

BRAKE ACTUATOR ASSY

32010-01

ON-VEHICLE INSPECTION

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 ACTUATOR MOTOR OPERATION

- (a) With the motor relay ON, check the actuator motor operation noise.
- (b) Turn the motor relay to 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 more than 20 seconds.

- (e) Turn the motor relay to 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 to 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 more than 20 seconds.

- (c) Turn the SFRH and SFRR solenoid to OFF simultaneously, and check that the pedal can be depressed.
- (d) Turn the motor relay to 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 more than 20 seconds.

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

4. INSPECT OTHER WHEEL OPERATION

- (a) As 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

REPLACEMENT

1. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surface.

2. REMOVE FRONT WHEEL RH

3. REMOVE FRONT FENDER LINER RH

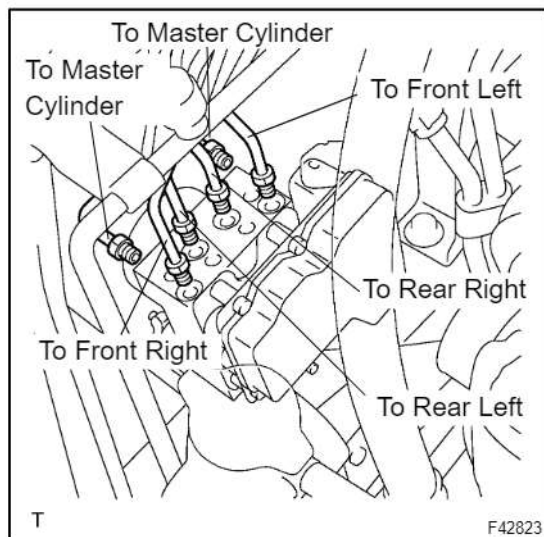
4. REMOVE BRAKE ACTUATOR WITH BRACKET

- (a) Turn the latch of the actuator connector to disconnect the connector.

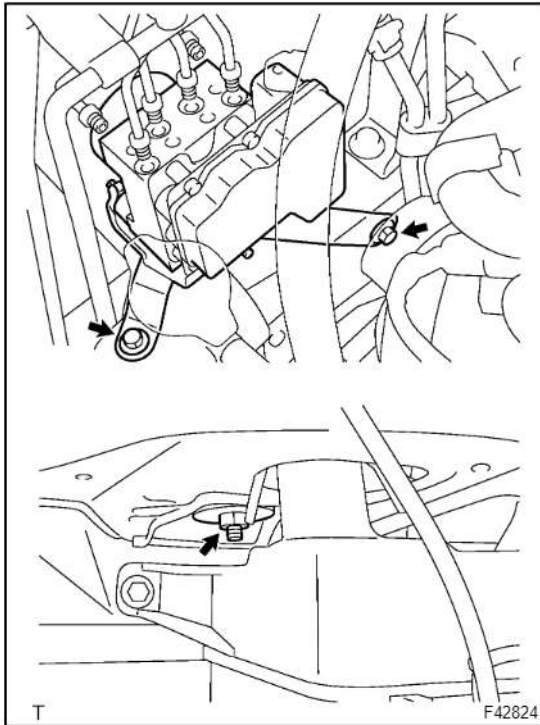


- (b) Using SST, disconnect the 6 brake tubes from the brake actuator.

SST 09023-00100



- (c) Attach tags or make a memo to identify the place to reconnect.



- (d) Remove the nut, 2 bolts and brake actuator with bracket.

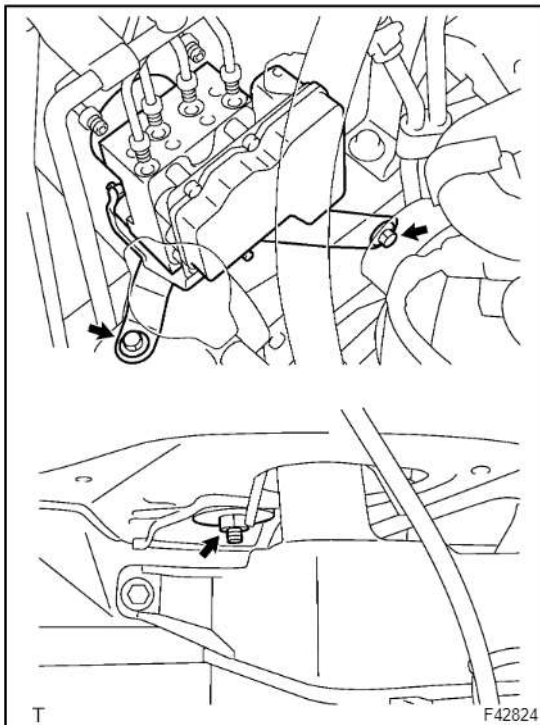
5. REMOVE BRAKE ACTUATOR ASSY

- (a) Remove the 3 nuts and brake actuator from bracket.

6. INSTALL BRAKE ACTUATOR ASSY

- (a) Install the brake actuator with the 3 nuts to the bracket.

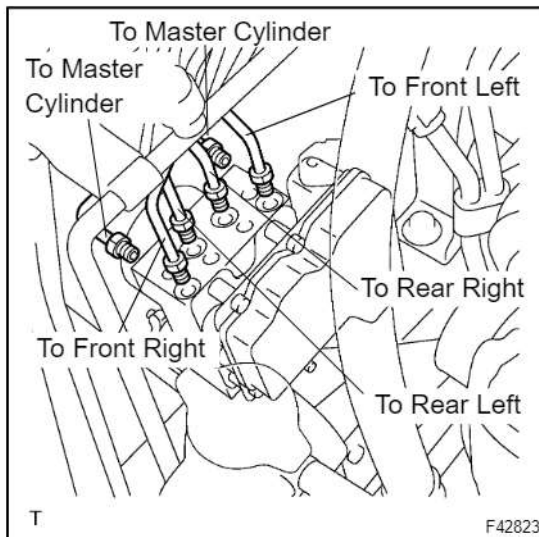
Torque: 4.7 N·m (48 kgf·cm, 42 in·lbf)



7. INSTALL BRAKE ACTUATOR WITH BRACKET

- (a) Install the brake actuator with bracket with the nut and 2 bolts.

Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)



- (b) Using SST, connect the 6 brake tubes to the correct position of brake actuator, as shown in the illustration.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)
- (c) Connect the brake actuator connector.

8. **INSTALL FRONT FENDER LINER RH**
9. **INSTALL FRONT WHEEL RH**
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
10. **FILL RESERVOIR WITH BRAKE FLUID**
11. **BLEED MASTER CYLINDER (See page 32-4)**
SST 09023-00100
12. **BLEED BRAKE LINE (See page 32-4)**
13. **CHECK FLUID LEVEL IN RESERVOIR**
14. **CHECK BRAKE FLUID LEAKAGE**
15. **CHECK BRAKE ACTUATOR WITH HAND-HELD TESTER (See page 05-297)**

w/ Cruise control:

- Cruise Control Actuator
- Gasket
- 12.7 (130, 9)
- Clevis Pin
- Wave Washer
- Clip
- Clevis
- Brake Tube
- Clamp
- Vacuum Hose
- Clip
- Grommet
- Vacuum Check Valve
- Level Warning Switch Connector
- 43 (438, 32)
- 15.2 (155, 11)
- 26 (265, 19)
- Brake Master Cylinder Sub-assy
- Brake Booster Assy
- M/T: Clip
- M/T: Clutch Reservoir Tube No.1
- No.1 Way
- 15.2 (155, 11)
- 12.5 (127, 9)
- Vacuum Check Valve Bracket

w/ ABS:

- No.1 Way
- 15.2 (155, 11)

Air Cleaner Cap Sub-assy

Air Cleaner Element

Air Cleaner Case Sub-assy

Brake Tube

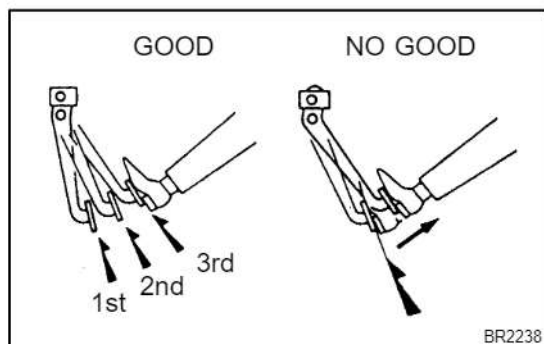
15.2 (155, 11)

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

F42812

BRAKE BOOSTER ASSY ON-VEHICLE INSPECTION

3201F-01



1. INSPECT BRAKE BOOSTER

(a) Airtightness check.

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

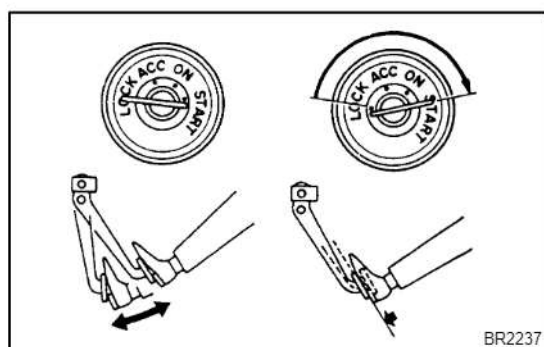
HINT:

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

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

HINT:

If there is no change in the pedal reserve distance after holding the pedal for 30 seconds, the booster is airtight.



(b) Operating check.

- (1) Depress the brake pedal several times with the ignition switch OFF and check that there is no change in the pedal reserve distance.
- (2) Depress the brake pedal and start the engine.

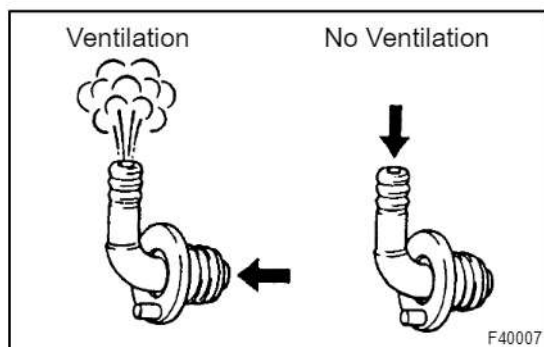
HINT:

If the pedal goes down slightly, operation is normal.

2. INSPECT VACUUM CHECK VALVE

(a) Check vacuum check valve.

- (1) Slide the clip and disconnect the vacuum hose.
- (2) Remove the vacuum check valve.



- (3) Check that there is ventilation from the booster to engine, and no ventilation from the engine to the booster.
- (4) If any fault is found, replace the vacuum check valve.

REPLACEMENT

1. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surface.

2. REMOVE AIR CLEANER CAP SUB-ASSY

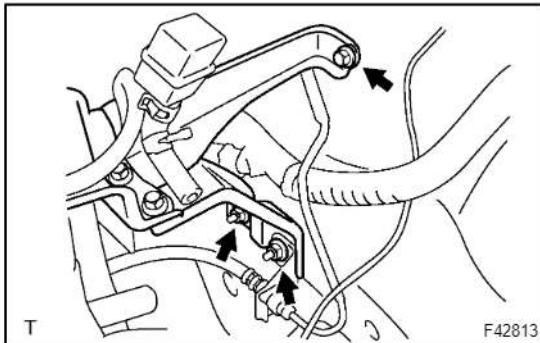
3. REMOVE AIR CLEANER CASE SUB-ASSY

- (a) Remove the air cleaner element, then remove the 3 bolts and air cleaner case sub-assy.

4. REMOVE BRAKE MASTER CYLINDER SUB-ASSY (See page 32-13)

5. DISCONNECT BRAKE MASTER CYLINDER PUSH ROD CLEVIS

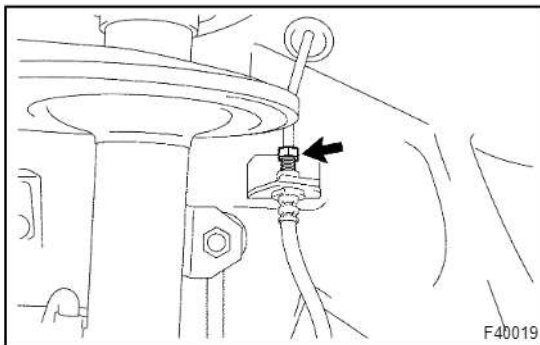
- (a) Loosen the push rod clevis lock nut.
(b) Remove the clip, clevis pin and wave washer.



6. REMOVE CRUISE CONTROL ACTUATOR ASSY (W/ CRUISE CONTROL)

- (a) Remove the 2 nuts and bolt from the cruise control actuator and bracket, and move cruise control actuator aside.

7. REMOVE FRONT WHEEL LH

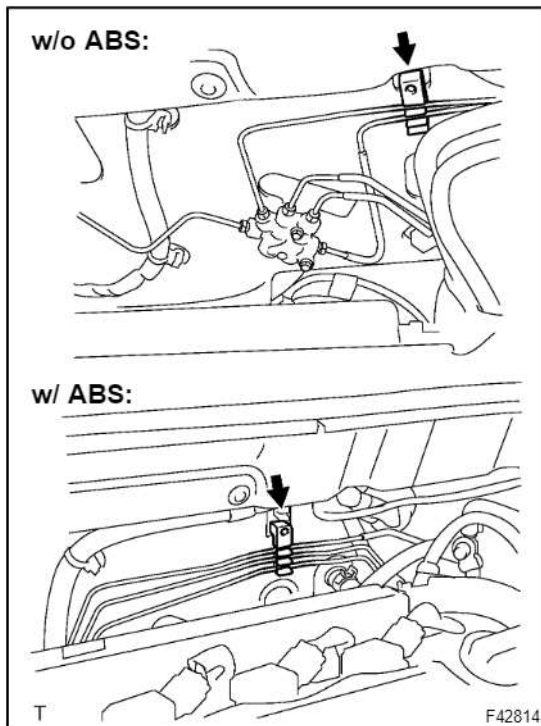


8. REMOVE BRAKE BOOSTER ASSY

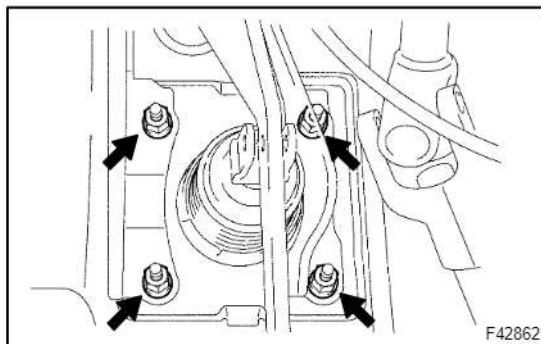
- (a) Using SST and spanner, disconnect the brake tube from the flexible hose, and remove the brake tube from the body.

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- (b) Slide the clip, disconnect the vacuum hose from the brake booster assy.



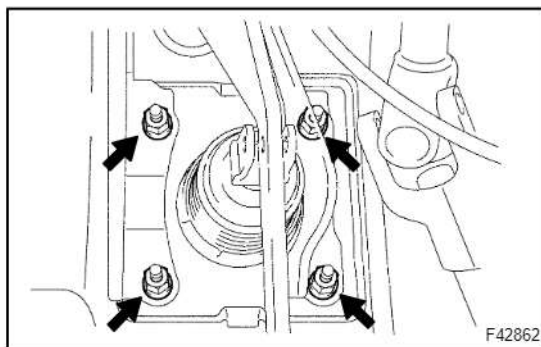
- (c) Disconnect the 2 or 3 brake tubes from the clamp, and move brake tubes aside.



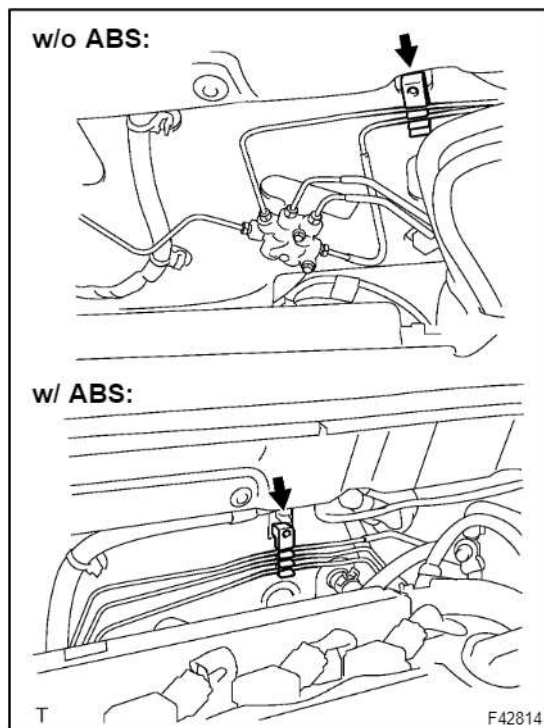
- (d) Remove the 4 nuts and clevis.
(e) Pull out the brake booster and gasket.

9. INSTALL BRAKE BOOSTER ASSY

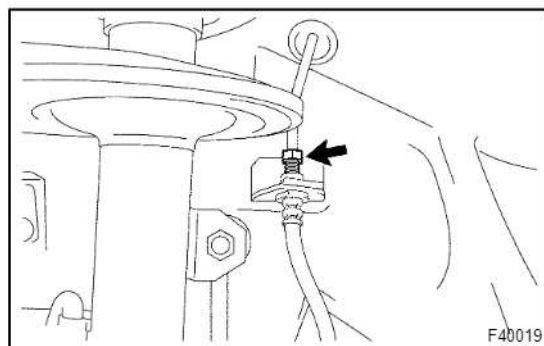
- (a) Install the clevis to the booster push rod.



- (b) Install a new gasket and brake booster with the 4 nuts.
Torque: 12.7 N·m (130 kgf·cm, 9 ft·lbf)



- (c) Connect the 2 or 3 brake tubes to the clamp.
- (d) Connect the vacuum hose to the brake booster.



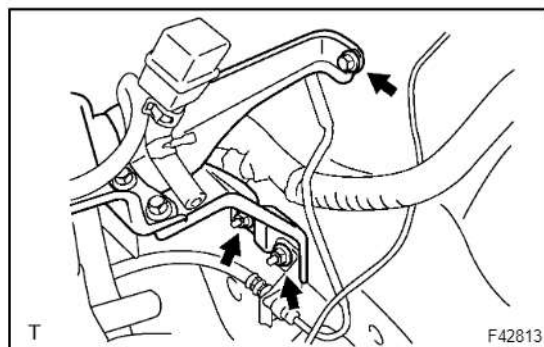
- (e) Using SST and spanner, connect the brake tube to the flexible hose.

SST 09023-00100

Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

10. INSTALL FRONT WHEEL LH

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



11. INSTALL CRUISE CONTROL ACTUATOR ASSY (W/ CRUISE CONTROL)

- (a) Install the cruise control actuator and bracket with 2 nuts and bolt.

Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)

12. CONNECT BRAKE MASTER CYLINDER PUSH ROD CLEVIS

- (a) Apply the lithium soap base glycol grease to the push rod clevis pin.
- (b) Connect the brake master cylinder push rod clevis with the push rod clevis pin, wave washer and clip.

13. INSTALL BRAKE MASTER CYLINDER SUB-ASSY (See page 32-13)

14. INSTALL AIR CLEANER CASE SUB-ASSY

- (a) Install the air cleaner case with 3 bolts, then install the air cleaner element to the air cleaner case sub-assy.

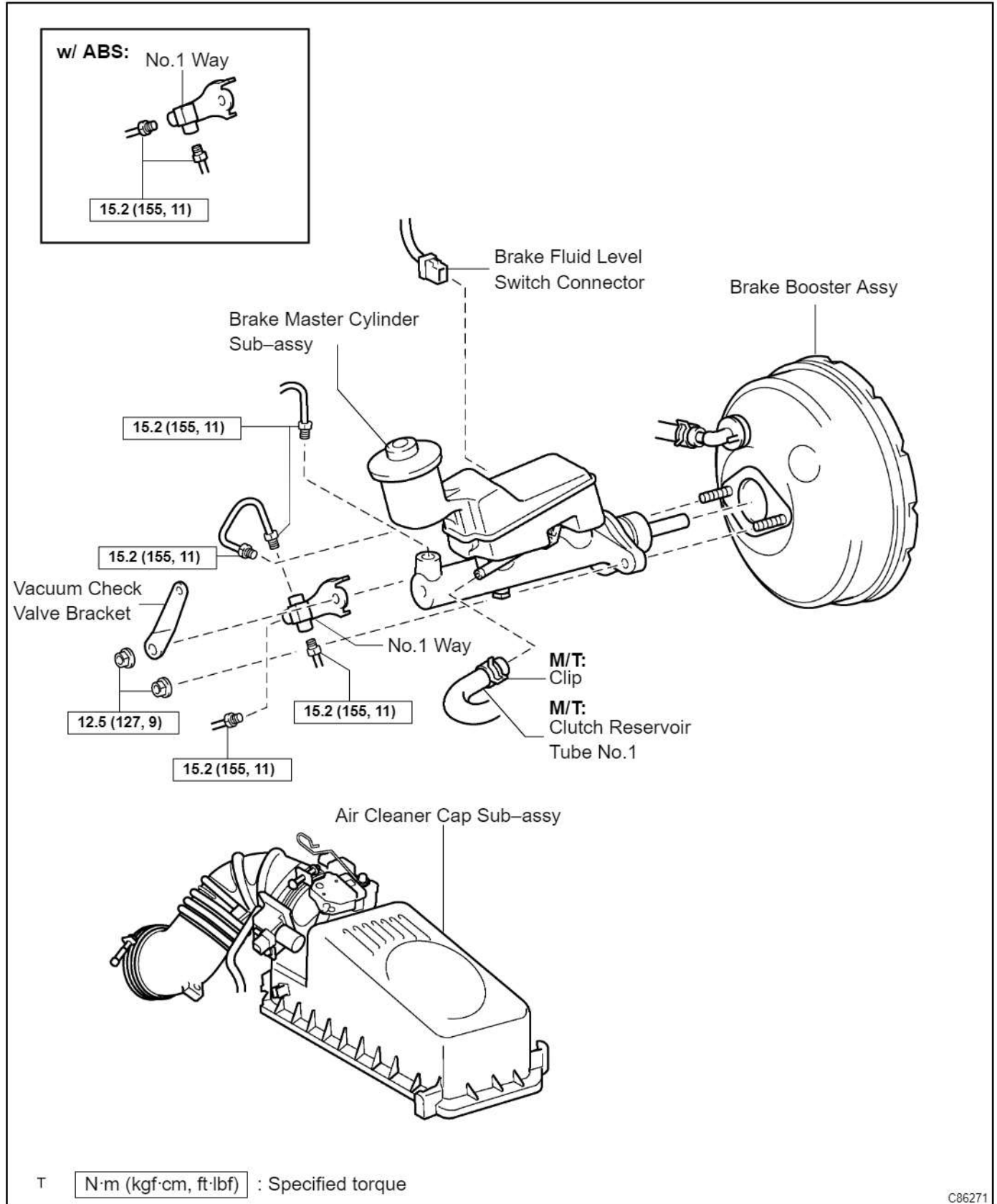
15. INSTALL AIR CLEANER CAP SUB-ASSY**16. FILL RESERVOIR WITH BRAKE FLUID****17. BLEED MASTER CYLINDER (See page 32-4)**

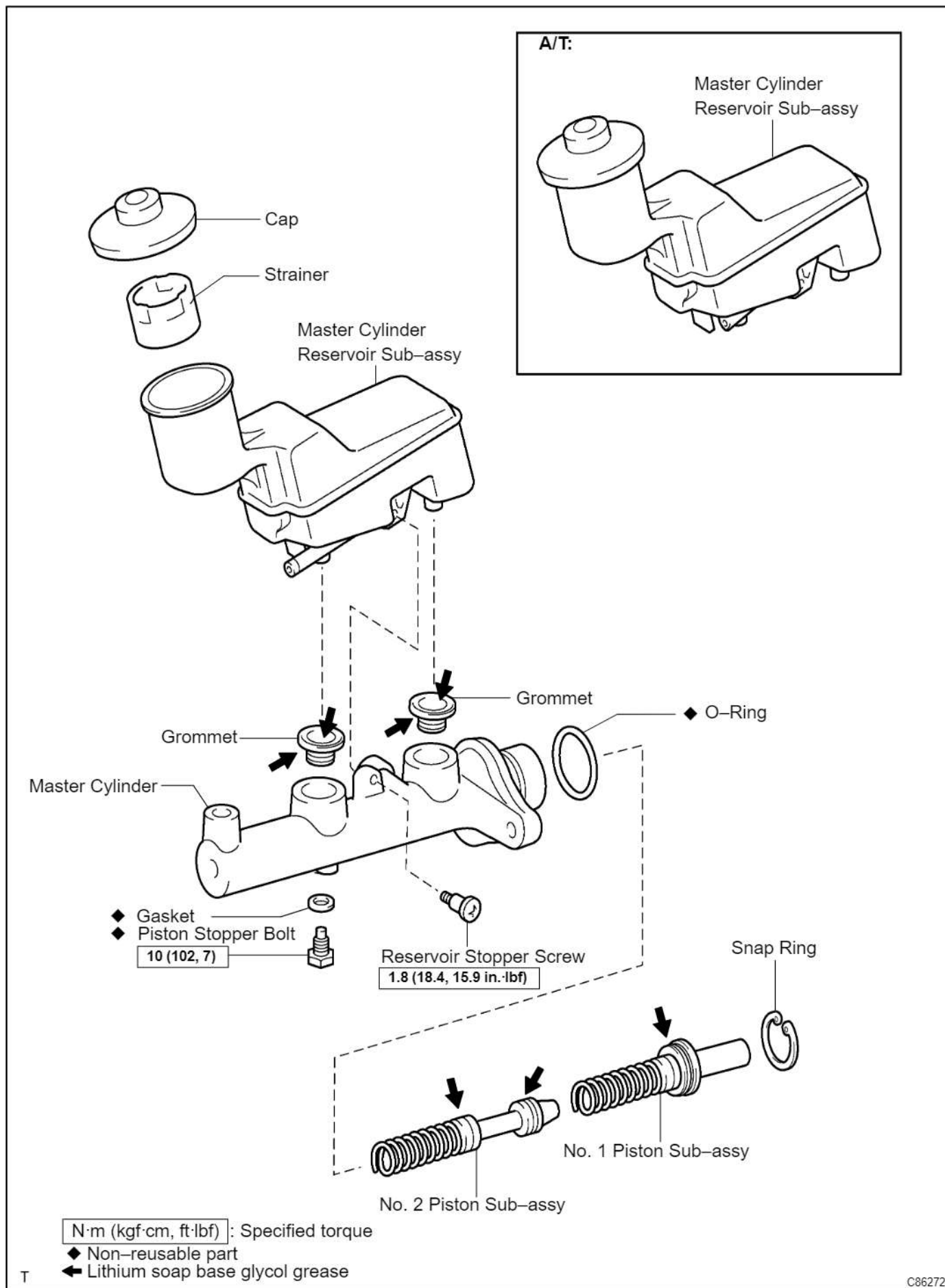
SST 09023-00100

18. BLEED BRAKE LINE (See page 32-4)**19. CHECK AND ADJUST BRAKE PEDAL HEIGHT (See page 32-6)****20. CHECK PEDAL FREE PLAY (See page 32-6)****21. CHECK PEDAL RESERVE DISTANCE (See page 32-6)****22. CHECK FLUID LEVEL IN RESERVOIR****23. CHECK BRAKE FLUID LEAKAGE**

BRAKE MASTER CYLINDER SUB-ASSY (April, 2003) COMPONENTS

3202N-01





OVERHAUL

1. DRAIN BRAKE FLUID

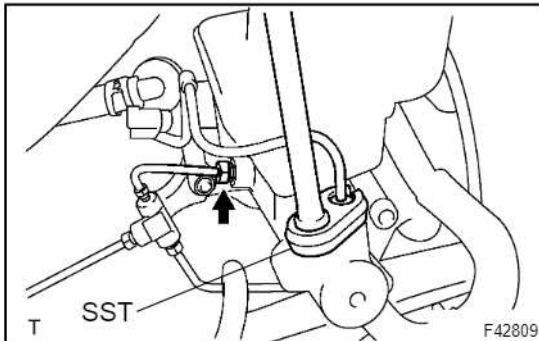
NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surface.

2. REMOVE AIR CLEANER CAP SUB-ASSY

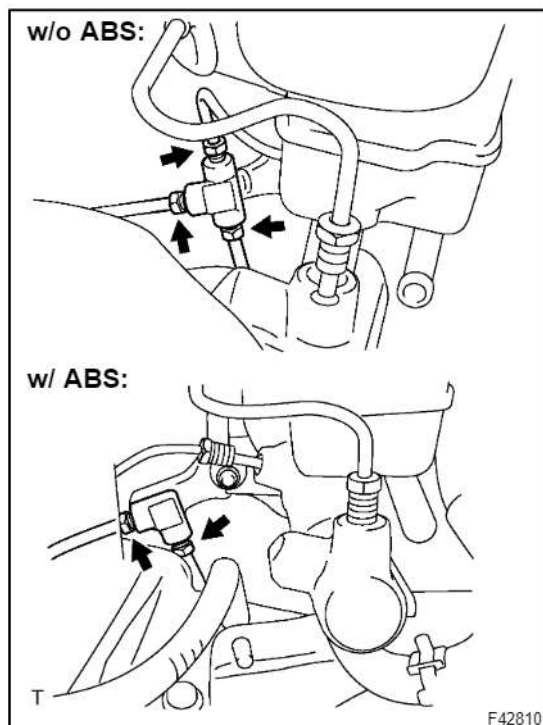
3. REMOVE BRAKE MASTER CYLINDER SUB-ASSY

- (a) Disconnect the brake fluid level switch connector from master cylinder reservoir sub-assy.
- (b) M/T:
Slide the clip and disconnect the clutch reservoir tube No.1 from master cylinder reservoir sub-assy.



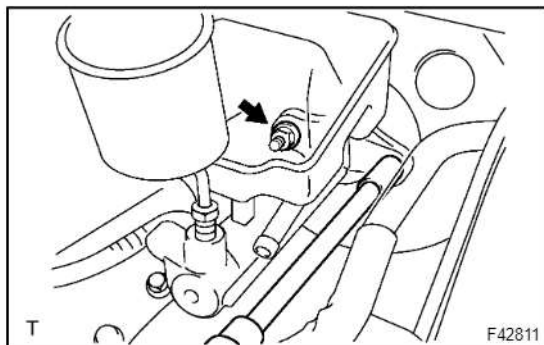
- (c) Using SST, disconnect the 2 brake tubes from the master cylinder.

SST 09023-00100



- (d) Using SST, disconnect the 2 or 3 brake tubes from the No.1 way.

SST 09023-00100



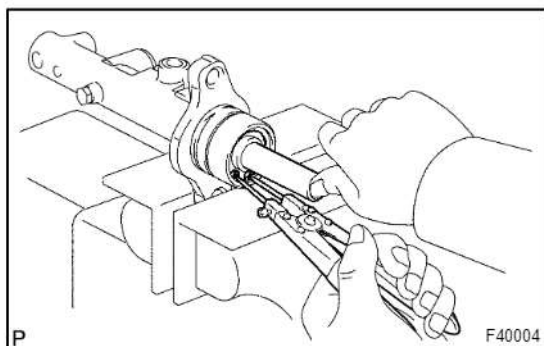
- (e) Remove the 2 nuts, and pull out the master cylinder, No.1 way and vacuum check valve bracket.

4. REMOVE BRAKE MASTER CYLINDER RESERVOIR SUB-ASSY

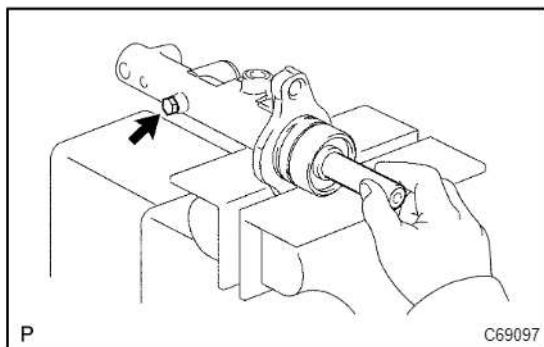
- (a) Remove the reservoir stopper screw and master cylinder reservoir sub-assy.
(b) Remove the 2 cylinder reservoir grommets.

5. REMOVE BRAKE MASTER CYLINDER KIT

- (a) Hold the master cylinder in the vise with the 2 aluminum plates in between.
(b) Remove the O-ring.



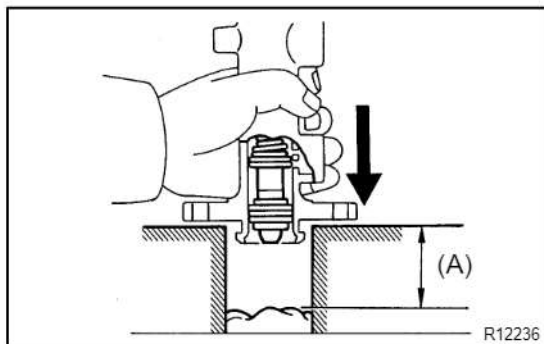
- (c) Push in the piston and remove the snap ring with snap ring pliers.



- (d) Push in the piston and remove the piston stopper bolt and gasket.
(e) Remove the No.1 piston sub-assy by hand, pulling straight out not at an angle.

NOTICE:

If being pulled out at an angle, the piston may damage the cylinder bore.



- (f) Place a cloth and 2 wooden blocks on the work table and lightly edges until the No.2 piston sub-assy drops out of the cylinder.

NOTICE:

If being pulled out at an angle, the piston may damage the cylinder bore.

HINT:

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

6. INSPECT BRAKE MASTER CYLINDER

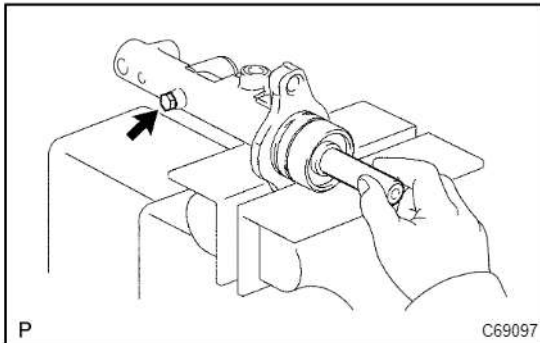
- (a) Check the cylinder bore for rust or scoring.

7. INSTALL BRAKE MASTER CYLINDER KIT

- (a) Hold the master cylinder in the vise with the 2 aluminum plates in between.
 (b) Apply the lithium soap base glycol grease to the No.1 and No.2 piston sub-assy.
 (c) Install the No.2 and No.1 piston sub-assy to the master cylinder.

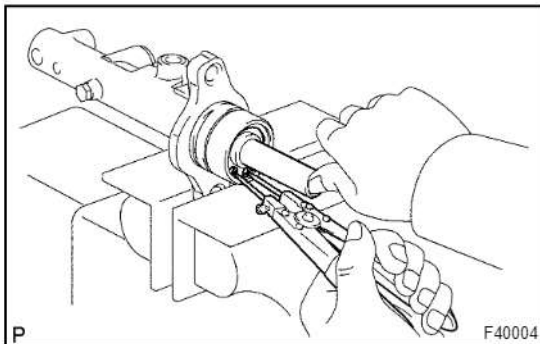
NOTICE:

- If being inserted at an angle, the piston may damage the cylinder bore.
- Be careful not to damage the rubber lips on the pistons.



- (d) Push in the piston and install a new gasket and a new piston stopper bolt.

Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)

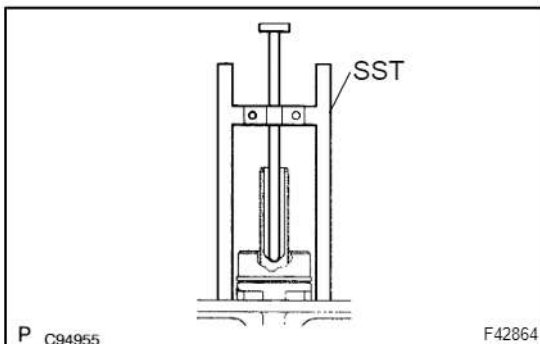


- (e) Push in the piston and install the snap ring with snap ring pliers.
 (f) Apply the lithium soap base glycol grease to a new O-ring, and install the O-ring to the master cylinder.

8. INSTALL BRAKE MASTER CYLINDER RESERVOIR SUB-ASSY

- (a) Apply the lithium soap base glycol grease to 2 brake master cylinder reservoir grommets.
 (b) Install the master cylinder reservoir with the screw.

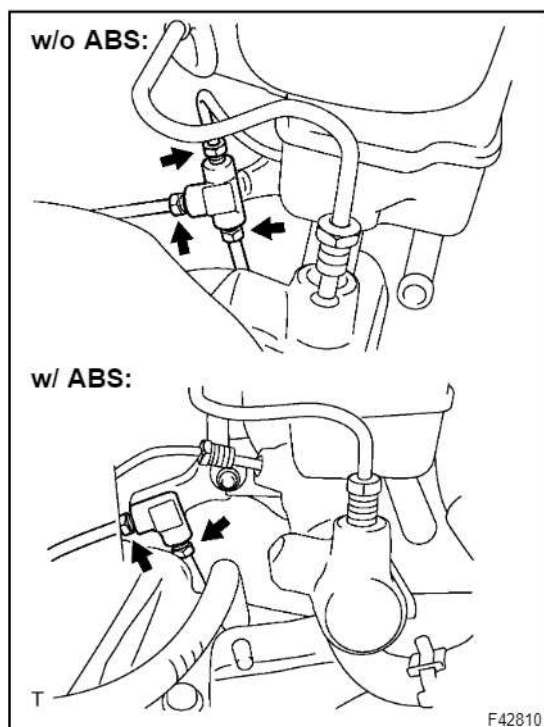
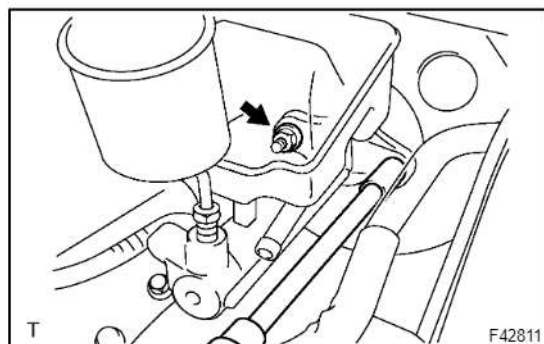
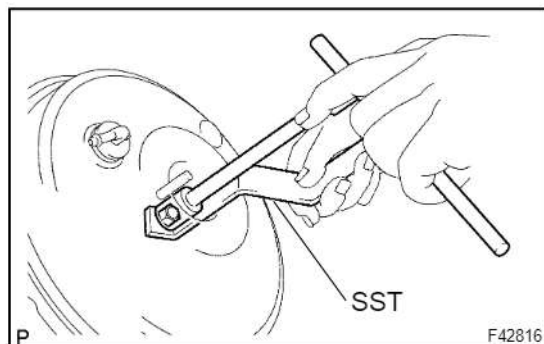
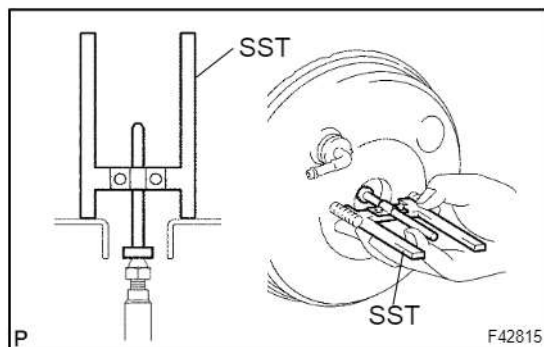
Torque: 1.8 N·m (18.4 kgf·cm, 15.9 in·lbf)



9. INSPECT AND ADJUST BRAKE BOOSTER PUSH ROD

- (a) Apply the chalk to the flat surfaced tip of the SST pin.
 (b) Set SST on the master cylinder and lower the pin of the SST until it slightly touches the piston.

SST 09737-00013



- (c) Turn SST upside down and place it on the brake booster.
SST 09737-00013
Clearance: 0 mm (0 in.)

HINT:

- If there is a space between the SST main body and the booster shell (chalk is applied to the booster push rod), it means that the clearance is too small.
 - If chalk is not applied to the booster push rod after placing the SST on the brake booster, it means that the clearance is too large.
- (d) If 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

HINT:

When adjusting the push rod, depress the brake pedal sufficiently so that the push rod sticks out.

10. INSTALL BRAKE MASTER CYLINDER SUB-ASSY

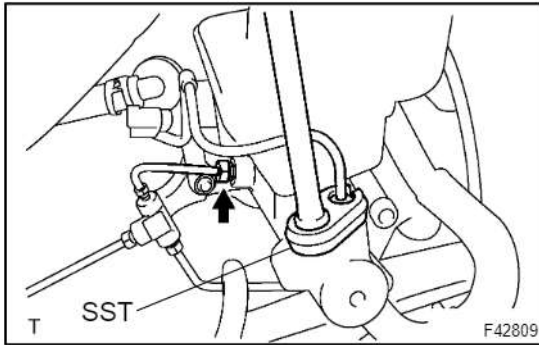
- (a) Install the master cylinder, No.1 way and vacuum check valve bracket with the 2 nuts.

Torque: 12.5 N·m (127 kgf·cm, 9 ft·lbf)

- (b) Using SST, connect the 2 or 3 brake tubes to the No.1 way.

SST 09023-00100

Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

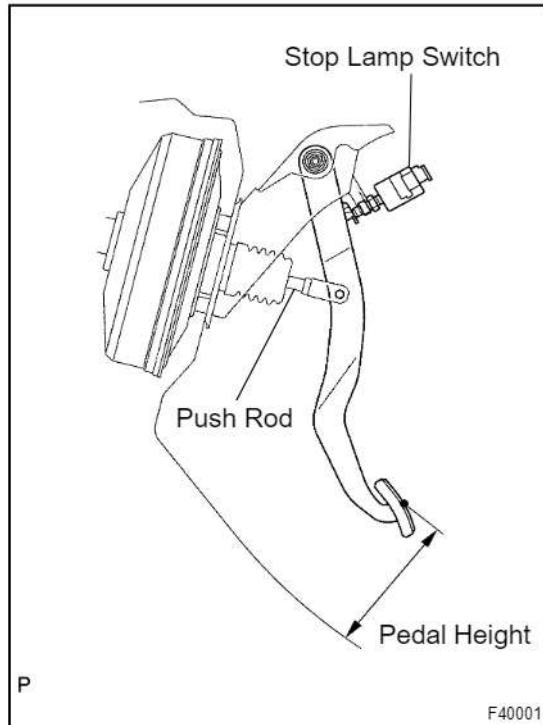


- (c) Using SST, connect the 2 brake tubes to the master cylinder.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)
- (d) M/T:
Connect the clutch reservoir tube No.1 with the clip to master cylinder reservoir sub-assy.
- (e) Connect the brake fluid level switch connector to master cylinder reservoir sub-assy.

11. **INSTALL AIR CLEANER CAP SUB-ASSY**
12. **FILL RESERVOIR WITH BRAKE FLUID**
13. **BLEED MASTER CYLINDER (See page 32-4)**
SST 09023-00100
14. **BLEED BRAKE LINE (See page 32-4)**
15. **CHECK FLUID LEVEL IN RESERVOIR**
16. **CHECK BRAKE FLUID LEAKAGE**

BRAKE PEDAL SUB-ASSY ADJUSTMENT

3201A-01



1. CHECK AND ADJUST BRAKE PEDAL HEIGHT

- (a) Inspect brake pedal height.

Pedal height from asphalt sheet:

M/T: 134.9 – 144.9 mm (5.311 – 5.703 in.)

A/T: 136.0 – 146.0 mm (5.353 – 5.747 in.)

- (1) Disconnect the connector from the stop lamp switch.
- (2) Remove the stop lamp switch.
- (3) Loosen the clevis lock nut.
- (4) Adjust the pedal height by turning the pedal push rod.
- (5) Tighten the push rod lock nut.

Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

- (6) Install the stop lamp switch.
- (7) Connect the connector to the stop lamp switch.
- (8) Push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), and turn the stop lamp switch to lock the nut in the position where the stop lamp goes off.
- (9) After installation, push the brake pedal in 5 – 15 mm (0.20 – 0.59 in.), check that stop lamp comes on.

2. 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 until the beginning of the resistance is felt. Measure the distance, as shown in the installation.

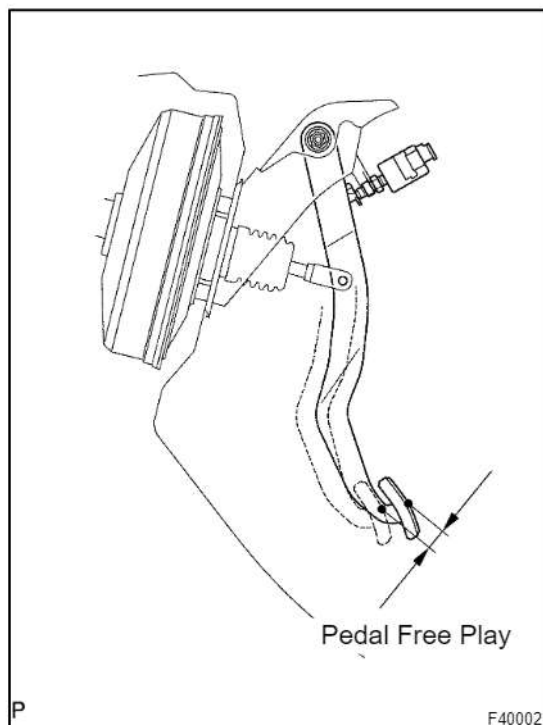
Pedal free play: 1 – 6 mm (0.04 – 0.24 in.)

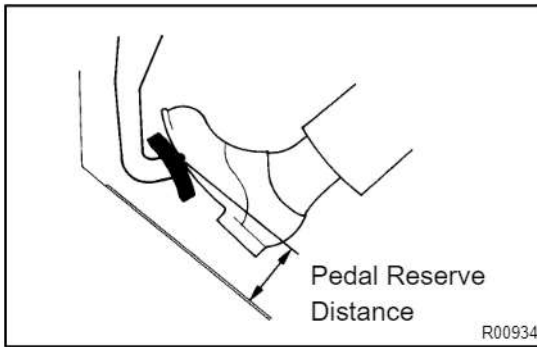
If incorrect, check the stop lamp switch clearance.

If the clearance is OK, then troubleshoot the brake system.

Stop lamp switch clearance:

0.5 – 2.4 mm (0.020 – 0.094 in.)





3. CHECK PEDAL RESERVE DISTANCE

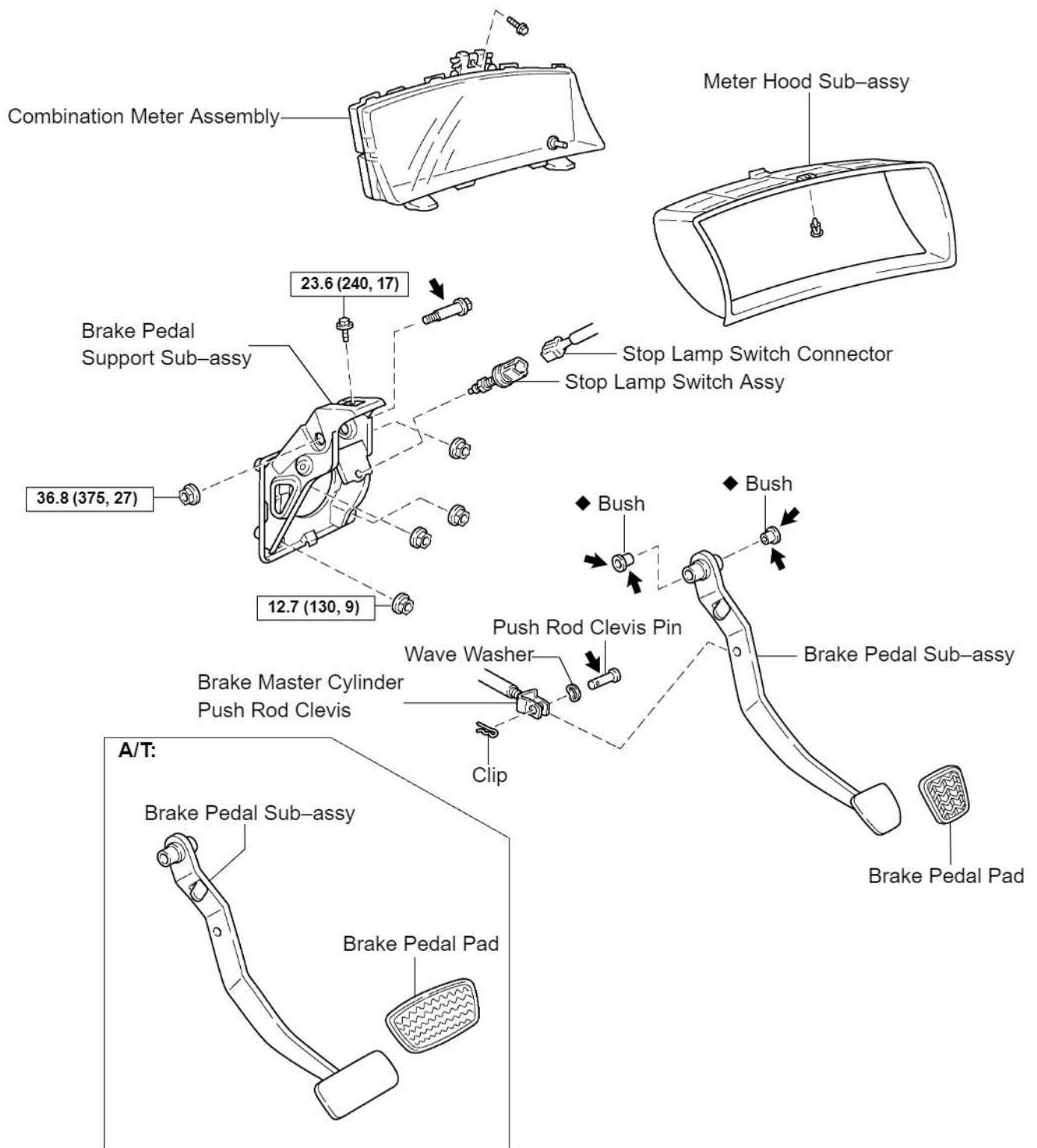
- (a) Release the parking brake lever.

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

Pedal reserve distance from asphalt sheet at 490 N (50 kgf, 110.2 lbf): More than 70 mm (2.76 in.)

If incorrect, troubleshoot the brake system.

COMPONENTS



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

◆ Non-reusable part

← Lithium soap base glycol grease

N

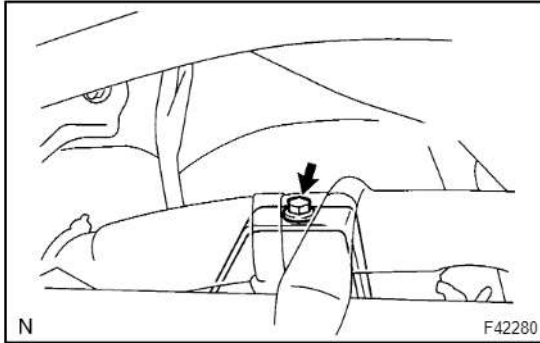
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REPLACEMENT

1. REMOVE COMBINATION METER ASSEMBLY (See page 71-17)

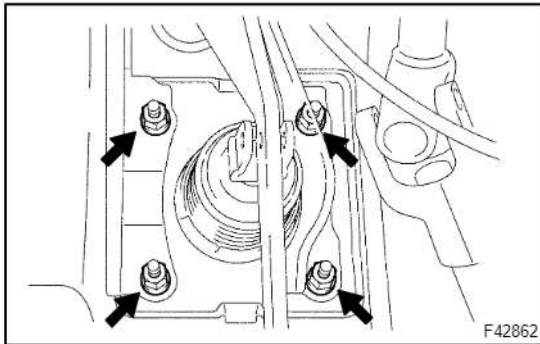
2. DISCONNECT BRAKE MASTER CYLINDER PUSH ROD CLEVIS

- (a) Remove the clip and push rod clevis pin and wave washer, and disconnect the push rod clevis from the brake pedal.



3. REMOVE BRAKE PEDAL SUPPORT SUB-ASSY

- (a) Remove the bolt from the brake pedal support.
(b) Disconnect the stop lamp switch connector.



- (c) Remove the 4 nuts and brake pedal support assy.

4. REMOVE BRAKE PEDAL SUB-ASSY

- (a) Remove the bolt and nut from the brake pedal support sub-assy.
(b) Remove the brake pedal sub-assy and 2 bushes.

5. REMOVE STOP LAMP SWITCH ASSY

- (a) Loosen the stop lamp switch lock nut.
(b) Remove the stop lamp switch assy from the brake pedal support sub-assy.

6. REMOVE BRAKE PEDAL PAD

- (a) Remove the brake pedal pad from the brake pedal sub-assy.

7. INSTALL BRAKE PEDAL PAD

- (a) Install the brake pedal pad to the brake pedal sub-assy.

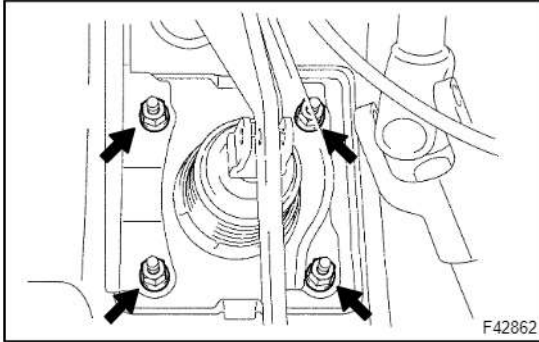
8. INSTALL STOP LAMP SWITCH ASSY

- (a) Install the stop lamp switch assy to the brake pedal sub-assy.

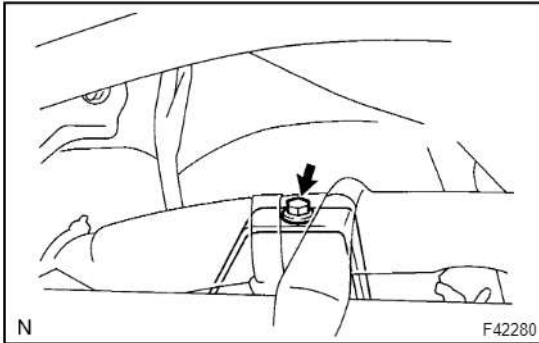
9. INSTALL BRAKE PEDAL SUB-ASSY

- (a) Apply the lithium soap base glycol grease to the 2 new bushes on the ends and sides.
(b) Install the brake pedal sub-assy and 2 bushes to the brake pedal support with the bolt and nut.

Torque: 36.8 N·m (375 kgf·cm, 27 ft·lbf)



- 10. INSTALL BRAKE PEDAL SUPPORT SUB-ASSY**
- (a) Install the brake pedal support assy with the 4 nuts.
Torque: 12.7 N·m (130 kgf·cm, 9 ft·lbf)
 - (b) Connect the stop lamp switch connector to the stop lamp switch assy.



- (c) Install the bolt to the brake pedal support sub-assy.
Torque: 23.6 N·m (240 kgf·cm, 17 ft·lbf)

11. CONNECT BRAKE MASTER CYLINDER PUSH ROD CLEVIS

- (a) Apply the lithium soap base glycol grease to the push rod clevis pin.
- (b) Connect the brake master cylinder push rod clevis with the push rod clevis pin, wave washer and clip.

12. INSTALL COMBINATION METER ASSEMBLY

13. CHECK AND ADJUST BRAKE PEDAL HEIGHT (See page 32-6)

14. CHECK PEDAL FREE PLAY (See page 32-6)

15. CHECK PEDAL RESERVE DISTANCE (See page 32-6)

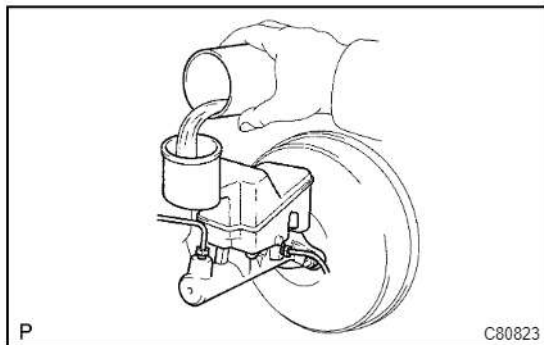
BRAKE FLUID BLEEDING

NOTICE:

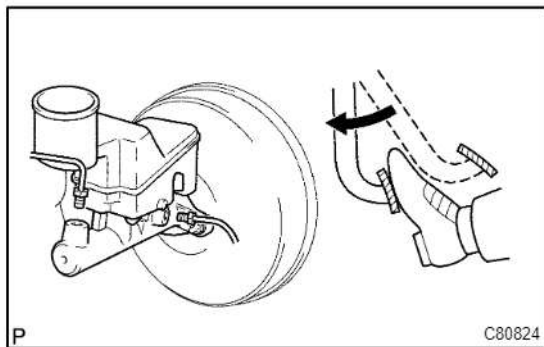
Wash the brake fluid off immediately if it comes into contact with any painted surface.

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.



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

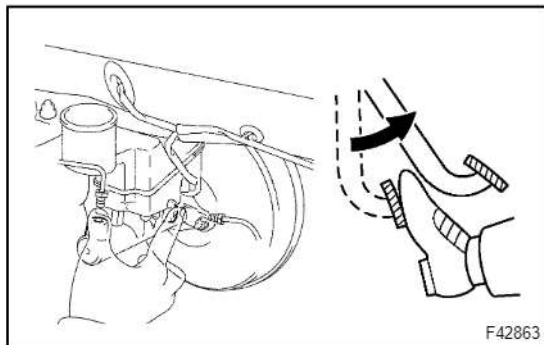


2. **BLEED MASTER CYLINDER**

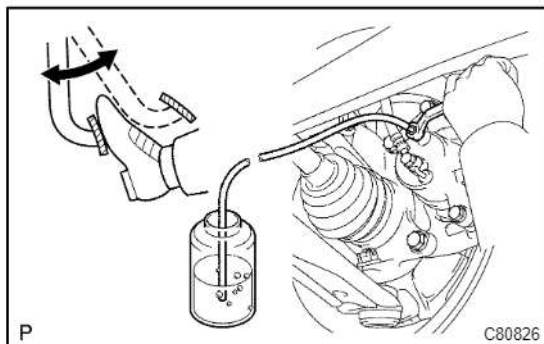
HINT:

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.



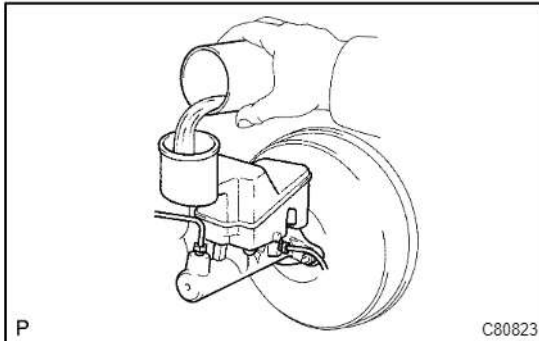
- (c) Block off the outer holes with your fingers, and release the brake pedal.
- (d) Repeat (b) and (c) 3 or 4 times.



3. **BLEED BRAKE LINE**

- (a) Connect the vinyl tube to the brake caliper.
- (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.
Torque: 8.3 N·m (85 kgf·cm, 74 in·lbf)
- (d) Repeat (b) and (c) until all the air in the fluid has been bled out.

- (e) Repeat the above procedures to bleed the air out of the brake line for each wheel.



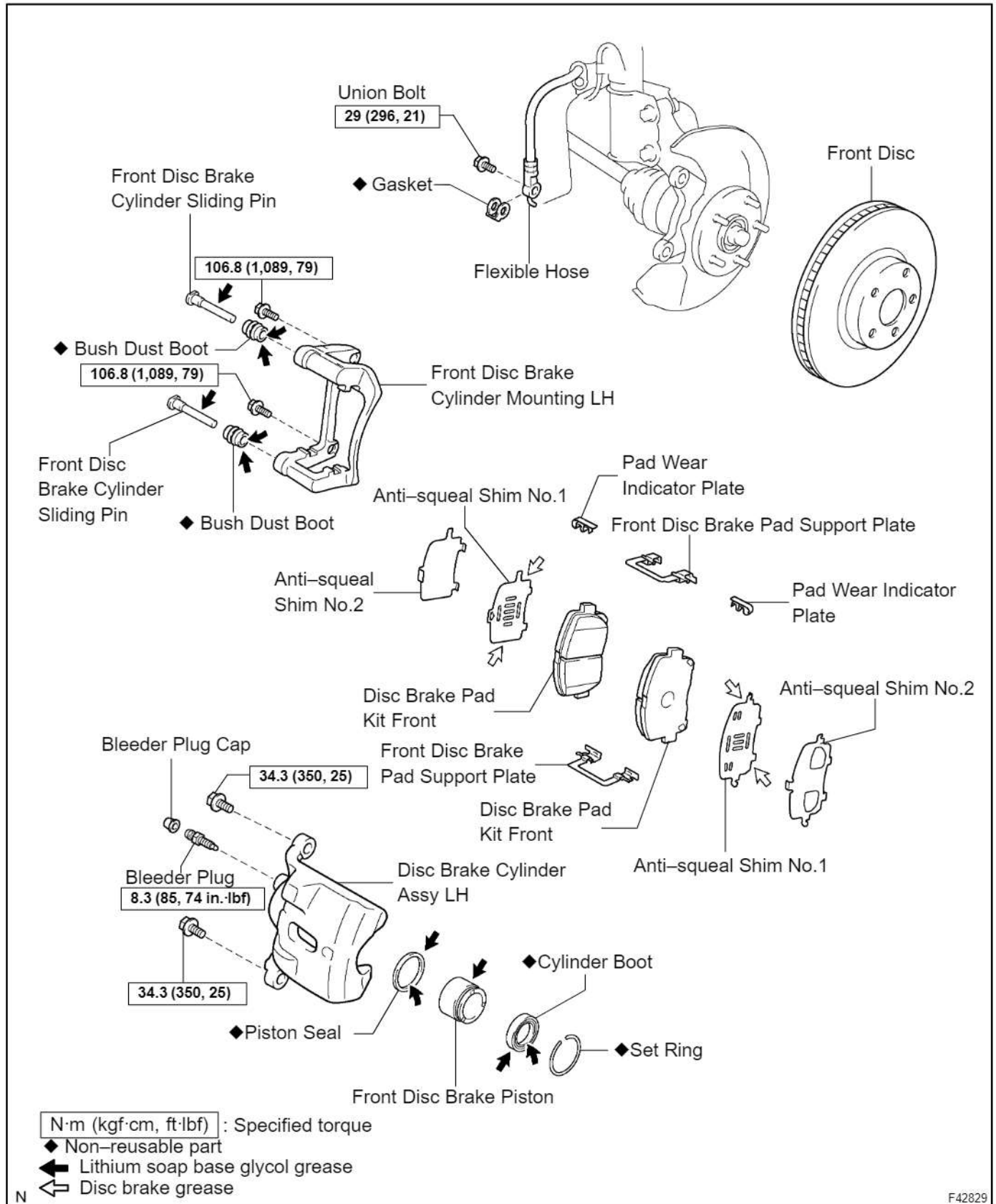
4. CHECK FLUID LEVEL IN RESERVOIR

- (a) Check the fluid level and add fluid if necessary.

Fluid: SAE J1703 or FMVSS No. 116 DOT3

FRONT BRAKE COMPONENTS

3208-01



F42829

OVERHAUL

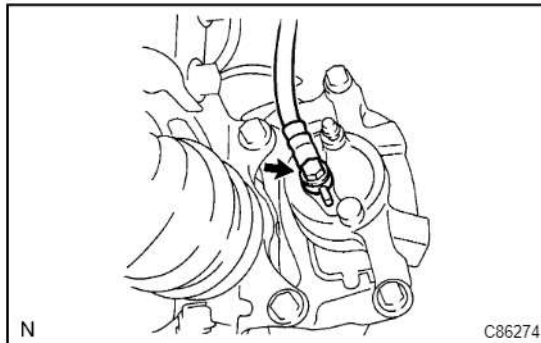
HINT:

Overhaul the RH side by the same procedure as the LH side.

1. **REMOVE FRONT WHEEL**
2. **DRAIN BRAKE FLUID**

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surface.

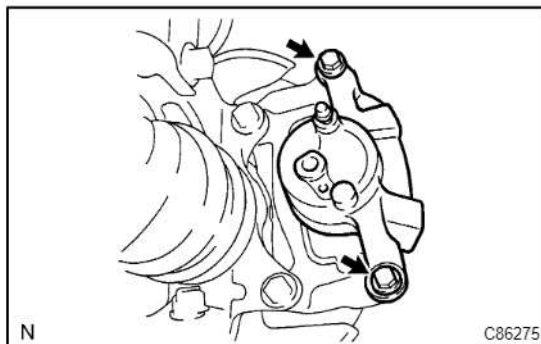


3. REMOVE FRONT DISC BRAKE CYLINDER SUB-ASSY

- (a) Remove the union bolt and gasket from the disc brake cylinder, then disconnect the flexible hose.

HINT:

Gasket has 2 types: 2-piece type and 1-piece type.



- (b) Hold the cylinder slide pin and remove the 2 bolts.

4. REMOVE DISC BRAKE PAD KIT FRONT (PAD ONLY)

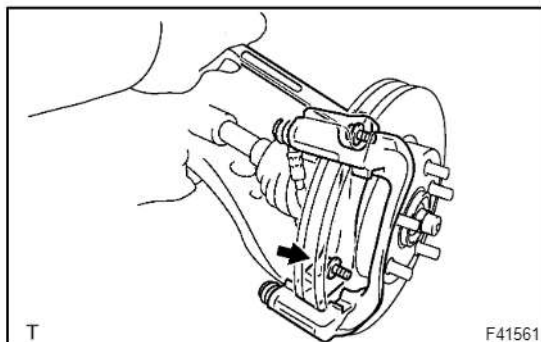
- (a) Remove the 2 brake pads with anti-squeal shims.
- (b) Remove the anti-squeal shim No.1 and anti-squeal shim No.2 from each pad.

5. REMOVE FRONT DISC BRAKE PAD SUPPORT PLATE

- (a) Remove the 2 front disc brake pad support plates from the cylinder mounting.

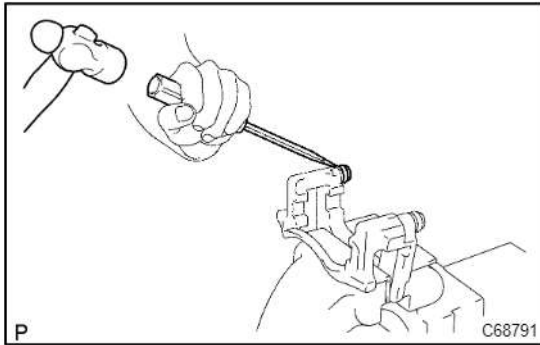
6. REMOVE FRONT DISC BRAKE CYLINDER SLIDE PIN

- (a) Remove the 2 cylinder slide pins from the disc brake cylinder mounting.

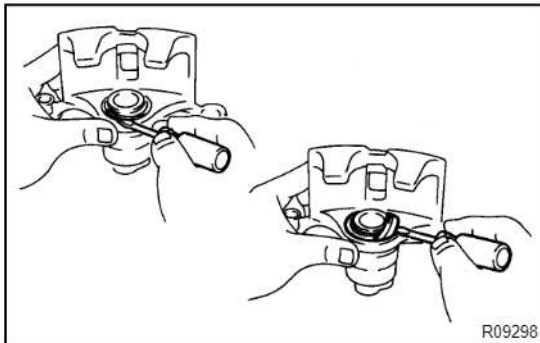


7. REMOVE FRONT DISC BRAKE CYLINDER MOUNTING LH

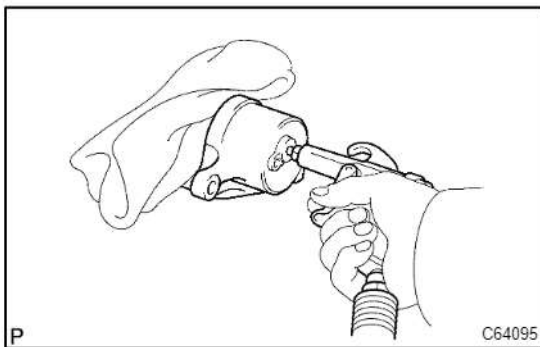
- (a) Remove the 2 bolts and disc brake cylinder mounting.

**8. REMOVE FRONT DISC BRAKE BUSH DUST BOOT**

- (a) Place front disc brake cylinder mounting in vise.
- (b) Using a screwdriver and hammer, remove the 2 bush dust boots from the disc brake cylinder mounting.

**9. REMOVE CYLINDER BOOT**

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

**10. REMOVE FRONT DISC BRAKE PISTON**

- (a) Place a piece of cloth or similar, between the piston and the disc brake cylinder.
- (b) Use compressed air to remove the piston from the disc brake cylinder.

CAUTION:

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

NOTICE:

Do not spatter the brake fluid.

11. REMOVE PISTON SEAL

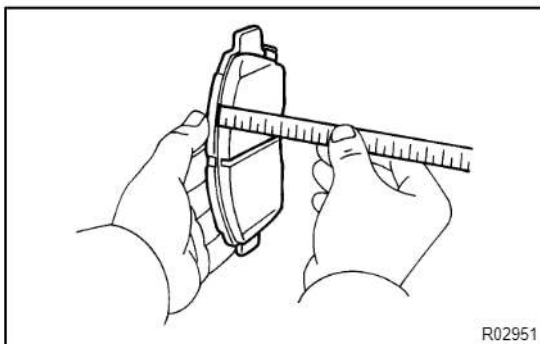
- (a) Using a screwdriver, remove the piston seal from the disc brake cylinder.

12. REMOVE FRONT DISC BRAKE BLEEDER PLUG

- (a) Remove the bleeder plug cap and bleeder plug from the disc brake cylinder.

13. INSPECT BRAKE CYLINDER AND PISTON

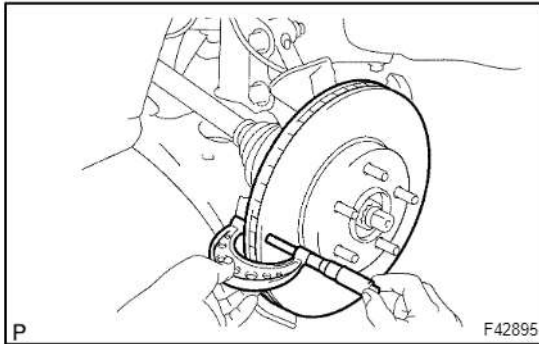
- (a) Check the cylinder bore and piston for rust or scoring.

**14. INSPECT PAD LINING THICKNESS**

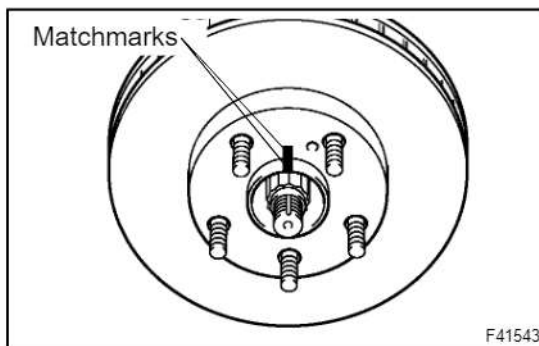
- (a) Using a ruler, measure the pad lining thickness.
Standard thickness: 11.0 mm (0.433 in.)
Minimum thickness: 1.0 mm (0.039 in.)

15. INSPECT FRONT DISC BRAKE PAD SUPPORT PLATE

- (a) Make sure that they have sufficient rebound, no deformation, cracks or wear, and have had all rust and dirt cleaned off.

**16. INSPECT DISC THICKNESS**

- (a) Using a micrometer, measure the disc thickness.
Standard thickness: 25.0 mm (0.984 in.)
Minimum thickness: 23.0 mm (0.906 in.)

**17. REMOVE FRONT DISC**

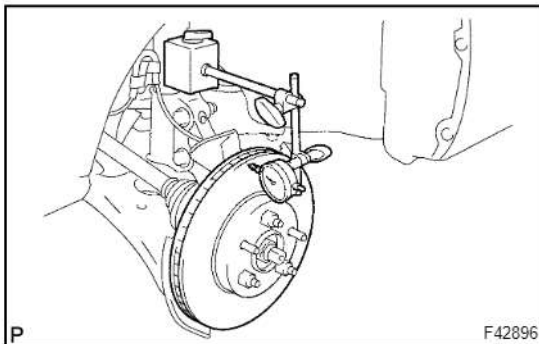
- (a) Make matchmarks on the front disc and the axle hub.
 (b) Remove the front disc.

18. INSTALL FRONT DISC

- (a) Aligning the matchmarks, install the front disc.

HINT:

Select the installation position where the front disc has the minimum runout.

**19. INSPECT DISC RUNOUT**

- (a) Temporarily fasten the disc with hub nuts.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
 (b) Using a dial indicator, measure the disc runout 10 mm (0.39 in.) away from the outer edge of the disc.
Maximum disc runout: 0.05 mm (0.0020 in.)
 (c) If the disc runout is the maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page 30-2). If the bearing play and axle hub runout are normal, adjust the disc runout or grind it on a "On-car" brake lathe.

20. TEMPORARY TIGHTEN FRONT DISC BRAKE BLEEDER PLUG

- (a) Temporarily tighten the bleeder plug, and install bleeder plug cap to the disc brake cylinder.

21. INSTALL PISTON SEAL

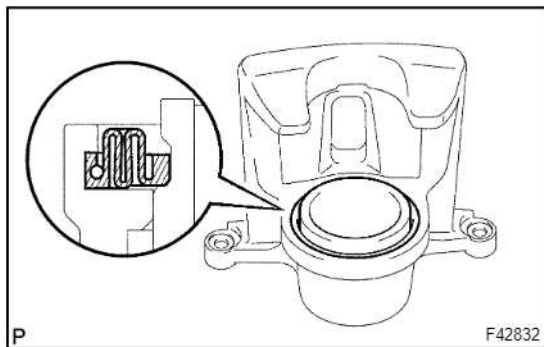
- (a) Apply the lithium soap base glycol grease on a new piston seal.
 (b) Install the piston seal to the disc brake cylinder.

22. INSTALL FRONT DISC BRAKE PISTON

- (a) Apply the lithium soap base glycol grease on the piston.
 (b) Install the piston to the disc brake cylinder.

NOTICE:

Do not screw the piston forcedly in the disc brake cylinder.



23. INSTALL CYLINDER BOOT

- (a) Apply the lithium soap base glycol grease to a new cylinder boot. Install the cylinder boot to the disc brake cylinder.

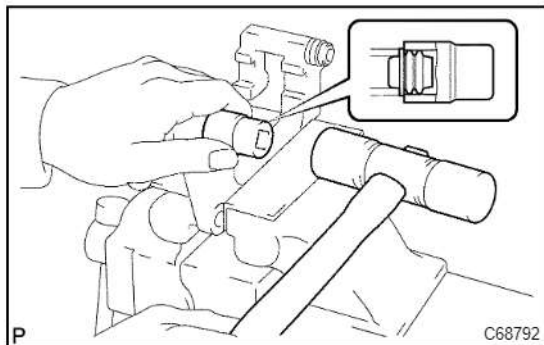
HINT:

Install the boot securely to the grooves of the cylinder and piston.

- (b) Using a screwdriver, install the set ring.

NOTICE:

Do not damage the cylinder boot.



24. INSTALL FRONT DISC BRAKE BUSH DUST BOOT

- (a) Place front disc brake cylinder mounting in vise.
 (b) Apply the lithium soap base glycol grease to seal surface of 2 new bush dust boots.
 (c) Using a socket wrench (19 mm) and hammer, drive the 2 bush dust boots to the disc brake cylinder mounting.

25. INSTALL FRONT DISC BRAKE CYLINDER MOUNTING LH

- (a) Install the disc brake cylinder mounting LH with the 2 bolts.

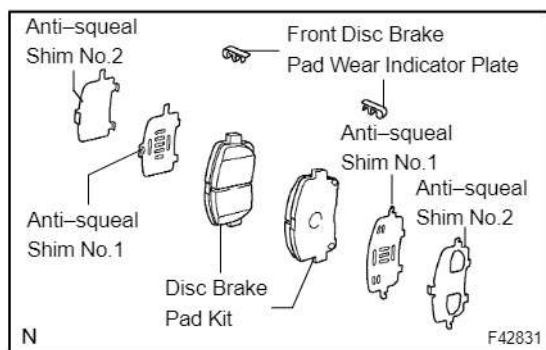
Torque: 106.8 N·m (1,089 kgf·cm, 79 ft·lbf)

26. INSTALL FRONT DISC BRAKE CYLINDER SLIDE PIN

- (a) Apply the lithium soap base glycol grease to the sliding part and the seal surface of the 2 cylinder slide pins.
 (b) Install the 2 cylinder slide pins to the disc brake cylinder mounting.

27. INSTALL FRONT DISC BRAKE PAD SUPPORT PLATE

- (a) Install the 2 front disc brake pad support plates to the cylinder mounting.

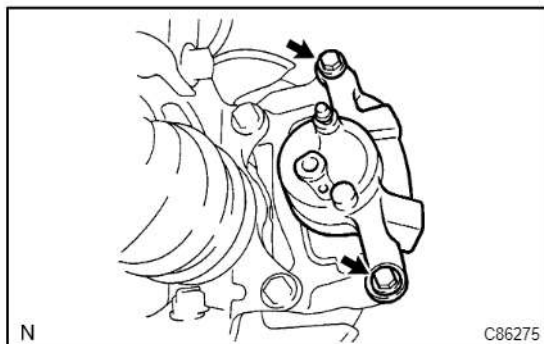


28. INSTALL DISC BRAKE PAD KIT FRONT (PAD ONLY)

NOTICE:

If necessary, replace the anti-squeal shim kit when replacing the brake pad.

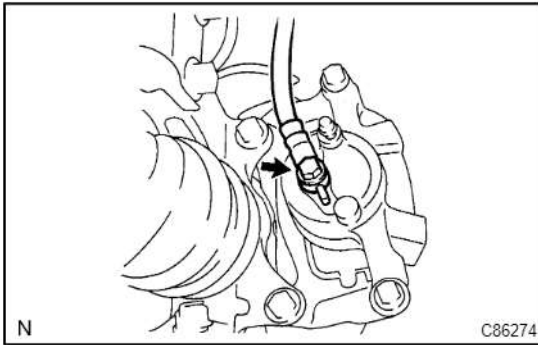
- (a) Apply disc brake grease to each anti-squeal shim No.1.
 (b) Install anti-squeal shims on each pad.
 (c) Install the pad wear indicator plate facing upward, and install each pad.



29. INSTALL FRONT DISC BRAKE CYLINDER SUB-ASSY

- (a) Install the disc brake cylinder with the 2 bolts.

Torque: 34.3 N·m (350 kgf·cm, 25 ft·lbf)



(b) Install a new gasket and flexible hose with the union bolt.

Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)

HINT:

- Gasket has 2 types: 2-piece type and 1-piece type.
- Install the flexible hose lock securely in the lock hole in the disc brake cylinder.

30. FILL RESERVOIR WITH BRAKE FLUID

31. BLEED MASTER CYLINDER (See page 32-4)

SST 09023-00100

32. BLEED BRAKE LINE (See page 32-4)

33. CHECK FLUID LEVEL IN RESERVOIR

34. CHECK BRAKE FLUID LEAKAGE

35. INSTALL FRONT WHEEL

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

BRAKE SYSTEM

3207-01

PRECAUTION

- Care must be taken to replace each part properly, because it could affect the performance of the brake system and result in a driving hazard. Replace the parts with the parts which have 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 introduction section.

PROPORTIONING VALVE ASSY

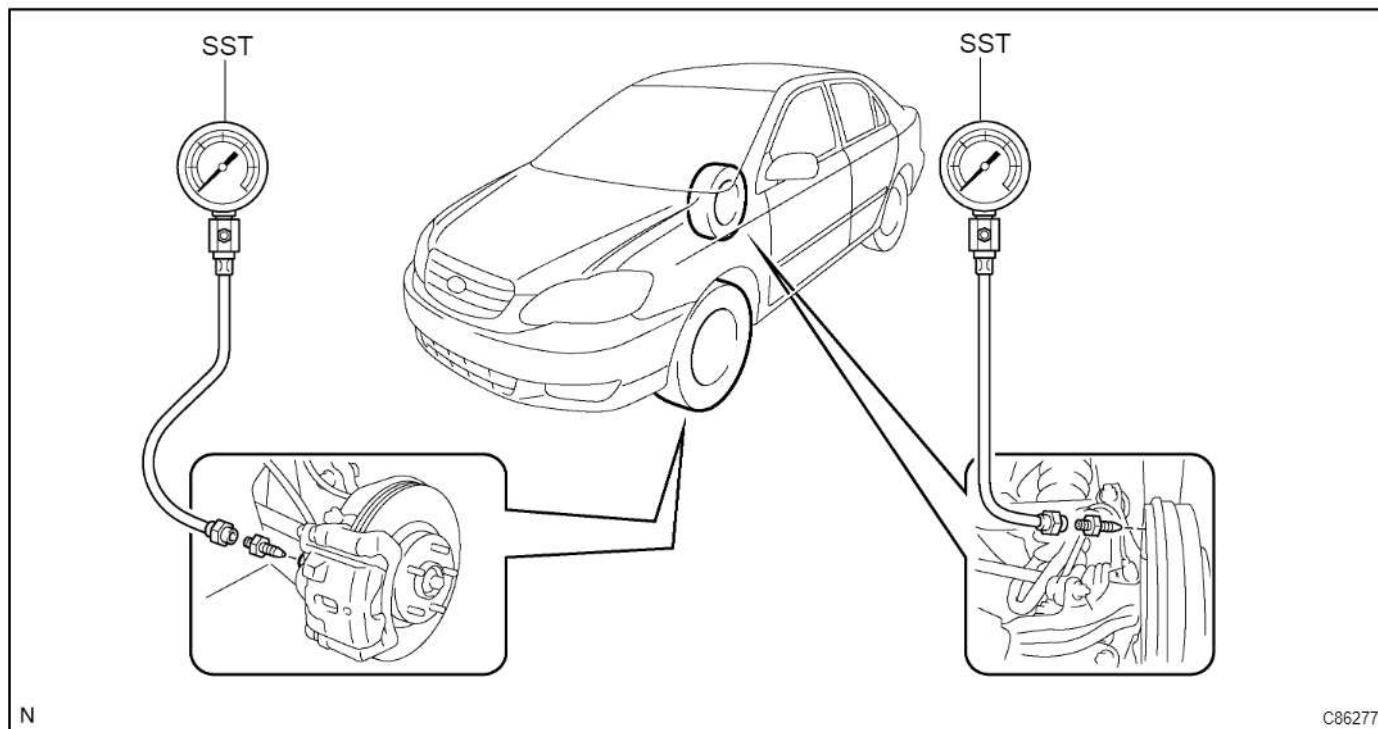
320M-01

ON-VEHICLE INSPECTION

1. INSTALL LSPV GAUGE (SST) AND BLEED AIR

- Remove the bleeder plugs from the front and rear brake cylinder.
- Install the LSPV gauge (SST), and bleed the air.

SST 09709-29018



2. RAISE MASTER CYLINDER PRESSURE AND CHECK REAR WHEEL CYLINDER PRESSURE

Master cylinder pressure	Rear wheel cylinder pressure
2,942 kPa (30 kgf/cm ² , 427 psi)	2,942 kPa (30 kgf/cm ² , 427 psi)
4,903 kPa (50 kgf/cm ² , 711 psi)	3,667 kPa (37 kgf/cm ² , 531 psi)
7,845 kPa (80 kgf/cm ² , 1,138 psi)	4,756 kPa (49 kgf/cm ² , 689 psi)

HINT:

When inspecting the fluid pressure, inspect the left front and right rear together, and the right front and left rear together.

If the rear wheel cylinder pressure is improper, replace the proportioning valve assy.

3. REMOVE LSPV GAUGE (SST)

- Remove the LSPV gauge (SST).

SST 09709-29018

- Install the bleeder plugs.

Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)

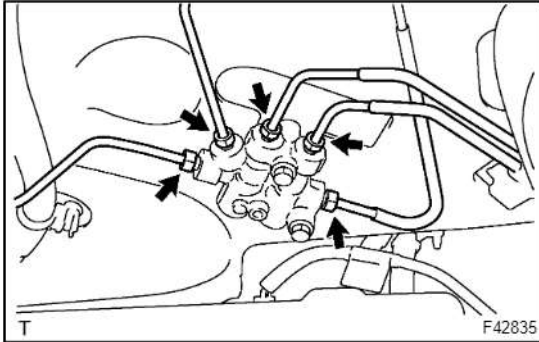
4. BLEED MASTER CYLINDER (See page 32-4)

SST 09023-00100

5. BLEED BRAKE LINE (See page 32-4)

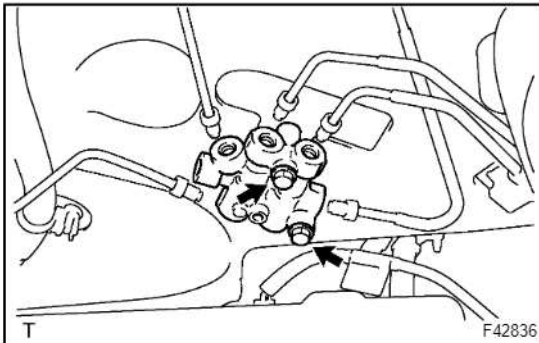
6. CHECK FOR LEAKS

REPLACEMENT

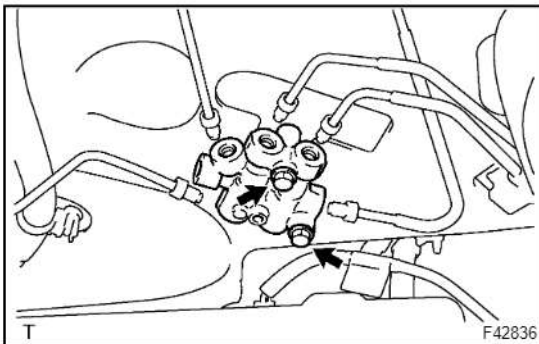


1. REMOVE PROPORTIONING VALVE ASSY

- (a) Using SST, disconnect the 5 brake tubes from the proportioning valve assy.
SST 09023-00100

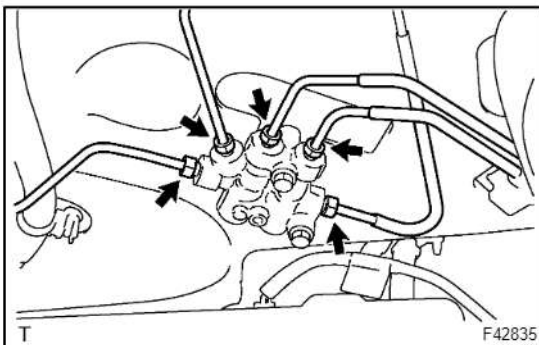


- (b) Remove the 2 bolts and proportioning valve assy from the body.



2. INSTALL PROPORTIONING VALVE ASSY

- (a) Install the proportioning valve assy with the 2 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)



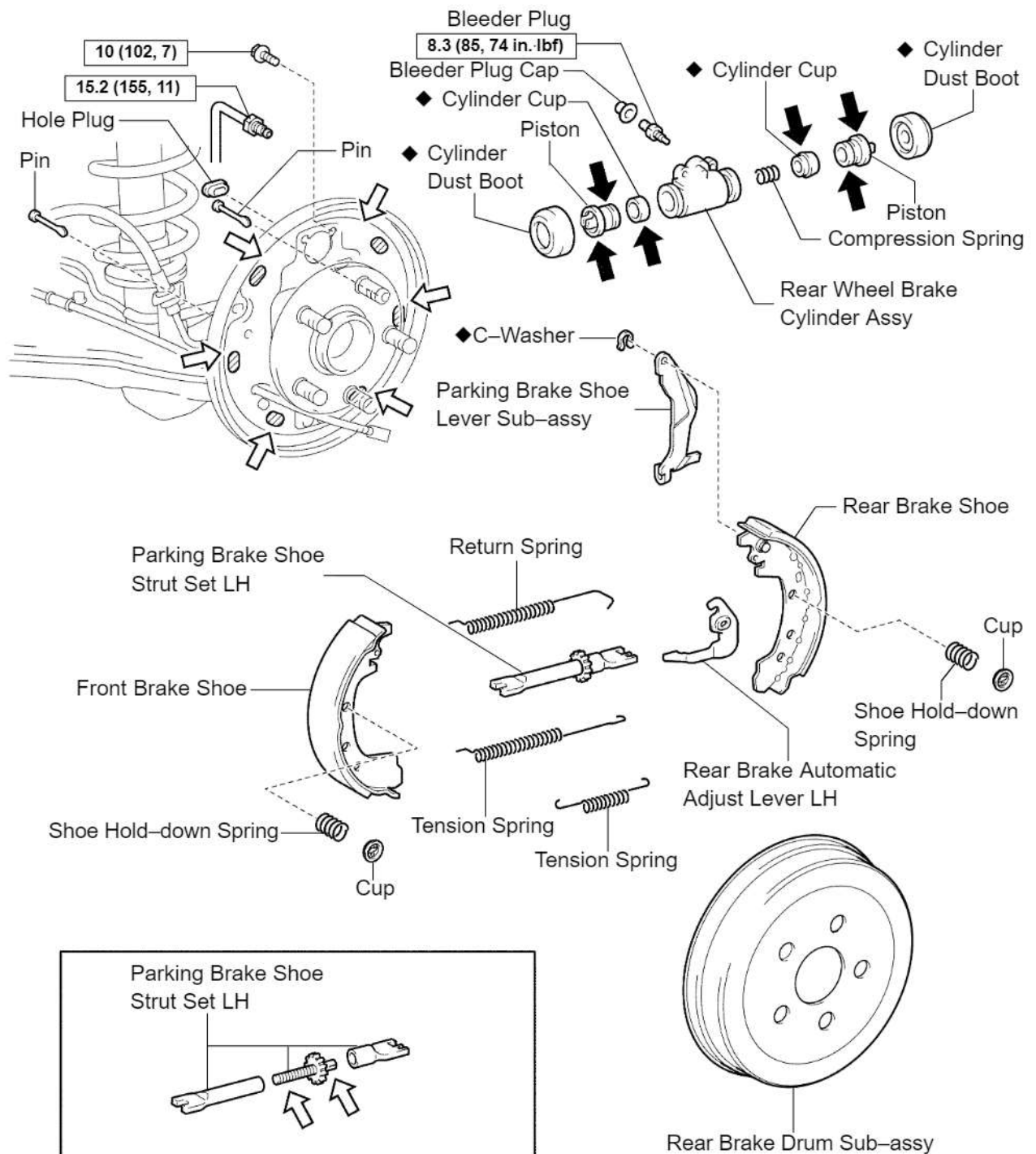
- (b) Using SST, connect the 5 brake tubes to the proportioning valve assy.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

3. FILL RESERVOIR WITH BRAKE FLUID
4. BLEED MASTER CYLINDER (See page 32-4)
SST 09023-00100
5. BLEED BRAKE LINE (See page 32-4)
6. CHECK FLUID LEVEL IN RESERVOIR

2004 COROLLA (RM1037U)

REAR BRAKE COMPONENTS

3209K-01



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

◆ Non-reusable part

◀ Lithium soap base glycol grease

↗ High temperature grease

F42669

OVERHAUL

HINT:

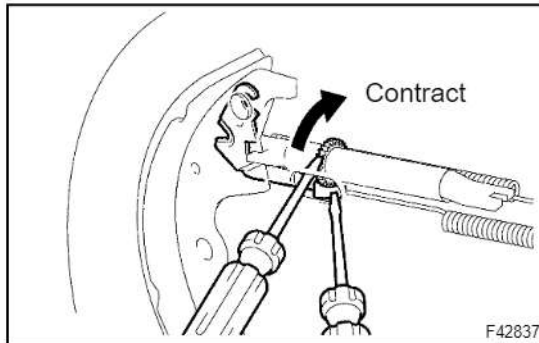
Overhaul the RH side by the same procedures with LH side.

1. REMOVE REAR WHEEL

2. DRAIN BRAKE FLUID

NOTICE:

Wash the brake fluid off immediately if it comes into contact with any painted surface.



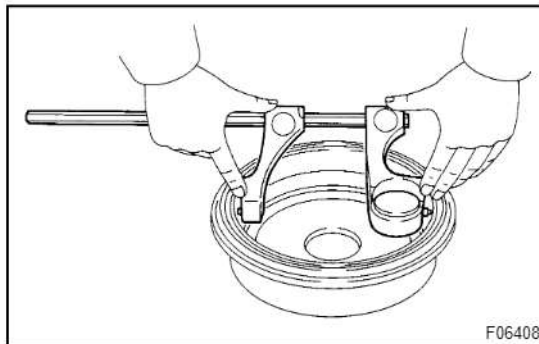
3. REMOVE REAR BRAKE DRUM SUB-ASSY

- (a) Release the parking brake lever, and remove the brake drum.

HINT:

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

- (b) Remove the hole plug and insert a screwdriver through the hole in the backing plate, and hold the automatic adjusting lever away from the adjuster.
- (c) Using a another screwdriver, reduce the brake shoe adjuster by turning the adjusting wheel.

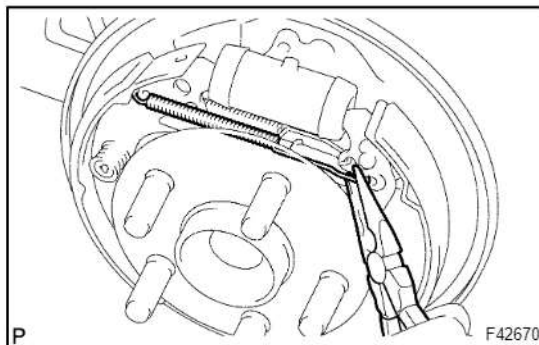


4. INSPECT BRAKE DRUM INSIDE DIAMETER

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

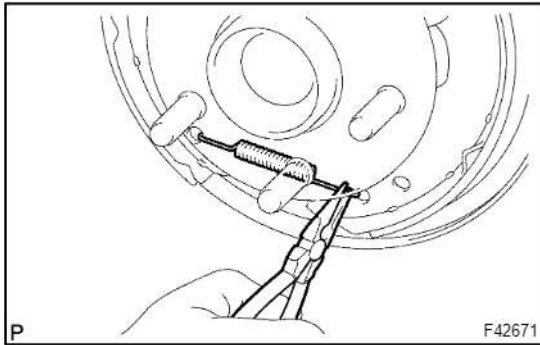
Standard inside diameter: 200.0 mm (7.874 in.)

Maximum inside diameter: 201.0 mm (7.913 in.)



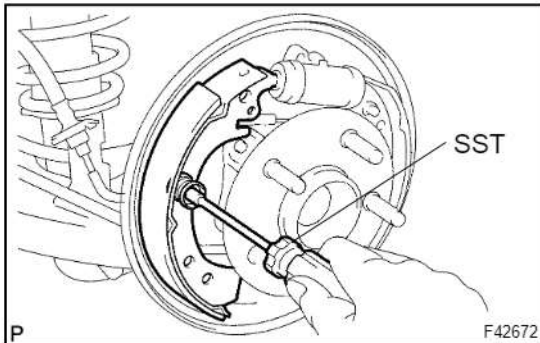
5. REMOVE REAR BRAKE AUTOMATIC ADJUST LEVER LH

- (a) Using a needle-nose pliers, remove the upper side tension spring.
- (b) Remove the rear brake automatic adjust lever LH from the rear brake shoe.



6. REMOVE FRONT BRAKE SHOE

- (a) Using a needle-nose pliers, remove the anchor side tension spring.

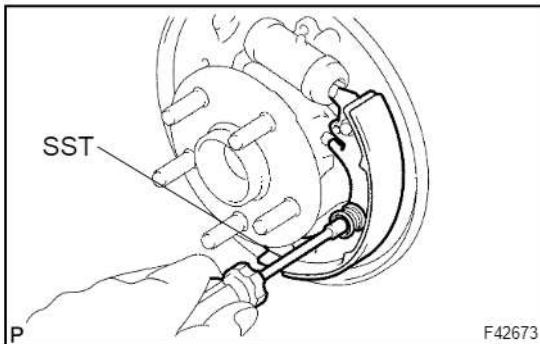


- (b) Using SST, remove the cup, shoe hold-down spring and pin.

SST 09718-00010

- (c) Disconnect the upper side return spring from the front brake shoe, and remove the front brake shoe.

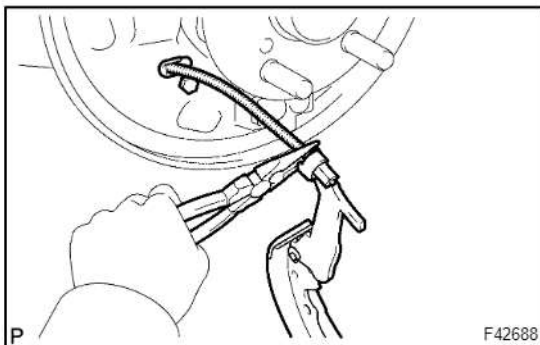
7. REMOVE PARKING BRAKE SHOE STRUT SET LH



8. REMOVE REAR BRAKE SHOE

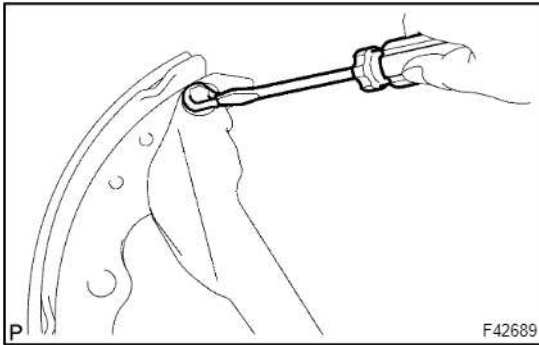
- (a) Using SST, remove the cup, shoe hold-down spring and pin.

SST 09718-00010



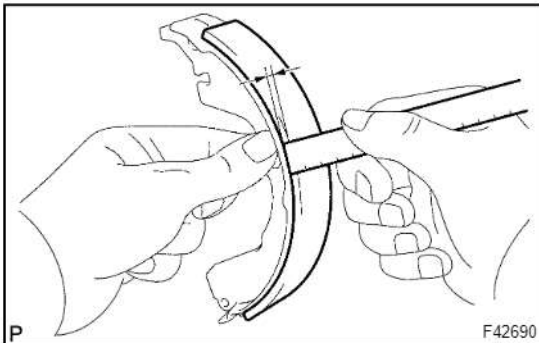
- (b) Using a needle-nose pliers, disconnect the parking brake cable No.3 and remove the rear brake shoe.

- (c) Remove the upper side return spring from the rear brake shoe.



9. REMOVE REAR BRAKE PARKING BRAKE SHOE LEVER SUB-ASSY

- (a) Using a screwdriver, remove the C-washer and parking brake shoe lever.



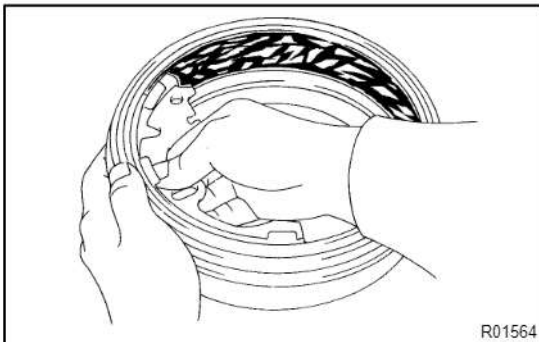
10. INSPECT REAR DRUM BRAKE SHOE LINING THICKNESS

- (a) Using a ruler, measure the thickness of the shoe lining.

Standard thickness: 4.4 mm (0.173 in.)

Minimum thickness: 1.0 mm (0.039 in.)

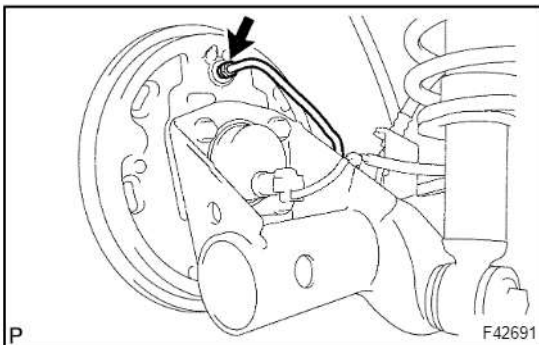
If the lining thickness is at the minimum thickness or less, or if there is severe, uneven wear, replace the brake shoe.



11. INSPECT BRAKE DRUM AND REAR DRUM BRAKE SHOE LINING FOR PROPER CONTACT

- (a) Apply chalk to the inside surface of the drum, then grind drum on the brake shoe lining to fit.

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



12. REMOVE RH, FRONT OR UPPER REAR WHEEL BRAKE CYLINDER ASSY

- (a) Using SST, disconnect the brake tube, use a container to catch brake fluid.

SST 09023-00100

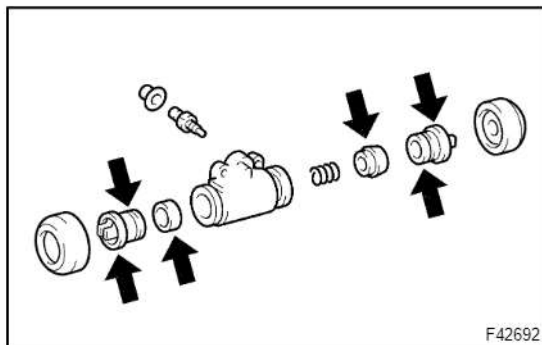
- (b) Remove the bolt and wheel cylinder.

13. REMOVE REAR WHEEL CYLINDER CUP KIT

- Remove the 2 cylinder dust boots from the wheel cylinder.
- Remove the 2 pistons and compression spring.
- Remove the 2 wheel cylinder cups from each piston.
- Remove the bleeder plug cap and bleeder plug from the wheel cylinder.

14. INSPECT BRAKE WHEEL CYLINDER

- (a) Check the cylinder bore and piston for rust or scoring.



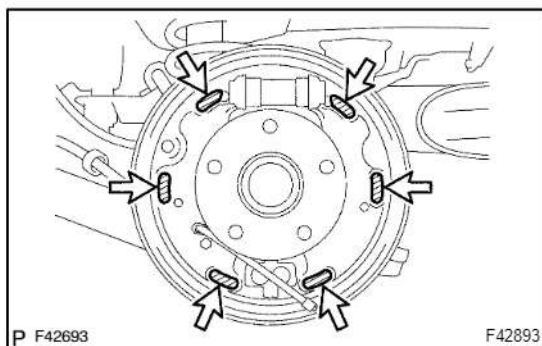
F42692

15. INSTALL REAR WHEEL CYLINDER CUP KIT

- (a) Temporary tighten the bleeder plug to the wheel cylinder, and install the bleeder plug cap.
- (b) Apply the lithium soap base glycol grease to 2 new wheel cylinder cups and the 2 pistons.
- (c) Install the 2 wheel cylinder cups to each piston.
- (d) Install the compression spring and 2 pistons to the wheel cylinder.
- (e) Install 2 new cylinder dust boots to the wheel cylinder.

16. INSTALL RH, FRONT OR UPPER REAR WHEEL BRAKE CYLINDER ASSY

- (a) Install the wheel cylinder with the bolt.
Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)
- (b) Using SST, connect the brake tube.
SST 09023-00100
Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

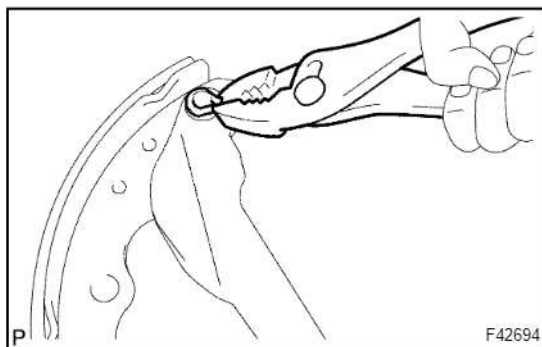


P F42693

F42893

17. APPLICATION HIGH TEMPERATURE GREASE

- (a) Apply the high temperature grease to the shoe attached surface of backing plate.

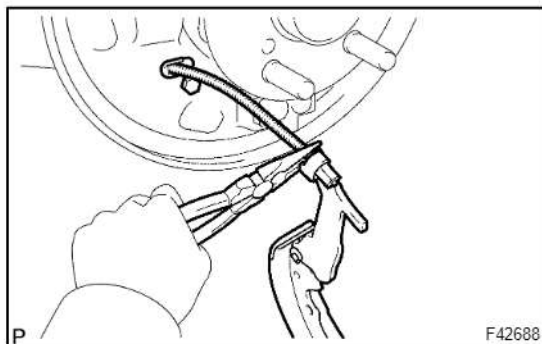


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F42694

18. INSTALL REAR BRAKE PARKING BRAKE SHOE LEVER SUB-ASSY

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

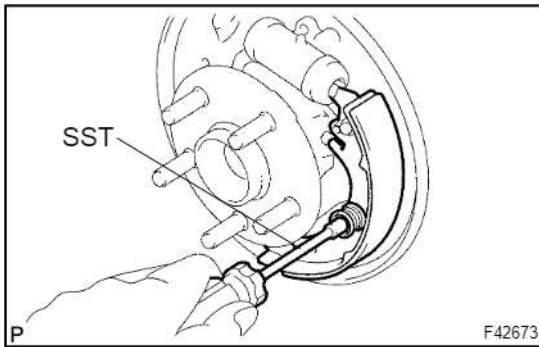


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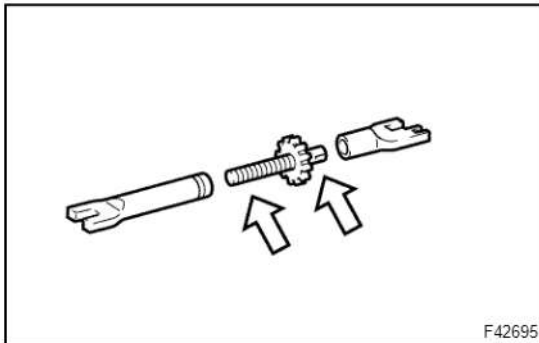
F42688

19. INSTALL REAR BRAKE SHOE

- (a) Using a needle-nose pliers, connect the parking brake cable No.3 to the parking brake shoe lever.

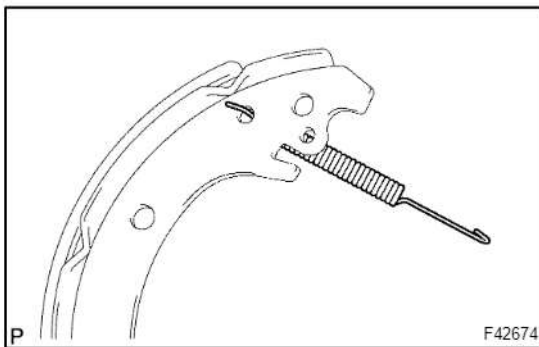


- (b) Using SST, install the rear brake shoe, pin, shoe hold-down spring and cup.
SST 09718-00010



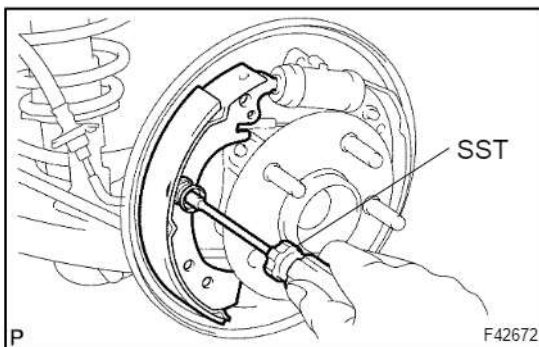
20. INSTALL PARKING BRAKE SHOE STRUT SET LH

- (a) Apply the high temperature grease to the adjusting bolt.
(b) Install the parking brake shoe strut set LH to the rear brake shoe.

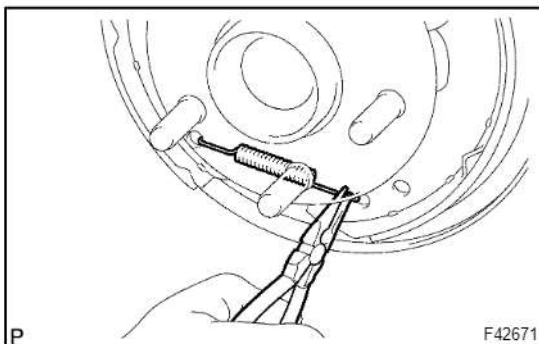


21. INSTALL FRONT BRAKE SHOE

- (a) Connect the upper side return spring to the front brake shoe.



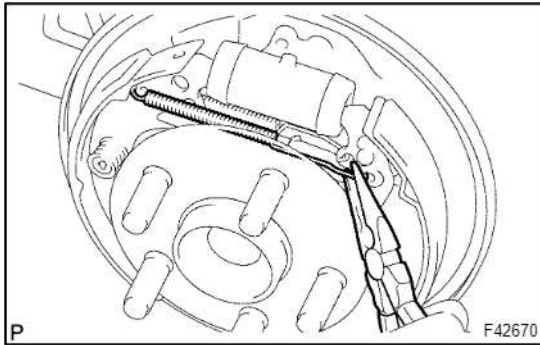
- (b) Using SST, install the front brake shoe, pin, shoe hold-down spring and cup.
SST 09718-00010



- (c) Using a needle-nose pliers, install the anchor side tension spring to each shoe.

22. INSTALL REAR BRAKE AUTOMATIC ADJUST LEVER LH

- (a) Install the rear brake automatic adjust lever LH to the rear brake shoe.



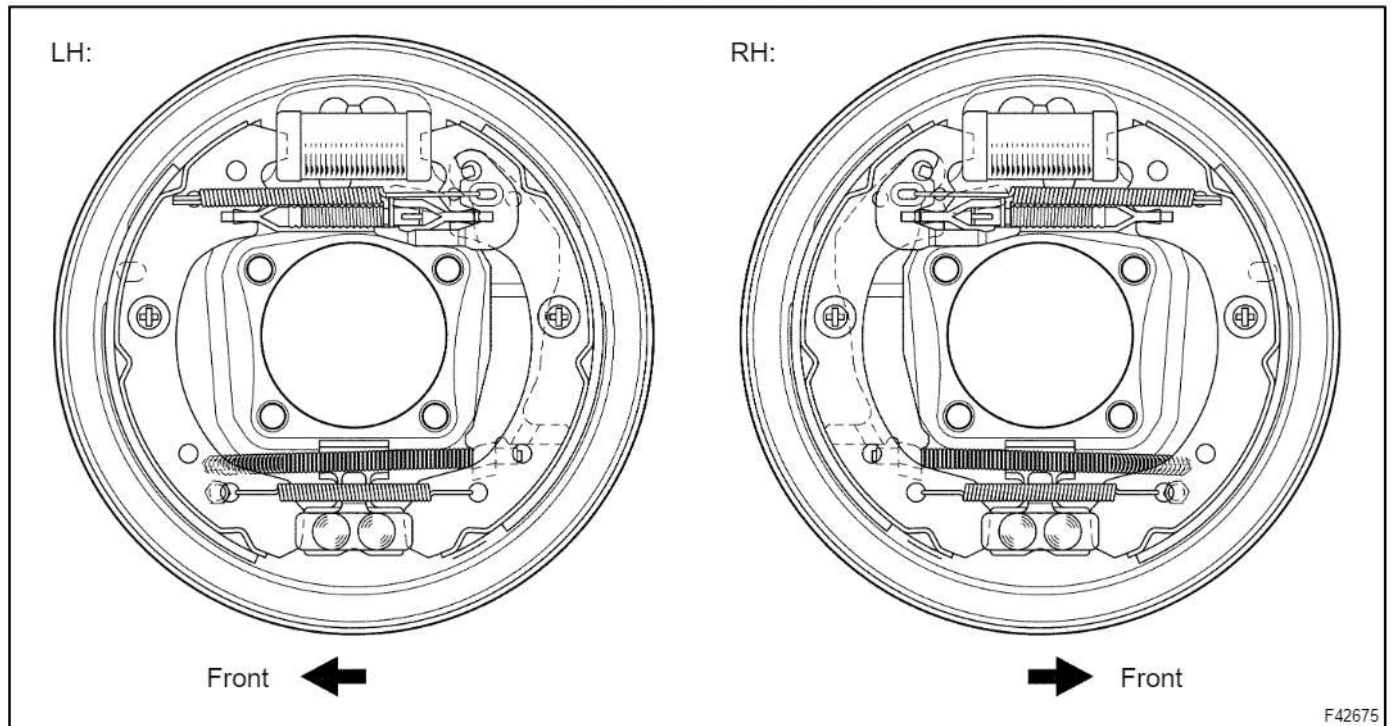
- (b) Using a needle-nose pliers, install the upper side tension spring.

23. CHECK REAR DRUM BRAKE INSTALLATION

- (a) Check that each part is installed properly.

NOTICE:

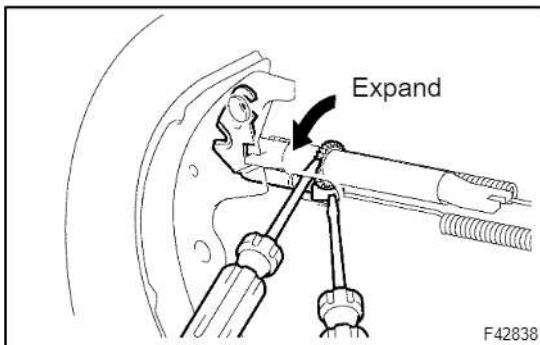
There should be no oil or grease adhering to the friction surfaces of the shoe lining and drum.



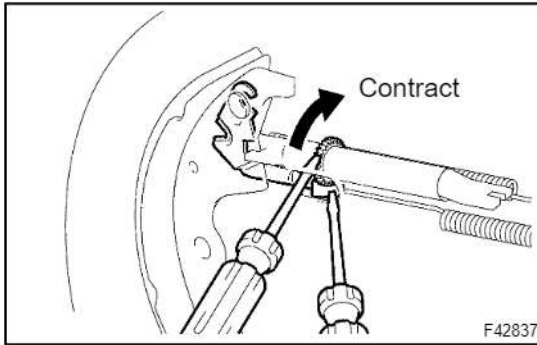
24. INSTALL REAR BRAKE DRUM SUB-ASSY

25. ADJUST REAR DRUM BRAKE SHOE CLEARANCE

- (a) Temporarily install the hub nuts.



- (b) Remove the hole plug, and turn the adjuster and expand the shoe until the drum locks.



- (c) Using a screwdriver, back off the adjuster 8 notches.
- (d) Install the hole plug.

- 26. **FILL RESERVOIR WITH BRAKE FLUID**
- 27. **BLEED MASTER CYLINDER** (See page 32-4)
SST 09023-00100
- 28. **BLEED BRAKE LINE** (See page 32-4)
- 29. **CHECK FLUID LEVEL IN RESERVOIR**
- 30. **CHECK BRAKE FLUID LEAKAGE**
- 31. **INSTALL REAR WHEEL**
- 32. **INSPECT PARKING BRAKE LEVER TRAVEL** (See page 33-2)
- 33. **ADJUST PARKING BRAKE LEVER TRAVEL** (See page 33-2)

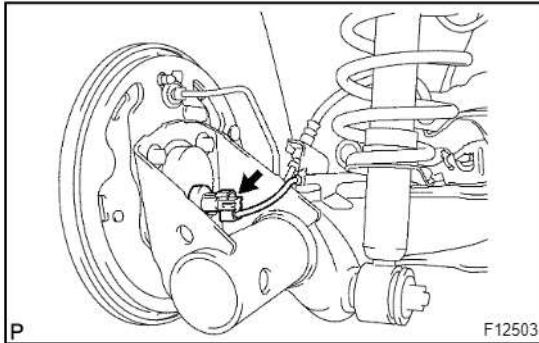
SKID CONTROL SENSOR REPLACEMENT

320IR-02

HINT:

Replace the RH side by the same procedure as the LH side.

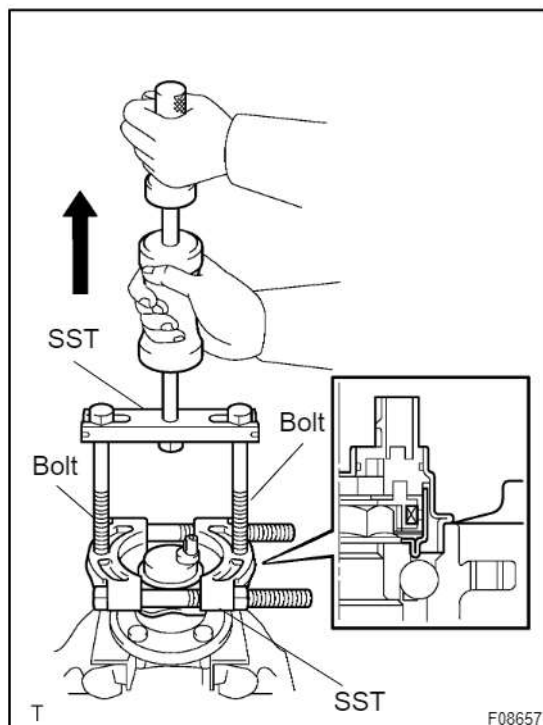
1. **REMOVE REAR WHEEL**
2. **REMOVE REAR BRAKE DRUM SUB-ASSY (See page 32-31)**



3. DISCONNECT SKID CONTROL SENSOR WIRE

- (a) Disconnect the skid control sensor wire connector from the skid control sensor.

4. **REMOVE REAR AXLE HUB & BEARING ASSY LH (See page 30-24)**



5. REMOVE SKID CONTROL SENSOR

- (a) Mount the rear axle hub in a soft jaw vise.

NOTICE:

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

- (b) Using a pin punch and hammer, drive out the 2 pins and remove the 2 attachments from SST.
- (c) Using SST and 2 bolts (Diameter: 12 mm, pitch: 1.5 mm), remove the skid control sensor from the rear axle hub.
SST 09520-00031 (09520-00040), 09521-00020, 09950-00020

NOTICE:

- If a damage is inflicted to the sensor rotor, replace the axle hub assembly.
- Do not scratch the contacting surface of axle hub and speed sensor.

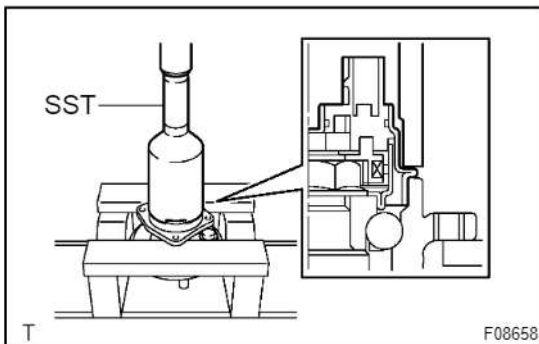
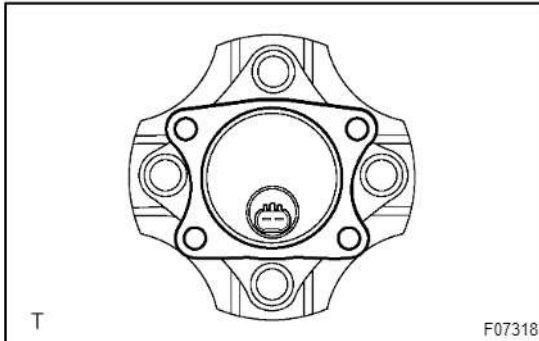
6. INSTALL SKID CONTROL SENSOR

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

NOTICE:

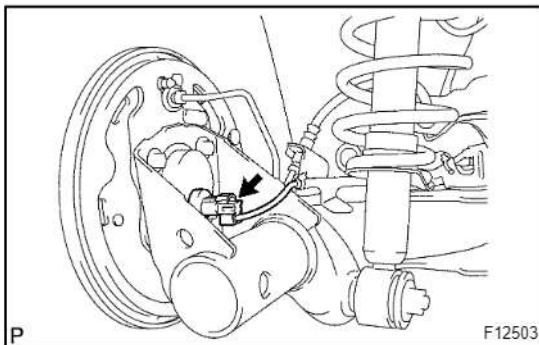
Do not stick any foreign objects to the sensor rotor.

- (b) Place the speed sensor on the axle hub so that the connector makes the lowest position under the on-vehicle condition.



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

SST 09214-76011

7. INSTALL REAR AXLE HUB & BEARING ASSY LH (See page 30-24)**8. CONNECT SKID CONTROL SENSOR WIRE**

- (a) Connect the skid control sensor wire connector to the skid control sensor.

9. INSTALL REAR BRAKE DRUM SUB-ASSY (See page 32-31)**10. INSTALL REAR WHEEL**

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

11. INSPECT AND ADJUST REAR WHEEL ALIGNMENT (See page 27-3)**12. CHECK ABS SPEED SENSOR SIGNAL (See page 05-297)**

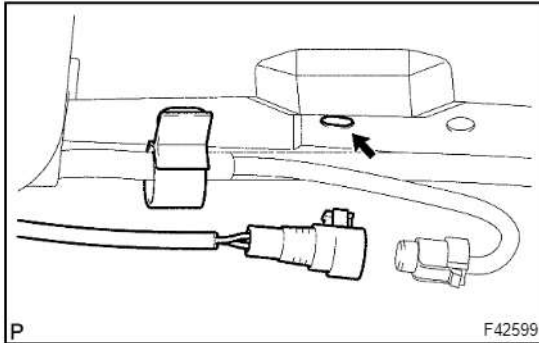
SPEED SENSOR FRONT LH REPLACEMENT

3201Q-02

HINT:

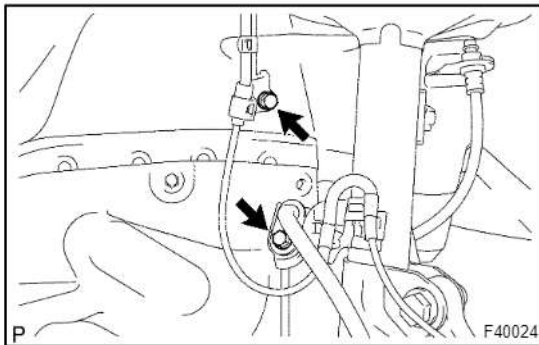
Replace the RH side by the same procedure as the LH side.

1. **REMOVE FRONT WHEEL**
2. **REMOVE FRONT FENDER LINER LH**

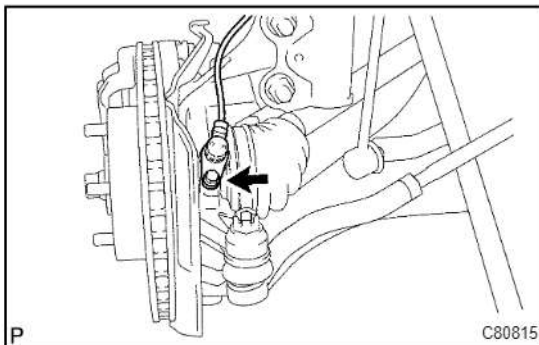


3. **REMOVE SPEED SENSOR FRONT LH**

- (a) Disconnect the speed sensor wire harness clamp from the body.
- (b) Disconnect the speed sensor connector.



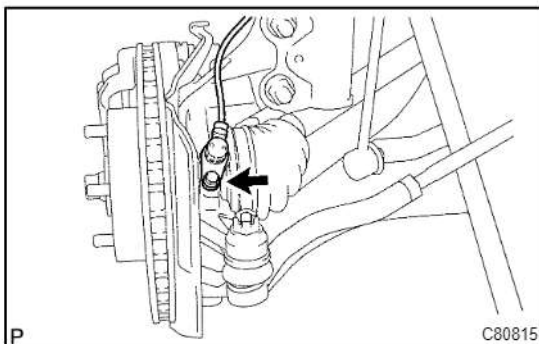
- (c) Remove the 2 clamp bolts holding the sensor harness from the body and shock absorber.



- (d) Remove the bolt and speed sensor front LH.

NOTICE:

Keep on the sensor tip clean.

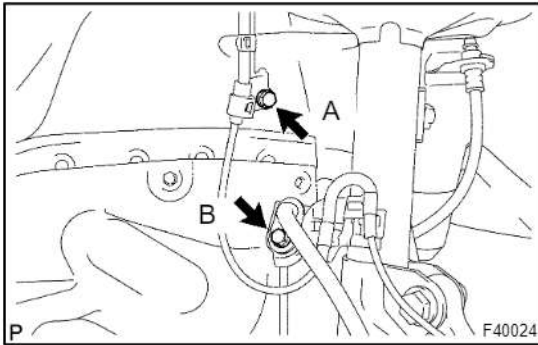


4. **INSTALL SPEED SENSOR FRONT LH**

- (a) Install the speed sensor front LH with the bolt.
Torque: 8.0 N·m (82 kgf·cm, 71 in·lbf)

NOTICE:

Make sure the sensor tip is clean.

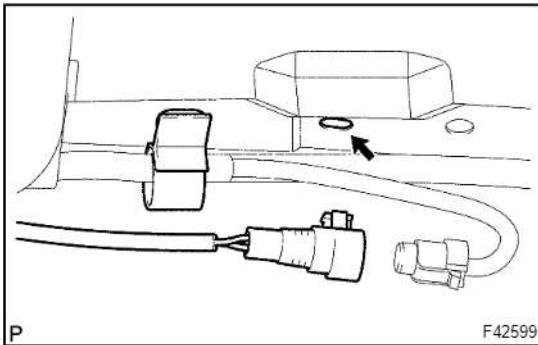


- (b) Install the sensor harness clamp with the 2 bolts "A" and "B" to the body and shock absorber.

Torque:

Bolt A: 8.0 N·m (82 kgf·cm, 71 in·lbf)

Bolt B: 29 N·m (296 kgf·cm, 21 ft·lbf)



- (c) Connect the speed sensor connector.
(d) Connect the speed sensor wire harness clamp to the body.

5. **INSTALL FRONT FENDER LINER LH**

6. **INSTALL FRONT WHEEL**

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

7. **CHECK ABS SPEED SENSOR SIGNAL (See page 05-297)**

PROBLEM SYMPTOMS TABLE

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

Symptom	Suspect Area	See page
Low pedal or spongy pedal	3. Fluid leaks for brake system	–
	4. Air in brake system	32-4
	5. Piston seals (Worn or damaged)	32-25
		32-31
	6. Rear brake shoe clearance (Out of adjustment)	32-31
	7. Master cylinder (faulty)	32-13
	8. Booster push rod (Out of adjustment)	32-13
Brake drag	1. Brake pedal free play (Minimal)	32-6
	2. Parking brake lever travel (Out of adjustment)	33-2
	3. Parking brake wire (Sticking)	33-7
		33-10
	4. Rear brake shoe clearance (Out of adjustment)	32-31
	5. Pad or lining (Cracked or distorted)	32-25
		32-31
	6. Piston (Stuck)	32-25
		32-31
	7. Piston (Frozen)	32-25
		32-31
	8. Tension or return spring (Faulty)	32-31
Brake pull	9. Booster push rod (Out of adjustment)	32-13
	10. Vacuum leaks for booster system	32-18
	11. Master cylinder (Faulty)	32-13
	1. Piston (Stuck)	32-25
		32-31
	2. Pad or lining (Oily)	32-25
		32-31
	3. Piston (Frozen)	32-25
		32-31
	4. Disc (Scored)	32-25
	5. Pad or lining (Cracked or distorted)	32-25
		32-31

BRAKE – BRAKE SYSTEM

Hard pedal but brake inefficient	1. Fluid leaks for brake system 2. Air in brake system 3. Pad or lining (Worn) 4. Pad or lining (Cracked or distorted) 5. Rear brake shoe clearance (Out of adjustment) 6. Pad or lining (Oily) 7. Pad or lining (Glazed) 8. Disc (Scored) 9. Booster push rod (Out of adjustment) 10. Vacuum leaks for booster system	– 32-4 32-25 32-31 32-25 32-31 32-31 32-25 32-31 32-25 32-13 32-18
Noise from brakes	1. Pad or lining (Cracked or distorted) 2. Installation bolt (Loose) 3. Disc (Scored) 4. Pad support plate (Loose) 5. Sliding pin (Worn) 6. Pad or lining (dirty) 7. Pad or lining (Glazed) 8. Anchor, return or tension spring (Faulty) 9. Anti-squeal shim (Damaged) 10. Shoe hold-down spring (Damaged)	32-25 32-31 32-25 32-25 32-25 32-25 32-31 32-25 32-31 32-25 32-31