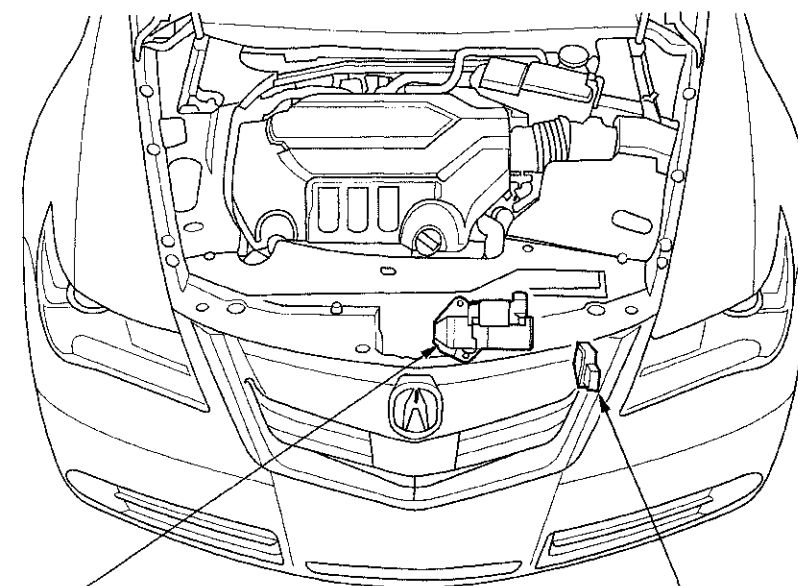
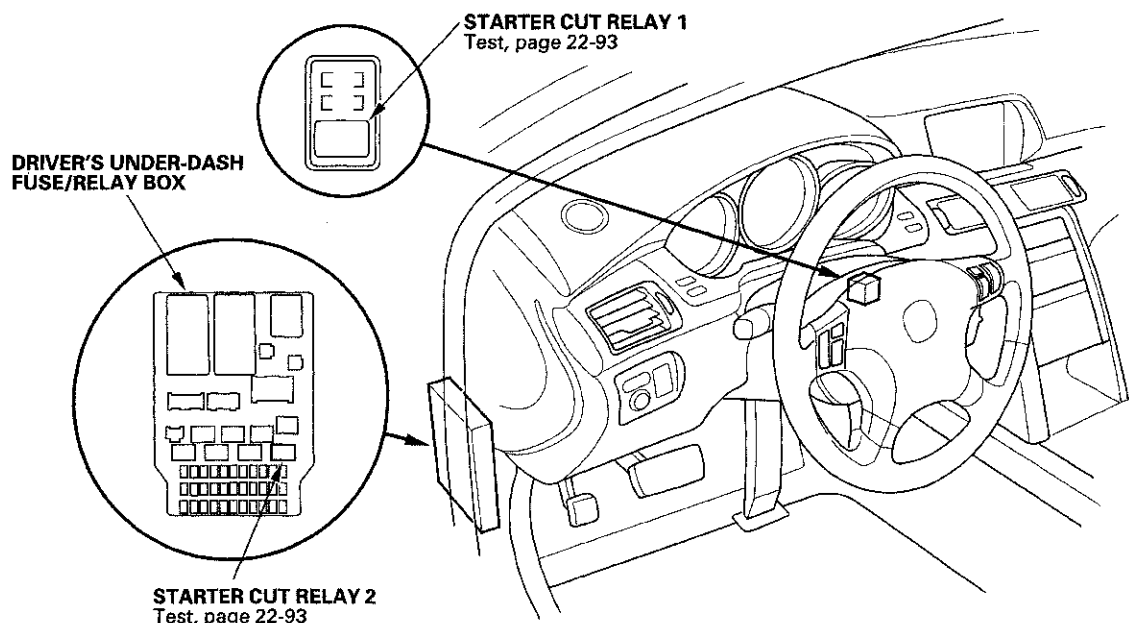


Starting System



Component Location Index



STARTER
Starter System Circuit Troubleshooting, page 4-6
Performance Test, page 4-9
Removal and Installation, page 4-10
Overhaul, page 4-12

TRANSMISSION RANGE SWITCH
Test, page 14-244
Replacement, page 14-245

Starting System

Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Engine does not start (does not crank)	1. Check for loose battery terminals or connections. 2. Test the battery for a low state of charge (see page 22-90). 3. Check the starter (see page 4-6). 4. Check the starter cut relay 1 and starter cut relay 2 (see page 22-93). 5. Check the transmission range switch (see page 14-244). 6. Check the ignition switch or wire (see page 22-100).	Poor ground at G101, G102
Engine cranks, but does not start	1. Check for PGM-FI DTCs (see page 11-3). 2. Check the fuel pressure (see page 11-335). 3. Check for a plugged or damaged fuel line (see page 11-338). 4. Check for a plugged fuel filter (see page 11-348). 5. Check the throttle body (see page 11-365). 6. Check for low engine compression (see page 6-7). 7. Check for a damaged or broken timing belt. 8. Do the powertrain control module (PCM) reset function with the Honda Diagnostic System (HDS) to cancel the ALL INJECTORS STOP function.	
Engine is hard to start	1. Check for PGM-FI DTCs (see page 11-3). 2. Check the fuel pressure (see page 11-335). 3. Check for a plugged or damaged fuel line (see page 11-338). 4. Check for a plugged fuel filter (see page 11-348).	
Engine cranks slowly	1. Check for loose battery terminals or connections. 2. Test the battery for a low state of charge (see page 22-90). 3. Check the starter for binding (see page 4-12). 4. Check for excessive drag in the engine.	
Multi-information display warning CHECK STARTING SYSTEM	Check for PGM-FI DTCs (see page 11-3).	



Starting System

Starter System Circuit Troubleshooting

Special Tools Required

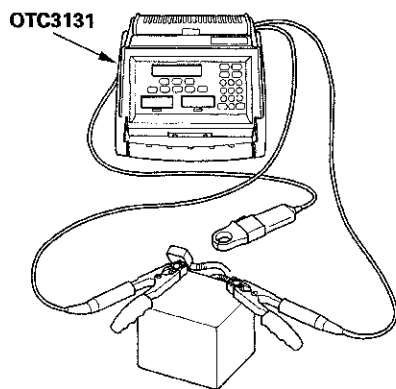
Alternator, Regulator, Battery & Starter tester OTC3131
Available through the Acura Tool and Equipment
Program 888-424-6857

NOTE:

- Air temperature must be within 59—100 °F (15—38 °C) during this procedure.
- After the inspection, you must reset the powertrain control module (PCM). Otherwise, the PCM will continue to stop the fuel injectors from operating.
- The battery must be in good condition, and fully charged.

1. Connect the alternator, regulator, battery & starter tester (OTC3131) to the battery as shown.

NOTE: The probe is not used for battery testing.



2. Do the BATTERY TEST.

Does the display indicate GOOD or LOW CHARGE?

YES—The battery is OK. Go to step 3.

NO—If the tester indicates **BAD BATTERY**, replace the battery, then retest. If the tester indicates **CHARGE & RETEST**, charge the battery, then retest.

3. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3).
4. Turn the ignition switch to ON (II).
5. Make sure the HDS communicates with the vehicle and the PCM. If it doesn't communicate, troubleshoot the DLC circuit (see page 11-211).
6. Select PGM-FI, INSPECTION, then ALL INJECTORS STOP on the HDS.
7. Set the parking brake, then with the shift lever in N or P, turn the ignition switch to START (III).

Does the starter crank the engine normally?

YES—The starting system is OK. Go to step 15.

NO—Go to step 8.

8. Turn the ignition switch to LOCK (0).
9. Check the electrical connections at the battery, the negative battery cable to the body, the engine ground cables, and the starter for looseness and corrosion. Then try cranking the engine again.

Does the starter crank the engine normally?

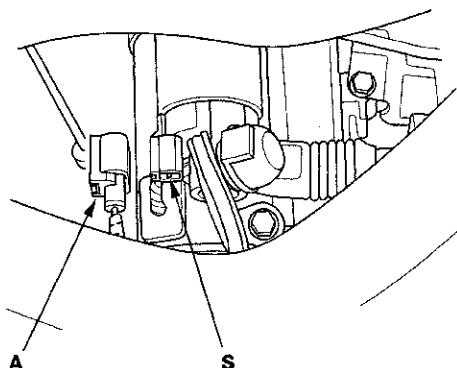
YES—Repairing the loose connection corrected the problem. The starting system is OK. Go to step 15.

NO—Based on the following symptoms, take the appropriate action:

- If the starter will not crank the engine at all, go to step 10.
- If the starter cranks the engine erratically or too slowly, go to step 12.
- If the starter will not disengage from the torque converter ring gear when you release the key, replace the starter, or remove and disassemble it, and check for the following: ■
 - Starter solenoid and switch malfunction.
 - Dirty drive gear or damaged overrunning clutch.



10. Make sure the shift lever is in N or P, then disconnect the BLK/WHT wire (A) from the starter S terminal. Connect a jumper wire from the battery positive terminal to the S terminal.



Does the starter crank the engine?

YES—Go to step 11.

NO—Remove the starter, then repair or replace (see page 4-10) it as necessary. ■

11. Check the following items in the order listed until you find the open or high resistance in the circuit:

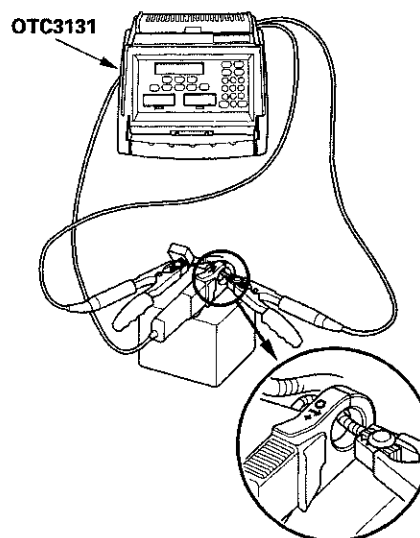
- The WHT wire and connectors between the auxiliary under-dash fuse/relay holder and the under-hood fuse/relay box.
- The RED wire and connectors between the driver's under-dash fuse/relay box and the auxiliary under-dash relay holder.
- The RED wire, BLK/WHT wire, and connectors between the driver's under-dash fuse/relay box and the starter.
- The ignition switch (see page 22-100).
- The transmission range switch and connector (see page 14-244).
- Starter cut relay 1 and the starter cut relay 2 (see page 22-93).

Are these items OK?

YES—Go to step 12.

NO—Repair or replace it, then go to step 12.

12. Connect alternator, regulator, battery & starter tester (OTC3131) to the battery.



13. Do the STARTING TEST.

Does the display indicate cranking voltage greater than or equal to 8.0 V and is the current draw less than or equal to 375 A?

YES—Go to step 14.

NO—Replace the starter, or remove and disassemble it, and check for these problems: ■

- Drag in the starter armature
- Short in the armature winding
- Excessive drag in the engine
- Open circuit in starter armature commutator segments
- Excessively worn starter brushes
- Open circuit in the starter brushes
- Dirty or damaged helical splines or drive gear
- Faulty over running clutch

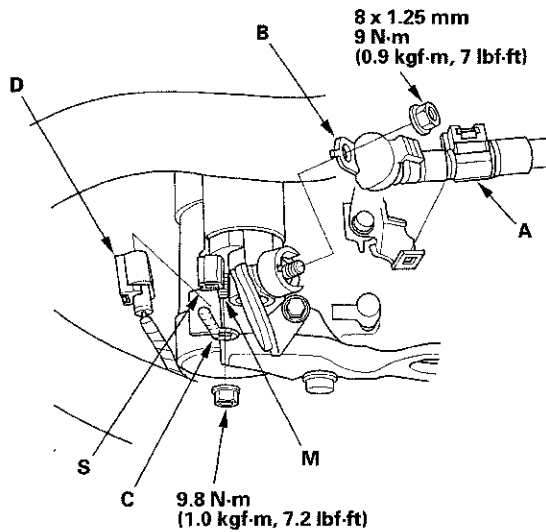
14. Remove the starter, and inspect its drive gear and the torque converter ring gear for damage. Replace any damaged parts.

15. Select PCM reset (see page 11-4) to cancel the ALL INJECTORS STOP on the HDS.

Starting System

Starter Solenoid Test

1. Do the battery terminal disconnection procedure (see page 22-91).
2. Remove the harness clamp (A), starter cable (B), and the motor cable (C), and disconnect BLK/WHT wire connector (D).



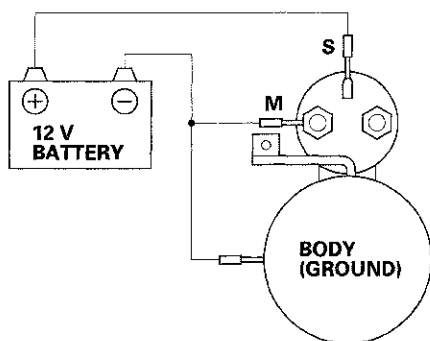
3. Check the hold-in coil for continuity between the S terminal and the armature housing (ground). There should be continuity.
 - If there is continuity, go to step 4.
 - If there is no continuity, replace the solenoid.
4. Check the pull-in coil for continuity between the S terminal and the M terminal. There should be continuity.
 - If there is continuity, the solenoid is OK.
 - If there is no continuity, replace the solenoid.
5. Install wire and the connector in the reverse order of removal.
6. Do the battery terminal reconnection procedure (see page 22-91).



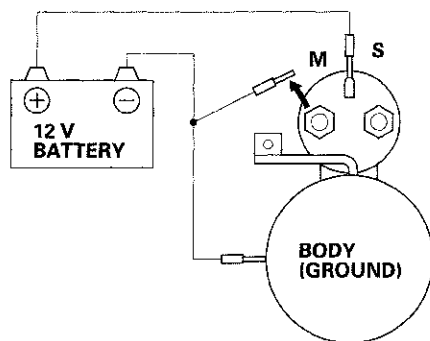
Starter Performance Test

1. Remove the starter (see page 4-10).
2. Clamp the starter firmly in a vise.
3. Disconnect the wire from the M terminal.
4. Make the connections for this test using the thickest (gauge) wire possible (preferably the same gauge as used on the vehicle).

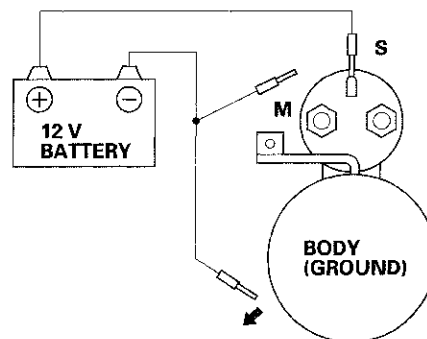
NOTE: To avoid damaging the starter, never leave the battery connected for more than 10 seconds.



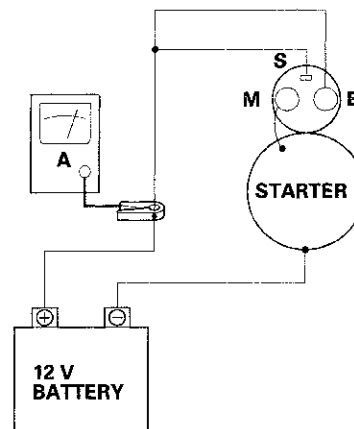
5. Connect the battery as shown. Make sure you disconnect the starter motor wire from the M terminal. If the starter pinion moves out, it is working properly.
6. Disconnect the battery from the M terminal. If the pinion does not retract, the hold-in coil of the solenoid is working properly.



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



8. Reconnect the wire to the M terminal.
9. Connect the starter to the battery as shown, and confirm that the motor runs.



10. If the electric current meets the specification when the battery voltage is at 11.5 V, the starter is working properly.

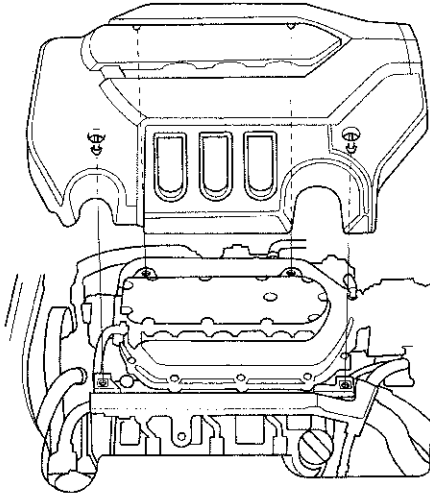
Specification
Electric Current: 90 A or less

Starting System

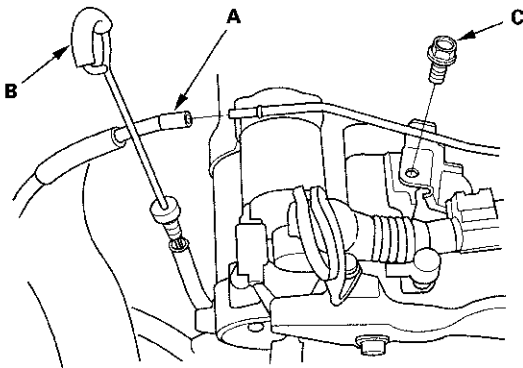
Starter Removal and Installation

Removal

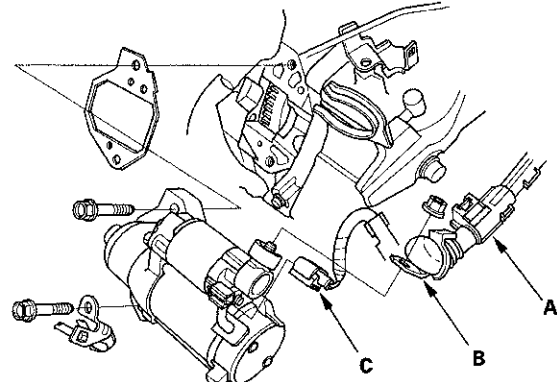
1. Do the battery terminal disconnection procedure (see page 22-91).
2. Remove the engine cover.



3. Remove the vacuum hose (A), transmission dipstick (B), and vacuum line mounting bolt (C).



4. Remove the harness clamp (A).

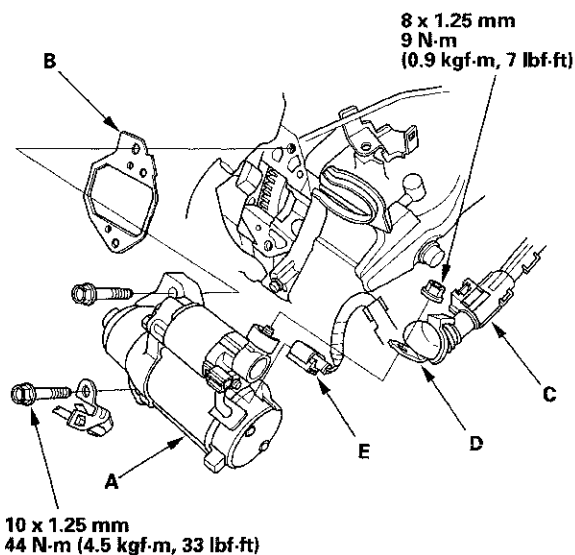


5. Disconnect the starter cable (B) from the B terminal, then disconnect the BLK/WHT wire (C) from the S terminal.
6. Remove the two bolts holding the starter, then remove the starter.

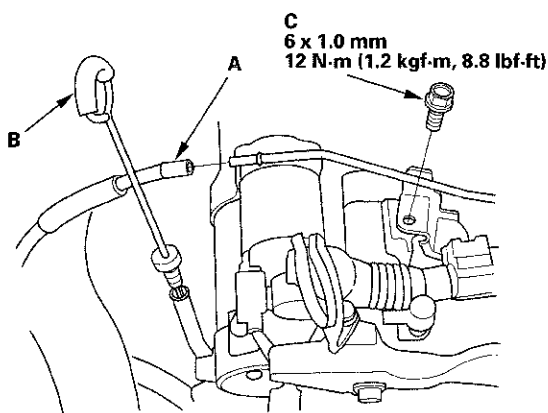


Installation

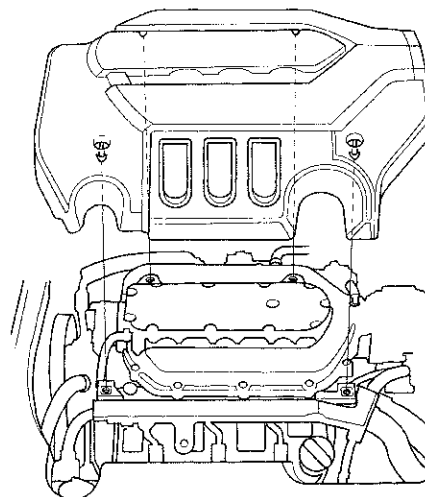
1. Install the starter (A) using a new gasket (B), then install the harness clamp (C), and connect the B terminal (D) and BLK/WHT wire (E). Make sure the crimped side of the B terminal faces away from the starter when you connect it.



2. Install the vacuum hose (A), transmission dipstick (B), and vacuum line mounting bolt (C).



3. Install the engine cover.

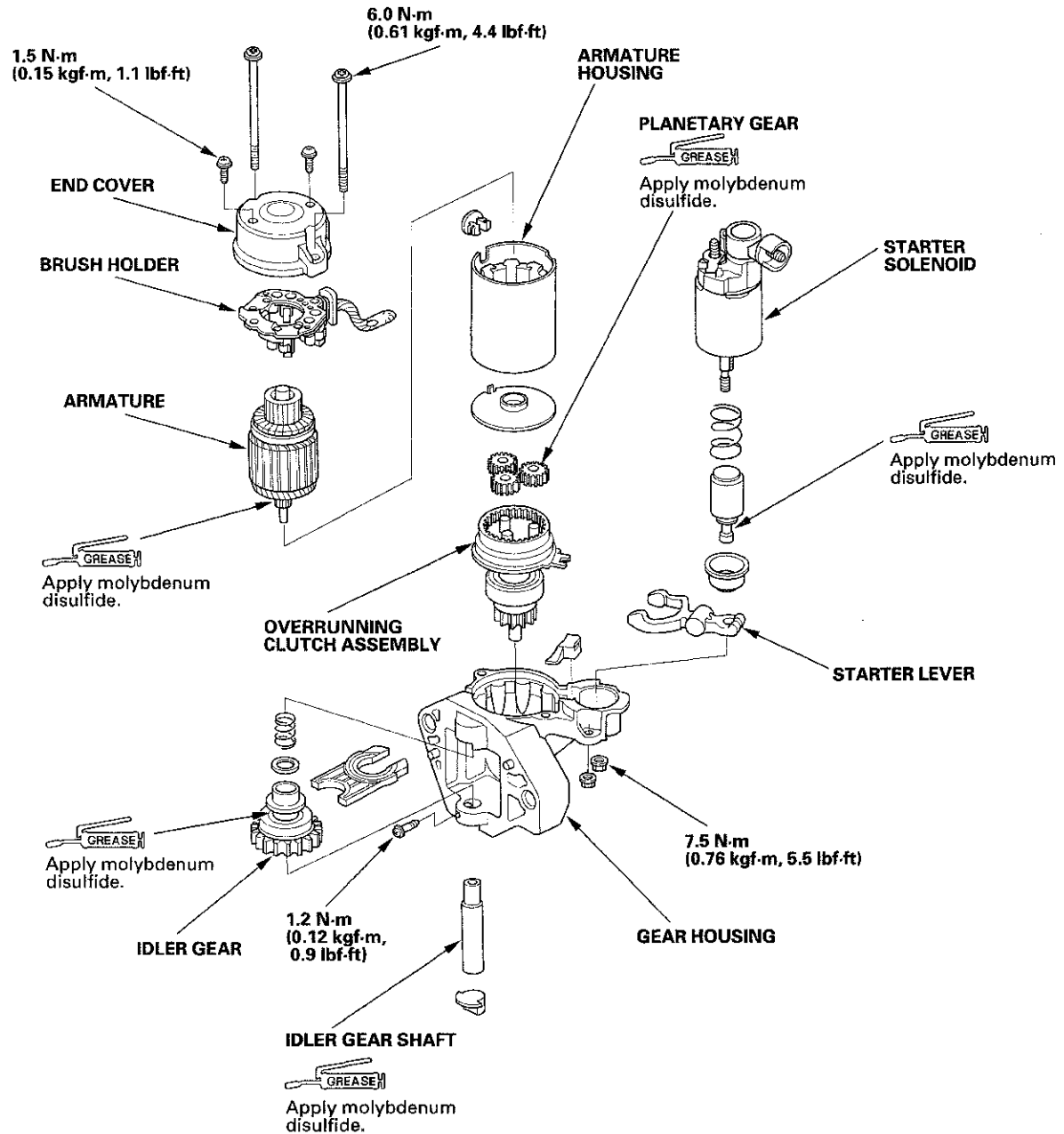


4. Do the battery terminal reconnection procedure (see page 22-91).
5. Start the engine to make sure the starter works properly.

Starting System

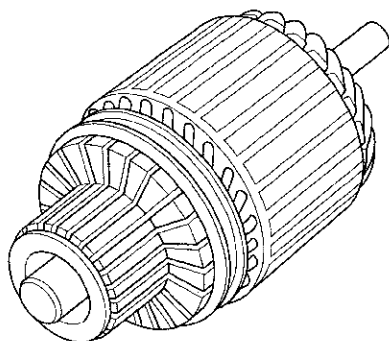
Starter Overhaul

Disassembly/Reassembly

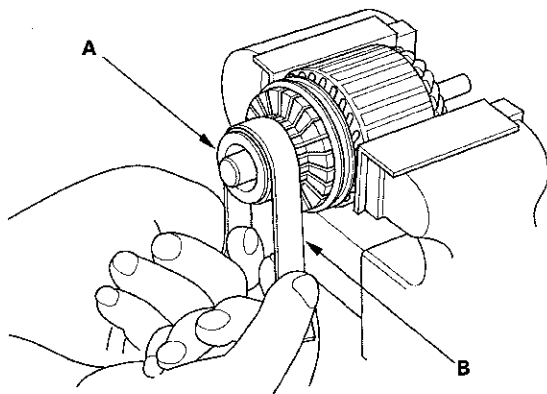


Armature Inspection and Test

1. Remove the starter (see page 4-10).
2. Disassemble the starter as shown in the Exploded View.
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 it with an emery cloth or a lathe to the specifications in step 5, or recondition with #500 or #600 sandpaper (B).

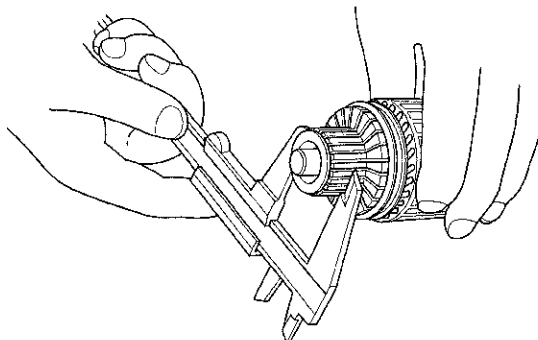


5. Check the commutator diameter. If the diameter is below the service limit, replace the armature.

Commutator Diameter

Standard (New): 28.9—29.0 mm (1.138—1.142 in)

Service Limit: 28.0 mm (0.711 in)



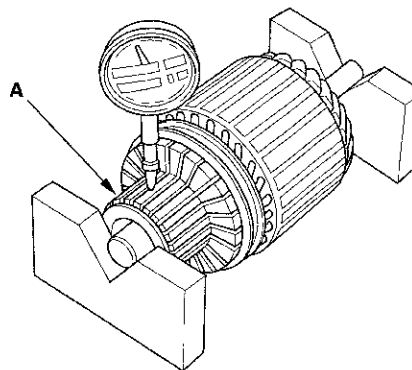
6. Measure the commutator (A) runout.

- 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 (0.0008 in) max.

Service Limit: 0.05 mm (0.002 in)



(cont'd)

Starting System

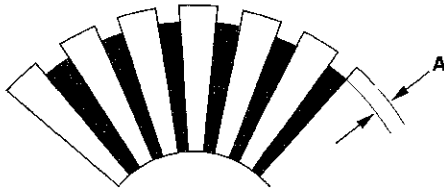
Starter Overhaul (cont'd)

7. Use a digital caliper or dial caliper to check the mica depth (A). If the mica depth is below the service limit, replace the armature.

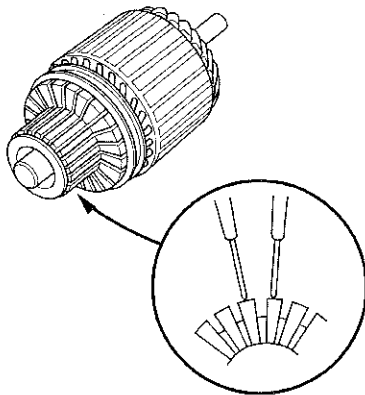
Commutator Mica Depth

Standard (New): 0.50—0.90 mm (0.020—0.035 in)

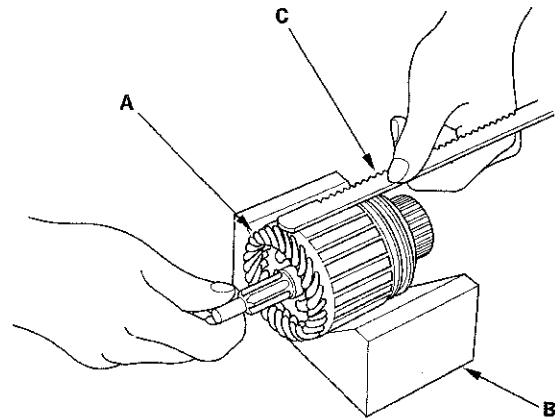
Service Limit: 0.20 mm (0.008 in)



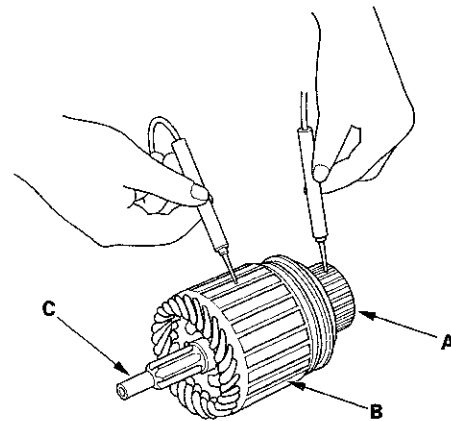
8. Check for continuity between the segments of the commutator. If there is an open circuit between any segments, replace the armature.



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.

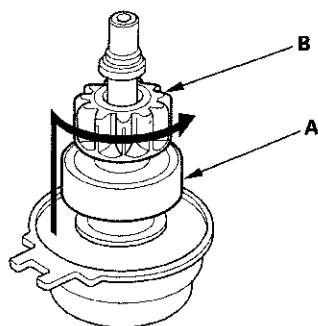


10. Use an ohmmeter to check for continuity between the commutator (A) and the armature coil core (B), and between the commutator and the armature shaft (C). If there is continuity, replace the armature.



Overrunning Clutch Inspection

11. Slide the overrunning clutch (A) along the shaft. Replace it if it does not slide smoothly.



12. Hold the drive gear (B), and turn the overrunning clutch in the direction shown to make sure it turns freely. Also make sure the overrunning clutch locks in the opposite direction. If it does not lock, replace the overrunning clutch assembly.
13. If the starter drive gear is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately. Check the condition of the torque converter ring gear. Replace it if the starter drive gear teeth are damaged.

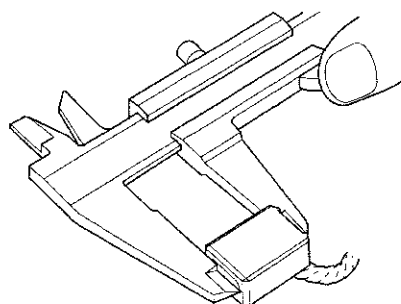
Starter Brush Inspection

14. Measure the brush length. If it is shorter than the service limit, replace the brush holder assembly.

Brush Length

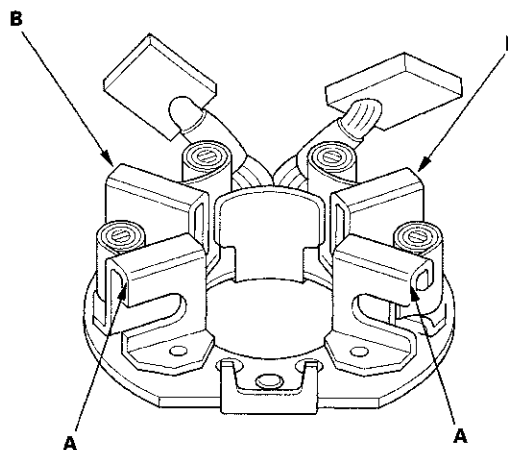
Standard (New): 15.0—16.0 mm (0.59—0.63 in)

Service Limit: 9.0 mm (0.35 in)



Starter Brush Holder Test

15. Check for continuity between the (+) brush holders (A) and (–) brush holders (B). If there is continuity, replace the brush holder assembly.



(cont'd)

Starting System

Starter Overhaul (cont'd)

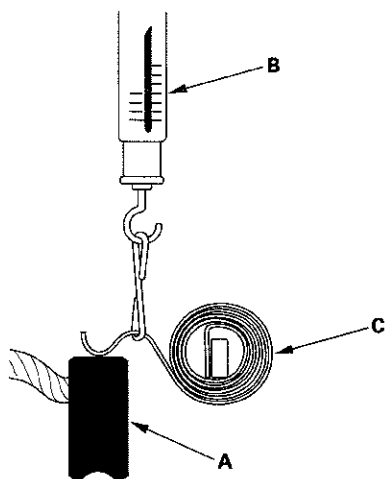
Brush Spring Inspection

16. 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 it is not within the standard, replace the brush holder assembly.

Spring Tension

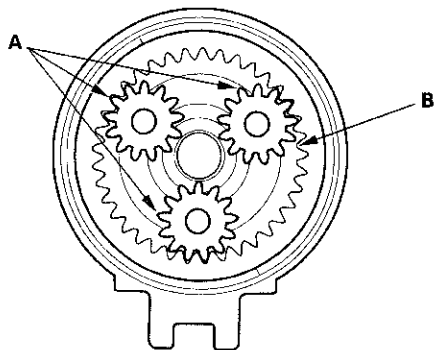
Standard (New): 22.3—27.3 N

(2.27—2.78 kgf, 5.00—6.13 lbf)



Planetary Gear Inspection

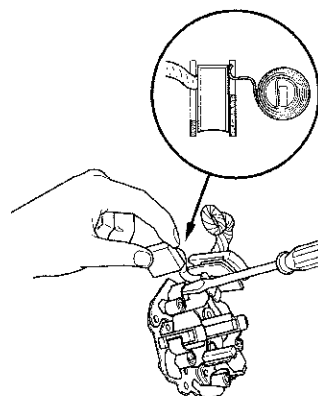
17. Check the planetary gears (A) and internal ring gear (B). Replace them if they are worn or damaged.



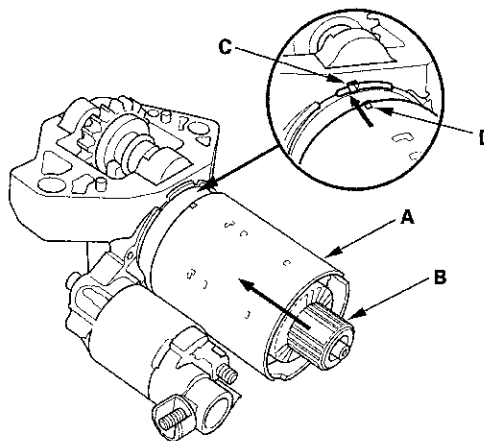
Starter Reassembly

18. Pry back each brush spring with a screwdriver, then position the brush on the brush holder about halfway out of its holder. Release the spring to hold it in place.

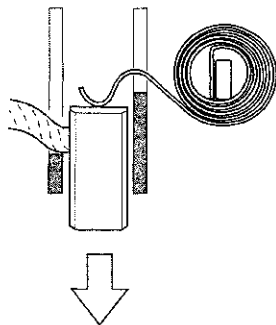
NOTE: To seat the new brushes. Slip a strip of #500 or #600 sandpaper, with the grit side up, between the commutator and the each brush, and smoothly turn the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.



19. Install the armature housing (A) and the armature (B) by aligning the slotted point (C) to the projection (D).



20. Install the brush holder. Next pry back each brush spring again, and push each brush down until it seats against the commutator, then release the spring against the end of the brush.



21. Install the end cover to retain the brush holder.

