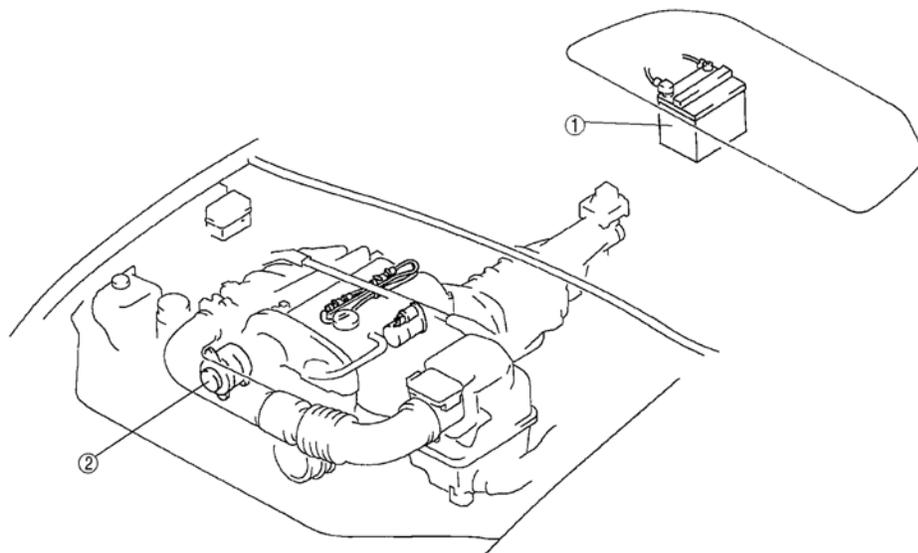


2005 ELECTRICAL

Charging System - MX-5 Miata

CHARGING SYSTEM LOCATION INDEX



1	Battery (See BATTERY REMOVAL/ INSTALLATION.) (See BATTERY INSPECTION.) (See BATTERY RECHARGING.)
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2	Generator (See GENERATOR REMOVAL/ INSTALLATION.) (See GENERATOR INSPECTION.)
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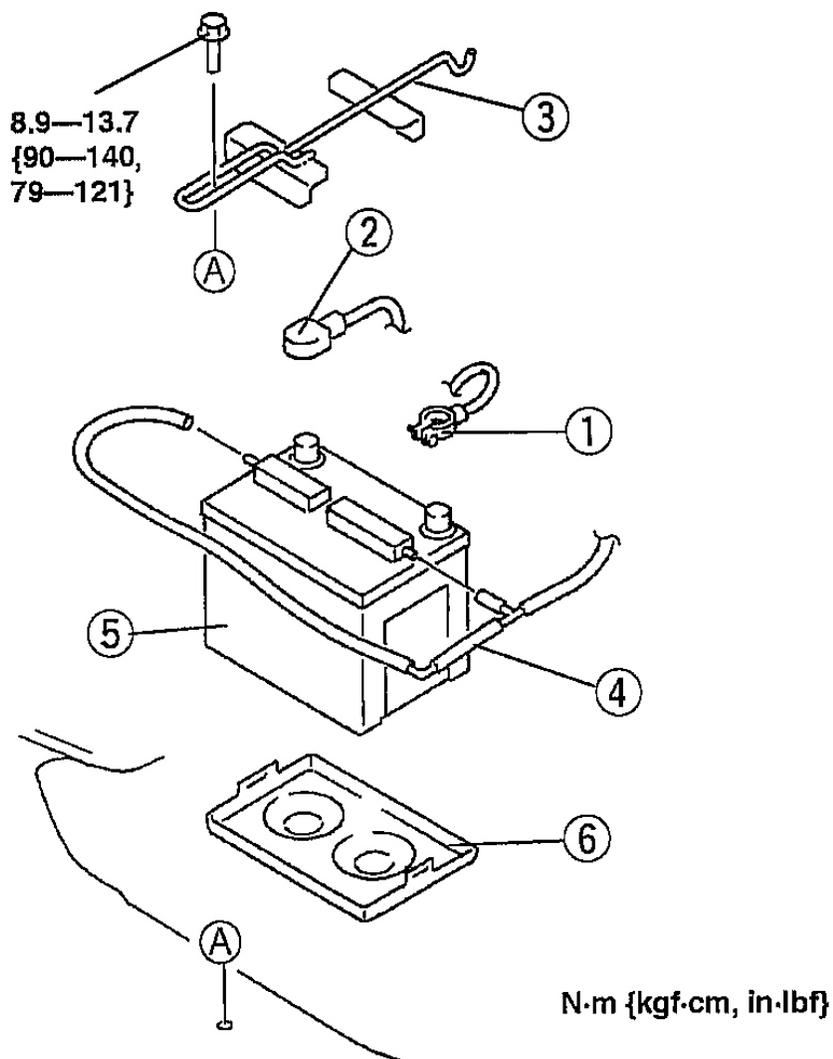
Fig. 1: Locating Components Of Charging System
Courtesy of MAZDA MOTORS CORP.

BATTERY REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.

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1	Negative battery cable
2	Positive battery cable
3	Battery clamp
4	Battery vent hose
5	Battery
6	Battery tray

Fig. 2: Identifying Components Of Battery & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

2. Install in the reverse order of removal.

BATTERY INSPECTION

WARNING:

- Since battery acid is toxic, be careful when handling the battery.
- Since battery acid is highly corrosive, be careful not to allow it to contact clothing or the vehicle.
- In case battery acid contacts skin, eyes, or clothing, flush it immediately with running water. Especially if the acid gets in the eyes, flush with water for more than 15 min and get prompt medical attention.

ELECTROLYTE GRAVITY

1. Measure the electrolyte gravity using a hydrometer.
 - If it is less than the specification, recharge the battery. (See **BATTERY RECHARGING**.)

Standard electrolyte gravity

1.22-1.29 [20°C {68°F}]

BATTERY VOLTAGE

1. Inspect the battery as follows:

BATTERY VOLTAGE INSPECTION

Step	Inspection	Result	Action
1	Measure open circuit voltage of battery.	12.4 V or more	Go to step 3.
		less than 12.4 V	Go to the next step.
2	Quick charge for 30 min and reinspect voltage.	12.4 V or more	Go to the next step.
		less than 12.4 V	Replace battery.
3	Apply test load (see test load chart) to battery using a battery load tester and record battery voltage after 15 s. Is voltage more than specification?	Yes	Battery is okay.
		No	Replace battery.

LOAD TEST CHART

Battery	Load (A)
S46A24L (S)	105

BATTERY POSITIVE VOLTAGE WITH LOAD

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Approximate battery temp.	Minimum voltage (V)
21 °C {70°F}	9.6
15 °C {59°F}	9.5
10 °C {50°F}	9.4
4 °C {39°F}	9.3
-1 °C {30°F}	9.1
-7 °C {19°F}	8.9
-12 °C {10°F}	8.7
-18 °C {0°F}	8.5

BACK-UP CURRENT

1. Verify that the ignition switch is turned off and that the key has been removed.
2. Disconnect the negative battery cable.

CAUTION:

- Operating electrical loads while measuring the back-up current can damage the circuit tester.

3. Measure the back-up current between the negative battery terminal and the negative battery cable.
 1. If the current exceeds the maximum, remove the fuse in the main fuse block and the fuse block one by one while measuring the back-up current.
 2. Inspect and repair harnesses and connectors of the fuse at which the current reduces.

Back-up current

20 mA max.

BATTERY RECHARGING

WARNING:

- Hydrogen gas is produced during normal battery operation. A battery-related explosion can cause serious injury. Keep all flames (including cigarettes), heat, and sparks away from the top and surrounding area of open battery cells.

CAUTION:

- When disconnecting the battery, remove the negative cable first and install it last to prevent damage to electrical components or the battery.
- To prevent damage to electrical components or the battery, turn all accessories off and stop the engine before performing maintenance or recharging the battery.
- Do not quick charge for over 30 min as it will damage the battery.

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1. Place a battery in a pan of water to prevent it from overheating. The water level should come up about halfway on the battery. Keep water off the top of the battery.
2. Connect a battery charger to the battery and adjust the charging current as follows.

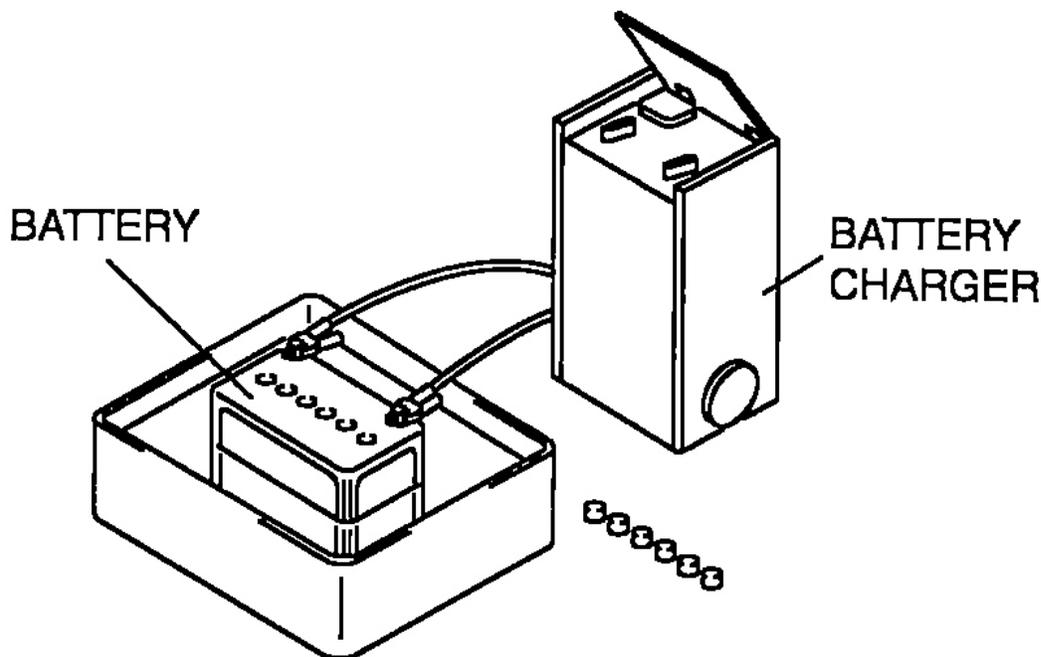
STANDARD SPECIFICATION

Battery type (5-h rate)	Slow charge (A)	Quick charge (A)/(30 min)
S46A24L (S) (32)	3.0-4.0	20

3. After the battery is recharged, verify that the voltage is within the specification and remains at the same value for **1 h or more** after the recharging was completed.
 - If not within the specification, replace the battery.

Standard voltage

12.4 V or more



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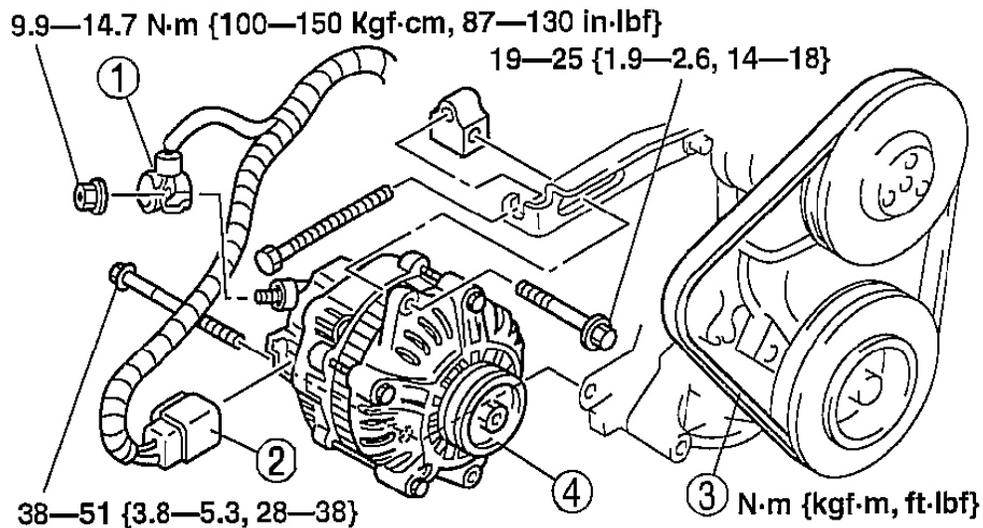
Fig. 3: Connecting A Battery Charger To Battery
Courtesy of MAZDA MOTORS CORP.

GENERATOR REMOVAL/INSTALLATION

WARNING:

- When the battery cables are connected, touching the vehicle body with generator terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the battery before performing the following operation.

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the air pipe No.5, No.6, and air hose No.8 (with TC). (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [BP WITH TC]** .)
4. Remove the intake manifold bracket.
5. Remove in the order indicated in the table.



1	Terminal B wire
2	Connector
3	Drive belt
4	Generator (See Generator Removal Note.)

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Fig. 4: Removing Intake Manifold Bracket & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

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6. Install in the reverse order of removal.
7. Inspect the drive belt deflection/tension. (See **DRIVE BELT INSPECTION** .)

GENERATOR REMOVAL NOTE

1. Remove the generator from the underside of the engine compartment.

GENERATOR INSPECTION

GENERATOR WARNING LIGHT

1. Verify that the battery is fully charged.
 - Charge if necessary.
2. Verify that the drive belt deflection/tension is within the specification. (See **DRIVE BELT INSPECTION** .)
 - Adjust if necessary.
3. Turn the ignition switch on and verify that the generator warning light comes on.
 - If the warning light does not illuminate, inspect the harness from ignition switch to generator warning light and from generator warning light to 3U terminal of PCM. If the generator warning light and harnesses are normal, replace the PCM.
4. Confirm that the generator warning light goes off after starting the engine.
 - If the generator warning light does not go off, inspect the on-board diagnostic system service code. (See **ENGINE CONTROL SYSTEM OPERATION INSPECTION [BP, BP WITH TC]** .)

GENERATOR

Voltage

1. Verify that the battery is fully charged.
 - Charge if necessary.
2. Verify that the drive belt deflection/tension is within the specification. (See **DRIVE BELT INSPECTION** .)
 - Adjust if necessary.
3. Turn off all electrical loads.
4. Turn the ignition switch to START and verify that the generator turns smoothly without any noise while the engine is running.
5. Measure the voltage at the terminals shown in the table.
 - If not as specified, disassemble and inspect the generator.

Terminal	Ignition switch ON (V)	Idle (V) [20 °C {68°F}]
B	B+	13-15
P	Below 1	Approx.3-8

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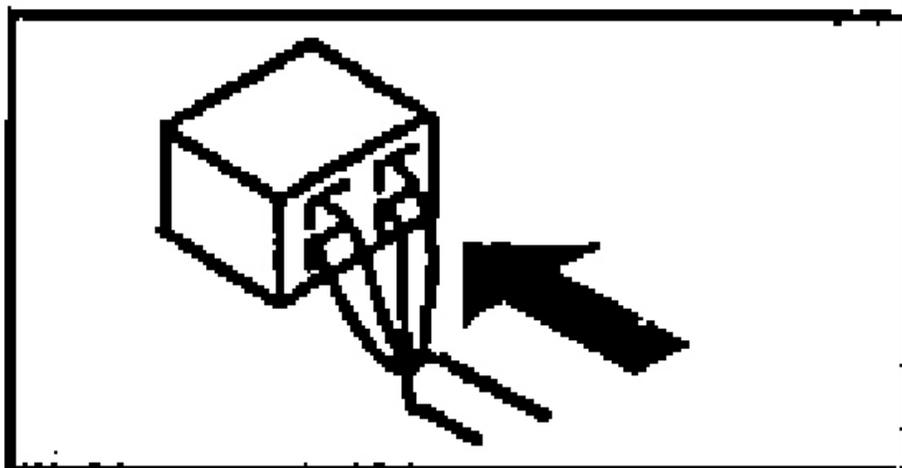
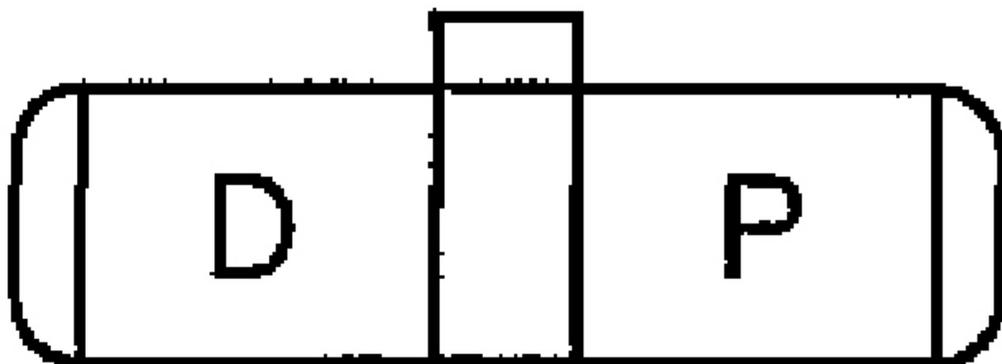
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Approx.0

0

0 Turn the following electrical loads on and verify that the voltage reading increases.

- Headlights
- Blower motor
- Rear window defroster



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Fig. 5: Identifying Connector Terminal
Courtesy of MAZDA MOTORS CORP.

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Current

1. Verify that the battery is fully charged.
 - Charge if necessary.
2. Verify that the drive belt deflection/tension is within the specification. (See **DRIVE BELT INSPECTION** .)
 - Adjust if necessary.
3. Disconnect the negative battery cable.
4. Connect a circuit tester, capable of reading **120 A or more**, between generator terminal B and the wiring harness.
5. Connect the negative battery cable.
6. Turn off all electrical loads.
7. Start the engine and increase the engine speed to **2,000-2,500 RPM**.
8. Turn the following electrical loads on and verify that the current reading increases.
 1. Headlights
 2. Blower motor
 3. Rear window defroster
 - If generator terminal B current will not increase, disassemble and inspect the generator.

NOTE:

- **Current required for generating power varies with electrical loads applied.**

Standard current (Reference)

Measuring conditions

Room temperature: 20 °C {68°F}

Voltage: 13.5 V

Engine hot

Engine speed (RPM)	Terminal B current (A)
1,000	0 ⁰ --65
2,000	0 ⁰ --77

⁰ Lower limit of current must be more than 0 A.