AMERICAN MOTORS

American Motors, All Models

DESCRIPTION & OPERATION

Temperature Indicator – Indicator circuit consists of a sending unit and guage 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

Pacer – 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 does light, check sending unit.

Hornet, Gremlin, Matador – Test accuracy of oil pressure gauge using a suitable variable resistance tester (J-22344-01). Disconnect wire from sending unit located on engine. Turn ignition switch on. Connect one lead of tester to a good 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.

OIL PRESSURE SENDING UNIT

All Models – After verifying a proper operating gauge, remove oil sender unit and install a "T" fitting between block fitting and sender. Connect a direct reading oil pressure gauge to "T" fitting. Reconnect sender unit wire, start engine and compare readings between the two gauges. Replace sender unit if defective.

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 a suitable variable resistance tester (J-22344-01) 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 or 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).

①TEMPERATURE 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).

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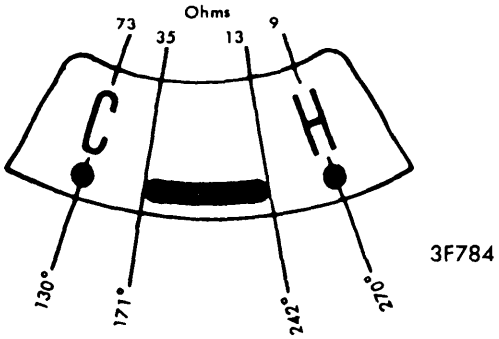


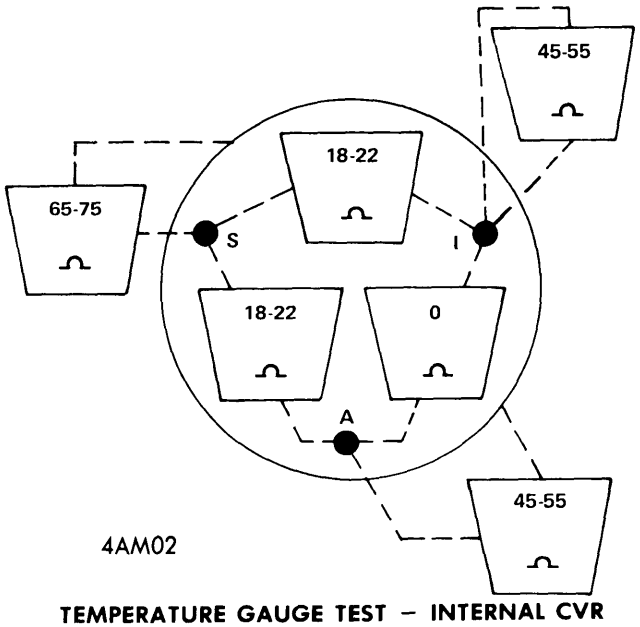
TEMPERATURE GAUGE TEST BAND (TYPICAL)

GAUGE TEST AT SENDER UNIT

NOTE – Perform test using a suitable testing instrument (J-22344-01) 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 suitable testing instrument (J-22344-01) 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 with separate CVR (Matador, Javelin, Ambassador), connect jumper wire between CVR case and ground. For other models, 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 "OFF".*



TEMPERATURE GAUGE TEST – INTERNAL CVR

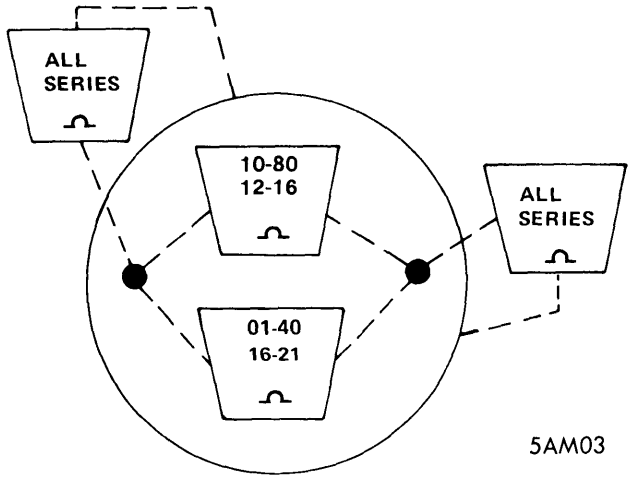
FUEL & TEMPERATURE GAUGE (UNIT TEST)

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

Hornet, Gremlin – Fuel gauge – 16-21 ohms, temperature gauge (see illustration ohm values).

Matador – Fuel gauge - 12-16 ohms, temperature gauge - 12-16 ohms.

Pacer – Fuel gauge - 12-18 ohms.



FUEL & 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 & INSTALLATION

CONSTANT VOLTAGE REGULATOR

Hornet & Gremlin – CVR is an intergral part of termperature 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

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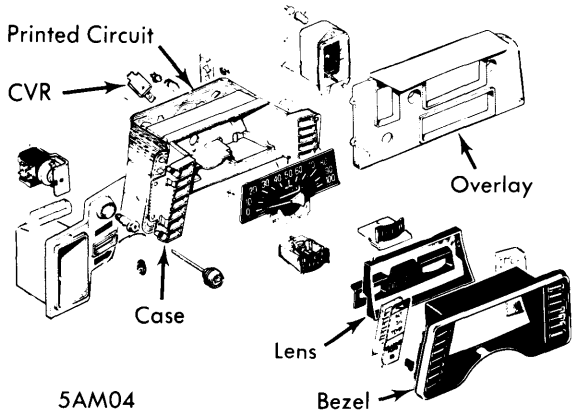
Matador, pull CVR from printed circuit board tension-type retainers.

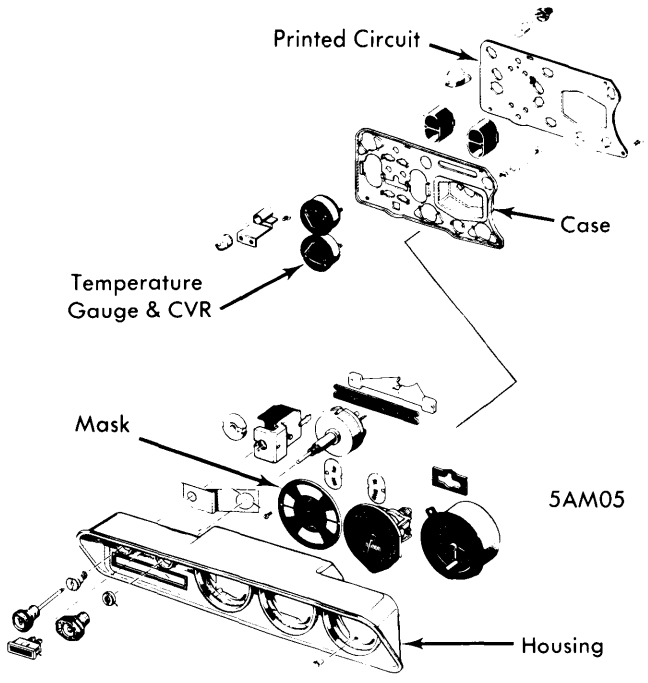
INSTRUMENT CLUSTER

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.



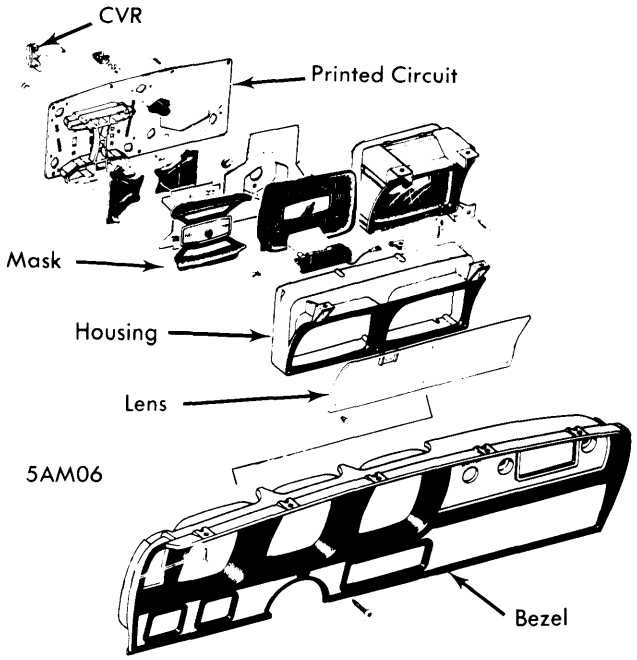
INSTRUMENT CLUSTER - PACER

Hornet & Gremlin – Disconnect battery ground cable. Cover steering column, remove package tray (if equipped), and disconnect speedometer cable. Remove headlight switch, wiper control knobs and retaining nuts. Remove five retaining screws from cluster bezel, pull bezel and cluster out as an assembly. Disconnect all wires and lamps on back of cluster and remove cluster.



INSTRUMENT CLUSTER - HORNET & GREMLIN

Matador – Disconnect battery ground. Remove radio control knobs and attaching nuts. Remove bezel screws; tilt bezel out and disconnect all electrical connections and remove bezel. Remove clock cover screws and pull clock away from cluster; disconnect electrical leads and remove clock. Using clock opening for access, disconnect speedometer cable by depressing the locking tab and pulling back from speedometer head. Remove lower instrument finish panel. Disconnect gear selector dial cable from steering column. Remove cluster mounting screws, disconnect electrical connections and remove cluster. To install, reverse removal procedure. *NOTE – Control knob aligning tabs must fit in control shaft slots when installing control knobs.*



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 insturment panel at far right side. Remove pad from instrument panel. To install pad, reverse removal procedure.

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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, All Models – Disconnect battery negative cable. On Pacer remove headlight switch overlay retaining screws and pull overlay forward. On all models, 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.

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.