BRAKE

BRAKE SYSTEM

PRECAUTION

BR0R8-01

- **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 having the same part number or equivalent.**
- **It is very important to keep parts and the area clean when repairing the brake system.**
- **If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.**

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

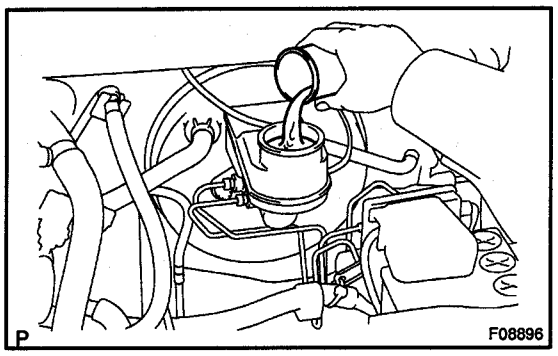
BR0AA–04

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	Page
Low pedal or spongy pedal	1. Fluid leaks for brake system	DI–98
	2. Air in brake system	BR–4
	3. Piston seal (Worn or damaged)	BR–23 BR–29 BR–37
	4. Rear brake shoe clearance (Out of adjustment)	BR–33 BR–47
	5. Master cylinder (Faulty)	BR–10
	6. Booster push rod (Out of adjustment)	BR–18
Brake drag	1. Brake pedal freeplay (Minimal)	BR–6
	2. Parking brake lever travel (Out of adjustment)	BR–9
	3. Parking brake wire (Sticking)	–
	4. Rear brake shoe clearance (Out of adjustment)	BR–33 BR–47
	5. Pad or lining (Cracked or distorted)	BR–20 BR–29 BR–34
	6. Piston (Stuck or frozen)	BR–23 BR–29 BR–37
	7. Anchor or return spring (Faulty)	BR–29 BR–43
	8. Booster push rod (Out of adjustment)	BR–18
	9. Vacuum leaks for booster system	BR–15
	10.Master cylinder (Faulty)	BR–10
Brake pull	1. Piston (Stuck or frozen)	BR–23 BR–29 BR–37
	2. Pad or lining (Oily)	BR–20 BR–29 BR–34
	3. Disc (Scored)	BR–26 BR–40
	4. Pad or lining (Cracked or distorted)	BR–20 BR–29 BR–34

BR

Hard pedal but brake inefficient	1. Fluid leaks for brake system	DI–98
	2. Air in brake system	BR–4
	3. Pad or lining (Worn)	BR–20 BR–29 BR–34
	4. Pad or lining (Cracked or distorted)	BR–20 BR–29 BR–34
	5. Rear brake shoe clearance (Out of adjustment)	BR–33 BR–47
	6. Pad or lining (Oily)	BR–20 BR–29 BR–34
	7. Pad or lining (Glazed)	BR–20 BR–29 BR–34
	8. Disc (Scored)	BR–26 BR–40
	9. Booster push rod (Out of adjustment)	BR–18
	10.Vacuum leaks for booster system	BR–15
Noise from brakes	1. Pad or lining (Cracked or distorted)	BR–20 BR–29 BR–34
	2. Installation bolt (Loose)	BR–23 BR–37
	3. Disc (Scored)	BR–26 BR–40
	4. Pad support plate (Loose)	BR–20
	5. Sliding pin (Worn)	BR–26 BR–40
	6. Pad or lining (Dirty or glazed)	BR–20 BR–29 BR–34
	7. Anchor or return spring (Faulty)	BR–29 BR–43
	8. Anti–squeal shim (Damaged)	BR–29 BR–43
	9. Shoe hold–down spring (Damaged)	BR–29 BR–43



BRAKE FLUID

BR0RA-04

BLEEDING

HINT:

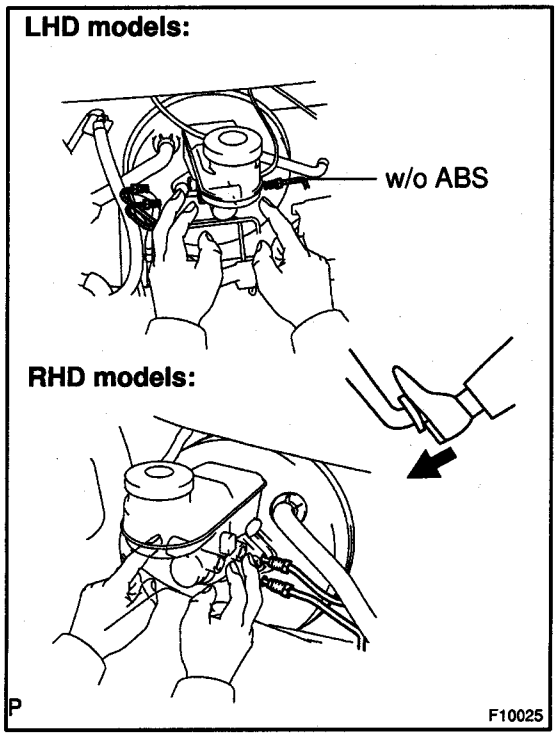
If any work is done on the brake system or air in the brake lines is suspected, bleed the air from the system.

NOTICE:

- **Do not let brake fluid remain on a painted surface. Wash it off immediately.**
- **RHD models:**
  Be careful not to let the brake fluid splash over the alternator.

1. **FILL BRAKE RESERVOIR WITH BRAKE FLUID**
   Fluid: SAE J1703 or FMVSS No. 116 DOT3

BR



2. **BLEED MASTER CYLINDER**

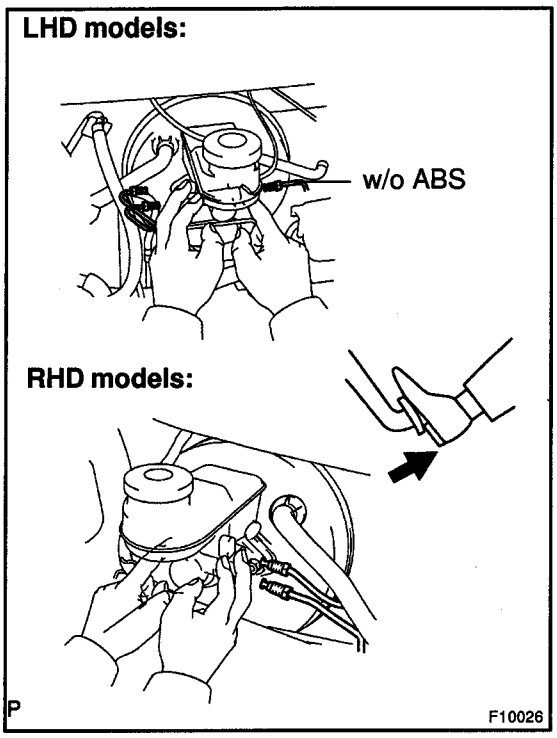
HINT:

If the master cylinder has been disassembled or the reservoir becomes empty, bleed the master cylinder.

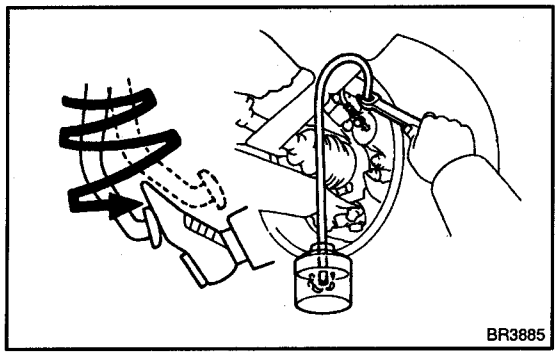
(a) LHD models:
Disconnect the 2 or 3 brake lines from the master cylinder.

(b) RHD models:
Disconnect the 2 brake lines from the master cylinder.

(c) Slowly depress the brake pedal and hold it.



(d) Block off the outer plug with your finger and release the brake pedal.
(e) Repeat (c) and (d) 3 or 4 times.



3. BLEED BRAKE LINE

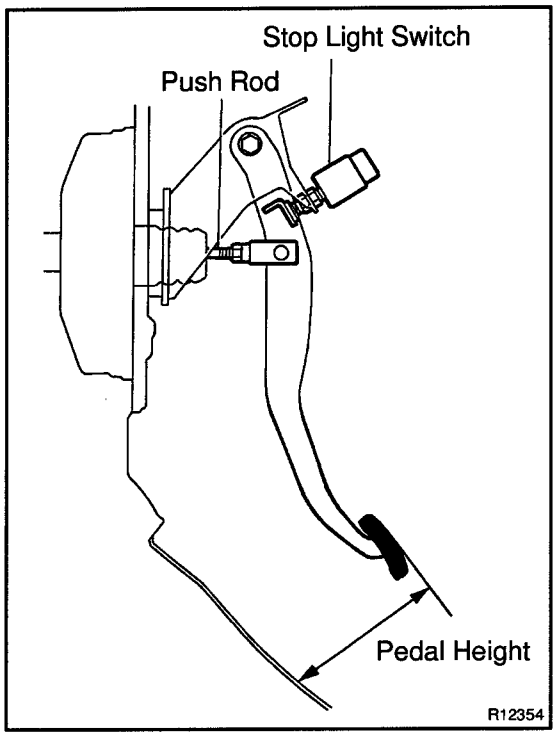
(a) Connect the vinyl tube to the caliper or wheel cylinder.
(b) Depress the brake pedal several times, then loosen the bleeder plug with the pedal held down.
(c) At the point when fluid stops coming out, tighten the bleeder plug, then release the brake pedal.
(d) Repeat (b) and (c) until all the air in the fluid has been bled out.
(e) Repeat the above procedure to bleed the brake line for each wheel.

Torque: (Bleeder plug) 8.3 N·m (85 kgf·cm, 73 in.·lbf)

4. CHECK FLUID LEVEL IN RESERVOIR

Check the fluid level and add fluid if necessary.

Fluid: SAE J1703 or FMVSS No. 116 DOT3



BRAKE PEDAL

BR0RB-06

ON–VEHICLE INSPECTION

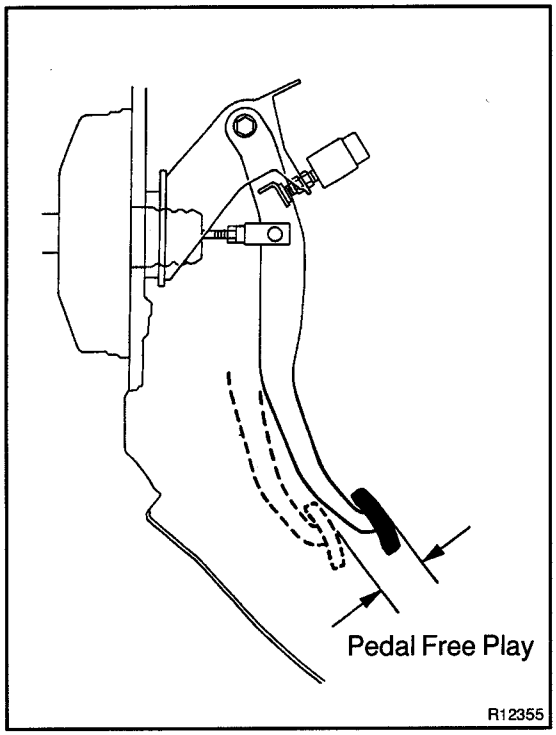
1. CHECK PEDAL HEIGHT

Pedal height from dash panel:
LHD: 124.3 – 134.3 mm (4.894 – 5.287 in.)
RHD: 129.3 – 139.3 mm (5.091 – 5.482 in.)

If the pedal height is incorrect, adjust it.

2. IF NECESSARY, ADJUST PEDAL HEIGHT

(a) Disconnect the connector from the stop light switch.
(b) Loosen the stop light switch lock nut and remove the stop light switch.
(c) Loosen the push rod lock nut.
(d) Adjust the pedal height by turning the pedal push rod.
(e) Tighten the push rod lock nut.
Torque: 26 N·m (260 kgf·cm, 20 ft·lbf)
(f) Install the stop light switch.
(g) Connect the connector to the stop light switch.
(h) Push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), turn the stop light switch to lock the nut in the position where the stop light goes off.
(i) Push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), check that stop light lights up.
(j) After adjusting the pedal height, check the pedal free play.

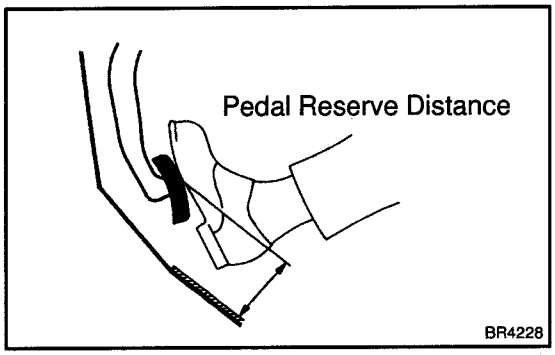


3. CHECK PEDAL FREE PLAY

(a) Stop the engine and depress the brake pedal several times until there is no more vacuum left in the booster.
(b) Push in the pedal by hand until the resistance begins to be felt, then measure the distance, as shown.
Pedal free play: 1 – 3 mm (0.04 – 0.12 in.)

If incorrect, check the stop light switch clearance. If the clearance is OK, then troubleshoot the brake system.

Stop light switch clearance:
0.5 – 2.4 mm (0.020 – 0.094 in.)



4. CHECK PEDAL RESERVE DISTANCE

Release the parking brake lever.

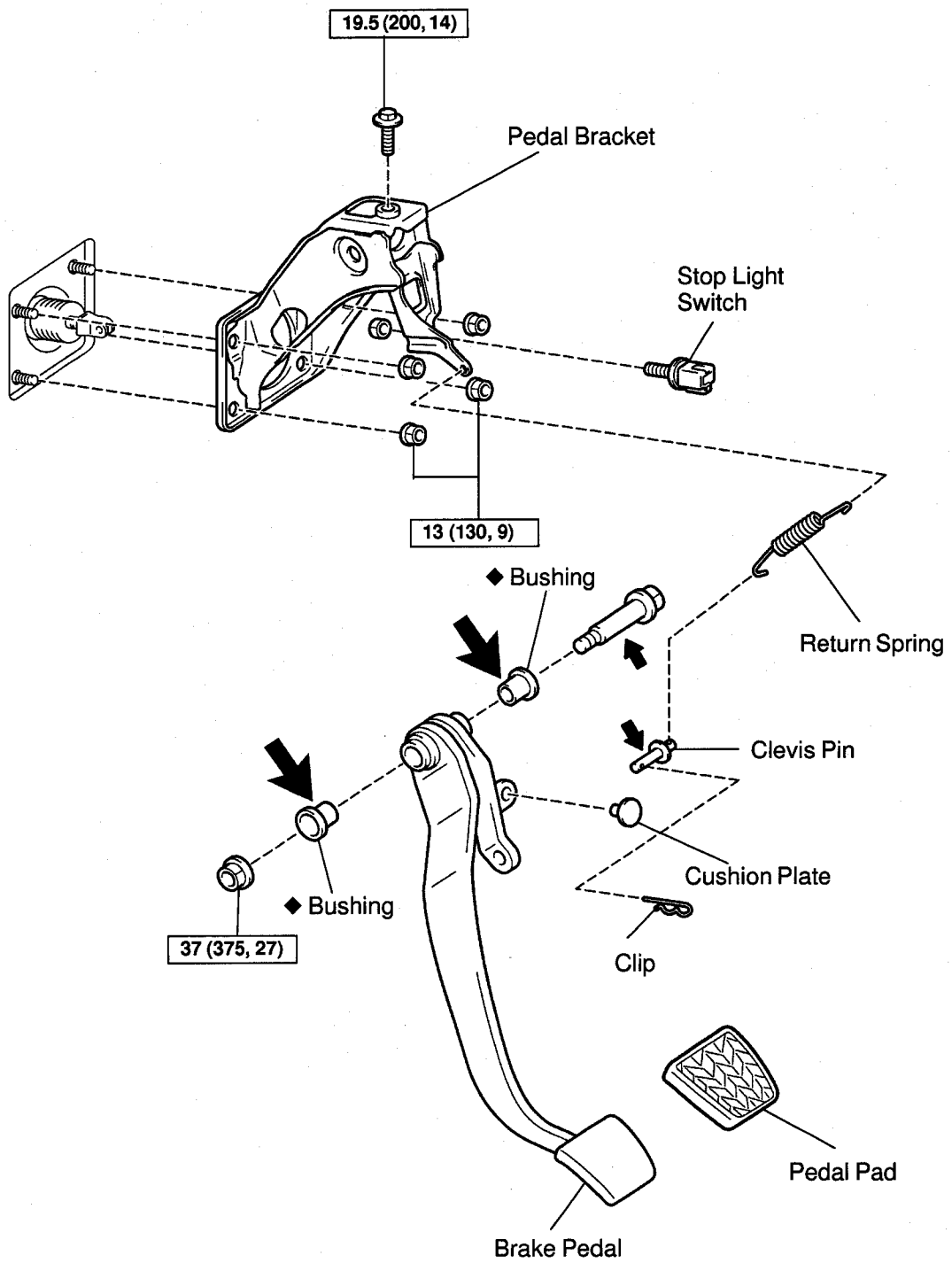
With the engine running, depress the pedal and measure the pedal reserve distance, as shown.

Pedal reserve distance from dash panel at 490 N (50 kgf, 110.2 lbf):
More than 48 mm (1.89 in.)

If the reserve distance is incorrect, troubleshoot the brake system.

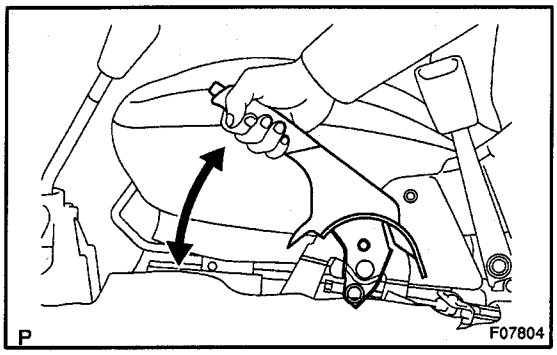
BR18I-01

COMPONENTS



N·m (kgf·cm, ft·lbf): Specified torque
◆ Non–reusable part
⬅ Lithium soap base glycol grease

F07807



PARKING BRAKE LEVER

BR0RC-04

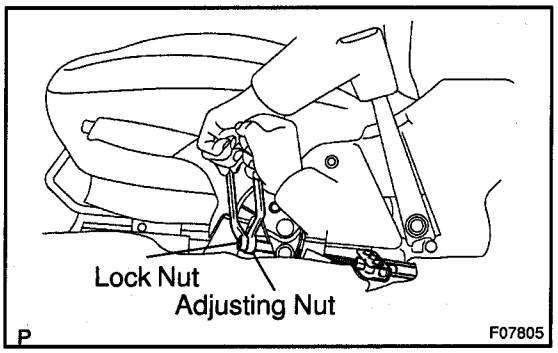
ON–VEHICLE INSPECTION

1. CHECK PARKING BRAKE LEVER TRAVEL

Pull the parking brake lever all the way up, and count the number of clicks.

Parking brake lever travel at 196 N (20 kgf, 44.1 lbf): 6 – 9 clicks

If incorrect, adjust the parking brake.



2. IF NECESSARY, ADJUST PARKING BRAKE

HINT:

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

For shoe clearance adjustment, see page BR–33 or BR–47.

(a) Remove the console box.

(b) Loosen the lock nut and turn the adjusting nut until the lever travel is correct.

(c) Tighten the lock nut.

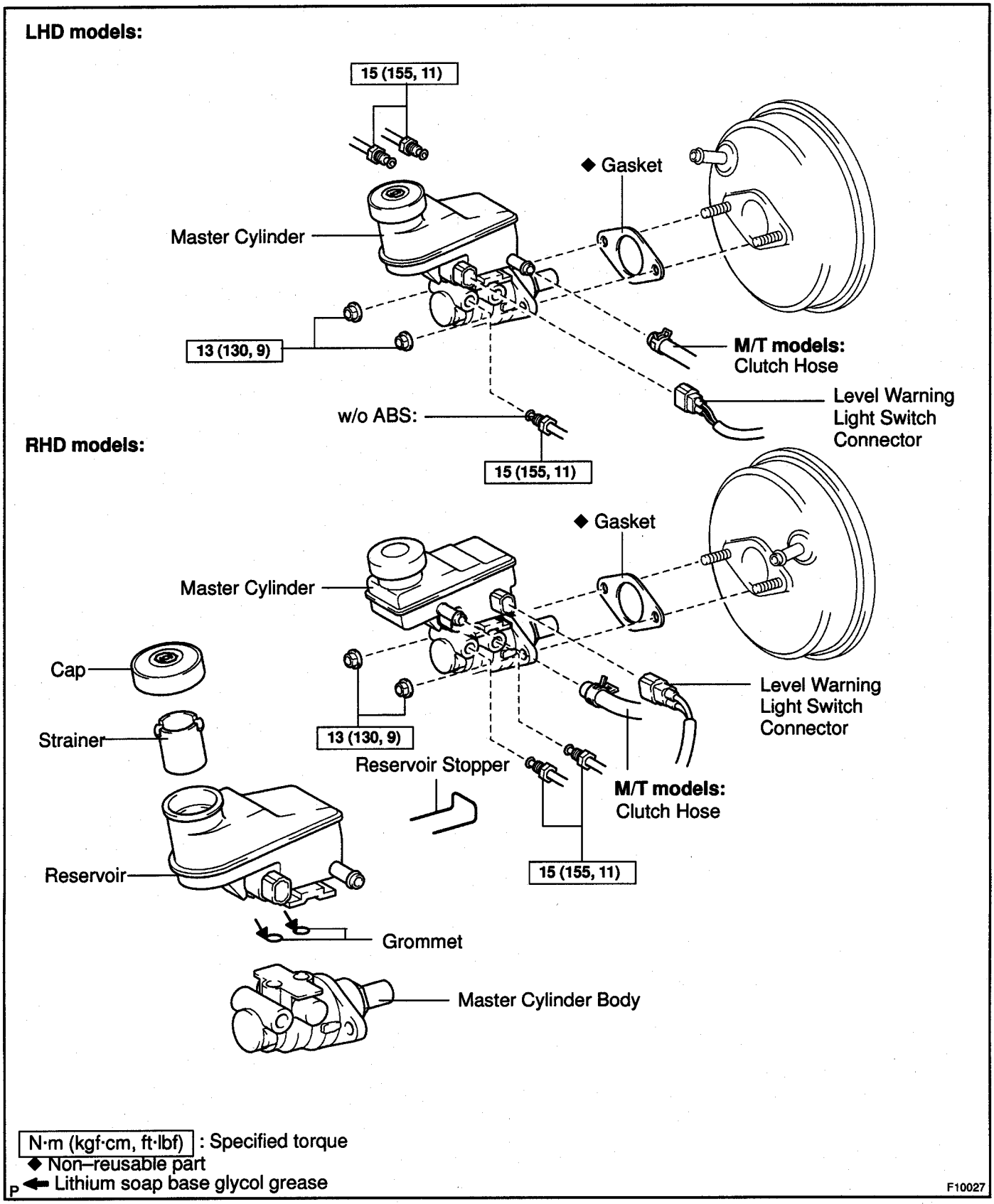
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(d) Install the console box.

BR112-02

BRAKE MASTER CYLINDER

COMPONENTS



BR

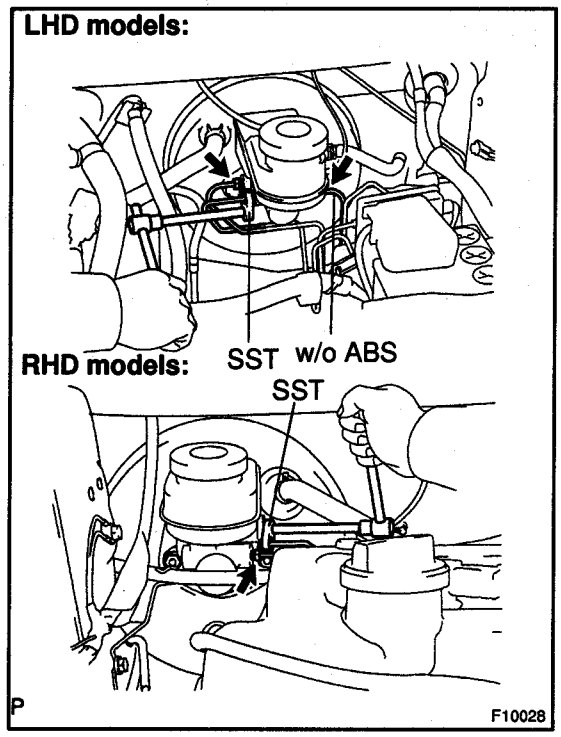
BR18A-01

REMOVAL

NOTICE:

- **Do not let brake fluid remain on a painted surface. Wash it off immediately.**
- **RHD models:**
  Be careful not to the brake fluid splash over the alternator.

1. **DISCONNECT LEVEL WARNING SWITCH CONNECTOR**
2. **DRAW OUT FLUID WITH SYRINGE**
3. **M/T models:**
   DISCONNECT CLUTCH HOSE FROM RESERVOIR

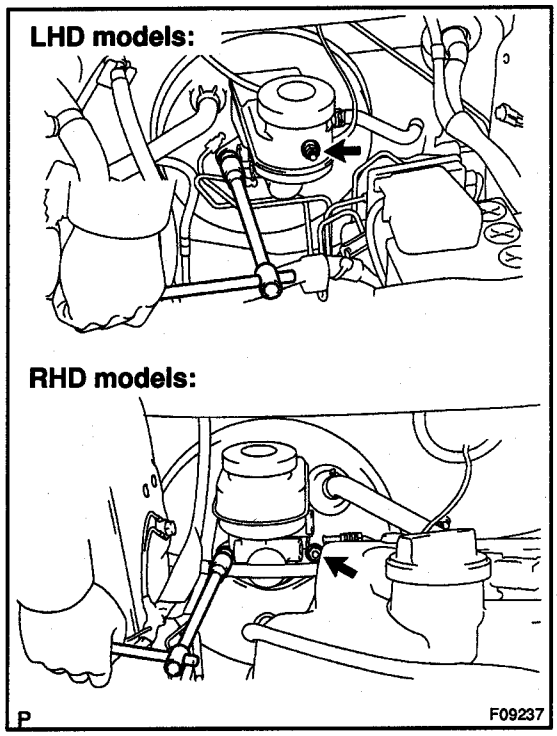


4. **DISCONNECT BRAKE LINES**

Using SST, disconnect the 2 or 3 brake lines from the master cylinder.

SST 09023–00100

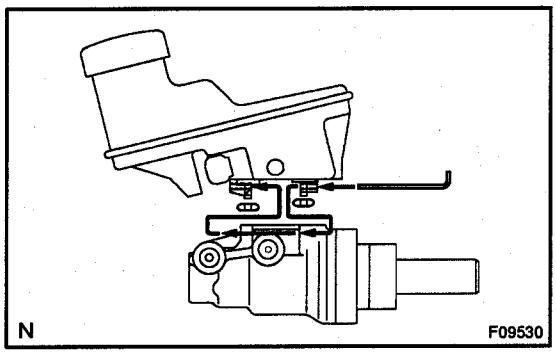
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)



5. REMOVE MASTER CYLINDER

Remove the 2 mounting nuts, and pull out the master cylinder and gasket.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



6. REMOVE RESERVOIR

(a) Pull out the reservoir stopper.

HINT:

At the time of installation, make sure to insert the reservoir stopper through holes of the reservoir and the master cylinder groove.

(b) Remove the reservoir and 2 grommets.

(c) Remove the cap and strainer from the reservoir.

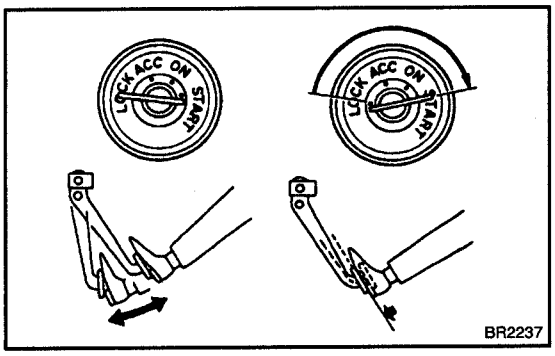
BR114-02

INSTALLATION

Installation is in the reverse order of removal (See page BR–13).

HINT:

- Before installation, adjust length of brake booster push rod (See page BR–18).
- After installation, fill the brake reservoir with brake fluid and bleed brake system (See page BR–4).
- Check for leaks, check and adjust brake pedal (See page BR–6).



BRAKE BOOSTER ASSEMBLY

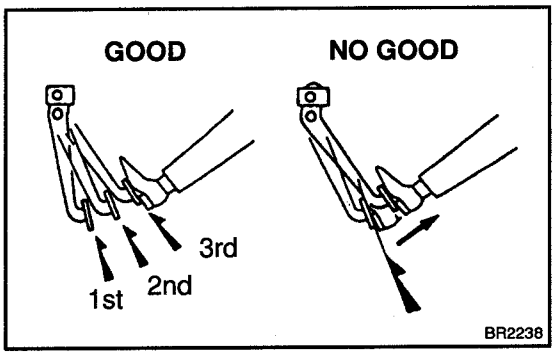
BR0RJ-03

ON–VEHICLE INSPECTION

1. OPERATING CHECK

(a) Depress the brake pedal several times with the engine off and check that there is no change in the pedal reserve distance.

(b) Depress the brake pedal and start the engine. If the pedal goes down slightly, operation is normal.



2. AIR TIGHTNESS CHECK

(a) Start the engine and stop it after 1 or 2 minutes. Depress the brake pedal several times slowly.

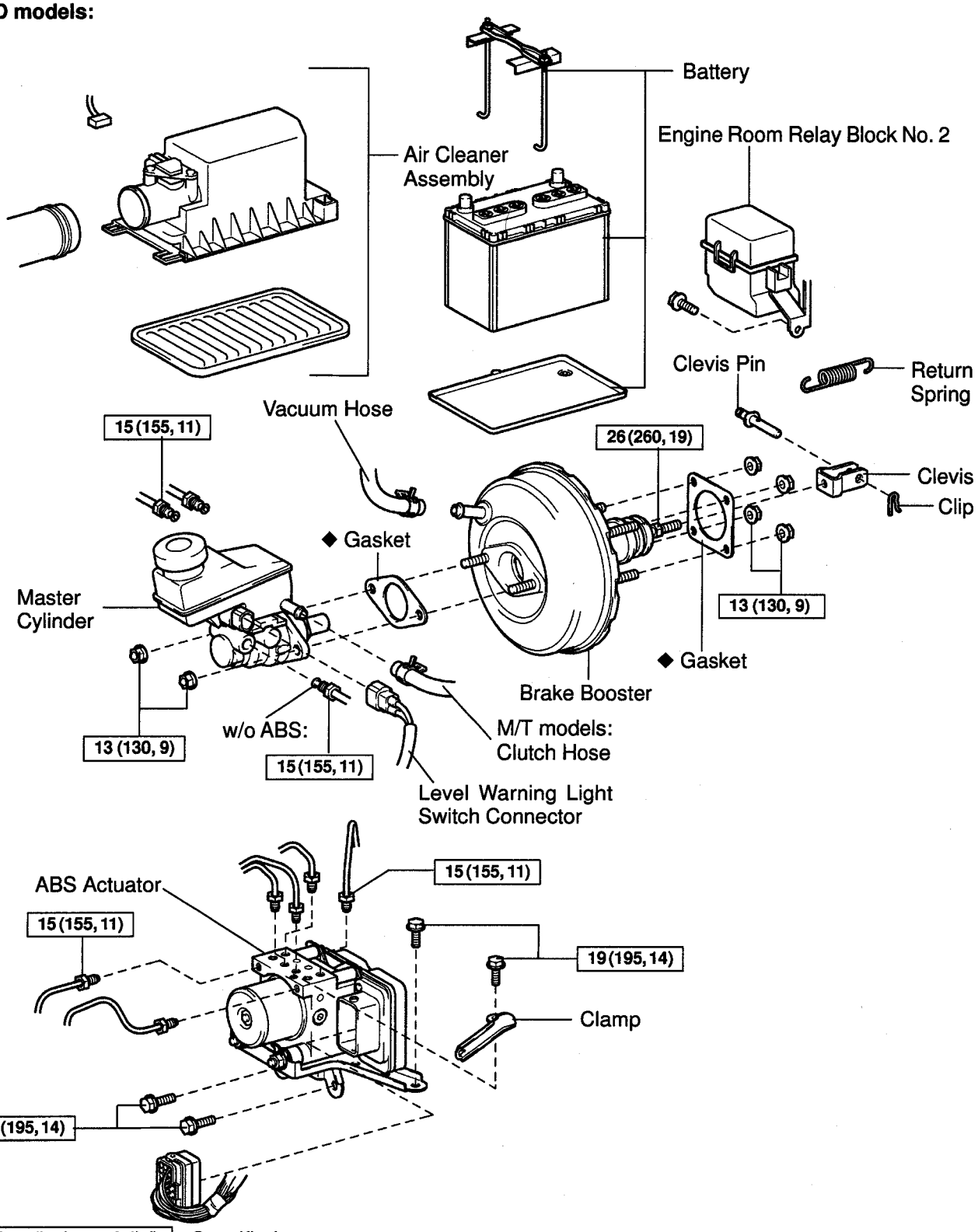
If the pedal goes down farthest the 1st time, but gradually rises after the 2nd or 3rd time, the booster is air tight.

(b) Depress the brake pedal while the engine is running, and stop the engine with the pedal depressed. If there is no change in the pedal reserve travel after holding the pedal for 30 seconds, the booster is air tight.

BR183-01

COMPONENTS

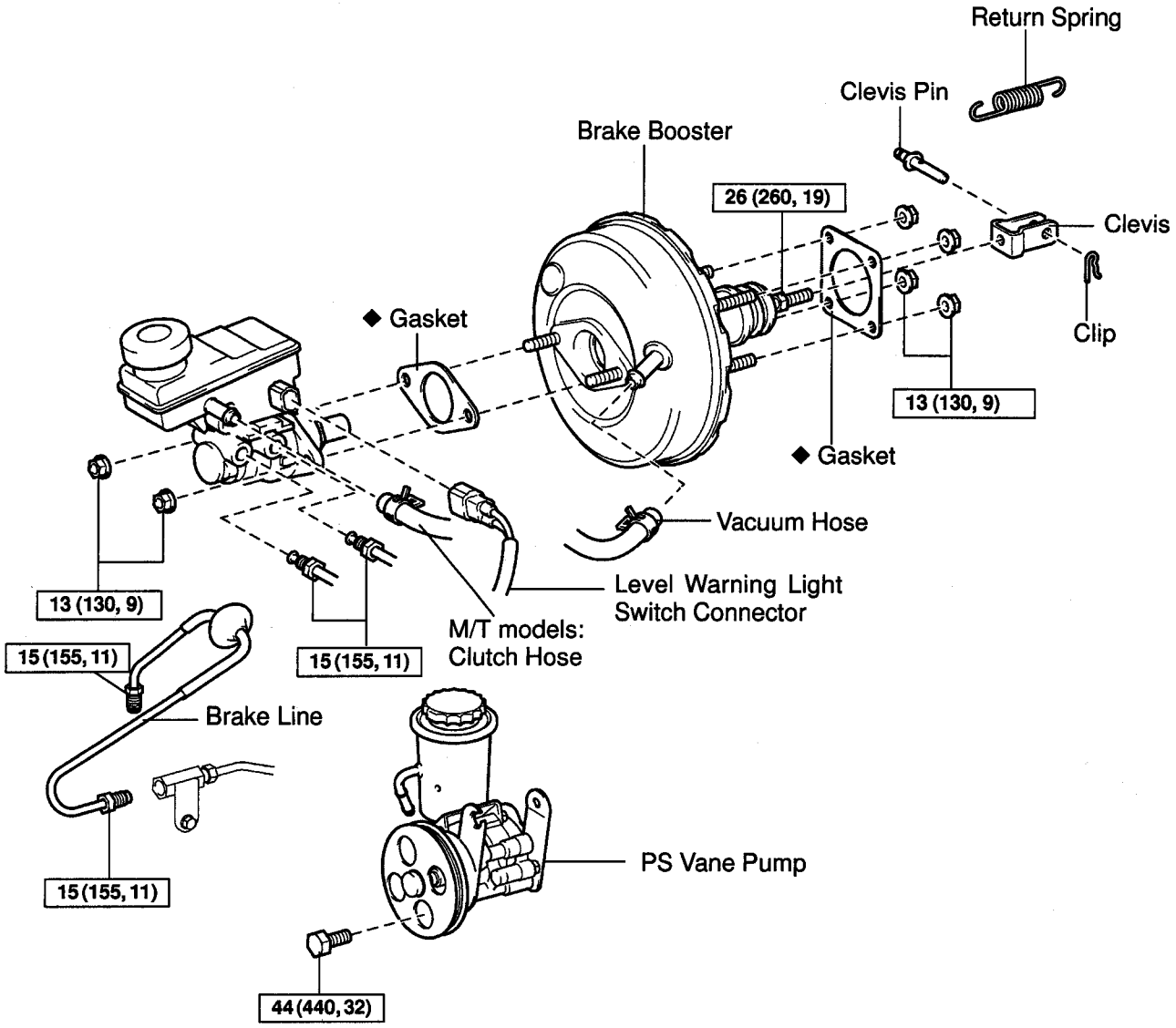
LHD models:



P [N·m (kgf·cm, ft·lbf)] : Specified torque
◆ Non–reusable part

F09246

RHD models:



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

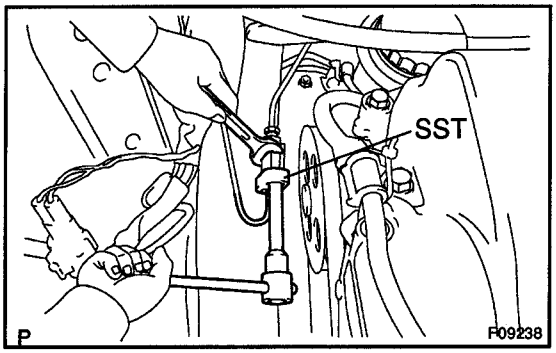
P

F10029

BR184-01

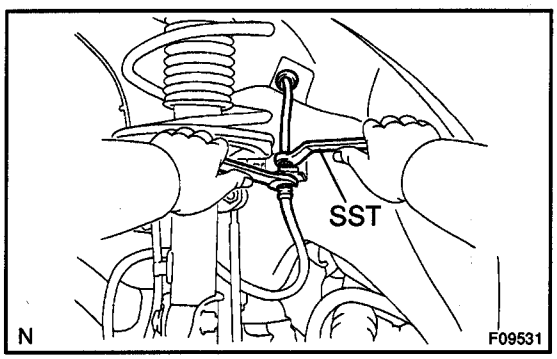
REMOVAL

1. **REMOVE MASTER CYLINDER (See page BR–11)**
2. **LHD models: REMOVE AIR CLEANER ASSEMBLY**
3. **LHD models: REMOVE ABS ACTUATOR (See page BR–56)**



4. **RHD models: REMOVE BRAKE LINE**

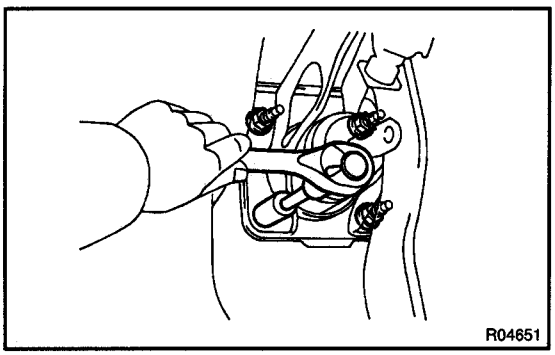
(a) Using SST and spanner, disconnect the brake line.
SST 09023–00100



(b) Using SST and spanner, disconnect the brake line from the flexible hose of RH front brake.

(c) Remove the brake line with grommet from the body.
SST 09751–36011

5. **RHD models: REMOVE 2 BOLTS OF PS VANE PUMP, AND MOVE PS VANE PUMP ASIDE (See page SR–25)**
6. **DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER**
7. **REMOVE RETURN SPRING**
8. **REMOVE CLIP AND CLEVIS PIN**



9. **REMOVE BRAKE BOOSTER**

(a) Remove the 4 nuts and clevis.

(b) Pull out the brake booster and gasket.

BR185-01

INSTALLATION

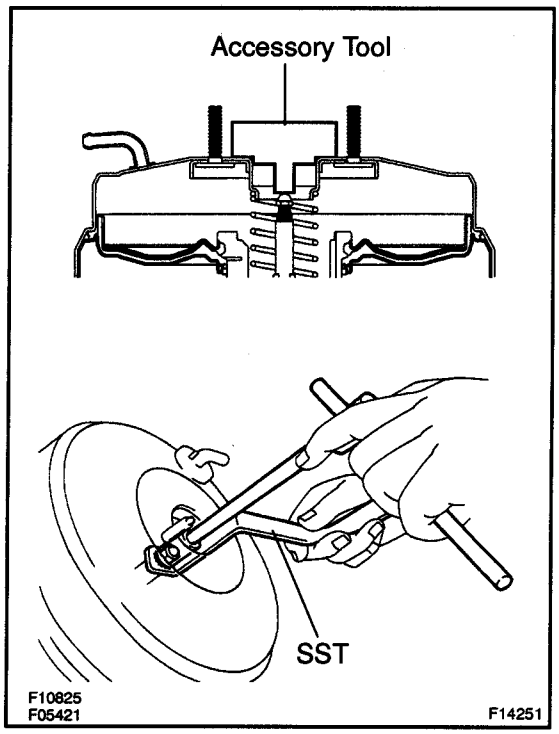
1. INSTALL BRAKE BOOSTER

(a) Install the booster and a new gasket.

(b) Install and torque the booster installation nuts.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(c) Install the clevis, and torque the lock nut.
Torque: 26 N·m (260 kgf·cm, 19 ft·lbf)

(d) Insert the clevis pin into the clevis and brake pedal, and install the clip to the clevis pin and install the return spring.



2. When replacing the brake master cylinder only: ADJUST LENGTH OF BRAKE BOOSTER PUSH ROD

(a) Apply chalk to the tip of an accessory tool.

(b) Place the accessory tool to the brake booster.

(c) Measure the clearance between the brake booster push rod and accessory tool.
Clearance: 0 mm (0 in.)

HINT:

Adjust the clearance in following cases:

- If there is a clearance between the accessory tool and the shell of the booster (floating accessory tool), the clearance is small.
- If the chalk does not stick on the tip of the push rod, the clearance is large.

(d) If the clearance is outside of the specified range, fix the push rod using SST and adjust the length of the protruding adjusting bolt.
SST 09737–00020

NOTICE:

Make an adjustment with the booster having no vacuum. (Depress the brake pedal several times with the engine stopped.)

3. CONNECT VACUUM HOSE TO BRAKE BOOSTER

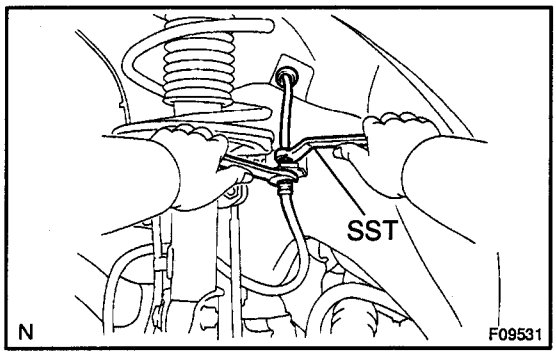
4. LHD models:
INSTALL ABS ACTUATOR (See page BR–56)

5. LHD models:
INSTALL AIR CLEANER ASSEMBLY

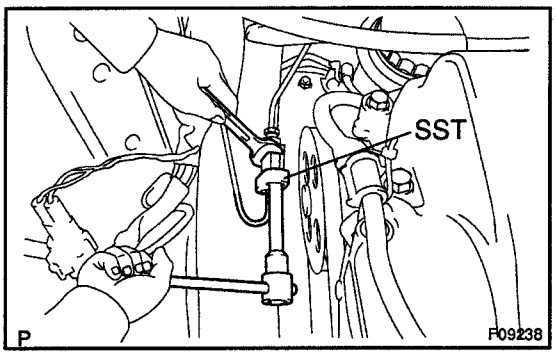
6. RHD models:
INSTALL PS VANE PUMP (See page SR–25)

7. RHD models:
INSTALL BRAKE LINE

(a) Install the brake line with grommet to the body.



(b) Using SST and spanner, disconnect the brake line to the flexible hose of RH front brake.
SST 09751–36011



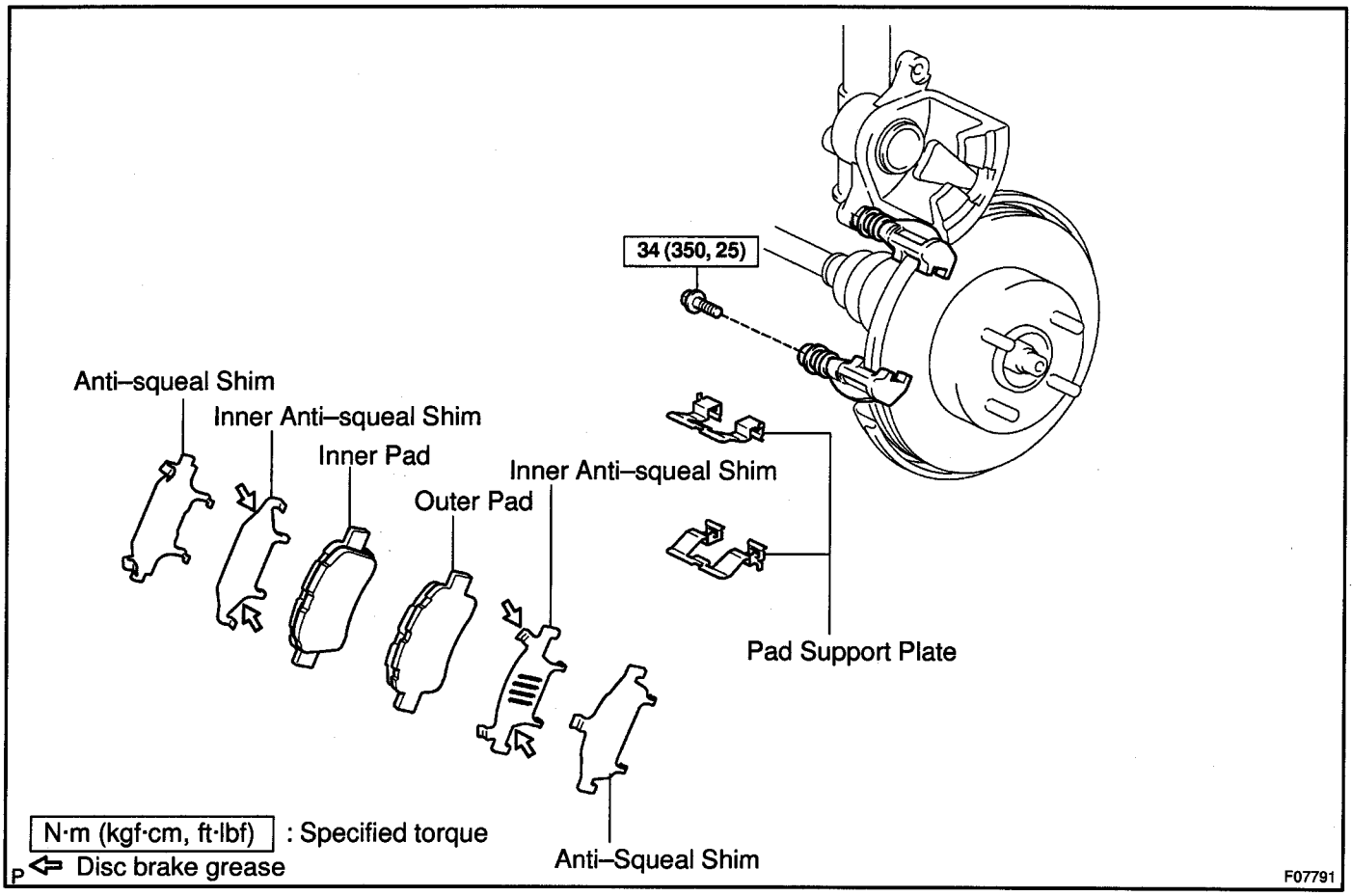
(c) Using SST and spanner, disconnect the brake line.
SST 09023–00100

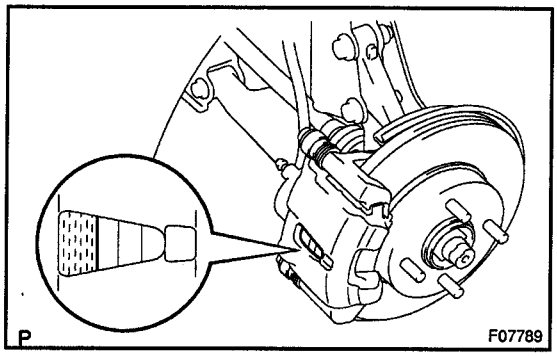
8. **INSTALL MASTER CYLINDER (See page BR–13)**
9. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR–4)**
10. **CHECK FOR LEAKS**
11. **CHECK AND ADJUST BRAKE PEDAL (See page BR–6)**
12. **DO OPERATIONAL CHECK (See page BR–14)**

FRONT BRAKE PAD

COMPONENTS

BR0RN–04





8R11D-02

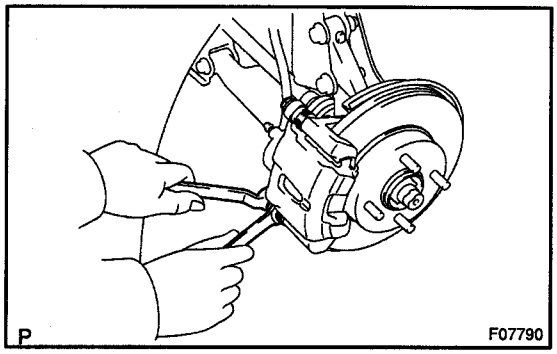
REPLACEMENT

1. REMOVE FRONT WHEEL

2. INSPECT PAD LINING THICKNESS

Check the pad thickness through the caliper inspection hole and replace the pads if they are not within the specification.

Minimum thickness: 1.0 mm (0.039 in.)



3. LIFT UP CALIPER

(a) Hold the sliding pin on the bottom and loosen the installation bolt, and remove the installation bolt.

(b) Lift up the caliper and suspend it securely.

HINT:

Do not disconnect the flexible hose from the caliper.

4. REMOVE BRAKE PADS WITH ANTI–SQUEAL SHIMS

5. REMOVE 2 PAD SUPPORT PLATES

NOTICE:

The support plates can be used again provided that they have sufficient rebound, no deformation, cracks or wear, and have had all rust, dirt and foreign particles cleaned off.

6. CHECK DISC THICKNESS AND RUNOUT

(See page BR–26)

7. INSTALL 2 PAD SUPPORT PLATES

8. INSTALL NEW PADS

NOTICE:

When replacing worn pads, the anti–squeal shims and pad wear indicator plates must be replaced together with the pads.

(a) Apply disc brake grease to the anti–squeal shims (See page BR–23).

(b) Install the 2 anti–squeal shims on the outer pad.

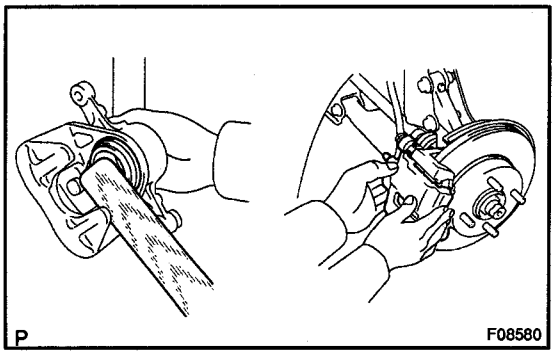
(c) Install the 2 anti–squeal shims on the inner pad.

(d) Install the inner pad with the pad wear indicator plate facing upward.

(e) Install the outer pad.

NOTICE:

There should be no oil or grease adhering to the friction surfaces of the pads or the disc.



9. INSTALL CALIPER

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

(b) Press in the piston with a hammer handle or similar implement.

HINT:

If the piston is difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

(c) Install the caliper.

(d) Hold the sliding pin and install the installation bolt.

Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

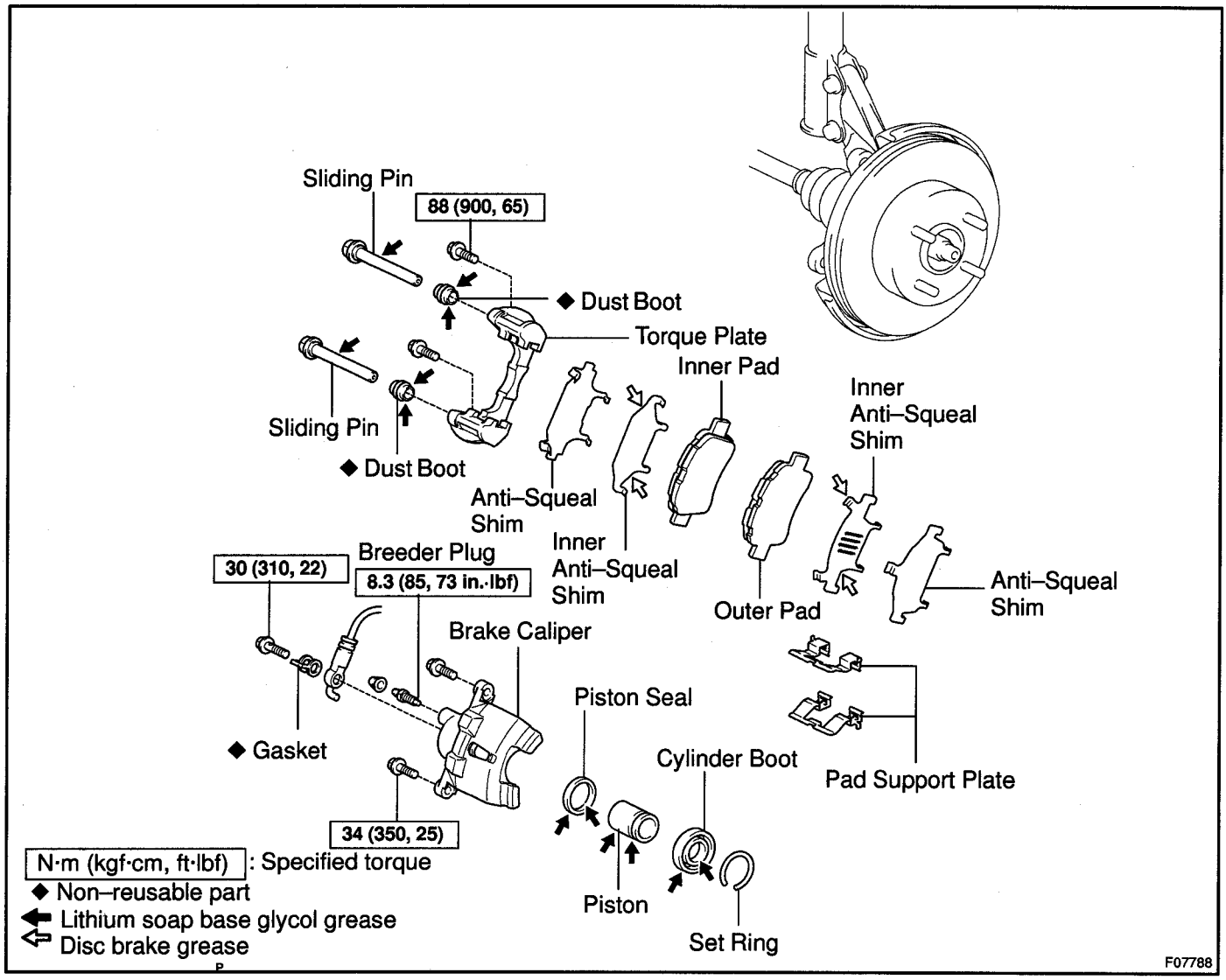
10. INSTALL FRONT WHEEL

11. CHECK THAT FLUID LEVEL IS AT MAX LINE

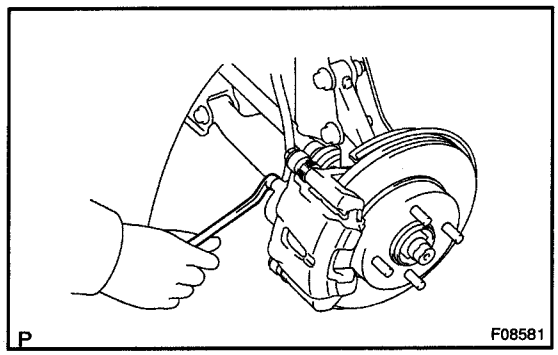
FRONT BRAKE CALIPER

COMPONENTS

BR0RP–05



BR0RQ-04



REMOVAL

1. REMOVE FRONT WHEEL

Remove the wheel and temporarily fasten the disc with hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. DISCONNECT FLEXIBLE HOSE

(a) Remove the union bolt and gasket from the caliper, then disconnect the flexible hose from the caliper.

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

HINT:

At the time of installation, install the flexible hose lock securely in the lock hole in the caliper.

(b) Use a container to catch the brake fluid as it drains out.

3. REMOVE BRAKE CALIPER

(a) Hold the sliding pin and loosen the 2 installation bolts, and remove the 2 installation bolts.

Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(b) Remove the caliper from the torque plate.

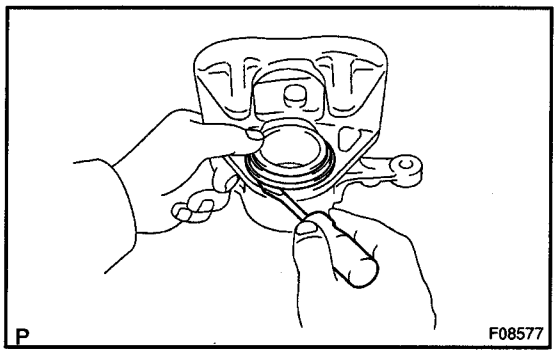
(c) Remove the 2 dust boots from the torque plate.

4. REMOVE BRAKE PADS WITH ANTI–SQUEAL SHIMS

5. REMOVE 2 PAD SUPPORT PLATES

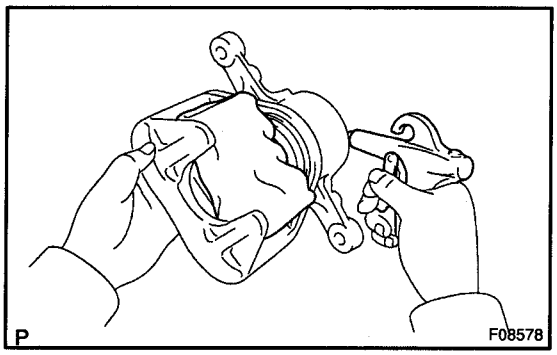
BR11E-02

DISASSEMBLY



1. REMOVE SET RING AND CYLINDER BOOT

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



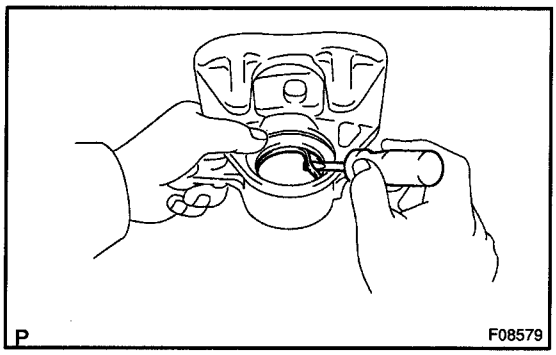
2. REMOVE PISTON

(a) Place a piece of cloth or similar, between the piston and the caliper.

(b) Use compressed air to remove the piston from the cylinder.

CAUTION:

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

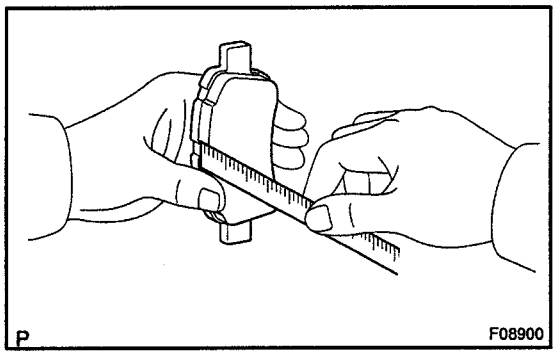


3. REMOVE PISTON SEAL

Using a screwdriver, remove the piston seal from the cylinder.

BR0RS-04

INSPECTION



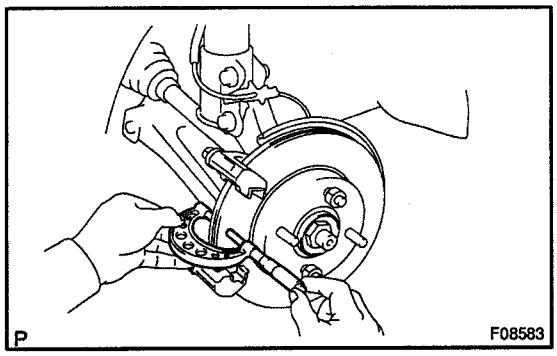
1. MEASURE PAD LINING THICKNESS

Using a ruler, measure the pad lining thickness.

Standard thickness: 11.0 mm (0.433 in.)

Minimum thickness: 1.0 mm (0.039 in.)

Replace the pad if the pad's thickness is at the minimum thickness or less, or if the pad has severe and uneven wear.



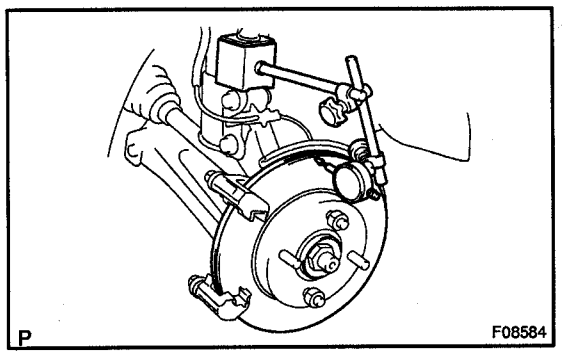
2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness: 20.0 mm (0.787 in.)

Minimum thickness: 18.0 mm (0.709 in.)

Replace the disc if the disc's thickness is at the minimum thickness or less. Replace the disc or grind it on a lathe if it is badly scored or worn unevenly.

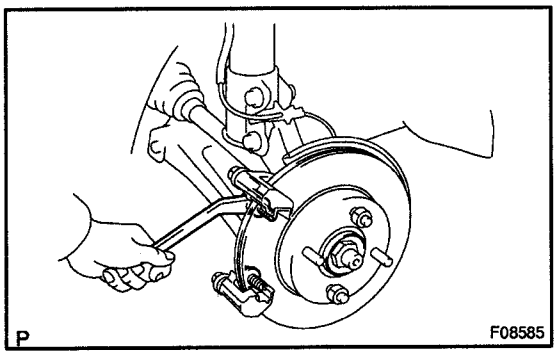


3. MEASURE DISC RUNOUT

Using a dial indicator, measure disc runout 10 mm (0.39 in.) away from the outer edge of the disc.

Maximum disc runout: 0.05 mm (0.0020 in.)

If the disc's runout is the maximum value or greater, check the bearing play is in the axial direction and check the axle hub runout (See page SA–9). If the bearing play and axle hub runout are not abnormal, adjust the disc runout or grind it on a "On–car" brake late.



4. IF NECESSARY, ADJUST DISC RUNOUT

(a) Remove the 2 mounting bolts and torque plate from the knuckle.

(b) Remove the hub nuts and the disc. Reinstall the disc in the position turned 1/4 from its original position on the hub. Install and torque the hub nuts.

Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)

(c) Remeasure the disc runout. Make a note of the runout and the disc's position on the hub.

Repeat (b) until the disc has been installed on the 2 remaining hub positions.

If the minimum runout recorded in (b) and (c) is less than 0.05 mm (0.0020 in.), install the disc in that position.

If the minimum runout recorded in (b) and (c) is greater than 0.05 mm (0.0020 in.), replace the disc and repeat step 3.

(d) Install the torque plate and 2 mounting bolts.

Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)

BR0RT-03

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR–25).

NOTICE:

Apply lithium soap base glycol grease and disc brake grease to the parts indicated by arrows (See page BR–23).

BR0RU–02

INSTALLATION

Installation is in the reverse order of removal (See page BR–24).

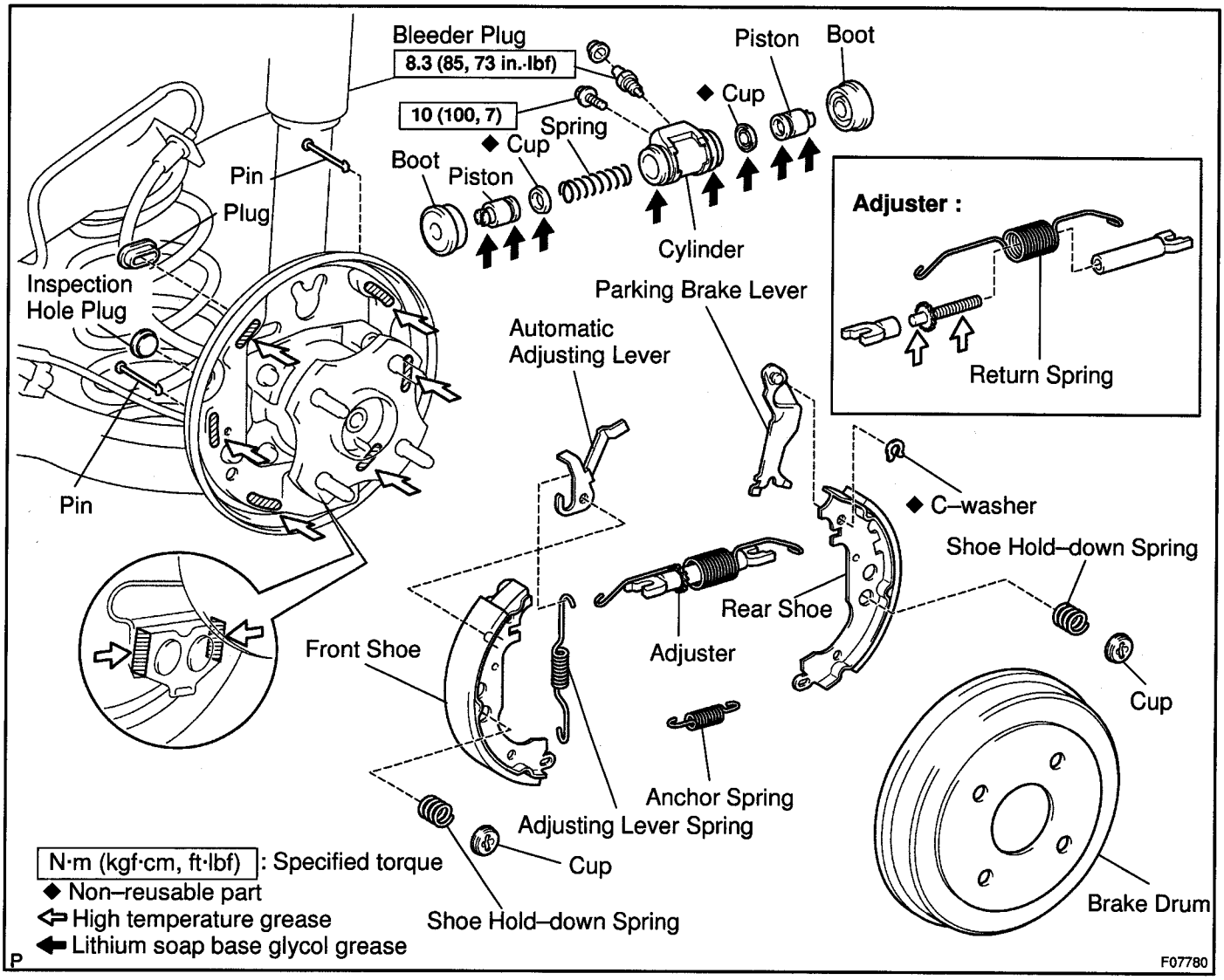
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed the brake system (See page BR–4).
- Check for leaks.

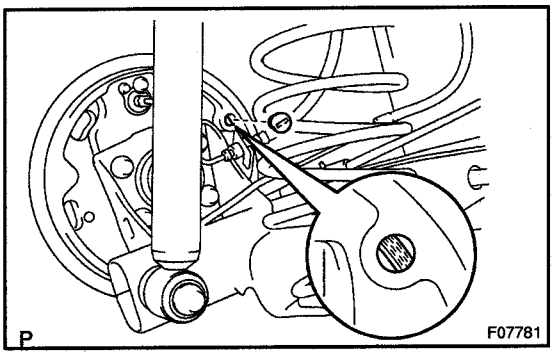
REAR DRUM BRAKE

COMPONENTS

BR14L-01



BR14M-01



REMOVAL

1. INSPECT SHOE LINING THICKNESS

Remove the inspection hole plug, and check the shoe lining thickness through the hole.

If less than minimum, replace the shoes.

Minimum thickness: 1.0 mm (0.039 in.)

2. REMOVE REAR WHEEL

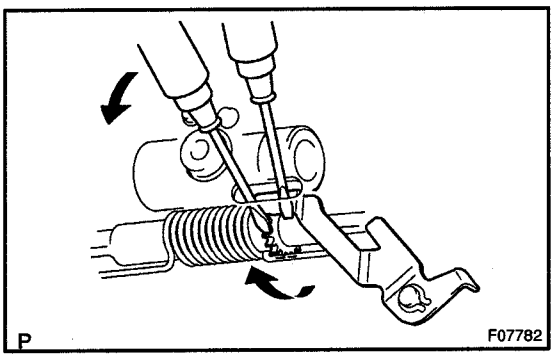
3. RELEASE PARKING BRAKE LEVER

4. REMOVE BRAKE DRUM

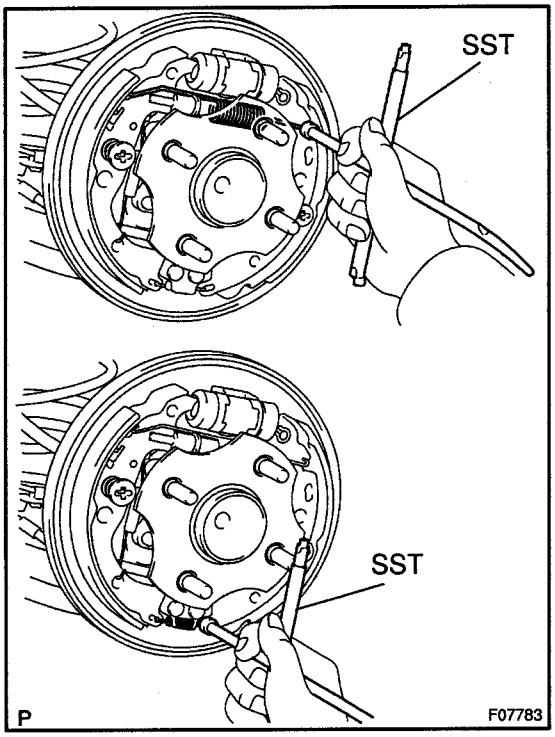
HINT:

If the brake drum cannot be removed easily, do the following steps.

(a) Remove the plug and insert a screwdriver through the hole in the backing plate.



(b) Using another screwdriver, reduce the brake shoe adjuster by turning the adjusting wheel.



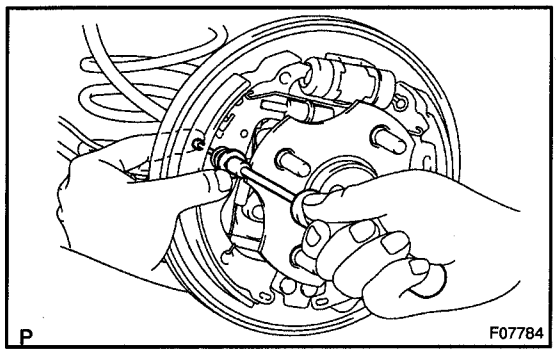
5. REMOVE FRONT SHOE

(a) Using SST, disconnect the return spring from the rear shoe.

SST 09703–30010

(b) Using SST, remove the anchor spring.

SST 09703–30010



(c) Using SST, remove the cup, shoe hold–down spring and pin.
SST 09718–00010

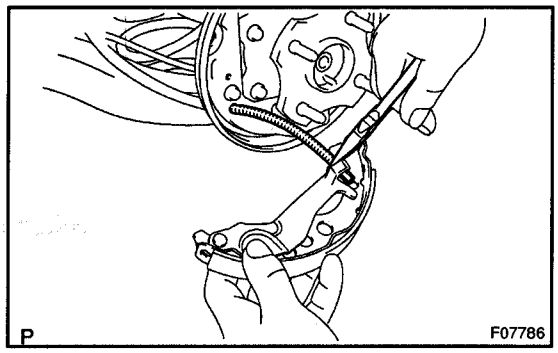
(d) Remove the adjuster together with the adjuster spring from the front shoe.

(e) Using needle–nose pliers, remove the adjusting lever spring.

(f) Remove the automatic adjusting lever from the front shoe.

6. REMOVE REAR SHOE

(a) Using SST, remove the cup, shoe hold–down spring and pin.
SST 09718–00010

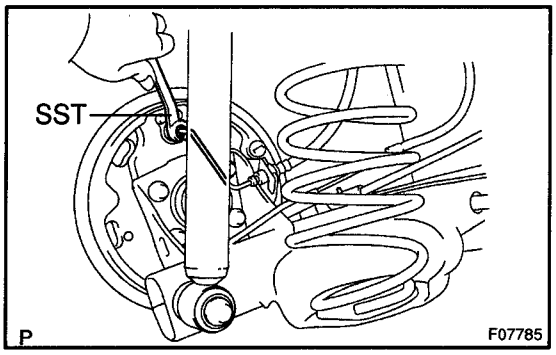


(b) Using needle–nose pliers, disconnect the parking brake cable from the parking brake lever, and remove the rear shoe.

7. REMOVE PARKING BRAKE LEVER

(a) Remove the C–washer.

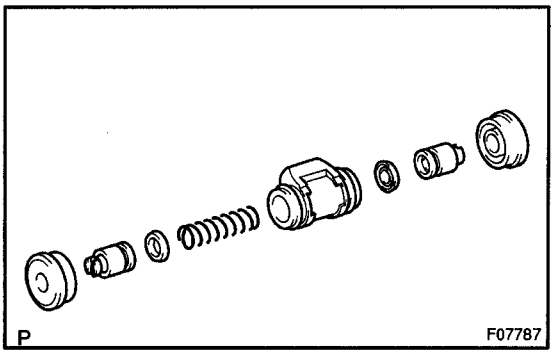
(b) Remove the parking brake lever from rear shoe.



8. REMOVE WHEEL CYLINDER

(a) Using SST, disconnect the brake line. Use a container to catch the brake fluid.
SST 09751–36011
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

(b) Remove the bolt and wheel cylinder.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



9. DISASSEMBLE WHEEL CYLINDER

(a) Remove the 2 boots from the wheel cylinder.

(b) Remove the 2 pistons from the wheel cylinder.

(c) Remove the spring from the wheel cylinder.

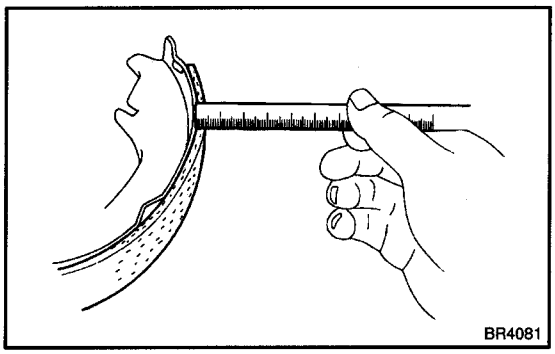
(d) Remove the 2 piston cups from the each piston.

BR0RX-06

INSPECTION

1. INSPECT DISASSEMBLED PARTS

Inspect the disassembled parts for wear, rust or damage.



2. MEASURE BRAKE SHOE LINING THICKNESS

Using a ruler, measure the shoe lining thickness.

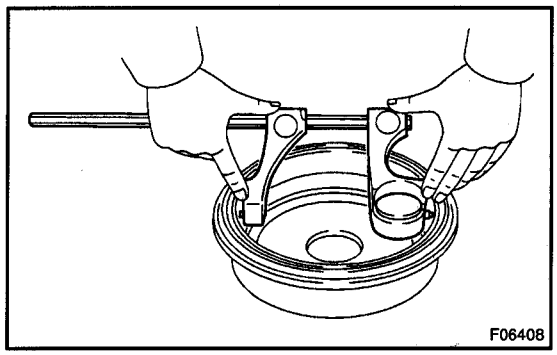
Standard thickness: 4.0 mm (0.157 in.)

Minimum thickness: 1.0 mm (0.039 in.)

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

HINT:

If a brake shoes needs replacing, the brake shoes must be replaced as a set



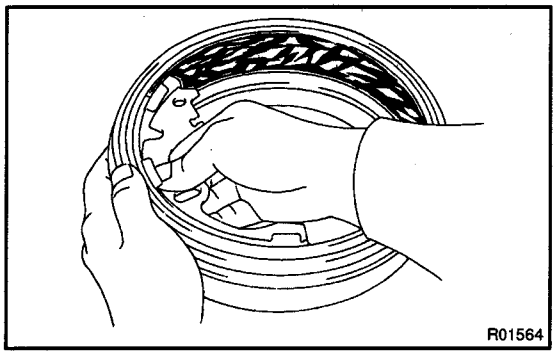
3. MEASURE BRAKE DRUM INSIDE DIAMETER

Using a brake drum gauge or equivalent, measure the inside diameter of the drum.

Standard inside diameter: 200.0 mm (7.874 in.)

Maximum inside diameter: 201.0 mm (7.913 in.)

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



4. INSPECT REAR BRAKE LINING AND DRUM FOR PROPER CONTACT

If the contact between the brake lining and drum is improper, repair the lining with a brake shoe grinder, or replace the brake shoe assembly.

BR11H-03

INSTALLATION

Installation is in the reverse order of removal (See page BR–30).

NOTICE:

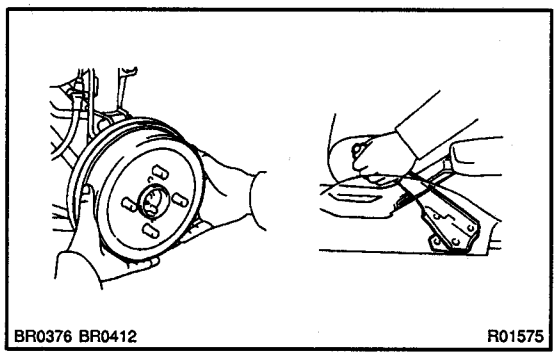
Apply lithium soap base glycol grease and high temperature grease to the parts indicated by the arrows (See page BR–29).

1. CHECK OPERATION OF AUTOMATIC ADJUSTING MECHANISM

(a) Move the parking brake lever of the rear shoe back and forth. Check that the adjuster turns.

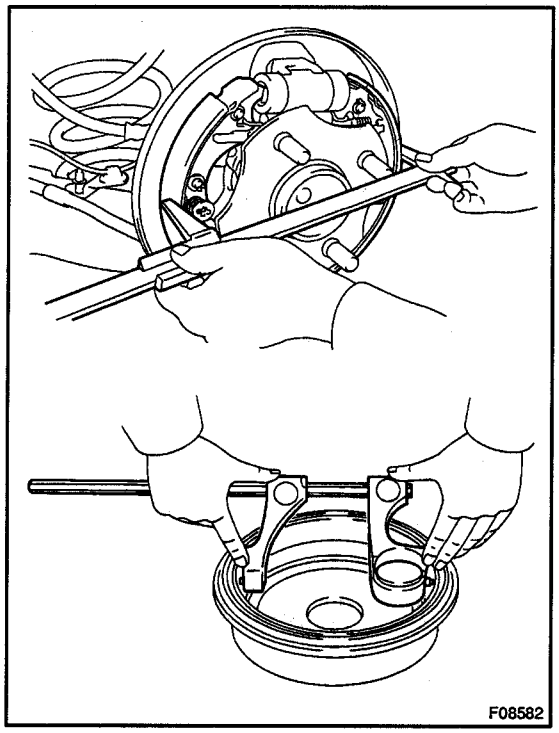
If the adjuster does not turn, check for incorrect installation of the rear brake.

(b) Adjust the adjuster length to the as short as possible.



(c) Install the brake drum.

(d) Pull the parking brake lever all the way up until a clicking sound can no longer be heard.



2. CHECK CLEARANCE BETWEEN BRAKE SHOES AND DRUM

(a) Remove the brake 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.

(c) Install the brake drum.

3. FILL BRAKE RESERVOIR WITH BRAKE FLUID

4. BLEED BRAKE SYSTEM (See page BR–4)

5. CHECK FOR LEAKS

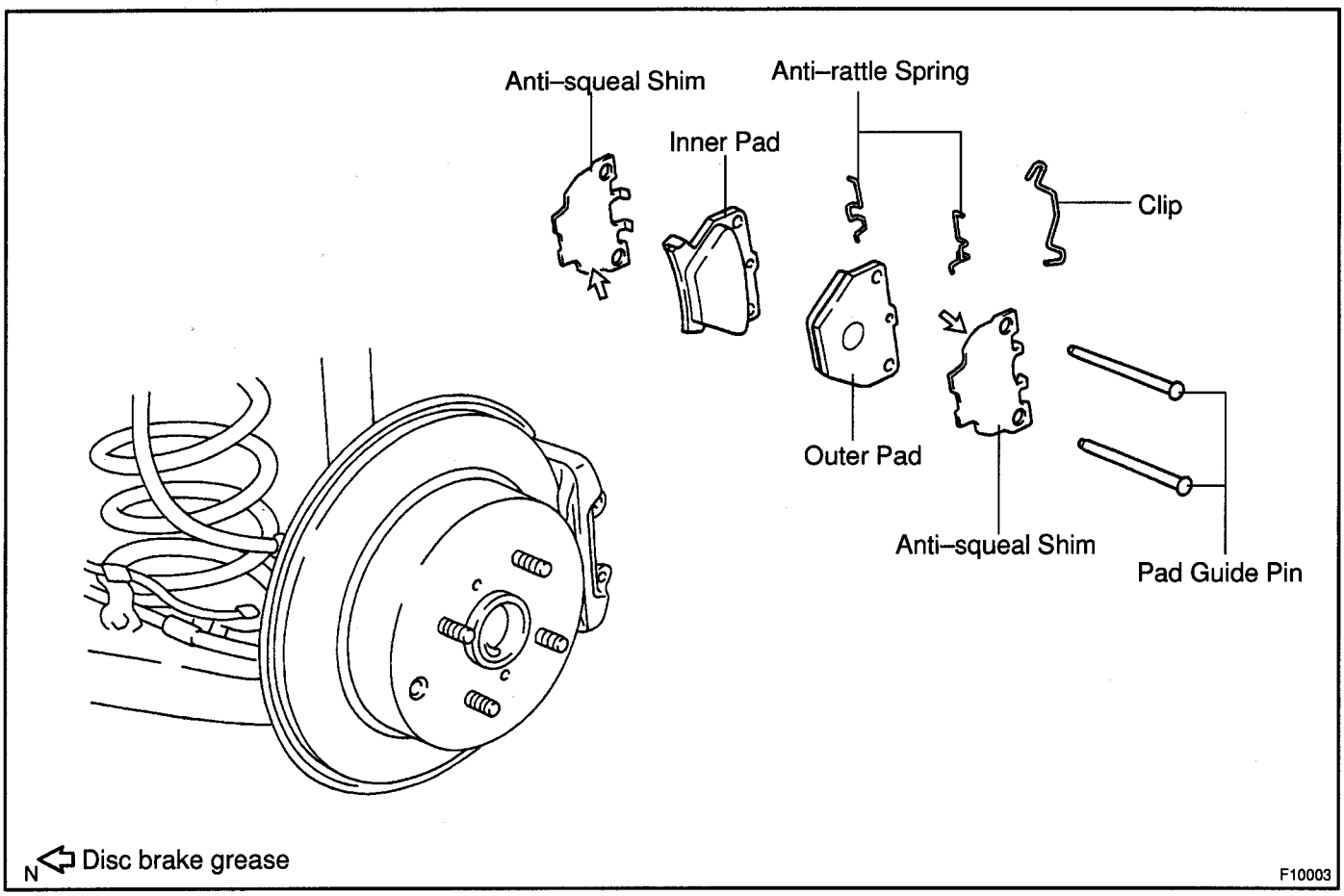
6. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

REAR BRAKE PAD

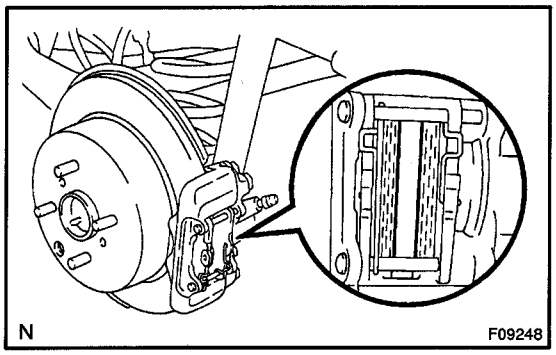
COMPONENTS

BR14N–01



BR14O–01

REPLACEMENT

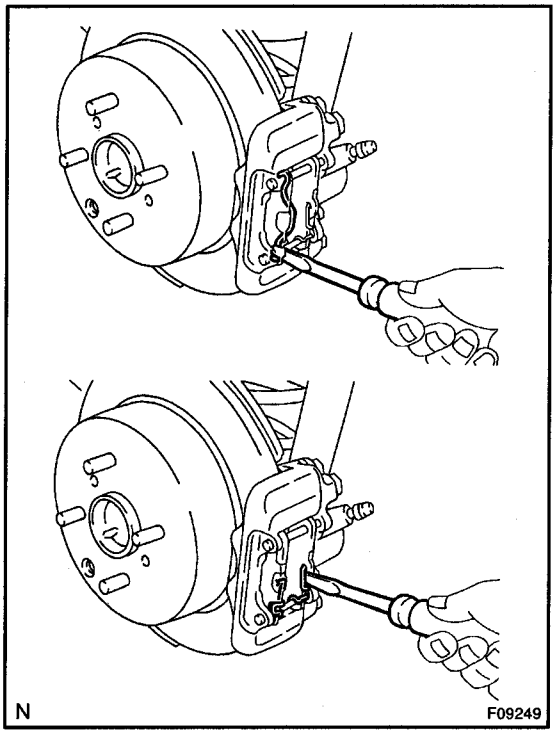


1. REMOVE REAR WHEEL

2. INSPECT PAD LINING THICKNESS

Check the pad thickness.

Minimum thickness: 1.0 mm (0.039 in.)



3. REMOVE CLIP, 2 ANTI–RATTLE SPRINGS AND 2 PAD GUIDE PINS

(a) Using a screwdriver, remove the clip and 2 anti–rattle springs.

NOTICE:

- **Do not deform the clip and anti–rattle spring.**
- **The clip and anti–rattle spring can be used again provided that they have sufficient rebound, no deformation, cracks or wear, and have had all rust, dirt and foreign particles cleaned off.**

(b) Remove the 2 pad guide pins.

4. REMOVE PADS AND ANTI–SQUEAL SHIMS

(a) Remove the 2 pads.

(b) Remove the anti–squeal shim from each pad.

5. CHECK DISC THICKNESS AND RUNOUT
(See page BR–40)

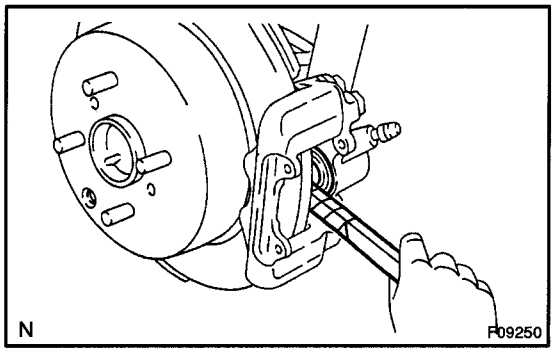
6. INSTALL NEW PADS

NOTICE:

When replacing worn pads, the anti–squeal shims must be replaced together with the pads.

(a) Apply disc brake grease to inside of anti–squeal shims (See page BR–34).

(b) Install the anti–squeal shim on each pad.



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

(d) Press in the piston with a monkey wrench handle or equivalent.

HINT:

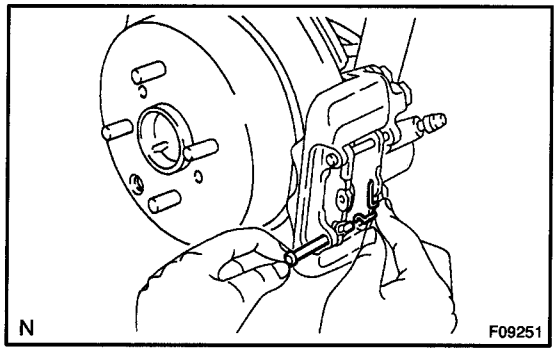
- Tape the monkey wrench handle before use.
- If the piston is difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

(e) Install the inner pad with the pad wear indicator plate facing upward, and install the outer pad.

NOTICE:
There should be no oil or grease adhering to the friction surfaces of the pads and the disc.

7. INSTALL 2 ANTI–RATTLE SPRINGS, 2 PAD GUIDE PINS AND CLIP

(a) Install the 2 anti–rattle spring on the each pad.



(b) While pressing the anti–rattle spring, and install the pad guide pin.

(c) Install the clip to the pad guide pin.

8. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

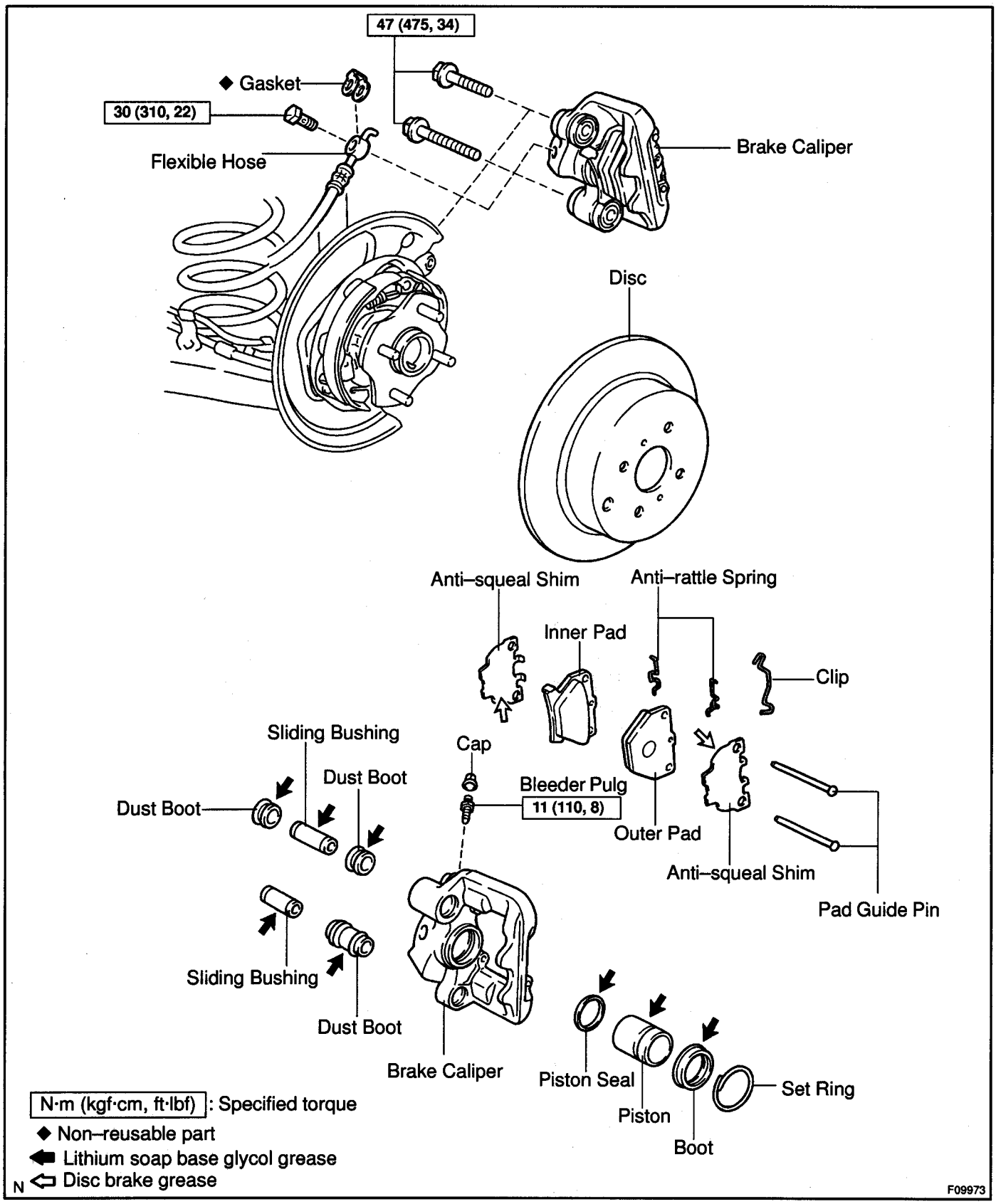
9. DEPRESS BRAKE PEDAL SEVERAL TIMES

10. CHECK THAT FLUID LEVEL IS AT MAX LINE

REAR BRAKE CALIPER

COMPONENTS

BR14P-01

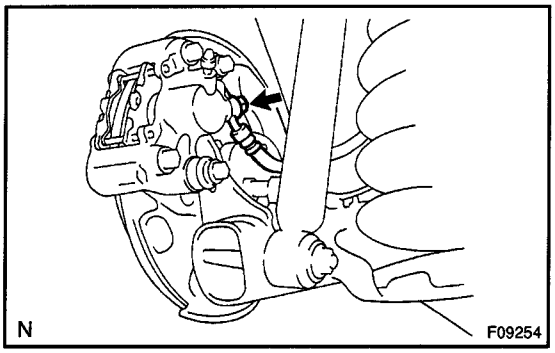


BR14Q-01

REMOVAL

1. REMOVE REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)



2. DISCONNECT FLEXIBLE HOSE

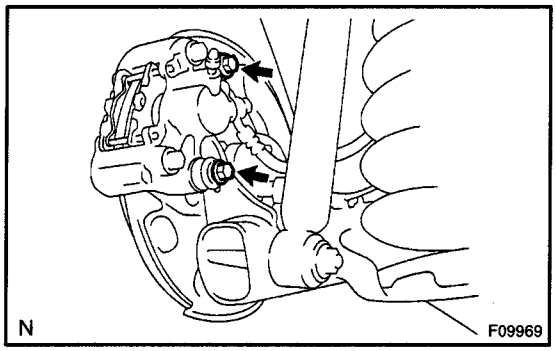
(a) Remove the union bolt and gasket from the caliper, then disconnect the flexible hose from the caliper.

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

HINT:

At the time of installation, insert the flexible hose lock securely in the lock hole in the caliper.

(b) Use a container to catch the brake fluid as it drains out.



3. REMOVE BRAKE CALIPER

(a) Remove the 2 installation bolts and caliper.

(b) Remove the caliper from the torque plate.

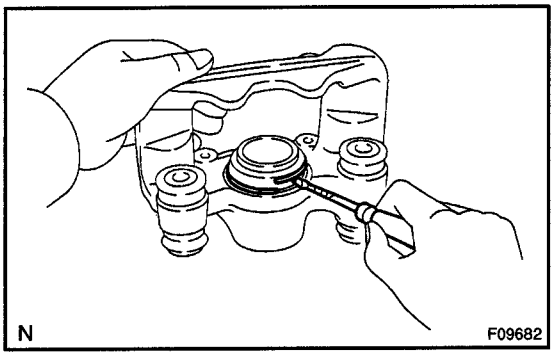
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

4. REMOVE 2 PADS WITH ANTI–SQUEAL SHIMS

(See page BR–35)

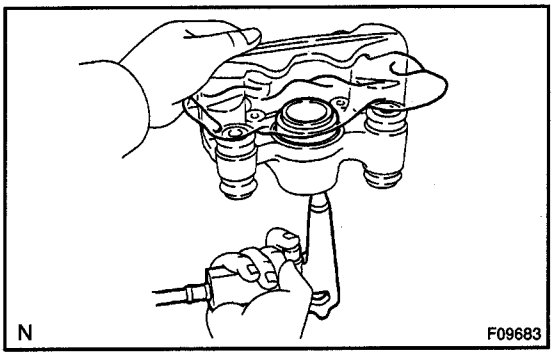
BR14R-01

DISASSEMBLY



1. REMOVE SET RING AND CYLINDER BOOT

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



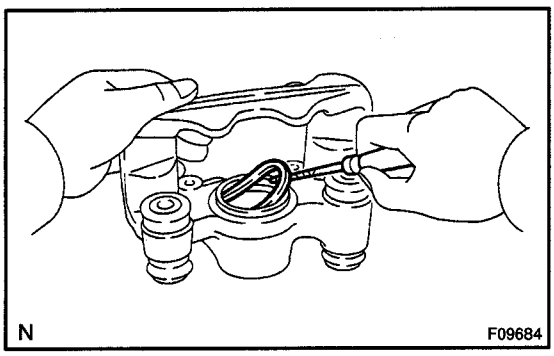
2. REMOVE PISTON

(a) Put a piece of cloth or an equivalent between the piston and caliper.

(b) Use compressed air to remove the piston from the cylinder.

CAUTION:

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



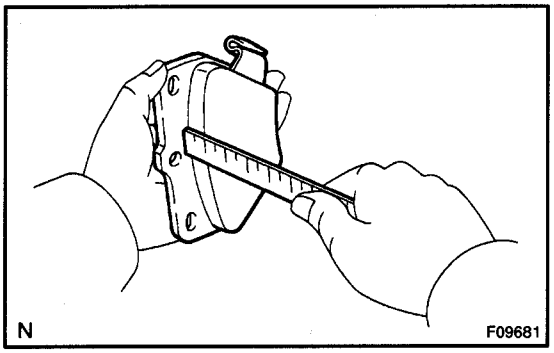
3. REMOVE PISTON SEAL FROM CYLINDER

Using a screwdriver, remove the piston seal.

4. REMOVE 2 SLIDING BUSHING AND 3 DUST BOOTS

BR14S-01

INSPECTION



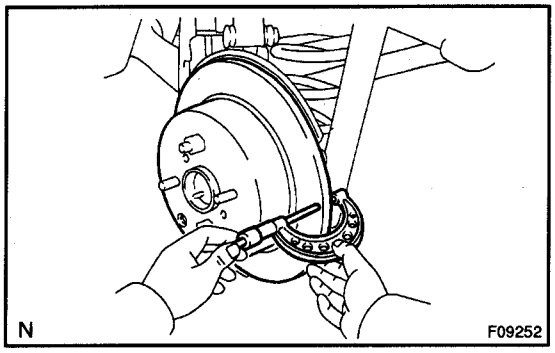
1. MEASURE PAD LINING THICKNESS

Using a ruler, measure the pad lining thickness.

Standard thickness: 10.0 mm (0.394 in.)

Minimum thickness: 1.0 mm (0.039 in.)

Replace the pad if the pad's thickness is at the minimum thickness or less, or if the pad has severe, uneven wear.



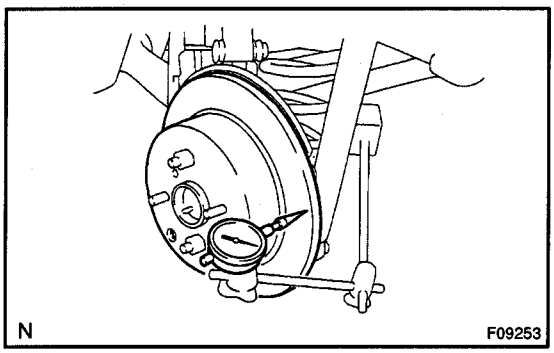
2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness: 9.0 mm (0.354 in.)

Minimum thickness: 8.0 mm (0.315 in.)

Replace the disc if the disc's thickness is at the minimum thickness or less. Replace the disc or grind it on a lathe if it is scored or worn unevenly.



3. MEASURE DISC RUNOUT

Using a dial indicator, measure disc runout at a position 10 mm (0.39 in.) from the outside edge.

Maximum disc runout: 0.15 mm (0.0059 in.)

If the disc's runout is at the maximum value or greater, check the bearing play is in the axial direction and check the axle hub runout (See page SA–41). If the bearing play and axle hub runout are not abnormal, adjust the disc runout or grind it on a "On–car" brake lathe.

4. IF NECESSARY, ADJUST DISC RUNOUT

(a) Remove the hub nuts and the disc. Reinstall the disc in the position turned 1/4 from its original position on the hub. Install and torque the hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

Remeasure the disc runout. Make a note of the runout and the disc's position on the hub.

(b) Repeat (a) until the disc has been installed on the 2 remaining hub positions.

(c) If the minimum runout recorded in (a) and (b) is less than 0.15 mm (0.0059 in.), install the disc in that position.

(d) If the minimum runout recorded in (a) and (b) is greater than 0.15 mm (0.0059 in.), replace the disc and repeat step 3.

BR14T-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR–39).

NOTICE:

Apply lithium soap base glycol grease and disc brake grease to the parts indicated by the arrows (See page BR–37).

BR14U-01

INSTALLATION

Installation is in the reverse order of removal (See page BR–38).

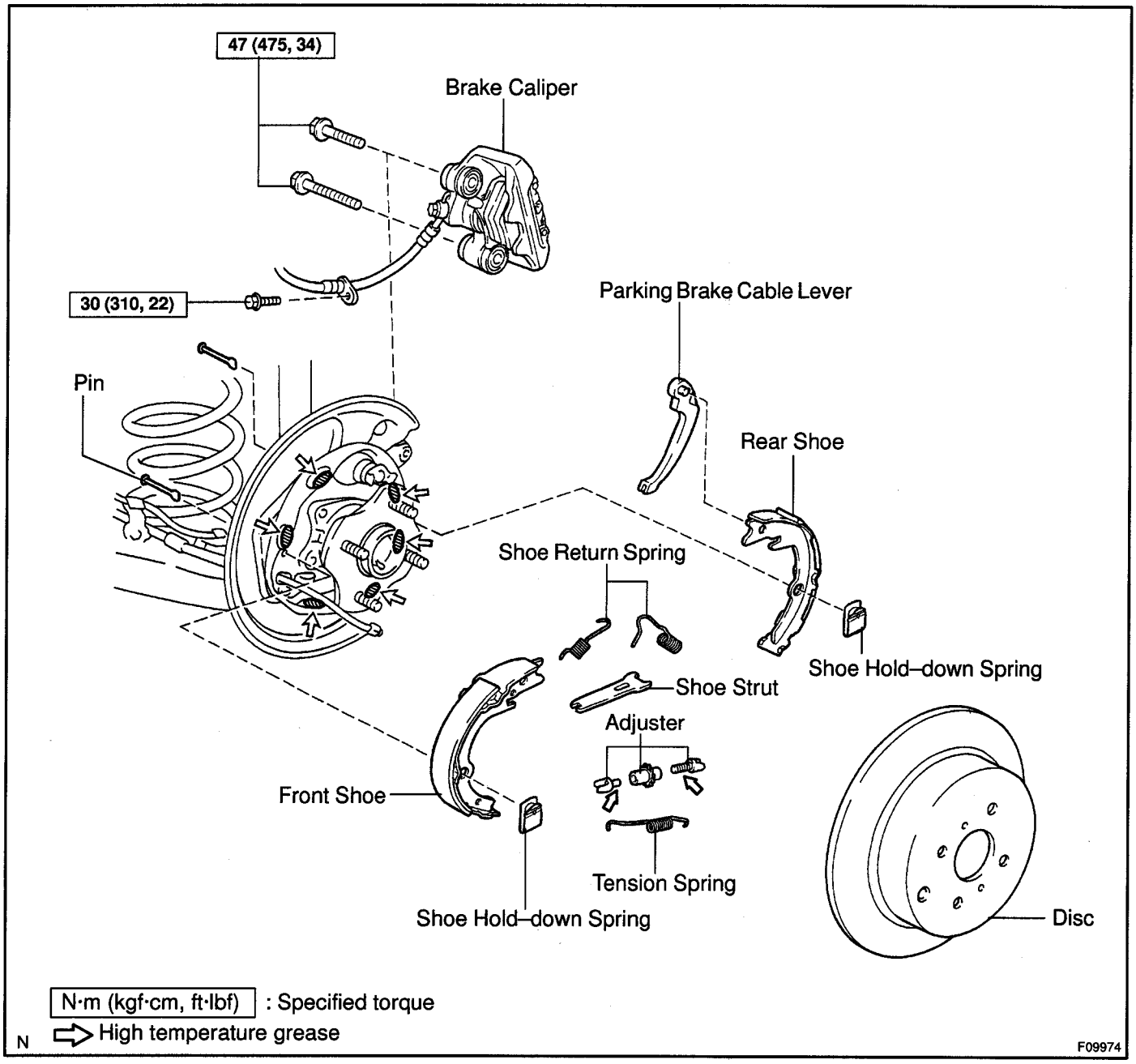
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed the brake system (See page BR–4).
- Check for leaks.

PARKING BRAKE

COMPONENTS

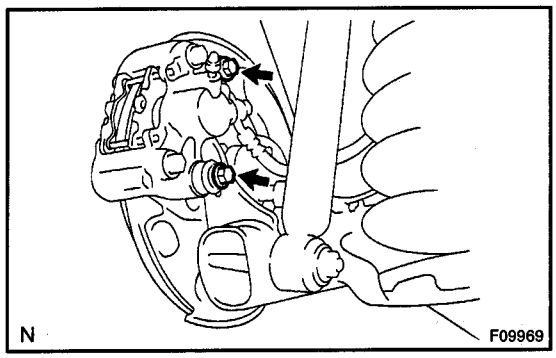
BR14V-01



BR14W–01

DISASSEMBLY

1. **REMOVE REAR WHEEL**
   Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
2. **REMOVE FLEXIBLE HOSE FROM REAR AXLE BEAM**
   Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

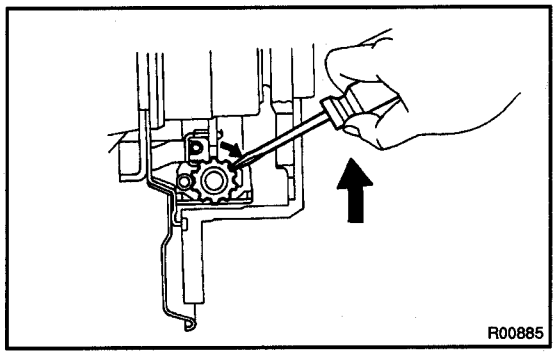


3. **REMOVE BRAKE CALIPER**

(a) Remove the 2 installation bolts and caliper.
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

(b) Remove the caliper from the torque plate.

(c) Suspend the disc brake securely. Ensure that the hose is not stretched.

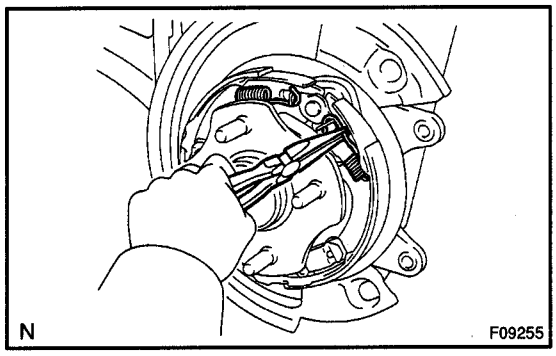


4. **REMOVE DISC**

Release the parking brake lever, and remove the disc.

HINT:

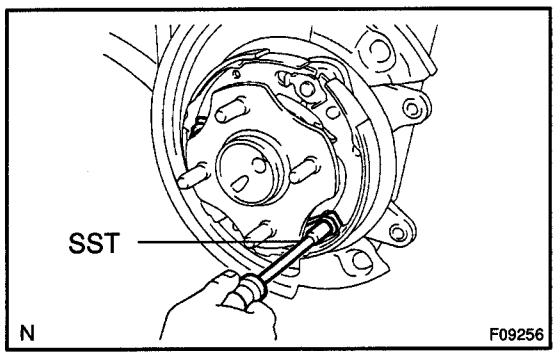
If the disc cannot be removed easily, turn the shoe adjuster until the wheel turns freely.



5. **REMOVE SHOE RETURN SPRINGS AND TENSION SPRING**

Using needle–nose pliers, remove the 2 shoe return springs and tension spring.

6. **REMOVE SHOE STRUT**



7. **REMOVE FRONT SHOE AND ADJUSTER**

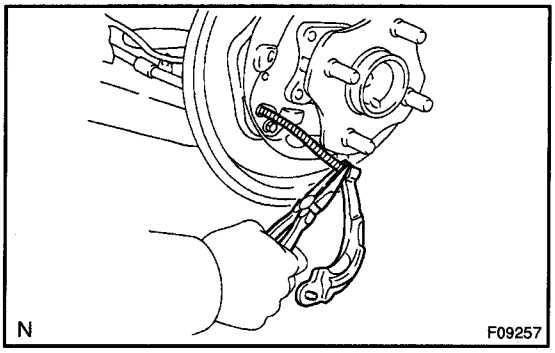
(a) Using SST, remove the shoe hold–down spring and pin from the front shoe.
SST 09718–00010

(b) Remove the front shoe and adjuster.

8. REMOVE REAR SHOE

(a) Using SST, remove the shoe hold–down spring and pin from the rear shoe.
SST 09718–00010

(b) Disconnect the rear shoe from the parking brake shoe lever, and remove rear shoe.



9. REMOVE PARKING BRAKE SHOE LEVER

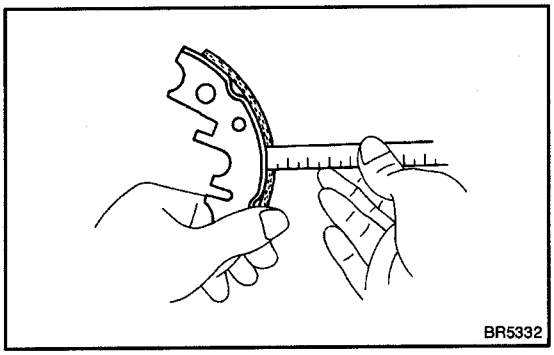
Using needle–nose pliers, disconnect the parking brake cable from the parking brake shoe lever.

BR14X–01

INSPECTION

1. INSPECT DISASSEMBLED PARTS

Inspect the disassembled parts for wear, rust or damage.



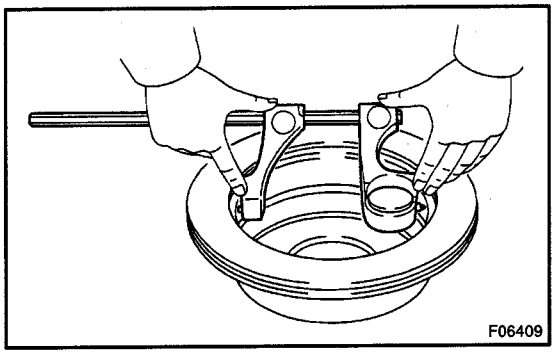
2. MEASURE BRAKE SHOE LINING THICKNESS

Using a ruler, measure the thickness of the shoe lining.

Standard thickness: 4.0 mm (0.157 in.)

Minimum thickness: 1.0 mm (0.039 in.)

If the lining thickness is at the minimum thickness or less, or if there is severe, uneven wear, replace the brake shoe.



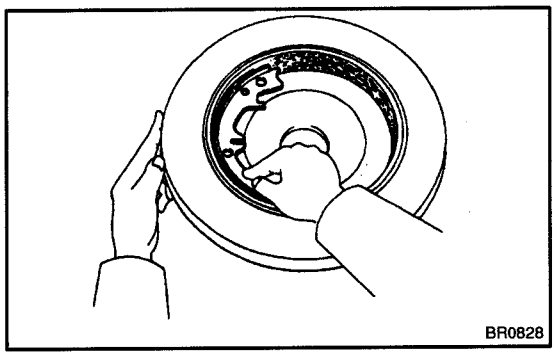
3. MEASURE DISC INSIDE DIAMETER

Using a brake drum gauge or equivalent, measure the inside diameter of the disc.

Standard inside diameter: 173.0 mm (6.811 in.)

Maximum inside diameter: 174.0 mm (6.850 in.)

Replace the disc if the inside diameter is at the maximum value or more. Replace the disc or grind it with a lathe if the disc is scored or is worn unevenly.



4. INSPECT PARKING BRAKE LINING AND DISC FOR PROPER CONTACT

Apply chalk to the inside surface of the disc, then grind down the brake shoe lining to fit. If the contact between the disc and the brake shoe lining is improper, repair it using a brake shoe grinder or replace the brake shoe assembly.

BR14Y-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR–44).

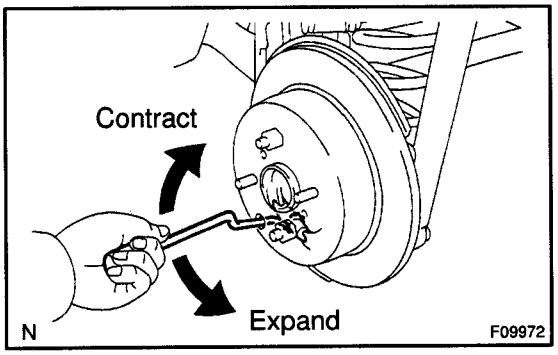
NOTICE:

Apply high temperature grease to the parts indicated by the arrows (See page BR–43).

1. ADJUST PARKING BRAKE SHOE CLEARANCE

(a) Temporarily install the hub nuts.

(b) Remove the hole plug.



(c) Turn the adjuster and expand the shoes until the disc locks.

(d) Return the adjuster 8 notches.

(e) Install the hole plug.

2. SETTLING PARKING BRAKE SHOES AND DISC

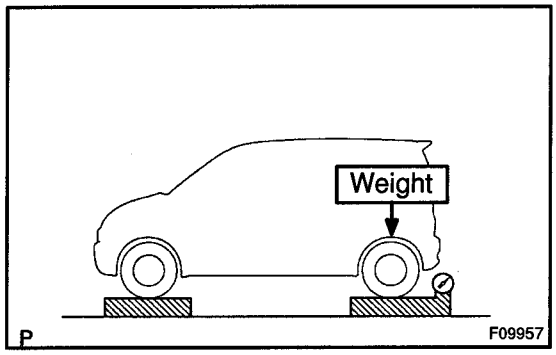
(a) Drive the vehicle at about 50 km/h (31 mph) on a safe, level and dry road.

(b) With the parking brake release button pushed in, pull on the lever with 98 N (10 kgf, 19.8 lbf) of force.

(c) Drive the vehicle for about 400 meters (0.25 mile) in this condition.

(d) Repeat this procedure 2 or 3 times.

3. CHECK AND ADJUST PARKING BRAKE LEVER TRAVEL (See page BR–9)



LOAD SENSING PROPORTIONING VALVE (LSPV)

BR186-01

ON–VEHICLE INSPECTION

1. SET REAR AXLE LOAD

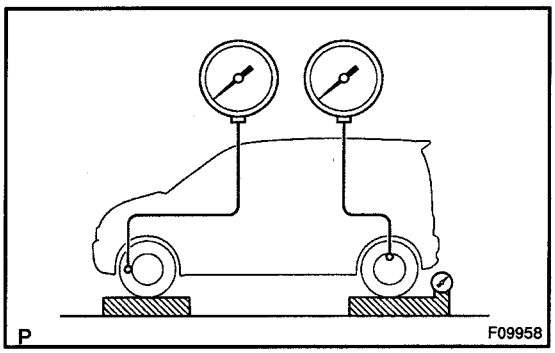
(a) Set the vehicle to its curb weight.

(b) Measure the rear axle load and note the value.

(c) Set the rear axle load.

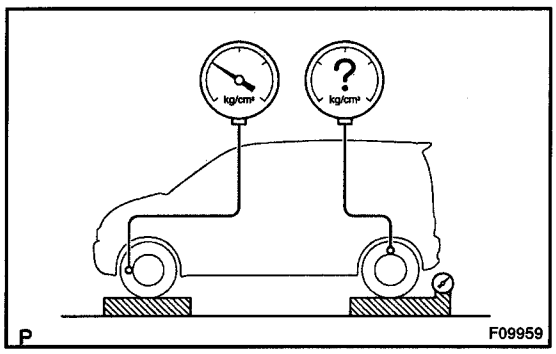
Rear axle load:

Rear axle curb weight + 42 kgf (93 lb)



2. INSTALL LSPV GAUGE (SST) AND BLEED BRAKE SYSTEM

SST 09709–29018



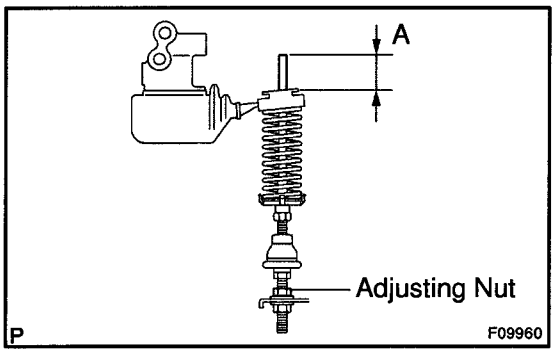
3. RAISE FRONT BRAKE FLUID PRESSURE TO 9,806 kpa (100 kgf/cm², 1,422 psi) AND CHECK REAR BRAKE FLUID PRESSURE

Rear axle pressure:

5,198 ± 588 kpa (53 ± 6 kgf/cm², 754 ± 85 psi)

HINT:

The brake pedal should not be depressed twice and/or returned while setting to the specified pressure. Read the value of rear pressure after holding the specified fluid pressure for 2 seconds after adjusting the specified fluid pressure.



4. IF NECESSAR, ADJUST FLUID PRESSURE

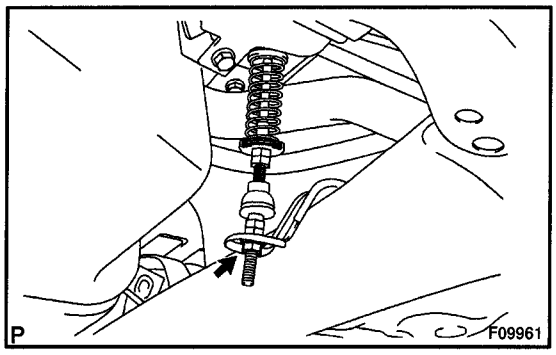
(a) Set the shaft length A to initial set length and tighten the adjusting bolt lock nut.

Initial set length: 12.2 mm (0.48 in.)

(b) Check the rear brake pressure.

(c) If not within the specification, adjust the fluid pressure by changing the shaft length.
Low pressure – Shorten A
High pressure – Lengthen A

HINT:
The fluid pressure is adjusted 304 kpa (3.1 kgf/cm^2, 44.1 psi) per each turn of the adjusting nut.

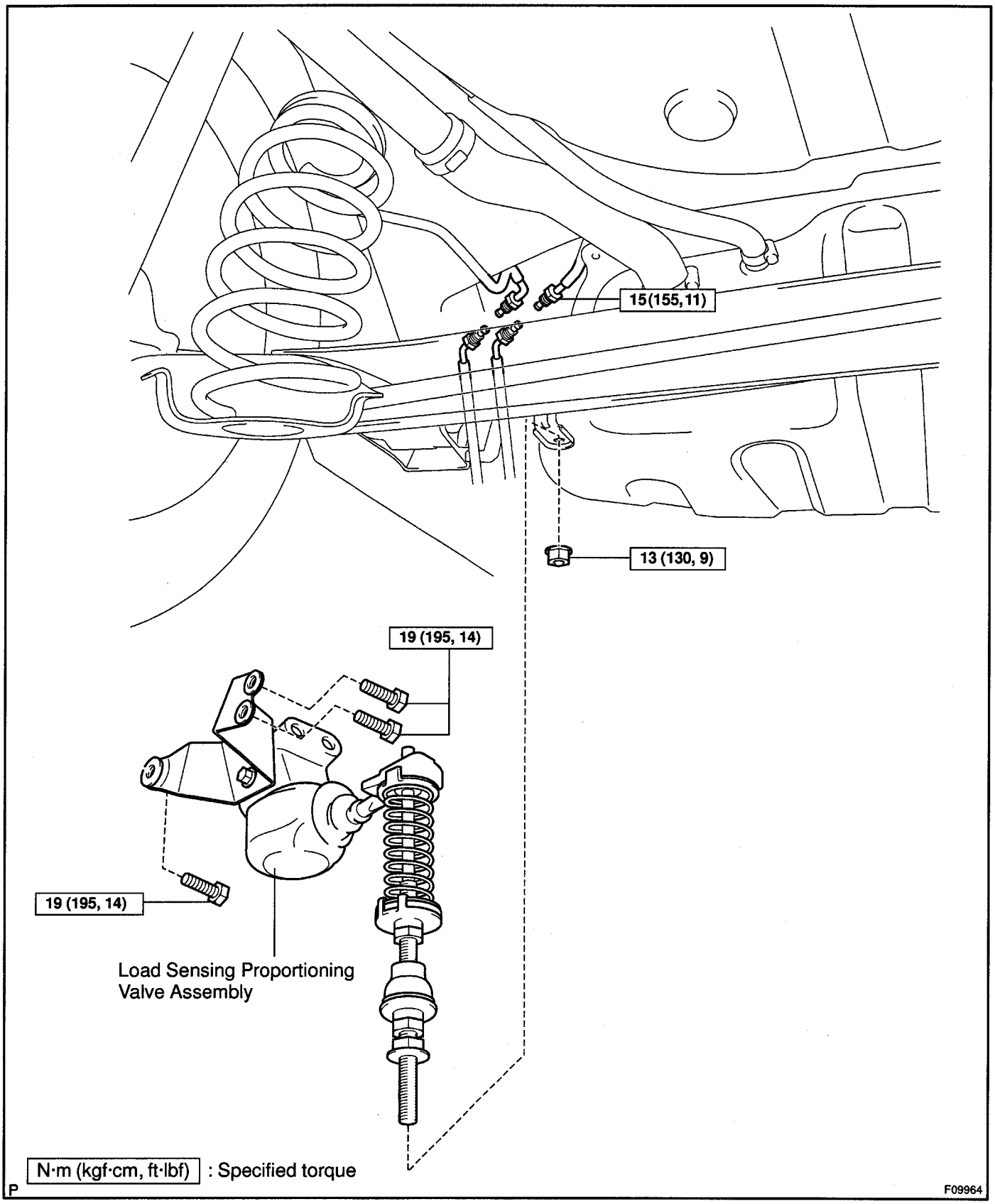


(d) Torque the lock nut.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

If it cannot be adjusted, replace the valve body.

BR187-01

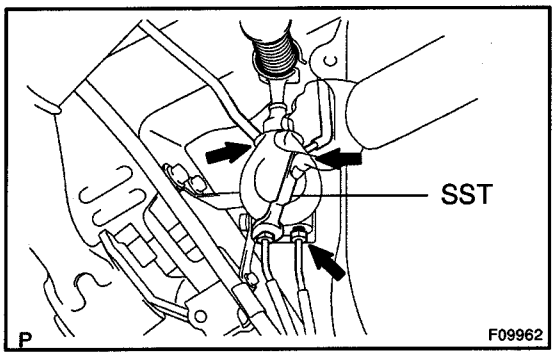
COMPONENTS



BR188-01

REMOVAL

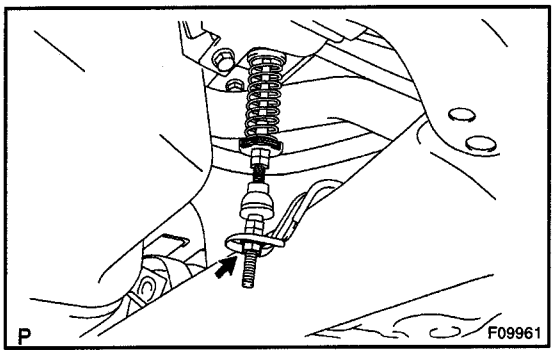
1. REMOVE BOLT AND DISCONNECT PARKING BRAKE CABLE CLAMP



2. DISCONNECT BRAKE LINES

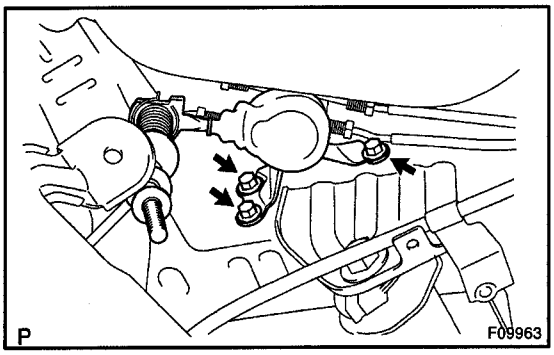
Using SST, disconnect the 4 brake lines from the valve body.

SST 09751–36011



3. REMOVE LSPV ASSEMBLY

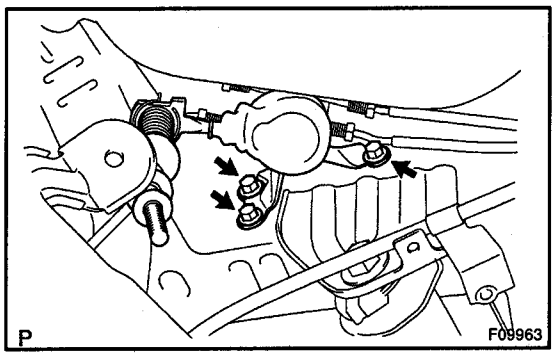
(a) Remove the lock nut and disconnect the adjusting bolt from the rear axle beam.



(b) Remove the 3 bolts and LSPV assembly.

BR189-01

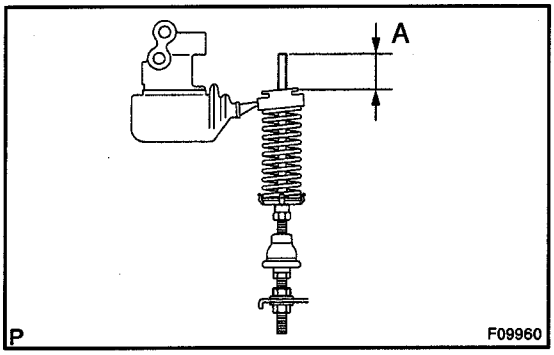
INSTALLATION



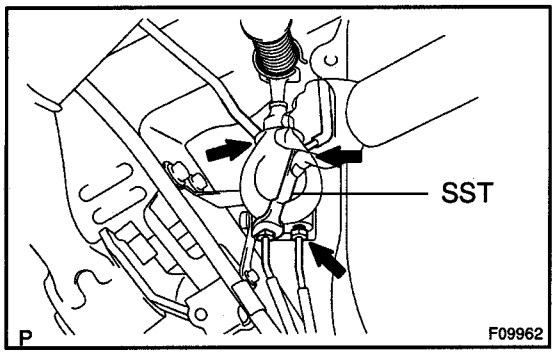
1. INSTALL LSPV ASSEMBLY

(a) Install the LSPV assembly with the 3 bolts.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

(b) Install the LSPV assembly to the rear axle beam with the lock nut.



(c) Set shaft length A to initial set length and temporarily tighten the lock nut.
Initial set length (Unladen): 12.2 mm (0.48 in.)
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



2. CONNECT BRAKE LINES

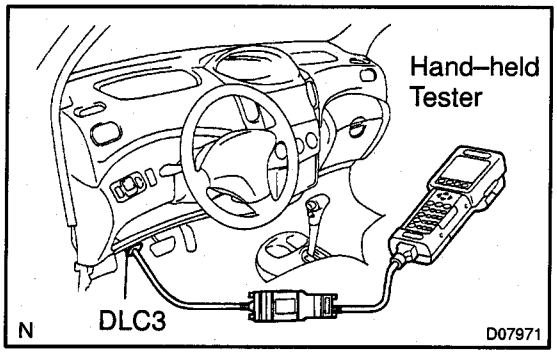
Using SST, connect the 4 brake lines.
SST 09751–36011
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

3. CONNECT PARKING BRAKE CABLE CLAMP WITH BOLT

4. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR–4)

5. CHECK FOR LEAKS

6. CHECK AND ADJUST FLUID PRESSURE (See page BR–48)



ABS ACTUATOR

ON–VEHICLE INSPECTION

BR0WF–04

1. CONNECT HAND–HELD TESTER

(a) Connect the hand–held tester to the DLC3.

(b) Start the engine and run it at idle.

(c) Select the ACTIVE TEST mode on the hand–held tester.

HINT:

Please refer to the hand–held tester operator's manual for further details.

2. INSPECT ABS ACTUATOR MOTOR OPERATION

(a) Check that the operation sound of the ABS actuator motor can be heard when the motor relay is turned ON by the hand–held tester.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

If the operation sound can not be heard, replace the ABS actuator because the motor operation is in failure.

(b) Turn the motor relay OFF.

3. INSPECT RIGHT FRONT WHEEL SOLENOID

(a) Depress the brake pedal and hold it for about 15 seconds, and check that the brake pedal does not go down further.

If the brake pedal goes down, replace the ABS actuator because the sealing condition of the reduction solenoid valve is abnormal.

(b) Check that the brake pedal does not pulsate when the motor relay is turned ON by the hand–held tester.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

If there is a pulsation in the brake pedal, replace the ABS actuator because the sealing condition of the reduction solenoid valve is abnormal.

(c) Turn the motor relay OFF.

(d) Depress the brake pedal and hold it until the step (g) is completed.

(e) Check that the brake pedal does not go down further when the SFRH and SFRR solenoids are turned ON by the hand–held tester.

NOTICE:

Do not keep solenoid ON for more than 2 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

If the brake pedal goes down, replace the ABS actuator because the holding solenoid valve operation is abnormal.

HINT:
To prevent the solenoids, hand–held tester turns OFF automatically 2 secs. after has been turned ON simultaneously.

(f) Check that the brake pedal goes down further when the solenoids are turned OFF.

If the brake pedal does not go down, replace the ABS actuator because the reduction solenoid valve operation is abnormal.

(g) Check that the brake pedal returns when the motor relay is turned ON by the hand–held tester.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

If the brake pedal does not return, replace the ABS actuator because the motor operation is in failure.

(h) Turn the motor relay OFF and release the brake pedal.

4. INSPECT OTHER WHEEL SOLENOIDS OPERATION

Check the solenoids of the other wheels with the same inspection procedure as the right front wheel solenoids.

HINT:
Left front wheel: SFLH and SFLR
Right rear wheel: SRRH and SRRR
Left rear wheel: SRLH and SRLR

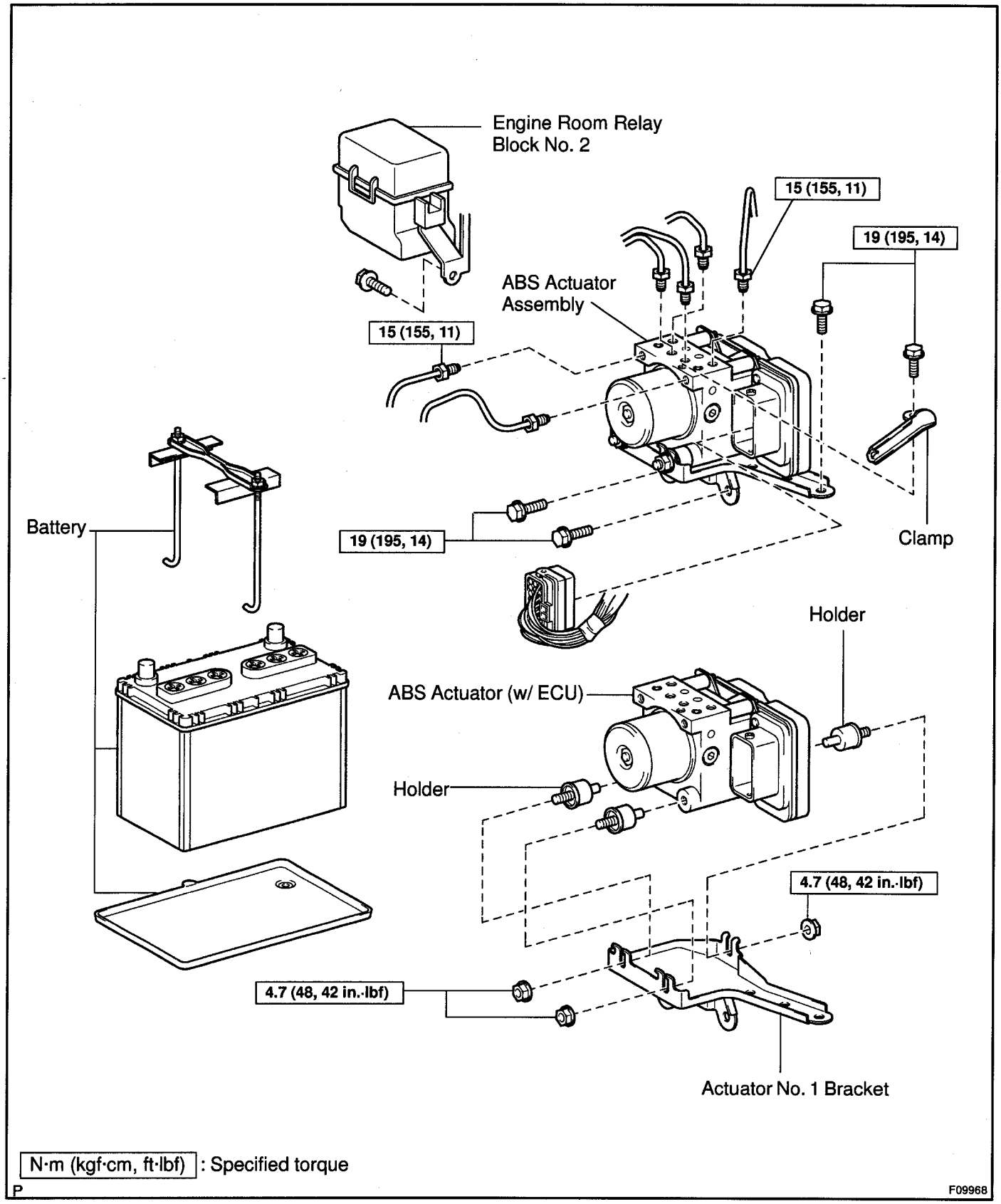
NOTICE:

Never depress the brake pedal under the condition that the reduction solenoid alone is turned ON as ABS ECU is reset.

5. CLEAR DTC (See page DI–60)

BR0S1-06

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

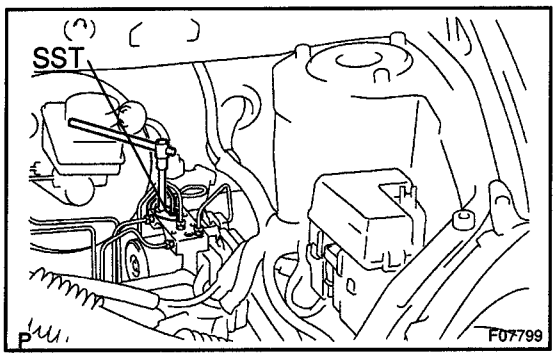
P

F09968

BR0S2-05

REMOVAL

1. **DISCONNECT CONNECTOR FROM ABS ACTUATOR ASSEMBLY**
2. **REMOVE BATTERY**
3. **REMOVE NUTS OF ENGINE ROOM RELAY BLOCK NO. 2, AND MOVE ENGINE ROOM RELAY BLOCK NO. 2 ASIDE**



4. **DISCONNECT BRAKE LINES**

Using SST, disconnect the 6 brake lines from the ABS actuator assembly.

SST 09023–00100

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

5. **REMOVE ABS ACTUATOR ASSEMBLY**

Remove the 3 bolts and ABS actuator assembly.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

6. **REMOVE ABS ACTUATOR**

(a) Remove the 3 nuts and ABS actuator from the actuator No. 1 bracket.

Torque: 4.7 N·m (48 kgf·cm, 42 in.·lbf)

(b) Remove the 3 holders from the ABS actuator.

7. **REMOVE BOLT AND CLAMP FROM ABS ACTUATOR**

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

BR0S3-05

INSTALLATION

Installation is in the reverse order of removal (See page BR–56).

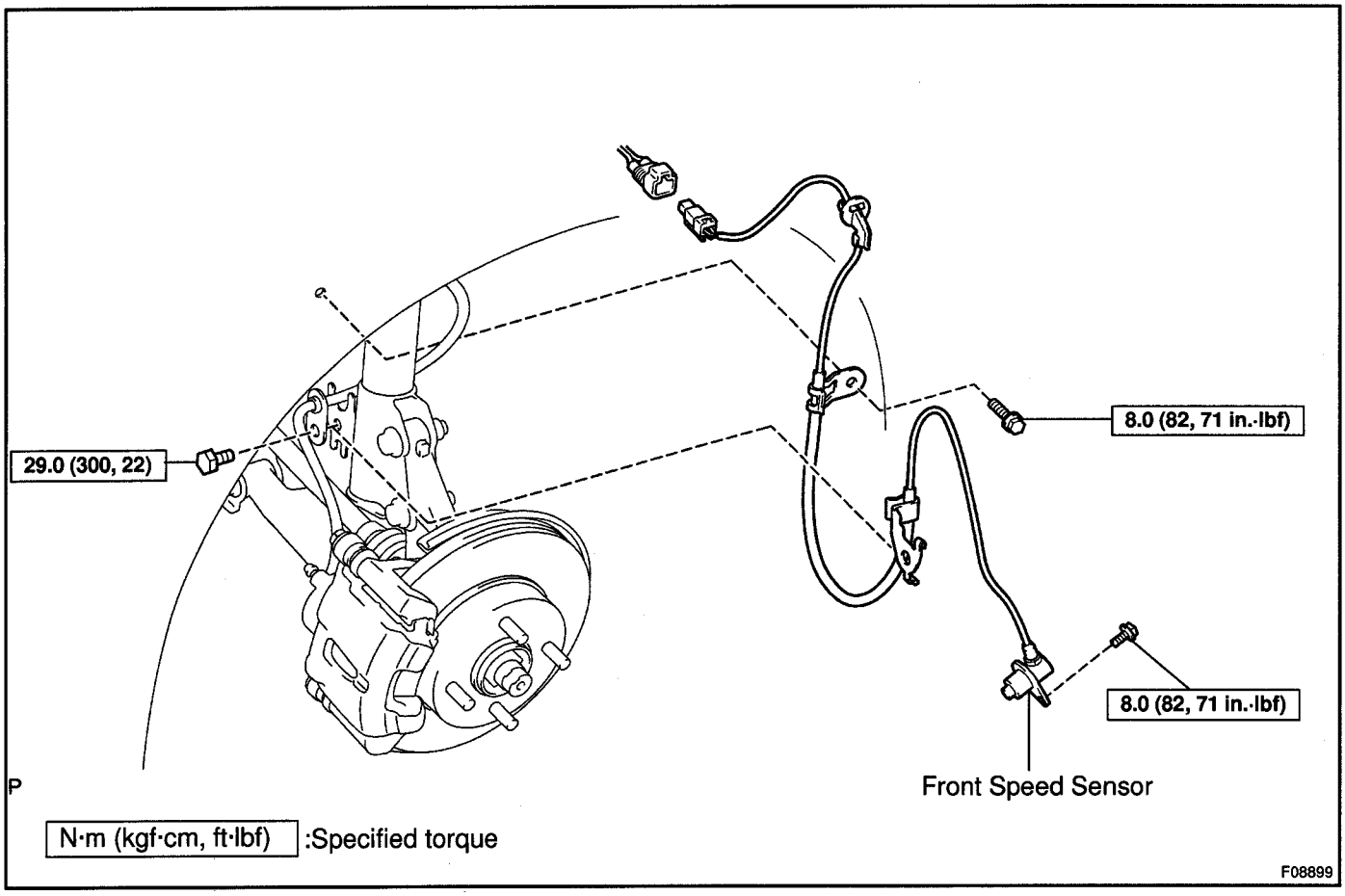
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed brake system (See page BR–4).
- Check for leaks.

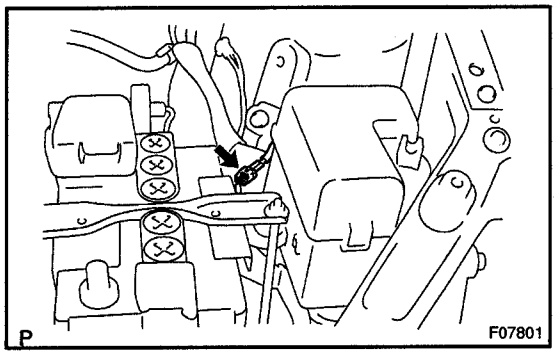
FRONT SPEED SENSOR

COMPONENTS

BR0S4-03



BR0S5-03



REMOVAL

1. DISCONNECT SPEED SENSOR CONNECTOR

Disconnect the speed sensor connector.

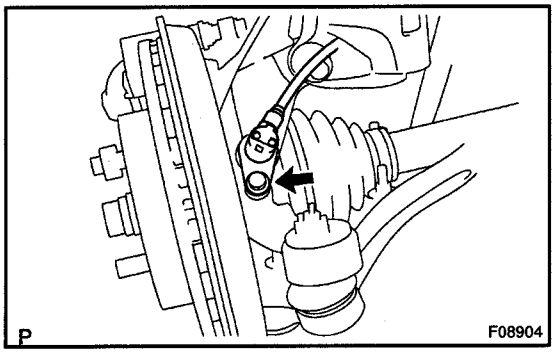
2. REMOVE FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

3. REMOVE SPEED SENSOR

(a) Remove the 2 clamp bolts and a clip holding the sensor harness to the body and shock absorber.

Torque:
Harness clamp x Body:
8.0 N·m (82 kgf·cm, 71 in.·lbf)
Harness clamp x Shock absorber:
29.0 N·m (300 kgf·cm, 22 ft·lbf)



(b) Remove the bolt and speed sensor from the steering knuckle.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

BR0S6-03

INSTALLATION

Installation is in the reverse order of removal (See page BR–59).

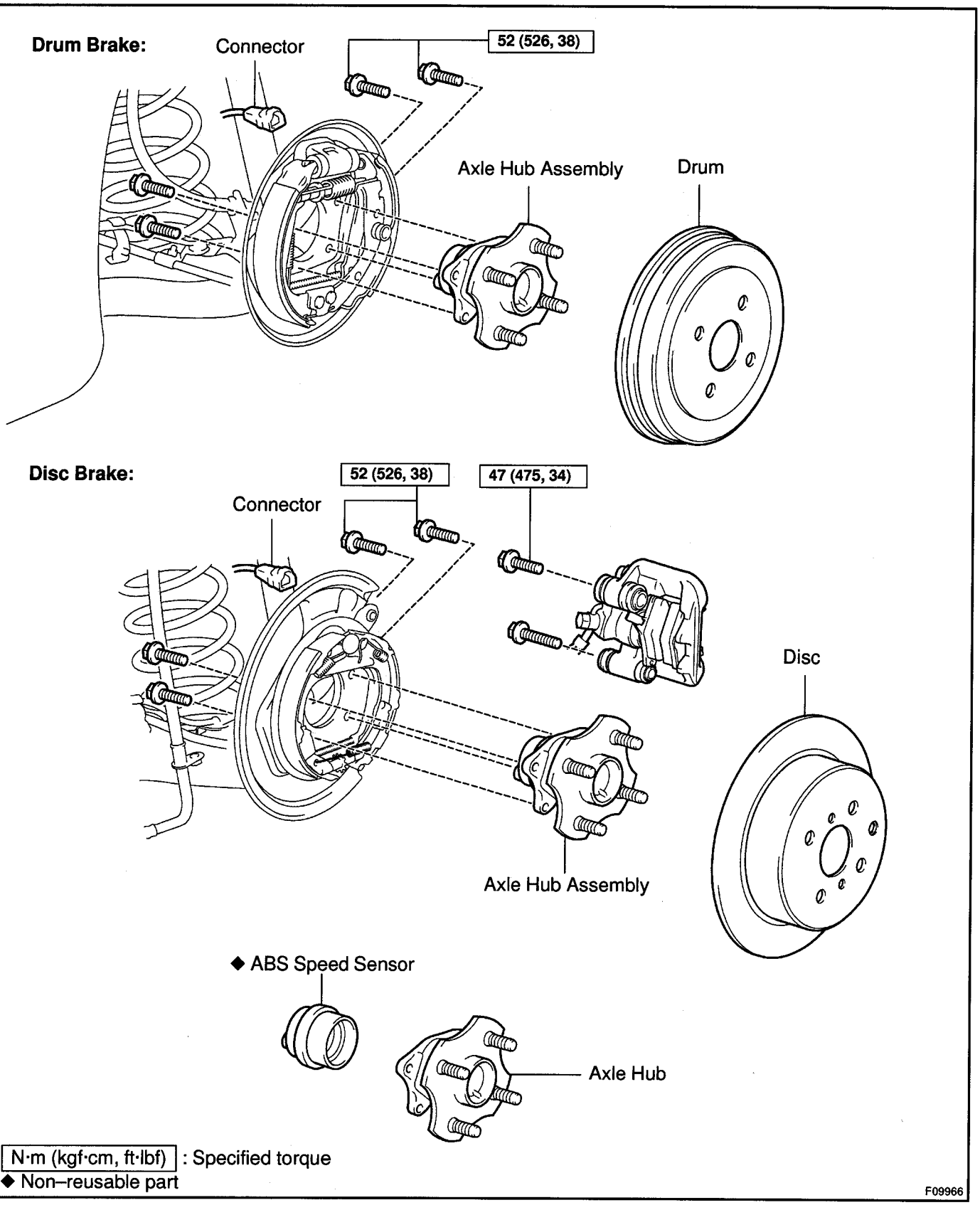
HINT:

After installation, check the speed sensor signal (See page DI–60).

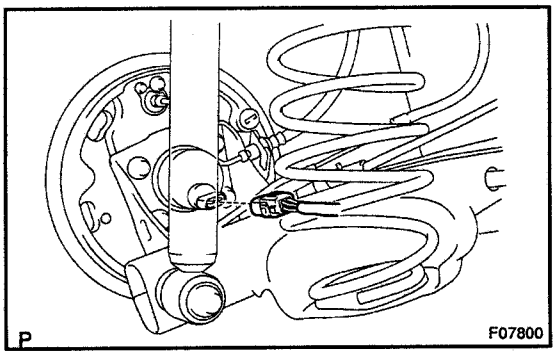
REAR SPEED SENSOR

COMPONENTS

BR0S7-03



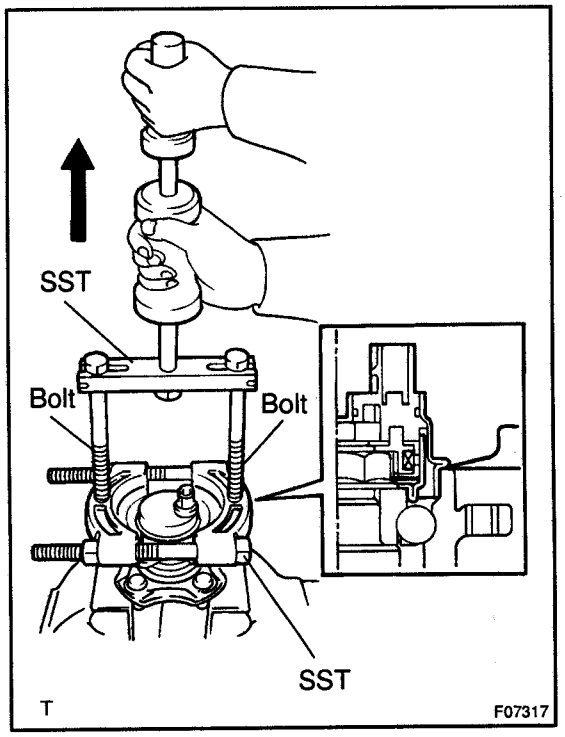
BR0S8-04



REMOVAL

1. **REMOVE REAR WHEEL**
2. **DISCONNECT SPEED SENSOR CONNECTOR**
3. **REMOVE SPEED SENSOR WITH REAR AXLE HUB (See page SA–41)**
4. **REMOVE ABS SPEED SENSOR**

(a) Using a pin punch and hammer, drive out the 2 pins and remove the 2 attachments from SST.
SST 09520–00031 (09520–00040, 09521–00020)



(b) Mount the axle hub assembly in a soft jaw vise.

NOTICE:

Replace the axle hub assembly if it is dropped or a strong shock is given to it.

(c) Using SST and 2 bolts (Diameter: 12 mm, Pitch: 1.5 mm), remove the ABS speed sensor.
SST 09520–00031 (09520–00040, 09521–00020), 09950–00020

NOTICE:

- **Do not allow any foreign matter sticking to the sensor rotor.**
- **Pull out the ABS speed sensor straightly not to damage the sensor rotor.**
- **If damage has occurred to the sensor rotor, replace the axle hub assembly.**
- **Do not scratch the contacting surface of the axle hub and speed sensor.**

BR11I-03

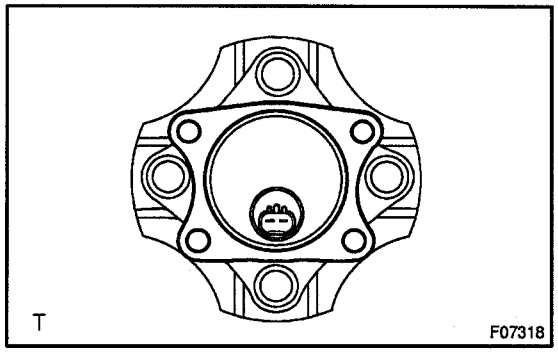
INSTALLATION

1. INSTALL NEW ABS SPEED SENSOR

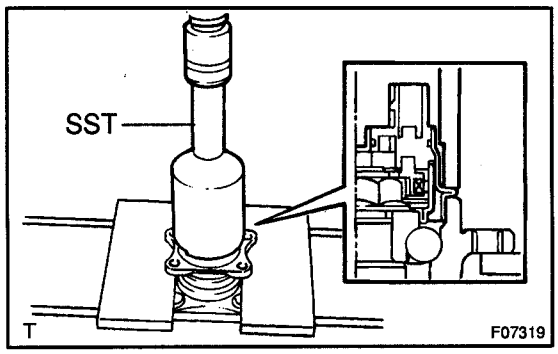
(a) Clean the contacting surface of the axle hub and a new ABS speed sensor.

NOTICE:

Do not stick any foreign objects to the sensor rotor.



(b) Place the ABS speed sensor on the axle hub so that the connector is set at the bottom under the on–vehicle condition.



(c) Using SST and a press, install a new ABS speed sensor to the axle hub.

SST 09214–76011

NOTICE:

- **Do not tap the speed sensor with a hammer directly.**
- **Check that there should be no foreign objects on the speed sensor detection portion.**
- **Press in the ABS speed sensor straight and slowly.**

2. INSTALL SPEED SENSOR WITH REAR AXLE HUB (See page SA–44)

3. CONNECT SPEED SENSOR CONNECTOR

4. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

5. CHECK SPEED SENSOR SIGNAL (See page DI–60)