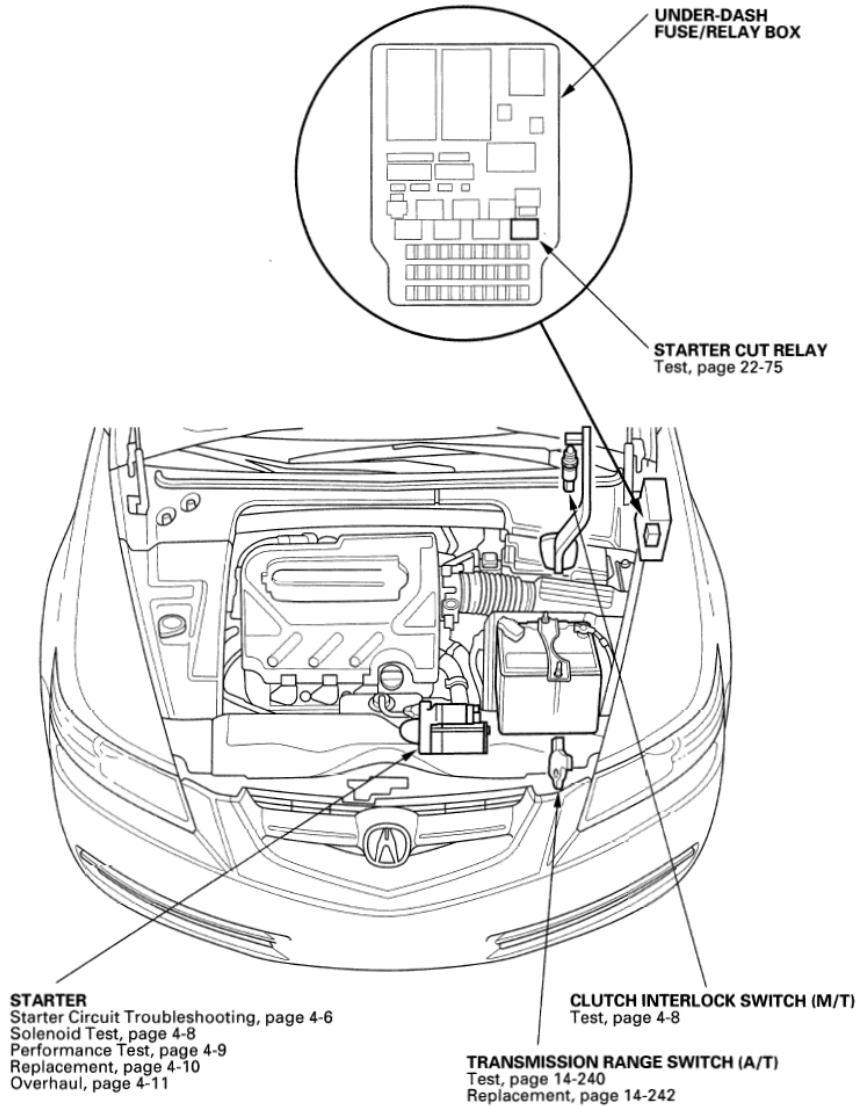


Starting System

Component Location Index

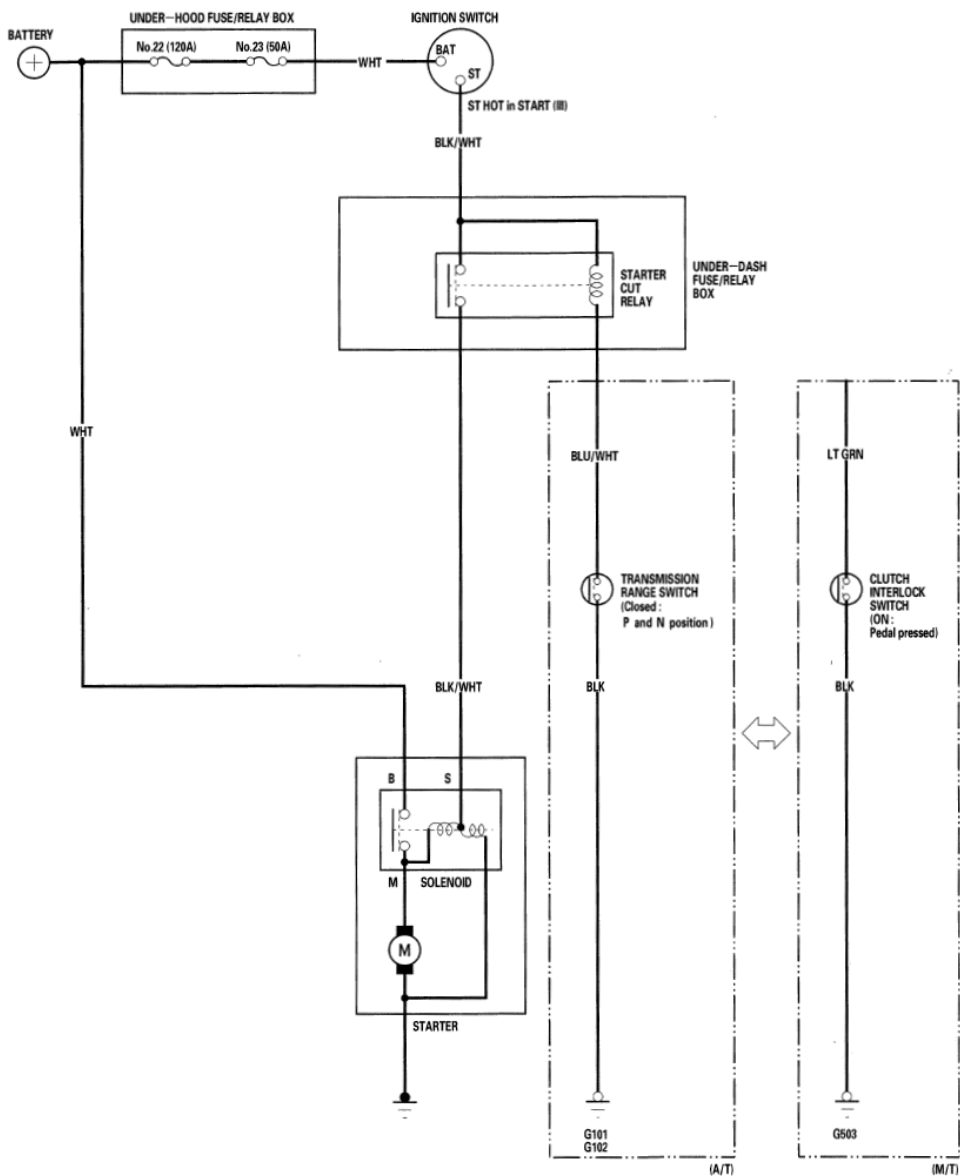


Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Engine does not start (does not crank)	<ol style="list-style-type: none"> 1. Check for loose battery terminals or connections. 2. Test the battery for a low charge (see page 22-74). 3. Check the starter (see page 4-6). 4. Check the starter cut relay (see page 22-75). 5. Check the transmission range switch (A/T) (see page 14-240). 6. Check the clutch interlock switch (M/T) (see page 4-8). 7. Check the ignition switch or wire (see page 22-77). 	<ul style="list-style-type: none"> • Poor ground at G101, G102 (A/T) or G503 (M/T)
Engine cranks, but does not start	<ol style="list-style-type: none"> 1. Troubleshoot the immobilizer system (see page 22-325). 2. Test the fuel pump (see page 11-241). 3. Check for plugged or damaged fuel line (see page 11-249). 4. Check for plugged fuel filter (see page 11-256). 5. Check the throttle body (see page 11-272). 6. Check for PGM-FI DTC's. 7. Check for low engine compression (see page 6-6). 8. Check for damaged or broken timing belt. 	
Engine is hard to start	<ol style="list-style-type: none"> 1. Test the fuel pump (see page 11-241). 2. Check for plugged or damaged fuel line (see page 11-249). 3. Check for plugged fuel filter (see page 11-256). 4. Check for restricted three way catalytic converter (TWC) or exhaust system. 5. Check for PGM-FI DTC's. 	

LAUNCH

Circuit Diagram



Starter Circuit Troubleshooting

NOTE:

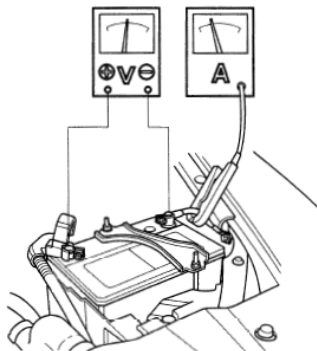
- Air temperature must be between 59° and 100°F (15° and 38°C) during this procedure.
- After this inspection, you must reset the engine control module (ECM)/powertrain control module (PCM), using the Honda Diagnostic System (HDS) (see page 11-4), otherwise the ECM/PCM will continue to stop the fuel injectors from operating.
- The battery must be in good condition and fully charged.

Recommended Procedure:

- Use a starter system tester.
- Connect and operate the equipment in accordance with the manufacturer's instructions.

Alternate Procedure

1. Remove the left side engine compartment cover (see step 3 on page 5-2).
2. Hook up the following equipment:
 - Ammeter, 0 – 400A
 - Voltmeter, 0 – 20 V (accurate within 0.1 volt)



3. Connect the HDS to the data link connector (DLC) (see step 2 on page 11-3).
4. Select PGM-FI, then INSPECTION, then ALL INJECTORS OFF function on the HDS.

5. With the shift lever in N or P (A/T) or clutch pedal pressed (M/T), turn the ignition switch to start (III).

Did the starter crank the engine normally?

YES—The starting system is OK. Go to step 12.

NO—Go to step 6.

6. Check the battery condition. Check electrical connections at the battery, the negative battery cable to body, the engine ground cables and the starter for looseness and corrosion. Then try cranking the engine again.

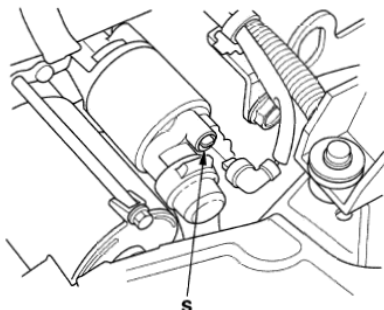
Did the starter crank the engine?

YES—Repairing the loose connection corrected the problem. The starting system is OK. Go to step 12.

NO—Check the following:

- If the starter will not crank the engine at all, go to step 7.
- If it cranks the engine erratically or too slowly, go to step 9.
- If it won't disengage from the flywheel or torque converter ring gear when you release the key, check the following:
 - Solenoid plunger and switch malfunction
 - Dirty drive gear or damaged overrunning clutch

7. Make sure the transmission is in neutral, then disconnect the BLK/WHT wire from the starter solenoid S terminal. Connect a jumper wire from the battery positive terminal to the solenoid terminal.



Did the starter crank the engine?

YES— Go to step 8.

NO— Remove the starter, and repair or replace as necessary. ■

8. Check the following items in the order listed until you find the open circuit:
- The BLK/WHT wire and connectors between the under-dash fuse/relay box and the ignition switch, and between the under-dash fuse/relay box and the starter.
 - The ignition switch (see page 22-77).
 - The transmission range switch and connector (A/T) (see page 14-240) or the clutch interlock switch and connector (M/T) (see page 4-8).
 - The starter cut relay (see page 22-75).

9. While cranking the engine, check the cranking voltage and current draw.

Is cranking voltage greater than or equal to 8.5 V and current draw less than or equal to 380A?

YES— Go to step 10.

NO— Replace the starter, or remove and disassemble it, and check the following: ■

- Starter armature dragging
- Shorted armature winding
- Excessive drag in engine

10. Check the engine speed while cranking the engine.

Is the engine speed above 100 rpm?

YES— Go to step 11.

NO— Replace the starter, or remove and disassemble it, and check the following: ■

- Open circuit in starter armature commutator segments
- Excessively worn starter brushes
- Open circuit in commutator brushes
- Dirty or damaged helical splines or drive gear
- Faulty drive gear clutch

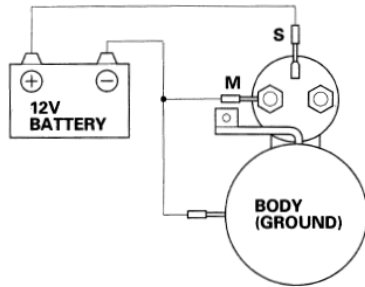
11. Remove the starter, and inspect its drive gear and the flywheel or torque converter ring gear for damage. Replace any damaged parts.

12. Select ECM/PCM reset (see page 11-4) to cancel the ALL INJECTORS OFF function on the HDS.

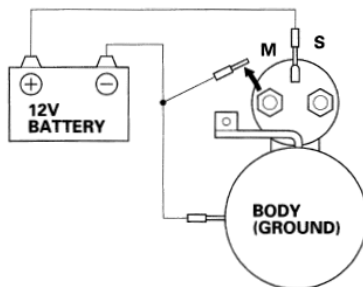
13. Reinstall the left side engine compartment cover (see step 68 on page 5-22).

Starter Performance Test

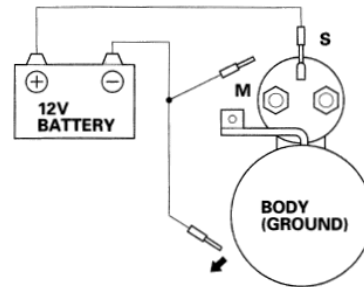
1. Disconnect the wire from the M terminal.
2. Make a connection as shown using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle). To avoid damaging the starter, never leave the battery connected for more than 10 seconds.
3. Connect the battery as shown. Be sure to disconnect the starter motor wire from the solenoid. If the starter pinion moves out, it is working properly.



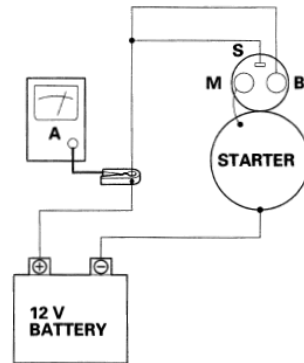
4. Disconnect the battery from the M terminal. If the pinion does not retract, the hold-in coil of the solenoid is working properly.



5. Disconnect the battery from the starter body. If the pinion retracts immediately, it is working properly.



6. Clamp the starter firmly in a vise.
7. Reconnect the wire to the M terminal.
8. Connect the starter to the battery as shown in the diagram, and confirm that the motor starts and keeps rotating.



9. If the electric current and motor speed meet the specifications when the battery voltage is at 11.5 V, the starter is working properly.

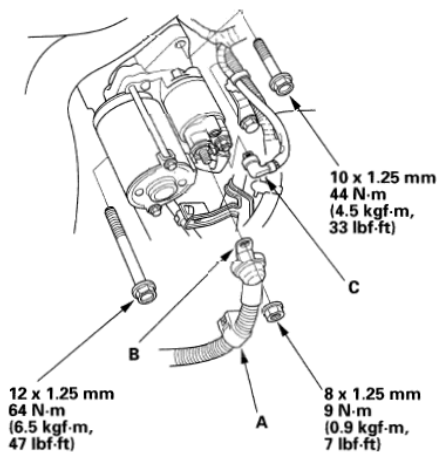
Specifications

Electric current: 80A or less

Motor speed: 2,600 rpm or more

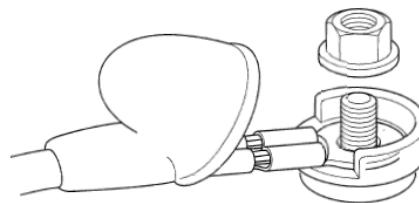
Starter Replacement

1. Make sure you have the anti-theft code for the radio, and the navigation system, then write down the XM radio channel presets. Make sure ignition switch OFF.
2. Remove the left side engine compartment cover (see step 3 on page 5-2).
3. Disconnect the negative cable from the battery first, then disconnect the positive cable.
4. Remove the battery hold-down bracket, then remove the battery and battery tray.
5. Remove the harness clamp (A).



6. Disconnect the starter cable (B) from the B terminal, then disconnect the BLK/WHT wire (C) from the S terminal.
7. Remove the two bolts holding the starter, then remove the starter.

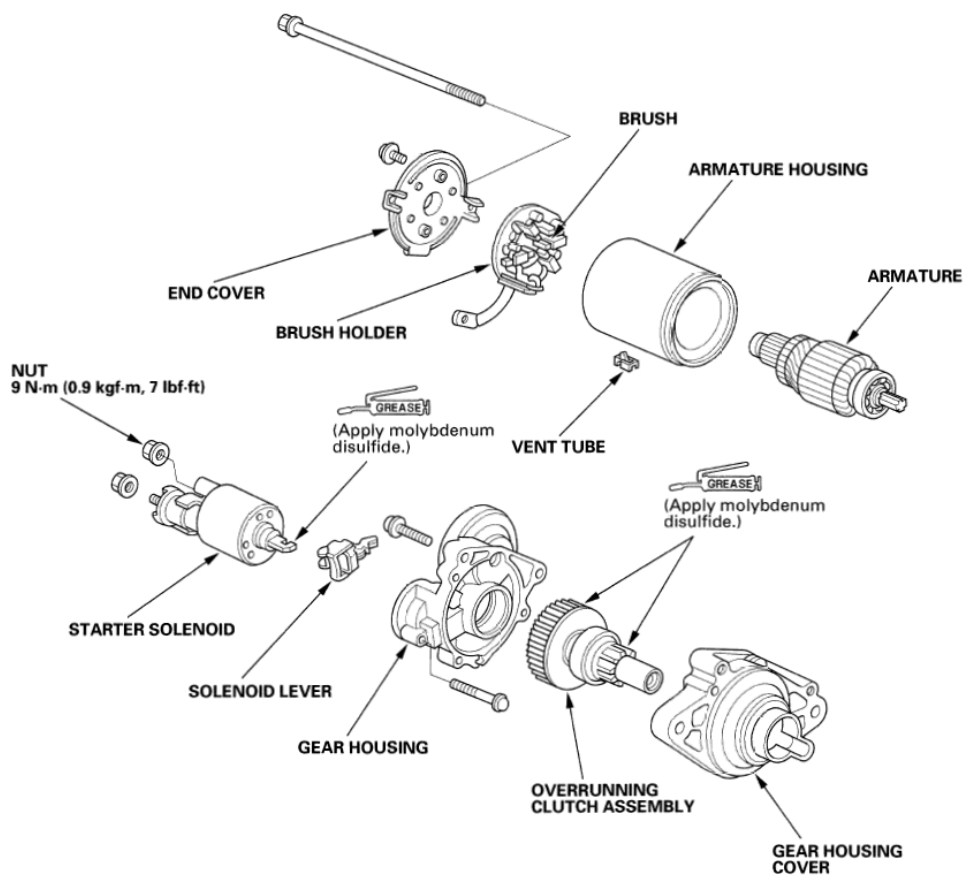
8. Install in the reverse order of removal. Make sure the crimped side of the ring terminal is facing out.



9. Connect the battery positive cable and negative cable to the battery.
10. Start the engine to make sure the starter works properly.
11. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's XM radio channel presets.
12. Set the clock.

Starter Overhaul

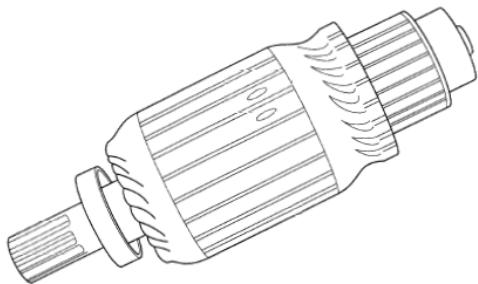
Disassembly/Reassembly



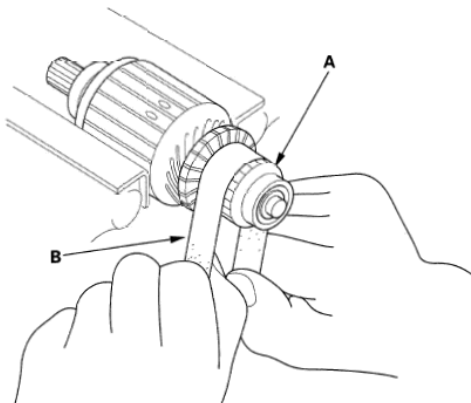
Starter Overhaul (cont'd)

Armature Inspection and Test

1. Remove the starter (see page 4-10).
2. Disassemble the starter as shown at the beginning of this procedure.
3. Inspect the armature for wear or damage from contact with the permanent magnet. If there is wear or damage, replace the armature.



4. Check the commutator (A) surface. If the surface is dirty or burnt, resurface with emery cloth or a lathe within the following specifications, or recondition with # 500 or # 600 sandpaper (B).

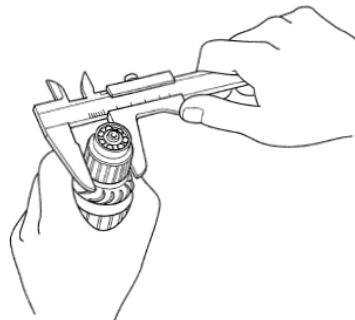


5. Check the commutator diameter. If the diameter is below the service limit, replace the armature.

Commutator Diameter

Standard (New): 28.0–28.1 mm (1.102–1.106 in.)

Service Limit: 27.5 mm (1.083 in.)



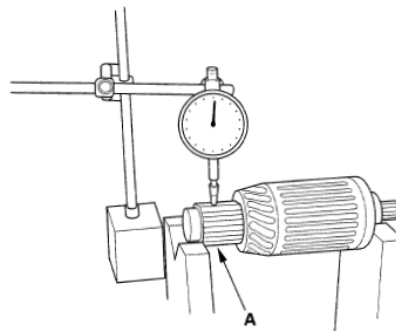
6. Measure the commutator (A) runout.

- If the commutator runout is within the service limit, check the commutator for carbon dust or brass chips between the segments.
- If the commutator runout is not within the service limit, replace the armature.

Commutator Runout

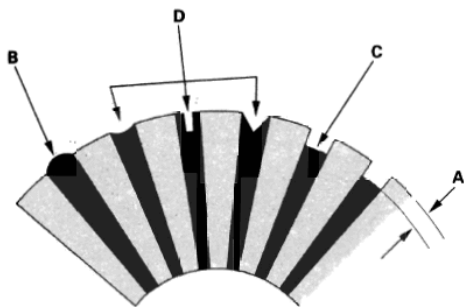
Standard (New): 0.02 mm (0.001 in.) max.

Service Limit: 0.05 mm (0.002 in.)

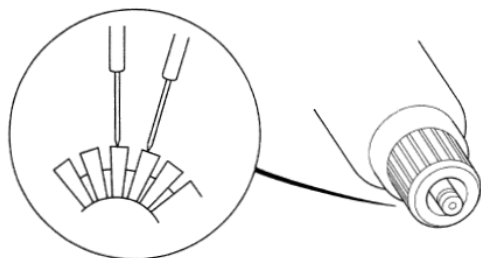


7. Check the mica depth (A). If the mica is too high (B), undercut the mica with a hacksaw blade to the proper depth. Cut away all the mica (C) between the commutator segments. The undercut should not be too shallow, too narrow, or V-shaped (D).

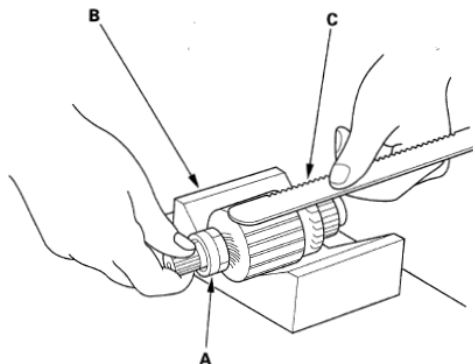
Commutator Mica Depth
Standard (New): 0.4–0.5 mm (0.016–0.020 in.)
Service Limit: 0.15 mm (0.006 in.)



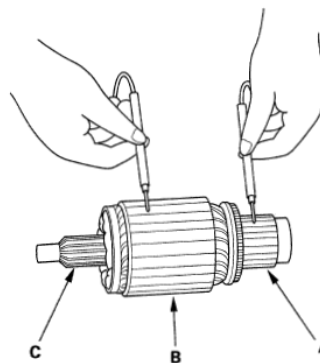
8. Check for continuity between the segments of the commutator. If an open circuit exists between any segments, replace the armature.



9. Place the armature (A) on an armature tester (B). Hold a hacksaw blade (C) on the armature core. If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.



10. Check with an ohmmeter that no continuity exists between the commutator (A) and armature coil core (B), and between the commutator and armature shaft (C). If continuity exists, replace the armature.



Starter Overhaul (cont'd)

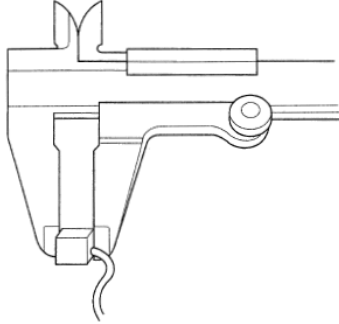
Starter Brush Inspection

11. Measure the brush length. If it is not within the service limit, replace the brush holder assembly.

Brush Length

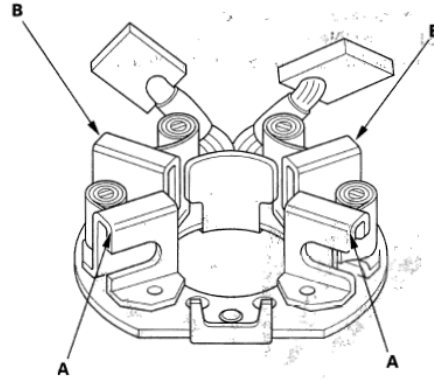
Standard (New): 15.8 – 16.2 mm (0.62 – 0.64 in.)

Service Limit: 11.0 mm (0.43 in.)



Starter Brush Holder Test

12. Check that there is no continuity between the (+) brush holder (A) and (-) brush holder (B). If there is continuity, replace the brush holder assembly.

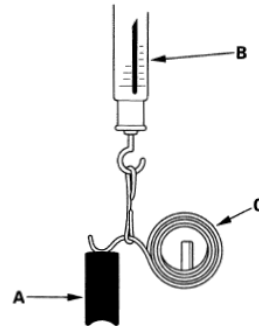


Brush Spring Inspection

13. Insert the brush (A) into the brush holder, and bring the brush into contact with the commutator, then attach a spring scale (B) to the spring (C). Measure the spring tension at the moment the spring lifts off the brush. If the spring tension is not within specification, replace the spring.

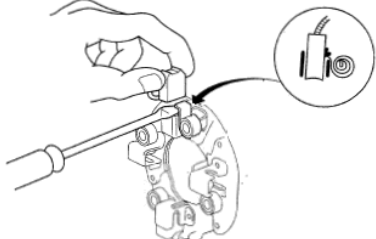
Spring Tension:

15.7 – 17.7 N (1.60 – 1.80 kgf, 3.53 – 3.97 lbf)

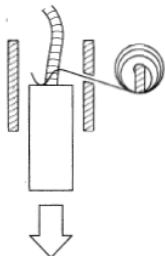


14. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.

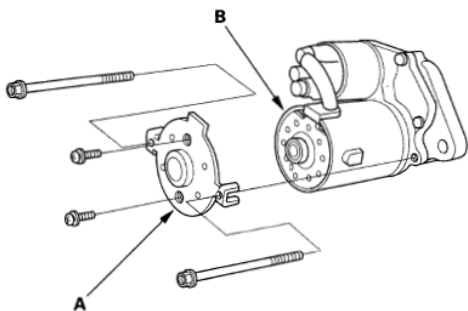
NOTE: To seat new brushes, slip a strip of # 500 or # 600 sandpaper, with the grit side up, between the commutator and each brush, and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.



15. Install the armature in the housing. Next, pry back each brush spring again, and push the brush down until it seats against the commutator, then release the spring against the end of the brush.



16. Install the starter end cover (A) to retain the brush holder (B).



Overrunning Clutch Inspection

17. Slide the overrunning clutch along the shaft. Replace it if it does not slide smoothly.
18. Rotate the overrunning clutch (A) both ways. If it does not lock in either direction or it locks in both directions, replace it.



19. If the starter drive gear (B) is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.

NOTE: Check the condition of the torque converter ring gear to see if the teeth are damaged.

20. Reassemble the starter in the reverse order of disassembly.