

ALTERNATOR & REGULATOR

1990-92 ELECTRICAL Alternators & Regulators - Mitsubishi

DESCRIPTION

Alternators are conventional 3-phase, self-rectifying type units containing 6 diodes (3 positive and 3 negative) which are used to rectify current. See **Fig. 1**. An internally-mounted, Integrated Circuit (IC) regulator is used on all models.

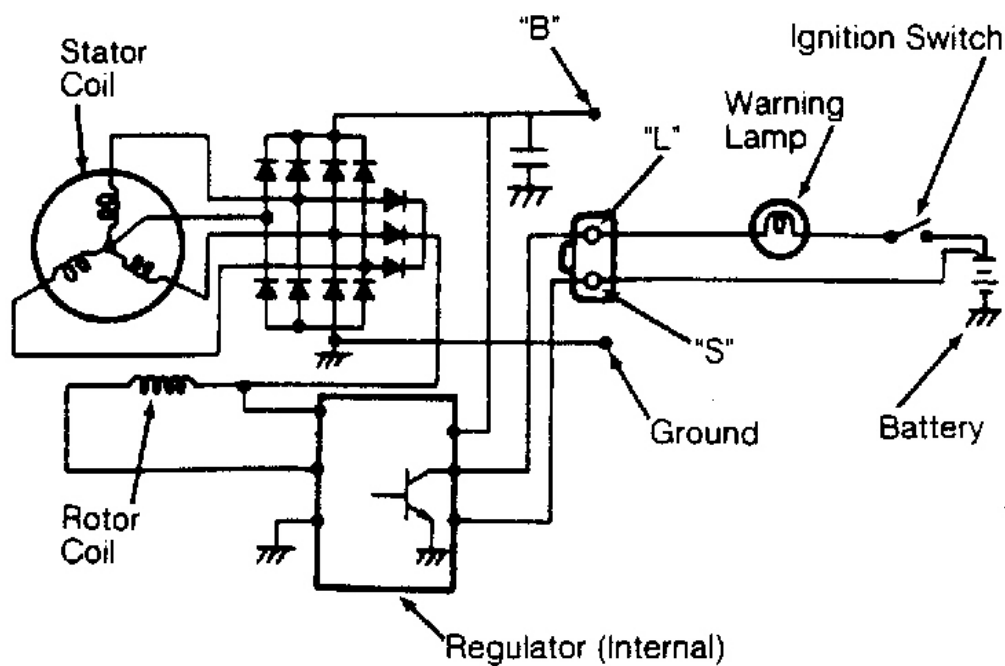


Fig. 1: Charging System Wiring Schematic

Courtesy of MAZDA MOTORS CORP.

ADJUSTMENTS

BELT DEFLECTION

Measure belt deflection in center of longest pulley-to-pulley span. See BELT DEFLECTION SPECIFICATIONS table. If belt deflection is not as specified, adjust as necessary.

BELT DEFLECTION SPECIFICATIONS

Application	Deflection - In. (mm)
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B2200	
New Belt	0.28-0.31 (7.0-8.0)
Used Belt	0.31-0.35 (8.0-9.0)
B2600i	
New Belt	0.39-0.47 (10.0-12.0)
Used Belt	0.43-0.51 (11.0-13.0)
Miata	
New Belt	0.31-0.35 (8.0-9.0)
Used Belt	0.35-0.39 (9.0-10.0)
MPV	
4-Cylinder Engine	
New Belt	0.39-0.47 (10-12)
Used Belt	0.43-0.57 (11-13)
V6 Engine	
New Belt	0.35-0.39 (9-10)
Used Belt	0.39-0.47 (10-12)
MX-3	
4-Cylinder Engine	
New Belt	0.31-0.35 (8.0-9.0)
Used Belt	0.35-0.39 (9.0-10.0)
V6 Engine	
New Belt	0.24-0.28 (6.0-7.0)
Used Belt	0.28-0.31 (7.0-8.0)
MX-6 & 626	
New Belt	0.24-0.31 (6.0-8.0)
Used Belt	0.28-0.35 (7.0-9.0)
Protege & 323	
New Belt	0.31-0.35 (8.0-9.0)
Used Belt	0.35-0.39 (9.0-10.0)
RX7	
New Belt	0.47-0.59 (12.0-15.0)
Used Belt	0.55-0.67 (14.0-17.0)
929	
New Belt	0.35-0.39 (9.0-10.0)
Used Belt	0.39-0.47 (10.0-12.0)
- With 22 lbs. (98N) applied to belt.	

TROUBLE SHOOTING**CHARGING SYSTEM**

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CHARGING SYSTEM TROUBLE SHOOTING

PROBLEM Possible Cause	Action
NO START CONDITION	
Dead Battery	Check/Replace Battery
Bad Cable Connections	Clean/Replace Cables
Ignition Switch/Circuit Fault	Check Switch/Circuit
CHARGING SYSTEM WARNING LIGHT STAYS ON	
Loose/Worn Alternator Belt	Tighten/Replace Belt
Loose Alternator Connections	Check/Repair Connections
Warning Light Wiring	Check/Repair Wiring
Faulty Stator/Diodes	Test/Repair Alternator
Faulty Voltage Regulator	Test/Repair Regulator
WARNING LIGHT OFF WITH IGNITION SWITCH ON	
Blown Fuse	Check/Replace Fuse
Faulty Alternator	Test Alternator
Bad Warning Light Bulb	Test/Replace Bulb
WARNING LIGHT ON WITH IGNITION SWITCH OFF	
Alternator Wiring Short	Check/Repair Wiring
Faulty Rectifier Bridge	Test/Repair Alternator
AMMETER INDICATES DISCHARGE	
Loose/Worn Alternator Belt	Tighten/Replace Belt
Loose Alternator Connections	Check/Repair Connections
Faulty Ammeter	Test/Replace Ammeter
NOISY Defective Battery	
Defective Alternator	Test/Repair Alternator
Defective Regulator	Test/Repair Regulator

TROUBLE SHOOTING PRECAUTIONS

NOTE: Observe the following precautions when trouble shooting or testing charging system:

Miata

- Obtain code number and deactivate audio anti-theft system before disconnecting battery.

All Models

- DO NOT reverse battery cable connections. Rectifier will be damaged.
- DO NOT use high voltage type testers.

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- Battery voltage is always applied to terminal "B".
- DO NOT ground terminal "L" while engine is running.
- DO NOT start engine with connector disconnected from terminals "L" and "S".
- DO NOT apply battery voltage to terminal "L".

ON-VEHICLE TESTING

NOTE: Check alternator wiring harness connections and drive belt tension. Battery must be fully charged before testing. Wait at least 30 seconds after starting engine before measuring system voltage.

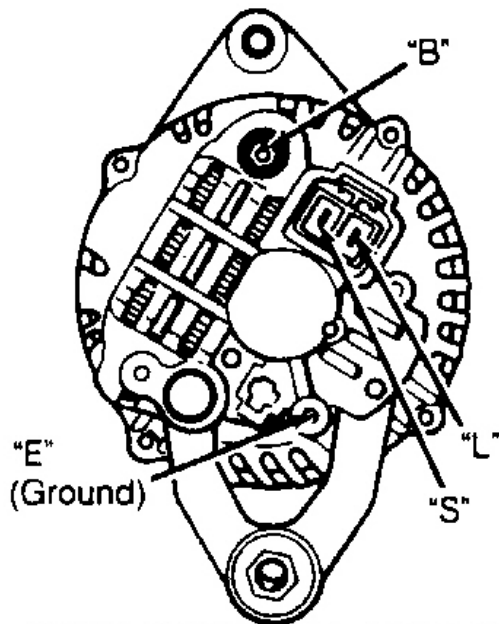
CAUTION: Ensure alternator terminal "B" does not contact ground.

ALTERNATOR OUTPUT

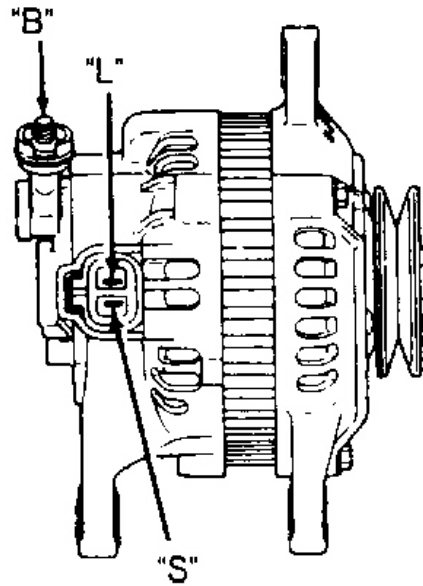
1. Connect an ammeter (80-amp minimum) in-line between terminal "B" connector and wire. See **Fig. 2**, **Fig. 3** and **Fig. 4**. Turn all headlights and accessories on and depress brake pedal. With engine operating at 2500-3000 RPM, measure output amperage.

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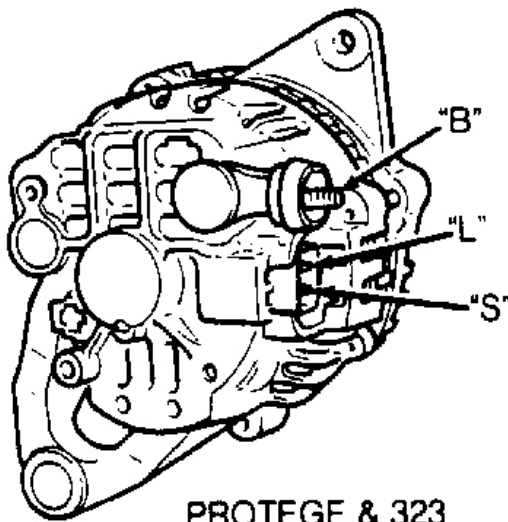
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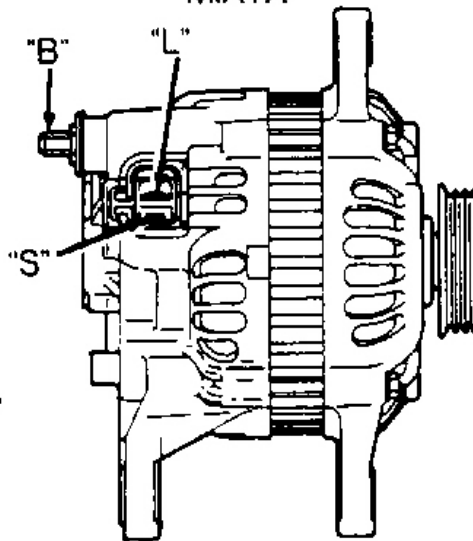
B2200, B2600i, MPV, RX7 & 929



MIATA

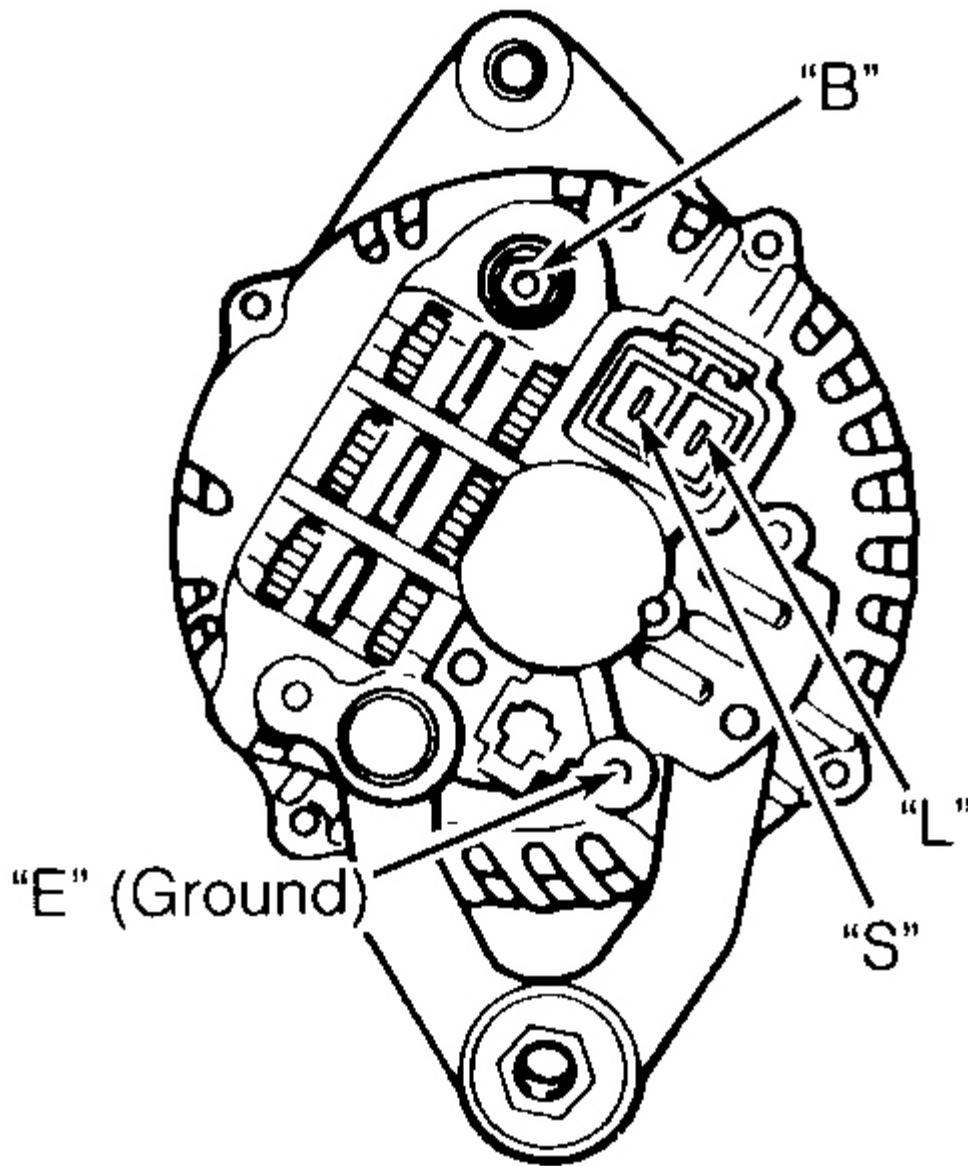


PROTEGE & 323



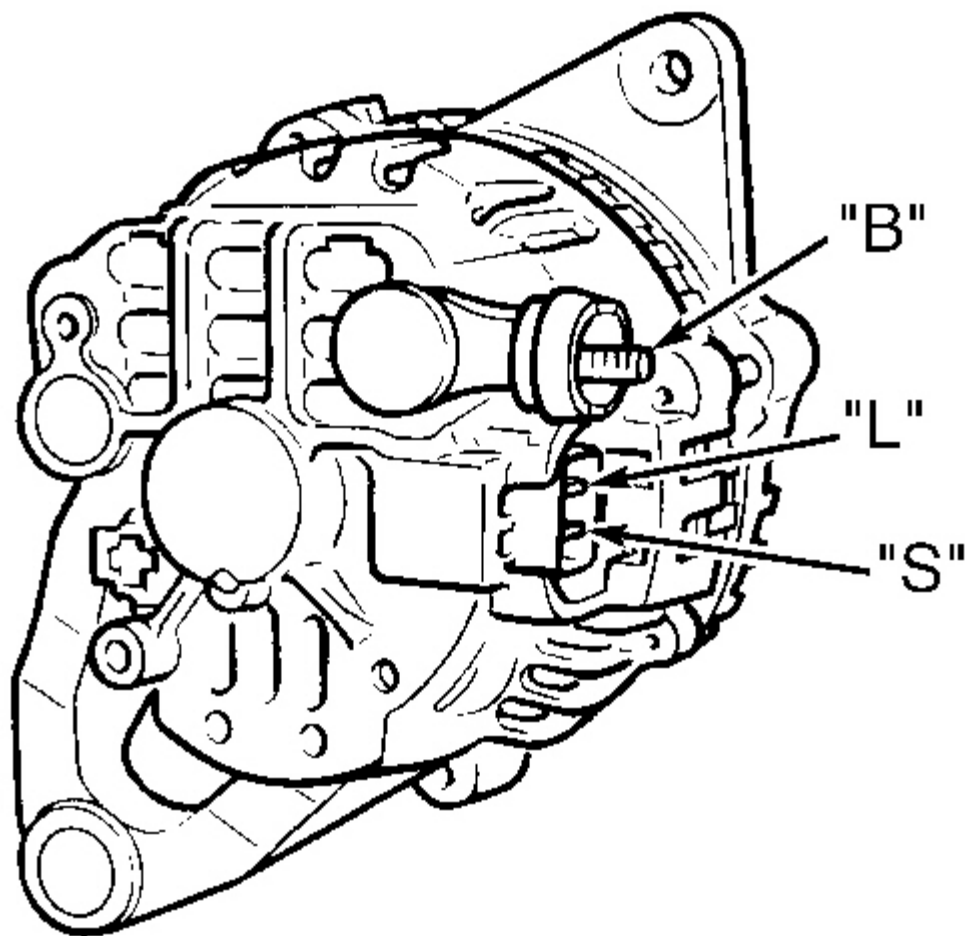
MX-6 & 626

Fig. 2: Identifying Alternator Terminals
Courtesy of MAZDA MOTORS CORP.



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Fig. 3: Identifying Alternator Terminals (1992 B2200, B2600i & MPV)
Courtesy of MAZDA MOTORS CORP.



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Fig. 4: Identifying Alternator Terminals (1992 All Other Models)
Courtesy of MAZDA MOTORS CORP.

2. If output amperage is not equal to or more than amount specified in ALTERNATOR OUTPUT table, repair or replace alternator as necessary.
3. Turn off all accessories and release brake pedal. With engine operating at 2500-3000 RPM, measure output amperage. If output amperage is not at least 5 amps, repair or replace alternator as necessary.
4. With engine operating at 2500-3000 RPM, measure voltage between terminal "S" and ground. If reading is not 14.1-14.7 volts, repair or replace alternator as necessary.

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ALTERNATOR OUTPUT

Application	Amps
B2200	55
B2600i	60
Miata	
A/T	65
M/T	60
MPV	70
MX-6 & 626	
Non-Turbo	70
Turbo	
A/T	80
M/T	70
MX-3	
4-Cylinder	70
V6	90
Protege & 323	65
RX7	80
929	70

BENCH TESTING

Rectifier/Diode Assembly

1. Using an ohmmeter, check continuity of each diode in both directions (polarity). See **Fig. 5** and **Fig. 6** . If diode shows high resistance in one direction and low resistance in other direction, diode is okay.
2. If diode shows low resistance in both directions, it is shorted. If diode shows high resistance in both directions, diode is open. If any diode is defective, replace rectifier assembly.

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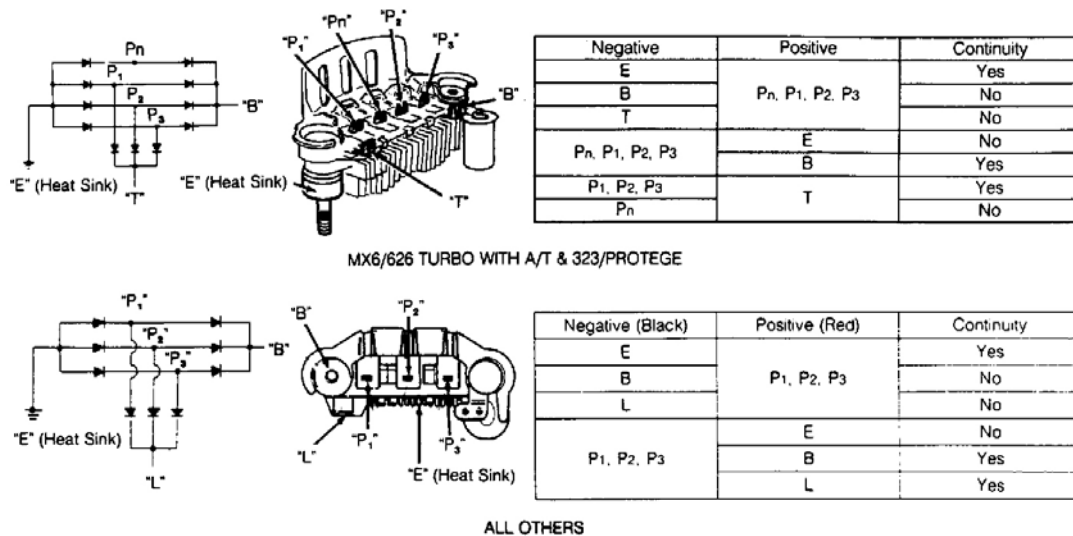


Fig. 5: Testing Alternator Rectifier & Diodes
 Courtesy of MAZDA MOTORS CORP.

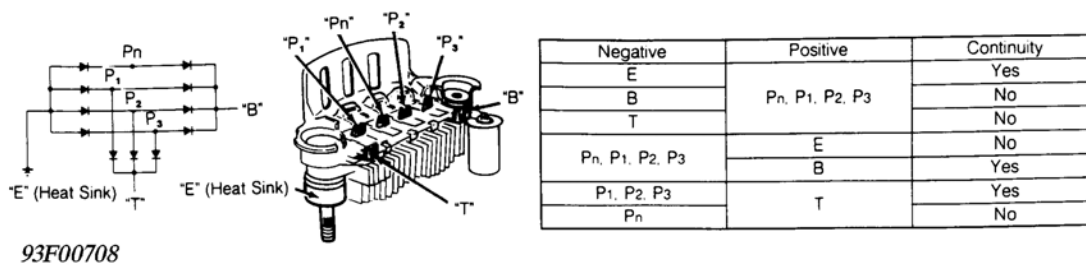


Fig. 6: Testing Alternator Rectifier & Diodes (1992)
 Courtesy of MAZDA MOTORS CORP.

Rotor & Slip Rings

Measure resistance between rotor slip ring contacts. See **Fig. 7**. If resistance is not within specification, replace rotor. See ROTOR RESISTANCE SPECIFICATIONS table. Check continuity between individual slip rings and rotor core/shaft. If there is continuity, replace rotor.

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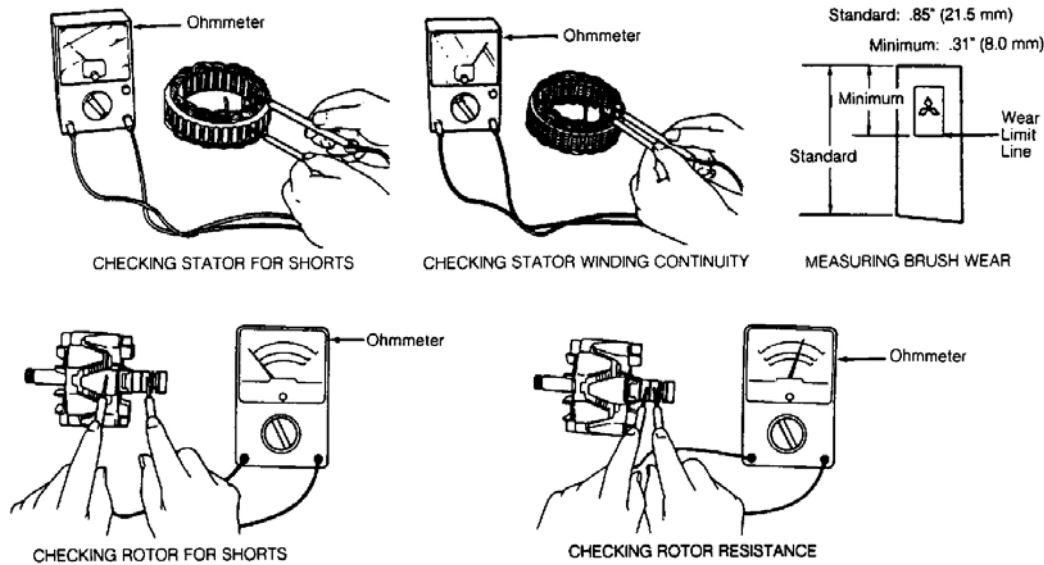


Fig. 7: Testing Alternator Stator, Rotor & Brushes
 Courtesy of MAZDA MOTORS CORP.

ROTOR RESISTANCE SPECIFICATIONS

Application	Ohms
MPV	2.7-2.9
RX7	2.0-4.0
All Others	3.5-4.5

Stator

Check continuity between stator coil leads and stator core. See **Fig. 7** . If there is continuity, replace stator. Check continuity between leads of stator coil. If there is no continuity, replace stator.

Brushes

Replace brushes if worn to limit line. See **Fig. 7** . Replace brush springs if corroded. For brush replacement procedure, see OVERHAUL.

OVERHAUL

DISASSEMBLY

1. Place a 200-watt soldering iron against rear bearing for 3-4 minutes to heat rear cover to 122-140°F (50-60°C). Carefully separate front case and rotor from rear cover and stator. See **Fig. 8** , **Fig. 10** and **Fig. 11** .

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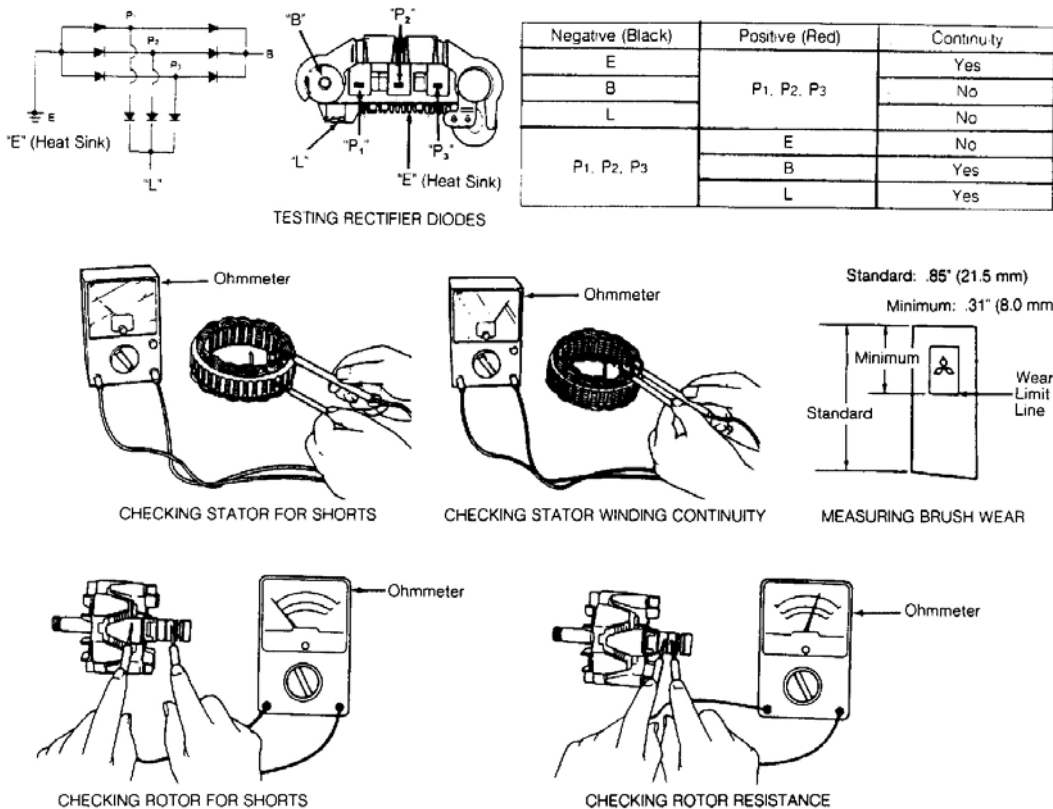


Fig. 8: Overhauling Alternators
 Courtesy of MAZDA MOTORS CORP.

2. Position rotor in vise. Remove pulley. Disassemble pulley, rotor and front case. Remove front bearing from front case. Using a bearing puller, remove rear bearing.
3. Remove "B" terminal nut and bushing from rear cover. Remove screws from brush holder and rectifier. Separate rear cover and stator. When unsoldering rectifier and stator leads, disconnect as quickly as possible (5 seconds maximum) to avoid damage to rectifier. To remove brushes from holder, unsolder pigtail from terminal.

REASSEMBLY

Brush Installation

1. Install brush and spring into holder. Allow brush to extend out of holder until wear limit line extends .08-.16" (2-4 mm) beyond end of brush holder. See **Fig. 9**. Solder pigtail onto brush holder.
2. Insert spring and brush into brush holder. Using a spring scale, pull brush into holder until end of brush protrudes .08" (2.0 mm) from holder. See **Fig. 9**. Note reading on spring scale. Replace spring if tension is not 5.6-15.5 ozs. (160-440 g).

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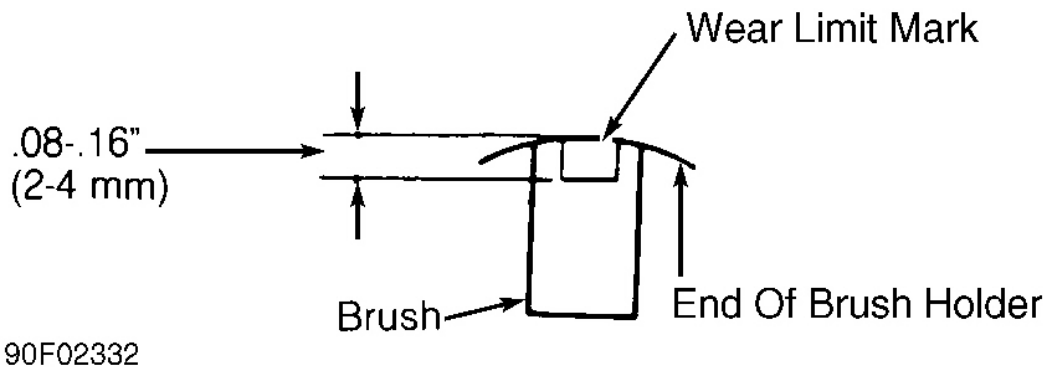


Fig. 9: Measuring Installed Depth of Brush
Courtesy of MAZDA MOTORS CORP.

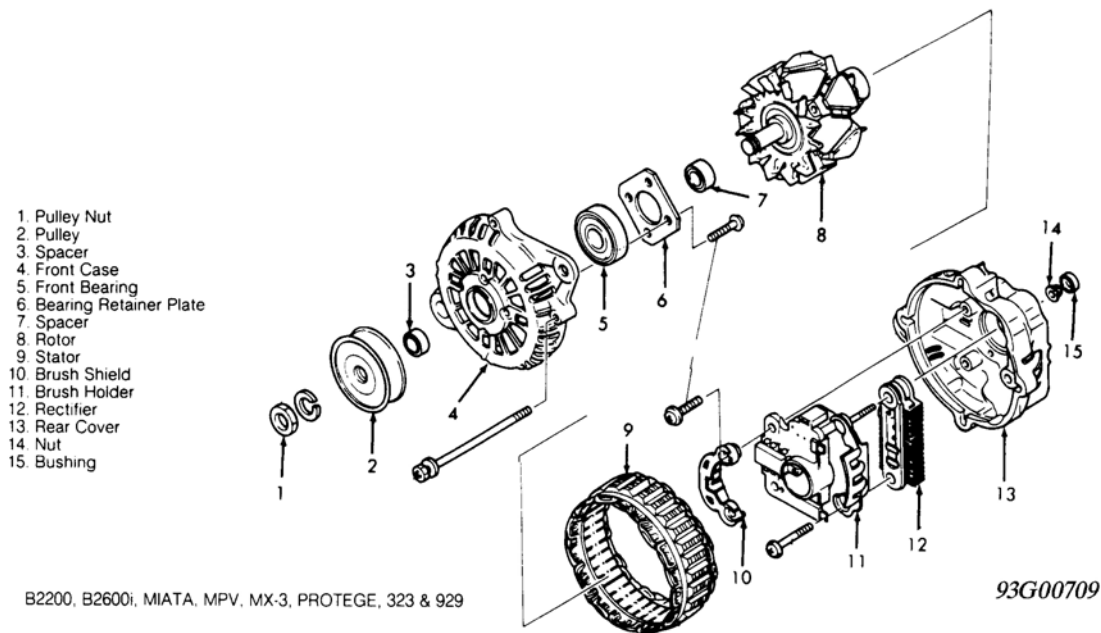
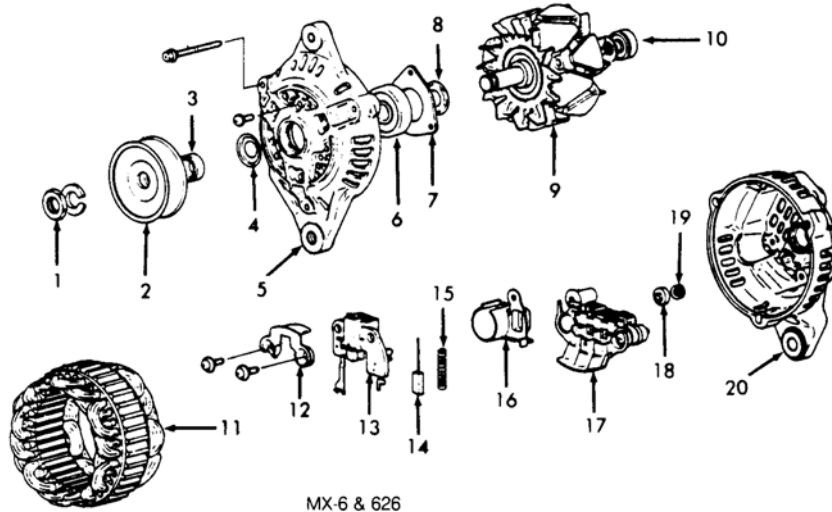


Fig. 10: Exploded View of Alternators
Courtesy of MAZDA MOTORS CORP.

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- 1 Pulley Nut
- 2 Pulley
- 3 Spacer
- 4 Dust Shield
- 5 Front Case
- 6 Front Bearing
- 7 Bearing Retainer Plate
- 8 Dust Shield
- 9 Rotor
- 10 Rear Bearing
- 11 Stator
- 12 Brush Shield
- 13 Brush Holder
- 14 Brush
- 15 Spring
- 16 Clip
- 17 Rectifier
- 18 Bushing
- 19 Nut
- 20 Rear Cover



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Fig. 11: Exploded View of Alternators
Courtesy of MAZDA MOTORS CORP.