

2012 - Mazda6 - Engine

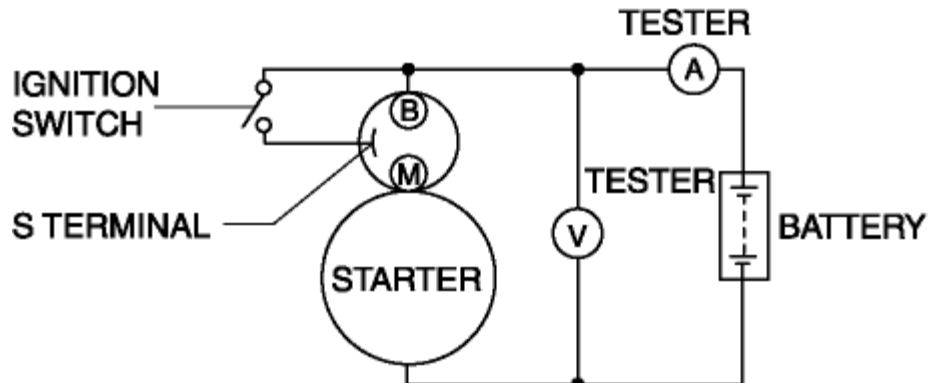
STARTER INSPECTION [MZR 2.5]

On-vehicle Inspection

1. Verify that the battery is fully charged.
2. The starter is normal if it rotates smoothly and without any noise when the engine is cranked.
 - If the starter does not operate, inspect the following:
 - Remove the starter, and inspect the starter unit.
 - Inspect the related wiring harnesses, the ignition switch, and the transaxle range switch (ATX) or starter interlock switch (MTX).

No-load Test

1. Verify that the battery is fully charged.
2. Connect the starter, battery, and a tester as shown in the figure.



3. Operate the starter and verify that it rotates smoothly.
 - If the starter does not rotate smoothly, inspect the starter unit.
4. Measure the voltage and current while the starter is operating.
 - If not within specification, replace the starter.

Starter no-load test voltage

- 11 V

Starter no-load test current

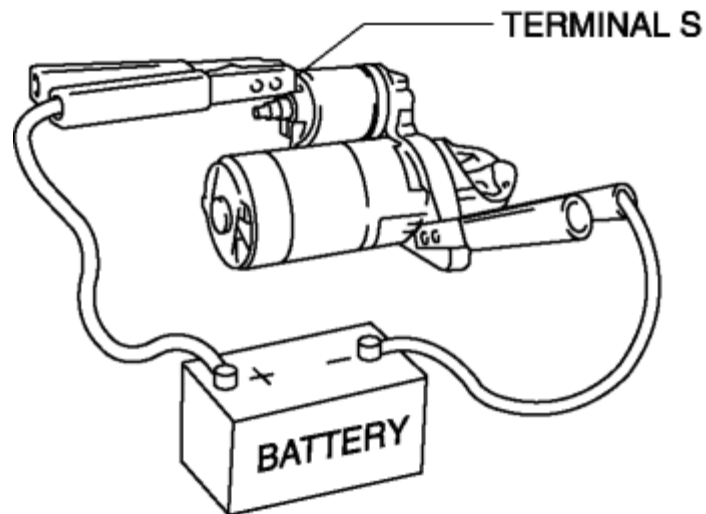
- 90 A or less

Magnetic Switch Operation Inspection

Pull-out test

NOTE:

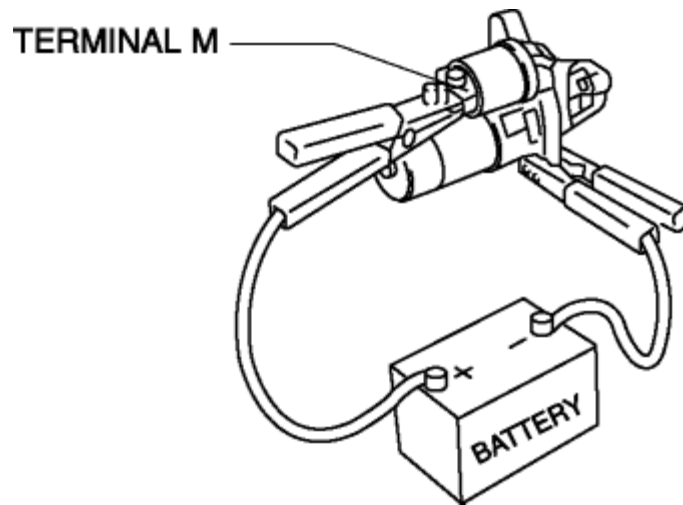
- Depending on the battery charge condition, the starter motor pinion may rotate while in an extended state. This is due to current flowing to the starter motor through the pull-in coil to turn the starter motor, and does not indicate an abnormality.
1. Verify that the starter motor pinion is extended while battery positive voltage is connected to terminal S and the starter body is grounded.



- If the starter motor pinion is not extended, repair or replace the starter.

Return test

1. Disconnect the motor wire from terminal M.
2. Connect battery positive voltage to terminal M and ground the starter body.

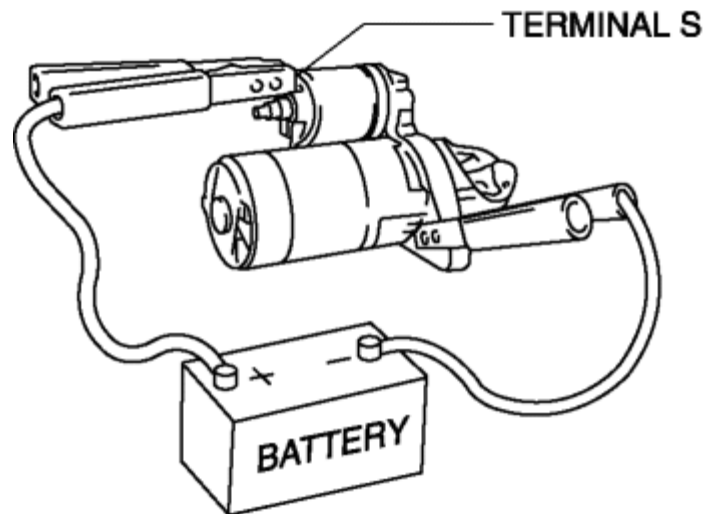


3. Pull out the drive pinion with a screwdriver. Verify that it returns to its original position when released.

- If it does not return, repair or replace the starter.

Pinion Gap Inspection

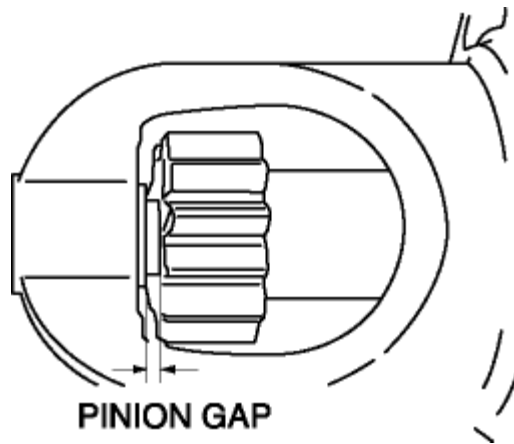
1. Pull out the drive pinion with the battery positive voltage connected to terminal S and the starter body grounded.



CAUTION:

- Applying power for more than 10 s can damage the starter. Do not apply power for more than 10 s.

2. Measure the pinion gap while the drive pinion is extended.



- If not as specified, adjust with an adjustment washer (between drive housing front cover and magnetic switch).

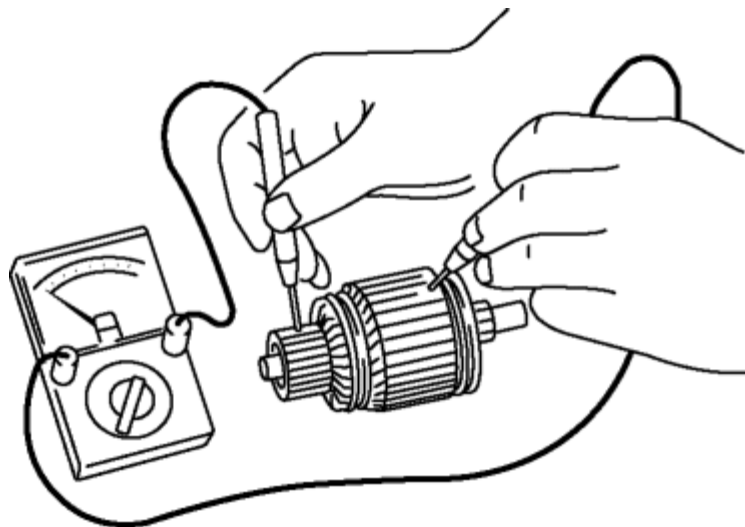
Starter pinion gap

- 0.5—2.0 mm {0.02—0.07 in}

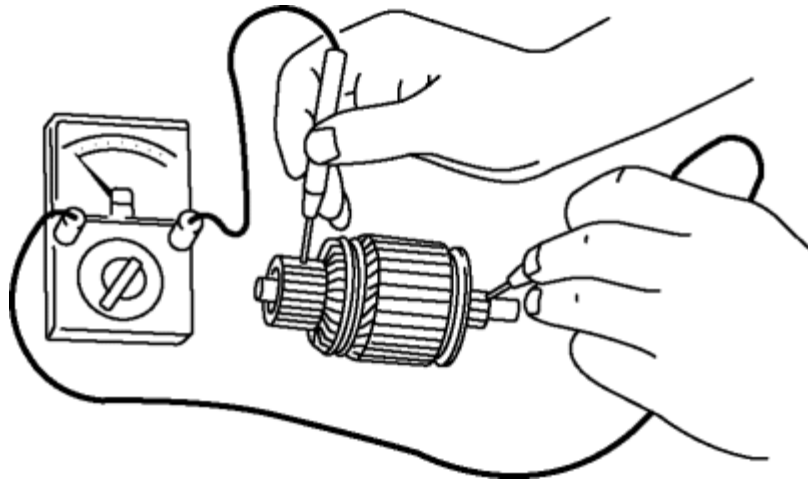
Starter Inner Parts Inspection

Armature

1. Verify that there is no continuity between the commutator and the core at each segment using a tester.

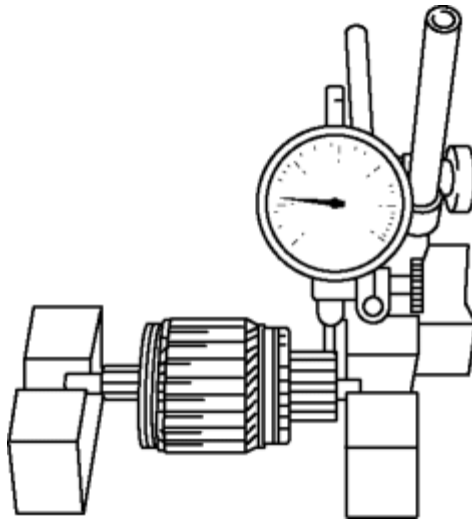


- If there is continuity, replace the armature.
2. Verify that there is no continuity between the commutator and the shaft using a tester.



- If there is continuity, replace the armature.

3. Place the armature on V-blocks, and measure the runout using a dial indicator.

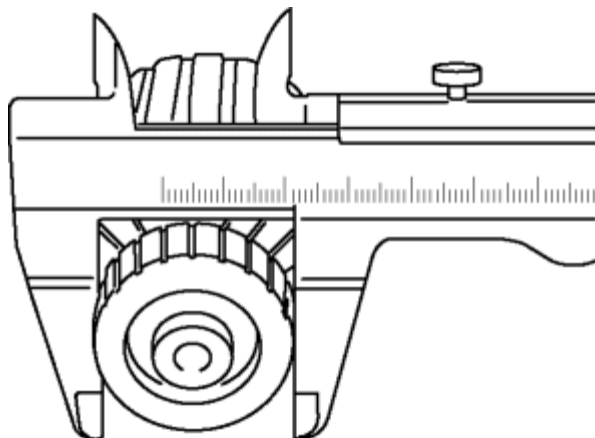


- If not within specification, replace the armature.

Starter armature runout

- 0.1 mm {0.004 in} max.

4. Measure the commutator diameter.

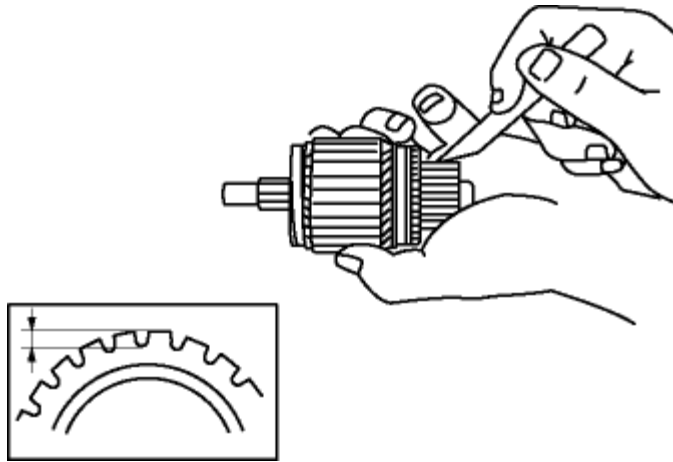


- If not within the minimum specification, replace the armature.

Starter commutator diameter

- Standard: 29.4 mm {1.16 in}
- Minimum: 28.8 mm {1.13 in}

5. Measure the segment groove depth of the commutator.



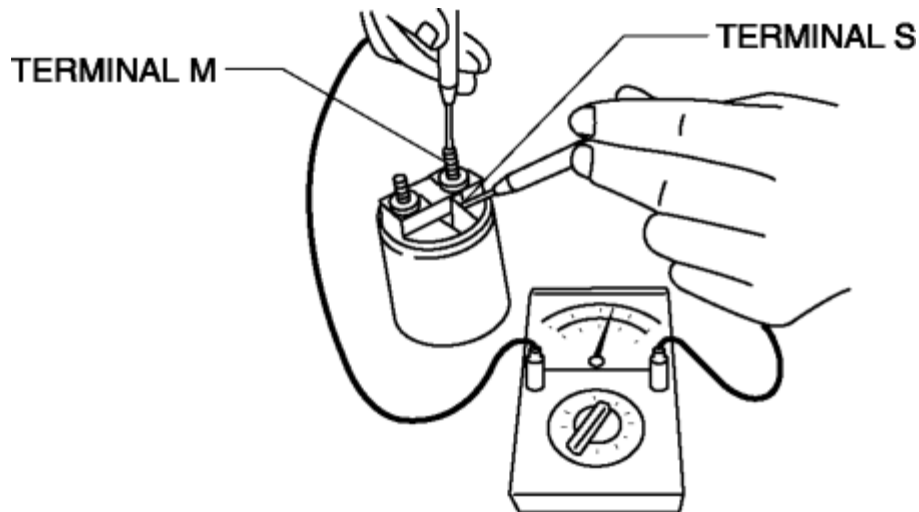
- If not within the minimum specification, undercut the grooves to the standard depth.

Segment groove depth of starter commutator

- Standard: 0.5 mm {0.02 in}
- Minimum: 0.2 mm {0.008 in}

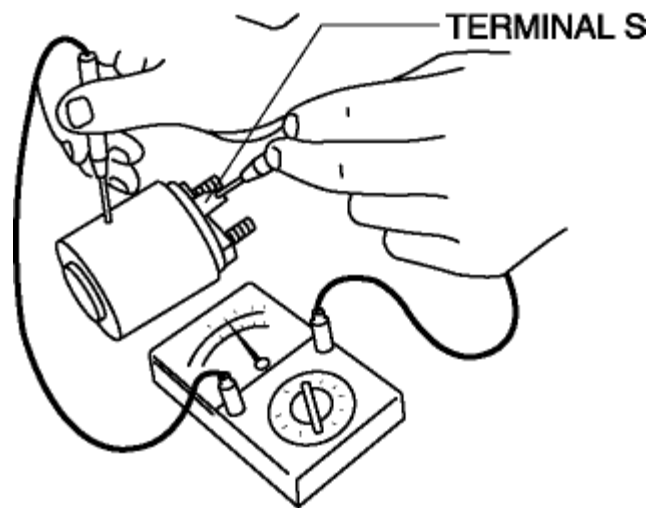
Magnetic switch

1. Inspect for continuity between terminals S and M using a tester.



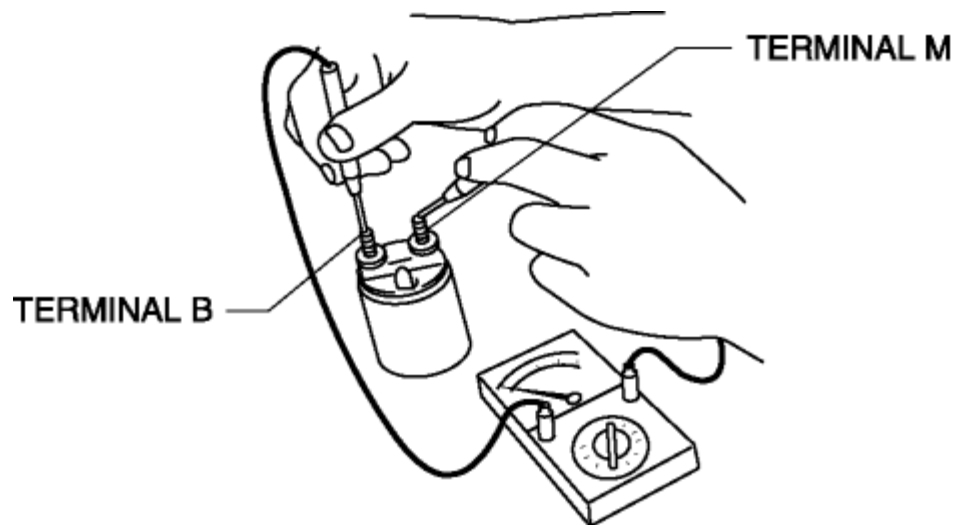
- If there is no continuity, replace the magnetic switch.

2. Inspect for continuity between terminal S and the body using a tester.



- If there is no continuity, replace the magnetic switch.

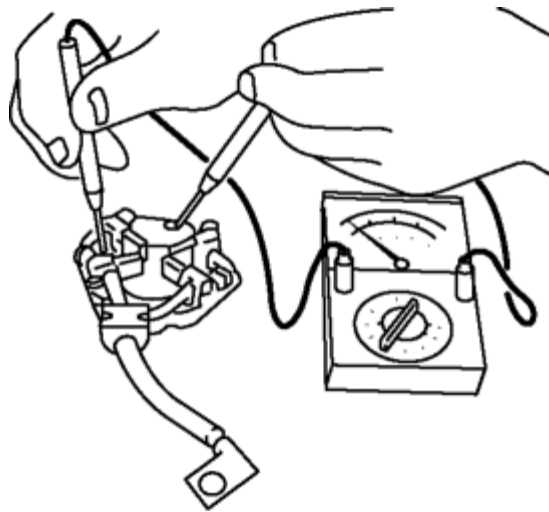
3. Verify that there is no continuity between terminals M and B using a tester.



- If there is continuity, replace the magnetic switch.

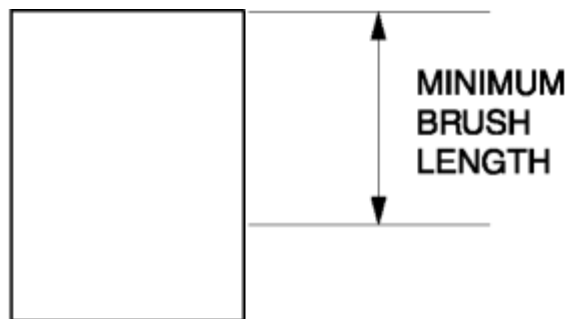
Brush and brush holder

1. Verify that there is no continuity between each insulated brush and plate using a tester.



- If there is continuity, replace the brush holder.

2. Measure the brush length.



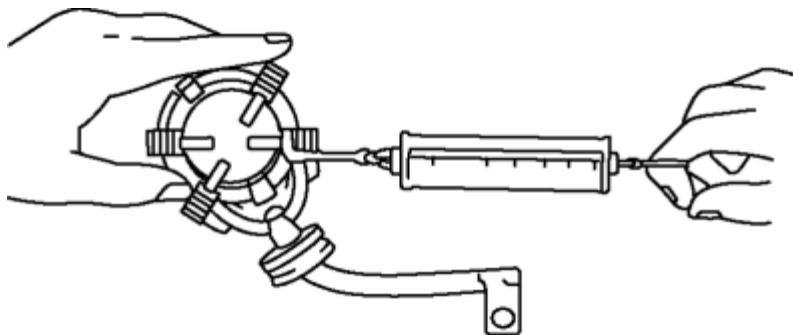
CONTACT FACE WITH COMMUTATOR

- If any brush is worn almost to or beyond the minimum specification, replace all of the brushes.

Starter brush length

- Standard: 12.3 mm {0.484 in}
- Minimum: 5.5 mm {0.22 in}

3. Measure the brush spring force using a spring balance.



- If not within the minimum specification, replace the brush and brush holder component.

Starter brush spring force

- Standard: 15.0—20.4 N {1.53—2.08 kgf, 3.38—4.58 lbf}

- Minimum: 2.75 N {0.280 kgf, 0.618 lbf}

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2012 - Mazda6 - Engine

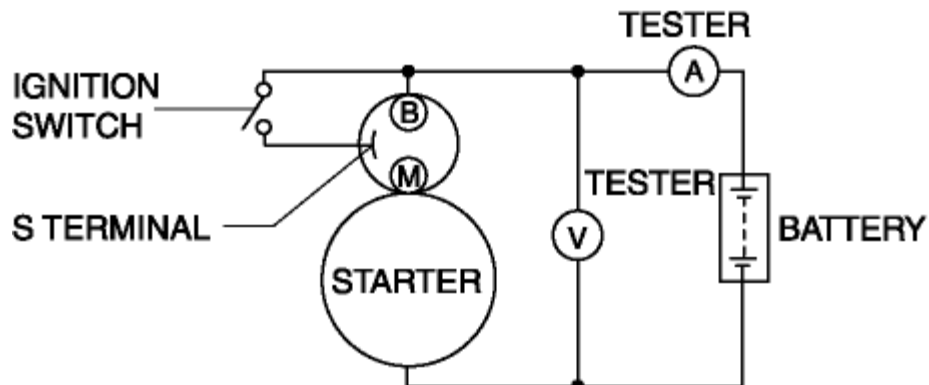
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Starter no-load test current

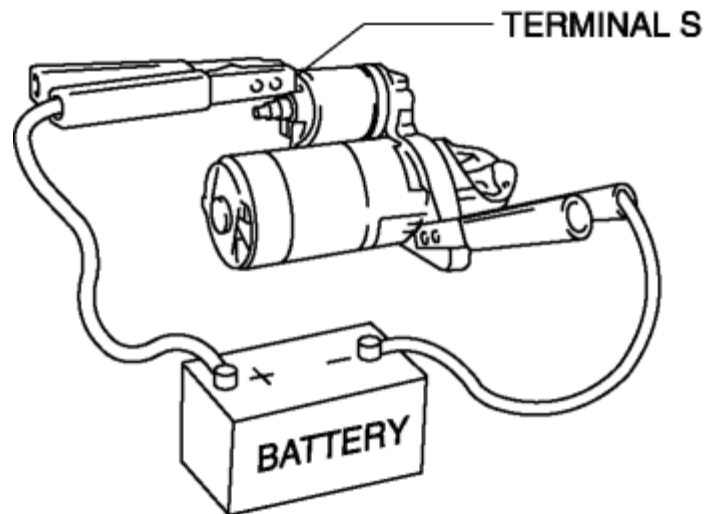
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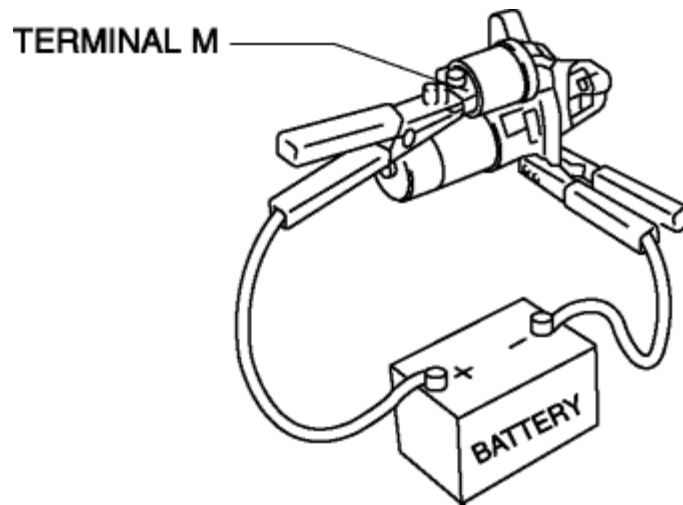
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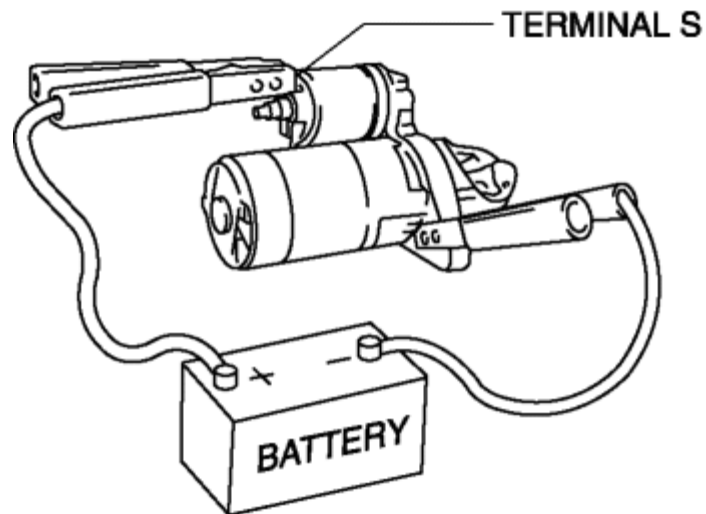


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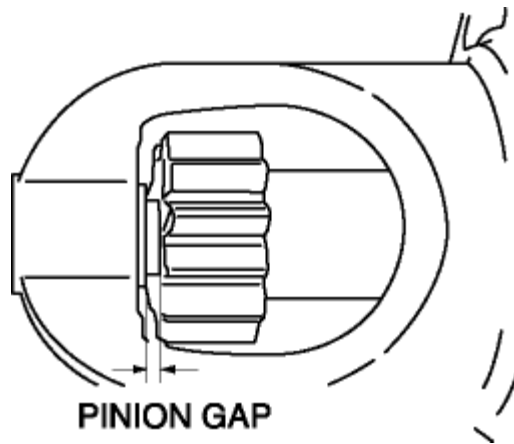
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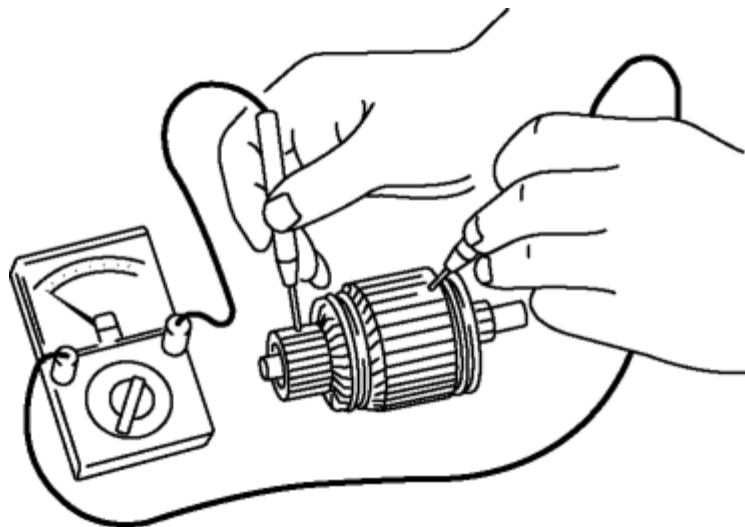
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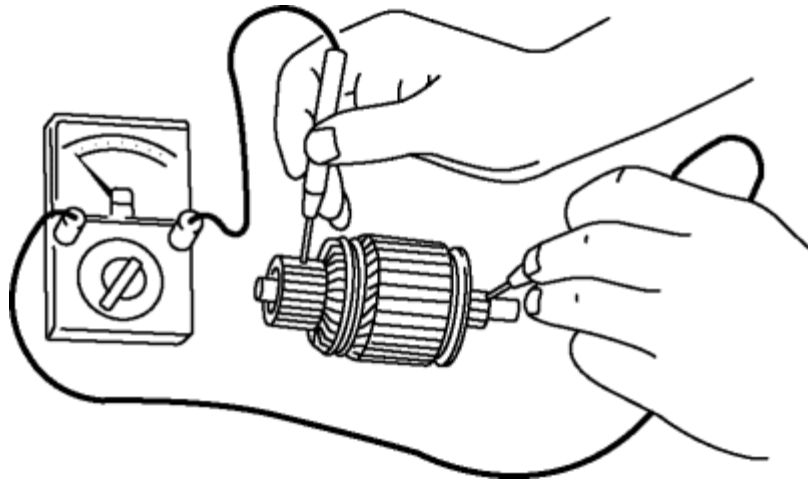
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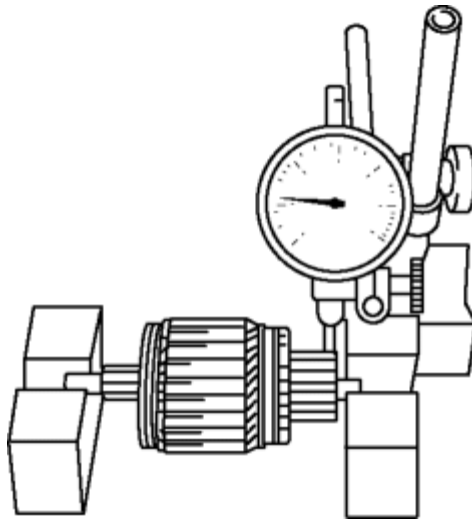


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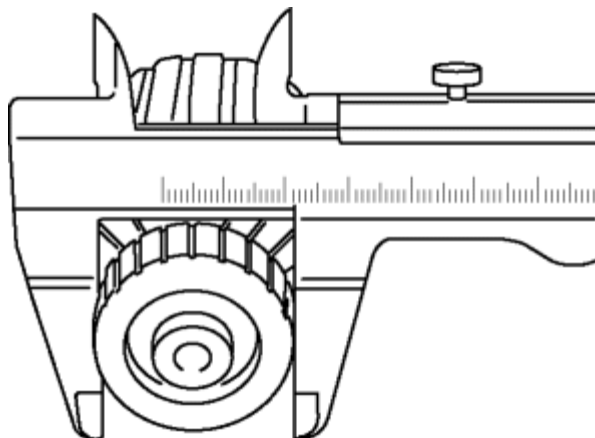


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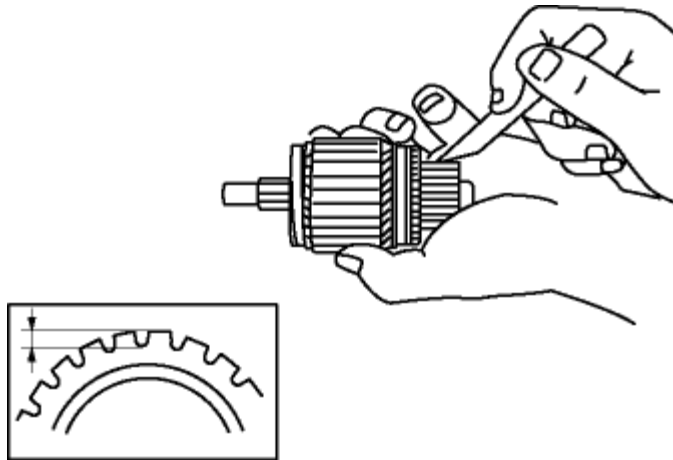


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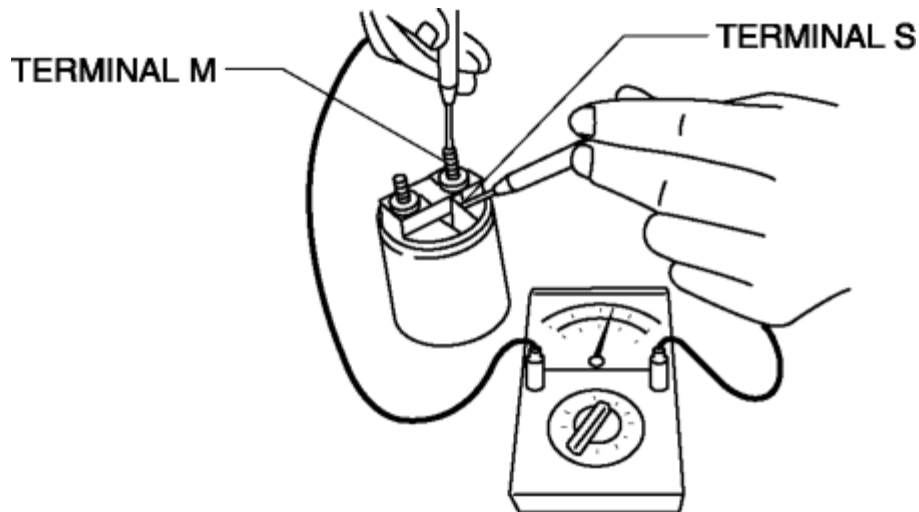
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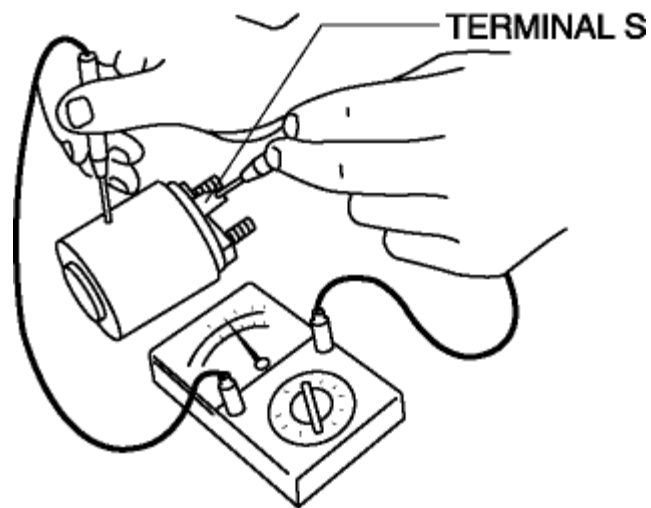
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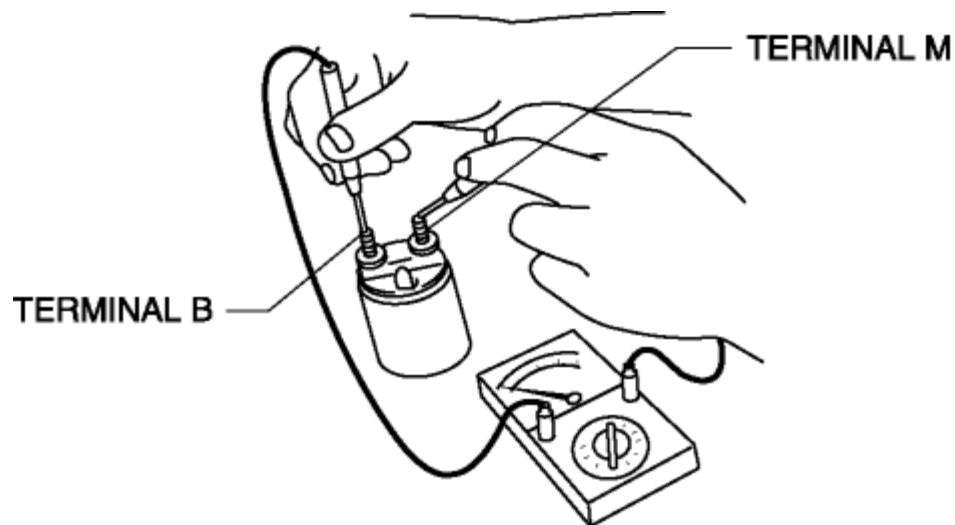
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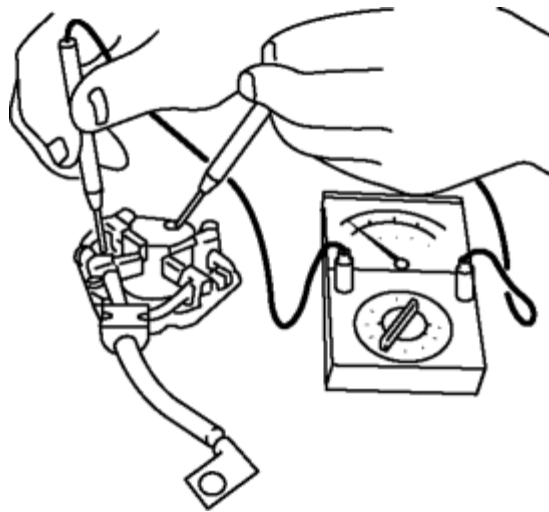
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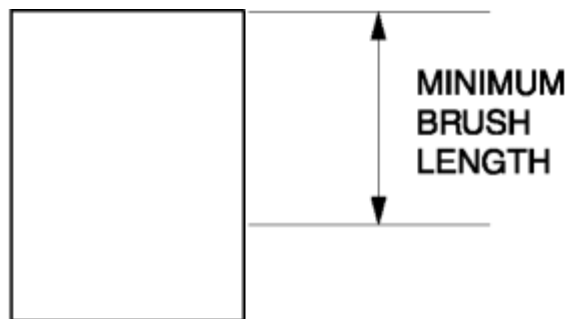
Brush and brush holder

1. Verify that there is no continuity between each insulated brush and plate using a tester.



- If there is continuity, replace the brush holder.

2. Measure the brush length.



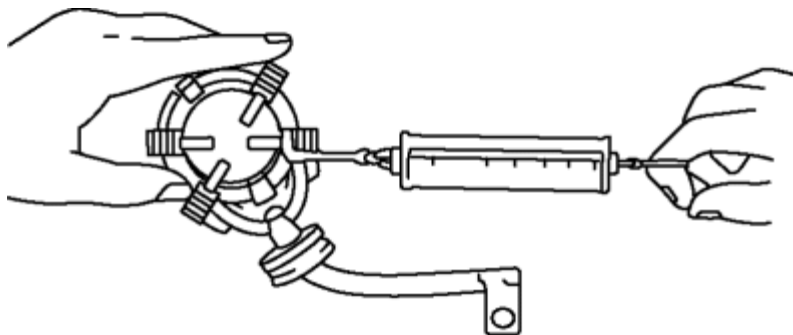
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