

01-17 CHARGING SYSTEM

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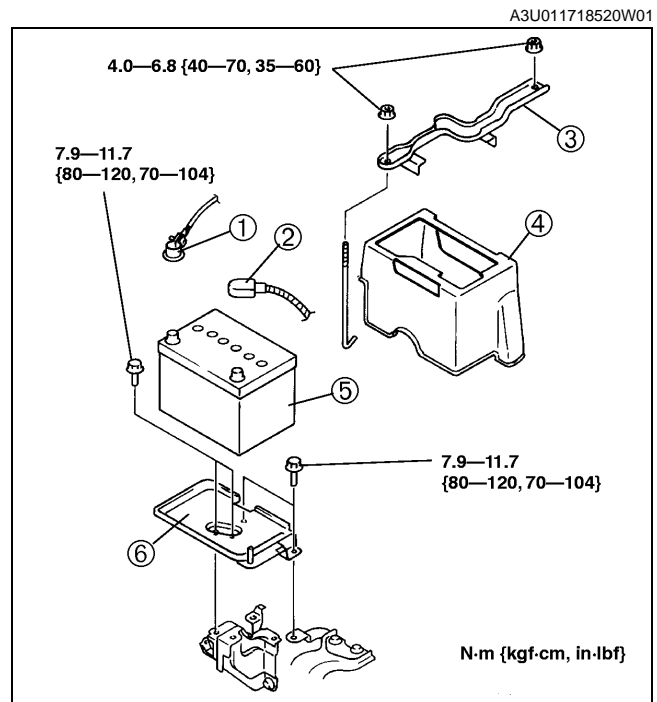
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BATTERY REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.

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

2. Install in the reverse order of removal.



BATTERY INSPECTION

Battery

- Inspect the battery in the following procedure.

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

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Load test chart

Battery	Load (A)
50D20L	150
75D23L	195

Battery positive voltage with load

Approximate battery temp.	Minimum voltage (V)
21 °C {70 °F}	9.6
15 °C {60 °F}	9.5
10 °C {50 °F}	9.4
4 °C {40 °F}	9.3
-1 °C {30 °F}	9.1
-7 °C {20 °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 off and that the ignition 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 minutes. It will damage the battery.

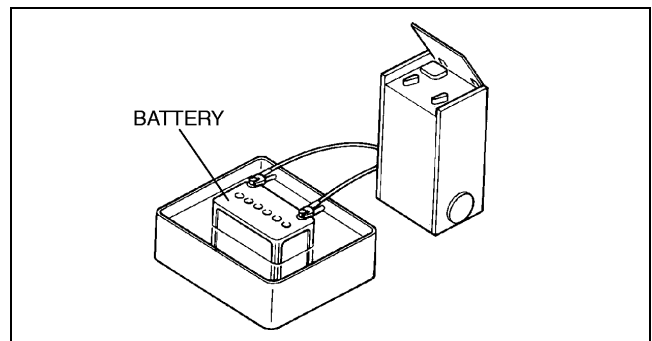
1. Place a battery in a pan of water to prevent it from overheating. The water level should come up about halfway on the battery. Keep water off the top of the battery.
2. Connect a battery charger to the battery.
3. Adjust the charging current as follows.

Battery type (5-hour rate)	Slow charge (A)	Quick charge (A)/(30 min.)
50D20L (40)	4.0—5.0	25
75D23L (52)	5.5—6.5	35

4. After the battery has been recharged, measure the battery positive voltage and verify that the battery keeps specified voltage for **more than 1 hour**.
 - If not as specified, replace the battery.

Specification

Above 12.4 V



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GENERATOR REMOVAL/INSTALLATION

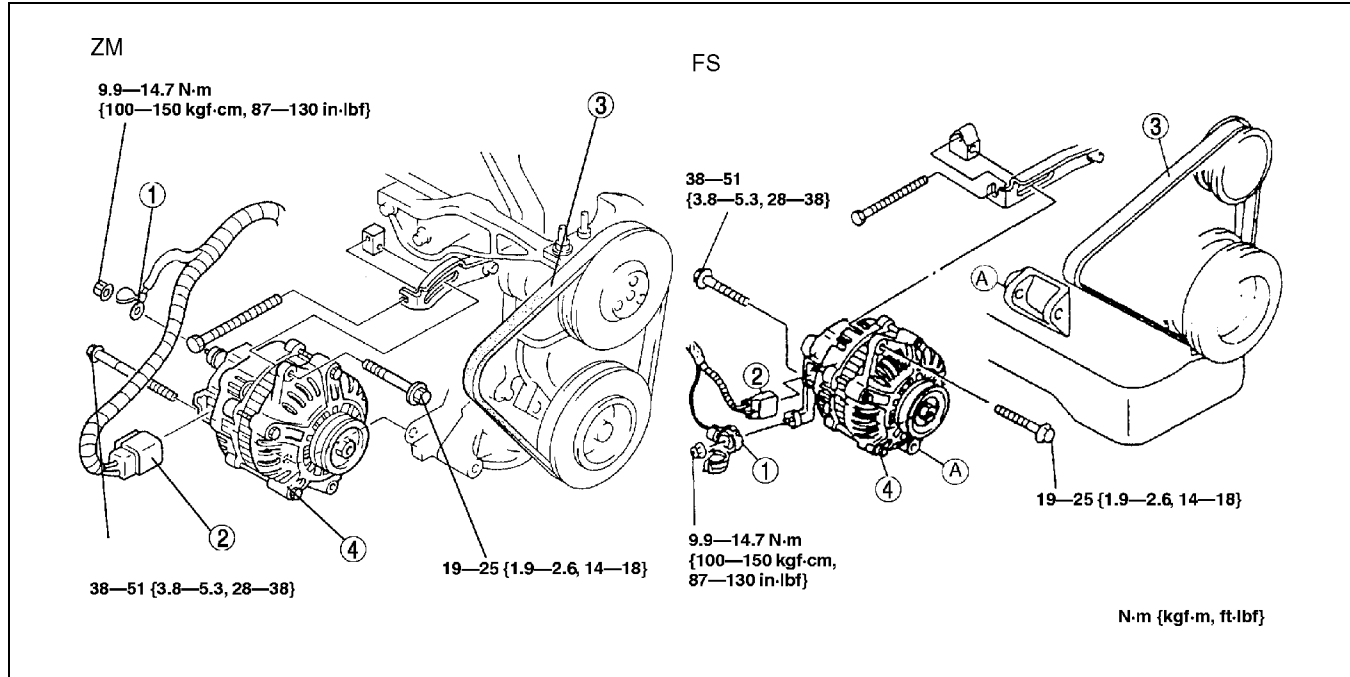
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Warning

- 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 in the order indicated in the table.
3. Install in the reverse order of removal.

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1	Terminal B wire
2	Connector
3	Drive belt (generator) (See 01-17-3 Drive Belt Installation Note)
4	Generator

Drive Belt Installation Note

- Install the drive belt and adjust the drive belt deflection or tension. (See 01-10A-4 DRIVE BELT ADJUSTMENT [ZM].) (See 01-10B-4 DRIVE BELT ADJUSTMENT [FS].)

GENERATOR INSPECTION

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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 01-10A-3 DRIVE BELT INSPECTION [ZM].) (See 01-10B-3 DRIVE BELT INSPECTION [FS].)
 - Adjust if necessary.
3. Turn the ignition switch to ON and verify that the generator warning light comes on.
 - If not, inspect generator warning light, wiring harnesses between the battery, generator warning light, and PCM terminal 42. When the generator warning light and the wiring harnesses are okay, replace the PCM.
4. Verify that the generator warning light goes out after the engine is started.
 - If not, inspect if any of the following DTCs are displayed: P0112, P0113, P1631, P1632, P1633, P1634. (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST [ZM].) (See 01-02B-7 ON-BOARD DIAGNOSTIC TEST [FS].)

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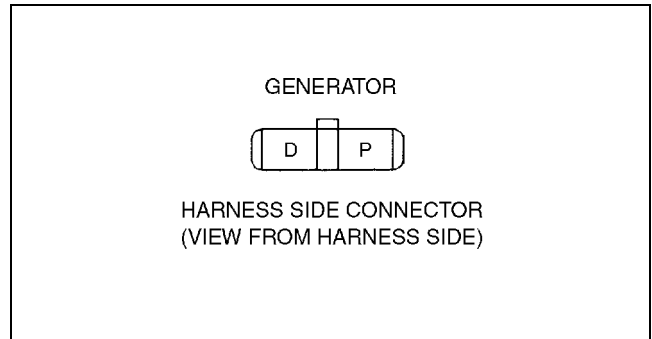
Generator

Voltage

- Verify that the battery is fully charged.
 - Charge if necessary.
- Verify that the drive belt deflection/tension is within the specification. (See 01-10A-3 DRIVE BELT INSPECTION [ZM].) (See 01-10B-3 DRIVE BELT INSPECTION [FS].)
 - Adjust if necessary.
- Turn off all electrical loads.
- Turn the ignition switch to start the engine and verify that the generator turns smoothly without any noise while the engine is running.
- Measure the voltage at the terminals indicated in the table.
 - If not as specified, repair or replace the generator as necessary.

Standard voltage

Terminal	Ignition switch ON(V)		Idle (V)[20 °C {68 °F}]	
	ZM	FS	ZM	FS
B	B+		13—15	
P	Approx. 1		Approx.3—8	
D	Approx.0		*	



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

- Headlights
- Blower motor
- Rear window defroster

Current

- Verify that the battery is fully charged.
 - Charge if necessary.
- Verify that the drive belt deflection/tension is within the specification. (See 01-10A-3 DRIVE BELT INSPECTION [ZM].) (See 01-10B-3 DRIVE BELT INSPECTION [FS].)
 - Adjust if necessary.
- Disconnect the negative battery cable.
- Connect ammeter, capable of reading **120 A** or above, between generator terminal B and the wiring harness.
- Connect the negative battery cable.
- Turn off all electrical loads.
- Start the engine and increase the engine speed to **2,000—2,500 rpm**.
- Turn the following electrical loads on and verify that the current reading increases.
 - Headlights
 - Blower motor
 - Rear window defroster
 - If generator terminal B current will not increase, repair or replace the generator as necessary.

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)	
	ZM	FS
1,000	0—60*	0—59*
2,000	0—68*	0—77*

* : Must not be **0 A**.