

N - REMOVE/INSTALL/OVERHAUL - GASOLINE

Article Text

1991 Volkswagen Passat
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Wednesday, August 25, 1999 08:57PM

ARTICLE BEGINNING

1990-91 ENGINE PERFORMANCE

Volkswagen Removal, Overhaul & Installation

1990-91 Passat

1991 Cabriolet, Corrado, Fox, Golf GL, GTI, Jetta,
Jetta GLI, Vanagon

MODEL APPLICATION

NOTE: Information in this article applies to gasoline engine models only.

INTRODUCTION

Removal, overhaul and installation procedures are covered in this article. If component removal and installation is primarily an unbolt and bolt-on procedure, only a torque specification may be furnished. See TORQUE SPECIFICATIONS table at end of article.

IGNITION SYSTEM

DISTRIBUTOR

Removal (AFC-Di g i f a n t)

Turn engine crankshaft to TDC. Remove distributor cap. Rotor should point to No. 1 cylinder mark on edge of distributor housing. Index mark distributor housing to crankcase relation. Remove distributor hold-down clamp and bolt. Remove distributor assembly.

Installation

Align rotor with No. 1 cylinder mark on edge of distributor housing. Install distributor and align housing to index mark made on crankcase. Install distributor hold-down clamp and bolt. Install distributor cap. Check timing. Tighten hold-down bolt to specification. See TORQUE SPECIFICATIONS table at end of article.

Removal (CIS-E & CIS-E Motronic)

1) Turn engine crankshaft to TDC. Marking on vibration dampener pulley must align with drive belt guard pointer. Marking on cam shaft gear sprocket must align with cylinder head cover.

2) Remove distributor cap and mark position of rotor. Rotor should be pointing to No. 1 cylinder in distributor firing sequence. Mark position of distributor housing for installation reference. Remove distributor hold-down clamp and bolt. Remove distributor assembly, noting position of rotor when distributor shaft gear is disengaged from driving gear.

Installation

1) Align oil pump drive pinion lug parallel to crankshaft.

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Set rotor pointing toward mark made when distributor was disengaged from drive gear.

2) Install distributor. Rotor should now point to mark made for No. 1 cylinder in distributor firing sequence. Align mark for distributor housing and install distributor hold-down clamp and bolt. Install distributor cap. Check timing. Tighten hold-down bolt to specification. See TORQUE SPECIFICATIONS table at end of article.

FUEL SYSTEM

FUEL SYSTEM PRESSURE RELEASE

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

1) Pinch shut fuel supply line to transfer pump from fuel tank. With a large container under pump and reservoir, disconnect output fuel line to drain reservoir and relieve pressure. Be prepared, with rags, to mop up any residue escaping container.

2) Locate fuel pressure testing port on end of fuel rail. As an alternative fuel system pressure release, open port slowly, using clean rags to absorb fuel.

WARNING: Fuel will be discharged! DO NOT disconnect any wires that could cause electrical sparks. DO NOT smoke or work near heaters or other fire hazards. Keep a fire extinguisher handy.

FUEL PUMP

Removal

1) Disconnect battery ground lead. Working under vehicle, disconnect harness connector from fuel pump. Thoroughly clean around outside of fuel line unions.

2) Temporarily pinch shut supply line from pump to fuel tank. With a large container under pump and reservoir, disconnect output fuel line to drain reservoir and relieve pressure. On models with CIS, CIS-E or CIS-E Motronic, remove cap nut, fuel line and 2 sealing washers. On Digifant models, remove hose clamp and fuel line. Be prepared, with clean rags, to mop up any residue escaping container.

WARNING: Fuel will be discharged! Do not smoke or work near heaters or other fire hazards. Keep a fire extinguisher handy.

3) Remove 3 mounting screws from fuel pump retaining ring and pull fuel pump assembly from fuel reservoir.

Installation

1) Moisten new "O" ring with fuel and install over fuel pump. Ensure fuel pump filter screen is clean. Install pump in fuel reservoir. Secure retaining ring with 3 screws. Tighten screws evenly,

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ensuring fuel pump is correctly seated.

2) Reconnect fuel line and harness connector. Use new sealing washers and hose clamps as required. On CIS, CIS-E and CIS-E Motronic models, torque cap nut to 15 ft. lbs. (20 N.m). Reconnect battery ground cable, start engine and check for leaks.

FUEL PUMP CHECK VALVE

CAUTION: ALWAYS relieve fuel pressure before disconnecting any fuel injection-related component. DO NOT allow fuel to contact engine or electrical components. See FUEL SYSTEM PRESSURE RELEASE.

Removal & Installation

Clean and disconnect fuel line. With line disconnected, check valve can be removed from pump. Use new sealing washers for both check valve and fuel line union. Torque both parts to 15 ft. lb. (20 N.m).

AIRFLOW SENSOR PLATE

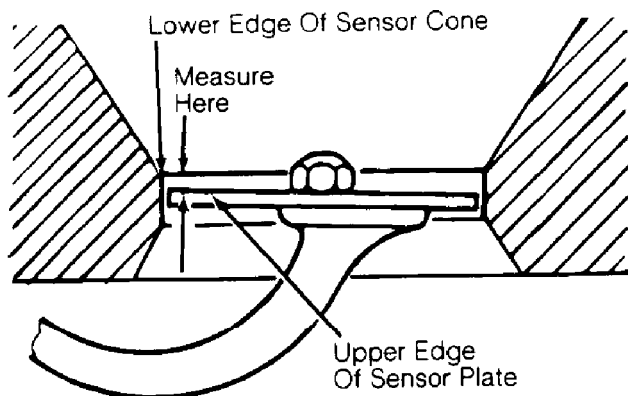
Removal & Installation

1) Remove air filter and unscrew stop bracket. Using heat gun, heat locking compound on fastening bolt. Remove bolt slowly. DO NOT damage threads. Clean locking compound from bolt hole threads.

2) Install airflow sensor plate. Ensure 5 dimple marks are up. Lightly tighten self-locking screw. Ensure sensor plate is centered and rest position is correct. To complete installation, reverse removal procedure. See TORQUE SPECIFICATIONS table at end of article.

Airflow Sensor Plate Rest Position

Upper edge of sensor plate must be .070-.080" (1.80-2.10 mm) below lower edge of sensor cone. See Fig. 1. If rest position is incorrect, raise sensor plate. Open or close wire clip to change position of sensor plate. DO NOT bend leaf spring.



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Fig. 1: Identifying Sensor Plate Rest Position
Courtesy of Volkswagen United States, Inc.

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Centering Sensor Plate & Lever

1) Check sensor plate for centered position in airflow sensor housing. See Fig. 2. If plate binds on housing or is off-center, remove 6-mm bolt holding plate to lever. Coat bolt with locking compound and install finger tight.

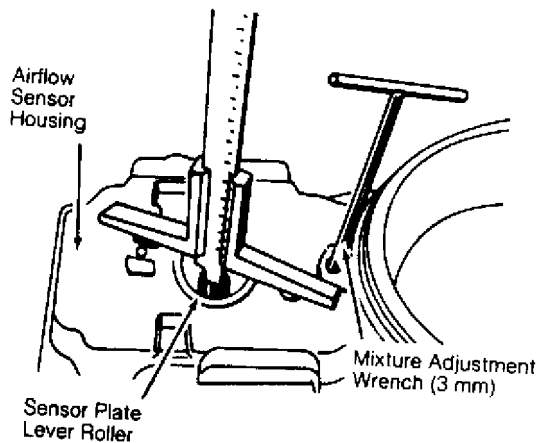


Fig. 2: Adjusting Sensor Plate Lever On Airflow Sensor Housing
Courtesy of Volkswagen United States, Inc.

2) Use Centering Gauge (US 1109) or .004" (.10 mm) feeler gauge to set plate an equal distance from sensor housing. If plate cannot be centered, remove airflow sensor housing.

3) Turn housing upside-down and remove counterweight-to-sensor lever bolt. Coat bolt with locking compound and install finger tight. Center sensor plate lever in housing and tighten bolt. Complete centering of plate.

Checking Sensor Plate Free Play

1) Free play is measured between control piston and adjusting lever. To ensure Differential Pressure Regulator (DPR) current is 4-16 mA, sensor plate lever must be positioned correctly. Measure free play on side of sensor cone closest to fuel distributor. See Fig. 3.

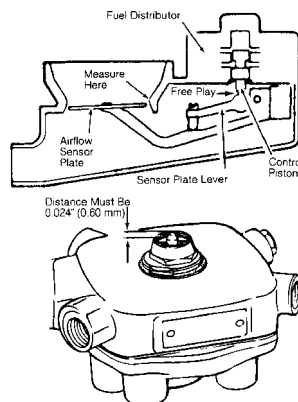


Fig. 3: Checking Sensor Plate Free Play
Courtesy of Volkswagen United States, Inc.

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2) Crank starter motor for 10 seconds to develop fuel pressure. Lift sensor plate slightly until resistance is felt. Minimum clearance is any noticeable free play. Maximum clearance is .083" (2.1 mm) up to sensor cone.

3) If free play clearance is incorrect, remove fuel distributor. Check basic adjustment of sensor plate lever. See SENSOR PLATE LEVER ADJUSTMENT. Recheck free play clearance. If free play clearance is still incorrect, adjust sensor plate clearance with control piston stop screw.

Sensor Plate Lever Adjustment

1) With fuel distributor removed from airflow sensor housing, measure distance between roller on sensor plate lever and contact points of fuel distributor on top of airflow sensor housing. See Fig. 2.

2) Use a depth gauge or vernier caliper for measuring distance. Distance should be .74-.75" (18.9-19.1 mm). If distance is out of specified range, correct it by adjusting mixture screw.

3) Lightly lubricate new sealing "O" ring and mount on fuel distributor. Install fuel distributor. See TORQUE SPECIFICATIONS table at end of article. Connect all fuel lines except those to fuel injectors. Check sensor plate adjusting lever and fuel distributor control piston for smooth operation.

4) Remove fuel pump relay and bridge fuel pump circuit. Use Jumper Switch (US 4480/3) in place of fuel pump relay. When pressure has built up, turn off fuel pump. Move sensor plate from rest position to end of travel.

5) Uniform resistance should be felt during entire movement. No resistance should be felt on quick return to rest position. Connect injector lines. Install fuel pump relay. Start engine and check for leaks.

AIRFLOW SENSOR POTENTIOMETER

Removal & Installation

1) Remove differential pressure regulator. Remove insulating compound covering mounting screws. Remove potentiometer. DO NOT touch or damage slide contact and conductor.

2) To install, reverse removal procedure. See TORQUE SPECIFICATIONS table at end of article. Adjust potentiometer. See ON-VEHICLE ADJUSTMENTS article.

FUEL DISTRIBUTOR (1.8L ONLY)

CAUTION: ALWAYS relieve fuel pressure before disconnecting any fuel injection-related component. DO NOT allow fuel to contact engine or electrical components. Wipe up any spilled fuel BEFORE continuing service.

Removal & Installation

1) Disconnect battery and remove air cleaner. Disconnect all fuel and injector lines from fuel distributor. Plug fuel supply and

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return lines. Use clean rags to catch any fuel spilled.

2) Disconnect wiring from differential pressure regulator.

Remove screws holding fuel distributor to airflow sensor housing.

Remove fuel distributor by turning back and forth while lifting up. To install, reverse removal procedure.

INJECTORS

CAUTION: ALWAYS relieve fuel pressure before disconnecting any fuel injection-related component. DO NOT allow fuel to contact engine or electrical components. Wipe up any spilled fuel BEFORE continuing service.

Removal (AFC-Digifant)

1) Disconnect negative battery cable. Disconnect main electrical connector from fuel rail. Remove idle stabilizer valve. Loosen and remove both hoses on each end of fuel rail. Remove fuel pressure regulator and mounting bracket.

2) Remove fuel rail mounting bolts. Pry off injector mounting clips. Disconnect injector electrical connectors. Remove fuel rail. Remove each injector from its insert.

Installation

To install injectors, reverse removal procedures. Use new "O" rings when installing injectors. Replace hose clamps if necessary. See TORQUE SPECIFICATIONS table at end of this article. Check for fuel leaks.

Removal (CIS-E & CIS-E Motronic)

Remove injectors from inserts in cylinder head with fuel lines attached. Using 12-mm or 13-mm hex wrench, remove inserts from head. Use 2 wrenches to remove injectors from fuel lines.

Installation

To install, reverse removal procedures. Use 2 wrenches when tightening injector lines to injectors. Use new "O" rings lightly lubricated. On models with 2-piece inserts, replace insert sealing washer (against head) and use sealing compound on upper insert threaded portion. See TORQUE SPECIFICATIONS table at end of article.

OXYGEN (O2) SENSOR

Removal & Installation

1) Oxygen (O2) sensor is mounted in exhaust pipe in front of catalytic converter. Disconnect permanent pigtail from sensor. Ensure sensor is free of contaminants, avoid using any cleaning solvents. Sensor may be difficult to remove when engine temperature is less than 118°F (48°C).

2) Always use anti-seize compound on threads before installation. Tighten sensor to specification. See TORQUE SPECIFICATIONS table at end of article.

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THROTTLE VALVE HOUSING (TVH)

Removal & Installation

1) Disconnect accelerator cable from linkage. Disconnect return spring on TVH. Remove cruise control connecting rod on TVH (if equipped). Pull off vacuum hoses. Remove TVH mounting nuts.

2) Disconnect throttle valve switch. Remove 2 TVH to metallic front vibration mounts nuts. Disconnect fuel return hose from pressure regulator. Lift sensor housing upward and remove TVH. Remove gasket.

3) To install, reverse removal procedure. Ensure all surfaces are clean and mate correctly. Use new gaskets when assembling. Adjust accelerator linkage and idle speed. See TORQUE SPECIFICATIONS table.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

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Application Ft. Lbs. (N.m)

AFC- Di gi fant

Fuel Injector Inserts	15 (20)
Fuel Pressure Regulator Mounting Bolt	11 (15)
Intercooler Bracket Mounting Bolts (Corrado)	15 (20)
Knock Sensor	15 (20)
Oxygen Sensor	37 (50)
Supercharger Mounting Bolts (Corrado)	18 (24)
Throttle Valve Body Mounting Bolts	15 (20)

CIS- E & CIS- E Motronic

Distributor Hold-Down Bolt (Fox)	18 (24)
Fuel Injection Valve Fuel Line Nut	18 (24)
Fuel Return Line Fitting	15 (20)
Fuel Supply Line Union Bolts	15 (20)
Intake Manifold Temperature Sensor (Jetta GLi 2.0L)	15 (20)
Oxygen Sensor	37 (50)
Thermo Time Switch (CIS-E)	22 (30)
Throttle Valve Housing Mounting Bolts	15 (20)

INCH Lbs. (N.m)

AFC- Di gi fant

Fuel Rail Mounting Bolts	87 (10)
Idle Stabilizer Valve Mounting Nuts	87 (10)
Intercooler Mounting Bolts (Corrado)	87 (10)
Supercharger Air Hose Mounting Bolts (Corrado)	87 (10)

CIS- E & CIS- E Motronic

Auxiliary Air Regulator Mounting Bolts	87 (10)
Cold Start Valve Mounting Bolts	87 (10)
Coolant Temperature Sensor	87 (10)
Distributor Hold-Down Bolt (Jetta GLi)	87 (10)
EGR Valve Mounting Bolts	87 (10)
Fuel Distributor Mounting Bolts	30 (3.4)
Fuel Line Fittings	87 (10)
Test Port Plug	87 (10)

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