

H - TESTS W/O CODES

Article Text

1989 Volkswagen Golf

For Volkswagen Technical Site

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Monday, August 23, 1999 11:54PM

ARTICLE BEGINNING

1989 ENGINE PERFORMANCE

Volkswagen Trouble Shooting - No Codes

Cabriolet, Fox, Golf, GTI, Jetta, Vanagon

INTRODUCTION

Before attempting to diagnose symptoms or intermittent faults, ensure steps in F - BASIC TESTING have been performed. Use this article to diagnose driveability problems that exist when an obvious fault 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" warning light to illuminate on some vehicles.

It is also possible that certain driveability concerns have been rectified by the manufacturer through substitution of a revised control unit. Check with manufacturer for latest information on updated components and control units.

NOTE: For specific testing procedures, refer to I - SYS/COMP TESTS article. For verifying specifications, refer to D - ADJUSTMENTS article.

SYMPTOMS

SYMPTOM DIAGNOSIS

Symptom checks cannot be used properly unless the problem is actually happening while the vehicle is being tested. To reduce diagnostic time, ensure steps in BASIC DIAGNOSTIC PROCEDURES article have been performed before attempting to diagnose a symptom. Symptoms available for diagnosis include the following:

- * Will not start (cranks okay)
- * Difficult start (cranks okay)
- * Engine surges
- * Rough or unstable idle
- * Excessive fast idle
- * Engine stalls
- * Engine has lack of power
- * Engine misfires or hesitates
- * Afterburn in exhaust system
- * Poor fuel mileage
- * Detonation or knocking

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- * Fails emission test

WILL NOT START (CRANKS OKAY)

Spark Available:

- * Check ignition fuse (if equipped).
- * Check fuel system fuse and fuel pump relay.
- * Verify air intake system is unrestricted.
- * Ensure fuel system pressure and volume are correct.
- * Check cold start valve operation (engine cold).
- * Check thermo time switch operation (engine cold).
- * Check for poor quality or contaminated fuel.
- * Check condensation (water) in fuel tank causing fuel pump to freeze (cold climate).
- * Check exhaust system for restriction.

No Spark Available:

- * Ensure secondary ignition system is in good condition.
- * Ensure ignition coil supply voltage is correct.
- * Ensure ignition coil primary resistance is correct.
- * Ensure ignition coil secondary resistance is correct.
- * Check hall sender operation.
- * Check ignition control unit (if equipped).
- * Ensure that ECU has correct voltage supply and is properly grounded (if equipped).
- * Check vehicle for aftermarket electronic equipment that may have been installed incorrectly.

DIFFICULT START (CRANKS OKAY)

- * Ensure sufficient secondary spark is available.
- * Check air induction system for cracks or restriction.
- * Check airflow sensor plate rest position.
- * Check cold start valve for leaking (engine warm).
- * Ensure vacuum hoses are not disconnected or damaged.
- * Ensure fuel system pressure and volume are correct.
- * Ensure fuel system residual pressure is correct.
- * Ensure fuel injector operation is correct.
- * Ensure EGR valve operation is correct and that valve closes completely (if equipped).
- * Check for cracks or poor connections at throttle body.
- * Check for cracks in air induction system.
- * Ensure ignition and valve timing are correct.
- * Check ignition coil primary connections and wiring harness.
- * Ensure ignition coil resistance is within specification.
- * Check air temperature sensor operation.
- * Check coolant temperature sensor operation.
- * Ensure electrical harness and connectors are not broken or loose.
- * Ensure that ECU or ignition control unit has correct voltage

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supply and is properly grounded.

- * Ensure engine has sufficient compression.

ENGINE SURGES

- * Ensure there are no vacuum leaks.
- * Check for distortion or cracks in the fuel injector(s) plastic connecting flange(s).
- * Ensure EGR valve operation is correct and that valve closes completely (if equipped).
- * Check throttle valve switch (Vanagon).
- * Check throttle shaft for excessive wear.
- * Ensure fuel system pressure is correct and consistent.
- * Ensure ignition timing is correct.

ROUGH OR UNSTABLE IDLE

- * Ensure idle RPM is correct.
- * Check air intake system for restrictions.
- * Check auxiliary air by-pass regulator.
- * Ensure fuel system pressure and volume are correct.
- * Check fuel injector electrical connections.
- * Use stethoscope to verify consistent operational noise coming from fuel injectors.
- * Ensure fuel injector spray pattern is correct.
- * Ensure sufficient secondary spark is available in all cylinders.
- * Verify vacuum hose routing is correct and that there are no vacuum leaks.
- * Check cold start valve for leaking (engine warm).
- * Check idle stabilizer operation.
- * Check throttle valve switch (Vanagon).
- * Check for EGR system malfunction (if equipped).
- * Check operation of coolant temperature sensor.
- * Check O2 sensor operation.
- * Check for distortion or cracks in the fuel injector(s) plastic connecting flange.
- * Check for use of poor quality fuel containing insufficient cleaning additives. Prolonged use of poor quality fuel can cause injector clogging and carbon build-up on intake system.

EXCESSIVE FAST IDLE

- * Check throttle cable adjustment.
- * Verify vacuum hose routing is correct.
- * Ensure there are no vacuum leaks.
- * Check idle stabilizer operation (if equipped).
- * Ensure fuel system pressure and volume are correct.
- * Check auxiliary air by-pass regulator.
- * Check cold start valve for leaking (engine warm).
- * Check coolant temperature sensor operation.

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ENGINE STALLS

- * Ensure air intake system is unrestricted.
- * Ensure PCV system operation is correct.
- * Check EGR system for correct operation.
- * Check for distortion or cracks in the fuel injector(s) plastic connecting flange(s).
- * Check idle stabilizer operation.
- * Check for cracks or poor connections at throttle body.
- * Check auxiliary air by-pass regulator.
- * Check cold start valve for leaking (engine warm).
- * Check throttle valve switch (Vanagon).
- * Check coolant temperature sensor operation.
- * Ensure fuel system pressure is correct.
- * Check for poor quality or contaminated fuel. Check for use of fuel with high alcohol content.

ENGINE HAS LACK OF POWER

- * Verify throttle valve opens completely when accelerator pedal is fully applied.
- * Check for limited airflow sensor plate travel caused by defective screen in airflow sensor plate boot.
- * Verify air intake system is unrestricted.
- * Check EGR system for correct operation (if equipped).
- * Ensure fuel system pressure and volume are correct.
- * Ensure base timing is correct and that timing advance system is functional.
- * Check coolant temperature sensor operation.
- * Check transmission for correct downshift (auto. trans).
- * Check fuel tank filler tube for tampering of restrictor. If tampering has occurred, check catalytic converter for lead contamination and exhaust system restriction.
- * Check for use of poor quality fuel containing insufficient cleaning additives. Prolonged use of poor quality fuel can cause injector clogging and carbon build-up on intake system.

ENGINE MISFIRES OR HESITATES

- * Ensure vacuum hoses are not disconnected or damaged.
- * Ensure electrical harness connectors and wires are not broken or loose.
- * Ensure fuel pressure is correct.
- * Check cold start valve for leaking (engine warm).
- * Check airflow sensor plate adjustment.
- * Check airflow sensor voltage output.
- * Check throttle valve switch (Vanagon).
- * Check coolant temperature sensor operation.
- * Check Oxygen (O2) sensor voltage output.

AFTERBURN IN EXHAUST SYSTEM

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- * Verify no leaks in exhaust system.
- * Ensure base timing system functions correctly.
- * Check fuel injectors for leaking.
- * Check cold start valve and thermo time switch operation.
- * Check coolant temperature sensor.

POOR FUEL MILEAGE

- * Ensure base timing and timing advance system is functional.
- * Ensure fuel system pressure is correct.
- * Check cold start valve for leaking (engine warm).
- * Check thermo time switch operation.
- * Check airflow sensor voltage output.
- * Check air induction system for leaks.
- * Check fuel injector operation.
- * Check engine coolant temperature sensor operation.
- * Check Oxygen (O2) sensor operation.

DETONATION OR KNOCKING

- * Check engine oil level.
- * Check engine for overheating.
- * Verify base timing is correct.
- * Check for vacuum leaks.
- * Check EGR system operation (if equipped).
- * Check for contaminated or poor quality fuel.
- * Check for carbon build-up in combustion chamber.
- * Ensure spark plug application is correct.
- * Check for correct torque of knock sensor (if equipped).
- * Check for correct knock sensor signal (if equipped).
- * Ensure ECU application is correct.

FAIL EMISSION TEST

- * Ensure air intake system is not restricted.
- * Ensure engine is at normal operating temperature.
- * Ensure fuel system pressure is correct.
- * Check cold start valve for leaking (engine warm).
- * Check thermo time switch operation.
- * Verify base timing is correct.
- * Check for correct PCV valve operation.
- * Check crankcase for gasoline contamination.
- * Check idle stabilizer operation.
- * Check EGR system for correct operation (if equipped).
- * Check vapor recovery system operation.
- * Check operation of coolant temperature sensor.
- * Check operation of Oxygen (O2) sensor.
- * Check fuel tank filler tube for tampering of restrictor. If tampering has occurred, check catalytic converter for lead contamination and exhaust system restriction.
- * Check for use of poor quality fuel containing insufficient cleaning additives. Prolonged use of poor quality fuel can

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cause injector clogging and carbon build-up on intake system.

INTERMITTENTS

INTERMITTENT PROBLEM DIAGNOSIS

Intermittent fault testing requires the duplication of circuit or component failure, in order to identify the fault. These procedures may lead to the computer recording a fault code (on some systems) which may help in diagnosis.

If problem vehicle does not produce fault codes, it will be necessary to monitor voltage or resistance values using an DVOM while attempting to reproduce conditions which will create an intermittent fault. A change in status on the DVOM will indicate a fault has been located.

When using a voltmeter to pinpoint faults, monitor voltage reading with ignition on, or vehicle running. A change in status on the voltmeter while performing intermittent "Test Procedures" will indicate area of fault.

When using an ohmmeter to detect problems in the circuit, monitor circuit resistance (ohms) with ignition switch in the "OFF" position, or with battery disconnected. A change in ohmmeter reading while performing "Test Procedures" will indicate area of fault.

TEST PROCEDURES

Intermittent Simulation

To reproduce the conditions which create an intermittent fault so that it may be identified during testing, some of the following methods may be used:

- * Applying light vibration to components.
- * Heating a component.
- * Wiggling or bending a wiring harness.
- * Applying humidity to a component.
- * Remove or apply a vacuum supply source.

Monitor circuit/component voltage or resistance while attempting to simulate intermittent. If vehicle is running, monitor for self-diagnostic codes. Use the results of these tests to identify a faulty component or an area which should be checked closely for the problem.

END OF ARTICLE