

BRAKE SYSTEM

PRECAUTION

NOTICE:

- Care must be taken to replace each part properly as it could affect the performance of the brake system and result in a driving hazard. Replace the parts with parts having the same part number or equivalent parts.
- It is very important to keep parts and the area clean when repairing the brake system.
- When air remains in the brake line or disconnecting the brake line, bleed the air.
- Wash brake fluid off immediately if it adheres to any painted surface.
- Prevent brake fluid from adhering to electronic parts.
- If the vehicle is equipped with a mobile communication system, refer to the precaution in the INTRODUCTION section (see page [IN-5](#)).
- When disconnecting the negative (-) battery terminal, initialize the following system after the terminal is reconnected.

System Name	See procedure
Power Window Control System	IN-32

BR-2

BRAKE – BRAKE SYSTEM

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

Brake system

Symptom	Suspected area	See page
Low pedal or spongy pedal	1. Fluid leaks for brake system	-
	2. Air in brake system	BR-3
	3. Front brake piston seals (Worn or damaged)	BR-41
	4. Rear brake wheel cylinder cups (Worn or damaged)	BR-47
	5. Master cylinder (Faulty)	BR-27
	6. Push rod (Out of adjustment)	BR-22
	7. Stroke simulator cylinder (Faulty)	BR-35
Brake drag	1. Brake pedal free play (Minimal)	BR-23
	2. Parking brake pedal travel (Out of adjustment)	PB-1
	3. Parking brake cable (Sticking)	PB-14
	4. Rear brake shoe clearance (Out of adjustment)	BR-53
	5. Front brake pad (Cracked or distorted)	BR-40
	6. Rear brake lining (Cracked or distorted)	BR-47
	7. Front brake piston (Stuck or frozen)	BR-41
	8. Rear brake wheel cylinder piston (Stuck or frozen)	BR-47
	9. Tension or return spring (Faulty)	BR-47
	10. Push rod (Out of adjustment)	BR-22
	11. Master cylinder (Faulty)	BR-27
Brake pull	1. Front brake piston (Stuck)	BR-41
	2. Rear brake wheel cylinder piston (Stuck)	BR-47
	3. Front brake pad (Oily, cracked or distorted)	BR-40
	4. Rear brake lining (Oily, cracked or distorted)	BR-47
	5. Front brake piston (Frozen)	BR-41
	6. Rear brake wheel cylinder piston (Frozen)	BR-47
	7. Disc (Scored)	BR-41
Hard pedal but brake inefficient	1. Brake pedal (Out of adjustment, faulty)	BR-22
	2. Front brake piston (Frozen)	BR-41
	3. Rear brake wheel cylinder piston (Frozen)	BR-47
	4. Front brake pad (Cracked, distorted, glazed or oily)	BR-40
	5. Rear brake lining (Cracked, distorted, glazed or oily)	BR-47
	6. Disc (Oily)	BR-41
	7. Push rod (Out of adjustment)	BR-22
Noise from brake	1. Front brake pad (Cracked, distorted, dirty or glazed)	BR-40
	2. Rear brake lining (Cracked, distorted, dirty or glazed)	BR-47
	3. Installation bolt (Loose)	BR-44
	4. Disc (Scored)	BR-41
	5. Pad support plate (Loose)	BR-41
	6. Slide pin (Worn)	BR-40
	7. Tension or return spring (Faulty)	BR-47
	8. Anti-squeal shim (Damaged)	BR-40
	9. Shoe hold-down spring (Damaged)	BR-47

BR

BRAKE FLUID

BLEEDING

CAUTION:

Bleeding without the intelligent tester may result in the air not being completely bled. As this can result in an accident, be sure to use the intelligent tester for air bleeding.

NOTICE:

- Move the shift lever to the P position and apply the parking brake before bleeding air.
- Add brake fluid carefully so that it remains between the MIN and MAX lines of the reservoir while bleeding air.
- Brake fluid may overflow when bleeding the brake actuator hose. Do not place the fluid can on the reservoir inlet.
- If the pump motor operates while there is air remaining inside the brake actuator hose, the air will enter the actuator, resulting in difficulty of air bleeding. Remove the No. 1 and No. 2 motor relays until instructed to reinstall them in order to prevent air from coming into the brake actuator hose.
- The actuator pump motor and master pressure cut-off solenoid can operate through a supplemental power source even if the power switch is OFF.
- A buzzer may sound due to the accumulator pressure decline during air bleeding. However, continue bleeding.
- DTCs for problems such as No. 1 and No. 2 motor relay malfunctions and pressure sensor malfunctions are stored after bleeding. Clear the DTCs when instructed during or after bleeding.
- Bleed the brake actuator hose if air enters as a result of the decline of reservoir fluid.

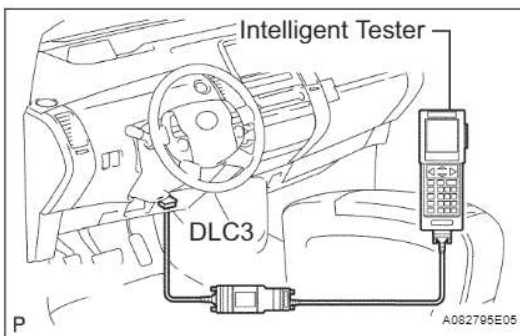
1. PREPARE FOR BLEEDING

- Move the shift lever to the P position and apply the parking brake.
- Connect the intelligent tester to the DLC3 with the power switch OFF as shown in the illustration.
- Turn the power switch ON (IG) and turn on the intelligent tester.

NOTICE:

Do not start the engine.

- Select "DIAGNOSTIC MENU" "ABS/VSC" "AIR BLEEDING" on the intelligent tester.


BR

BR-4**BRAKE – BRAKE FLUID**

AIR BLEEDING

1. Usual

2. Actuator

3. Master Cylinder
or Stroke Simulator

Select the work No.

1

2

3

PRESS [ENTER]

F101050E01

- (e) Select "AIR BLEEDING".
- (1) Select "Usual" if the front/rear brakes were removed, installed or disassembled.
HINT:
Go to "BLEED AIR FROM FRONT AND REAR BRAKE SYSTEMS" if "Usual" is selected.
- (2) Select "Actuator" if the actuator is removed, installed or replaced.
NOTICE:
Be sure to release the pressure out of the actuator before removing. See "BLEED AIR FROM BRAKE ACTUATOR" for bleeding instructions.
HINT:
Go to "BLEED AIR FROM BRAKE ACTUATOR" if "Actuator" is selected.
- (3) Select "Master Cylinder or Stroke Simulator" if the brake master cylinder or the brake stroke simulator was removed, installed or replaced.
HINT:
Go to "BLEED AIR FROM MASTER CYLINDER/STROKE SIMULATOR" if "Master Cylinder or Stroke Simulator" is selected.
- (f) Return to "MENU" and bleed the air again if the display (see illustration for reference) appears during air bleeding.

FAILED

This command can
not be available.

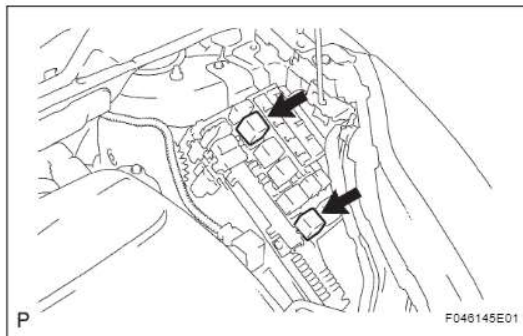
PRESS [ENTER]

F101050E04

BR

BRAKE – BRAKE FLUID

BR-5



- (g) Remove and install the relays as shown in the illustration if instructed to remove and install No. 1 and No. 2 motor relays by the intelligent tester.

2. FILL RESERVOIR WITH BRAKE FLUID

NOTICE:

Wash brake fluid off immediately if it adheres to any painted surface.

- (a) Add brake fluid into the reservoir.

Fluid:

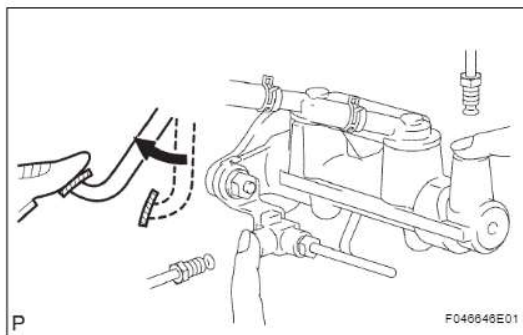
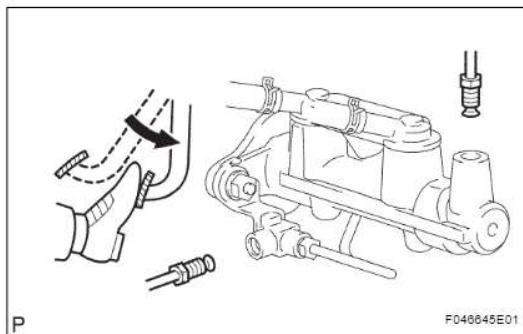
SAE J1703 or FMVSS No. 116 DOT3

3. BLEED AIR FROM MASTER CYLINDER

HINT:

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

- (a) Disconnect the brake lines from the master cylinder.
SST 09023-00100
(b) Slowly depress and hold the brake pedal.



- (c) Cover the outer holes with your fingers, and release the brake pedal.

- (d) Repeat the above steps 3 or 4 times.

- (e) Connect the brake lines to the master cylinder.

SST 09023-00100

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

4. BLEED AIR FROM FRONT AND REAR BRAKE SYSTEMS

NOTICE:

Wash brake fluid off immediately if it adheres to any painted surface.

HINT:

Bleed the air out of the front and rear brake systems in accordance with the display (see illustration for reference).

- (a) Remove the No. 1 and No. 2 motor relays.

NOTICE:

- Remove the No. 1 and No. 2 motor relays before bleeding the air out of the front brake system.
- Be sure to turn the power switch OFF before removing the No. 1 and No. 2 motor relays.

BR

OPERATION

1. Turn the IG OFF.
2. Remove the motor relays No. 1 and No. 2.
3. Turn the IG ON.

PRESS [ENTER]

F101050E05

BR-6

BRAKE – BRAKE FLUID

OPERATION

Perform the usual
air bleeding for
FR and FL wheels.

PRESS [ENTER]

F101060E06

- (b) Bleed the air out of the FR/FL wheels if the display (see illustration for reference) appears.
- (1) Remove the bleeder plug cap.
 - (2) Connect the vinyl tube to the bleeder plug.
 - (3) Depress the brake pedal several times, then loosen the bleeder plug with the brake pedal depressed.
 - (4) When the fluid stops coming out, tighten the bleeder plug, and then release the brake pedal.
Torque: 8.4 N*m (86 kgf*cm, 74 in.*lbf)
 - (5) Repeat the above steps until all the air in the fluid is completely bled out.
 - (6) Install the bleeder plug cap.
 - (7) Repeat the previous procedures to bleed the air out of the brake line for each wheel.

OPERATION

1. Turn the IG OFF.
2. Install the motor relays No. 1 and No. 2.
3. Turn the IG ON.

PRESS [ENTER]

F101060E07

- (c) Install the No. 1 and No. 2 motor relays.

NOTICE:

- **Install the No. 1 and No. 2 motor relays before bleeding the air out of the rear brake system.**
- **Be sure to turn the power switch OFF before installing the No. 1 and No. 2 motor relays.**

BRAKE – BRAKE FLUID

BR-7

OPERATION

Hold the brake pedal depressed and loosen the bleeder plug of RL wheel until all the air in the fluid is completely bled out.

PRESS [ENTER]

F101050E08

- (d) Bleed the air out of the RL wheel if the display (see illustration for reference) appears.

- (1) Remove the bleeder plug cap of RL wheel.
- (2) Connect the vinyl tube to the bleeder plug of RL wheel.
- (3) Depress the brake pedal and loosen the bleeder plug of RL wheel until all the air in the fluid is completely bled out.

NOTICE:

Do not pump the brake pedal. Hold the brake pedal depressed when bleeding the air out of the rear brake system.

HINT:

The actuator motor relay starts operation and oil pressure is applied to the rear brake system if the brake pedal is depressed, which allows air bleeding through the bleeder plug.

- (4) Tighten the bleeder plug if the air is completely bled out.

Torque: 8.4 N*m (86 kgf*cm, 74 in.*lbf)

OPERATION

Hold the brake pedal depressed and loosen the bleeder plug of RR wheel until all the air in the fluid is completely bled out.

PRESS [ENTER]

F101050E09

- (e) Bleed the air out of the RR wheel if the display (see illustration for reference) appears.

- (1) Remove the bleeder plug cap of RR wheel.
- (2) Connect the vinyl tube to the bleeder plug of RR wheel.
- (3) Depress the brake pedal and loosen the bleeder plug of RR wheel until all the air in the fluid is completely bled out.

NOTICE:

Do not pump the brake pedal. Hold the brake pedal depressed when bleeding the air out of the rear brake system.

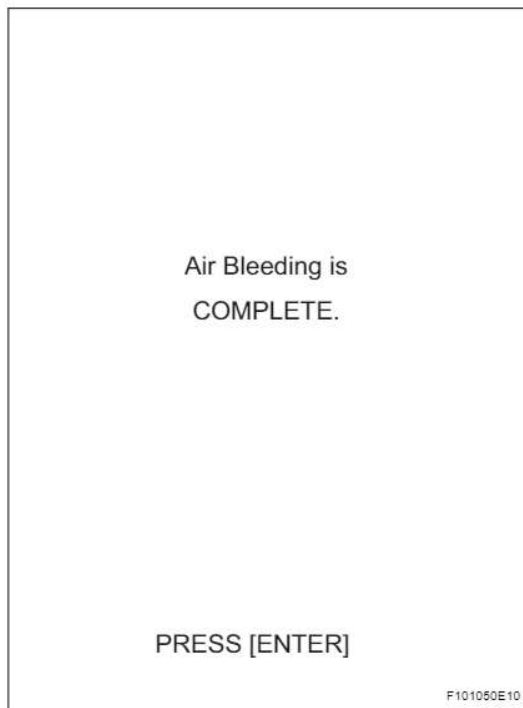
HINT:

The actuator motor relay starts operation and oil pressure is applied to the rear brake system if the brake pedal is depressed, which allows air bleeding through the bleeder plug.

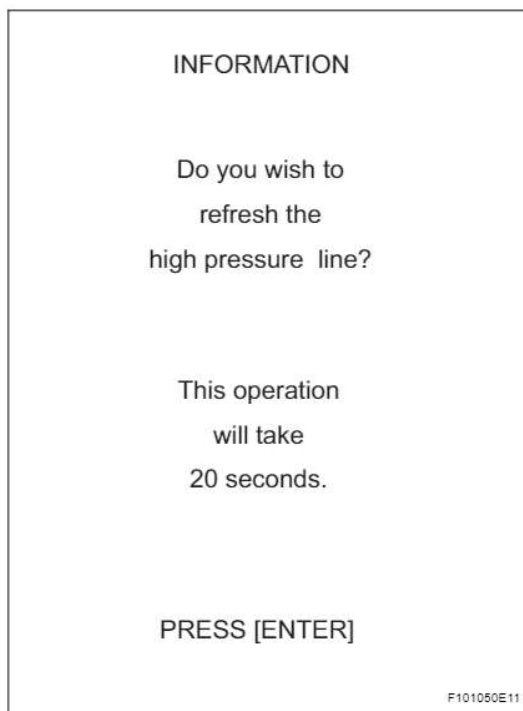
BR

BR-8

BRAKE – BRAKE FLUID



- (f) The air bleeding of the front and rear brake system finishes if the display (see illustration for reference) appears.



5. BLEED AIR FROM BRAKE ACTUATOR

NOTICE:

Wash brake fluid off immediately if it adheres to any painted surface.

HINT:

Bleed the air out of the brake actuator in accordance with the display (see illustration for reference).

- (a) Refresh the high pressure line.

NOTICE:

Be sure to perform this procedure before replacement, removal or installation of the actuator.

HINT:

- Decrease the internal pressure by performing this procedure.
- Count down from 20 seconds.

BR

BRAKE – BRAKE FLUID

BR-9

OPERATION

1. Turn the IG OFF.
2. Remove the motor relays No. 1 and No. 2.
3. Turn the IG ON.
4. Confirm ABS pump motor runs and stops.

PRESS [ENTER]

F101050E02

- (b) Follow the procedures shown on the display (see illustration for reference).

NOTICE:

Be sure to remove the No. 1 and No. 2 motor relays before removing the actuator for replacement, removal or installation.

OPERATION

Perform the usual
air bleeding for
FR and FL wheels.

PRESS [ENTER]

F101050E06

- (c) Follow the procedures shown on the display (see illustration for reference).

HINT:

See "BLEED AIR FROM FRONT AND REAR BRAKE SYSTEMS" for bleeding the air out of the front brake system.

BR

BR-10**BRAKE – BRAKE FLUID****INFORMATION**

Do you wish to
bleed the air out
of the drain line?

This command
activates solenoids
(SLRFR, SLRFL,
SLRRR and SLRRL).

PRESS [ENTER]

F101050E12

OPERATION

1. Depress the brake
pedal 30 times in
30 seconds.
2. Turn the IG OFF.
3. Install the motor
relays No. 1 and
No. 2.
4. Turn the IG ON.

PRESS [ENTER]

F101050E03

- (d) Bleed the air out of the drain line.

NOTICE:

**Be sure to perform this procedure if air remains
in the actuator hose.**

HINT:

Fluid inside the actuator hose returns to the
reservoir tank when performing this procedure.

- (e) Depress the brake pedal 30 times within 30 seconds
while the solenoid is operating.

HINT:

The solenoid stops operation automatically after
approximately 30 seconds.

- (f) Install the No. 1 and No. 2 motor relays.

NOTICE:

- **Install the No. 1 and No. 2 motor relays before
bleeding the air out of the rear brake system.**
- **Be sure to turn the power switch OFF before
installing the No. 1 and No. 2 motor relays.**

BRAKE – BRAKE FLUID**BR-11****OPERATION**

Hold the brake
pedal depressed and
loosen the bleeder
plug of RL wheel
until all the air
in the fluid is
completely bled
out.

PRESS [ENTER]

F101050E08

- (g) Bleed the air out of the rear brake RL wheel.
HINT:
See "BLEED AIR FROM FRONT AND REAR
BRAKE SYSTEMS" for bleeding the air out of the
rear brake system.

OPERATION

Hold the brake
pedal depressed and
loosen the bleeder
plug of RR wheel
until all the air
in the fluid is
completely bled
out.

PRESS [ENTER]

F101050E09

- (h) Bleed the air out of the rear brake RR wheel.
HINT:
See "BLEED AIR FROM FRONT AND REAR
BRAKE SYSTEMS" for bleeding the air out of the
rear brake system.

BR

BR-12

BRAKE – BRAKE FLUID

OPERATION

Loosen the bleeder
plug of FL wheel.

PRESS [ENTER]

F101050E13

(i) Loosen the bleeder plug of FL wheel.

INFORMATION

Do you wish to
bleed the air out
of the power
supply line?

This command
activates solenoids
(SMC2 and SLAFL).

PRESS [ENTER]

F101050E21

(j) Bleed the air out of the power supply line.
HINT:
Air can be bled out of the high pressure line inside
the actuator when performing this procedure.

BRAKE – BRAKE FLUID**BR-13****OPERATION**

Tighten the bleeder
plug of FL wheel.

PRESS [ENTER]

F101050E15

- (k) Tighten the bleeder plug of FL wheel.
Torque: 8.4 N*m (86 kgf*cm, 74 in.*lbf)

INFORMATION

(* / 2)

Do you wish to
bleed the air out
of the stroke
simulator line?

This command
activates solenoids
(SMC2 and SCSS).

PRESS [ENTER]

F101050E22

- (l) Bleed the air out of the stroke simulator line.
HINT:
- See "BLEED AIR FROM BRAKE MASTER CYLINDER/STROKE SIMULATOR" for bleeding the air out of the stroke simulator.
 - Bleed the air out of the stroke simulator twice.
 - The number of times air is bled is displayed as 1/2 (first) and 2/2 (second).

BR

BR-14**BRAKE – BRAKE FLUID****OPERATION**
(*1/2)

Depress the brake
pedal 20 times in
20 seconds.

PRESS [ENTER]

F101050E17

- (1) Depress the brake pedal 20 times in 20 seconds.

HINT:

Depress the brake pedal 20 times at 1 second intervals, holding the pedal down on the last depression.

OPERATION
(*1/2)

Perform the usual
air bleeding for
FL wheel.

PRESS [ENTER]

F101050E18

- (2) Perform the usual air bleeding for the FL wheel.

HINT:

- Loosen the bleeder plug of the FL wheel and bleed the air with the brake pedal depressed.
- See "BLEED AIR FROM FRONT AND REAR BRAKE SYSTEMS" for bleeding instructions.

BR

BRAKE – BRAKE FLUID

BR-15

INFORMATION

(*5)

Do you wish to
refresh the
high pressure line?

This operation
will take
20 seconds.

PRESS [ENTER]

F101050E19

(m) Refresh the high pressure line.

NOTICE:

Keep the fluid inside the reservoir above the "LOW" level by replenishing fluid.

HINT:

- Accumulator pressure is released and accumulated repeatedly, which circulates the fluid inside the accumulator when performing this procedure.
- The high pressure line is refreshed 5 times. The number of times refreshed is displayed as 1/5 (first), 2/5 (second), etc.
- Count down from 20 seconds.

OPERATION

(*5)

1. Turn the IG OFF,
and ON again.

2. Confirm the ABS
motor pump runs and
stops.

PRESS [ENTER]

F101050E23

(n) Turn the power switch OFF. Turn the power switch ON (IG) and check if the ABS motor pump runs and stops.

HINT:

The pump motor rotates and the accumulator is pressurized every time the power switch is turned from OFF to ON (IG).

(o) Return to "MENU".

BR

OPERATION

1. Turn the IG OFF.

2. Remove the motor relays No. 1 and No. 2.

3. Turn the IG ON.

PRESS [ENTER]

F101050E05

OPERATION

Perform the usual air bleeding for FR and FL wheels.

PRESS [ENTER]

F101050E06

6. BLEED AIR FROM MASTER CYLINDER/STROKE SIMULATOR
- NOTICE:
- Wash brake fluid off immediately if it adheres to any painted surface.
- HINT:
- Bleed the air out of the master cylinder/stroke simulator in accordance with the display (see illustration for reference).
- (a) Remove the No. 1 and No. 2 motor relays.
- NOTICE:
- Remove the No. 1 and No. 2 motor relays before bleeding the air out of the front brake system.

• Be sure to turn the power switch OFF before removing the No. 1 and No. 2 motor relays.
- (b) Bleed the air out of the FR/FL wheels in accordance with the display (see illustration for reference).
- HINT:
- Air can be completely bled out of the master cylinder by performing this procedure.

• See "BLEED AIR FROM FRONT AND REAR BRAKE SYSTEMS" for bleeding instructions.

BRAKE – BRAKE FLUID

BR-17

OPERATION

1. Turn the IG OFF.
2. Install the motor relays No. 1 and No. 2.
3. Turn the IG ON.

PRESS [ENTER]

F101050E07

- (c) Install the No. 1 and No. 2 motor relays.

NOTICE:

- **Install the No. 1 and No. 2 motor relays before bleeding the air out of the stroke simulator.**
- **Be sure to turn the power switch OFF before installing the No. 1 and No. 2 motor relays.**

INFORMATION

(*1/2)

Do you wish to
bleed the air out
of the stroke
simulator line?

This command
activates solenoids
(SMC2 and SCSS).

PRESS [ENTER]

F101050E24

- (d) Bleed the air out of the stroke simulator line.

HINT:

- Bleed the air out of the stroke simulator twice.
- The number of times air is bled is displayed as 1/2 (first) and 2/2 (second).

BR

BR-18**BRAKE – BRAKE FLUID****OPERATION**
(*1/2)

Depress the brake
pedal 20 times in
20 seconds.

PRESS [ENTER]

F101050E17

- (1) Depress the brake pedal 20 times in 20 seconds.

HINT:

Depress the brake pedal 20 times at 1 second intervals, holding the brake pedal down on the last depression.

OPERATION
(*1/2)

Perform the usual
air bleeding for
FL wheel.

PRESS [ENTER]

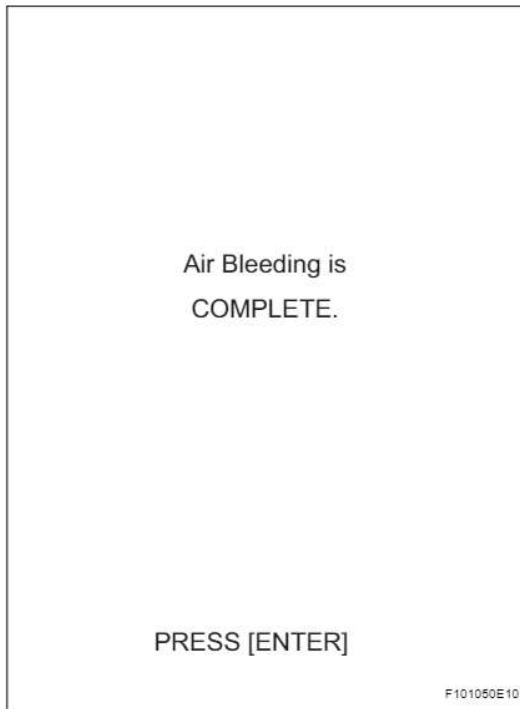
F101050E18

- (2) Perform the usual air bleeding for the FL wheel.

HINT:

- Loosen the bleeder plug of the FL wheel and bleed the air with the brake pedal depressed.
- See "BLEED AIR FROM FRONT AND REAR BRAKE SYSTEMS" for bleeding instructions.

BR

BRAKE – BRAKE FLUID**BR-19**

(e) The air bleeding of the master cylinder/stroke simulator finishes if the display (see illustration for reference) appears.

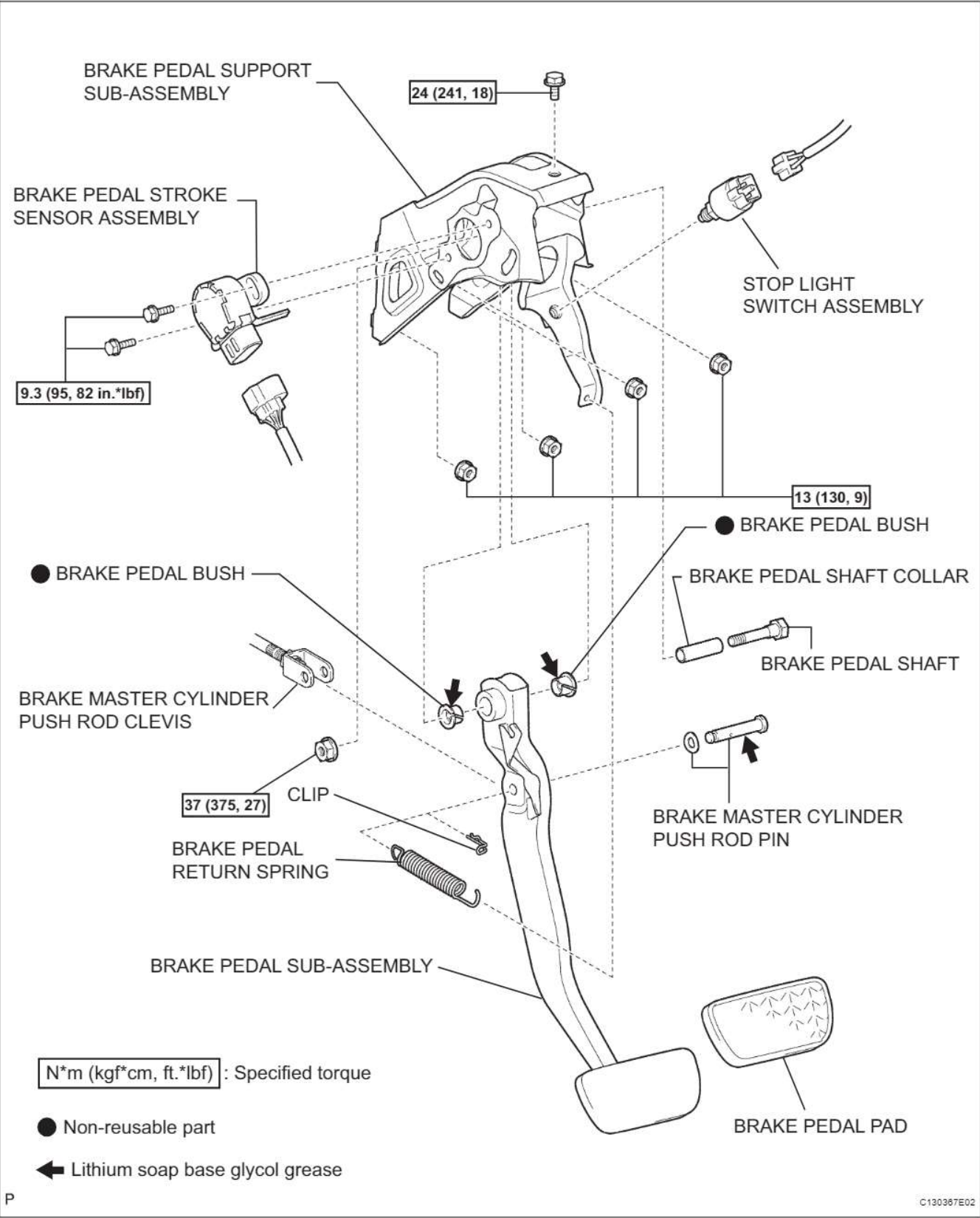
7. CHECK AND CLEAR DTC

(a) Check and clear the DTC (see page [BC-38](#)).

BR

BRAKE PEDAL

COMPONENTS



REMOVAL

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

2. **REMOVE INSTRUMENT PANEL SUB-ASSEMBLY**

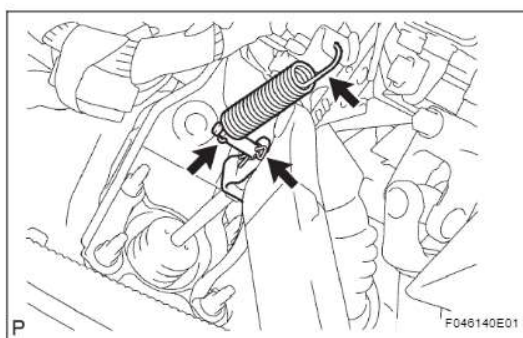
- (a) Remove the instrument panel (see page IP-5).

HINT:

Refer to the procedures from the removal of the No. 1 instrument panel register assembly up until the removal of the instrument panel sub-assembly.

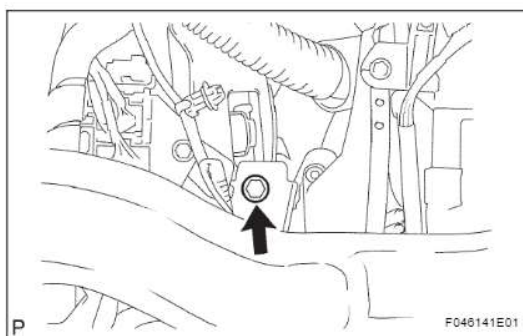
3. **REMOVE MASTER CYLINDER PUSH ROD CLEVIS**

- (a) Remove the brake pedal return spring.
- (b) Remove the clip and brake master cylinder push rod pin.
- (c) Separate the push rod clevis from the brake pedal.

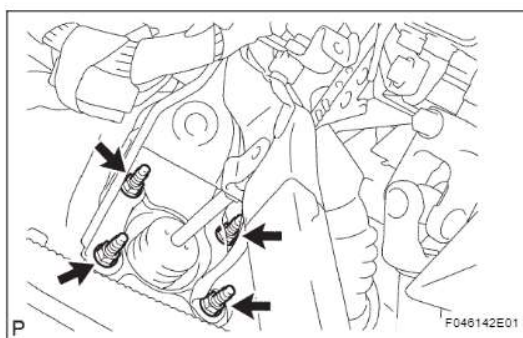


4. **REMOVE BRAKE PEDAL SUPPORT SUB-ASSEMBLY**

- (a) Disconnect the connector from the stop light switch.
- (b) Disconnect the connector from the brake pedal stroke sensor.
- (c) Remove the bolt from the instrument panel upper panel side.



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



BR-22

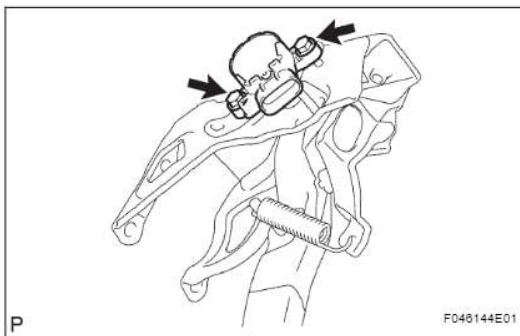
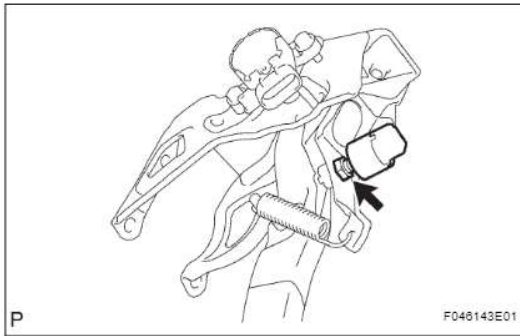
BRAKE – BRAKE PEDAL

DISASSEMBLY

1. REMOVE BRAKE PEDAL PAD

2. REMOVE STOP LIGHT SWITCH ASSEMBLY

- (a) Loosen the stop light switch lock nut and remove the stop light switch from the brake pedal support.



3. REMOVE BRAKE PEDAL STROKE SENSOR ASSEMBLY

- (a) Remove the 2 bolts and brake pedal stroke sensor from the brake pedal support.

4. REMOVE BRAKE PEDAL SUB-ASSEMBLY

- (a) Remove the nut from the brake pedal shaft.
 (b) Remove the brake pedal shaft and separate the brake pedal from the brake pedal support.
 (c) Remove the 2 brake pedal bushes from the brake pedal.
 (d) Remove the brake pedal shaft collar from the brake pedal shaft.

ADJUSTMENT

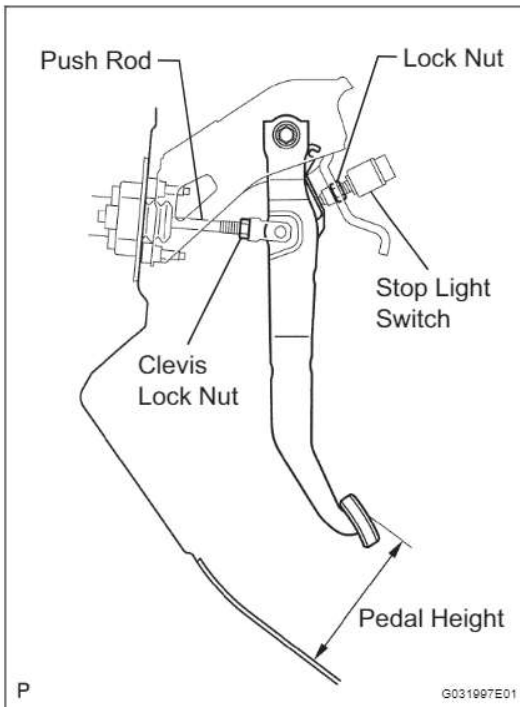
1. CHECK AND ADJUST BRAKE PEDAL HEIGHT

NOTICE:

Pull up the floor carpet and dash panel insulator, and then check and adjust the brake pedal height.

- (a) Remove the lower instrument panel finish panel (see page [IP-6](#)).
 (b) Inspect brake pedal height.
Pedal height from the top of the asphalt sheet:
138 to 148 mm (5.433 to 5.827 in.)
 (c) Adjust brake pedal height.
 (1) Disconnect the connector from the stop light switch.
 (2) Loosen the stop light switch lock nut. Turn the switch in order to give the pedal some free play.
 (3) Loosen the clevis lock nut. Turn the push rod and adjust the pedal height.
 (4) Tighten the clevis lock nut.

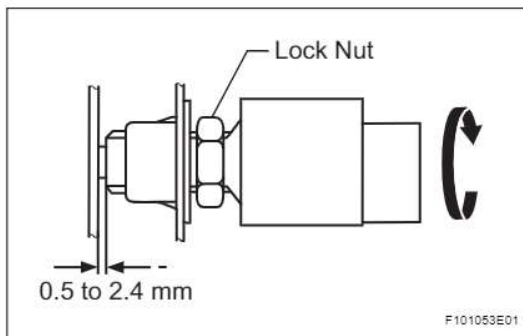
Torque: 26 N*m (265 kgf*cm, 19 ft.*lbf)



BR

BRAKE – BRAKE PEDAL

BR-23



- (5) Turn the stop light switch so that the clearance between its thread portion tip and the area where the pedal makes contact is between 0.5 to 2.4 mm (0.020 to 0.095 in.). Tighten the lock nut.

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

- (6) Connect the connector to the stop light switch.
 (7) Connect the intelligent tester to the DLC3.
 (8) Loosen the stroke sensor set bolts.

- (9) Turn the power switch ON (IG). Read the stroke sensor 1 value displayed on the data monitor using the intelligent tester. Slowly turn the stroke sensor to the right and left to adjust it to the standard value.

Standard voltage:

0.8 to 1.2 V

- (10) Tighten the stroke sensor set bolts.

Torque: 9.3 N*m (95 kgf*cm, 82 in.*lbf)

CAUTION:

Do not depress the brake pedal after the power switch turns ON (IG).

- (11) Carry out system initialization (see page [BC-19](#)).

- (d) Install lower instrument panel finish panel (see page [IP-13](#)).

2. CHECK BRAKE PEDAL FREE PLAY

- (a) Depress the brake pedal several times strongly after the engine stops.

- (b) Check the brake pedal free play.

Standard pedal free play:

0.5 to 4 mm (0.02 to 0.16 in.)

If incorrect, proceed to the following step.

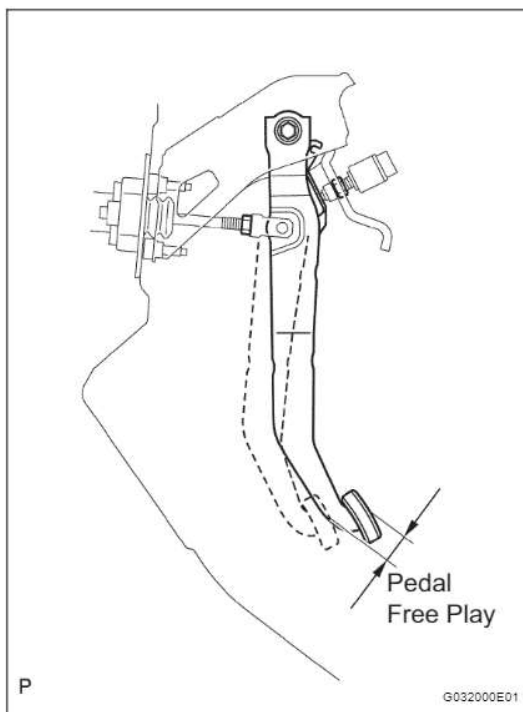
- (1) Check the stop light switch clearance.

Standard stop light switch clearance:

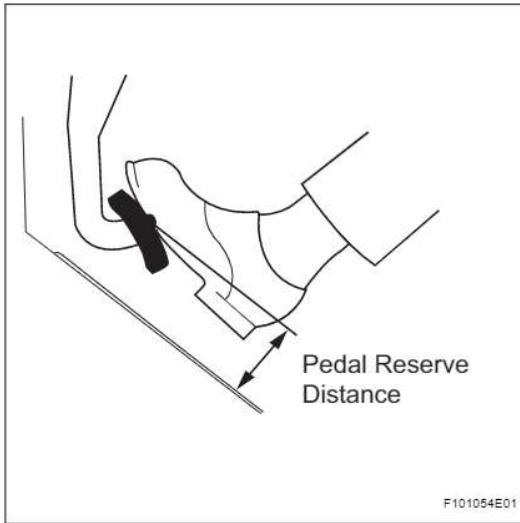
0.5 to 2.4 mm (0.020 to 0.095 in.)

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

If incorrect, adjust the stop light switch clearance.



BR

BR-24**BRAKE – BRAKE PEDAL****3. CHECK BRAKE PEDAL RESERVE DISTANCE**

- (a) Release the parking brake pedal.
- (b) With engine running, depress the pedal and measure the pedal reserve distance, as shown in the illustration.

Standard pedal reserve distance (from the top of the asphalt sheet):

196 N (20 kgf, 44.1 lbf): More than 104 mm (4.1 in.)

NOTICE:

Pull up the floor carpet and dash panel insulator, and then check the brake pedal reserve distance.

If incorrect, troubleshoot the brake system.

BRAKE – BRAKE PEDAL

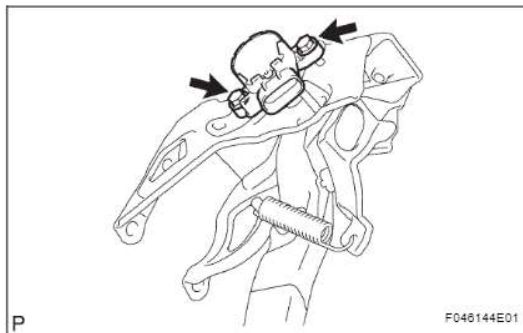
BR-25

REASSEMBLY

1. INSTALL BRAKE PEDAL SUB-ASSEMBLY

- Apply lithium soap base glycol grease to 2 new brake pedal bushes. Install the brake pedal bushes to the brake pedal.
- Install the brake pedal shaft collar to the brake pedal shaft.
- Install the brake pedal to the brake pedal support with the brake pedal shaft and nut.

Torque: 37 N*m (375 kgf*cm, 27 ft.*lbf)



2. INSTALL BRAKE PEDAL STROKE SENSOR ASSEMBLY

- Install the brake pedal stroke sensor to the brake pedal support with the 2 bolts.

HINT:

Tighten the bolts when checking and adjusting the brake pedal height.



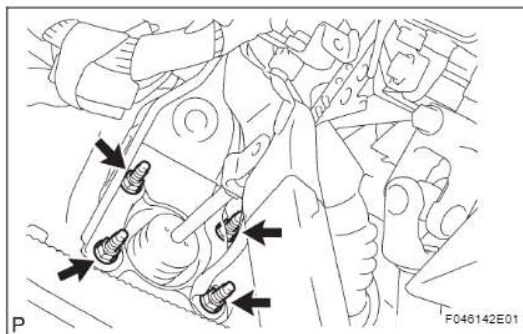
3. INSTALL STOP LIGHT SWITCH ASSEMBLY

- Turn the stop light switch clockwise and install it to the brake pedal support.

HINT:

Tighten the lock nut when checking and adjusting the brake pedal height.

4. INSTALL BRAKE PEDAL PAD

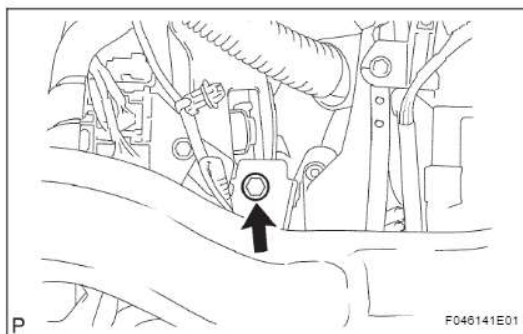


INSTALLATION

1. INSTALL BRAKE PEDAL SUPPORT SUB-ASSEMBLY

- Install the brake pedal support with the 4 nuts.

Torque: 13 N*m (130 kgf*cm, 9 ft.*lbf)

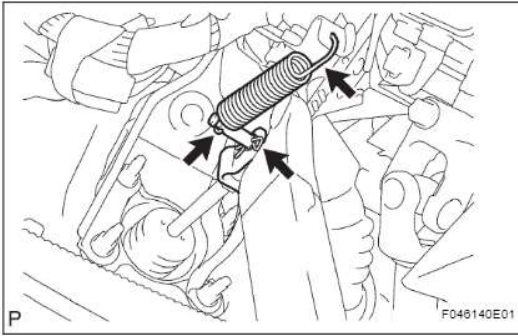


- Install the brake pedal support to the instrument panel side with the bolt.

Torque: 24 N*m (241 kgf*cm, 18 ft.*lbf)

- Connect the connector to the stop light switch.
- Connect the connector to the brake pedal stroke sensor.

BR

BR-26**BRAKE – BRAKE PEDAL****2. INSTALL MASTER CYLINDER PUSH ROD CLEVIS**

- (a) Apply lithium soap base glycol grease to the circumference of the brake master cylinder push rod pin.
- (b) Install the push rod clevis to the brake pedal with the brake master cylinder push rod pin.
- (c) Install the clip and brake pedal return spring.

3. INSTALL INSTRUMENT PANEL SUB-ASSEMBLY

- (a) Install the instrument panel (see page [IP-11](#)).

HINT:

Refer to the procedures from the installation of the instrument panel sub-assembly up until the installation of the No 1. instrument panel register assembly.

4. CHECK AND ADJUST BRAKE PEDAL HEIGHT (See page [BR-22](#))**5. CHECK BRAKE PEDAL FREE PLAY (See page [BR-23](#))****6. CHECK BRAKE PEDAL RESERVE DISTANCE (See page [BR-24](#))****7. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL****8. PERFORM INITIALIZATION**

- (a) Perform initialization (see page [IN-32](#)).

NOTICE:

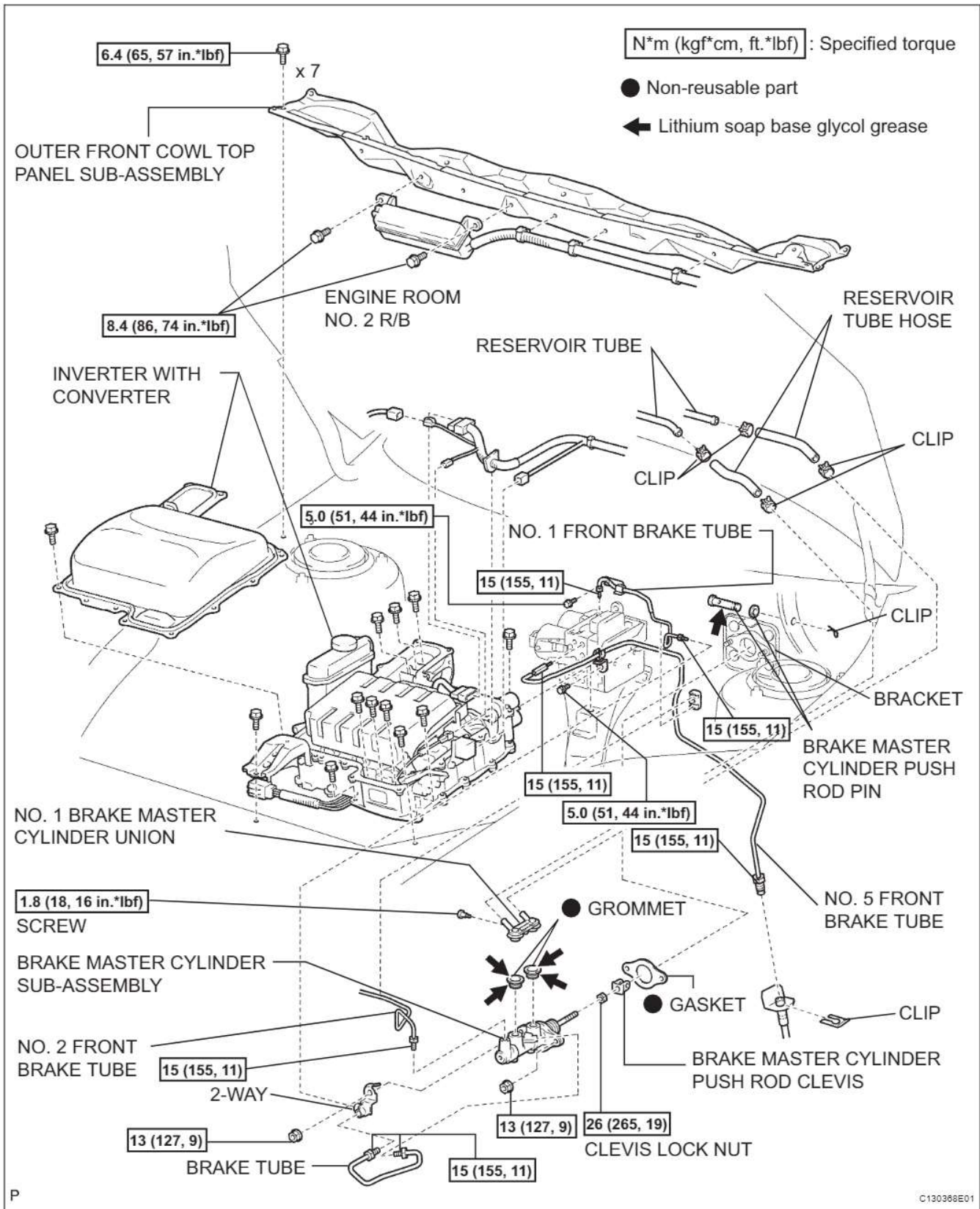
Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.

BR-26

BRAKE – BRAKE MASTER CYLINDER

BRAKE MASTER CYLINDER

COMPONENTS



ON-VEHICLE INSPECTION

NOTICE:

The DTC may be stored after inspection. Be sure to clear the DTC and check that a normal system code is output after the inspection is finished.

1. INSPECT BRAKE MASTER CYLINDER

- (a) Check battery voltage.

Standard battery voltage:

10 to 14 V (during engine stop)

- (b) Connect intelligent tester and pedal effort gauge.
- (1) Connect the pedal effort gauge.
 - (2) Move the shift lever to the P position. Apply the parking brake and connect the intelligent tester to the DLC3.
 - (3) Turn the power switch ON (IG).
 - (4) Clear the DTC (see page [BC-38](#)).
- (c) Check operation w/o brake booster.
- (1) Check and adjust brake pedal height (see page [BR-22](#)).
 - (2) Check pedal free play (see page [BR-23](#)).
 - (3) Check pedal reserve distance (see page [BR-24](#)).
 - (4) Turn on the intelligent tester and select "ECB INVALID" to prohibit the brake control (ECB).
 - (5) Monitor "MAS CYL PRS 1", "MAS CYL PRS 2", "PEDAL STROKE" and "PEDAL STROKE 2" using the intelligent tester.
 - (6) Check the value output from "MAS CYL PRS 1", "MAS CYL PRS 2", "PEDAL STROKE" and "PEDAL STROKE 2" by depressing the brake pedal.

Standard output voltage

Pedal Effort N (kgf, lbf)	MAS CYL PRS 1 (V)	MAS CYL PRS 2 (V)	PEDAL STROKE (V)	PEDAL STROKE 2 (V)
200 (20.4, 45)	0.9 to 1.2	0.9 to 1.2	1.7 to 2.1	2.9 to 3.3
500 (51, 112)	1.7 to 2.2	1.7 to 2.2	1.9 to 2.3	2.7 to 3.1

- (7) Finish the brake control prohibition on the intelligent tester.

BR-28

BRAKE – BRAKE MASTER CYLINDER

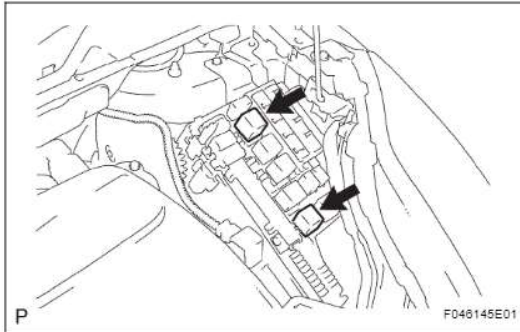
REMOVAL

1. REMOVE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY

- (a) Remove the windshield wiper motor and link (see page [WW-13](#)).

HINT:

Refer to the procedures from the removal of the front wiper arm LH/RH up until the removal of the windshield wiper motor and link assembly.



2. SET BRAKE CONTROL (ECB) OFF

NOTICE:

Prohibit the brake control (ECB) before bleeding the brake fluid.

- (a) With the power switch OFF to prohibit brake control, remove the No. 1 and No. 2 motor relays.

NOTICE:

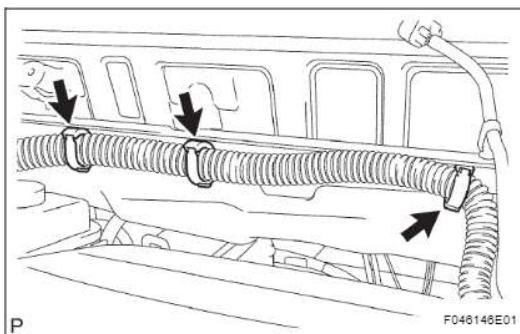
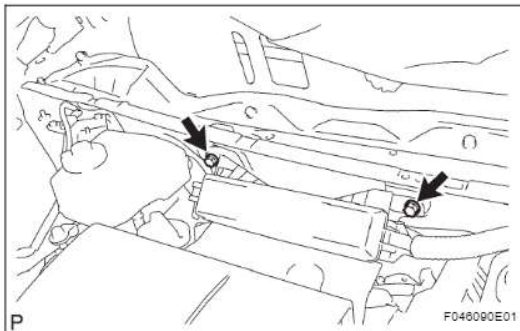
If the pump motor operates while there is air remaining inside the brake actuator hose, the air will enter the actuator, resulting in difficulty in air bleeding.

HINT:

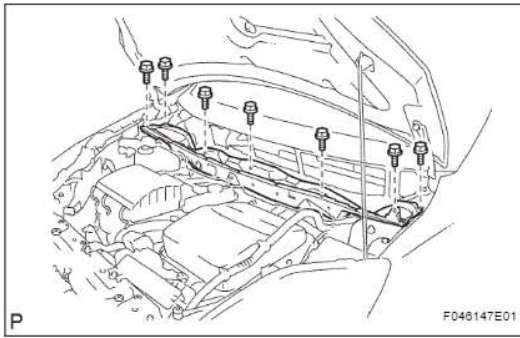
Brake control (ECB) can be prohibited by selecting "ECB INVALID" on the intelligent tester.

3. REMOVE OUTER FRONT COWL TOP PANEL SUB-ASSEMBLY

- (a) Remove the 2 bolts and engine room No. 2 R/B.



- (b) Remove the 3 clamps from the outer front cowl top panel.

BRAKE – BRAKE MASTER CYLINDER**BR-29**

(c) Remove the 7 bolts and outer front cowl top panel.

4. REMOVE INVERTER WITH CONVERTER

(a) Remove the inverter with converter (see page [HV-530](#)).

HINT:

Refer to the procedures from the removal of the engine under cover LH up until the removal of the inverter with converter.

5. DRAIN BRAKE FLUID

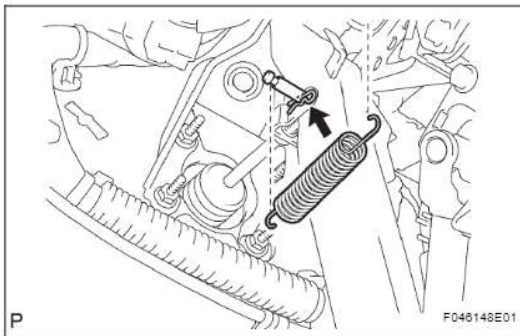
NOTICE:

Wash brake fluid off immediately if it adheres to any painted surface.

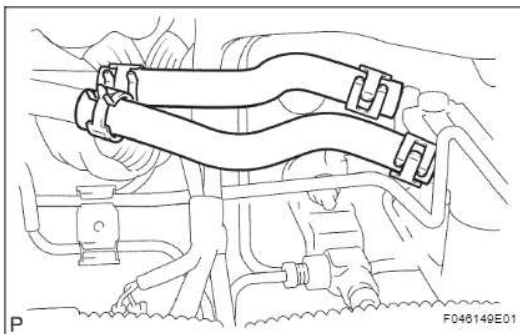
6. REMOVE NO. 1 INSTRUMENT PANEL REGISTER ASSEMBLY (See page [IP-5](#))**7. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY (See page [IP-6](#))****8. REMOVE BRAKE MASTER CYLINDER SUB-ASSEMBLY**

(a) Remove the brake return spring.

(b) Remove the clip and brake master cylinder push rod pin, and disconnect the push rod clevis from the brake pedal.



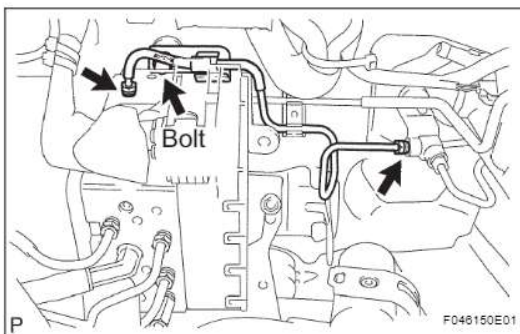
(c) Remove the 4 clips and 2 reservoir tube hoses.

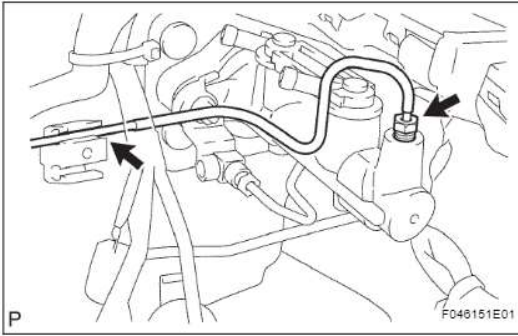


(d) Remove the bolt from the actuator bracket.

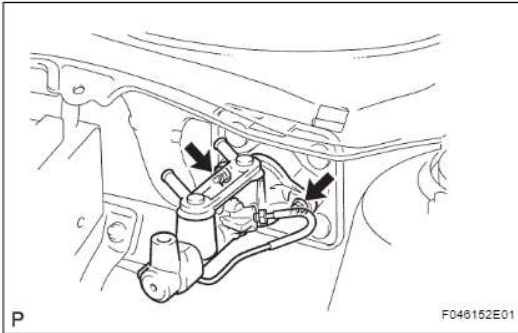
(e) Using SST, remove the No. 1 front brake tube.

SST 09023-00101

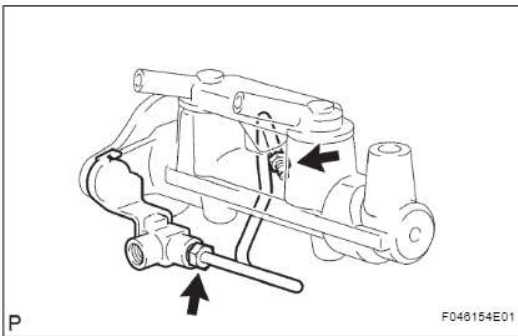
**BR**

BR-30**BRAKE – BRAKE MASTER CYLINDER**

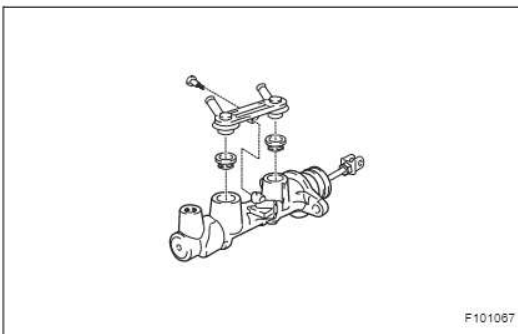
- (f) Using SST, disconnect the No. 2 front brake tube from the clamp and brake master cylinder.
SST 09023-00101



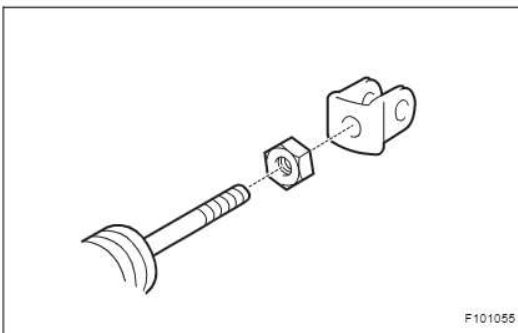
- (g) Remove the 2 nuts, brake master cylinder gasket and brake master cylinder from the bracket.



- (h) Using SST, remove the brake tube and 2-way from the brake master cylinder.
SST 09023-00101



- (i) Remove the screw, No. 1 brake master cylinder union and 2 grommets from the brake master cylinder.



- (j) Loosen the clevis lock nut and remove the brake master cylinder push rod clevis.

BR

BRAKE – BRAKE MASTER CYLINDER**BR-31****INSTALLATION****1. INSTALL BRAKE MASTER CYLINDER SUB-ASSEMBLY**

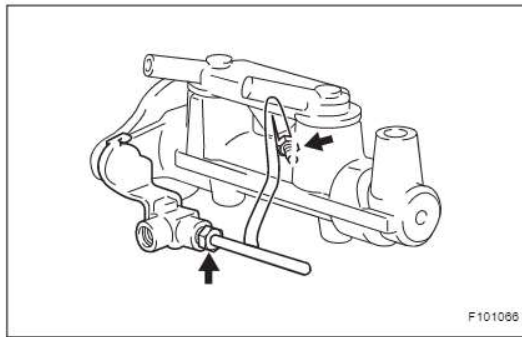
- (a) Install the brake master cylinder push rod clevis to the brake master cylinder, and tighten the lock nut.

HINT:

After adjusting the brake pedal height, torque the lock nut.

- (b) Apply lithium soap base glycol grease to 2 new grommets.
- (c) Install the No. 1 brake master cylinder union and 2 grommets to the brake master cylinder with the screw.

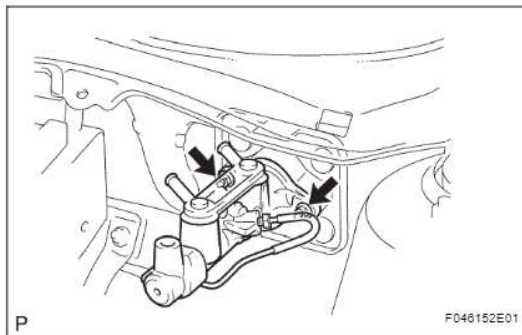
Torque: 1.8 N*m (18 kgf*cm, 16 in.*lbf)



- (d) Using SST, install the brake tube and 2-way to the brake master cylinder.

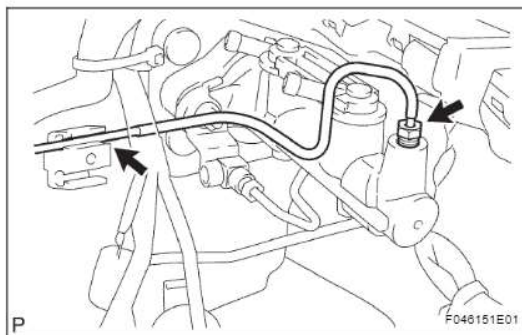
SST 09023-00101

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



- (e) Placing the gasket inbetween, install the brake master cylinder to the bracket with the 2 nuts.

Torque: 13 N*m (127 kgf*cm, 9 ft.*lbf)

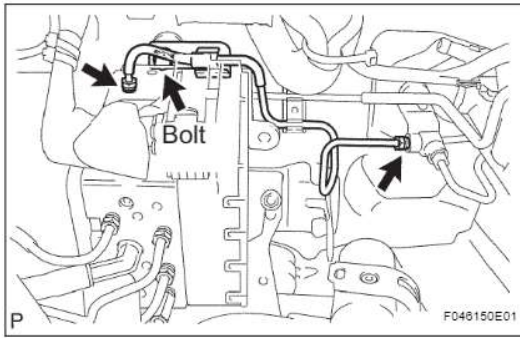


- (f) Using SST, connect the No. 2 front brake tube to the clamp and brake master cylinder.

SST 09023-00101

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

BR

BR-32**BRAKE – BRAKE MASTER CYLINDER**

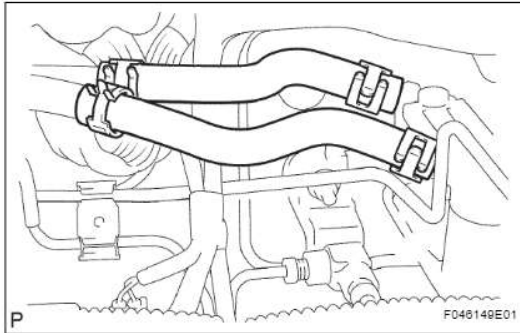
- (g) Using SST, install the No. 1 front brake tube.

SST 09023-00101

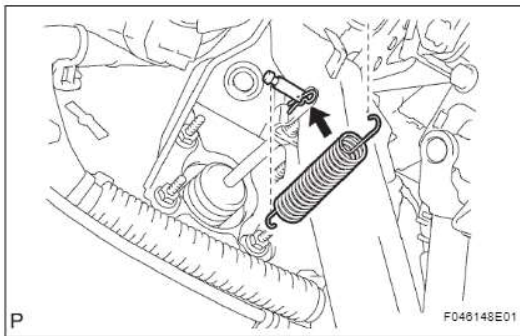
Torque: 15 N*m (155 kgf*cm, 11 ft.*lbf)

- (h) Install the bolt to the actuator bracket.

Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)



- (i) Install the 2 reservoir tube hoses and hold them there with the 4 clips.



- (j) Connect the push rod clevis to the brake pedal with the brake master cylinder push rod pin.

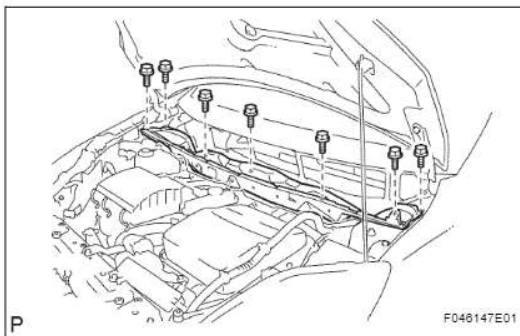
- (k) Install the clip and brake pedal return spring.

2. INSTALL INVERTER WITH CONVERTER

- (a) Install the inverter with converter (see page [HV-535](#)).

HINT:

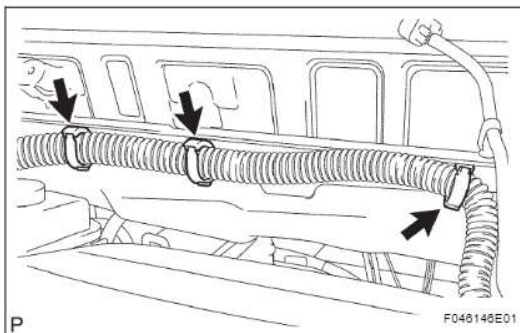
Refer to the procedures from the installation of the inverter with converter up until the installation of the engine under cover LH.



3. INSTALL OUTER FRONT COWL TOP PANEL SUB-ASSEMBLY

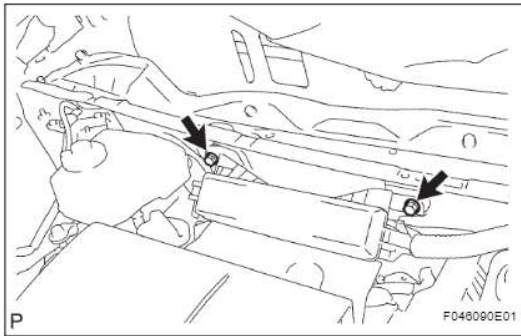
- (a) Install the outer front cowl top panel with the 7 bolts.

Torque: 6.4 N*m (65 kgf*cm, 57 in.*lbf)



- (b) Install the 3 clamps to the outer front cowl top panel.

BR

BRAKE – BRAKE MASTER CYLINDER**BR-33**

- (c) Install the engine room No. 2 R/B with the 2 bolts.
Torque: 8.4 N*m (86 kgf*cm, 74 in.*lbf)

4. INSTALL WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY

- (a) Install the windshield wiper motor and link (see page [WW-15](#)).

HINT:

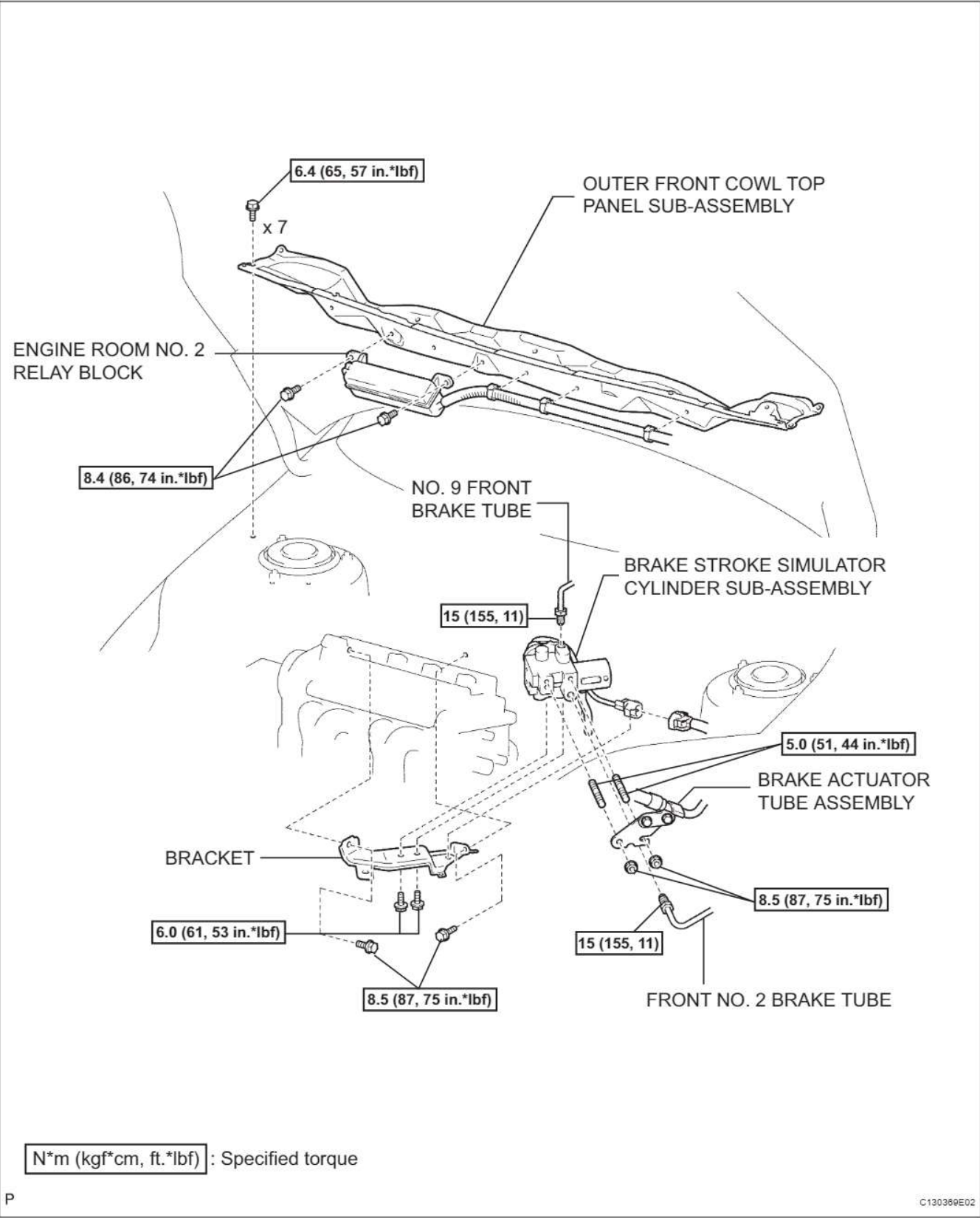
Refer to the procedures from the installation of the windshield wiper motor and link assembly up until the installation of the front wiper arm LH/RH.

5. **FILL RESERVOIR WITH BRAKE FLUID** (See page [BR-5](#))
6. **BLEED AIR FROM MASTER CYLINDER** (See page [BR-5](#))
7. **BLEED AIR FROM MASTER CYLINDER/STROKE SIMULATOR** (See page [BR-16](#))
8. **CHECK FOR BRAKE FLUID LEAKAGE**
9. **CHECK BRAKE FLUID LEVEL IN RESERVOIR**
10. **CHECK AND ADJUST BRAKE PEDAL HEIGHT** (See page [BR-22](#))
11. **CHECK BRAKE PEDAL FREE PLAY** (See page [BR-23](#))
12. **CHECK BRAKE PEDAL RESERVE DISTANCE** (See page [BR-24](#))
13. **INSTALL LOWER INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY** (See page [IP-13](#))
14. **INSTALL NO. 1 INSTRUMENT PANEL REGISTER ASSEMBLY** (See page [IP-13](#))
15. **CHECK AND CLEAR DTC**
 - (a) Check and clear the DTC (see page [BC-38](#)).

BR

BRAKE STROKE SIMULATOR CYLINDER

COMPONENTS



ON-VEHICLE INSPECTION

NOTICE:

The DTC may be stored after inspection. Be sure to clear the DTC and check that a normal system code is output after the inspection is finished.

1. INSPECT STROKE SIMULATOR

- (a) Check battery voltage.

Standard battery voltage:

10 to 14 V (during engine stop)

- (b) Connect intelligent tester and pedal effort gauge.
- (1) Connect the pedal effort gauge.
 - (2) Move the shift lever to the P position. Apply the parking brake and connect the intelligent tester to the DLC3.
 - (3) Turn the power switch ON (IG).
 - (4) Clear the DTC (see page [BC-38](#)).
- (c) Check operation w/o brake booster.
- (1) Check and adjust brake pedal height (see page [BR-22](#)).
 - (2) Check pedal free play (see page [BR-23](#)).
 - (3) Check pedal reserve distance (see page [BR-24](#)).
 - (4) Turn on the intelligent tester and select "ECB INVALID" to prohibit the brake control (ECB).
 - (5) Monitor "MAS CYL PRS 1", "MAS CYL PRS 2", "PEDAL STROKE" and "PEDAL STROKE 2" using the intelligent tester.
 - (6) Check the value output from "MAS CYL PRS 1", "MAS CYL PRS 2", "PEDAL STROKE" and "PEDAL STROKE 2" by depressing the brake pedal.

Standard output voltage

Pedal Effort N (kgf, lbf)	MAS CYL PRS 1 (V)	MAS CYL PRS 2 (V)	PEDAL STROKE (V)	PEDAL STROKE 2 (V)
200 (20.4, 45)	0.9 to 1.2	0.9 to 1.2	1.7 to 2.1	2.9 to 3.3
500 (51, 112)	1.7 to 2.2	1.7 to 2.2	1.9 to 2.3	2.7 to 3.1

- (7) Finish the brake control prohibition on the intelligent tester.
- (d) Check operation w/ brake booster.
- (1) Turn the power switch ON (IG).
 - (2) Turn on the intelligent tester and monitor the value of "PEDAL STROKE" and "PEDAL STROKE 2".
 - (3) Depress the brake pedal 4 to 5 times.
 - (4) Check the value output from "PEDAL STROKE" and "PEDAL STROKE 2" by depressing the brake pedal.

Standard output voltage

Pedal Effort N (kgf, lbf)	PEDAL STROKE (V)	PEDAL STROKE 2 (V)
50 (5.1, 11)	1.1 to 1.7	3.3 to 3.8
100 (10.2, 22)	1.3 to 1.8	3.2 to 3.7

BR

BR-36

BRAKE – BRAKE STROKE SIMULATOR CYLINDER

Pedal Effort N (kgf, lbf)	PEDAL STROKE (V)	PEDAL STROKE 2 (V)
150 (15.3, 34)	1.4 to 1.8	3.2 to 3.6
200 (20.4, 45)	1.4 to 1.8	3.2 to 3.6

BR

REMOVAL

1. REMOVE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY

- (a) Remove the windshield wiper motor and link (see page [WW-13](#)).

HINT:

Refer to the procedures from the removal of the front wiper arm LH/RH up until the removal of the windshield wiper motor and link assembly.

2. SET BRAKE CONTROL (ECB) OFF (See page [BR-28](#))

3. REMOVE OUTER FRONT COWL TOP PANEL SUB-ASSEMBLY (See page [BR-28](#))

4. DRAIN BRAKE FLUID

NOTICE:

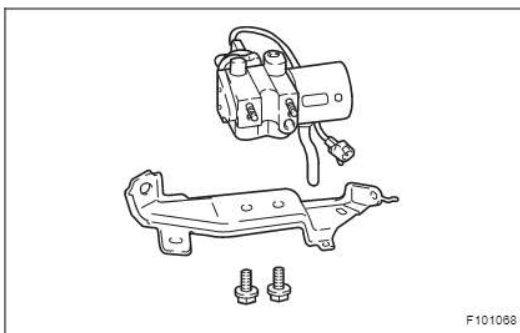
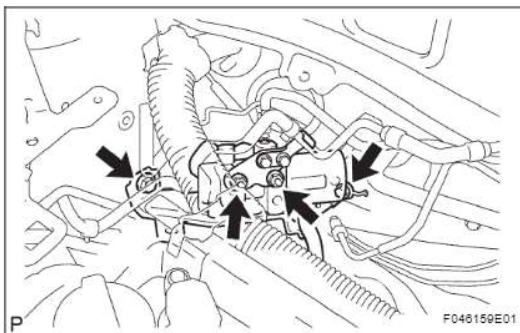
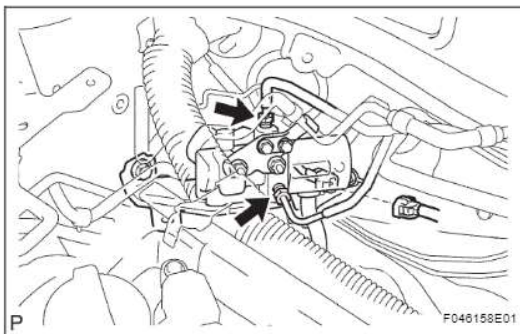
Wash brake fluid off immediately if it adheres to any painted surface.

5. REMOVE BRAKE STROKE SIMULATOR CYLINDER SUB-ASSEMBLY

- (a) Using SST, disconnect the 2 brake tubes from the brake simulator cylinder.

SST 09023-00101

- (b) Disconnect the connector.

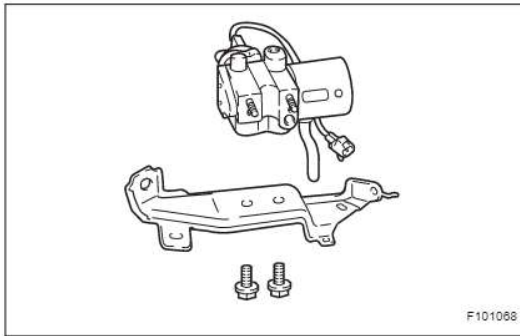


- (c) Remove the 2 nuts, 2 bolts and brake stroke simulator cylinder with bracket.

- (d) Remove the 2 bolts, connector clamp and bracket from the brake stroke simulator cylinder.

- (e) Remove the 2 stud bolts from the brake stroke simulator cylinder.

BR

BR-38**BRAKE – BRAKE STROKE SIMULATOR CYLINDER****INSTALLATION****1. INSTALL BRAKE STROKE SIMULATOR CYLINDER SUB-ASSEMBLY**

- (a) Install the 2 stud bolts to the brake stroke simulator cylinder.

Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

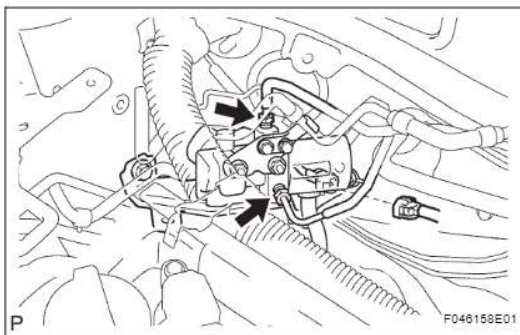
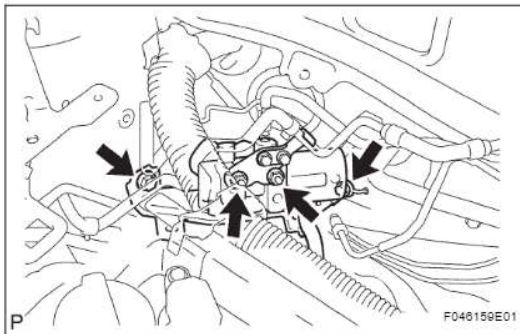
- (b) Install the brake stroke simulator cylinder to the bracket with the 2 bolts.

Torque: 6.0 N*m (61 kgf*cm, 53 in.*lbf)

- (c) Install the connector clamp of the brake stroke simulator cylinder to the bracket.

- (d) Install the brake stroke simulator cylinder with bracket to the body with the 2 nuts and 2 bolts.

Torque: 8.5 N*m (87 kgf*cm, 75 in.*lbf)



- (e) Using SST, connect the 2 brake tubes to the brake stroke simulator cylinder.

SST 09023-00101

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

- (f) Connect the connector.

2. INSTALL OUTER FRONT COWL TOP PANEL SUB-ASSEMBLY (See page BR-32)**3. INSTALL WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY**

- (a) Install the windshield wiper motor and link (see page WW-15).

HINT:

Refer to the procedures from the installation of the windshield wiper motor and link assembly up until the installation of the front wiper arm LH/RH.

4. FILL RESERVOIR WITH BRAKE FLUID (See page BR-5)**5. BLEED AIR FROM MASTER CYLINDER/STROKE SIMULATOR (See page BR-16)****6. CHECK FOR BRAKE FLUID LEAKAGE****7. CHECK FLUID LEVEL IN RESERVOIR****8. CHECK AND CLEAR DTC**

- (a) Check and clear the DTC (see page BC-38).

9. PERFORM SYSTEM INITIALIZATION

- (a) Perform the brake system initialization (see page BC-19).

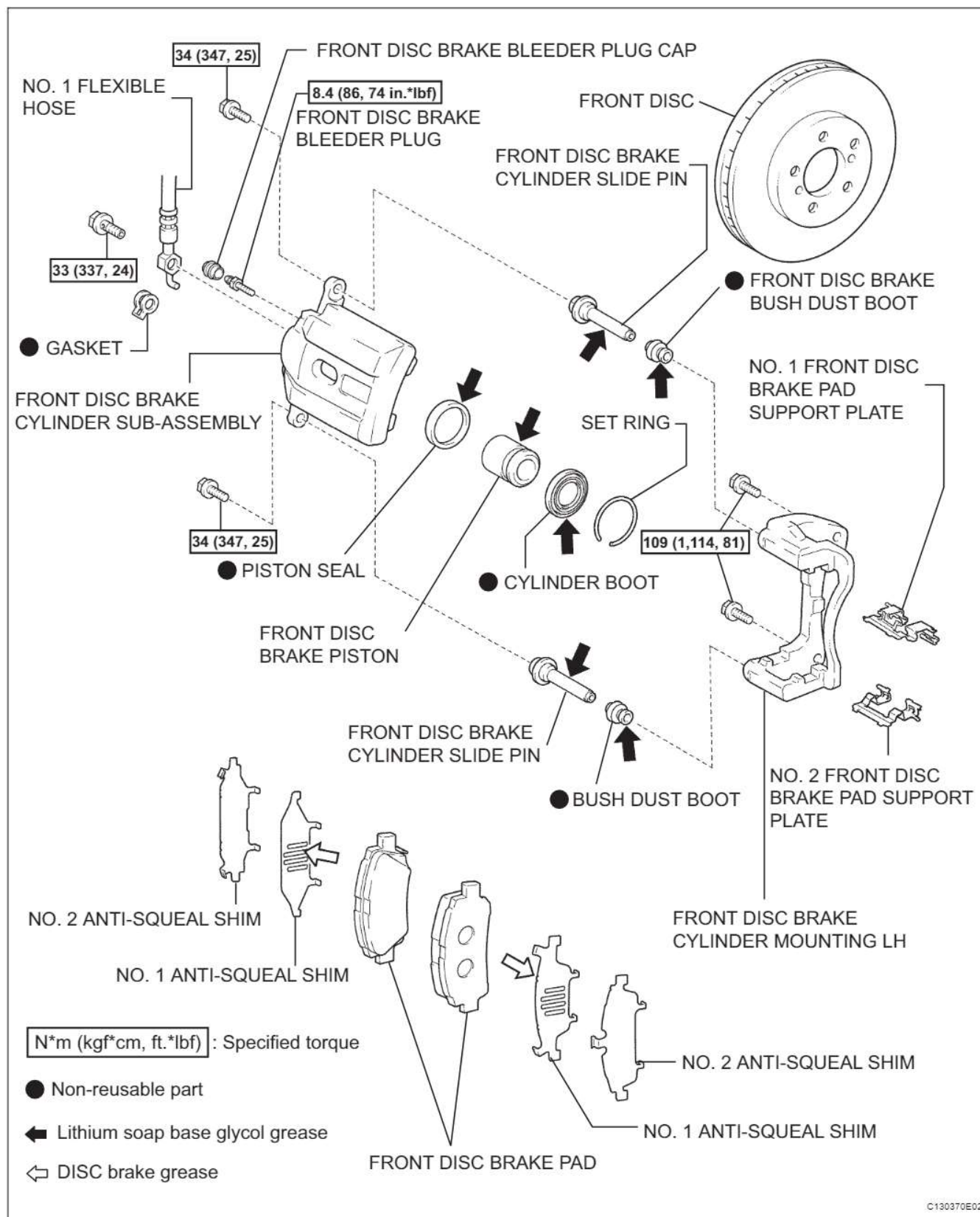
10. CHECK OPERATION (See page BR-35)**BR**

BRAKE – FRONT BRAKE

BR-39

FRONT BRAKE

COMPONENTS



C130370E02

BR

BR-40**BRAKE – FRONT BRAKE****REMOVAL****HINT:**

- Use the same procedures for the LH side and RH side.
- The procedures listed below are for the LH side.
- If work that does not involve brake fluid bleeding, such as disc brake pad replacement, is started 2 minutes or more after the power switch is turned OFF, brake control (ECB) prohibition is not necessary.

1. REMOVE FRONT WHEEL**2. SET BRAKE CONTROL (ECB) OFF (See page [BR-28](#))****3. DRAIN BRAKE FLUID****NOTICE:**

Wash brake fluid off immediately if it adheres to any painted surface.

4. REMOVE FRONT DISC BRAKE CYLINDER SUB-ASSEMBLY

- Remove the union bolt and gasket, and disconnect the No. 1 flexible hose from the front disc brake cylinder.
- Hold the front disc brake cylinder slide pin using a wrench. Remove the 2 bolts and separate the front disc brake cylinder.

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

- Remove the 2 front disc brake pads from the front disc brake cylinder mounting.

6. REMOVE FRONT ANTI-SQUEAL SHIM KIT

- Remove the 2 No. 1 anti-squeal shims and 2 No. 2 anti-squeal shims from the front disc brake pads.

7. REMOVE NO. 1 FRONT DISC BRAKE PAD SUPPORT PLATE

- Remove the No. 1 pad support plate from the front disc brake cylinder mounting.

8. REMOVE NO. 2 FRONT DISC BRAKE PAD SUPPORT PLATE

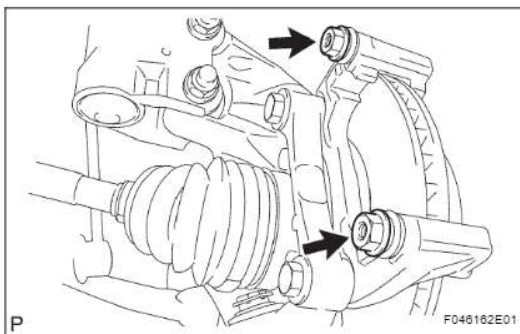
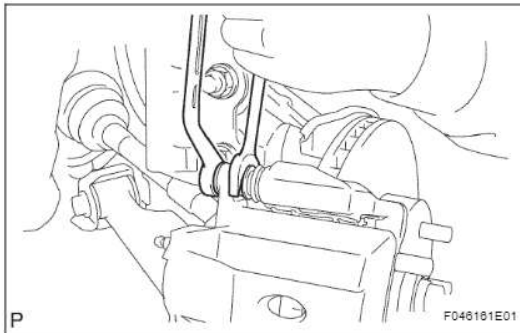
- Remove the No. 2 pad support plate from the front disc brake cylinder mounting.

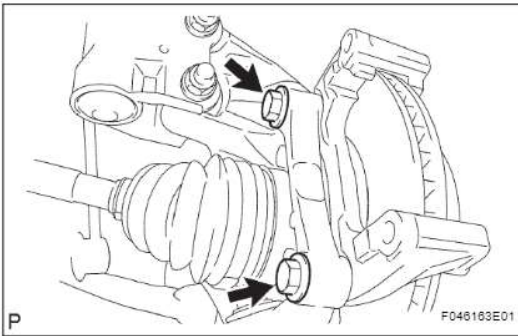
9. REMOVE FRONT DISC BRAKE CYLINDER SLIDE PIN

- Pull off the 2 front disc brake cylinder slide pins from the front disc brake cylinder mounting.

10. REMOVE FRONT DISC BRAKE BUSH DUST BOOT

- Remove the 2 bush dust boots from the front disc brake cylinder mounting.

**BR**

BRAKE – FRONT BRAKE**BR-41****11. REMOVE FRONT DISC BRAKE CYLINDER MOUNTING LH**

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

BR

BR-42

BRAKE – FRONT BRAKE

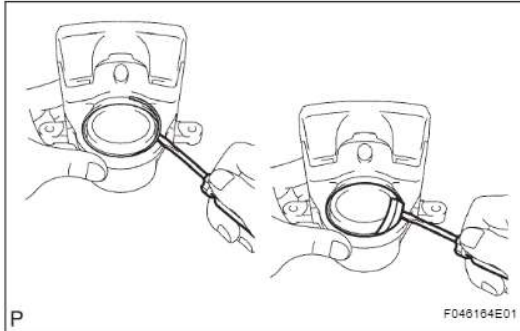
DISASSEMBLY

HINT:

- Use the same procedures for the LH side and RH side.
- The procedures listed below are for the LH side.

1. REMOVE CYLINDER BOOT

- (a) Remove the set ring and cylinder boot from the front disc brake cylinder.



2. REMOVE FRONT DISC BRAKE PISTON

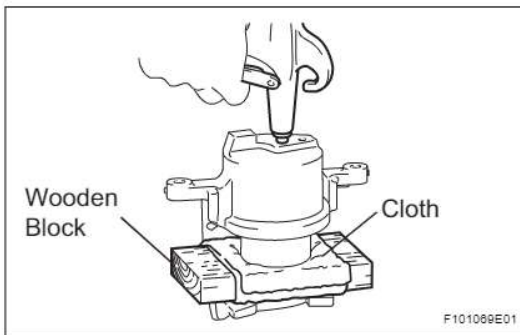
- (a) Place a wooden block wrapped in a cloth between the front disc brake piston and front disc brake cylinder to prevent them from being damaged.
- (b) Put air into the front disc brake cylinder gradually so that the piston does not protrude using compressed air. Remove the front disc brake piston from the front disc brake cylinder.

CAUTION:

Be careful not to pinch fingers.

NOTICE:

Do not spatter fluid.

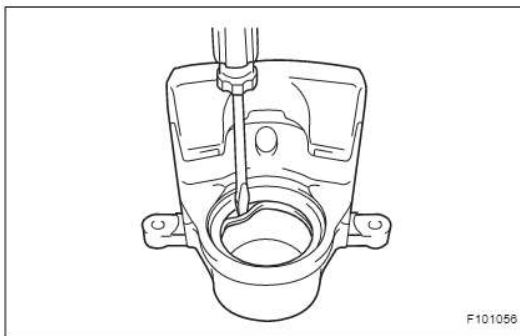


3. REMOVE PISTON SEAL

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

NOTICE:

Do not damage the inside of the cylinder or the seal groove.



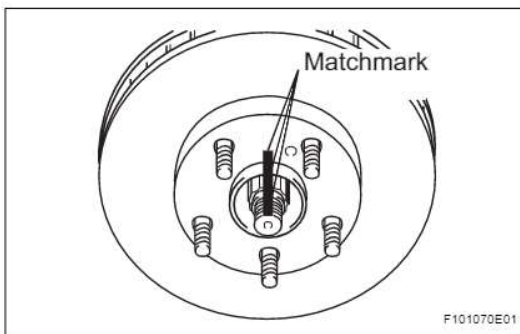
4. REMOVE FRONT DISC BRAKE BLEEDER PLUG CAP

5. REMOVE FRONT DISC BRAKE BLEEDER PLUG

6. REMOVE FRONT DISC

HINT:

Put matchmarks on the disc and axle hub.

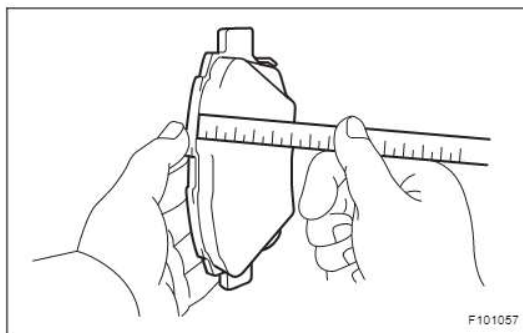


BR

INSPECTION

1. INSPECT BRAKE CYLINDER AND PISTON

- (a) Check that the side of the front disc brake piston and the inside of the cylinder are not damaged. If necessary, replace the front disc brake cylinder and front disc brake piston.



2. 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.)

HINT:

If the disc brake pad thickness is at the minimum or less, replace the disc brake pad.

3. INSPECT NO. 1 FRONT DISC BRAKE PAD SUPPORT PLATE

- (a) Clean the area where the No. 1 front disc brake support plate contacts the brake pad using brake cleaner. Check that there are no deformations, cracks or rust.
- (b) Check that there is no looseness or deformation with the front disc brake cylinder mounting installed.
- (c) Make sure that the support has sufficient rebound when installing the pad. Check that the pad does not easily drop after installation.

4. INSPECT NO. 2 FRONT DISC BRAKE PAD SUPPORT PLATE

HINT:

Check the No. 2 pad support plate using the same inspection procedures for the No. 1 pad support plate.

5. INSPECT DISC THICKNESS

- (a) Using a micrometer, measure the disc thickness.

Standard thickness:

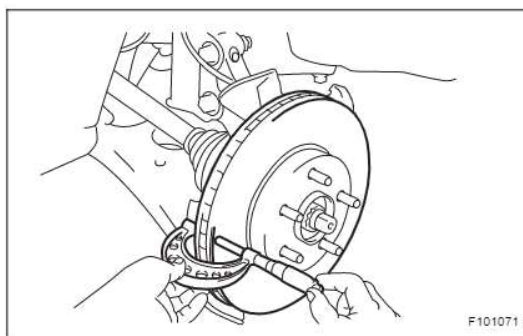
22.0 mm (0.866 in.)

Minimum thickness:

20.0 mm (0.787 in.)

HINT:

If the disc plate thickness is at the minimum or less, replace the front disc.



BR-44

BRAKE – FRONT BRAKE

REASSEMBLY

HINT:

- Use the same procedures for the LH side and RH side.
- The procedures listed below are for the LH side.

1. INSTALL FRONT DISC

- (a) Align matchmarks on the disc and the axle hub.
Install the front disc.

NOTICE:

When installing a new disc, select the position where the disc has the minimum runout.

2. INSPECT DISC RUNOUT

- (a) Check the looseness of the front wheel bearing and runout in the axle hub before inspecting the disc runout (see page [AH-4](#)).
- (b) Hold the front disc with the 3 hub nuts.
Torque: 103 N*m (1,050 kgf*cm, 76 ft.*lbf)
- (c) Holding a dial indicator 10 mm (0.394 in.) away from the outer edge of the front disc, measure the disc runout.

Maximum disc runout:

0.05 mm (0.0020 in.)

NOTICE:

If the runout exceeds the maximum value, change the installation positions of the disc and axle so that the runout will become minimal. If the runout exceeds even when the installation positions are changed or if disc thickness does not exceed the limit, shave the disc. If disc thickness exceeds the limit, replace the disc.

3. TEMPORARILY TIGHTEN FRONT DISC BRAKE BLEEDER PLUG

4. INSTALL FRONT DISC BRAKE BLEEDER PLUG CAP

5. INSTALL PISTON SEAL

- (a) Apply lithium soap base glycol grease around a new piston seal and install it into the brake cylinder groove securely.

6. INSTALL FRONT DISC BRAKE PISTON

- (a) Check the side of the front disc brake piston for any scratch.

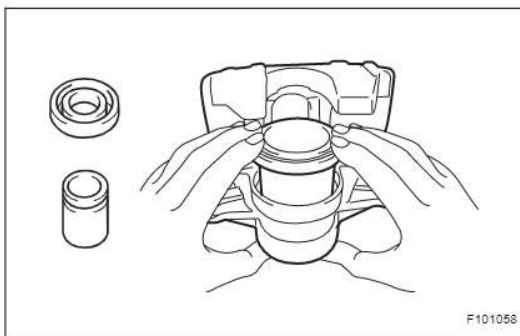
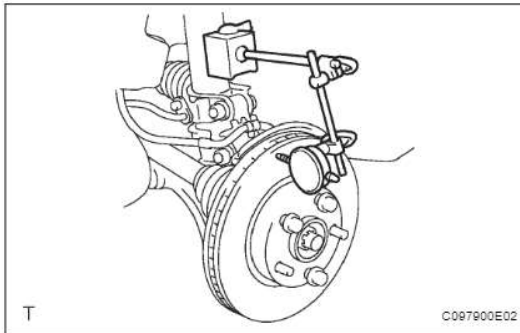
NOTICE:

Replace the front disc brake piston with a new one if there is any scratch on it.

- (b) Apply lithium soap base glycol grease to the inside of a new cylinder boot and install it to the front disc brake piston.

NOTICE:

Install the cylinder boot securely into the front disc brake piston groove.



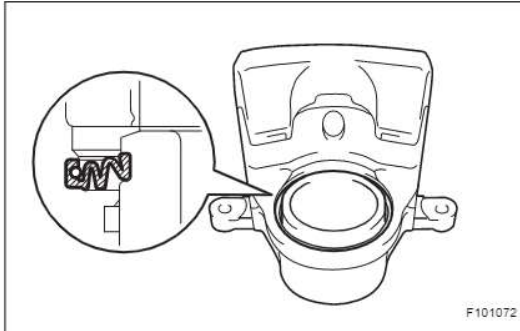
BR

BRAKE – FRONT BRAKE**BR-45**

- (c) Apply lithium soap base glycol grease around the front disc brake piston and install it to the front disc brake cylinder.

NOTICE:

- Do not install the piston forcibly into the front disc brake cylinder.
- Do not damage the piston tip during installation.
- Do not push the piston directly using hard or sharp tools.

**7. INSTALL CYLINDER BOOT**

- (a) Install the cylinder boot to the disc brake cylinder groove.

NOTICE:

Install the cylinder boot securely into the disc brake cylinder and piston groove.

- (b) Using a screwdriver, install a new front disc brake piston set ring to the front disc brake cylinder.

NOTICE:

Do not damage the cylinder boot.

BR

BR-46

BRAKE – FRONT BRAKE

INSTALLATION

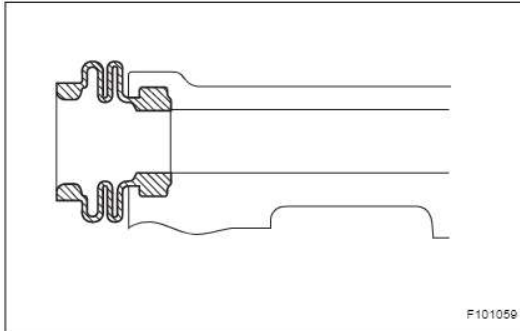
HINT:

- Use the same procedures for the LH side and RH side.
- The procedures listed below are for the LH side.

1. INSTALL FRONT DISC BRAKE CYLINDER MOUNTING LH

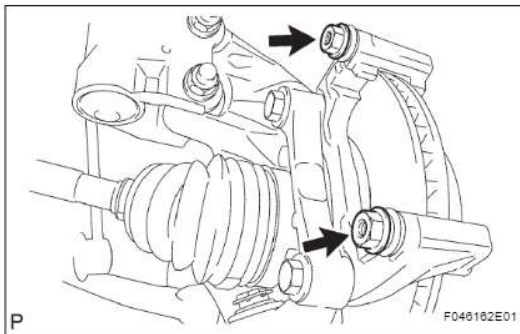
- (a) Install the front disc brake cylinder mounting with the 2 bolts.

Torque: 109 N*m (1,114 kgf*cm, 81 ft.*lbf)



2. INSTALL FRONT DISC BRAKE BUSH DUST BOOT

- (a) Apply lithium soap base glycol grease to seal surface of 2 new bush dust boots.
- (b) Install the 2 bush dust boots to the front disc brake cylinder mounting.



3. INSTALL FRONT DISC BRAKE CYLINDER SLIDE PIN

- (a) Apply lithium soap base glycol grease to the sliding and fitting portion of the front disc brake cylinder slide pin.
- (b) Push the front disc brake cylinder slide pin into the disc brake bush dust boot to install it.

4. INSTALL NO. 1 FRONT DISC BRAKE PAD SUPPORT PLATE

- (a) Install the No. 1 pad support plate to the front disc brake cylinder mounting.

5. INSTALL NO. 2 FRONT DISC BRAKE PAD SUPPORT PLATE

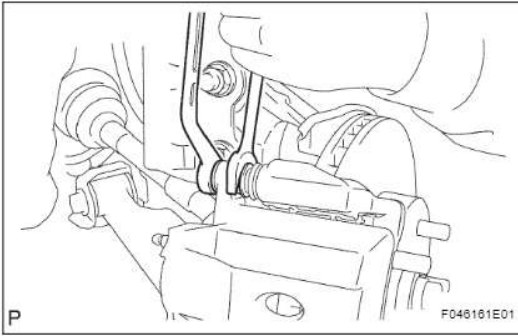
- (a) Install the No. 2 pad support plate to the front disc brake cylinder mounting.

6. INSTALL FRONT ANTI-SQUEAL SHIM KIT

- (a) Apply disc brake grease to the area where the No. 1 anti-squeal shim makes contact.
- (b) Install the 2 No. 1 anti-squeal shims and 2 No. 2 anti-squeal shims to the front disc brake pads.

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

- (a) Install the 2 front disc brake pads to the front disc brake cylinder mounting.

BRAKE – FRONT BRAKE**BR-47****8. INSTALL FRONT DISC BRAKE CYLINDER SUB-ASSEMBLY**

- (a) Install the front disc brake cylinder with the 2 bolts.
Torque: 34 N*m (347 kgf*cm, 25 ft.*lbf)
- (b) Placing a new gasket inbetween, connect the No. 1 flexible hose to the front disc brake cylinder with the union bolt.
Torque: 33 N*m (337 kgf*cm, 24 ft.*lbf)

9. FILL RESERVOIR WITH BRAKE FLUID (See page [BR-5](#))**10. BLEED AIR FROM FRONT AND REAR BRAKE SYSTEMS (See page [BR-5](#))****11. CHECK FOR BRAKE FLUID LEAKAGE****12. CHECK FLUID LEVEL IN RESERVOIR****13. INSTALL FRONT WHEEL****Torque: 103 N*m (1,050 kgf*cm, 76 ft.*lbf)****14. CHECK AND CLEAR DTC**

- (a) Check and clear the DTC (see page [BC-38](#)).

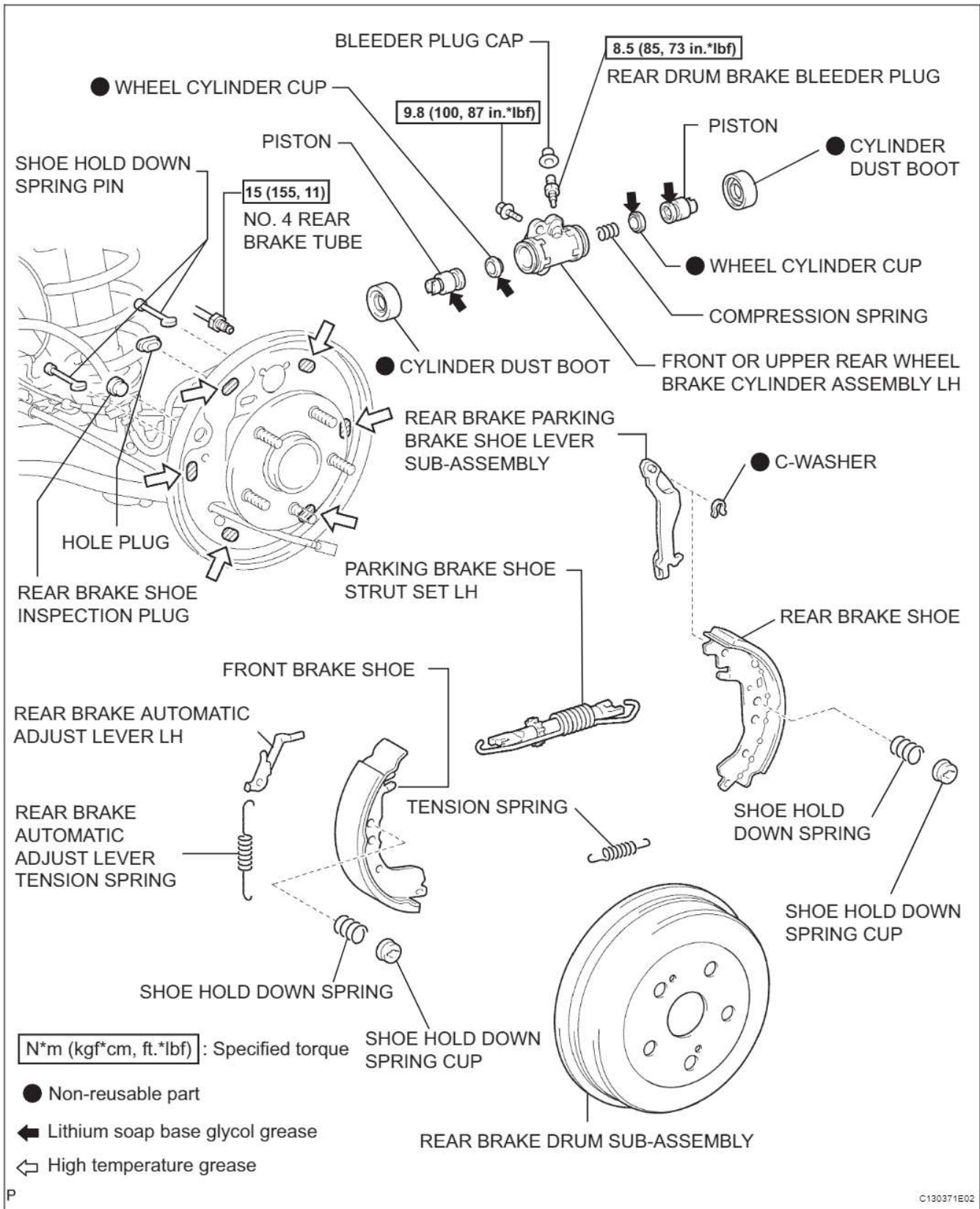
BR

BR-46

BRAKE – REAR DRUM BRAKE

REAR DRUM BRAKE

COMPONENTS



C130371E02

REMOVAL

HINT:

- Use the same procedures for the LH side and RH side.
- The procedures listed below are for the LH side.
- If work that does not involve brake fluid bleeding, such as drum brake shoe replacement, is started 2 minutes or more after the power switch is turned OFF, brake control (ECB) prohibition is not necessary.

1. REMOVE REAR WHEEL

2. SET BRAKE CONTROL (ECB) OFF (See page [BR-28](#))

3. DRAIN BRAKE FLUID

NOTICE:

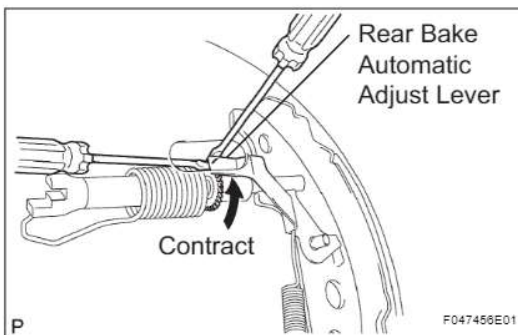
Wash brake fluid off immediately if it adheres to any painted surfaces.

4. REMOVE REAR BRAKE DRUM SUB-ASSEMBLY

- (a) Put matchmarks on the rear brake drum and the axle hub.
- (b) Release the parking brake and remove the rear brake drum.

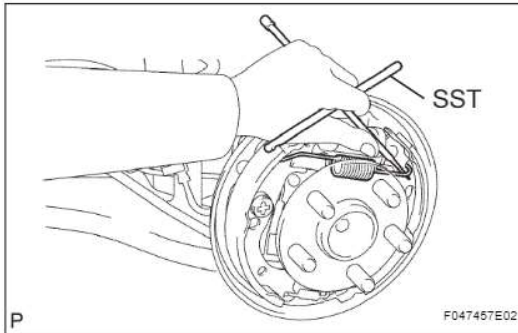
HINT:

If the rear brake drum cannot be removed, push the rear brake automatic adjust lever through the backing plate service hole using a screwdriver. Turn and contract the adjuster using another screwdriver.

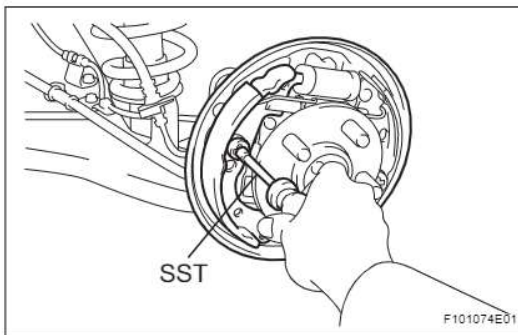


BR-48**BRAKE – REAR DRUM BRAKE****DISASSEMBLY****HINT:**

- Use the same procedures for the LH side and RH side.
- The procedures listed below are for the LH side.

**1. DISCONNECT PARKING BRAKE SHOE STRUT SET LH**

- (a) Using SST, disconnect the spring and parking brake shoe strut set from the brake shoes.

SST 09703-30011**NOTICE:****Be careful not to damage the cylinder dust boot.****2. REMOVE FRONT BRAKE SHOE**

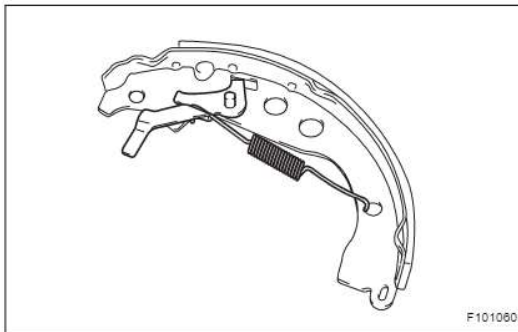
- (a) Using SST, remove the cup, shoe hold down spring and pin.

SST 09718-00010

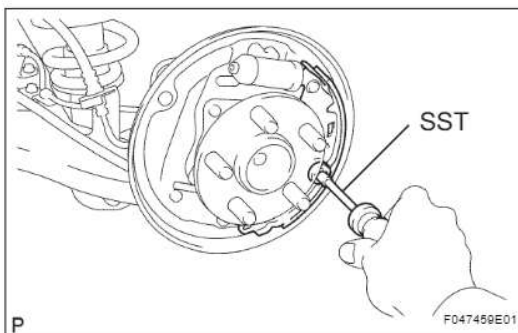
- (b) Remove the front brake shoe and tension spring.

3. REMOVE PARKING BRAKE SHOE STRUT SET LH

- (a) Remove the parking brake shoe strut set from the rear brake shoe.

**4. REMOVE REAR BRAKE AUTOMATIC ADJUST LEVER LH**

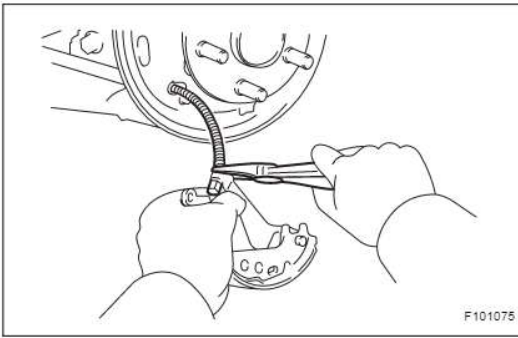
- (a) Remove the rear brake automatic adjust lever tension spring and the rear brake automatic adjust lever.

**5. REMOVE REAR BRAKE SHOE**

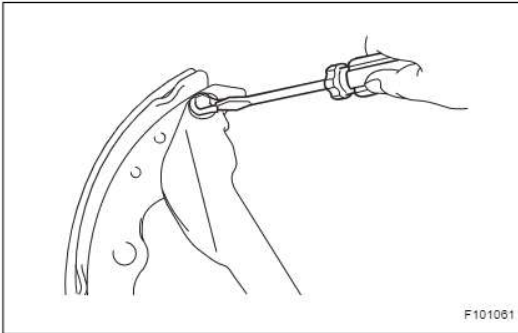
- (a) Remove the tension spring from the rear brake shoe.

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

SST 09718-00010**BR**

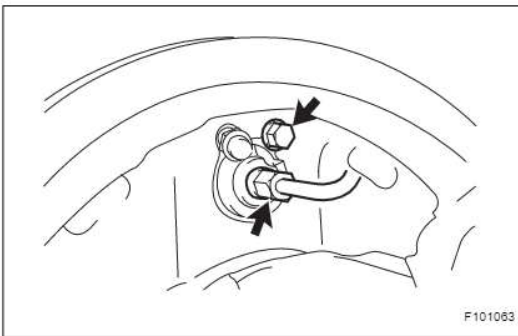
BRAKE – REAR DRUM BRAKE**BR-49**

- (c) Using needle-nose pliers, disconnect the parking brake cable, and remove the rear brake shoe.



6. REMOVE REAR BRAKE PARKING BRAKE SHOE LEVER SUB-ASSEMBLY

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



7. REMOVE FRONT OR UPPER REAR WHEEL BRAKE CYLINDER ASSEMBLY LH

- (a) Using SST, disconnect the brake line.

SST 09023-00101

HINT:

Use a container to catch the brake fluid.

- (b) Remove the bolt and the rear wheel brake cylinder.

8. REMOVE REAR WHEEL CYLINDER CUP KIT

- (a) Remove the 2 cylinder dust boots from the rear wheel brake cylinder.
 (b) Remove the 2 pistons and the compression spring.
 (c) Remove the 2 wheel cylinder cups from each piston.

9. REMOVE REAR DRUM BRAKE BLEEDER PLUG

- (a) Remove the rear drum bleeder plug from the rear wheel cylinder.

INSPECTION

1. INSPECT BRAKE DRUM INSIDE DIAMETER

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

Standard inside diameter:

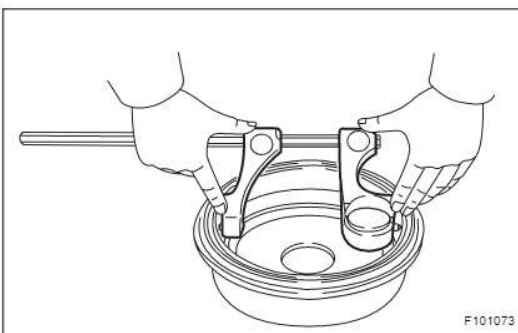
200.0 mm (7.874 in.)

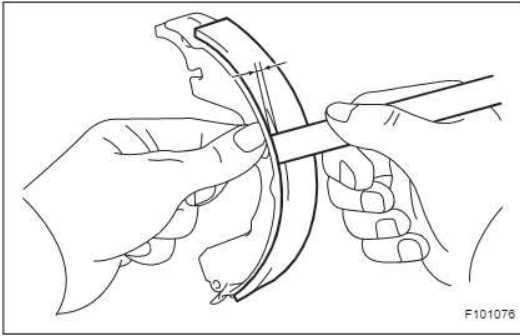
Maximum inside diameter:

201.0 mm (7.913 in.)

HINT:

If the inside diameter of the brake drum is at the maximum or more, replace the rear brake drum sub-assembly.

**BR**

BR-50**BRAKE – REAR DRUM BRAKE****2. INSPECT REAR DRUM BRAKE SHOE LINING THICKNESS**

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

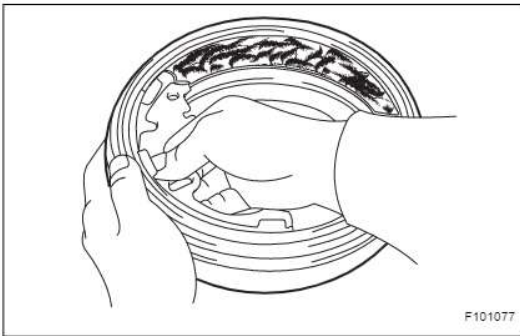
Standard thickness:

4.0 mm (0.157 in.)

Minimum thickness:

1.0 mm (0.039 in.)

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

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

- (a) Apply chalk to the inside surface of the drum, then grind the 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.

4. INSPECT BRAKE WHEEL CYLINDER

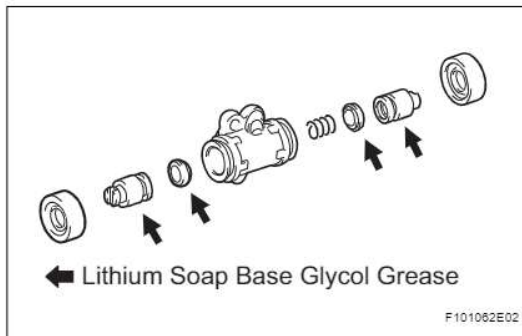
- (a) Check the cylinder bore and the piston for rust or scoring. If necessary, replace the rear wheel brake cylinder assembly.

BRAKE – REAR DRUM BRAKE**BR-51****REASSEMBLY****HINT:**

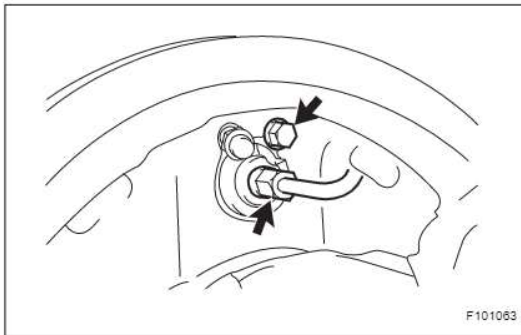
- Use the same procedures for the LH side and RH side.
- The procedures listed below are for the LH side.

1. TEMPORARILY TIGHTEN REAR DRUM BRAKE BLEEDER PLUG

- Install the rear drum brake bleeder plug to the rear wheel brake cylinder.

**2. INSTALL REAR WHEEL CYLINDER CUP KIT**

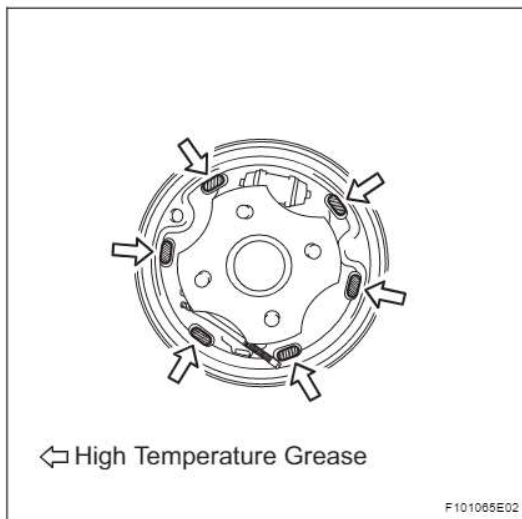
- Apply lithium soap base glycol grease to 2 new wheel cylinder cups and 2 pistons.
- Install the 2 wheel cylinder cups on each piston.
- Install the compression spring and the 2 pistons to the rear wheel brake cylinder.
- Install the 2 new cylinder dust boots to the rear wheel brake cylinder.

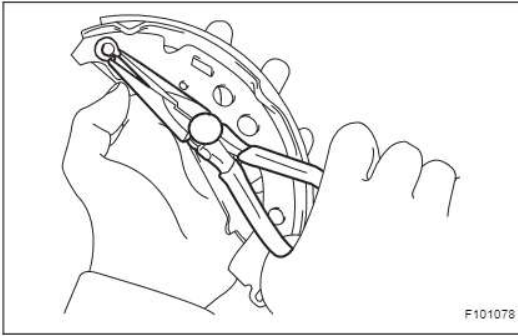
**3. INSTALL FRONT OR UPPER REAR WHEEL BRAKE CYLINDER ASSEMBLY LH**

- Install the rear wheel brake cylinder with the bolt.
Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)
- Using SST, connect the brake line.
SST 09023-00101
Torque: 15 N*m (155 kgf*cm, 11 ft.*lbf)

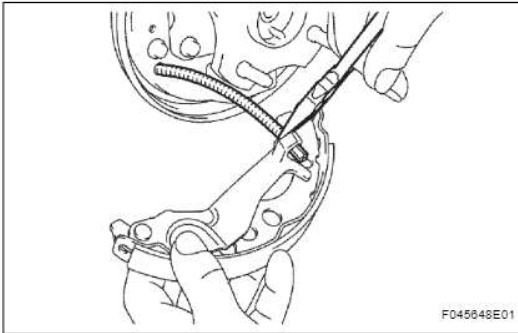
4. APPLY HIGH TEMPERATURE GREASE

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

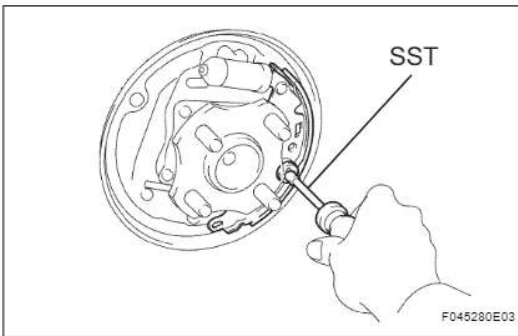
**BR**

BR-52**BRAKE – REAR DRUM BRAKE****5. INSTALL REAR BRAKE PARKING BRAKE SHOE LEVER SUB-ASSEMBLY**

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

**6. INSTALL REAR BRAKE SHOE**

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

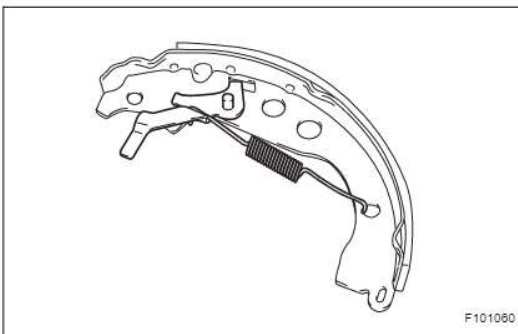


- (b) Using SST, install the rear brake shoe, pin, shoe hold down spring and cup.

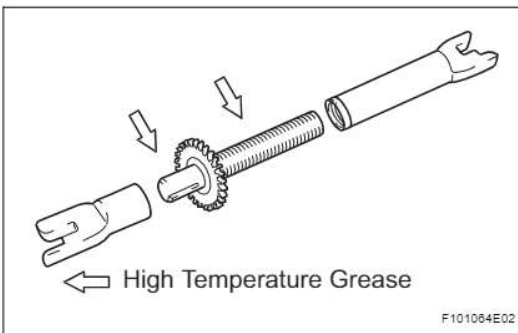
SST 09718-00010

7. INSTALL REAR BRAKE SHOE RETURN SPRING

- (a) Install the rear brake shoe return spring to the rear brake shoe.

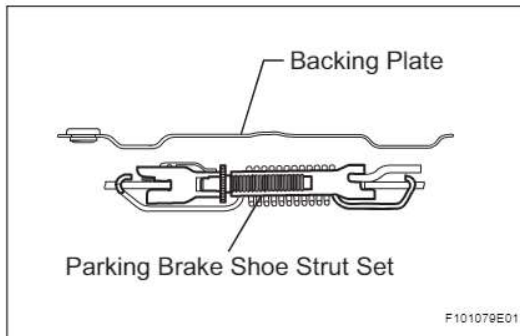
**8. INSTALL REAR BRAKE AUTOMATIC ADJUST LEVER LH**

- (a) Install the rear brake automatic adjust lever and the rear brake automatic adjust lever tension spring to the front brake shoe.

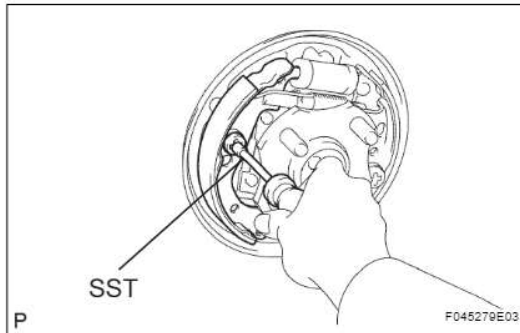
**9. INSTALL PARKING BRAKE SHOE STRUT SET LH**

- (a) Apply high temperature grease to the adjusting bolt and assemble the strut set.
- (b) Install the shoe return spring to the strut set.

BR

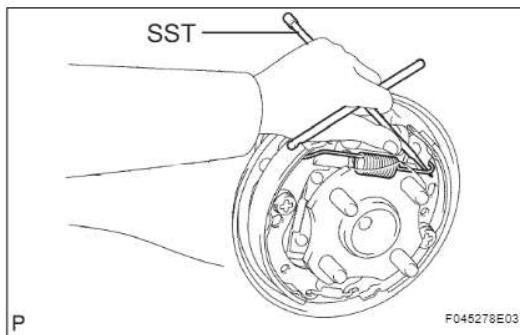
BRAKE – REAR DRUM BRAKE**BR-53**

(c) Install the strut set as shown in the illustration.

**10. INSTALL FRONT BRAKE SHOE**

- (a) Connect the tension spring to the front brake shoe and rear brake shoe.
- (b) Using SST, install the front brake shoe, pin, shoe hold down spring and cup.

SST 09718-00010

**11. CONNECT PARKING BRAKE SHOE STRUT SET LH**

- (a) Using SST, connect the shoe return spring to the front brake shoe and rear brake shoe.

SST 09703-30011

NOTICE:

Be careful not to damage the wheel cylinder boot.

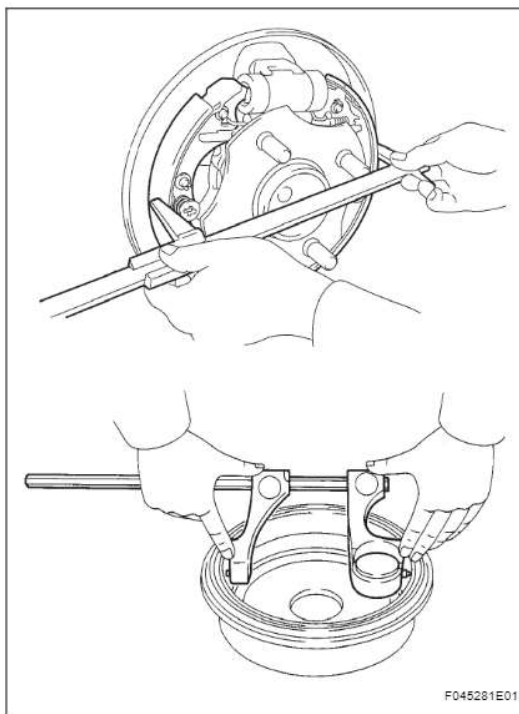
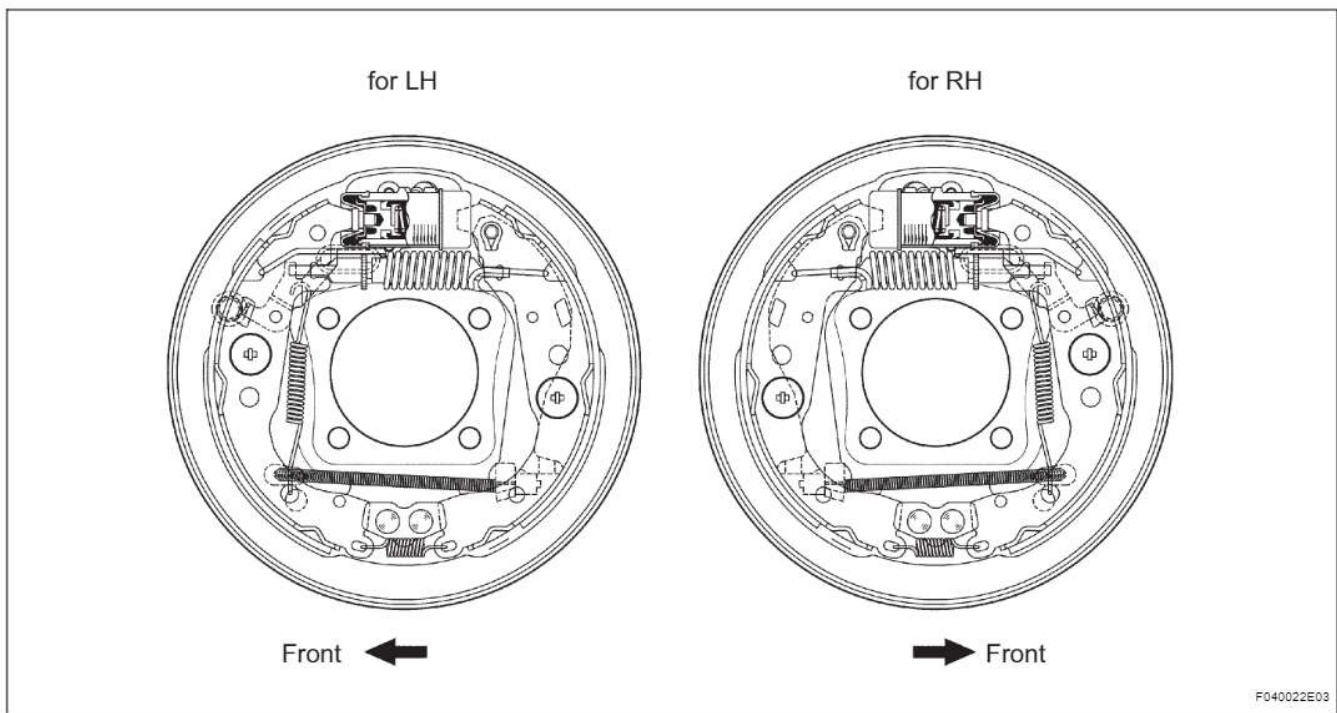
12. CHECK REAR DRUM BRAKE INSTALLATION

- (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. If they are not installed correctly as shown in the illustration, reinstall them.

BR

BR-54**BRAKE – REAR DRUM BRAKE**

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

Standard shoe clearance:

0.6 mm (0.024 in.)

NOTICE:

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

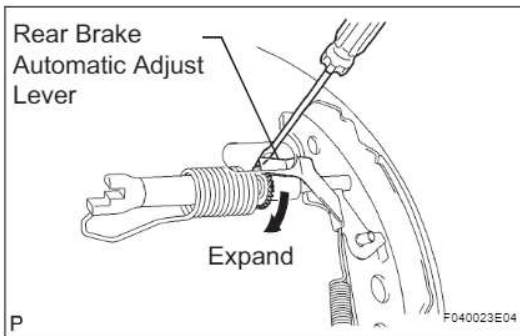
INSTALLATION

HINT:

- Use the same procedures for the LH side and RH side.
- The procedures listed below are for the LH side.

1. INSTALL REAR BRAKE DRUM SUB-ASSEMBLY

- (a) Aligning the matchmarks, install the rear brake drum.



2. ADJUST REAR DRUM BRAKE SHOE CLEARANCE

- (a) Temporarily install 2 hub nuts.
- (b) Remove the hole plug, and turn the adjuster to expand the shoe until the drum locks.
- (c) Rotate the adjuster by 8 notches.
- (d) Install the hole plug.
- (e) Remove the 2 hub nuts.

3. FILL RESERVOIR WITH BRAKE FLUID (See page [BR-5](#))

4. BLEED AIR FROM FRONT AND REAR BRAKE SYSTEMS (See page [BR-5](#))

5. CHECK FOR BRAKE FLUID LEAKAGE

6. CHECK FLUID LEVEL IN RESERVOIR

7. INSTALL REAR WHEEL

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

8. CHECK PARKING BRAKE PEDAL TRAVEL (See page [PB-1](#))

9. ADJUST PARKING BRAKE PEDAL TRAVEL (See page [PB-1](#))

10. CHECK AND CLEAR DTC

- (a) Check and clear the DTC (see page [BC-38](#)).