

1981 Audi 5 Tune-Up

TUNE-UP

4000
5000
5000 Turbo

ENGINE IDENTIFICATION

Engine number is stamped on left side of block near No. 3 cylinder.

Engine Code

Application	Code
4000 & 5000	WE
5000 Turbo	WK

COMPRESSION PRESSURE

Check compression with engine warm, all spark plugs removed and throttle wide open. Crank engine at least 6 "puffs" per cylinder to determine engine compression.

Compression Pressure Specifications

Application	Pressure psi (kg/cm ²)
All Except Turbo	
Normal (New Engine)	131-174 (9-12)
Minimum	102 (7)
Maximum Variation	44 (3)
Turbo	
Normal (New Engine)	100-128 (7-9)
Minimum	71 (5)
Maximum Variation	28 (2)

VALVE CLEARANCE

1) Adjust valves with engine at normal operating temperature. Remove accelerator linkage and cylinder head cover. Clearance adjustments are to be checked and made according to firing order sequence (1-2-4-5-3). Rotate crankshaft until cam lobes for No. 1 cylinder valves point upward; then measure valve clearances of No. 1 cylinder.

NOTE — When adjusting valves, turn engine **CLOCKWISE** only, or timing belt may slip.

2) If adjustment is necessary, use special tools US 4476 (disc removal tool) and 2078 (tappet depressing tool) to remove and install adjusting discs. Turn tappet until notches are at 90° to camshaft. Insert tool 2078 and depress tappet. Using tool US 4476, grasp tappet disc and rotate it out from under camshaft.

3) Thickness is stamped on bottom side of disc. Using clearance measurement, determine thickness of adjusting disc necessary to bring valve clearance within specifications. Discs are available in .0019" (.05 mm) increments from .1181-.1673" (3.0-4.25 mm). Repeat procedure as required for remaining valves.

Valve Clearance Specifications^①

Application	Intake In. (mm)	Exhaust In. (mm)
All Models	.010 (.3)	.018 (.5)

① — Set with engine warm.

VALVE ARRANGEMENT

E-I-E-I-I-E-I-E-I-E (front to rear)

SPARK PLUGS

Application	Gap In. (mm)	Torque Ft. Lbs. (N·m)
All Models	.028 (.7)	22 (30)


① — Turbo models are equipped with 2 oil filters. Both should be changed at 15,000 mile intervals.

Spark Plug Type

Application	Bosch	Champion
4000 & 5000		
Federal	W7D	N8Y
Calif.	WR7DS	N8GY
5000 Turbo	WR7DS	N8GY

HIGH TENSION WIRE RESISTANCE

Carefully remove ends of wire from spark plug and distributor. Using an ohmmeter, check resistance of wire while gently twisting wire. If resistance is not to specification, or fluctuates from infinity to any value, replace wire.

NOTE — Wire resistance cannot be measured if the wires are marked with this symbol: 

Resistance (Ohms) Per Wire

Application	Resistance
Ignition Wire Only	800-1400
Ignition Wire With Connector	4800-7400
Coil Wire	1600-2400

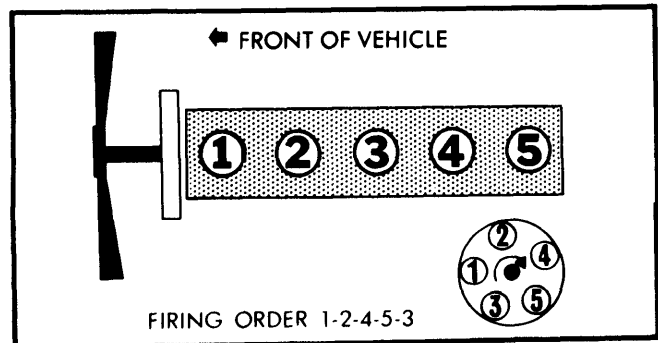


Fig. 1 Firing Order and Distributor Rotation

DISTRIBUTOR

All models are equipped with electronic, breakerless ignition systems. All California models and Federal Turbo models have an idle stabilizer unit, which adjusts ignition timing to maintain a constant idle speed. Some models without idle stabilizers may be equipped with an impedance transformer, which is gray in color.

TUNE-UP (Cont.)

IGNITION TIMING

Turbo — Disconnect and plug both hoses at distributor. With engine at 3000 RPM, adjust timing by turning distributor.

All Except Turbo — Disconnect 2 plugs at idle stabilizer unit (if equipped) and connect them together. Leave vacuum hoses connected at distributor. With engine idling, adjust ignition timing by turning distributor. Reconnect idle stabilizer unit.

NOTE — If equipped with an impedance transformer in place of an idle stabilizer, do not disconnect it when checking ignition timing.

Ignition Timing Specifications

Application	RPM	Timing
4000 & 5000		
Federal	Ⓢ800-1000	3° ATDC
Calif.	880-1000	3° ATDC
5000 Turbo	3000	21° BTDC

Ⓢ — 5000 reading should be 850-1000 RPM.

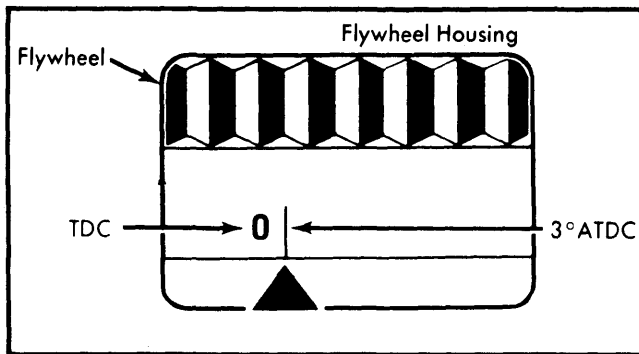


Fig. 2 Ignition Timing Mark Location

IDLE SPEED & MIXTURE

1) With engine at normal operating temperature, turn all electrical accessories off. With engine stopped, disconnect both plugs from idle stabilizer unit and connect them together. Disconnect and plug PCV valve hose.

2) Check and adjust ignition timing as necessary. Adjust idle speed to specified RPM using adjusting screw on side of throttle valve housing.

NOTE — Engine cooling fan must not run while adjustments are being made.

3) Remove cap from CO test receptacle on exhaust manifold and connect CO tester hose directly to test receptacle. Connect a dwell meter to frequency valve electrical connector. Zero dwell meter and set it to the 4-cylinder scale.

NOTE — When taking CO reading on California models, turn all electrical sources off; on Federal models turn lights on high beam.

4) Disconnect oxygen sensor wire at connector and check dwell meter reading. Meter reading must be constant between 40-50°.

5) Adjust CO level to specifications using adjusting tool (P377). Turn adjusting tool clockwise to increase CO and counterclockwise to decrease CO.

CAUTION — Do not press down on adjusting tool when adjusting CO level. Also, do not accelerate engine with tool in place. Remove tool after each adjustment and accelerate engine briefly before reading CO level. Always adjust CO level from lean to rich.

6) Reconnect oxygen sensor wire and check dwell meter reading. Meter reading should now pulsate. Reconnect all hoses and wiring at idle stabilizer, then recheck idle speed.

Idle Speed & CO Level

Application	Idle RPM	CO%
4000 & 5000		
Federal	Ⓢ800-1000	0.4-1.2%
Calif.	880-1000	0.4-1.2%
5000 Turbo	880-1000	0.4-1.2%

Ⓢ — 5000 reading should be 850-1000 RPM.

FUEL PUMP PRESSURE & VOLUME

System Pressure	
4000 & 5000	65-75 psi (4.5-5.2 kg/cm ²)
5000 Turbo	72-82 psi (4.9-5.6 kg/cm ²)
Volume	Approx. 1 quart in 40 sec.

EXHAUST EMISSION SYSTEMS

See EXHAUST EMISSION SYSTEMS section.

GENERAL SERVICING

IGNITION

DISTRIBUTOR

All models are equipped with electronic ignition. California 4000 and 5000 models and all Turbo models use an idle stabilizer in addition to the Hall generator ignition system. Some models without the idle stabilizer may have an impedance transformer in its place.

IGNITION COIL

Resistance Specifications (Ohms@68°F)

Application	Primary	Secondary
All Models52-.76	2400-3500

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GENERAL SERVICING (Cont.)

FUEL SYSTEMS

FUEL INJECTION

All models are equipped with Bosch CIS Continuous Injection System.

ELECTRICAL

BATTERY

Application	Amp. Hr. Capacity
All Models	63

Battery Location — On models with factory-installed air conditioning, the battery is located under the left side of the rear seat. On all other models, the battery is located in the engine compartment.

STARTER

All models are equipped with Bosch Starters.

ALTERNATOR

Application	Rated Amp. Output
4000	
Without A/C	55
With A/C	75
5000	75
5000 Turbo	90

ALTERNATOR REGULATOR

Bosch — Non-adjustable, integral with alternator.

Operating Voltage 12.5-14.5 Volts

BELT ADJUSTMENT

All Models — With a 20 lbs. (9.1 kg) pressure, belt should be able to be depressed $\frac{3}{8}$ - $\frac{9}{16}$ " (10-15 mm).

FILTERS

Filter	Service Interval (Miles)
Oil Filter ^①	15,000
Air Filter	30,000
Fuel Filter	15,000

① — Turbo models are equipped with 2 oil filters. Both should be changed at 15,000 mile intervals.

CAPACITIES

Application	Quantity
Crankcase (Includes Filter)	4.8 qts.
Cooling System	
4000 & 5000	8.6 qts.
5000 Turbo	10.0 qts.
Man. Trans. (SAE 80W-90)	
4000	1.7 qts.
5000	2.7 qts.
Auto. Trans. (Dexron)	3.2 qts.
Auto. Trans. Final Drive (SAE 90)	
4000	0.8 qts.
5000 & 5000 Turbo	1.1 qts.
Fuel Tank	
4000	15.9 gals.
5000 & 5000 Turbo	19.8 gals.

TUNE-UP

4000 Diesel
5000 Diesel

ENGINE IDENTIFICATION

Engine number is stamped into left side of block near number 3 cylinder.

Engine Code

Application	Code
4000 (4-Cylinder)	CR
5000 (5-Cylinder)	CN

COMPRESSION PRESSURE

Remove electrical wire from fuel shut-off solenoid on injection pump. Remove injector pipes, injectors and heat shields. Insert old heat shield into head, then adapter (VW 1323/2) and compression tester. Check compression after cranking engine through at least 6 strokes.

Compression Pressure Specifications

Application	Pressure psi (kg/cm ²)
Normal (New Engine)	406-493 (28-34)
Minimum	400 (28)
Maximum Variation	73 (5)

VALVE CLEARANCE

1) Turn engine clockwise until camshaft lobes for valves to be checked point upwards. Check valve clearance. If not within tolerance, adjusting disc must be changed.

2) Turn crankshaft 1/4 turn after TDC (so valves will not hit piston top). Depress cam followers with tool (VW 2078), then remove disc with pliers (VW 4476). Calculate thickness of disc needed, coat with oil and install with marks down.

NOTE — Discs are available in thicknesses from .120" (3.00 mm) to .167" (4.25 mm) in increments of .002" (0.05 mm).

3) Check valve clearance on remaining cylinders, proceeding in firing order. Be sure to check valve clearance at TDC, then turn 1/4 turn after TDC before depressing valves.

Valve Clearance Specifications

Application	Clearance In. (mm)
Checking	
Cold	
Intake006-.010 (.15-.25)
Exhaust014-.018 (.35-.45)
Warm	
Intake008-.012 (.20-.30)
Exhaust016-.020 (.40-.50)
Adjustment	
Cold	
Intake008 (.20)
Exhaust016 (.40)
Warm	
Intake010 (.25)
Exhaust018 (.45)

VALVE ARRANGEMENT

4000 Diesel — E-I-E-I-I-E-I-E (Front-to-rear)
5000 Diesel — E-I-E-I-I-E-I-E-I-E (Front-to-rear)

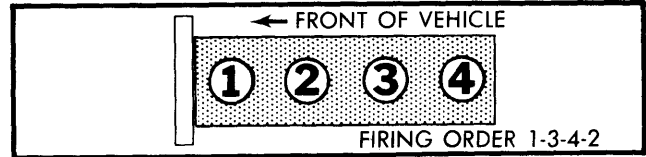


Fig. 1 4000 Diesel Firing Order Illustration

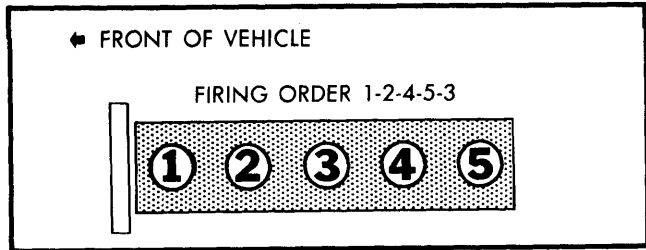


Fig. 2 5000 Diesel Firing Order Illustration

GLOW PLUGS

Glow Plug Type

Application	Bosch
All Models	N 019 100 6

IDLE SPEED ADJUSTMENT

1) With engine at normal operating temperature, turn idle speed control knob on dash panel counterclockwise to stop.

2) Connect diesel tachometer (VW 1367) according to instructions from manufacturer. Adjust speed to specifications with idle adjusting screw. Tighten lock nut. See Fig. 3.

3) Open throttle fully and quickly adjust maximum speed to specifications using maximum RPM screw. Tighten lock nut.

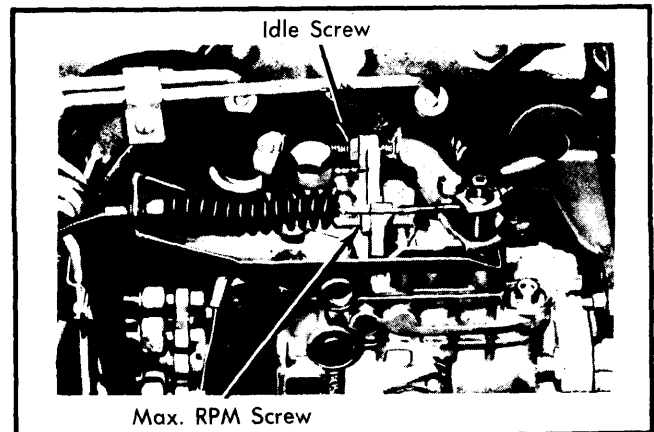


Fig. 3 Adjusting Idle Speed and Maximum Speed

Idle Speed Specifications

Application	Idle RPM	Maximum RPM
4000 Diesel	770-870	5300-5400
5000 Diesel	720-880	5350-5450