

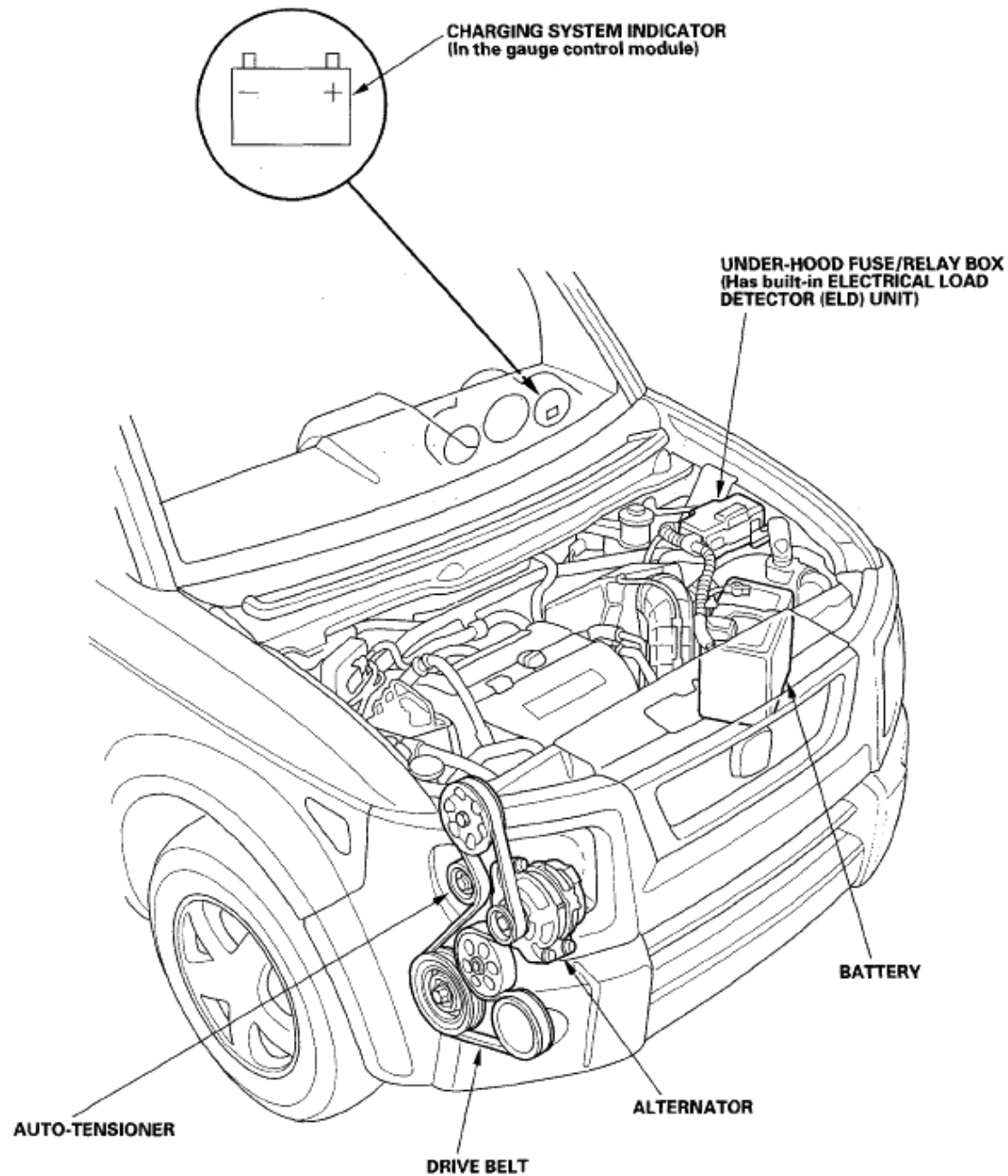
# 2007 Honda Element EX

2007-08 ELECTRICAL Charging System - Element

## 2007-08 ELECTRICAL

### Charging System - Element

#### COMPONENT LOCATION INDEX



**Fig. 1: Identifying Charging System Component Location**

## SYMPTOM TROUBLESHOOTING INDEX

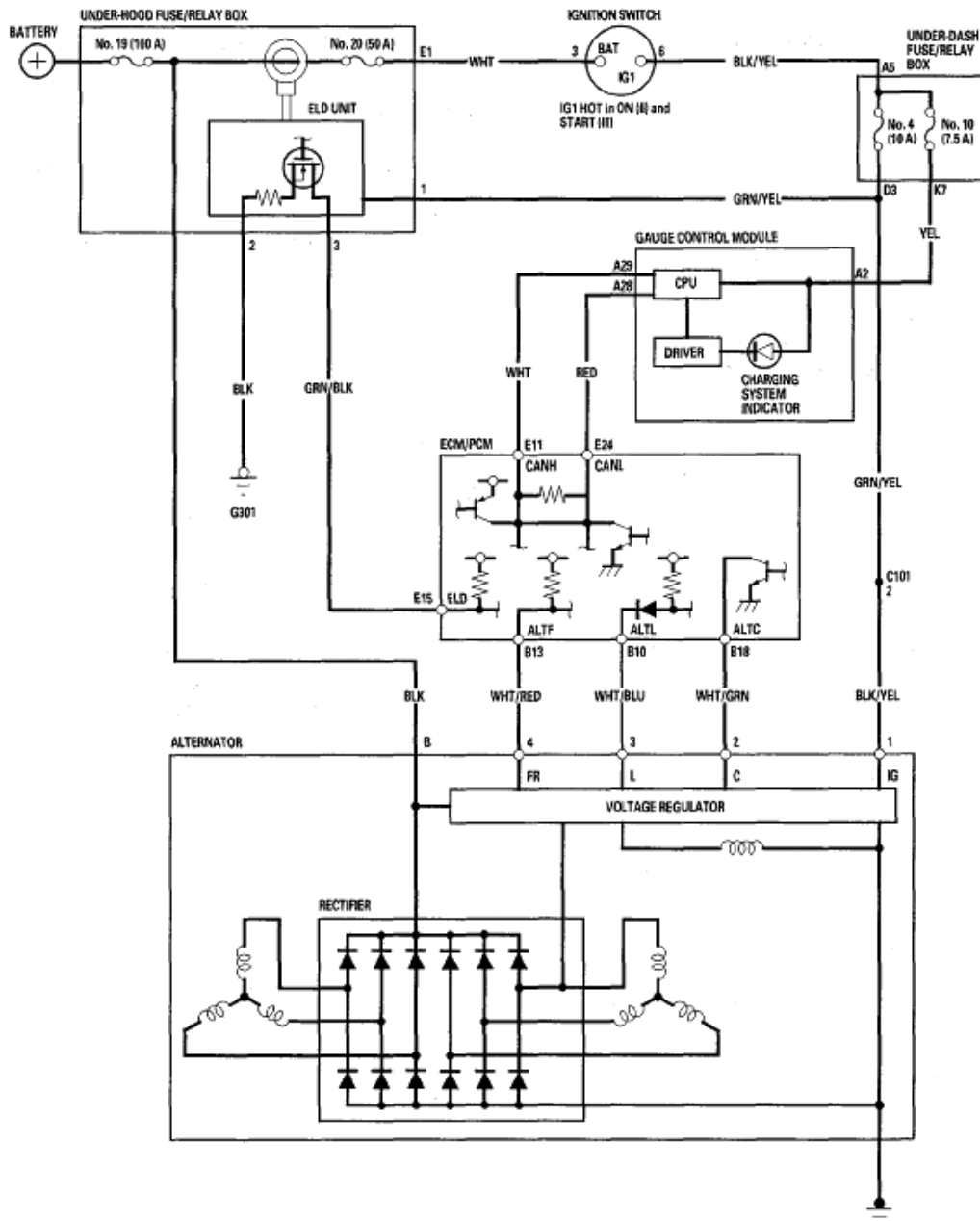
### SYMPTOM TROUBLESHOOTING CHART

Symptom	Diagnostic procedure
Charging system indicator does not come on with the ignition switch ON (II)	Troubleshoot the charging system indicator circuit (see <b><u>CHARGING SYSTEM INDICATOR CIRCUIT TROUBLESHOOTING</u></b> ).
Charging system indicator stays on	<ol style="list-style-type: none"> <li>1. Check for PGM-FI DTCs (see <b><u>GENERAL TROUBLESHOOTING INFORMATION</u></b> ).</li> <li>2. Troubleshoot the charging system indicator circuit (see <b><u>CHARGING SYSTEM INDICATOR CIRCUIT TROUBLESHOOTING</u></b> ).</li> <li>3. Check for a broken drive belt (see <b><u>DRIVE BELT INSPECTION</u></b> ).</li> <li>4. Check the drive belt auto-tensioner (see <b><u>DRIVE BELT AUTO-TENSIONER INSPECTION</u></b> ).</li> </ol>
Battery discharged	<ol style="list-style-type: none"> <li>1. Check for excessive parasitic electrical current draw with the ignition switch is OFF, and the key removed. The multiplex control unit may take up to 10 minutes to turn off (sleep mode) for some models.</li> <li>2. Check for a broken drive belt (see <b><u>DRIVE BELT INSPECTION</u></b> ).</li> <li>3. Check the drive belt auto-tensioner (see <b><u>DRIVE BELT AUTO-TENSIONER INSPECTION</u></b> ).</li> <li>4. Troubleshoot the alternator and regulator circuit (see <b><u>ALTERNATOR AND REGULATOR CIRCUIT TROUBLESHOOTING</u></b> ).</li> <li>5. Check for a poor connection at the battery terminal.</li> <li>6. Test the battery (see <b><u>BATTERY TEST</u></b> ).</li> </ol>
Battery overcharged	<ol style="list-style-type: none"> <li>1. Troubleshoot the alternator and regulator circuit (see <b><u>ALTERNATOR AND REGULATOR CIRCUIT TROUBLESHOOTING</u></b> ).</li> <li>2. Test the battery (see <b><u>BATTERY TEST</u></b> ).</li> </ol>

### CIRCUIT DIAGRAM

## 2007 Honda Element EX

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**Fig. 2: Charging System Circuit Diagram**

## CHARGING SYSTEM INDICATOR CIRCUIT TROUBLESHOOTING

1. Turn the ignition switch ON (II).

*Does the charging system indicator come on?*

**YES** -Go to step 2.

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**NO** -Go to step 14.

2. Start the engine. Hold the engine speed at 2,000 rpm for 1 minute.

*Does the charging system indicator go off?*

**YES** -Charging system indicator circuit is OK. Go to the alternator and regulator circuit troubleshooting (see **ALTERNATOR AND REGULATOR CIRCUIT TROUBLESHOOTING** ).

**NO** -Go to step 3.

3. Do the gauge control module self-diagnostic function procedure (see **SELF-DIAGNOSTIC FUNCTION** ).

*Does the charging system indicator flash?*

**YES** -Go to step 4.

**NO** -Replace the gauge control module (see **GAUGE CONTROL MODULE REPLACEMENT** ).

4. Turn the ignition switch OFF.
5. Disconnect the alternator 4P connector.
6. Turn the ignition switch ON (II).

**NOTE:**        **The charging system indicator may come on and then go off.**

*Does the charging system indicator go off?*

**YES** -Replace the alternator (see **ALTERNATOR REMOVAL AND INSTALLATION** ), or repair the alternator (see **ALTERNATOR OVERHAUL** ).

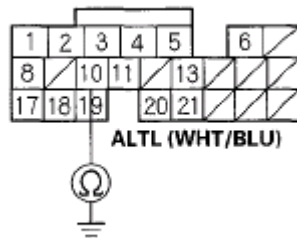
**NO** -Go to step 7.

7. Turn the ignition switch OFF.
8. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 in **HOW TO USE THE HDS (HONDA DIAGNOSTIC SYSTEM)** ).
9. Turn the ignition switch ON (II).
10. Make sure the HDS communicates with the vehicle and the engine control module (ECM)/powertrain control module (PCM). If it doesn't communicate, troubleshoot the DLC circuit (see **DLC CIRCUIT TROUBLESHOOTING** ).
11. Jump the SCS line with the HDS, then turn the ignition switch OFF.

**NOTE:**        **This step must be done to protect the ECM/PCM from damage.**

12. Disconnect ECM/PCM connector B (24P).
13. Check for continuity between ECM/PCM connector terminal B10 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

**Fig. 3: Checking Continuity Between ECM/PCM Connector Terminal B10 And Body Ground***Is there continuity?***YES** -Repair short in the wire between the alternator and the ECM/PCM.

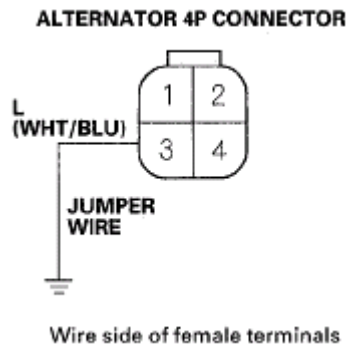
**NO** -Update the ECM/PCM if it does not have the latest software (see **UPDATING THE ECM/PCM** ), or substitute a known-good ECM/PCM (see **SUBSTITUTING THE ECM/PCM** ), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see **ECM/PCM REPLACEMENT** ).

14. Do the gauge control module self-diagnostic function procedure (see **SELF-DIAGNOSTIC FUNCTION** ).

*Does the charging system indicator flash?***YES** -Go to step 15.

**NO** -Replace the gauge control module (see **GAUGE CONTROL MODULE REPLACEMENT** ).

15. Turn the ignition switch OFF.
16. Disconnect the alternator 4P connector.
17. Connect alternator 4P connector terminal No. 3 and body ground with a jumper wire.



**Fig. 4: Connecting Alternator 4P Connector Terminal No. 3 And Body Ground**

18. Turn the ignition switch ON (II).

*Does the charging system indicator come on?*

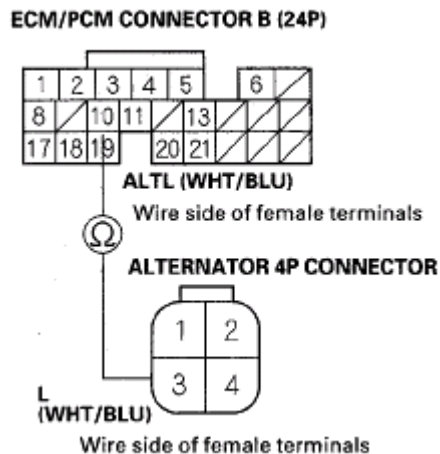
**YES** -Replace the alternator (see **ALTERNATOR REMOVAL AND INSTALLATION** ), or repair the alternator (see **ALTERNATOR OVERHAUL** ).

**NO** -Disconnect the jumper wire, then go to step 19.

19. Connect the HDS to the DLC (see step 2 in **HOW TO USE THE HDS (HONDA DIAGNOSTIC SYSTEM)** ).
20. Turn the ignition switch ON (II).
21. Make sure the HDS communicates with the vehicle and the ECM/PCM. If it doesn't communicate, troubleshoot the DLC circuit (see **DLC CIRCUIT TROUBLESHOOTING** ).
22. Jump the SCS line with the HDS, then turn the ignition switch OFF.

**NOTE:**        **This step must be done to protect the ECM/PCM from damage.**

23. Disconnect ECM/PCM connector B (24P).
24. Check for continuity between ECM/PCM connector terminal B10 and the alternator 4P connector terminal No. 3.



**Fig. 5: Checking Continuity Between ECM/PCM Connector Terminal B10 And Alternator 4P Connector Terminal No. 3**

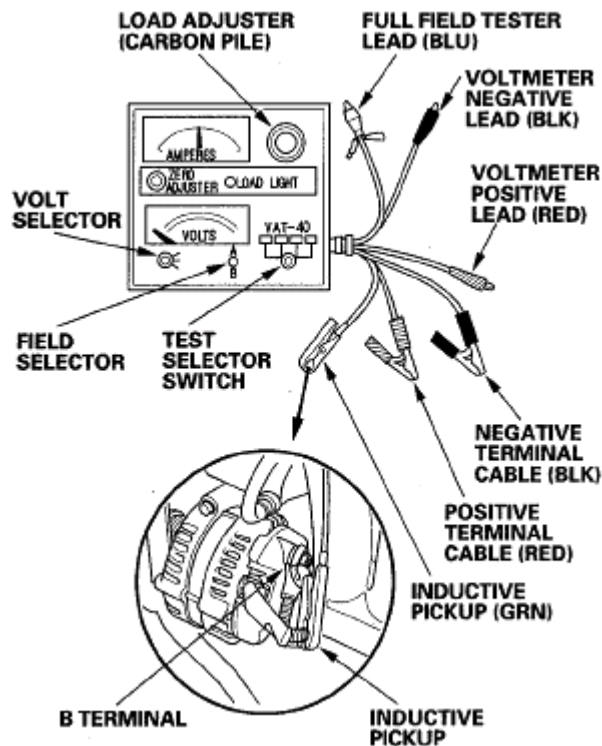
*Is there continuity?*

**YES** -Update the ECM/PCM if it does not have the latest software (see **UPDATING THE ECM/PCM** ), or substitute a known-good ECM/PCM (see **SUBSTITUTING THE ECM/PCM** ), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see **ECM/PCM REPLACEMENT** ).

**NO** -Repair open in the wire between the alternator and the ECM/PCM.

## **ALTERNATOR AND REGULATOR CIRCUIT TROUBLESHOOTING**

1. Make sure the battery connections are good and the battery is sufficiently charged (see **BATTERY TEST** ).
2. Connect a VAT-40 (or equivalent tester), and turn the selector switch to position 1 (starting).



**Fig. 6: Identifying VAT-40 Components**

3. Start the engine. Hold the engine speed 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 ALTERNATOR REMOVAL AND INSTALLATION ), or rear housing assembly (see ALTERNATOR OVERHAUL ).

**NO** -Go to step 5.

5. Release the accelerator pedal, and let the engine idle.
6. Turn off all the accessories. Select the charging test on the tester.
7. Remove the inductive pickup, and zero the ammeter.
8. Place the inductive pickup over the B terminal wire of the alternator so 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 circuit troubleshooting (see ALTERNATOR CONTROL CIRCUIT TROUBLESHOOTING ).



**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 87.5 A or more?*

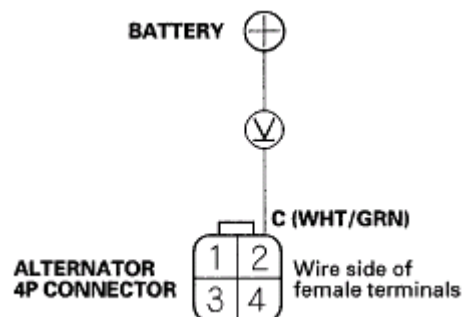
**YES** -The charging system is OK.

**NOTE:** If the charging system indicator is still on, replace the alternator (see ALTERNATOR REMOVAL AND INSTALLATION ).

**NO** -Replace the alternator (see ALTERNATOR REMOVAL AND INSTALLATION ), or repair the alternator (see ALTERNATOR OVERHAUL ).

## ALTERNATOR CONTROL CIRCUIT TROUBLESHOOTING

1. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 in HOW TO USE THE HDS (HONDA DIAGNOSTIC SYSTEM) ).
2. Turn the ignition switch ON (II).
3. Make sure the HDS communicates with the vehicle and the engine control module (ECM)/powertrain control module (PCM). If it doesn't communicate, troubleshoot the DLC circuit (see DLC CIRCUIT TROUBLESHOOTING ).
4. Check for DTCs (see GENERAL TROUBLESHOOTING INFORMATION ). If a DTC is present, diagnose and repair the cause before continuing with this test.
5. Disconnect the alternator 4P connector from the alternator.
6. Start the engine, and turn on the headlights to high beam.
7. Measure the voltage between alternator 4P connector terminal No. 2 and the positive terminal of the battery.



**Fig. 7: Measuring Voltage Between Alternator 4P Connector Terminal No. 2 And Positive Terminal Of Battery**

*Is there less than 1 V?*

**YES** -Go to step 11.

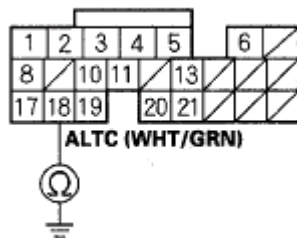
**NO** -Go to step 8.

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

**NOTE:** This step must be done to protect the ECM/PCM from damage.

9. Disconnect ECM/PCM connector B (24P).  
10. Check for continuity between ECM/PCM connector terminal B18 and body ground.

**ECM/PCM CONNECTOR B (24P)**



Wire side of female terminals

**Fig. 8: Checking Continuity Between ECM/PCM Connector Terminal B18 And Body Ground**

*Is there continuity?*

**YES** -Repair short in the wire between the alternator and the ECM/PCM.

**NO** -Update the ECM/PCM if it does not have the latest software (see **UPDATING THE ECM/PCM** ), or substitute a known-good ECM/PCM (see **SUBSTITUTING THE ECM/PCM** ), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see **ECM/PCM REPLACEMENT** ).

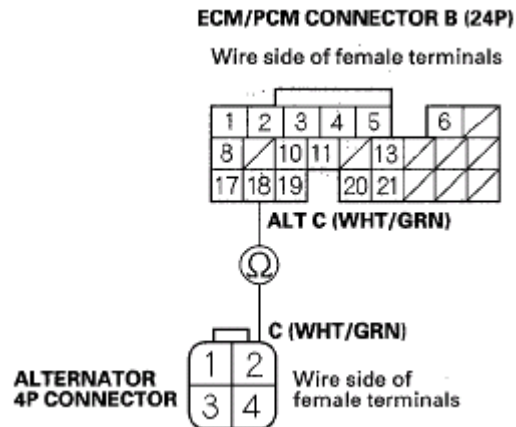
11. Jump the SCS line with the HDS, then turn the ignition switch OFF.

**NOTE:** This step must be done to protect the ECM/PCM from damage.

12. Disconnect ECM/PCM connector B (24P).  
13. Check for continuity between ECM/PCM connector terminal B18 and alternator 4P connector terminal No. 2.

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**Fig. 9: Checking Continuity Between ECM/PCM Connector Terminal B18 And Body Ground**

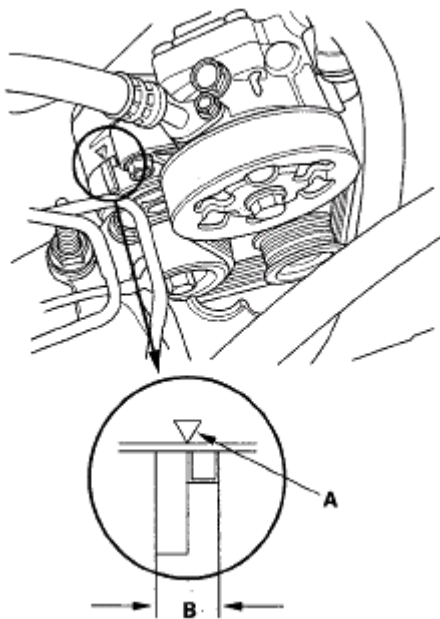
*Is there continuity?*

**YES** -Replace the alternator (see **ALTERNATOR REMOVAL AND INSTALLATION** ), or repair the alternator (see **ALTERNATOR OVERHAUL** ).

**NO** -Repair open in the wire between the alternator and the ECM/PCM.

## DRIVE BELT INSPECTION

1. Inspect the belt for cracks or damage. If the belt is cracked or damaged, replace it.
2. 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 **DRIVE BELT INSPECTION** ).



**Fig. 10: Identifying Auto-Tensioner Indicator**

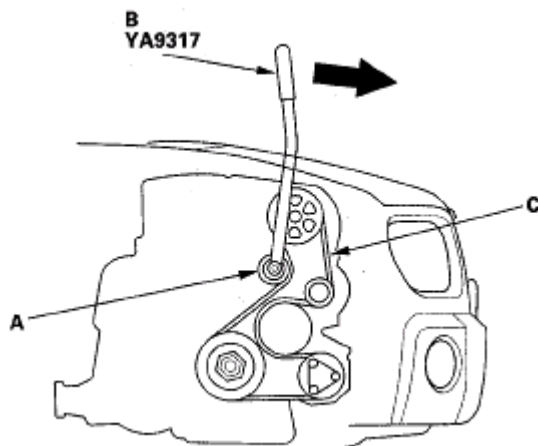
## DRIVE BELT REPLACEMENT

### Special Tools Required

Belt tension release tool

Snap-on YA9317 or equivalent, commercially available

1. Move the auto-tensioner (A) using the belt tension release tool (B) in the direction shown to relieve tension from the drive belt (C), then remove the drive belt.

**Fig. 11: Moving Auto-Tensioner Using Belt Tension Release Tool**

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

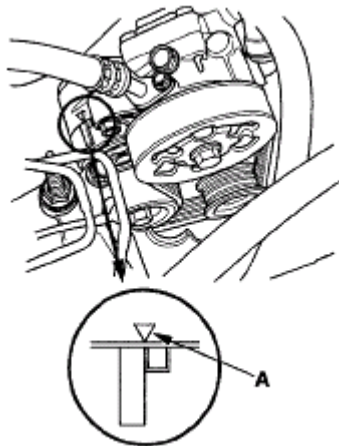
## DRIVE BELT AUTO-TENSIONER INSPECTION

### Special Tools Required

Belt tension release tool

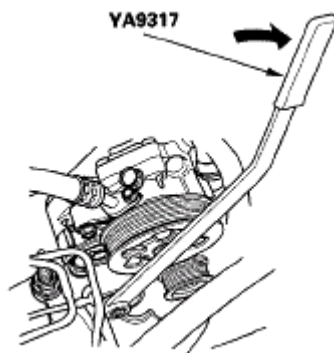
Snap-on YA9317 or equivalent, commercially available

1. Turn the ignition switch ON (II). Make sure the A/C switch is OFF. Turn the ignition switch OFF.
2. Check the position of the auto-tensioner indicator's pointer (A). Start the engine, then check the position again with the engine idling. If the position of the indicator moves or fluctuates a lot, replace the auto-tensioner (see **DRIVE BELT AUTO-TENSIONER REPLACEMENT** ).



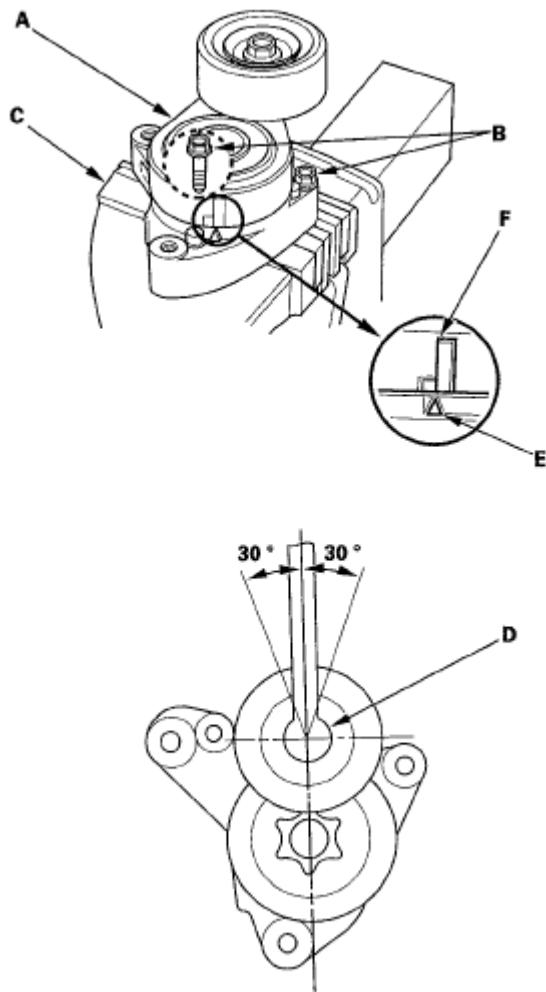
**Fig. 12: Identifying Position Of Auto-Tensioner Indicator's Pointer**

3. Check for abnormal noise from the tensioner pulley. If you hear abnormal noise, replace the auto-tensioner pulley (see **DRIVE BELT AUTO-TENSIONER REPLACEMENT** ).
4. Remove the drive belt (see **DRIVE BELT INSPECTION** ).
5. Move the auto-tensioner within its limit using the belt tension release tool in the direction shown. Check that the tensioner moves smoothly and without any abnormal noise. If the tensioner does not move smoothly, or if you hear abnormal noise, replace the auto-tensioner (see **DRIVE BELT AUTO-TENSIONER REPLACEMENT** ).



**Fig. 13: Moving Auto-Tensioner Using Belt Tension Release Tool**

6. Remove the auto-tensioner (see **DRIVE BELT AUTO-TENSIONER REPLACEMENT** ).
7. Clamp the auto-tensioner (A) by using two 8 mm bolts (B) and a vise (C) as shown. Do not clamp the auto-tensioner itself.



**Fig. 14: Clamping Auto-Tensioner Bolts And Vise**

8. Set the torque wrench (D) in the pulley bolt in the direction shown.
9. Align the indicator (E) on the tensioner base with center mark (F) on the tensioner arm by using the torque wrench, and measure the torque. If the torque value is out of specification, replace the auto-tensioner (see **DRIVE BELT AUTO-TENSIONER REPLACEMENT** ).

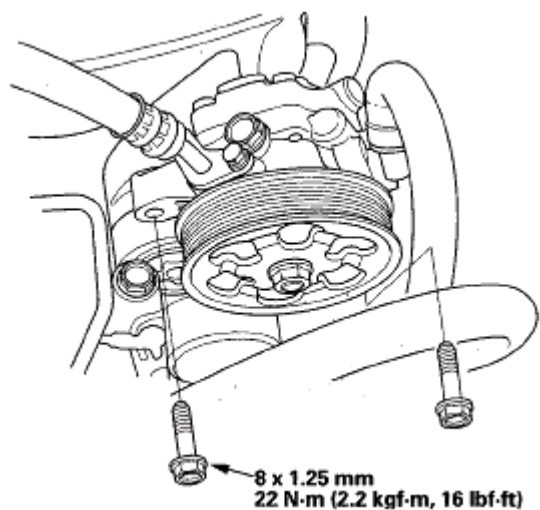
**NOTE:** If the indicator exceeds the center mark, recheck the torque.

#### Auto-tensioner Spring Torque

32.5-39.7 N.m (3.31-4.05 kgf.m, 23.9-29.3 lbf.ft)

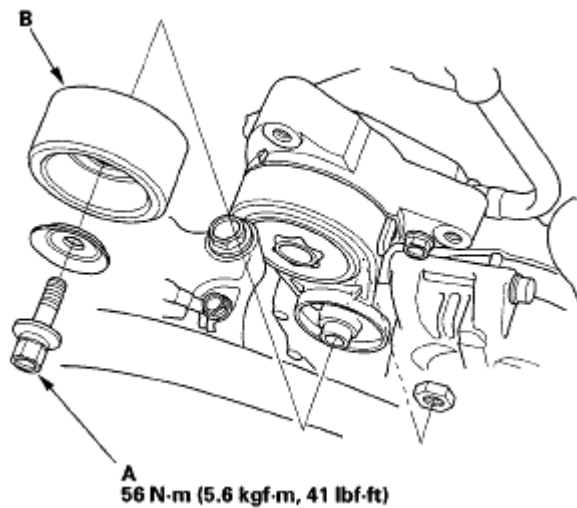
## DRIVE BELT AUTO-TENSIONER REPLACEMENT

1. Remove the drive belt (see **DRIVE BELT INSPECTION** ).
2. Remove the power steering (P/S) pump without disconnecting the P/S hoses.



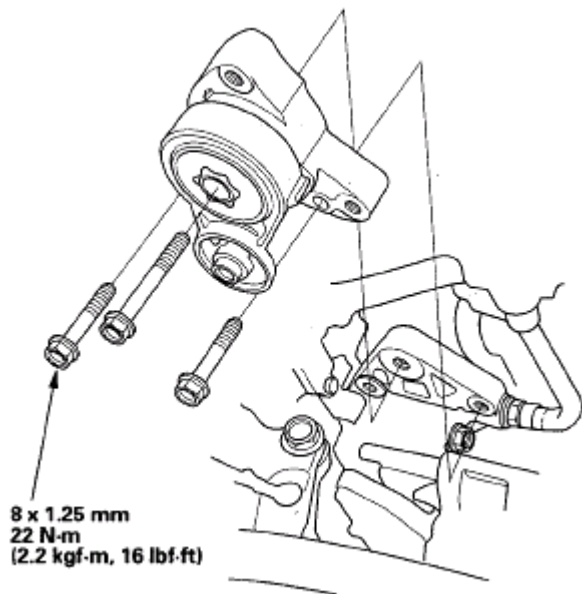
**Fig. 15: Identifying Power Steering (P/S) Pump Bolts**

3. Remove the pulley bolt (A), and remove the tensioner pulley (B).



**Fig. 16: Identifying Pulley Bolt (With Torque Specifications)**

4. Remove the auto-tensioner.



**Fig. 17: Identifying Auto-Tensioner Bolts (With Torque Specifications)**

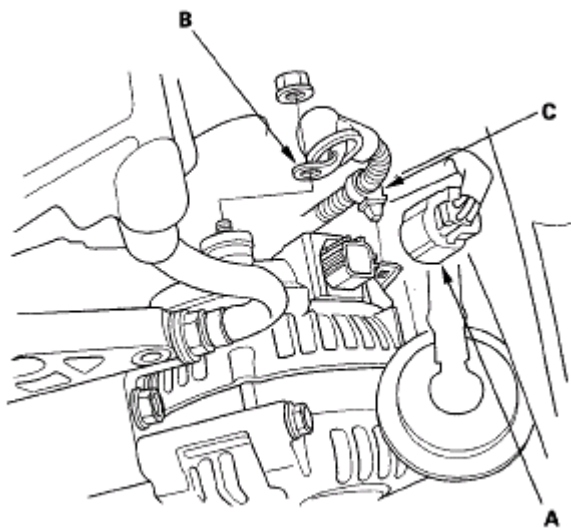
5. Install the auto-tensioner in the reverse order of removal.

## **ALTERNATOR REMOVAL AND INSTALLATION**

### **REMOVAL**

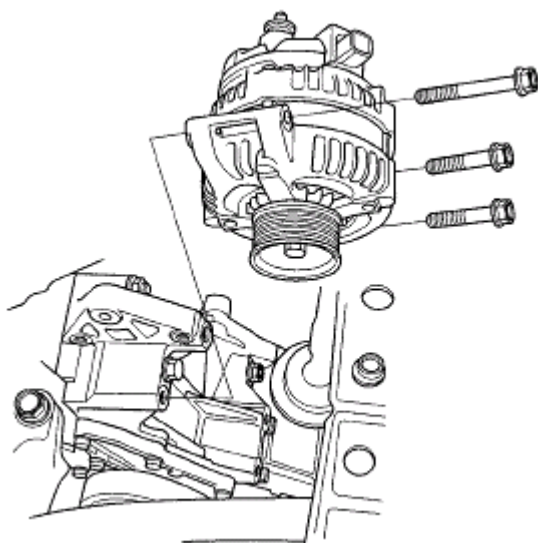
1. Make sure you have the anti-theft code for the audio system.
2. Disconnect the negative cable from the battery.
3. Remove the drive belt (see **DRIVE BELT INSPECTION** ).
4. Remove the auto-tensioner (see **DRIVE BELT AUTO-TENSIONER REPLACEMENT** ).
5. Disconnect the alternator connector (A), BLK wire (B), and harness clamp (C) from the alternator.





**Fig. 18: Identifying Alternator Connector, BLK Wire And Harness Clamp**

6. Remove the positive crankcase ventilation (PCV) valve (see **GENERAL TROUBLESHOOTING INFORMATION** 52).
7. Remove the three bolts securing the alternator.



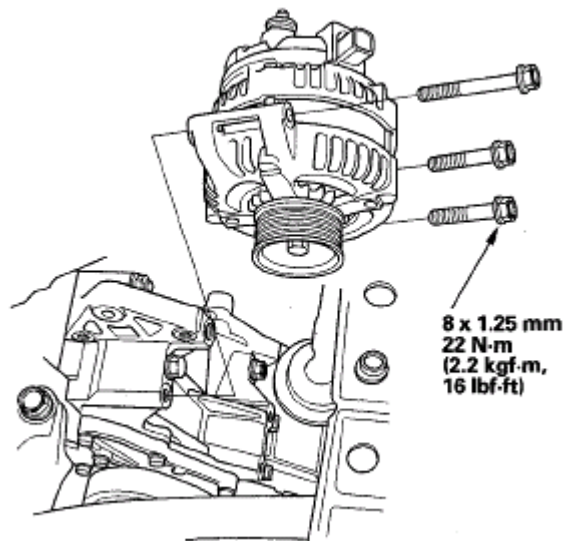
**Fig. 19: Identifying Alternator Bolts**

## INSTALLATION

1. Install the alternator.

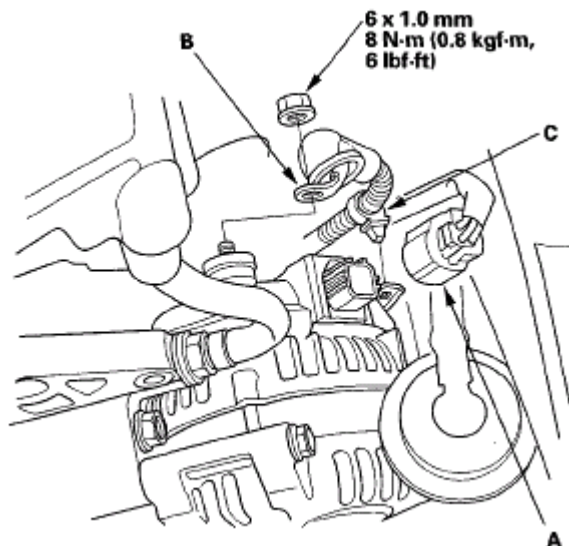
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**Fig. 20: Identifying Alternator Bolts**

2. Install the positive crankcase ventilation (PCV) valve (see **GENERAL TROUBLESHOOTING INFORMATION** 52).
3. Connect the alternator connector (A), BLK wire (B), and harness clamp (C) to the alternator. Make sure the crimped side of the ring terminal faces away from the alternator when you connect it.



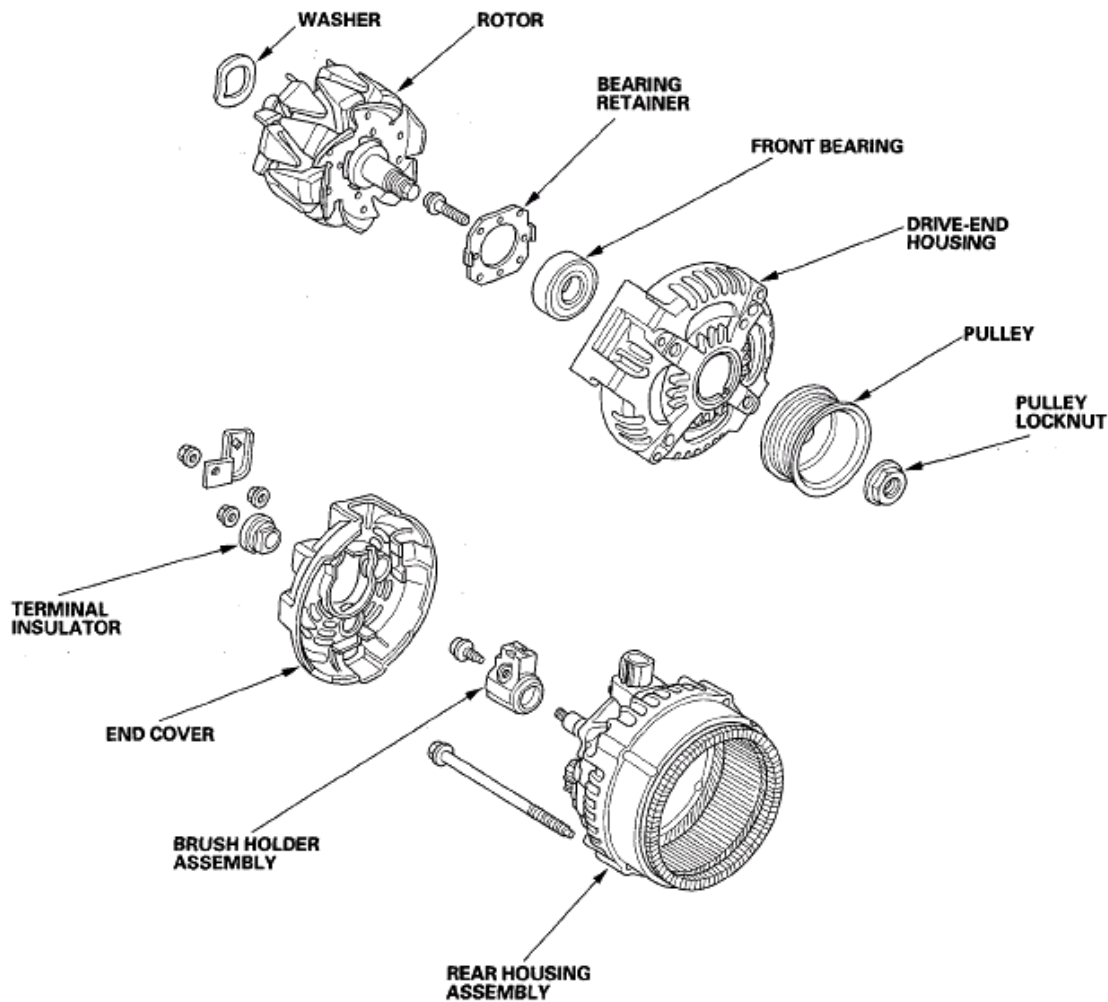
**Fig. 21: Identifying Alternator Connector, BLK Wire And Harness Clamp**

4. Install the auto-tensioner (see **DRIVE BELT AUTO-TENSIONER REPLACEMENT** ).
5. Install the drive belt (see **DRIVE BELT INSPECTION** ).
6. Connect the negative cable to the battery.
7. Enter the anti-theft code for the audio system.

8. Do the power window control unit reset procedure (see **RESETTING THE POWER WINDOW CONTROL UNIT** ).
9. Set the clock.

## ALTERNATOR OVERHAUL

### EXPLODED VIEW



**Fig. 22: Exploded View Of Alternator Overhaul**

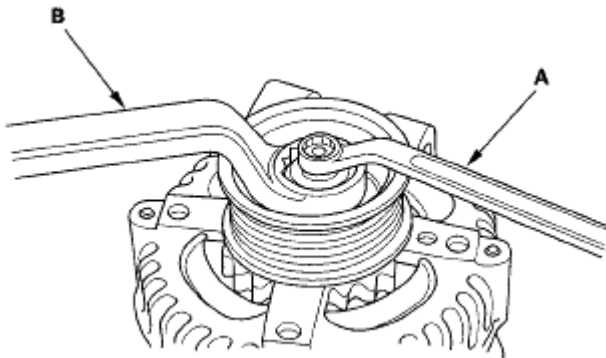
### Special Tools Required

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

**NOTE:** Refer to the **EXPLODED VIEW** as needed during this procedure.

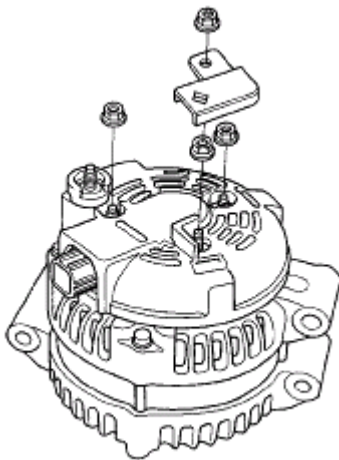
### Alternator Disassembly

1. Test the alternator and regulator before you remove them (see **ALTERNATOR AND REGULATOR CIRCUIT TROUBLESHOOTING** ).
2. Remove the alternator (see **ALTERNATOR REMOVAL AND INSTALLATION** ).
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.



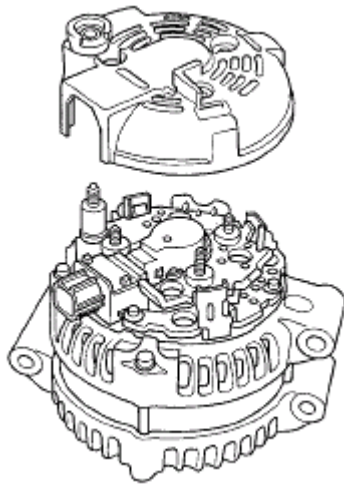
**Fig. 23: Removing Pulley Lock Nut**

4. Remove the harness stay and the three flange nuts from the alternator.



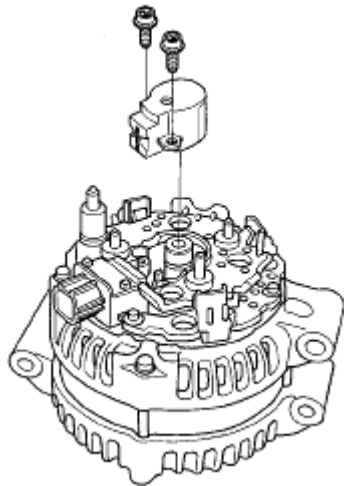
**Fig. 24: Identifying Harness Stay And Flange Nuts From Alternator**

5. Remove the end cover.



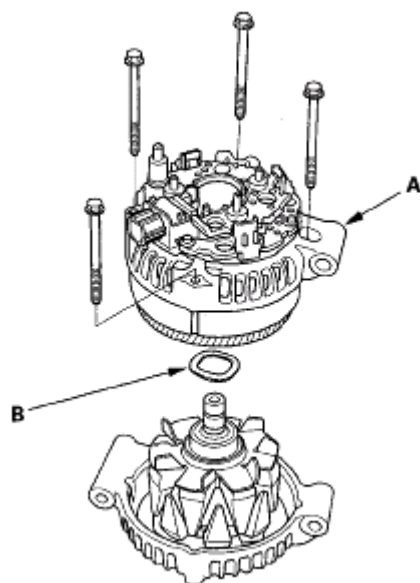
**Fig. 25: Identifying End Cover**

6. Remove the brush holder.



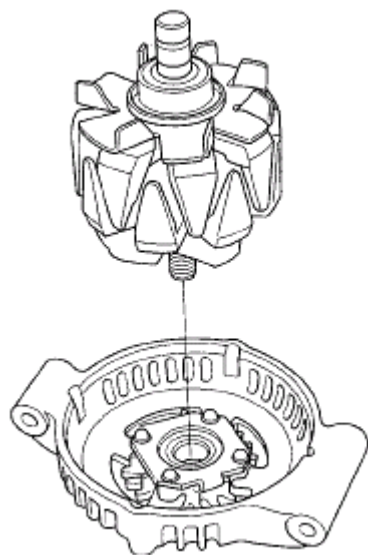
**Fig. 26: Identifying Brush Holder**

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



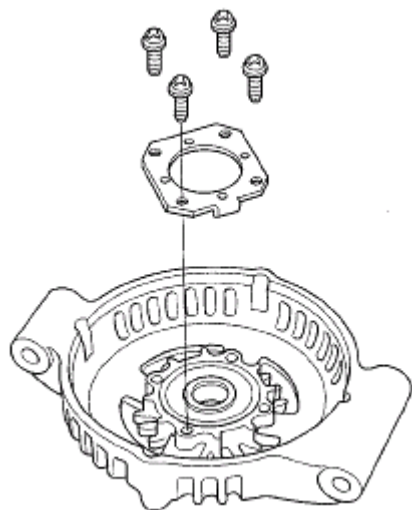
**Fig. 27: Identifying Rear Housing Assembly And Washer Bolts**

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



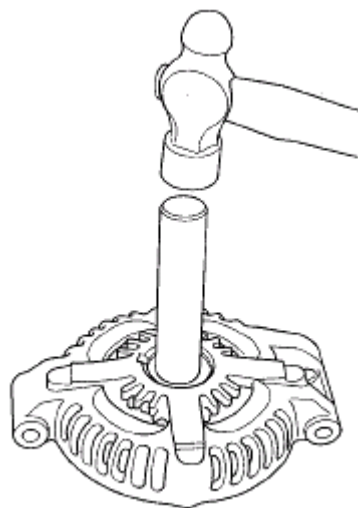
**Fig. 28: Identifying Rotor From Drive-End Housing**

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 bearing retainer.



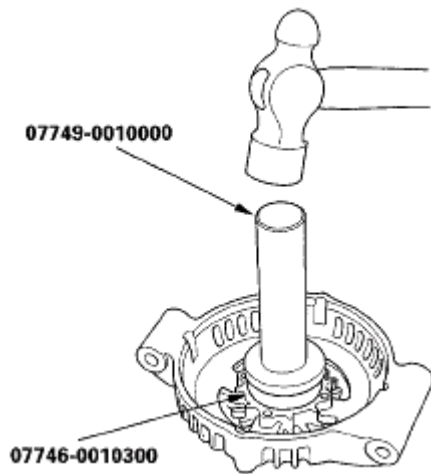
**Fig. 29: Identifying Bearing Retainer**

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



**Fig. 30: Driving Out Front Bearing**

12. Install a new front bearing in the drive-end housing with a hammer, the handle driver, and attachment.



**Fig. 31: Installing Front Bearing In Drive-End Housing**

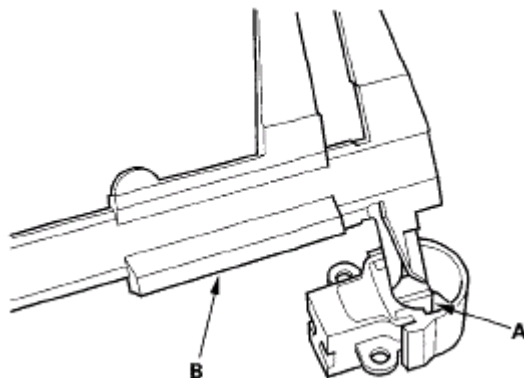
### Alternator Brush Inspection

13. Measure the length of both brushes (A) with a vernier caliper (B).
  - If either brush is shorter than the service limit, replace the brush holder assembly.
  - If the 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.)**



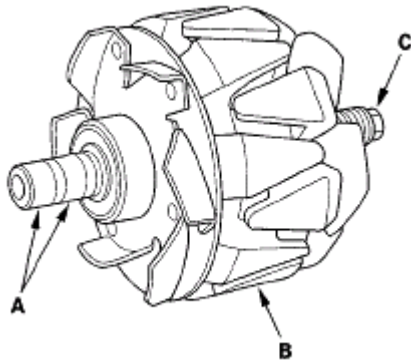
**Fig. 32: Measuring Length Of Both Brushes With Vernier Caliper**

### Rotor Slip Ring Test

14. Check for continuity between the slip rings (A).
  - If there is continuity, go to step 15.



- If there is no continuity, replace the rotor assembly.

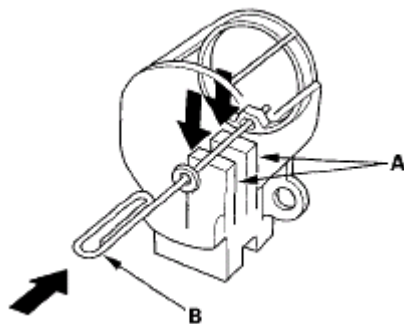


**Fig. 33: Checking Continuity Between Slip Rings**

15. Check for 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.

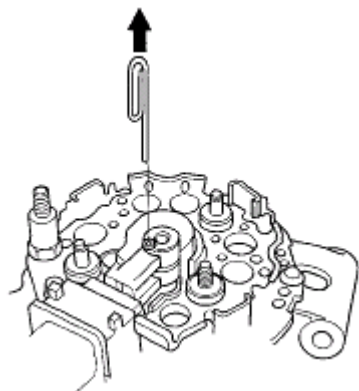
**Alternator Reassembly**

16. If you removed the pulley, put the rotor in the drive-end housing, then torque its locknut to 110 N.m (11.0 kgf.m, 81.0 lbf.ft).
17. Remove any grease or any oil from the slip rings.
18. Put the rear housing assembly and drive-end housing/rotor assembly together, torque the four through bolts.
19. Push in the brushes (A), then insert a pin or drill bit (B) (about 1.6 mm (0.06 in.) diameter) to hold them there.



**Fig. 34: Pushing In Brushes**

20. Install the brush holder, and pull out the pin.



**Fig. 35: Pulling Out Pin**

21. Install the end cover.
22. After assembling the alternator, turn the pulley by hand to make sure the rotor rotates smoothly and without noise.
23. Install the alternator (see **INSTALLATION** ) and drive belt (see **DRIVE BELT INSPECTION** ).