

2002 ENGINE PERFORMANCE

Trouble Shooting - No Codes

INTRODUCTION

Before diagnosing symptoms or intermittent faults, perform steps in **BASIC DIAGNOSTIC PROCEDURES** and appropriate SELF-DIAGNOSTICS articles. Use this article to diagnose driveability problems existing when a hard fault code is not present.

NOTE: Some driveability problems may have been corrected by manufacturer with a revised Engine Control Module (ECM) or flashing (reprogramming). Check with manufacturer for ECM application.

Symptom checks can direct the technician to malfunctioning components for further diagnosis. A symptom should lead to a specific component, system test or adjustment.

Use intermittent test procedures to locate driveability problems that do not occur when the vehicle is being tested. These test procedures should also be used if a Diagnostic Trouble Code (DTC) or pending code was present but no problem was found during self-diagnostic testing.

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

SYMPTOMS

SYMPTOM DIAGNOSIS

Symptom checks cannot be used properly unless problem occurs while vehicle is being tested. To reduce diagnostic time, ensure steps in BASIC DIAGNOSTIC PROCEDURES and SELF-DIAGNOSTICS articles were performed before diagnosing a symptom. Following symptoms are available for diagnosis:

- **ENGINE DOES NOT CRACKS**
- **CRANKS NORMALLY BUT WILL NOT START**
- **CRANKS NORMALLY BUT DIFFICULT TO START**
- **ROUGH OR UNSTABLE IDLE**
- **HIGH IDLE AFTER WARM-UP**
- **ENGINE STALLS SOON AFTER STARTING**
- **ENGINE STALLS ON ACCELERATION**
- **ENGINE STALLS ON DECELERATION**
- **ENGINE STALLS INTERMITTENTLY**
- **ENGINE HESITATES OR STUMBLES ON ACCELERATION**

- **ENGINE SURGES WHILE CRUISING**
- **LACK OF POWER**
- **ENGINE RUNS ROUGH ON DECELERATION**
- **ABNORMAL NOISE, DETONATION OR KNOCKING**
- **FUEL ODOR**
- **EXCESSIVE OIL CONSUMPTION**
- **POOR FUEL MILEAGE**

ENGINE DOES NOT CRANKS

- Check power supply and ignition switch.
- Check battery and cables condition.
- Check starter relay.
- Check starter.
- Check Transmission Range (TR) switch (A/T).
- Check ignition lock switch (M/T).
- If starter turns and engine does not crank, check starter overrunning clutch. Flywheel (M/T) and drive plate (A/T).

CRANKS NORMALLY BUT WILL NOT START

- Check for strong spark.
- Check fuel pump operation.
- Check fuel injector operation.
- Check fuel system pressure.
- Check spark plug condition.
- Check timing belt condition and alignment.
- Check engine compression.
- Check Camshaft Position (CMP) sensor.
- Check Crankshaft Position (CKP) sensor.
- Check voltages of Mass Airflow (MAF) sensor, Throttle Position (TP) sensor, ignition coils and Engine Coolant Temperature (ECT) sensor at Engine Control Module (ECM).
- Check for contaminated MAF sensor.
- Check intake air leak.
- Check Engine Control Module (ECM) power and grounds.
- If no start after engine is warmed up, disconnect ECT and check if engine starts.

CRANKS NORMALLY BUT DIFFICULT TO START

- Check for strong spark.

- Check ignition timing.
- Check Engine Control Module (ECM) ground and power circuits.
- Check intake manifold vacuum. Vacuum should be more than 17.7 in. Hg at idle.
- Check air filter element.
- Check if engine starts with throttle 1/4 open. If engine starts, check for carbon deposit on throttle valve.
- Check fuel pump operation while cranking engine.
- Check fuel injector operation while cranking engine.
- Check fuel pressure while engine is idling.
- Check fuel system holding pressure.
- Check spark plug condition.
- Check engine compression.
- Check terminal voltages of Mass Airflow (MAF) sensor, Throttle Position (TP) sensor, ignition coils and Engine Coolant Temperature (ECT) sensor at Engine Control Module (ECM).
- Check for contaminated MAF sensor element.
- Check Idle Air Control (IAC) valve.
- Check if engine starts with ECT disconnected.

ROUGH OR UNSTABLE IDLE

- Check air filter element.
- Check ignition timing
- Check for air intake system leaks.
- Check intake manifold vacuum. Vacuum should be more than 17.7 in. Hg at idle.
- Check fuel injector operation while engine is running.
- Check for battery voltage to injectors when ignition is on.
- Check resistance of injectors.
- Check fuel pressure.
- Check engine compression.
- Check terminal voltages of Mass Airflow (MAF) sensor, Throttle Position (TP) sensor, ignition coils and Engine Coolant Temperature (ECT) sensor at Engine Control Module (ECM).
- Check TP sensor.
- Check for contaminated MAF sensor element.
- Disconnect ECT sensor and check if engine condition improves.
- Check ECT sensor resistances.
- Check Exhaust Gas Recirculation (EGR) system, check EGR valve stuck open and EGR solenoid for proper operation.
- Disconnect Oxygen sensor and check if engine condition improves.
- If A/C is on, turn off A/C and observe if condition improves.

HIGH IDLE AFTER WARM-UP

- Check that throttle valve closes completely when accelerator pedal is released.
- Check throttle cable adjustment.
- Check PCV valve operation.
- Check for vacuum leaks.
- Check Idle Speed Control (ISC) valve operation.
- Disconnect Engine Coolant Temperature (ECT) sensor and see if engine idle improves.
- Check ECT sensor resistances.
- Check Throttle Position (TP) sensor.
- Check A/C idle compensation circuit
- Check fuel ejectors for operation and leaks.
- Ensure Engine Control Module (ECM) terminal voltages and grounds are okay.

ENGINE STALLS SOON AFTER STARTING

- Check fuel quality.
- Check fuel pressure regulator.
- Check fuel pump operation.
- Check fuel lines for leaks or restrictions and condition.
- Check Idle Speed Control (ISC) valve.
- Check Mass Air Flow (MAF) sensor.
- Check Engine Coolant Temperature (ECT) sensor circuit.
- Check fuel injectors operation.
- Ensure Engine Control Module (ECM) terminal voltages and grounds are okay.

ENGINE STALLS ON ACCELERATION

- Check Mass Air Flow (MAF) sensor.
- Check Throttle Position (TP) sensor.
- Check Camshaft Position (CMP) sensor.
- Check Crankshaft Position (CKP) sensor.
- Check spark plugs.
- Check fuel pressure regulator operation.
- Check fuel injectors operation.
- Check fuel system for leaks or restrictions.
- Ensure Engine Control Module (ECM) terminal voltages and grounds are okay.

ENGINE STALLS ON DECELERATION

- Check idle condition. If vehicle does not idle properly, see **ROUGH OR UNSTABLE IDLE**.
- Check Throttle Position (TP) sensor.
- Check Idle Air Control (IAC) valve.
- Ensure Engine Control Module (ECM) terminal voltages and grounds are okay.
- Check EGR system, check EGR valve for sticking open and EGR solenoid for proper operation.
- Disconnect Oxygen sensor and check if engine condition improves.
- Check for poor connections at ignition coil, ignitor, distributor, high tension leads, TP sensor, Mass Airflow (MAF) sensor, Crankshaft Position (CKP) sensor, Camshaft Position (CMP) sensor, injectors, fuel pump relay and ECM.

ENGINE STALLS INTERMITTENTLY

- Check idle condition. If vehicle does not idle properly, see **ROUGH OR UNSTABLE IDLE**.
- Ensure Engine Control Module (ECM) terminal voltages and grounds are okay.
- Check for poor connections at ignition coils, Throttle Position (TP) sensor, Mass Airflow (MAF) sensor, Crankshaft Position (CKP) sensor, fuel injector, fuel pump relay and ECM.
- Check that MAF sensor and CKP sensor output signals are normal.
- Check EGR system, check EGR valve for sticking open and EGR solenoid for proper operation.
- Disconnect Oxygen sensor and check if engine condition improves.
- Perform **INTERMITTENT PROBLEM DIAGNOSIS** under INTERMITTENTS.

ENGINE HESITATES OR STUMBLES ON ACCELERATION

- Check intake manifold vacuum. Vacuum should be more than 17.7 in. Hg at idle.
- Check air filter element.
- Check Mass Airflow (MAF) sensor.
- Check MAF sensor element for contamination.
- Check Engine Coolant Temperature (ECT) sensor.
- Check Throttle Position (TP) sensor.
- Disconnect injectors in turn and check for equal RPM drop between cylinders.
- Check throttle linkage operation.
- Check fuel pressure.
- Check air passage and vacuum hose installation.
- Check for restricted exhaust system.

ENGINE SURGES WHILE CRUISING

- Check intake manifold vacuum. Vacuum should be more than 17.7 in. Hg at idle.
- Check Throttle Position (TP) sensor.
- Check oxygen sensor.

- Check for normal Vehicle Speed Sensor (VSS) signal to Engine Control Module (ECM).
- Ensure Engine Control Module (ECM) terminal voltages are okay.
- Check throttle linkage operation.
- Check air filter element.
- Check fuel system pressure.
- Check for restricted exhaust system.

LACK OF POWER

- On M/T models, ensure clutch is not slipping.
- On A/T models, ensure transmission is not slipping.
- Ensure brakes do not drag.
- Ensure tire size and air pressure are to specification.
- Check throttle linkage installation and operation.
- Check operation of throttle body.
- Check Camshaft Position (CMP) sensor.
- Check Throttle Position (TP) sensor.
- Check intake manifold vacuum. Vacuum should be more than 17.7 in. Hg at idle.
- Disconnect injectors in turn and check for equal RPM drop between cylinders.
- Check air filter element.
- Check fuel system holding pressure.
- Check that fuel pressure increases when abruptly accelerating.
- Check Mass Airflow (MAF) sensor.
- Check MAF sensor element for contamination.
- Check spark plug condition.
- Check spark plug wires.
- Check ignition coil resistance.
- Check engine compression.
- Check for restricted exhaust system.
- Check fuel filter.
- Check for contaminated fuel.

ENGINE RUNS ROUGH ON DECELERATION

- Check intake manifold vacuum. Vacuum should be more than 17.7 in. Hg at idle.
- Check air filter element.
- Ensure Engine Control Module (ECM) terminal voltages are okay.
- Check fuel injection system operation.
- Check Mass Air Flow (MAF) sensor.

- Check MAF sensor element for contamination.
- Check Throttle Position (TP) sensor.
- Check throttle body for contamination.
- Check for leaking fuel injectors.
- Check EGR system, check EGR valve for sticking open and EGR solenoid for proper operation.

ABNORMAL NOISE, DETONATION OR KNOCKING

- Check engine oil and coolant level.
- Check that throttle valve opens fully when accelerator pedal fully depressed.
- Check installation of throttle cable.
- Check installation of throttle body.
- Check Camshaft Position (CMP) sensor.
- Check Intake Air Temperature (AIT) sensor.
- Check Idle Speed Control (ISC) valve.
- Check ignition circuit.
- Check cooling system.
- Check spark plugs for correct heat range.
- Check fuel system pressure.
- Check fuel quality/octane.
- Check for fuel contamination.
- Check for intake system air leaks.
- Check ignition timing and timing belt position.
- Check engine compression.
- Check for carbon build-up in cylinders.
- Check if head or deck has been resurfaced.

FUEL ODOR

- Check fuel evaporative control system.
- Check fuel system for leaks or damage.

EXCESSIVE OIL CONSUMPTION

- Check for restricted PCV system.
- Check for leaks.
- Check for worn engine parts.
- Check for fuel dilution of oil.

POOR FUEL MILEAGE

- On (M/T) models, ensure clutch is not slipping.
- On (A/T) models, ensure transmission is not slipping.
- Ensure brakes do not drag.
- Ensure tire size and air pressure are to specification.
- Check alignment.
- Check for restricted exhaust system.
- Ensure all vacuum hoses are connected correctly.
- Check intake manifold vacuum. Vacuum should be more than 17.7 in. Hg at idle.
- Check air filter element.
- Check spark plugs.
- Check compression.
- Ensure Engine Control Module (ECM) terminal voltages and grounds are okay.
- Ensure fuel system pressure is correct.
- Check fuel injectors for leaks.
- Check fuel system for external leaks.

INTERMITTENTS

INTERMITTENT PROBLEM DIAGNOSIS

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

If problem vehicle does not produce fault codes, monitor voltage or resistance values using Digital Volt-Ohmmeter (DVOM) while attempting to reproduce conditions causing intermittent fault. Abnormal status changes on DVOM indicate a fault has been located.

Use a DVOM to pinpoint faults. When monitoring voltage, ensure ignition switch is on or engine is running. Ensure ignition switch is off or negative battery cable is disconnected when monitoring circuit resistance. Status changes on DVOM during test procedures indicate area of fault.

TEST PROCEDURES

Intermittent Simulation

To reproduce conditions creating an 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 Diagnostic Trouble Codes (DTCs) or pending codes. Use test results to identify a faulty component or circuit.