

# BRAKE SYSTEM

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## PRECAUTIONS

1. Care must be taken to replace each part properly as it could affect the performance of the brake system and result in a driving hazard. Replace the parts with parts of the same part number or equivalent.
2. It is very important to keep parts and area clean when repairing the brake system.

## TROUBLESHOOTING

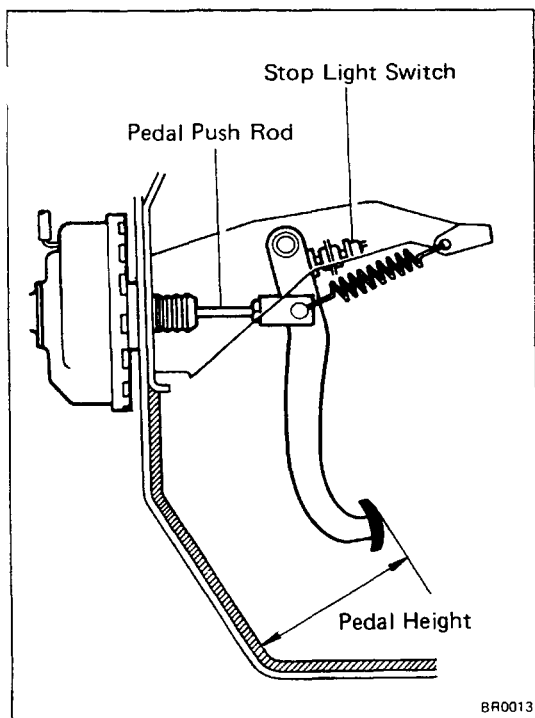
Problem	Possible cause	Remedy	Page
Low or spongy pedal	Linings worn	Replace brake linings	BR-30,37,43
	Drums worn	Replace drums	BR-30,37,43
	Leak in brake system	Repair leak	
	Master cylinder faulty	Repair or replace master cylinder	BR-8
	Air in brake system	Bleed brake system	BR-6
	Wheel cylinder faulty	Repair wheel cylinder	BR-30,37,43
Brakes drag	Parking brake out of adjustment	Adjust parking brake	BR-7
	Binding parking brake wire	Repair as necessary	
	Booster push rod out of adjustment	Adjust push rod	BR-10
	Return spring faulty	Replace spring	
	Brake line restricted	Repair as necessary	
	Lining cracked or distorted	Replace brake linings	BR-30,37,43
	Wheel cylinder sticking	Repair as necessary	BR-30,37,43
Brakes pull	Master cylinder faulty	Repair or replace master cylinder	BR-8
	Incorrect front wheel alignment	Adjust front wheel alignment	FA-3
	Unmatched tires on same axle	Correct	
	Tires improperly inflated	Inflate tires to proper pressure	
	Oil or grease on linings	Check for cause. Replace linings	BR-30,37,43
	Brake shoes distorted	Replace brake shoes	BR-30,37,43
	Linings worn or glazed	Replace linings	BR-30,37,43
	Drum out of round	Replace drums	BR-30,37,43
	Return spring faulty	Replace spring	
	Wheel cylinder faulty	Repair wheel cylinder	BR-30,37,43
Brakes grab/chatter	Drums out of round	Replace drums	BR-30,37,43
	Scored brake drums	Replace drums	BR-30,37,43
	Scored brake drums	Replace drums	BR-30,37,43
	Brake shoes distorted	Replace brake shoes	BR-30,37,43
	Linings worn or glazed	Replace linings	BR-30,37,43
	Oil or grease on linings	Check for cause. Replace linings	BR-30,37,43
	Wheel cylinder faulty	Repair wheel cylinder	BR-30,37,43
	Brake booster faulty	Repair booster	BR-11

## TROUBLESHOOTING (Cont'd)

Problem	Possible cause	Remedy	Page
Hard pedal but brakes inefficient	Oil or grease on linings Brake shoes distorted Linings worn or glazed Brake booster faulty Brake line restricted	Check for cause. Replace linings Replace brake shoes Replace linings Repair booster Repair as necessary	BR-30,37,43 BR-30,37,43 BR-30,37,43 BR-11
Snapping or clicking noise when brakes are applied ledges worn	Drum brakes in 3 places — brake shoes binding at backing plate ledges Drum brakes in 3 places — backing plate  Drum braks—loose or missing or clip Drum brakes—looseness of set bolt at backing plate	Lubricate Replace and lubricate ledges  Replace Tighten	BR-30,37,43 BR-30,37,43  BR-30,37,43 BR-30,37,43
Scraping or grinding noise when brakes are applied	Worn brake lining Dust cover to drum interference Other brake system components: Warped or bent brake backing plate cracked drums Tires rubbing against chassis and body	Replace refinish drums if heavily scored Correct or replace Inspect or service  Inspect or service	BR-30,37,43  BR-30,37,43
Squeaking, squealing, groaning or chattering noise when brakes are applied  Note: Brake friction materials inherently generate noise and heat in order to dissipate energy. As a result, occasional squeal is normal and is aggravated by severe environmental conditions such as cold, heat, wetness, snow, salt, mud, etc. This occasional squeal is not a functional problem and does not indicate any loss of brake effectiveness	Brake drums and linings worn or scored Dirty, greasy, contaminated or glazed linings  Improper lining parts Maladjustment of brake pedal or booster push-rod Drum brakes—weak damaged or incorrect shoe retracting springs, loose or damaged shoe retaining pins, springs and clips and grooved backing plate ledges	Inspect, service or replace Clean or replace  Inspect for correct usage replace Inspect and adjust  Inspect, service or replace	BR-30,37,43 BR-30,37,43  BR-30,37,43 BR-5, 12  BR-30,37,43

## TROUBLESHOOTING (Cont'd)

Problem	Possible cause	Remedy	Page
Squealing and squeaking noise when brakes are not applied	Bent or warped backing plate causing interference with drum	Service or replace	BR-30,37,43
	Improper machining of drum causing interference with backing plate or shoe	Replace drum	BR-30,37,43
	Maladjustment of brake pedal or booster push-rod	Inspect and adjust	BR-5, 12
	Poor return of brake booster or master cylinder or wheel cylinder	Inspect, service or replace	BR-8,11,30 37,43
	Other brake system components: Loose or extra parts in brakes Drum adjustment too tight causing lining to glaze Worn, damaged or insufficiently lubricated wheel bearings Drum brakes—weak, damaged or incorrect shoe reacting springs Drum brakes—grooved backing plate ledges	Inspect, service, replace as required	
Groaning, clicking or rattling noise when brakes are not applied	Loose wheel lug nuts	Tighten to correct torque. Replace if stud holes are elongated	BR-5, 12
	Maladjustment of brake pedal or booster push-rod	Inspect and adjust	
	Drum brakes—loose or extra parts	Inspect, remove or service	BR-30,37,43
	Worn, damaged or dry wheel bearings	Inspect, lubricate or replace	



## CHECKS AND ADJUSTMENTS

### CHECK AND ADJUSTMENT OF BRAKE PEDAL

#### 1. CHECK THAT PEDAL HEIGHT IS CORRECT

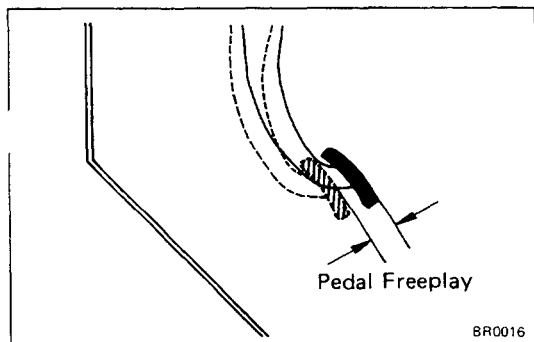
Pedal height: 144 — 149 mm (5.67 — 5.87 in.)

If incorrect, adjust the pedal height.

#### 2. IF NECESSARY, ADJUST PEDAL HEIGHT

- Sufficiently loosen the stop light switch.
- Adjust the pedal height by turning the pedal push rod.
- Return the stop light switch until its body lightly contacts the pedal stopper.

NOTE: After adjusting the pedal height, check and adjust the pedal freeplay.



#### 3. CHECK AND ADJUST PEDAL FREEPLAY

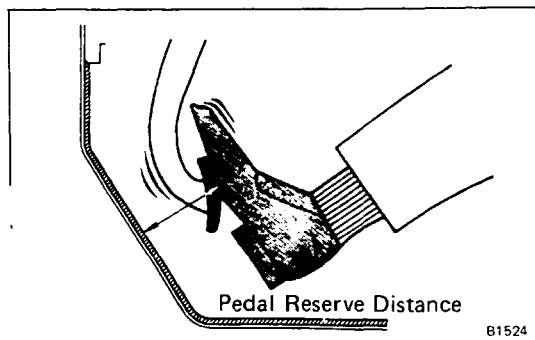
- Stop the engine and depress the brake pedal several times until there is no more vacuum left in the booster.
- Push in the pedal until the beginning of resistance is felt. Measure the distance, as shown.

Pedal freeplay: 3 — 6 mm (0.12 — 0.24 in.)

NOTE: The pedal freeplay is the amount of the stroke until the booster air valve is moved by the pedal push rod.

- If incorrect, adjust the pedal freeplay by turning the pedal push rod.
- Start the engine and confirm that the pedal freeplay exists.

NOTE: After adjusting the pedal freeplay, check the pedal height.



#### 4. CHECK THAT PEDAL RESERVE DISTANCE IS CORRECT

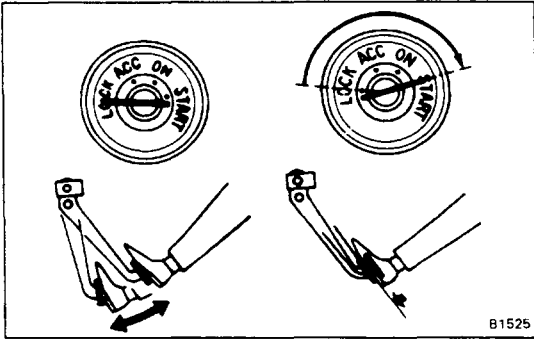
Depress the pedal and measure the pedal reserve distance, as shown.

Pedal reserve distance from asphalt sheet

at 50 kg (110.2 lb, 490 N):

2WD 1/2 ton	More than 65 mm (2.56 in.)
1 ton, C&C	More than 55 mm (2.17 in.)
4WD	More than 60 mm (2.36 in.)

If incorrect, troubleshoot the brake system.



## OPERATIONAL TEST OF BRAKE BOOSTER

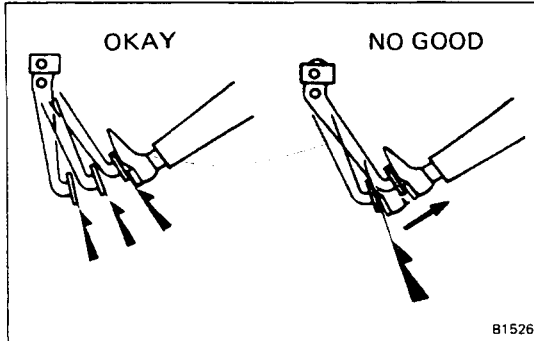
NOTE: If there is leakage or lack of vacuum, repair before testing.

### 1. OPERATING CHECK

- Depress the brake pedal several times with the engine off, and check that there is no change in the pedal reserve distance.
- Depress the brake pedal and start the engine. If the pedal goes down slightly, operation is normal.

### 2. AIR TIGHTNESS

- Start the engine and stop it after one or two minutes. Depress the brake pedal several times slowly. If the pedal goes down farthest the first time, but gradually rises after the second or third time, the booster is air tight.
- Depress the brake pedal while the engine is running, and stop it with the pedal depressed. If there is no change in pedal reserve travel after holding the pedal for thirty seconds, the booster is air tight.



## BLEEDING OF BRAKE SYSTEM

NOTE: If any work is done on the brake system or if air is suspected in the brake lines, bleed the system of air.

**CAUTION:** Do not let brake fluid remain on a painted surface. Wash it off immediately.

### 1. FILL BRAKE RESERVOIRS WITH BRAKE FLUID

Check the reservoir after bleeding each wheel. Add fluid, if necessary.

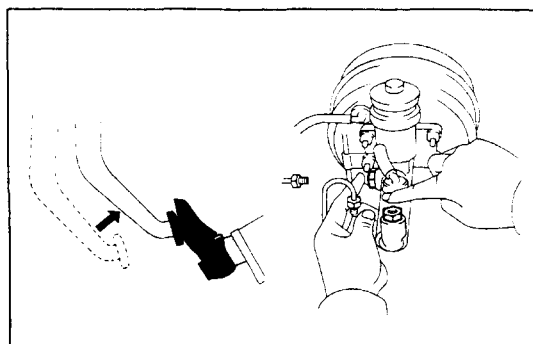
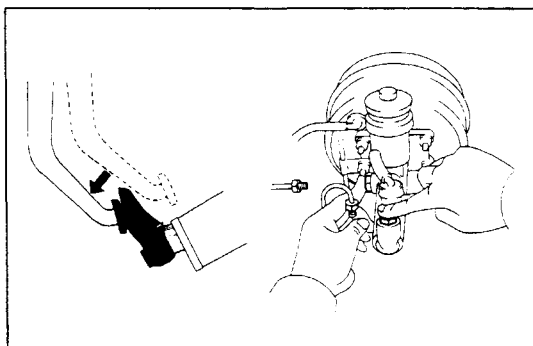
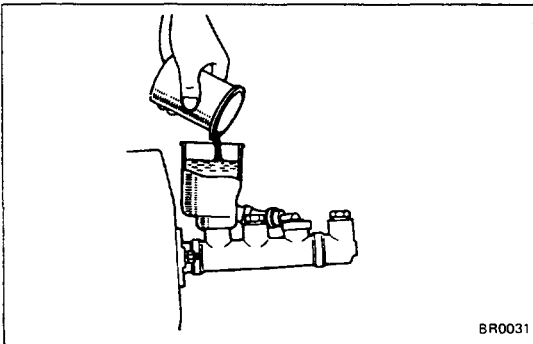
### 2. BLEED MASTER CYLINDER (FOR 1/2 TON)

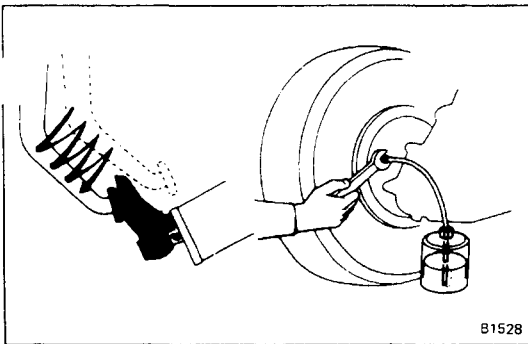
NOTE: If the master cylinder was disassembled or if the reservoir tank becomes empty, bleed the air from the master cylinder.

- Disconnect the brake tubes from the master cylinder.
- Depress the brake pedal and hold it.

- Block off the outlet plug with your finger, and release the brake pedal.

- Repeat (b) and (c) three or four times.





B1528

### 3. CONNECT VINYL TUBE TO WHEEL CYLINDER BLEEDER PLUG

Insert the other end of the tube in a half-full container of brake fluid.

NOTE: Begin air bleeding from the wheel cylinder with the longest hydraulic line.

### 4. BLEED BRAKE LINE

- Slowly pump the brake pedal several times.
- While having an assistant press on the pedal, loosen the bleeder plug until fluid starts to run out. Then close the bleeder plug.
- Repeat this procedure until there are no more air bubbles in the fluid.

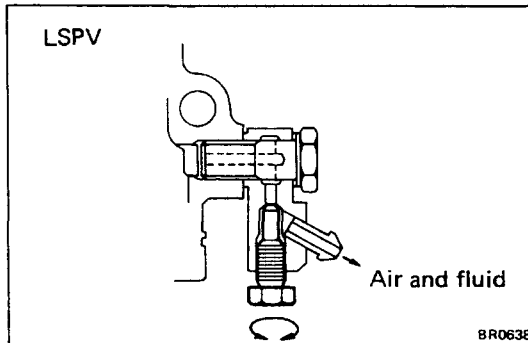
**Bleeder plug tightening torque:**

**110 kg-cm (8 ft-lb, 11 N-m)**

### 5. REPEAT PROCEDURE FOR EACH WHEEL

### 6. BLEED LSP AND BV

NOTE: The bleeder plug on 4WD vehicles is shaped like a regular bolt.



BR0638

## CHECK AND ADJUSTMENT OF PARKING BRAKE

### 1. CHECK THAT PARKING BRAKE LEVER TRAVEL IS CORRECT

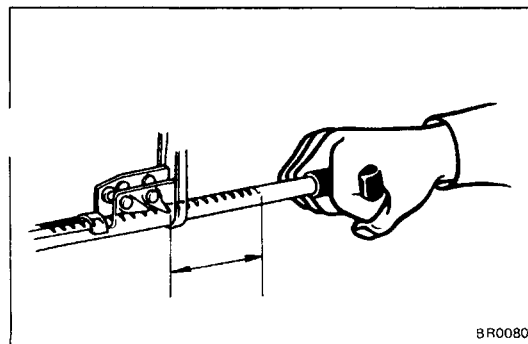
Pull the parking brake lever all the way, and count the notches of lever travel.

**Lever travel at 20 kg (44.1 lb, 196 N):**

**2WD 10 — 16 clicks**

**4WD 7 — 15 clicks**

If incorrect, adjust the parking brake.



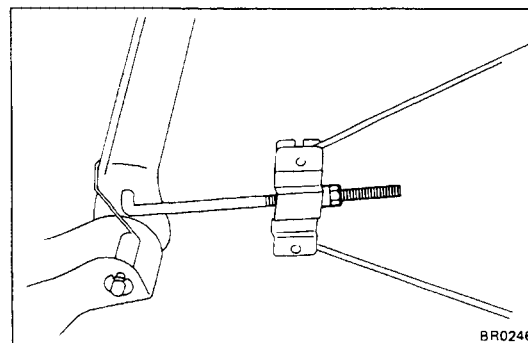
BR0080

### 2. IF NECESSARY, ADJUST PARKING BRAKE

NOTE: Before adjusting the parking brake, make sure that the rear brake shoe clearance has been adjusted.

#### (2WD)

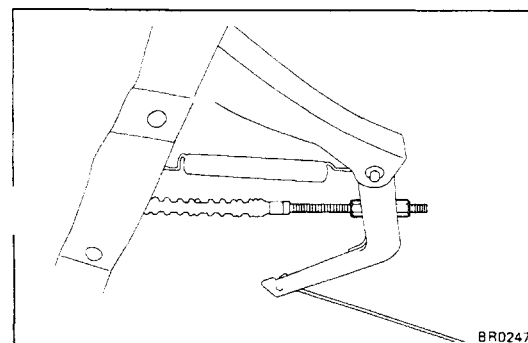
- Tighten the adjusting nut until the travel is correct.
- After adjusting the parking brake, confirm that the rear brakes are not dragging.



BR0246

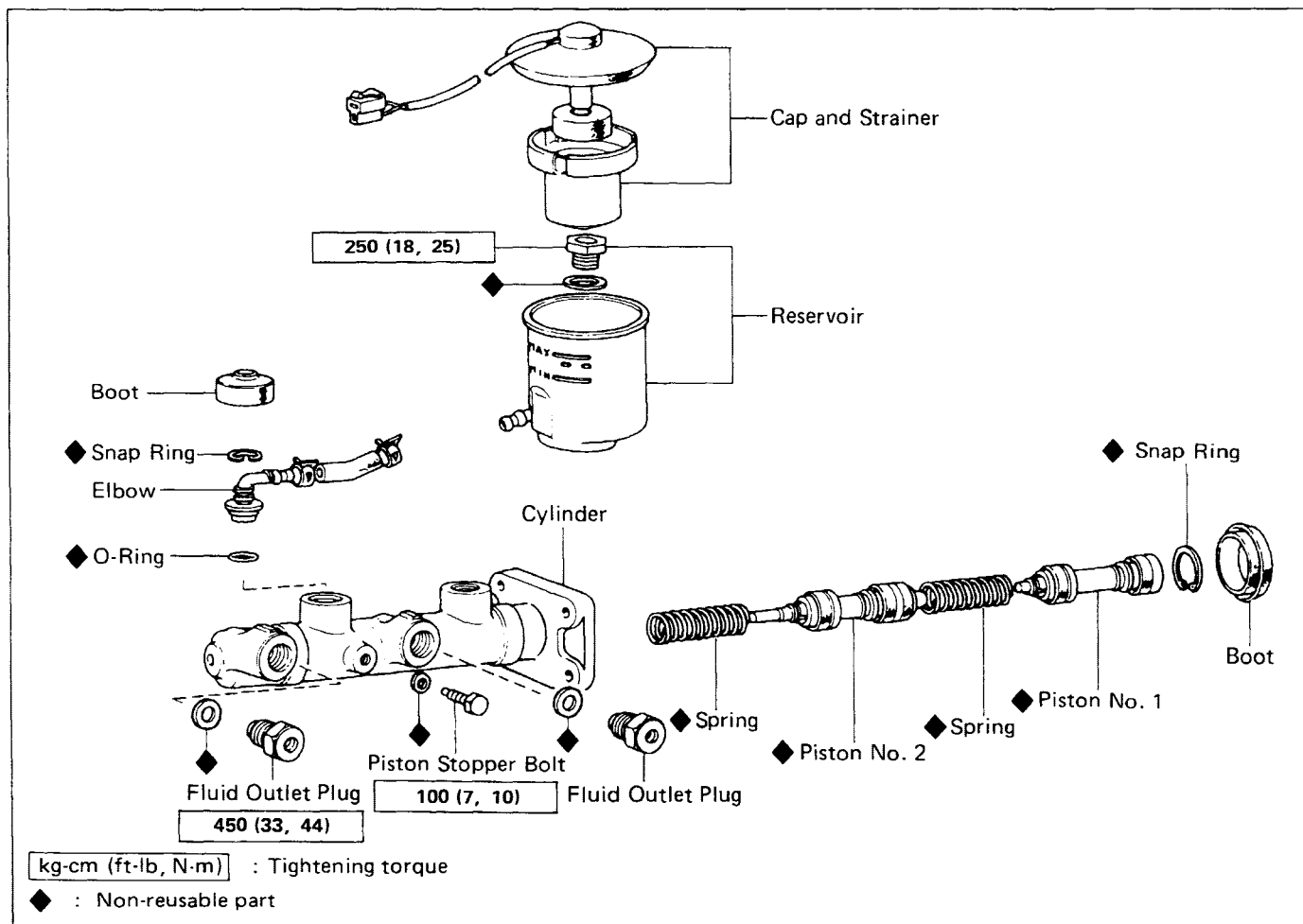
#### (4WD)

- Tighten the bellcrank stopper screw until the play of the rear brake links become zero, and then loosen the screw one turn. Tighten the screw lock nut.
- Tighten one of the adjusting nuts of the intermediate lever while loosening the other one until the travel is correct. Tighten the two adjusting nuts.
- After adjusting the parking brake, confirm that the bellcrank stopper screw comes in contact with the backing plate.



BR0247

## MASTER CYLINDER COMPONENTS



### REMOVAL OF MASTER CYLINDER

**CAUTION:** Do not let brake fluid remain on a painted surface. Wash it off immediately.

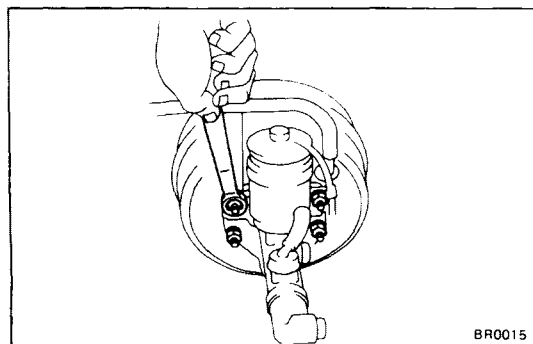
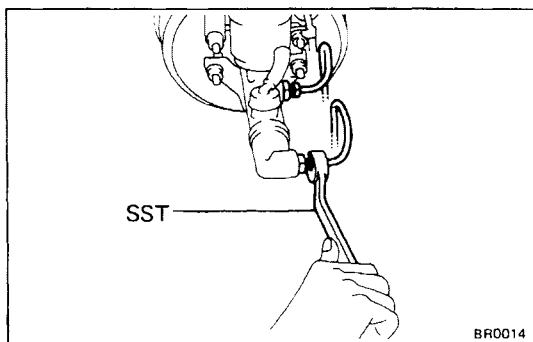
1. **DISCONNECT LEVEL WARNING SWITCH CONNECTOR**
2. **DISCONNECT TWO BRAKE TUBES**

Using SST, disconnect the two brake tubes from the master cylinder.

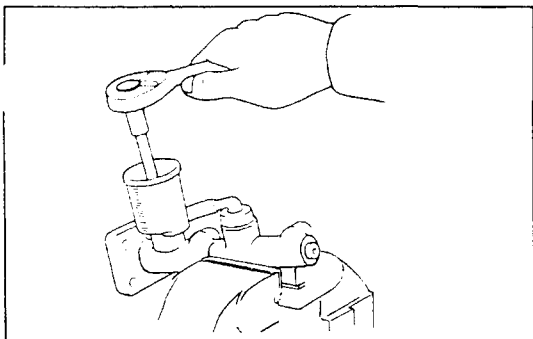
SST 09751-36011

3. **REMOVE MASTER CYLINDER**

- (a) Remove the four nuts.
- (b) Remove the master cylinder and gasket from the brake booster.

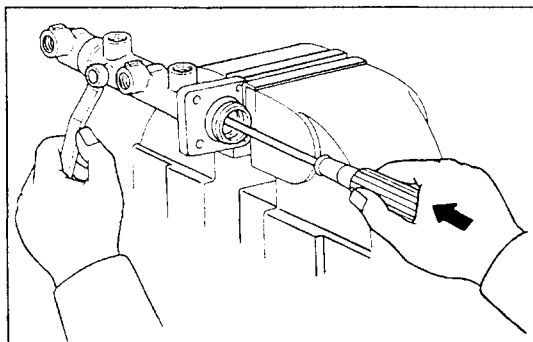




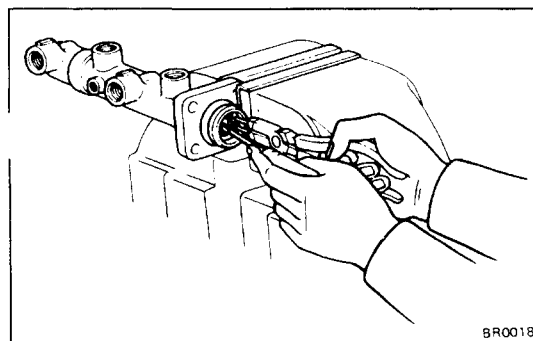


## DISASSEMBLY OF MASTER CYLINDER

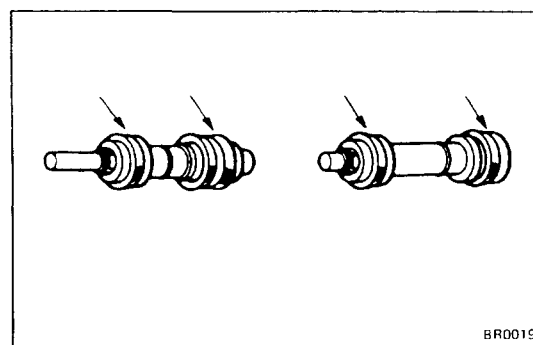
1. **PLACE CYLINDER IN VISE**
2. **DISCONNECT RESERVOIR AND HOSE**  
Remove the cap, strainer, bolt and hose.
3. **REMOVE SNAP RING AND ELBOW**
4. **REMOVE TWO FLUID OUTLET PLUGS**



5. **REMOVE PISTON STOPPER BOLT**  
Using a screwdriver, push the pistons in all the way and remove the piston stopper bolt.



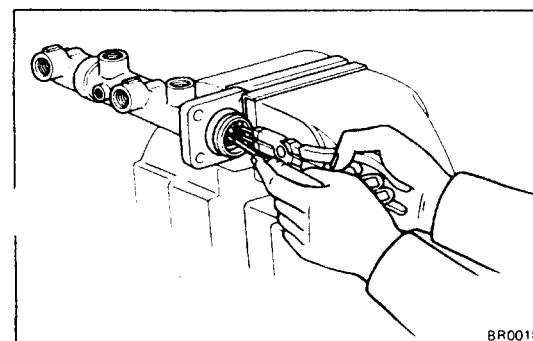
6. **REMOVE TWO PISTONS AND SPRINGS**
    - (a) Using snap ring pliers, remove the snap ring.
    - (b) Remove the two pistons and springs from the master cylinder.
- NOTE:** It may be necessary to inject compressed air in the check valve hole to force out the No. 2 piston.



## ASSEMBLY OF MASTER CYLINDER

(See page BR-8)

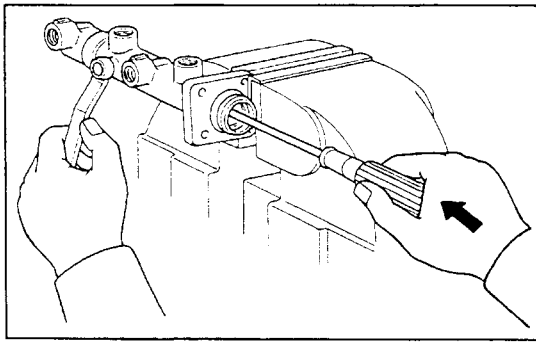
1. **APPLY LITHIUM SOAP BASE GLYCOL GREASE TO RUBBER PARTS OF PISTON**



2. **INSTALL TWO SPRINGS AND PISTONS**

**CAUTION:** Be careful not to damage the rubber lips on the pistons.

  - (a) Insert the two springs and pistons in the master cylinder housing as shown.
  - (b) Using snap ring pliers, install the snap ring.



### 3. INSTALL PISTON STOPPER BOLT

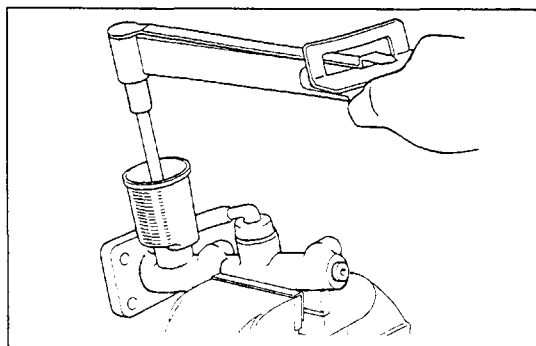
Using a screwdriver, push the pistons in all the way and install the piston stopper bolt. Torque the bolt.

**Torque:** 100 kg-cm (7 ft-lb, 10 N·m)

### 4. INSTALL TWO FLUID OUTLET PLUGS

Torque two plugs.

**Torque:** 16 mm plug 450 kg-cm (33 ft-lb, 44 N·m)  
18 mm plug 685 kg-cm (50 ft-lb, 67 N·m)



### 5. INSTALL RESERVOIR

(a) Install the reservoir on the master cylinder. Torque the bolt.

**Torque:** 250 kg-cm (18 ft-lb, 25 N·m)

(b) Install the strainer and cap.

### 6. INSTALL ELBOW AND SNAP RING

### 7. CONNECT RESERVOIR HOSE

## INSTALLATION OF MASTER CYLINDER

(See page BR-8)

### 1. CLEAN OUT GROOVE ON LOWER INSTALLATION SURFACE OF MASTER CYLINDER

### 2. CONFIRM THAT "UP" MARK ON MASTER CYLINDER BOOT IS IN CORRECT POSITION

### 3. ADJUST LENGTH OF BRAKE BOOSTER PUSH ROD BEFORE INSTALLING MASTER CYLINDER (See page BR-12)

### 4. INSTALL MASTER CYLINDER

Install the master cylinder and gasket on the brake booster with four nuts.

**Torque:** 130 kg-cm (9 ft-lb, 13 N·m)

### 5. CONNECT TWO BRAKE TUBES

Using SST, connect the two brake tubes to the check valves. Torque the nuts.

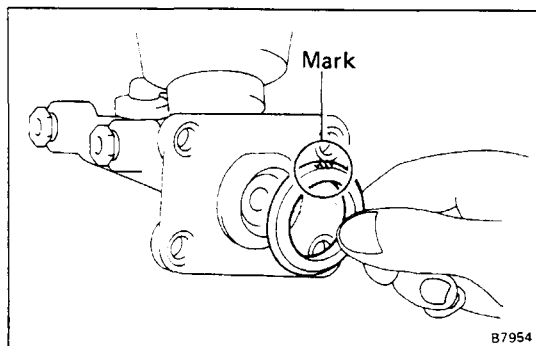
SST 09751-36011

**Torque:** 155 kg-cm (11 ft-lb, 15 N·m)

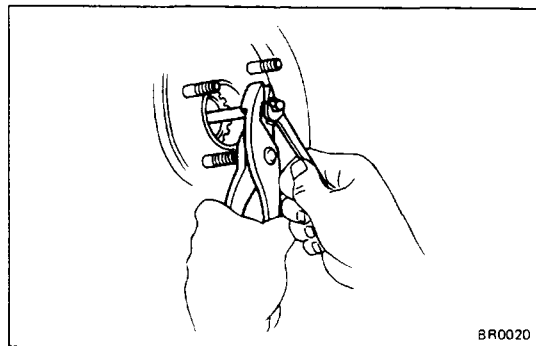
### 6. CONNECT LEVEL WARNING SWITCH CONNECTOR

### 7. ADJUST BRAKE PEDAL (See page BR-5)

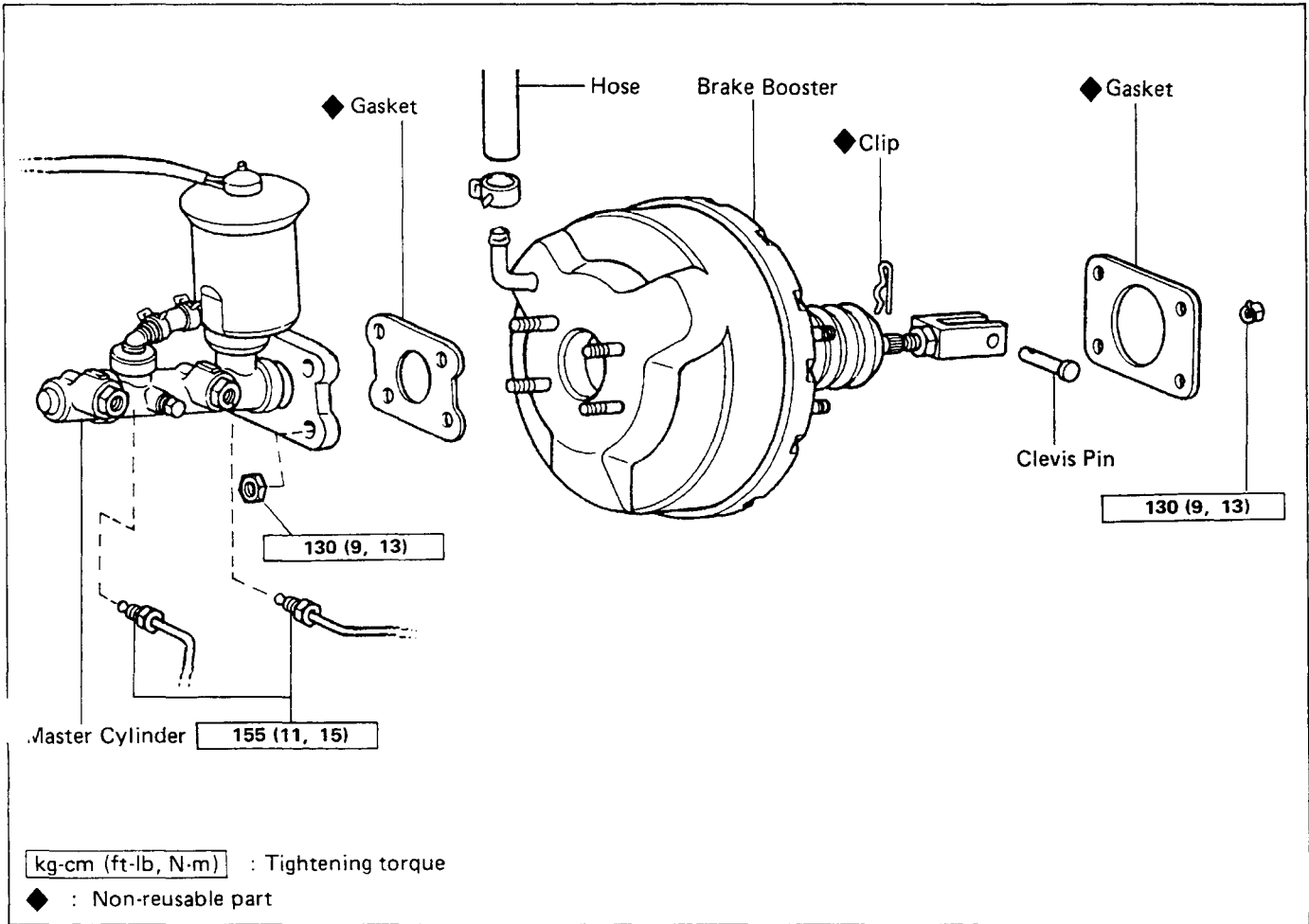
### 8. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR-6)



B7954



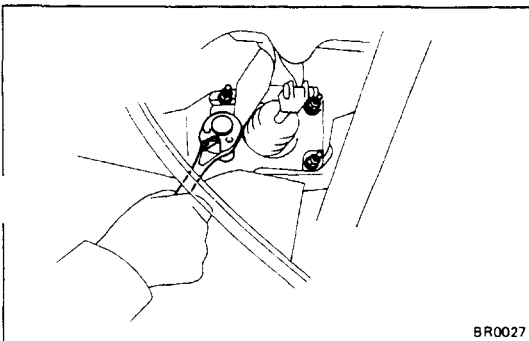
BR0020

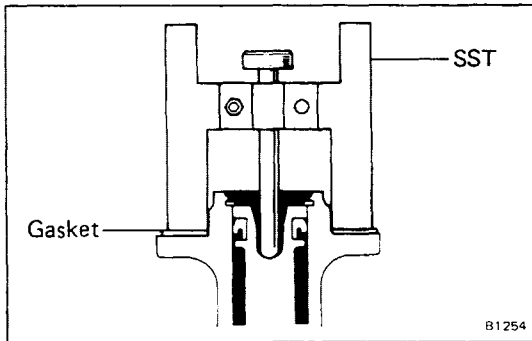
**BRAKE BOOSTER****REMOVAL OF BRAKE BOOSTER**

1. REMOVE MASTER CYLINDER (See page BR-8)
2. DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER
3. DISCONNECT STOP LIGHT SWITCH CONNECTOR
4. REMOVE PEDAL RETURN SPRING
5. REMOVE CLIP AND CLEVIS PIN

#### 6. REMOVE BRAKE BOOSTER AND GASKET

Remove the four nuts, and pull out the brake booster and gasket.





## INSTALLATION OF BRAKE BOOSTER

(See page BR-11)

### 1. ADJUST LENGTH OF BOOSTER PUSH ROD

- (a) Set SST on the master cylinder, and lower the pin until its tip slightly touches the piston.

SST 09737-00010

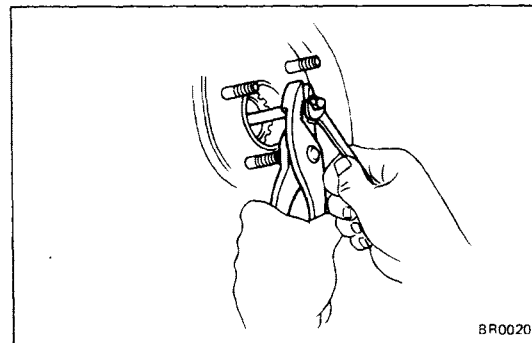
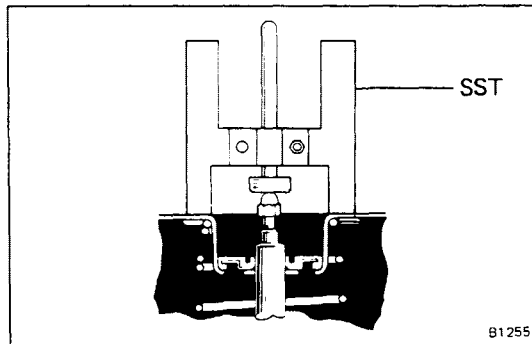
NOTE: Take the measurement with the gasket in place.

- (b) Turn SST upside down, and set it on the booster.

SST 09737-00010

- (c) Adjust the booster push rod length until the push rod lightly touches the pin head.

Clearance: 0 mm (0 in. )



### 2. INSTALL BRAKE BOOSTER AND GASKET

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

### 3. CONNECT CLEVIS TO BRAKE PEDAL

Insert the push rod pin into the clevis and brake pedal and install the clip to the pin.

### 4. INSTALL PEDAL RETURN SPRING

### 5. CONNECT STOP LIGHT SWITCH CONNECTOR

### 6. INSTALL MASTER CYLINDER

(See page BR-10)

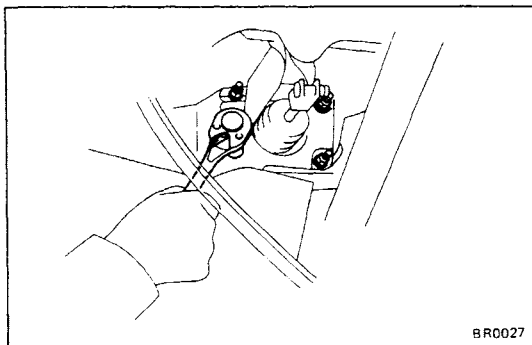
### 7. CONNECT HOSE TO BRAKE BOOSTER

### 8. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR-6)

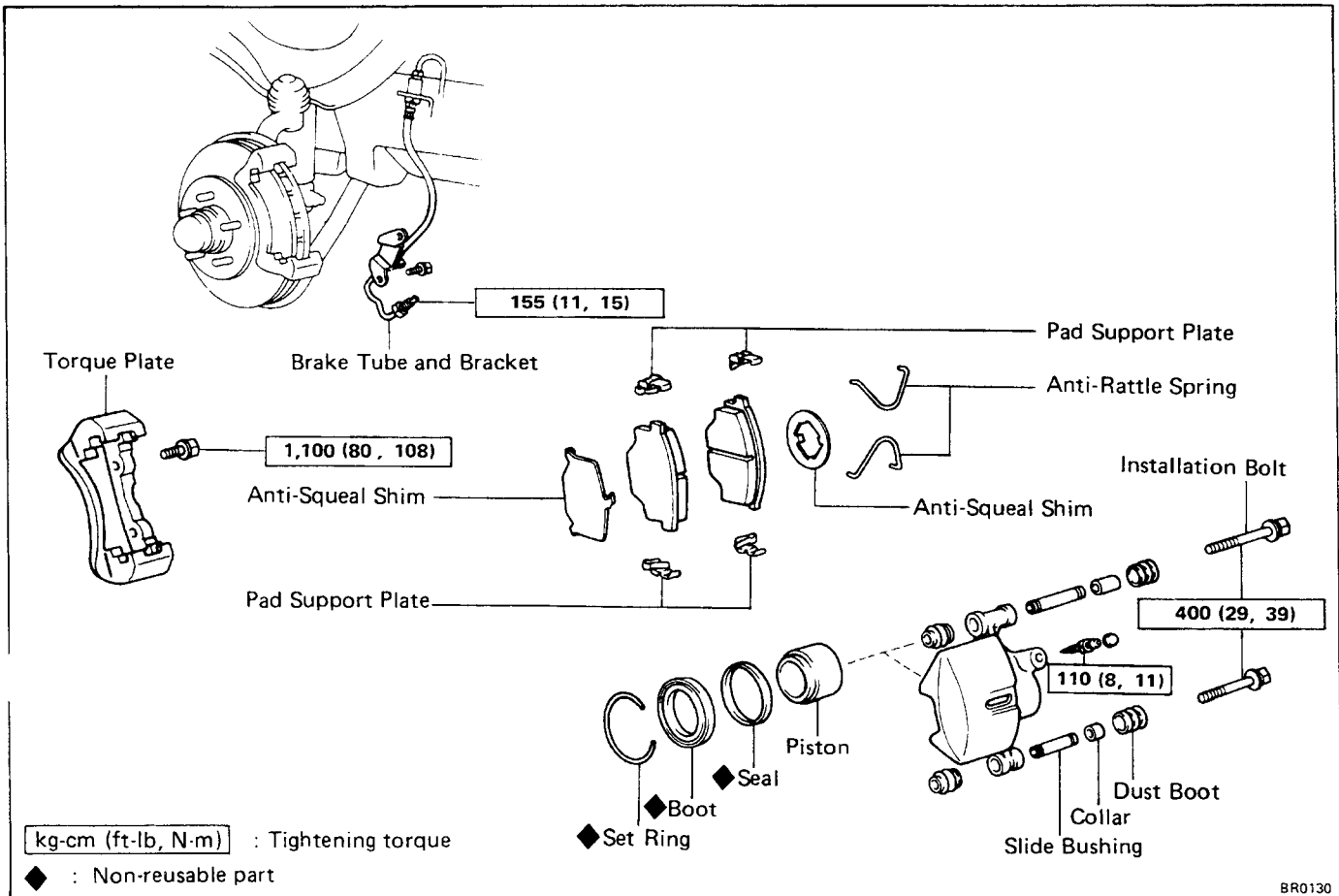
### 9. CHECK FLUID LEAKAGE

### 10. CHECK AND ADJUST BRAKE PEDAL (See page BR-5)

### 11. PERFORM OPERATIONAL CHECK (See page BR-6)



## FRONT BRAKE — 2WD (PD60 Type Disc) COMPONENTS



### REPLACEMENT OF BRAKE PADS

#### 1. INSPECT PAD LINING THICKNESS

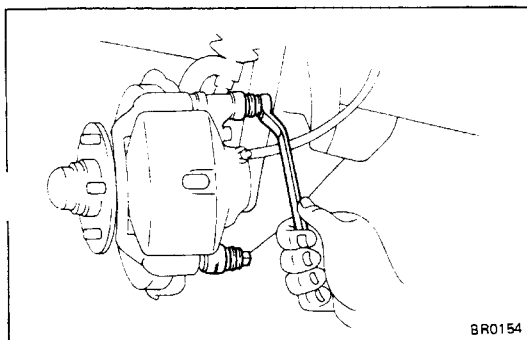
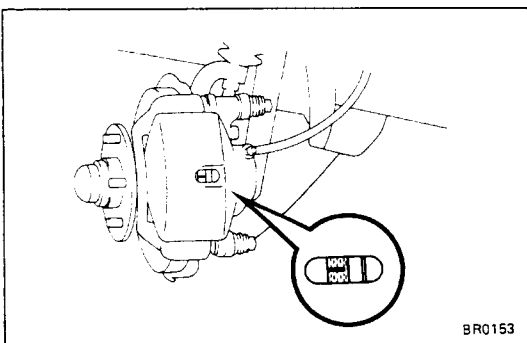
Check the pad thickness through the cylinder inspection hole and replace pads if not within specification.

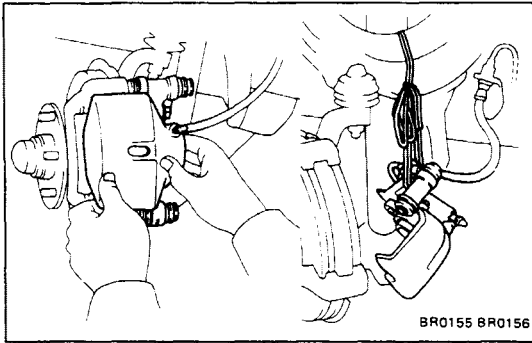
**Minimum thickness:** 1.0 mm (0.039 in.)

**Standard thickness:** 10.0 mm (0.394 in.)

#### 2. REMOVE CYLINDER FROM TORQUE PLATE

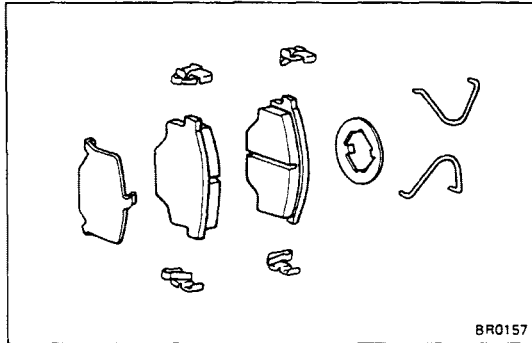
- (a) Remove the two installation bolts from the torque plate.





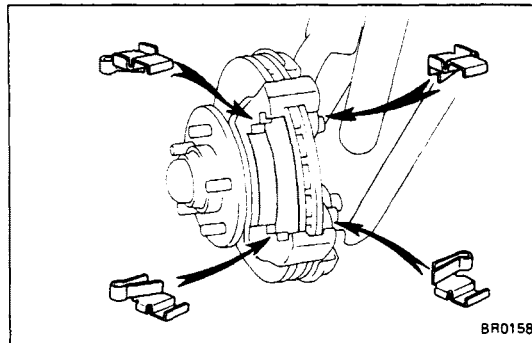
- (b) Remove the brake cylinder and suspend it so the hose is not stretched.

NOTE: Do not disconnect the brake hose.



### 3. REMOVE FOLLOWING PARTS:

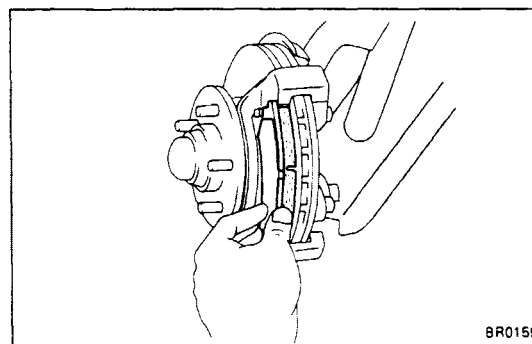
- (a) Two anti-rattle springs
- (b) Two brake pads
- (c) Anti-squeal shims
- (d) Four support plates



### 4. CHECK ROTOR DISC THICKNESS (See step 2 on page BR-16)

### 5. CHECK ROTOR DISC RUNOUT (See step 3 on page BR-17)

### 6. INSTALL NEW PAD SUPPORT PLATES



### 7. INSTALL NEW PADS

**CAUTION:** Do not allow oil or grease to get on the rubbing face.

- (a) Install a new anti-squeal shim toward the backside of the outside pad.
- (b) Install the pads onto each support plate.

### 8. INSTALL ANTI-RATTLE SPRINGS

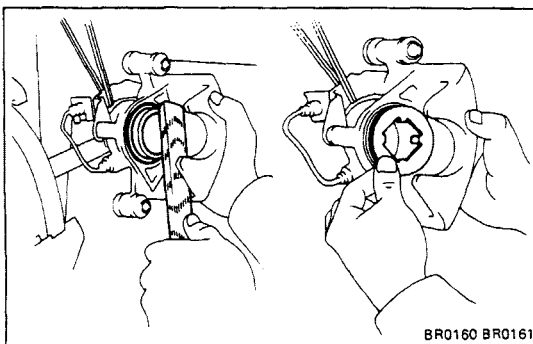
### 9. INSTALL CYLINDER

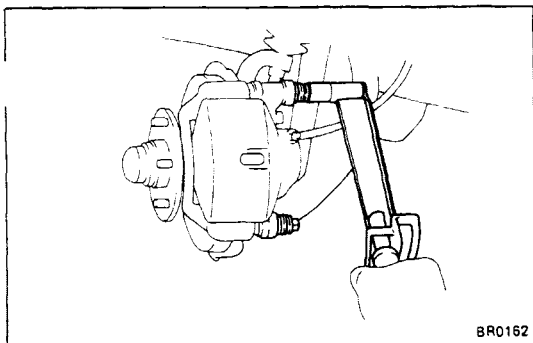
- (a) Draw out a small amount of brake fluid from the reservoir.

- (b) Press in piston with a hammer handle or such.

NOTE: Always change the pad on one wheel at a time as there is possibility of the opposite piston flying out.

- (c) Assemble the anti-squeal shim to the piston.



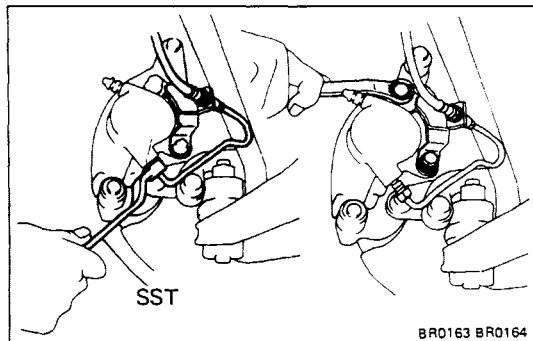


(d) Insert the brake cylinder carefully so the dust boot is not wedged.

(e) Install and torque the two mount bolts.

Torque: 400 kg-cm (29 ft-lb, 39 N·m)

#### 10. CHECK THAT FLUID LEVEL IS MAX AT LINE



### REMOVAL OF CYLINDER

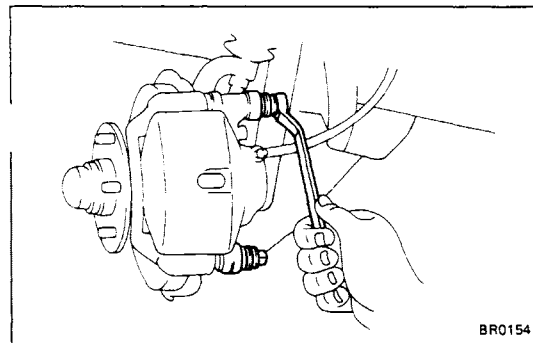
(See page BR-13)

#### 1. DISCONNECT BRAKE LINE

(a) Using SST, disconnect the brake line.  
Use a container to catch the brake fluid.

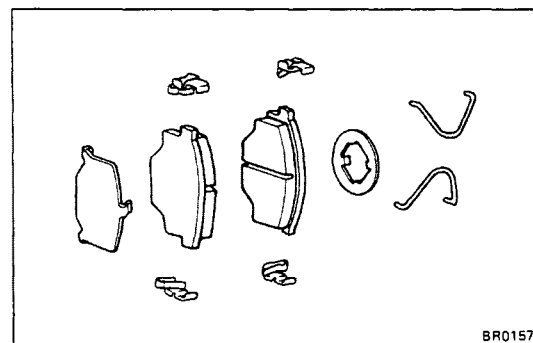
SST 09751-36011

(b) Remove the bracket from the cylinder.



#### 2. REMOVE CYLINDER

Remove the two installation bolts and cylinder.

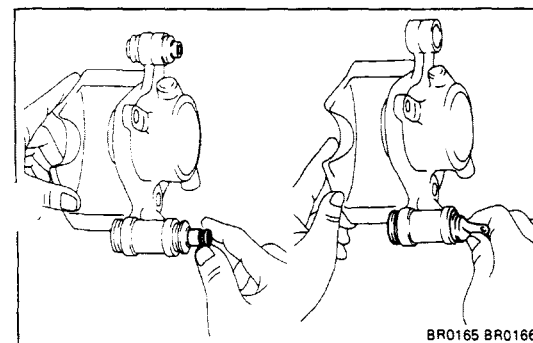


#### 3. REMOVE ANTI-RATTLE SPRINGS

#### 4. REMOVE BRAKE PADS

#### 5. REMOVE ANTI-SQUEAL SHIMS

#### 6. REMOVE SUPPORT PLATES

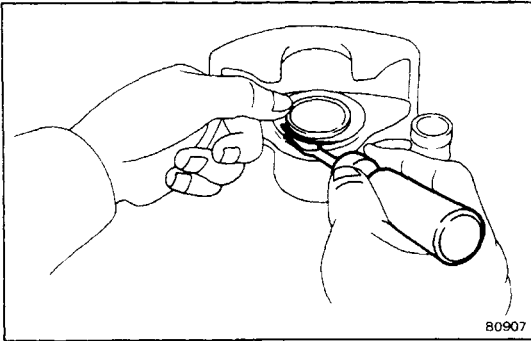


### DISASSEMBLY OF CYLINDER

(See page BR-13)

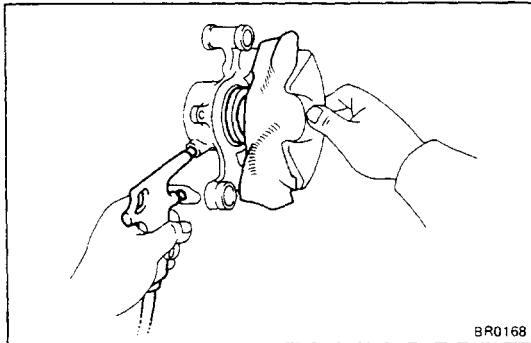
#### 1. REMOVE FOLLOWING PARTS:

- (a) Two cylinder slide bushings
- (b) Four dust boots
- (c) Two collars



## 2. REMOVE CYLINDER BOOT SET RING AND BOOT

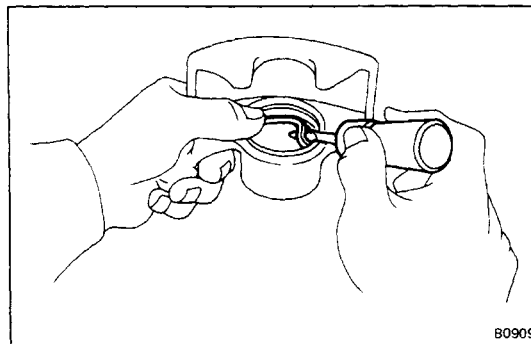
Using a screwdriver, remove the cylinder boot set ring and boot.



## 3. REMOVE PISTON FROM CYLINDER

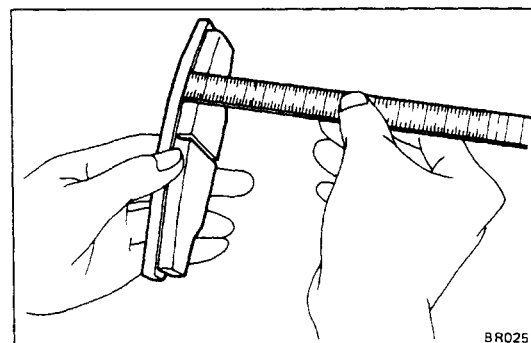
- Put a piece of cloth or such between the piston and cylinder.
- Use compressed air to remove the piston from the cylinder.

**WARNING:** Do not place your fingers in front of the piston when using compressed air.



## 4. REMOVE PISTON SEAL FROM BRAKE CYLINDER

Using a screwdriver, remove the piston seal.



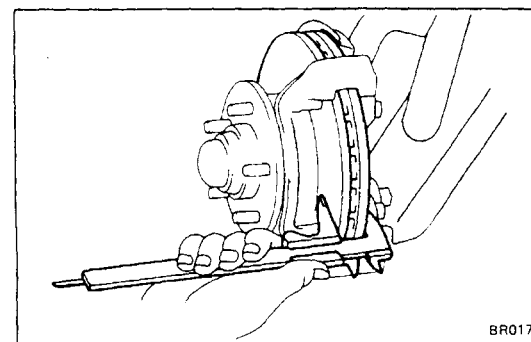
## INSPECTION AND REPAIR OF FRONT BRAKE COMPONENTS

### 1. MEASURE PAD LINING THICKNESS

Minimum thickness: 1.0 mm (0.039 in.)

Standard thickness: 10.0 mm (0.394 in.)

Replace the pad if the thickness is less than the minimum (the 1.0 mm slit is no longer visible) or if it shows sign of uneven wear.



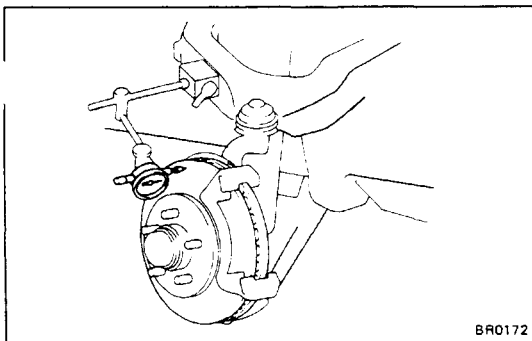
### 2. MEASURE ROTOR DISC THICKNESS

Minimum thickness: 24.0 mm (0.945 in.)

Standard thickness: 25.0 mm (0.984 in.)

If the disc is scored or worn, or if thickness is less than minimum, repair or replace the disc.





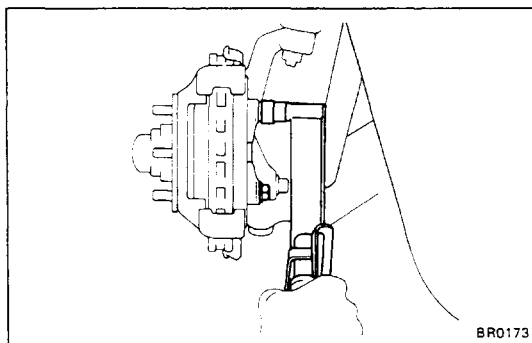
### 3. MEASURE ROTOR DISC RUNOUT

Measure the rotor disc runout at 10 mm (0.39 in.) from the outer edge of the rotor disc.

**Maximum disc runout: 0.15 mm (0.0059 in.)**

If the runout is greater than the maximum, replace the disc.

**NOTE:** Before measuring the runout, confirm that the front bearing play is within specification.



### 4. IF NECESSARY, REPLACE ROTOR DISC

(a) Remove the torque plate from the knuckle.

(b) Remove the axle hub. (See page FA-7)

(c) Remove the disc from the axle hub.

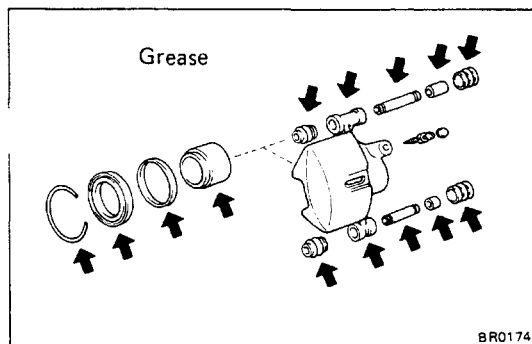
(d) Install a new rotor disc. Torque the bolts.

**Torque: 650 kg-cm (47 ft-lb, 64 N·m)**

(e) Install the axle hub and adjust the front bearing preload. (See page FA-8)

(f) Install the torque plate onto the knuckle.

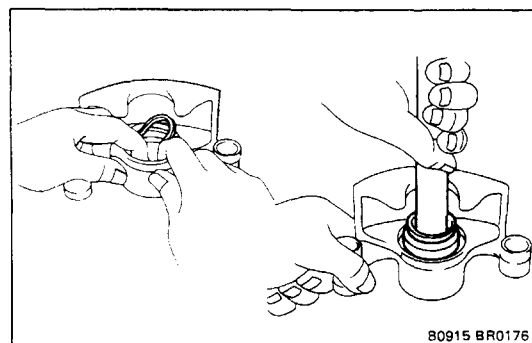
**Torque: 1,100 kg-cm (80 ft-lb, 108 N·m)**



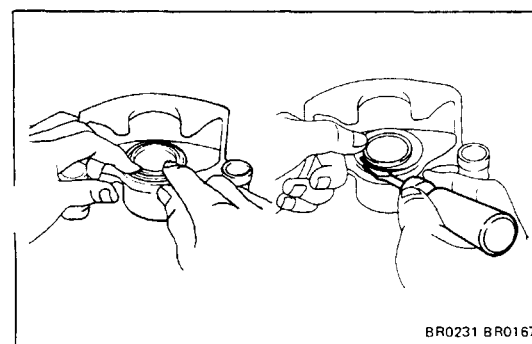
## ASSEMBLY OF CYLINDER

(See page BR-13)

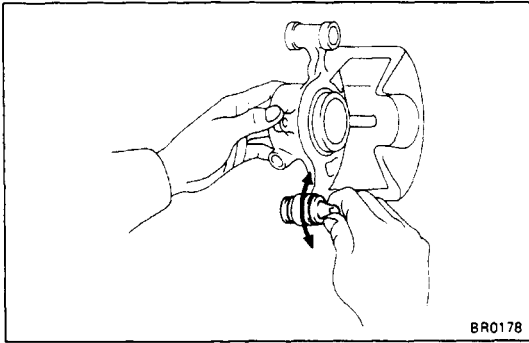
### 1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO PARTS INDICATED BY ARROWS



### 2. INSTALL PISTON SEAL AND PISTON IN CYLINDER



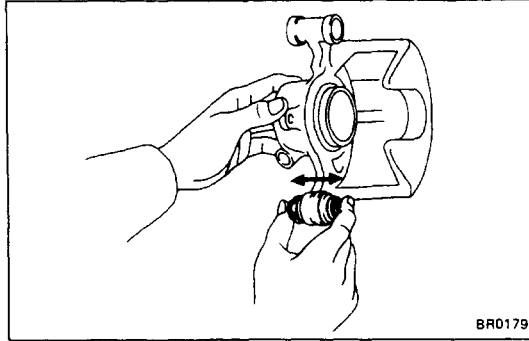
### 3. INSTALL CYLINDER BOOT AND SET RING IN CYLINDER



BR0178

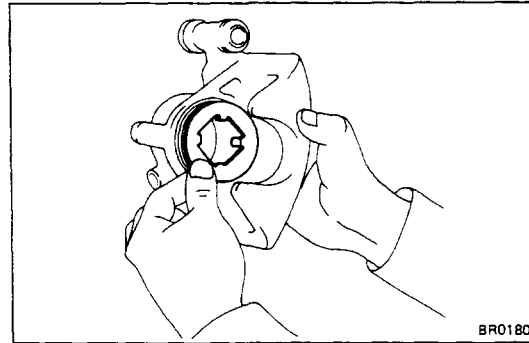
#### 4. INSTALL COLLAR, DUST BOOT AND CYLINDER SLIDE BUSHING

- (a) Install the collar and dust boots to the brake cylind.
- (b) Insure that the boots are secured firmly to each brake cylinder groove.



BR0179

- (c) Install the bushing into the boots.
- (d) Insure that the boots are secured firmly to each bushing groove.



BR0180

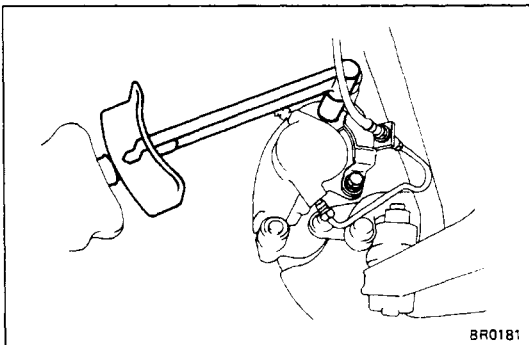
#### INSTALLATION OF CYLINDER

(See page BR-13)

1. INSTALL ANTI-SQUEAL SHIM TO PISTON
2. INSTALL PADS ANTI-RATTLE SPRINGS AND PAD SUPPORT PLATES (See steps 6 to 8 on page BR-14)
3. INSTALL CYLINDER  
(See step 9 on pages BR-14, 15)

#### 4. INSTALL BRACKET TO CYLINDER

Torque: 185 kg-cm (13 ft-lb, 18 N·m)



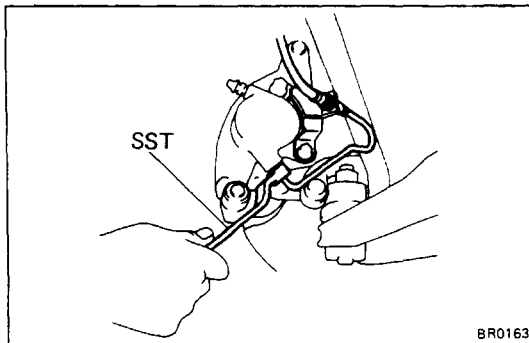
BR0181

#### 5. CONNECT BRAKE LINE

Using SST, connect the brake line.

SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)

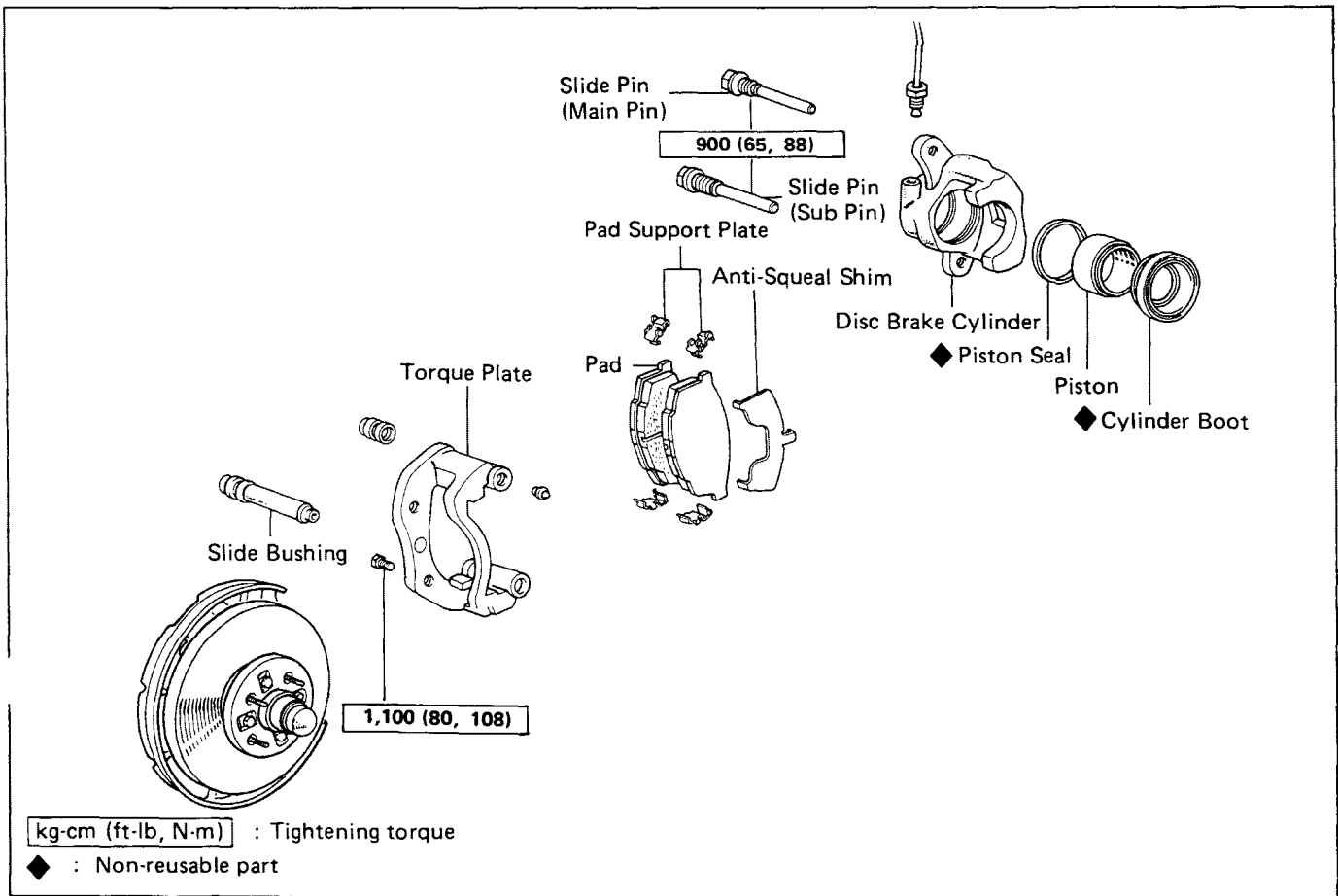


BR0163

#### 6. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR-6)

#### 7. CHECK FOR FLUID LEAKAGE

## FRONT BRAKE—2WD (FS17 Type Disc) COMPONENTS



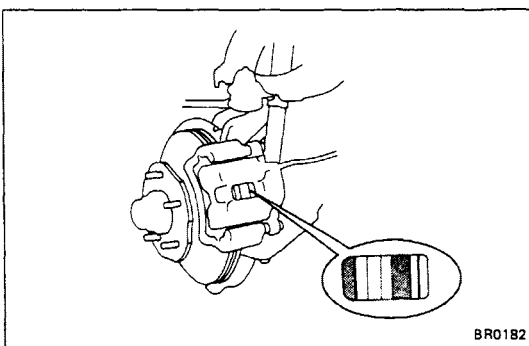
## REPLACEMENT OF BRAKE PADS

### 1. INSPECT PAD LINING THICKNESS

Check the pad thickness through the cylinder inspection hole and replace the pads if not within specification.

**Minimum thickness:** 1.0 mm (0.039 in.)

**Standard thickness:** 10.0 mm (0.394 in.)

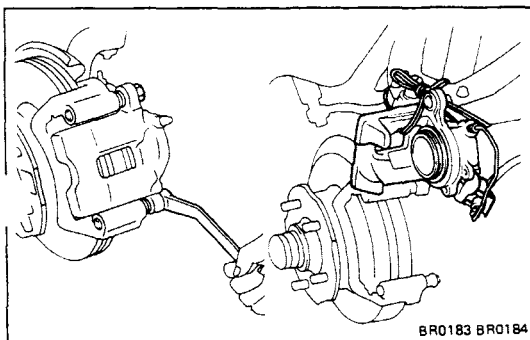


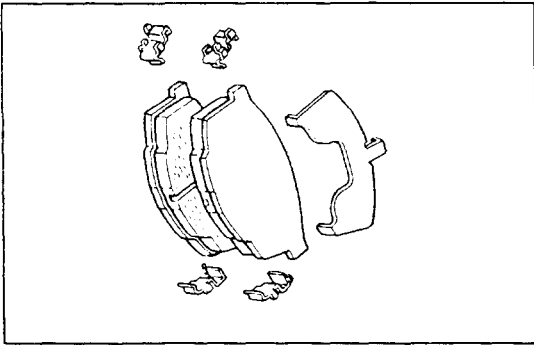
### 2. REMOVE CYLINDER SLIDE PIN ON SUB PIN SIDE

- Remove the cylinder slide pin on the sub pin side.
- Lift up the cylinder and support it.

#### NOTE:

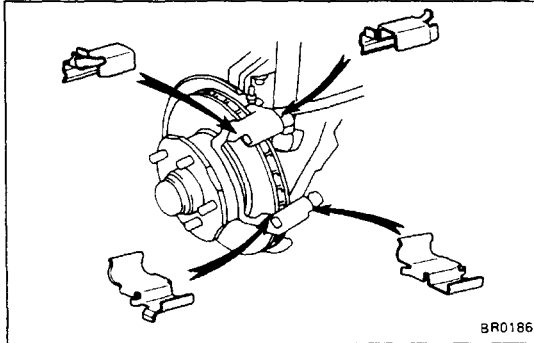
- Do not remove the cylinder slide pin on the main side unless necessary.
- Do not disconnect the brake hose.





### 3. REMOVE FOLLOWING PARTS:

- (a) Two brake pads
- (b) Anti-squeal shim
- (c) Four support plates



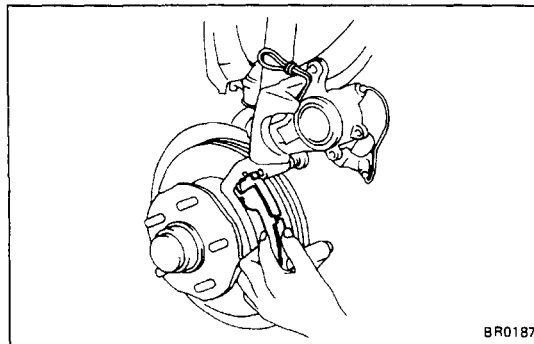
### 4. CHECK ROTOR DISC THICKNESS

(See step 2 on page BR-22)

### 5. CHECK ROTOR DISC RUNOUT

(See step 3 on page BR-22)

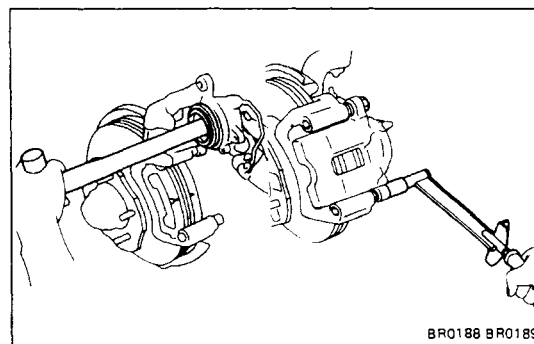
### 6. INSTALL NEW PAD SUPPORT PLATES



### 7. INSTALL NEW PADS

**CAUTION:** Do not allow oil or grease to get on the rubbing face.

- (a) Install a new anti-squeal shim toward the backside the outside pad.
- (b) Install the pads onto each support plate.



### 8. INSTALL CYLINDER

- (a) Draw out a small amount of brake fluid from the reservoir.

- (b) Press in piston with a hammer handle or such.

**NOTE:** Always change the pad on one wheel at a time as there is possibility of the opposite piston flying out.

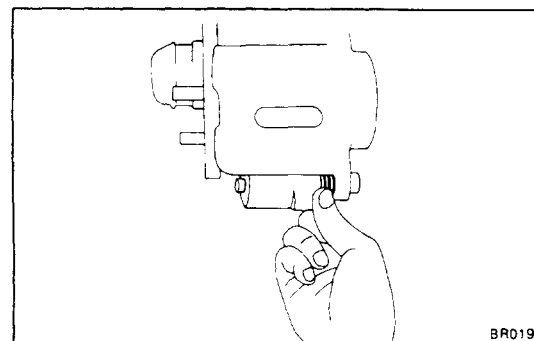
- (c) Insert the brake cylinder carefully so the dust boot is not wedged.

- (d) Install and torque the slide pin on the sub pin side.

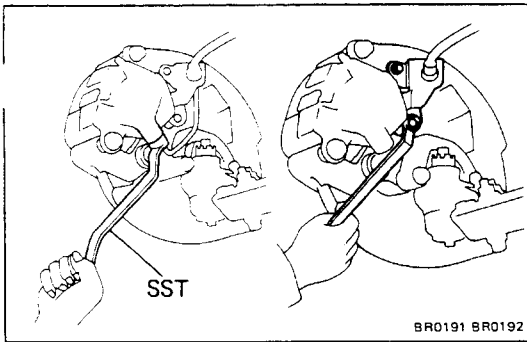
**Torque: 900 kg-cm (65 ft-lb, 88 N·m)**

**NOTE:**

- (1) Confirm the condition of the cylinder side bushing boot and pull on the boot to relieve the air from the cylinder side pin mounting area.
- (2) Confirm that the hole plug on the main pin side is installed and push on the center of the plug to relieve the air from the inner portion of the main pin.



### 9. CHECK THAT FLUID LEVEL IS AT MAX LINE

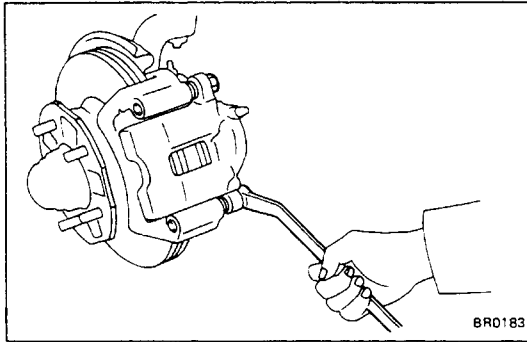


## REMOVAL OF CYLINDER

(See page BR-19)

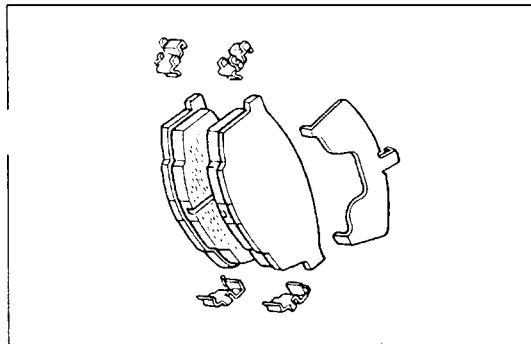
### 1. DISCONNECT BRAKE LINE

- (a) Using SST, disconnect the brake line.  
Use a container to catch the brake fluid.  
SST 09751-36011
- (b) Remove the bracket from the cylinder.



### 2. REMOVE CYLINDER

Remove the two slide pins and cylinder.



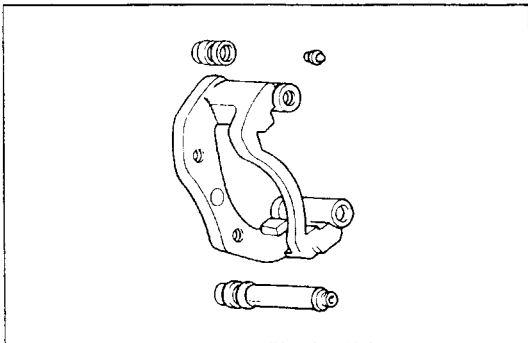
### 3. REMOVE BRAKE PADS

### 4. REMOVE ANTI-SQUEAL SHIM

### 5. REMOVE SUPPORT PLATES

### 6. IF NECESSARY, REMOVE FOLLOWING PARTS:

- (a) Slide bushing
- (b) Pin boots

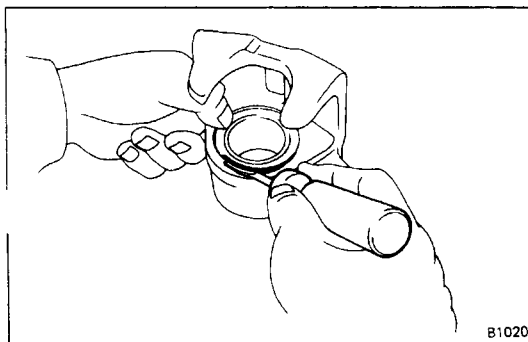


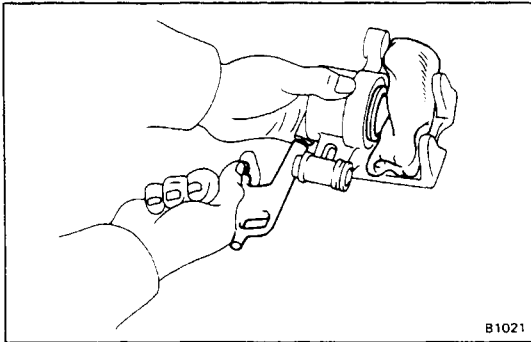
## DISASSEMBLY OF CYLINDER

(See page BR-19)

### 1. REMOVE CYLINDER BOOT SET RING AND BOOT

Using a screwdriver, remove the cylinder boot set ring and boot.

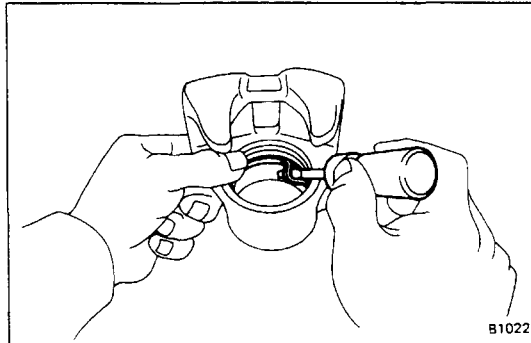




## 2. REMOVE PISTON FROM CYLINDER

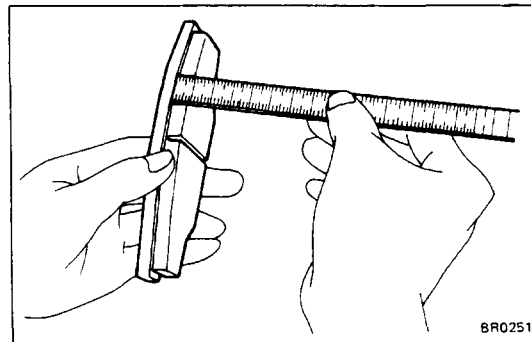
- (a) Put a piece of cloth or such between the piston and cylinder.
- (b) Use compressed air to remove the piston from the cylinder.

**WARNING:** Do not place your fingers in front of the piston when using compressed air.



## 3. REMOVE PISTON SEAL FROM BRAKE CYLINDER

Using a screwdriver, remove the piston seal.



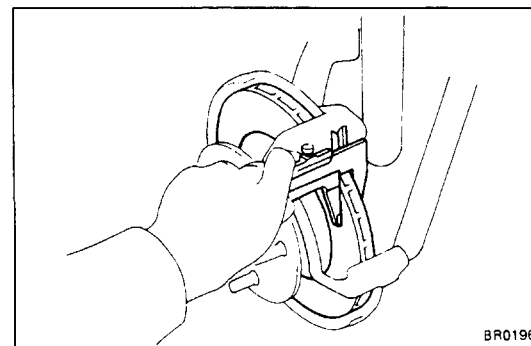
## INSPECTION AND REPAIR OF FRONT BRAKE COMPONENTS

### 1. MEASURE PAD LINING THICKNESS

**Minimum thickness:** 1.0 mm (0.039 in.)

**Standard thickness:** 10.0 mm (0.394 in.)

Replace the pad if the thickness is less than the minimum (the 1.0 mm slit is no longer visible) or if it shows sign of uneven wear.

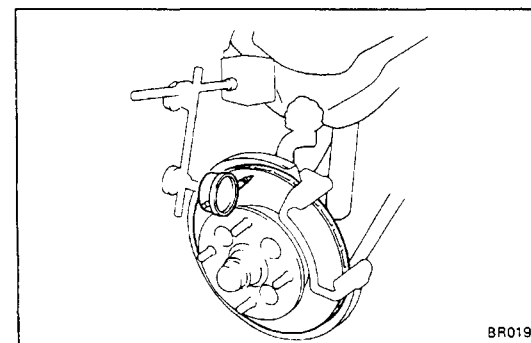


### 2. MEASURE ROTOR DISC THICKNESS

**Minimum thickness:** 21.0 mm (0.827 in.)

**Standard thickness:** 22.0 mm (0.866 in.)

If the disc thickness is less than minimum, replace the disc.



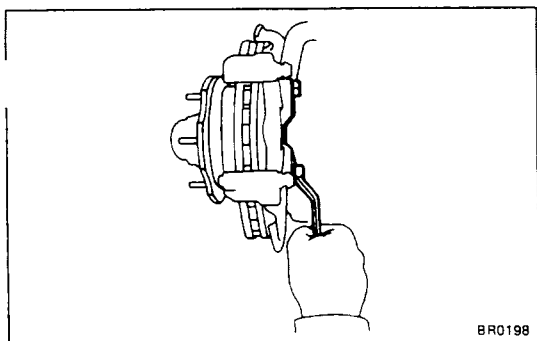
### 3. MEASURE ROTOR DISC RUNOUT

Measure the rotor disc runout at 10 mm (0.39 in.) from the outer edge of rotor disc.

**Maximum disc runout:** 0.15 mm (0.0059 in.)

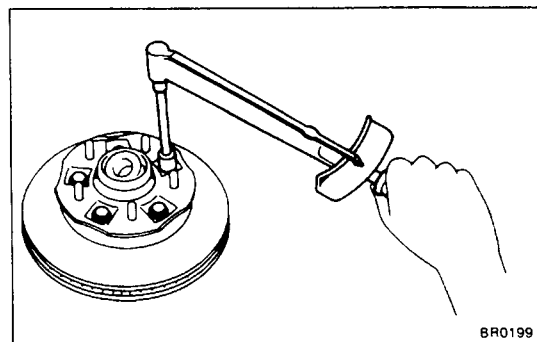
If the runout is greater than the maximum, replace the disc.

**NOTE:** Make sure the front bearing is adjusted correct before measuring the slit.



#### 4. IF NECESSARY, REPLACE ROTOR DISC

- (a) Remove the torque plate from the knuckle.
- (b) Remove the axle hub. (See page FA-7)
- (c) Remove the disc from the axle hub.



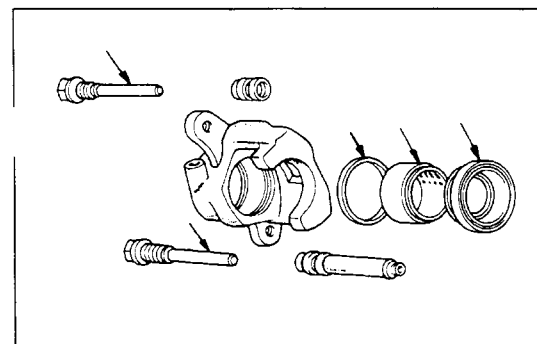
- (d) Install a new rotor disc. Torque the bolts.

**Torque: 650 kg-cm (47 ft-lb, 64 N·m)**

- (e) Install the axle hub and adjust the front bearing preload. (See page FA-8)

- (f) Install the torque plate onto the knuckle.

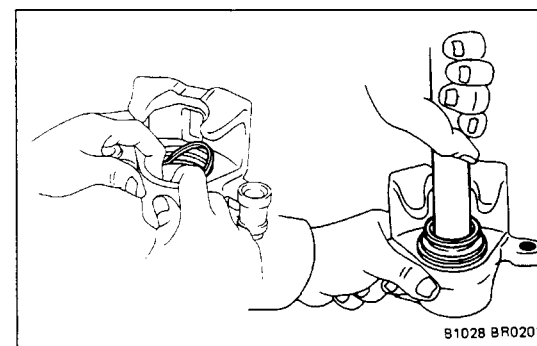
**Torque: 1,100 kg-cm (80 ft-lb, 108 N·m)**



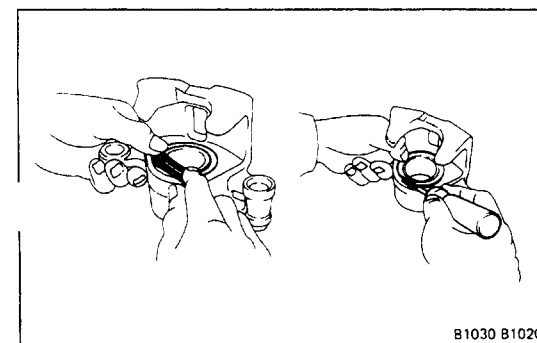
#### ASSEMBLY OF CYLINDER

(See page BR-19)

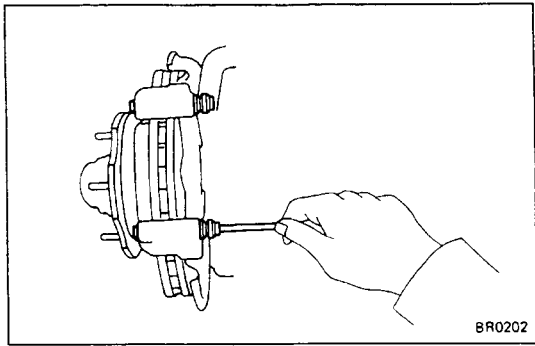
1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO PARTS INDICATED BY ARROWS



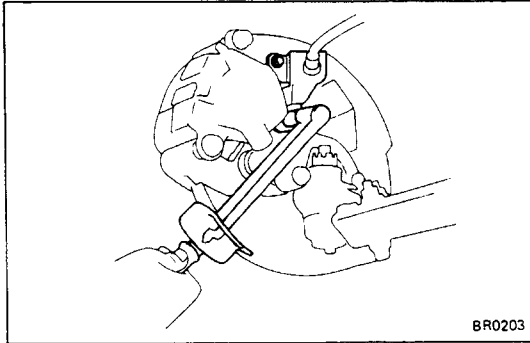
2. INSTALL PISTON SEAL AND PISTON IN CYLINDER



3. INSTALL CYLINDER BOOT AND SET RING IN CYLINDER

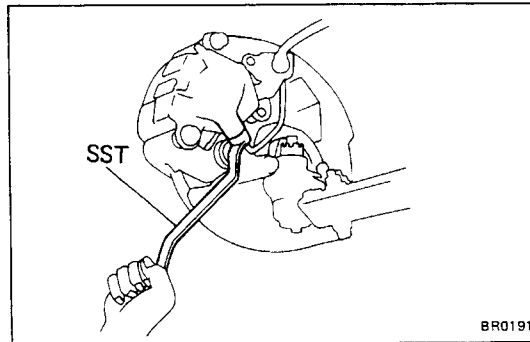
**4. INSTALL PIN BOOTS AND SLIDE BUSHING**

- (a) Install the pin boots to the torque plate of the main pin side.
- (b) Using a plastic bar, install the slide bushing into the torque plate of the sub pin side.

**INSTALLATION OF CYLINDER**

(See page BR-13)

1. **INSTALL PADS** (See step 7 on page BR-20)
2. **INSTALL CYLINDER**  
(See step 8 on page BR-20)
3. **INSTALL BRACKET TO CYLINDER**  
Torque: 185 kg-cm (13 ft-lb, 18 N·m)

**4. CONNECT BRAKE LINE**

Using SST, connect the brake line.

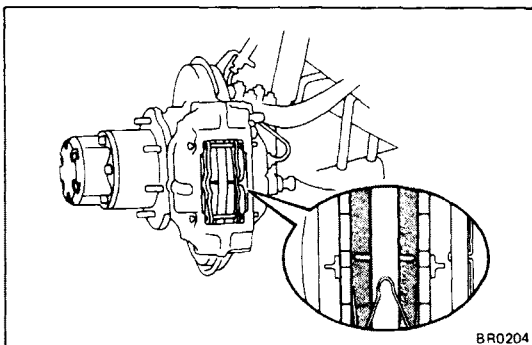
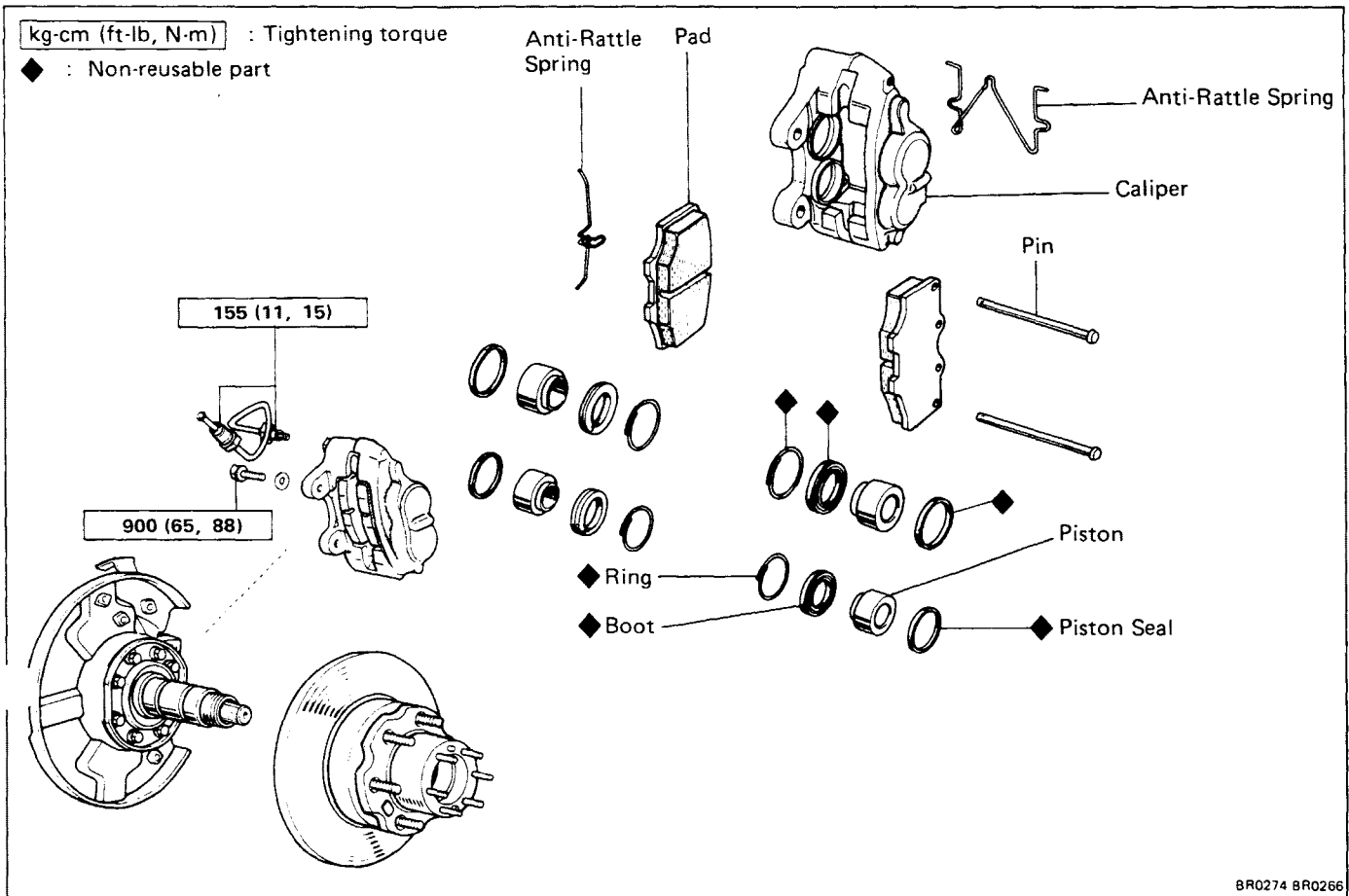
SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)

5. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM** (See page BR-6)
6. **CHECK FOR FLUID LEAKAGE**



## FRONT BRAKE—4WD (S12+8 Type Disc) COMPONENTS



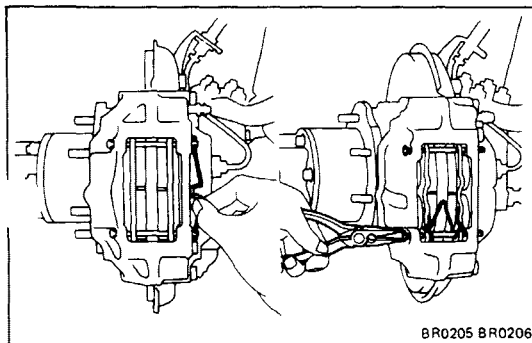
### REPLACEMENT OF BRAKE PADS

#### 1. INSPECT PAD LINING THICKNESS

Check the pad thickness through the cylinder inspection hole and replace pads if not within specification.

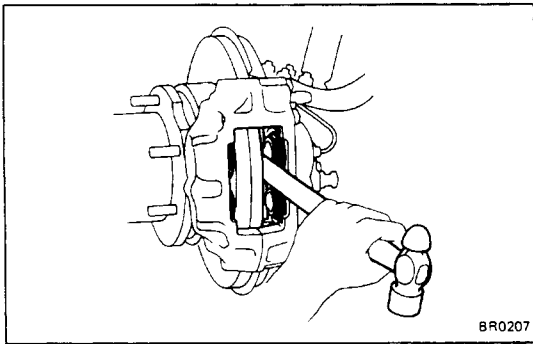
**Minimum thickness:** 1.0 mm (0.039 in.)

**Standard thickness:** 9.7 mm (0.382 in.)



#### 2. REMOVE FOLLOWING PARTS:

- (a) Anti-rattle clip
- (b) Two anti-rattle pins
- (c) Anti-rattle spring
- (d) Two pads

**3. CHECK ROTOR DISC THICKNESS**

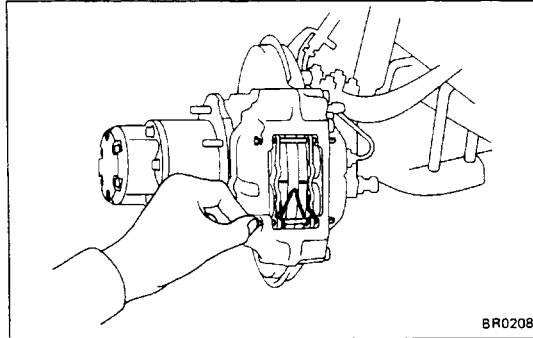
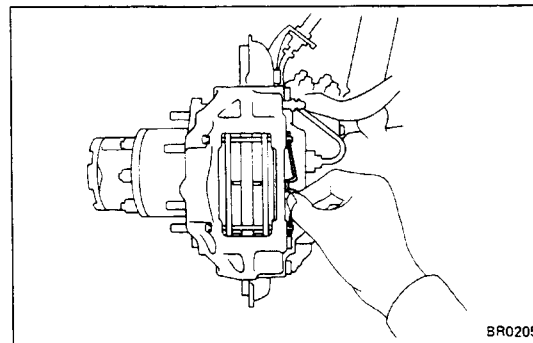
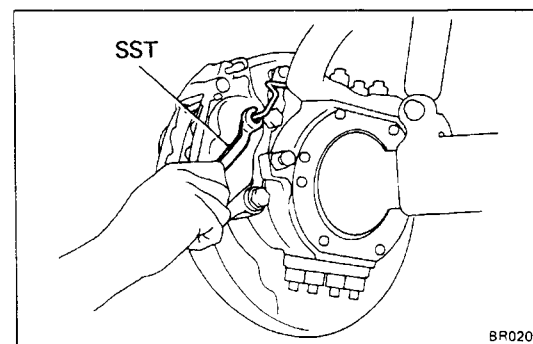
(See step 2 on page BR-28)

**4. CHECK ROTOR DISC RUNOUT**

(See step 3 on page BR-28)

**5. INSTALL NEW PADS**

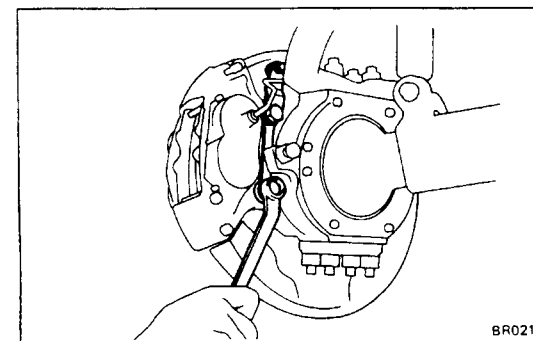
**CAUTION:** Do not allow oil or grease to get on the rubbing face.

**6. INSTALL ANTI-RATTLE SPRING****7. INSTALL TWO ANTI-RATTLE SPRING PINS****8. INSTALL ANTI-RATTLE SPRING****REMOVAL OF CYLINDER**

(See page BR-25)

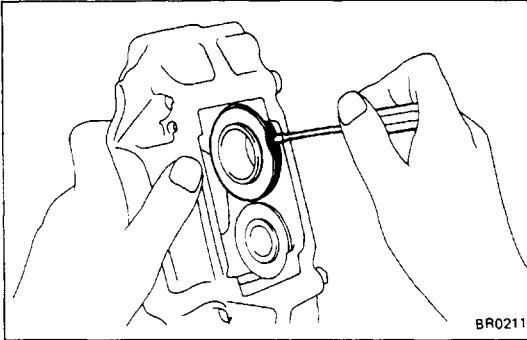
**1. DISCONNECT BRAKE LINE**

Using SST, disconnect the brake line.  
Use a container to catch the brake fluid.  
SST 09751-36011

**2. REMOVE CYLINDER**

Remove the two mounting bolts and cylinder.

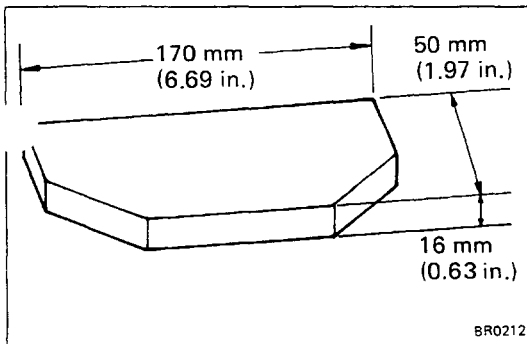
3. REMOVE ANTI-RATTLE SPRING
4. REMOVE ANTI-RATTLE SPRING PINS
5. REMOVE ANTI-RATTLE SPRING
6. REMOVE BRAKE PADS



## DISASSEMBLY OF CYLINDER

### 1. REMOVE CYLINDER BOOT SET RING AND BOOT

Using a screwdriver, remove the cylinder boot set ring and boot.

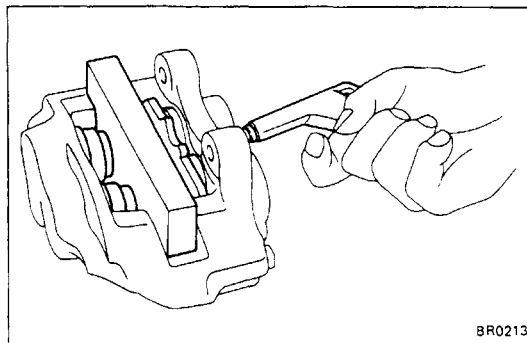


### 2. REMOVE PISTON FROM CYLINDER

- (a) Prepare the wooden plate as shown in the figure to hold the piston.

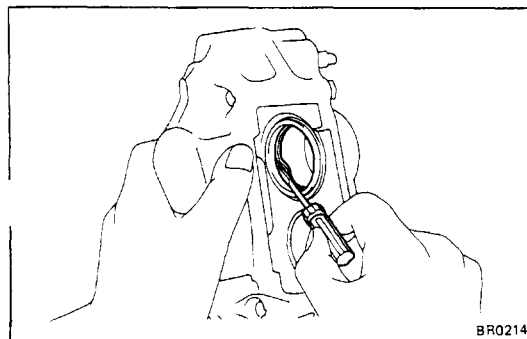
- (b) Place the plate between the pistons and insert a pad at one side.
- (c) Use compressed air to remove the pistons alternately from the cylinder.

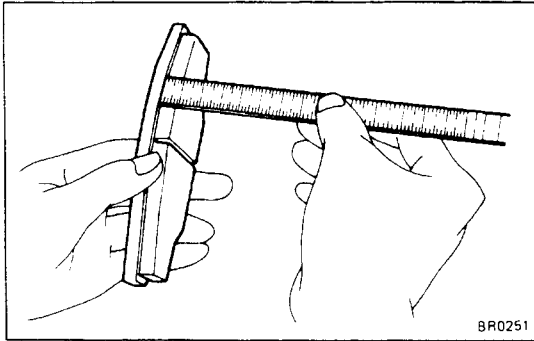
**WARNING:** Do not place your fingers in front of the piston when using compressed air.



### 3. REMOVE PISTON SEAL

Using a screwdriver, remove the seal from the cylinder.





BR0251

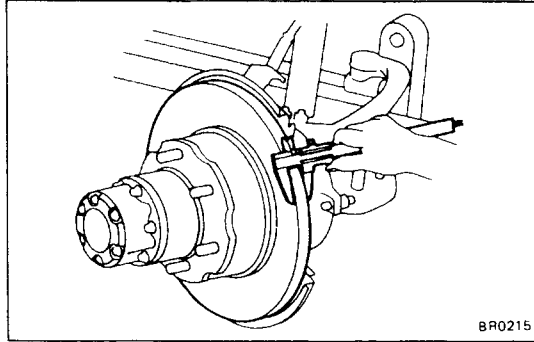
## INSPECTION AND REPAIR OF FRONT BRAKE COMPONENTS

### 1. MEASURE PAD LINING THICKNESS

**Minimum thickness:** 1.0 mm (0.039 in.)

**Standard thickness:** 9.7 mm (0.382 in.)

Replace the pad if the thickness is less than the minimum (the 1.0 mm slit is no longer visible) or if it shows sign of uneven wear.



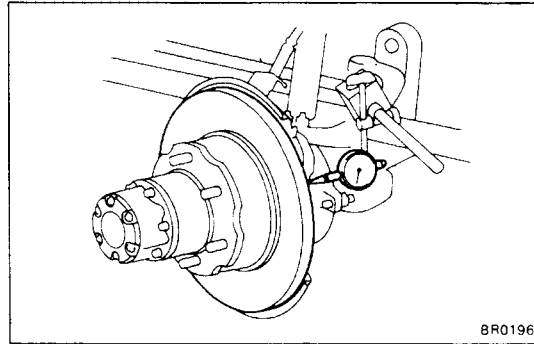
BR0215

### 2. MEASURE ROTOR DISC THICKNESS

**Minimum thickness:** 11.5 mm (0.453 in.)

**Standard thickness:** 12.5 mm (0.492 in.)

If the disc is scored or worn, or if thickness is less than minimum, repair or replace the disc.



BR0196

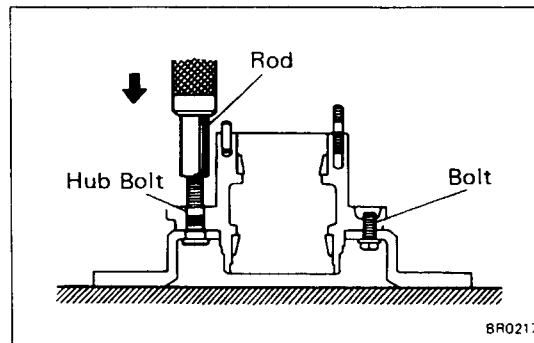
### 3. MEASURE ROTOR DISC RUNOUT

Measure the rotor disc runout at 10 mm (0.39 in.) from the outer edge of the rotor disc.

**Maximum disc runout:** 0.15 mm (0.0059 in.)

If the runout is greater than the maximum, replace the disc.

**NOTE:** Before measuring the runout, confirm that the front bearing play is within specification.



BR0217

### 4. IF NECESSARY, REPLACE DISC

(a) Remove the axle hub. (See page FA-45)

(b) Using rod, press the hub bolts out of the axle hub.

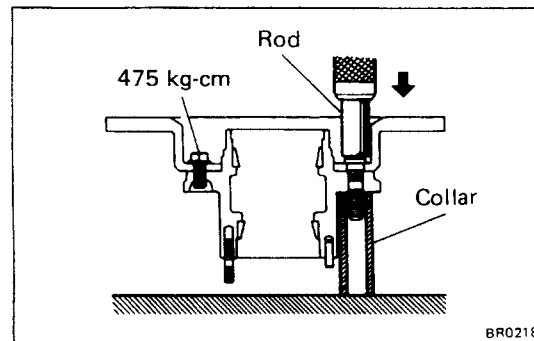
(c) Remove the two bolts and separate the disc and hub.

(d) Install a new disc to the axle hub and tighten the two bolts.

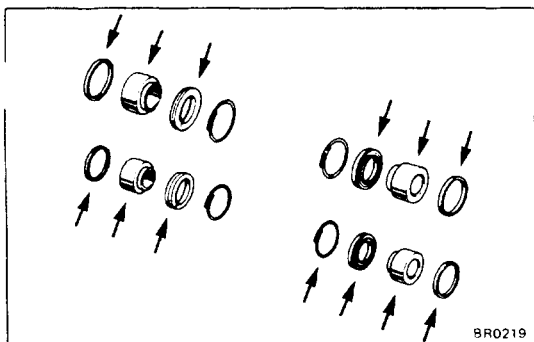
**Torque:** 475 kg-cm (34 ft-lb, 47 N·m)

(e) Using a collar and rod, press the hub bolts into the hub.

(f) Install the axle hub and adjust the front bearing preload. (See page FA-46)



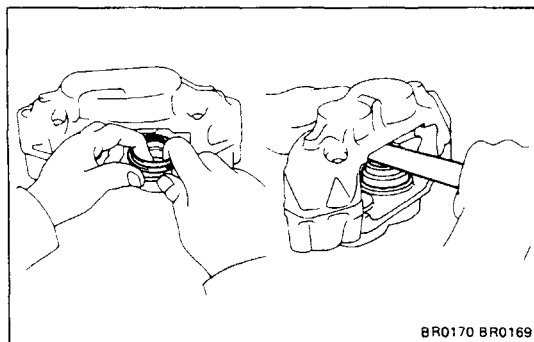
BR0218



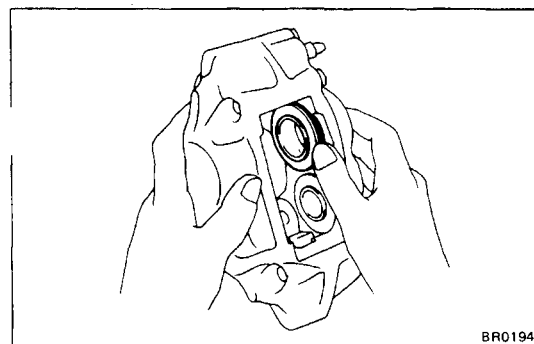
## ASSEMBLY OF CYLINDER

(See page BR-25)

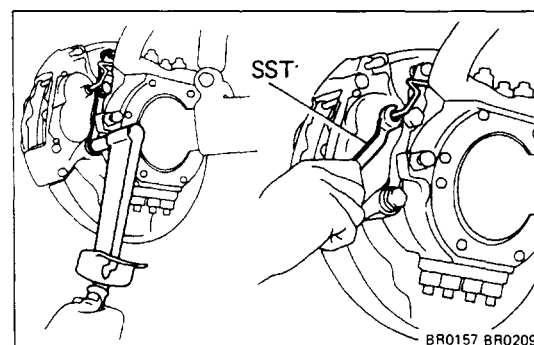
1. **APPLY LITHIUM SOAP BASE GLYCOL GREASE TO PARTS INDICATED BY ARROWS**



2. **INSTALL PISTON SEAL AND PISTON IN CYLINDER**



3. **INSTALL CYLINDER BOOT AND SET RING IN CYLINDER**



## INSTALLATION OF CYLINDER

(See page BR-25)

1. **INSTALL PADS, ANTI-RATTLE SPRING PINS AND ANTI-RATTLE SPRINGS**  
(See steps 5 to 8 on page BR-26)

2. **INSTALL CYLINDER**

Install and torque the mounting bolts.

Torque: 900 kg-cm (65 ft-lb, 88 N·m)

3. **CONNECT BRAKE LINE**

Using SST, connect the brake line.

SST 09751-36011

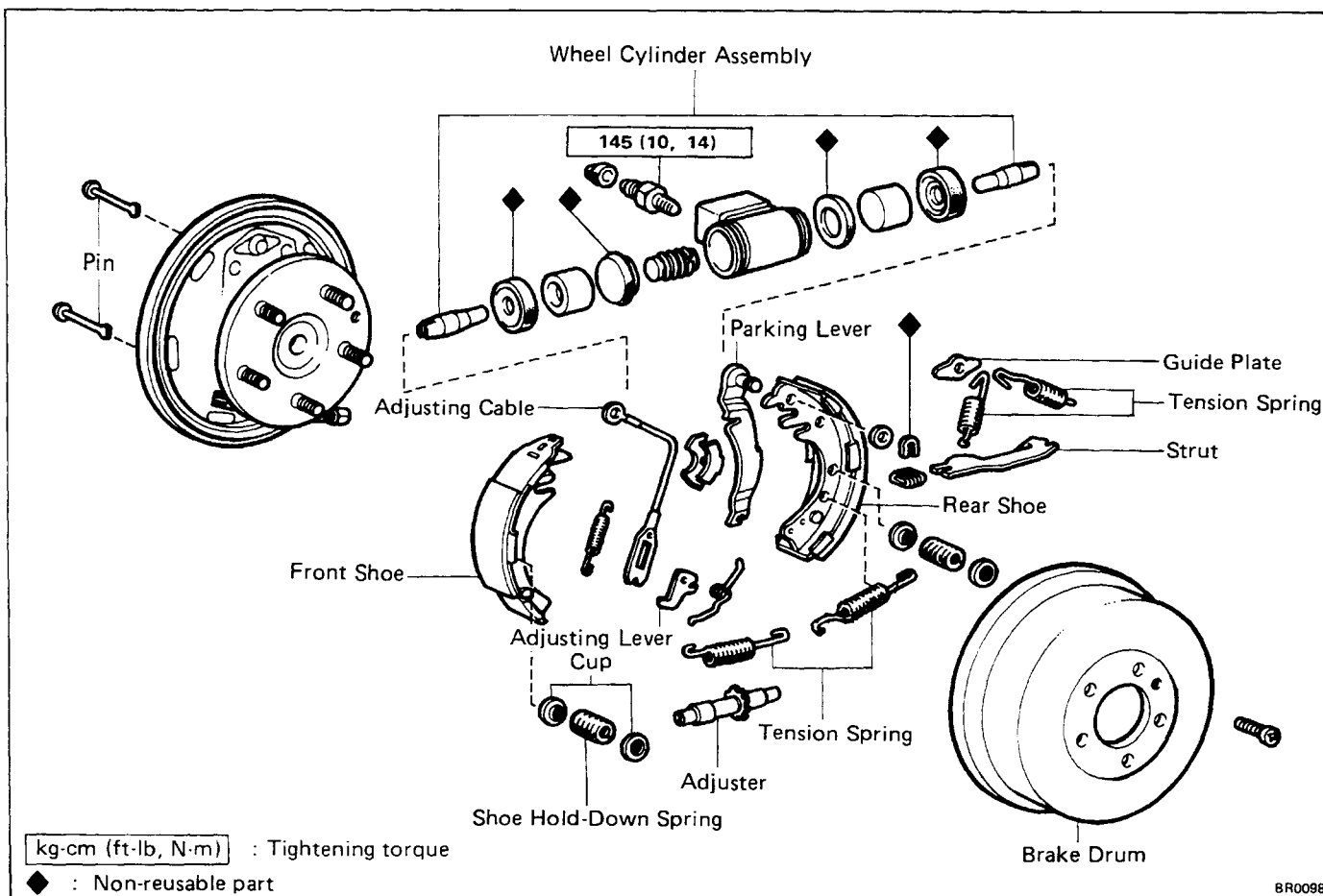
Torque: 155 kg-cm (11 ft-lb, 15 N·m)

4. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM**  
(See page BR-6)

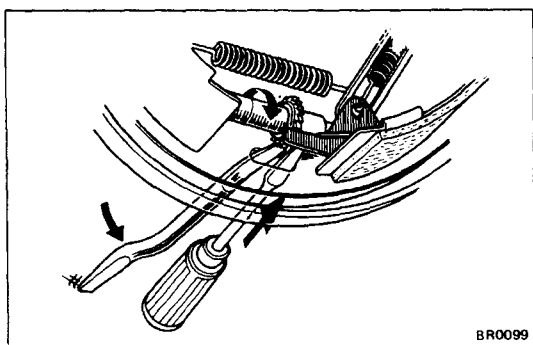
5. **CHECK FOR FLUID LEAKAGE**

## REAR BRAKE — 2WD (Duo-Servo Type)

### COMPONENTS



BR0098



BR0099

### REMOVAL OF REAR BRAKE

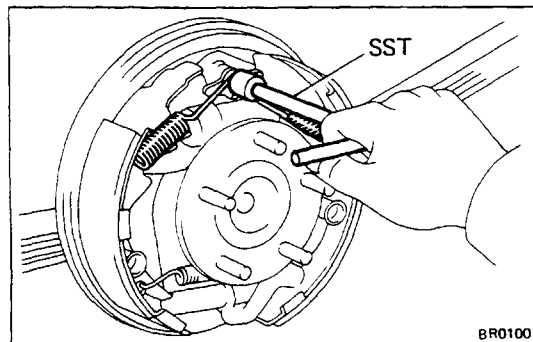
#### 1. REMOVE REAR WHEEL AND BRAKE DRUM

NOTE: If the brake drum cannot be removed easily, perform the following steps:

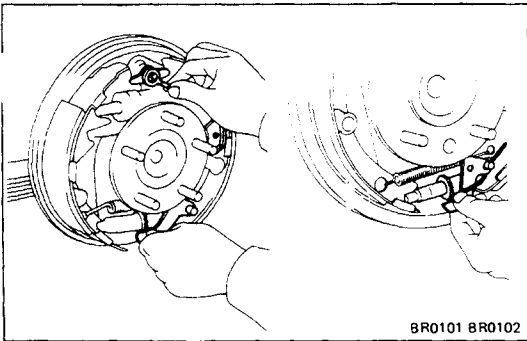
- Insert a screwdriver through the hole in the backing plate, and hold the adjuster lever away from the adjuster.
- Using another screwdriver, reduce the brake shoe adjustment by turning the adjusting bolt.

#### 2. REMOVE TWO SHOE RETURN SPRINGS

Using SST, remove the two return springs.  
SST 09717-20010

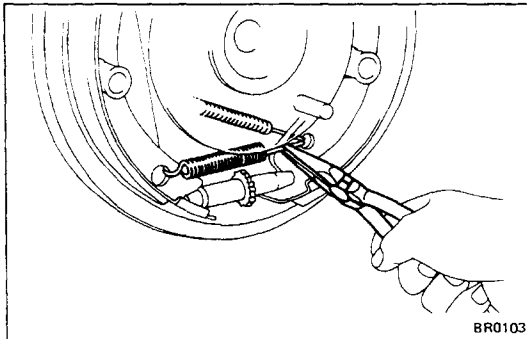


BR0100



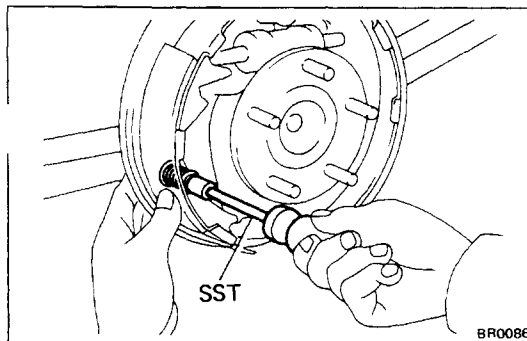
### 3. REMOVE ADJUSTING CABLE, SHOE GUIDE PLATE, CABLE GUIDE AND ADJUSTING LEVER

- (a) Push up the lever and remove the cable, shoe guide plate and cable guide.
- (b) Take off the spring from the lever and remove the lever and spring.



### 4. REMOVE TWO TENSION SPRINGS

Using pliers, remove the two tension springs.

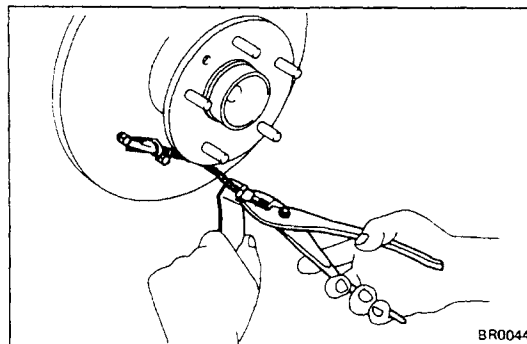


### 5. REMOVE SHOES, ADJUSTER AND STRUT

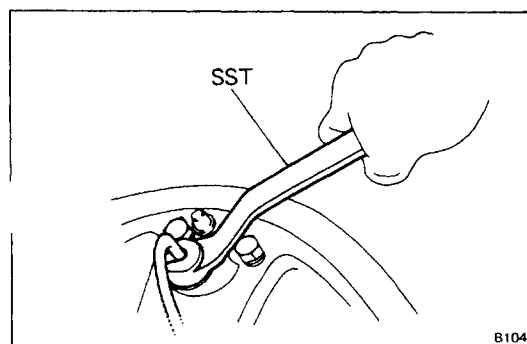
- (a) Using SST, remove the shoe hold-down springs and pins.

SST 09718-00010

- (b) Remove the shoes, adjuster and strut.



- (c) Disconnect the parking brake cable from the parking brake lever.

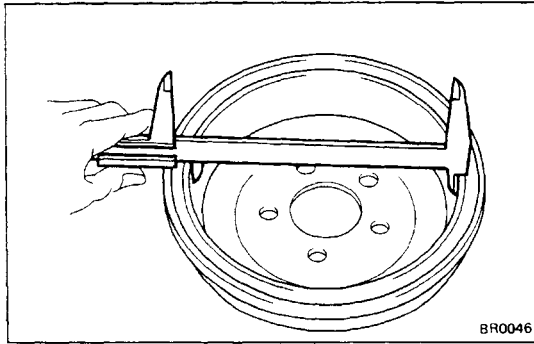


### 6. IF NECESSARY, REMOVE AND DISASSEMBLE WHEEL CYLINDER

- (a) Using SST, disconnect the line.  
Use a container to catch the brake fluid.

SST 09751-36011

- (b) Remove the two bolts and the wheel cylinder.
- (c) Remove the two rods, boots, pistons, piston cups and one spring from the cylinder.



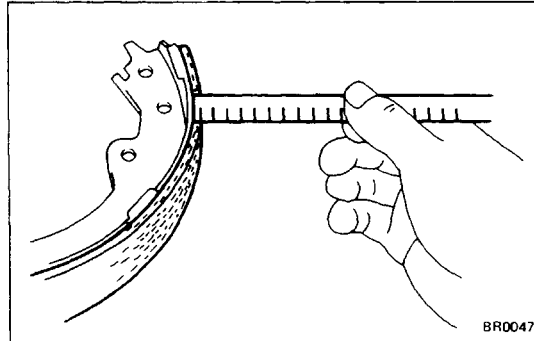
## INSPECTION OF REAR BRAKE COMPONENTS

### 1. MEASURE BRAKE DRUM INSIDE DIAMETER

**Maximum inside diameter:** 256.0 mm (10.079 in.)

**Standard inside diameter:** 254.0 mm (10.000 in.)

If the drum is scored or worn, the brake drum may be lathed to the maximum inside diameter.



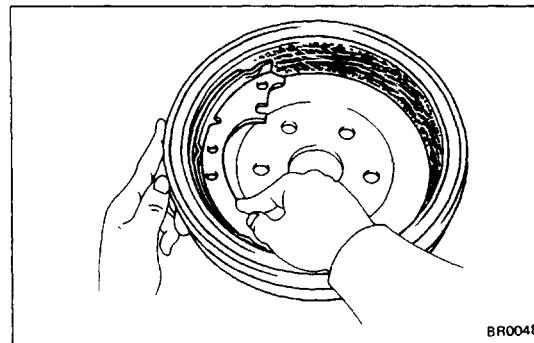
### 2. MEASURE BRAKE SHOE LINING THICKNESS

**Minimum thickness:** 1.0 mm (0.039 in.)

**Standard thickness:** 5.0 mm (0.197 in.)

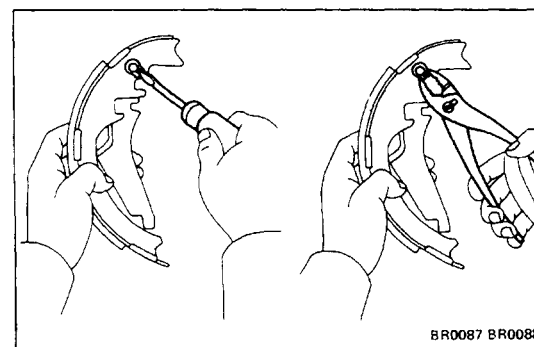
If the shoe lining is less than minimum or shows signs of uneven wear, replace the brake shoes.

**NOTE:** If any brake shoe has to be replaced, replace all the rear brake shoes to maintain effective brakes.



### 3. INSPECT BRAKE LINING AND DRUM FOR PROPER CONTACT

Replace the brake shoe or turn the brake drum, as necessary.



### 4. IF NECESSARY, REPLACE BRAKE SHOES

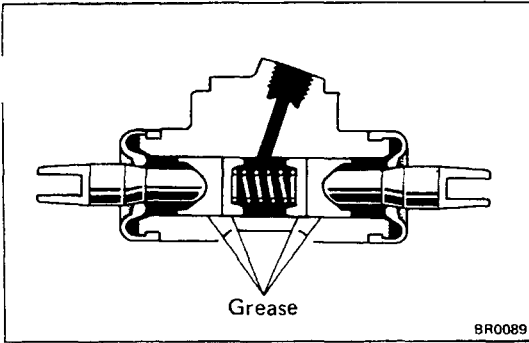
(a) Using a screwdriver, remove the parking brake lever from the front shoe.

(b) Using pliers, install the parking brake lever with a new C-washer.

### 5. INSPECT WHEEL CYLINDER FOR CORROSION OR DAMAGE

### 6. INSPECT BACKING PLATE FOR WEAR OR DAMAGE



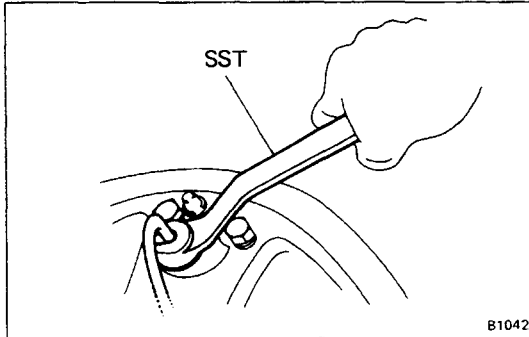


## ASSEMBLY OF REAR BRAKES

(See page BR-30)

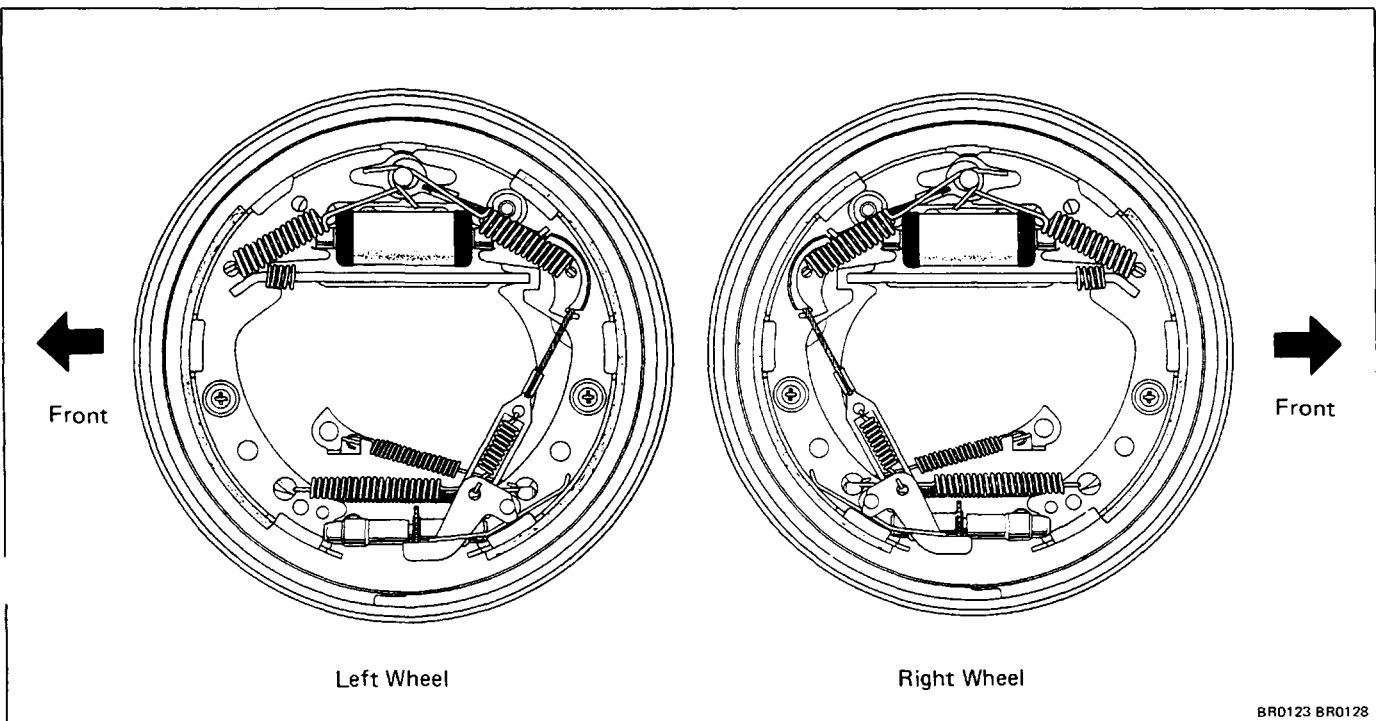
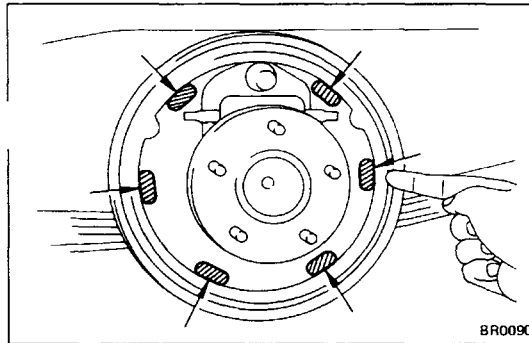
### 1. IF NECESSARY, ASSEMBLE AND INSTALL WHEEL CYLINDER

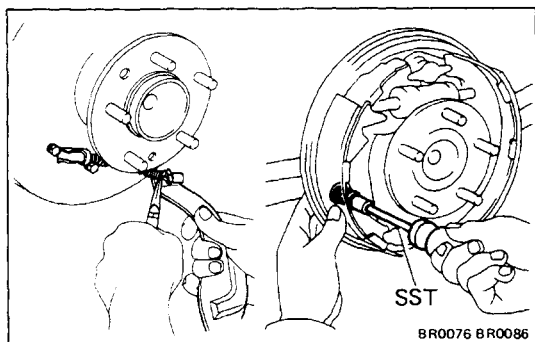
- (a) Apply lithium soap base glycol grease to the piston cups and piston.  
Install the spring and two piston cups in the wheel cylinder.  
Make sure flanges of the cups are pointed inward.
- (b) Install the two pistons, boots and rods in the cylinder.
- (c) Install the wheel cylinder on the backing plate with two bolts.
- (d) Using SST, connect the brake line.  
SST 09751-36011



### 2. APPLY GREASE ON BACKING PLATE, AS SHOWN

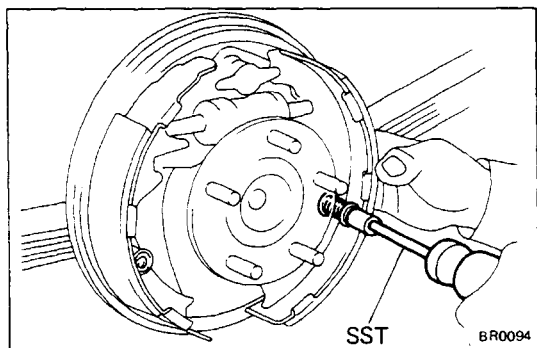
Use high-temperature type grease.





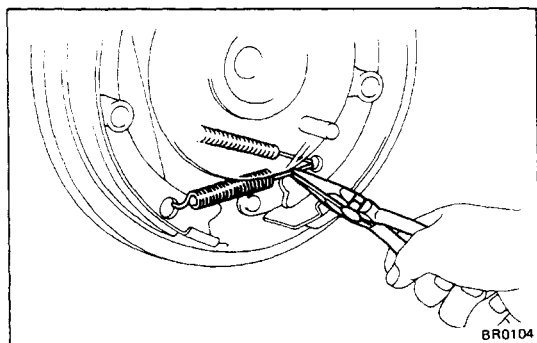
### 3. INSTALL REAR SHOE

- (a) Install the parking brake cable to the parking brake lever.
  - (b) Set the rear brake shoe in place with the end of the shoe inserted in the piston rod.  
Using SST, install the shoe hold-down spring and pin.
- SST 09718-00010



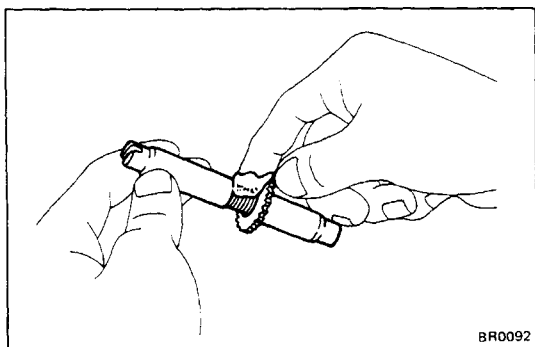
### 4. INSTALL STRUT AND FRONT SHOE

- (a) Install the strut with the spring rearward.
  - (b) Set the front brake shoe in place with the end of the shoe inserted in the piston rod and the strut in place.  
Using SST, install the shoe hold-down spring and pin.
- SST 09718-00010



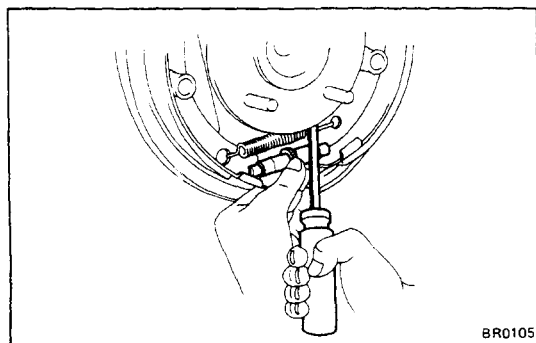
### 5. INSTALL TWO TENSION SPRINGS

Using pliers, install the two tension springs.



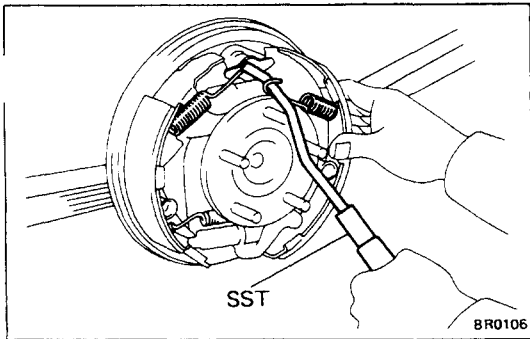
### 6. APPLY GREASE TO ADJUSTER BOLT THREADS AND END

Use high-temperature type grease.



### 7. INSTALL ADJUSTER

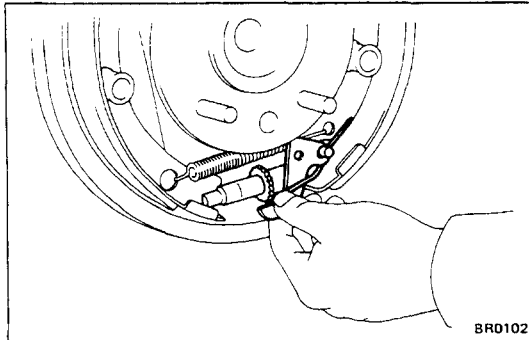
Using a screwdriver, open the shoes and install the adjuster.



## 8. INSTALL SHOE GUIDE PLATE, CABLE GUIDE, ADJUSTING CABLE AND RETURN SPRINGS

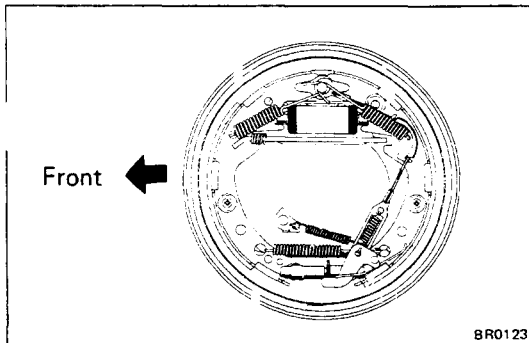
- Install the shoe guide plate, cable guide and adjusting cable.
- Using SST, install the front return spring and then install the rear return spring.

SST 09718-20010



## 9. INSTALL ADJUSTING LEVER

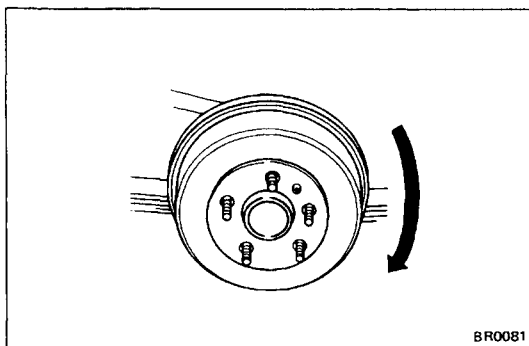
- Install the tension spring to the rear shoe.
- Hook the adjusting lever with the cable and install the lever.
- Hold the adjusting lever with the tension spring.



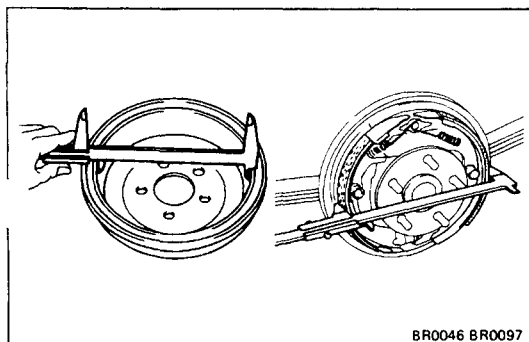
## 10. CHECK OPERATION OF AUTOMATIC ADJUSTER MECHANISM

- Pull the adjusting cable backward as shown, and release.  
Check that the adjusting bolt turns.

If the bolt does not turn, check for incorrect installation of the rear brakes.



- Adjust the strut to the shortest possible length.
- Install the drum.
- Turn the brake drum in reverse direction and depress the brake pedal. Repeat this procedure several times.



## 11. CHECK CLEARANCE BETWEEN BRAKE SHOES AND DRUM

- Remove the drum.
- Measure the brake drum inside diameter and diameter of the brake shoes. Check that the difference between the diameters is the correct shoe clearance.

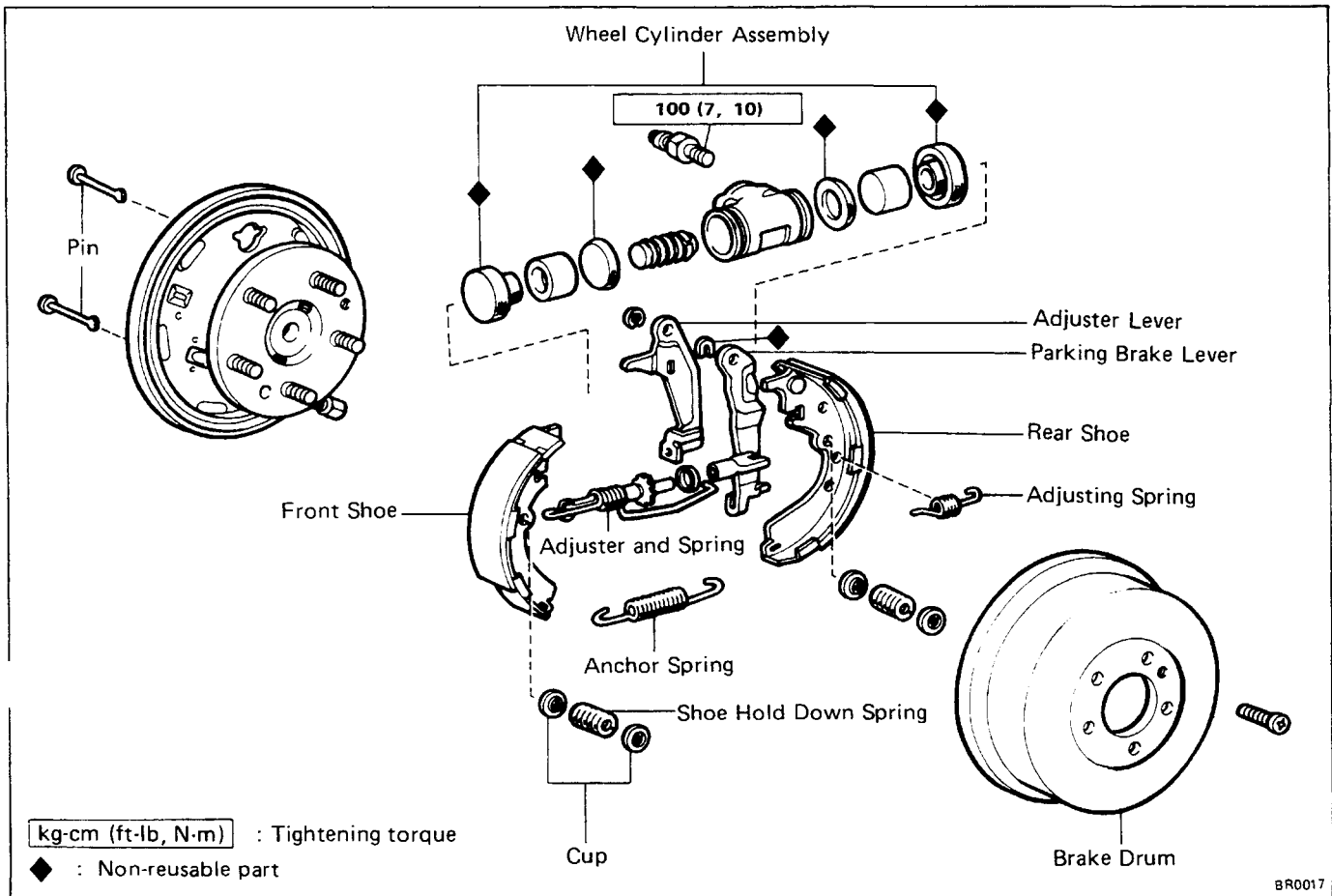
**Shoe clearance: 0.6 mm (0.024 in.)**

If incorrect, check the parking brake system.

**12. INSTALL BRAKE DRUM**

- 13. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND  
BLEED BRAKE SYSTEM**  
(See page BR-6)

## REAR BRAKE — 2WD (Leading-Trailing Type) COMPONENTS



## REMOVAL OF REAR BRAKE

### 1. REMOVE BRAKE DRUM

NOTE: If the brake drum cannot be removed easily, perform the following steps:

- Insert a hook through the hole in the backing plate, and hold the adjust lever away from the adjuster.
- Using a screwdriver, reduce the brake shoe adjustment by turning the adjuster.

### 2. REMOVE FRONT BRAKE SHOE AND ADJUSTER

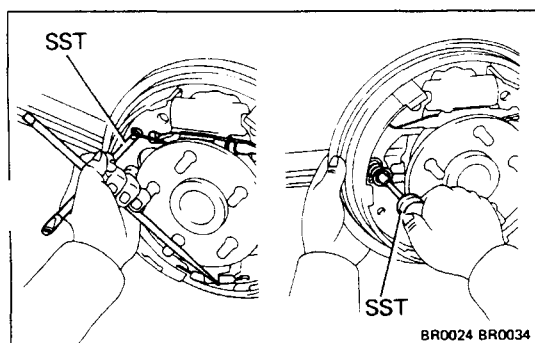
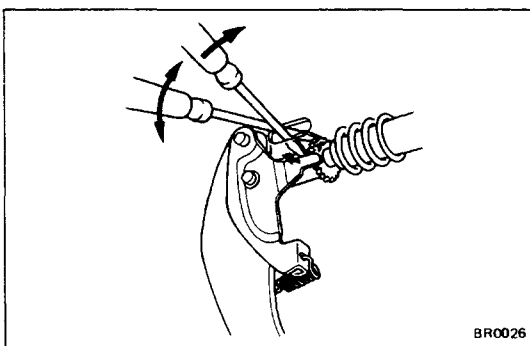
- Using SST, remove the return spring adjuster.

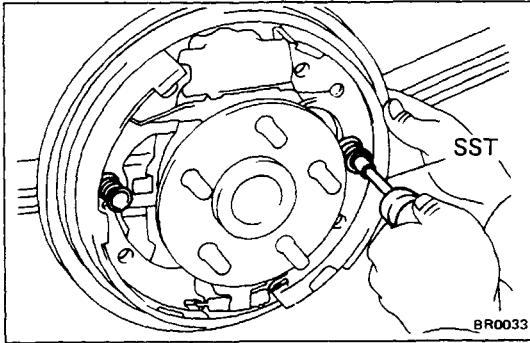
SST 09703-30010

- Using SST, remove the front shoe hold-down spring and pin.

SST 09718-00010

- Remove the front brake shoe and anchor spring.

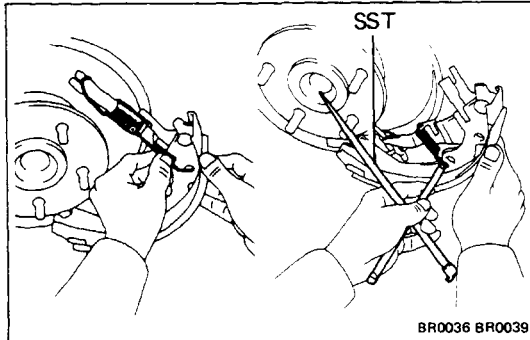




### 3. REMOVE REAR BRAKE SHOE, LEVER AND STRUT

- (a) Using SST, remove the hold-down spring and pin, and remove the rear shoe.

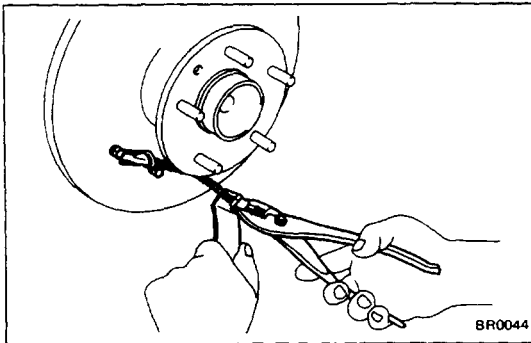
SST 09718-00010



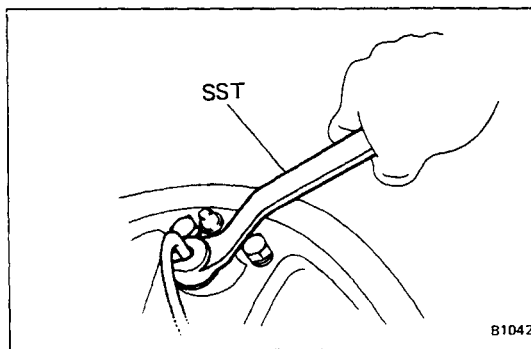
- (b) Remove the strut and spring from the parking brake lever.

- (c) Using SST, remove the adjusting lever spring.

SST 09703-30010



- (d) Remove the parking brake cable from the parking brake lever.



### 4. IF NECESSARY, REMOVE AND DISASSEMBLE WHEEL CYLINDER

- (a) Using SST, disconnect the line.  
Use a container to catch the brake fluid.

SST 09751-36011

- (b) Remove the two bolts and the wheel cylinder.

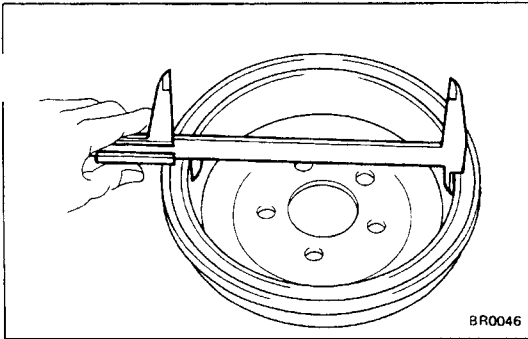
- (c) Remove the two boots, two pistons, two piston cups and spring from the cylinder.

**INSPECTION OF REAR BRAKE COMPONENTS****1. MEASURE BRAKE DRUM INSIDE DIAMETER**

**Maximum inside diameter:** 256.0 mm (10.079 in.)

**Standard inside diameter:** 254.0 mm (10.000 in.)

If the drum is scored or worn, the brake drum may be lathed to the maximum inside diameter.

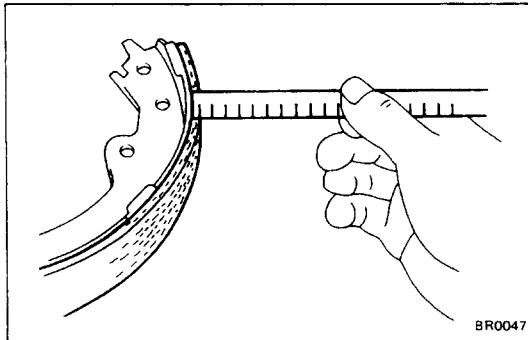
**2. MEASURE BRAKE SHOE LINING THICKNESS**

**Minimum thickness:** 1.0 mm (0.039 in.)

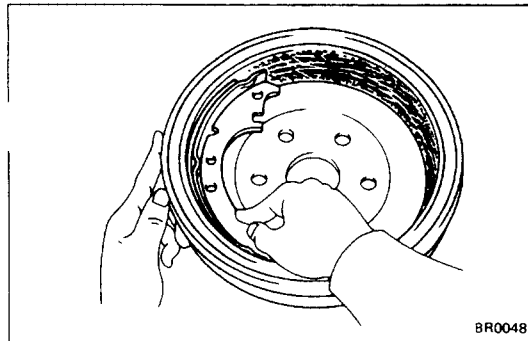
**Standard thickness:** 5.0 mm (0.197 in.)

If the shoe lining is less than minimum or shows signs of uneven wear, replace the brake shoes.

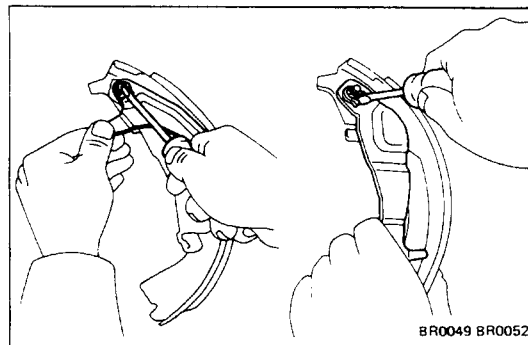
**NOTE:** If any brake shoe has to be replaced, replace all the rear brake shoes to maintain effective brakes.

**3. INSPECT BRAKE LINING AND DRUM FOR PROPER CONTACT**

Replace the brake shoe or turn the brake drum, as necessary.

**4. IF NECESSARY, REPLACE BRAKE SHOES**

- (a) Using a screwdriver, remove the parking brake lever and automatic adjusting lever from the front shoe.
- (b) Using pliers, install the parking brake lever with a new C-washer, and install the automatic adjusting lever with an E-ring.

**5. INSPECT WHEEL CYLINDER FOR CORROSION OR DAMAGE****6. INSPECT BACKING PLATE FOR WEAR OR DAMAGE**

**ASSEMBLY OF REAR BRAKE**

(See page BR-37)

**1. IF NECESSARY, ASSEMBLE AND INSTALL WHEEL CYLINDER**

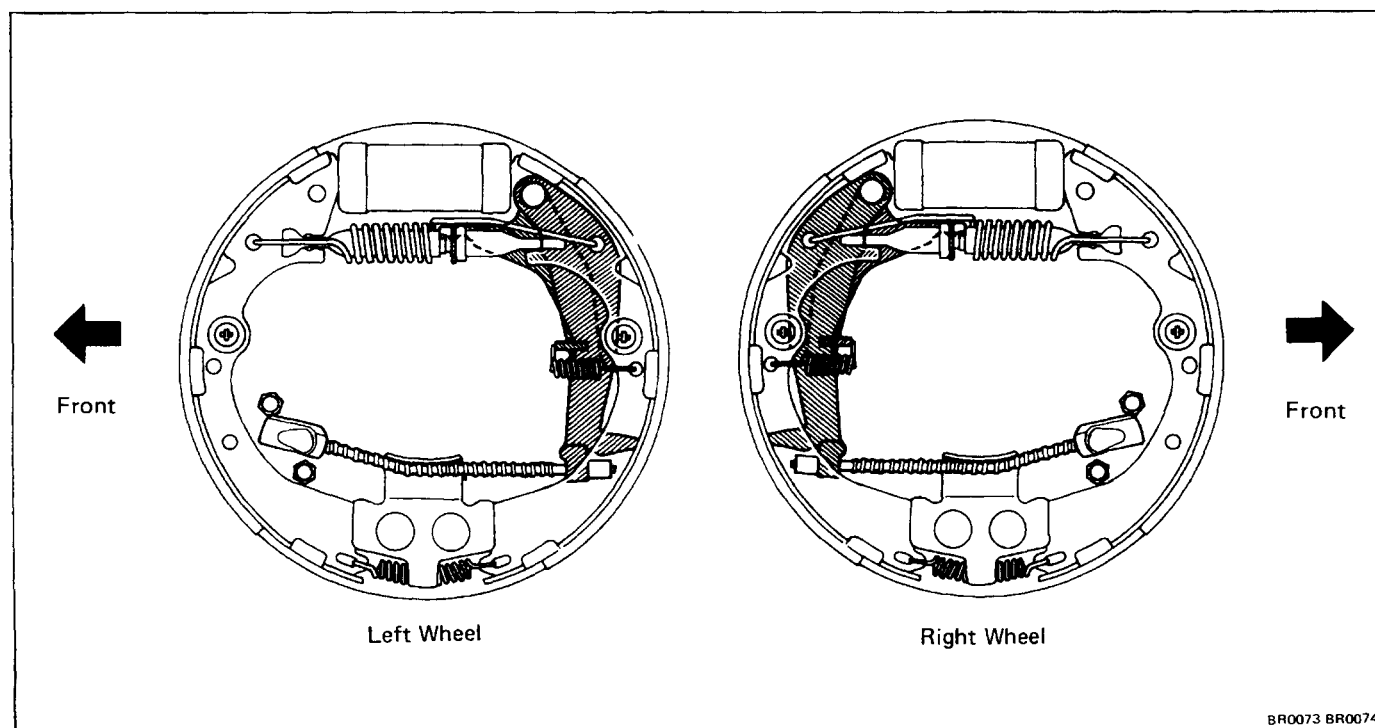
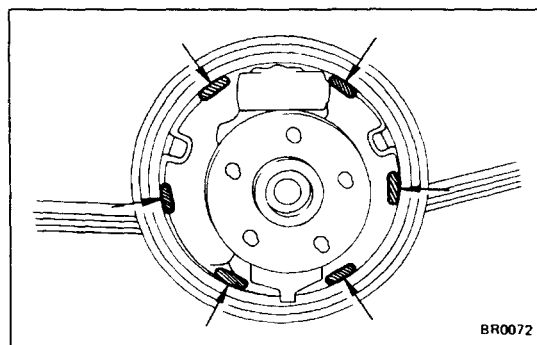
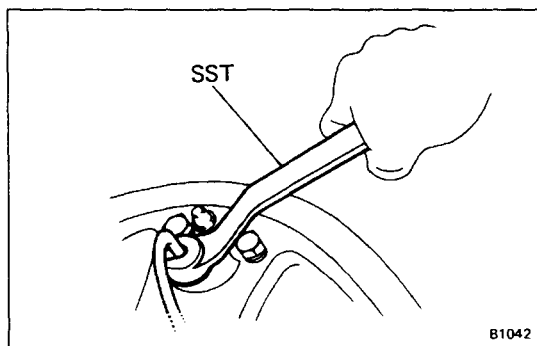
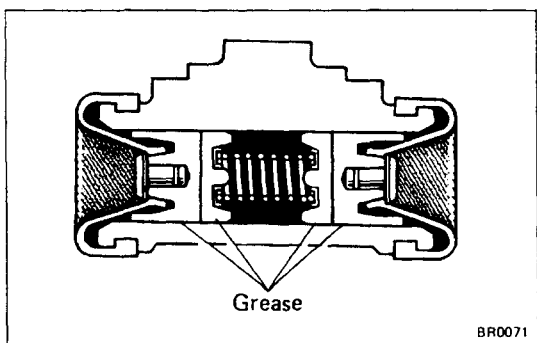
- (a) Apply lithium soap base glycol grease to the piston cups and piston.  
Install the spring and two piston cups in the wheel cylinder.  
Make sure the flanges of the cups are pointed inward.
- (b) Install two pistons. Apply lithium soap base glycol grease as shown, and install the two boots.
- (c) Install the wheel cylinder on the backing plate with two bolts.
- (d) Using SST, connect the brake line.

SST 09751-36011

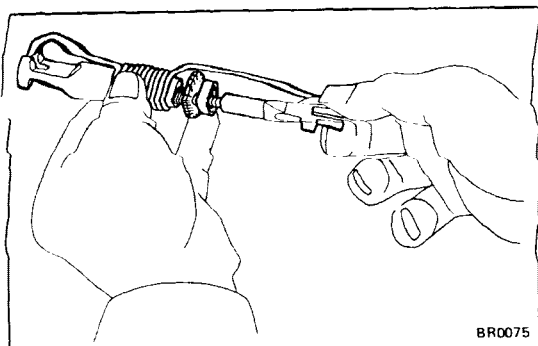
Torque: 155 kg-cm (11 ft-lb, 15 N·m)

**2. APPLY GREASE ON BACKING PLATE, AS SHOWN**

Use high-temperature type grease.

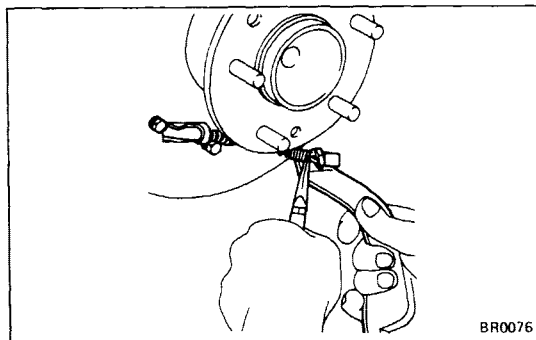




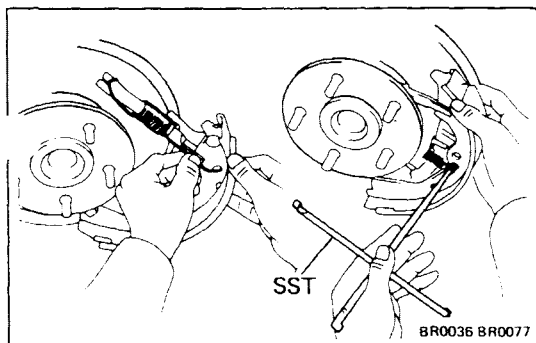


**3. APPLY GREASE TO ADJUSTER BOLT THREADS AND END**

Use high-temperature type grease.

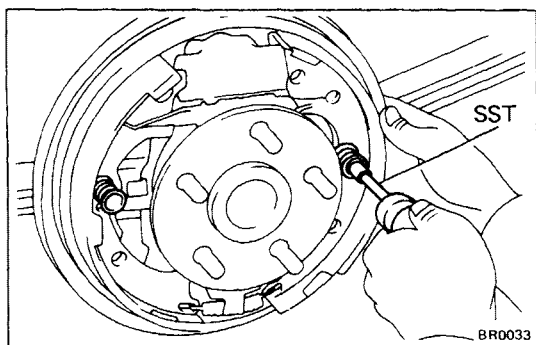


**4. CONNECT PARKING BRAKE CABLE TO PARKING BRAKE LEVER**



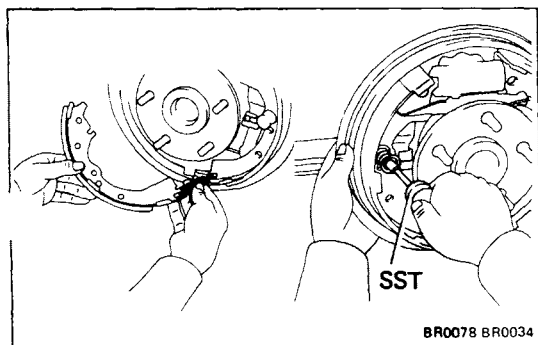
**5. INSTALL STRUT ONTO REAR SHOE**

- (a) Install the strut and return spring to lever.
  - (b) Using SST, install the adjusting lever spring.
- SST 09703-30010



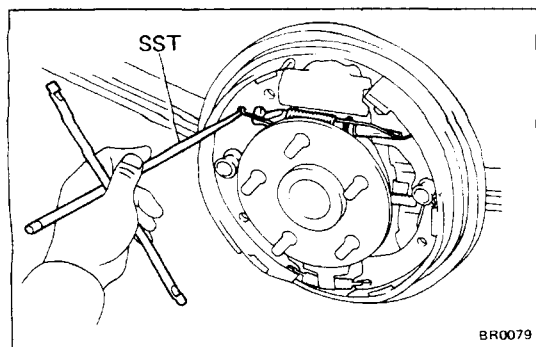
**6. INSTALL REAR SHOE**

- (a) Set the rear shoe in place with the end of the shoe inserted in the wheel cylinder and the other end in the anchor plate.
  - (b) Using SST, install the pin and shoe hold-down spring.
- SST 09718-00010

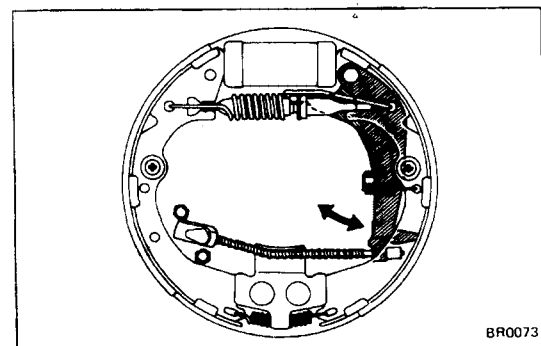


**7. INSTALL FRONT SHOE**

- (a) Install the anchor spring between the front and rear shoes.
  - (b) Set the front shoe in place with the end of the shoe inserted in the wheel cylinder and the strut in place.
  - (c) Using SST, install the pin and shoe hold-down spring.
- SST 09718-00010



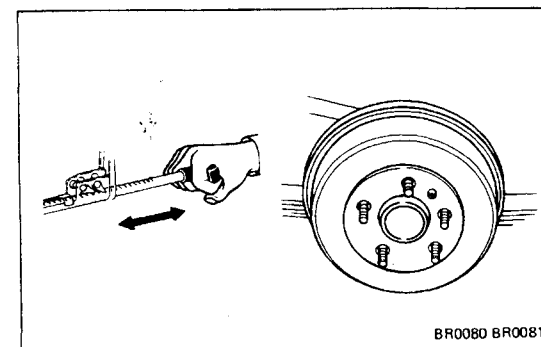
- (d) Using SST, install the return spring.  
SST 09703-30010



## 8. CHECK OPERATION OF AUTOMATIC ADJUSTER MECHANISM

- (a) Check that the adjusting bolt turns while pulling the parking brake lever up.

If the bolt does not turn, check for incorrect installation of the rear brakes.



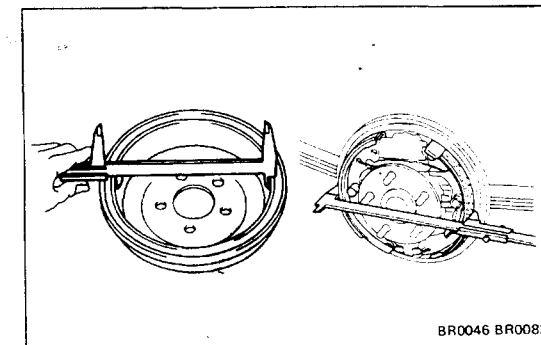
- (b) Adjust the strut to the shortest possible length.  
(c) Install the drum.  
(d) Pull the parking brake lever all the way up several times.

## 9. CHECK CLEARANCE BETWEEN BRAKE SHOES AND DRUM

- (a) Remove the drum.  
(b) Measure the brake drum inside diameter and diameter of the brake shoes. Check that the difference between the diameters is the correct shoe clearance.

**Shoe clearance: 0.6 mm (0.024 in.)**

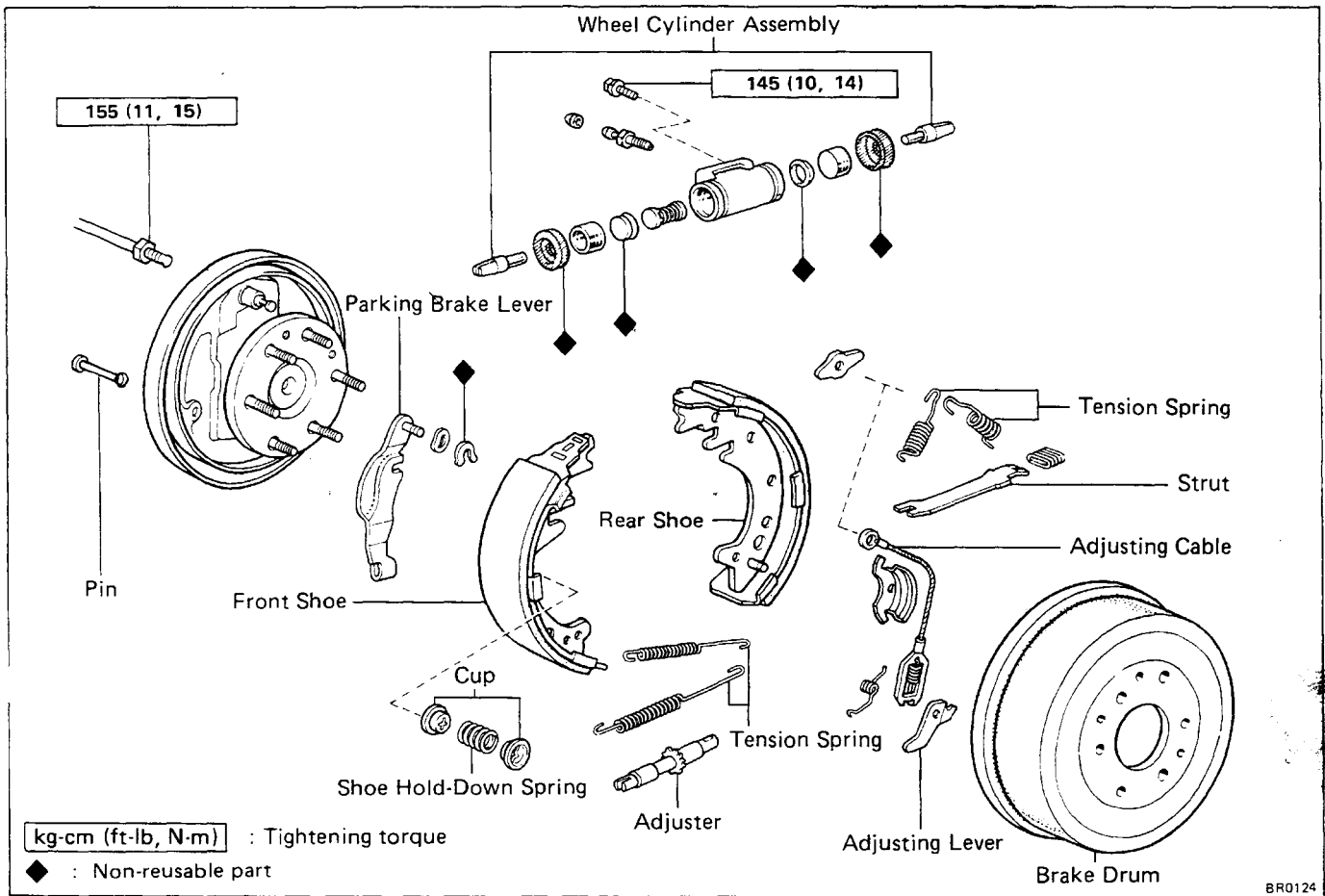
If incorrect, check the parking brake system.



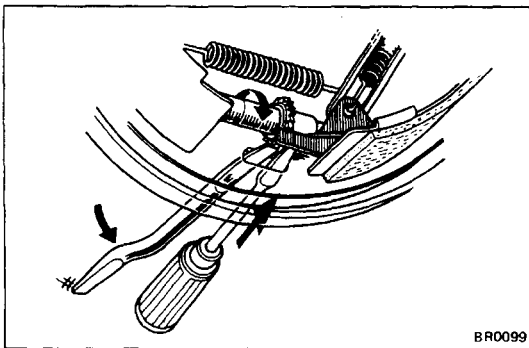
## 10. INSTALL BRAKE DRUM AND REAR WHEEL

## 11. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR-6)

## REAR BRAKE—4WD (Duo-Servo Type) COMPONENTS



BR0124



### REMOVAL OF REAR BRAKE

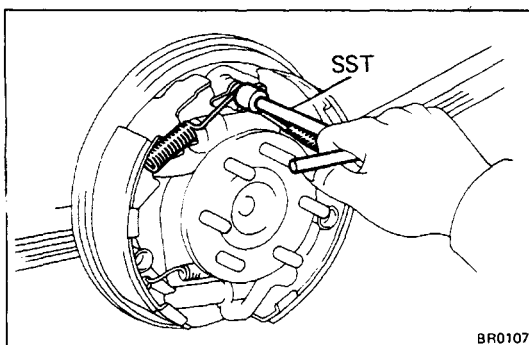
#### 1. REMOVE REAR WHEEL AND BRAKE DRUM

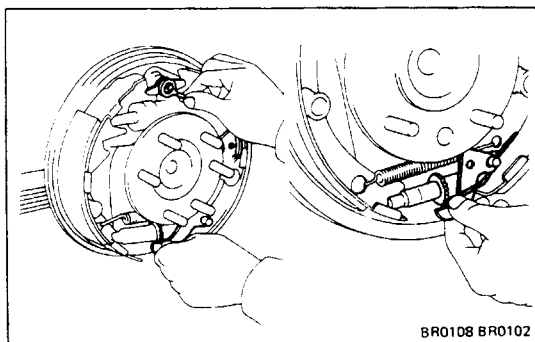
NOTE: If the brake drum cannot be removed easily, perform the following steps:

- Insert a screwdriver through the hole in the backing plate, and hold the adjuster lever away from the adjuster.
- Using another screwdriver, reduce the brake shoe adjustment by turning the adjusting bolt.

#### 2. REMOVE TWO SHOE RETURN SPRINGS

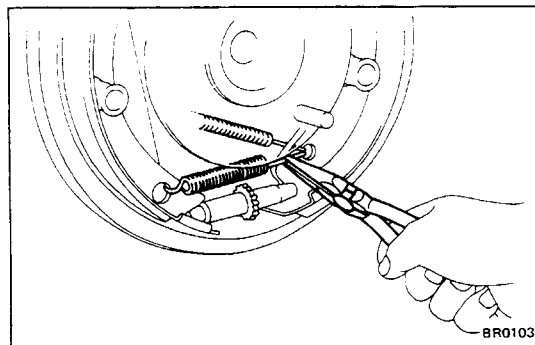
Using SST, remove the two return springs.  
SST 09717-20010





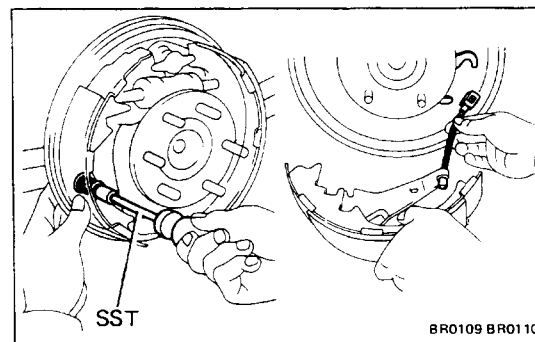
### 3. REMOVE ADJUSTING CABLE, CABLE GUIDE AND ADJUSTING LEVER

- (a) Push up the lever and remove the cable and ca. guide.
- (b) Take off the spring from the lever and remove the lever and spring.



### 4. REMOVE TWO TENSION SPRINGS

Using pliers, remove the two tension springs.

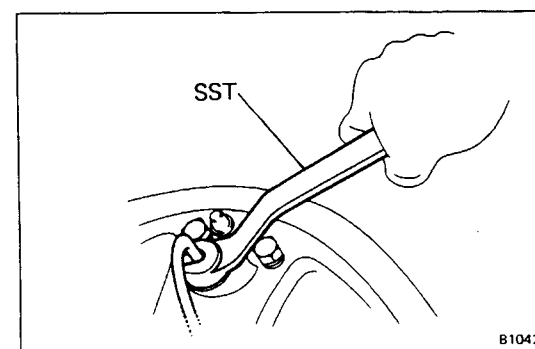


### 5. REMOVE SHOES, ADJUSTER AND STRUT

- (a) Using SST, remove the shoe hold-down springs and pins.

SST 09718-00010

- (b) Remove the shoes, adjuster and strut.
- (c) Disconnect the parking brake cable from the bellcrank.

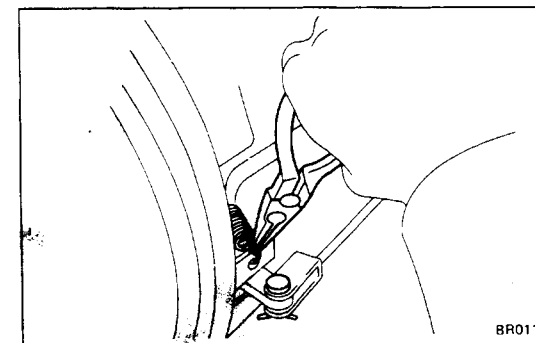


### 6. IF NECESSARY, REMOVE AND DISASSEMBLE WHEEL CYLINDER

- (a) Using SST, disconnect the line.  
Use a container to catch the brake fluid.

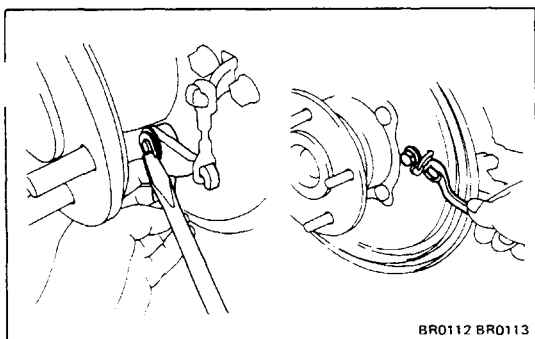
SST 09751-36011

- (b) Remove the two bolts and the wheel cylinder.
- (c) Remove the two rods, boots, pistons, piston cups and one spring from the cylinder.

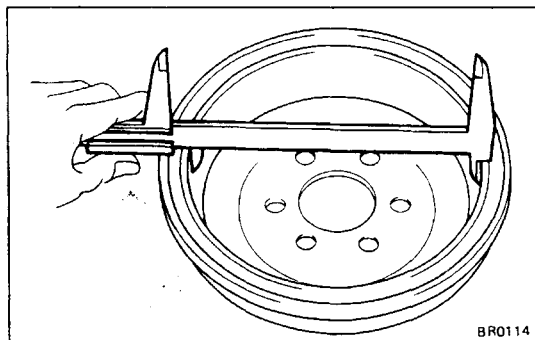


### 7. IF NECESSARY, REMOVE AND DISASSEMBLE BELLCRANK ASSEMBLY

- (a) Remove the tension spring from the bellcrank.
- (b) Remove the cotter pin and disconnect the parking brake rear cable.



- (c) Using a screwdriver, remove the small bellcrank from the backing plate with parking brake wire No.2.
- (d) Remove the two mounting bolts and large bellcrank assembly.



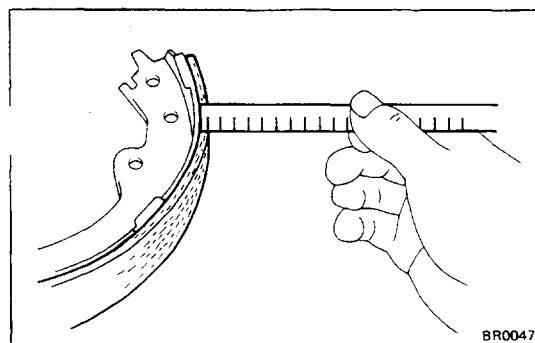
## INSPECTION OF REAR BRAKE COMPONENTS

### 1. MEASURE BRAKE DRUM INSIDE DIAMETER

Maximum inside diameter: 256.0 mm (10.079 in.)

Standard inside diameter: 254.0 mm (10.000 in.)

If the drum is scored or worn, the brake drum may be lathed to the maximum inside diameter.



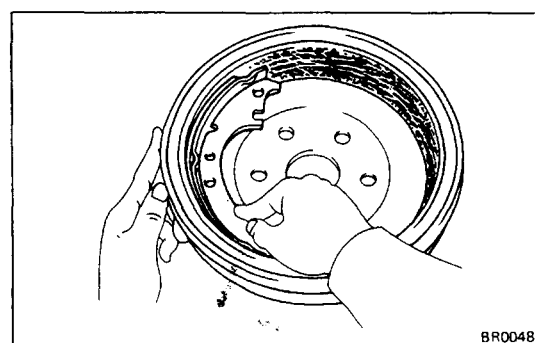
### 2. MEASURE BRAKE SHOE LINING THICKNESS

Minimum thickness: 1.0 mm (0.039 in.)

Standard thickness: 5.0 mm (0.197 in.)

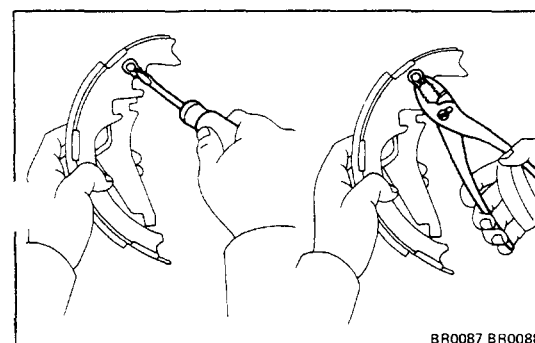
If the shoe lining is less than minimum or shows signs of uneven wear, replace the brake shoes.

NOTE: If any brake shoe has to be replaced, replace all the rear brake shoes to maintain effective brakes.



### 3. INSPECT BRAKE LINING AND DRUM FOR PROPER CONTACT

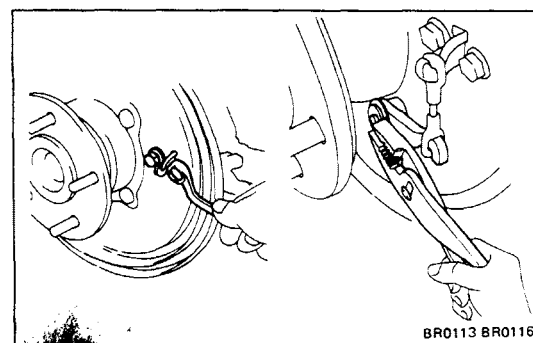
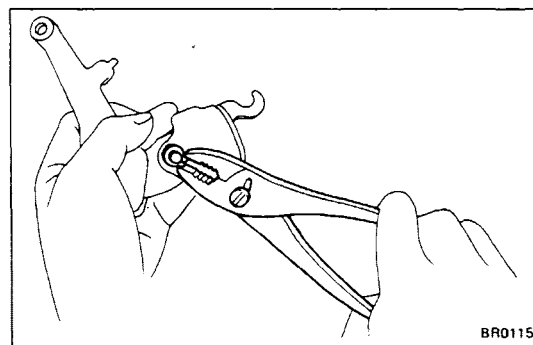
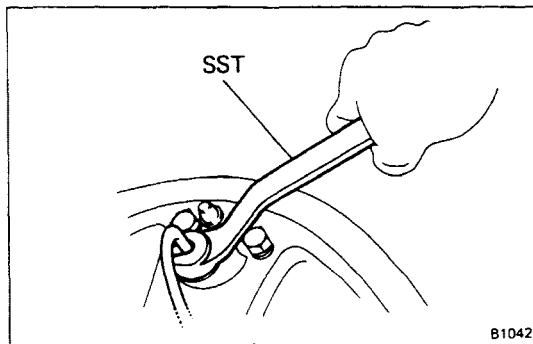
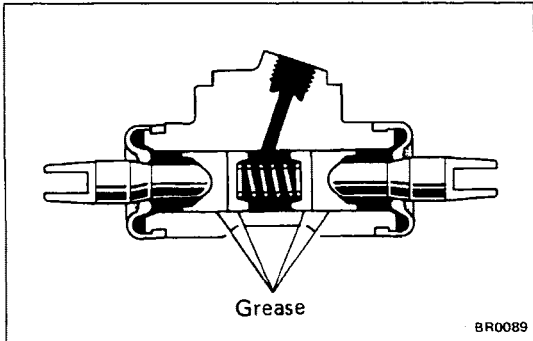
Replace the brake shoe or turn the brake drum, as necessary.



### 4. IF NECESSARY, REPLACE BRAKE SHOES

- (a) Using a screwdriver, remove the parking brake lever from the front shoe.
- (b) Using pliers, install the parking brake lever with a new C-washer.

5. INSPECT WHEEL CYLINDER FOR CORROSION OR DAMAGE
6. INSPECT BACKING PLATE FOR WEAR OR DAMAGE
7. INSPECT BELLCRANK PARTS FOR BENDING, WEAR OR DAMAGE



## ASSEMBLY OF REAR BRAKES

(See page BR-43)

### 1. IF NECESSARY, ASSEMBLE AND INSTALL WHEEL CYLINDER

- (a) Apply lithium soap base glycol grease to the piston cups and piston.  
Install the spring and two piston cups in the wheel cylinder.  
Make sure flanges of the cups are pointed inward.
  - (b) Install the two pistons, boots and rods in the cylinder.
  - (c) Install the wheel cylinder on the backing plate with two bolts.
  - (d) Using SST, connect the brake line.
- SST 09751-36011

**Torque: 155 kg-cm (11 ft-lb, 15 N·m)**

### 2. IF NECESSARY, ASSEMBLE AND INSTALL BELLCRANK ASSEMBLY

- (a) Apply high-temperature type grease to the rotating parts to the bellcrank.
- (b) Install the bellcrank to the bracket with a new C-washer.
- (c) Apply rubber grease to the seal lip.

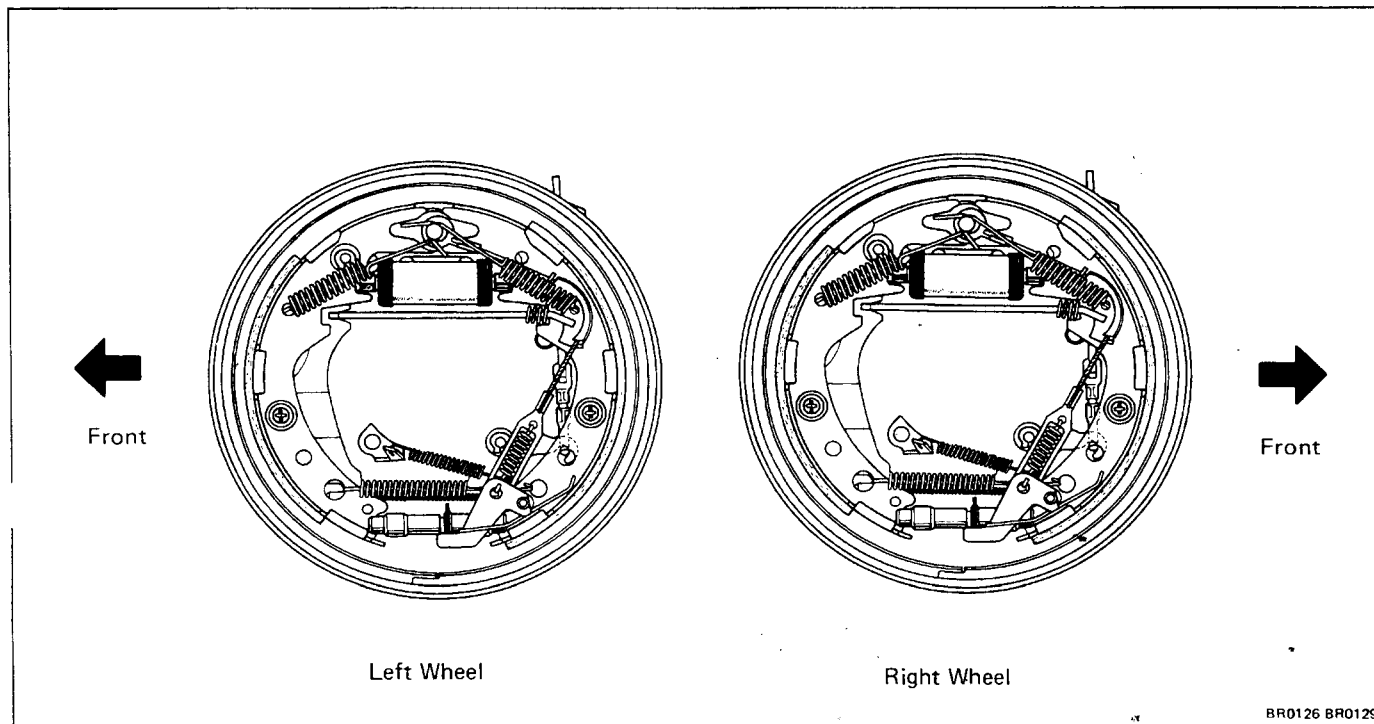
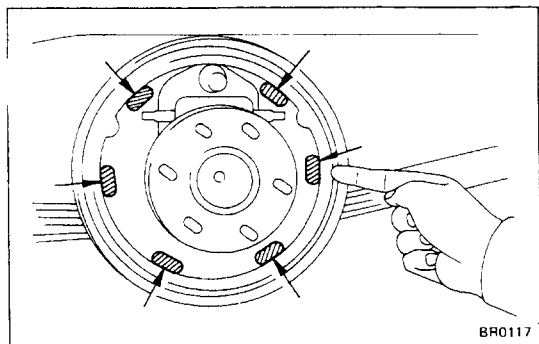
- (d) Install the bellcrank assembly on the backing plate with two bolts.
- (e) Torque the bolts.

**Torque: 130 kg-cm (9 ft-lb, 13 N·m)**

- (f) Install the parking brake wire to the large bellcrank.
- (g) Hook the small bellcrank to the parking brake wire and then install the bellcrank on the backing plate with a new C-washer.

**3. APPLY GREASE ON BACKING PLATE, AS SHOWN**

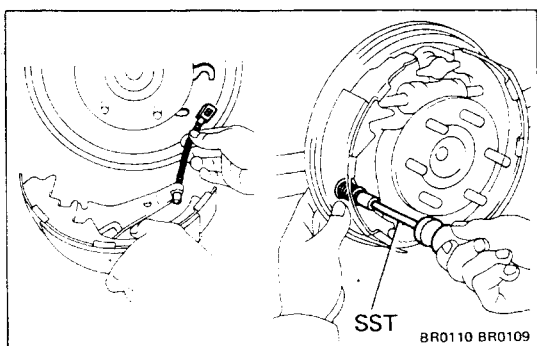
Use high-temperature type grease.

**4. INSTALL FRONT SHOE**

- (a) Install the parking brake cable to the parking brake lever and bellcrank.
- (b) Set the front brake shoe in place with the end of the shoe inserted in the piston rod.

Using SST, install the shoe hold-down spring and pin.

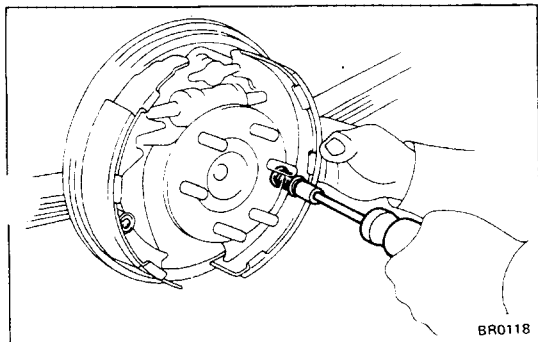
SST 09718-00010

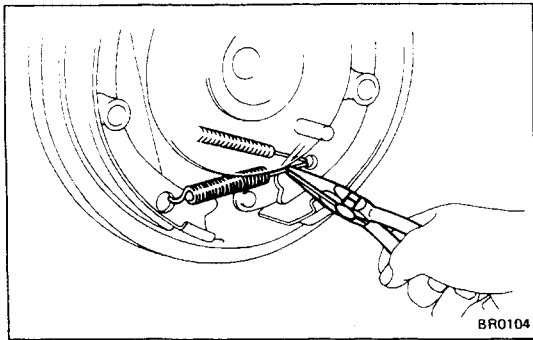
**5. INSTALL STRUT AND REAR SHOE**

- (a) Install the strut with the spring rearward.
- (b) Set the rear brake shoe in place with the end of the shoe inserted in the piston rod and the strut in place.

Using SST, install the shoe hold-down spring and pin.

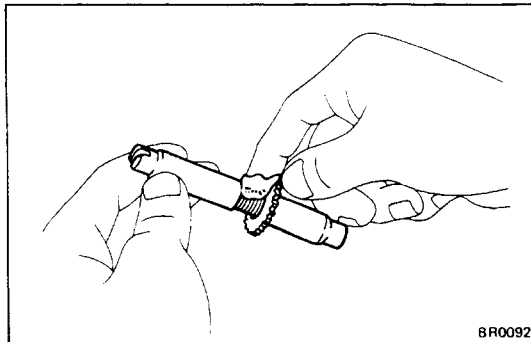
SST 09718-00010





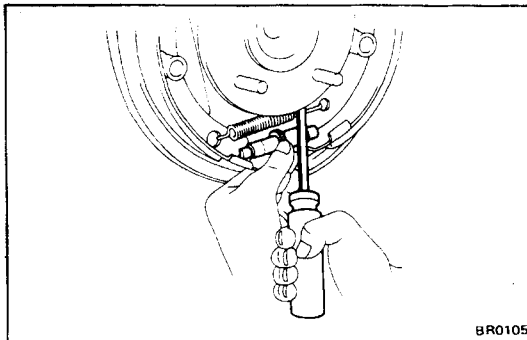
## 6. INSTALL TWO TENSION SPRINGS

Using pliers, install the two tension springs.



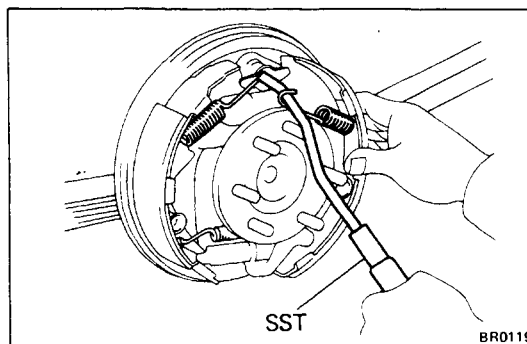
## 7. APPLY GREASE TO ADJUSTER BOLT THREADS AND END

Use high-temperature type grease.



## 8. INSTALL ADJUSTER

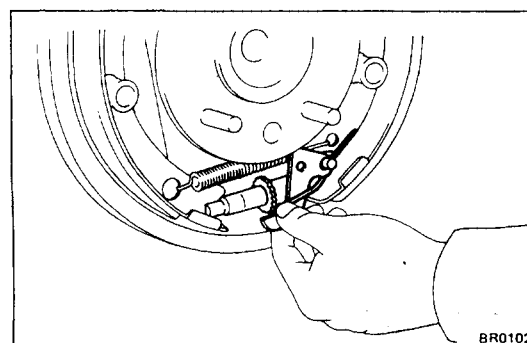
Using a screwdriver, open the shoes and install the adjuster.



## 9. INSTALL ADJUSTING CABLE AND RETURN SPRINGS

- (a) Install the shoe guide plate, cable guide and adjusting cable.
- (b) Using SST, install the front return spring and then install the rear return spring.

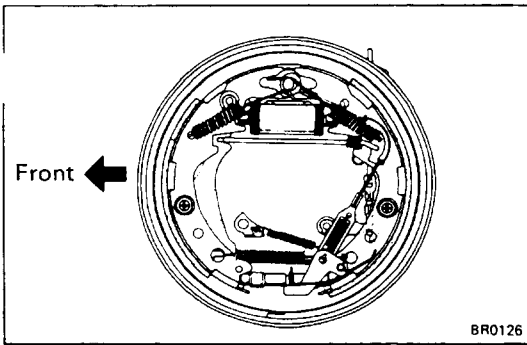
SST 09718-20010



## 10. INSTALL ADJUSTING LEVER

- (a) Install the tension spring to the rear shoe.
- (b) Hook the adjusting lever with the cable and install the lever.
- (c) Hold the adjusting lever with the tension spring



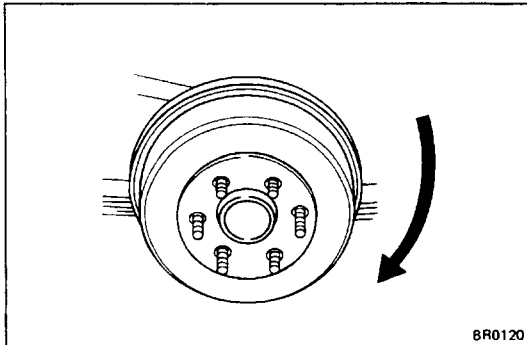


### 11. CHECK OPERATION OF AUTOMATIC ADJUSTER MECHANISM

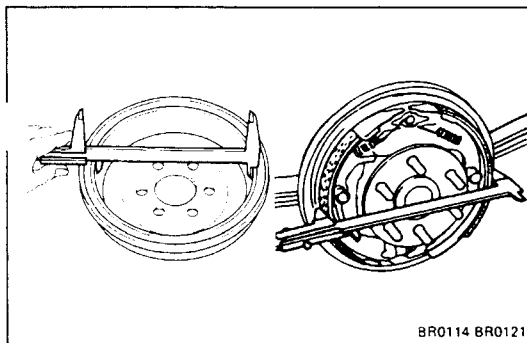
- (a) Pull the adjusting cable backward as shown, and release.

Check that the adjusting bolt turns.

If the bolt does not turn, check for incorrect installation of the rear brakes.



- (b) Adjust the strut to the shortest possible length.  
 (c) Install the drum.  
 (d) Turn the brake drum in reverse direction and depress the brake pedal.  
 Repeat this procedure several times.

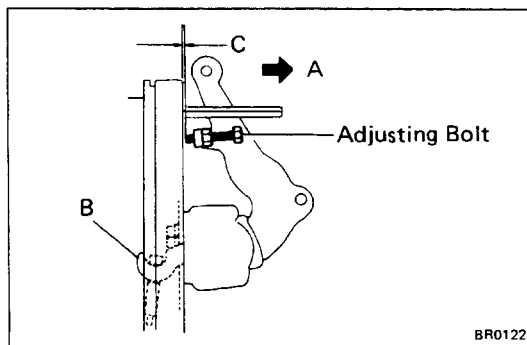


### 12. CHECK CLEARANCE BETWEEN BRAKE SHOES AND DRUM

- (a) Remove the drum.  
 (b) Measure the brake drum inside diameter and diameter of the brake shoes. Check that the difference between the diameters is the correct shoe clearance.

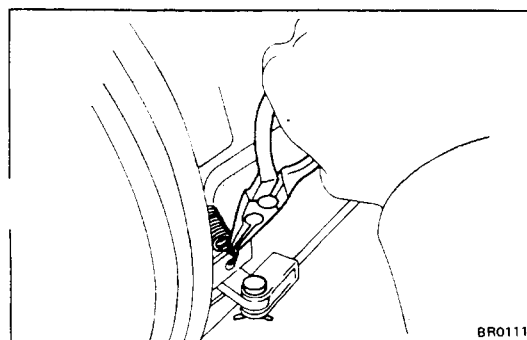
**Shoe clearance: 0.6 mm (0.024 in.)**

If incorrect, check the parking brake system.



### 13. IF NECESSARY, ADJUST BELLCRANK

- (a) Lightly pull the bellcrank in direction A until there is no slack at part B.  
 (b) In this condition, turn the adjusting bolt so that dimension C will be 1.0 — 2.0 mm (0.039 — 0.078 in.).  
 (c) Lock the adjust bolt with the lock nut.



- (d) Connect the parking brake cable No.2 to the bellcrank.

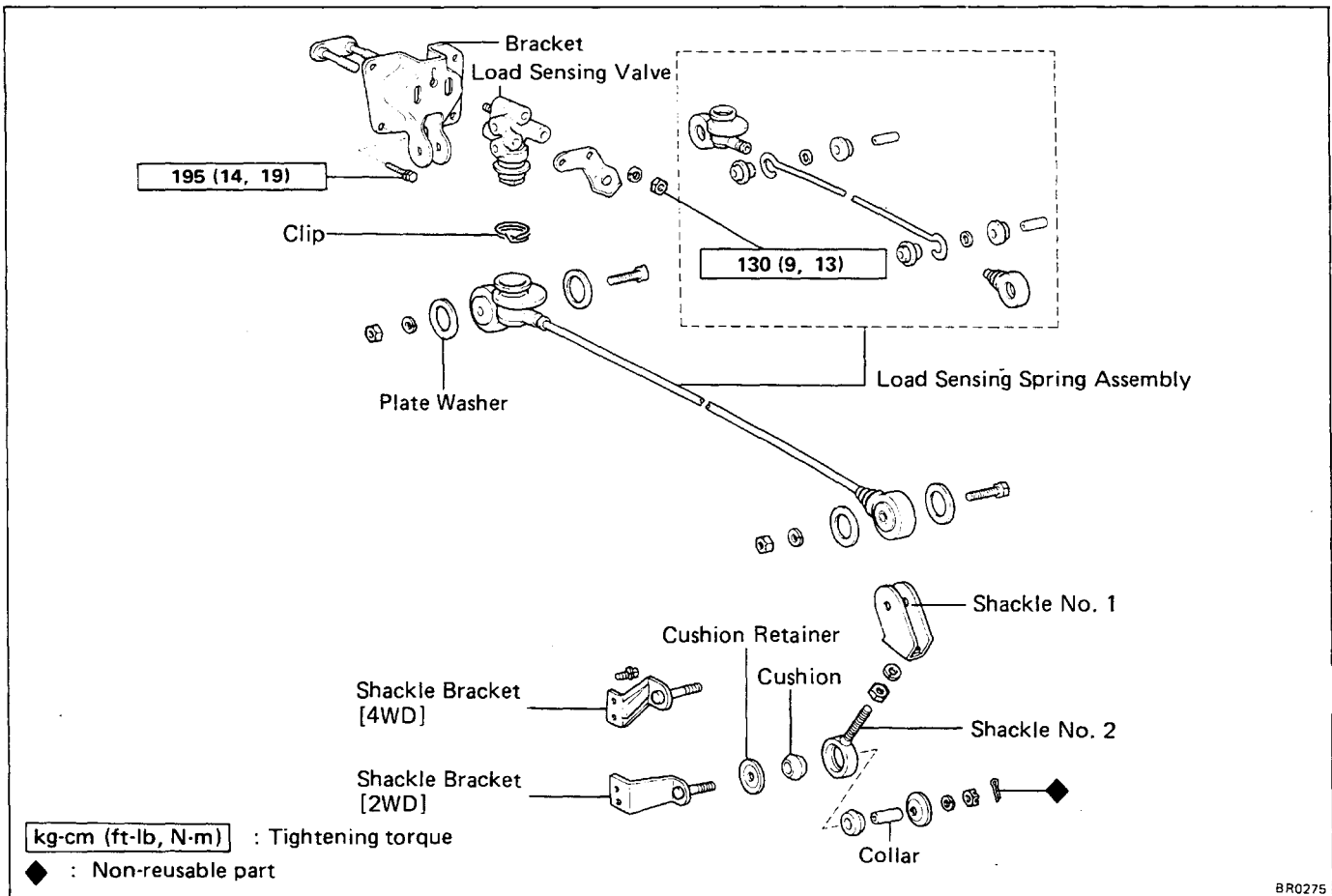
- (e) Install the tension spring.

### 14. INSTALL BRAKE DRUM AND REAR WHEEL

### 15. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM

(See page BR-6)

## LOAD SENSING PROPORTIONING AND BY-PASS VALVE (LSP & BV) COMPONENTS



### CHECK AND ADJUSTMENT OF FLUID PRESSURE

#### 1. SET REAR AXLE LOAD

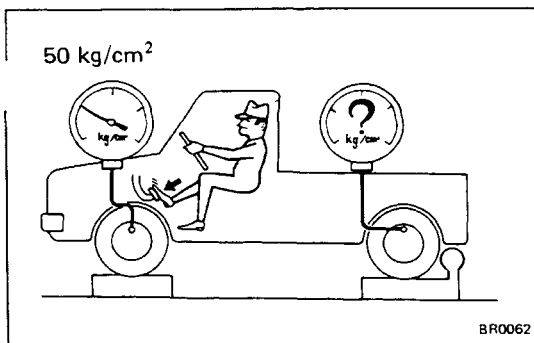
Rear axle load (includes vehicle weight):

2WD	700 kg (1,543 lb)
4WD	750 kg (1,653 lb)

#### 2. INSTALL LSPV GAUGE (SST) AND BLEED AIR

SST 09709-29017

**B02030**



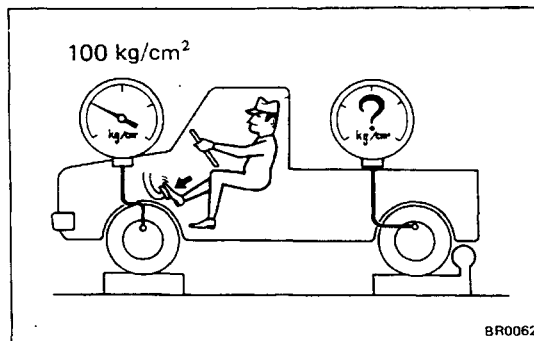
### 3. RAISE FRONT BRAKE PRESSURE TO 50 kg/cm<sup>2</sup> (711 psi, 4,903 kPa) AND CHECK REAR BRAKE PRESSURE

Rear brake pressure:

2WD  $37 \pm 5$  kg/cm<sup>2</sup> (526  $\pm$  71 psi, 3,628  $\pm$  490 kPa)

4WD  $36 \pm 5$  kg/cm<sup>2</sup> (512  $\pm$  71 psi, 3,530  $\pm$  490 kPa)

NOTE: The brake pedal should not be depressed twice and/or returned while setting to the specified pressure. Read the value of rear brake pressure two seconds after adjusting the specified fluid pressure.



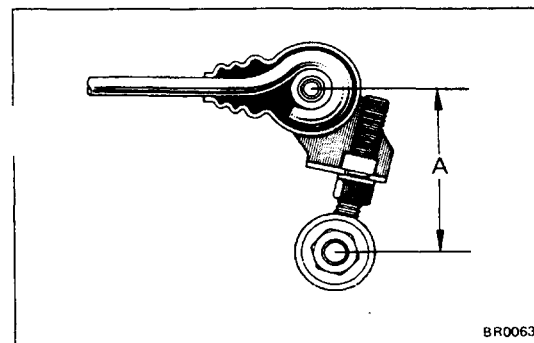
### 4. RAISE FRONT BRAKE PRESSURE TO 100 kg/cm<sup>2</sup> (1,422 psi, 9,807 kPa) AND CHECK REAR BRAKE PRESSURE

Rear brake pressure:

2WD  $56 \pm 7$  kg/cm<sup>2</sup> (796  $\pm$  100 psi, 5,492  $\pm$  686 kPa)

4WD  $55 \pm 7$  kg/cm<sup>2</sup> (782  $\pm$  100 psi, 5,394  $\pm$  686 kPa)

If the brake pressure is incorrect, adjust the fluid pressure.



### 5. IF NECESSARY, ADJUST FLUID PRESSURE

(a) Adjust the length of the No.2 shackle.

Low pressure — Lengthen A

High pressure — Shorten A

Initial set:

2WD 78mm (3.07 in.)

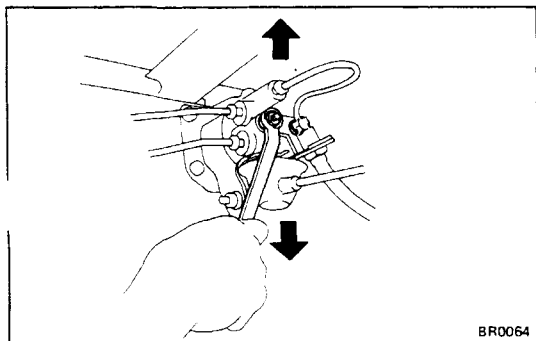
4WD 120mm (4.72 in.)

Adjusting range:

2WD 72 — 84 mm (2.83 — 3.31 in.)

4WD 114 — 126 mm (4.49 — 4.96 in.)

NOTE: One turn of the No.2 shackle changes the fluid pressure about 0.6 kg/cm<sup>2</sup> (8.5 psi, 59 kPa).



(b) In event the pressure cannot be adjusted by the No.2 shackle, raise or lower the valve body.

Low pressure — Lower

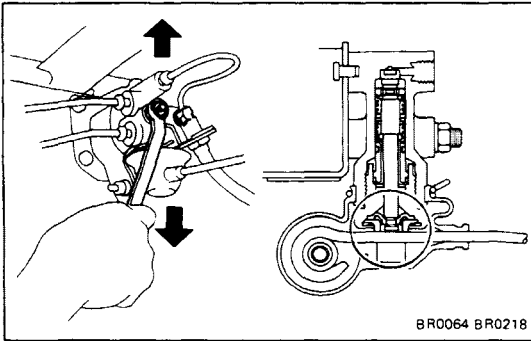
High pressure — Raise

(c) Torque the nuts.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

(d) Adjust the length of the No.2 shackle again.

If it cannot be adjusted, inspect the valve housing.



## 6. IF NECESSARY,CHECK VALVE BODY

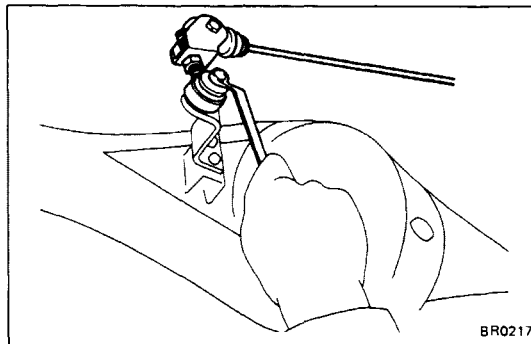
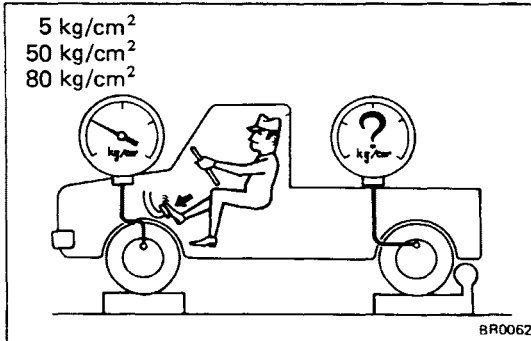
(a) Assemble the valve body in the uppermost position

NOTE: When the brakes are applied,the piston will move down about 1 mm (0.04 in.).Even at this time,the piston should not make contact with or move the load sensing spring.

(b) In this position,check the rear brake pressure.

kg/cm <sup>2</sup> (psi,kPa)	
Front brake pressure	Rear brake pressure
5 (71, 490)	5 (71, 490)
50 (711, 4,903)	19.7–23.7 (280–337, 1,932–2,324)
80 (1,138, 7,845)	29.8–35.8 (424–509, 2,922–3,511)

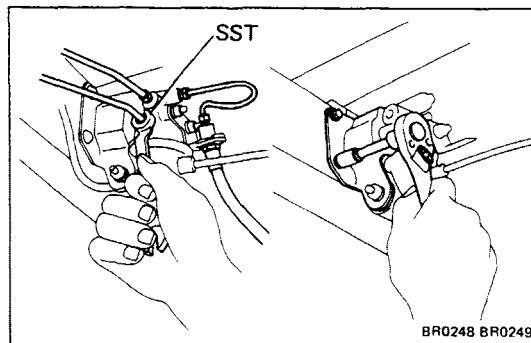
If the measured value is not within standard,replace the valve body.



## REMOVAL OF LSP & BV OR LSPV

(See page BR-50)

### 1. DISCONNECT SHACKLE NO.2 FROM BRACKET

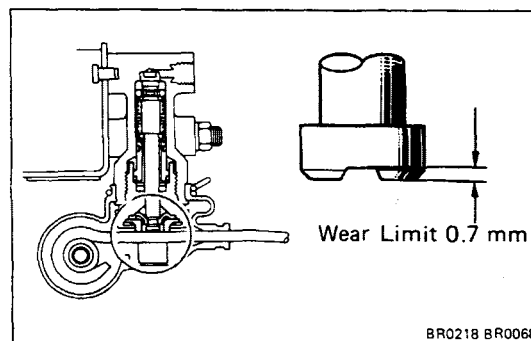


### 2. REMOVE LSP & BV (LSPV) ASSEMBLY

(a) Using SST, disconnect the brake tube from the valve body.

SST 09751-36011

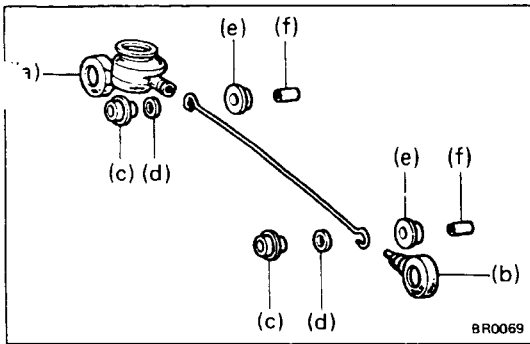
(b) Remove the valve bracket mounting bolts and remove the LSP & BV (LSPV) assembly.



## INSPECTION OF LSP & BV OR LSPV

### INSPECT VALVE PISTON PIN AND LOAD SENSING CONTACT SURFACE FOR WEAR

Wear limit: 0.7 mm (0.028 in.)



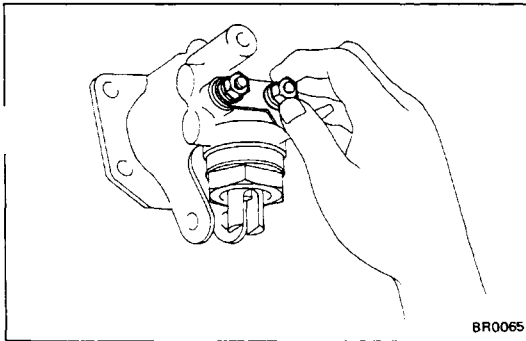
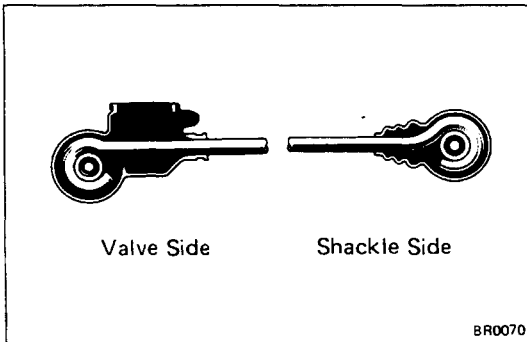
## INSTALLATION OF LSP & BV OR LSPV

(See page BR-50)

### 1. ASSEMBLE FOLLOWING PARTS TO LOAD SENSING SPRING:

- (a) Load sensing valve boot
- (b) Load sensing spring boot
- (c) Bushings
- (d) Rubber plates
- (e) Bushings
- (f) Collars

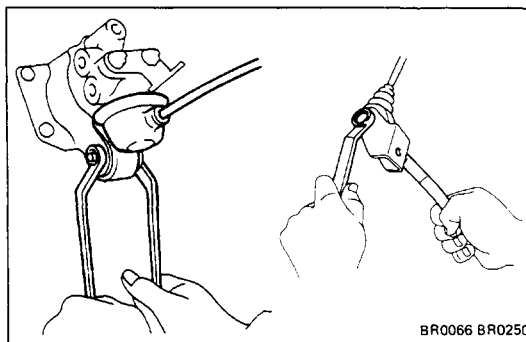
**NOTE:** Apply rubber grease to all rubbing areas.  
Do not mistake the valve side for the shackle side of the load sensing spring.



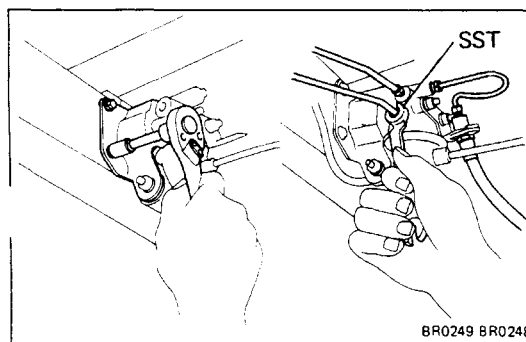
### 2. ASSEMBLE VALVE BODY TO BRACKET

Assemble the valve body to the valve body bracket.

**NOTE:** Finger tighten the valve body mounting nuts.



### 3. CONNECT VALVE BODY AND NO.1 SHACKLE TO LOAD SENSING SPRING



### 4. INSTALL LSP & BV (LSPV) ASSEMBLY TO FRAME

**Torque:** 195 kg-cm (14 ft-lb, 19 N·m)

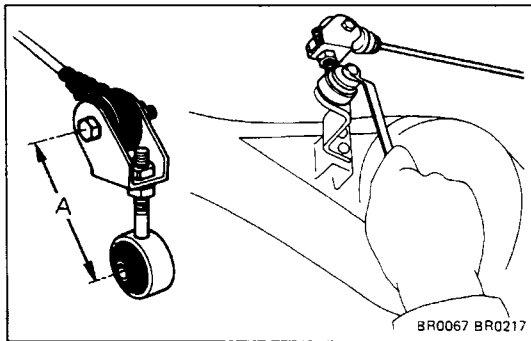
### 5. CONNECT BRAKE TUBE

Using SST, connect the brake tubes.

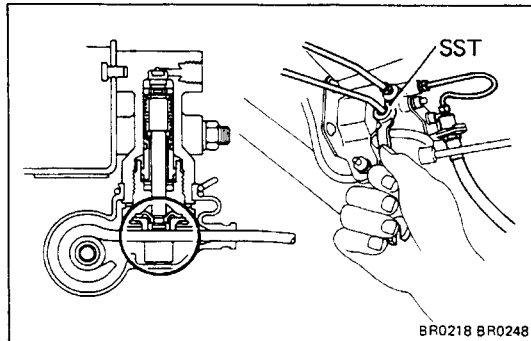
Torque the nut.

**Torque:** 155 kg-cm (11 ft-lb, 15 N·m)

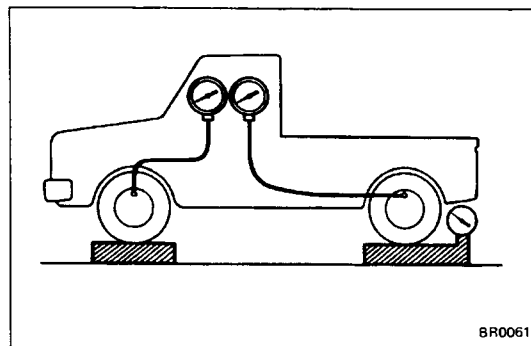
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**6. CONNECT SHACKLE NO.2 TO BRACKET**

- (a) Install shackle No. 1 and shackle No.2 to the load sensing spring.
  - (b) Set dimension A by turning shackle No.2.
- Initial set:   2WD 78 mm (3.07 in.)  
                   4WD 120 mm (4.72 in.)
- (c) Connect shackle No. 2 to the shackle bracket.

**7. SET REAR AXLE LOAD (See page BR-50)****8. SET VALVE BODY**

- (a) When pulling down the load sensing spring, confirm that the valve piston moves down smoothly.
- (b) Position the valve body so that the valve piston lightly contacts load sensing spring.
- (c) Tighten the valve body mounting nuts.

**9. BLEED BRAKE LINE (See page BR-6)****10. CHECK AND ADJUST LSP & BV FLUID PRESSURE (See page BR-50)**

## BRAKE HOSES AND TUBES

### DISCONNECT AND CONNECT HOSE AND TUBE

#### 1. DISCONNECT HOSE AND TUBE

- (a) Disconnect the clip.
- (b) Using a wrench to hold the hose and SST to hold the tube, disconnect the tube and hose.

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#### 2. CONNECT HOSE AND TUBE

- (a) Connect the hose and tube by hand.
- (b) Using a wrench to hold the hose and SST to hold the tube, torque the connection.

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**Torque: 155 kg-cm (11 ft-lb, 15 N·m)**

- (c) Install a new hose clip.

### INSPECTION OF BRAKE HOSES AND TUBES

#### 1. INSPECT BRAKE HOSES

- (a) Inspect the hose for damage, cracks or swelling.
- (b) Inspect the threads for damage.

#### 2. INSPECT BRAKE TUBES

- (a) Inspect the tube for damage, cracks, dents or corrosion.
- (b) Inspect the threads for damage.

