

INSTRUMENT PANEL

1991 Mitsubishi Montero

1991 ACCESSORIES & SAFETY EQUIPMENT
Chrysler Motors/Mitsubishi Switches & Instrument Panels

Dodge; Ram-50
Mitsubishi: Montero, Pickup

DESCRIPTION & OPERATION

Instrument cluster includes speedometer, fuel gauge and temperature gauge. Fuel gauge has a built-in voltage limiter to keep voltage supply to gauges at 7 volts. Some models may also have a shunt-type ammeter, oil pressure gauge, tachometer, voltmeter and/or turbo boost pressure gauge. Oil pressure gauge uses full battery voltage. The tachometer operates by pulse feed.

TROUBLE SHOOTING

FUEL/TEMPERATURE GAUGE NOT WORKING

Check for blown fuse, faulty voltage limiter or faulty relay. Ensure sending unit connections are clean and tight. Test sending unit for correct operation. Tighten connections in instrument cluster.

SPEEDOMETER NOT WORKING

Ensure speedometer cable is properly connected and correctly routed. If speedometer pointer and/or odometer still do not work, replace speedometer as an assembly.

TACHOMETER NOT WORKING

Tachometer is serviced as an assembly. If wiring harness is okay, replace tachometer assembly.

WARNING LIGHTS NOT WORKING

Test for defective sending unit, burned out bulb, or broken printed circuit. Ensure all wire connections are clean and tight.

TESTING

FUEL TANK SENDING UNIT

Resistance Test

Remove fuel tank sending unit from fuel tank. Measure resistance between appropriate terminals with fuel float in Full and Empty positions. See Fig. 1. Compare resistance reading to FUEL TANK SENDING UNIT RESISTANCE SPECIFICATIONS table. If resistance is not to specifications, replace fuel tank sending unit.

FUEL TANK SENDING UNIT RESISTANCE SPECIFICATIONS TABLE

Application	Empty	Full
All Models	103-117	1-5

FUEL GAUGE

Simple Test

Disconnect fuel sending unit connector wire in luggage compartment, cargo space, or at tank unit. Connect a 12-volt, 3.4-watt bulb to harness side of connector, between power terminal and ground (Yellow and Black wires on Montero). On Pickup and Ram-50 see Fig. 1. Turn ignition switch to ON position. Ensure test bulb flashes, or stays on, and fuel gauge needle moves. If bulb or gauge needle does not function as described, check and repair fuel gauge circuit.

CAUTION: Gauge coils can be damaged if wire is grounded too long. Perform test as quickly as possible.

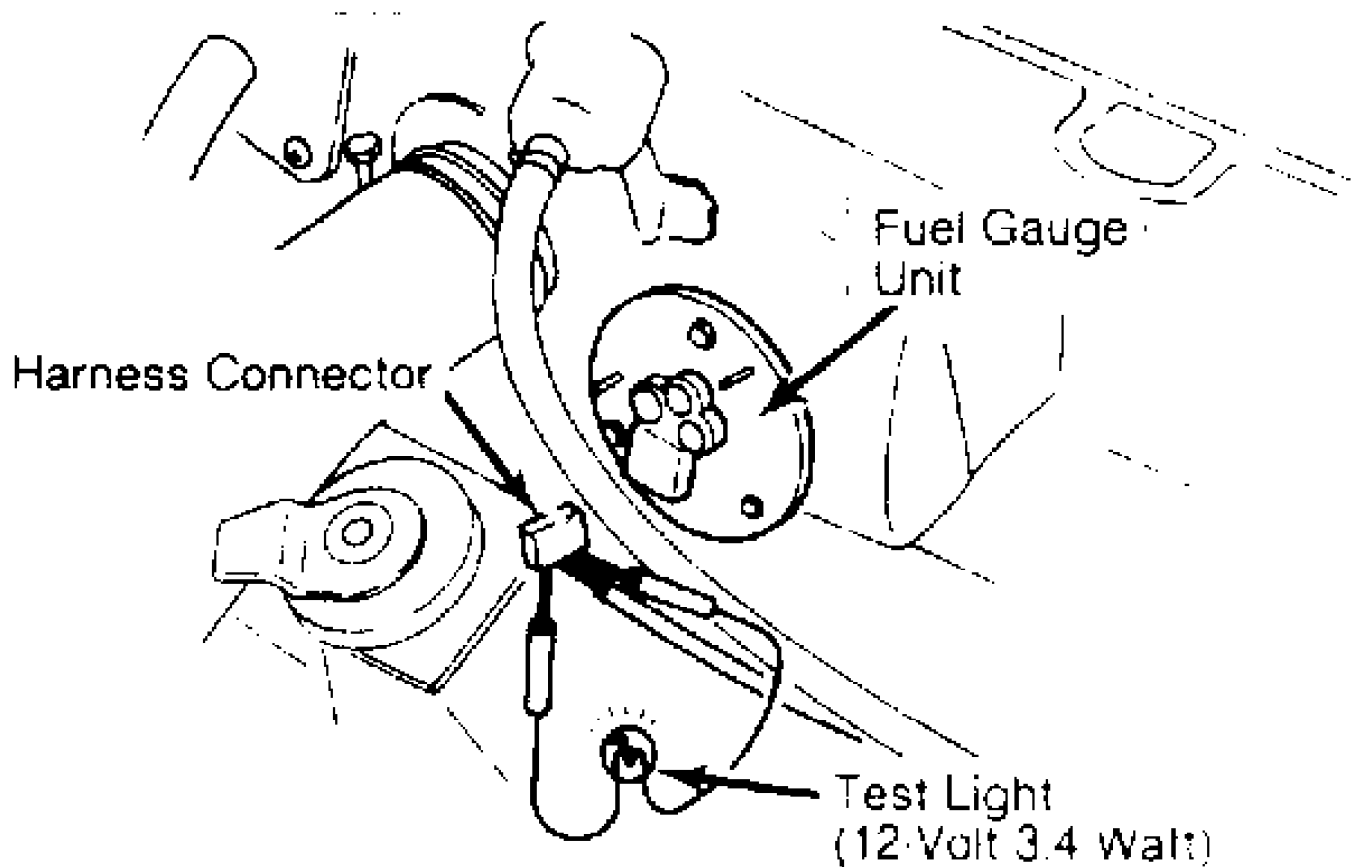


Fig. 1: Identifying Fuel Gauge Test Connection (Pickup & Ram-50)
Courtesy of Chrysler Motors.

NOTE: The following test must be completed with instrument panel cluster removed. Use ohmmeter for all measurements. If resistance is extremely low, there may be a short in the coil. If resistance is extremely high, there may be a broken wire or similar problem in the gauge.

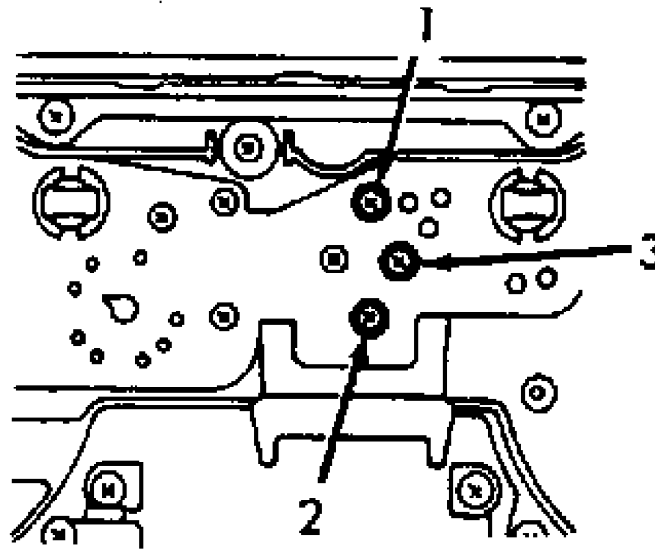
Resistance Test

Remove instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Measure resistance between appropriate terminals of instrument cluster or combination gauges. See Fig. 2 or

Fig. 3. See FUEL GAUGE RESISTANCE SPECIFICATIONS table. If resistance readings are not to specifications, replace fuel gauge.

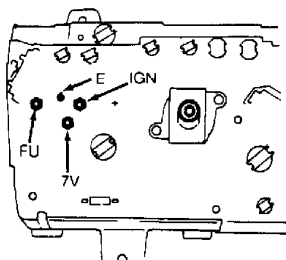
FUEL GAUGE RESISTANCE SPECIFICATIONS TABLE

Application	Terminals	Ohms
Montero	No. 1 & 2	55
"	No. 2 & 3	165
"	No. 1 & 3	110
Pickup & Ram-50	IGN & ground.	62-78
"	7V & FU	49-61



MONTERO

Fig. 2: Fuel Gauge Resistance Check Terminal ID (Montero)
 Courtesy of Mitsubishi Motor Sales of America.



PICKUP & RAM-50

Fig. 3: Fuel Gauge Resistance Check Terminal ID (Pickup & Ram-50)
 Courtesy of Mitsubishi Motor Sales of America.

OIL PRESSURE GAUGE

Circuit Test

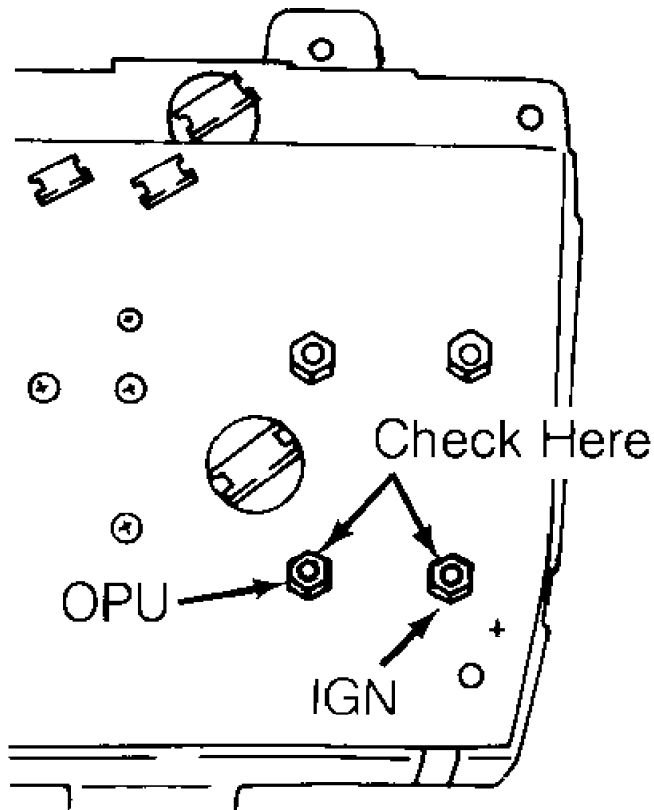
Disconnect oil pressure gauge wiring connector from sending unit inside the engine compartment. Connect a 12-volt test light between harness connector terminal and ground. Turn ignition on, but DO NOT start engine. If test light comes on and gauge needle moves, go to GAUGE RESISTANCE TEST. If test light does not come on and gauge needle does not move, repair wiring to sending unit.

Gauge Resistance Test

Remove instrument cluster from instrument panel. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Check continuity between oil pressure gauge terminals. See Fig. 4 or Fig. 5. See OIL PRESSURE GAUGE RESISTANCE SPECIFICATIONS table. If resistance is not within specification, replace oil pressure gauge.

OIL PRESSURE GAUGE RESISTANCE SPECIFICATIONS TABLE

Application	Ohms
Montero	50
Pickup & Ram-50	37-47



91H01890

Fig. 4: Oil Pressure Gauge Test Terminal ID (Pickup & Ram-50)
Courtesy of Chrysler Motors

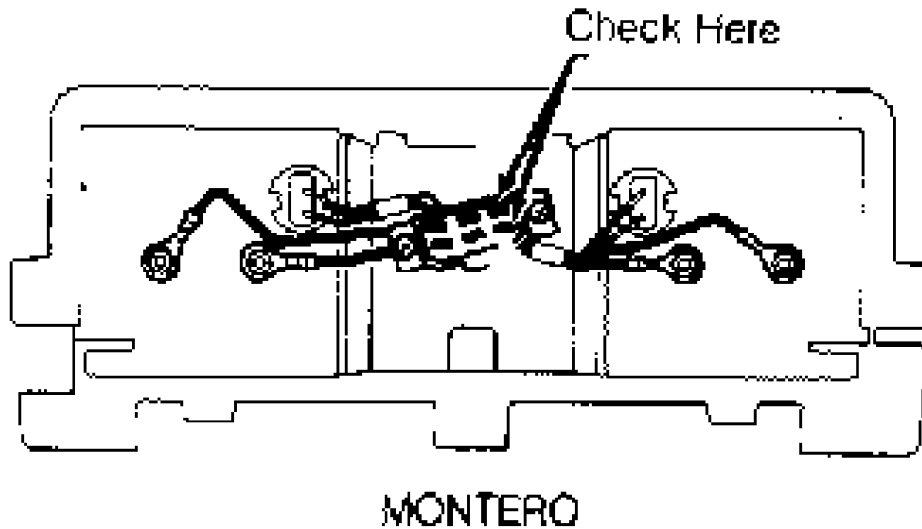


Fig. 5: Oil Pressure Gauge Test Terminal ID (Montero)
 Courtesy of Chrysler Motors

REED SWITCH

Continuity Check (Except Pickup & Ram-50)

Remove instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Check continuity between reed switch terminals No. 1 and 2. See Fig. 6. Ensure continuity pulses on and off 4 times per revolution of speedometer shaft connection. If continuity is not as specified, replace reed switch.

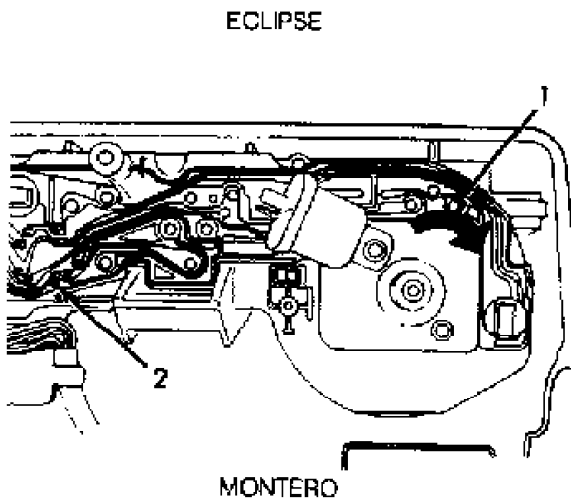


Fig. 6: Identifying Reed Switch Test Terminals (Montero)
 Courtesy of Mitsubishi Motor Sales of America.

SPEEDOMETER

Calibration Test

Adjust tire pressure to standard value. Using a calibrated, reliable speedometer tester, compare reading of vehicle speedometer to speedometer tester. See SPEEDOMETER ALLOWABLE VARIATION table. Replace speedometer if necessary.

SPEEDOMETER ALLOWABLE VARIATION TABLE

MPH (km/h)	Allowable Variation MPH (km/h)
20 (32)	19-22 (31-35)
40 (64)	38-44 (61-71)
60 (97)	57-66 (92-106)
80 (129)	76-88 (122-142)
100 (161)	94-110 (151-177)

TACHOMETER

NOTE: DO NOT reverse polarity when installing tachometer, as diode and transistor may be damaged.

Calibration Test

Connect a calibrated, reliable tach-dwell meter to vehicle ignition system. Operate engine at various speeds (RPM). See TACHOMETER ALLOWABLE VARIATION table. If comparison between tach-dwell meter and vehicle tachometer readings do not fall in the standard range of permissible variation, replace vehicle tachometer.

TACHOMETER ALLOWABLE VARIATION TABLE

Engine Speed (RPM)	Allowable Variation (RPM)
1000	900-1100
3000	2850-3150
5000	4750-5250
6000	5700-6300

TEMPERATURE GAUGE

CAUTION: DO NOT connect sender wire directly to ground during test.

Circuit Test

Disconnect temperature sender wire from sending unit. Connect a 12-volt, 3.4-watt test bulb between connector terminal and ground. Turn ignition switch to ON position. If test bulb flashes and temperature gauge needle moves, go to SENSOR RESISTANCE TEST. If test light does not flash and gauge needle does not move, repair wiring to sending unit.

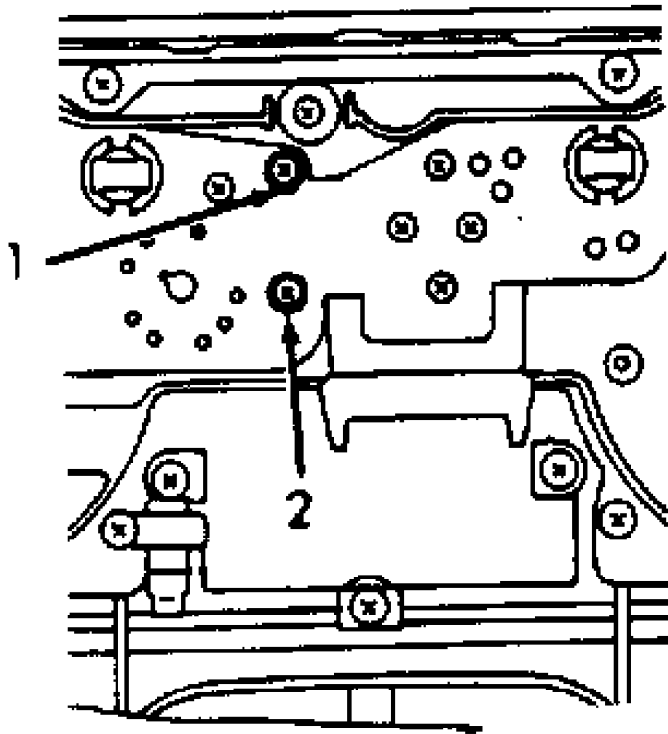
Sensor Resistance Test

Remove thermosensor (sending unit) from engine block. Place sending unit in hot water of 158°F (70°C) temperature. Check sensor resistance with an ohmmeter. Thermosensor resistance should be 90-117 ohms at 158°F (70°C). If thermosensor resistance is okay, go to GAUGE RESISTANCE TEST. Replace thermosensor if resistance is not as specified.

Gauge Resistance Test

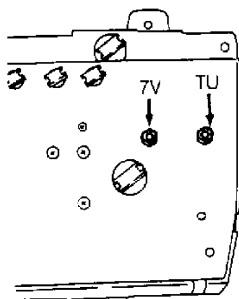
Remove instrument cluster from instrument panel. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Measure resistance between temperature gauge terminals at rear of cluster or combination

gauges. See TEMPERATURE GAUGE RESISTANCE SPECIFICATIONS table. See Fig. 7 or Fig. 8.



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Fig. 7: Temperature Gauge Test Terminals (Montero)
Courtesy of Mitsubishi Motor Sales of America.



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Fig. 8: Temperature Gauge Test Terminal ID (Pickup & Ram-50)
Courtesy of Mitsubishi Motor Sales of America.

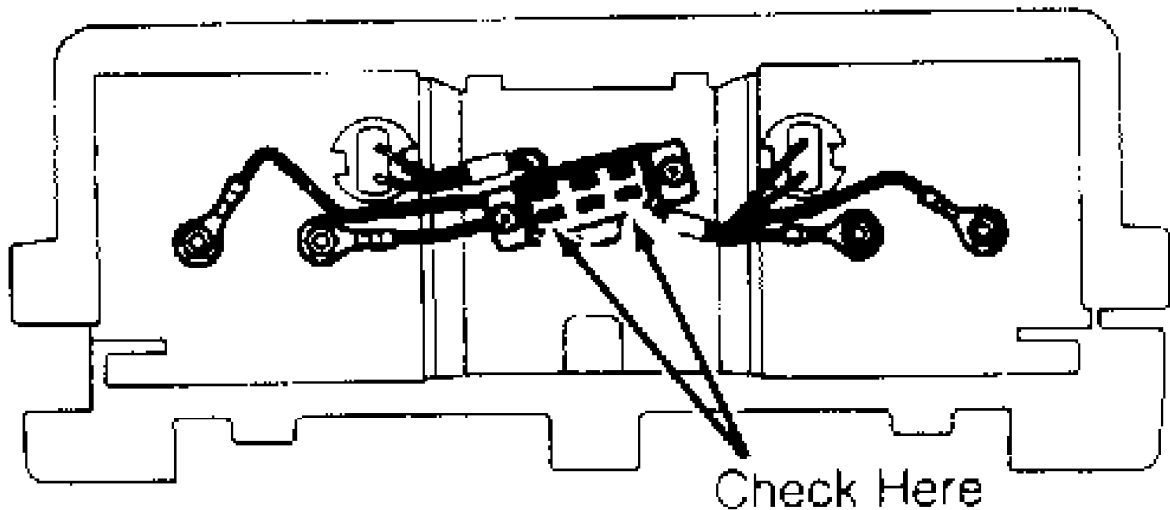
TEMPERATURE GAUGE RESISTANCE SPECIFICATIONS TABLE

Application	Terminals	Ohms
Montero	No. 1 & 2	55
Pickup & Ram-50	7V & TU	49-61

VOLTMETER

Resistance Test (Montero)

Using an ohmmeter, measure resistance between voltmeter terminals. See Fig. 9. Resistance should be 380-460 ohms.



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Fig. 9: Identifying Voltmeter Resistance Test Terminals (Montero)
 Courtesy of Mitsubishi Motor Sales of America.

Voltage Test (Pickup & Ram-50)

Using a voltmeter, connect positive lead to terminal No. 7 of fuse box, and ground negative terminal. Crank engine and compare readings of vehicle voltmeter to testing voltmeter. Voltage variation should not exceed 0.5 volt (plus or minus). Replace voltmeter if voltage reading is not as specified.

REMOVAL & INSTALLATION

INSTRUMENT CLUSTER

Removal & Installation (Montero)

1) Remove instrument cluster cover. Remove screws from bottom of instrument cluster. Remove bolt from upper part of cluster.

2) Disconnect speedometer cable from back of instrument cluster by pushing stopper of plug on speedometer cable side of connection. Pull cluster out part way. Disconnect all connectors attaching cluster. Remove cluster. See Fig. 10. To install, reverse removal procedure.

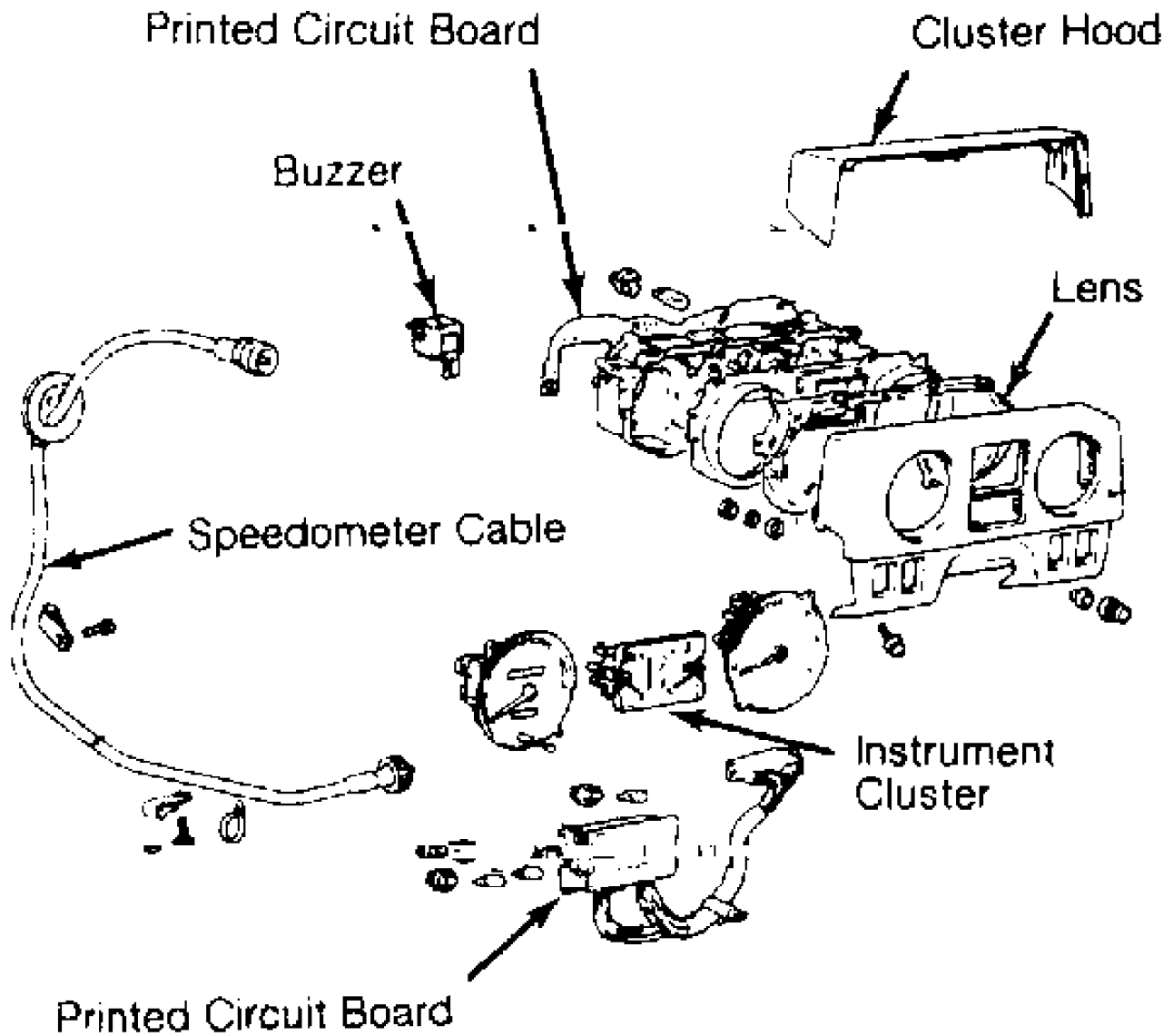


Fig. 10: Identifying Instrument Cluster Components (Montero)
 Courtesy of Mitsubishi Motor Sales of America.

Removal & Installation (Pickup & Ram-50)

- 1) Disconnect negative battery cable. Remove heater fan

switch knob, heater control knobs and radio knobs. Remove instrument cluster bezel. Remove mounting screws from 4 corners of cluster.

2) Disconnect speedometer cable and connectors from back of cluster. Remove cluster assembly. See Fig. 11 or Fig. 12. To install, reverse removal procedure.

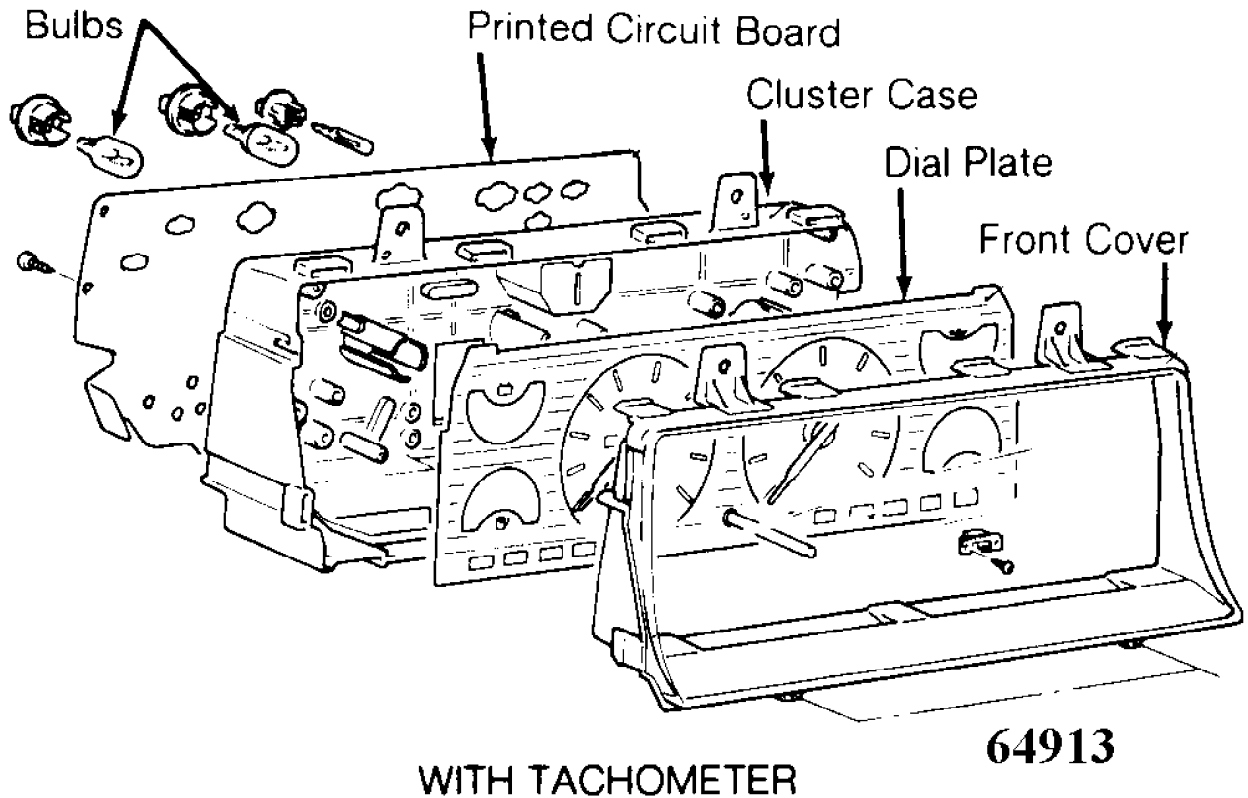
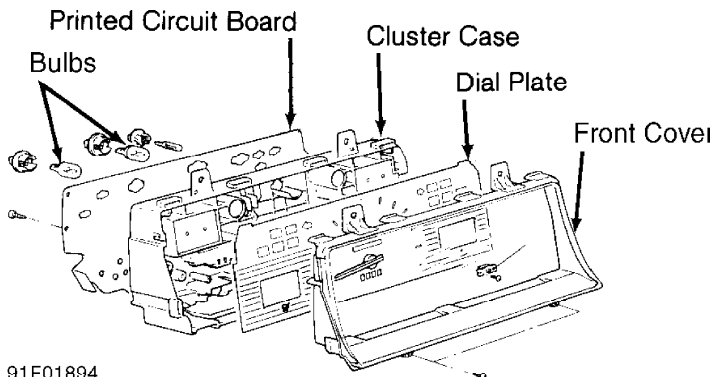


Fig. 11: Instrument Cluster Component ID (Pickup & Ram-50 W/Tach)
 Courtesy of Mitsubishi Motor Sales of America.



91F01894
 Fig. 12: Instrument Cluster Component ID (Pickup & Ram-50 W/O Tach)
 Courtesy of Mitsubishi Motor Sales of America.

SPEEDOMETER CABLE

NOTE: When routing speedometer cable, DO NOT bend cable sharply. Minimum bending radius is 6" (150 mm). Speedometer cable length varies with transmission type.

Removal

Disconnect speedometer cable from transmission or transaxle. Remove instrument cluster from instrument panel. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Disconnect speedometer cable from instrument cluster and/or adapter (if equipped). Remove speedometer cable from firewall grommet.

Installation

Install new cable. Insert cable until stopper seats properly in groove on rear of speedometer housing. Pull speedometer cable through firewall grommet until cable marking is visible from engine compartment. Install adapter onto speedometer cable (if equipped). Install instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Install cable onto transmission or transaxle. Check for proper operation.

NOTE: An improperly installed cable can cause fluctuating meter, noise or damaged harness inside instrument panel.

WIRING DIAGRAMS

See appropriate chassis wiring diagram in the WIRING DIAGRAMS Section.