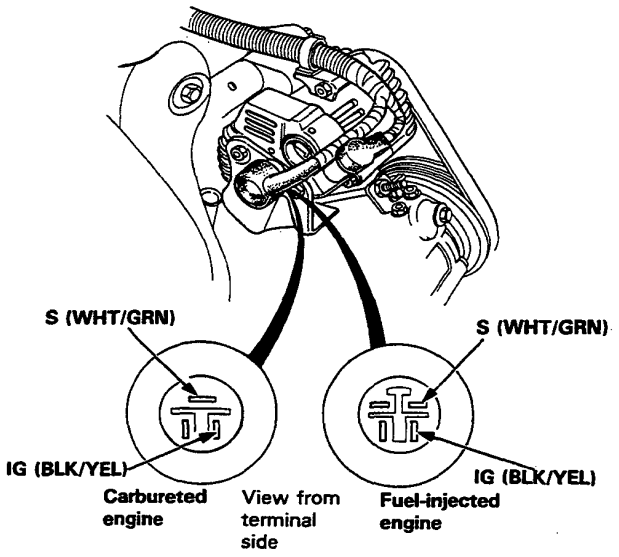
Alternator and Regulator Test

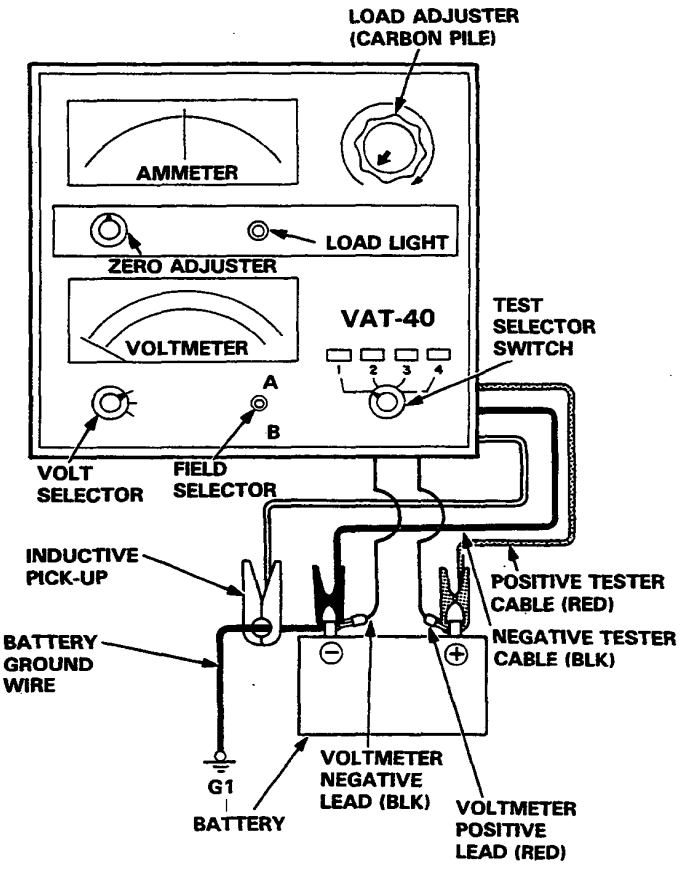
1. First make sure you have a good battery, and that the alternator belt, and connections at the alternator and main fuses are good. Next, check the No. 12 (10 A) fuse in the dash fuse box and the No. 37 (10 A) fuse in the under-hood relay box. (If blown, the charge warning light will come on even if the system's working properly.)

2. Disconnect the alternator connector from the alternator.
   With the ignition switch on, there should be battery voltage between the IG (BLK/YEL) terminal and body ground, and between the S (WHT/GRN) terminal and body ground.



- If there is no voltage, check for:
  - Blown No. 12 (10 A) fuse in the dash fuse box.
  - An open in the BLK/YEL wire between the dash fuse box and the voltage regulator, or the WHT/GRN wire between the under-hood relay box and the voltage regulator.
- If there is battery voltage, go to step 3.

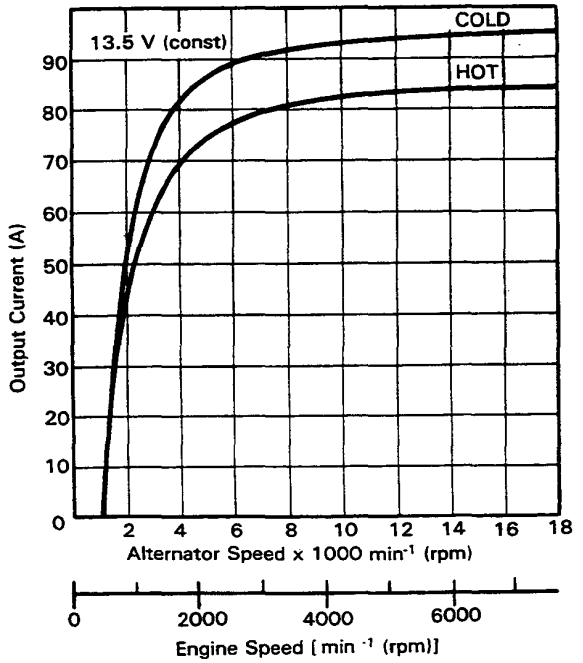
3. Following the manufacturer's instructions, connect the SUN VAT-40 (or equivalent) and turn the test selector switch to the "Starting (No. 1)" position.



4. Start the engine. Turn off all accessories, move the test selector switch to the "Charging (No. 2) position, remove the inductive pick-up, and zero the ammeter.
   Reconnect the inductive pick-up to the battery ground wire, so the arrow is pointing away from the battery.

5. Raise engine speed to 2,000 min^{-1} (rpm) and hold (make sure cooling fans are off).
   Apply a "load" with the carbon pile, so the voltage drops to no less than 12 volts.
   Check the maximum amperage reading and compare with the chart below.

   NOTE: Subtract 5 to 10 amperes from the maximum reading due to engine operation.

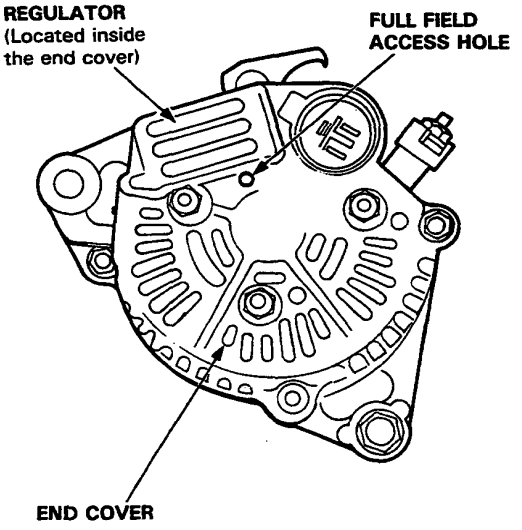


- If amperage is within specification, the system is OK: Proceed to the Charge Warning Light Test (see page 16-70).
- If amperage is not within specification, go to step 6.

6. Perform full field test: Attach a probe to the VAT-40 full field test lead and insert the prove into the full field access hole at the back of the alternator. Switch the field selector to the "A" (ground) position momentarily and check amperage reading.

   NOTE:
   - As an alternative, use a screwdriver and an ammeter.
   - Before performing full field test, remove a protector from the alternator end cover.

   CAUTION: The voltage will rise quickly when the alternator is full field. Do not allow the voltage to exceed 18 volts or damage to the electrical system may result.

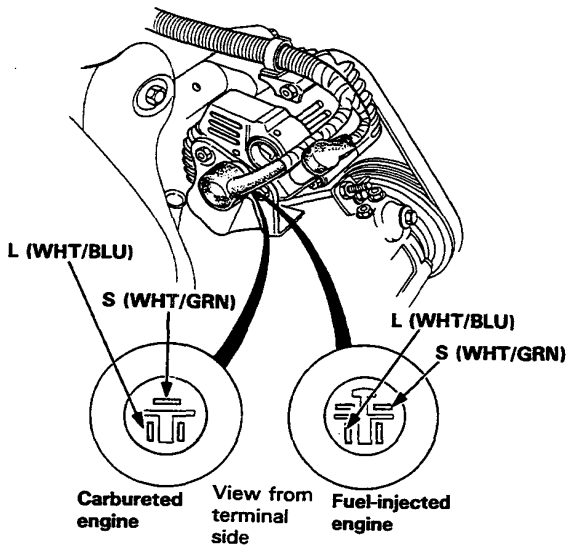


- If the amperage is within specification, replace the regulator.
- If the amperage is not within specification, replace the alternator.

Charge Warning Light Test

NOTE: Before testing, check the wire harness connection and alternator belt tension.

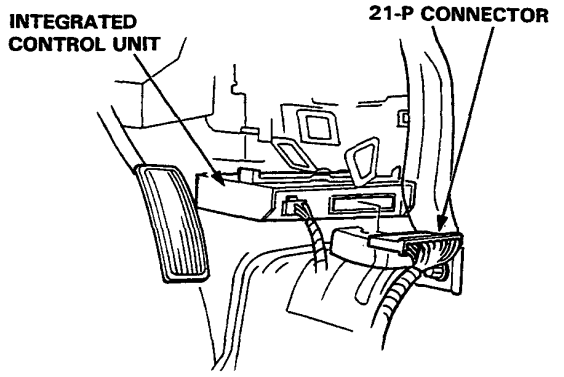
1. Turn the ignition switch on. The charge warning light should come on.
   If it does not come on, unplug the alternator connector and short the pin of the L (WHT/BLU) terminal to ground.



- If the warning light still does not come on, check for:
  - Blown No. 12 (10 A) fuse in the dash fuse box.
  - Bad bulb.
  - An open in the WHT/BLU wire between the warning light and voltage regulator.
  - An open in the BLK/YEL wire between the warning light and the dash fuse box, or the dash fuse box and the ignition switch.
- If the light comes on, check the alternator and regulator (see page 16-68).

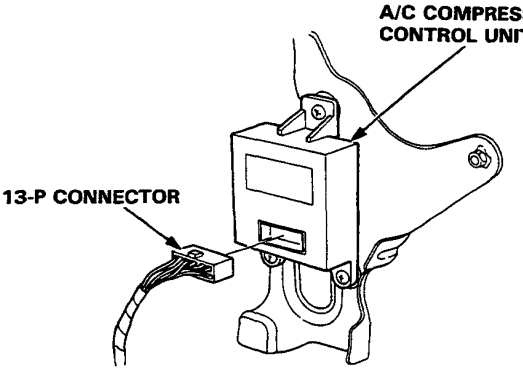
2. Start the engine and let it idle. The charge warning light should go off.
   If it stays on this time, check the No. 37 (10 A) fuse in the under-hood relay box and the WHT/GRN wire between the under-hood relay box and the alternator.
   If the fuse and wire are OK, check the alternator and regulator (see page 16-66).
   If the system is charged, proceed as follows.

3. Remove the front console, then disconnect the 21-P connector from the integreted control unit. With the engine running, the charge warning light should go out.



- If the light goes out, there is a short in the integrated control unit.
- If the light does not go out:
  Without A/C: There is short to ground in the WHT/BLU wire from the warning light to the control unit.
  With A/C: Go to step 4.

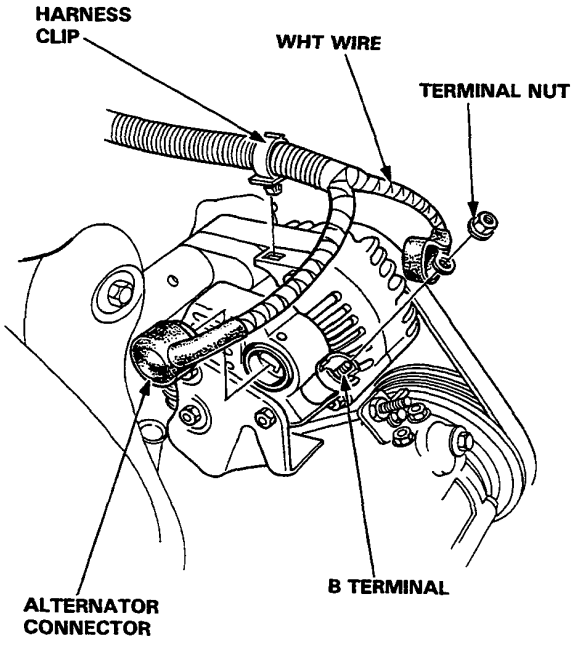
4. Remove the glove box, then disconnect the 13-P connector from the A/C compressor control unit. With the engine running, the charge warning light should go out.



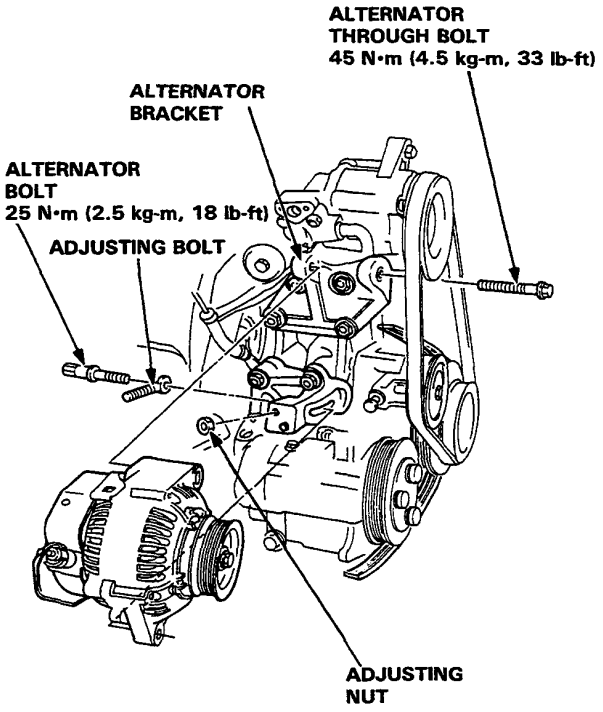
- If the light goes out, there is a short in the A/C compressor control unit.
- If the light does not go out, there is a short to ground in the WHT/BLU wire from the warning light to the control unit.

Alternator Replacement

1. Disconnect the ground wire from the battery negative (—) post.
2. Disconnect the alternator connector from the alternator, and remove the clip from the harness bracket.
3. Remove the terminal nut and the WHT wire from the B terminal.



4. Loosen the through bolt and adjusting nut.
5. Remove the alternator bolt, then remove the belt from the pulley.
6. Remove the through bolt, then remove the alternator from the bracket.

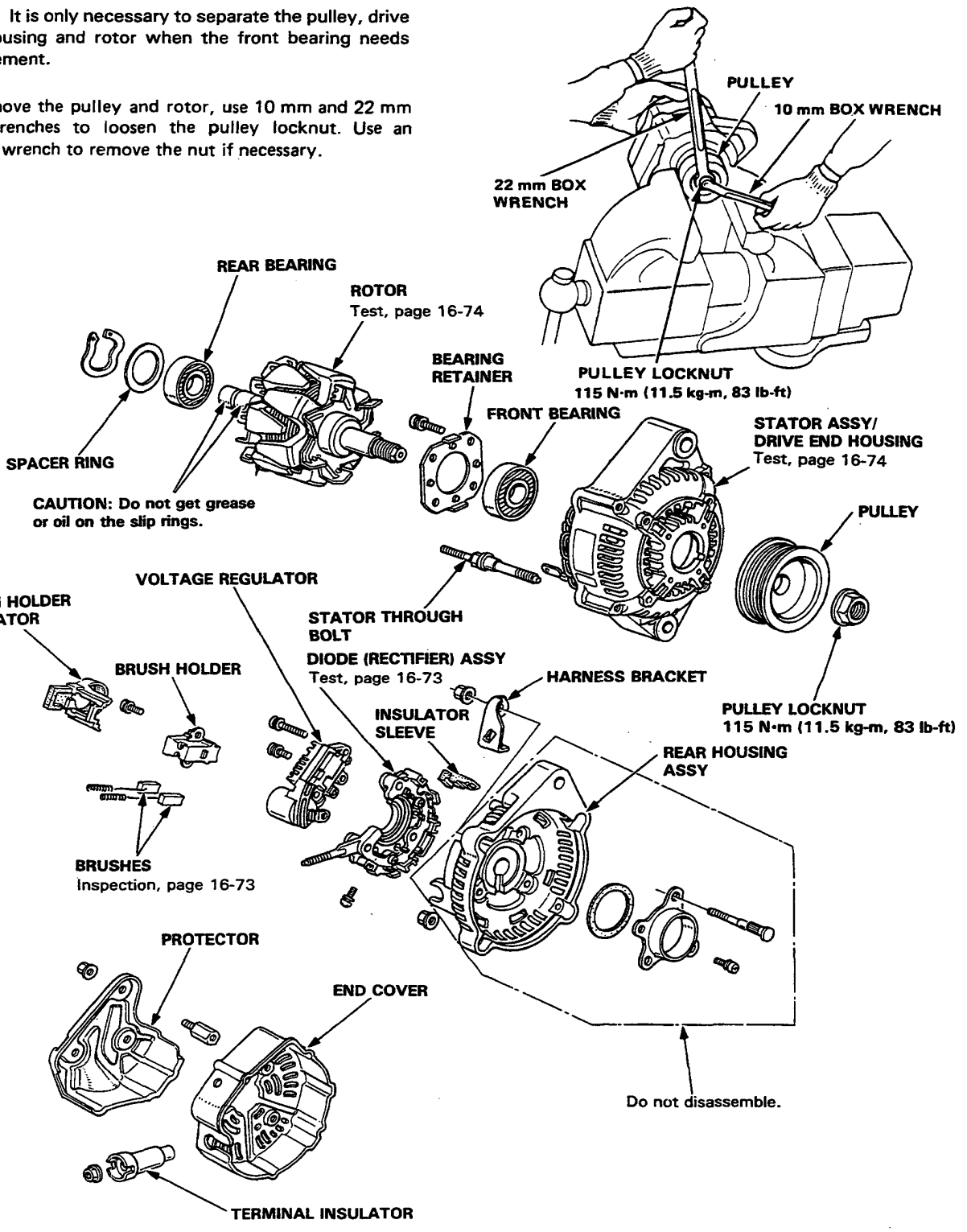


7. Adjust the alternator belt tension after installation (see page 16-75).

Alternator Overhaul

NOTE: It is only necessary to separate the pulley, drive end housing and rotor when the front bearing needs replacement.

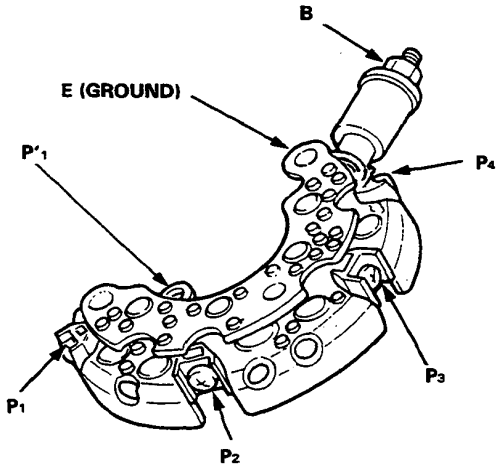
To remove the pulley and rotor, use 10 mm and 22 mm box wrenches to loosen the pulley locknut. Use an impact wrench to remove the nut if necessary.

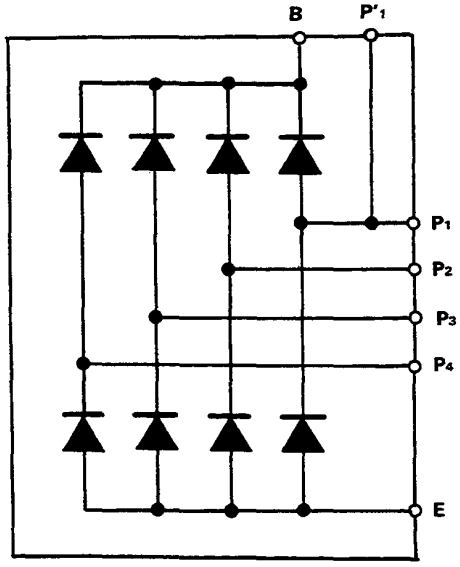


Rectifier Test

NOTE: The diodes are designed to pass current in one direction and block current in the opposite direction. Since the alternator rectifier is made up of eight diodes (4 pairs), each diode must be tested for continuity in both directions; a total of 16 checks.

1. Check for continuity in each direction, between the B and P (of each diode pair) terminals, and between the E (ground) and P (of each diode pair) terminals. All diodes should have continuity in only one direction.





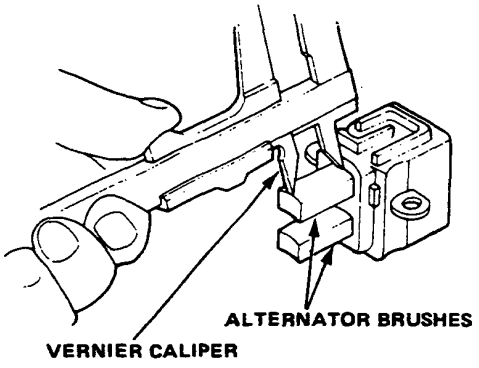
2. If any of the 8 diodes fails, replace the rectifier assembly. (Diodes are not available separately.)

Alternator Brush Inspection

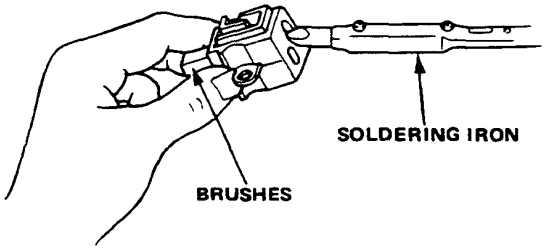
1. Remove the end cover, then take out the brush holder by removing its 2 screws.

2. Measure length of the brushes with a vernier caliper.

Alternator Brush Length:
Standard : 10.5 mm (0.41 in)
Service Limit: 5.5 mm (0.22 in)



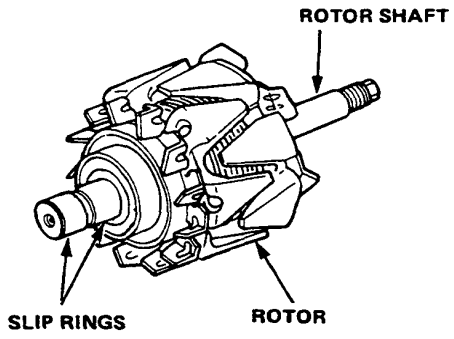
If the brushes are not within the service limit, replace them.



CAUTION: When replacing the brushes, use only a rosin core type solder or solder joints will corrode.

Rotor Slip Ring Test

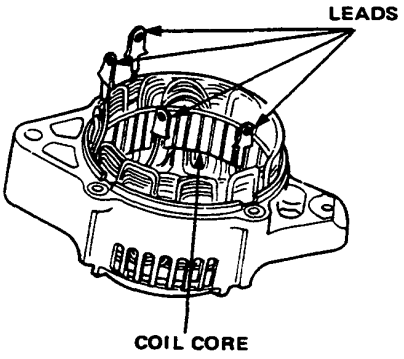
1. Check that there is continuity between the slip rings.
2. Check that there is no continuity between the rings and the rotor or rotor shaft.



3. If the rotor fails either continuity check, replace it.

Stator Test

1. Check that there is continuity between each pair of leads.
2. Check that there is no continuity between each lead and the coil core.



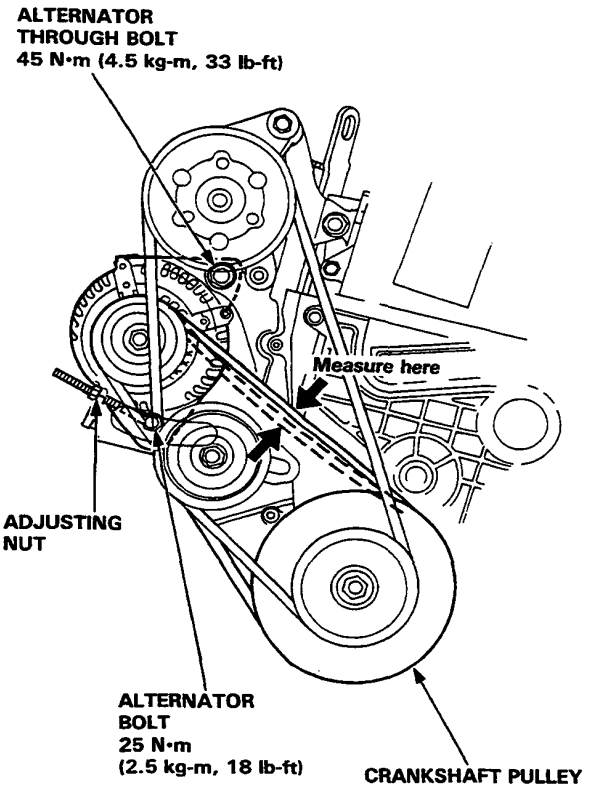
3. If the coil fails either continuity check, replace the stator.

Alternator Belt Adjustment

1. Apply a force of 98 N (10 kg, 22 lb) and measure the deflection between the alternator and the crankshaft pulley.

   Deflection: 10—12 mm (0.39—0.47 in)

   NOTE: On a brand-new belt, the deflection should be 8—10 mm (0.31—0.39 in) when first measured.



2. Loosen the alternator bolt and through bolt.
3. Move the alternator by turning the adjusting nut to obtain the proper belt tension, then retighten the alternator bolt and through bolt.
4. Recheck the deflection of the belt.