reads up scale with an empty tank, the instrument voltage regulator is not working properly and should be replaced.

**Note:** Before replacing a regulator, check the regulator attaching screws for being tight so that the regulator is properly grounded. The grounding is essential to the proper functioning of the unit.

If the temperature gauge and the fuel gauge both read too low at the same time, either the input voltage to the regulator is below 5.0 volts or the regulator is not operating properly and should be replaced. Check the battery output voltage before replacing the regulator.

A definite check to determine if the regulator is defective is to disconnect the wires from the regulator terminals and attach them to a new unit out of stock. Ground the new unit against the instrument cluster case, at which time the gauges should operate properly.

## Gauge Sending Unit Testing

A new fuel tank sending unit from stock and two test leads with clip terminals at each end may be used to determine whether a temperature or a fuel gauge



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and their respective sending units are operating properly. Test leads approximately 10 feet long will permit the individual making the check to sit in the seat of the car and observe the gauge being checked.

To check the water temperature gauge, disconnect the wire from the terminal on the sending unit in the cylinder head and clip one end of a test lead to the disconnected wire. Clip the other end of the test lead to the terminal on the new tank unit. Clip one end of the second test lead to the flange on the tank unit and ground the other end of the lead. Turn on the ignition switch and operate the float arm of the new tank unit.

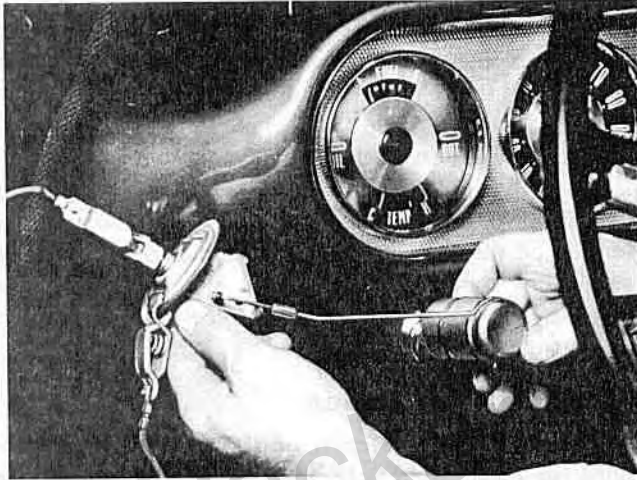


Figure 4—Testing the Temperature Gauge Panel Unit

When the float is at the bottom or empty position, the temperature gauge should register at the "C" marking on the dial. See figure 4. When the float is moved upward to its top or full position, the gauge pointer should come to rest at the "H" marking on the dial, as shown in figure 5.

If the gauge checks satisfactorily, the sending unit

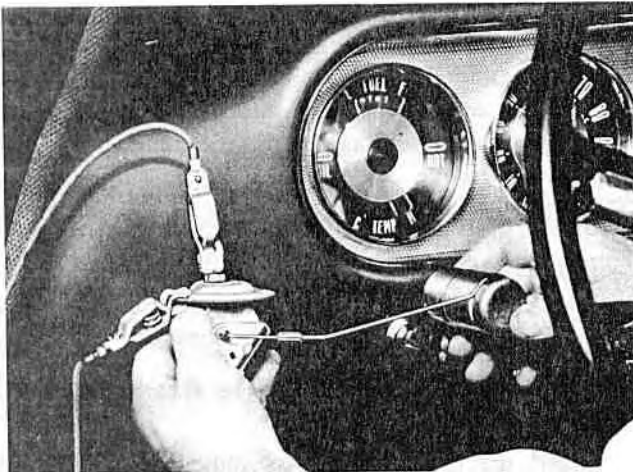


Figure 5—Testing the Temperature Gauge Panel Unit

to gauge wire is O.K. If the gauge does not check satisfactorily, disconnect the sending unit to gauge wire at the gauge and hook up the new tank unit to the terminal on the gauge. Repeat the empty and full checks. If the gauge operates properly, the sending unit to gauge wire should be replaced.

If the gauge operated properly with the new tank unit and the original wire, the sending unit in the cylinder head should be replaced.

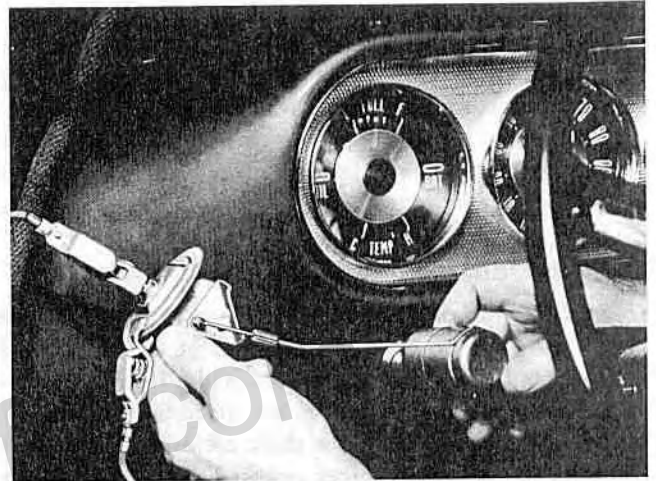


Figure 6—Testing the Fuel Gauge Tank Unit

The fuel gauge and the tank sending unit may be checked by following the same procedure. Be sure that the tank unit is tight and properly grounded in the tank and that the tank is grounded to the frame. If the fuel gauge instrument panel unit does not operate satisfactorily with the test tank unit, the instrument panel unit is at fault and should be replaced. If the instrument panel unit registers correctly with the test tank unit, the fuel gauge tank unit is at fault and should be replaced.

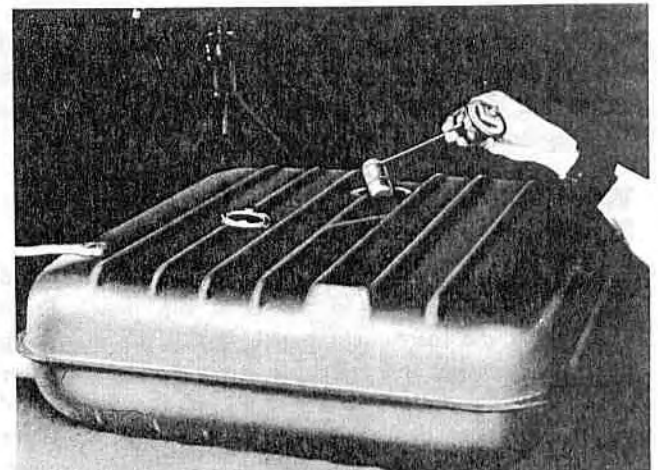


Figure 7—Installing the Fuel Gauge Tank Unit

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## Windshield Wiper Motor Removal

Disconnect the rubber vacuum tubing at the windshield wiper connection. Disconnect the motor control cable assembly at the wiper motor. Release the flat spring which is locked into the ratchet of the lower section of the tensioner by pushing it towards the dash panel. With the spring released, rotate the lower part of the tensioner assembly toward the windshield wiper until the locking pin hole is in line with a similar hole in the upper section, and install a locking pin or drift in the hole. With the tensioner now locked in this position, the tension on the cable is released. Remove the cables from the motor swivels and pulleys. If the car is equipped with a windshield washer, disconnect the rubber tubing at the windshield wiper motor. Remove the screws attaching the windshield wiper motor to the front of the dash panel, and lift out the windshield wiper motor and gasket from the dash panel.

## Windshield Wiper Motor Installation

Position the windshield wiper motor and gasket in the dash panel with the right swivel of the windshield wiper motor overlapping the top of the left swivel. Install the windshield wiper motor to dash panel attaching screws. Install the pivot shaft cables on the pulleys and the swivels of the wiper motor. Remove the locking pin or drift holding the tensioner assembly in the locked position to permit the cables to retension. Install the windshield washer tubing at the proper connection.

## Windshield Wiper Drive Cable and Pivot Removal

Remove the wiper arm and wiper blade. From underneath the instrument panel, disconnect the rubber tubing at the windshield wiper pivot if the car is equipped with a windshield washer. Remove the cables from the tensioner assembly and cleaner motor swivels as described under "Windshield Wiper Drive Tensioner Assembly Removal." From underneath the instrument panel, remove the attaching screw and mounting bracket holding the pivot shaft and cable assembly to the cowl top panel and windshield moulding. The pivot shaft and cable assembly may then be removed from the opening on the cowl top panel.

## Windshield Wiper Drive Cable and Pivot Installation

Position the pivot shaft and drive cable assembly and gasket in the opening in the cowl top panel. From underneath the instrument panel, install the mounting pivot shaft bracket and attaching screw. Install the drive cables on the pulleys and swivels of the windshield wiper motor as described under "Windshield Wiper Drive Cable Tensioner Installation." When disconnecting the windshield wiper cables, the battery should be

disconnected to prevent possible contact with "live" wires.

## Windshield Wiper Drive Cable Tensioner Assembly

The tensioner assembly is the self-adjusting type, with pulleys, and is spring-loaded to maintain a constant tension through a ratchet and spring arrangement, preventing slippage and wear of the cables.

## Tensioner Removal

Press the flat tensioner ratchet spring toward the dash panel to release it from the tensioner ratchet. With the spring released, rotate the lower section of the tensioner that holds the pulleys toward the windshield wiper motor until the locking pin hole is in line with a similar hole in the upper section. This hole is  $\frac{1}{8}$  inch diameter and is located near the rear of the tensioner assembly. Insert a locking pin or drift in this hole to lock the two sections of the tensioner together, releasing the tension on the drive cables. Unhook the cables from the swivels of the windshield wiper motor. Remove the attaching screws holding the tensioner assembly to the dash panel.

## Tensioner Installation

Rotate the lower section of the tensioner assembly until the locking pin hole is in line with a similar hole in the upper section. Insert a locking pin or drift to lock the upper and lower sections of the tensioner in this position. Position the tensioner on the dash panel and install the attaching screws. Install the drive cables on the pulleys and swivels of the windshield wiper motor. Remove the locking pin or drift from tensioner assembly to tension the cables.

## Windshield Wiper Motor Control Cable Assembly Removal

Pull off the windshield wiper motor cable control knob. Using tool number J-2602, windshield wiper switch nut wrench, remove the nut holding the control cable assembly to the steering gear shroud and push the control cable into the shroud. Loosen the screw at the wiper motor holding the control cable and remove the cable. Remove the lower bracket, holding the steering gear and shroud to the bottom of the instrument panel. Remove the tape holding the control cable to the wiring harness. Pull the felt washer in the end of the shroud down on the steering gear. Pull down on the control cable to remove it from the shroud.

## Wiper Motor Control Cable Assembly Installation

Install the control cable assembly into the shroud, working the end that contains the gears into the opening

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for the control knob and nut. Install the attaching nut and tighten with wrench J-2602. Install the control knob. Install the end of the control cable into the connection at the wiper motor and tighten the screw. Position the felt into the end of the shroud. Tape the control cable to the wire harness. Install the bracket attaching the steering gear and shroud to the instrument panel.

### Windshield Wiper Blade

When the windshield wiper blade needs replacement, a windshield wiper blade refill rubber assembly kit is available from service, making it unnecessary to purchase a complete blade assembly.

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