

# I - SYSTEM/COMPONENT TESTS - VR6

## Article Text

1993 Volkswagen Passat

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Wednesday, March 22, 2000 10:18PM

## ARTICLE BEGINNING

1993 ENGINE PERFORMANCE

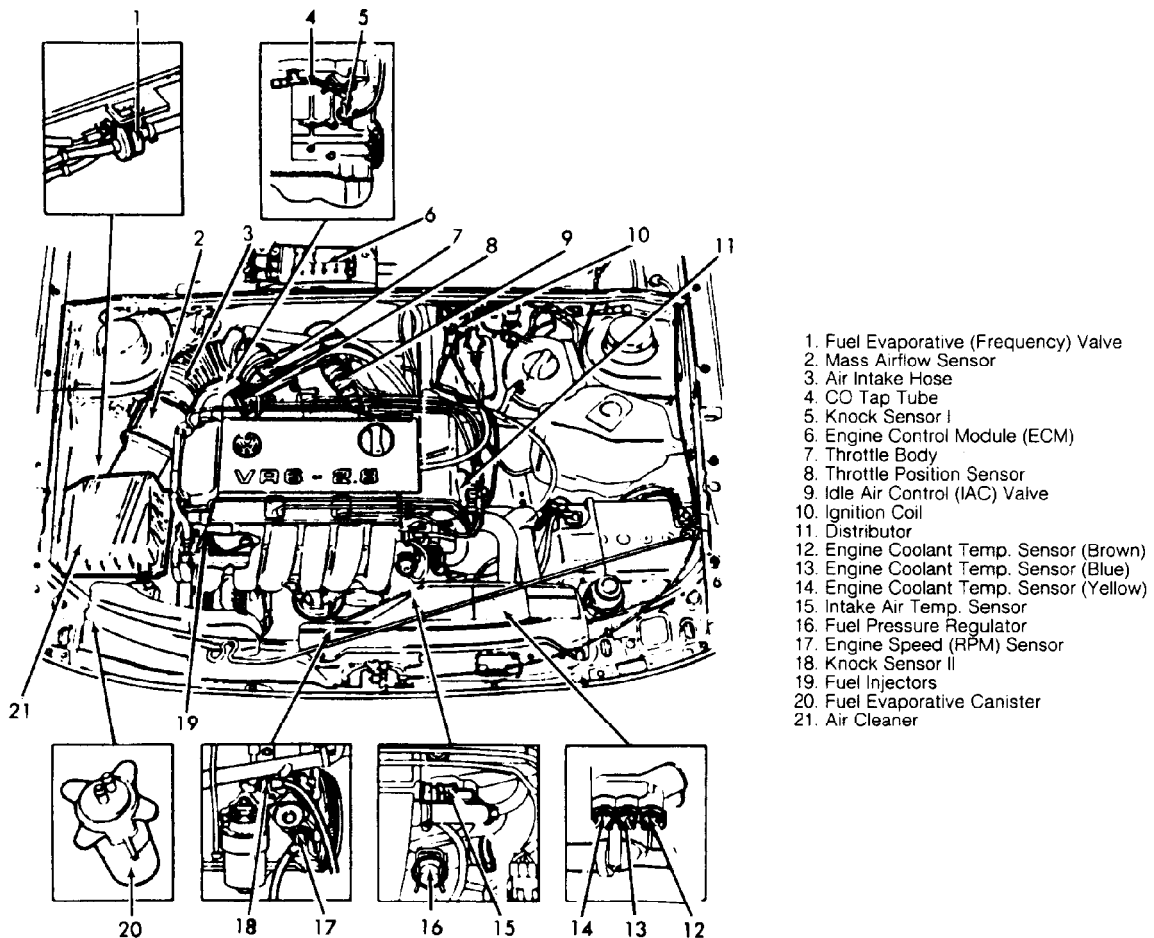
System & Component Testing - Motronic

Passat GLX

## INTRODUCTION

Since many computer-controlled and monitored components set a trouble code if they malfunction, also perform test procedures in the G - TESTS W/CODES article. In most instances, Scan Tester (VAG 1551) must be used to test systems and/or components. See ENTERING SELF-DIAGNOSTICS in the G - TESTS W/CODES article for additional scan tester operating instructions. See Fig. 1.

## COMPONENT LOCATIONS



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Fig. 1: Component Locations (Passat GLX)  
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### COMPUTERIZED ENGINE CONTROLS

#### ELECTRONIC CONTROL MODULE (ECM)

Ground & Power Circuits

Check ECM ground and power circuits using the values in the appropriate J - PIN VOLTAGE CHARTS - VR6 article.

### ENGINE SENSORS & SWITCHES

#### ENGINE COOLANT TEMPERATURE SENSOR

Passat GLX (2.8L)

1) Ensure engine is cold. Connect Scan Tester (VAG 1551) to Data Link Connectors (DLC) located in center console, in front of shift lever. Start engine and allow it to idle.

2) With scan tester in READ TEST VALUE BLOCK function, select group No. 01 and read coolant temperature value in field No. 2 of scan tester. Temperature value must increase uniformly without interruption. If value increases as specified, select END OUTPUT function on scan tester.

3) If displayed value does not change or if engine malfunctions during certain temperature ranges, turn ignition off and measure engine coolant temperature sensor resistance. See ENGINE COOLANT TEMPERATURE SENSOR RESISTANCE table.

#### ENGINE COOLANT TEMPERATURE SENSOR RESISTANCE

AA

Temperature °F (°C) Ohms

68 (20)	.....	3000-2000
86 (30)	.....	2000-1500
104 (40)	.....	1500-1000
122 (50)	.....	1000-800
140 (60)	.....	700-500
158 (70)	.....	500-375
176 (80)	.....	375-275
194 (90)	.....	275-225

AA

#### INTAKE AIR TEMPERATURE SENSOR

Passat GLX (2.8L)

1) Turn ignition off. Disconnect intake air temperature sensor. Remove sensor from intake manifold and plug opening in manifold. Reconnect sensor to wiring harness.

2) Connect Scan Tester (VAG 1551) to Data Link Connectors (DLC) located in center console, in front of shift lever. Start engine and allow it to idle. With scan tester in READ TEST VALUE BLOCK function, select group 03 and read intake air temperature sensor value in field No. 4 of scan tester.

3) Spray sensor with cooling spray and observe value on scan

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tester. Scan tester value must decrease. If temperature value does not change, repair intake air temperature sensor circuit or replace sensor as necessary. After repairs, erase Diagnostic Trouble Code (DTC) memory (if applicable) and select END OUTPUT function.

### HALL EFFECT SENSOR

Passat GLX (2.8L)

Testing information is not available from manufacturer. These vehicles are equipped with a distributorless ignition system.

### FUEL SYSTEM

#### ACCELERATION/FULL THROTTLE ENRICHMENT & DECELERATION FUEL CUT-OFF

Passat GLX (2.8L)

1) Ensure engine coolant temperature is at least 176°F (80°C). Connect Scan Tester (VAG 1551) to Data Link Connectors (DLC) located in center console, in front of shift lever.

2) Start engine and allow it to idle. With scan tester in READ TEST VALUE BLOCK function, select group No. 04 and read value in field No. 4 of scan tester. Display value must be 00010 at idle.

3) Using accelerator pedal, increase engine speed to 3000 RPM and observe scan tester. Display value in field No. 4 of scan tester must briefly be 10100. Release accelerator pedal and observe scan tester.

4) Display value in field No. 4 of scan tester must briefly be 00011, then return to 00010 at idle. If values are not as specified, see THROTTLE POSITION (TP) SENSOR ADJUSTMENT procedures in the D - ADJUSTMENTS - VR6 article. If values are as specified, select END OUTPUT function on scan tester.

### FUEL INJECTORS & CIRCUIT

Passat GLX (2.8L)

1) To access fuel injectors, remove ignition wires. Remove hose from mass airflow sensor. Disconnect hose to fuel evaporative (frequency) solenoid valve at throttle body.

2) Disconnect throttle position sensor and idle air control valve. Disconnect accelerator cable from throttle body. Disconnect and plug coolant hoses at throttle body.

3) Disconnect hose from air intake heated tube. Detach fuel lines at cylinder head cover and remove from fuel rail. Disconnect vacuum hose from fuel pressure regulator. Remove intake manifold upper section. See Fig. 2.

4) With intake manifold upper section removed, disconnect wiring harness from fuel injectors. Using a Digital Volt-Ohmmeter (DVOM) and test leads from Adapter Kit (VW 1594), check fuel injector resistance. See Fig. 3.

5) Fuel injector resistance should be 15.0-21.5 ohms. If resistance is zero ohms, check for a short circuit in wiring harness.

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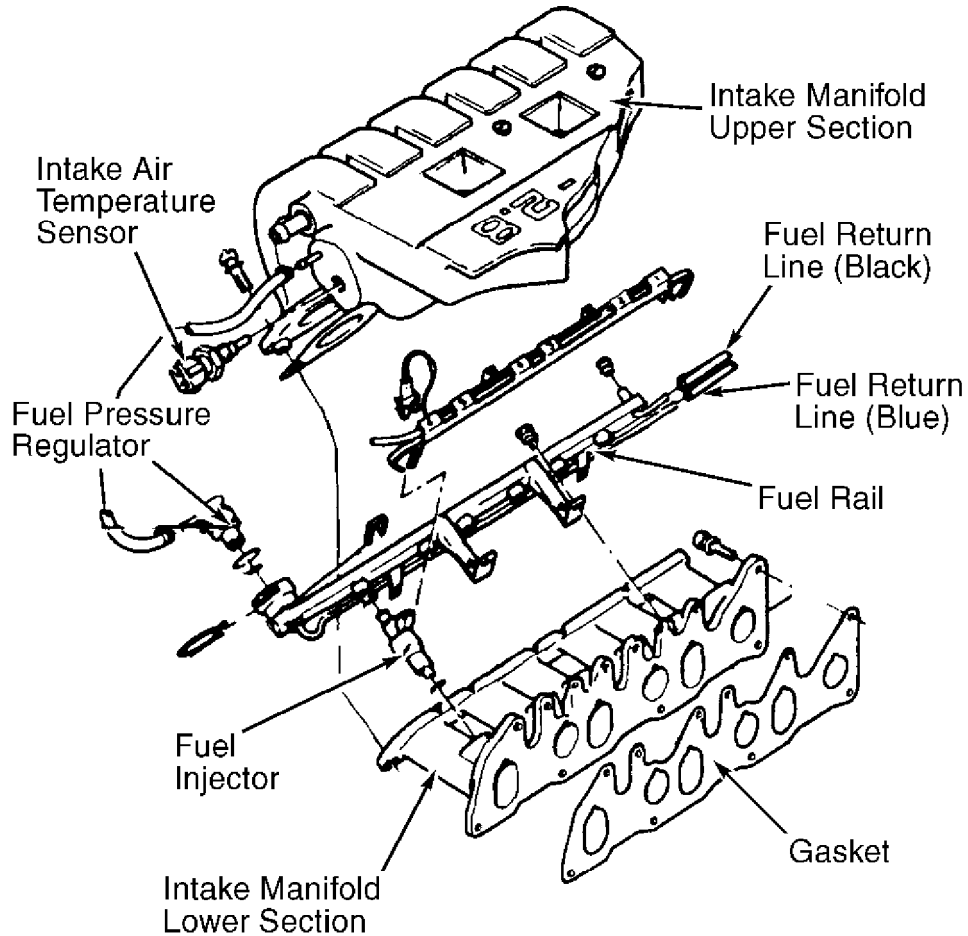
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If wiring harness is okay, replace fuel injector(s).



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Fig. 2: Accessing Fuel Injectors (Passat GLX)

Courtesy of Volkswagen United States, Inc.

6) With wiring harness and fuel injectors okay, disconnect ignition coil power output stage. Using test leads from adapter kit, check voltage supply to each injector by connecting LED tester between wiring harness connector terminals. See Fig. 3.

7) Crank engine and observe LED tester. LED tester must flicker. If LED tester does not flicker, reconnect wiring harness connector(s) to fuel injector(s). Check wiring harness for an open circuit between fuel injector(s) and Engine Control Module (ECM).

8) If LED tester flickers, remove fuel rail assembly (leaving fuel lines and injectors attached). Use test leads and fuel rail hose extensions if necessary. Disconnect Blue Engine Coolant Temperature (ECT) sensor. Connect the 15,000 ohm side of Adapter (VAG 1490) directly to ECT sensor wiring harness connector.

9) Place injectors in Fuel Analyzer (VAG 1602). Crank engine and observe injectors. Injector spray pattern must be the same for all injectors. Turn ignition on for 5 seconds and check fuel injectors for leaks. No more than 2 drops are permissible per minute. When

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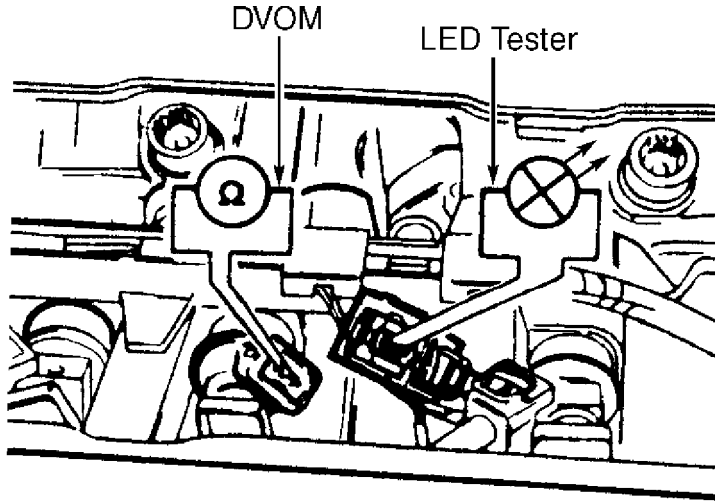
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reinstalling fuel rail, ensure that "O" rings are not damaged.



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Fig. 3: Testing Fuel Injectors & Circuit (Passat GLX)

Courtesy of Volkswagen United States, Inc.

## OXYGEN SENSOR CONTROL

### IDLE CONTROL SYSTEM

#### IDLE AIR CONTROL (IAC) VALVE

Passat GLX (2.8L)

1) Connect Scan Tester (VAG 1551) to Data Link Connectors (DLC) located in center console, in front of shift lever. With scan tester in OUTPUT DIAGNOSTIC TEST MODE, test IAC valve. For more information, see the G - TESTS W/CODES article in this section.

2) To check IAC valve triggering circuit, turn ignition off. Disconnect wiring harness connector from idle air control valve. Connect LED Tester (US 1115) to wiring harness connector terminals No. 1 and 2.

3) Turn ignition on. Perform OUTPUT DIAGNOSTIC TEST MODE until IAC valve is triggered. LED tester must flash. If LED tester does not flash, check IAC valve circuit.

4) If LED tester flashes, disconnect wiring harness connector from idle air control valve. Using Test Leads from Adapter Kit (VW 1594), connect DVOM to IAC valve terminals No. 1 and 2. IAC valve resistance must be 10-20 ohms. If resistance is incorrect, replace IAC valve.

### IGNITION SYSTEM

NOTE: Ignition system testing information is not available. These vehicles are equipped with a distributorless ignition system.

#### IGNITION COIL

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## EMISSION SYSTEMS & SUB-SYSTEMS

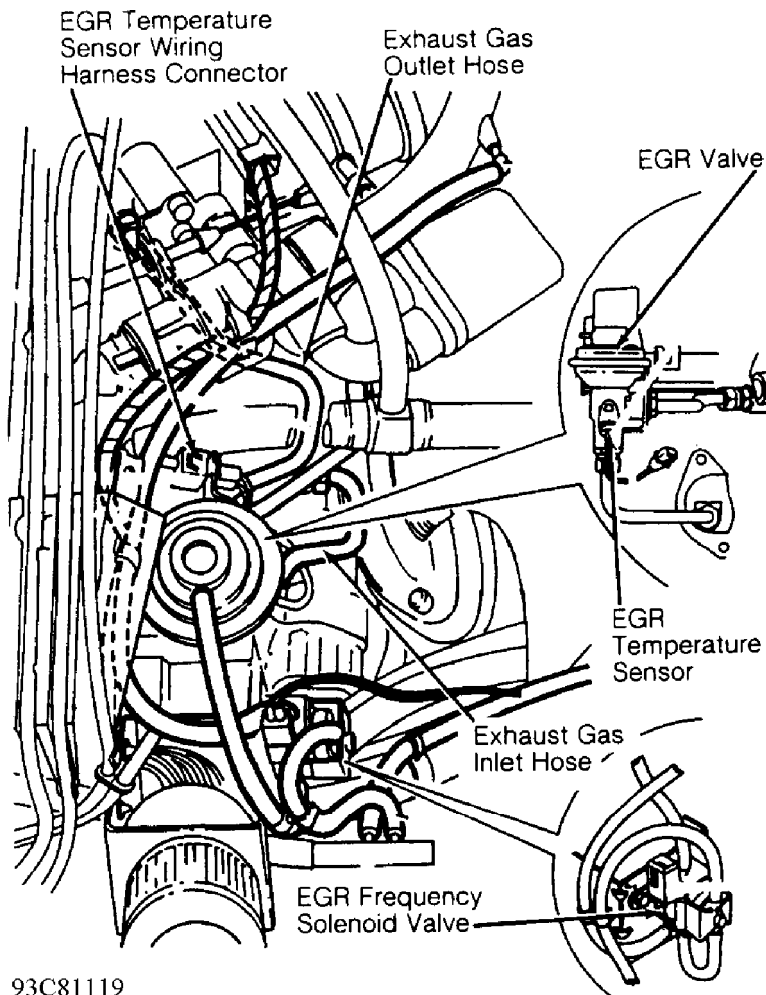
NOTE: Other than EGR system, additional emission systems and sub-system component testing information is not available from manufacturer.

### EXHAUST GAS RECIRCULATION (EGR)

Passat GLX (2.8L)

1) Ensure engine coolant temperature is at least 122°F (50°C). Start engine and allow it to idle. Disconnect vacuum hose from EGR valve. See Fig. 4. Connect hand-held vacuum pump to EGR valve and apply vacuum.

2) Idle quality must noticeably deteriorate. If idle quality does not change, check EGR valve and exhaust manifold for plugging. Replace EGR valve if necessary. After repairs, erase DTC memory.



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Fig. 4: Testing EGR System (Passat GLX)  
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**END OF ARTICLE**