AMERICAN MOTORS

American Motors, All Models

DESCRIPTION & OPERATION

Temperature Indicator – Temperature gauge is standard on all models except Pacer, which has a warning light. Circuit consists of 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. All temperature gauges are magnetic except gauges which operate on a constant voltage regulator (CVR). Sending unit has variable resistance actuating the gauge. Coolant warning light will come on when temperature reaches 250°F. Temperature warning light 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

NOTE – *Pacer with Rally Package uses the gauge.*

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 Warning Lamp – Test accuracy of oil pressure sending unit using a variable resistance tester (J-24538) or equivalent. 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. Sending unit calibration for all models should be Open above 4-6 psi; Closed below 4-6 psi.

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 250° 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 simulate 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
Spirit, AMX, Concord	248	151	105	65	31
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)
Spirit, AMX, Concord	147°-353 ohms	180°-192 ohms	242°-73.9 ohms	280°-45.2 ohms

① – **Sending unit resistance requirements (ohms).**

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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 equivalent. 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 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 test 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 & 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:

Spirit, AMX, Concord – Fuel gauge – 81.6-327.5 ohms, temperature gauge – 45-353 ohms.

Pacer – Fuel gauge – 12-18 ohms

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 & INSTALLATION

CONSTANT VOLTAGE REGULATOR

Removal (Pacer) – Remove instrument cluster. CVR is attached to the printed circuit at the back of the instrument cluster by screws.

Installation – To install, reverse removal procedure.

NOTE – *Spirit, AMX and Concord are magnetic type gauges and do not require a constant voltage regulator.*

INSTRUMENT CLUSTER

Removal (Pacer) – **1)** Disconnect battery negative cable. Remove cluster bezel, radio knobs, nuts and overlay retaining screws, pull overlay back and disconnect speedometer cable.

2) Remove cluster retaining screws, disconnect instrument panel wiring, gear selector dial cable from steering column (if equipped) and remove cluster assembly.

Installation – To install, reverse removal procedure.

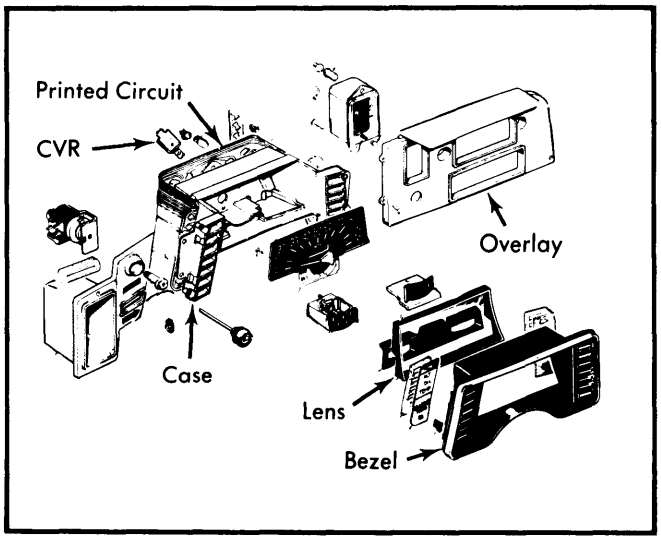

Fig. 1 Instrument Cluster – Pacer

Removal (Spirit, AMX & Concord) – **1)** Disconnect battery negative cable. Remove package tray if equipped, cover steering column, then remove speedometer cable. Remove top and side screws from instrument panel.

2) Tilt panel forward and disconnect headlight switch and wiper control wiring connectors. Disconnect harness connectors and fuel economy gauge vacuum hose (if equipped); then remove instrument cluster.

Installation – To install, reverse removal procedure.

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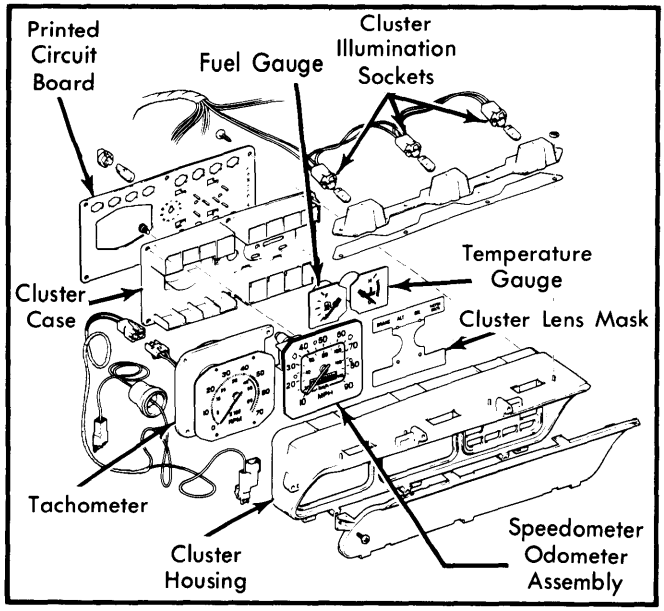

Fig. 2 Instrument Cluster (Spirit, AMX and Concord)

INSTRUMENT PANEL OVERLAY PAD

Removal (Spirit, AMX & Concord) – **1)** Disconnect battery, remove instrument cluster (as previously described) and remove windshield pillar reveal mouldings and corner mouldings.

2) 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.

Installation – To install, reverse removal procedure.

PRINTED CIRCUIT BOARD

Removal (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 suppressor or connector strip if not equipped with radio. On all models remove printed circuit board.

Installation – To install, reverse removal procedure.

HEADLIGHT SWITCH

Removal (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.

Installation – To install, reverse removal procedure.

Removal (Spirit, AMX & Concord) – **1)** Disconnect battery negative cable. Remove package tray (if equipped), and disconnect speedometer cable. Remove cluster bezel screws and tilt bezel away from panel.

2) 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.

Installation – To install, reverse removal procedure.

SPEEDOMETER

Removal (All Models) – Remove instrument cluster. Remove speedometer attaching screws and slip assembly out of cluster. To replace odometer, hold an ink pad away from odometer with a piece of paper. Pry odometer retaining clip away from bracket and lift out odometer at clip end.

Installation – To install, reverse removal procedure.

GAUGES

Removal (Pacer) – Fuel gauge can be removed after removing instrument cluster and speedometer.

Installation – To install, reverse removal procedure.

Removal (Spirit, AMX & Concord) – Remove instrument cluster, printed circuit board, speedometer and indicator assembly, fuel and temperature indicator face plate. Remove retaining nuts and separate gauge or indicator from assembly.

Installation – To install, reverse removal procedure.