2003-06 BRAKES

Conventional Brake Components - MDX

SPECIAL TOOLS

Ref. No.	Tool Number	Description	Qty
①	07AAE-SEPA101	Brake Caliper Piston Compressor	1

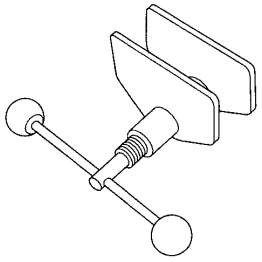

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Fig. 1: Identifying Special Service Tools
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COMPONENT LOCATION INDEX

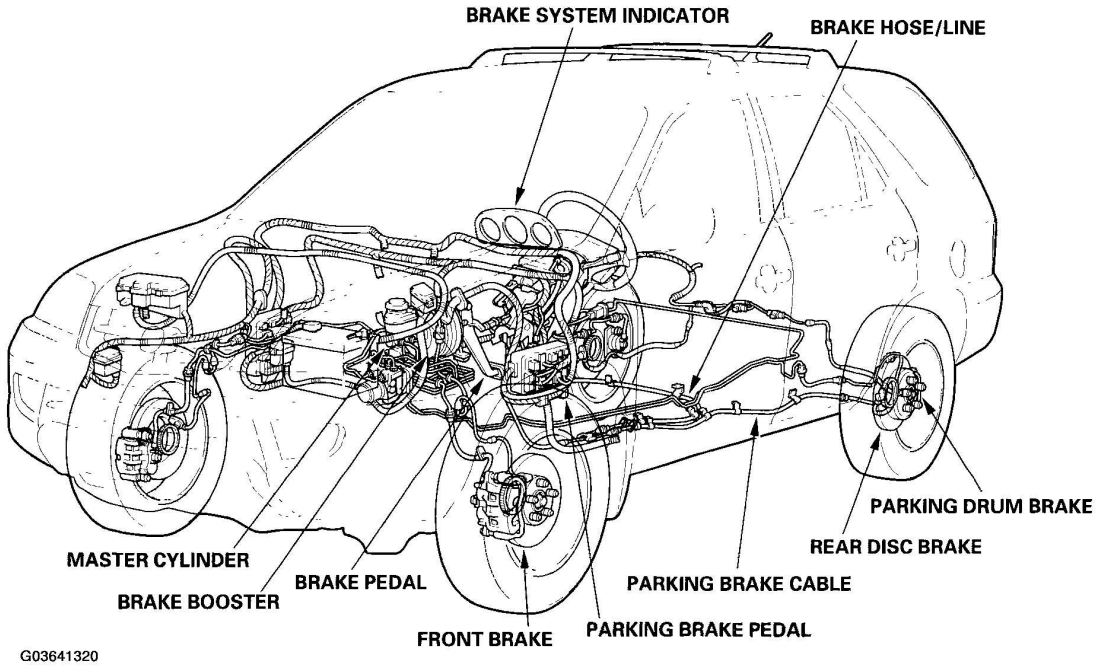

Fig. 2: Component Location Index
Courtesy of AMERICAN HONDA MOTOR CO., INC.

BRAKE SYSTEM INSPECTION AND TEST

Inspect the brake system components listed. Repair or replace any parts that are leaking or damaged.

Component Inspections:

COMPONENT INSPECTIONS

Component	Procedure	Also check for:
Master Cylinder	Look for damage or signs of fluid leakage at: • Reservoir or reservoir grommets • Line joints • Between master cylinder and booster	Bulging seal at reservoir cap. This is a sign of fluid contamination.
Brake Hoses	Look for damage or signs of fluid leakage at: • Line joints and banjo bolt connections • Hoses and lines, also inspect for twisting or damage	Bulging, twisted, or bent lines.
Caliper	Look for damage or signs of fluid leakage at: • Piston seal	Seized or sticking caliper pins.

	• Banjo bolt connections • Bleed screw	
VSA Modulator-Control Unit	Look for damage or signs of fluid leakage at: • Line joints • Modulator-control unit	

BRAKE SYSTEM TEST

Brake pedal sinks/fades when braking

1. Start the engine, and let it warm up to operating temperature.
2. Attach a 50 mm (2 in.) piece of masking tape along the bottom of the steering wheel, and draw a horizontal reference mark across it.
3. With the transmission in Neutral, press and hold the brake pedal lightly (about the same pressure needed to keep an A/T-equipped car from creeping), then release the parking brake.
4. While still holding the brake pedal, hook the end of the tape measure behind it. Then pull the tape up to the steering wheel, noting where the tape measure lines up with the reference mark you made on the masking tape.
5. Apply steady pressure to the brake pedal for 3 minutes.
6. Watch the tape measure.
   - If it moves less than 10 mm (3/8 in.), the master cylinder is OK.
   - If it moves more than 10 mm (3/8 in.), replace the master cylinder.

NOTE: If the brake pedal sinks more than 10 mm (3/8 in.) in 3 minutes, the master cylinder is faulty. A slight change in pedal height when the A/C compressor cycles on and off is normal. (The A/C compressor load changes the vacuum available to the brake booster.)

SYMPTOM TROUBLESHOOTING

RAPID BRAKE PAD WEAR, VEHICLE VIBRATION (AFTER A LONG DRIVE), OR HIGH, HARD BRAKE PEDAL

NOTE: Make sure that the caliper pins are installed correctly.

The upper and lower caliper pins are different. If the top and bottom caliper pins are installed in the wrong location, it will cause uneven tire wear, vibration, and or uneven or rapid pad wear for proper caliper pin location (see **FRONT BRAKE CALIPER OVERHAUL**).

1. Drive the vehicle until the brakes drag or until the pedal is high and hard. This can take 20 or more brake pedal applications during an extended test-drive.

2. With the engine running, raise the vehicle on a lift, and spin all four wheels by hand.

   Is there brake drag at any of the wheels?

   YES - Go to step 3.

   NO - Look for other causes of the pad wear, high pedal, or vehicle vibration.
3. Turn the engine off, pump the brake pedal to deplete the vacuum in the brake booster, and then spin the wheels again to check for brake drag.

   Is there brake drag at any of the wheels?

   YES - Go to step 4.

   NO - Replace the brake booster.
4. Without removing the brake lines, unbolt and separate the master cylinder from the booster, then spin the wheels to check for brake drag.

   Is there brake drag at any of the wheels?

   YES - Go to step 5.

   NO - Check the brake pedal position switch adjustment and pedal free play.
5. Loosen the hydraulic lines at the master cylinder, then spin the wheels to check for brake drag.

   Is there brake drag at any of the wheels?

   YES - Go to step 6.

   NO - Replace the master cylinder.
6. Loosen the bleed screws at each caliper, then spin the wheels to check for brake drag.

   Is there brake drag at any of the wheels?

   YES - Disassemble and repair the caliper on the wheel(s) with brake drag.

   NO - Look for a bulging master cylinder cap seal, discolored or contaminated brake fluid in the master cylinder, or damaged brake lines. If any of these items are damaged, replace them. If all of these items are OK, replace the VSA modulator-control unit.

BRAKE PEDAL AND BRAKE PEDAL POSITION SWITCH ADJUSTMENT

PEDAL HEIGHT

1. Turn the brake pedal position switch (A) counterclockwise, and pull it back until it is no longer touching the brake pedal.

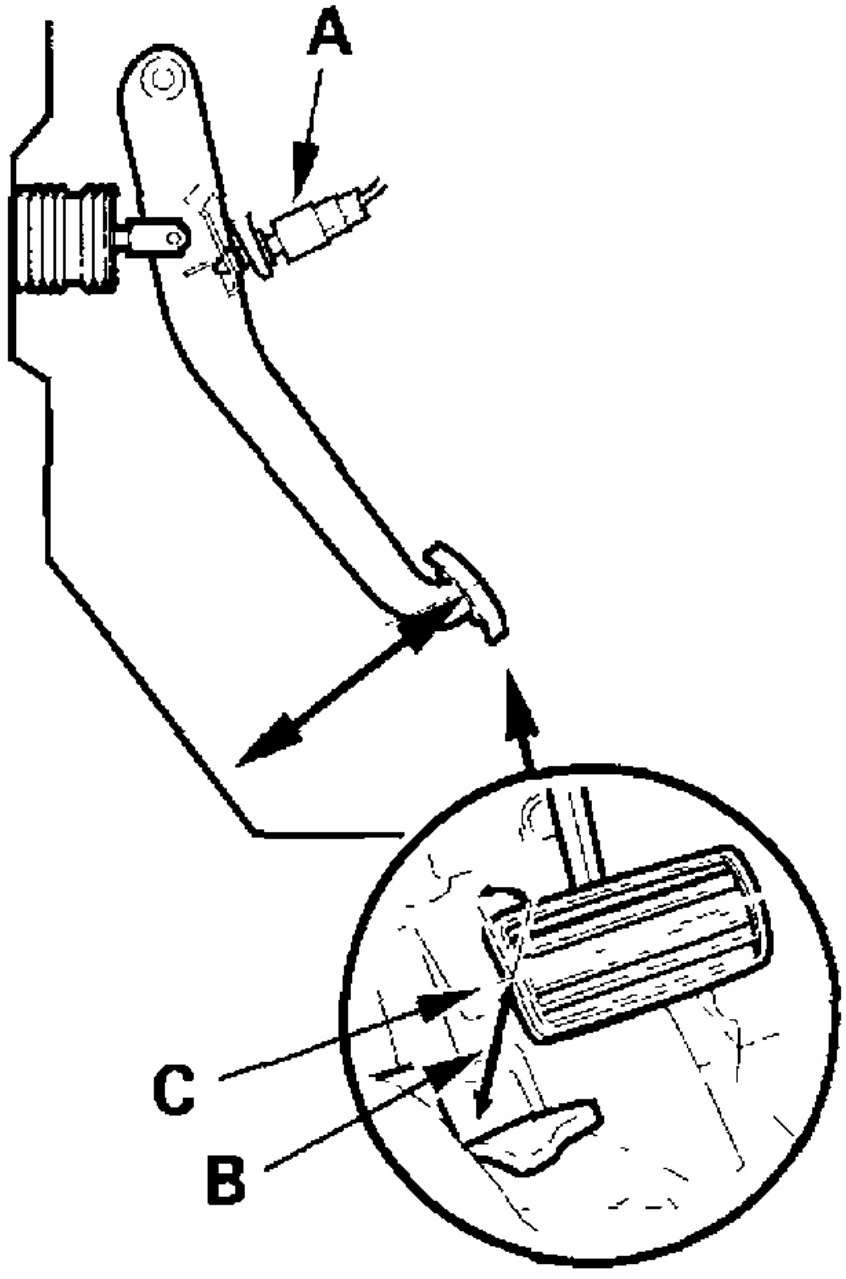

Fig. 3: Identifying Pedal Height
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Pull back the carpet at the insulator cutout, and measure the pedal height (B) from the middle of the left

side center of the pedal pad (C).

Standard pedal height (with carpet removed): 164 mm (6 7/16 in.)

Brake Switch Clearance

3. Push in the brake pedal position switch until its plunger is fully pressed (threaded end (A) touching the pad (B) on the pedal arm). Then, turn the switch 45 ° clockwise to lock it. The gap between the brake pedal position switch and the pad is automatically adjusted to 0.4-3.0 mm (0.016-0.118 in.) by locking the switch. Make sure the brake lights go off when the pedal is released.

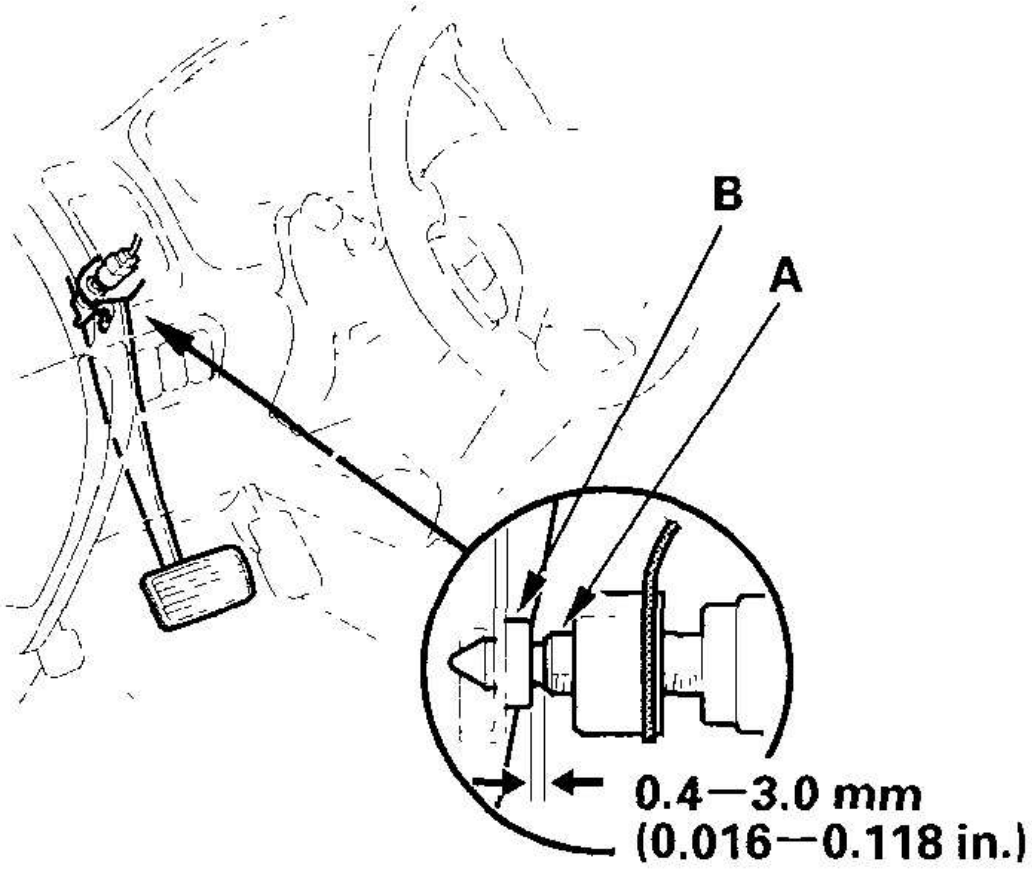

Fig. 4: Identifying Brake Switch Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

PEDAL FREE PLAY

1. With the engine stopped, inspect the pedal free play (A) on the pedal pad (B) by pushing the brake pedal by hand.

   Free play: 1-5 mm (0.04-0.2 in.)

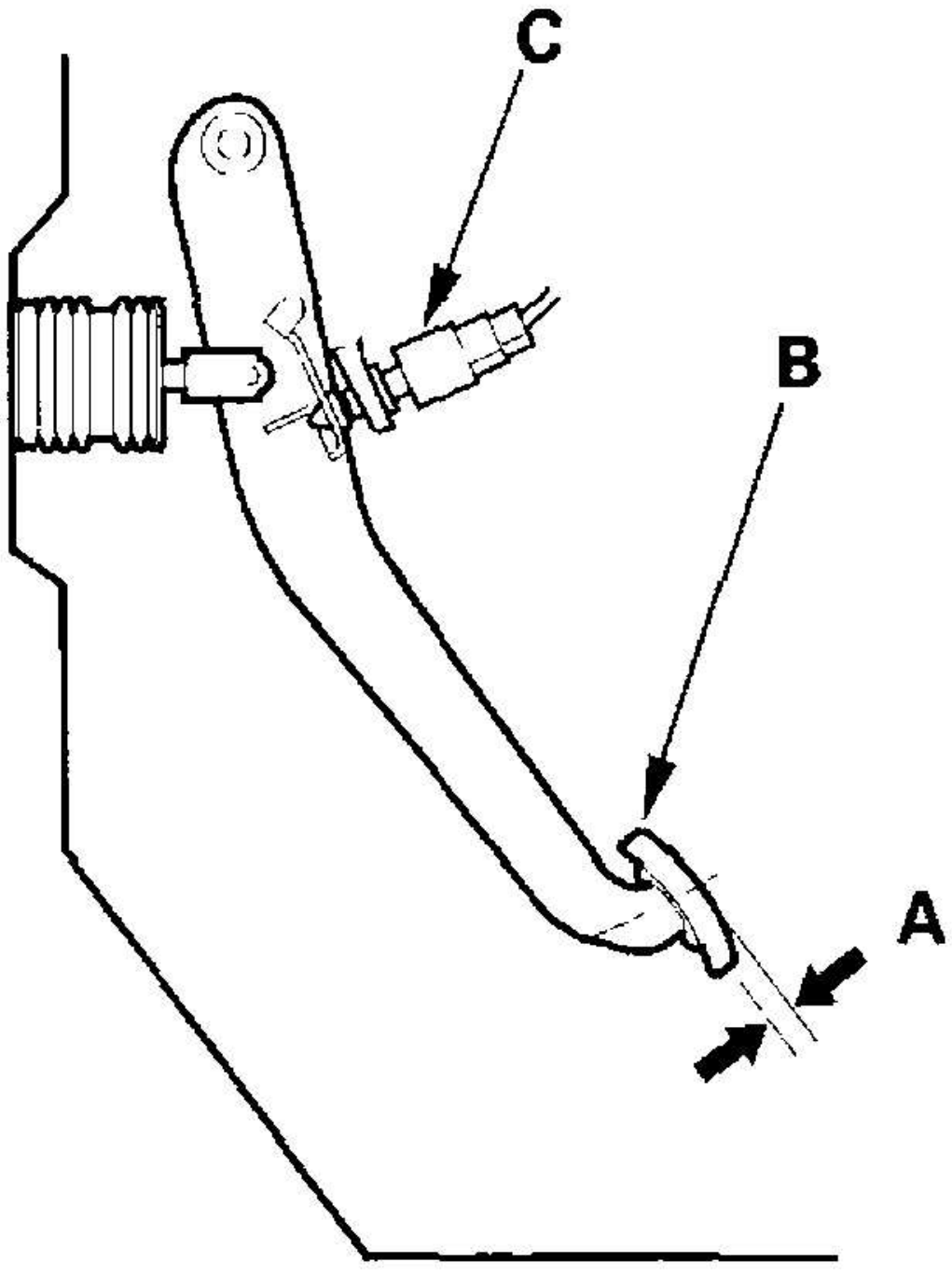

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Fig. 5: Identifying Pedal Free Play
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. If the pedal free play is out of specification, adjust the brake pedal position switch (C). If the pedal free play is insufficient, it may result in brake drag.

PARKING BRAKE CHECK AND ADJUSTMENT

INSPECTION

1. Press the parking brake pedal (A) with 441 N (45 kgf, 99 lbf) of force. The parking brake pedal should travel within the specified number of clicks (B).

   Pedal locked clicks: 6 to 8

   If the number of pedal clicks is excessive, adjust the parking brake.

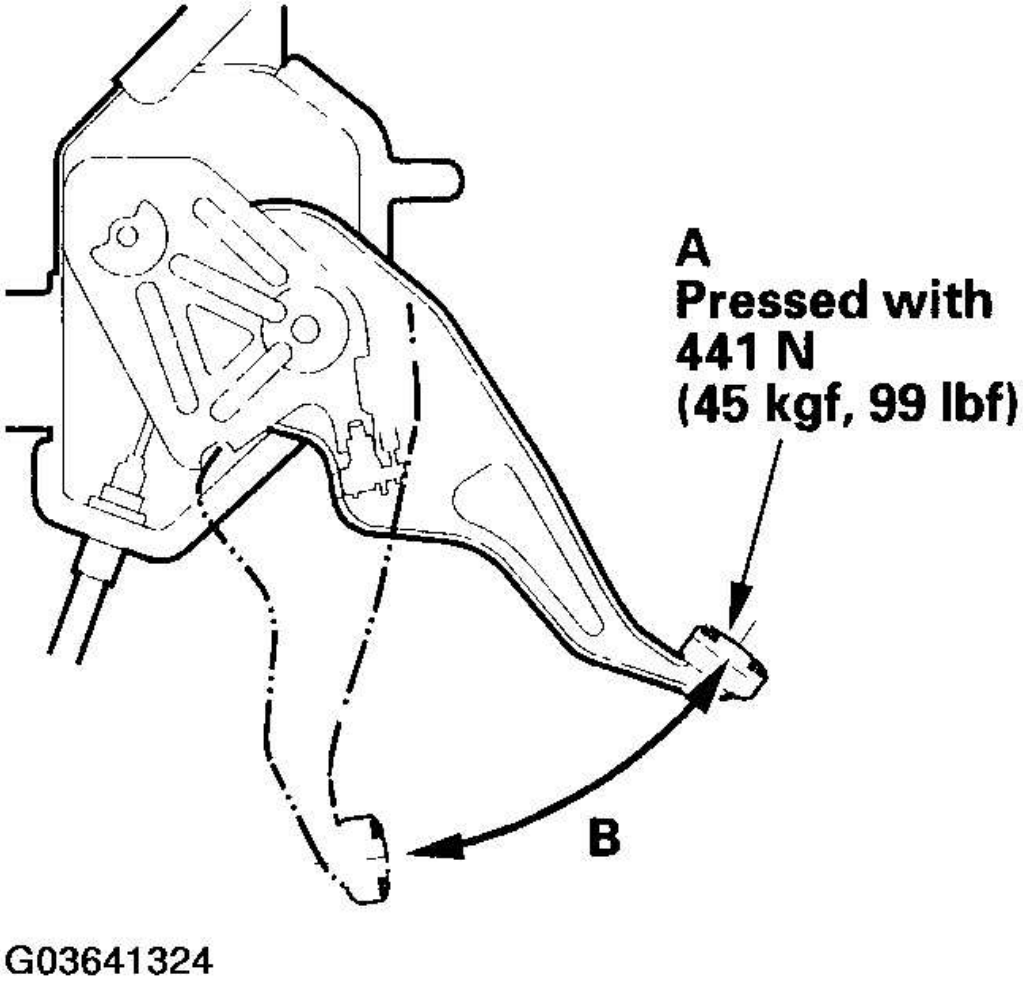

Fig. 6: Checking Parking Brake
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MINOR ADJUSTMENT

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
2. Tighten the adjusting nut (A) until the parking brake drags slightly when the rear wheels are turned.

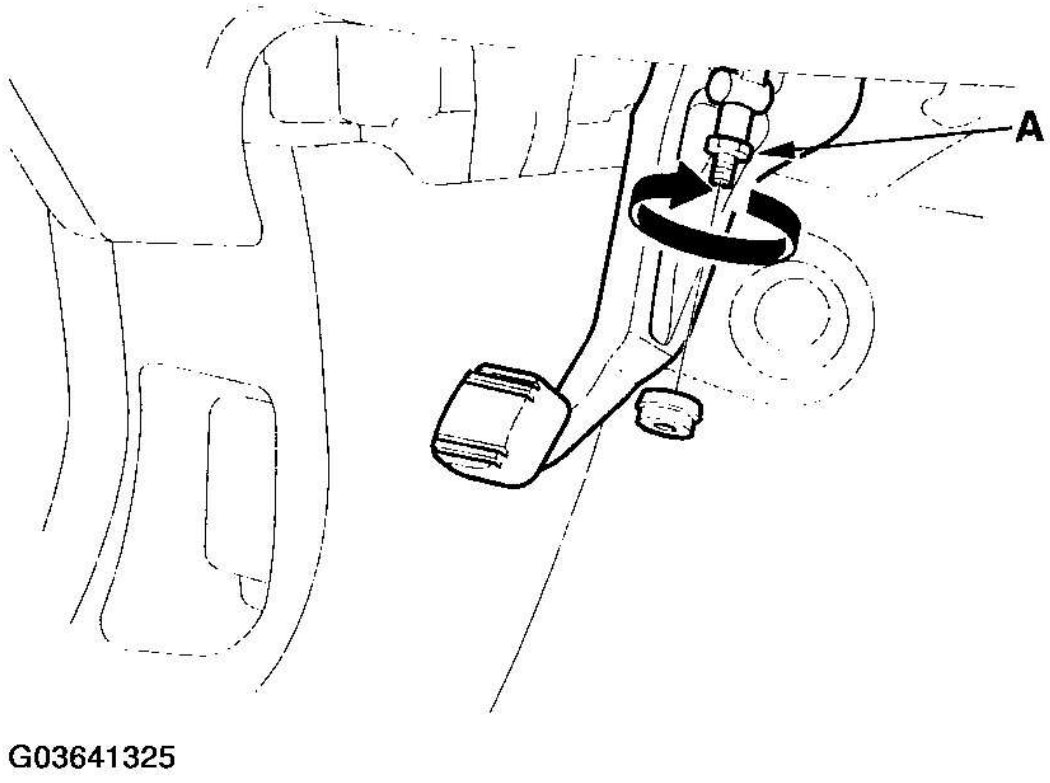

Fig. 7: Tightening Adjusting Nut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Back off the adjusting nut in half-turn increments, and check for proper adjustment (seven clicks) at a pedal force of 441 N (45 kgf, 99 lbf).

MAJOR ADJUSTMENT (TO BE DONE WHEN REPLACING BRAKE SHOES)

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**). Remove the rear wheels.
2. Release the parking brake, and back off the adjusting nut (A).

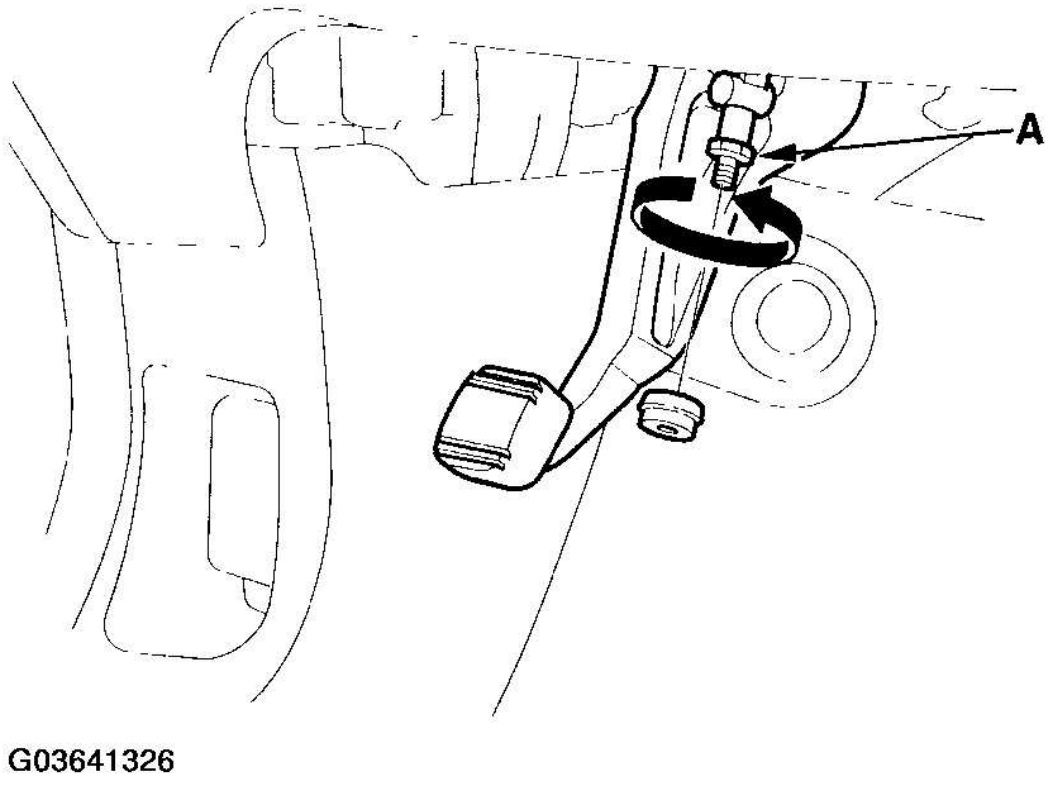

Fig. 8: Tightening Adjusting Nut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the access plug (A).

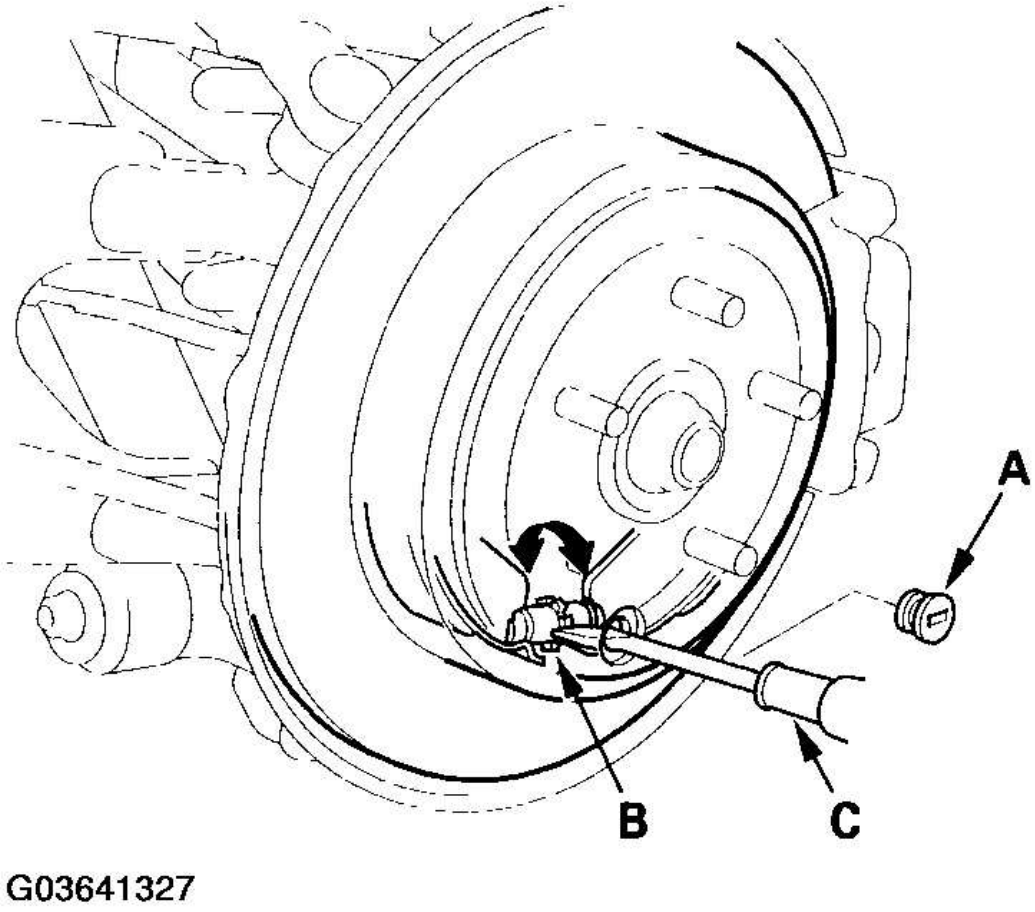

Fig. 9: Removing Access Plug
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Turn up the ratchet teeth (B) on the adjuster assembly with a flat-tip screwdriver (C) until the shoes lock against the drum. Then back off ten clicks, and install the access plug.
5. Do the minor adjustment procedure.
6. Install the rear wheels.

BRAKE SYSTEM BLEEDING

NOTE:

- **Do not reuse the drained fluid. Use only clean ACURA DOT 3 Brake Fluid from an unopened container.**

  Using a non-Acura brake fluid can cause corrosion and shorten the life of

the system.

- **Do not mix different brands of brake fluid; they may not be compatible.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **Do not spill brake fluid on the vehicle, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of the bleeding procedure and checked after bleeding each brake caliper. Add fluid as required.**

1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line (A).

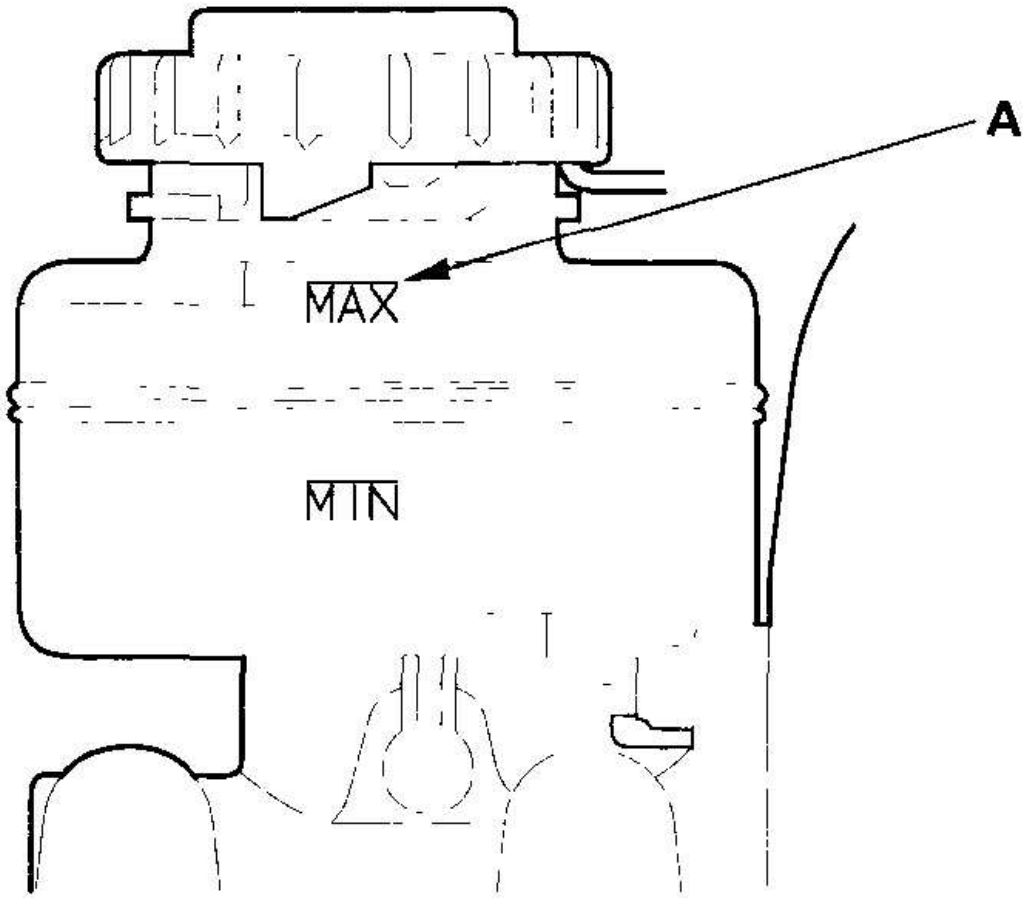

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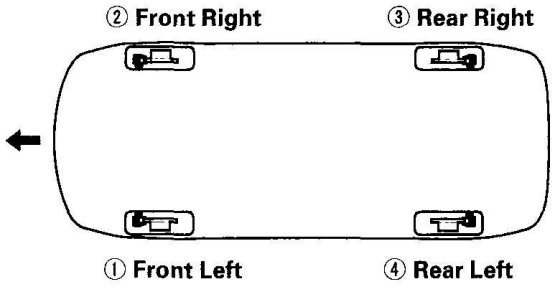
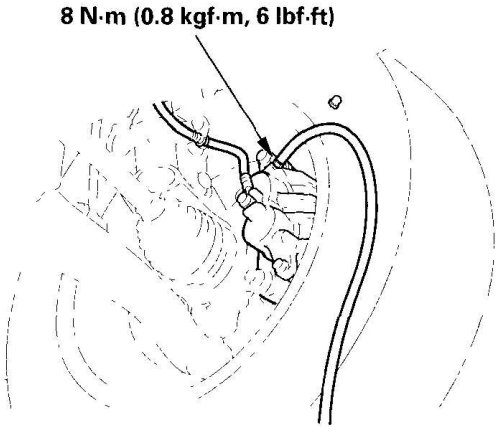
Fig. 10: Identifying Brake Fluid Level
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Slide a piece of clear plastic hose over the first bleed screw, and submerge the other end in a container of new brake fluid.
3. Have someone slowly pump the brake pedal several times, then apply steady pressure.
4. Loosen the left-front brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.
5. Repeat the procedure for each wheel in the sequence shown following until air bubbles no longer appear in the fluid.



Front



Rear

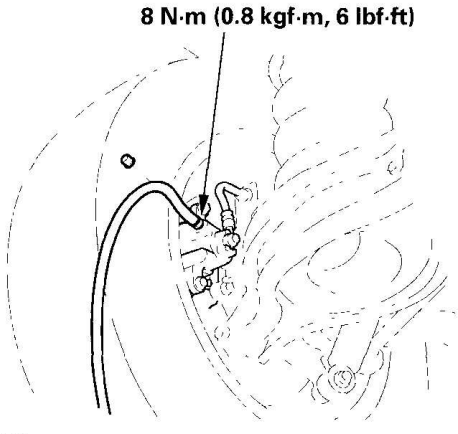


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Fig. 11: Identifying System Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Refill the master cylinder reservoir to the MAX (upper) level line.

BRAKE SYSTEM INDICATOR CIRCUIT DIAGRAM

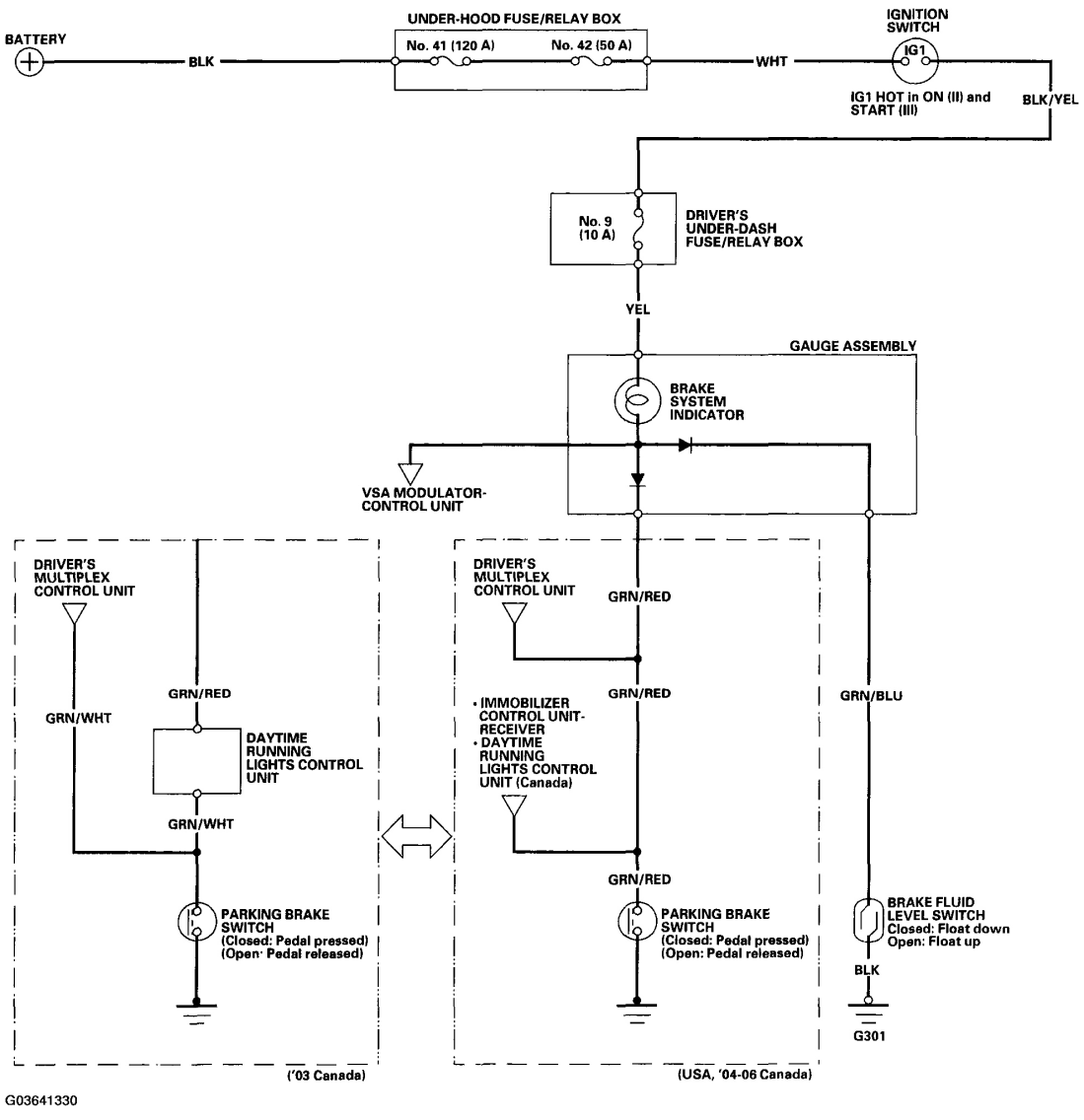

Fig. 12: Brake System Indicator Circuit Diagram
Courtesy of AMERICAN HONDA MOTOR CO., INC.

PARKING BRAKE SWITCH TEST

1. Disconnect the parking brake switch connector (A) from the parking brake switch (B).

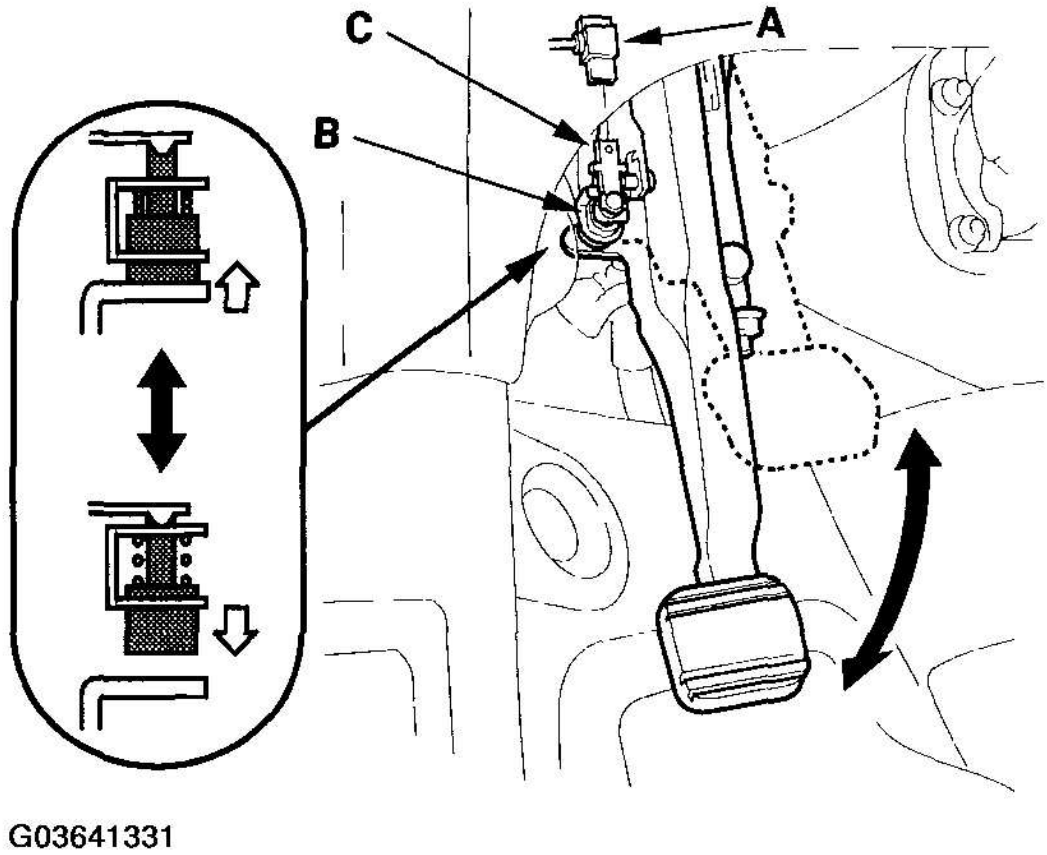

Fig. 13: Disconnecting Parking Brake Switch Connector
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Check for continuity between the positive terminal (C) and body ground.
   - With the parking brake pedal pressed, there should be continuity.
   - With the parking brake pedal released, there should be no continuity.

NOTE:

- **If both the ABS indicator and the brake system indicator come on at the same time, check the VSA first.**
- **If the parking brake switch/fluid level switch is OK, but the brake system indicator does not function, check the VSA (For '03 Canada model: Do the input test for the daytime running lights control unit first).**

BRAKE FLUID LEVEL SWITCH TEST

1. Remove the reservoir cap (A). Check that the float (B) moves up and down freely; if it doesn't, replace the reservoir cap assembly.

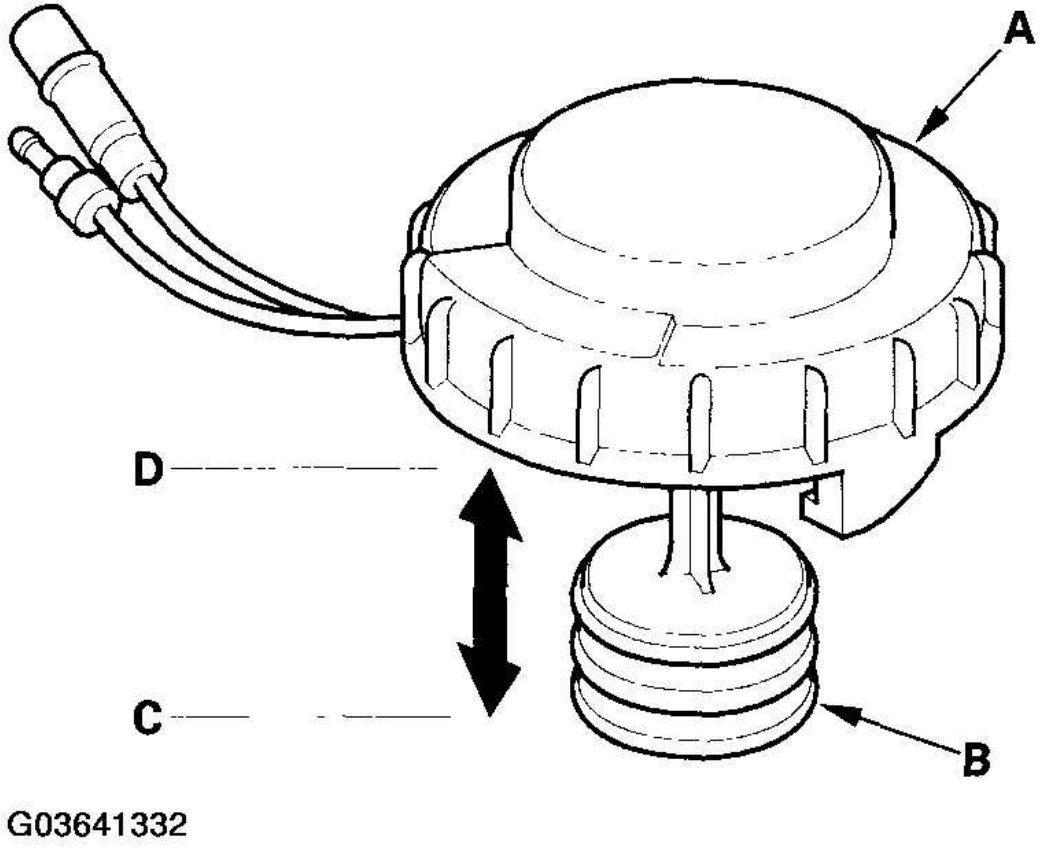

Fig. 14: Removing Reservoir Cap
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Check for continuity between the terminals with the float in the down position (C) and the up position (D).
   - With the float up, there should be no continuity.
   - With the float down, there should be continuity.

FRONT BRAKE PAD INSPECTION AND REPLACEMENT

Special Tools Required

Brake caliper piston compressor 07AAE-SEPA101

CAUTION: Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- **Avoid breathing dust particles.**
- **Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.**

INSPECTION

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
2. Remove the front wheels.
3. Check the thickness of the inner pad (A) and outer pad (B). Do not include the thickness of the backing plate.

   Brake pad thickness:

   Standard: 10.7-11.3 mm (0.42-0.44 in.)

   Service limit: 1.6 mm (0.06 in.)

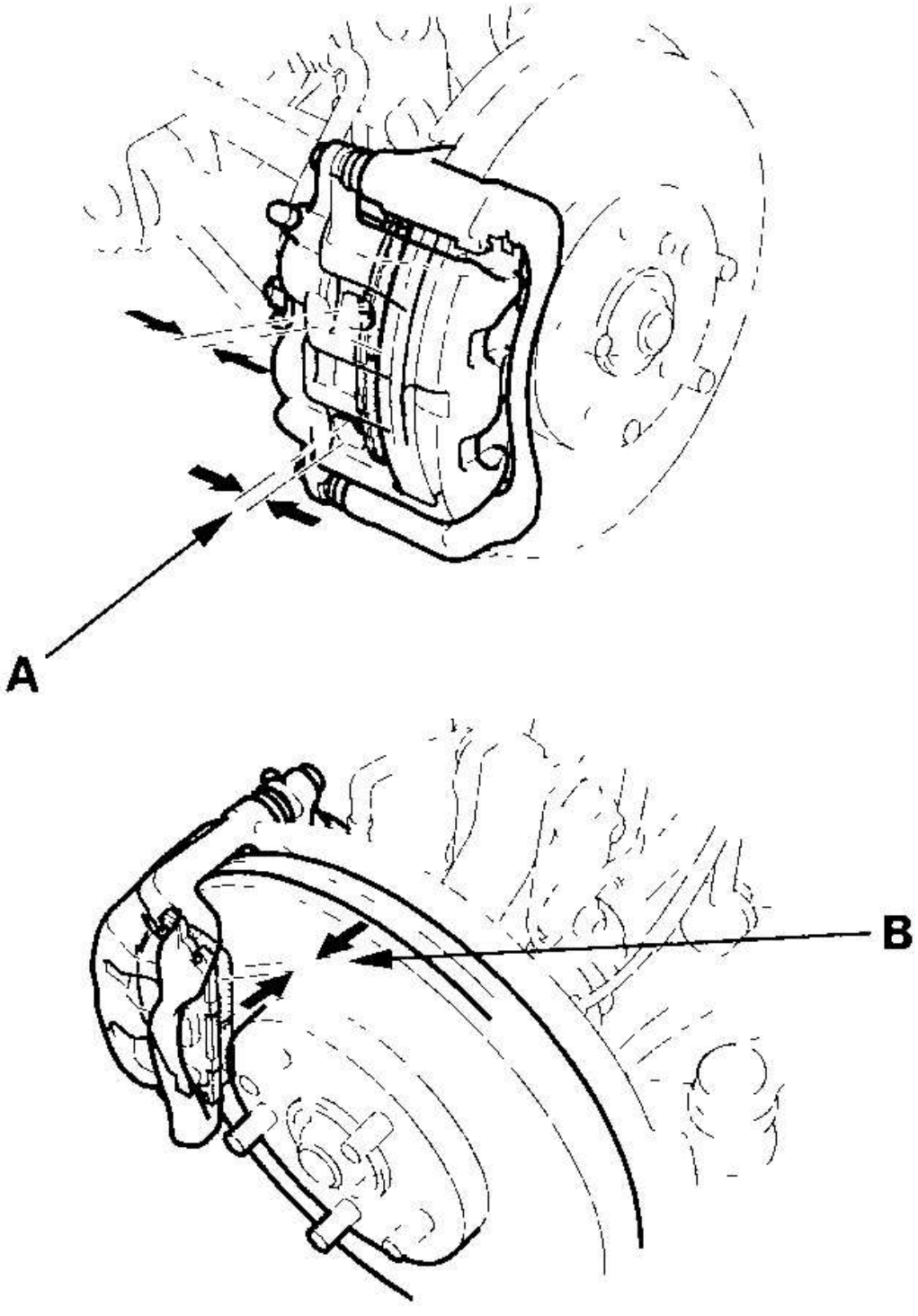
A
B
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Fig. 15: Checking Thickness Of Inner Pad And Outer Pad
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. If the brake pad thickness is less than the service limit, replace all the front brake pads as a set.

REPLACEMENT

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
2. Remove the front wheels.
3. Remove the flange bolt (B) while holding the caliper pin A with a wrench being careful not to damage the pin boot, and pivot the caliper (C) up out of the way. Check the hose and pin boots for damage and deterioration.

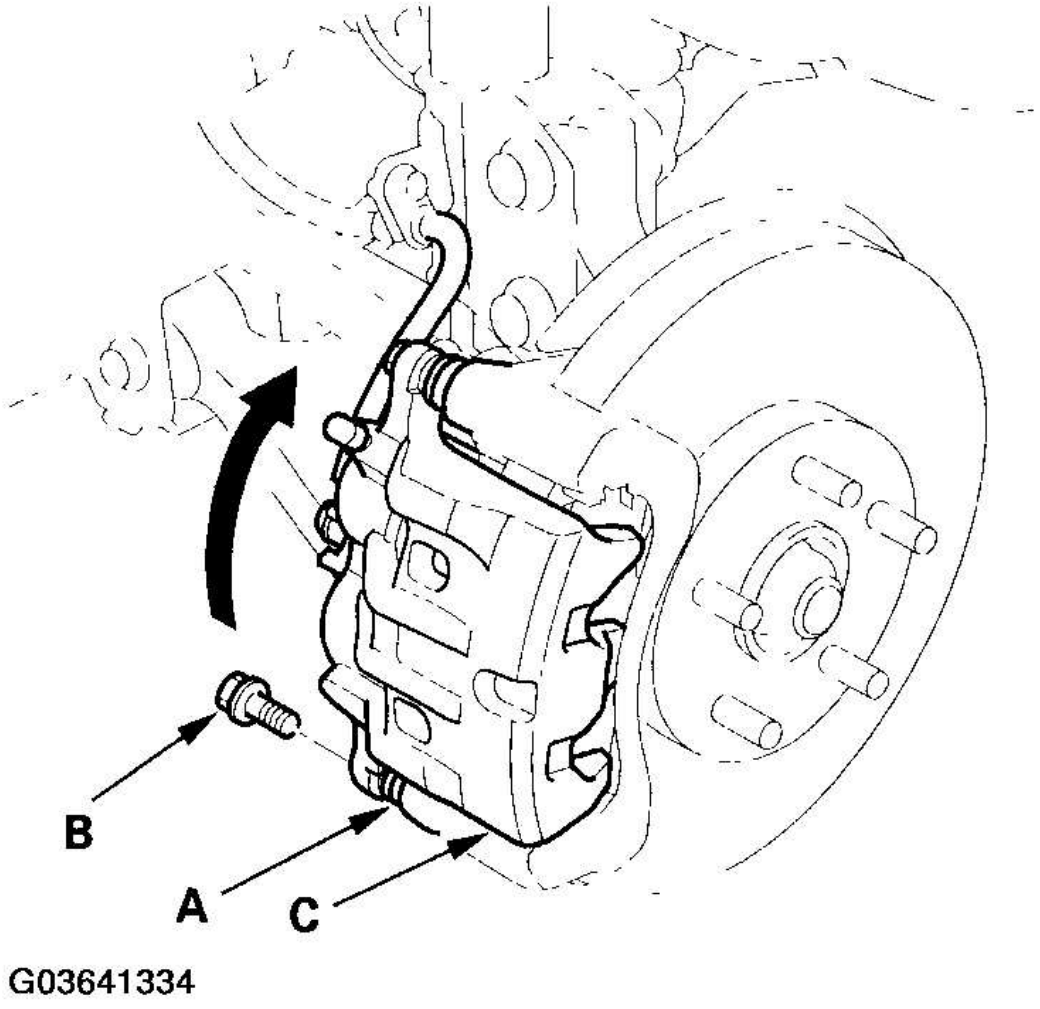

Fig. 16: Checking Hose And Pin Boots For Damage And Deterioration
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the pad springs (A) while holding the brake pads.

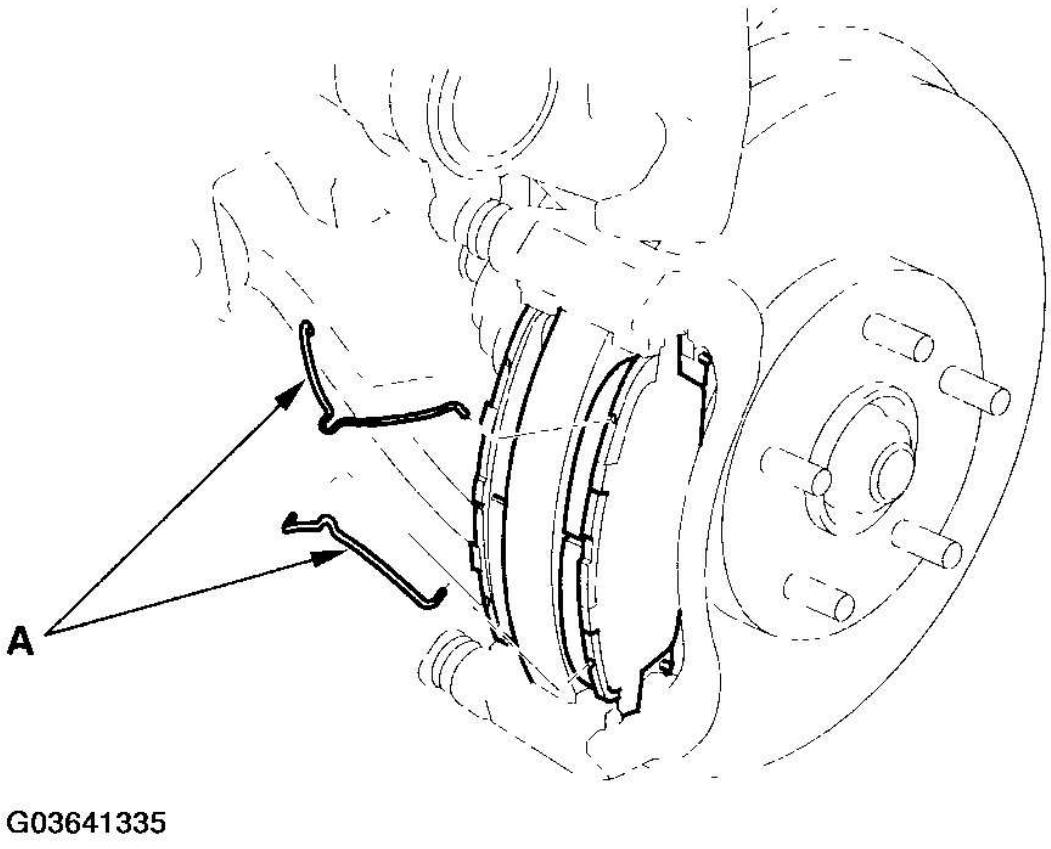

Fig. 17: Removing Pad Springs While Holding Brake Pads
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the inner pad shim A, inner pad shim B, and outer pad shim (C) and brake pads (D).

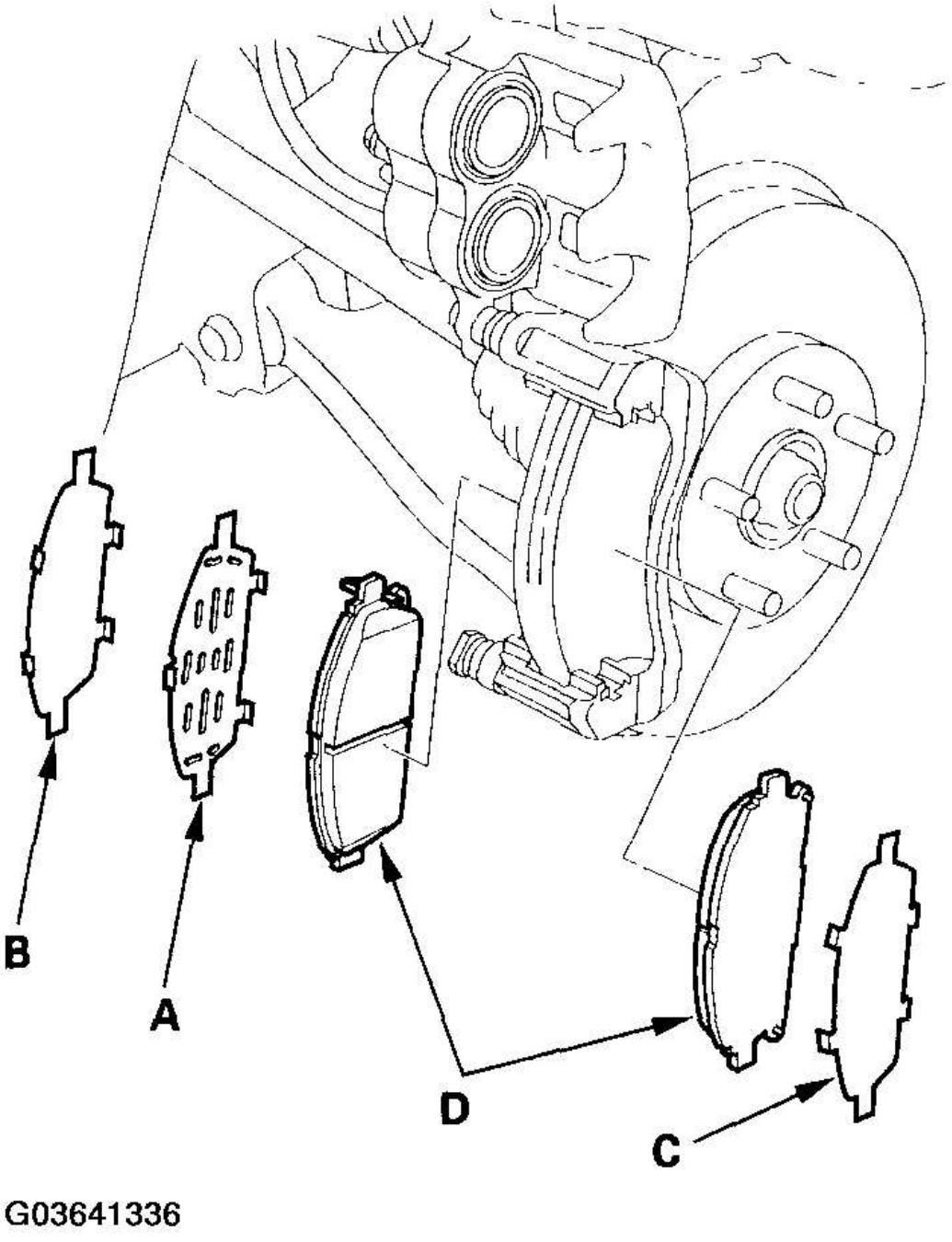

Fig. 18: Removing Inner Pad Shim A, Inner Pad Shim B, And Outer Pad Shim
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove the pad retainers (A).

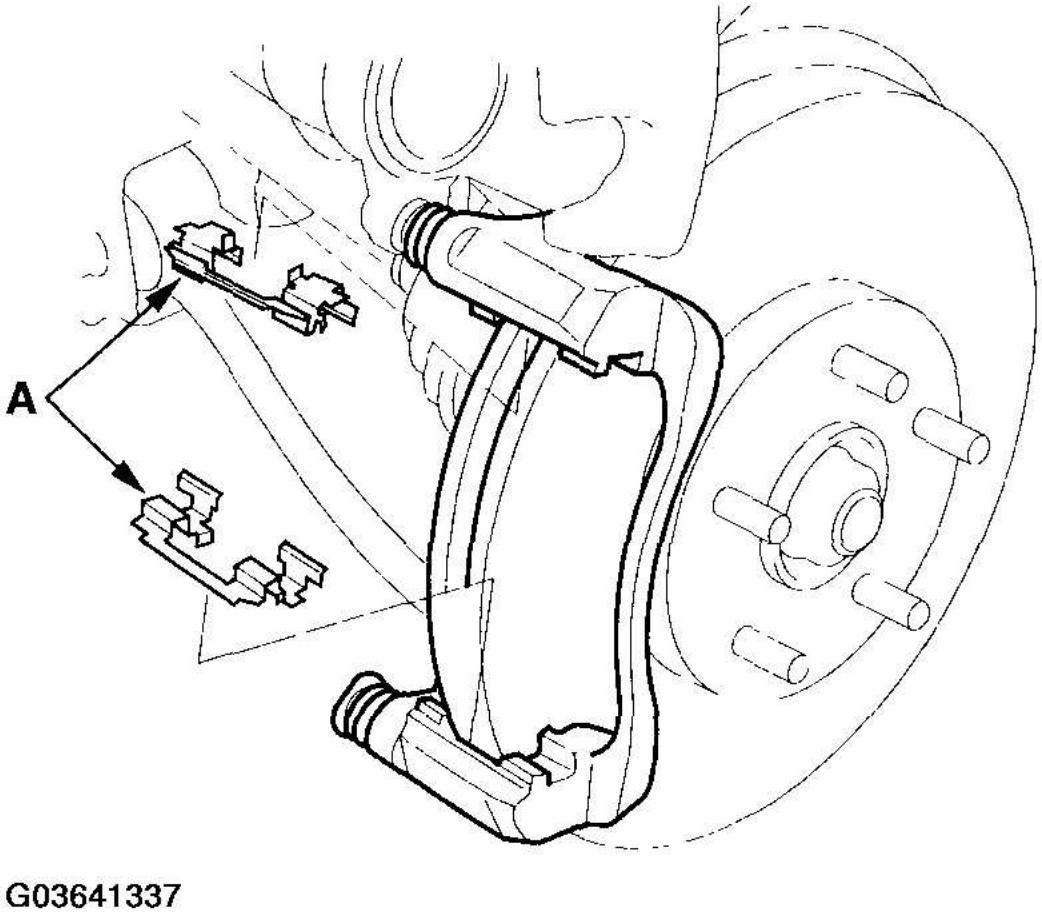

Fig. 19: Removing Pad Retainers
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Clean and install the pad retainers.
10. Apply a thin coat of M-77 assembly paste (P/N 08798-9010) to the pad side of inner shim A, inner pad shim B, both sides of outer pad shim (C), the back of the brake pads (D), and the other areas indicated by the arrows. Wipe excess assembly paste off the shims and brake pads. Contaminated brake discs or brake pads reduce stopping ability. Keep assembly paste off the brake discs and brake pad materials.

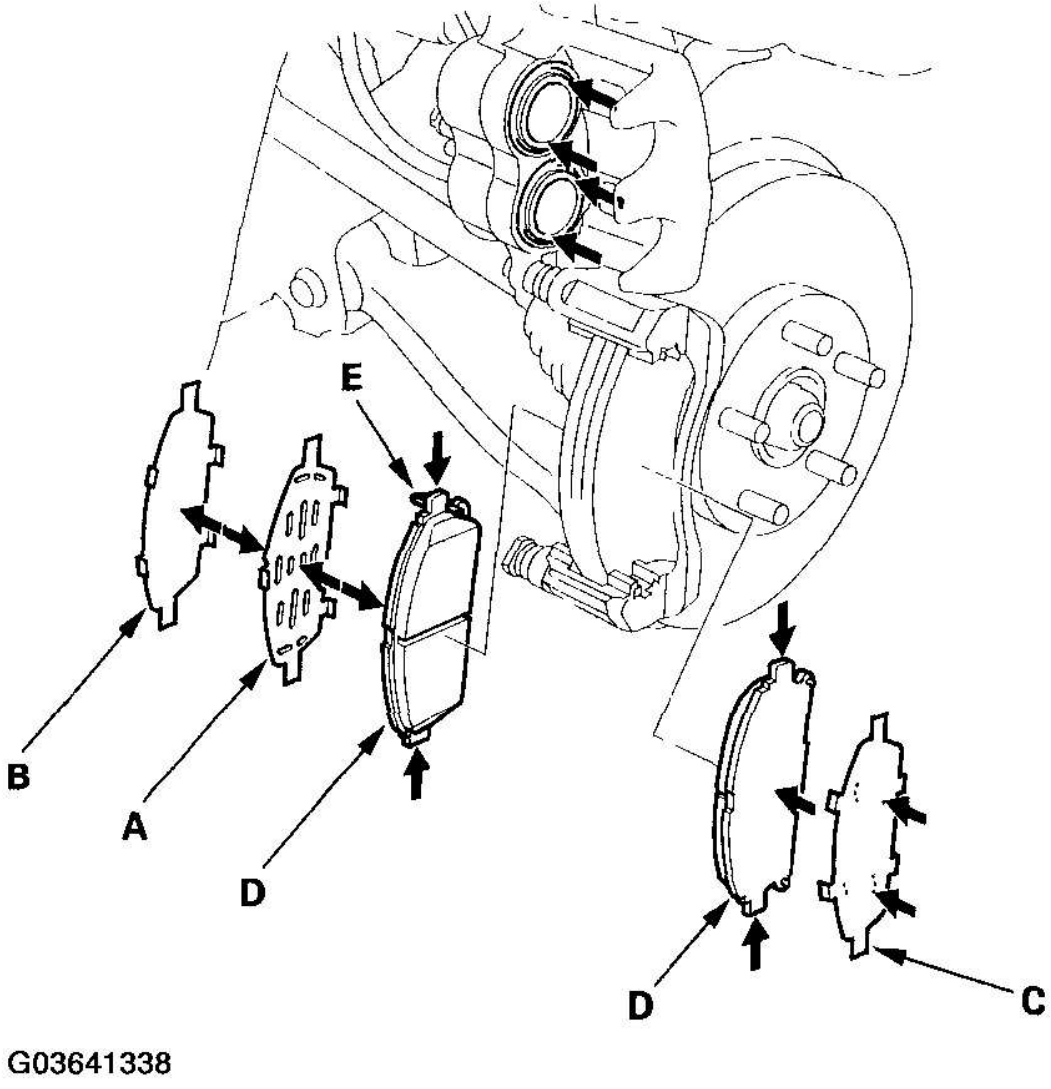

Fig. 20: Identifying Installation Procedure
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Install the brake pads and pad shims correctly.

    Install the brake pad with the wear indicator (E) on the upper inside.

    If you are reusing the brake pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.

12. Install the pad springs (A) while holding the brake pads.

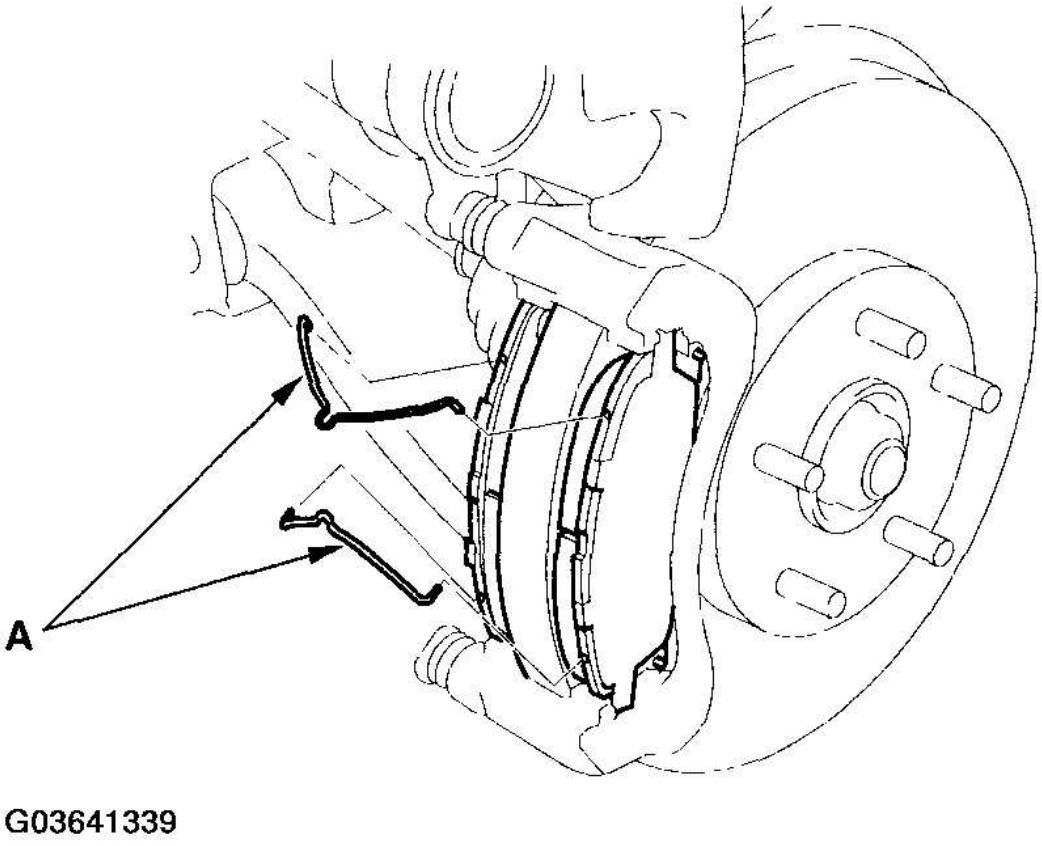

Fig. 21: Installing Pad Springs While Holding Brake Pads
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Mount the brake caliper piston compressor on the caliper (A).

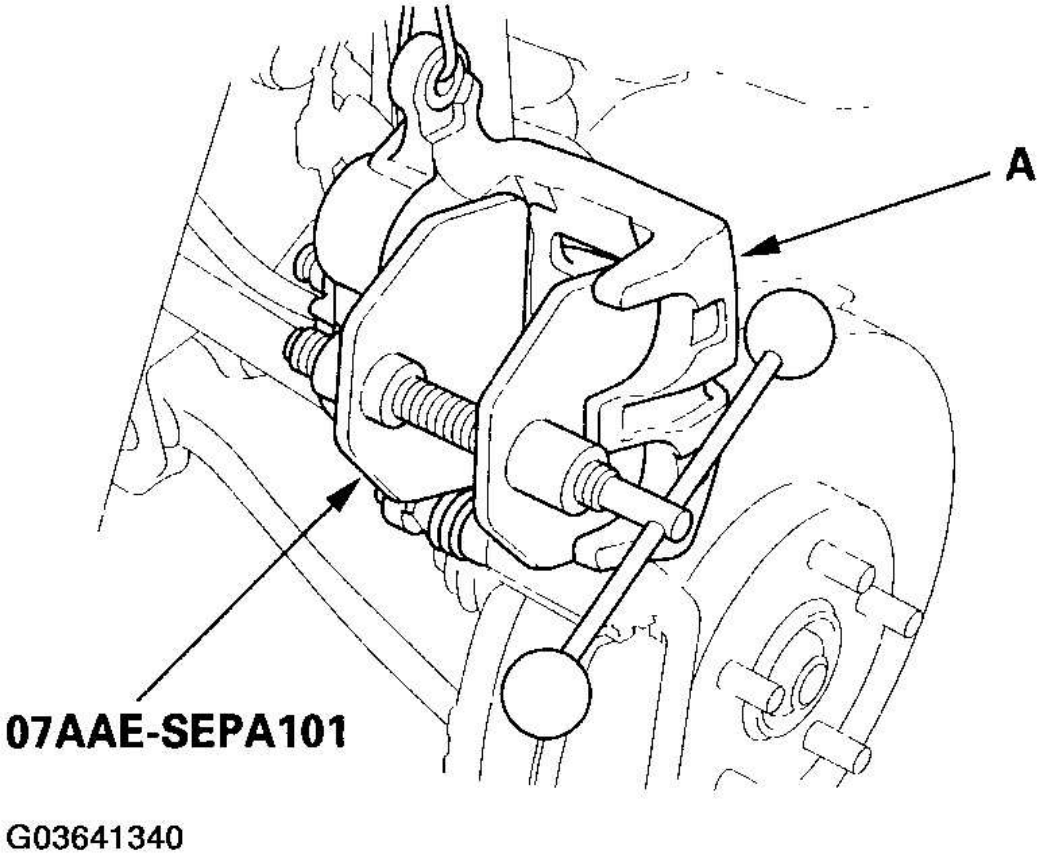

Fig. 22: Mounting Brake Caliper Piston Compressor On Caliper
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Press in the piston with the brake caliper piston compressor so the caliper will fit over the brake pads. Make sure the piston boot is in position to prevent damaging it when pivoting the caliper down.

NOTE: Be careful when pressing in the piston, the brake fluid might overflow from the master cylinder's reservoir.

15. Remove the brake caliper piston compressor.
16. Pivot the caliper down into position. Install the flange bolt (B), and torque it to the specified torque while holding the caliper pin A with a wrench, being careful not to damage the pin boot.

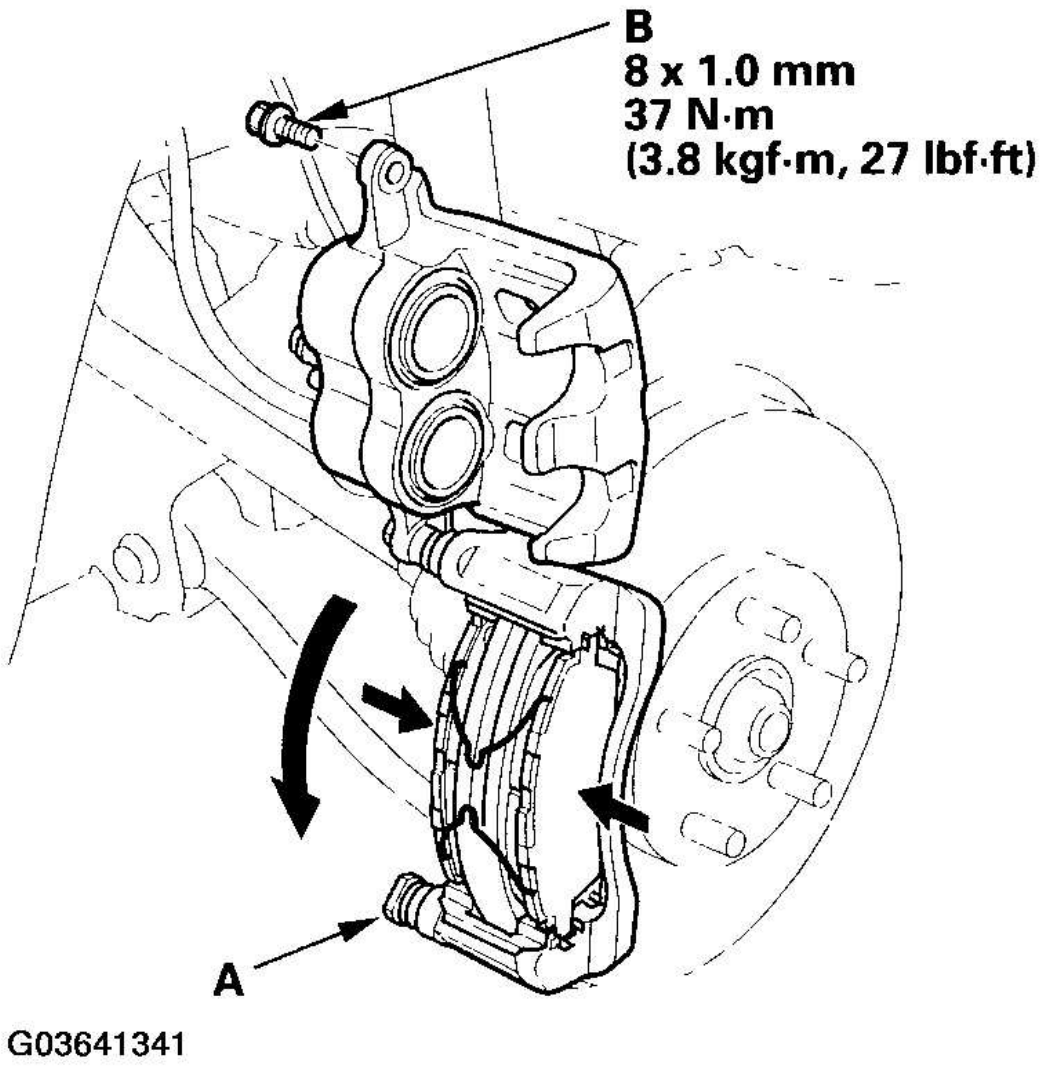

Fig. 23: Removing Brake Caliper Piston Compressor
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Press the brake pedal several times to make sure the brakes work.

NOTE: Engagement of the brakes may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

18. After installation, check for leaks at hose and line joints or connections, and retighten if necessary. Test-drive the vehicle, then check for leaks.

FRONT BRAKE DISC INSPECTION

RUNOUT

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
2. Remove the front wheels.
3. Remove the brake pads (see **FRONT BRAKE PAD INSPECTION AND REPLACEMENT**).
4. Inspect the brake disc surface for damage and cracks. Clean the brake disc thoroughly, and remove all rust.
5. Install suitable flat washers (A) and wheel nuts, and tighten the wheel nuts to the specified torque to hold the brake disc securely against the hub.

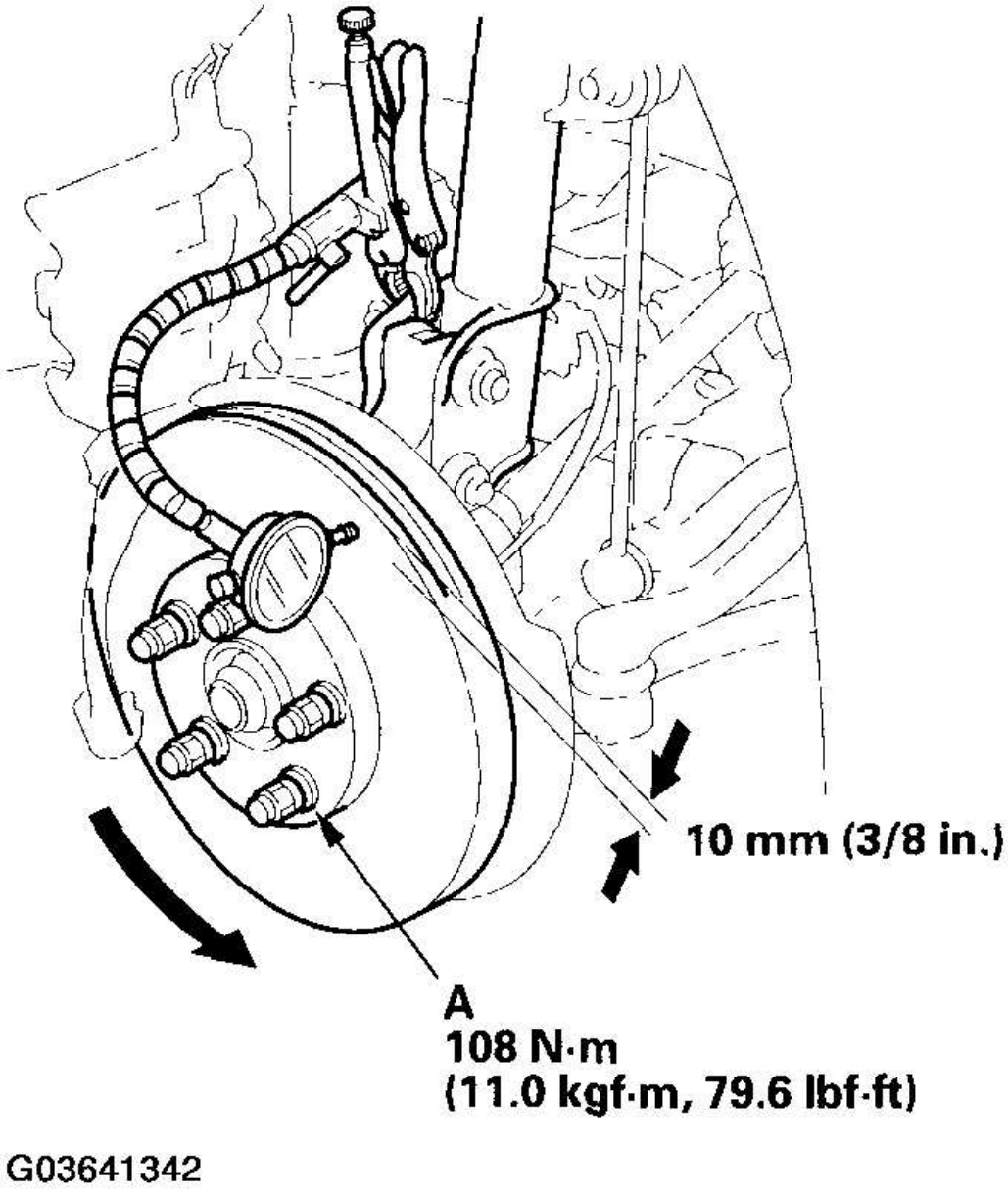

Fig. 24: Measuring Runout
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Set up the dial gauge against the brake disc as shown, and measure the runout at 10 mm (3/8 in.) from the outer edge of the brake disc.

Brake disc runout:

Service limit: 0.10 mm (0.004 in.)

7. If the brake disc is beyond the service limit, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-Way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

   Max. refinish limit: 26.0 mm (1.02 in.)

   NOTE:
   - **If the brake disc is beyond the service limit for refinishing, replace it (see step 3,KNUCKLE/HUB REPLACEMENT).**
   - **A new brake disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).**

THICKNESS AND PARALLELISM

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
2. Remove the front wheels.
3. Remove the brake pads (see **FRONT BRAKE PAD INSPECTION AND REPLACEMENT**).
4. Using a micrometer, measure brake disc thickness at eight points, approximately 45 ° apart and 10 mm (3/8 in.) in from the outer edge of the brake disc.

   Brake disc thickness:

   Standard: 27.9-28.1 mm (1.10-1.11 in.)

   Max. refinishing limit: 26.0 mm (1.02 in.)

   Brake disc parallelism: 0.015 mm (0.0006 in.) max.

   NOTE: This is the maximum allowable difference between the thickness measurements.

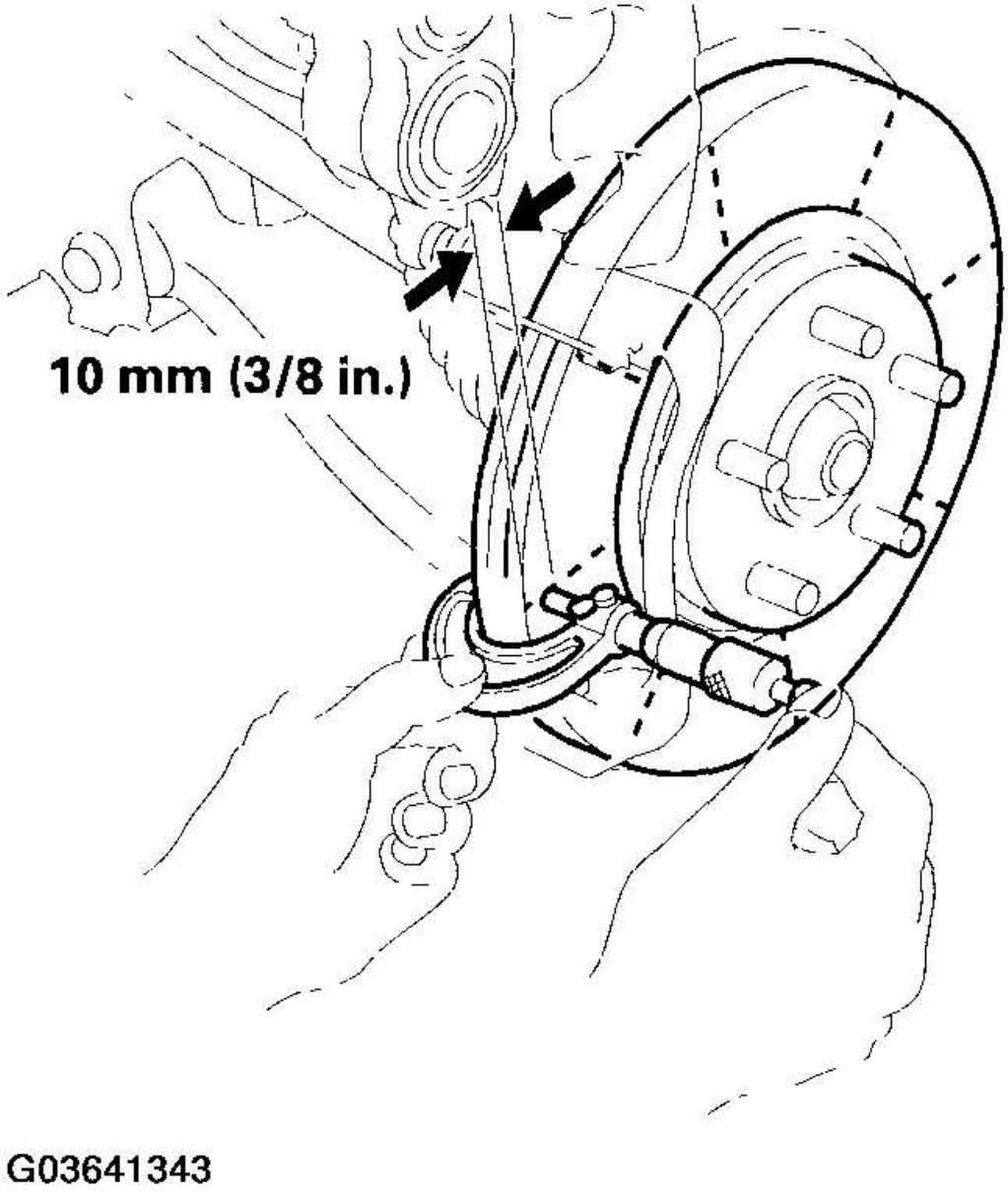

Fig. 25: Measuring Thickness And Parallelism
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. If the brake disc is beyond the service limit for parallelism, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-Way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

NOTE: If the brake disc is beyond the service limit for refinishing, replace it (see step 3, KNUCKLE/HUB REPLACEMENT).

FRONT BRAKE CALIPER OVERHAUL

CAUTION: Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- **Avoid breathing dust particles.**
- **Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.**

Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

NOTE: Make sure that the caliper pins are installed correctly.
The upper and lower caliper pins are different. If the top and bottom caliper pins are installed in the wrong location, it will cause uneven tire wear, vibration, and or uneven or rapid pad wear.

- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping brake fluid, cover disconnected hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter does not contaminate the brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- When reusing brake pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid. Use only clean ACURA DOT 3 Brake Fluid from an unopened container. Using a non-Acura brake fluid can cause corrosion and shorten the life of the system.
- Do not mix different brands of brake fluid as they may not be compatible.
- Coat the pistons, piston seal grooves, and caliper bores with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.

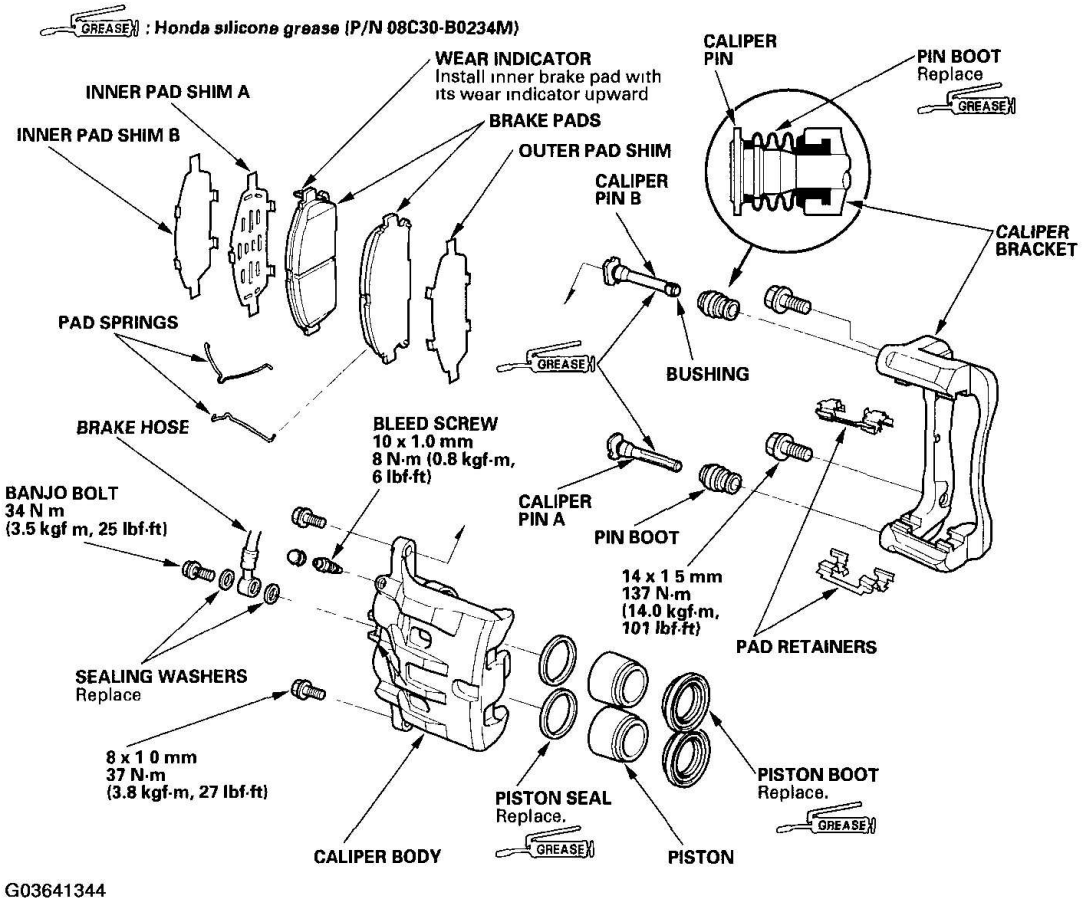

Fig. 26: Identifying Caliper Components (Exploded View)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MASTER CYLINDER REPLACEMENT

NOTE: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.

1. Remove the intake air duct (see step 8 on **ENGINE REMOVAL**).
2. Remove the throttle cable holder.
3. Disconnect the brake fluid level switch connectors (A), and remove the reservoir cap (B).

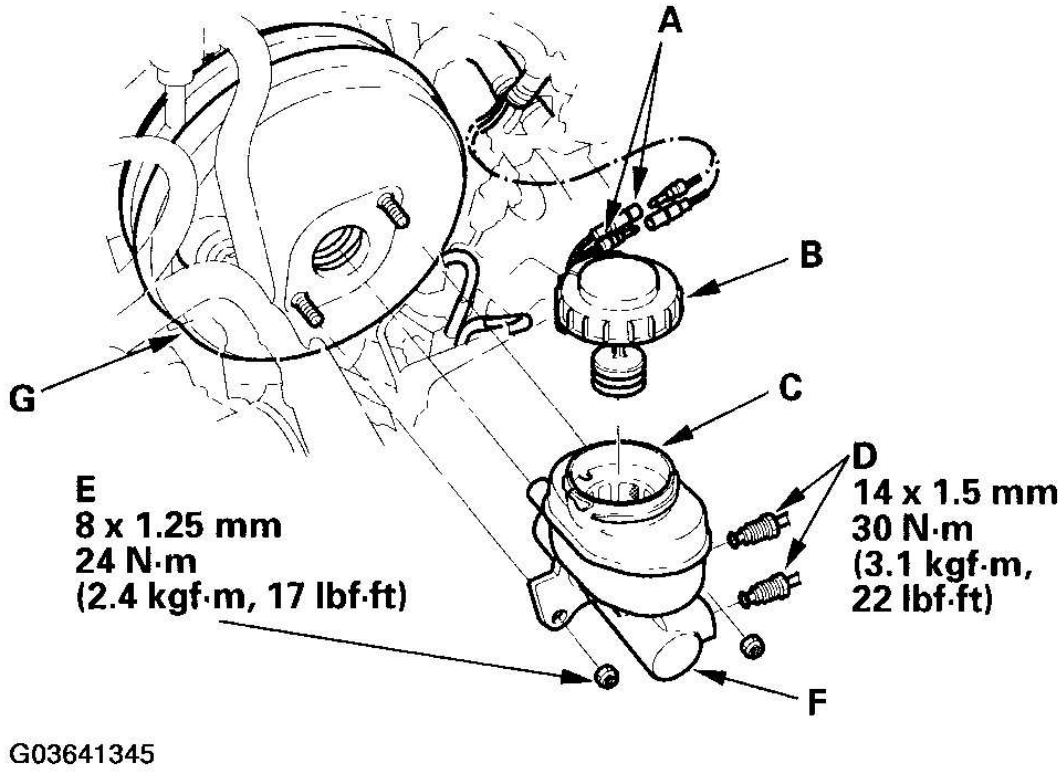

Fig. 27: Removing Reservoir Cap
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the brake fluid from the master cylinder reservoir (C) with a syringe.
5. Disconnect the brake lines (D) from the master cylinder. To prevent spills, cover the hose joints with rags or shop towels.
6. Remove the master cylinder mounting nuts (E).
7. Remove the master cylinder (F) from the brake booster (G). Be careful not to bend or damage the brake lines when removing the master cylinder.
8. Install the master cylinder in the reverse order of removal, and note these items:
   - Fill the reservoir with new brake fluid, then bleed the brake system (see **BRAKE SYSTEM BLEEDING**).
   - Check the brake pedal height and free play (see **BRAKE PEDAL AND BRAKE PEDAL POSITION SWITCH ADJUSTMENT**).
9. Spin the wheels to check for brake drag.

MASTER CYLINDER INSPECTION

NOTE:

- **Before reassembling, check that all parts are free of dirt and other foreign particles.**
- **Do not try to disassemble the master cylinder assembly. Replace the master cylinder assembly with a new part if necessary.**
- **Do not allow dirt or foreign matter to contaminate the brake fluid.**
- **Bleed the brake system (see BRAKE SYSTEM BLEEDING).**

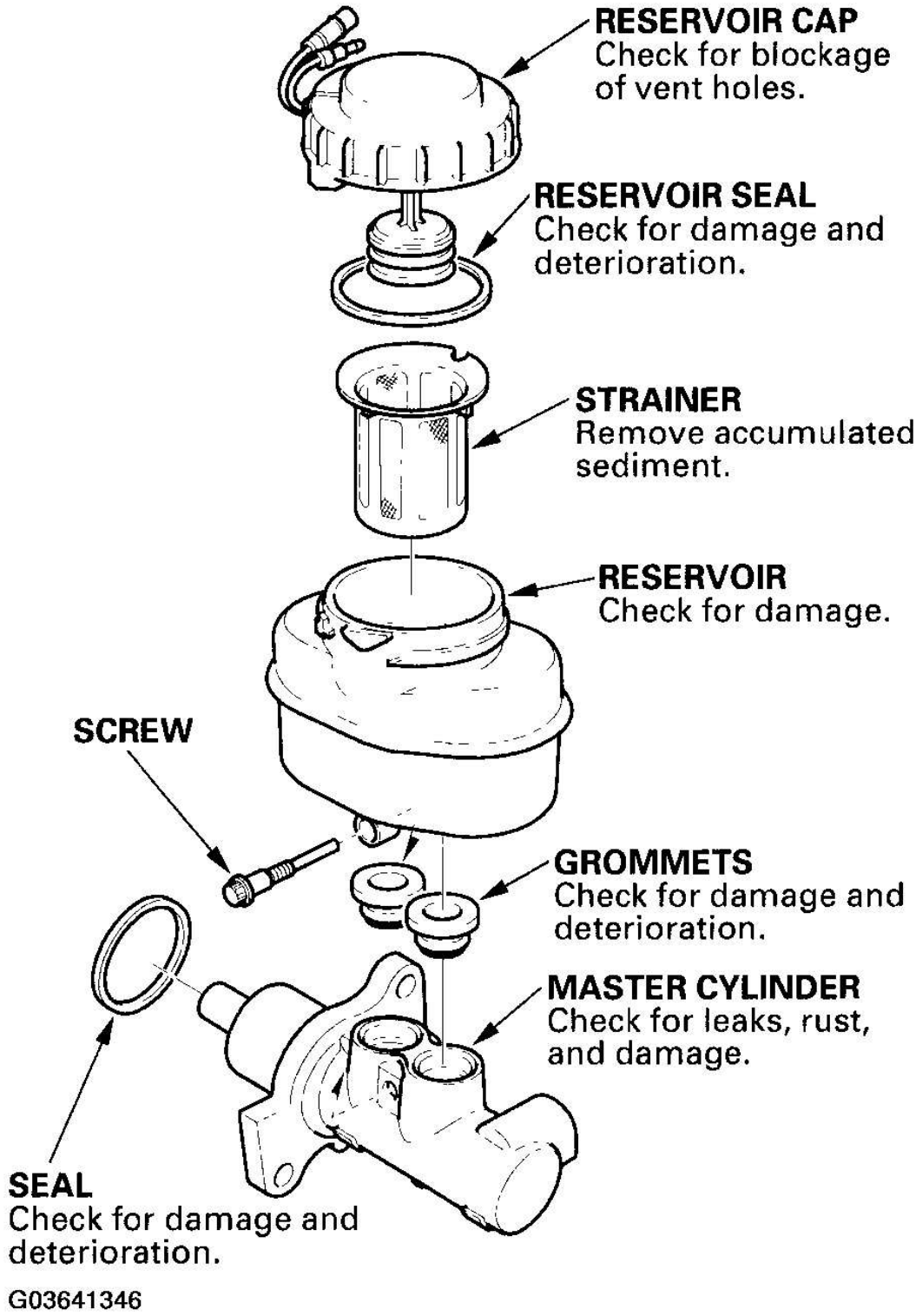
RESERVOIR CAP
Check for blockage of vent holes.
RESERVOIR SEAL
Check for damage and deterioration.
STRAINER
Remove accumulated sediment.
RESERVOIR
Check for damage.
SCREW
GROMMETS
Check for damage and deterioration.
MASTER CYLINDER
Check for leaks, rust, and damage.
SEAL
Check for damage and deterioration.
G03641346

Fig. 28: Identifying Master Cylinder Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

BRAKE BOOSTER TEST

FUNCTIONAL TEST

1. With the engine stopped, press the brake pedal several times to deplete the vacuum reservoir, then press the brake pedal hard, and hold it for 15 seconds. If the brake pedal sinks, either the master cylinder is bypassing internally, or the brake system (master cylinder, lines, modulator, or calipers) is leaking.
2. Start the engine with the brake pedal pressed. If the brake pedal sinks slightly, the vacuum booster is operating normally. If the brake pedal height does not vary, the booster or check valve is faulty.
3. With the engine running, press the brake pedal lightly, and shift the transmission to the D position. Apply just enough pressure to hold back automatic transmission creep. If the brake pedal sinks more than 10 mm (3/8 in.) in 3 minutes, the master cylinder is faulty. A slight change in brake pedal height when the A/C compressor cycles on and off is normal. (The A/C compressor load changes the vacuum available to the booster.)

LEAK TEST

1. Press the brake pedal with the engine running, then stop the engine. If the brake pedal height does not vary while pressed for 30 seconds, the vacuum booster is OK. Does the pedal height rises go to step 6 . If it does not rise go to step 2.
2. Start the engine and let it idle for 30 seconds. Turn the engine off and wait 30 seconds. Press the brake pedal several times using normal pressure. When the brake pedal is first pressed, it should be low. On consecutive applications, the brake pedal height should gradually rise. Does the pedal rise on each consecutive application? If it rises the booster is OK. If it does not go to step 3.
3. Disconnect the brake booster vacuum hose (check valve built-in) (A) at the booster side (B).

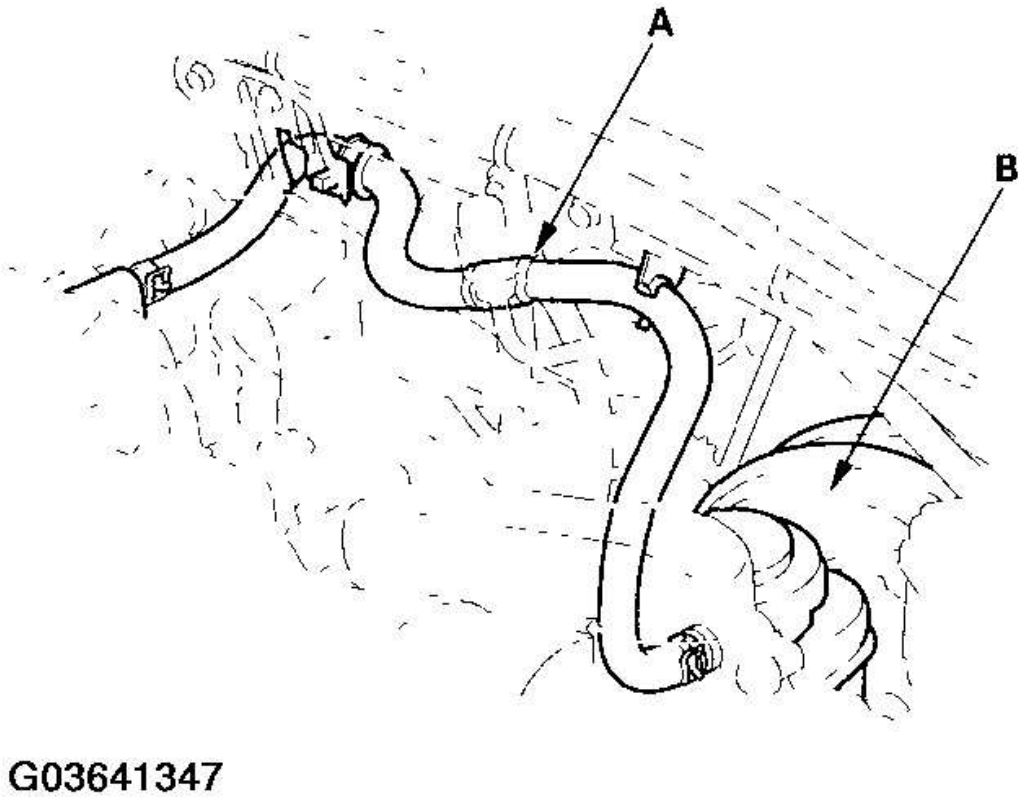

Fig. 29: Testing Leak
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Start the engine, and let it idle. There should be vacuum available. If no vacuum is available, the check valve is not working properly. Replace the brake booster vacuum hose and check valve, and retest. If vacuum is found, go to step 5.
5. Reconnect the brake booster vacuum hose to the brake booster.
6. Start the engine, and then pinch the brake booster vacuum hose between the check valve and the booster.
7. Turn the engine off, and wait 30 seconds. Press the brake pedal several times using normal pressure. When the brake pedal is first pressed, it should be low. On consecutive applications, the brake pedal height should gradually rise.
    - If the pedal position does not vary inspect the seal between the master cylinder and booster. If the seal is OK, replace the brake booster.
    - If the brake pedal position varies, replace the brake booster vacuum hose/check valve assembly.

BRAKE BOOSTER REPLACEMENT

1. Remove the master cylinder (see **MASTER CYLINDER REPLACEMENT**).
2. Disconnect the vacuum hose (A) from the brake booster (B).

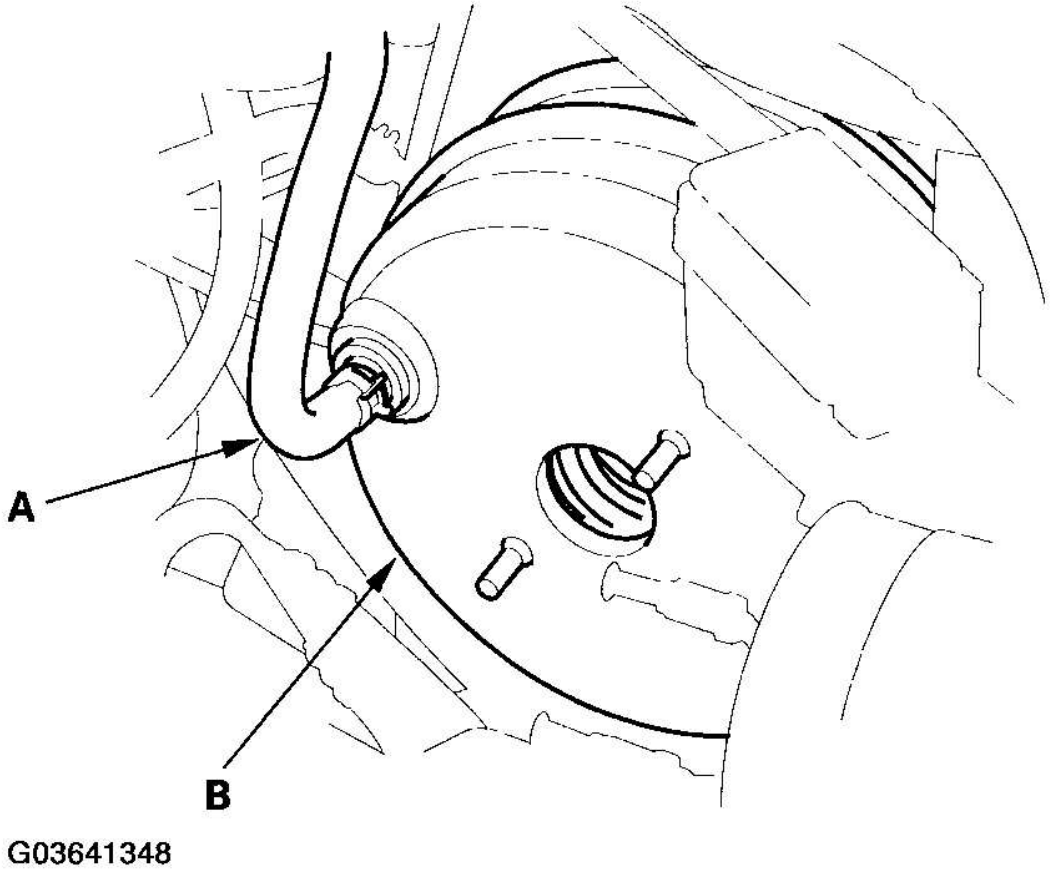

Fig. 30: Disconnecting Vacuum Hose
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the lock pin (A) and joint pin (B).

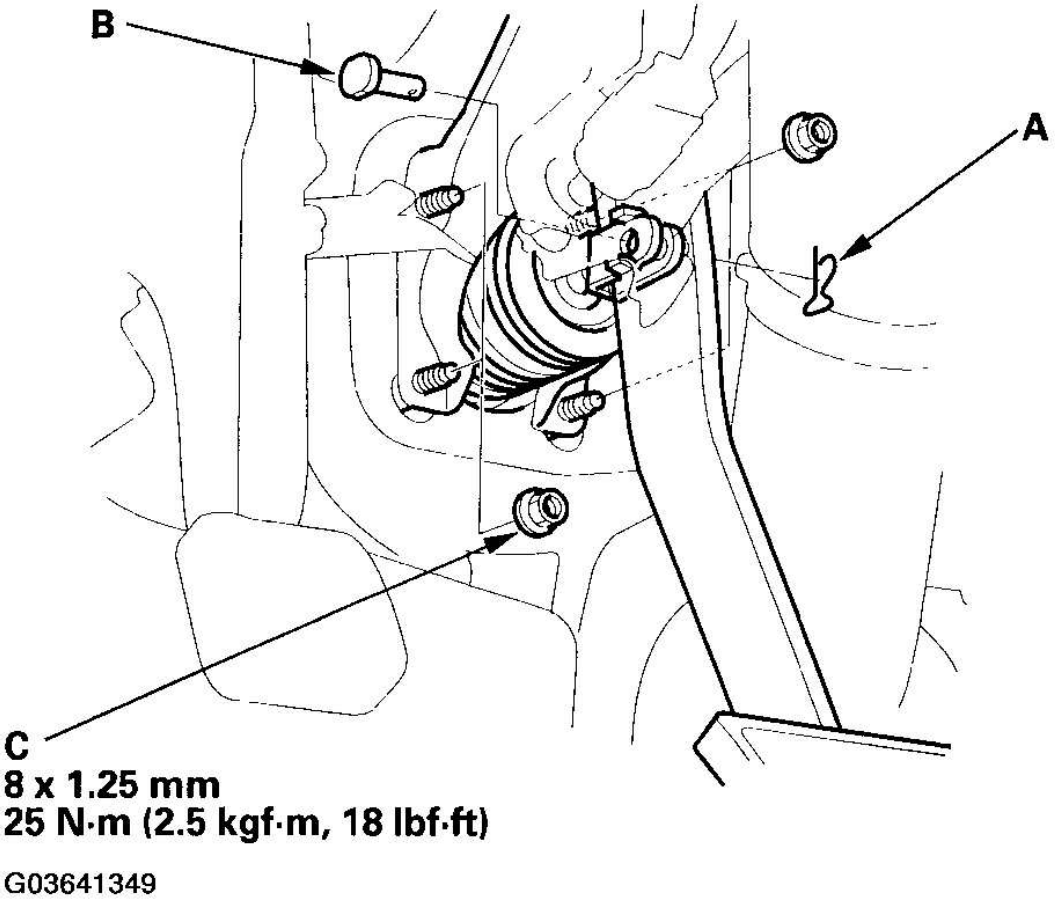

Fig. 31: Removing Lock Pin And Joint Pin
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the brake booster mounting nuts (C).
5. Pull the brake booster (A) forward, and remove it from the engine compartment.

NOTE:

- **Be careful not to damage the booster surfaces and threads of the booster stud bolts.**
- **Be careful not to bend or damage the brake lines.**

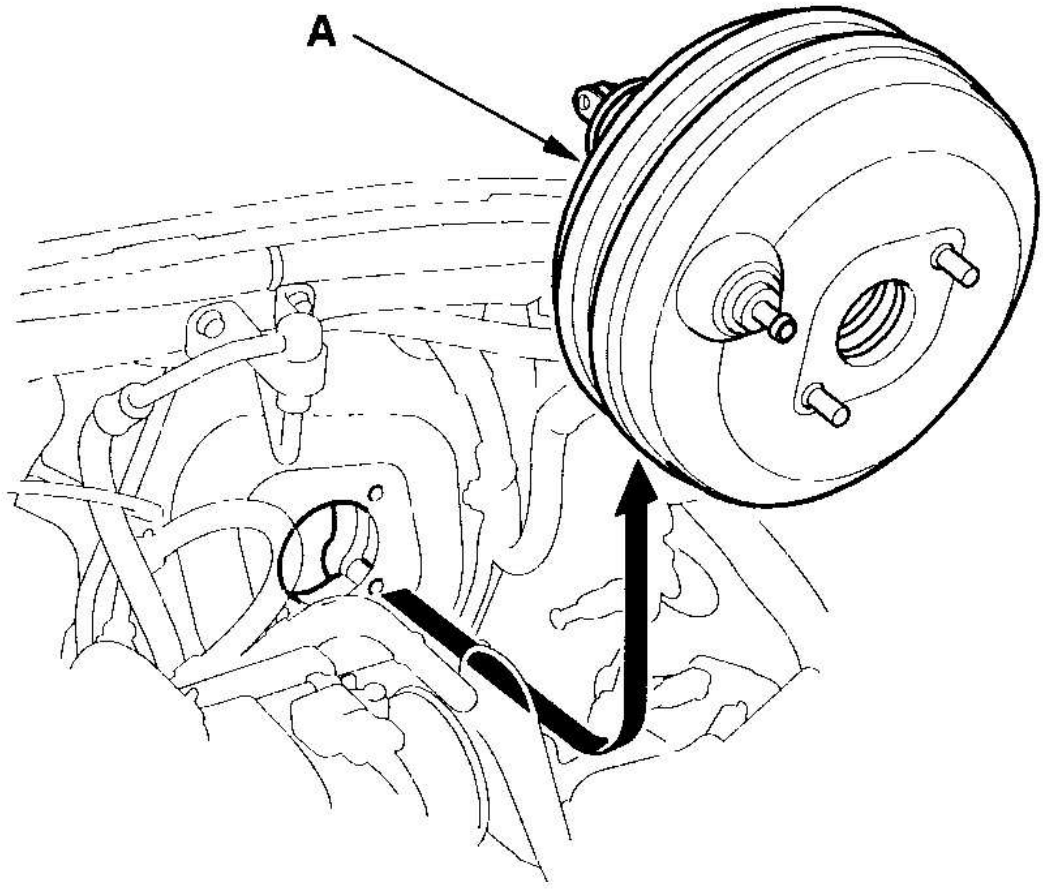

Fig. 32: Removing Brake Booster From Engine Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the brake booster in the reverse order of removal, and note these items:
   - Use a new lock pin whenever installing.
   - After installing the brake booster and master cylinder, fill the reservoir with new brake fluid, bleed the brake system (see **BRAKE SYSTEM BLEEDING**), and check the brake pedal height and free play (see **BRAKE PEDAL AND BRAKE PEDAL POSITION SWITCH ADJUSTMENT**).

REAR BRAKE PAD INSPECTION AND REPLACEMENT

CAUTION: Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- **Avoid breathing dust particles.**
- **Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.**

INSPECTION

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
2. Remove the rear wheels.
3. Check the thickness of the inner pad (A) and outer pad (B). Do not include the thickness of the backing plate.

   Brake pad thickness:

   Standard: 9.5-10.1 mm (0.37-0.40 in.)

   Service limit: 1.6 mm (0.06 in.)

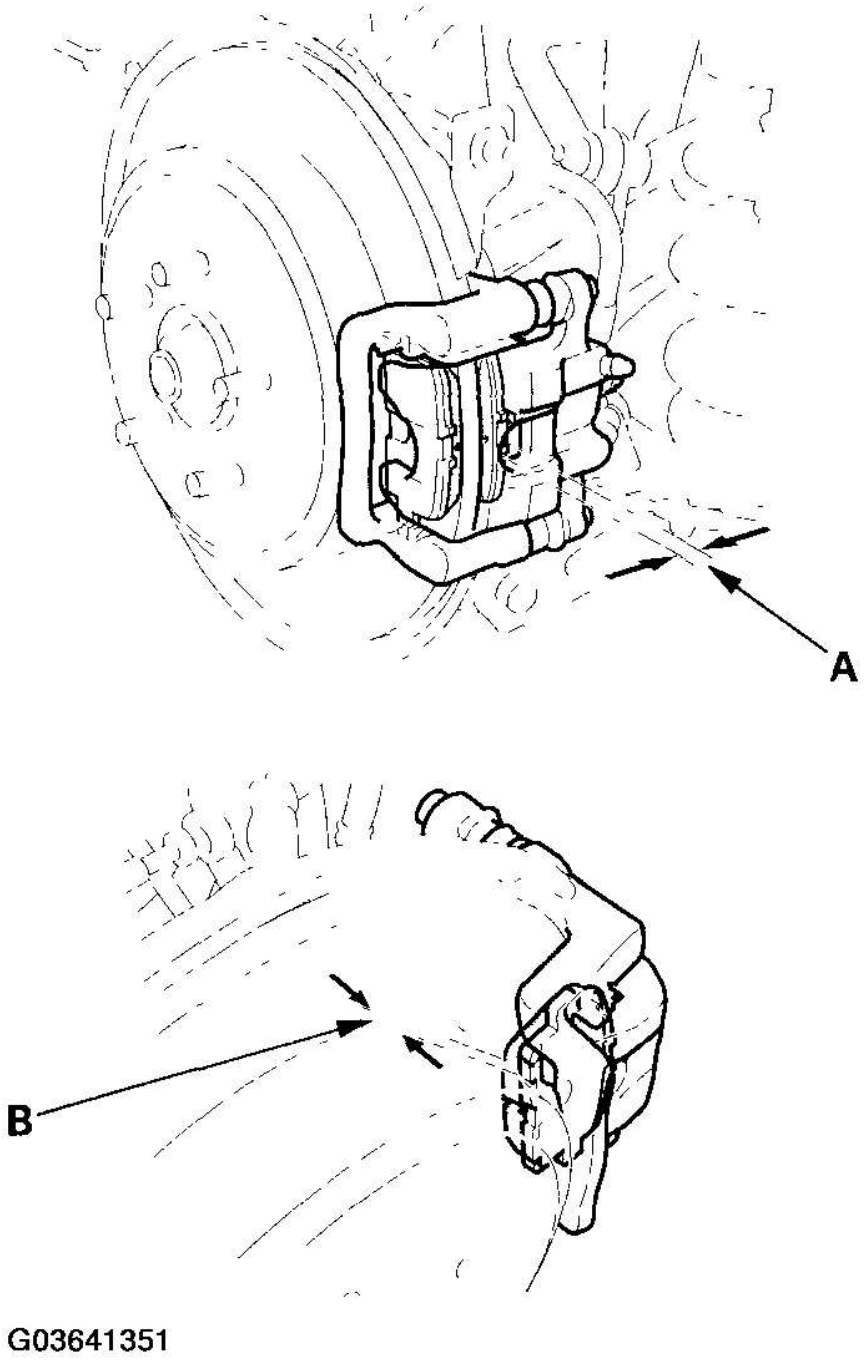

Fig. 33: Checking Thickness Of Inner Pad And Outer Pad
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. If the brake pad thickness is less than the service limit, replace all the brake pads as a set.

REPLACEMENT

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
2. Remove the rear wheels.
3. Remove the flange bolt (A) while holding the caliper pin (B) with a wrench, being careful not to damage the pin boot, and pivot the caliper (C) up out of the way. Check the hose and pin boots for damage and deterioration.

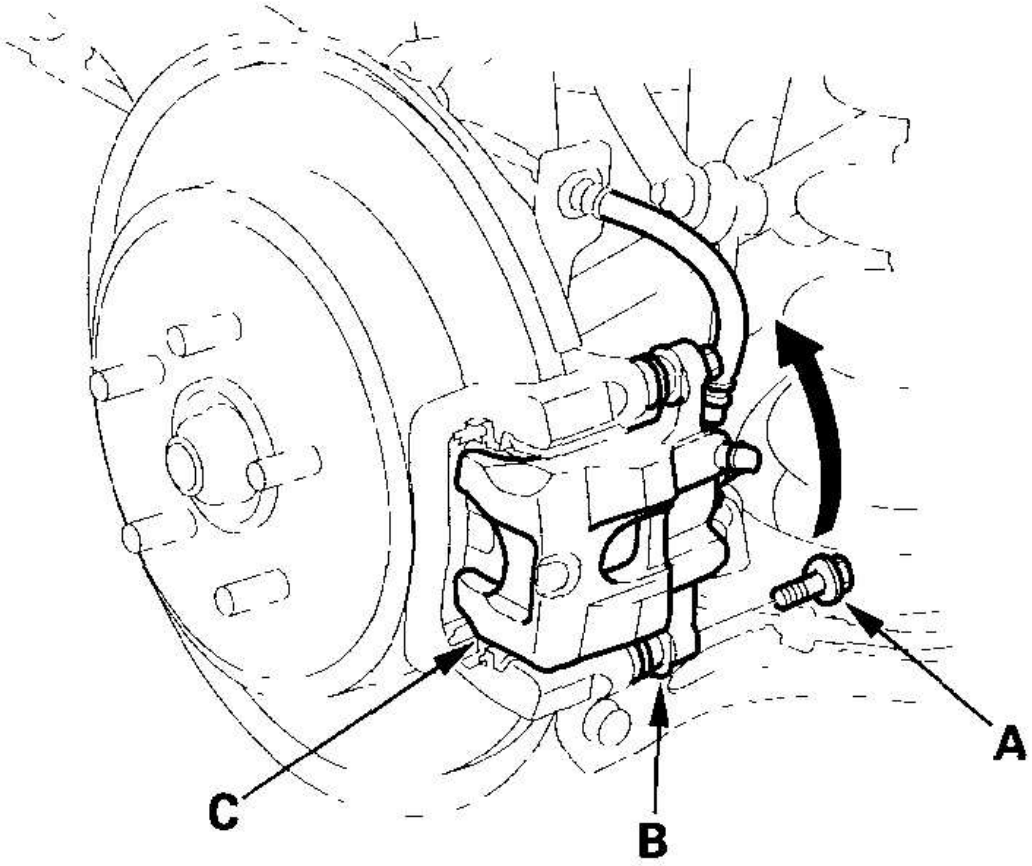

Fig. 34: Removing Flange Bolt While Holding Caliper Pin
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the inner pad shims (A), outer pad shim(s) (B), and brake pads (C).

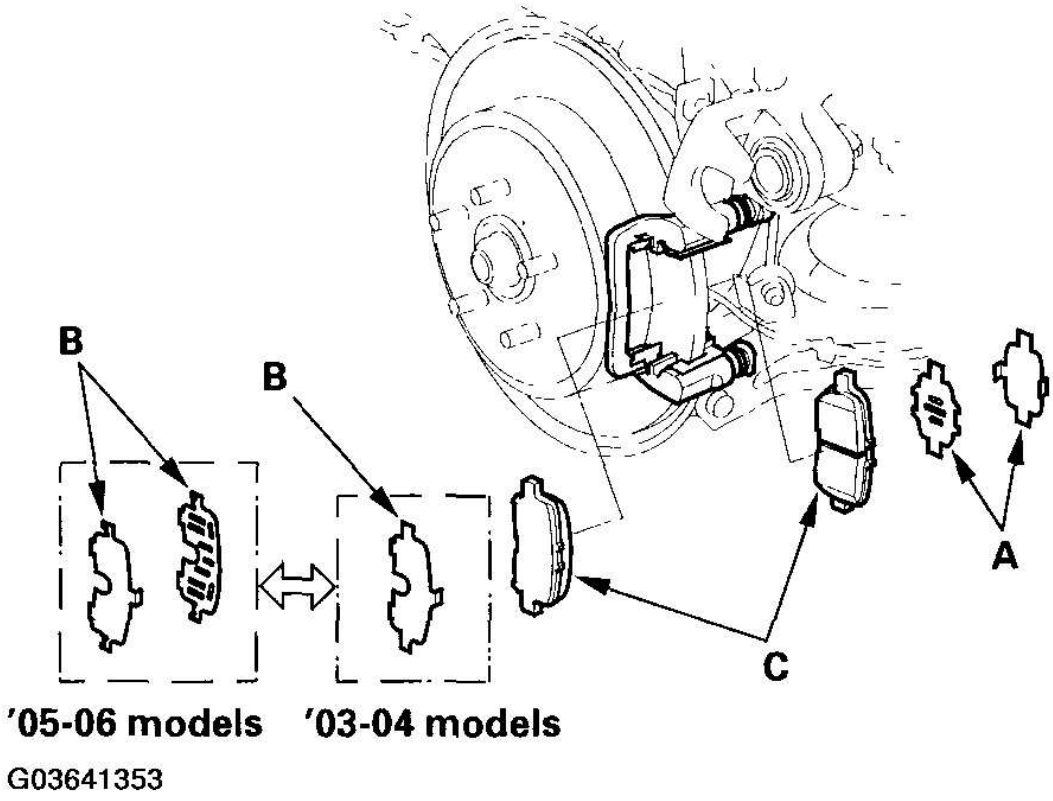

Fig. 35: Removing Inner Pad Shims, Outer Pad Shim And Brake Pads
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the pad retainers (A).

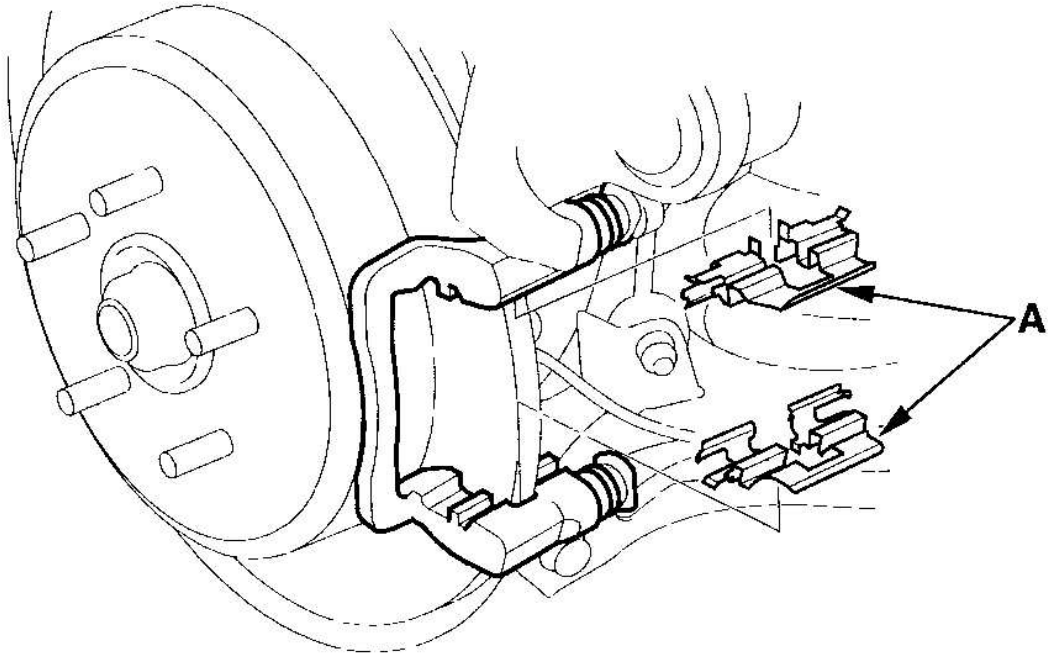

Fig. 36: Removing Pad Retainers
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
7. Check the brake disc for damage and cracks.
8. Clean and install the pad retainers.
9. Apply a thin coat of M-77 assembly paste (P/N 08798-9010) to the pad shims (A), the back of the brake pads (B), and the other areas indicated by the arrows. Wipe excess assembly paste off the pad shims and brake pads. Contaminated brake discs or pads reduce stopping ability. Keep assembly paste off the brake discs and pad materials.

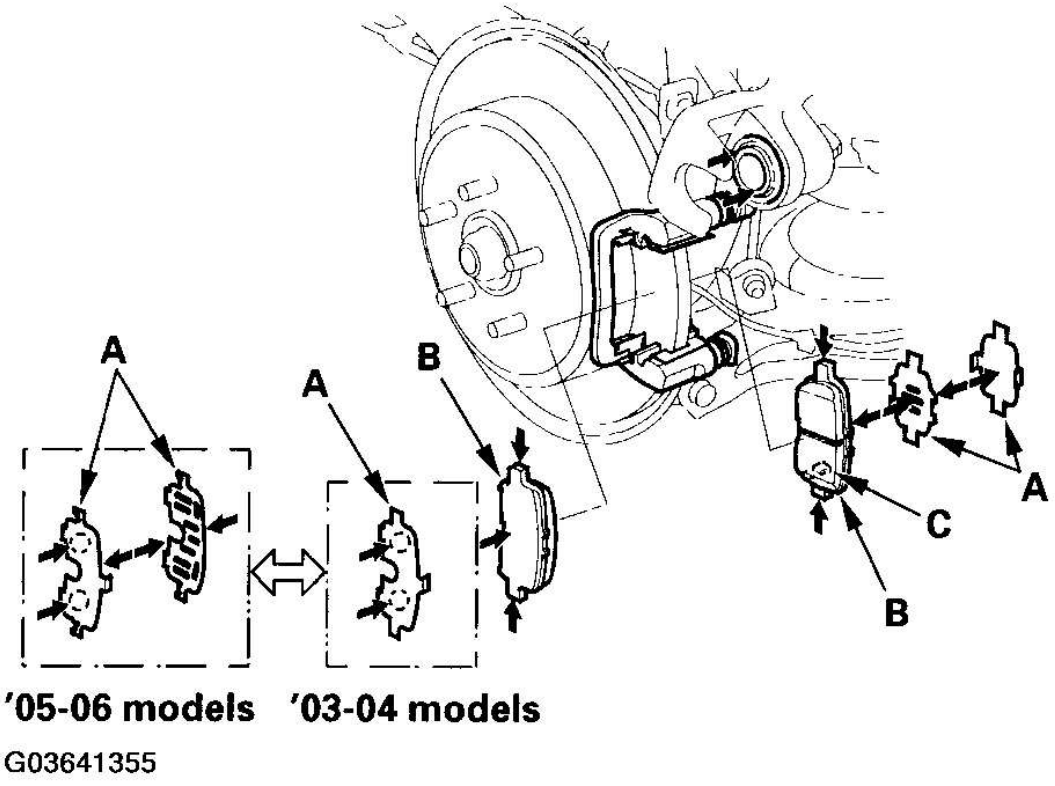

Fig. 37: Checking Brake Disc For Damage And Cracks
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the brake pads and pad shims correctly. Install the brake pad with the wear indicator (C) on the inside bottom.

    If you are reusing the brake pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.

11. Push in the piston (A) so the caliper will fit over the brake pads. Make sure the piston boot is in position to prevent damaging it when pivoting the caliper down.

    NOTE: Be careful when pushing in the caliper, brake fluid might overflow from the master cylinder's reservoir.

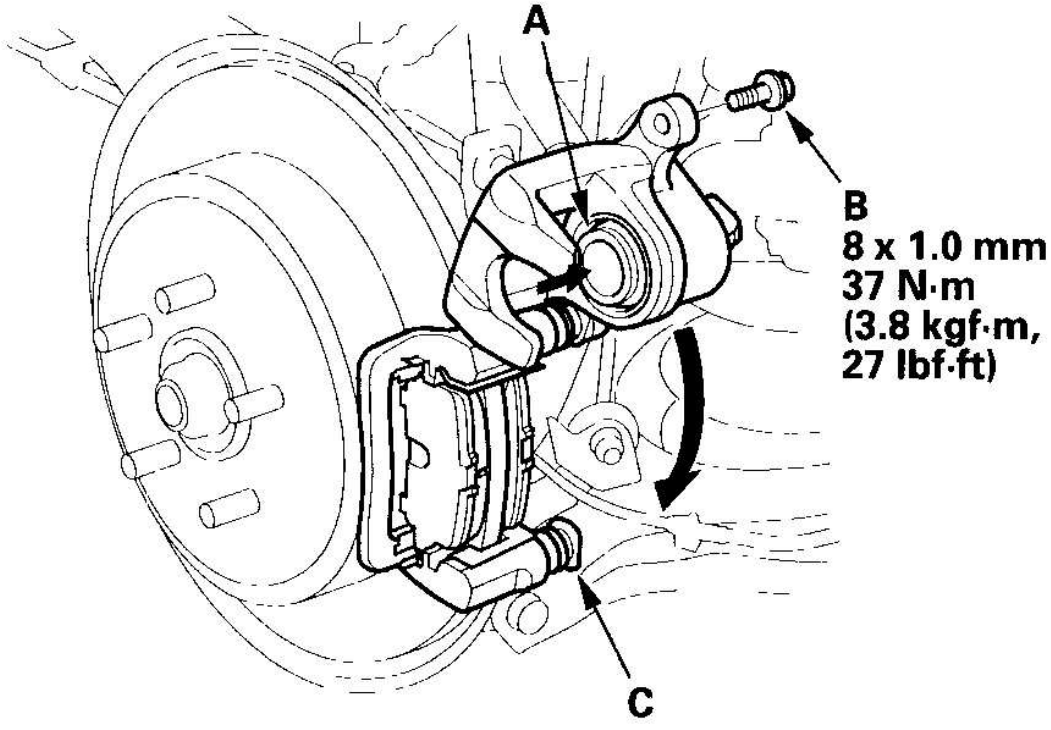

Fig. 38: Installing Brake Pads And Pad Shims Correctly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Pivot the caliper down into position. Install the flange bolt (B), and torque it to the specified torque while holding the caliper pin (C) with a wrench, being careful not to damage the pin boot.
13. Press the brake pedal several times to make sure the brakes work.

NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

14. After installation, check for leaks at hose and line joints or connections, and retighten if necessary. Test-drive the vehicle, then check for leaks.

REAR BRAKE DISC INSPECTION

RUNOUT

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND**

SUPPORT POINTS).

2. Remove the rear wheels.
3. Remove the brake pads (see **REAR BRAKE PAD INSPECTION AND REPLACEMENT**).
4. Inspect the brake disc surface for damage and cracks. Clean the brake disc thoroughly, and remove all rust.
5. Install suitable flat washers (A) and wheel nuts, and tighten the wheel nuts to the specified torque to hold the brake disc securely against the hub.

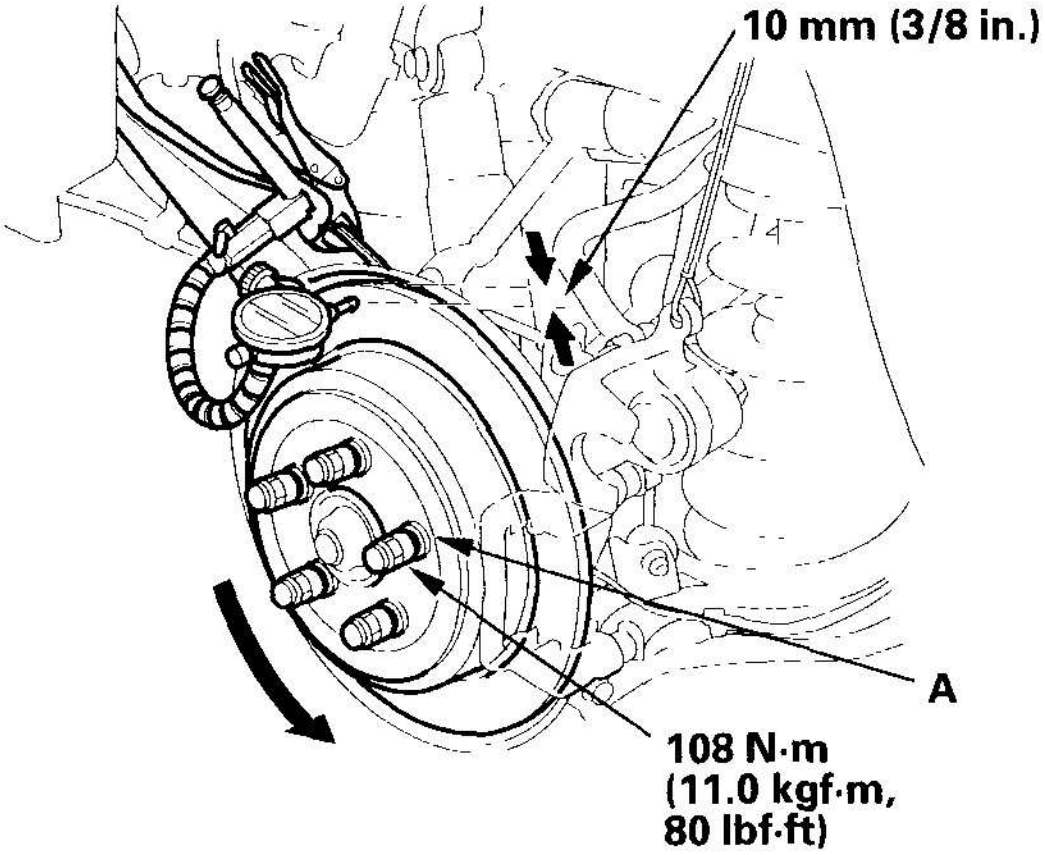

Fig. 39: Installing Suitable Flat Washers
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Set up the dial gauge against the brake disc as shown, and measure the runout at 10 mm (3/8 in.) from the outer edge of the brake disc.

Brake disc runout:

Service limit: 0.10 mm (0.004 in.)

7. If the brake disc is beyond the service limit, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-Way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

   Max. refinish limit: 9.0 mm (0.35 in.)

NOTE:

- **If the brake disc is beyond the service limit for refinishing, replace it (see step 4, KNUCKLE/HUB/WHEEL BEARING REPLACEMENT).**
- **A new brake disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).**

THICKNESS AND PARALLELISM

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
2. Remove the rear wheels.
3. Remove the brake pads (see **REAR BRAKE PAD INSPECTION AND REPLACEMENT**).
4. Using a micrometer, measure brake disc thickness at eight points, approximately 45 ° apart and 10 mm (3/8 in.) in from the outer edge of the brake disc.

   Brake disc thickness:

   Standard: 10.9-11.1 mm (0.43-0.44 in.)

   Max. refinishing limit: 9.0 mm (0.35 in.)

   Brake disc parallelism: 0.015 mm (0.0006 in.) max.

NOTE: **This is the maximum allowable difference between the thickness measurements.**

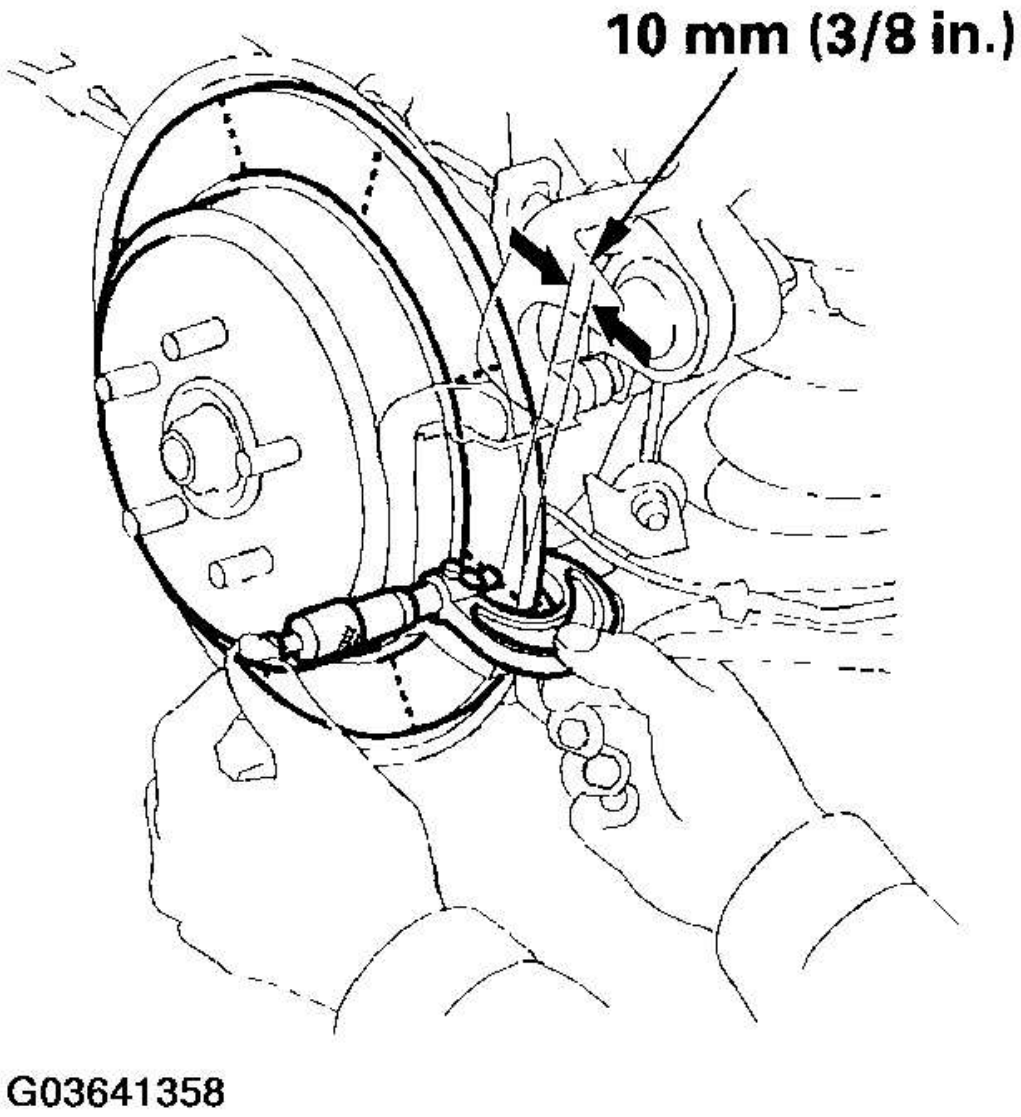

Fig. 40: Identifying Thickness And Parallelism
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. If the brake disc is beyond the service limit for parallelism, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-Way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

NOTE: If the brake disc is beyond the service limit for refinishing, replace it (see step 4, KNUCKLE/HUB/WHEEL BEARING REPLACEMENT).

REAR BRAKE CALIPER OVERHAUL

CAUTION: Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- **Avoid breathing dust particles.**
- **Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.**

Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping brake fluid, cover disconnected hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter does not contaminate the brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- When reusing brake pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid. Use only clean ACURA DOT 3 Brake Fluid from an unopened container. Using a non-Acura brake fluid can cause corrosion and shorten the life of the system.
- Do not mix different brands of brake fluid as they may not be compatible.
- Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.

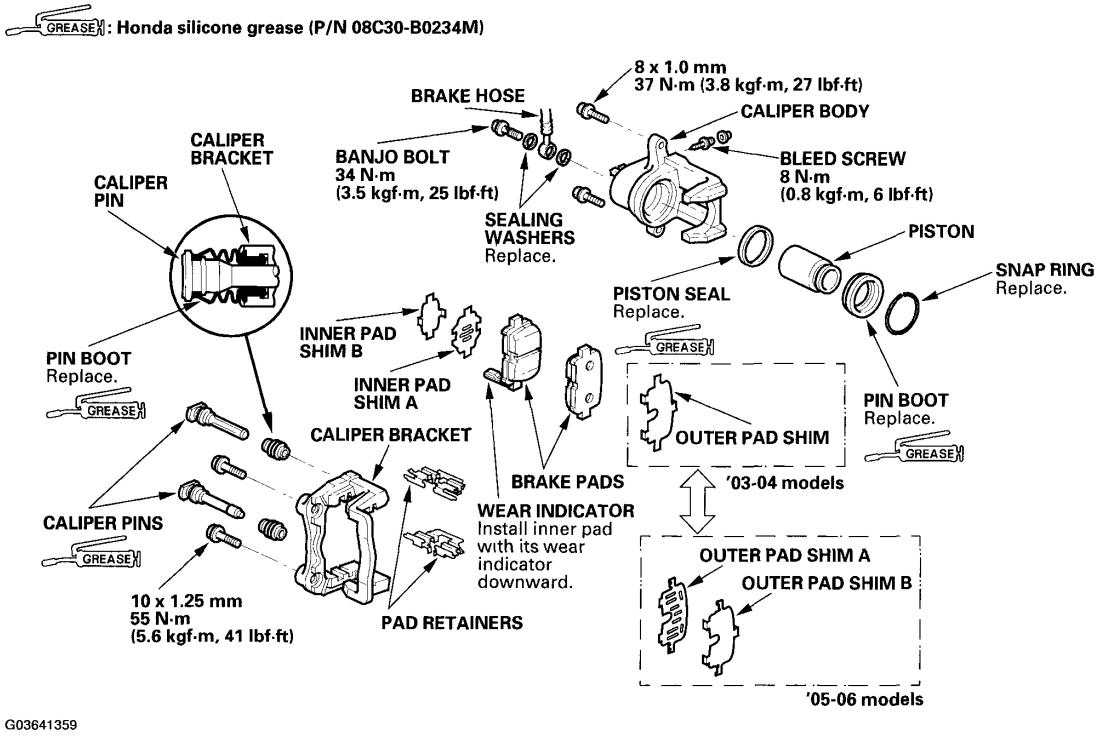

Fig. 41: Identifying Caliper Components (Exploded View)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

PARKING BRAKE INSPECTION

CAUTION: Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- **Avoid breathing dust particles.**
- **Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.**

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**). Remove the rear wheels.
2. Release the parking brake, and remove the rear brake caliper and brake disc/drum (see step 3, **KNUCKLE/HUB/WHEEL BEARING REPLACEMENT**).

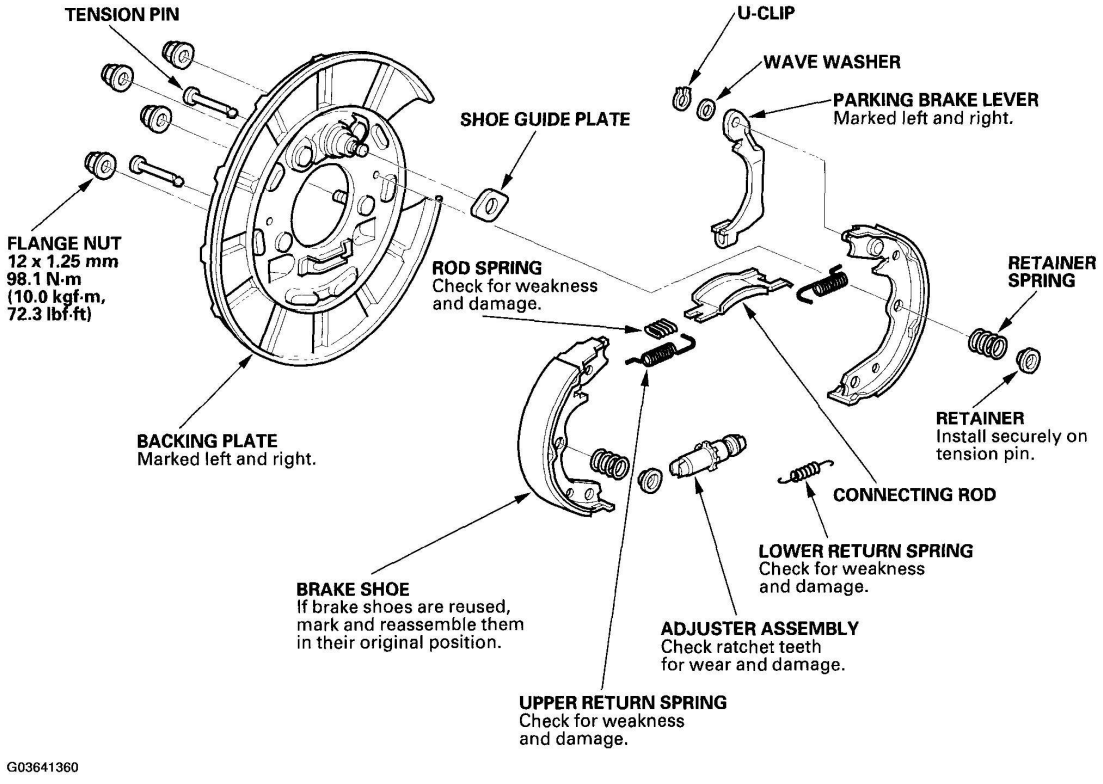

Fig. 42: Identifying Parking Brake Components (Exploded View)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Check the parking brake linings (A) for cracking, glazing, wear, and contamination.

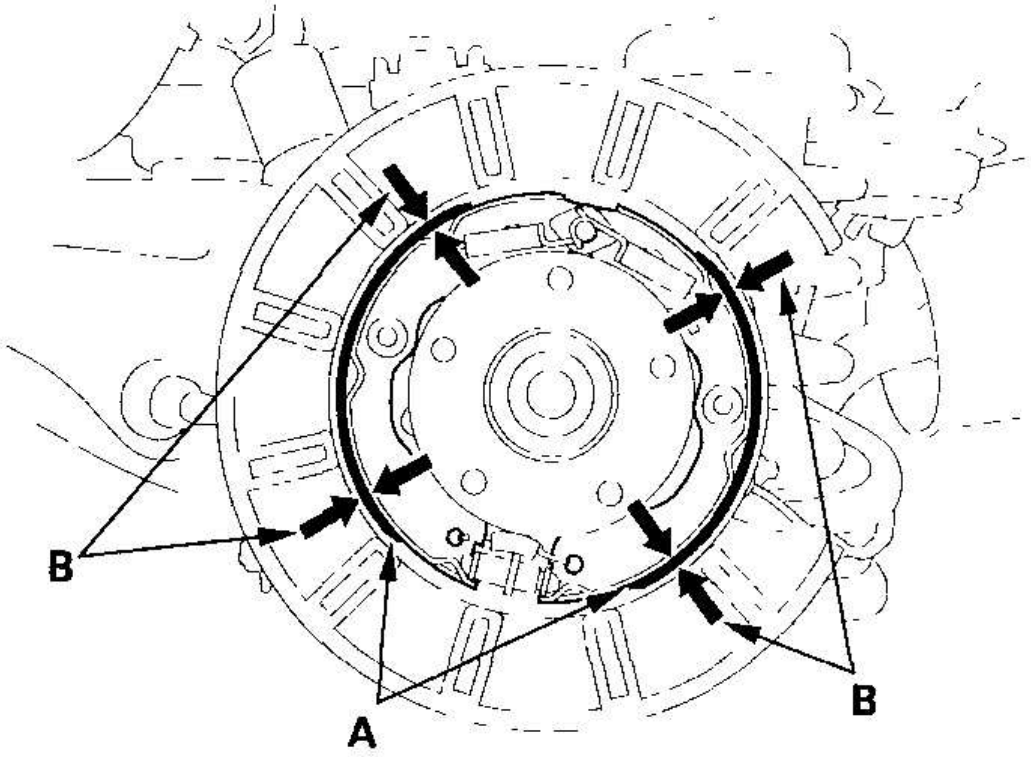

Fig. 43: Checking Parking Brake Linings
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Measure the parking brake lining thickness (B). Measurement does not include brake shoe thickness.

   Parking brake lining thickness:

   Standard: 4.0 mm (0.16 in.)

   Service limit: 1.0 mm (0.04 in.)

5. If the parking brake lining thickness is less than the service limit, replace all the parking brake shoes as a set.
6. Check the bearings in the hub unit for smooth operation.
7. Measure the inside diameter of the parking brake disc/drum with inside vernier calipers.

   Parking brake drum inside diameter:

Standard: 209.9-210.0 mm (8.264-8.267 in.)

Service limit: 211.0 mm (8.307 in.)

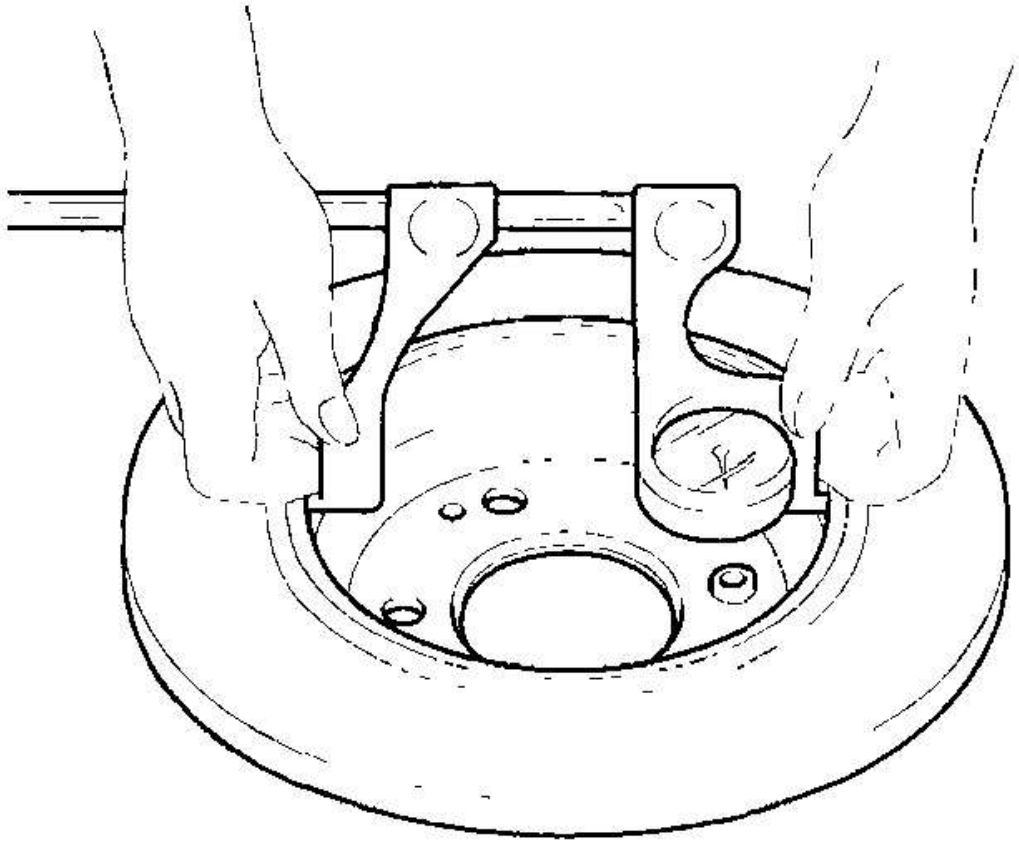

Fig. 44: Measuring Inside Diameter Of Parking Brake
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. If the inside diameter of the parking brake disc/drum is more than the service limit, replace the rear brake disc/drum.
9. Check the parking brake drum for scoring, grooves, and cracks.

PARKING BRAKE SHOE REPLACEMENT

CAUTION: Frequent inhalation of brake pad dust, regardless of material composition,

could be hazardous to your health.

- **Avoid breathing dust particles.**
- **Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.**

DISASSEMBLY

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
2. Remove the rear wheels.
3. Release the parking brake, and remove the rear brake caliper and brake disc/drum (see step 3, **KNUCKLE/HUB/WHEEL BEARING REPLACEMENT**).
4. Disconnect and remove the upper return springs (A).

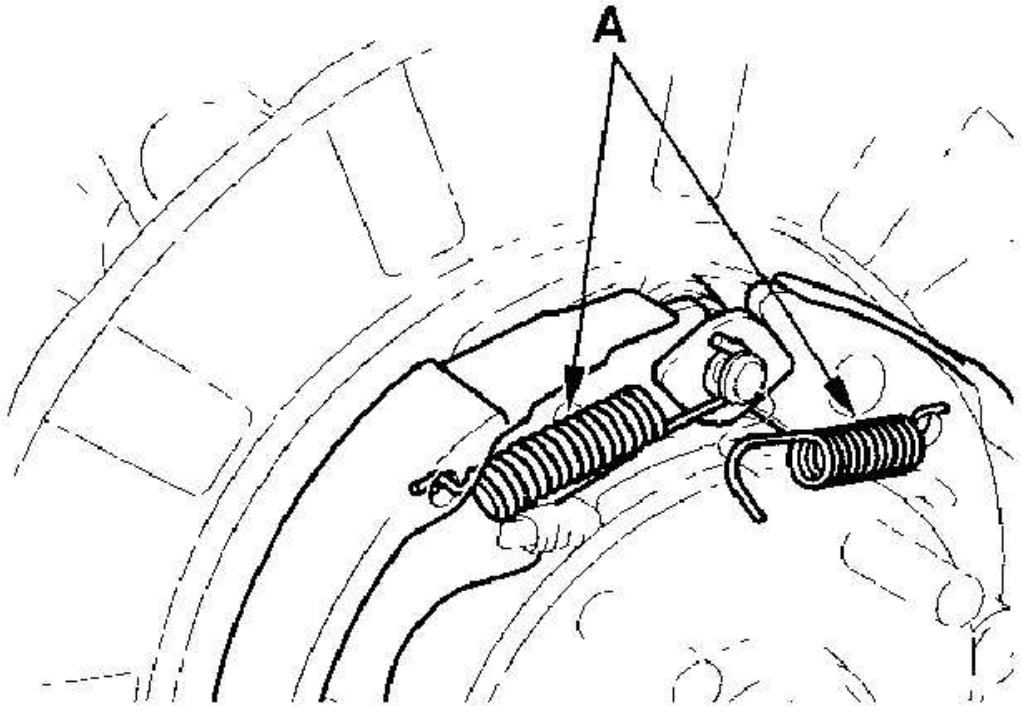

Fig. 45: Removing Upper Return Springs
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the tension pins (A) by pushing and turning the retainers (B).

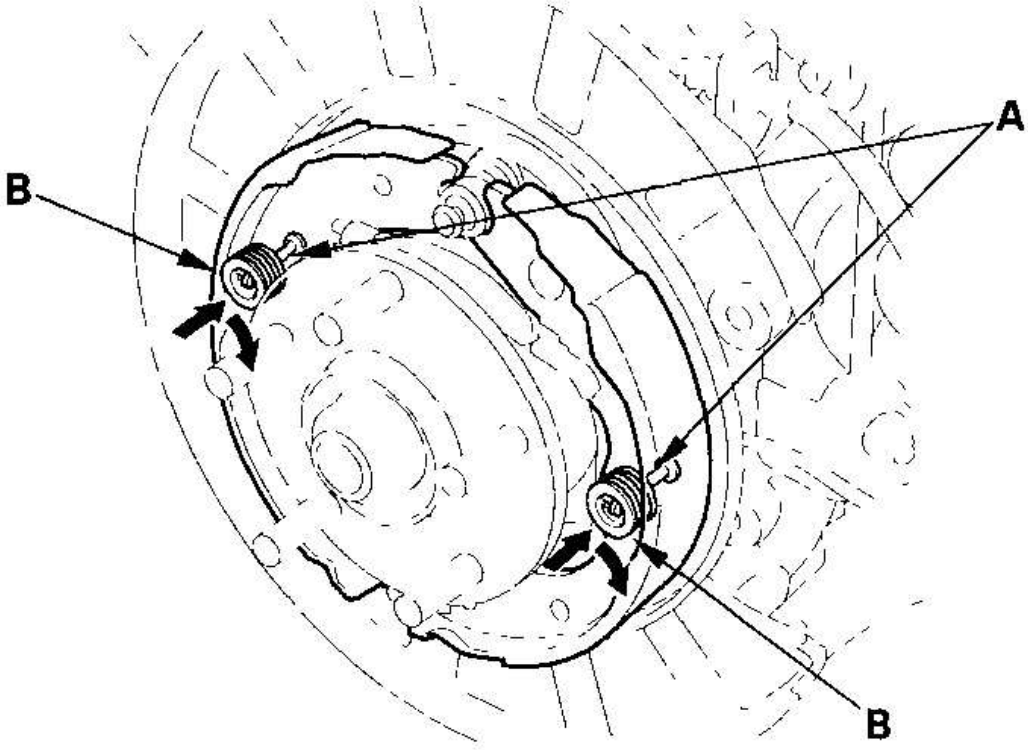

Fig. 46: Removing Tension Pins By Pushing And Turning Retainers
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove the connecting rod (A).

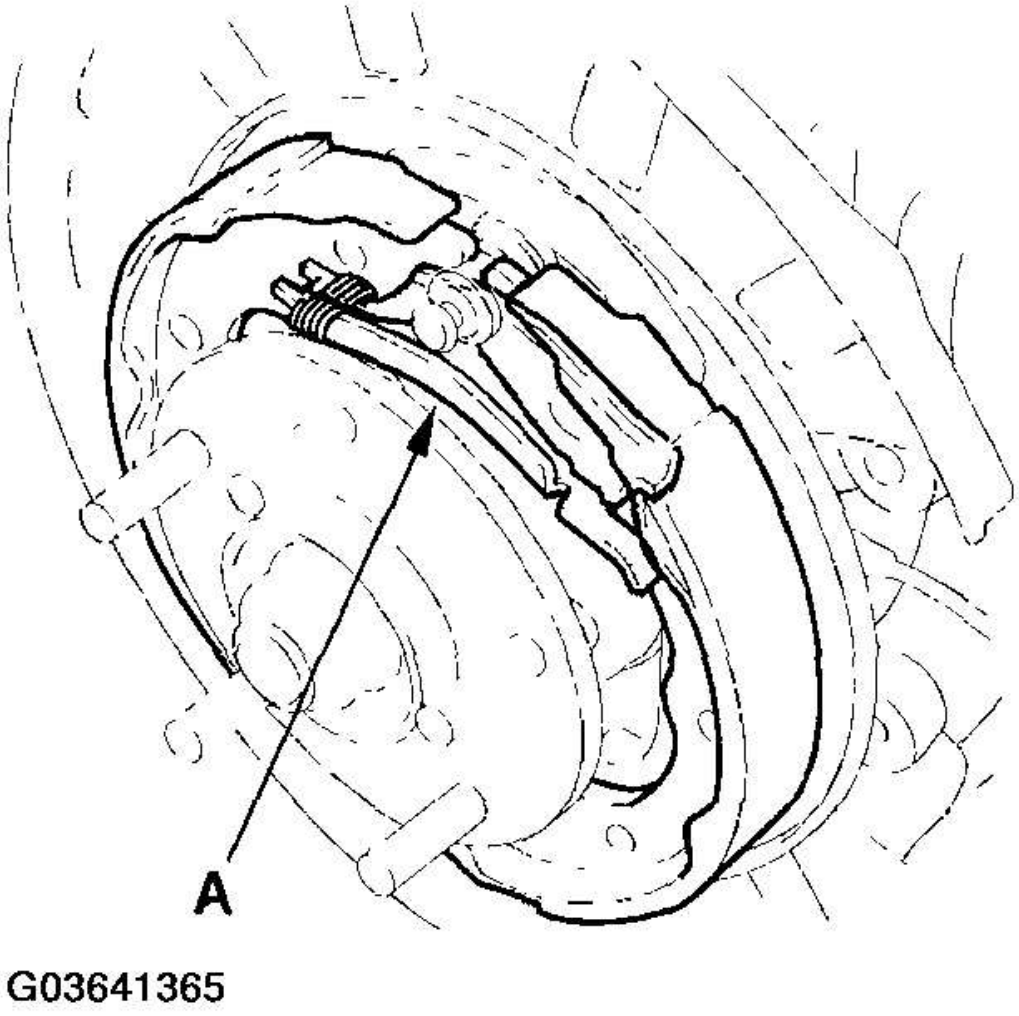

Fig. 47: Removing Connecting Rod
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Lower the parking brake shoe assembly.
8. Remove the forward brake shoe by removing the lower return spring (A) and adjuster assembly (B).

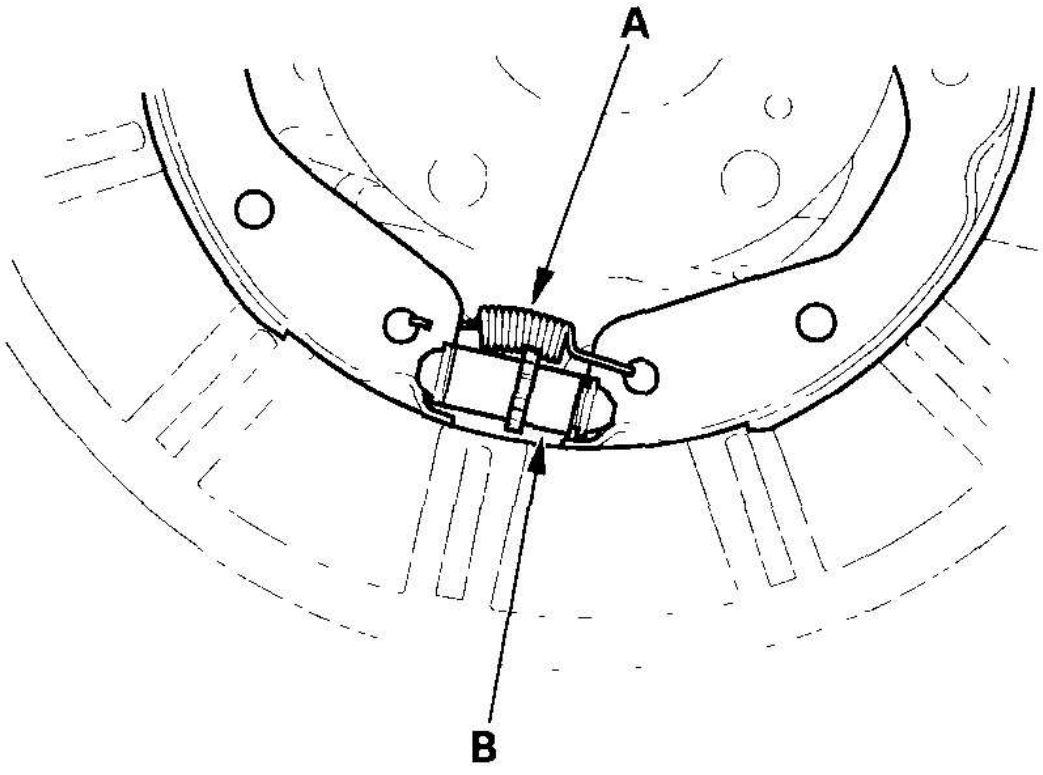

Fig. 48: Removing Forward Brake Shoe
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Remove the rearward brake shoe by disconnecting the parking brake cable (A) from the parking brake lever (B).

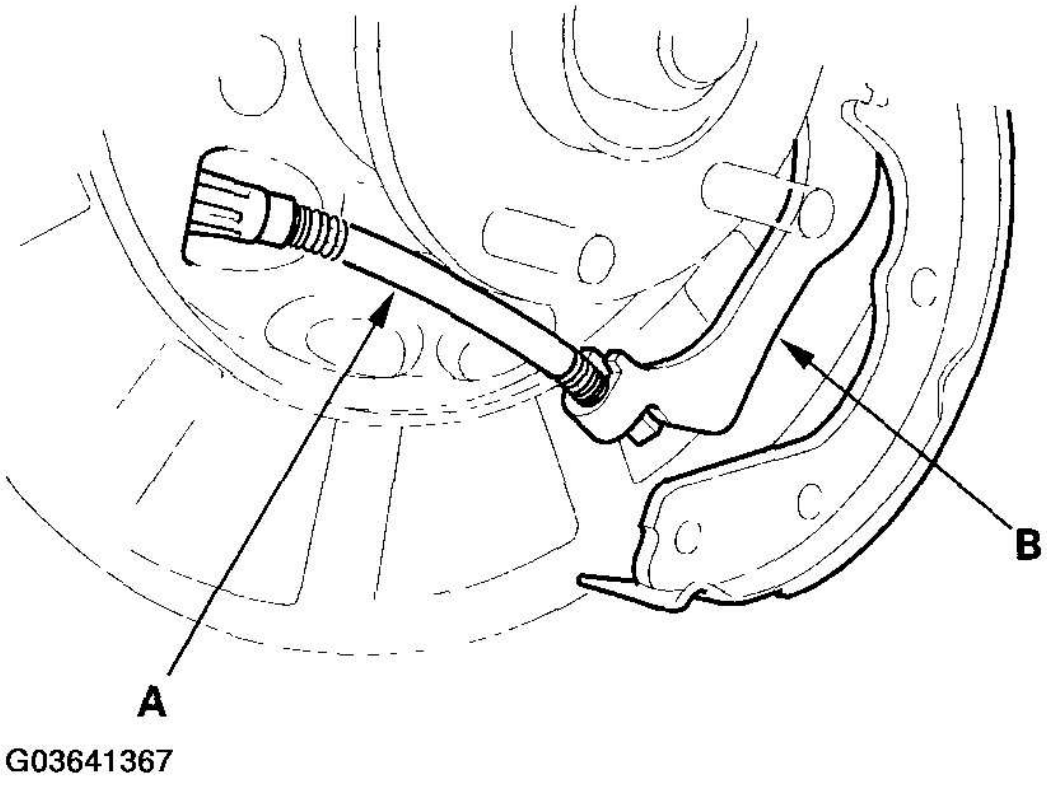

Fig. 49: Removing Rearward Brake Shoe
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Remove the U-clip (A), wave washer (B), and parking brake lever (C) from the brake shoe.

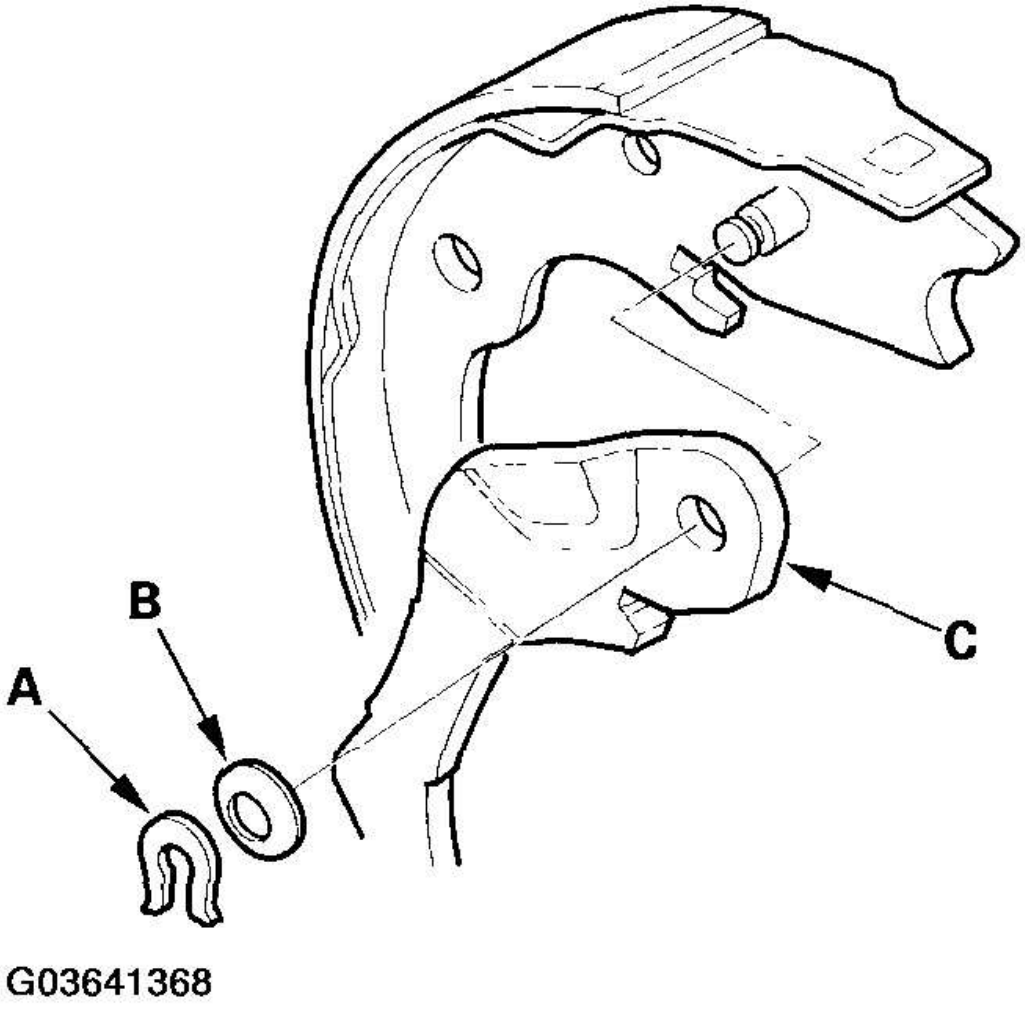

Fig. 50: Removing U-Clip
Courtesy of AMERICAN HONDA MOTOR CO., INC.

REASSEMBLY

1. Apply Molykote 44 MA grease to the sliding surface of the pivot pin (A) of the rearward brake shoe (B).

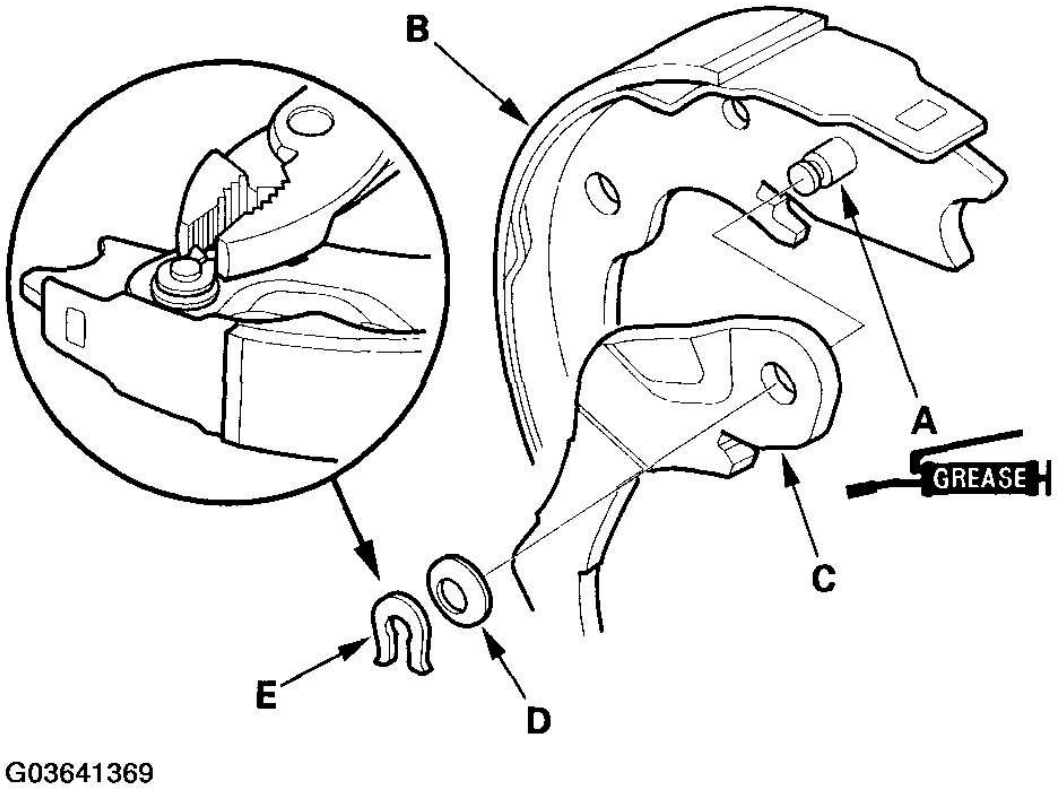

Fig. 51: Installing Parking Brake
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the parking brake lever (C) and wave washer (D) on the pivot pin, and secure with a new U-clip (E).
    - Install the wave washer with its convex side facing out.
    - Pinch the U-clip securely to prevent the parking brake lever from coming out of the brake shoe.
3. Connect the parking brake cable (A) to the parking brake lever (B).

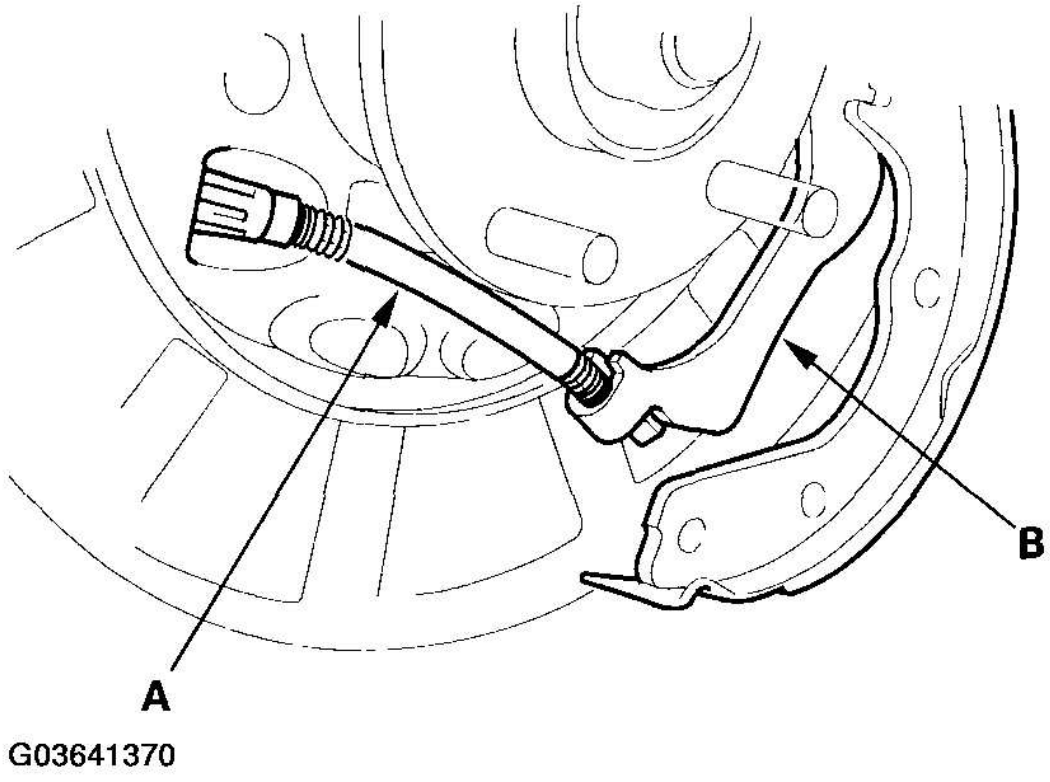

Fig. 52: Installing Parking Brake Cable
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Apply Molykote 44 MA grease to the shoe ends and connecting rod ends (A), sliding surfaces (B), and opposite edges of the parking brake shoe (C) as shown. Wipe off any excess. Keep grease off the brake linings.

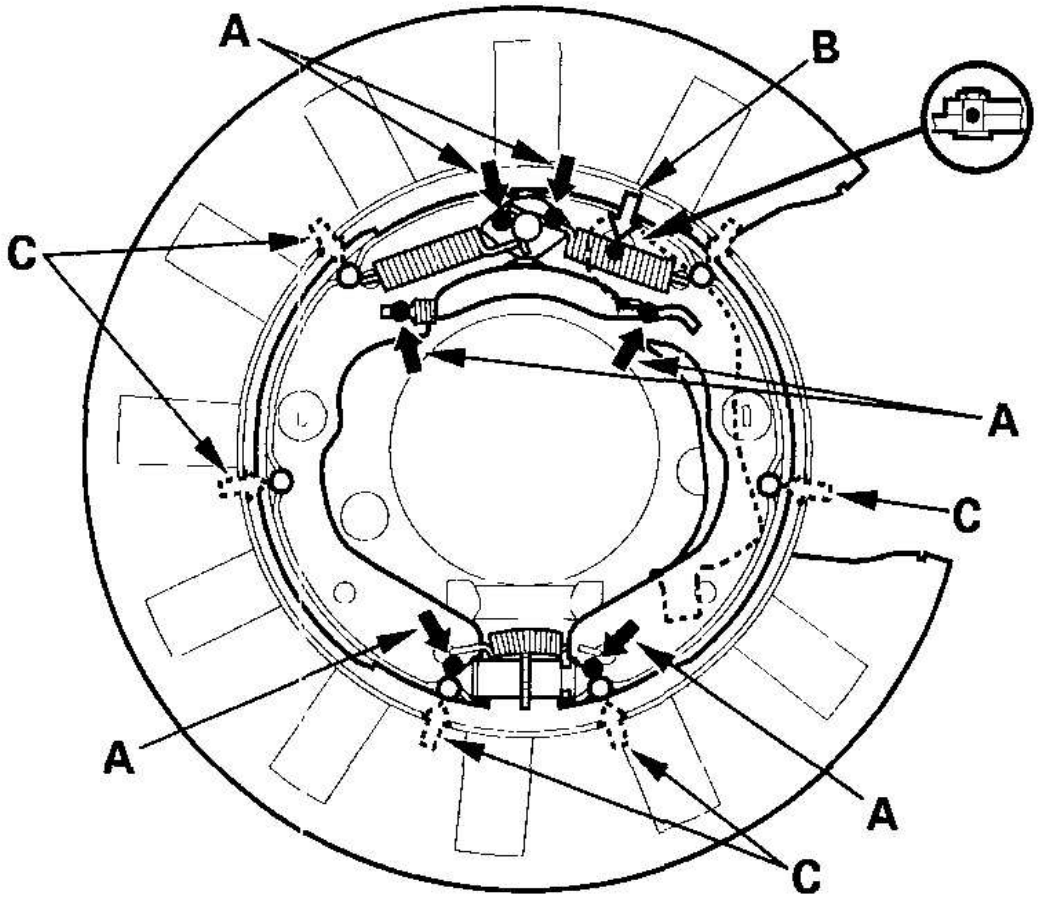

Fig. 53: Identifying Brake Linings For Greasing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the tension pin (A), retainer spring (B), and retainer (C) of the rearward brake shoe (D). Make sure the tension pin does not contact the parking brake lever.

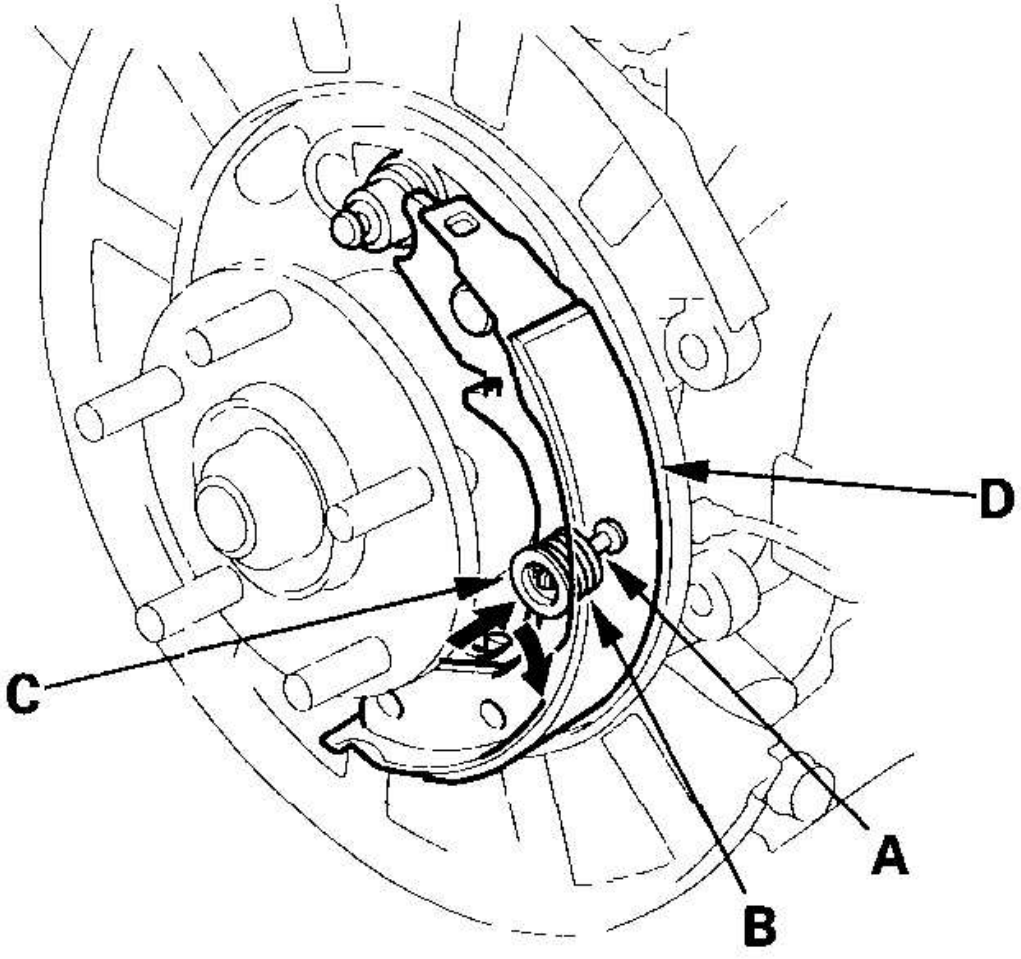

Fig. 54: Installing Tension Pin
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Clean the threaded portions of clevis A, and coat the threads of clevis A with multipurpose grease. Clean the sliding surface of clevis B, and coat the sliding surface of clevis B with multipurpose grease. Install clevis A and B on the adjuster (C), and shorten clevis A by turning the adjuster.

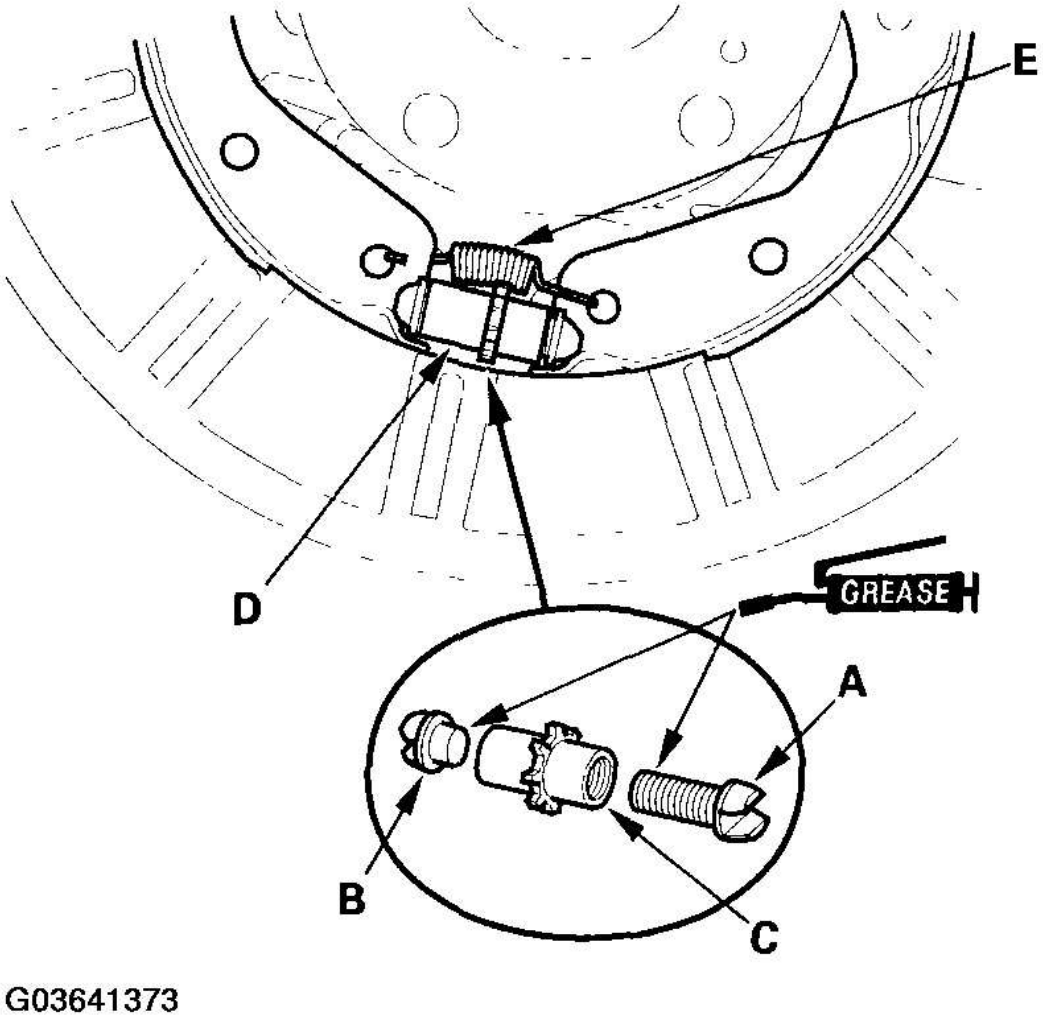

Fig. 55: Identifying Clevis Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Reinstall the brake shoe adjuster assembly (D), and hook the lower return spring (E) on the parking brake shoes.
8. Install the rod spring (A) to the connecting rod (B) first. Then install the connecting rod on the parking brake shoes.

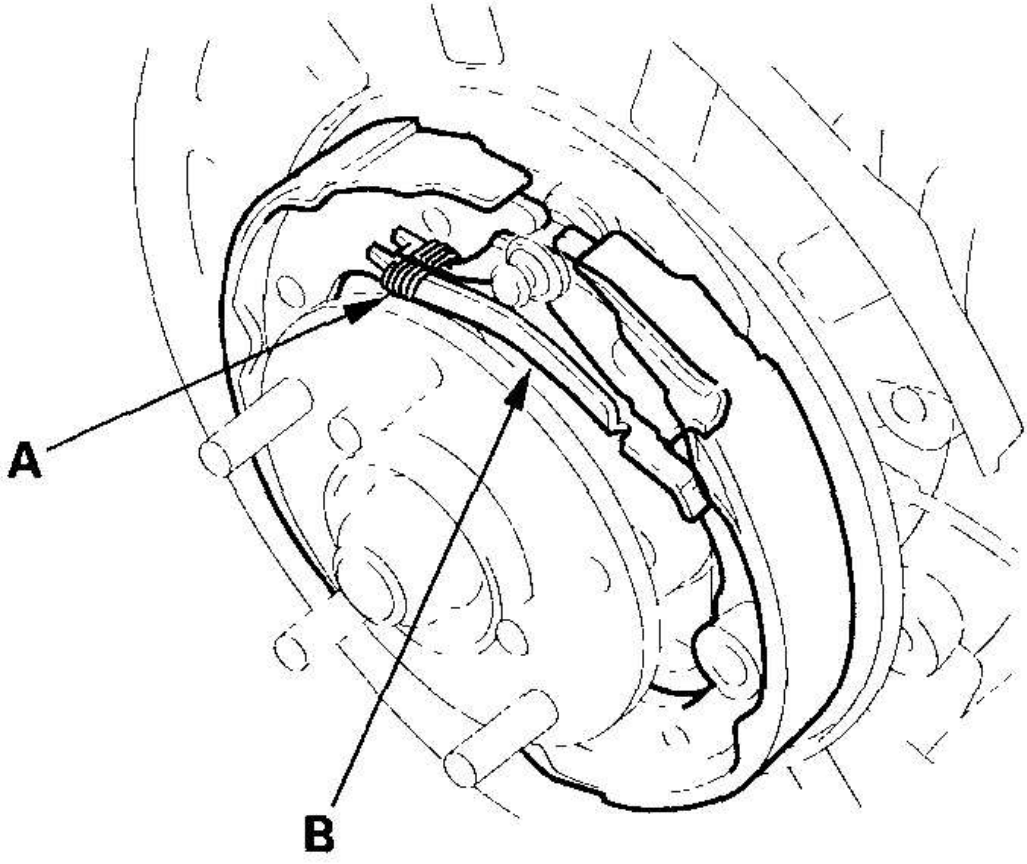

Fig. 56: Installing Rod Spring
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Install the tension pin (A), retainer spring (B), and retainer (C) of the forward brake shoe (D).

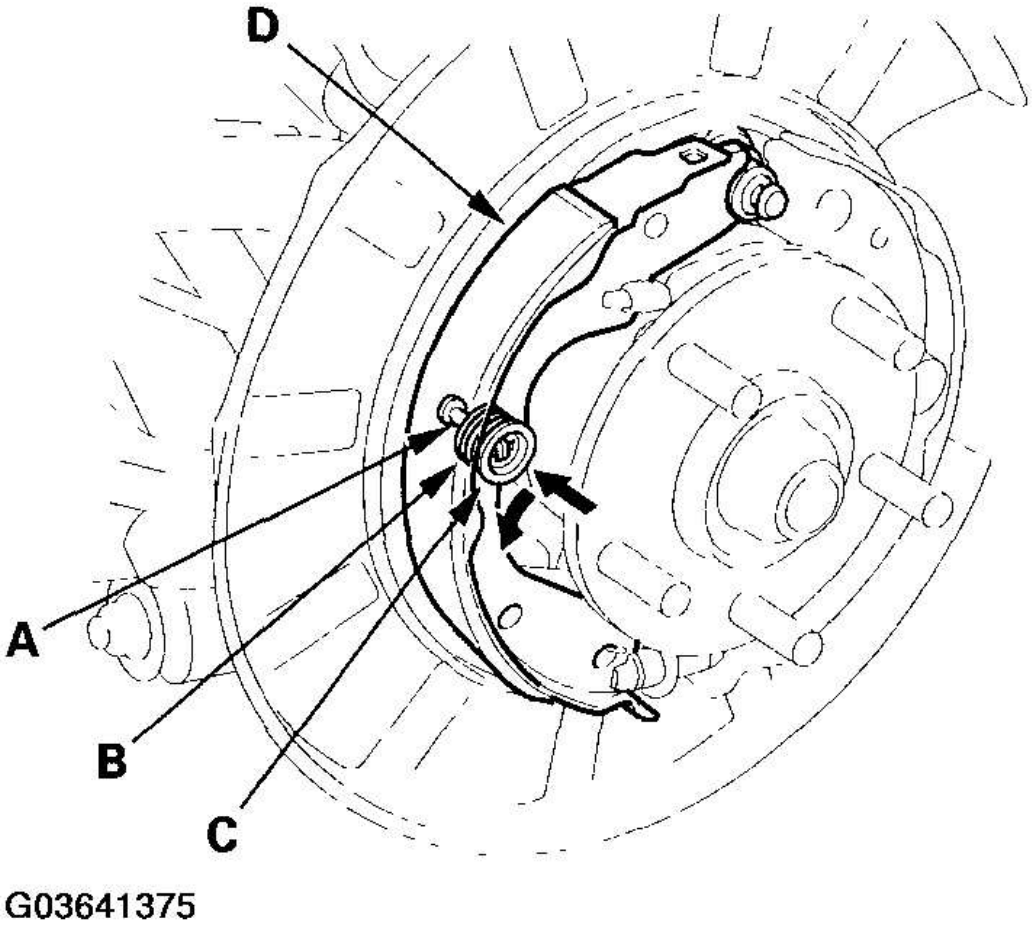

Fig. 57: Installing Tension Pin
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the upper return springs (A).

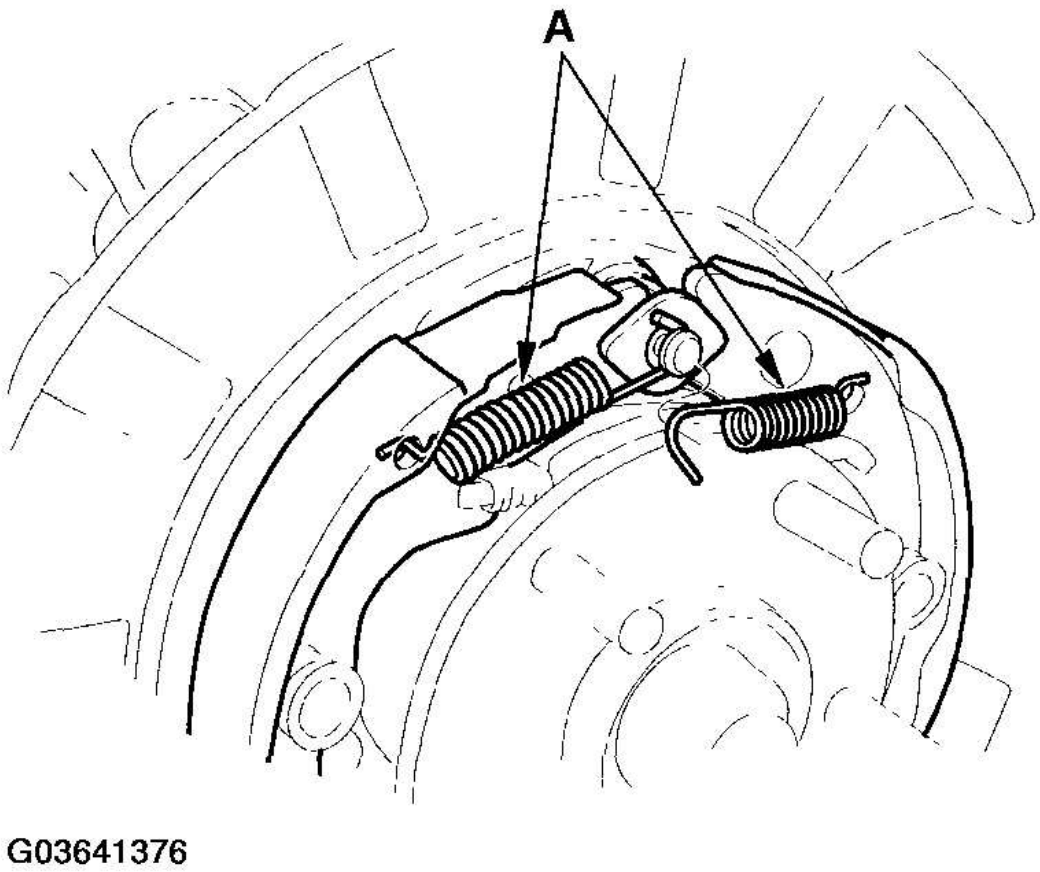

Fig. 58: Installing Upper Return Springs
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Install the brake disc/drum and rear brake caliper.
12. Adjust the parking brake (see **PARKING BRAKE CHECK AND ADJUSTMENT**).

PARKING BRAKE SHOE LINING BREAK-IN

NOTE: Do brake linings surface break-in when replacing shoes with new brake linings and/or new brake drum/disc.

WARNING: Do this operation in a safe area.

1. Park the vehicle on a firm, level surface.

2. Do the major parking brake adjustment (see **PARKING BRAKE CHECK AND ADJUSTMENT**).
3. Press the parking brake pedal five clicks.

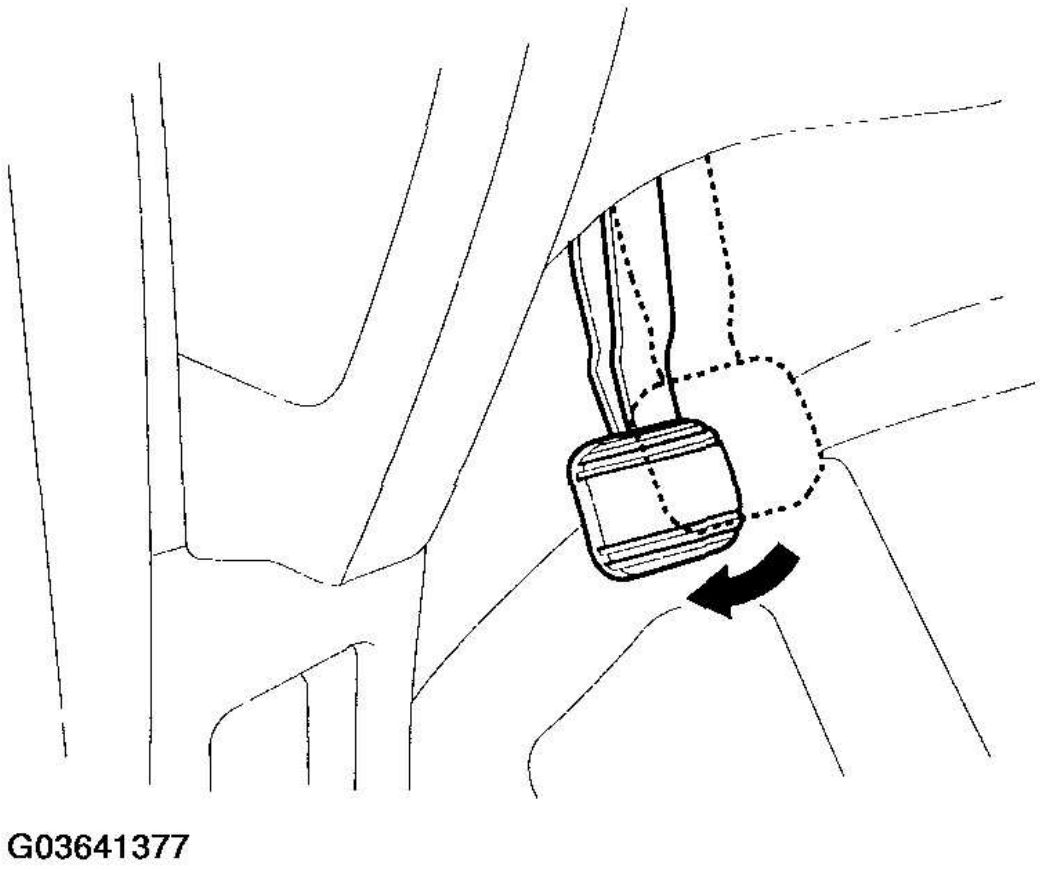

Fig. 59: Pressing Parking Brake Pedal
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Drive the vehicle for 1/4 mile (400 m) at 31 mph (50 km/h).
5. Stop the vehicle, and release the parking brake for 5-10 minutes to allow the brake disc/drum to cool.
6. Repeat steps 3 through 5 .
7. Check the parking brake pedal adjustment (see **PARKING BRAKE CHECK AND ADJUSTMENT**).

BRAKE PEDAL REPLACEMENT

1. Remove the lock pin (A) and pin (B).

NOTE: Use a new lock pin whenever in stalling.

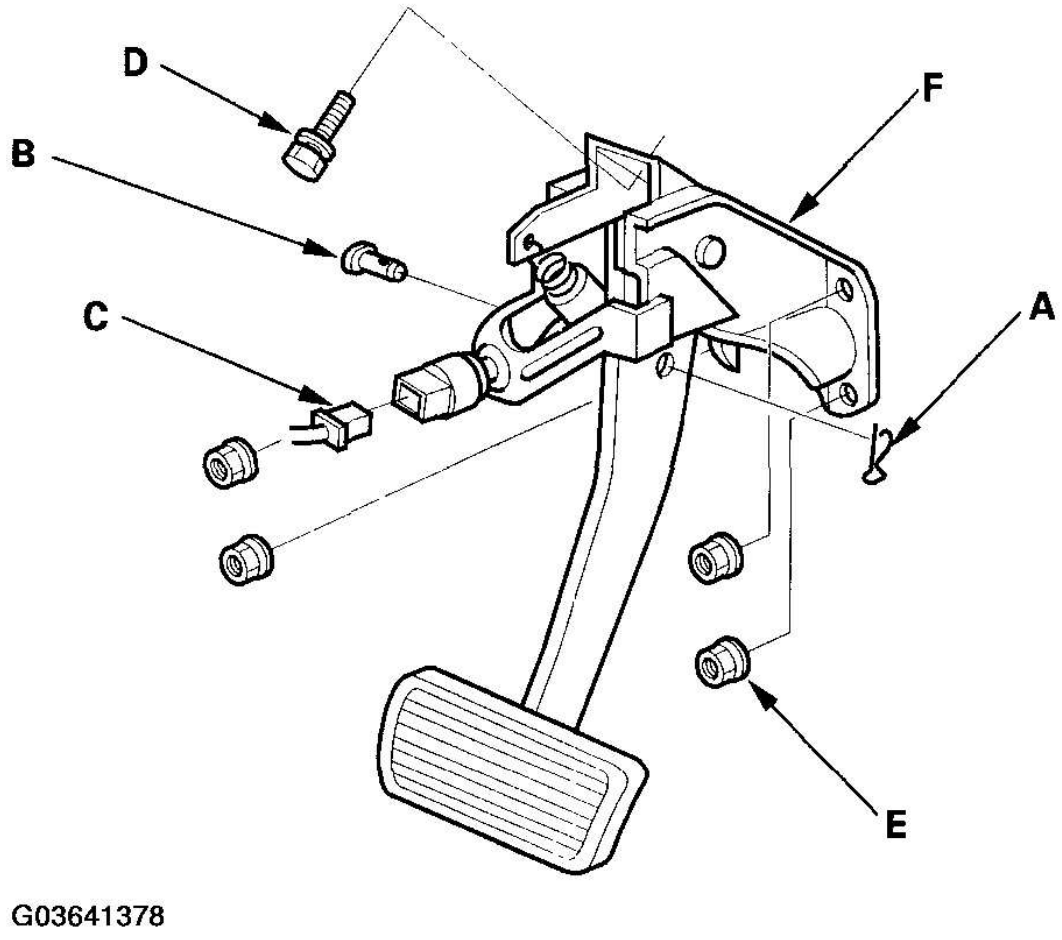

Fig. 60: Removing Lock Pin And Pin
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Disconnect the brake pedal position switch connector (C).
3. Remove the brake pedal bracket mounting bolt (D) and nuts (E).
4. Remove the brake pedal with bracket (F).
5. Install in the reverse order of removal.
6. Do the brake pedal and brake pedal position switch adjustment (see **BRAKE PEDAL AND BRAKE PEDAL POSITION SWITCH ADJUSTMENT**).

BRAKE HOSE AND LINE INSPECTION

1. Inspect the brake hoses for damage, deterioration, leaks, interference, and twisting.

2. Check the brake lines for damage, rusting, and leaks. Also check for bent brake lines.
3. Check for leaks at hose and line joints and connections, and retighten if necessary.
4. Check the master cylinder and VSA modulator-control unit for damage and leaks.

NOTE: Replace the brake hose clip whenever the brake hose is serviced.

Connection Point	Component	Connected to	Specified Torque Value	Note
A	Front brake caliper	Brake hose	34 N·m (3.5 kgf·m, 25 lbf·ft)	Banjo bolt
		Bleeder screw	8 N·m (0.8 kgf·m, 6 lbf·ft)	
B	Rear brake caliper	Brake hose	34 N·m (3.5 kgf·m, 25 lbf·ft)	Banjo bolt
		Bleeder screw	8 N·m (0.8 kgf·m, 6 lbf·ft)	
C	Brake hose	Brake line	15 N·m (1.5 kgf·m, 11 lbf·ft)	Flare nut
D	Master cylinder	Brake line	30 N·m (3.1 kgf·m, 22 lbf·ft)	Flare nut
E	VSA modulator-control unit	Brake line (14 mm nut)	30 N·m (3.1 kgf·m, 22 lbf·ft)	Flare nut
		Brake line (10 mm nut)	15 N·m (1.5 kgf·m, 11 lbf·ft)	Flare nut

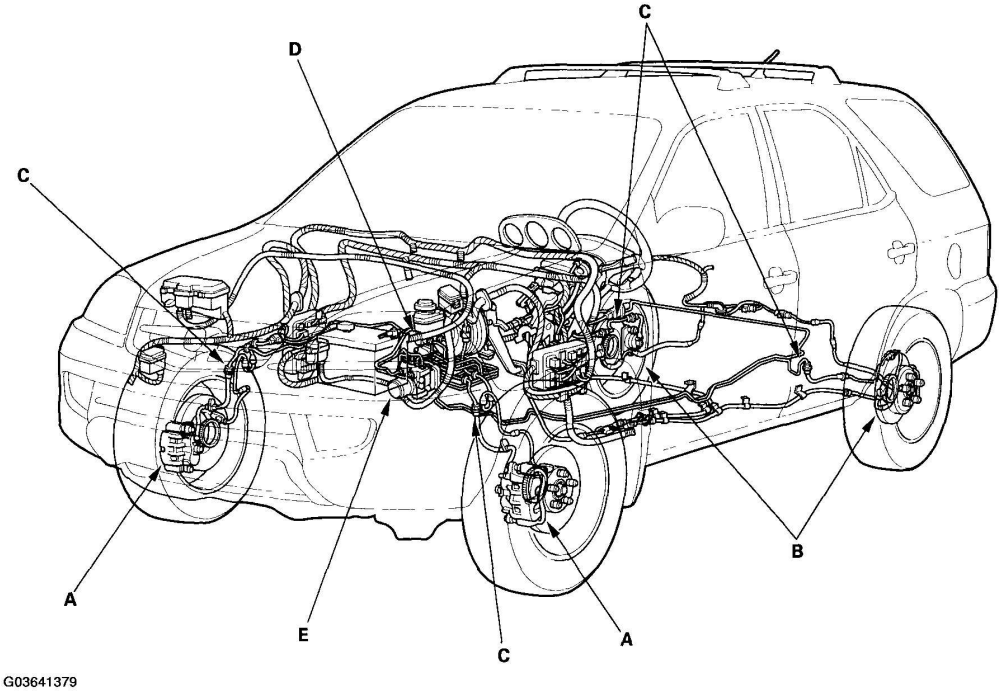

Fig. 61: Checking Master Cylinder And VSA Modulator-Control Unit For Damage
Courtesy of AMERICAN HONDA MOTOR CO., INC.

BRAKE HOSE REPLACEMENT

NOTE:

- **Before reassembling, check that all parts are free of dirt and other foreign particles.**
- **Replace parts with new ones whenever specified to do so.**
- **Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.**

- **To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.**

1. Replace the brake hose (A) if the hose is twisted, cracked, or if it leaks.

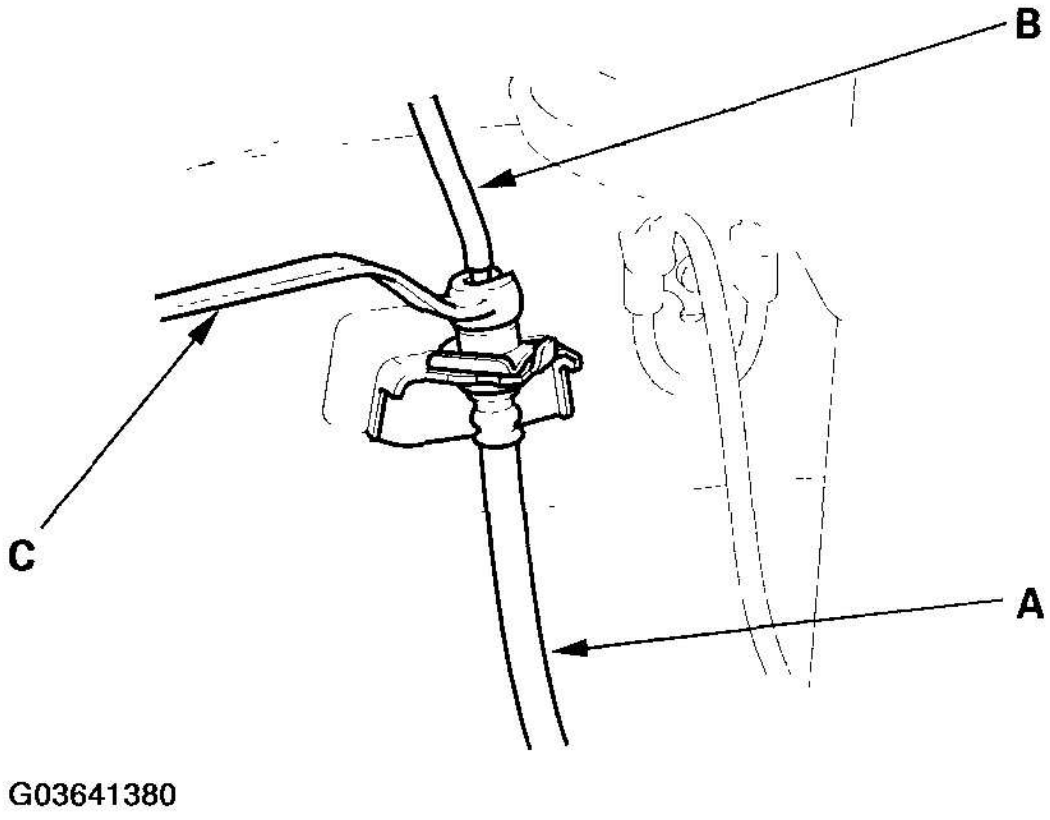

Fig. 62: Replacing Brake Hose
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Disconnect the brake hose from the brake line (B) using a 10 mm flare nut wrench (C).
3. Remove and discard the brake hose clip (A) from the brake hose (B).

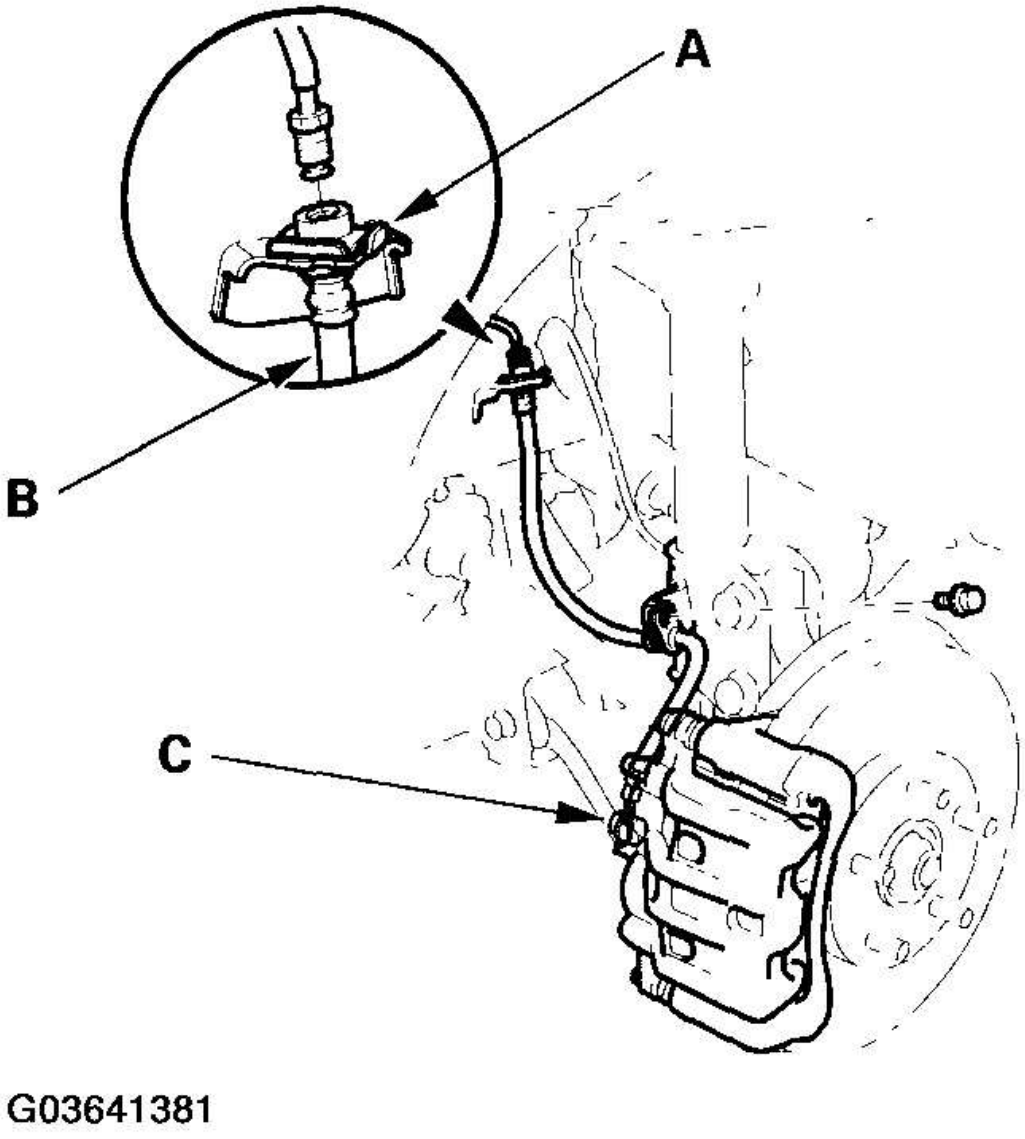

Fig. 63: Removing And Discard Brake Hose Clip
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the banjo bolt (C), and disconnect the brake hose from the caliper.
5. Remove the brake hose from the damper.
6. Install the brake hose (A) on the damper with flange bolt (B) first, then connect the brake hose to the caliper with the banjo bolt (C) and new sealing washers (D).

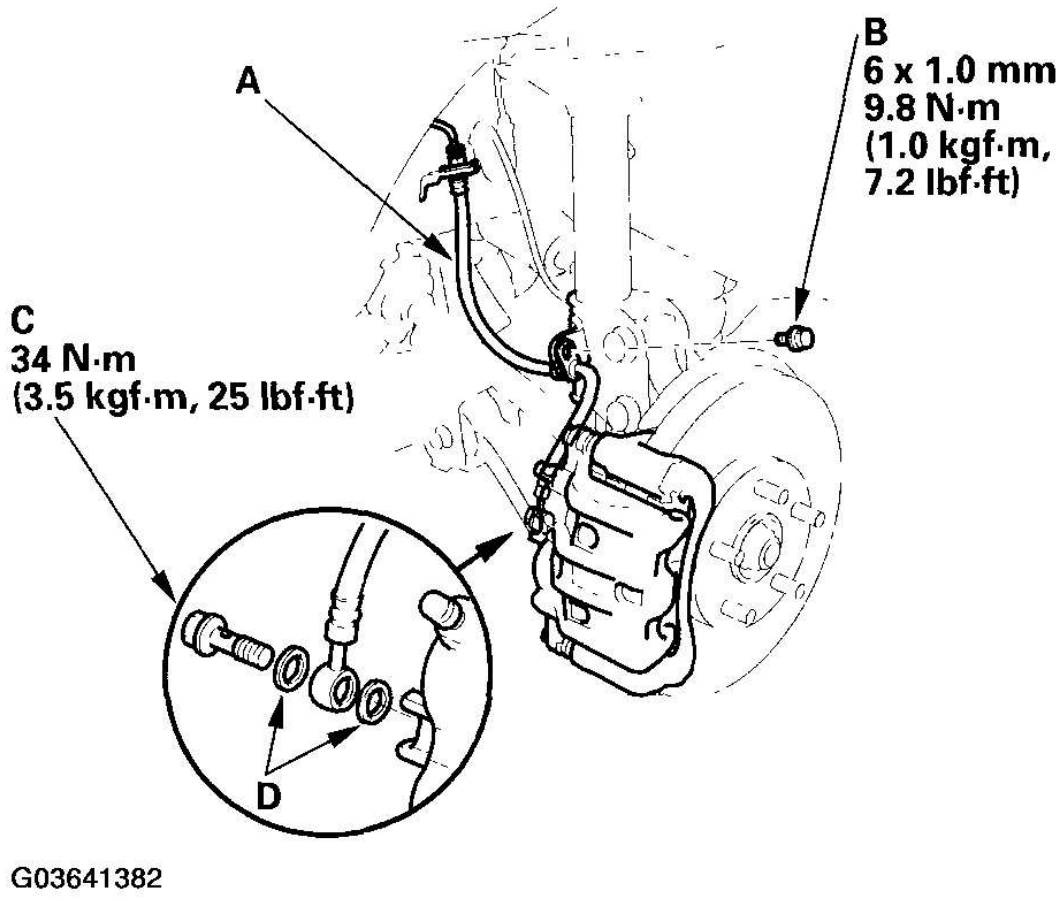

Fig. 64: Installing Brake Hose
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the brake hose (A) on the upper brake hose bracket (B) with a new brake hose clip (C).

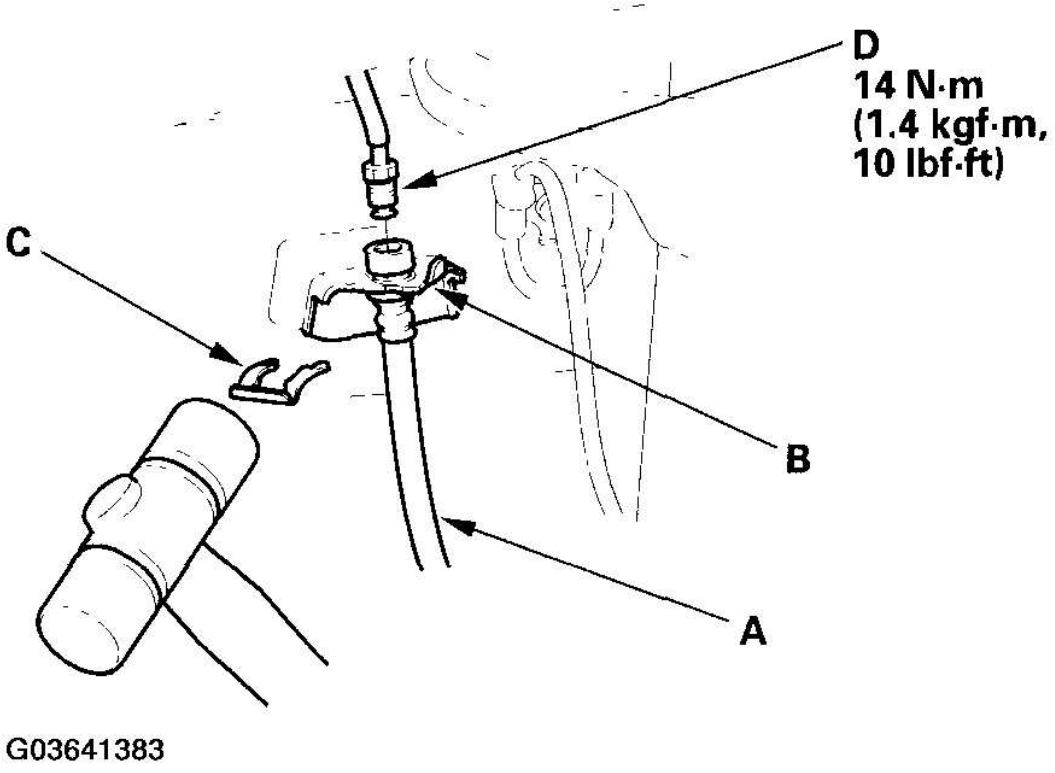

Fig. 65: Installing Brake Hose On Upper Brake Hose Bracket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Connect the brake line (D) to the brake hose.
9. After installing the brake hose, bleed the brake system (see **BRAKE SYSTEM BLEEDING**).
10. Do the following checks:
    - Check the brake hose and line joint for leaks, and tighten if necessary.
    - Check the brake hoses for interference and twisting.

PARKING BRAKE CABLE REPLACEMENT

EXPLODED VIEW

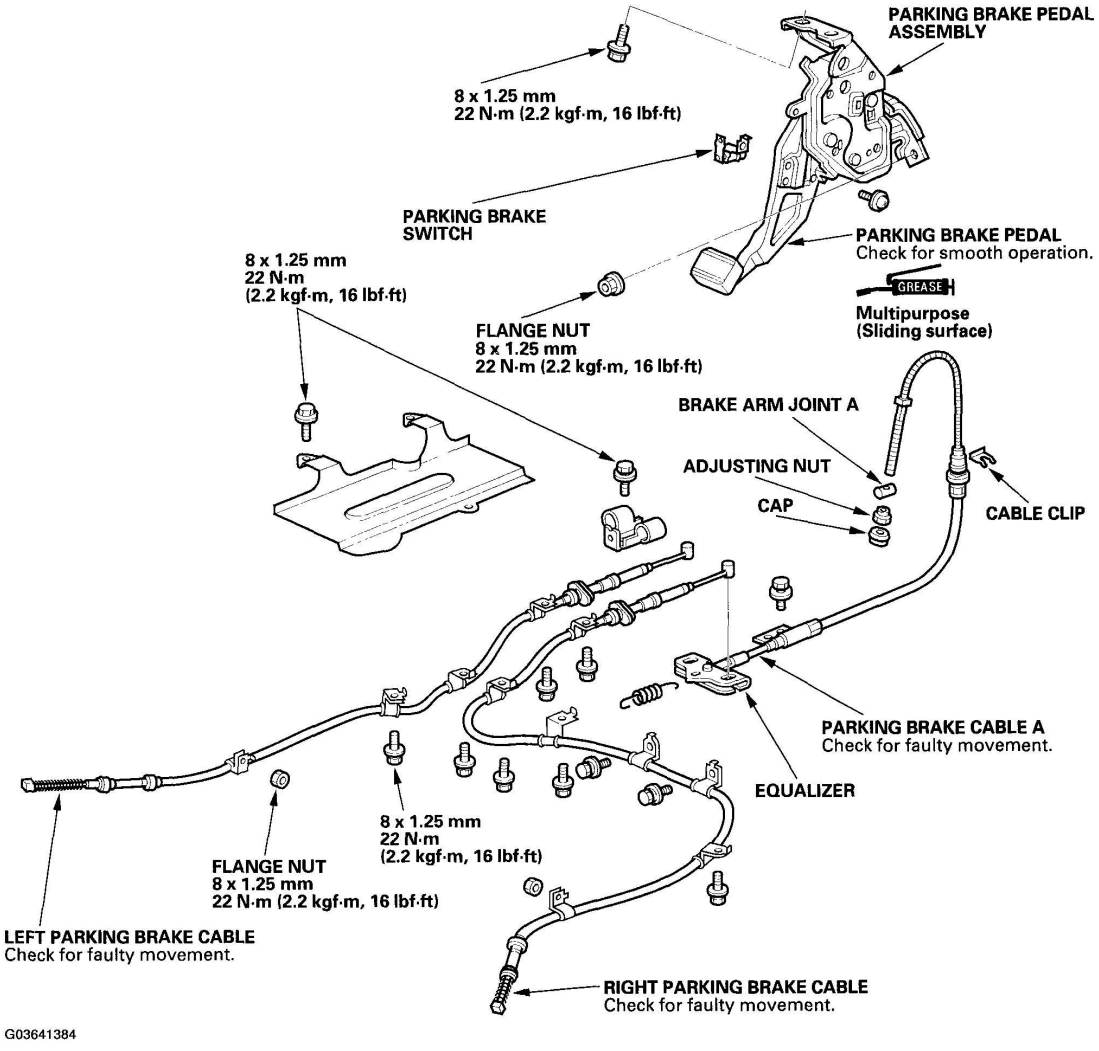

Fig. 66: Exploded View Of Parking Brake Cable
Courtesy of AMERICAN HONDA MOTOR CO., INC.

NOTE: The parking brake cable must not be bent or distorted. This will lead to stiff operation and premature cable failure. Refer to the Exploded View as needed during this procedure.

1. Remove the parking brake shoes, and disconnect the parking brake cable from the brake shoe (see **PARKING BRAKE SHOE REPLACEMENT**).
2. Remove the parking brake cable (A) from the backing plate (B) using a 12 mm offset wrench (C).

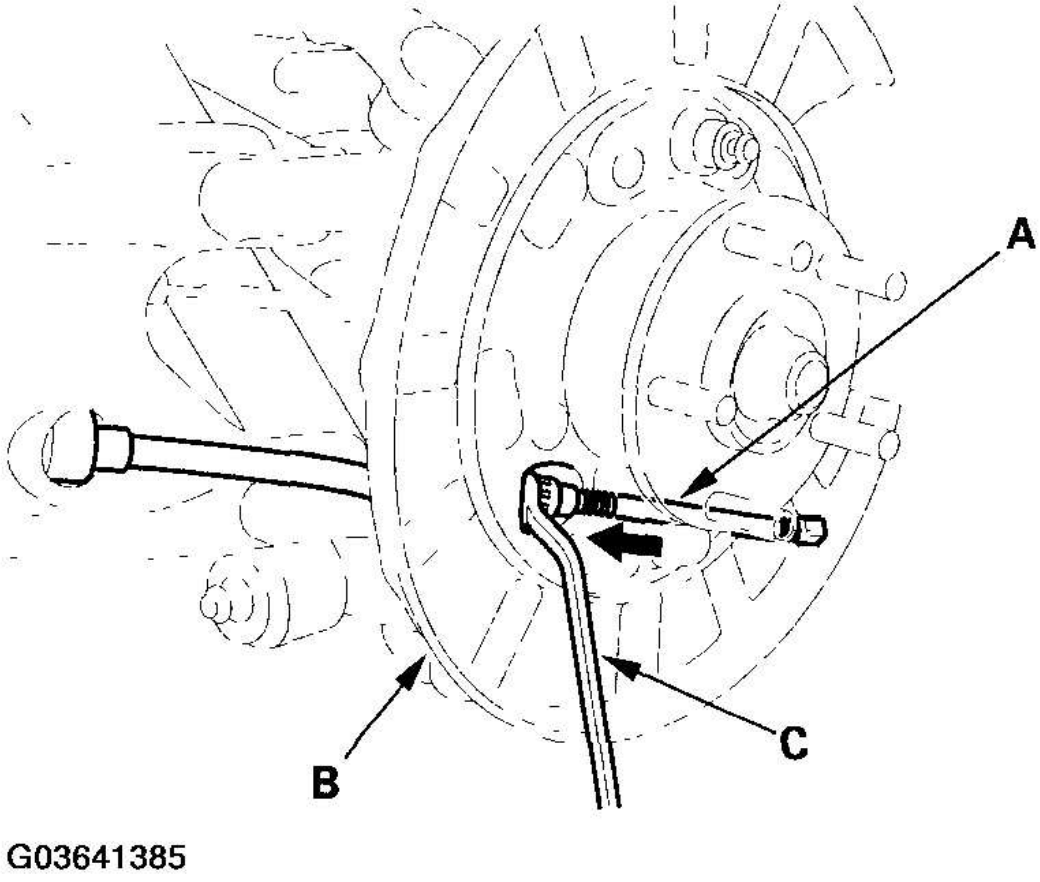

Fig. 67: Removing Parking Brake Cable From Backing Plate
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the parking brake cable in the reverse order of removal, and adjust the parking brake (see **PARKING BRAKE CHECK AND ADJUSTMENT**). Apply the parking brake firmly ten times, then adjust it again.