

ALTERNATOR & REGULATOR

Article Text

1990 Audi 100

For atsg&cvt

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Sunday, July 02, 2000 12:00AM

ARTICLE BEGINNING

1990 ELECTRICAL

Alternators & Regulators

80, 90, 100, 200 Turbo

SYSTEM DESCRIPTION

Bosch alternators are conventional 3-phase, self-rectifying type alternators. Bosch 110-amp alternators use 14 diodes. See Fig. 1. 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 and integral with alternator.

WIRING CONTINUITY TEST

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

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

ALTERNATOR EXCITER CIRCUIT TEST

CURRENT CHECKING

Check that battery voltage is a minimum of 12 volts. Charge as needed. Disconnect Blue wire from alternator terminal and connect Multimeter (US 1119) between alternator terminal and Blue wire. Set multimeter to 200-mA range. If reading is lower than 150-185 mA, check Blue wire between alternator and instrument panel or replace printed circuit in instrument cluster.

RESISTANCE CHECKING

Disconnect negative battery cable. Disconnect Blue wire terminal of alternator. Connect Multimeter (US 1119) between Blue wire and battery positive. Turn ignition on. If readings is not 140-160 ohms, replace instrument cluster printed circuit and recheck.

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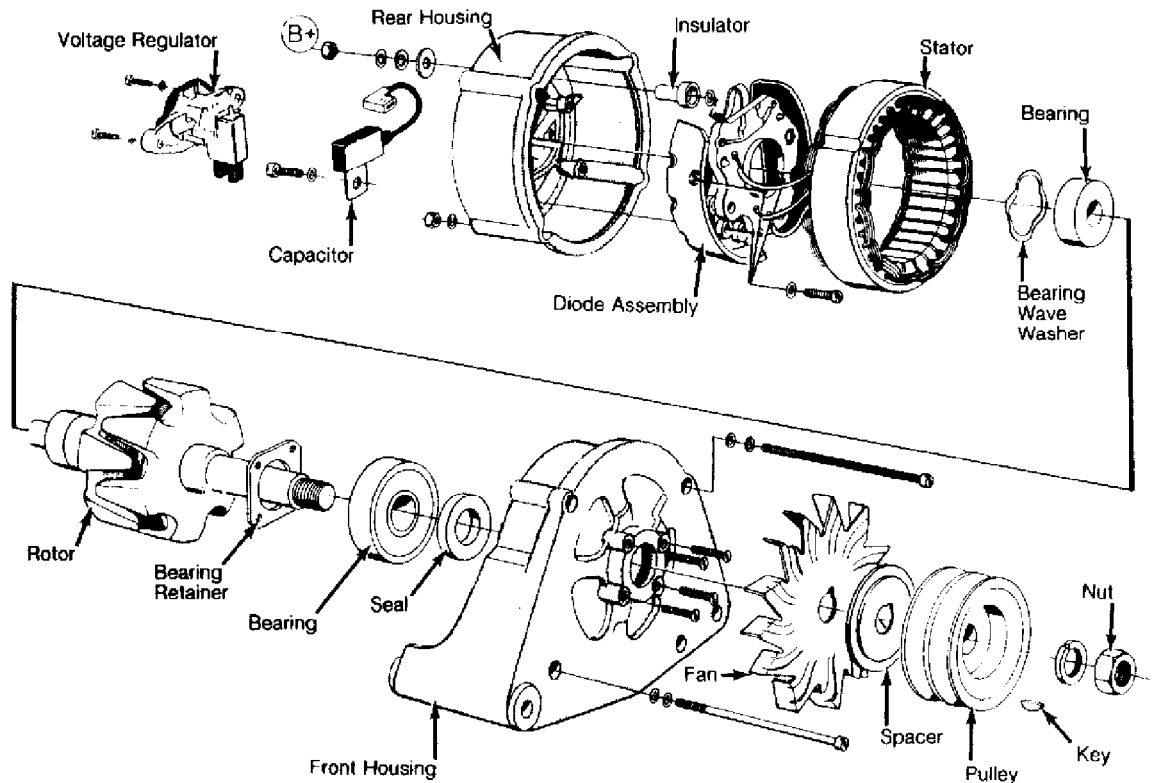


Fig. 1: Exploded View of Bosch 110-Amp Alternator

OUTPUT CHECK

1) Ensure connections at battery, alternator and starter 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/Voltmeter (VAT-40/60) or equivalent, following manufacturer's instructions. Connect voltmeter leads to battery terminals. Connect Green clamp (ammeter inductive pick-up) to alternator Brown/Yellow wire to battery (positive post). Start engine and allow to idle. Alternator output should be 20-30 amps.

3) Repeat test at 2000 RPM. Alternator output should be 90-110 amps or within 10 percent of manufacturer's specification. If alternator output is low, remove alternator for testing and repairs. If reading is 16-20 amps less than alternator rating, replace regulator and retest. If output is still low, repair or replace alternator.

DIODE ASSEMBLY BENCH TESTING

1) Place ohmmeter on x100 scale. Connect ohmmeter leads across B+ terminal and each of the 3 stator terminals, in turn. Reverse leads. Ohmmeter should indicate continuity in one direction only.

2) Connect ohmmeter leads across negative plate and each of the 3 stator terminals, in turn. See Fig. 2. Reverse leads. Ohmmeter

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should indicate continuity in one direction only.

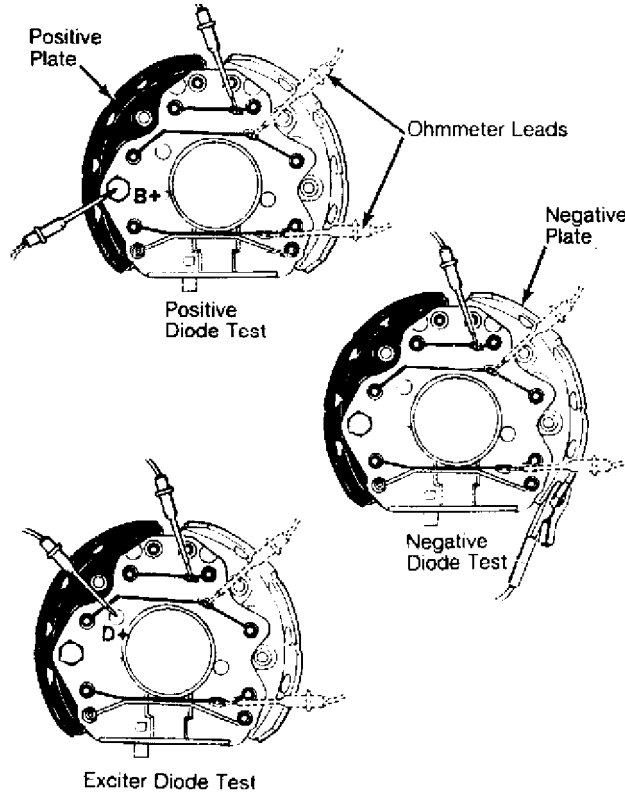


Fig. 2: Testing Bosch Diode Assembly

3) Connect ohmmeter leads across D+ terminal and each of the 3 stator terminals, in turn. Reverse leads. Ohmmeter should indicate continuity in one direction only. Replace diode assembly if defective.

STATOR BENCH TESTING

1) Place ohmmeter on lowest scale. Connect ohmmeter across stator leads. Resistance between leads should be approximately .09-.10 ohm. If resistance is incorrect, stator has open or shorted windings and must be replaced.

2) Place ohmmeter on x1000 scale. Connect ohmmeter between stator core and stator lead. No continuity should exist. If continuity exists, stator is grounded and must be replaced.

ROTOR BENCH TESTING

1) Place ohmmeter on lowest scale. Connect ohmmeter across slip rings. Resistance should be 2.8-3.1 ohms.

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

3) Place ohmmeter on x1000 scale. Connect ohmmeter between

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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" (27 mm).

5) If slip rings are beyond repair, 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" (3.57 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 BENCH TESTING

Always replace bearings when overhauling alternator. 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 BENCH TESTING

Ensure brushes are longer than 7/32" (5.56 mm). Replace if necessary. Unsolder brushes from voltage regulator. Solder new brushes. Do not allow solder to run into strands of brush leads. Brushes must be free to slide in brush holder with normal spring tension of 10-14 ozs. (283-397 g).

END OF ARTICLE