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Engine Electrical

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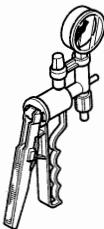
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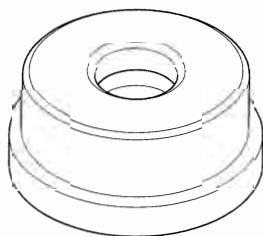
Engine Electrical

Special Tools

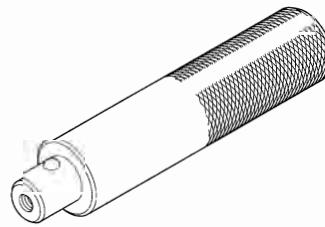
Ref. No.	Tool Number	Description	Qty
①	A973X-041-XXXXX	Vacuum Pump/Gauge, 0–30 in.Hg	1
②	07746-0010300	Attachment, 42 x 47 mm	1
③	07749-0010000	Driver	1



①



②

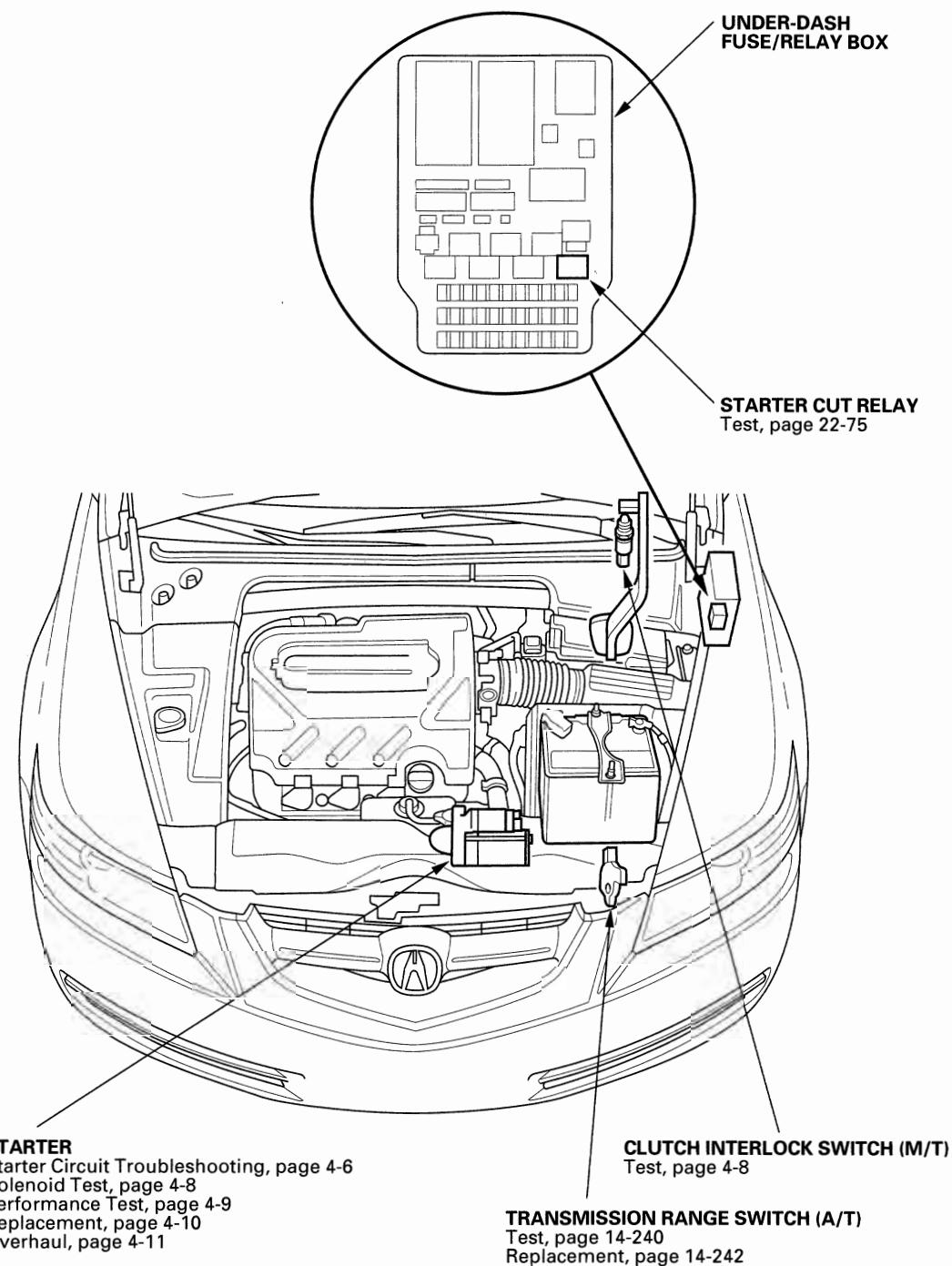


③



Starting System

Component Location Index



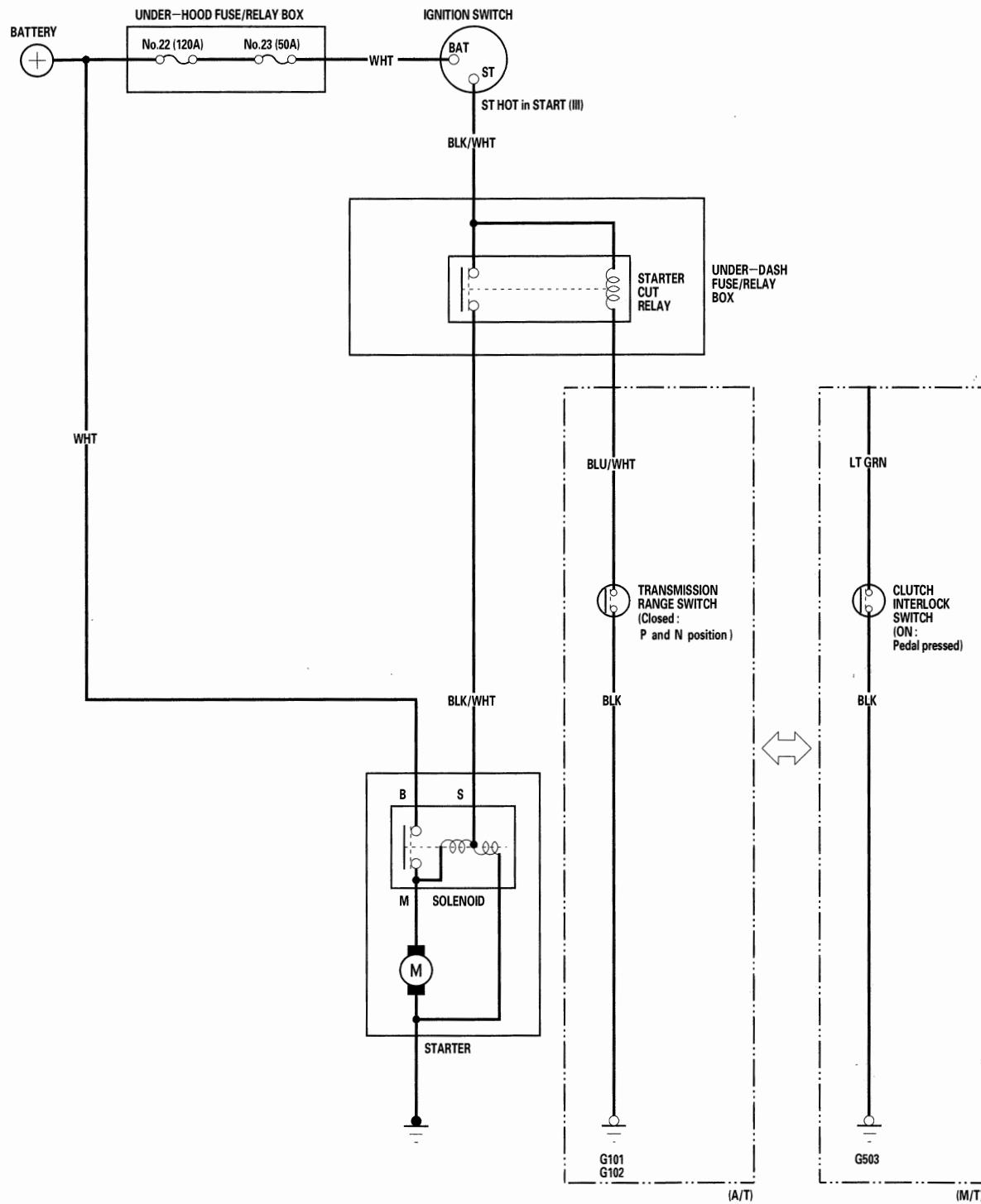
Starting System

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.	



Circuit Diagram



Starting System

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.

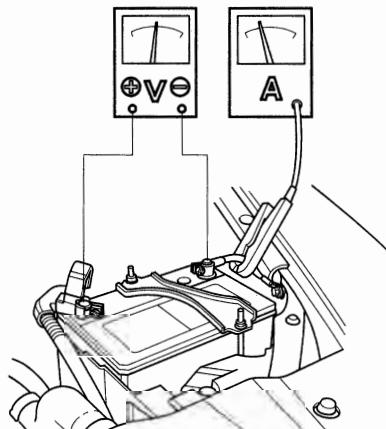
Recommended Procedure:

- 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.

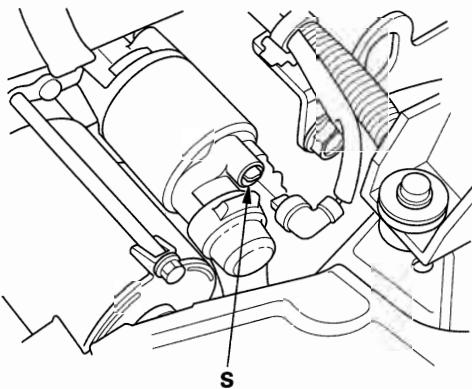
Did the starter crank the engine?

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.

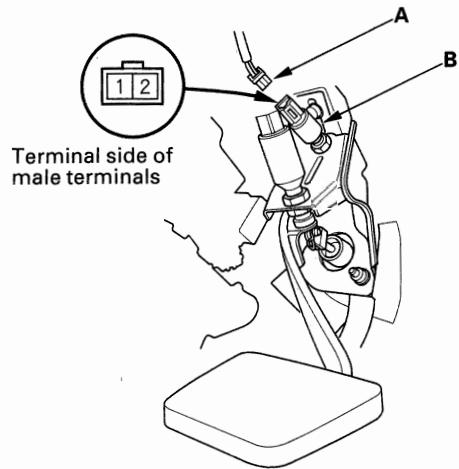
12. Select ECM/PCM reset (see page 11-4) to cancel the ALL INJECTORS OFF function on the HDS.

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

Starting System

Clutch Interlock Switch Test

1. Disconnect the clutch interlock switch 2P connector (A).

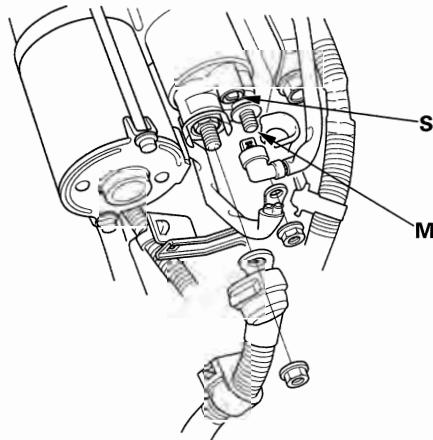


2. Remove the clutch interlock switch (B).
3. Check for continuity between the terminals according to the table.
 - If the continuity is not as specified, replace the clutch interlock switch.
 - If OK, install clutch interlock switch and adjust the pedal height (see page 12-6).

Terminal	1	2
Clutch Interlock Switch		
PRESSED	○	○
RELEASED		

Starter Solenoid Test

1. 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 2.
 - If there is no continuity, replace the solenoid.

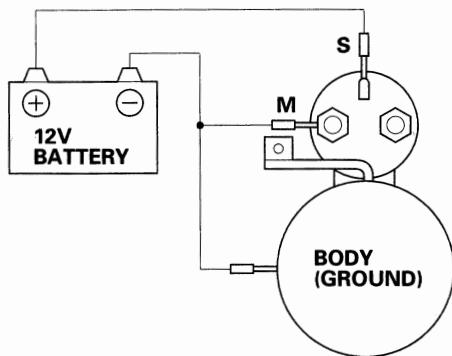


2. Check the pull-in coil for continuity between the S terminal and M terminal. There should be continuity.
 - If there is continuity, the solenoid is OK.
 - If there is no continuity, replace the solenoid.

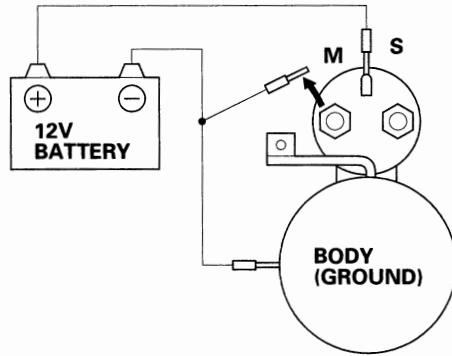


Starter Performance Test

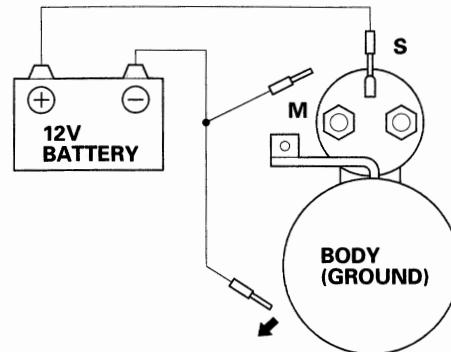
1. Disconnect the wire from the M terminal.
2. Make a connection as shown using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle). To avoid damaging the starter, never leave the battery connected for more than 10 seconds.
3. Connect the battery as shown. Be sure to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



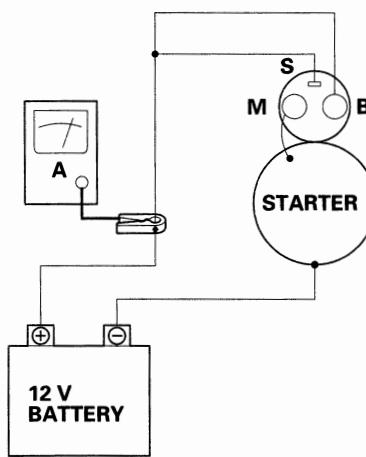
4. Disconnect the battery from the M terminal. If the pinion does not retract, the hold-in coil of the solenoid is working properly.



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

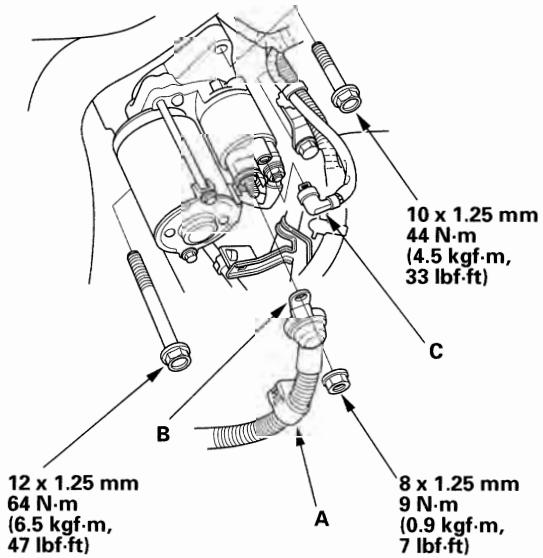
Electric current: 80A or less

Motor speed: 2,600 rpm or more

Starting System

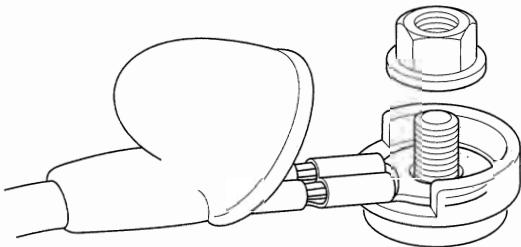
Starter Replacement

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).

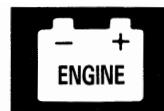


6. Disconnect the starter cable (B) from the B terminal, then disconnect the BLK/WHT wire (C) from the S terminal.
7. Remove the two bolts holding the starter, then remove the starter.

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

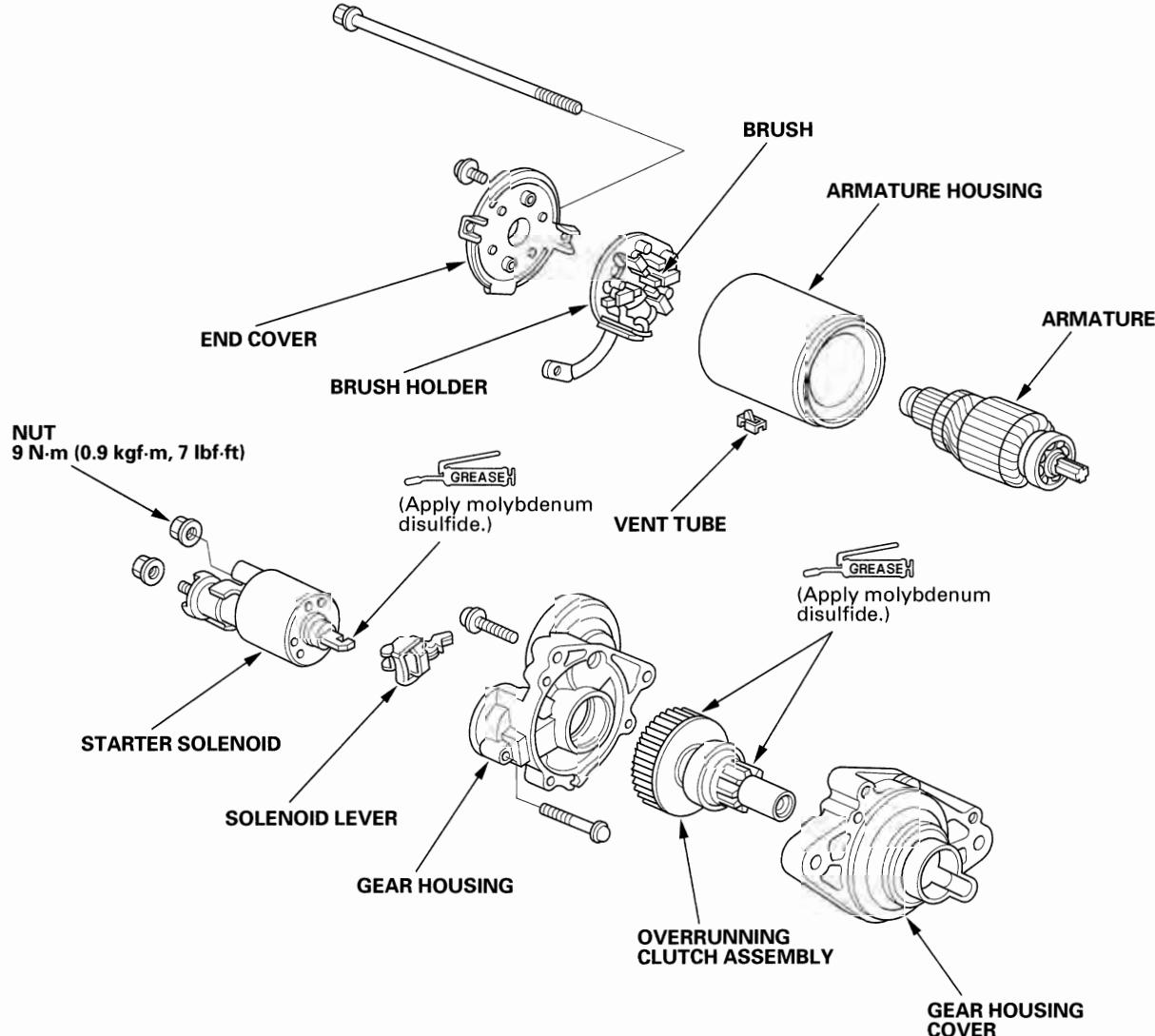


9. Connect the battery positive cable and negative cable to the battery.
10. Start the engine to make sure the starter works properly.
11. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's XM radio channel presets.
12. Set the clock.



Starter Overhaul

Disassembly/Reassembly



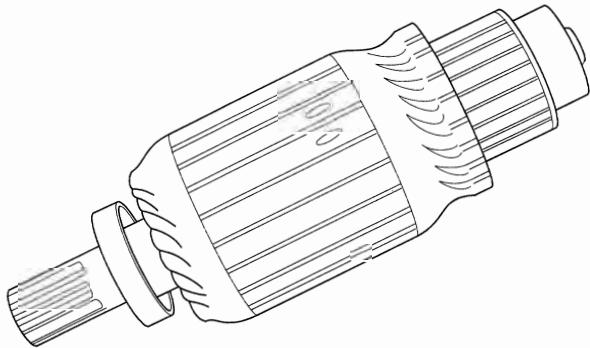
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Starting System

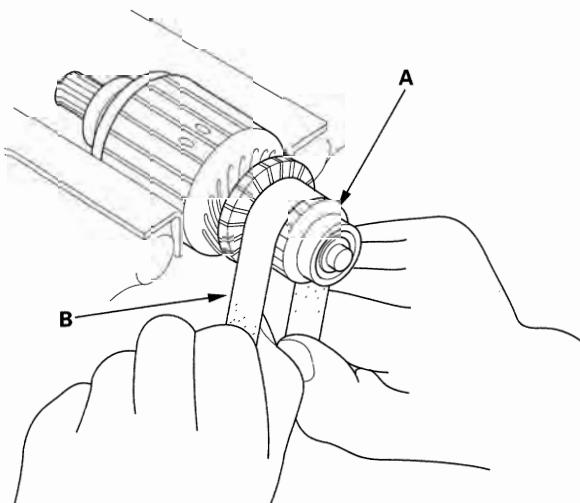
Starter Overhaul (cont'd)

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.



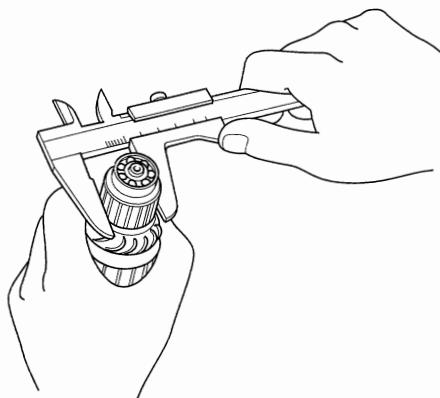
4. Check the commutator (A) surface. If the surface is dirty or burnt, resurface with emery cloth or a lathe within the following specifications, or recondition with # 500 or # 600 sandpaper (B).



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.)

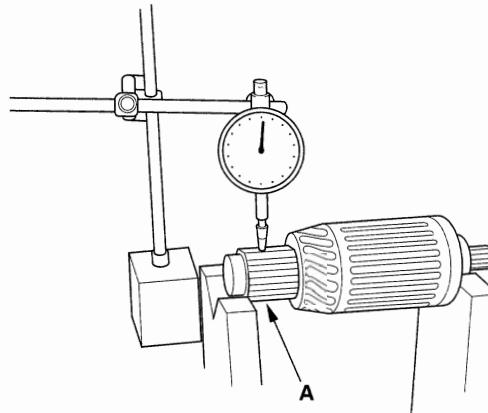


6. Measure the commutator (A) runout.

- 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

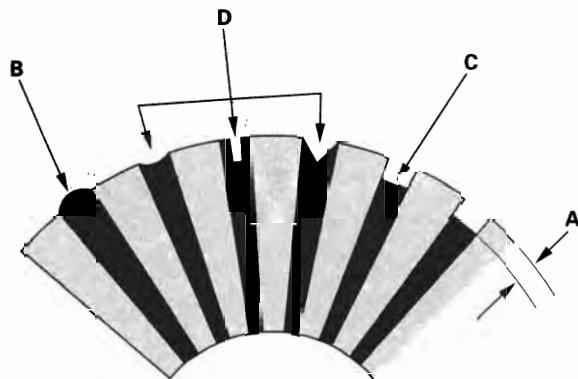
Standard (New): 0.02 mm (0.001 in.) max.
Service Limit: 0.05 mm (0.002 in.)



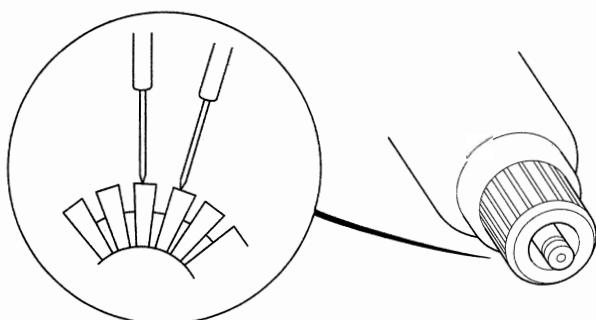
7. Check the mica depth (A). If the mica is too high (B), undercut the mica with a hacksaw blade to the proper depth. Cut away all the mica (C) between the commutator segments. The undercut should not be too shallow, too narrow, or V-shaped (D).

Commutator Mica Depth

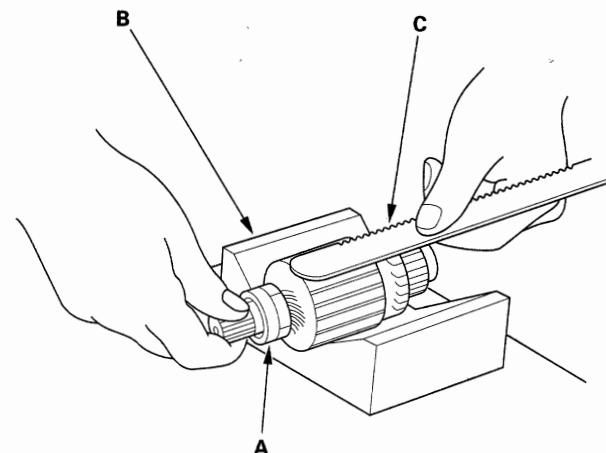
Standard (New): 0.4–0.5 mm (0.016–0.020 in.)
Service Limit: 0.15 mm (0.006 in.)



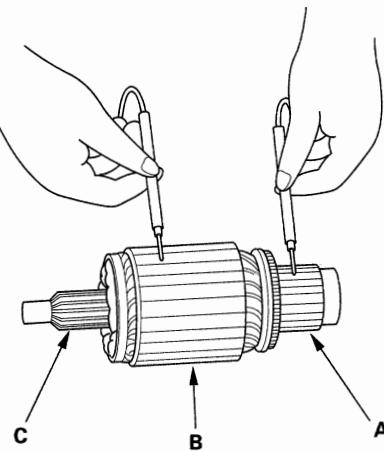
8. Check for continuity between the segments of the commutator. If an open circuit exists between any segments, replace the armature.



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.



(cont'd)

Starting System

Starter Overhaul (cont'd)

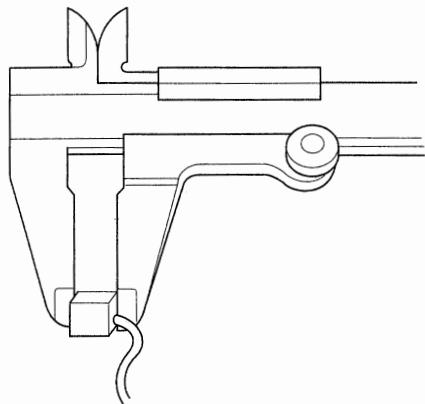
Starter Brush Inspection

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

Brush Length

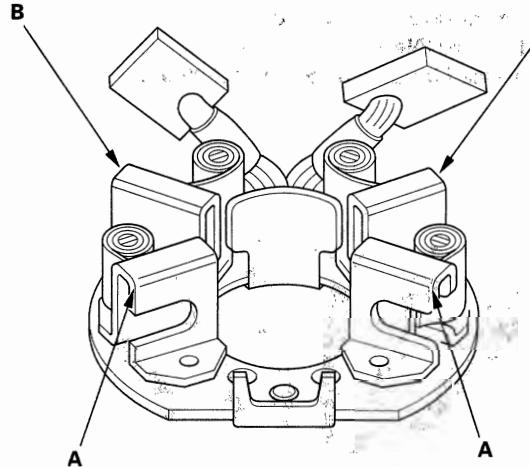
Standard (New): 15.8–16.2 mm (0.62–0.64 in.)

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.

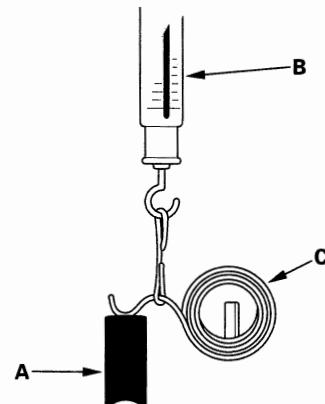


Brush Spring Inspection

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:

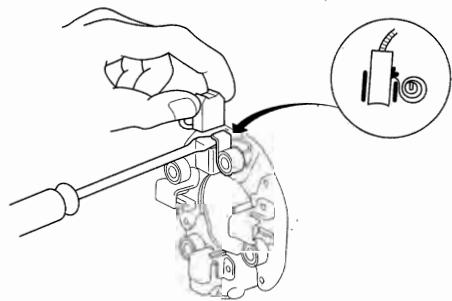
15.7–17.7 N (1.60–1.80 kgf, 3.53–3.97 lbf)



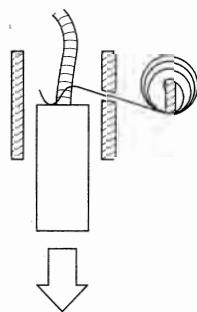


14. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.

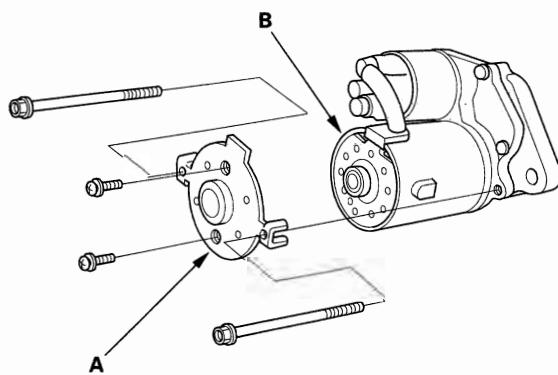
NOTE: To seat new brushes, slip a strip of # 500 or # 600 sandpaper, with the grit side up, between the commutator and each brush, and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.



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.



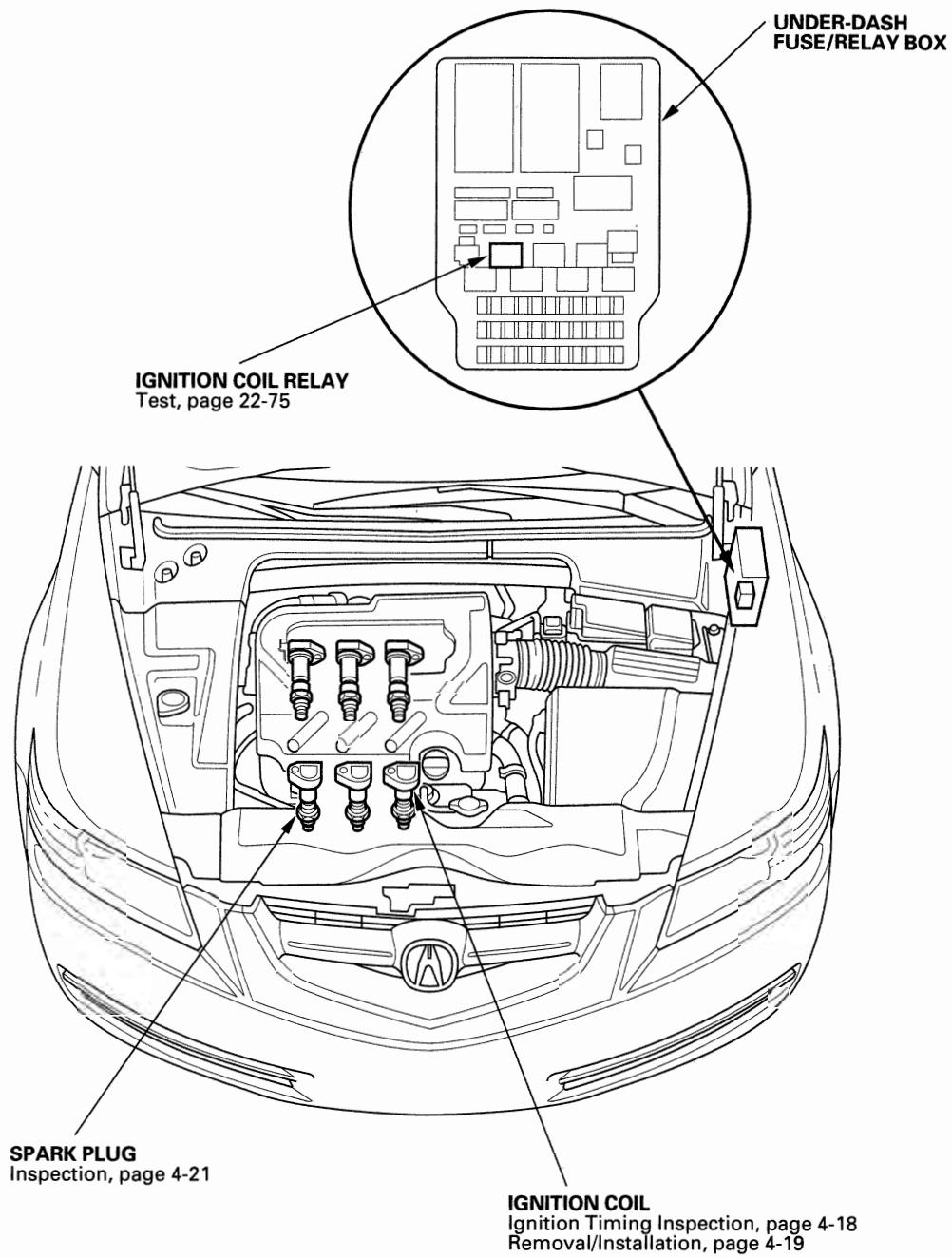
19. If the starter drive gear (B) is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.

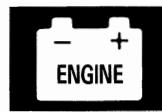
NOTE: Check the condition of the torque converter ring gear to see if the teeth are damaged.

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

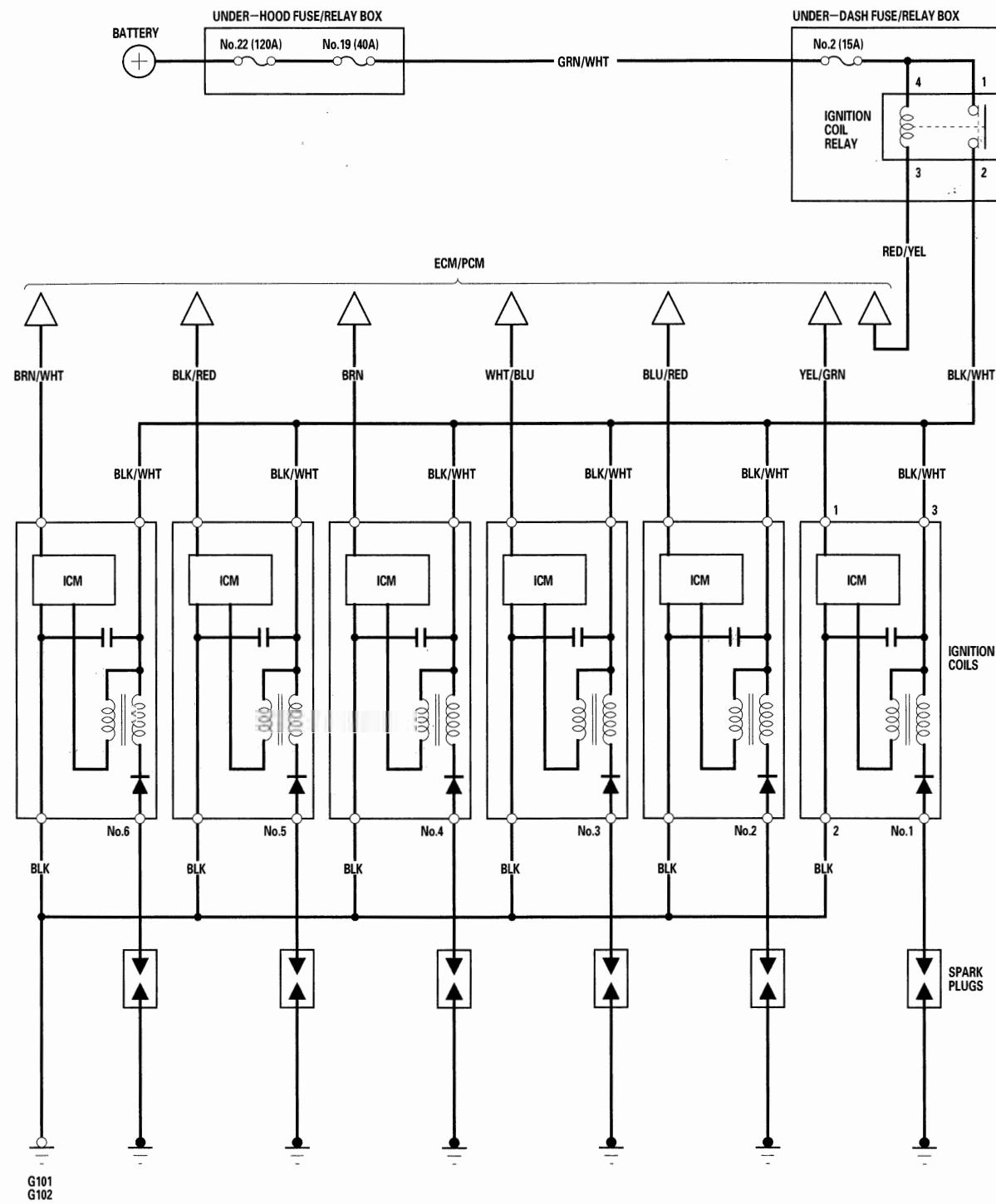
Ignition System

Component Location Index





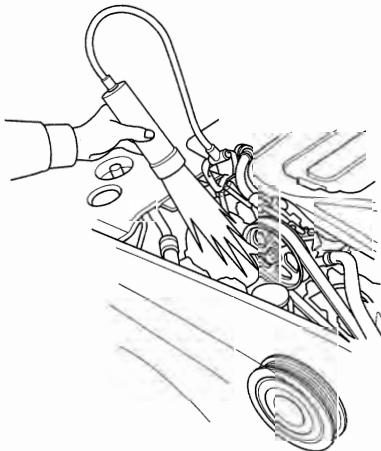
Circuit Diagram



Ignition System

Ignition Timing Inspection

1. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3), and check for DTC's. If a DTC is present, diagnose and repair the cause before inspecting the ignition timing.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Neutral) until the radiator fan comes on, then let it idle.
3. Check the idle speed (see page 11-238).
4. Select "SCS" mode using the HDS.
5. Remove the right side engine compartment cover (see step 1 on page 4-29).
6. Connect the timing light to the service loop.

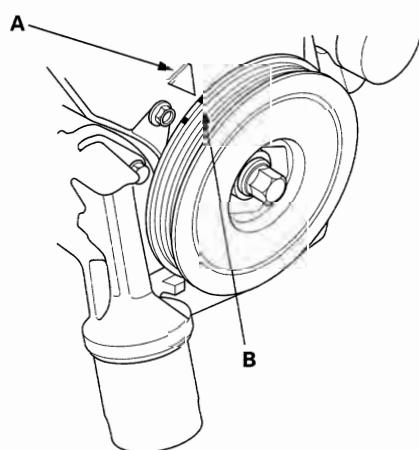


7. Aim the light toward the pointer (A) on the timing belt cover. Check the ignition timing under no load condition: headlights, blower fan, rear window defogger, and air conditioner are not operating.

Ignition Timing

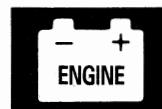
M/T: $10^\circ \pm 2^\circ$ BTDC (RED mark (B)) at idle in Neutral

A/T: $10^\circ \pm 2^\circ$ BTDC (RED mark (B)) at idle in Park or Neutral



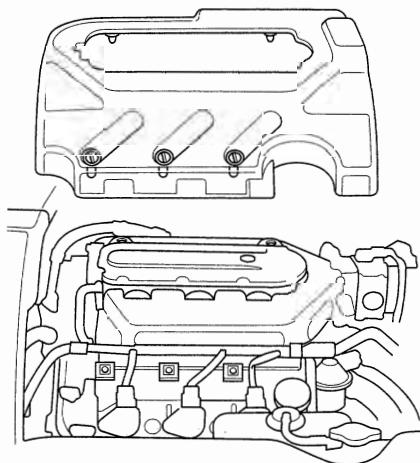
8. If the ignition timing differs from the specification, check cam timing. If cam timing is OK, update the engine control module (ECM)/powertrain control module (PCM) if it does not have the latest software (see page 11-6), or substitute a known-good ECM/PCM (see page 11-7), then recheck. If the system works properly, and the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-171).

9. Disconnect the HDS and the timing light.

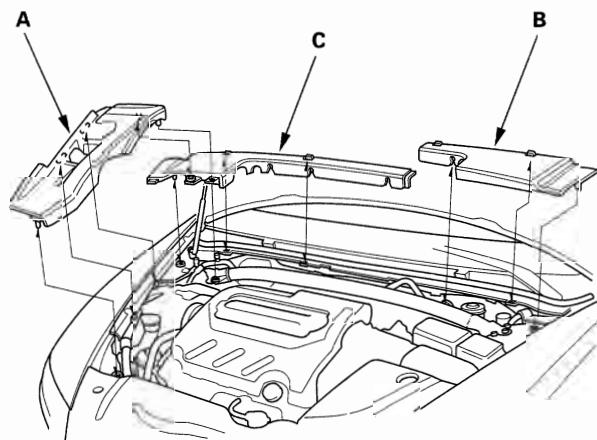


Ignition Coil Removal/Installation

1. Remove the intake manifold cover.

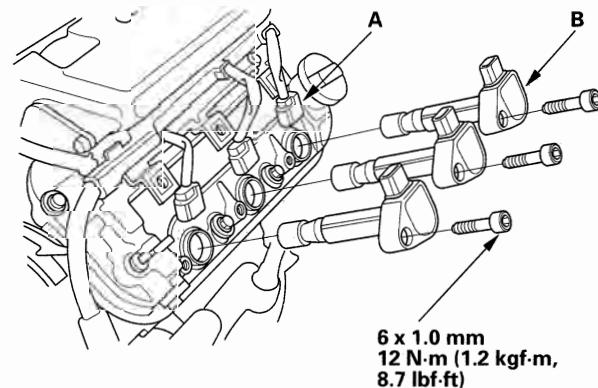


2. Remove the right side engine compartment cover (A), then remove the left rear engine compartment cover (B) and right rear engine compartment cover (C).



3. When removing the No. 6 coil you must remove the reserve tank heat shield and reserve tank.

4. Disconnect the ignition coil connectors (A), then remove the ignition coils (B).



5. Install the ignition coils in the reverse order of removal.

Ignition System

Ignition Coil Relay Circuit Troubleshooting

1. Check the No. 2 (15A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

YES — Go to step 2.

NO — Replace the fuse. ■

2. Remove the ignition coil relay from the under-dash fuse/relay box and test it (see page 22-75).

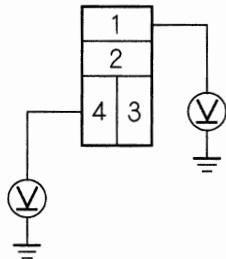
Is the relay OK?

YES — Go to step 3.

NO — Replace the ignition coil relay. ■

3. Measure the voltage between ignition coil relay 4P socket terminal No. 1 and body ground, then terminal No. 4 and body ground.

IGNITION COIL RELAY 4P SOCKET



Terminal side of female terminals

Is there battery voltage?

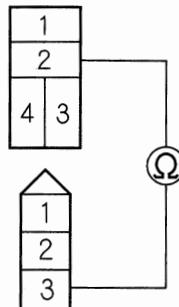
YES — Go to step 4.

NO — Replace the under-dash fuse/relay box. ■

4. Check for continuity between ignition coil relay 4P socket terminal No. 2 and the No. 1 ignition coil 3P connector terminal No. 3.

IGNITION COIL RELAY 4P SOCKET

Terminal side of female terminals



No.1 IGNITION COIL 3P CONNECTOR

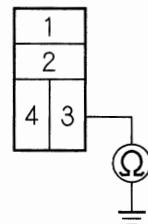
Is there continuity?

YES — Go to step 5.

NO — Repair an open in the wire between ignition coil relay 4P socket terminal No. 2 and ignition coil 3P connector terminal No. 3. ■

5. Check for continuity between ignition coil relay 4P socket terminal No. 3 and body ground.

IGNITION COIL RELAY 4P SOCKET



Terminal side of female terminals

Is there continuity?

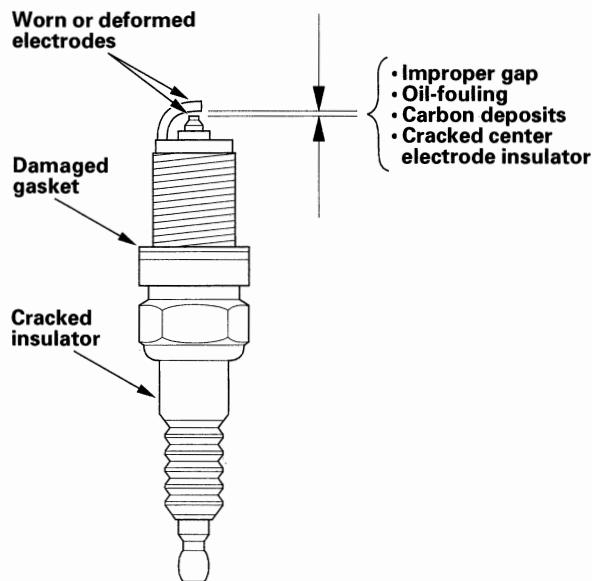
YES — Repair a short in the wire between ignition coil relay 4P socket terminal No. 3 and ECM/PCM. ■

NO — Repair an open in the wire between ignition coil relay 4P socket terminal No. 3 and ECM/PCM. ■

Spark Plug Inspection

1. Inspect the electrodes and ceramic insulator.

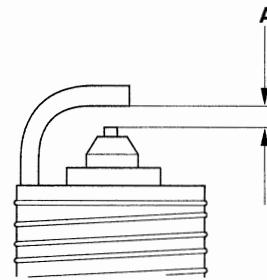
- Burned or worn electrodes may be caused by:
 - Advanced ignition timing
 - Loose spark plug
 - Plug heat range too hot
 - Insufficient cooling
- Fouled plug may be caused by:
 - Retarded ignition timing
 - Oil in combustion chamber
 - Incorrect spark plug gap
 - Plug heat range too cold
 - Excessive idling/low speed running
 - Clogged air cleaner element
 - Deteriorated ignition coils



2. Do not adjust the gap (A) of iridium tip plugs ; replace the spark plug if the gap is out of specification.

Electrode Gap

Standard (New): 1.0 – 1.1 mm (0.039 – 0.043 in.)

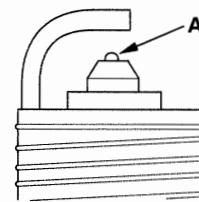


3. Replace the plug at the specified interval or if the center electrode is rounded (A). Use only the spark plugs as listed.

Spark Plugs

NGK: IZFR6K-11

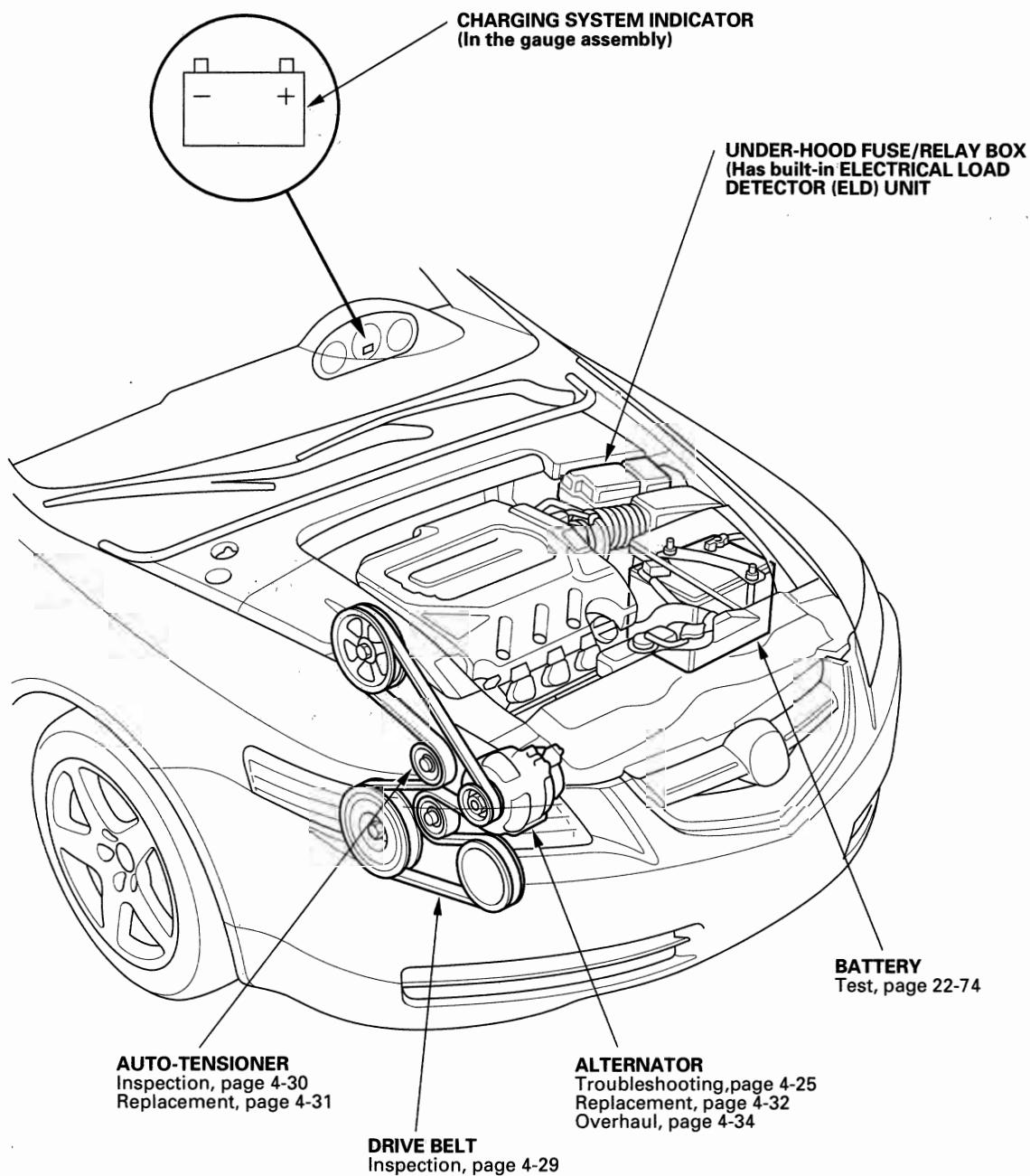
DENSO: SKJ20DR-M11



4. Apply a small quantity of anti-seize compound to the plug threads, and screw the plugs into the cylinder head finger-tight. Then torque them to 18 N·m (1.8 kgf·m, 13 lbf·ft).

Charging System

Component Location Index



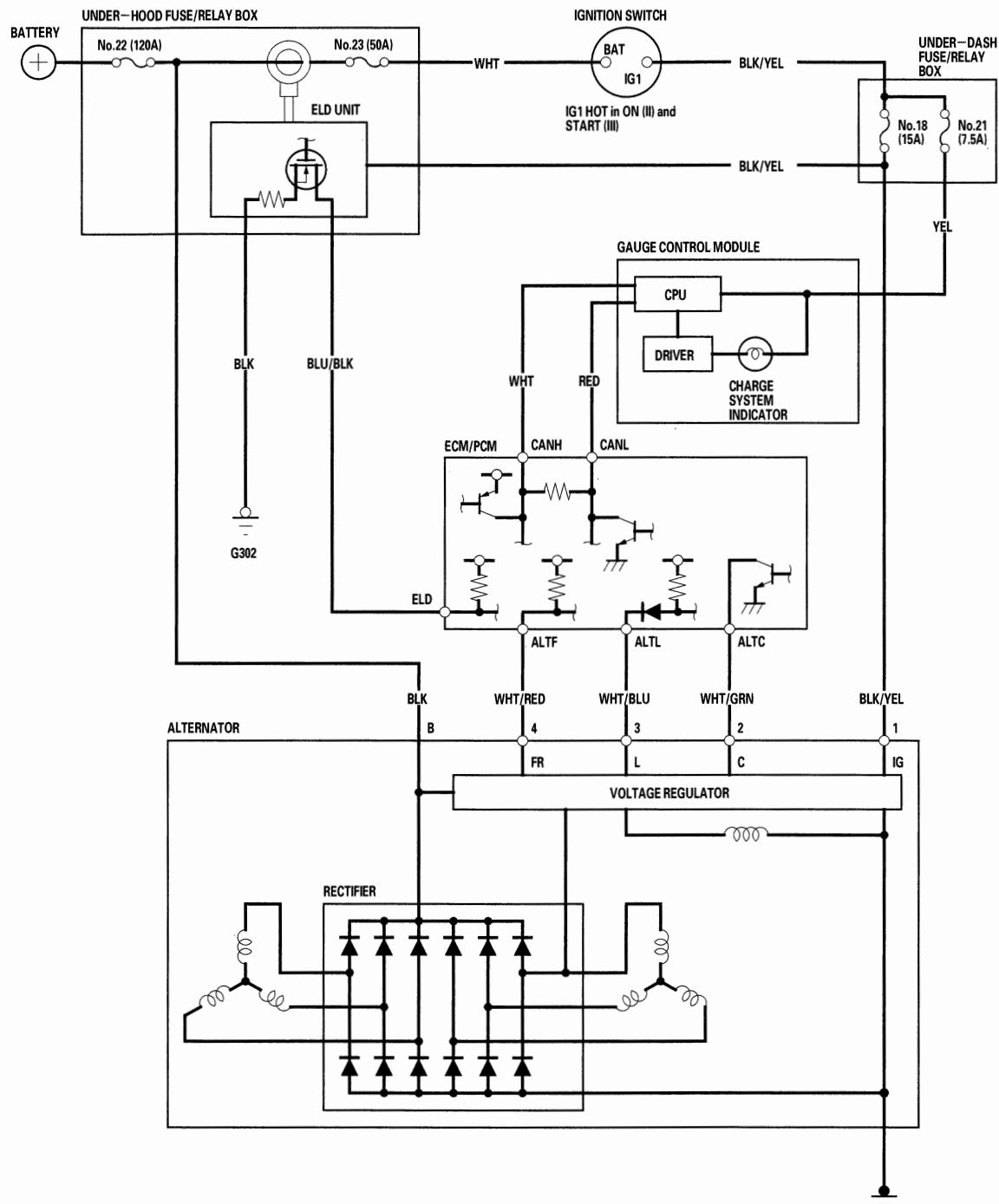


Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Charging system indicator stays on	<ol style="list-style-type: none">1. Troubleshoot the charging system indicator circuit (see page 4-25).2. Check for a broken drive belt (see page 4-29).3. Check the drive belt auto-tensioner (see page 4-30).4. Test the alternator (see page 4-25).	
Battery discharged	<ol style="list-style-type: none">1. Check for poor connection, open or shorted wire(s) in charging system.2. Check for electrical current draw.3. Check for a broken drive belt (see page 4-29).4. Check the drive belt auto-tensioner (see page 4-30).5. Test the alternator (see page 4-25).6. Troubleshoot the alternator control system (see page 4-25).7. Check for poor connection at battery terminal.8. Test the battery (see page 22-74).	
Battery overcharged	<ol style="list-style-type: none">1. Test the alternator (see page 4-25).2. Troubleshoot the alternator control system (see page 4-25).3. Test the battery (see page 22-74).	

Charging System

Circuit Diagram





Charging Circuit Troubleshooting

If the charging system indicator does not come on or does not go off, or the battery is dead or low, test the following items in the order as listed:

- Battery (see page 22-74)
- Charging system indicator test
- Alternator and regulator circuit test
- Alternator control system test

Charging System Indicator Test

1. Turn the ignition switch ON (II).

Does the charging system indicator come on?

YES—Go to step 2.

NO—Go to step 3.

2. Start the engine.

Does the charging system indicator go off?

YES—Charging system indicator circuit is OK. Go to the Alternator and Regulator Circuit Test. ■

NO—Go to step 3.

3. Troubleshoot the multiplex integrated control system (see page 22-108).

Is the multiplex integrated control system OK?

YES—Go to step 4.

NO—Repair the multiplex integrated control system. ■

4. Run the gauge control module self-diagnostic function (see page 22-262).

Does the charge indicator flash?

YES—Go to step 5.

NO—Replace the gauge control module (see page 22-265). ■

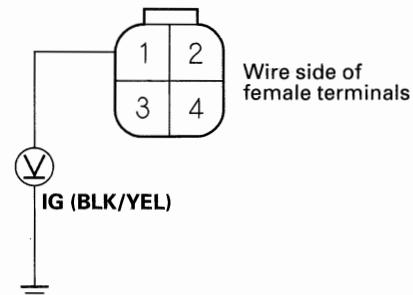
5. Turn the ignition switch OFF.

6. Disconnect the alternator 4P connector.

7. Turn the ignition switch ON (II).

8. Measure the voltage between alternator 4P connector terminal No. 1 and body ground.

ALTERNATOR 4P CONNECTOR



Is there battery voltage?

YES—Go to step 9.

NO—Check for a blown No. 18 (15A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the alternator and under-dash fuse/relay box. ■

9. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC). Turn the ignition switch ON (II), and jump the SCS line with the HDS, then turn the ignition switch OFF.

NOTE: This step must be done to protect the engine control module (ECM)/powertrain control module (PCM) from damage.

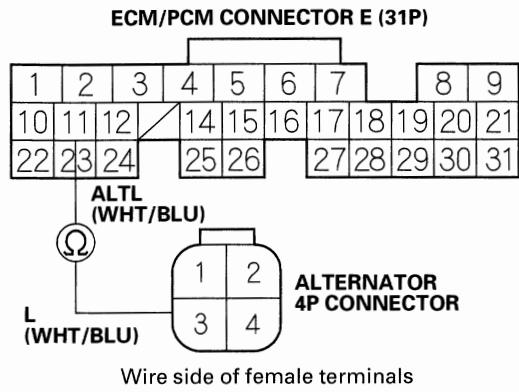
10. Disconnect ECM/PCM connector E (31P).

(cont'd)

Charging System

Charging Circuit Troubleshooting (cont'd)

11. Check for continuity between ECM/PCM connector terminal E11 and alternator 4P connector terminal No. 3.

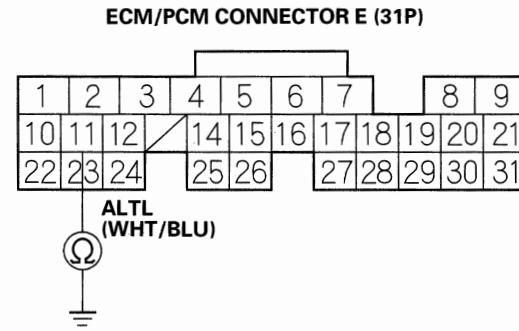


Is there continuity?

YES—Go to step 12.

NO—Repair an open in the wire between the alternator and the ECM/PCM. ■

12. Check for continuity between ECM/PCM connector terminal E11 and body ground.



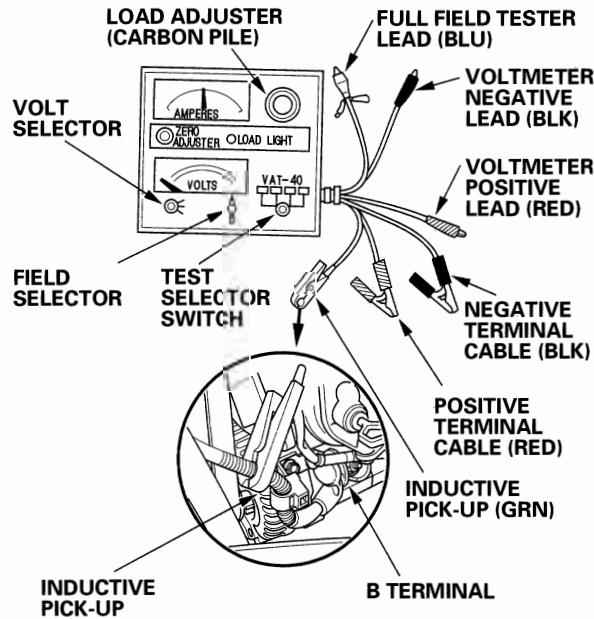
Is there continuity?

YES—Repair a short in the wire between the alternator and the ECM/PCM. ■

NO—Go to the Alternator and Regulator Circuit Test. ■

Alternator and Regulator Circuit Test

1. Be sure the battery connections are good, and that the battery is sufficiently charged (see page 22-74).
2. Connect a VAT-40 (or equivalent tester), and turn the selector switch to position 1 (starting).



3. Shift to Park or Neutral, and start the engine. Hold the engine at 3,000 rpm, with no load until the radiator fan comes on, then let it idle.
4. Raise the engine speed to 2,000 rpm, and hold it there.

Is the voltage over 15.1 V?

YES—Replace the alternator (see page 4-32) or rear housing assembly (see page 4-34). ■

NO—Go to step 5.



5. Release the accelerator pedal, and let the engine idle.
6. Make sure all accessories are turned off. Turn the selector switch to position 2 (charging).
7. Remove the inductive pick-up, and zero the ammeter.
8. Place the inductive pick-up over the B terminal wire of the alternator so that the arrow points away from the alternator.
9. Raise the engine speed to 2,000 rpm, and hold it there.

Is the voltage less than 13.5 V?

YES – Go to Alternator Control System Test. ■

NO – Go to step 10.

10. Apply a load with the VAT-40 until the battery voltage drops to between 12 – 13.5 V.

Is the amperage 87.5A or more?

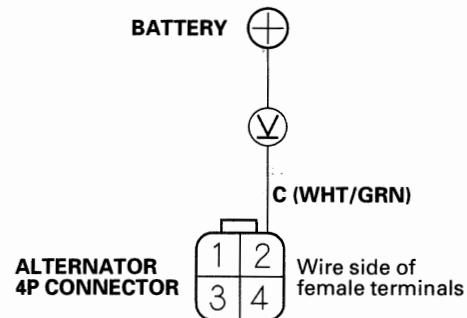
YES – The charging system is OK. ■

NOTE: If the charge system indicator is still on, replace the alternator (see page 4-32).

NO – Repair or replace the alternator (see page 4-34). ■

Alternator Control System Test

1. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC), and check for DTC's. If a DTC is present, diagnose and repair the cause before continuing with this test.
2. Disconnect the alternator 4P connector from the alternator.
3. Start the engine, and turn the headlights ON to high beam.
4. Measure voltage between alternator 4P connector terminal No. 2 and the positive terminal of the battery.



Is there 1 V or less?

YES – Go to step 5.

NO – Go to step 8.

5. Jump the SCS line with the HDS, then turn the ignition switch OFF.

NOTE: This step must be done to protect the engine control module (ECM)/powertrain control module (PCM) from damage.

6. Disconnect ECM/PCM connector E (31P).

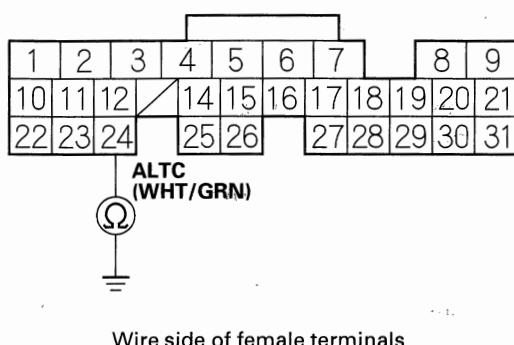
(cont'd)

Charging System

Charging Circuit Troubleshooting (cont'd)

7. Check for continuity between ECM/PCM connector terminal E24 and body ground.

ECM/PCM CONNECTOR E (31P)



Is there continuity?

YES—Repair short in the wire between the alternator and ECM/PCM. ■

NO—Update the ECM/PCM if it does not have the latest software (see page 11-6), or substitute a known-good ECM/PCM (see page 11-7), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-171). ■

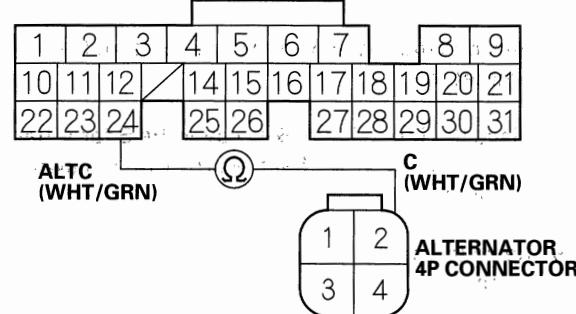
8. Jump the SCS line with the HDS, then turn the ignition switch OFF.

NOTE: This step must be done to protect the engine control module (ECM)/powertrain control module (PCM) from damage.

9. Disconnect ECM/PCM connector E (31P).

10. Check for continuity between ECM/PCM connector terminal E24 and alternator 4P connector terminal No. 2.

ECM/PCM CONNECTOR E (31P)



Is there continuity?

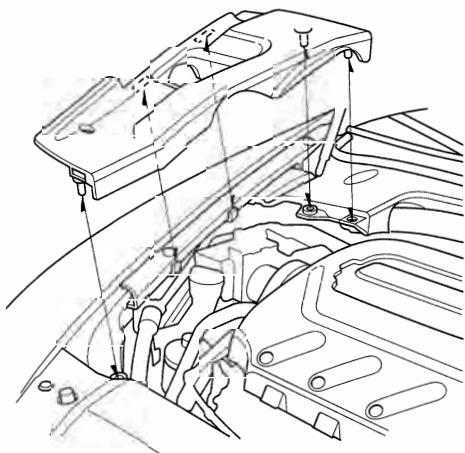
YES—Replace or repair the alternator (see page 4-32). ■

NO—Repair an open in the wire between the alternator and ECM/PCM. ■

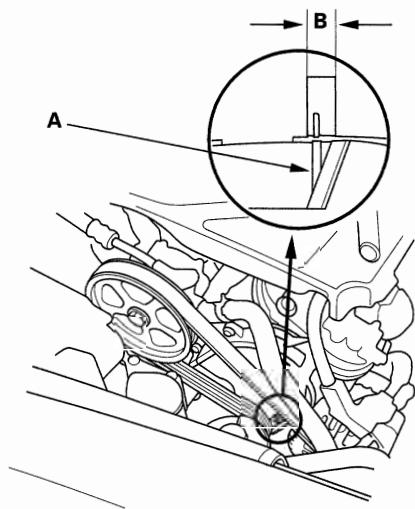


Drive Belt Inspection

1. Remove the right side engine compartment cover.

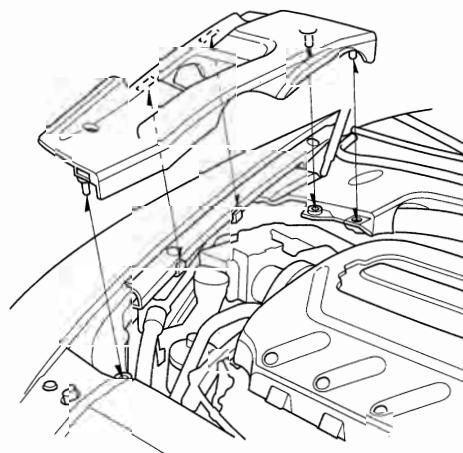


2. Inspect the belt for cracks or damage. If the belt is cracked or damaged, replace it.
3. Check that the auto-tensioner indicator (A) is within the standard range (B) as shown. If it is out of the standard range, replace the drive belt (see page 4-29).

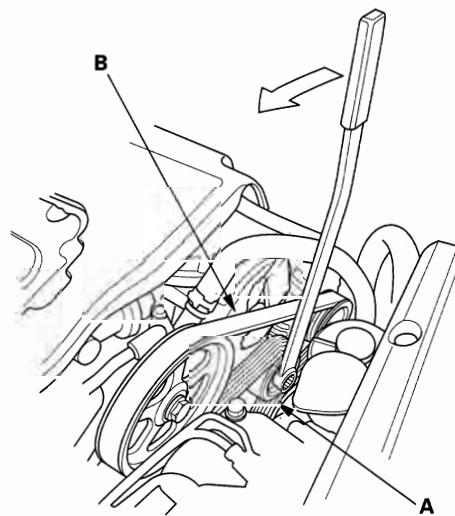


Drive Belt Replacement

1. Remove the right side engine compartment cover.



2. Move the auto-tensioner (A) to relieve tension from the drive belt (B), then remove the drive belt.

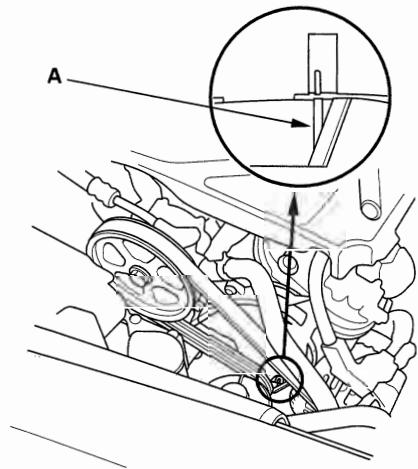


3. Install the new belt in the reverse order of removal.

Charging System

Drive Belt Auto-tensioner Inspection

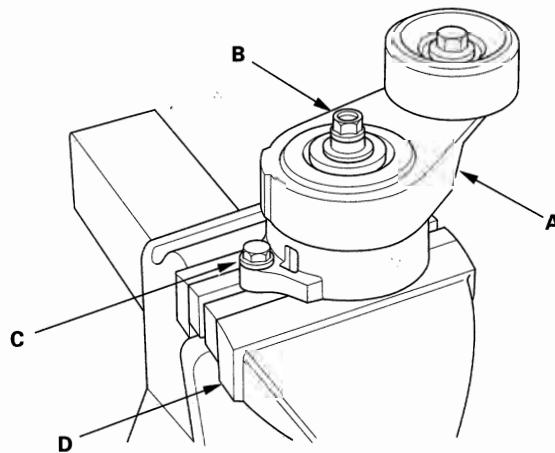
1. Remove the right side engine compartment cover (see step 1 on page 4-29).
2. Check the position of the auto-tensioner indicator's pointer (A), start the engine, then check the position of the pointer again. If the position changes, replace the auto-tensioner.



3. Check for abnormal noise from the tensioner pulley. If you hear abnormal noise, replace the auto-tensioner pulley (see page 4-31).
4. Remove the drive belt (see page 4-29).
5. Move the auto-tensioner within its limit with the wrench in the direction shown. Check that the tensioner moves smoothly and without any abnormal noise. If the tensioner does not move smoothly or there is abnormal noise, replace the auto-tensioner (see page 4-31).

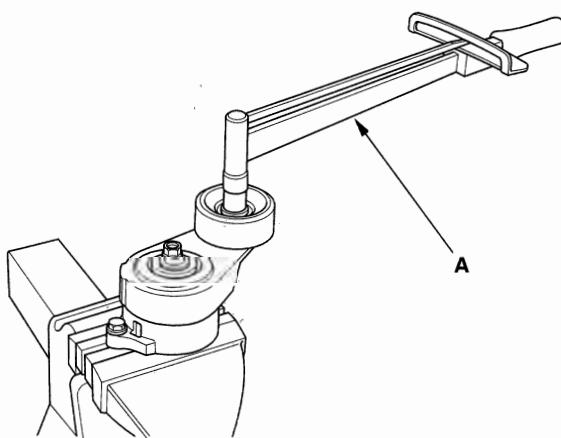


6. Remove the auto-tensioner (see page 4-31).
7. Clamp the auto-tensioner (A) by using a 10 mm bolt (B), 8 mm bolt (C) and a vise (D) as shown. Do not clamp the auto-tensioner itself.



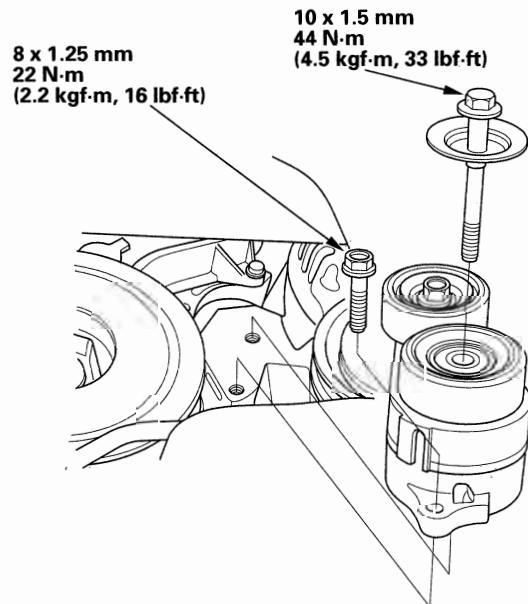
8. Attach a torque wrench (A) to the pulley bolt. measure the torque when the tensioner is turned counterclockwise. If the torque is less than the specified value, replace the auto-tensioner (see page 4-31).

50.5 N·m (5.15 kgf·m, 37.2 lbf·ft)



Drive Belt Auto-tensioner Replacement

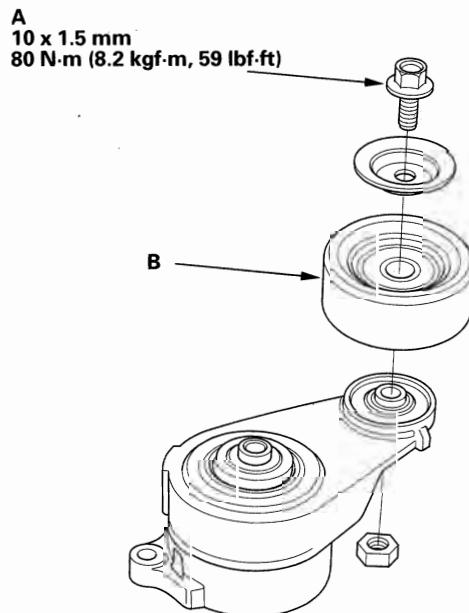
1. Remove the drive belt (see page 4-29).
2. Remove the splash shield.
3. Remove the auto-tensioner.



4. Install the auto-tensioner in the reverse order of removal.

Tensioner Pulley Replacement

1. Remove the auto-tensioner (see page 4-31).
2. Remove the pulley bolt (A) (left-hand threads), and remove the tensioner pulley (B).

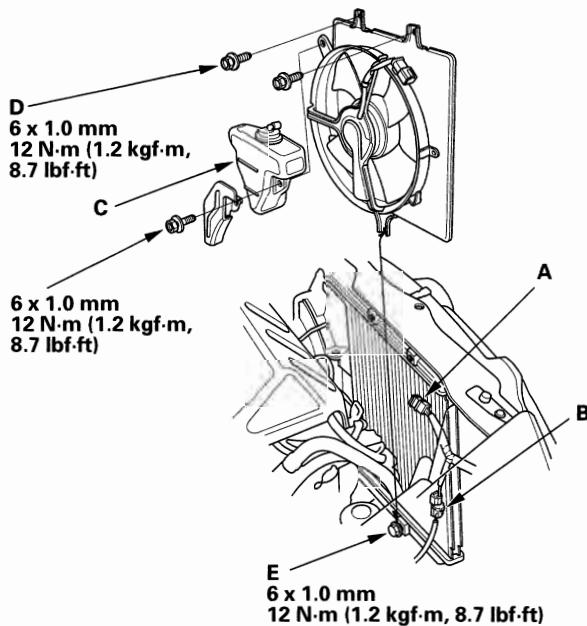


3. Install the tensioner pulley in the reverse order of removal.

Charging System

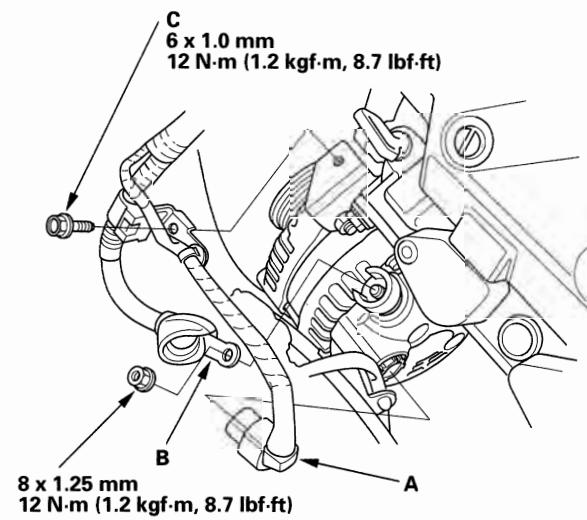
Alternator Replacement

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 the ignition switch is OFF.
2. Disconnect the negative cable from the battery, then disconnect the positive cable.
3. Disconnect the fan motor connector (A) and compressor clutch connector (B), then remove the reserve tank (C).

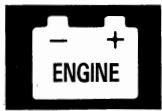


4. Remove the two bolts (D), and loosen bolt (E), then remove the condenser fan shroud.

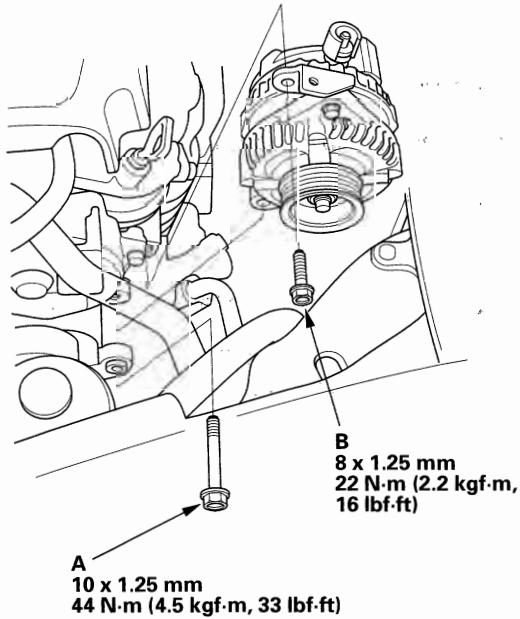
5. Remove the drive belt (see page 4-29).
6. Disconnect the alternator connector (A) and BLK wire (B) from the alternator.



7. Remove the bolt (C) securing the harness bracket.



8. Remove the mounting bolt (A) and alternator bracket mounting bolt (B), then remove the alternator.



9. Install the alternator and drive belt in the reverse order of removal.

10. Connect the battery positive cable and negative cable to the battery.

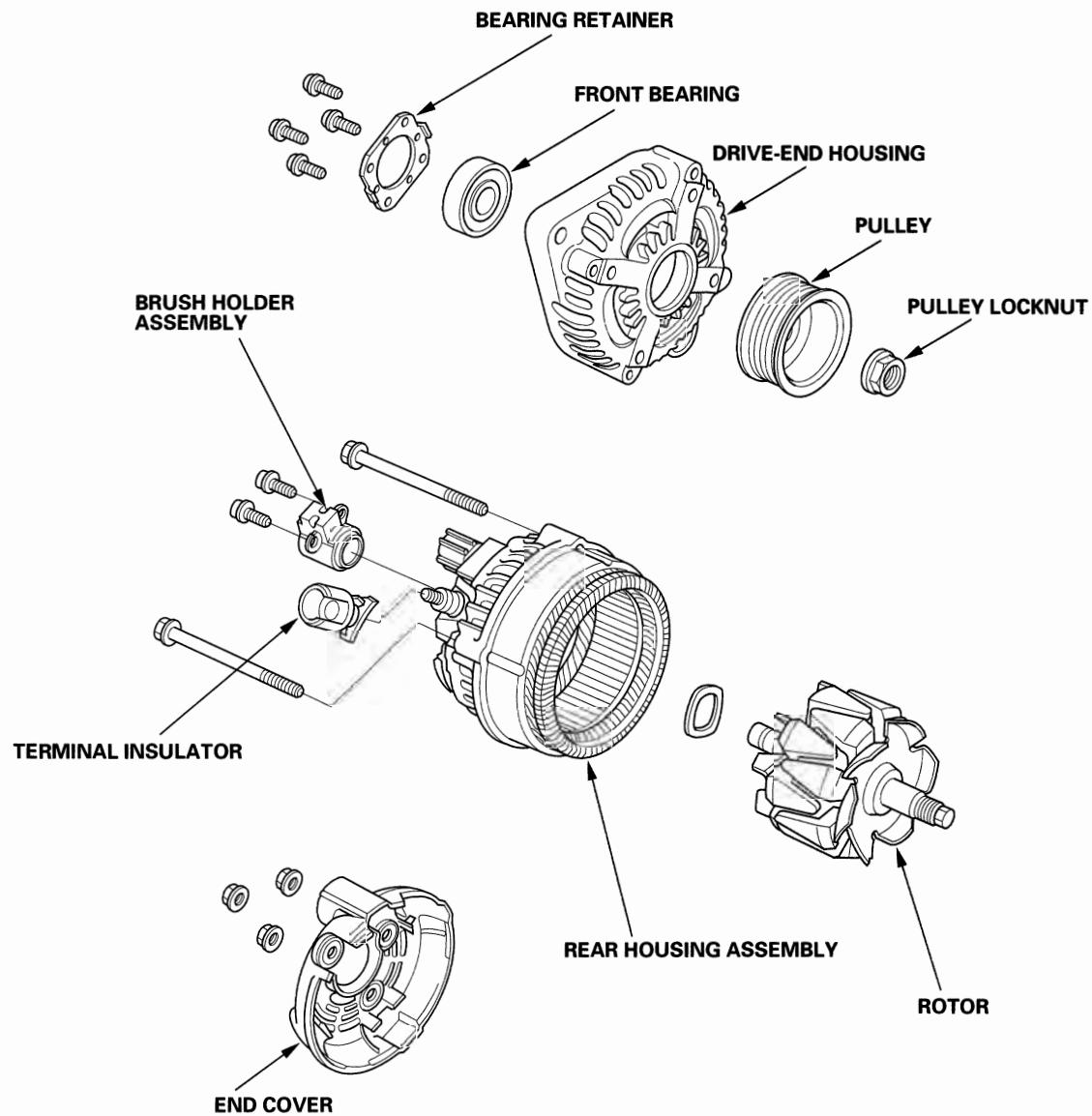
11. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's XM radio channel presets.

12. Set the clock.

Charging System

Alternator Overhaul

Exploded View

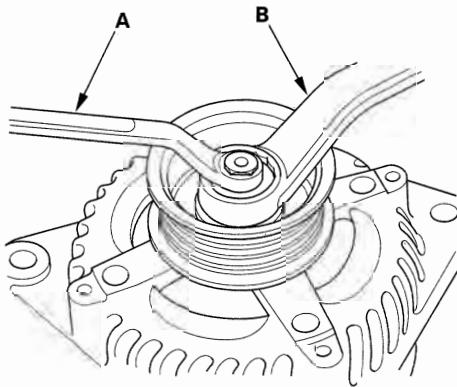


Special Tools Required

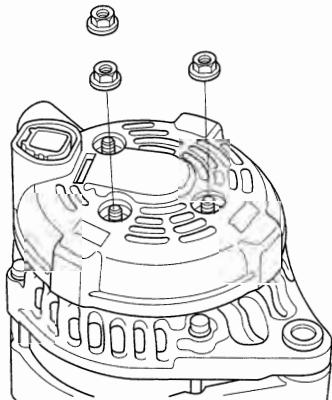
- Handle driver 07749-0010000
- Attachment, 42 x 47 mm 07746-0010300

NOTE: Refer to the Exploded View as needed during this procedure.

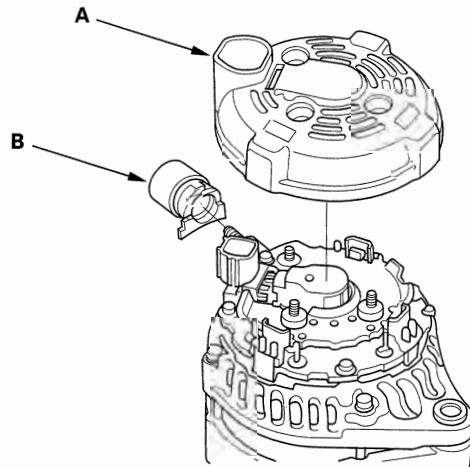
1. Test the alternator and regulator before you remove them (see page 4-25).
2. Remove the alternator (see page 4-32).
3. If the front bearing needs replacing, remove the pulley locknut with a 10 mm wrench (A) and a 22 mm wrench (B). If necessary, use an impact wrench.



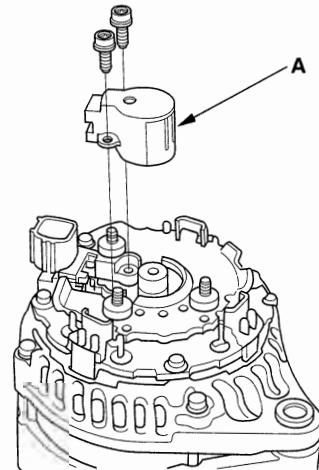
4. Remove the three flange nuts.



5. Remove the end cover (A) and the insulator (B).



6. Remove the brush holder (A).

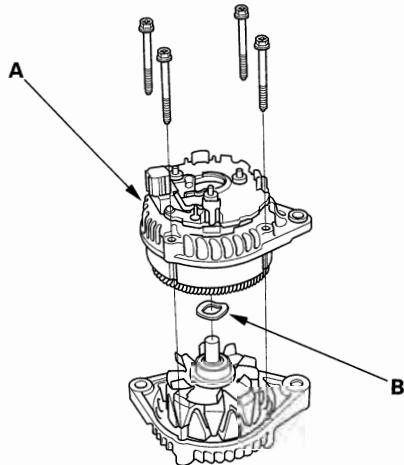


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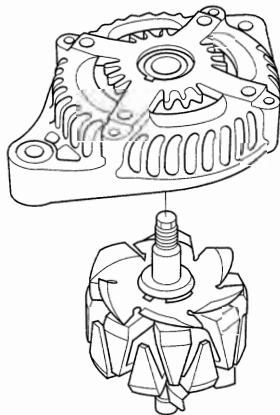
Charging System

Alternator Overhaul (cont'd)

7. Remove the four bolts, then remove the rear housing assembly (A) and washer (B).



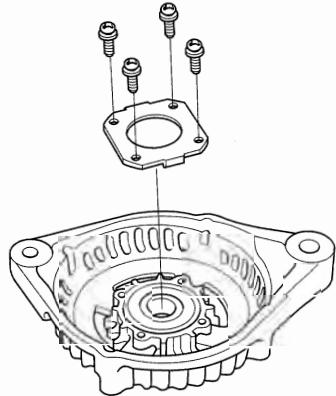
8. If you are not replacing the front bearing, go to step 13. Remove the rotor from the drive end housing.



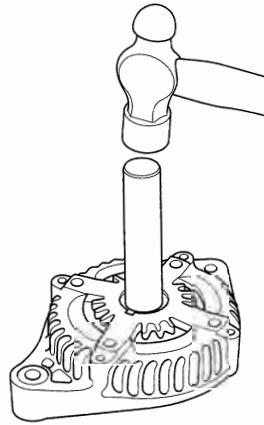
9. Inspect the rotor shaft for scoring, and inspect the bearing journal surface in the drive end housing for seizure marks.

- If the rotor is damaged, replace the rotor assembly.
- If the rotor is OK, go to step 10.

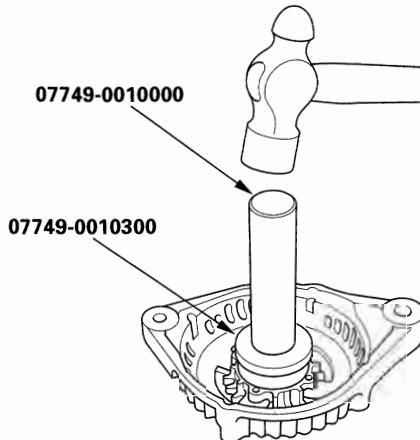
10. Remove the front bearing retainer plate.



11. Drive out the front bearing with a brass drift and hammer.



12. With a hammer and special tools, install a new front bearing in the drive end housing.



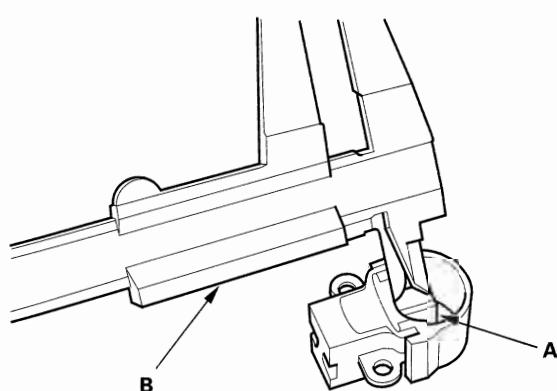
Alternator Brush Inspection

13. Measure the length of both brushes (A) with vernier calipers (B).

- If either brush is shorter than the service limit, replace the brush holder assembly.
- If brush length is OK, go to step 14.

Alternator Brush Length

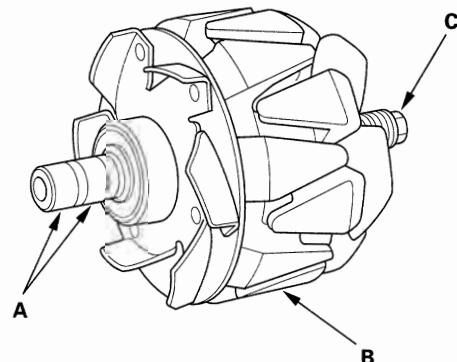
Standard (New): 10.5 mm (0.41 in.)
Service Limit: 1.5 mm (0.06 in.)



Rotor Slip Ring Test

14. Check that there is continuity between the slip rings (A).

- If there is continuity, go to step 15.
- If there is no continuity, replace the rotor assembly.



15. Check that there is no continuity between each slip ring and the rotor (B) and the rotor shaft (C).

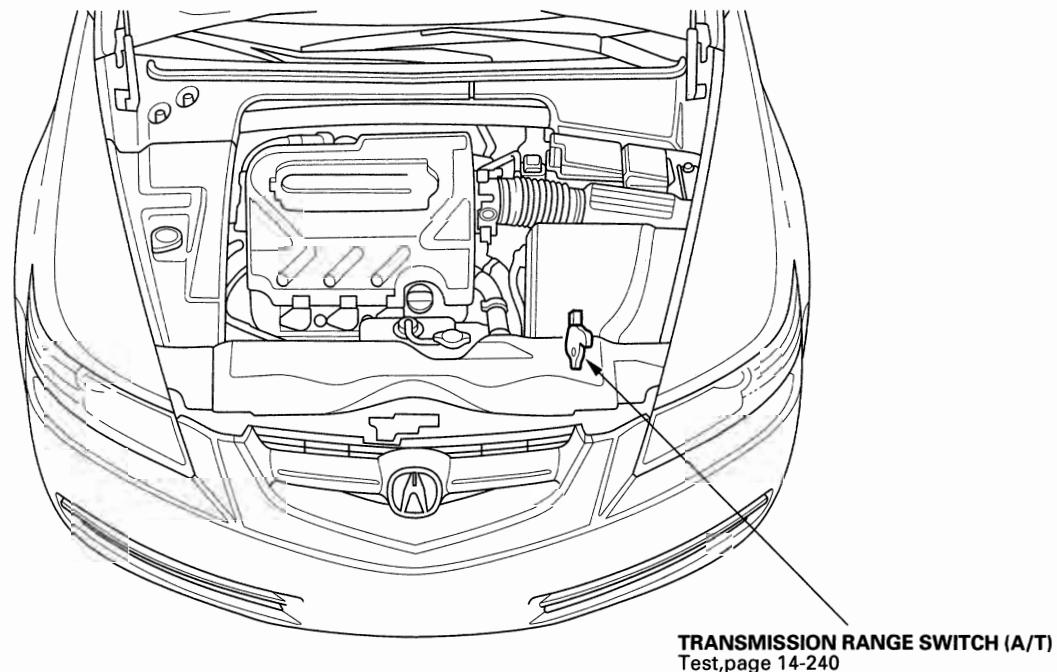
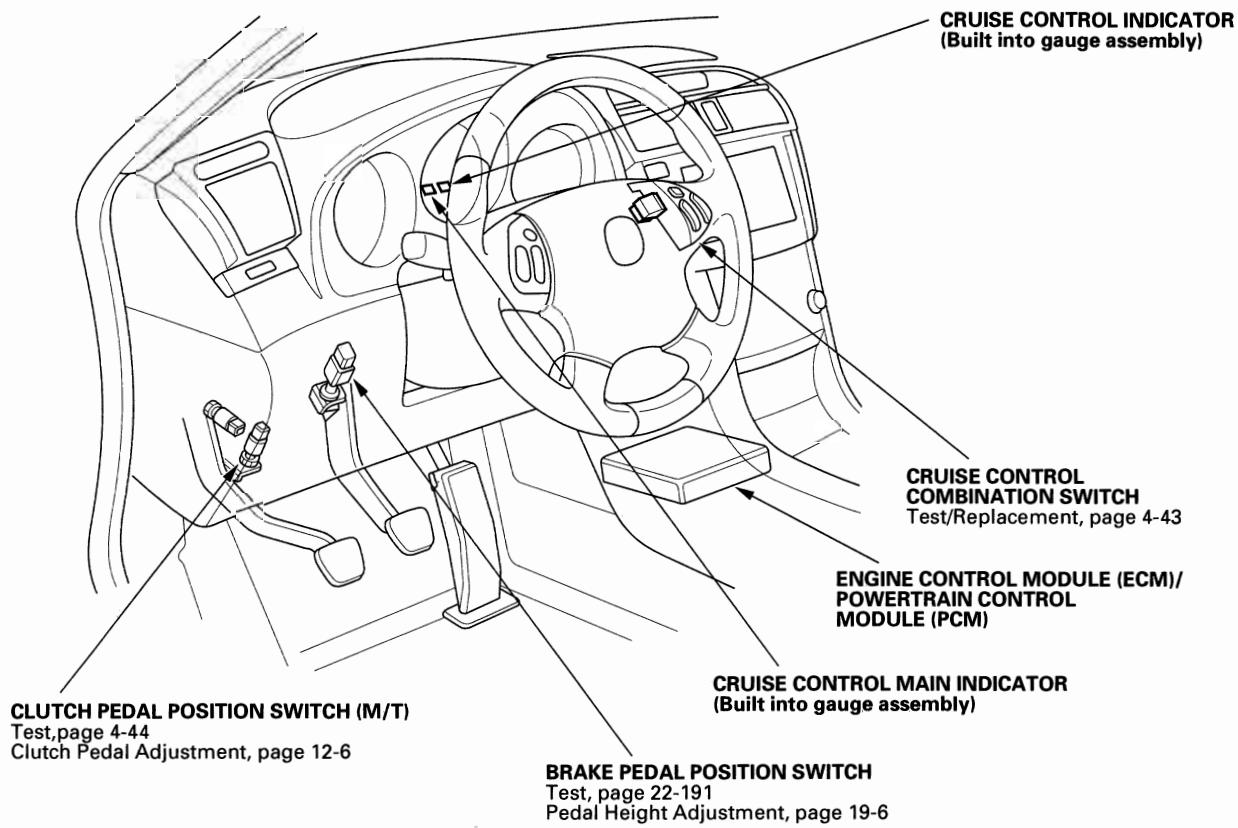
- If there is no continuity, replace the rear housing assembly, and go to step 16.
- If there is continuity, replace the rotor assembly.

16. Assemble the alternator in reverse order of disassembly, and note these items:

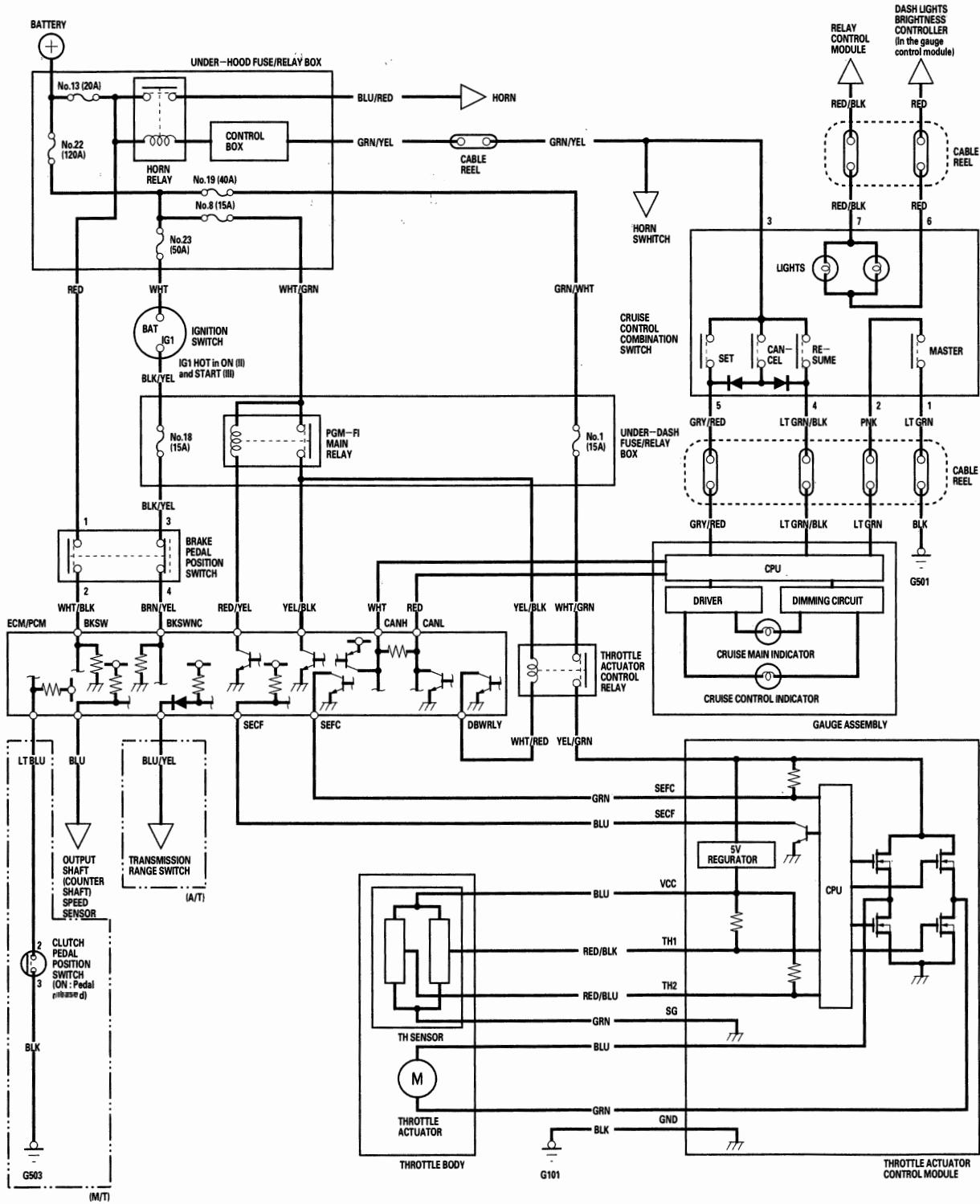
- Be careful not to get any grease or oil on the slip rings.
- If you removed the pulley, tighten its locknut to 110 N·m (11.2 kgf·m, 81.0 lbf·ft) when you reinstall it.

Cruise Control

Component Location Index



Circuit Diagram



Cruise Control

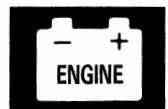
Symptom Troubleshooting Index

NOTE:

Before troubleshooting.

- Check for PGM-FI and body DTC's.
- Check the No. 13 (20A) fuse in the under-hood fuse/relay box, and the No. 18 (15A) fuse in the under-dash fuse/relay box.
- Check that the horn sounds.
- Check the speedometer to see if it works properly.

Symptom	Diagnostic procedure	Also check for
Cruise control cannot be set	Perform the cruise control input test (see page 4-41).	
Cruise control can be set, but cruise main indicator does not come on	Perform the cruise control input test (see page 4-41).	
Cruise control can be set, but cruise control indicator does not come on	Perform the cruise control input test (see page 4-41).	
Vehicle does not decelerate or accelerate accordingly when SET/RESUME/CANCEL button is pressed	Perform the cruise control input test (see page 4-41).	
Set speed does not cancel when brake pedal is pressed	Perform the cruise control input test (see page 4-41).	
Set speed does not cancel when MASTER button is turned OFF	Perform the cruise control input test (see page 4-41).	
Set speed does not cancel when CANCEL button is pressed	Perform the cruise control input test (see page 4-41).	
Set speed will not resume when RESUME button is pressed (with MASTER button ON, and set speed temporarily cancelled by pressing the brake pedal)	Perform the cruise control input test (see page 4-41).	
With the ignition switch ON (II), and the lighting switch ON, the cruise control combination switch illumination does not come on	Replace the cruise control combination switch illumination bulb(s) (see page 4-43).	



Cruise Control Input Test

1. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC).
2. Go to B-CAN System Diagnosis Test Mode A and check for DTC's.
3. Go to PGM-FI and check for DTC's.
4. Turn the ignition switch ON (II).
5. Perform the following tests while monitoring parameters in the PGM-FI DATA LIST with the HDS.

Signal to be tested	Test condition	Parameter: Desired result	Possible cause if result is not obtained
Brake switch signal	Brake pedal pressed, then released	CRUISE BRK SW should indicate OFF when the brake pedal is pressed and ON should be indicated when the brake pedal is released.	<ul style="list-style-type: none">• Faulty brake pedal position switch• Blown No. 18 (15A) fuse in the under-dash fuse/relay box• An open in the wire between the ECM/PCM and the brake pedal position switch• A wire shorted to ground between the ECM/PCM and the brake pedal position switch
Clutch pedal position switch signal	Clutch pedal pressed, then released	SHIFT/CLUTCH SW should indicate OFF when the clutch pedal is pressed and ON should be indicated when the clutch pedal is released.	<ul style="list-style-type: none">• Faulty clutch pedal position switch• An open in the wire between the ECM and the clutch pedal position switch• A wire shorted to ground between the ECM and the clutch pedal position switch• Poor ground G503
Transmission range switch signal	Shift in D or 2 position	TRANS RANGE SW should indicate OFF in P, R, and N position and ON in D and 2 position.	<ul style="list-style-type: none">• Faulty transmission range switch• An open in the wire between the PCM and the transmission range switch• A wire shorted to ground between the PCM and the transmission range switch• Poor ground G101, G102
Cruise control master button signal	Cruise control master button ON and OFF	CRUISE MASTER SW should indicate ON when the cruise control master button is turned ON and OFF when the cruise control master button is turned OFF.	<ul style="list-style-type: none">• Faulty cruise control combination switch• An open in the wire between the gauge assembly and the cruise control combination switch• A wire shorted to ground between the gauge assembly and the cruise control combination switch• An open in the wire between the cruise control combination switch and the ground
Set button signal	Set button pressed and released	CRUISE SET SW should indicate ON when the set button is pressed and OFF when the set button is released.	<ul style="list-style-type: none">• Faulty cruise control combination switch• An open in the wire between the gauge assembly and the cruise control combination switch• A wire shorted to ground between the gauge assembly and the cruise control combination switch

(cont'd)

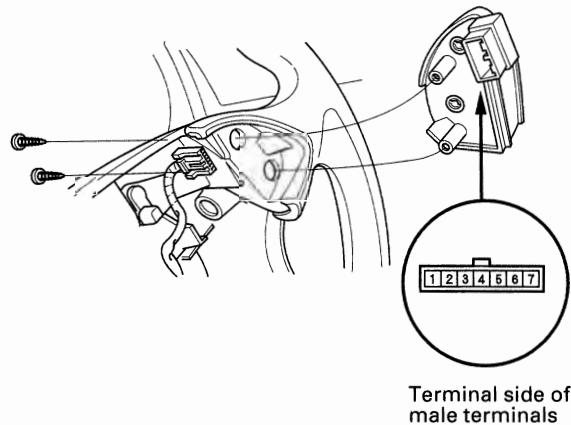
Cruise Control

Cruise Control Input Test (cont'd)

Signal to be tested	Test condition	Parameter: Desired result	Possible cause if result is not obtained
Resume button signal	Resume button pressed and released	CRUISE RESUME SW should indicate ON when the resume button is pressed and OFF when the resume button is released.	<ul style="list-style-type: none">• Faulty cruise control combination switch• An open in the wire between the gauge assembly and the cruise control combination switch• A wire shorted to ground between the gauge assembly and the cruise control combination switch
Cancel button signal	Cancel button pressed and released	CRUISE CANCEL SW should indicate ON when the cancel button is pressed and OFF when the cancel button is released.	<ul style="list-style-type: none">• Faulty cruise control combination switch
Cruise control indicator signal	Start the engine, turn the cruise control master button on and drive the vehicle to speeds over 25 mph (40 km/h) with the cruise control set and cancel the cruise control	CRUISE LIGHT should indicate ON when the cruise control is set and OFF when the cruise control is cancelled.	<ul style="list-style-type: none">• Faulty gauge assembly• A burnt cruise control indicator bulb

Cruise Control Combination Switch Test/Replacement

1. Remove the driver's airbag (see page 23-128).
2. Remove the two screws, then disconnect the connector, and remove the switch.

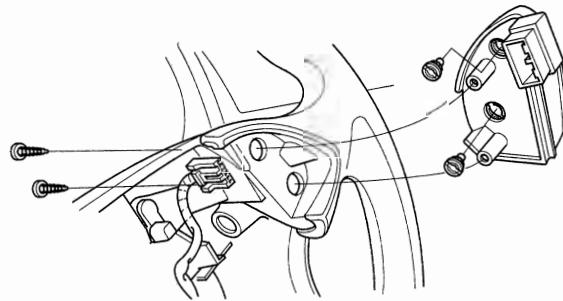


3. Check for continuity between the terminals in each switch position according to the table.
 - If there is continuity, and it matches the table, but switch failure occurred on the cruise control unit input test, check and repair the wire harness on the switch circuit.
 - If there is no continuity in one or both positions, replace the switch.

Terminal Position	1	2	3	4	5
MASTER (ON)	○	○			
MASTER (OFF)					
SET (ON)			○	○	
RESUME (ON)			○	○	
CANCEL (ON)			○	➡	○

Cruise Control Combination Switch Illumination Bulb Replacement

1. Remove the driver's airbag (see page 23-128).
2. Remove the two screws, then disconnect the connector, and remove the switch.

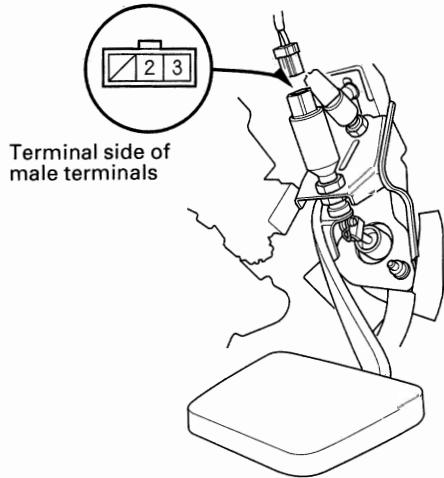


3. Replace the illumination bulb.
4. Install in the reverse order of removal.

Cruise Control

Clutch Pedal Position Switch Test

1. Disconnect the 3P connector from the clutch pedal position switch (A).



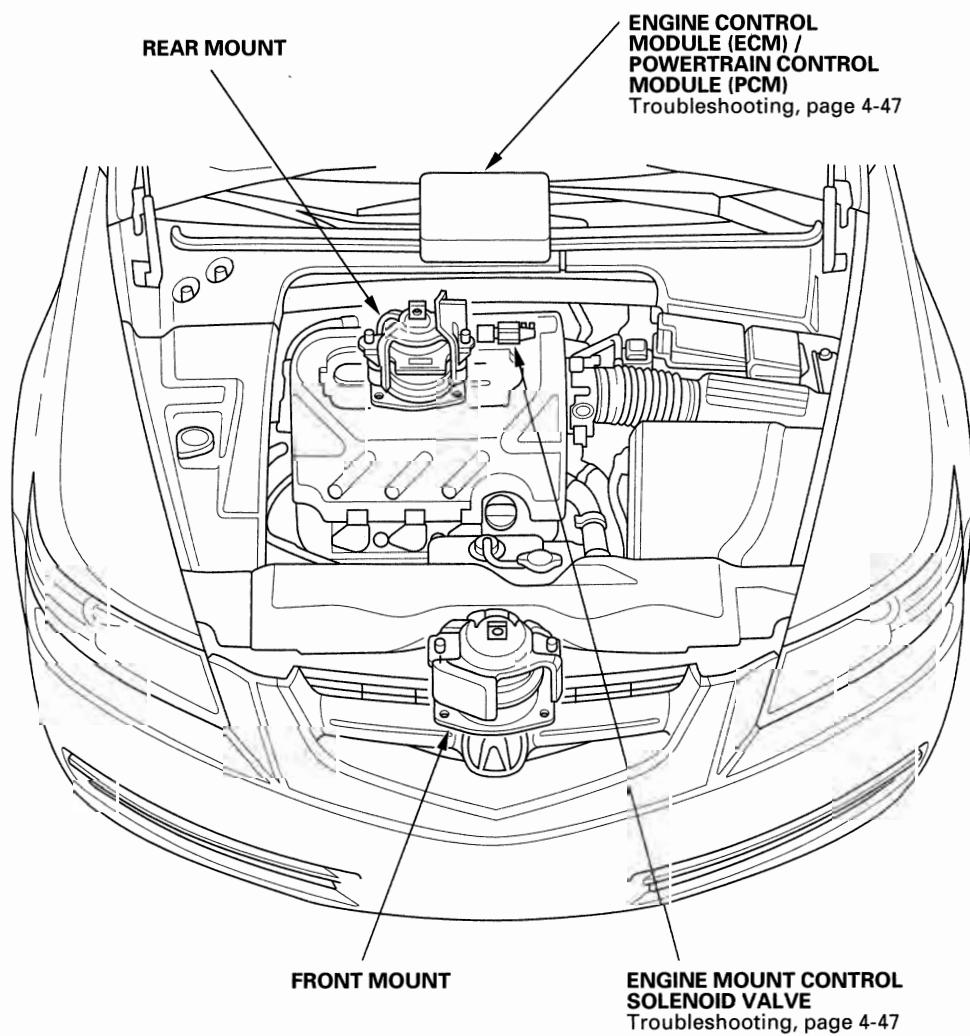
2. Remove the clutch pedal position switch.
3. Check for continuity between the terminals according to the table.
 - If the continuity is not as specified, replace the clutch pedal position switch.
 - If OK, install the clutch pedal position switch and adjust the pedal height (see page 12-6).

Terminal	1	2	3
Clutch Pedal Position Switch			
PRESSED			
RELEASED		○	○



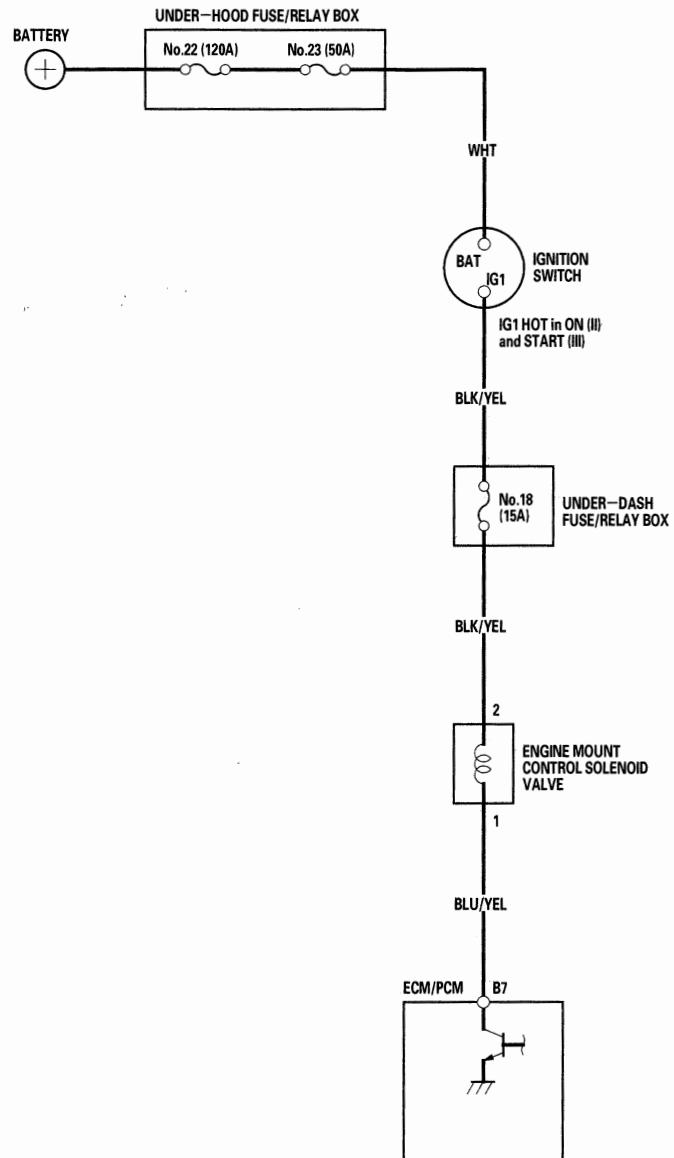
Engine Mount Control System

Component Location Index



Engine Mount Control System

Circuit Diagram





Troubleshooting

Special Tools Required

Vacuum pump/gauge, 0–30 in.Hg
A973X-041-XXXXX

NOTE: Check the vacuum hoses and lines for damage and proper connections before troubleshooting.

Follow this procedure if the engine vibrates excessively when idling.

1. Start the engine and let it idle (see page 11-238).
2. Raise the engine speed from idling to 2,000 rpm.
3. Check the MOUNT CTRL SOL in the PGM-FI DATA LIST with the Honda Diagnostic System (HDS).

Is ON indicated at idling and OFF indicated at 2,000 rpm?

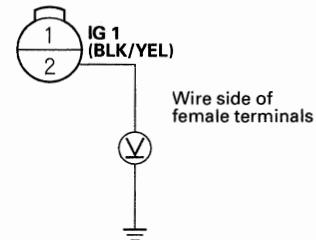
YES—Go to step 4.

NO—Update the engine control module (ECM) / powertrain control module (PCM) if it does not have the latest software (see page 11-6), or substitute a known-good ECM/PCM (see page 11-7), then recheck. If the engine mount control system works properly, and the ECM/PCM was updated, the troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-171). ■

4. Shift the transmission to park (A/T), or neutral (M/T) position.
5. Disconnect the engine mount control solenoid valve 2P connector from the engine mount control solenoid valve.

6. Measure voltage between engine mount control solenoid valve 2P connector terminal No. 2 and body ground.

ENGINE MOUNT CONTROL
SOLENOID VALVE 2P CONNECTOR



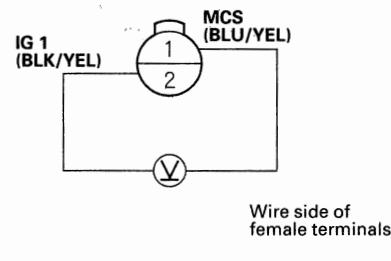
Is there battery voltage?

YES—Go to step 7.

NO—Repair an open in the wire between engine mount control solenoid valve and No. 18 (15A) fuse in the under-dash fuse/relay box. ■

7. Measure voltage between engine mount control solenoid valve 2P connector terminals No. 1 and No. 2, with the engine at idle.

ENGINE MOUNT CONTROL
SOLENOID VALVE 2P CONNECTOR



Is there battery voltage?

YES—Go to step 8.

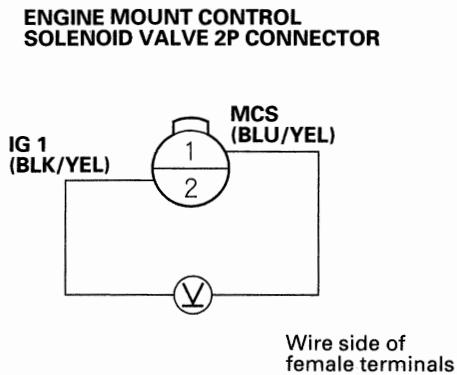
NO—Repair an open in the wire between ECM/PCM (B7) and the engine mount control solenoid valve 2P connector. If the wire is OK, update the ECM/PCM if it does not have the latest software (see page 11-6), or substitute a known-good ECM/PCM (see page 11-7), and recheck. If the engine mount control system works properly, and the ECM/PCM was updated, the troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-171). ■

(cont'd)

Engine Mount Control System

Troubleshooting (cont'd)

8. Raise the engine speed above 1,000 rpm.
9. Measure voltage between engine mount control solenoid valve 2P connector terminals No. 1 and No. 2.

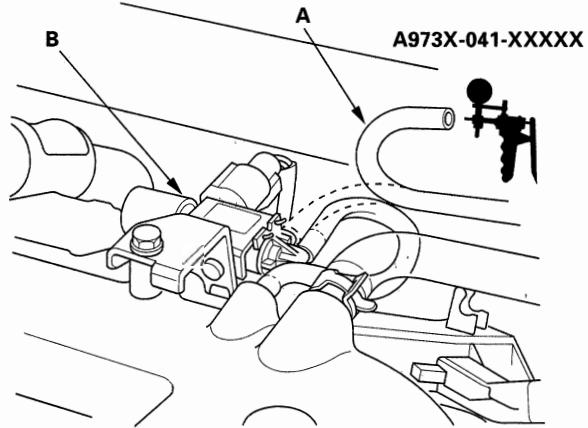


Is there battery voltage?

YES—Repair a short to body ground in the wire between ECM/PCM (B7) and the engine mount control solenoid valve. If the wire is OK, update the ECM/PCM if it does not have the latest software (see page 11-6), or substitute a known-good ECM/PCM (see page 11-7), and recheck. If the engine mount control system works properly, and the ECM/PCM was updated, the troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-171). ■

NO—Go to step 10.

10. Disconnect the vacuum hose (A) that is closest to the solenoid connector from the engine mount control solenoid valve (B), and connect a vacuum pump/gauge to the hose. Apply about 20 in.Hg of vacuum, and wait for 20 seconds.



Does the engine mounts hold vacuum?

YES—Go to step 11.

NO—Either the vacuum hose or one of the engine mount has a vacuum leak. Repair as needed. ■



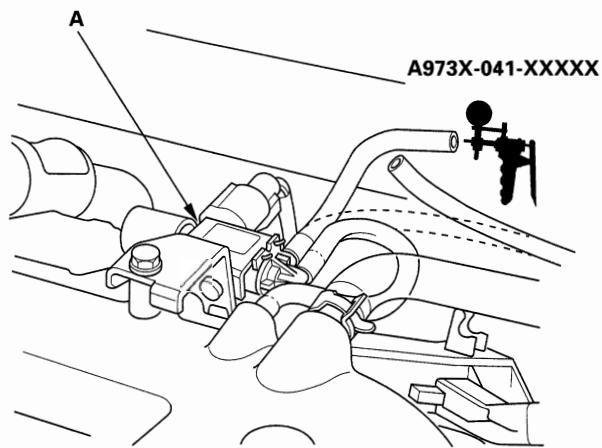
11. Release the vacuum, then apply vacuum again.

Is there a noticeable change in idle smoothness with and without vacuum applied?

YES—Go to step 12.

NO—Replace the front engine mount and/or rear engine mount. ■

12. Connect a vacuum pump/gauge to the engine mount control solenoid valve port (A) that is closest to the solenoid connector.



Is there manifold vacuum at idle, and a decrease in manifold vacuum when you raise the engine speed above 1,000 rpm?

YES—The system is OK. ■

NO—Replace the engine mount control solenoid valve. ■

