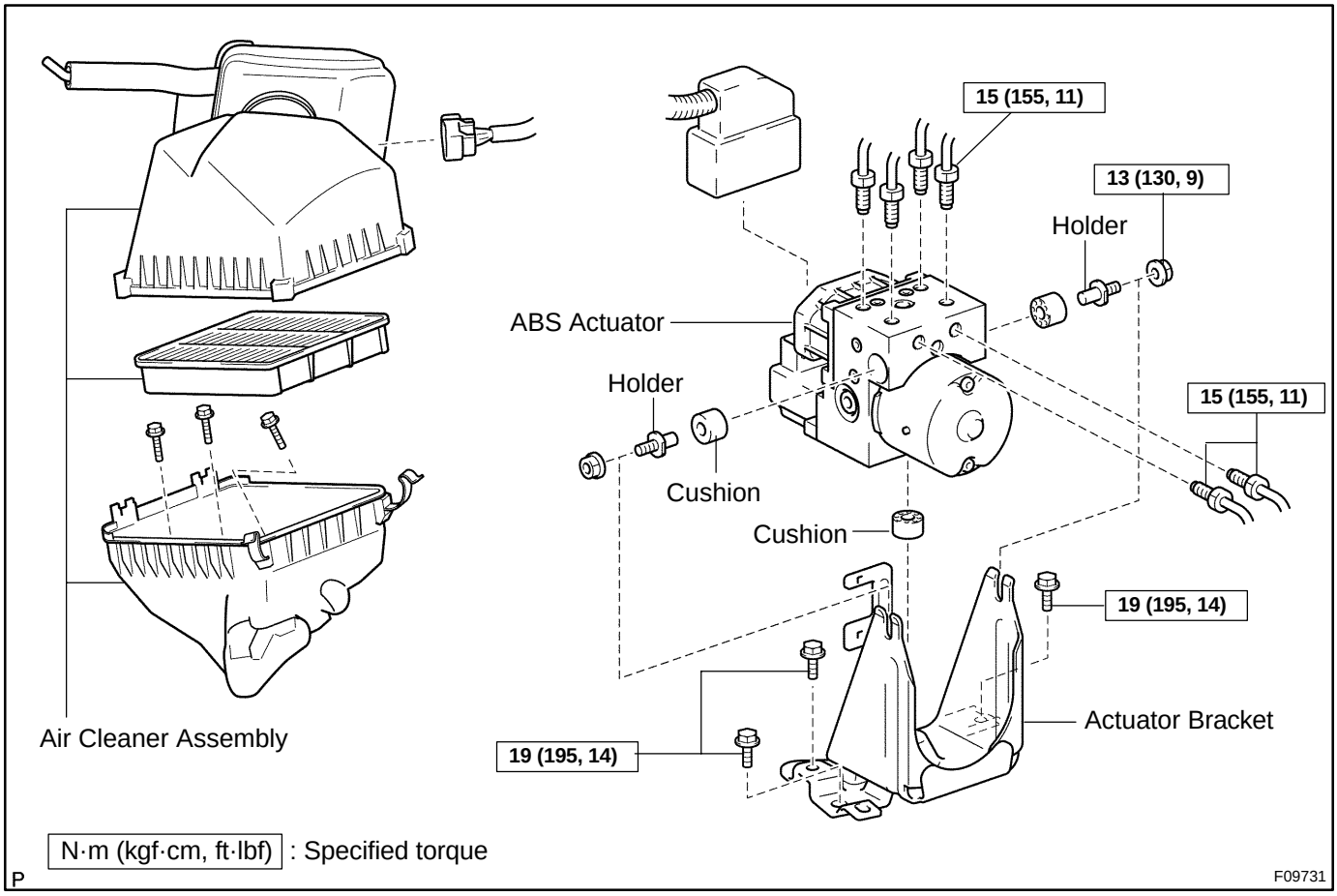
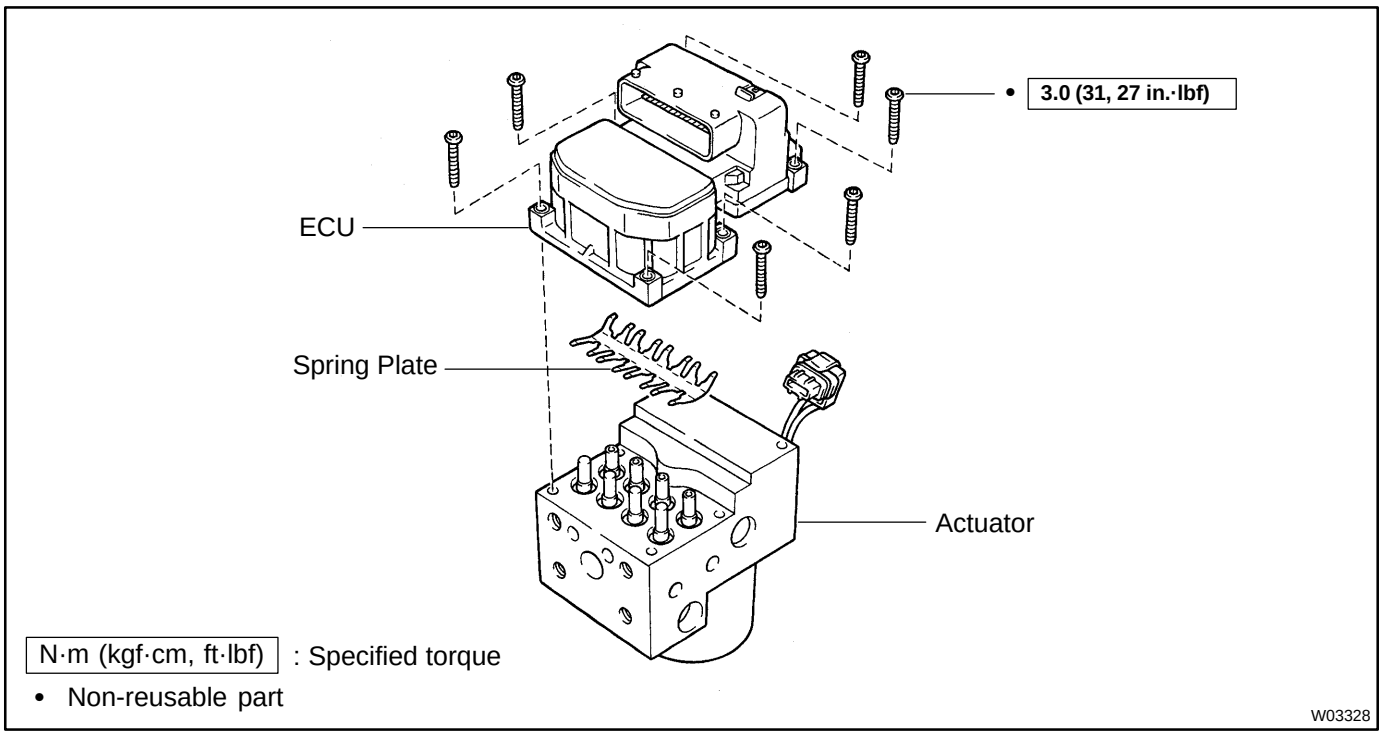
ABS ACTUATOR

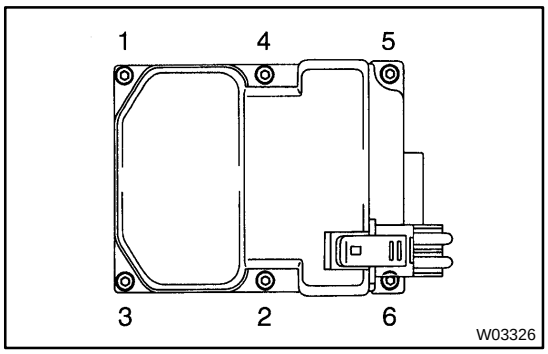
COMPONENTS

BR0LL-05





BR0LN-03



DISASSEMBLY

1. DISCONNECT CONNECTOR

2. REMOVE ECU

(a) Using a T20 torx wrench, loosen the 6 screws.

Torque: 3.0 N·m (31 kgf·cm, 27 in.·lbf)

NOTICE:

At the time of reassembly, tighten the screws according to the order shown on the left.

(b) Remove the ECU and spring plate from the actuator.

NOTICE:

Protect the actuator in order to prevent sealing surface from getting dirty and causing damage on the valve body. If the dirt and the like are stuck to the sealing surface, use plastic tools or soft objects to remove the dirt. Do not use chemical solvents.

BR0LP-04

INSTALLATION

Installation is in the reverse order of removal (See page BR-48).

HINT:

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

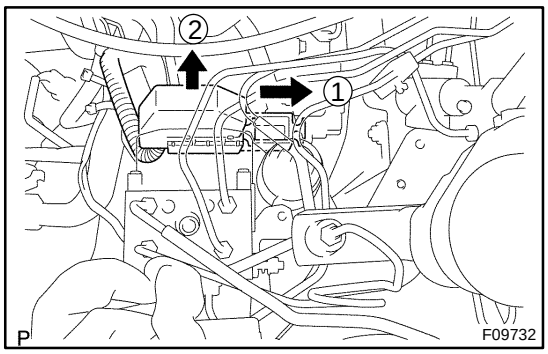
BR0LO-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR-49).

BR154-01

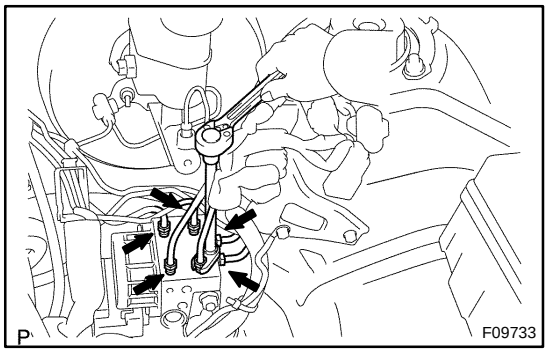
REMOVAL



1. REMOVE AIR CLEANER ASSEMBLY

2. DISCONNECT CONNECTOR

Pull out the release bar, and disconnect the connector.

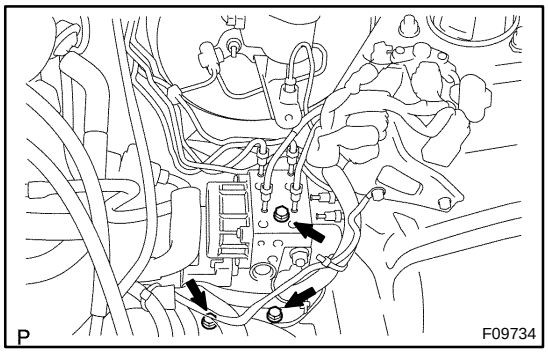


3. DISCONNECT BRAKE LINES

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

SST 09023-00100

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



4. REMOVE ABS ACTUATOR ASSEMBLY

Remove the 3 bolts and ABS actuator assembly.

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

5. REMOVE ABS ACTUATOR

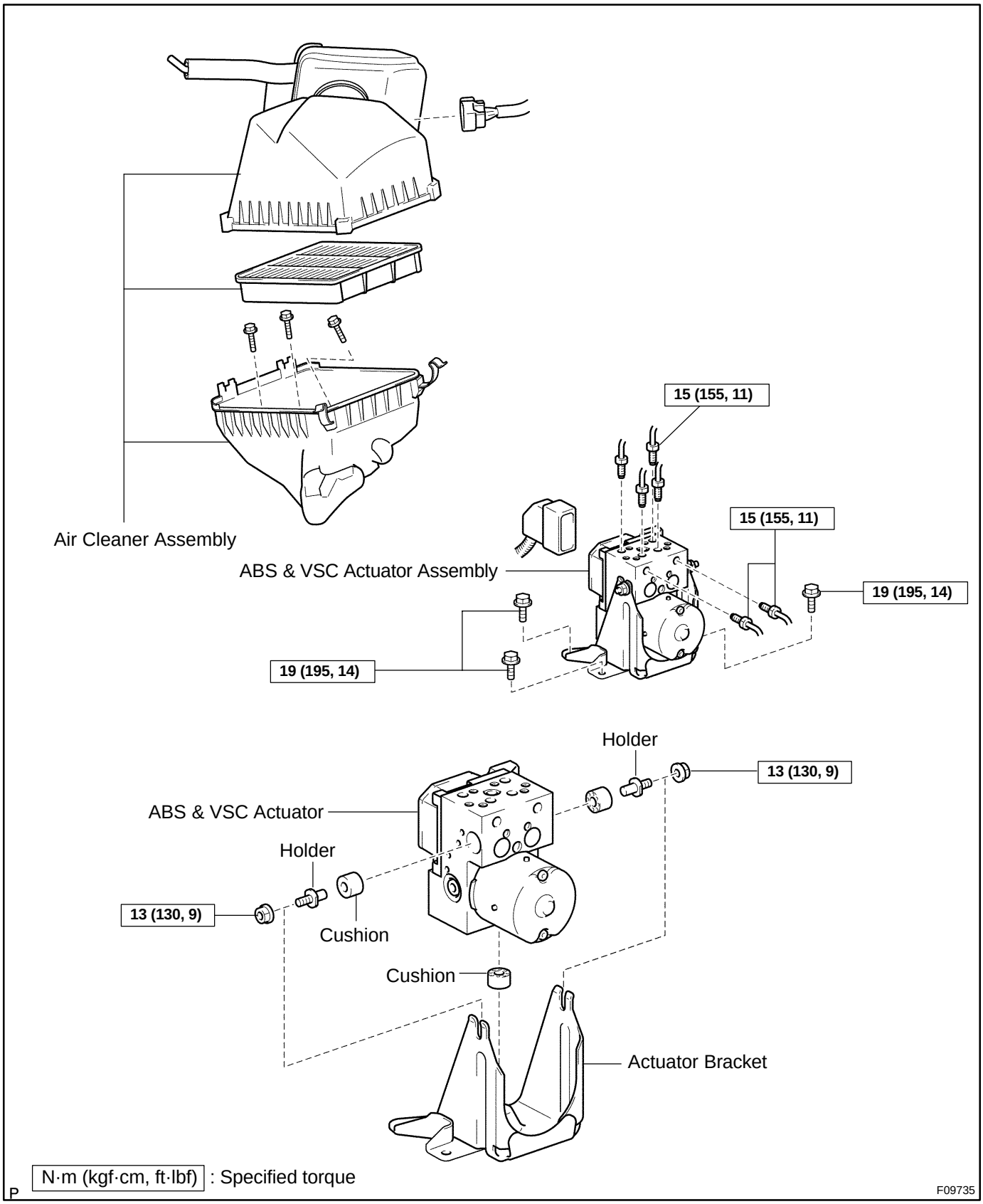
(a) Remove the 2 nuts and ABS actuator.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(b) Remove the 2 holders and 3 cushions from the ABS actuator.

BR156-01

COMPONENTS



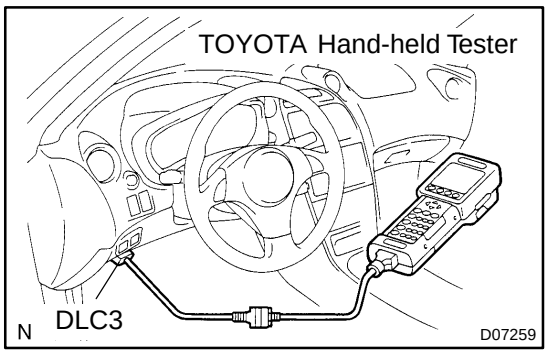
BR158-01

INSTALLATION

Installation is in the reverse order of removal (See page BR-54).

HINT:

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



ABS & VSC ACTUATOR

BR155-01

ON-VEHICLE INSPECTION

1. CONNECT TOYOTA HAND-HELD TESTER:

(a) Connect the TOYOTA hand-held tester to the DLC3.

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

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

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

2. INSPECT ACTUATOR MOTOR OPERATION

(a) With the motor relay ON, check the actuator motor operation noise.

(b) Turn the motor relay OFF.

(c) Depress the brake pedal and hold it for about 15 seconds. Check that the brake pedal cannot be depressed.

(d) With the motor relay ON, check that the pedal does not pulsate.

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.

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

3. INSPECT RIGHT FRONT WHEEL OPERATION

NOTICE:

Never turn ON the solenoid which is not described below.

(a) With the brake pedal depressed, perform the following operations.

(b) Turn the SFRH and SFRR solenoid ON simultaneously, and check that the pedal cannot be depressed.

NOTICE:

Do not keep solenoid ON for more than 10 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

(c) Turn the SFRH and SFRR solenoid OFF simultaneously, and check that the pedal can be depressed.

(d) Turn the motor relay ON, and check that the pedal returns.

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.

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

4. INSPECT OTHER WHEEL OPERATION

As in the same procedure, check the solenoids of other wheels.

HINT:

Left front wheel: SFLH, SFLR

Right rear wheel: SRRH, SRRR

Left rear wheel: SRLH, SRLR

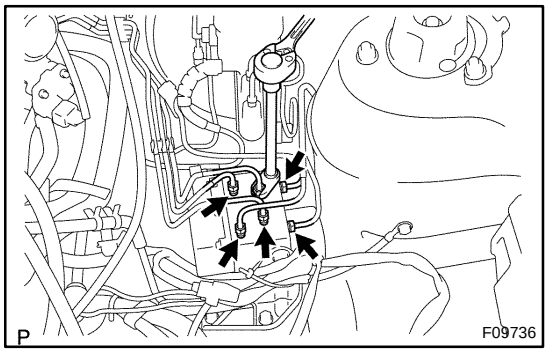
5. CLEAR DTC (See page DI-252)

BR157-01

REMOVAL

1. REMOVE AIR CLEANER ASSEMBLY

2. DISCONNECT ABS & VSC ACTUATOR CONNECTOR

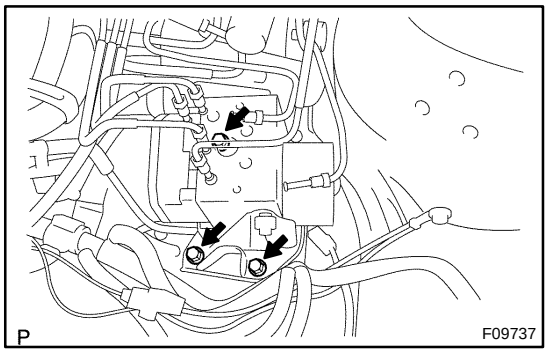


3. DISCONNECT BRAKE LINES

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

SST 09023-00100

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



4. REMOVE ABS & VSC ACTUATOR ASSEMBLY

Remove the 3 bolts and ABS & VSC actuator assembly.

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

5. REMOVE ABS & VSC ACTUATOR

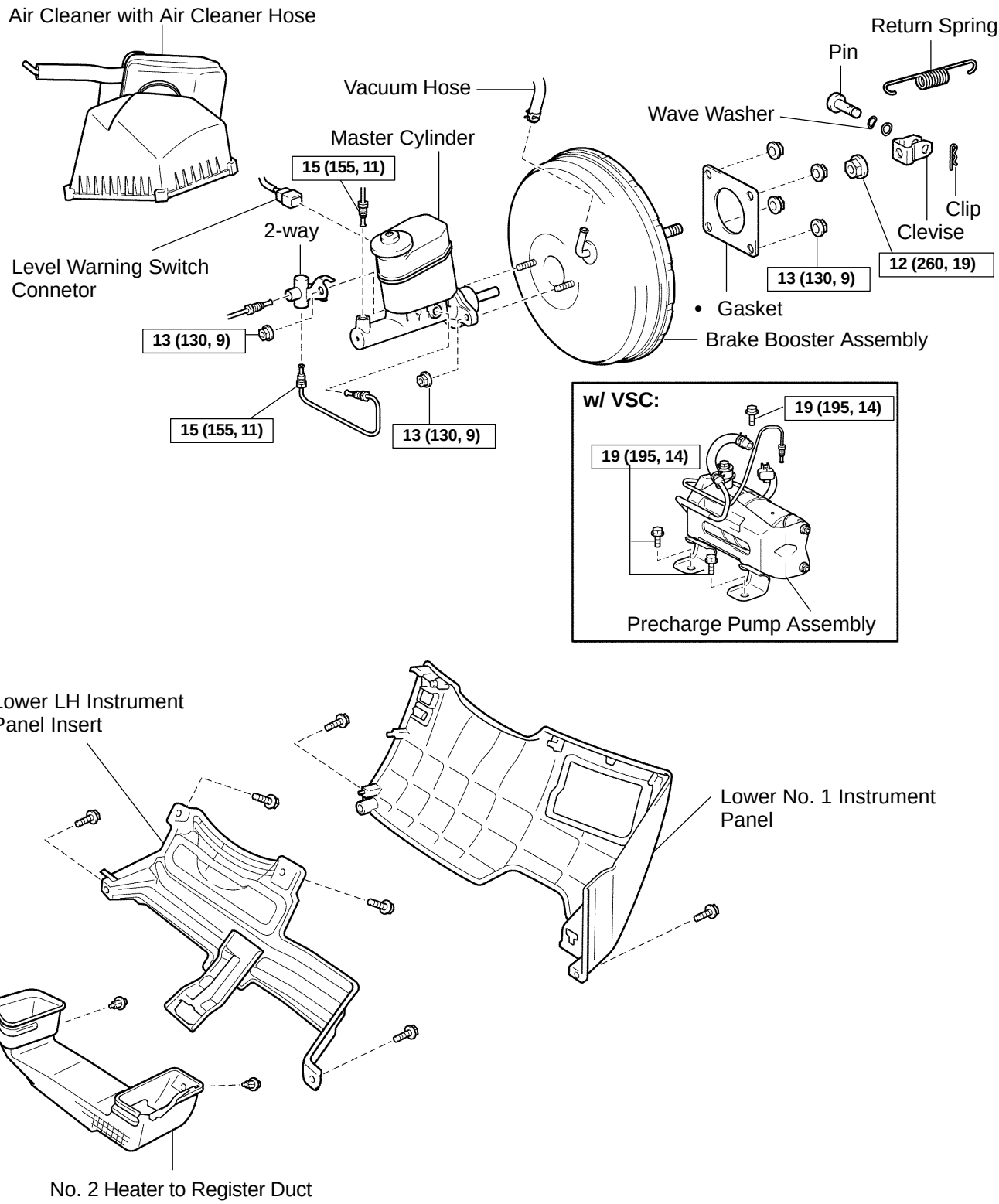
(a) Remove the 2 nuts and ABS & VSC actuator from the bracket.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(b) Remove the 2 holders and 3 cushions from the ABS & VSC actuator.

BR0KX-04

COMPONENTS



BR152-01

INSTALLATION

1. INSTALL BRAKE BOOSTER

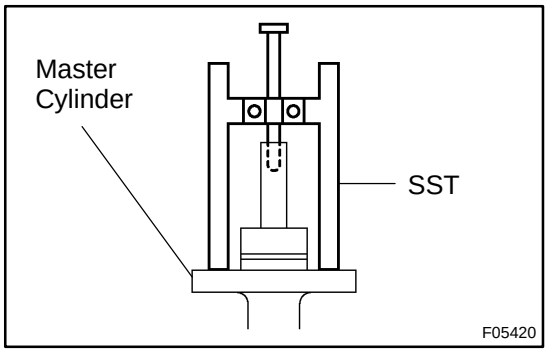
(a) Install the booster and a new gasket.

(b) Install the clevis to the operating rod.

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

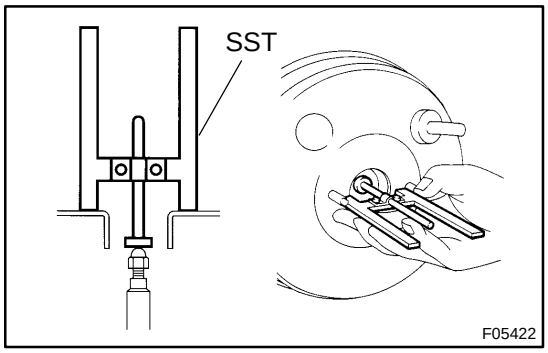
(d) Install the clevis pin into the clevis and brake pedal, and install the clip to the clevis pin.

(e) Install the pedal return spring.



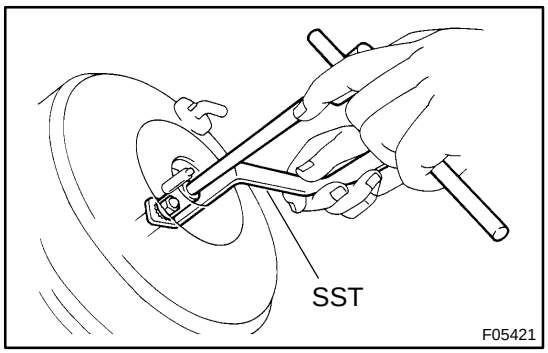
2. ADJUST LENGTH OF BOOSTER PUSH ROD

(a) Set the SST on the master cylinder, and lower the pin until its tip slightly touches the piston.
SST 09737-0001 1



(b) Turn the SST upside down, and set it on the booster.
SST 09737-0001 1

(c) Measure the clearance between the booster push rod and pin head (SST).
Clearance: 0 mm (0 in.)



(d) Using SST, adjust the booster push rod length until the push rod lightly touches the pin head.
SST 09737-00020

3. w/ VSC:
INSTALL PRECHARGE PUMP ASSEMBLY (See page BR-58)

4. INSTALL MASTER CYLINDER (See page BR-20)

5. CONNECT VACUUM HOSE TO BRAKE BOOSTER

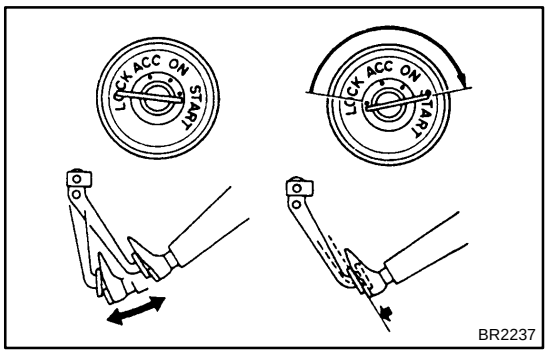
6. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR-4)

7. CHECK FOR LEAKS

8. CHECK AND ADJUST BRAKE PEDAL (See page BR-6)

9. INSTALL NO. 2 HEATER TO REGISTER DUCT, LOWER LH INSTRUMENT PANEL INSERT AND LOWER NO. 1 INSTRUMENT PANEL (See page BO-87)

10. DO OPERATIONAL CHECK (See page BR-21)



BRAKE BOOSTER ASSEMBLY

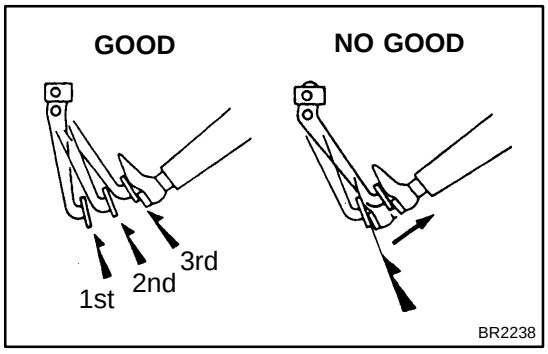
BR0KW-04

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.

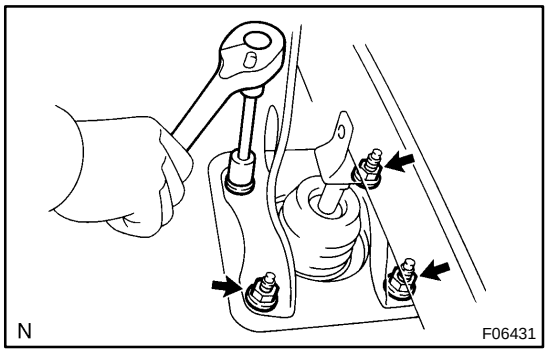
(b) Depress the brake pedal while the engine is running, and stop the engine with the pedal depressed.

If there is no change in the pedal reverse travel after holding the pedal for 30 seconds, the booster is air tight.

BR0KY-05

REMOVAL

1. **REMOVE AIR CLEANER COVER WITH AIR CLEANER HOSE**
2. **REMOVE MASTER CYLINDER (See page BR-15)**
3. **w/ VSC:**
   REMOVE PRECHARGE PUMP ASSEMBLY (See page BR-57)
4. **DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER**
5. **REMOVE LOWER NO. 1 INSTRUMENT PANEL, LOWER LH INSTRUMENT PANEL INSERT AND NO. 2 HEATER TO REGISTER DUCT (See page BO-87)**



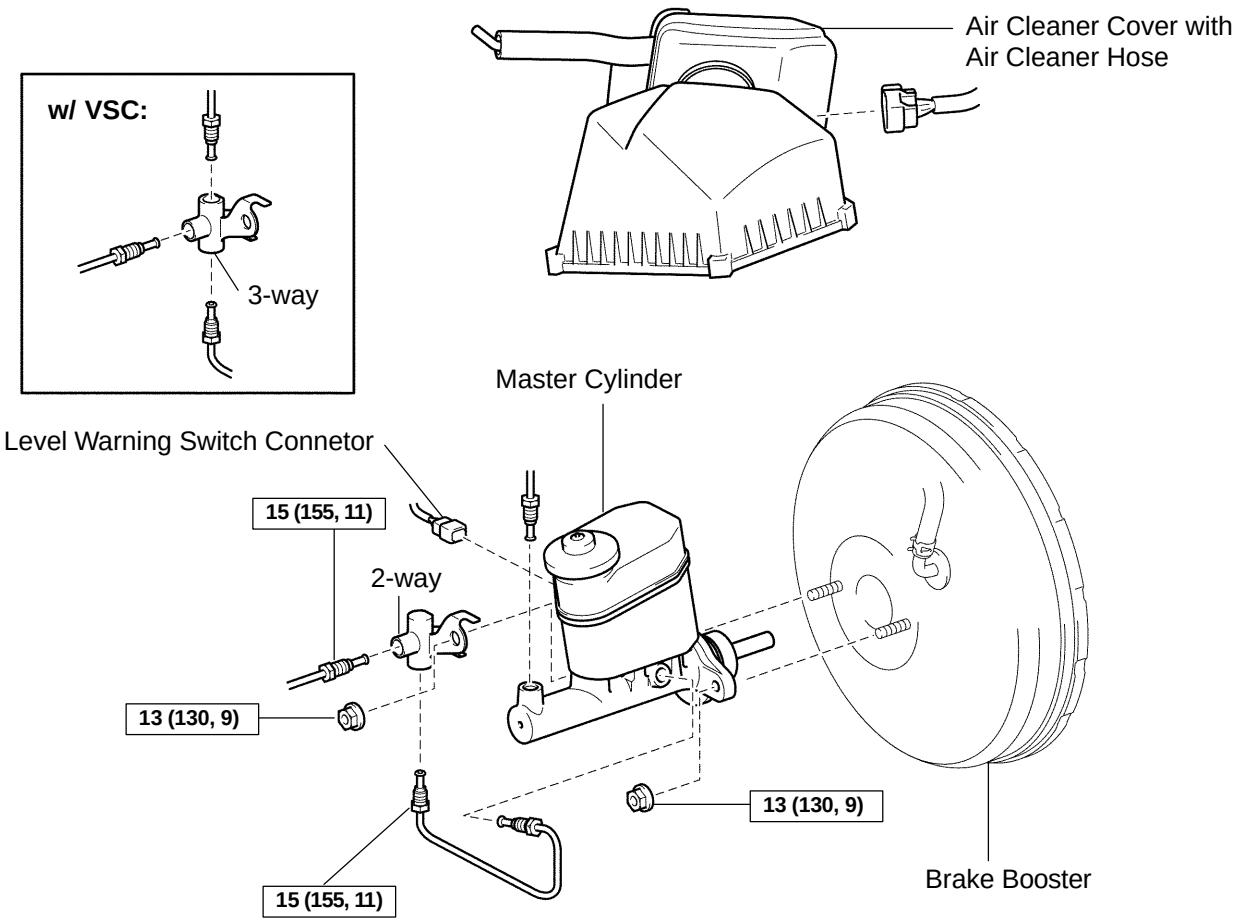
6. **REMOVE BRAKE BOOSTER ASSEMBLY**

(a) Remove the pedal return spring.
(b) Remove the clip and clevis pin.
(c) Remove the 4 nuts and clevis.
(d) Pull out the brake booster and gasket.

BRAKE MASTER CYLINDER

COMPONENTS

BR0KQ-04

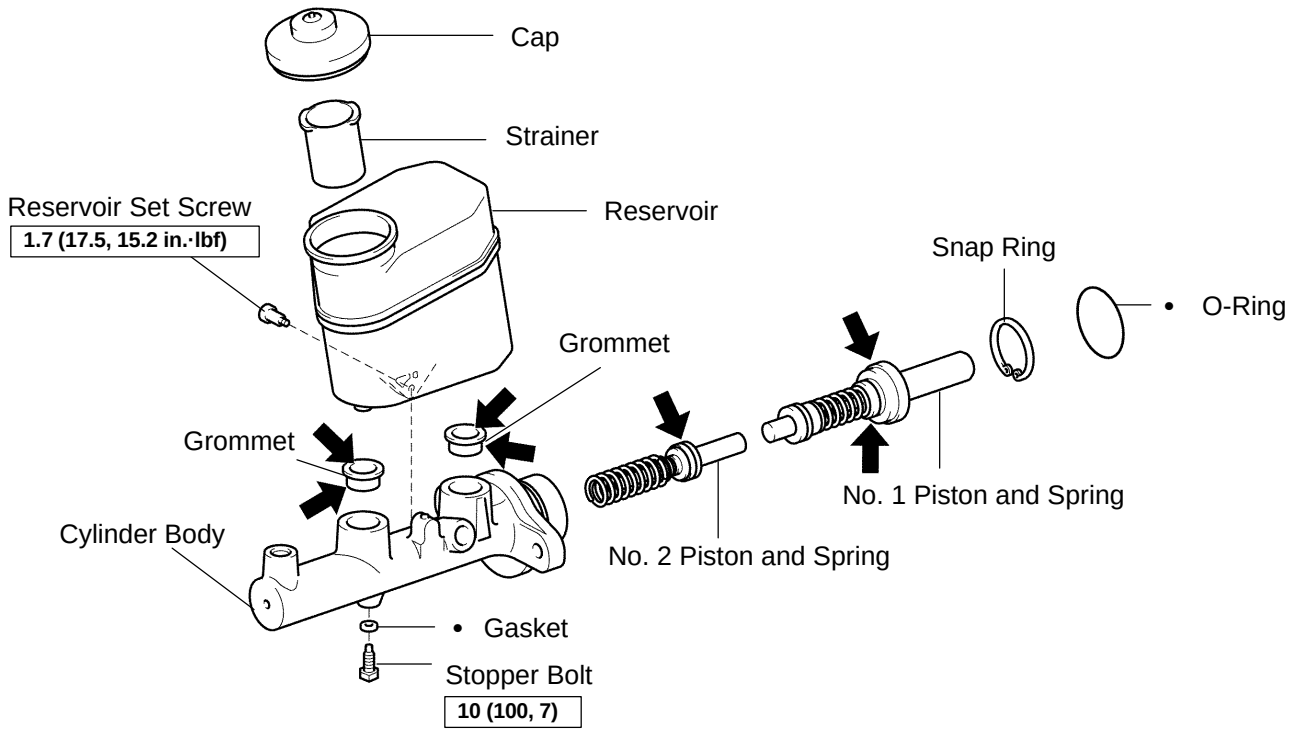


N·m (kgf·cm, ft·lbf) : Specified torque

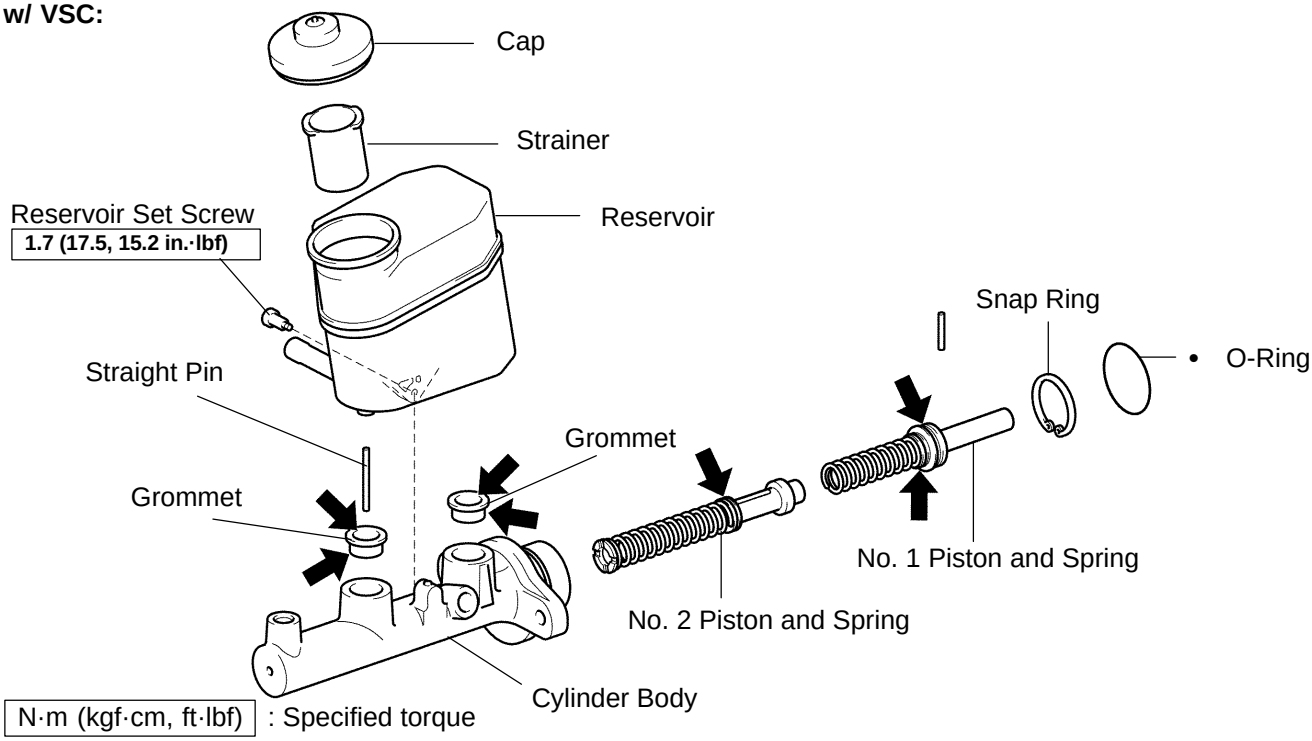
P

F09712

w/o VSC:



w/ VSC:



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

• Non-reusable part

P ➡ Lithium soap base giycol grease

F09748

BR0KS-03

DISASSEMBLY

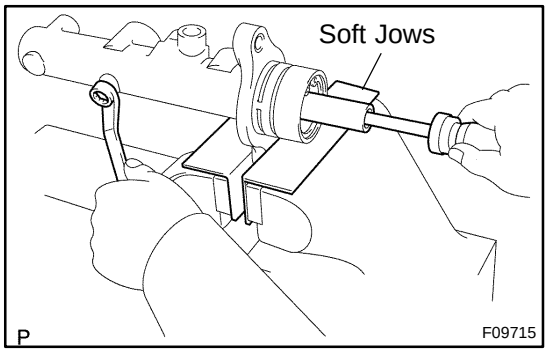
1. REMOVE RESERVOIR

(a) Remove the set screw and pull out the reservoir.
Torque: 1.7 N·m (17.5 kgf·cm, 15.2 in.·lbf)

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

2. REMOVE 2 GROMMETS

3. w/o VSC:
PLACE CYLINDER IN VISE



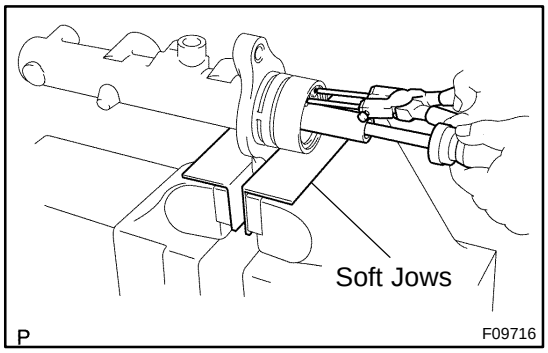
4. w/o VSC:
REMOVE PISTON STOPPER BOLT

Using a screwdriver, push the pistons in all the way and remove the piston stopper bolt and gasket.

HINT:

Tape the screwdriver tip before use.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



5. w/o VSC:
REMOVE 2 PISTONS AND SPRINGS

(a) Push in the piston with a screwdriver and remove the snap ring with snap ring pliers.

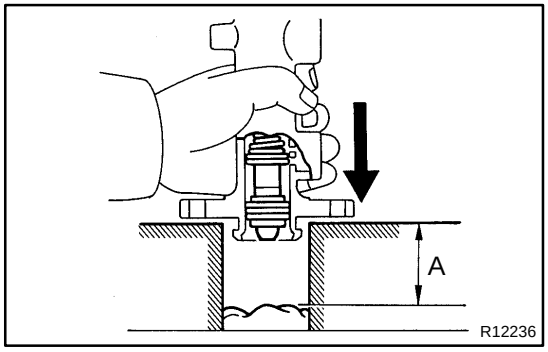
HINT:

Tape the screwdriver tip before use.

(b) Remove the No. 1 piston and spring by hand, pulling straight out, not at an angle.

NOTICE:

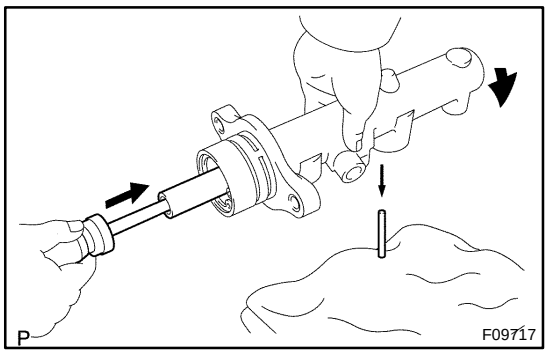
- **If pulled out and install at an angle, there is a possibility that the cylinder bore could be damaged.**
- **At the time of reassembly, be careful not to damage the rubber lips on the pistons.**



(c) Place a rag and 2 wooden blocks on the work table, and lightly tap the cylinder flange against the block edges until the No. 2 piston drops out of the cylinder.

HINT:

Make sure that the distance (A) from the rag to the top of the blocks is at least 100 mm (3.94 in.).



6. w/ VSC:
REMOVE 2 PISTONS AND SPRINGS

(a) Push in the piston with a screwdriver, and remove the straight pin by turning over the cylinder body.

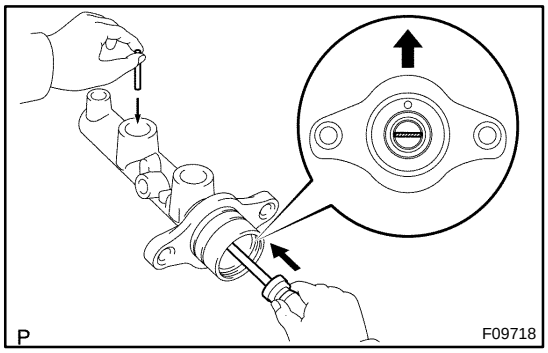
HINT:

Tape the screwdriver tip before use.

(b) Remove the 2 piston and springs by hand, pulling straight out, not at an angle.

NOTICE:

- **If pulled out and installed at an angle, there is a possibly that the cylinder bore could be damaged.**



- **At the time of reassembly, be careful not to damage the rubber lips on the pistons.**

HINT:

Insert the No. 2 piston with the groove positioning horizontally.

BR0KT-01

INSPECTION

HINT:

Clean the disassembled parts with compressed air.

1. INSPECT CYLINDER BORE FOR RUST OR SCORING

2. INSPECT CYLINDER FOR WEAR OR DAMAGE

If necessary, clean or replace the cylinder.

BR0KV-05

INSTALLATION

Installation is in the reverse order of removal (See page BR-15).

HINT:

- Before installation, adjust length of brake booster push rod (See page BR-24).
- After installation, fill the brake reservoir with brake fluid, bleed brake system (See page BR-4), and check for leaks.
- Check and adjust brake pedal (See page BR-6).

BR0KU-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See-page BR-16).

NOTICE:

Apply lithium soap base glycol grease to the rubber parts indicated by the arrows (See page BR-13).

BR0KR-02

REMOVAL

1. REMOVE AIR CLEANER COVER WITH AIR CLEANER HOSE

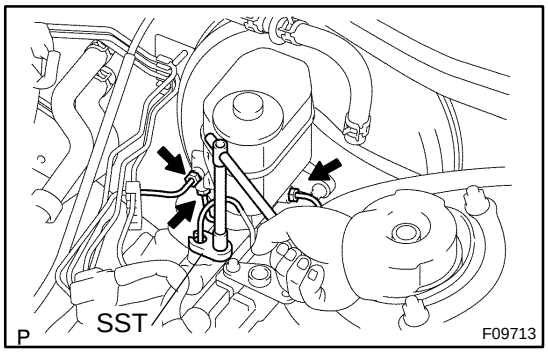
2. TAKE OUT FLUID WITH SYRINGE

NOTICE:

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

3. DISCONNECT LEVEL WARNING SWITCH CONNECTOR

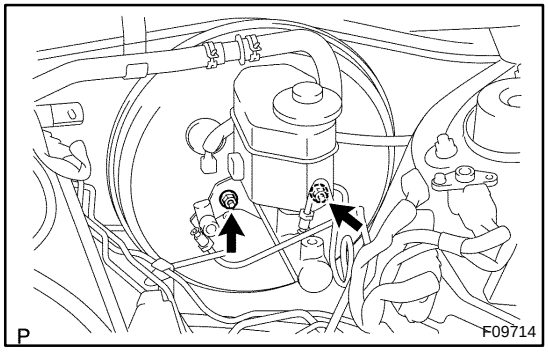
4. w/ VSC:
DISCONNECT RESERVOIR HOSE



5. DISCONNECT BRAKE LINES

(a) w/o VSC:
Using SST, disconnect the 4 brake lines from the master cylinder and 2-way.
SST 09023-00100
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

(b) w/ VSC:
Using SST, disconnect the 5 brake lines from the master cylinder and 3-way.
SST 09023-00100
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)



6. REMOVE MASTER CYLINDER

Remove the 2 mounting nuts, and pull out the 2 or 3-way, master cylinder and gasket.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

BRAKE FLUID

BR14Z-01

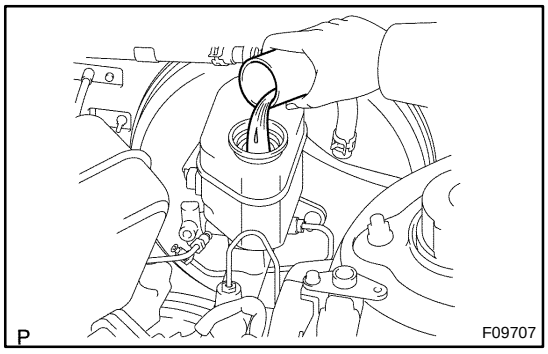
BLEEDING

HINT:

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

NOTICE:

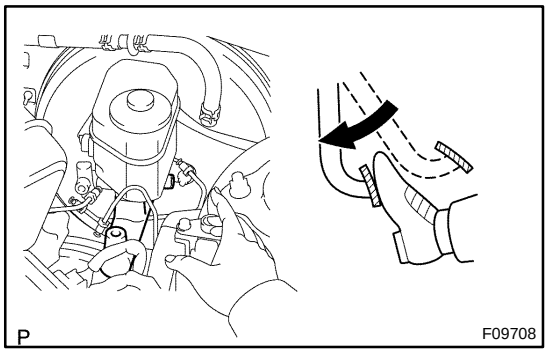
Do not let brake fluid remain on a painted surface. Wash it off immediately.



1. FILL BRAKE RESERVOIR WITH BRAKE FLUID

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

Fluid: SAE J1703 or FMVSS No. 116 DOT3



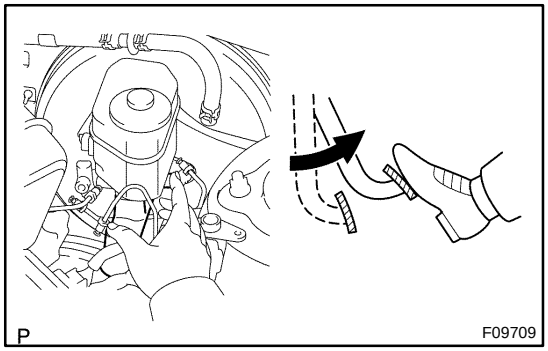
2. BLEED MASTER CYLINDER

HINT:

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

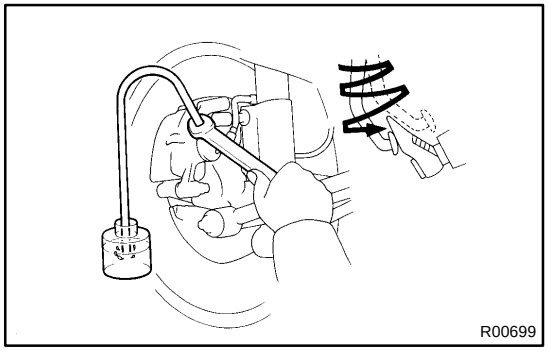
(a) Disconnect the brake lines from the master cylinder.
SST 09023-00100

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



(c) Block off the outlet plugs with your fingers, and release the brake pedal.

(d) Repeat (b) and (c) 3 or 4 times.



3. CONNECT VINYL TUBE TO BRAKE CALIPER BLEEDER PLUG

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

NOTICE:

Bleed air of the rear brake first. If front brake is bled first, rear brake air cannot be bled.

4. BLEED BRAKE LINE

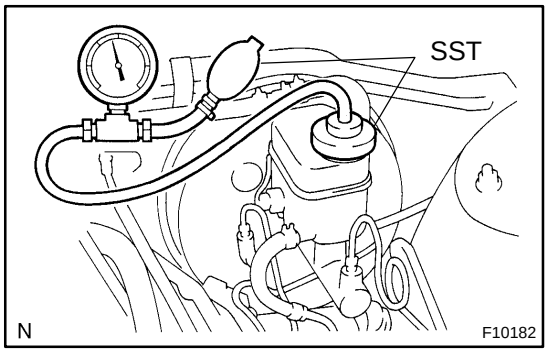
(a) Slowly depress the brake pedal several times.

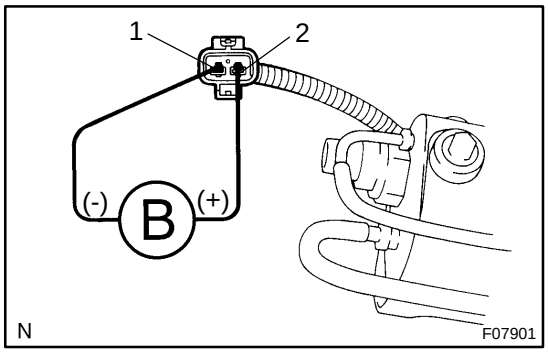
(b) While an assistant depresses the pedal, loosen the bleeder plug until fluid starts to run out. Then tighten the bleeder plug.

(c) Repeat this procedure until there are no more air bubbles in the fluid.

Bleeder plug tightening torque:
8.3 N·m (85 kgf·cm, 74 in.·lbf)

5. REPEAT PROCEDURE FOR EACH WHEEL





6. w/ VSC:

BLEED PRECHARGE PUMP

CAUTION:

When repairing the brake master cylinder or precharge pump, bleed the precharge pump of the air.

(a) Install the SST to the reservoir.
SST 09992-00242, 09992-00350

(b) Using SST, apply pressure to the reservoir.
Pressure: 98.1 kpa (1.0 kgf/cm^2, 14.2 psi)

(c) Disconnect the precharge pump connector.

(d) Connect ML+ (2) terminal to the battery positive (+) and ML- (1) terminal to the battery negative (-), and activate the precharge pump about 20 seconds.

(e) Remove the SST from the reservoir.

(f) Connect the vinyl tube to the front brake caliper RH, and loosen the bleeder plug.

(g) Activate the precharge pump again until there are no more air bubbles in the fluid.

Bleeder plug tightening torque:
8.3 N·m (85 kgf·cm, 74 in.·lbf)

(h) Connect the precharge pump connector.

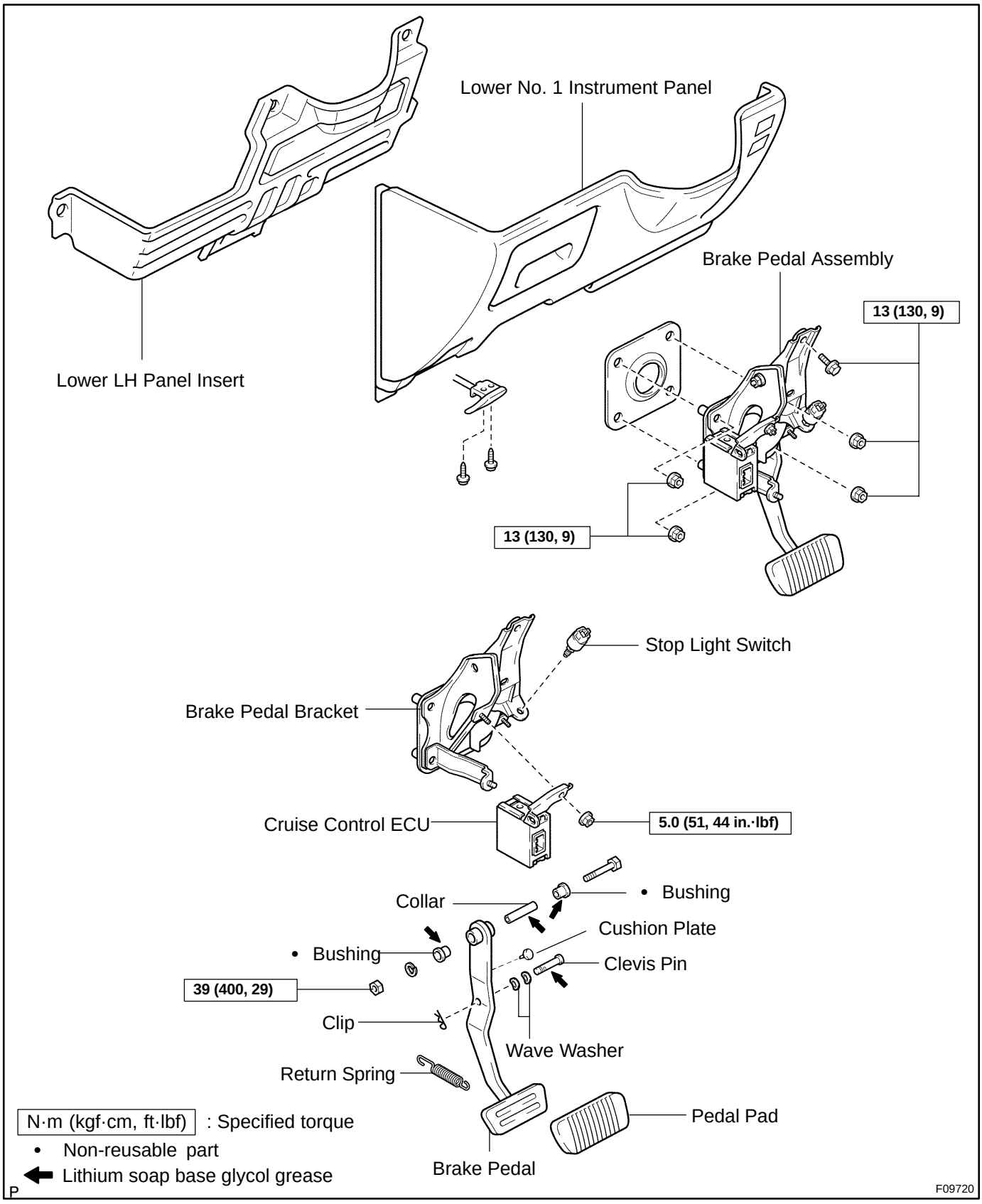
7. CHECK FLUID LEVEL IN RESERVOIR

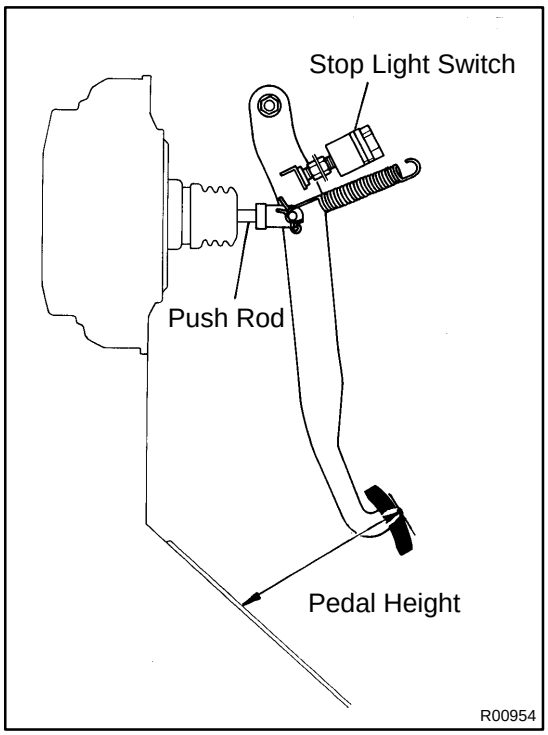
Check the fluid level and add fluid if necessary.

Fluid: SAE J1703 or FMVSS No. 116 DOT3

BR150-01

COMPONENTS





BRAKE PEDAL

BR0KI-04

ON-VEHICLE INSPECTION

1. CHECK PEDAL HEIGHT

Pedal height from asphalt sheet:
153.3 - 163.3 mm (6.035 - 6.429 in.)

If the pedal height is incorrect, adjust it.

2. IF NECESSARY, ADJUST PEDAL HEIGHT

(a) Remove the lower No. 1 instrument panel and lower LH instrument panel insert (See page BO-87).

(b) Disconnect the connector from the stop light switch.

(c) Loosen the stop light switch lock nut and remove the stop light switch.

(d) Loosen the push rod lock nut.

(e) Adjust the pedal height by turning the pedal push rod.

(f) Tighten the push rod lock nut.

Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)

(g) Install the stop light switch.

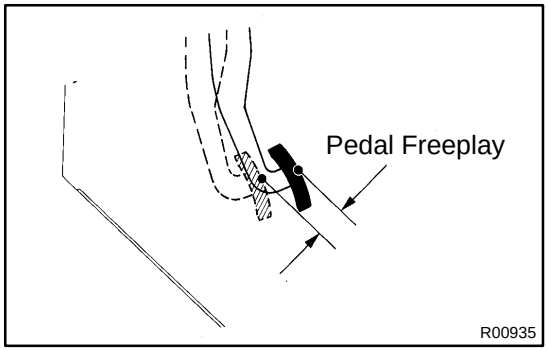
(h) Connect the connector to the stop light switch.

(i) 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.

(j) After installation, push the brake pedal in 5 - 15 mm (0.20 - 0.59 in.), check that stop light lights up.

(k) After adjusting the pedal height, check the pedal freeplay.

(l) Install the lower LH instrument panel insert and lower No. 1 instrument panel (See page BO-87).



3. CHECK PEDAL FREEPLAY

(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 beginning of the resistance is felt, then measure the distance.

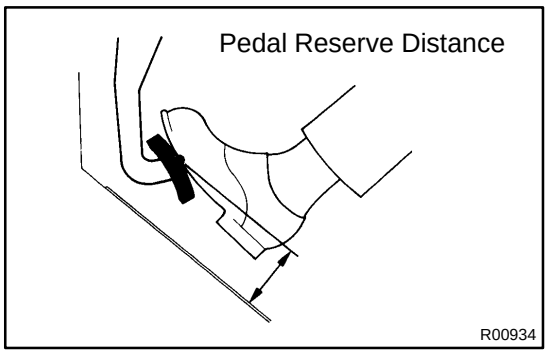
Pedal freeplay: 1 - 6 mm (0.04 - 0.24 in.)

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.)

HINT:

The freeplay to the 1st resistance is due to the play between the clevis and pin. This is magnified up to 1 - 6 mm (0.04 - 0.24 in.) at the pedal.



4. CHECK PEDAL RESERVE DISTANCE

Release the parking brake.

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

Pedal reserve distance from asphalt sheet at 490 N (50 kgf, 110.2 lbf): More than 75 mm (3.0 in.)

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

BRAKE SYSTEM

BR0MH-01

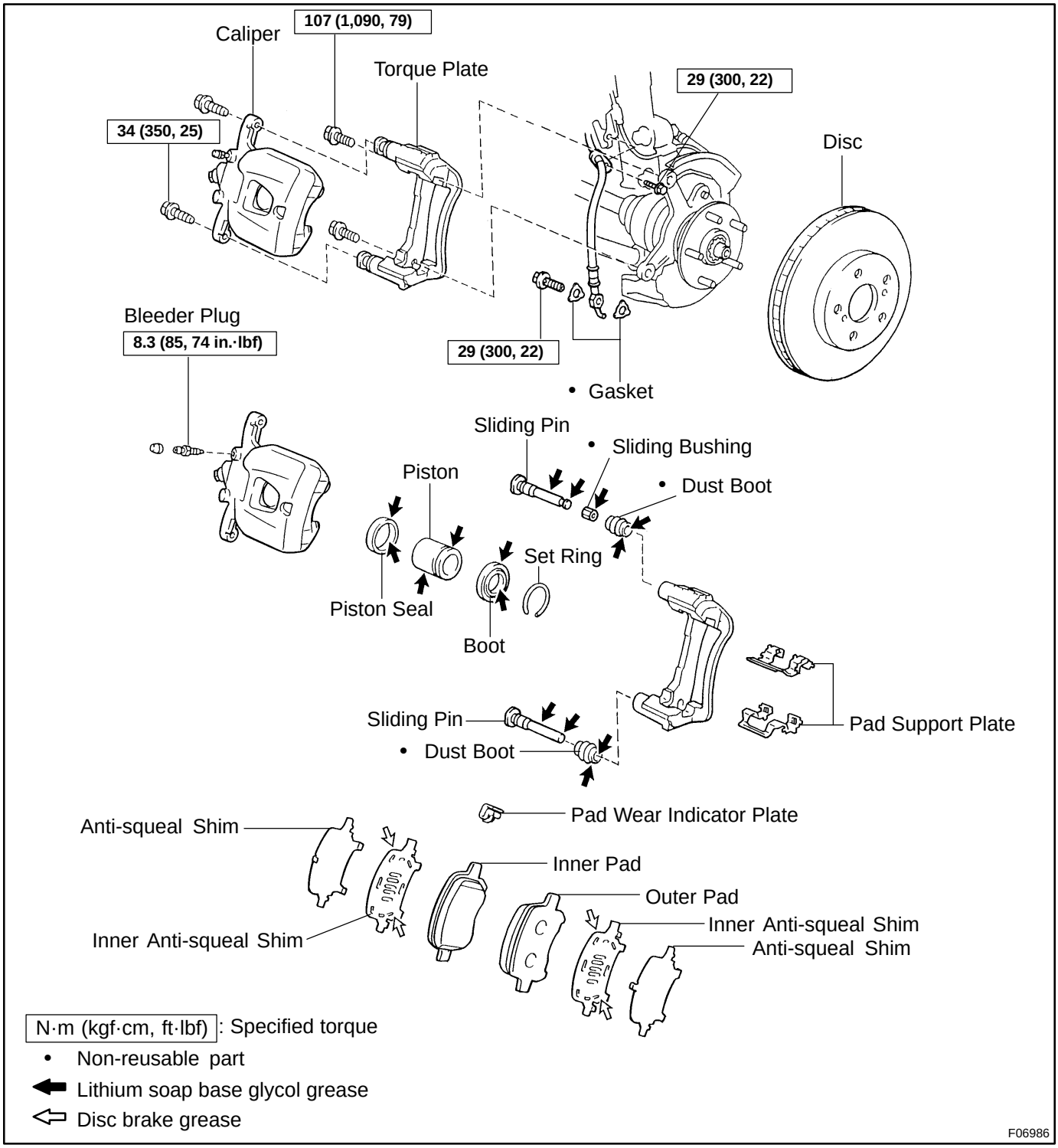
PRECAUTION

- **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.**
- **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.**

FRONT BRAKE CALIPER

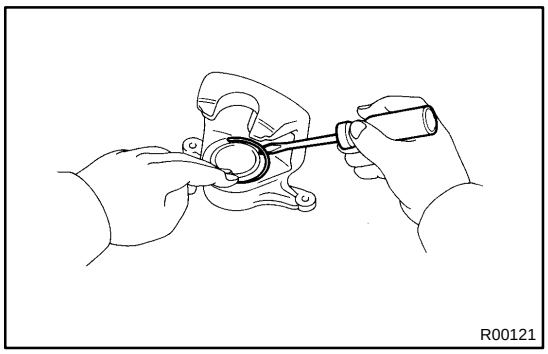
BR0L2-04

COMPONENTS



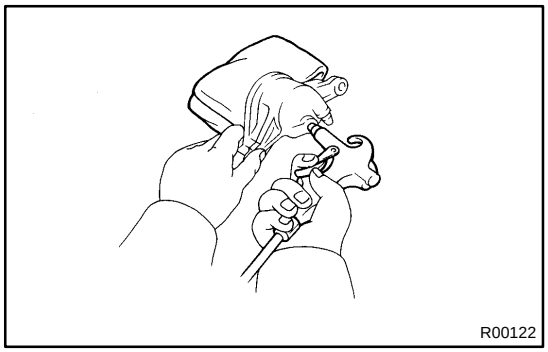
BR0L4-04

DISASSEMBLY



1. REMOVE SET RING AND CYLINDER BOOT

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



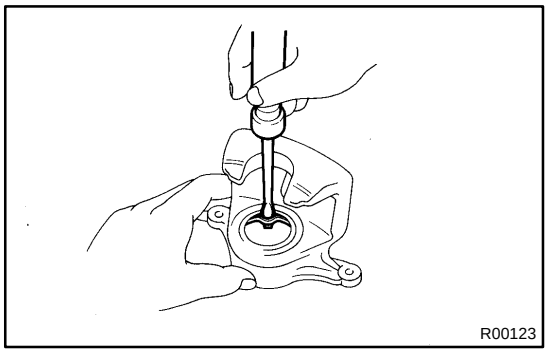
2. REMOVE PISTON

(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.

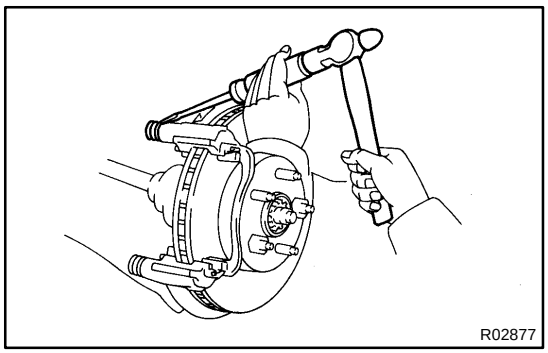
CAUTION:

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



3. REMOVE PISTON SEAL

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



4. REMOVE SLIDING PINS AND DUST BOOTS

(a) Remove the 2 sliding pins from the torque plate.

NOTICE:

At the time of reassembly, insert the sliding pin with sliding bushing into the top side.

(b) Using a screwdriver and hammer, tap out the 2 dust boots.

HINT:

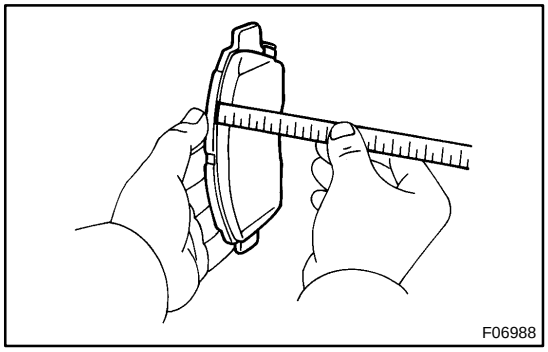
At the time of reaseembly, use a 24 mm socket wrench and tap in 2 new dust boots into the torque plate.

NOTICE:

At the time of reassembly, confirm that the metal plate portion of the dust boot fits snugly in the torque plate.

BR0L5-04

INSPECTION



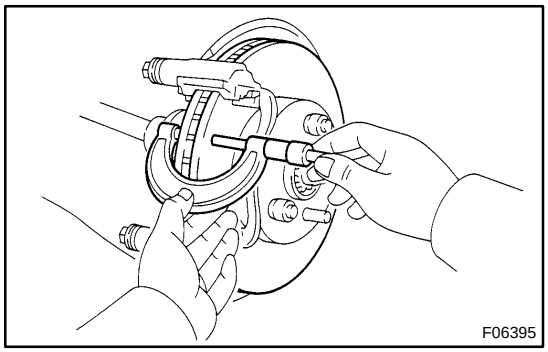
1. MEASURE PAD LINING THICKNESS

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, uneven wear.



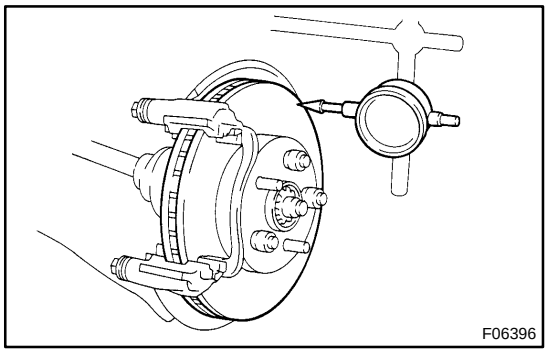
2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness: 28.0 mm (1.102 in.)

Minimum thickness: 26.0 mm (1.024 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.

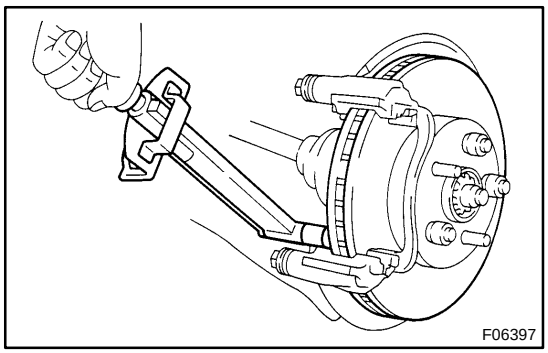


3. MEASURE DISC RUNOUT

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

Maximum disc runout: 0.05 mm (0.0020 in.)

If the disc's runout is at the maximum value or greater, check the bearing play 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, adjusting the disc runout or grind it on a "On-Car" brake lathe.



4. IF NECESSARY, ADJUST DISC RUNOUT

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

(b) Remove the hub nuts and the disc. Reinstall the disc 1/5 of a turn round 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.

(c) Repeat (b) until the disc has been installed on the 3 remaining hub positions.

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

(e) 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.

(f) Install the torque plate and torque the mounting bolts.

Torque: 107 N·m (1,090 kgf·cm, 79 ft·lbf)

BR0L7-04

INSTALLATION

Installation is in the reverse order of removal (See page BR-29).

HINT:

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

BR0L6-01

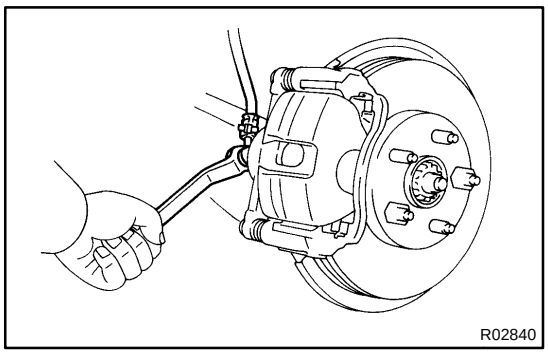
REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR-30).

NOTICE:

Apply lithium soap base glycol grease to the parts indicated by arrows (See page BR-28).

BR0L3-04



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 2 gaskets from the caliper, then disconnect the flexible hose from the caliper.

Torque: 29 N·m (300 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 CALIPER

(a) Remove the 2 installation bolts.

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

(b) Remove the caliper from the torque plate.

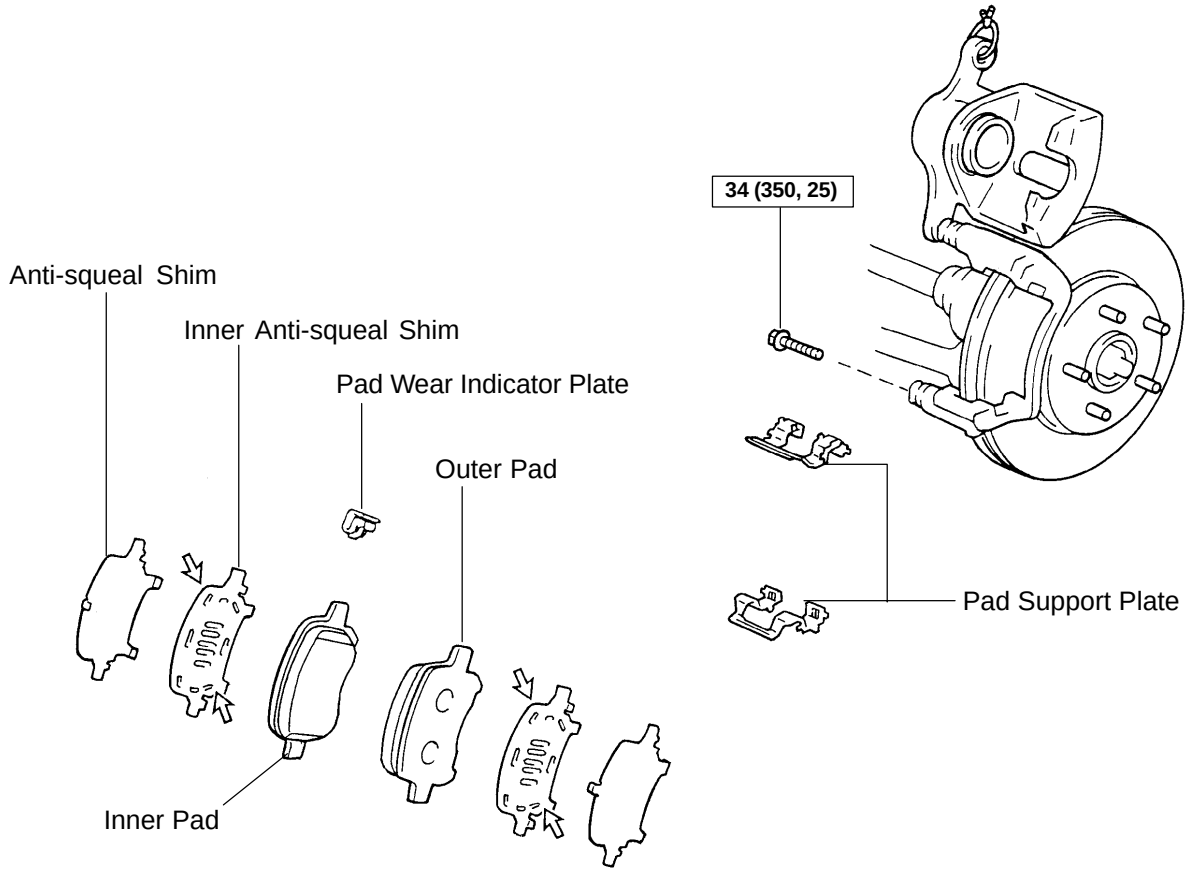
4. REMOVE 2 BRAKE PADS WITH ANTI- SQUEAL SHIMS

5. REMOVE 2 PAD SUPPORT PLATES

FRONT BRAKE PAD

BR0L0-04

COMPONENTS



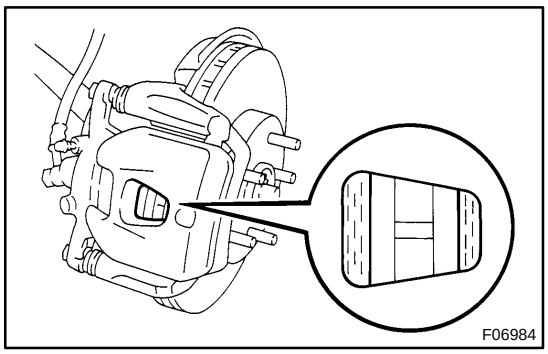
N·m (kgf·cm, ft·lbf) : Specified torque

⇦ Disc brake grease

F06983

BR0L1-04

REPLACEMENT



1. REMOVE FRONT WHEEL

2. INSPECT PAD LINING THICKNESS

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

Minimum thickness: 1.0 mm (0.039 in.)

3. LIFT UP CALIPER

(a) Remove the bolt and flexible hose from the shock absorber bracket.

(b) Remove the bottom side installation bolt.

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

HINT:

Do not disconnect the flexible hose from the caliper.

4. REMOVE 2 BRAKE PADS WITH 4 ANTI- SQUEAL SHIMS

5. REMOVE PAD WEAR INDICATOR PLATE

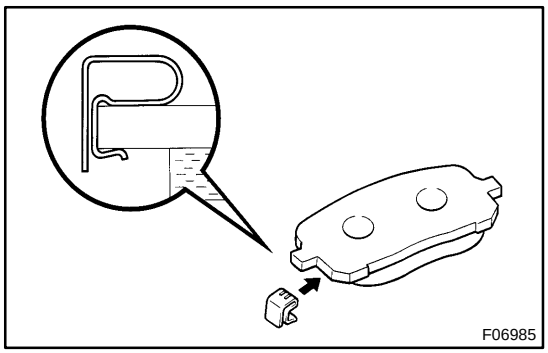
6. REMOVE 2 PAD SUPPORT PLATES

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.

7. CHECK DISC THICKNESS AND RUNOUT (See page BR-31)

8. INSTALL 2 PAD SUPPORT PLATES



9. INSTALL NEW PADS

NOTICE:

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

(a) Install a pad wear indicator plate on the inner pad.

(b) Apply disc brake grease to both sides of the inner anti-squeal shims (See page BR-25).

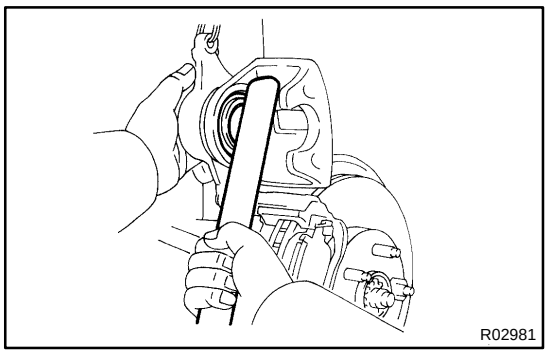
(c) Install the 2 anti-squeal shims on each pad.

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

(e) Install outer pad.

NOTICE:

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



10. 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 torque the installation bolt.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(e) Install the flexible hose and bolt to the shock absorber bracket.
Torque: 29 N·m (300 kgf·cm, 21 ft·lbf)

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

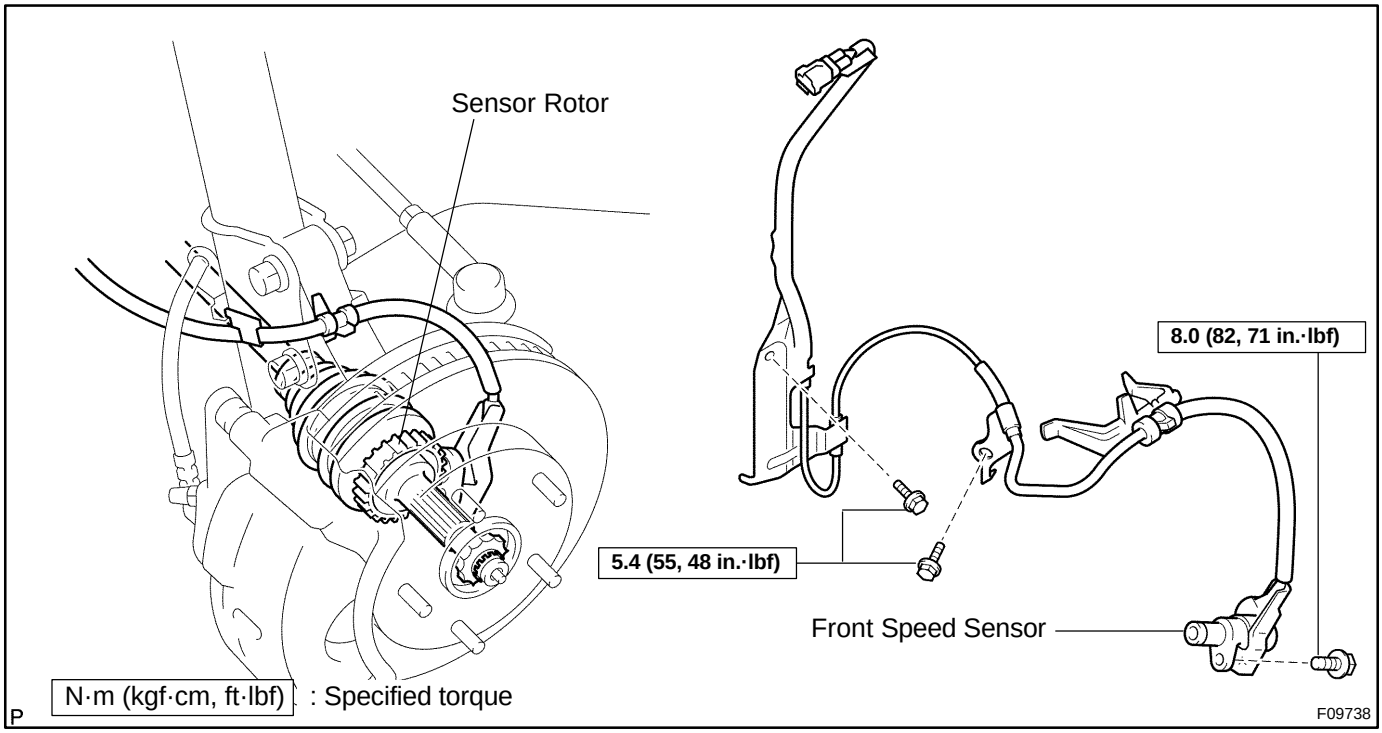
12. DEPRESS BRAKE PEDAL SEVERAL TIMES

13. CHECK THAT FLUID LEVEL IS AT MAX LINE

FRONT SPEED SENSOR

COMPONENTS

BR0LU-02



BR0LW-03

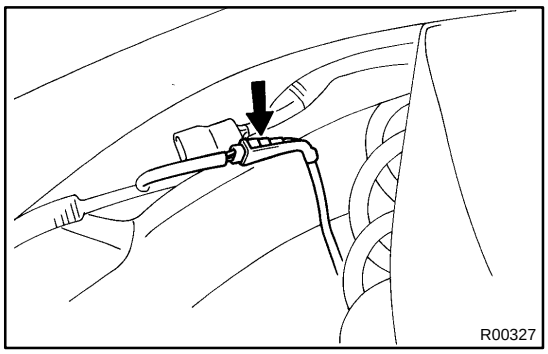
INSTALLATION

Installation is in the reverse order of removal (See page BR-60).

AFTER INSTALLATION, CHECK SPEED SENSOR SIGNAL (See page DI-252 or DI-212)

BR0LV-03

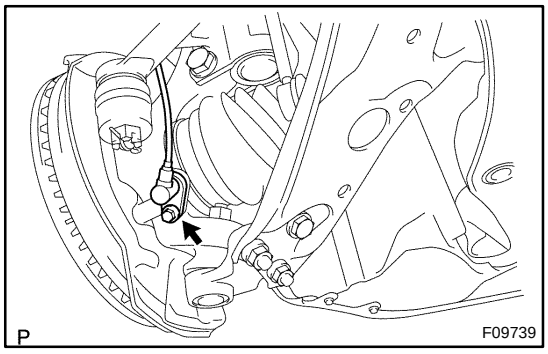
REMOVAL



1. DISCONNECT SPEED SENSOR CONNECTOR

(a) Remove the fender liner.

(b) Disconnect the speed sensor connector.



2. REMOVE SPEED SENSOR

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

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

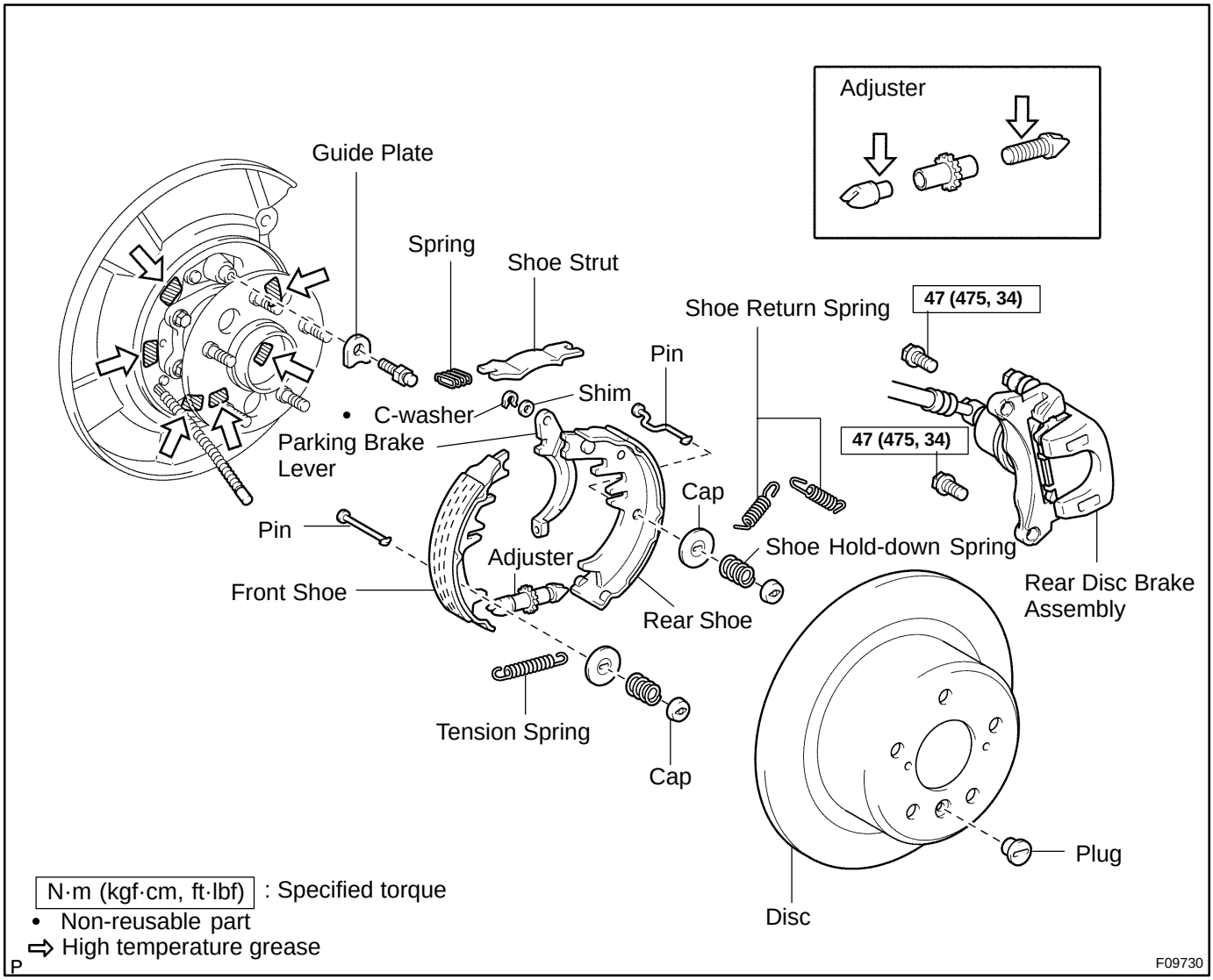
(b) Remove the bolt and speed sensor from the steering knuckle.

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

PARKING BRAKE

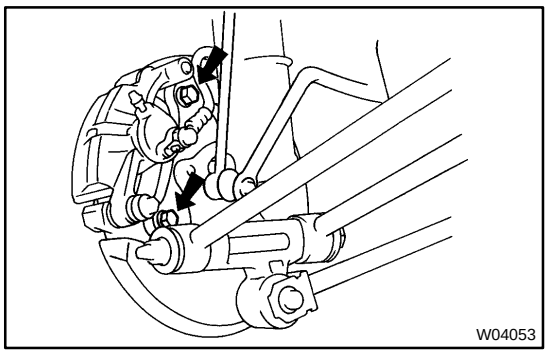
BR0LG-03

COMPONENTS



BR0LH-03

DISASSEMBLY



1. REMOVE REAR WHEEL

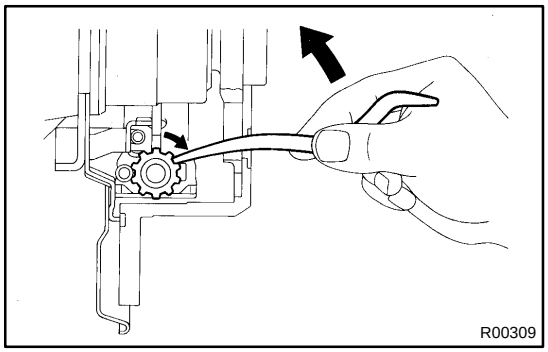
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. REMOVE REAR DISC BRAKE ASSEMBLY

(a) Remove the 2 mounting bolts and remove the disc brake assembly.

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

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

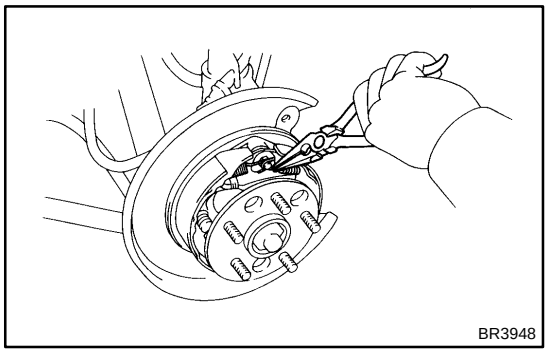


3. REMOVE DISC

Release the parking brake pedal, and remove the disc.

HINT:

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



4. REMOVE SHOE RETURN SPRINGS

Using needle-nose pliers, remove the 2 shoe return springs.

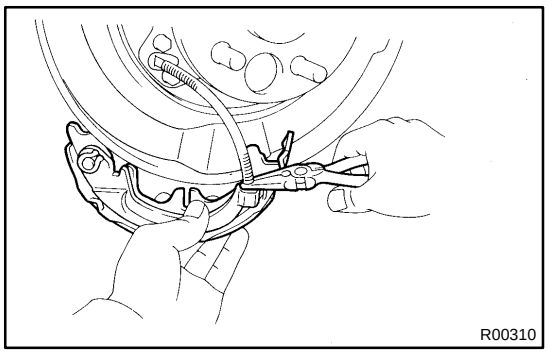
5. REMOVE FRONT SHOE, ADJUSTER AND TENSION SPRING

(a) Disconnect the tension spring from the front shoe.

(b) Slide out the front shoe and remove the shoe adjuster.

(c) Remove the shoe strut with the spring.

(d) Remove the shoe hold-down spring, 2 caps and pin.



6. REMOVE REAR SHOE

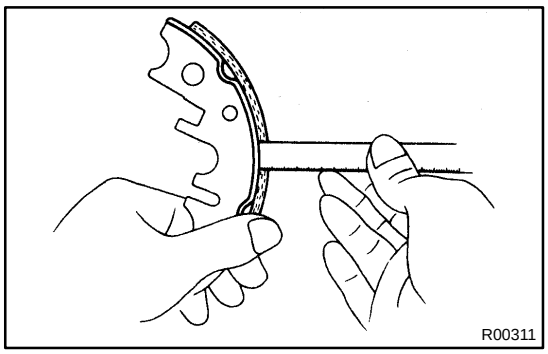
(a) Slide out the rear shoe and remove the tension spring.

(b) Remove the shoe hold-down spring, 2 caps and pin.

(c) Using needle-nose pliers, disconnect the parking brake cable from the parking brake shoe lever.

BR0LI-03

INSPECTION



1. INSPECT DISASSEMBLED PARTS

Inspect the disassembled parts for wear, rust or damage.

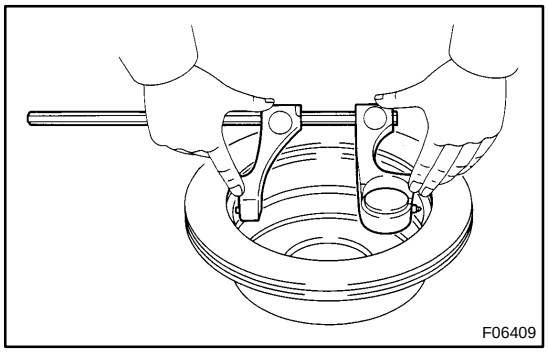
2. MEASURE BRAKE SHOE LINING THICKNESS

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

Standard thickness: 2.0 mm (0.079 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.



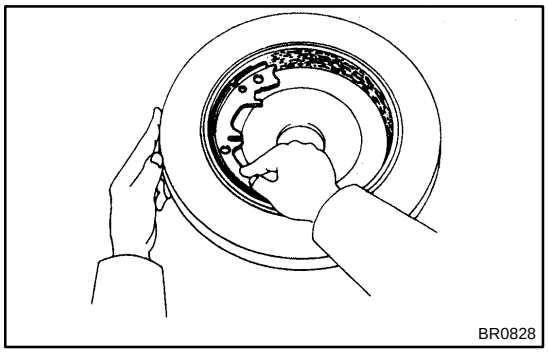
3. MEASURE DISC INSIDE DIAMETER

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

Standard inside diameter: 170 mm (6.69 in.)

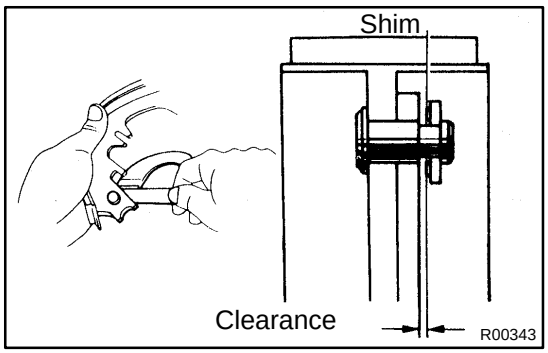
Maximum inside diameter: 171 mm (6.73 in.)

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 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.



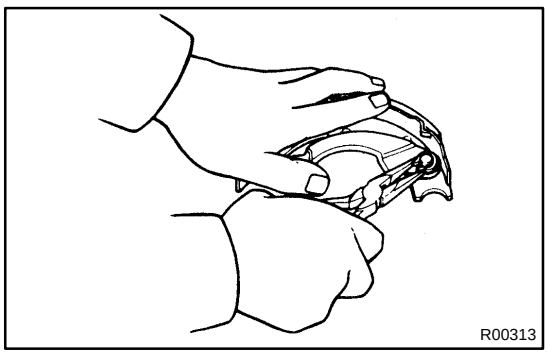
5. MEASURE CLEARANCE BETWEEN PARKING BRAKE SHOE AND LEVER

Using a feeler gauge, measure the clearance.

Standard clearance: Less than 0.35 mm (0.0138 in.)

If the clearance is not within the specification, replace the shim with one of the correct size.

Shim Thickness	Shim Thickness
0.3 mm (0.012 in.)	0.9 mm (0.035 in.)
0.6 mm (0.024 in.)	-



6. IF NECESSARY, REPLACE SHIM

(a) Using a screwdriver, remove the C-washer and shim.
(b) Install the correct size shim with a new C-washer.
(c) Remeasure the clearance.

BR0LJ-03

REASSEMBLY

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

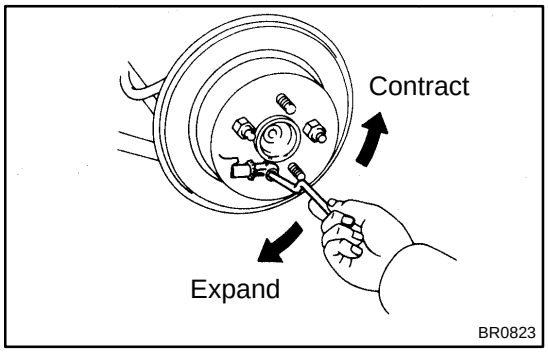
NOTICE:

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) Depress the parking brake pedal with 147 N (15 kgf, 33 lbf).

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

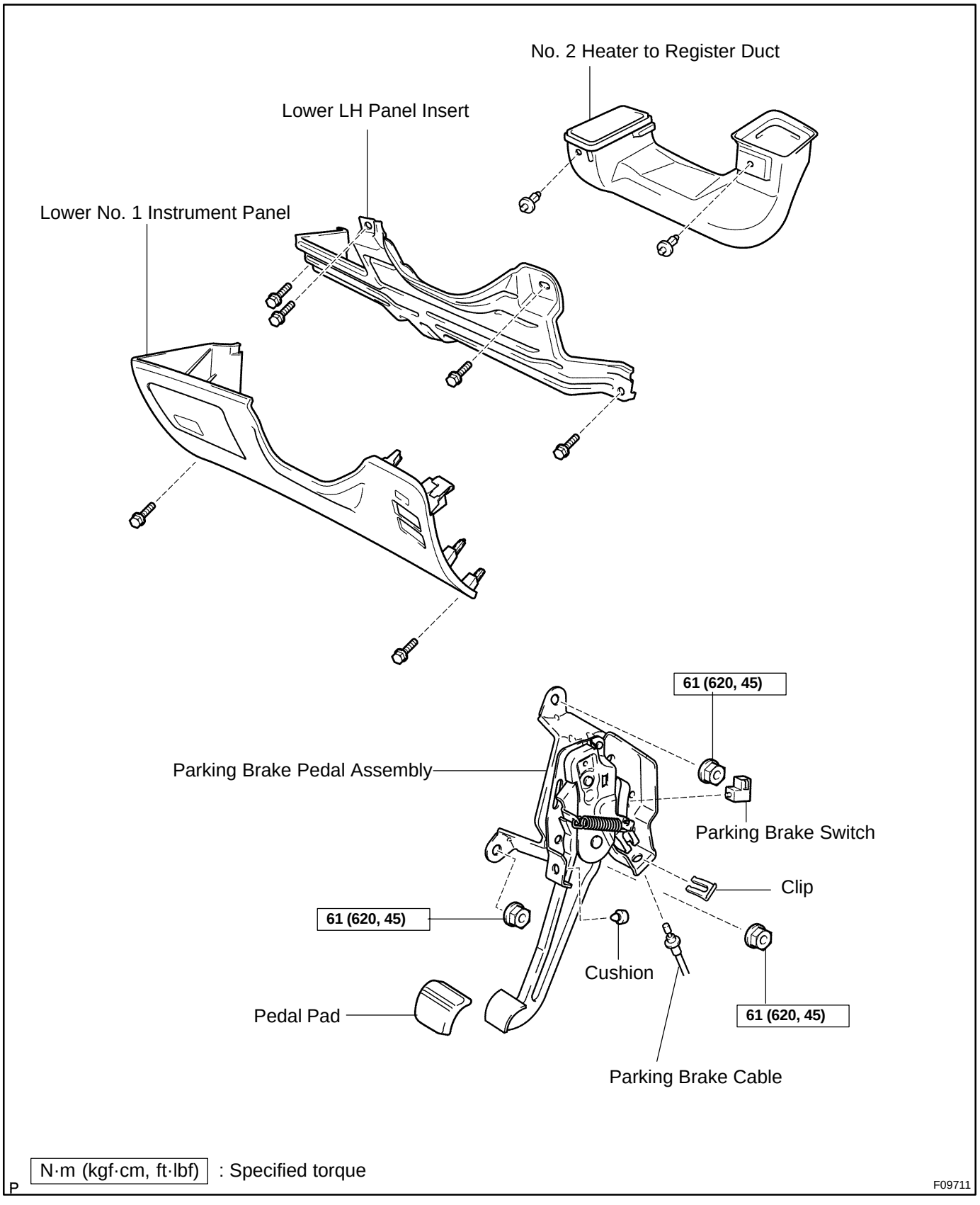
(c) Drive the vehicle for about 400 meters (0.25 mile) in this condition.

(d) Repeat this procedure 2 or 3 times.

3. RECHECK AND ADJUST PARKING BRAKE PEDAL TRAVEL (See page BR-9)

BR0KK-03

COMPONENTS

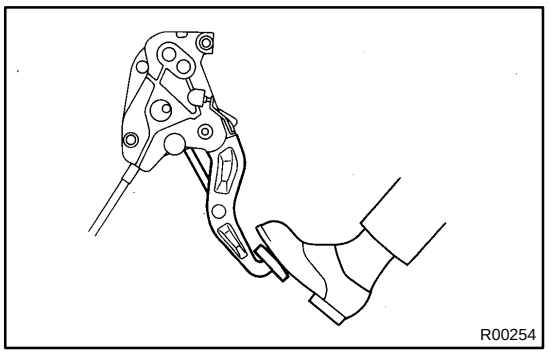


BR0KM-03

INSTALLATION

Installation is in the reverse order of removal (See page BR-11).

AFTER INSTALLATION, ADJUST PARKING BRAKE PEDAL TRAVEL (See page BR-6)


R00254

PARKING BRAKE PEDAL

BR0KJ-02

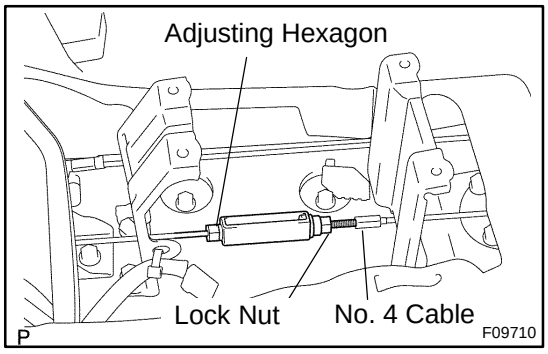
ON-VEHICLE INSPECTION

1. CHECK PARKING BRAKE PEDAL TRAVEL

Slowly depress the parking brake pedal all the way, and count the number of clicks.

Parking brake pedal travel at 294 N (30 kgf, 66 lbf): 3 - 6 clicks

If incorrect, adjust the parking brake.



2. IF NECESSARY, ADJUST PARKING BRAKE PEDAL TRAVEL

HINT:

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

For shoe clearance adjustment, see step 1 on page BR-46 .

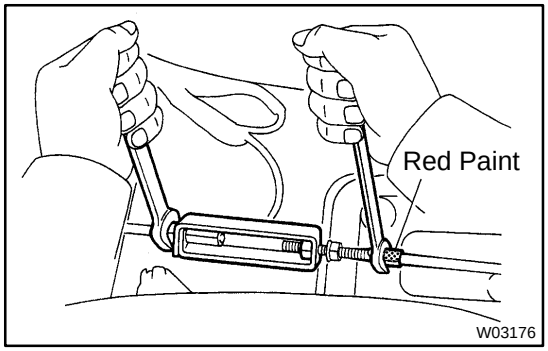
(a) Floor shift:
Remove the console box.

(b) Column shift:
Remove the hole cover.

(c) Confirm that the parking brake pedal is released.

(d) Hold the screw end of No. 4 cable not to rotate.

(e) Loosen the lock nut.



(f) Hold the parking brake cable and turn the adjusting hexagon until the pedal travel is correct.

NOTICE:

To prevent the parking brake cable from twisting, always keep the red-painted surface up.

(g) Holding the adjusting hexagon, tighten the lock nut.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

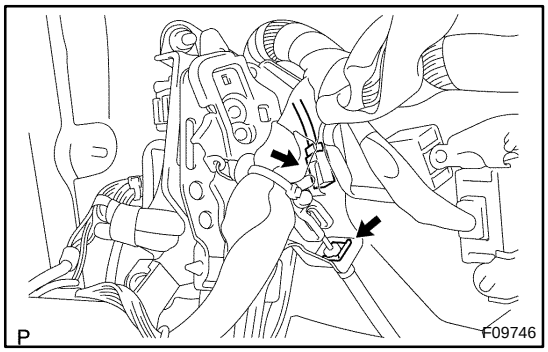
(h) Floor shift:
Install the console box.

(i) Column shift:
Install the hole cover.

BR151-01

REMOVAL

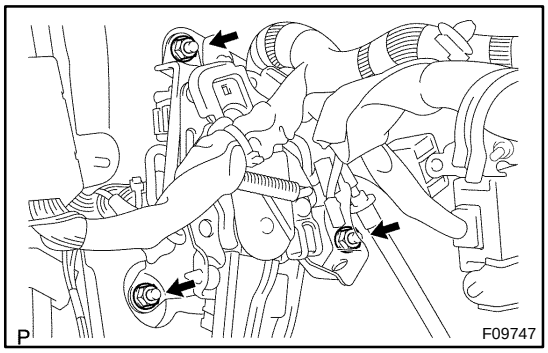
1. **REMOVE LOWER NO. 1 INSTRUMENT PANEL, LOWER LH PANEL INSERT AND NO. 2 HEATER TO REGISTER DUCT (See page BO-87)**
2. **RELEASE PARKING BRAKE PEDAL**



3. **REMOVE PARKING BRAKE PEDAL ASSEMBLY**

(a) Disconnect the parking brake switch connector.

(b) Remove the clip, and disconnect the parking brake cable.



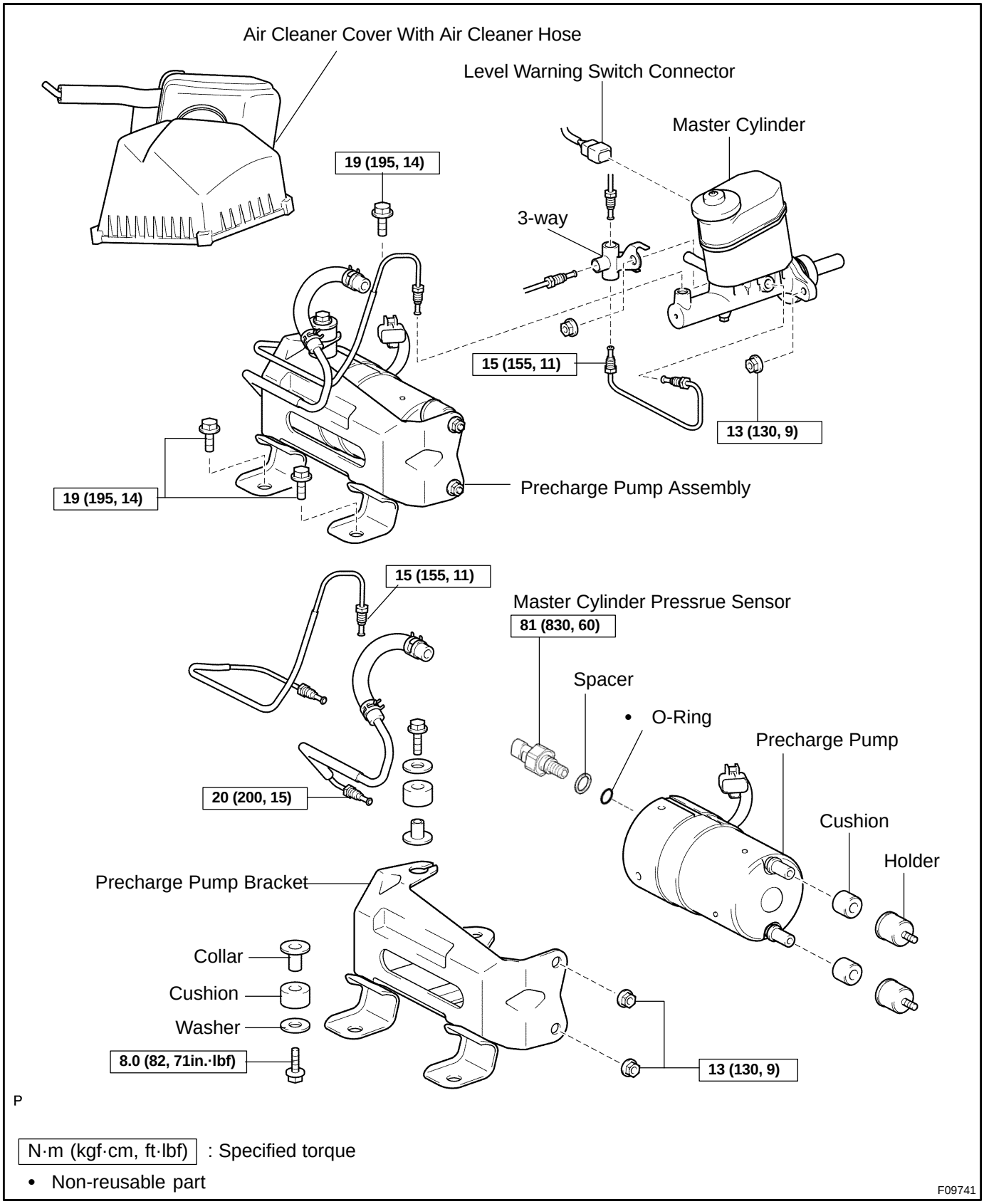
(c) Remove the 3 nuts and parking brake pedal assembly.
Torque: 61 N·m (620 kgf·cm, 45 ft·lbf)

(d) Remove the parking brake switch and cushion from the parking brake pedal assembly.

PRECHARGE PUMP

COMPONENTS

BR159-01



BR15B-01

INSTALLATION

Installation is in the reverse order of removal (See page BR-57).

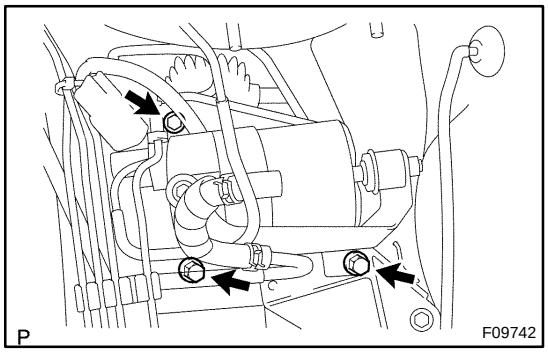
HINT:

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

BR15A-01

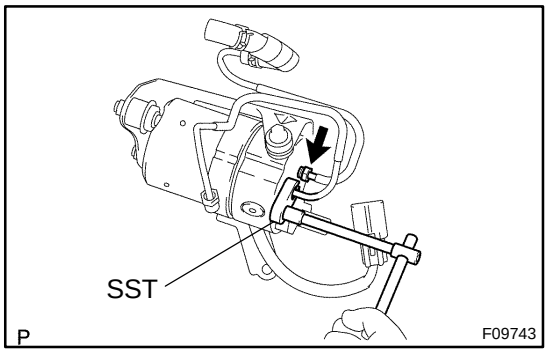
REMOVAL

1. **REMOVE AIR CLEANER CASE WITH AIR CLEANER HOSE**
2. **REMOVE MASTER CYLINDER (See page BR-15)**
3. **DISCONNECT PRECHARGE PUMP CONNECTOR**

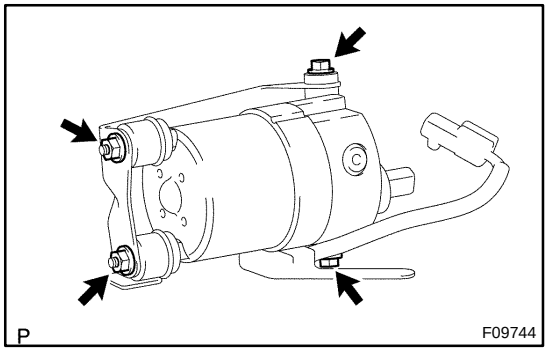


4. **REMOVE PRECHARGE PUMP ASSEMBLY**

(a) Remove the 3 bolts and precharge pump assembly.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)



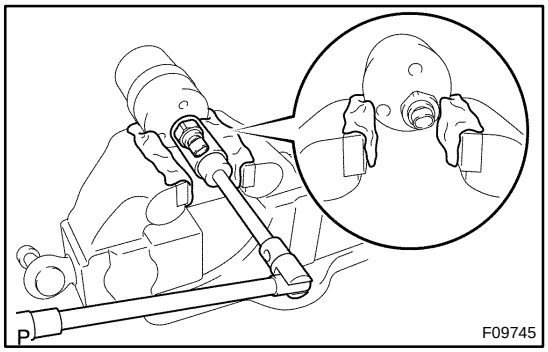
(b) Using SST, disconnect the 2 brake lines from the precharge pump.
SST 09751-3601 1
Torque:
10 mm nut: 15 N·m (155 kgf·cm, 11 ft·lbf)
12 mm nut: 20 N·m (200 kgf·cm, 15 ft·lbf)



5. **REMOVE PRECHARGE PUMP**

(a) Remove the 2 nuts, 2 bolts and precharge pump from the pump bracket.
Torque:
Nut: 13 N·m (130 kgf·cm, 9 ft·lbf)
Bolt: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) Remove the 2 holders, 2 collars, 2 washers and 4 cushions.



6. **REMOVE MASTER CYLINDER PRESSURE SENSOR**

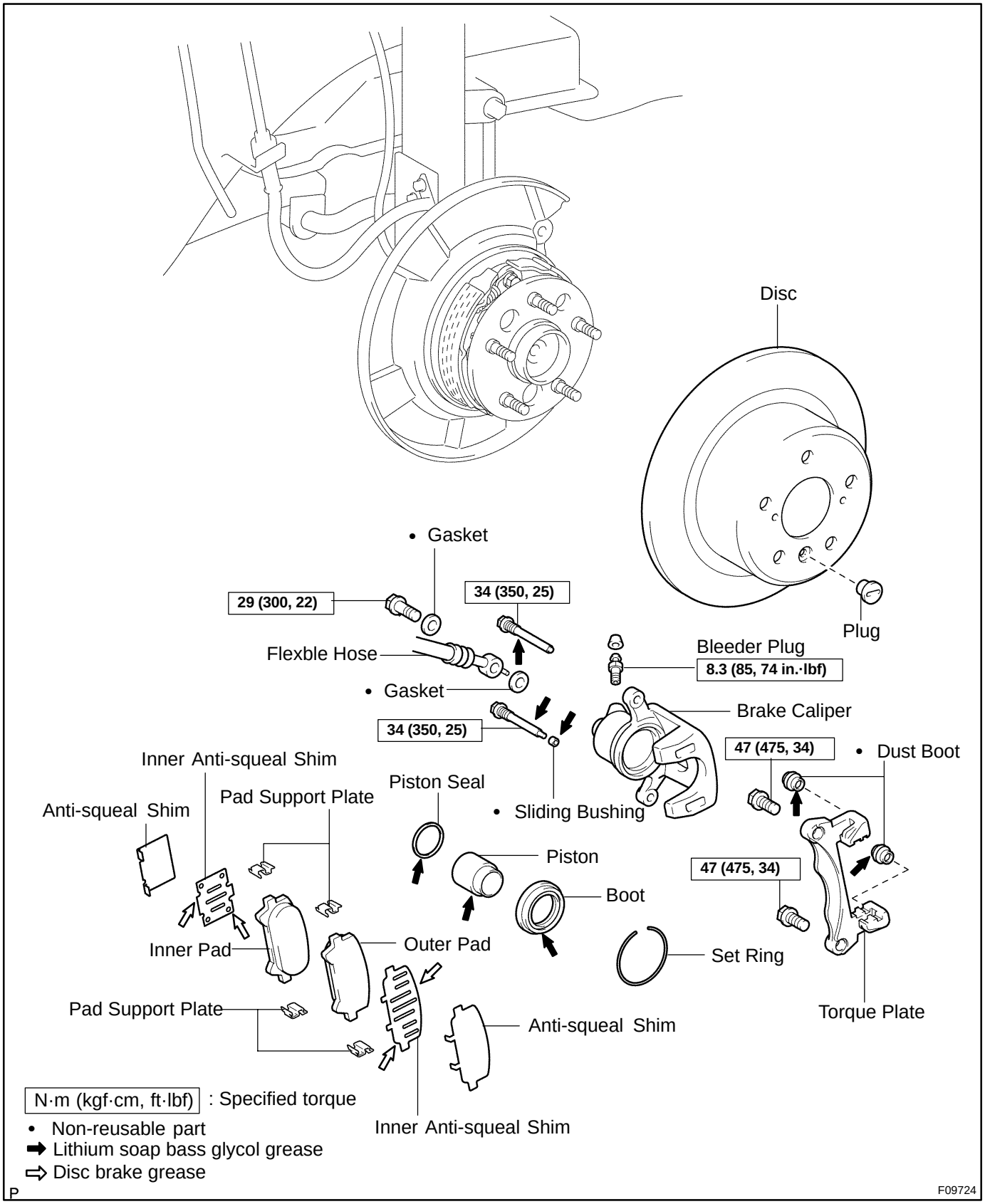
(a) Place the precharge pump in a vise with a cloth shown in the illustration on the left.

(b) Using 30 mm deeper socket wrench, and remove the master cylinder pressure sensor, O-ring and spacer.
Torque: 81 N·m (830 kgf·cm, 60 ft·lbf)

REAR BRAKE CALIPER

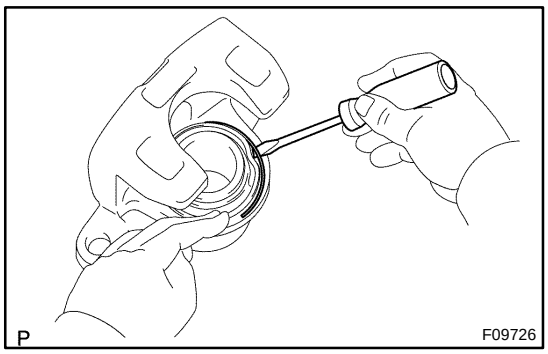
BR0LA-03

COMPONENTS



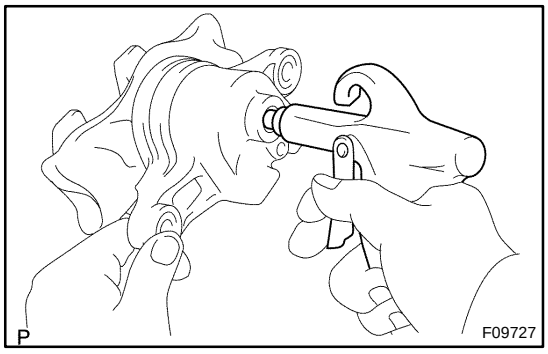
BR153-01

DISASSEMBLY



1. REMOVE CYLINDER BOOT SET RING AND CYLINDER BOOT

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



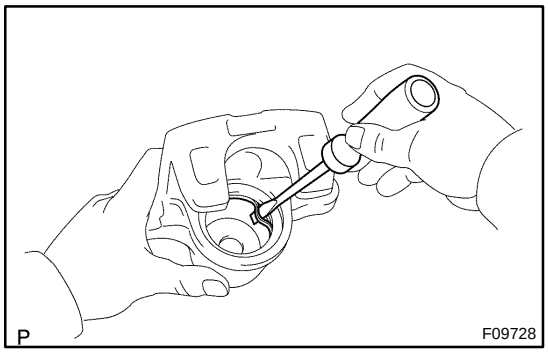
2. REMOVE PISTON

(a) Place a piece of cloth or similar, 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

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

4. REMOVE 2 DUST BOOTS

BR0LD-03

INSPECTION

1. MEASURE PAD LINING THICKNESS (See page BR-31)

Standard thickness: 10.0 mm (0.394 in.)

Minimum thickness: 1.0 mm (0.039 in.)

2. MEASURE DISC THICKNESS

(See step 2 on page BR-31)

Standard thickness: 12.0 mm (0.472 in.)

Minimum thickness: 10.5 mm (0.413 in.)

3. MEASURE DISC RUNOUT

(See step 3 on page BR-31)

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 in the axial direction and check the axle hub runout (See page SA-45). If the bearing play and axle hub runout are not abnormal, adjusting the disc runout or grind it on a "On-Car" brake lathe.

4. IF NECESSARY, ADJUST DISC RUNOUT

(a) Remove the 2 bolts and torque plate.

(b) Remove the hub nuts and the disc. Reinstall the disc 1/5 of a turn round from its original position on the hub. Install and torque the hub nuts.

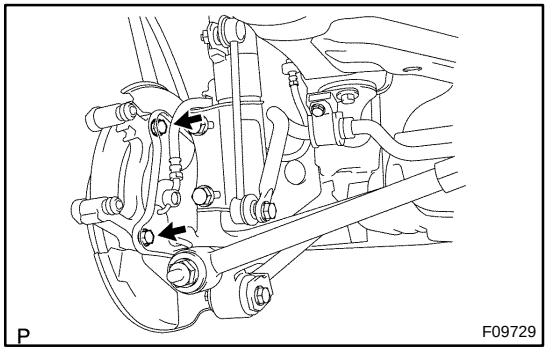
Torque: 103 N·m (1050 kgf·cm, 76 ft·lbf)

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

(c) Repeat (b) until the disc has been installed on the 3 remaining hub positions.

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

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



(f) Install the torque plate and torque the mounting bolts.

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

BR0LF-03

INSTALLATION

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

HINT:

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

BR0LE-01

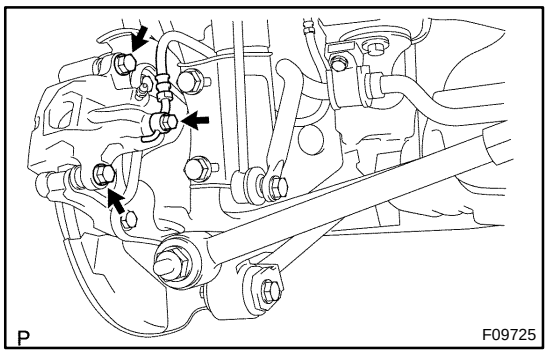
REASSEMBLY

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

NOTICE:

Apply lithium soap base glycol grease to the parts indicated by the arrows (See page BR-37).

BR0LB-02



REMOVAL

1. REMOVE REAR 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 2 gaskets from the caliper, then disconnect the flexible hose from the caliper.

Torque: 29 N·m (300 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 CALIPER

(a) Remove the 2 installation bolts.

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

NOTICE:

At the time of installation, insert the sliding pin with sliding bushing into the bottom side.

(b) Remove the caliper from the torque plate.

4. REMOVE 2 BRAKE PADS WITH ANTI- SQUEAL SHIMS

5. REMOVE 4 PAD SUPPORT PLATES

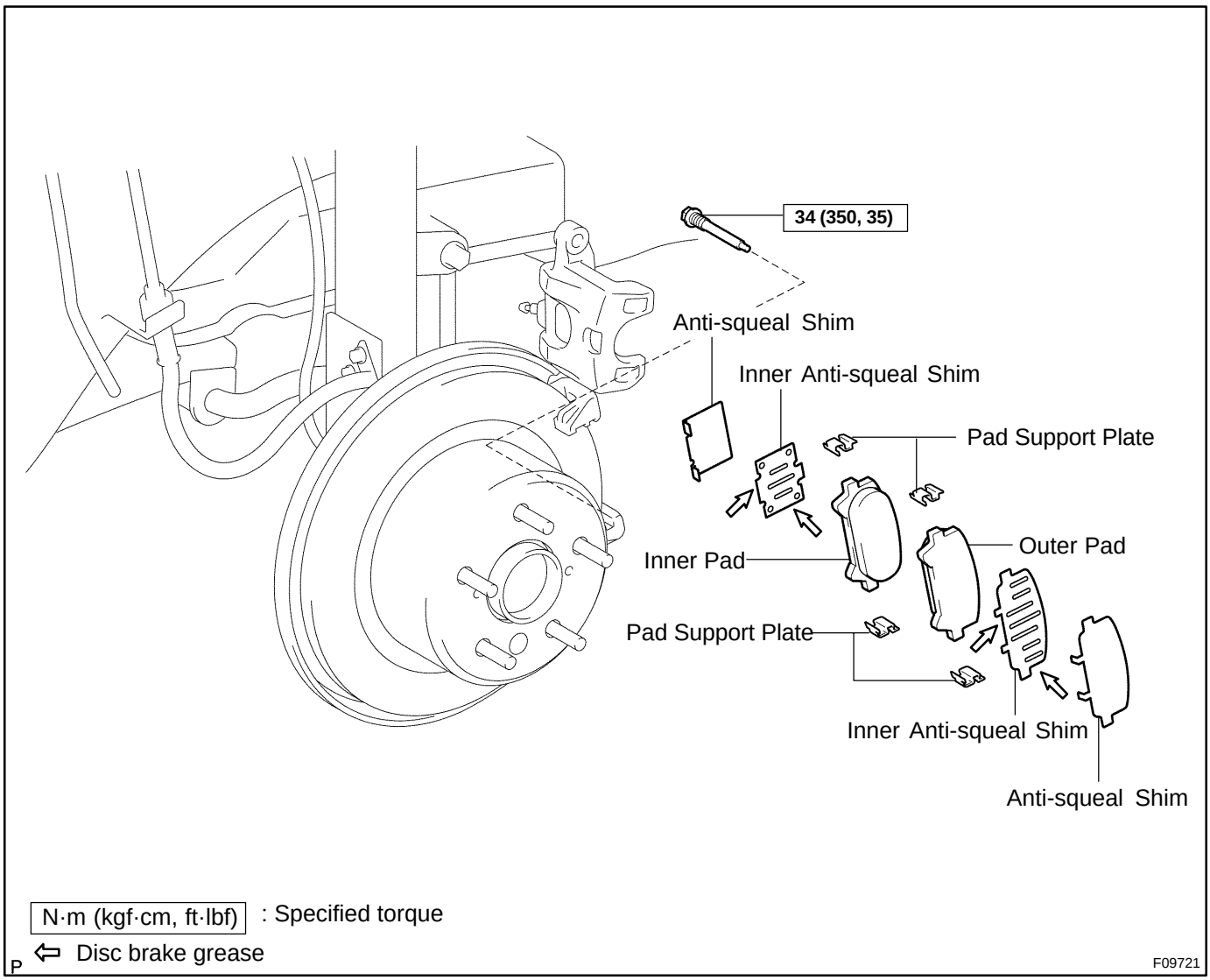
NOTICE:

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

REAR BRAKE PAD

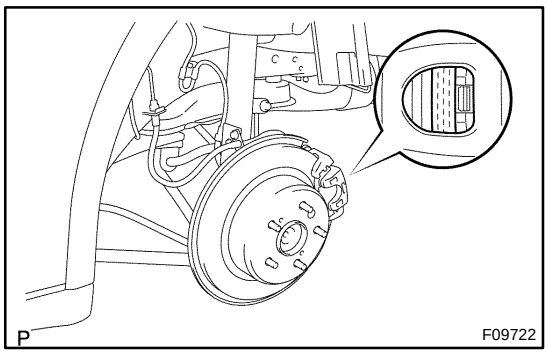
COMPONENTS

BR0L8-03



BR0L9-03

REPLACEMENT

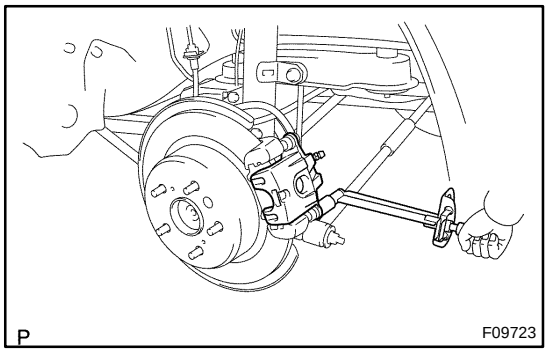


1. REMOVE REAR WHEEL

2. INSPECT PAD LINING THICKNESS

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

Minimum thickness: 1.0 mm (0.039 in.)



3. LIFT UP CALIPER

(a) Remove the bottom side installation bolt.

(b) Lift up and suspend it securely.

HINT:

Do not disconnect the flexible hose from the caliper.

4. REMOVE 2 BRAKE PADS WITH 4 ANTI- SQUEAL SHIMS

5. REMOVE 4 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-40)

7. INSTALL PAD SUPPORT PLATES

Install the 4 pad support plates.

8. INSTALL NEW PADS

NOTICE:

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

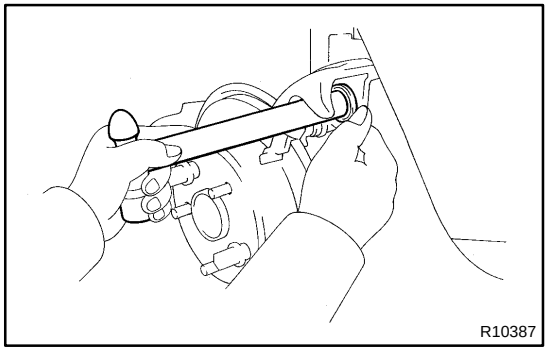
(a) Apply disc brake grease to both side of the inner anti-squeal shims (See page BR-37).

(b) Install the 2 anti-squeal shims on each pad.

(c) Install 2 pads with the pad wear indicator plates facing downward.

NOTICE:

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



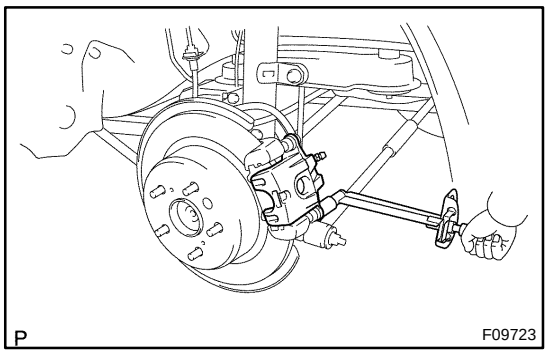
9. INSTALL CALIPER

(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) Install the installation bolt.

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

10. INSTALL REAR WHEEL

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

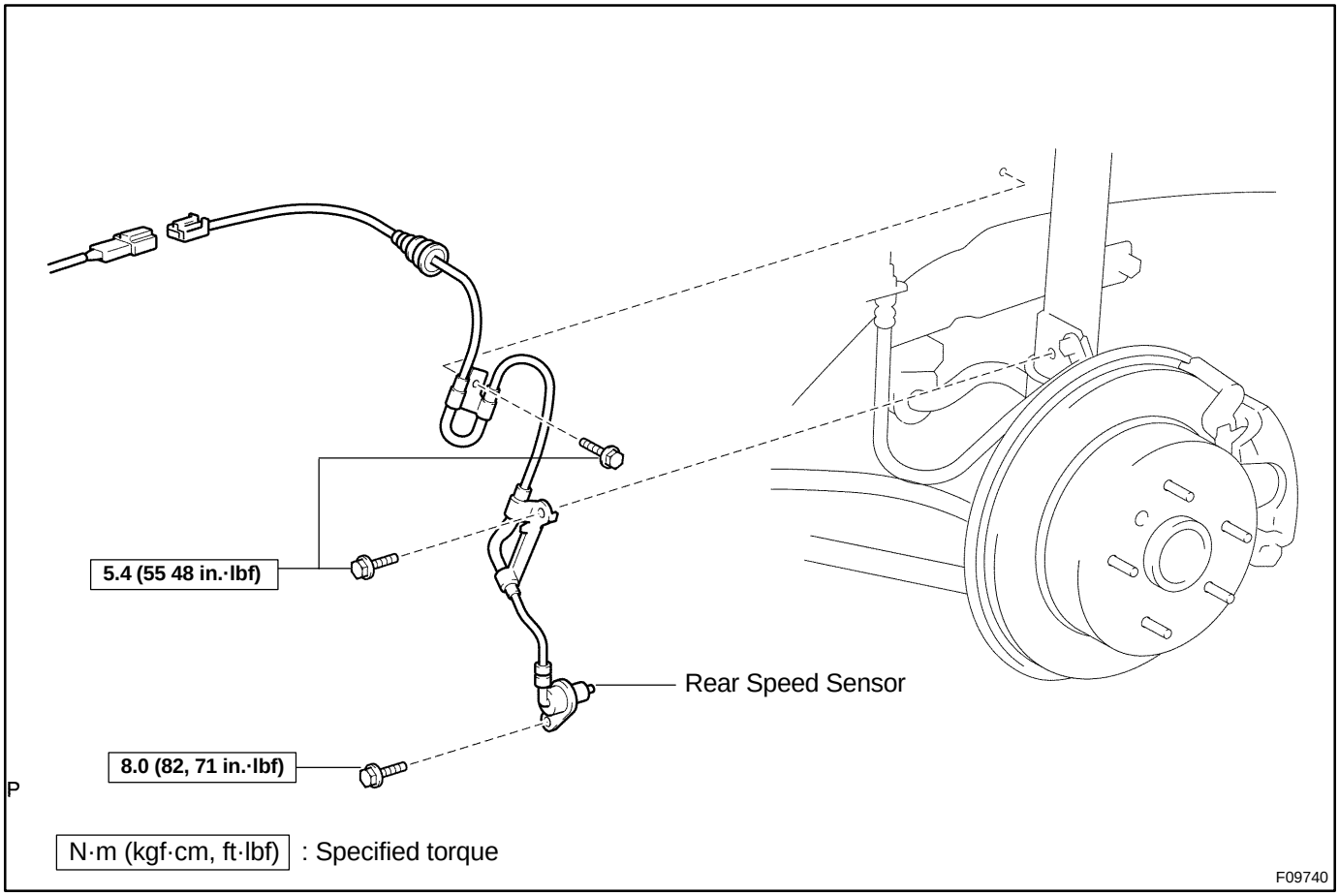
11. DEPRESS BRAKE PEDAL SEVERAL TIMES

12. CHECK THAT FLUID LEVEL IS AT MAX LINE

REAR SPEED SENSOR

COMPONENTS

BR0LX-03



BR0LZ-04

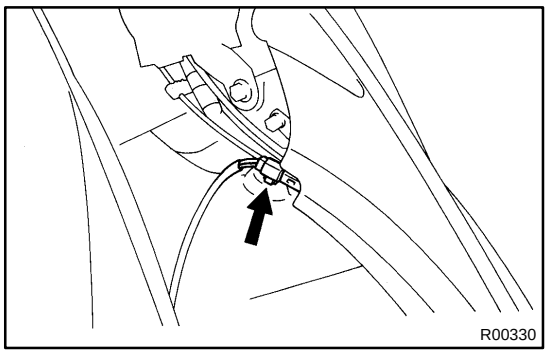
INSTALLATION

Installation is in the reverse order of removal (See page BR-63).

AFTER INSTALLATION, CHECK SPEED SENSOR SIGNAL (See page DI-252 or DI-212)

BR0LY-03

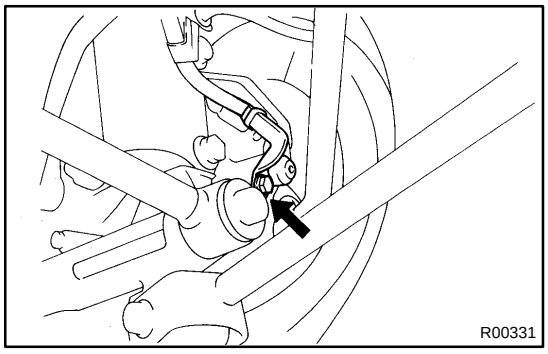
REMOVAL



1. DISCONNECT SPEED SENSOR CONNECTOR

(a) Remove the seat cushion and seatback.

(b) Disconnect the speed sensor connector, and pull out the sensor wire harness with the grommet.



2. REMOVE SPEED SENSOR

(a) Remove the bolt and speed sensor from the axle carrier.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) Remove the 2 clamp bolts holding the sensor wire harness to the body and shock absorber.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

BR0KG-05

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	See page
Lower pedal or spongy pedal	5. Fluid leaks for brake system	DI-249 DI-346
	6. Air in brake system	BR-4
	7. Piston seals (Worn or damaged)	BR-28 BR-37
	8. Master cylinder (Faulty)	BR-13
	9. Booster push rod (Out of adjustment)	BR-24
Brake drag	1. Brake pedal freeplay (Minimal)	BR-6
	2. Parking brake pedal travel (Out of adjustment)	BR-9
	3. Parking brake wire (Sticking)	-
	4. Rear brake shoe clearance (Out of adjustment)	BR-46
	5. Pad (Cracked or distorted)	BR-25 BR-34
	6. Piston (Stuck)	BR-28 BR-37
	7. Piston (Frozen)	BR-28 BR-37
	8. Tension or return spring (Faulty)	BR-43
	9. Booster push rod (Out of adjustment)	BR-24
	10. Vacuum leaks for booster system	BR-22
	11. Master cylinder (Faulty)	BR-13
Brake pull	1. Piston (Stuck)	BR-28 BR-37
	2. Pad (Oily)	BR-25 BR-34
	3. Piston (Frozen)	BR-28 BR-37
	4. Disc (Scored)	BR-28 BR-37
	5. Pad (Cracked or distorted)	BR-25 BR-34
Hard pedal but brake inefficient	1. Fluid leaks for brake system	DI-249 DI-346
	2. Air in brake system	BR-4
	3. Piston (Stuck)	BR-28 BR-37
	4. Pad (Cracked or distorted)	BR-25 BR-34
	5. Pad (Oily)	BR-25 BR-34
	6. Pad (Glazed)	BR-25 BR-34
	7. Disc (Scored)	BR-28 BR-37
	8. Booster push rod (Out of adjustment)	BR-24
	9. Vacuum leaks for booster system	BR-22

Symptom	Suspect Area	See page
Noise from brake	1. Pad (Cracked or distorted)	BR-25 BR-34
	2. Installation bolt (Loosen)	BR-28 BR-37
	3. Disc (Scored)	BR-28 BR-37
	4. Pad support plate (Loosen)	BR-25 BR-34
	5. Sliding pin (Worn)	BR-28 BR-37
	6. Pad (Dirty)	BR-25 BR-34
	7. Pad (Glazed)	BR-25 BR-34
	8. Tension or return spring (Faulty)	BR-43
	9. Anti-squeal shim (Damage)	BR-25 BR-34
	10.Hold-down spring (Damage)	BR-43