

# TROUBLE SHOOTING - NO CODES

2001 Chevrolet Camaro

2001 ENGINE PERFORMANCE  
Trouble Shooting - No Codes - Cars

## INTRODUCTION

Before diagnosing symptoms or intermittent faults, perform appropriate ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article. Use this article to diagnose driveability problems when a current DTC is not present.

Symptom checks are intended to direct the technician to malfunctioning component(s) so that further diagnosis may be performed. A symptom should lead to further testing of specific components or systems, or verification of adjustment specifications.

Use intermittent test procedures to locate intermittent driveability problems that do not occur when the vehicle is being tested. These problems may cause a noticeable driveability problem or cause the Malfunction Indicator Light (MIL) to illuminate on some vehicles.

It is also possible that certain driveability concerns have been rectified by the manufacturer through substitution of a revised PROM or PCM. Check with manufacturer for latest information on updated PROMs and PCMs.

**NOTE:** For specific testing procedures, see appropriate SYSTEM & COMPONENT TESTING article. To verify specifications, see appropriate ON-VEHICLE ADJUSTMENTS article, or SERVICE & ADJUSTMENT SPECIFICATIONS article.

## PRELIMINARY INSPECTION

- \* Verify on-vehicle diagnostics are working by performing appropriate ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article.
- \* Ensure PCM grounds are clean, tight, and properly located.
- \* Check vacuum hoses for splits, kinks, leaks, restrictions and proper connections. Ensure vacuum hoses are correctly routed as shown on vehicle emission control information label.
- \* Check for air leaks at all intake manifold sealing surfaces.
- \* Check ignition wires for cracking, hardness, proper routing and carbon tracking.
- \* Check wiring for proper connections and routing, pinches, burns, cuts or other damage.
- \* Ensure PCM and MIL are functioning properly.
- \* Ensure there are no DTCs stored, or only intermittent DTCs are present.
- \* Ensure fuel control system is operating properly. See appropriate BASIC DIAGNOSTIC PROCEDURES article.
- \* Perform fuel system pressure test. See appropriate BASIC DIAGNOSTIC PROCEDURES article.
- \* Perform a careful visual inspection of all systems.

After all checks have been performed, verify customer complaint and locate correct symptom. Check items indicated under that symptom. Not all items listed under each symptom apply to all models

and systems. These procedures will normally recommend testing of a specific system or component, such as EGR, ignition, TCC, etc. See appropriate SYSTEM & COMPONENT TESTING article for test procedures.

NOTE: If PCM displays data but engine fails to start, see NO START DIAGNOSIS in appropriate BASIC DIAGNOSTIC PROCEDURES article.

## **SYMPTOMS**

Before proceeding with any symptom diagnosis, perform all steps under PRELIMINARY INSPECTION.

### **SYMPTOM DIAGNOSIS**

Symptom checks should not be used unless symptom occurs while vehicle is being tested. To reduce diagnostic time, ensure steps in appropriate BASIC DIAGNOSTIC PROCEDURES and SELF-DIAGNOSTICS articles were performed before diagnosing a symptom. Symptoms available for diagnosis include:

- \* CUTS OUT, MISSES
- \* DETONATION/SPARK KNOCK
- \* ENGINE BACKFIRES
- \* ENGINE DIESELING/RUN-ON
- \* EXCESSIVE EXHAUST EMISSIONS OR ODORS
- \* HARD START
- \* HESITATION, SAG OR STUMBLE
- \* LACK OF POWER, SLUGGISH OR SPONGY
- \* POOR FUEL ECONOMY
- \* POOR FUEL FILL QUALITY
- \* ROUGH, UNSTABLE OR INCORRECT IDLE, STALLING
- \* VEHICLE SURGES OR CHUGGLES

### **CUTS OUT, MISSES**

#### **Symptom Definition**

Cuts out or misses is a steady pulsation or jerking which follows engine speed and is usually more pronounced as engine load increases. Exhaust may have a steady spitting sound at idle or low speed. Perform a careful visual inspection as described in appropriate BASIC DIAGNOSTIC PROCEDURES article.

#### **Possible Cause & Correction**

Check the following items:

- \* Check ignition wires for short or faulty insulation. Spray spark plug wires with a fine mist of water to check for shorts.
- \* Using Spark Tester (J-26792), check for available secondary voltage.
- \* Check ignition system for faulty ground and power feed circuits.
- \* Ensure ignition control wiring harness is not routed too close to wiring which may cause induced voltage signals.
- \* Check Transaxle Range (TR) switch input with vehicle in drive and shifter in drive or overdrive.
- \* Remove spark plugs and check for correct heat range, wear, cracks, wetness, improper gap or heavy deposits.
- \* Check for poor quality or alcohol contaminated fuel.
- \* Check for improper fuel pressure. Check for restricted fuel filter. See FUEL SYSTEM PRESSURE TEST under BASIC

- FUEL SYSTEM CHECKS in appropriate BASIC DIAGNOSTIC PROCEDURES article.
- \* Check for plugged injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.
  - \* Check PCM for proper ground circuits. Check for internal PCM intermittents.
  - \* Check engine compression. Check for incorrect valve timing, bent push rods, broken valve springs or worn camshaft lobes.
  - \* Check for sticking EGR valve.
  - \* Check TP sensor for sticking and binding. Check for correct TP sensor voltage. See FUEL SYSTEMS in appropriate SERVICE & ADJUSTMENT SPECIFICATIONS article.
  - \* Check for proper Crankshaft Position (CKP) and Camshaft Position (CMP) sensor resistance.
  - \* Check exhaust system for restrictions, such as a damaged or collapsed pipe, muffler or catalytic converter.
  - \* Check for faulty motor mounts.
  - \* Check injector drivers by disconnecting all injector harness connectors and connecting an injector test light (noid light) to each injector's harness terminal. Light should flash while cranking.
  - \* Check intake and exhaust manifold passages for casting flash.
  - \* Check PCM and engine grounds for correct locations, tight and clean connections. See WIRING DIAGRAMS article.

## DETONATION/SPARK KNOCK

### Symptom Definition

A mild to severe ping, usually worse under acceleration. The engine makes sharp metallic knocks which change with amount of acceleration.

### Possible Cause & Correction

Check the following items:

- \* Check TP sensor adjustment and operation.
- \* Check fuel system. Perform BASIC FUEL SYSTEM CHECKS. See appropriate BASIC DIAGNOSTIC PROCEDURES article.
- \* Check fuel injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.
- \* Check Knock Sensor (KS) system for no retard.
- \* Check EGR system (insufficient).
- \* Check Torque Converter Clutch (TCC) system operation (applying too soon).
- \* Remove carbon from engine with top engine cleaner.
- \* If excessive carbon exists in combustion chamber, check for excessive oil burning due to leaking valve guide seals.
- \* Check for incorrect basic engine parts such as camshaft, cylinder heads and pistons.
- \* Ensure the installed PROM and/or PCM is correct for the particular vehicle. Check with dealer for latest application information.
- \* Check cooling fan for proper operation.
- \* Check for restricted airflow to radiator or restricted coolant flow through radiator.
- \* Check for loose water pump belt.
- \* Check engine coolant sensor for shift in calibration. See appropriate SENSOR OPERATING RANGE CHARTS article.

- \* Check for rich or lean running conditions.
- \* Using Spark Tester (J-26792), check available output voltage of ignition coil.
- \* Check for crossfire between spark plugs and spark plug wires. Check for shorts and faulty insulation by spraying spark plug wires with a fine water mist.
- \* Check spark plugs for proper application and heat range.
- \* Check engine compression.
- \* Check Transaxle Range (TR) switch. Ensure scan tool indicates proper gear range as selected.
- \* Check for alcohol contaminated or poor quality fuel.
- \* Check vehicle operation using a higher octane fuel (minimum 87 octane).

## ENGINE BACKFIRES

### Symptom Definition

Fuel ignites in intake manifold or in exhaust system, making a loud popping noise.

### Possible Cause & Correction

Check the following items:

- \* Check for incorrect valve timing, bent push rods, broken valve springs or worn camshaft lobes.
- \* Check for sticking or leaking valves.
- \* Check EGR valve for leaking base gasket or valve hanging open.
- \* Check for engine vacuum leaks and/or engine not tuned to specifications.
- \* Check ignition module ground and power feed circuits for poor or loose connections.
- \* Check air induction system for restrictions or air leaks. Also check for air leaks between Mass Airflow (MAF) sensor and throttle body. Check MAF sensor for proper operation.
- \* Check fuel injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.
- \* Check fuel system. Perform BASIC FUEL SYSTEM CHECKS. See appropriate BASIC DIAGNOSTIC PROCEDURES article.
- \* Using Spark Tester (J-26792), check available output voltage of ignition coil.
- \* Check for crossfire between spark plugs and spark plug wires.
- \* Remove spark plugs and check for wet plugs, cracks, improper gap, burned electrodes or heavy carbon deposits. Also, check condition of spark plug wires. Spray spark plug wires with a fine mist of water to check for shorts.
- \* Check for proper Crankshaft Position (CKP) and Camshaft Position (CMP) sensor resistance.
- \* Check ignition system for faulty ground and power feed circuits.
- \* Check exhaust system for restrictions, such as a damaged or collapsed pipe, muffler or catalytic converter.
- \* Check intake and exhaust manifold passages for casting flash.
- \* Check harmonic balancer interrupter rings for missing, broken or bent vanes.

## ENGINE DIESELING/RUN-ON

### Symptom Definition

Engine continues to run after ignition is turned off but runs very rough. If engine runs smoothly, check ignition switch and adjustment.

Possible Cause & Correction  
Check the following items:

- \* Check for leaking fuel injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.
- \* Check for alcohol contaminated fuel, correct fuel pressure or a restricted fuel injector.
- \* Check for fuel in pressure regulator vacuum hose. Replace pressure regulator if fuel is present.
- \* Check injector harness locations. Ensure injectors are connected to correct injector/cylinder according to firing order.
- \* Check for faulty PCV valve.
- \* Check for failure of A/C compressor or relay.
- \* Check Idle Air Control (IAC) system. Check for vacuum leak or high idle. Check for foreign material in IAC bore of throttle body. Check for proper connection of IAC valve electrical connector.
- \* Check for short between battery voltage and ignition feed circuits. See WIRING DIAGRAMS article.

## EXCESSIVE EXHAUST EMISSIONS OR ODORS

Symptom Definition

Vehicle fails emission test. Vehicle may also have excessive "rotten egg" smell (hydrogen sulfide) being emitted from tailpipe. Excessive odors DO NOT necessarily indicate exhaust emissions are high.

Possible Cause & Correction  
Check the following items:

- \* Check for lead contamination of catalytic converter. Look for removal/tampering at restrictor in fuel filler neck.
- \* Check coolant level. Check cooling system thermostat for proper operation and application.
- \* Check cooling fan for proper operation.
- \* Check for restricted airflow to radiator or restricted coolant flow through radiator.
- \* If emission test shows excessive carbon monoxide (CO) and hydrocarbons (HC) emissions and vehicle is also emitting excessive odor, check all systems and components which could cause engine to run rich.
- \* Ensure the installed PROM is correct for the particular vehicle. Check with dealer for latest application information.
- \* If emission test shows excessive oxides of nitrogen (NOx) emissions, check all systems and components which could cause engine to run lean or to run too hot. Check EGR system. Check for an inoperative cooling fan.
- \* Ensure fuel filler cap is properly installed.
- \* Check fuel pressure.
- \* Check fuel injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.
- \* Check EVAP fuel canister for fuel loading.

- \* Check spark plugs, plug wires and ignition components.
- \* Check for plugged or stuck PCV valve. Check for fuel in crankcase.
- \* Check for vacuum leaks.
- \* Check for excessive carbon build-up. Remove with top engine cleaner.
- \* Check EGR valve (not opening).
- \* Check fuel injector harness locations. Ensure fuel injectors are connected to correct injector/cylinder according to firing order.

## HARD START

### Symptom Definition

Engine cranks okay, but does not start for a long time.  
Engine eventually starts, and may stall immediately or run okay.

### Possible Cause & Correction

Check the following items:

- \* Check fuel pump relay by connecting test light between fuel pump relay connector ignition feed circuit and ground. Turn ignition on. Light should illuminate for 2 seconds. If light does not illuminate for 2 seconds, see RELAYS under MODULES, RELAYS & SOLENOIDS in appropriate SYSTEM & COMPONENT TESTING article. For location of fuel pump test connector, see COMPONENT LOCATIONS in appropriate SYSTEM & COMPONENT TESTING article.
- \* Check for open injector fuse.
- \* Check for poor quality or alcohol contaminated fuel.
- \* Visually inspect fuel injector fuse(s).
- \* Check for binding or sticking TP sensor, or high TP sensor voltage with throttle closed.
- \* Check EGR operation.
- \* Check for leaking fuel injector.
- \* Ensure resistance of Engine Coolant Temperature (ECT) sensor circuit is within specification. See appropriate SENSOR OPERATING RANGE CHARTS article.
- \* Check resistance of ECT and Intake Air Temperature (IAT) sensors. On a cold engine, ECT and IAT sensor readings should be within 5°F of each other.
- \* Check for proper spark output using Spark Tester (J-26792).
- \* Remove spark plugs and check for wet plugs, cracks, improper gap, burned electrodes or heavy carbon deposits.
- \* Check fuel pressure. See FUEL SYSTEM PRESSURE TEST under BASIC FUEL SYSTEM CHECKS in appropriate BASIC DIAGNOSTIC PROCEDURES article.
- \* Check for plugged injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEM in appropriate SYSTEM & COMPONENT TESTING article.
- \* Check for loose ignition coil ground and power feed circuit connections. Also check ignition coil fuse.
- \* Check for faulty in-tank fuel pump check valve (if equipped). A faulty in-tank fuel pump check valve will allow fuel to drain back to tank after engine is stopped. To check this condition, turn ignition off, disconnect fuel pressure line at fuel rail and remove filler cap. Using a radiator pressure tester, apply 15 psi (1.0 kg/cm<sup>2</sup>). If pressure holds for 60 seconds, check valve is okay.
- \* Ensure the installed PROM and/or PCM is correct for the particular vehicle. Check with dealer for latest application information.

- \* Check for restricted exhaust system, such as a damaged or collapsed pipe, muffler or catalytic converter.
- \* Check Idle Air Control (IAC) system. Check for vacuum leak at high idle. Check for binding of throttle blade or linkage. Check for foreign material in IAC bore of throttle body. Check for proper connection of IAC valve electrical connector. Check for failure of A/C compressor or relay.
- \* Check Manifold Absolute Pressure (MAP) or Mass Airflow (MAF) sensor. Check air intake tube for air leaks, blockage or damage.
- \* Inspect Crankshaft Position (CKP) sensor clearance and resistance. Check harmonic balancer interrupter rings for bent or missing vanes.
- \* Check if PCV valve is stuck open.
- \* Check basic engine mechanical problems (i.e., compression, head gasket(s), valves). Check for incorrect valve timing, bent push rods, broken valve springs or worn camshaft lobes.
- \* Check PCM and engine grounds for correct locations, tight and clean connections. See WIRING DIAGRAMS article.

## HESITATION, SAG OR STUMBLE

### Symptom Definition

Momentary lack of response when accelerator is pushed down.

Condition occurs at all vehicle speeds or usually occurs when taking off from a stop. If severe enough, may cause engine to stall.

### Possible Cause & Correction

Check the following items:

- \* Visually check vacuum hoses for splits, kinks and proper connections as shown on vehicle emission control information label.
- \* Check ignition wires for cracking, hardness and proper connections at spark plugs. Spray spark plug wires with a fine mist of water to check for shorts.
- \* Check wires for pinches, cuts and proper connections.
- \* Check fuel pressure. See FUEL SYSTEM PRESSURE TEST under BASIC FUEL SYSTEM CHECKS in appropriate BASIC DIAGNOSTIC PROCEDURES article.
- \* Check for poor quality or alcohol/water contaminated fuel.
- \* Check for fouled spark plugs.
- \* Ensure the installed PROM and/or PCM is correct for that particular vehicle. Check with dealer for latest application information.
- \* Check for a binding or sticking TP sensor. Voltage should increase steadily as throttle is moved toward Wide Open Throttle (WOT). Also check related wiring.
- \* Ensure PCM-controlled idle speed is correct.
- \* Check EGR operation.
- \* Check engine cooling system thermostat for proper operation and heat range.
- \* Check ignition control system ground and power feed circuits.
- \* Check canister purge system for proper operation.
- \* Check charging system output. Repair charging system if voltage is less than 9 volts or more than 16 volts.
- \* Check fuel injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.

- \* Check injector harness locations. Ensure injectors are connected to correct injector/cylinder according to firing order.
- \* Check for proper Crankshaft Position (CKP) and Camshaft Position (CMP) sensor resistance. Check for intermittent ignition feed or ground circuits.
- \* Check Heated Oxygen Sensor (HO2S) ground (corroded threads in exhaust manifold or pipe).
- \* Check for air leaks between Mass Airflow (MAF) sensor and throttle body.
- \* Check air induction system for damage, restriction or air leaks.
- \* Check for intake valve deposits.
- \* Check Manifold Absolute Pressure (MAP) and MAF sensor values and related wiring.
- \* Check for excessive exhaust system backpressure.

## LACK OF POWER, SLUGGISH OR SPONGY

### Symptom Definition

Engine delivers less power than expected. Little or no increase in speed when accelerator is pushed down.

### Possible Cause & Correction

Check the following items:

- \* Ensure air filter and fuel filter are not plugged. Replace if necessary. Check for incorrect fuel pressure. Also check for contaminated fuel.
- \* Check shift solenoid system and Torque Converter Clutch (TCC) system for proper operation.
- \* Check Knock Sensor (KS) system for excessive retard.
- \* Check ignition control system for proper operation.
- \* Check for plugged injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.
- \* Ensure EGR valve is not open all the time.
- \* Check exhaust system for restrictions, such as a damaged or collapsed pipe, muffler or catalytic converter.
- \* Check charging system output. Repair charging system if voltage is less than 9 volts or more than 16 volts.
- \* Check for A/C clutch cutout at Wide Open Throttle (WOT).
- \* Check Manifold Absolute Pressure (MAP) sensor.
- \* Using Spark Tester (J-26792), check for available secondary voltage.
- \* Check air induction system for restrictions or air leaks.
- \* Ensure the installed PROM and/or PCM is correct for the particular vehicle. Check with dealer for latest application information.
- \* Check PCM grounds for clean, tight connections.
- \* Check engine compression. Check for incorrect valve timing, bent push rods, broken valve springs or worn camshaft lobes.
- \* Check for excessive fuel additives.
- \* Check for binding accelerator cable.
- \* Check engine supercharger (if equipped).
- \* Check if engine is operating in power management mode (if equipped).
- \* Check boost control system components and connections (if equipped).
- \* Check PCM and engine grounds for correct locations, tight and clean connections. See WIRING DIAGRAMS article.

## POOR FUEL ECONOMY

### Symptom Definition

Fuel economy, as measured by an actual road test, is noticeably lower than expected. Fuel economy is noticeably lower than it was previously on this vehicle.

### Possible Cause & Correction

Check the following items:

- \* Visually check vacuum hoses for splits, kinks and proper connections as shown on vehicle emission control information label.
- \* Check for dirty or clogged air filter.
- \* Check coolant level. Check engine cooling system thermostat for proper heat range and operation.
- \* Check engine compression. Check for incorrect valve timing, bent push rods, broken valve springs or worn camshaft lobes.
- \* Check Engine Coolant Temperature (ECT) sensor for shift in calibration. See appropriate SENSOR OPERATING RANGE CHARTS article.
- \* Check A/C for "full time" operation.
- \* Ensure initial ignition timing is properly set, and check for proper operation of ignition control and knock sensor systems.
- \* Check Torque Converter Clutch (TCC) for proper operation.
- \* Check transmission shift pattern and clutch adjustment.
- \* Check air intake system and crankcase for air leaks.
- \* Check exhaust system for restrictions, such as a damaged or collapsed pipe, muffler or catalytic converter.
- \* Check Heated Oxygen Sensor (HO2S) for silicone or lead contamination.
- \* Remove spark plugs and check for wet plugs, cracks, improper gap, burned electrodes or heavy carbon deposits.
- \* Ensure speedometer is properly calibrated.
- \* Check fuel pressure. See FUEL SYSTEM PRESSURE TEST under BASIC FUEL SYSTEM CHECKS in appropriate BASIC DIAGNOSTIC PROCEDURES article.
- \* Check for poor quality or alcohol contaminated fuel.
- \* Check fuel injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.
- \* Check injector harness locations. Ensure injectors are connected to correct injector/cylinder according to firing order.
- \* Check for fuel in pressure regulator vacuum hose. If fuel is present, replace regulator.
- \* Check Camshaft Position (CMP) and Crankshaft Position (CKP) sensors for proper operation.
- \* Check for air leaks between Mass Airflow (MAF) sensor and throttle body. Check air induction system for damage, restriction or air leaks.
- \* Check boost control system (if equipped).
- \* Check engine compression.
- \* Check for dragging brakes.
- \* Check for incorrect tire pressure.
- \* Check for uneven or excessive tire wear from suspension misalignment.
- \* Check with operator to see if vehicle is operated under excessive acceleration or is heavily loaded.

## POOR FUEL FILL QUALITY

Symptom Definition  
Problem filling fuel tank.

Possible Cause & Correction  
Check the following items:

- \* Fill limiter vent valve stuck closed.
- \* EVAP canister restricted.
- \* EVAP vent valve stuck closed.
- \* Restricted vapor lines.
- \* High reid vapor pressure or high fuel temperature.
- \* Fuel filler hose is pinched or kinked.
- \* Ignition switch on (EVAP vent valve closed).

Symptom Definition  
Overfill tank.

Possible Cause & Correction  
Check the following items:

- \* Pressure relief valve is stuck open or leaking.
- \* Fill limiter vent valve is stuck open or leaking.

Symptom Definition  
Pre-mature shutoff of fuel dispensing nozzle.

Cause & Correction  
Check the following items:

- \* Fill limiter vent valve stuck closed.
- \* EVAP canister restricted.
- \* EVAP vent valve stuck closed.
- \* Restricted vapor lines.
- \* High reid vapor pressure or high fuel temperature.
- \* Ignition switch on (EVAP vent valve closed).

Symptom Definition  
Fuel spitback.

Possible Cause & Correction  
Check the following items:

- \* EVAP canister restricted.
- \* High reid vapor pressure or high fuel temperature.
- \* Ignition switch on (EVAP vent valve closed).

Symptom Definition  
Liquid to EVAP canister.

Possible Cause & Correction  
Check the following items:

- \* Fill limiter vent valve stuck open or leaking.
- \* Over-filled fuel tank (topping off fuel tank).

Symptom Definition  
Liquid leak to ground.

Possible Cause & Correction  
Check the following items:

- \* Pressure relief valve is stuck open or leaking.

- \* Fuel filler pipe loose or ruptured.
- \* Leaking fuel tank (seepage).

Symptom Definition  
Fuel odor.

Possible Cause & Correction  
Check the following items:

- \* Pressure relief valve is stuck open or leaking.
- \* Saturated EVAP canister.
- \* Seepage from fuel tank.

## ROUGH, UNSTABLE OR INCORRECT IDLE, STALLING

Symptom Definition

Engine runs unevenly at idle. If severe enough, vehicle will shake. Idle may vary in RPM. Either problem may cause stalling. Engine idles at incorrect RPM.

Possible Cause & Correction  
Check the following items:

- \* Ensure throttle linkage and/or TP sensor is not sticking or binding. Ensure throttle bore is free of foreign material.
- \* Check for vacuum leaks.
- \* Check engine idle speed (both base idle and PCM idle).
- \* Check Idle Air Control (IAC) system. Check for vacuum leak or high idle. Check for alcohol contaminated fuel, incorrect fuel pressure or a restricted injector. Check for foreign material in IAC bore of throttle body. Check for proper connection of IAC valve electrical connector. Check for failure of A/C compressor or relay.
- \* Check for proper operation of EGR system.
- \* Check Transaxle Range (TR) switch circuit. Ensure TR switch is properly adjusted.
- \* Check Power Steering Pressure (PSP) switch operation.
- \* Check charging system output. Repair charging system if voltage is less than 9 volts or more than 16 volts.
- \* Check for fuel in pressure regulator vacuum hose. If fuel is present, replace regulator.
- \* Check evaporative emission control system.
- \* Check for proper spark plug gap, and check engine compression.
- \* Check PCM grounds for clean and tight connections.
- \* Check A/C signal to PCM. If problem exists only when A/C is on, check A/C system operation and pressures.
- \* Ensure the installed PROM and/or PCM is correct for the particular vehicle. Check with dealer for latest application information.
- \* Check Manifold Absolute Pressure (MAP) or Mass Airflow (MAF) sensors for proper operation.
- \* Check Heated Oxygen Sensor (HO2S) operation. Check for silicone contamination or incorrect RTV sealant.
- \* Check for excessive fuel additives.
- \* Check for shorted or open injector windings.
- \* Check for leaking injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.
- \* Check injector harness locations. Ensure injectors are connected to correct injector/cylinder according to firing order.

- \* If rough idle only occurs when engine is hot, check PCV valve operation. Check for manifold vacuum at inlet end of crankcase vent tube assembly with engine idling.
- \* Check ignition system. Check for moisture, dust, cracks, burns, etc. Check for shorts and faulty insulation by spraying spark plug wires with a fine water mist.
- \* Using Spark Tester (J-26792), check for available secondary voltage.
- \* Check to see if condition is caused by engine running either rich or lean.
- \* Check engine compression. Check for incorrect valve timing, bent push rods, broken valve springs or worn camshaft lobes.
- \* Check Engine Coolant Temperature (ECT) sensor for proper temperature-to-resistance values.
- \* Check exhaust system for restrictions, such as a damaged or collapsed pipe, muffler or catalytic converter.
- \* Check for weak or broken motor mounts.

## VEHICLE SURGES OR CHUGGLES

### Symptom Definition

Engine power varies under steady throttle or cruise. Vehicle speeds up and slows down without changing position of accelerator pedal.

### Possible Cause & Correction Check the following items:

- \* Visually check vacuum hoses for splits, kinks and proper connections as shown on vehicle emission control information label.
- \* Check canister purge system for proper operation.
- \* Check ignition control system for proper operation.
- \* Check EGR system for proper operation.
- \* Ensure the installed PROM and/or PCM is correct for that particular vehicle. Check with dealer for latest application information.
- \* Check for proper ignition voltage output using Spark Tester (J-26792).
- \* Check Heated Oxygen Sensor (HO2S) for contamination. This will cause a false high voltage signal to PCM. PCM will respond by leaning out air/fuel ratio.
- \* Check in-line fuel filter, and replace if dirty or clogged.
- \* Check fuel pressure while condition exists. See FUEL SYSTEM PRESSURE TEST under BASIC FUEL SYSTEM CHECKS in appropriate BASIC DIAGNOSTIC PROCEDURES article.
- \* Check for poor quality or alcohol contaminated fuel.
- \* Check Mass Airflow (MAF) sensor for proper operation. Check air induction system for damage, restriction or air leaks. See DIAGNOSTIC TESTS in appropriate SELF-DIAGNOSTICS article.
- \* Remove spark plugs and check for wet plugs, cracks, improper gap, burned electrodes or heavy carbon deposits. Also, check condition of spark plug wires. Spray spark plug wires with a fine mist of water to check for shorts.
- \* Check charging system output. Repair charging system if voltage is less than 9 volts or more than 16 volts.
- \* Check for restricted exhaust system, such as a damaged or collapsed pipe, muffler or catalytic converter.
- \* Check transmission shift solenoid system and Torque Converter Clutch (TCC) system for proper operation.

- \* Ensure owner understands operation of TCC and A/C clutch operation, as stated in owners manual.
- \* Check injector harness locations. Ensure injectors are connected to correct injector/cylinder according to firing order.
- \* Check for rich or lean conditions. Drive vehicle at speed when complaint occurs. See appropriate HO2S DTCs for diagnostic aids. See appropriate SELF-DIAGNOSTICS article.
- \* Check for plugged injectors. Perform injector balance test. See FUEL INJECTOR BALANCE TEST under FUEL SYSTEMS in appropriate SYSTEM & COMPONENT TESTING article.
- \* Ensure PCM grounds are clean and tight.
- \* Check for excessive use of additives in fuel.

## **INTERMITTENTS**

**CAUTION:** When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery.

### **PROBLEM DIAGNOSIS**

Intermittent fault testing requires duplicating circuit or component failure to identify fault. These procedures may lead to computer setting a DTC which may help in diagnosis.

If problem vehicle does not produce DTCs, monitor voltage or resistance values using a scan tool or DVOM while attempting to reproduce conditions causing the intermittent fault. A status change on scan tool or DVOM indicates a fault has been located.

Use scan tool or DVOM to pinpoint faults. When monitoring voltage, ensure ignition switch is in ON position or engine is running. When monitoring resistance, ensure ignition switch is in OFF position or negative battery cable is disconnected. A status change on scan tool or DVOM while performing test procedures indicates area of fault.

### **TEST PROCEDURES**

#### **Intermittent Simulation**

To reproduce conditions causing intermittent fault, use the following methods:

- \* Lightly vibrate component.
- \* Heat component.
- \* Wiggle or bend wiring harness.
- \* Spray component with water.
- \* Remove/apply vacuum source.

Monitor circuit/component voltage or resistance while simulating intermittent. If engine is running, monitor for DTCs. Use test results to identify a faulty component or circuit.

### **TROUBLE SHOOTING**

#### **Intermittent Symptom Definition**

Malfunction Indicator Light (MIL) illuminates but does not remain on. A stored DTC may or may not exist.

Possible Cause & Correction

To track down possible causes of an intermittent MIL, check the following items:

- \* Check for poor mating of one connector to another. Terminals may not be fully seated. Check for improperly formed or damaged terminals. Check wire-to-terminal connections.
- \* Check for poor connection from ignition coil to ground or arcing at spark plug wires or plugs.
- \* Check for intermittent short to ground on data circuits of Data Link Connector (DLC) or in Malfunction Indicator Light (MIL) circuit. See WIRING DIAGRAMS article.
- \* Check for poor connections in PCM ground terminals.
- \* Check for loss of DTC memory. To check DTC memory, disconnect MAP or TP sensor and run engine at idle until MIL illuminates. MAP or TP sensor DTC should be stored and retained in memory when ignition is turned off. If DTC is not stored, PCM is faulty.
- \* Check for electrical system interference caused by a defective relay, or a PCM-driven solenoid or switch which may cause sharp electrical surge. This type of problem will normally occur when faulty component is operated.
- \* Check for aftermarket parts which may not have been produced to manufacturer's specifications.
- \* Check for any open diodes in A/C system or engine wiring.
- \* Check for improper installation of electrical accessories such as auxiliary lights or 2-way radios.
- \* Ensure ignition control wires are kept away from spark plug wires, ignition coil and generator. Ensure ground wire from PCM to ignition control module is connected to a good ground.