

ALL MODELS EXCEPT VANAGON

## D - ADJUSTMENTS

### Article Text (p. 2)

1990 Volkswagen Corrado

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connected, timing mark on flywheel should appear at pointer in hole.

NOTE: Before checking engine timing, raise engine speed above 2100 RPM at least 4 times. This must be done each time ignition is turned off and restarted to clear ECU memory and by-pass hot-start, fast-idle function.

3) If an adjustment is needed, turn ignition off and loosen distributor hold-down bolt (2.0L has 2 hold-down bolts) just enough to move distributor by hand. Start engine and allow to idle. Turn distributor until timing mark is aligned with pointer in bellhousing.

4) Stop engine and tighten hold down bolt to 18 ft. lbs. (24 N.m). On 2.0L tighten hold-down bolts to 87 INCH lbs. (10 N.m). Check and readjust if necessary and install plastic plug in inspection hole.

### VANAGON

1) Engine oil temperature must be 176°F (80°C). Connect timing light and tachometer. Start engine and allow to idle. Check ignition timing at 800-1000 RPM.

NOTE: Before checking engine timing, raise engine speed above 2100 RPM at least 4 times. This must be done each time ignition is turned off and restarted to clear ECU memory and by-pass hot-start, fast-idle function.

2) If an adjustment is needed, turn ignition off and loosen distributor hold-down bolt just enough to move distributor by hand. Remove connectors from idle stabilizer by squeezing connectors then pulling apart. Plug idle stabilizer connectors together.

3) Start and allow engine to idle. Turn distributor until notch on V-belt pulley matches separation in case. Set timing and RPM. Reconnect electrical connectors to idle stabilizer. Tighten distributor clamp bolt.

### IGNITION TIMING TABLE

IGNITION TIMING (Degrees BTDC @ RPM)

AA

Application	Checking	Adjusting
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1.8L .....	4-8 @ 870-930 .....	5-7 @ 870-930
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2.0L .....	4-8 @ 770-830 .....	5-7 @ 770-830
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2.1L .....	4-8 @ 800-900 .....	5-7 @ 800-900
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AA

### COLD (FAST) IDLE

Fast idle RPM is not adjustable.

### IDLE SPEED & MIXTURE

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NOTE: Mixture adjustment is NOT a part of normal tune-up procedure and should not be performed unless mixture control unit is replaced or vehicle fails emissions testing.

NOTE: Ensure system pressure is correct before attempting idle speed or mixture adjustment.

### IDLE SPEED & MIXTURE ADJUSTMENT

#### FOX (CIS-E) & JETTA GLI 2.0L (CIS-MOTRONIC)

1) Ignition timing and idle speed must be checked before CO is adjusted. See CHECKING & ADJUSTING under IGNITION TIMING. With ignition timing properly adjusted, check and adjust idle speed, differential pressure regulator current and idle mixture. Repeat the adjustments until all occur at the same time.

2) Warm engine to normal operating temperature. Radiator fan must come on at least once and engine oil temperature must be at least 176°F (80°C). Turn off all electrical equipment, including A/C and radiator fan. Disconnect all fuel pressure test equipment (if installed). If injection lines have been removed or replaced, run engine several times to 3000 RPM for about 2 minutes.

3) Ensure idle switch is properly adjusted. Check that auxiliary air regulator valve is fully closed. Pinch shut the hose leading from the idle speed boost valve(s). Remove temperature sensor harness connector from the temperature sensor. Pull crankcase breather hoses off valve cover and air filter, vent to atmosphere.

4) Remove suction hose from carbon canister. Disconnect "T" fitting from carbon canister at air intake boot. On Fox models only, remove connector from coolant temperature sensor and install 15,000-ohm resistor (VW 1490) on temperature sensor harness. See Fig. 1.

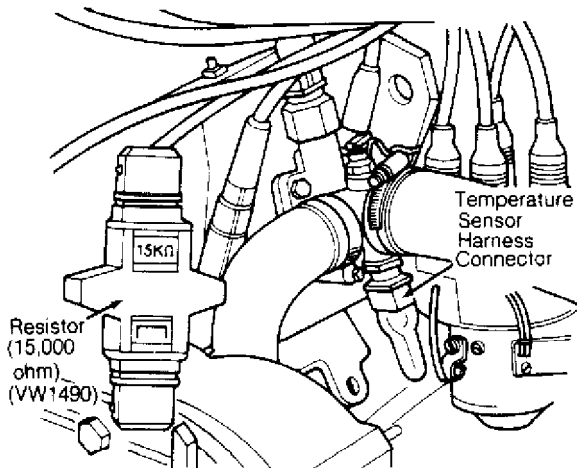


Fig. 1: Fox Coolant Temperature Sensor Location & 15,000-Ohm Test Resistor

Courtesy of Volkswagen United States, Inc.

5) Turn "T" fitting 90 degrees and insert blank side with .

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059" (1.5 mm) restrictor into hole in intake air boot. If vehicle is not equipped with this type of connector, use Plug (026 133 382D) with .059" (1.5 mm) orifice. Adjust idle speed if not within specification. See IDLE SPEED & CO LEVEL table.

6) Connect fuel pressure gauge and ensure system fuel pressure is correct. See FUEL SYSTEM in F - BASIC TESTING article. Connect an inductive tachometer or Tester (VW 1367) and Test Lead (VW 1473). See Fig. 2.

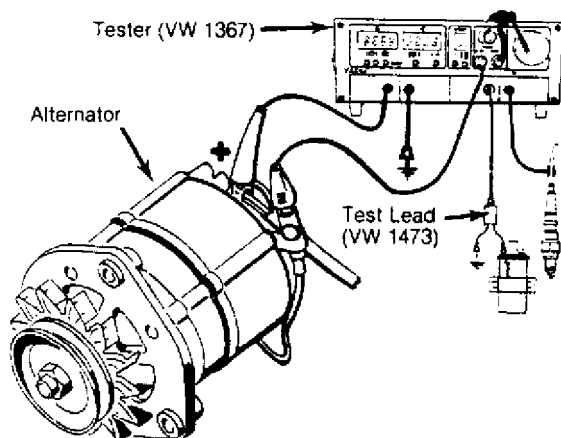


Fig. 2: Tester (VW 1367) & Test Lead (VW 1473)  
Courtesy of Volkswagen United States, Inc.

7) Remove CO probe receptacle cap and connect CO meter. Ensure fit is snug to prevent exhaust leaks. Connect Digital Multimeter (US 1119) with Adapter (VW 1315 A/1) to differential pressure regulator. See Fig. 3.

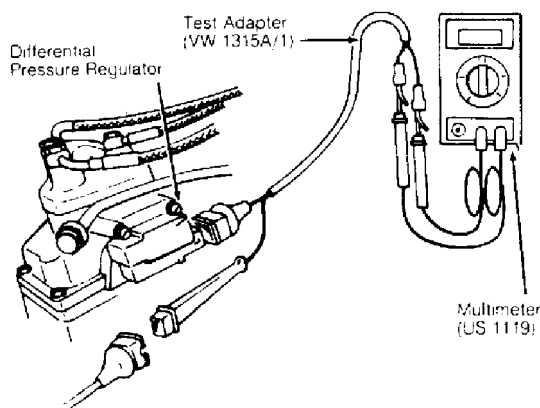


Fig. 3: Digital Multimeter Hook-Up  
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8) Connect adapter between connector and regulator. Connect multimeter to adapter and turn switch to DCA 200 milliamp-range. Read and compare current (4-16 milliamps) and CO values to specifications. Turn engine off.

9) If CO reading is more than 1.2% at current reading of 4-16 milliamps, check for exhaust system leaks, ignition timing, injector inserts for leaks, and fuel distributor for uneven fuel distribution. If required, seal injector inserts with sealing compound and tighten to 15 ft. lbs. (20 N.m).

10) If current reading is less than 4 milliamps or more than 16 milliamps, adjustment must be made with CO adjustment screw as follows: remove boot from mixture control unit. Center punch hole in CO adjusting hole and drill a 3/32" hole to a depth of 5/32" (4 mm). DO NOT drill completely through as adjustment screw will be damaged.

11) Install a 1/8" sheet metal screw and remove plug using pliers. Start engine and run at idle. Adjust current reading to 10 milliamps by turning CO adjustment screw with Wrench (P 377). Turn screw clockwise to lower reading, counterclockwise to raise reading. See Fig. 4.

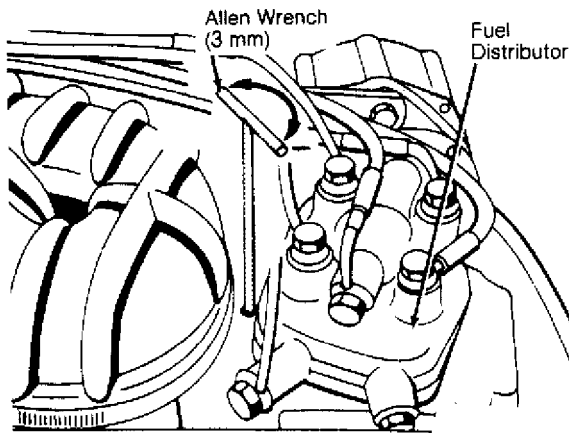


Fig. 4: Adjusting Idle CO (CIS-E)  
Courtesy of Volkswagen United States, Inc.

12) Readjust idle speed if required. Turn engine off. Install new plug in mixture control unit and seat plug flush with unit. Remove all test equipment and reconnect all hoses and wiring.

### CABRIOLET, CORRADO, GOLF GL/GTI 1.8L & JETTA (DIGIFANT II)

1) For correct system operation the basic adjustments to ignition timing, CO content and idle speed must be correct. These adjustments are inter-related and must be checked/adjusted together.

2) Warm engine to normal operating temperature (radiator fan should have cycled at least once). Engine oil temperature must be at least 176°F (80°C). All electrical components must be off. Ensure idle speed stabilization system is okay (with ignition on idle stabilizer valve must hum/buzz). Ensure throttle valve switch is adjusted correctly.

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**NOTE:** Before checking engine timing, raise engine speed above 2100 RPM at least 4 times. This must be done each time ignition is turned off and restarted to clear ECU memory and by-pass hot-start, fast-idle function.

3) Connect an inductive tachometer or Tester (VW 1367) to alternator, Test Lead (VW 1473) to ignition coil, and timing light lead to No. 1 spark plug wire. See Fig. 2. Start engine and ensure engine speed and timing are correct. If not, adjust to specification.

4) Remove the Blue cap from the CO tap tube rising from the exhaust manifold and connect exhaust gas analyzer. Disconnect the coolant sensor harness connector. Raise the oil dipstick slightly to vent crankcase. Disconnect and plug the crankcase ventilation hose. Start engine and raise engine speed to 2100 RPM at least 4 times. Check idle, adjust if incorrect. check CO is correct. See IDLE & CO LEVEL table. If CO adjustment is needed, the idle mixture screw anti-tamper plug must be remove from the top of the air flow sensor.

5) Center punch plug in CO adjusting hole. See Fig. 5. Using a 3/32" drill bit, drill hole 5/32" (4 mm) deep in center of plug. Remove any metal shavings. Screw in a sheet metal screw and remove plug using pliers to pry plug out.

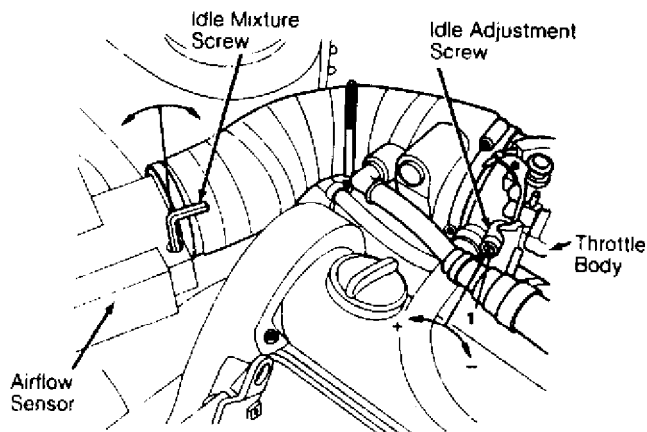


Fig. 5: Idle Mixture Screw & Adjustment Screw (1.8L)  
Courtesy of Volkswagen United States, Inc.

6) Adjust the idle mixture CO with a 5 mm hex wrench. Turning the idle mixture screw clockwise richens CO. Adjust idle mixture to get correct CO. Check engine idle and CO, repeat procedure if needed.

## VANAGON

1) Warm engine to normal operating temperature. Engine oil temperature must be at least 176°F (80°C). Connect an inductive tachometer or Tester (VW 1367) to alternator, Test Lead (VW 1473) to ignition coil, and timing light lead to No. 1 spark plug wire. Start engine and ensure engine speed and timing are correct. If not, adjust to specification.

2) Remove connectors from idle stabilizer by squeezing connectors then pulling apart. Plug idle stabilizer connectors

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together. Turn idle speed screw until idle speed is correct. To adjust timing, see CHECKING & ADJUSTING under IGNITION TIMING in this article.

3) Ensure all vehicle electrical equipment is off. Place exhaust gas analyzer in exhaust pipe. See IDLE SPEED & CO LEVEL table. If adjustment is needed, go to next step.

4) If adjustment is needed in step 2). Remove intake air sensor from engine. Center punch plug in CO adjusting hole. Using a 3/32" drill bit, drill hole 5/32" (4 mm) deep in center of plug. Remove any metal shavings. Screw in a sheet metal screw and remove plug using pliers to pry plug out.

5) Disconnect oxygen sensor connector on left side of engine compartment (Green wire). Start engine. Set idle speed and CO reading by alternately turning mixture and idle speed adjustment screws. Reconnect oxygen sensor and idle stabilizer connectors. Let engine idle for 2 minutes.

6) Check CO value. If incorrect, repeat adjusting procedure. If correct turn ignition off. Drive in new adjusting hole plug flush with air intake sensor. Remove all test equipment and reconnect all hoses and wiring.

NOTE: Do not push down on adjustment screw and do not accelerate engine with wrench in plate. Remove wrench after each adjustment and accelerate engine briefly before measuring current reading. Always adjust from a high to a low reading.

#### IDLE SPEED & CO LEVEL

AA			
Application	Idle RPM		CO Level
Cabriolet .....	850-1000	.....	0.3-1.2%
Fox .....	800-1000	.....	0.3-1.2%
Golf .....	800-1000	.....	0.3-1.2%
Golf GT .....	800-900	.....	0.3-1.2%
GTI .....	800-1000	.....	0.3-1.2%
Jetta .....	800-1000	.....	0.3-1.2%
Vanagon .....	830-930	.....	0.3-1.2%
AA			

#### THROTTLE STOP SCREW

NOTE: Stop screw is set by manufacturer and should not be moved.

If basic factory setting has been changed, turn throttle stop screw counterclockwise until there is a gap between stop and screw. Turn screw in until it just touches stop. Turn screw 1/2 turn (180 degrees) further. Check and adjust idle speed and CO.

#### IDLE & FULL THROTTLE SWITCH ADJUSTMENTS

##### IDLE SWITCH ADJUSTMENT DIGIFANT II (EXCEPT VANAGON)

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1) Check idle and adjust if needed. The idle air by-pass screw is located in the throttle valve. Adjusting the screw changes the amount of air by-passing the throttle plate raising or lowering idle speed See Fig. 6.

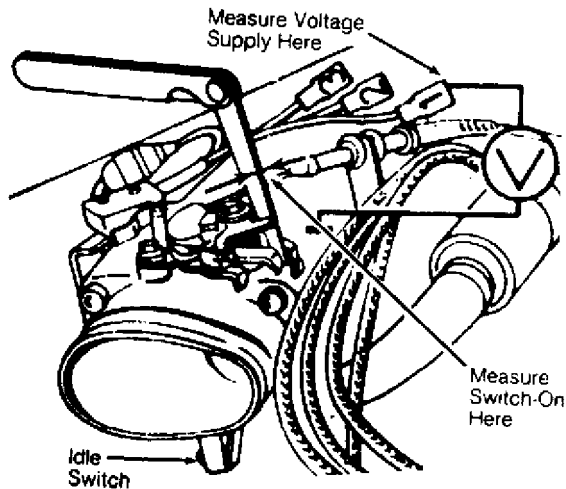


Fig. 6: Checking Idle Switch Adjustment  
Courtesy of Volkswagen United States, Inc.

2) To adjust idle speed, disconnect the harness connector from the coolant temperature sensor. Idle speed should be 925-1025 RPM. If not, turn idle air by-pass adjusting screw until 950-1000 RPM is obtained. When the coolant temperature sensor harness is reconnected, idle speed should drop to 750-850 RPM.

#### IDLE & FULL THROTTLE SWITCH DIGIFANT II (VANAGON)

1) The idle and full throttle switches are wired in parallel on the throttle valve assembly. Disconnect throttle valve connector from throttle valve switch. Connect voltmeter between terminal in harness connector. Turn ignition on. If 5 volts is NOT present, check for break in wiring and repair. If no break in wiring, replace Digifant II control unit and recheck.

2) The circuit should be closed when throttle is at rest. Check continuity between test harness terminal No. 1 and 2. If switch-on point is incorrect, loosen and adjust idle switch position. Recheck that clearance between the throttle valve lever and stop is .002-.006 (.15-.05 mm). The throttle switch is located on underside of throttle valve housing, opposite idle stop.

NOTE: The airflow potentiometer is factory adjusted. No adjustment should be needed, unless component is replaced.

#### AIRFLOW SENSOR POTENTIOMETER ADJUSTMENT (FOX)

1) Disconnect the airflow sensor potentiometer. Loosen 4 retaining screws and adjust the airflow sensor potentiometer until the voltage between the center terminal and ground is 0.2-0.3 volt.



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A line drawing of the bottom of the device showing the potentiometer. Four screws are indicated by arrows: two on the left and two on the right. A label with '+1', '2', and '-3' is visible near the left screws.

Airflow Potentiometer  
Adjusting Screws

A line drawing showing the test harness (VW 1501) connected to the engine's wiring. The harness has three numbered connectors (1, 2, 3) and is plugged into a multi-pin connector on the engine. Labels include 'Airflow Sensor' pointing to a sensor on the engine, 'Test Harness (VW 1501)' pointing to the harness itself, and 'Potentiometer Adjustment Screw (Under Harness)' pointing to a screw on the engine block.

[illegible]

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Input Voltage	Output Voltage
4.35.....	0.43-0.75
4.50.....	0.45-0.77
4.60.....	0.47-0.79
4.70.....	0.48-0.80
4.80.....	0.49-0.81
4.90.....	0.50-0.83
5.00.....	0.51-0.85
5.10.....	0.52-0.87
5.20.....	0.53-0.89
5.30.....	0.54-0.90
5.40.....	0.55-0.91
AA	

**END OF ARTICLE**