

F - BASIC TESTING

Article Text

1992 Dodge Colt

For a a a a

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ARTICLE BEGINNING

1992 ENGINE PERFORMANCE

Chrysler Motors/Mitsubishi Basic Diagnostic Procedures

Chrysler Motors: Colt, Colt 200, Summit

Mitsubishi: Mirage

INTRODUCTION

The following diagnostic steps will help prevent overlooking a simple problem. This is also where to begin diagnosis for a no-start condition.

The first step in diagnosing any driveability problem is verifying the customer's complaint with a test drive under the conditions the problem reportedly occurred.

Before entering self-diagnostics, perform a careful and complete visual inspection. Most engine control problems result from mechanical breakdowns, poor electrical connections or damaged/misrouted vacuum hoses. Before condemning the computerized system, perform each test listed in this article.

NOTE: Perform all voltage tests with a Digital Volt-Ohmmeter (DVOM) with a minimum 10-megohm input impedance, unless stated otherwise in test procedure.

PRELIMINARY INSPECTION & ADJUSTMENTS

VISUAL INSPECTION

Visually inspect all electrical wiring, looking for chafed, stretched, cut or pinched wiring. Ensure electrical connectors fit tightly and are not corroded. Ensure vacuum hoses are properly routed and are not pinched or cut. See M - VACUUM DIAGRAMS article in the ENGINE PERFORMANCE Section to verify routing and connections (if necessary). Inspect air induction system for possible vacuum leaks.

MECHANICAL INSPECTION

Compression

Check engine mechanical condition with a compression gauge, vacuum gauge, or an engine analyzer. See engine analyzer manual for specific instructions.

WARNING: DO NOT use ignition switch during compression tests on fuel injected vehicles. Use a remote starter to crank engine. Fuel injectors on many models are triggered by ignition switch during cranking mode, which can create a fire hazard or contaminate the engine's oiling system.

COMPRESSION SPECIFICATIONS TABLE

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Application	psi (kg/cm ²)
Compression Pressure	
1.5L	
Except Mirage	194 (13.6)
Mirage	192 (13.4)
1.6L (VIN Y)	192 (13.4)
Maximum Variation Between Cylinders .	14 psi (1.0 kg/cm ²)

Exhaust System Backpressure

Exhaust system can be checked with a vacuum or pressure gauge. Remove O2 sensor or air injection check valve (if equipped). Connect a 0-5 psi pressure gauge and run engine at 2500 RPM. If exhaust system backpressure is greater than 1 3/4-2 psi, exhaust system or catalytic converter is plugged.

If using a vacuum gauge, connect vacuum gauge hose to intake manifold vacuum port and start engine. Observe vacuum gauge. Open throttle part way and hold steady. If vacuum gauge reading slowly drops after stabilizing, exhaust system should be checked for a restriction.

FUEL SYSTEM

WARNING: ALWAYS relieve fuel pressure before disconnecting any fuel injection-related component. DO NOT allow fuel to contact engine or electrical components.

FUEL PRESSURE

Relieving Fuel Pressure

1) Remove rear seat cushion to disconnect fuel pump harness connector. Start engine. Let engine run until it stops. Turn ignition off. Disconnect negative battery terminal. Connect fuel pump harness connector. Reinstall rear seat (if necessary.)

WARNING: Before disconnecting high pressure fuel hose at fuel delivery pipe, cover fuel hose connection with a rag. Some residual fuel pressure may still be in system.

Pressure Testing

1) Disconnect high pressure fuel hose at fuel delivery pipe. Remove throttle body bracket (if necessary). Connect fuel pressure gauge with adapter between fuel delivery pipe and high pressure hose. See Fig. 1.

2) Connect negative battery terminal. Connect battery voltage to fuel pump test terminal. See FUEL PUMP TEST TERMINAL LOCATION table. Ensure no fuel leaks are present. Disconnect battery voltage to fuel pump test terminal.

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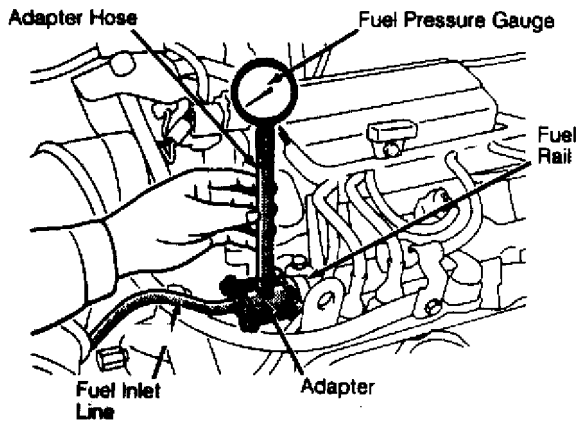


Fig. 1: Installing Fuel Pressure Tester (Typical)
Courtesy of Mitsubishi Motor Sales of America.

3) Start engine and let idle. Measure fuel pressure with vacuum hose connected to fuel pressure regulator. Record fuel pressure reading. Disconnect and plug vacuum hose from fuel pressure regulator. Record fuel pressure reading. See FUEL PUMP PERFORMANCE table.

4) Check for fuel pressure in fuel return hose by gently pinching hose while increasing engine speed. If fuel volume is low, fuel pressure in return hose will not be felt. Increase engine speed to 2500-3000 RPM, 2-3 times. Return engine to idle. Fuel pressure should not drop when engine is returned to idle.

5) Turn ignition off. On all models except Precis, ensure fuel pressure reading does not decrease within 2 minutes. On Precis, fuel pressure reading should not decrease within 5 minutes. On all models, if a decrease is noted, monitor speed of decrease.

6) If fuel pressure is lower than specification, fuel pressure drops at idle after increasing engine speed to 2500-3000 RPM, or no fuel pressure in fuel return hose can be felt, check for clogged fuel filter, or faulty fuel pressure regulator or fuel pump.

7) If fuel pressure is higher than specification, check for a faulty fuel pressure regulator or plugged fuel return line. If fuel pressure does not change when vacuum hose to regulator is connected or disconnected, check for a leaking or clogged vacuum hose to fuel pressure regulator or faulty fuel pressure regulator.

8) If fuel pressure decreases suddenly after engine is stopped, check valve within fuel pump is not seated. Replace fuel pump. If fuel pressure drops slowly, fuel injector is leaking or fuel pressure regulator valve seat is leaking. Check for faulty fuel injector or fuel pressure regulator. Repair as necessary.

9) When fuel pressure test is complete, repeat fuel pressure release procedure before disconnecting fuel pressure gauge. Install new "O" ring at end of high pressure hose. Check for fuel leaks.

FUEL PUMP TEST TERMINAL LOCATION TABLE

Application	Wire Color	Location
1.5L	BLK/WHT	Center Of Firewall

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1.6L BLK/BLU Center Of Firewall

FUEL PUMP PERFORMANCE TABLE

Application	(1) At Idle psi (kg/cm ²)	(2) At Idle psi (kg/cm ²)
All Models	38 (2.6)	47-50 (3.3-3.5)

(1) - With vacuum at pressure regulator.

(2) - Without vacuum at pressure regulator.

MPI Control Relay

Multipurpose relay switches power to vehicle sensors and actuators including airflow sensor, crank angle sensor, idle speed control, injectors and fuel pump. When ignition switch is turned to ON position, ECU energizes coils controlling injectors, airflow sensor and idle speed control. When ignition switch is turned to START position, ECU energizes coils (through inhibitor switch on A/T models) to supply power to fuel pump. Relay failure will cause a no-start condition. For testing procedure, see I - SYS/COMP TESTS article in the ENGINE PERFORMANCE Section.

IGNITION CHECKS

SPARK

Check for spark at coil wire (if applicable) and at each spark plug wire using a high output spark tester. Check spark plug wire resistance on suspect wires. For wire resistance specification, see C - SPECIFICATIONS article in the ENGINE PERFORMANCE Section.

CRANK ANGLE SENSOR

For crank angle sensor testing procedure, see I - SYS/COMP TESTS article in the ENGINE PERFORMANCE Section.

DISTRIBUTORLESS IGNITION SYSTEM (DIS) 4-CYLINDER

Ignition Coil Resistance

1) Using a Digital Volt-Ohmmeter (DVOM), measure primary coil resistance between ignition coil connector terminals No. 2 and 3 (coils for cylinders No. 1 and 4) and terminals No. 1 and 3 (coils for cylinders No. 2 and 3). See Fig. 2.

2) Disconnect ignition coil connector. Measure secondary coil resistance between coil towers for cylinders No. 1 and 4 and between coil towers for cylinders No. 2 and 3. See Fig. 3. Primary and secondary coil resistance should be within specification. See IGNITION COIL RESISTANCE (4-CYLINDER) table.

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IGNITION COIL RESISTANCE TABLE (1.6L) Ohms @ 68°F (20°C)

Application	Primary	Secondary
Mirage77-.95	10,300-13,900

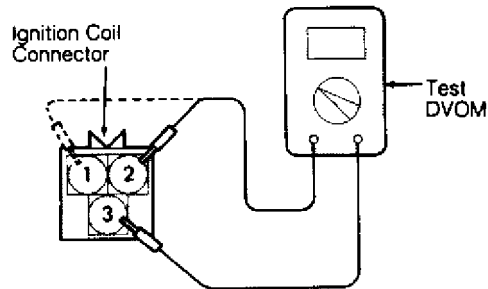


Fig. 2: Testing Ignition Coil Primary Resistance (1.6L)

Courtesy of Mitsubishi Motor Sales of America.

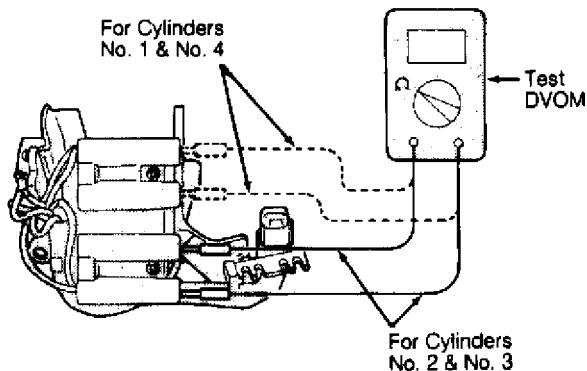


Fig. 3: Testing Ignition Coil Secondary Resistance (1.6L)

Courtesy of Mitsubishi Motor Sales of America.

Power Transistor

1) To test power transistor coil for No. 1 and 4 cylinders, disconnect power transistor connector. Using a 1.5-volt dry cell battery, connect negative end of 1.5-volt battery to terminal No. 3 of power transistor and positive end of 1.5-volt battery to power transistor terminal No. 7 as shown in STEP 1. See Fig. 4.

2) Using an analog ohmmeter, check for continuity between terminals No. 3 and 8 of power transistor. Continuity should exist. With positive end of 1.5-volt battery disconnected, no continuity should exist. Replace power transistor if it does not test as specified.

3) To test power transistor coil for No. 2 and 4 cylinders, connect negative end of 1.5-volt dry cell battery to terminal No. 3 of power transistor and positive end of 1.5-volt battery to power transistor terminal No. 2 as shown in STEP 2. See Fig. 5.

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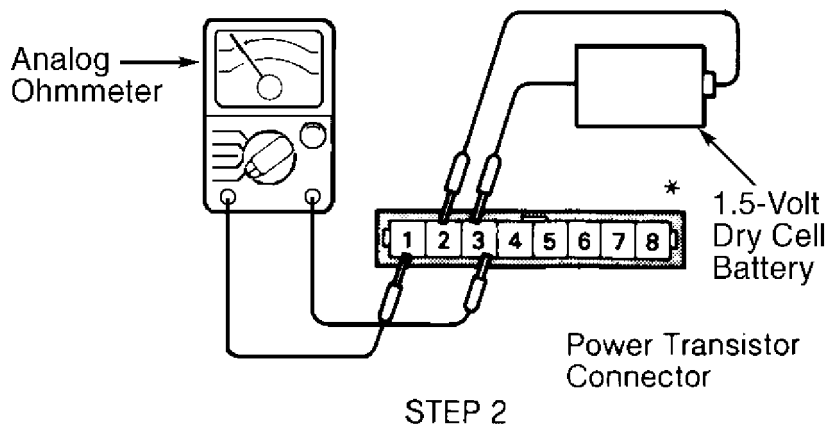
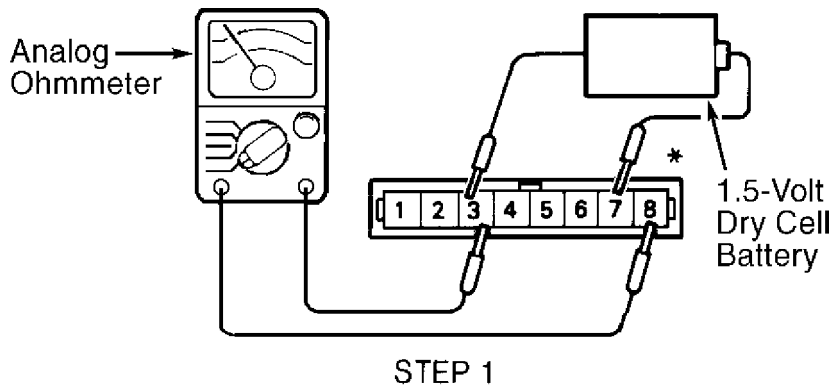
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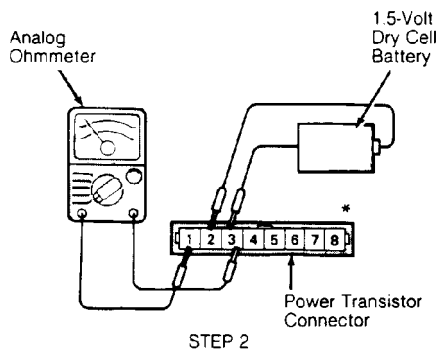
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4) Using an analog ohmmeter, check for continuity between terminals No. 1 and 3 of power transistor. Continuity should exist. With positive end of 1.5-volt battery disconnected, no continuity should exist. Replace power transistor if it does not test as specified.



* Terminal No. 5 Not Used On Mirage.

92.126434
Fig. 4: Testing Power Transistor (Step 1)
Courtesy of Mitsubishi Motor Sales of America.



* Terminal No. 5 Not Used On Mirage.

Fig. 5: Testing Power Transistor (Step 2)
Courtesy of Mitsubishi Motor Sales of America.

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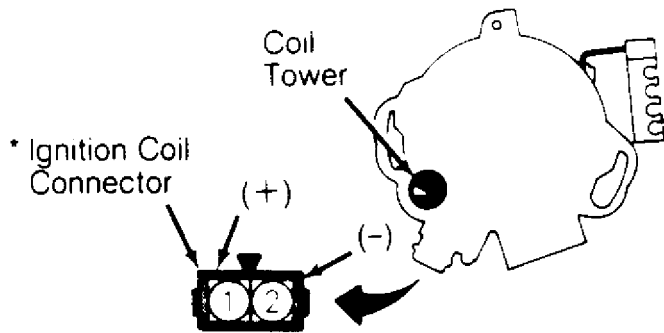
HALL EFFECT & OPTICAL IGNITION

Ignition Coil Resistance

Using a DVOM, measure primary coil resistance between positive and negative terminals of coil. See Fig. 6. Measure secondary coil resistance between coil positive terminal and ignition coil tower. Primary and secondary coil resistance should be within specification. See IGNITION COIL RESISTANCE table.

IGNITION COIL RESISTANCE TABLE (1.5L) - Ohms @ 68°F (20°C)

Application	Primary	Secondary
1.5L90-1.2	20,000-29,000



* Terminals No. 11 & 12 On Mirage & Summit Wagon (1.8L).

COLT, COLT 200, ECLIPSE, EXPO (1.8L)
MIRAGE, SUMMIT, SUMMIT WAGON (1.8L) &
VISTA WAGON (1.8L)

92J26442

Fig. 6: Ignition Coil Terminal ID
Courtesy of Mitsubishi Motor Sales of America.

Power Transistor (Colt, Colt 200 & Summit)

1) Disconnect power transistor connectors. Using a 1.5-volt dry cell battery, connect negative end of 1.5-volt battery to terminal No. 7 of power transistor and positive end of 1.5-volt battery to power transistor terminal No. 8. See Fig. 7.

2) Using an analog ohmmeter, check for continuity between terminals No. 2 and 7 of power transistor. Continuity should exist. With positive end of 1.5-volt battery disconnected, no continuity should exist. Replace power transistor if it does not test as specified.

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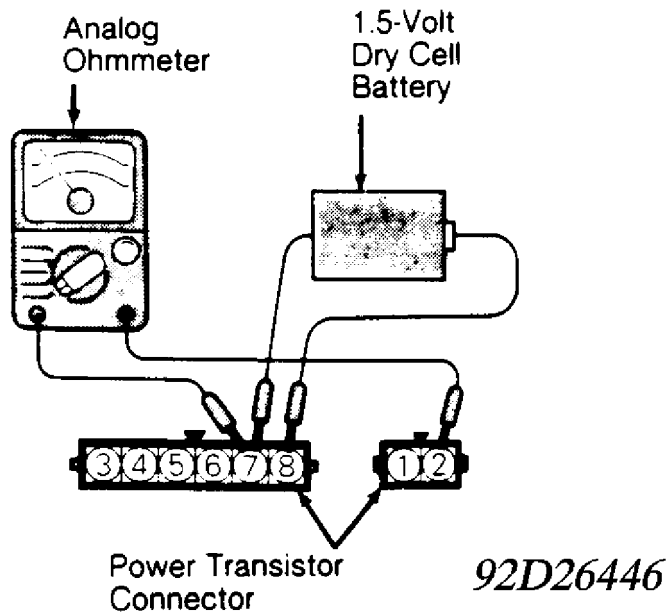


Fig. 7: Testing Power Transistor (Colt, Colt 200 & Summit)
Courtesy of Mitsubishi Motor Sales of America.

Power Transistor (Mirage)

1) Disconnect power transistor connector. Using a 1.5-volt dry cell battery, connect negative end of 1.5-volt battery to terminal No. 5 of power transistor and positive end of 1.5-volt battery to power transistor terminal No. 6. See Fig. 8.

2) Using an analog ohmmeter, check for continuity between terminals No. 5 and 12 of power transistor. Continuity should exist. With positive end of 1.5-volt battery disconnected, no continuity should exist. Replace power transistor if it does not test as specified.

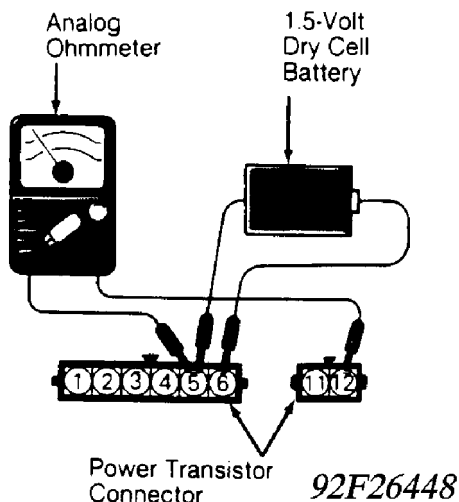


Fig. 8: Testing Power Transistor (Mirage)
Courtesy of Mitsubishi Motor Sales of America.

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IDLE SPEED & IGNITION TIMING

Ensure idle speed and ignition timing are set to specification. See IGNITION TIMING SPECIFICATIONS table. For adjustment procedures, see D - ADJUSTMENTS article in the ENGINE PERFORMANCE Section.

IGNITION TIMING SPECIFICATIONS TABLE (Degrees BTDC @ RPM)

Application	(1) Basic	(2)(3) Actual
1.5L		
Except Mirage	5 @ 650-850	10 @ 650-850
Mirage	3-7 @ 650-850	10 @ 650-850
1.6L		
Mirage	3-7 @ 650-850	8 @ 650-850

- (1) - With ignition timing adjustment connector grounded or vacuum hose (farthest from distributor) disconnected.
- (2) - With ignition timing adjustment connector ungrounded or vacuum hose (farthest from distributor) connected. Ignition timing may fluctuate.
- (3) - If vehicle altitude is more than 2300 ft. above sea level, actual timing may be advanced.

SUMMARY

If no faults were found while performing F - BASIC TESTING, proceed to G - TESTS W/ CODES article in the ENGINE PERFORMANCE Section. If no hard codes are found in self-diagnostics, proceed to H - TESTS W/O CODES article in the ENGINE PERFORMANCE Section for diagnosis by symptom (i.e., ROUGH IDLE, NO START, etc.) or intermittent diagnostic procedures.

END OF ARTICLE