

# ALTERNATOR & REGULATOR - BOSCH

## Article Text

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Sunday, March 19, 2000 01:02AM

### ARTICLE BEGINNING

Alternators & Regulators  
BOSCH WITH INTEGRAL REGULATORS

Volkswagen

### DESCRIPTION

Bosch alternators are conventional 3-phase, self-rectifying type alternators. Bosch 55 through 75-amp alternators use 3 positive and 3 negative diodes connected to stator windings to rectify current. Bosch 80 and 90-amp alternators use 14 diodes.

All alternators use 3 exciter diodes connected to stator windings. These diodes turn off the alternator indicator light and supply power to the voltage regulator while the engine is running. Bosch regulators are transistorized solid state and integral with alternator.

### TROUBLE SHOOTING

NOTE: See the TROUBLE SHOOTING - BASIC PROCEDURES article in the GENERAL TROUBLE SHOOTING section.

### TESTING (ON-VEHICLE)

#### WIRING CONTINUITY TEST

1) Connect a voltmeter between alternator "B+" terminal and ground. Voltmeter should indicate battery voltage. If not, check wiring between alternator and battery.

2) Turn ignition on and check that alternator indicator light comes on. If light does not come on, check wiring between alternator and warning light, including indicator bulb.

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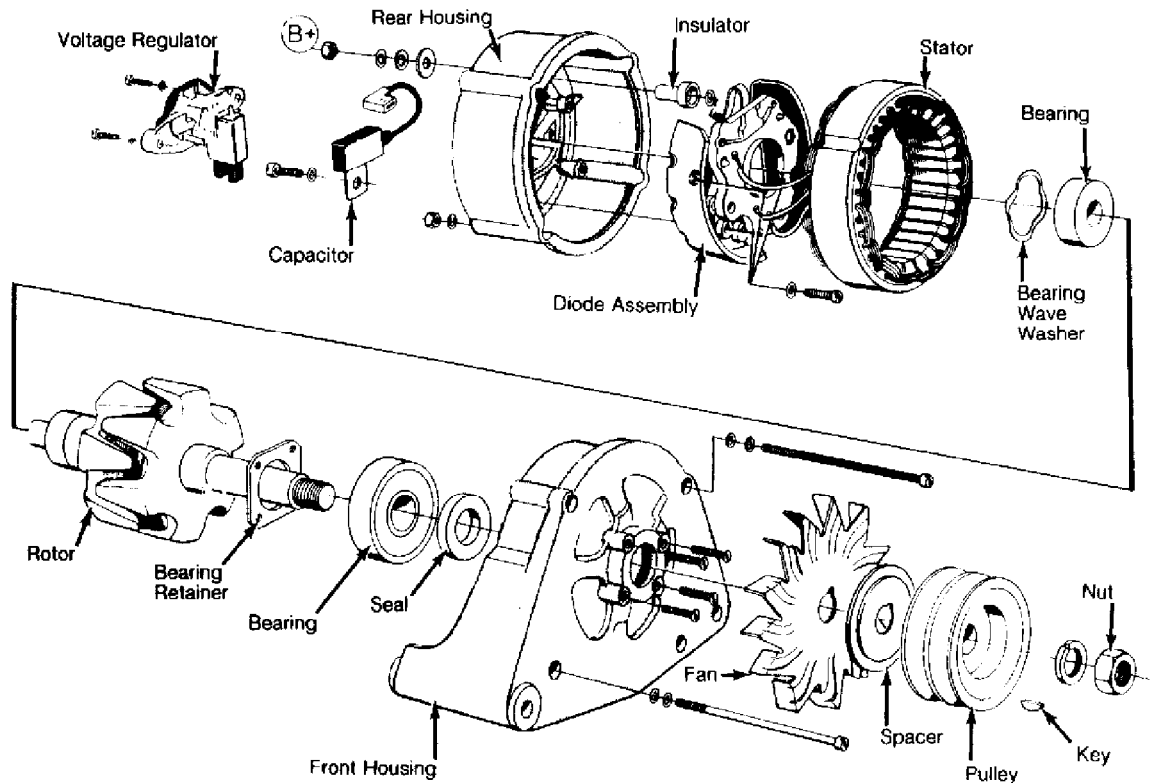


Fig. 1: Exploded View of Bosch 55-Ampere Alternator

### OUTPUT TEST

1) Ensure connections at battery, alternator, and starter (most vehicles) are clean and tight. Ensure alternator, engine and body are properly grounded. Ensure alternator drive belt is tight and in good condition.

2) Connect ammeter following manufacturer's instructions. Connect voltmeter leads to battery terminals.

3) Start engine and run at 3000 RPM. Adjust carbon pile to obtain maximum alternator output. Do not allow voltage to go below 12.6 volts.

4) Alternator output should equal alternator rated output, minus 16-20 amps. If reading is 16-20 amps below alternator rating, replace regulator and retest. If output is still too low, repair or replace alternator.

### REGULATOR CONTROL VOLTAGE TEST

1) Connect ammeter following manufacturer's instructions. Connect voltmeter leads to battery terminals. Start engine and run at 3000 RPM.

2) Run engine until voltage stops rising. Voltage should be 13.5-14.5 volts. If reading is incorrect, remove regulator and ensure brushes are longer than 7/32" (6 mm). Replace if necessary.

3) If brushes are okay and regulator fails to keep voltage within specified limits, replace regulator and retest. If voltage is

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still incorrect, repair or replace alternator.

## OVERHAUL

### DISASSEMBLY

1) Remove nut, lock washer, and pulley. Note position of spacer(s), then remove fan assembly and key. Scribe mark on front and rear housings. Remove voltage regulator and remove screws holding alternator together. Separate front and rear housings.

2) Disconnect capacitor from terminal. Remove nut, insulator(s), screws and washers. Remove stator assembly. See Figs. 1 and 3. Unsolder stator from diode assembly. Remove bearing wave washer or "O" ring from rear housing.

3) Support front housing and carefully press out rotor. Do not allow rotor to fall. Remove screws securing bearing retainer. Remove retainer, front bearing and seal. Remove rear bearing from slip ring end of rotor.

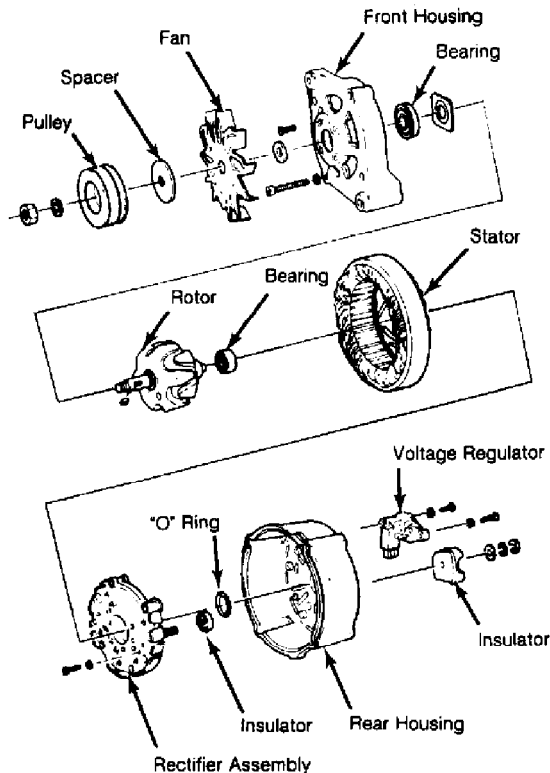


Fig. 2: 90-Ampere Alternator

## TESTING & REPAIR

### Diode Assembly

1) Place ohmmeter scale on x100 scale. Connect ohmmeter leads across "B+" terminal and 3 stator terminals one at a time. Reverse leads. Ohmmeter should indicate continuity in one direction only.

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2) Connect ohmmeter leads across negative plate and 3 stator terminals one at a time. See Fig. 3. Reverse leads. Ohmmeter should indicate continuity in one direction only.

3) Connect ohmmeter leads across "D+" terminal and 3 stator terminals one at a time. Reverse leads. Ohmmeter should indicate continuity in one direction only. If diodes are found to be defective, replace diode assembly.

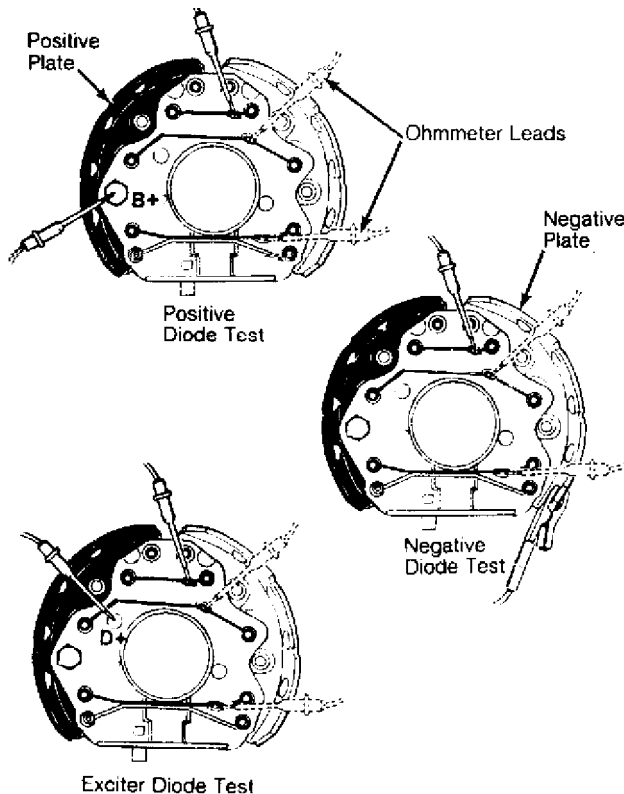


Fig. 3: Bosch Diode Assembly Test

Diode assembly for 55-amp alternator is shown. Others are similar.

#### Stator

1) Place ohmmeter on lowest scale. Connect ohmmeter across stator leads. Resistance between leads should be .14-.15 ohms for 55-amp alternator and .09-.10 ohms for 65 through 90-amp alternators. If resistance is incorrect, stator has open or shorted windings and must be replaced.

2) Place ohmmeter on X 1000 scale. Connect ohmmeter between stator core and stator lead. No continuity should exist. If continuity exists, stator is grounded and must be replaced.

#### Rotor

1) Place ohmmeter on lowest scale. Connect ohmmeter across slip rings. Resistance should be 3.4-3.75 ohms for 55-amp alternator and 2.8-3.1 ohms for 65 through 90-amp alternators.

2) If resistance is too low, rotor has short circuit and must be replaced. If resistance is infinity (no continuity), rotor has open

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circuit and must be replaced.

3) Place ohmmeter on x1000 scale. Connect ohmmeter between either slip ring and rotor core. No continuity should exist. If continuity exists, rotor is grounded and must be replaced.

4) Clean slip rings using fine sandpaper. Rings which are worn or pitted should be turned on lathe. Minimum ring diameter is 1 1/16" (26.8 mm). If slip rings are beyond repair, replace slip rings as outlined in steps 5) and 6).

5) Remove rear bearing from slip ring end of rotor. Unsolder wires from slip rings and bend up ends of rotor winding. Pull off slip rings. Ensure ends of rotor winding are not damaged.

6) Insert ends of rotor winding into slip ring and press new slip ring onto rotor. Slip ring end must be 9/64" (3.5 mm) from end of collar. Solder rotor winding to slip ring terminals. Turn rings on lathe and retest rotor. Maximum slip ring run-out is .0012" (.03 mm).

### Bearings

Always replace bearings. If replacement front bearing is sealed on one side only, open side must face rotor. If replacement rear bearing is sealed on one side only, open side must face away from rotor.

### Brushes

Ensure brushes are longer than 7/32" (6 mm). Replace if necessary. Unsolder brushes from voltage regulator. Solder new brushes. Do not allow solder to run into strands of brush leads. Brush must be free to slide in holder with normal spring tension of 10-14 ozs. (283-397 g).

## REASSEMBLY

1) Install bearing, retainer, and screws in front housing. Press rotor onto housing. Press bearing on slip ring end of rotor. Solder stator to diode assembly. Exercise care when soldering near diodes due to possible heat damage.

2) Install insulators on stator assembly. Assemble stator assembly and rear housing. Install wave washer or "O" ring in rear housing. Align scribe marks and assemble front and rear housings.

3) Install key, fan assembly, and spacers. Install pulley, lock washer and nut. Tighten nut to 23-29 ft. lbs. (3-4 N.m). Ensure rotor spins freely. Install voltage regulator and capacitor.

## ALTERNATOR APPLICATIONS

### ALTERNATOR APPLICATION

AA

Model	Volts/Amps	(1) Bosch Part No.
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Volkswagen ..... (2)

(1) - Bosch alternator part numbers are preceded by the

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numbers 0 120.

- (2) - Alternator part numbers not available from manufacturer. Obtain part number from I.D. plate on the alternator.

AA

**END OF ARTICLE**