

## AMERICAN MOTORS

American Motors, All Models

### DESCRIPTION & OPERATION

**Temperature Indicator** — Indicator circuit consists of a sending unit and gauge or warning light. Sending unit is threaded into cylinder head on 6 cylinder engines, and manifold coolant crossover on V8 engines. The gauge is grounded through the variable resistance of the sending unit. Changes in coolant temperature vary resistance in sending unit, increasing or decreasing indication when equipped with a gauge, or turning on the light by completing the ground circuit with coolant temperature at 255°F. Temperature indicator lamp should turn on with ignition turned to "START".

**Fuel Level Indicator** — Fuel indicator circuit consists of a sending unit, fuel gauge and on Pacer, a constant voltage regulator (CVR). Sending unit is located in fuel tank, gauge and CVR are located on instrument panel. Gauge is grounded through variable resistance of sending unit. A float attached to a slide rheostat follows fuel level and the varying resistance increases or decreases indicator reading.

**Constant Voltage Regulator** — On Pacer, CVR is connected in series to fuel gauge and on all other models it is connected in series to fuel and temperature gauges. CVR provides equal regulated voltage to each gauge. The CVR's function is to regulate the variable input voltage available from car battery, or charging system to provide a constant 5 volt output to gauges. The CVR does not produce a steady DC voltage output, but rather a pulsating voltage averaging 5 volts. Output voltage averaging lower or higher than 5 volts will result in proportionately higher or lower gauge readings.

### TESTING

#### OIL PRESSURE INDICATOR & SENDING UNIT

**Indicator Light** — With ignition "ON" and engine not running, indicator lamp should light. If not, ground sending unit wire to engine. If lamp does not light, check bulb, wire, or printed circuit. If lamp lights, replace sending unit.

**Oil Pressure Gauge** — Test accuracy of oil pressure gauge using a variable resistance tester (J-24538). Disconnect wire from sending unit located on engine. Turn ignition switch "ON". Connect one lead of tester to ground and other lead to sending unit wire. Oil pressure gauge should read as follows: 0 psi @ 73 ohms; 5-7 psi @ 44 ohms; 77-83 psi @ 10 ohms. Check all circuit connections before replacing gauge or sending unit.

#### TEMPERATURE INDICATOR (PACER)

**Circuit Test** — Disconnect wire from sending unit. Connect test lamp between sending unit and ground. Turn ignition "ON" and both the indicator and test lamp should light. If test lamp lights but indicator does not, check indicator bulb. If both lamps fail to light, check Violet wire between ignition switch and cluster.

**Sending Unit Test** — Drain cooling system and remove sending unit from cylinder head. Connect ohmmeter between sending unit wire terminal and sending unit body. If continuity is indicated, replace sending unit. If no continuity exists, suspend unit in antifreeze. With ohmmeter connected as before, heat antifreeze. **CAUTION** — Do not breathe fumes. At 225°F (±5°F) ohmmeter should indicate continuity. If not, replace sending unit.

#### FUEL GAUGE (ALL MODELS) & TEMPERATURE INDICATOR (EXC. PACER)

**Fuel & Temperature** — Use variable resistance tester (J-24538) with an ohm scale of 0-500 in one-ohm increments. Tester is to be used on ground side of gauge to stimulate operation of sending unit.

To test at sender unit: Disconnect wires at sending unit. Connect one lead of tester to disconnected wire and other lead to a known good ground. Turn ignition on. Turn tester controls to select each ohm value in tables below and observe gauge. If gauge reading is accurate for each ohm value selected, the trouble is in the sending unit ground circuit.

After being sure sending unit ground circuit is good, replace sending unit. If gauge reading is not accurate for each ohm value selected, no gauge reading is obtained, or gauge needle is pegged above the FULL or HOT position, disconnect test leads and reconnect sender unit wire and proceed to following tests.

① FUEL GAUGE INDICATION					
Series	E	1/4	1/2	3/4	F
HORNET	62	34	25	18	12
MATADOR	61	37	26	19	11
GREMLIN	62	34	25	18	12
PACER	61	39	27	20	11

① — Sending unit resistance requirements (ohms).

① TEMPERATURE GAUGE INDICATION				
Series	C (COLD)	Beginning of Band	Top of Band	H (HOT)
HORNET, GREMLIN	130°-73 ohms	171°-35 ohms	242°-13 ohms	270°-9 ohms
MATADOR	130°-73 ohms	185°-28 ohms	245°-13 ohms	268°-9 ohms

① — Sending unit resistance requirements (ohms).

## AMERICAN MOTORS (Cont.)

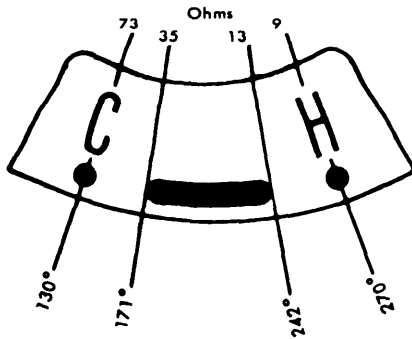


Fig. 1 Temperature Gauge Test Band (Similar)

## GAUGE TEST AT SENDER UNIT

**NOTE** — Perform test using a suitable testing instrument (J-24538) or an extra fuel tank sending unit and ohmmeter. Attach one lead of ohmmeter to fuel tank sending unit terminal. Connect other lead of ohmmeter to sending unit ground wire. See *Sending Unit Resistance Requirements table*. Move float arm and mark arm location at each of the appropriate resistance values. Disconnect sending wire from sending unit. Connect one lead of tester to disconnected sending wire and other lead to ground. Turn ignition "ON". Adjust tester to select ohm values listed in table and observe gauge indication at each ohm setting. **NOTE** — Fuel and temperature gauge indications may vary width of needles at any specific resistance value.

## TEMPERATURE GAUGE TESTING

## AT CLUSTER PIN TERMINAL

**NOTE** — Perform test using a variable resistance tester (J-24538) or an extra fuel tank sending unit and ohmmeter. See *American Motors Printed Circuits in WIRING DIAGRAM Section*. Disconnect battery ground cable. Remove instrument cluster and disconnect instrument wire harness. Check gauge retaining nuts for corrosion and tightness. Connect a jumper wire between CVR case and ground. **NOTE** — For vehicles

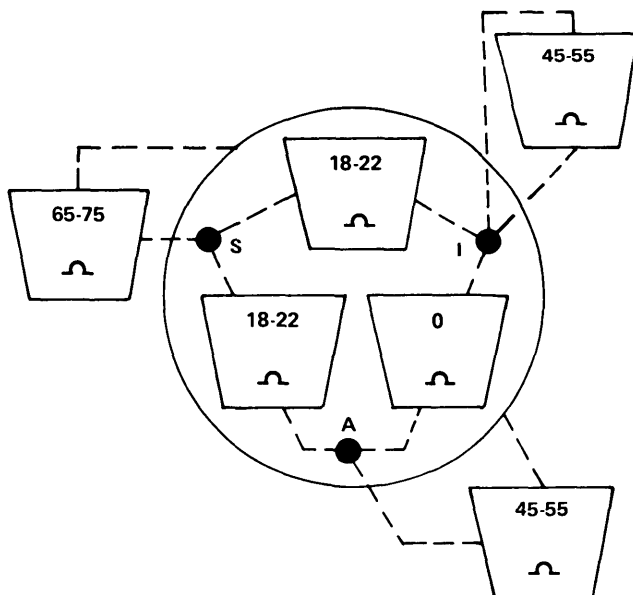


Fig. 2 Temperature Gauge Test — Internal CVR

with integral CVR, connect jumper between printed circuit board ground screw and ground. Connect jumper wire in series with a 4 amp. fuse between battery voltage source and ignition feed pin terminal of printed circuit board. Reconnect battery cable. Connect one tester lead to gauge sending unit pin terminal. Connect other tester lead to ground. Observe gauge indication while selecting ohm values listed in temperature gauge indication table. **CAUTION** — After completing test, do not disconnect ground jumper wire until ignition is turned to "OFF".

## FUEL &amp; TEMPERATURE GAUGE (UNIT TEST)

Using an ohmmeter, connect one lead to gauge input terminal and other lead to gauge sender terminal. Gauge resistance should be as follows:

**Hornet, Gremlin** — Fuel gauge — 16-21 ohms, temperature gauge (see Fig. 3 for ohm values)

**Matador** — Fuel gauge - 12-16 ohms, temperature gauge - 12-16 ohms.

**Pacer** — Fuel gauge - 12-18 ohms.

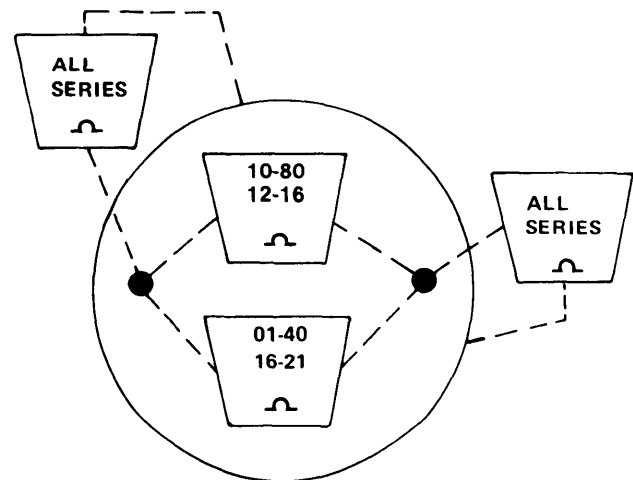


Fig. 3 Fuel &amp; Temperature Gauge Test — External CVR

## ADJUSTMENT

## STOP LIGHT SWITCH

Switch is mechanically actuated by brake pedal, mounted on master cylinder push rod and is not adjustable. If switch remains on, check for binding linkage.

## REMOVAL &amp; INSTALLATION

## CONSTANT VOLTAGE REGULATOR

**Hornet & Gremlin** — CVR is an integral part of temperature gauge. To replace CVR, remove instrument panel cluster and replace temperature gauge.

**Pacer & Matador** — Remove instrument cluster. On Pacer, remove screws retaining CVR to printed circuit board. On

## AMERICAN MOTORS (Cont.)

Matador, pull CVR from printed circuit board tension-type retainers.

### INSTRUMENT CLUSTER

**Pacer** — Disconnect battery negative cable. Remove cluster bezel, radio knobs, nuts and overlay retaining screws. Remove headlight switch overlay retaining screws, pull overlay back and disconnect speedometer cable. Remove cluster retaining screws, disconnect instrument panel wiring, gear selector dial cable from steering column (if equipped) and remove cluster assembly.

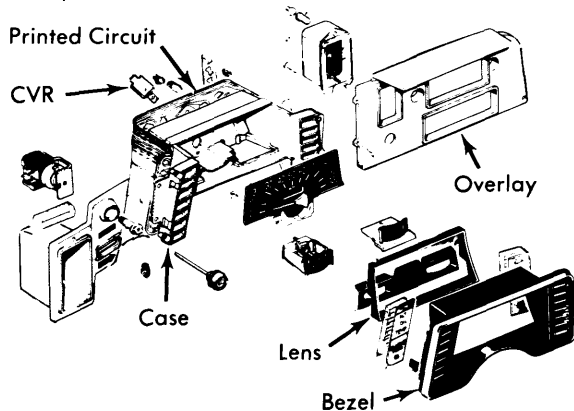


Fig. 4 Instrument Cluster — Pacer

**Hornet & Gremlin** — Disconnect battery negative cable. Remove package tray if equipped, cover steering column, then remove speedometer cable. Remove top and side screws from instrument panel. Tilt panel forward and disconnect headlight switch and wiper control wiring connectors. Disconnect fiber-optic ashtray light, if equipped. Disconnect harness connectors and fuel economy gauge vacuum hose, if equipped; then remove instrument cluster. To install, reverse removal procedure.

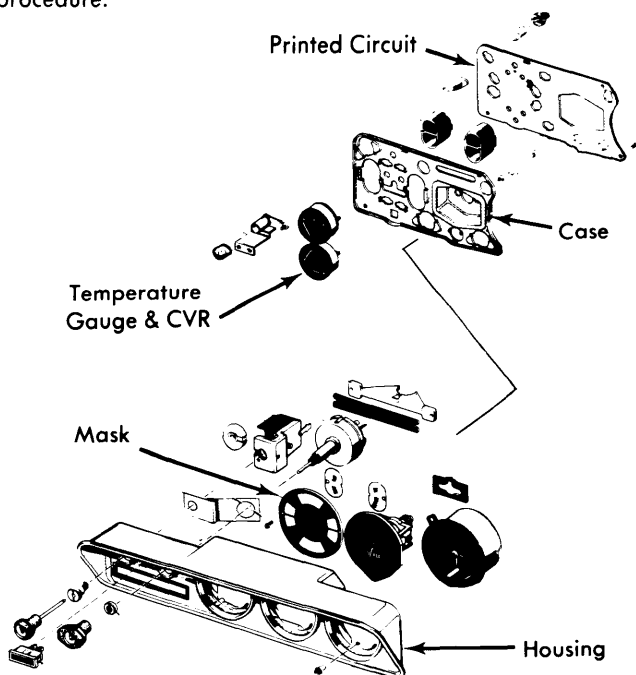


Fig. 5 Instrument Cluster — Hornet & Gremlin

**Matador** — Disconnect battery negative cable. Remove radio control knobs and retaining nuts. Remove right side mirror remote control from instrument panel (if equipped). Remove bezel, and cover steering column. Remove clock or fuel economy gauge (if equipped) retaining screws, pull assembly outward, and disconnect lamp, electrical leads, or vacuum hose (as required), then remove assembly from panel. Through clock opening, remove speedometer cable. Disconnect gear selector dial cable from steering column. Remove cluster mounting screws, cluster wiring connections, then remove cluster. To install, reverse removal procedure.

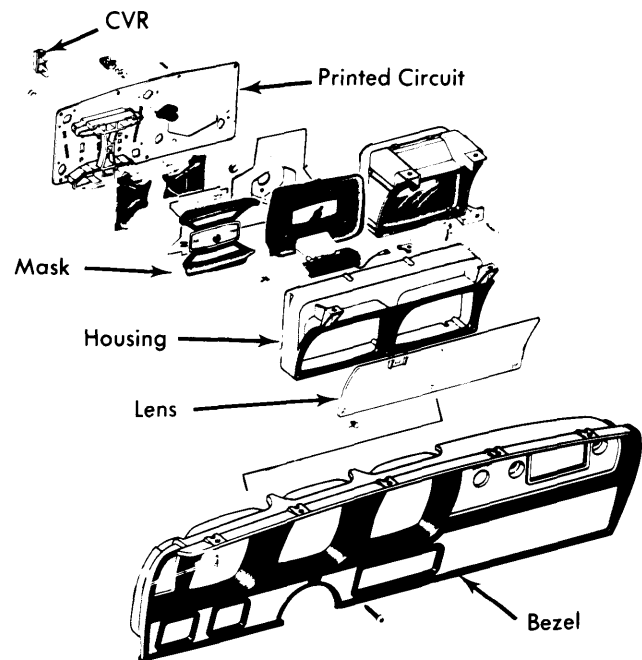


Fig. 6 Instrument Cluster — Matador

### INSTRUMENT PANEL OVERLAY PAD

**Hornet & Gremlin** — Disconnect battery, remove instrument cluster (as previously described) and remove windshield pillar reveal moldings and corner moldings. Remove upper portion of glove box, then remove screws retaining instrument panel center housing to underside of overlay pad. Remove overlay pad retaining nuts (from rear) and remove pad.

**Matador** — Disconnect battery ground. Remove lower instrument finish panel and glove box door with hinges. Remove fuse block mounting screws and disconnect wire connectors from fuse block; mark connectors for reassembly. Remove glove box screws and remove box through panel opening. Remove bezel. Remove pad screws located at lower glove box opening. Remove pad attaching nut from back of instrument panel on lower left side. Remove upper screws attaching pad to instrument panel. On cars equipped with air conditioning, remove the right hand duct bracket and lower duct to gain access to screw securing pad to instrument panel at far right side. Remove pad from instrument panel. To install pad, reverse removal procedure.

## AMERICAN MOTORS (Cont.)

### PRINTED CIRCUIT BOARD

**All Models** – Remove instrument cluster and from back of cluster remove bulbs, bulb clips, CVR (if removable), speedometer housing screws, fuel and temperature gauge attaching nuts and radio noise suppressor or connector strip if not equipped with radio. On Matador, remove circuit board attaching screws, mask, lens and gauges. On all models, remove printed circuit board. To install, reverse removal procedure.

### INSTRUMENT PANEL SWITCHES

**Headlight Switch, Pacer** – Disconnect battery negative cable. Remove headlight switch overlay retaining screws and pull overlay forward. Pull switch knob and shaft assembly out of switch while depressing shaft release button located on switch housing. Remove switch sleeve nut, switch wiring, and switch. To install, reverse removal procedure.

**Headlight Switch, Hornet & Gremlin** – Disconnect battery negative cable. Remove package tray (if equipped), and disconnect speedometer cable. Remove cluster bezel screws and tilt bezel away from panel. Place switch in full "ON" position, pull on knob while depressing shaft release button on side of switch. Remove switch retaining sleeve nut, lower switch and disconnect wiring. To install, reverse removal procedure.

**Headlight Switch, Matador** – Disconnect battery negative cable. Remove cluster bezel and screws retaining switch and wiper-washer bracket to panel. Pull switch to full "ON" position and pull knob out of switch while depressing shaft release button on side of switch. Use a wide blade screwdriver

to remove switch retaining nut. Remove wiring connector plug and remove switch. To install, reverse removal procedure.

### SPEEDOMETER

**Pacer & Matador** – Remove instrument cluster and on Matador remove printed circuit. Remove speedometer attaching screws and slip assembly out of cluster. To replace odometer, hold ink pad away from odometer with a piece of paper. Pry odometer retaining clip away from bracket and lift out odometer at clip end. To install, reverse removal procedure.

**Hornet & Gremlin** – Remove instrument cluster and separate speedometer from housing by removing attaching screws. To replace odometer, unhook odometer retaining clip by twisting and pushing down to disengage clip. Lift out odometer. To install, reverse removal procedure.

### GAUGES

**Pacer** – Fuel gauge can be removed and installed after removing instrument cluster and speedometer.

**Hornet & Gremlin** – Remove instrument cluster, printed circuit board, speedometer and indicator assembly, and fuel and temperature indicator face plate. Remove retaining nuts and separate gauge or indicator from assembly. To install, reverse removal procedure.

**Matador** – Remove instrument cluster, printed circuit board, mask and lens, and then remove appropriate gauge retaining screws and gauge. To install, reverse removal procedure.