2004 STARTING & CHARGING SYSTEMS

Generators & Regulators - TSX

COMPONENT LOCATIONS

For component location, see **Fig. 1** .

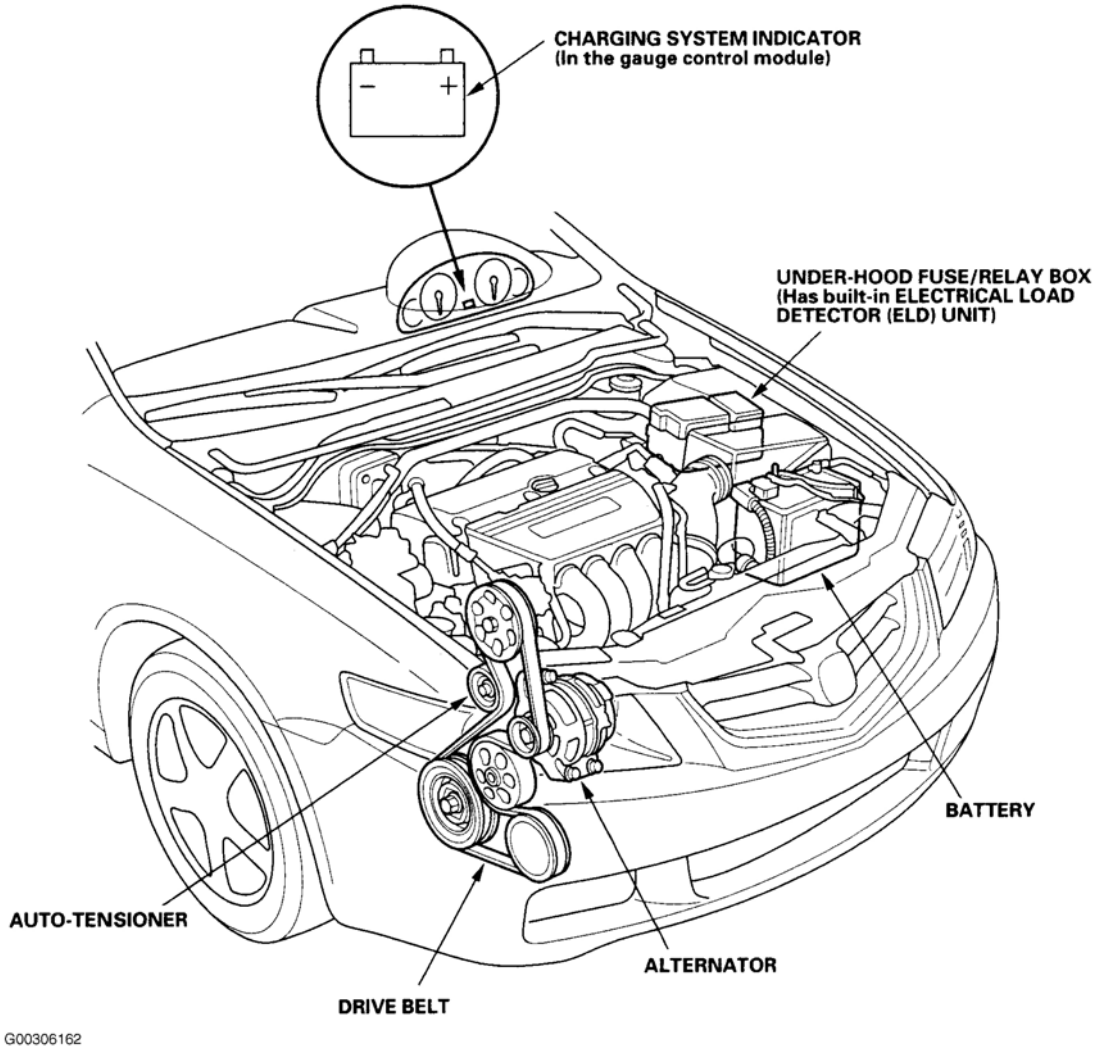


Fig. 1: Identifying Component Location
Courtesy of AMERICAN HONDA MOTOR CO., INC.

ADJUSTMENTS

DRIVE BELT

1. Inspect the belt for cracks and damage. If the belt is cracked or damaged, replace it. See **DRIVE BELT** under REMOVAL AND INSTALLATION.
2. Check that the auto-tensioner indicator "A" is within the standard range "B". If it is out of the standard range, replace the drive belt. See **Fig. 2** .

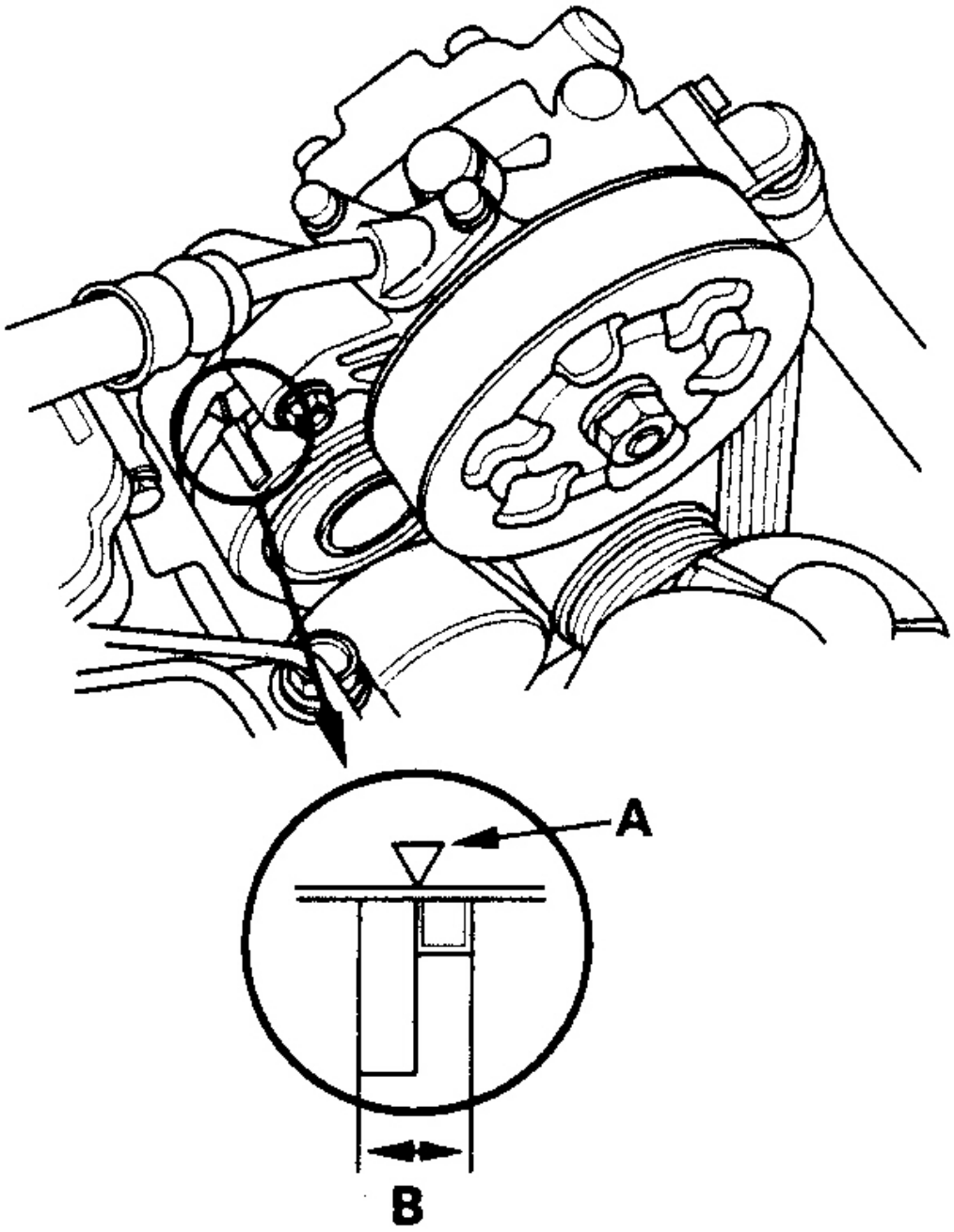


Fig. 2: Checking Auto-Tensioner Indicator Position
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TROUBLE SHOOTING

CHARGING CIRCUIT

If the charging system indicator does not illuminate or does not go off, or the battery is dead or low, test the following items in the order below.

1. Battery
2. Charging System Indicator
3. Alternator/Regulator Circuit
4. Alternator Control System

Charging System Indicator Test

For charging system indicator test, see **Fig. 3** .

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.

   Is the multiplex integrated control system OK?

   YES – Go to step 4.

   NO – Check the multiplex integrated control system as indicated by the DTC.■

4. Perform the gauge control module self test procedure. See APPROPRIATE INSTRUMENT PANELS article.
   Does the charging system indicator flash?

   YES – Go to step 5.

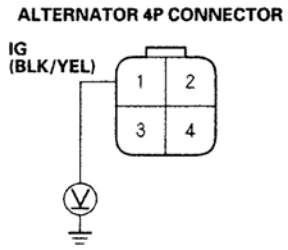
   NO – Replace the gauge control module.■

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.



Wire side of female terminals

   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.■

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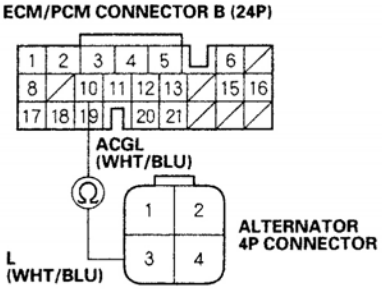
9. Connect the Honda Diagnostic System (HDS) to the data link connecter (DLC). Turn the ignition switch ON (II), and jump the SCS line with the HDS, then turn the ignition switch OFF.

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

10. Disconnect ECM/PCM connector B (24P).

11. Check for continuity between ECM/PCM connector terminal B10 and alternator 4P connector terminal No. 3.



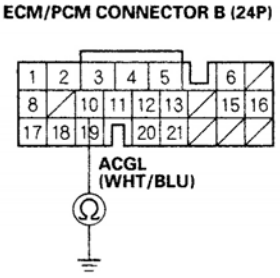
Wire side of female terminals

   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 B10 and body ground.



Wire side of female terminals

   Is there continuity?

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

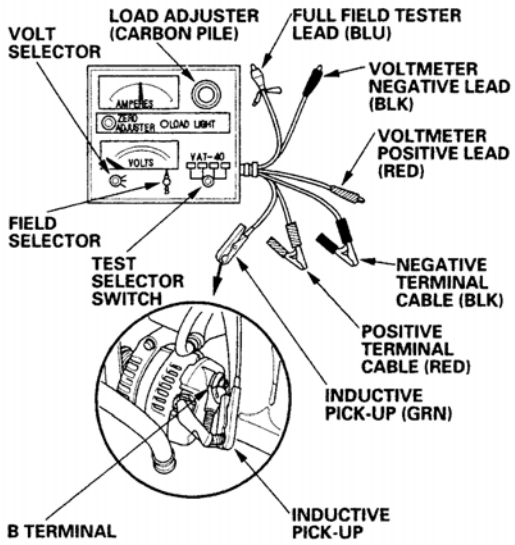
   NO – Go to the Alternator and Regulator Circuit Test.■

Fig. 3: Charging Indicator Test
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Alternator & Regulator Circuit Test

For alternator and regulator circuit test, see **Fig. 4** .

1. Be sure the battery connections are good, and that the battery is sufficiently charged.
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 or the rear housing assembly. ■

   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 60A or more?

    YES – The charging system is OK. ■

    NOTE: If the charging system indicator is still on, replace the alternator or the rear housing assembly.

    NO – Replace or repair the alternator. ■

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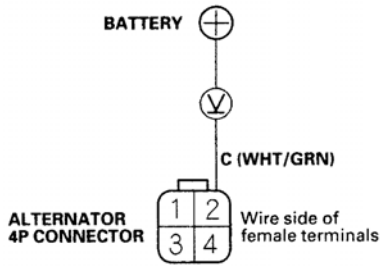
Fig. 4: Alternator & Regulator Circuit Test
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Alternator Control System Test

For alternator control system test, see **Fig. 5** .

1. Check for proper operation of the electrical load detector (ELD) by checking the malfunction indicator lamp (MIL).
2. 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.
3. Disconnect the alternator 4P connector from the alternator.
4. Start the engine, and turn the headlights ON to high beam.
5. Measure voltage between alternator 4P connector terminal No. 2 and the positive terminal of the battery.



Is there 1 V or less?

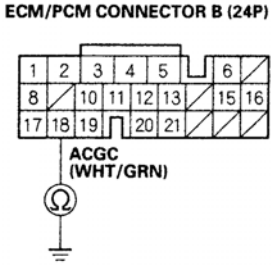
YES – Go to step 6.

NO – Go to step 9.

6. 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.

7. Disconnect engine control module ECM/PCM connector B (24P).
8. Check for continuity between ECM/PCM connector terminal B18 and body ground.



Is there continuity?

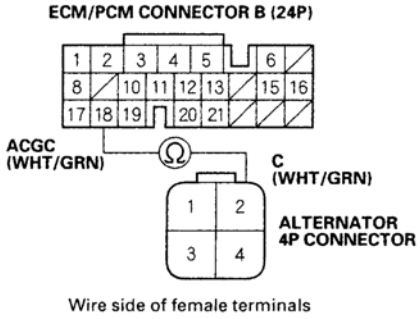
YES – Repair short in the wire between the alternator and ECM/PCM. ■

NO – Update the ECM/PCM if it does not have the latest software or substitute a known-good ECM/PCM, then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM. ■

9. 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) for damage.

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



Is there continuity?

YES – Replace or repair the alternator. ■

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

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Fig. 5: Alternator Control System Test
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SYMPTOM TROUBLE SHOOTING

For symptom trouble shooting diagnose chart, see **Fig. 6** .

Symptom	Diagnostic procedure	Also check for
Charging system indicator stays on	1. Troubleshoot the charging system indicator circuit. 2. Check for a broken drive belt. 3. Check the drive belt auto-tensioner. 4. Test the alternator.	
Battery discharged	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. 4. Check the drive belt auto-tensioner. 5. Test the alternator. 6. Troubleshoot the alternator control system. 7. Check for poor connection at battery terminal. 8. Test the battery.	
Battery overcharged	1. Test the alternator. 2. Troubleshoot the alternator control system. 3. Test the battery.	

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Fig. 6: Identifying Symptom Trouble Shooting Diagnose Chart
Courtesy of AMERICAN HONDA MOTOR CO., INC.

BENCH TESTING

BRUSHES

Measure the length of both brushes "A" with a vernier caliper "B". See **Fig. 7** . If either brush is shorter than the service limit, replace the brush assembly. If brush length is OK, go to **ROTOR SLIP RING** .

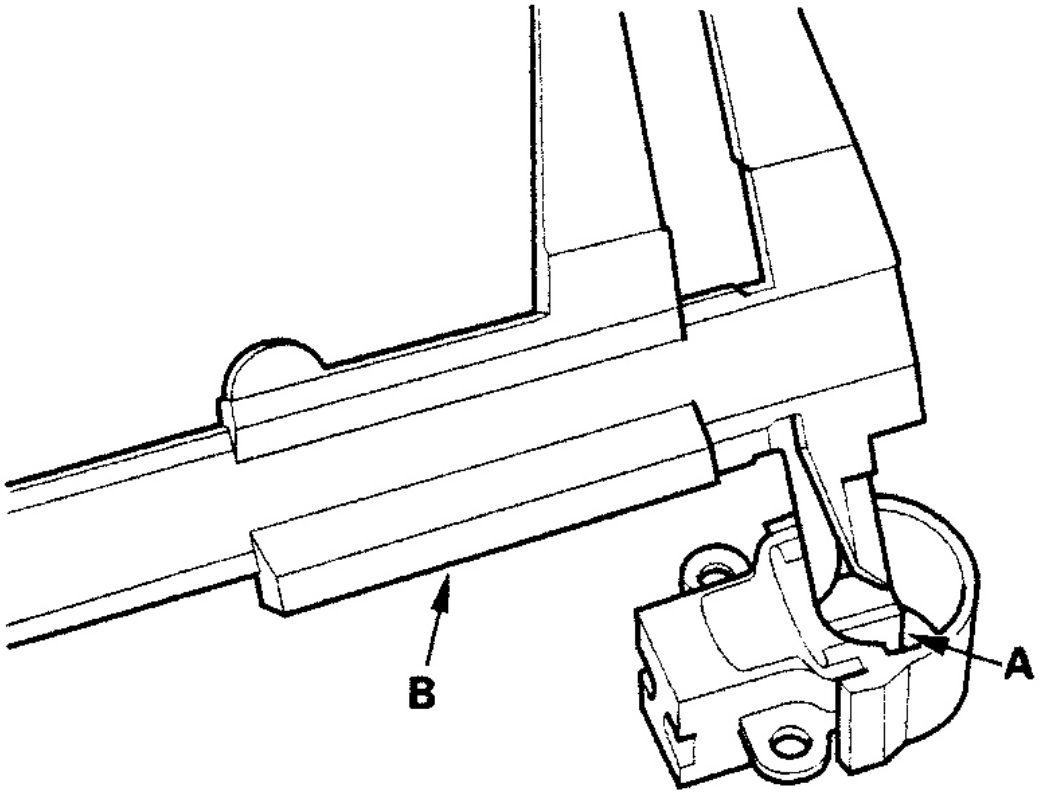

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Fig. 7: Measuring Alternator Brush Length
Courtesy of AMERICAN HONDA MOTOR CO., INC.

ROTOR SLIP RING

1. Check that there is continuity between the slip rings "A". See **Fig. 8** . If there is continuity, go to next step. If there is no continuity, replace the rotor assembly.
2. 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 **REASSEMBLY** under ALTERNATOR in OVERHAUL. If there is continuity, replace the rotor assembly.

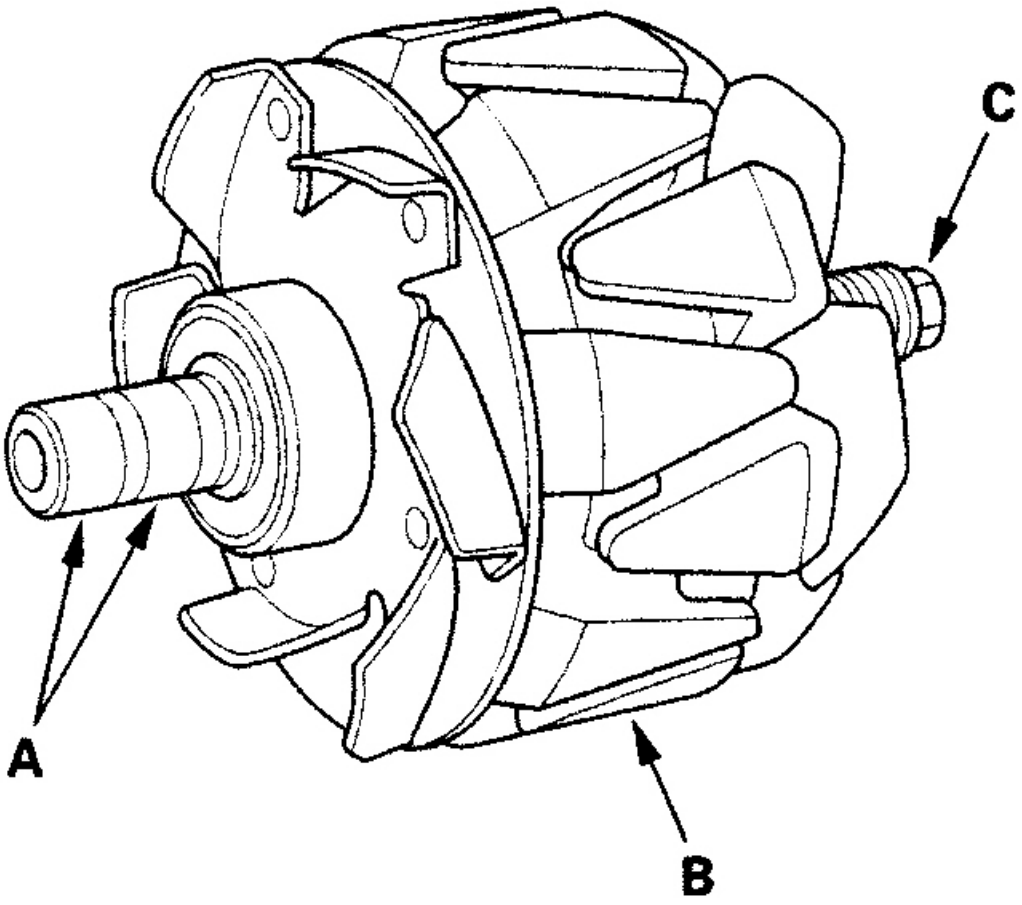

Fig. 8: Inspecting Rotor Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

REMOVAL & INSTALLATION

ALTERNATOR

Removal

1. Ensure you have the anti-theft codes for the radio, and the navigation system. Write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery. Disconnect the positive cable.
3. Remove the drive belt. See **DRIVE BELT** .

4. Remove the auto-tensioner. See **DRIVE BELT AUTO-TENSIONER** .
5. Disconnect the alternator connector "A" and Black wire "B" from the alternator. See **Fig. 9** .
6. Remove the three bolts securing the alternator. See **Fig. 10**

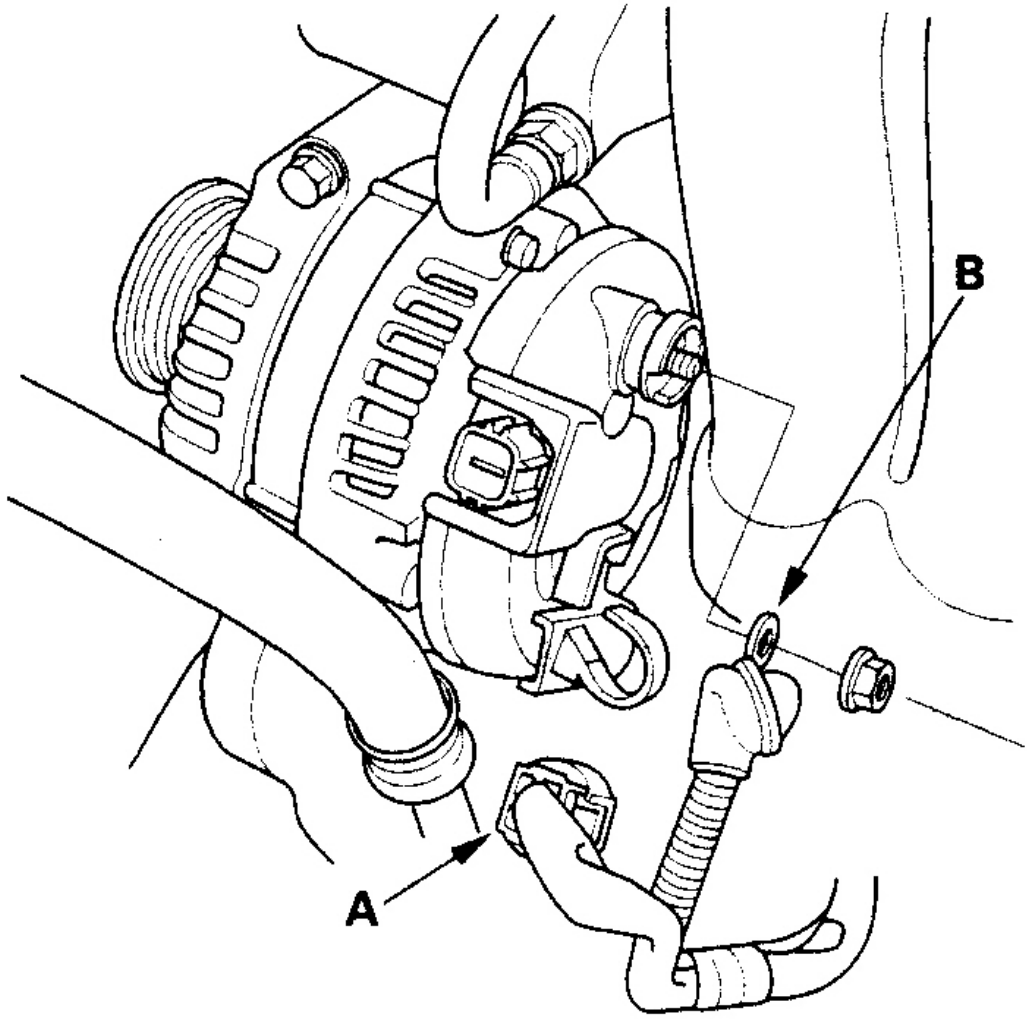

Fig. 9: Disconnecting Alternator Harness
Courtesy of AMERICAN HONDA MOTOR CO., INC.

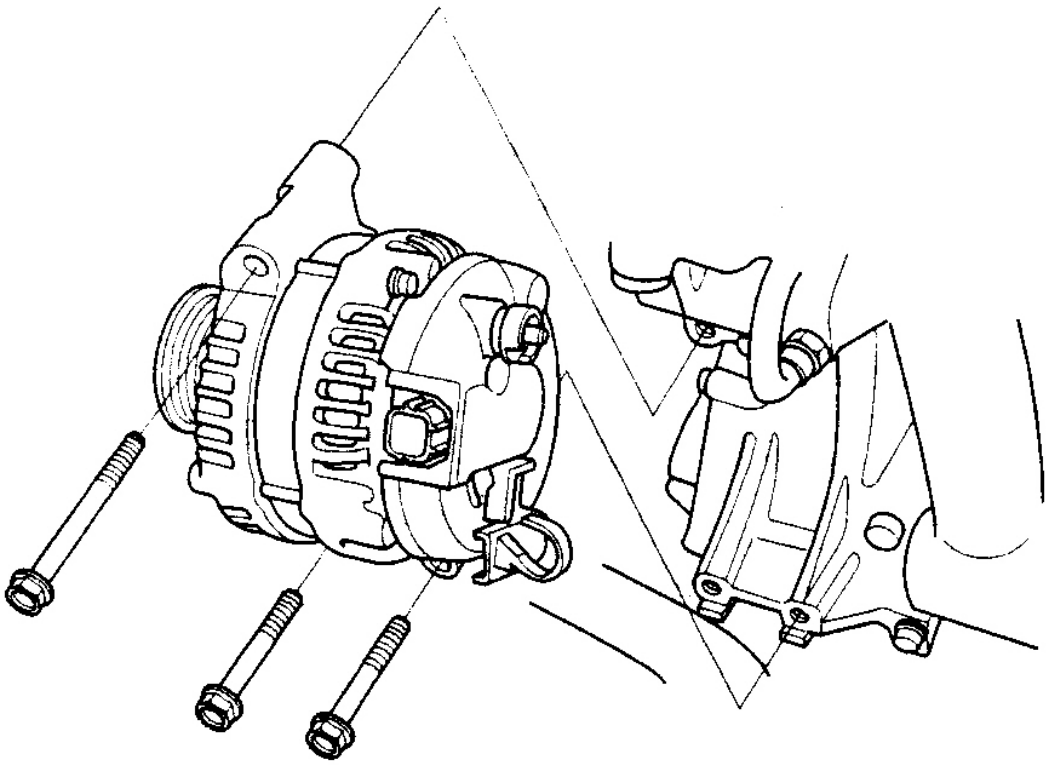

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Fig. 10: Removing Alternator
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Installation

1. Install the alternator and drive belt in the reverse order of removal.
2. Connect the battery positive cable and negative cable to the battery.
3. Enter the anti-theft codes for the radio and the navigation system. Enter the customer's radio station preset. Set the clock.

DRIVE BELT

Removal & Installation

1. Move the auto-tensioner "A" to relieve tension from the drive belt "B", and remove the drive belt. See **Fig. 11** .
2. Install the new belt in the reverse order of removal.

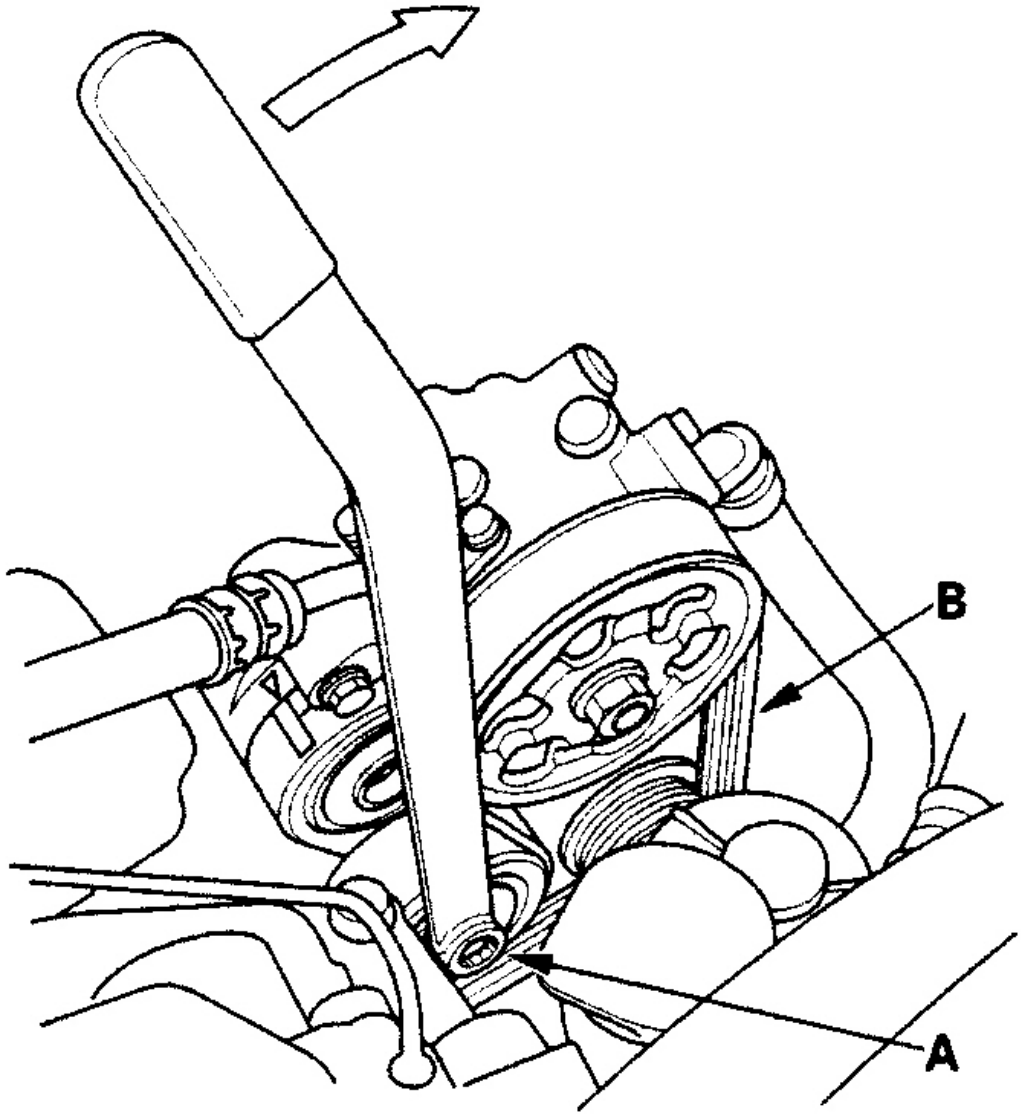

Fig. 11: Removing/Installing Drive Belt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

DRIVE BELT AUTO-TENSIONER

Inspection

1. Check whether there is a change in the position of the auto-tensioner indicator before starring the engine and after starting the engine. If there is a change in the position, replace the auto-tensioner. See **Fig. 2** .

2. Check for abnormal noise from the tensioner pulley. If you hear abnormal noise, replace the auto-tensioner pulley. See **REPLACEMENT** .
3. Remove the drive belt. See **DRIVE BELT** .
4. Move the auto-tensioner within its limit with the wrench. See **Fig. 11** . 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.
5. Remove the auto-tensioner. See **REPLACEMENT** .
6. Clamp the auto-tensioner "A" by using two 8 mm bolts "B" and a vise "C". Do not clamp the auto-tensioner itself.
7. Set the torque wrench "D" in the pulley bolt in the direction. See **Fig. 12**

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

8. Align the indicator "E" on the tensioner base with center mark on the tensioner arm by using the torque wrench, and measure the torque. If the torque value is not 24-30 ft.lbs (32-40 N.m), replace the auto-tensioner.

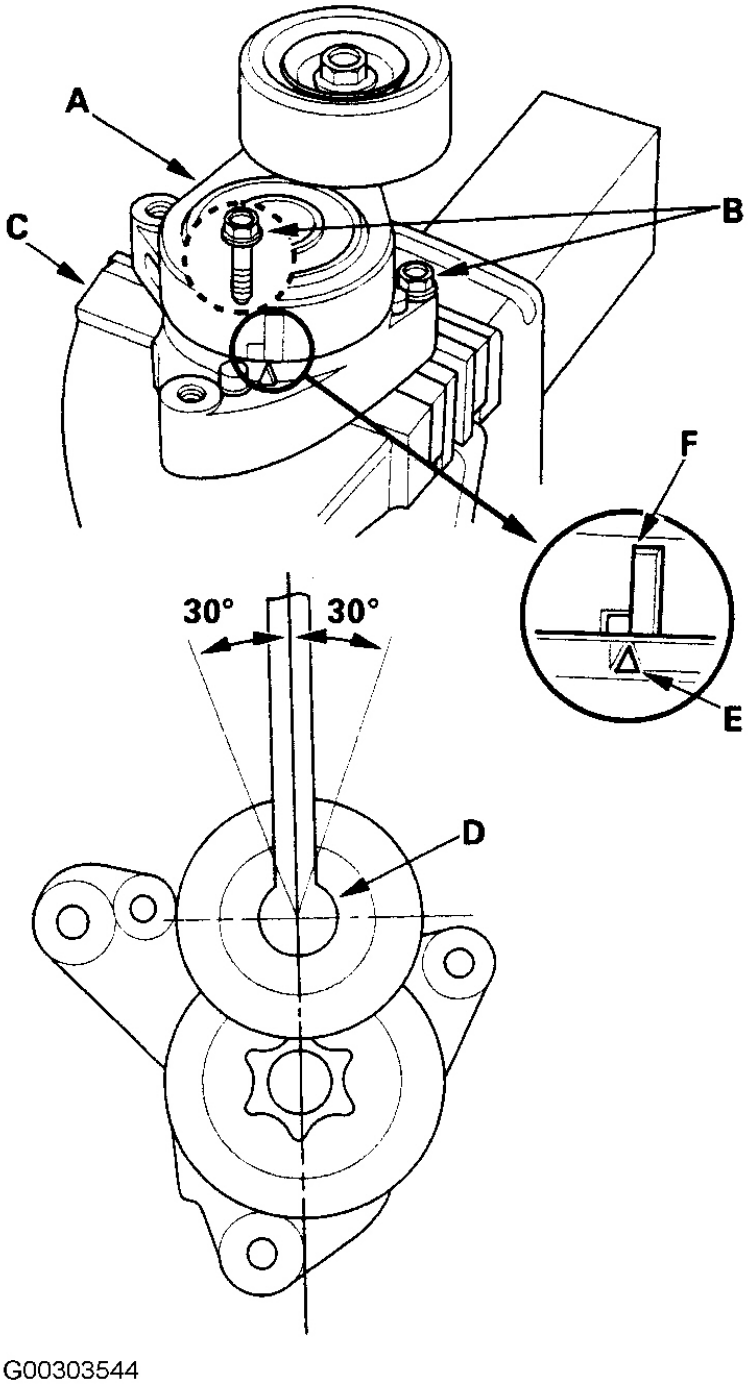

Fig. 12: Connecting Auto-Tensioner
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Replacement

1. Remove the drive belt. See **DRIVE BELT** .
2. Remove the Power Steering (P/S) pump without disconnecting the P/S hoses. See **Fig. 13** .
3. Remove the auto-tensioner. See **Fig. 14** .
4. Install the auto-tensioner in the reverse order of removal.

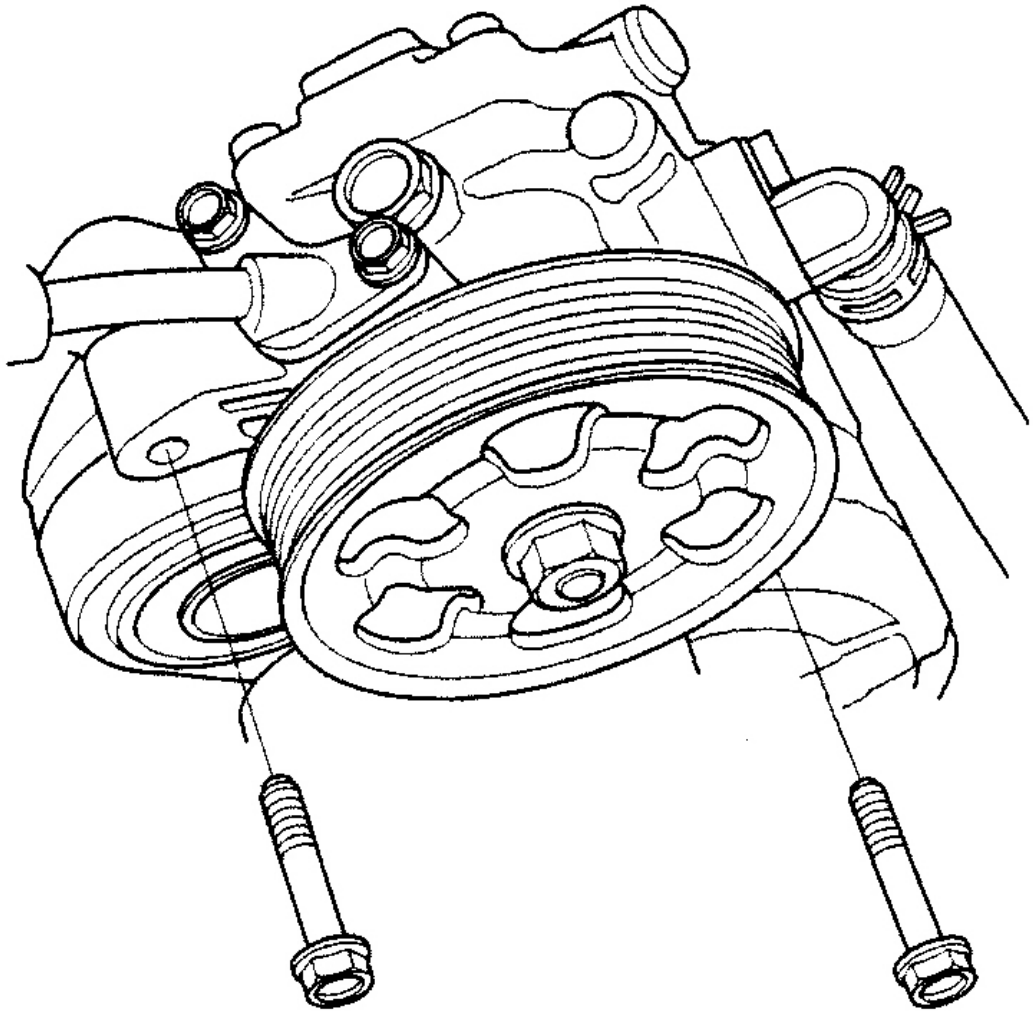

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Fig. 13: Removing Power Steering Pump
Courtesy of AMERICAN HONDA MOTOR CO., INC.

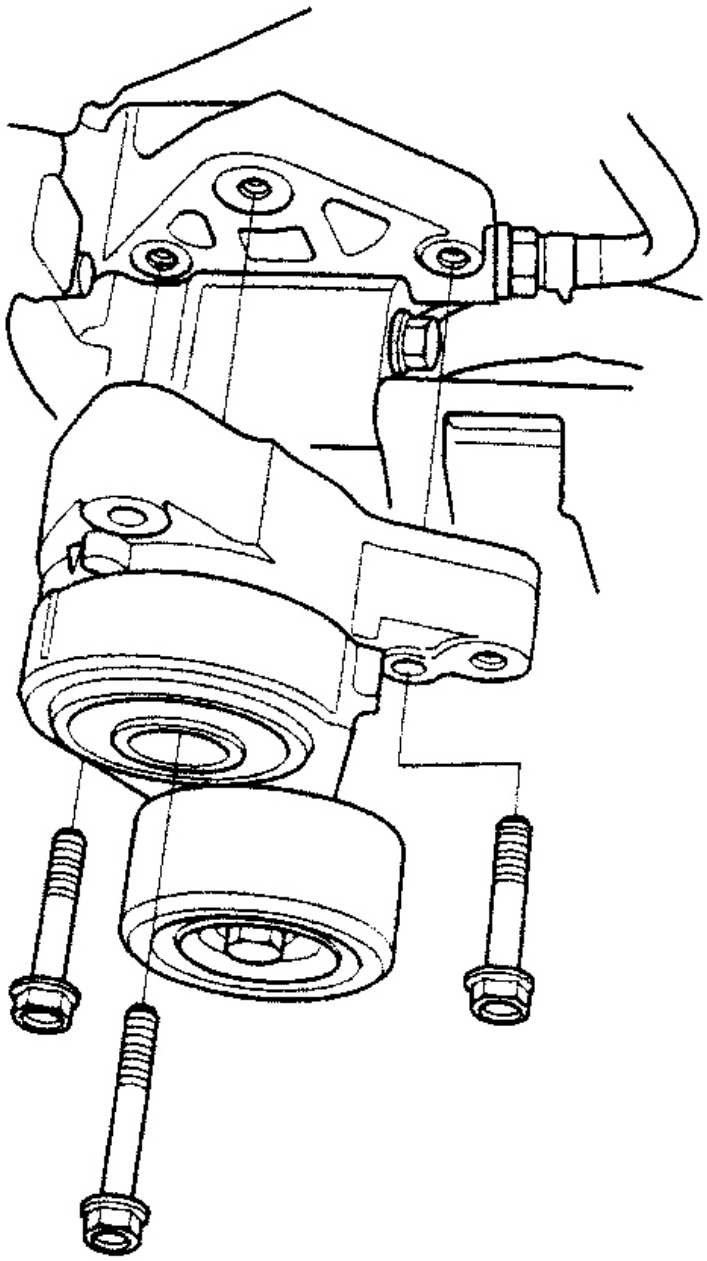

Fig. 14: Removing/Installing Auto-Tensioner
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TENSIONER PULLEY

Replacement

1. Remove the drive belt. See **DRIVE BELT** .
2. Remove the pulley bolt "A", and remove the tensioner pulley "B".
3. Install the tensioner pulley in the reverse order of removal. See **Fig. 15** .

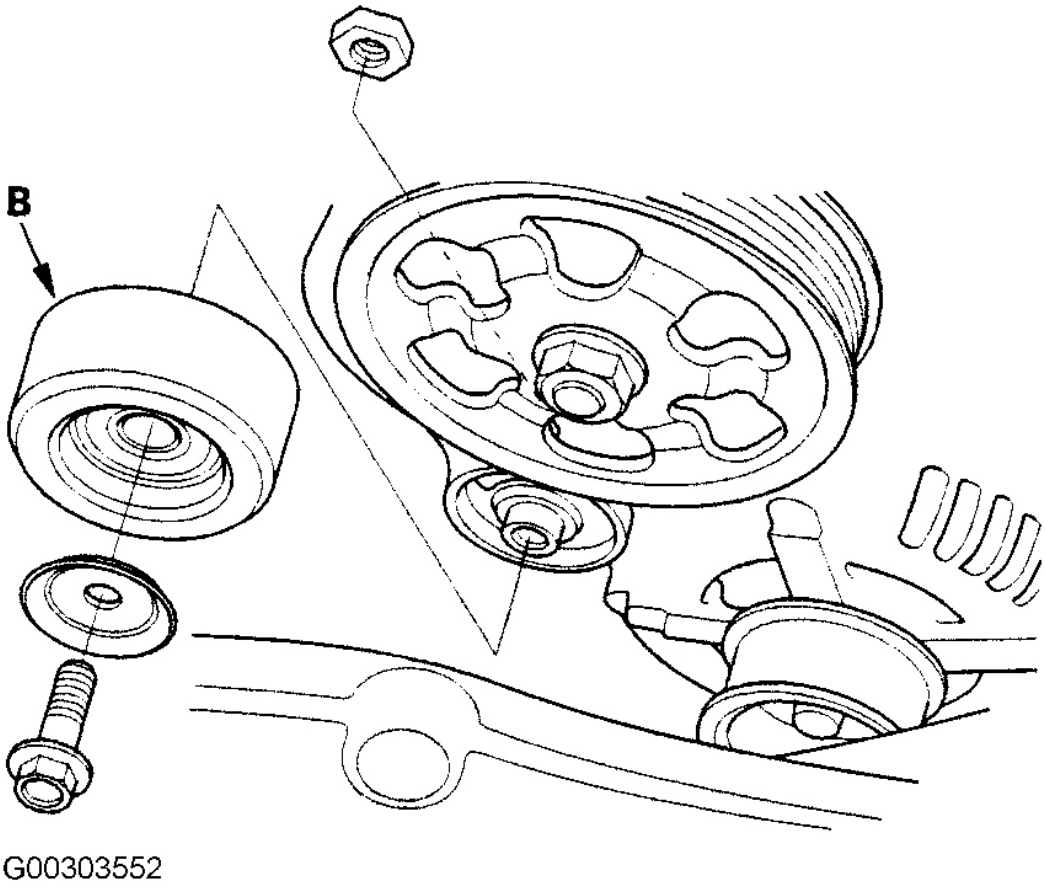

Fig. 15: Removing/Installing Tensioner Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

OVERHAUL

ALTERNATOR

Disassembly

NOTE: For overhaul information, see exploded view of alternator. See Fig. 16 .

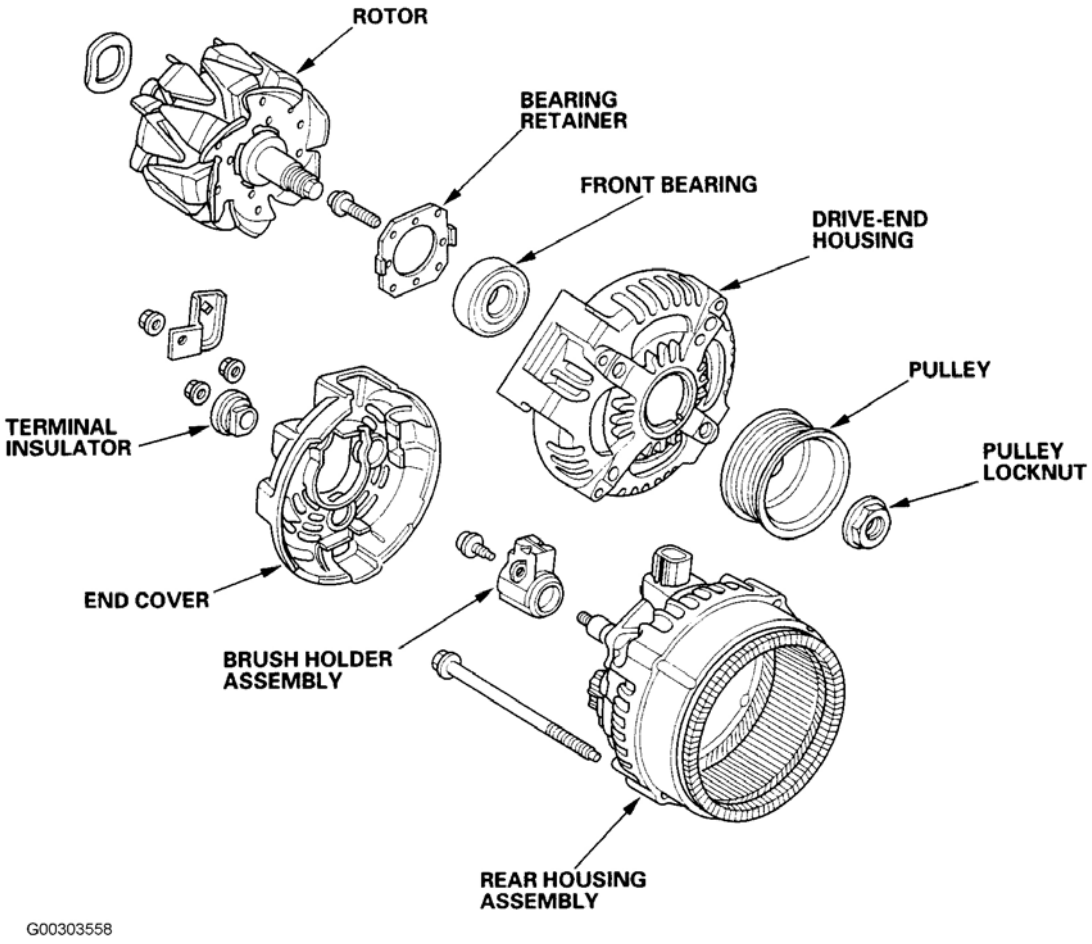

Fig. 16: Exploded View Of Alternator
Courtesy of AMERICAN HONDA MOTOR CO., INC.

1. Test the alternator and regulator before you remove them. See **CHARGING SYSTEM INDICATOR TEST** under TROUBLE SHOOTING.
2. Remove the alternator. See **ALTERNATOR** under REMOVAL & 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. See **Fig. 17** .
4. Remove harness stay and flange nuts. See **Fig. 18** .
5. Remove the end cover. See **Fig. 19** .
6. Remove the brush holder. See **Fig. 20** .
7. Remove the 4 bolts. Remove the rear housing assembly "A", and washer "B". See **Fig. 21** .
8. If you are not replacing the front bearing "A", go to **BRUSHES** . Remove the rotor from the stator drive-end housing. See **Fig. 22** .
9. Inspect the rotor shaft for scoring, and inspect the bearing journal surface in the stator housing for seizure marks. If either the rotor or stator housing is damaged, replace the alternator. If both the rotor and the stator housing are OK, go to next step.

10. Remove the front bearing retainer plate. See **Fig. 23** .
11. Drive out the front bearing with a brass drift and hammer. See **Fig. 24** .
12. With a hammer, driver and attachment, install a new front bearing in the drive-end housing. See **Fig. 25** .

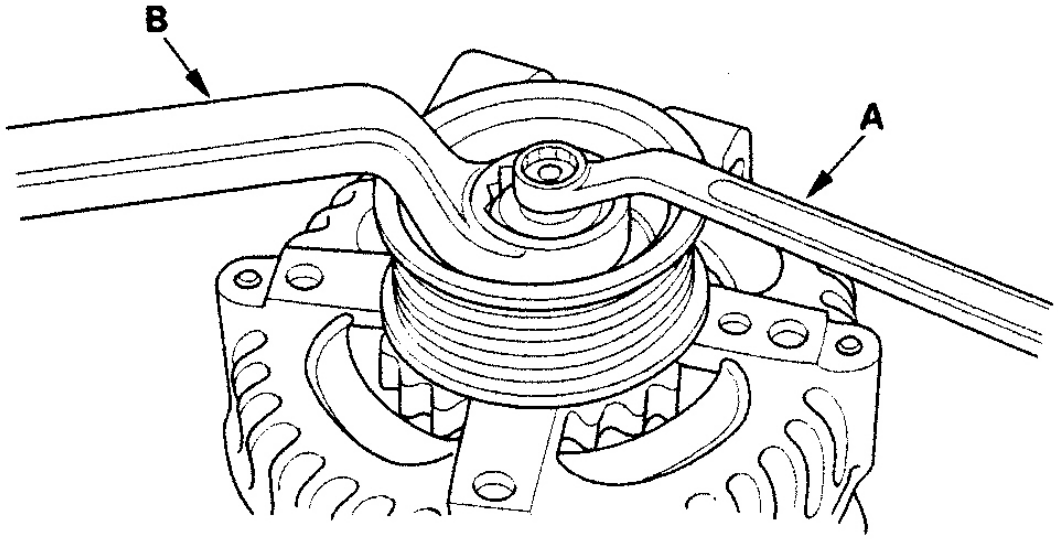

Fig. 17: Removing Drive-End Housing Pulley Locknut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

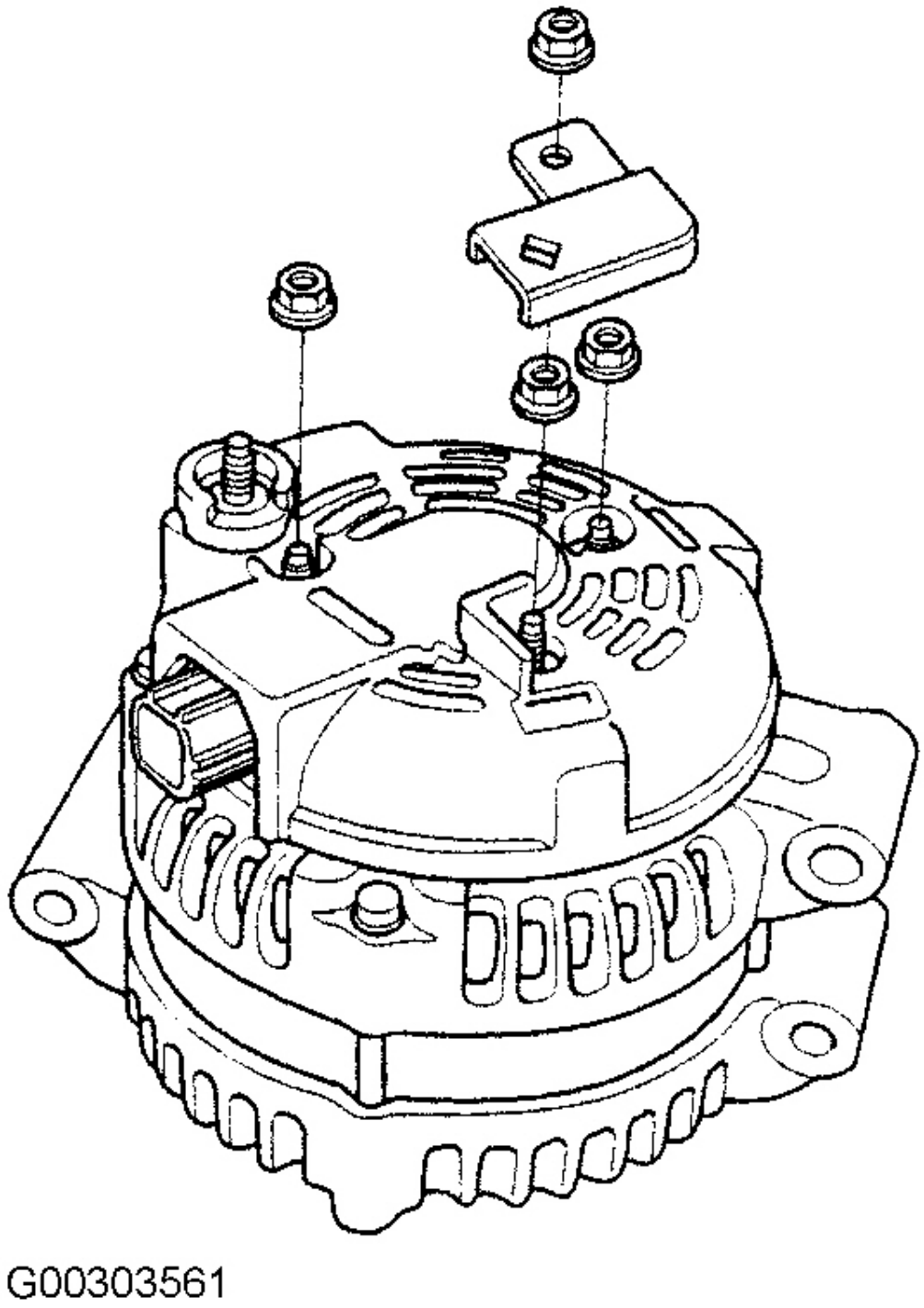

Fig. 18: Removing Harness Stay And Flange Nuts

Courtesy of AMERICAN HONDA MOTOR CO., INC.

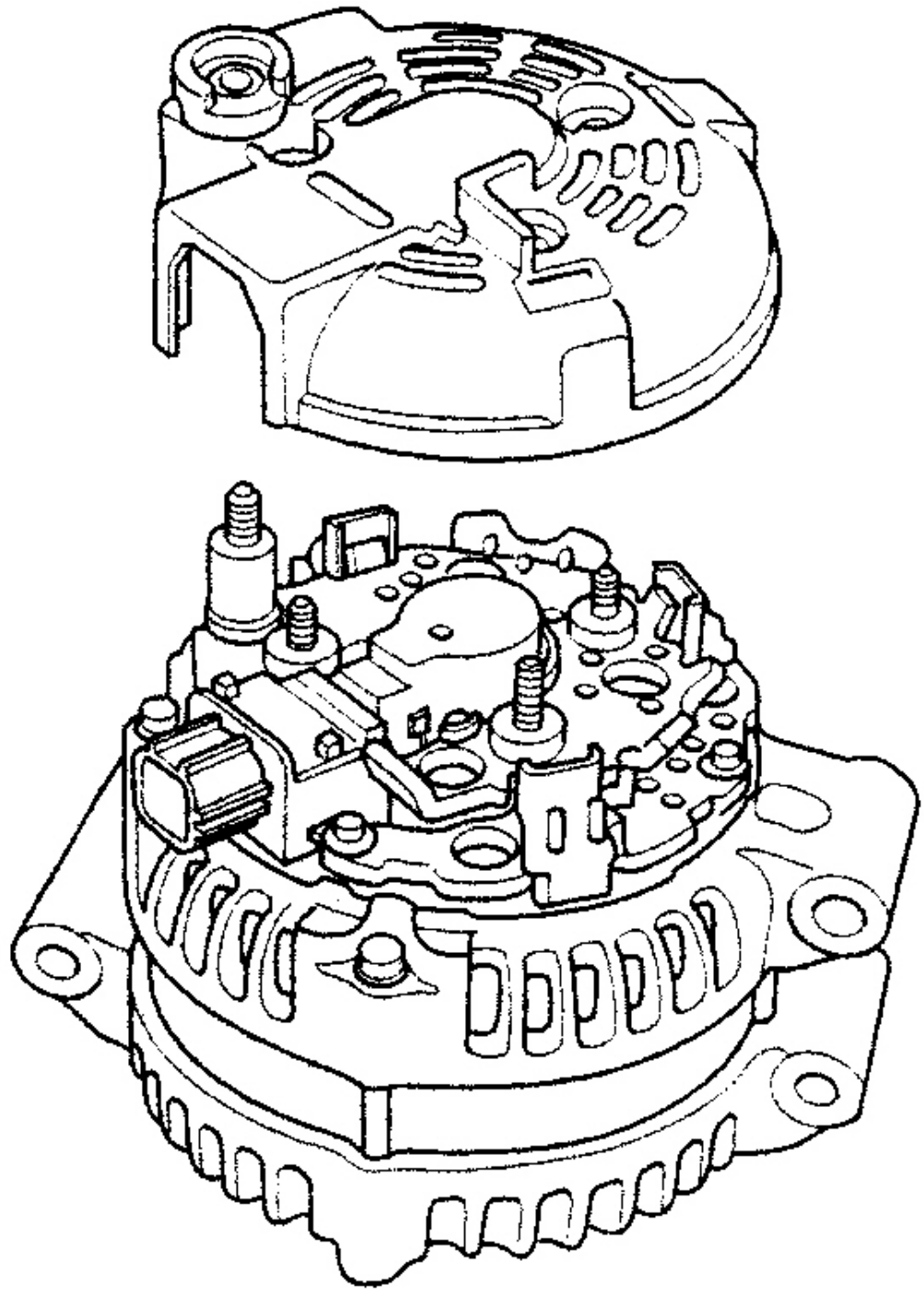

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Fig. 19: Removing End Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

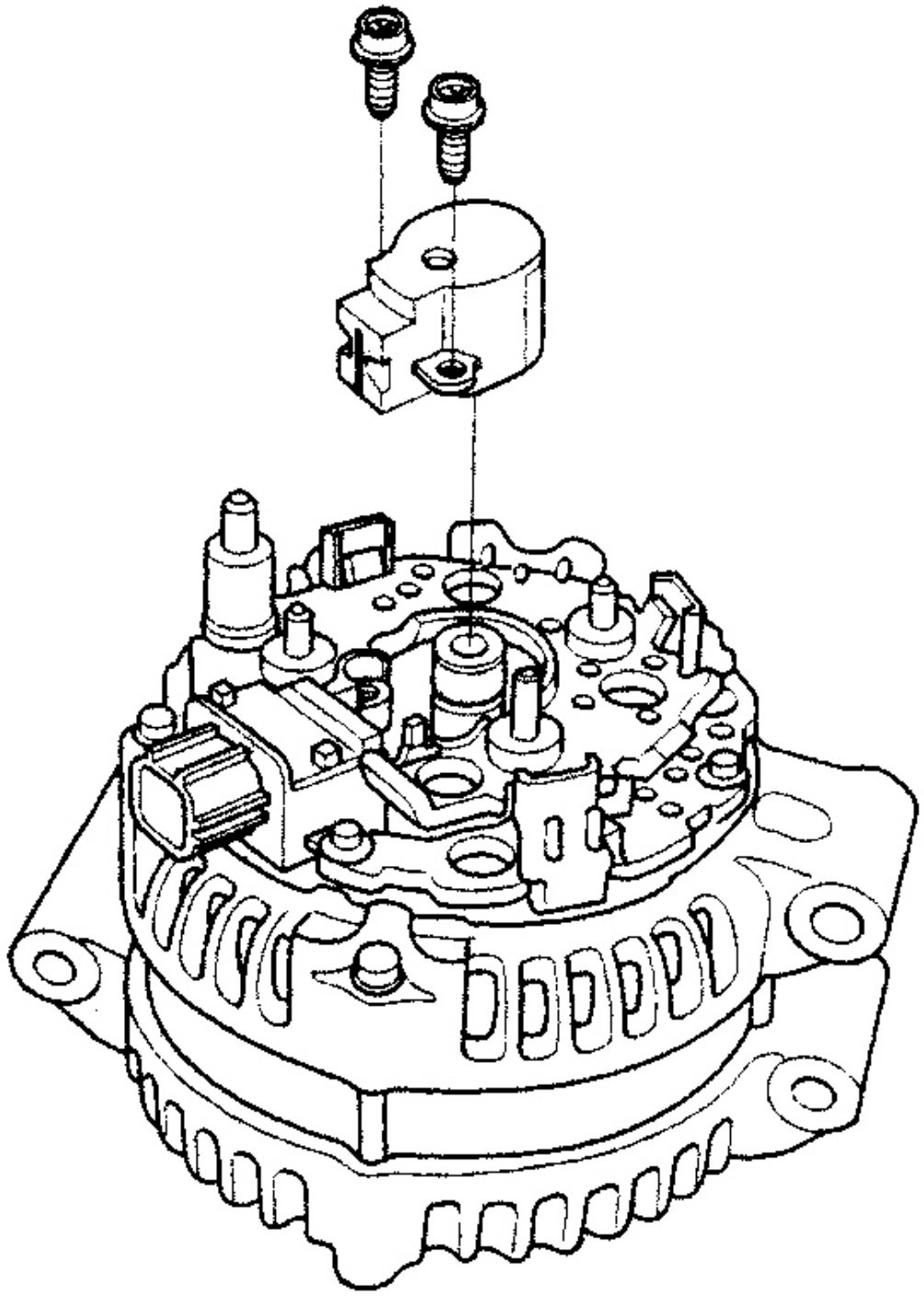

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Fig. 20: Removing Brush Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

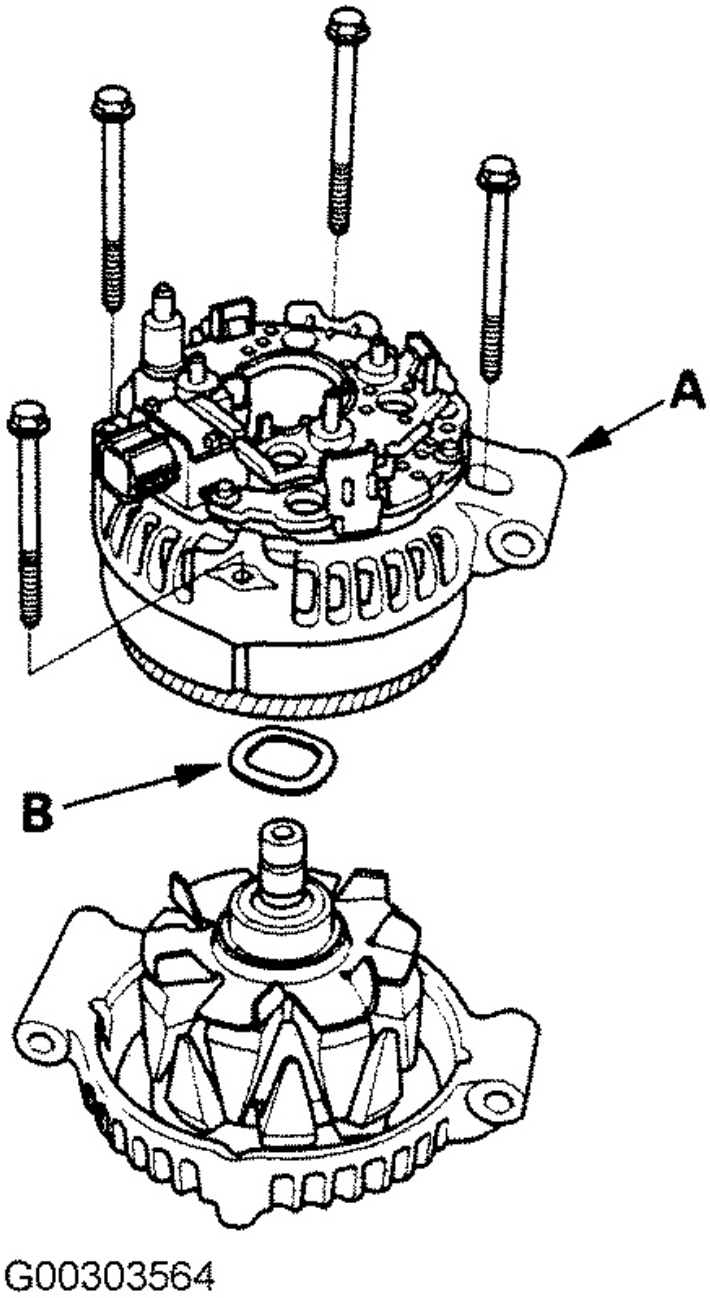

Fig. 21: Removing Rear Housing Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

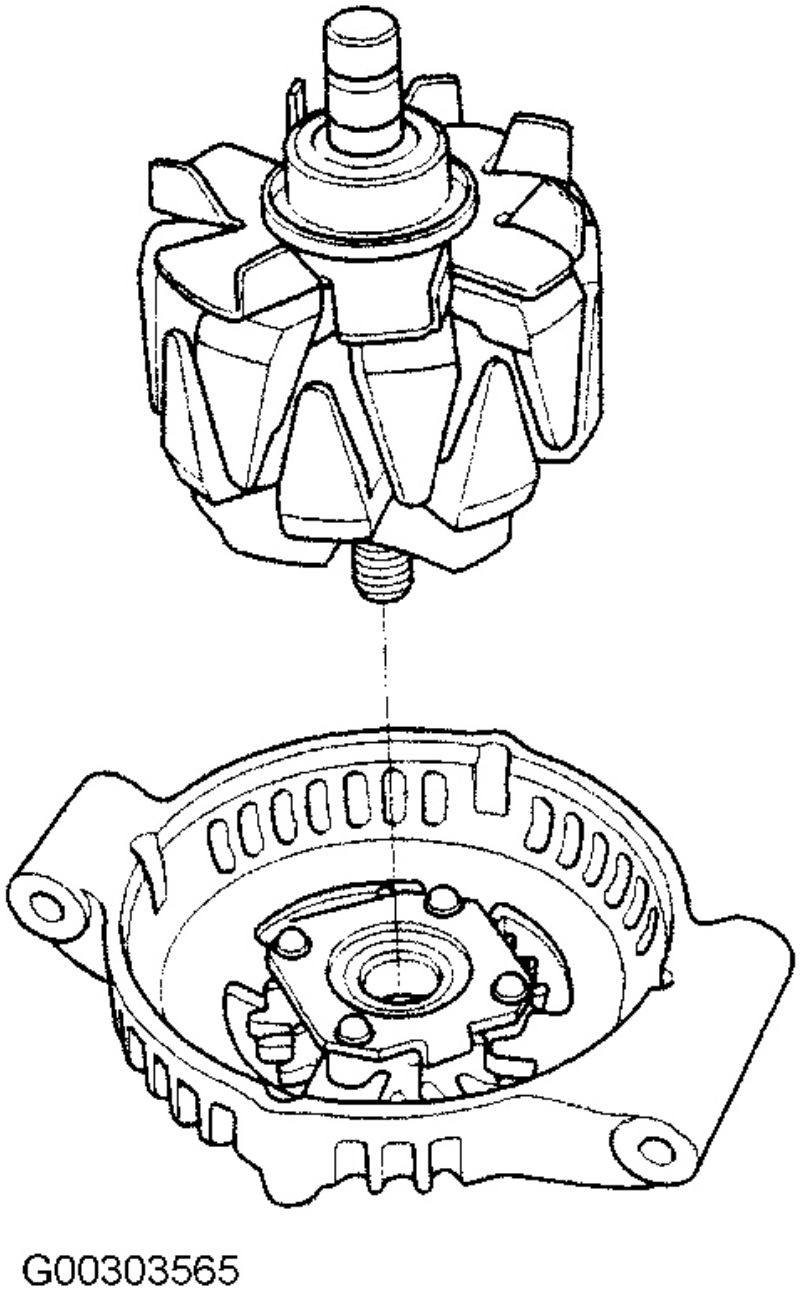

Fig. 22: Removing Rotor From Stator Drive-End Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

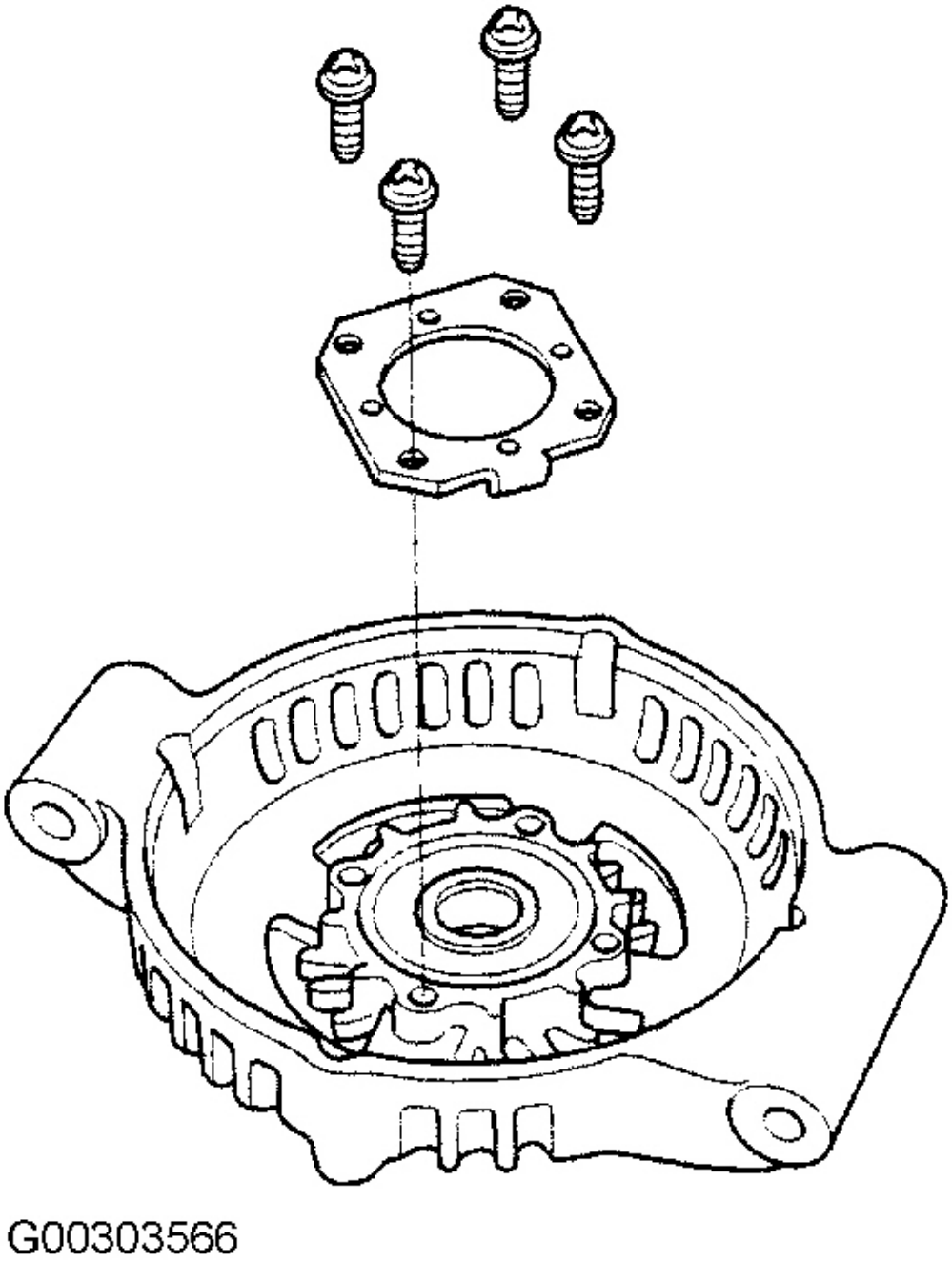

Fig. 23: Removing Front Bearing Retainer Plate
Courtesy of AMERICAN HONDA MOTOR CO., INC.

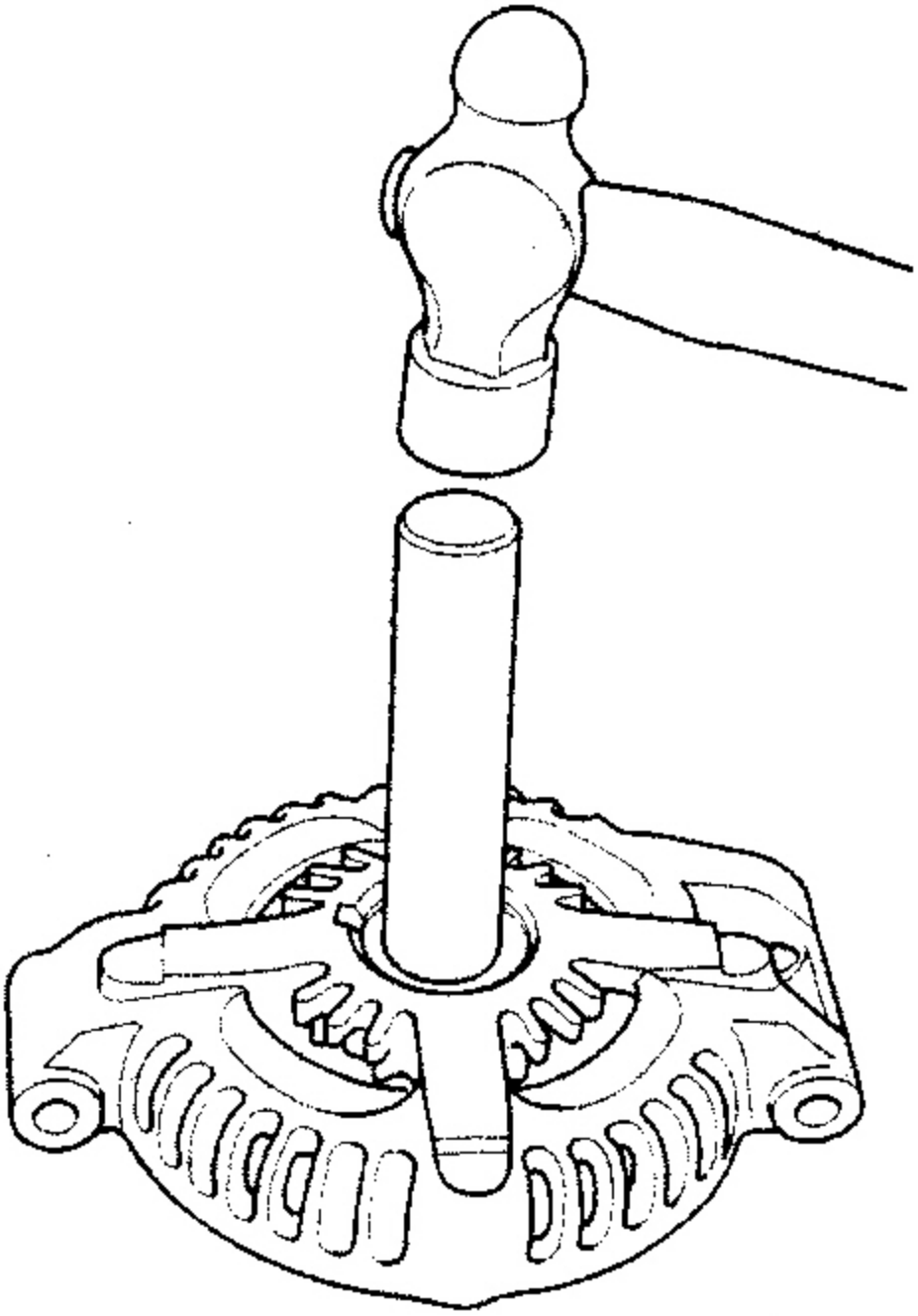

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Fig. 24: Driving Out Front Bearing With Hammer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

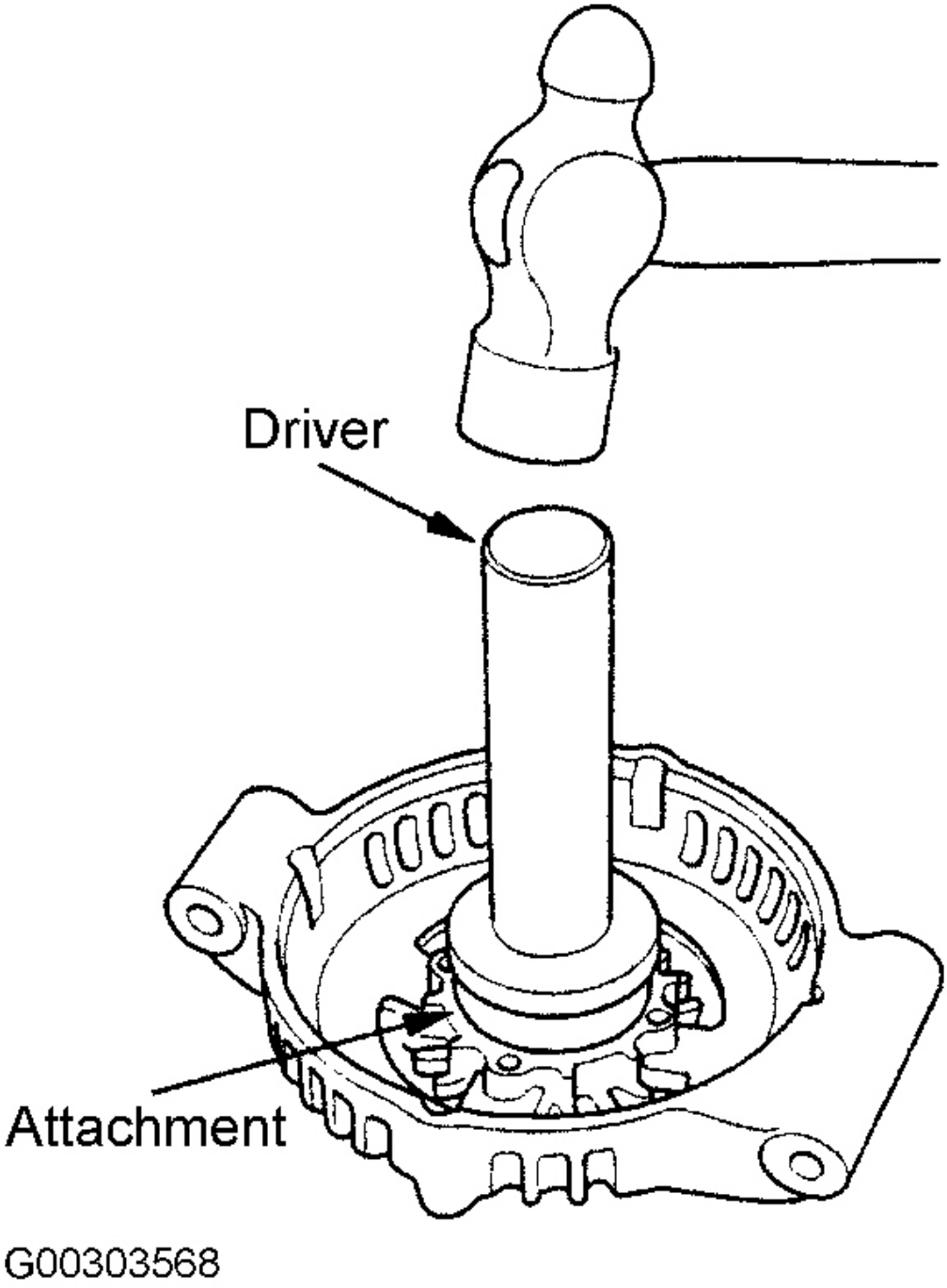

Fig. 25: Installing Front Bearing In Drive-End Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Reassembly

1. If you removed the pulley, put the rotor in the drive-end housing. Tighten locknut to specification. See **TORQUE SPECIFICATIONS** .
2. Remove any grease or any oil from the slip rings.
3. Put the rear housing assembly and drive end housing/rotor assembly together. Tighten the 4 through bolts.
4. Push the brushes "A" inward. Insert a pin or drill bit "B" .06" (1.6 mm diameter) to hold them there. See **Fig. 26** .
5. Install the brush holder, and pull out the pin. See **Fig. 27** .
6. Install the end cover.
7. After assembling the alternator, turn the pulley by hand to ensure the rotor rotates smoothly and without noise.
8. Install the alternator and drive belt **ALTERNATOR** and **DRIVE BELT** under REMOVAL & INSTALLATION.

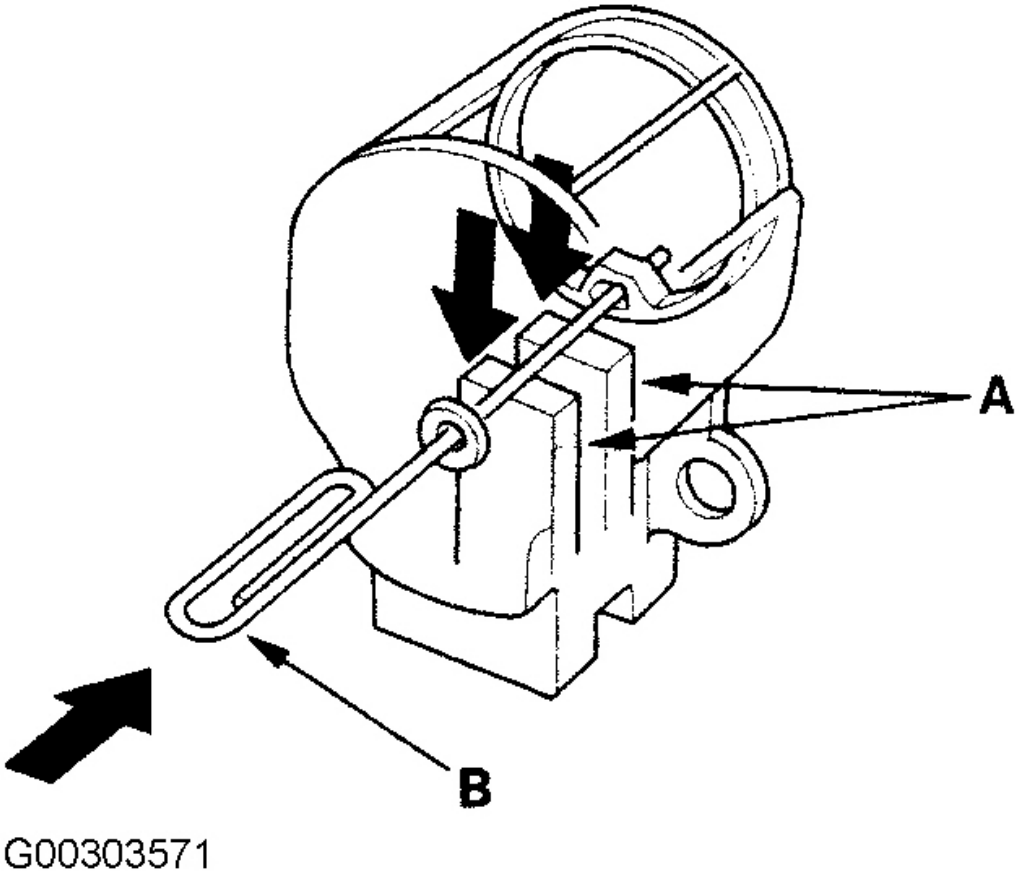

Fig. 26: Retaining Brushes In Installation Position
Courtesy of AMERICAN HONDA MOTOR CO., INC.

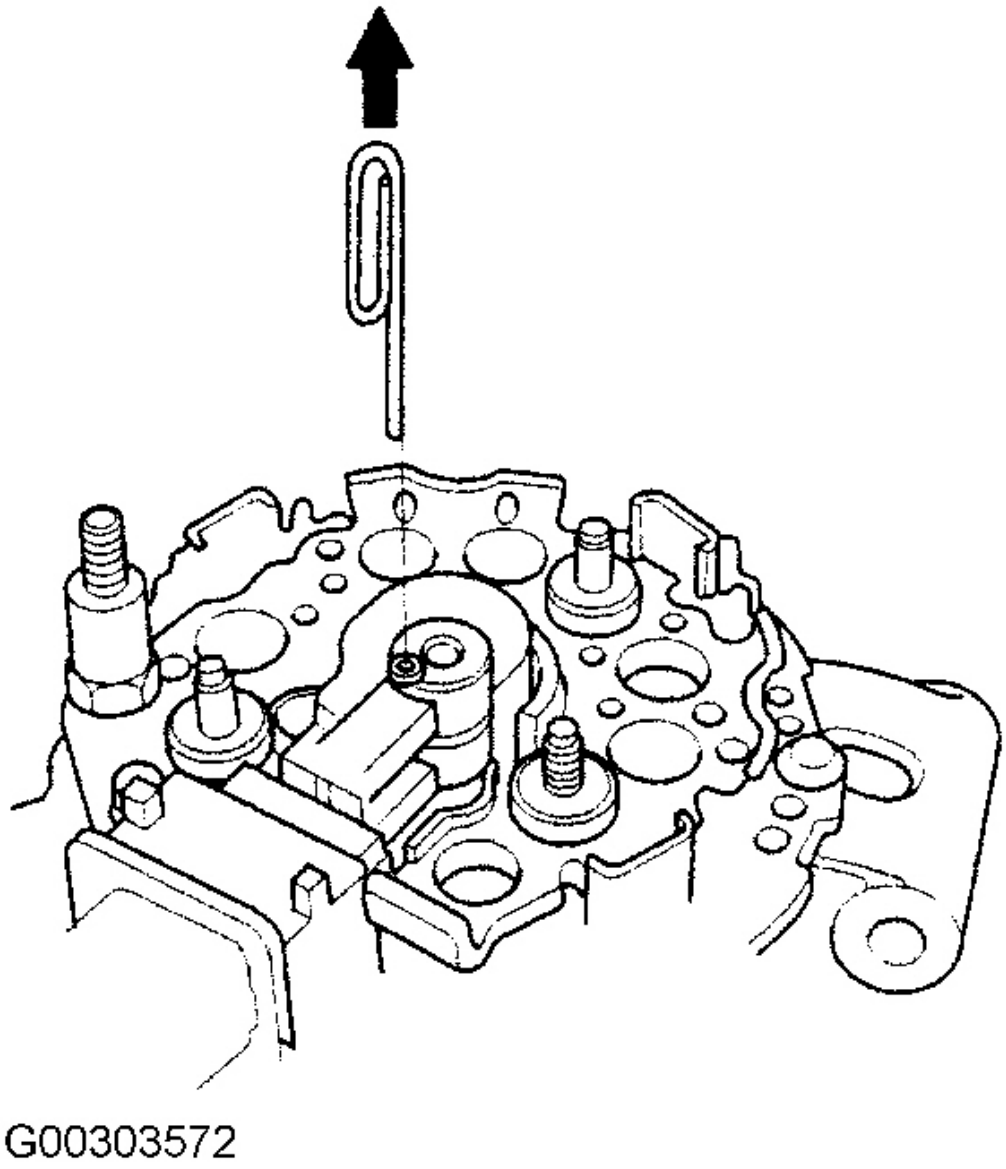

Fig. 27: Installing Brush Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

GENERATOR SPECIFICATIONS

For generator service specifications, see **SERVICE SPECIFICATIONS** in ACURA - TSX article in SPECIFICATIONS.

TORQUE SPECIFICATIONS

For generator torque specifications, see **TORQUE SPECIFICATIONS** in ACURA - TSX article in SPECIFICATIONS.

WIRING DIAGRAMS

For wiring diagram on 2004 TSX models, see **STARTING/CHARGING** in SYSTEM WIRING DIAGRAM article in ELECTRICAL.