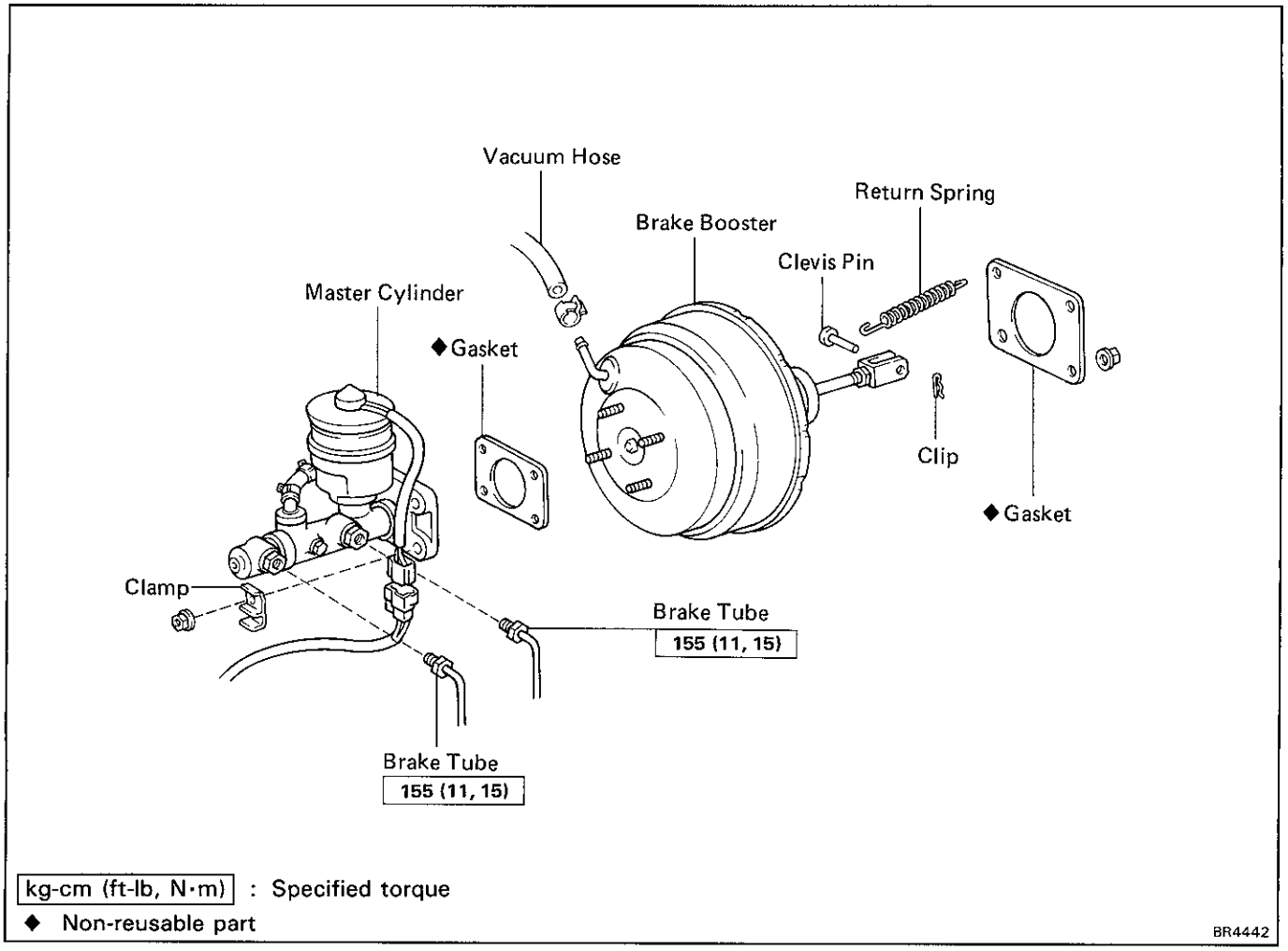
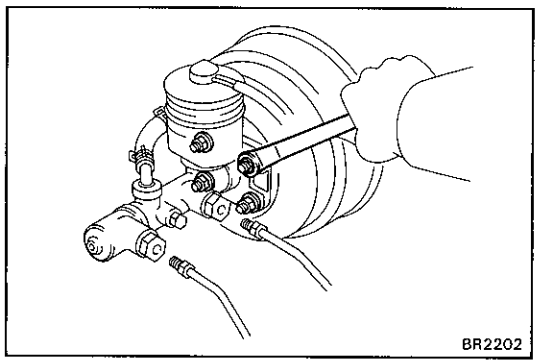
BRAKE BOOSTER

REMOVAL OF BRAKE BOOSTER



kg-cm (ft-lb, N·m) : Specified torque
◆ Non-reusable part

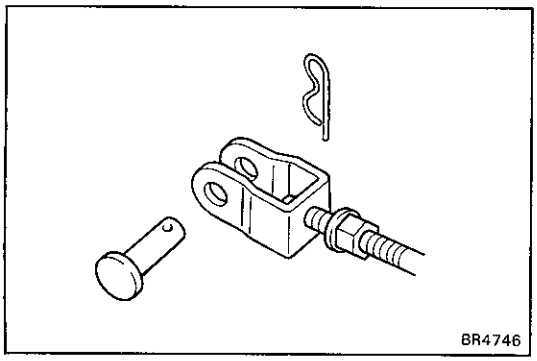
BR4442



BR2202

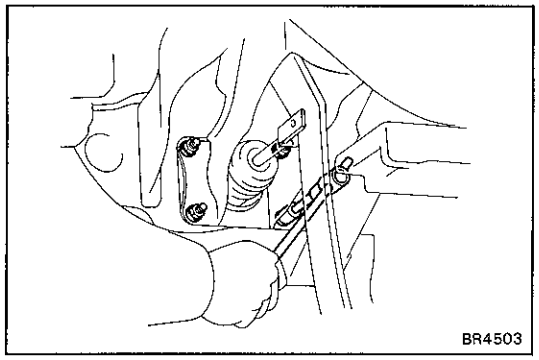
1. **REMOVE MASTER CYLINDER**
   (See page BR-10)

2. **DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER**



BR4746

3. **DISCONNECT BRAKE PEDAL FROM CLEVIS**
   (a) Remove the return spring.
   (b) Remove the clip.
   (c) Loosen the lock nut.
   (d) Remove the clevis pin.



4. REMOVE BRAKE BOOSTER

(a) Remove the four nuts.

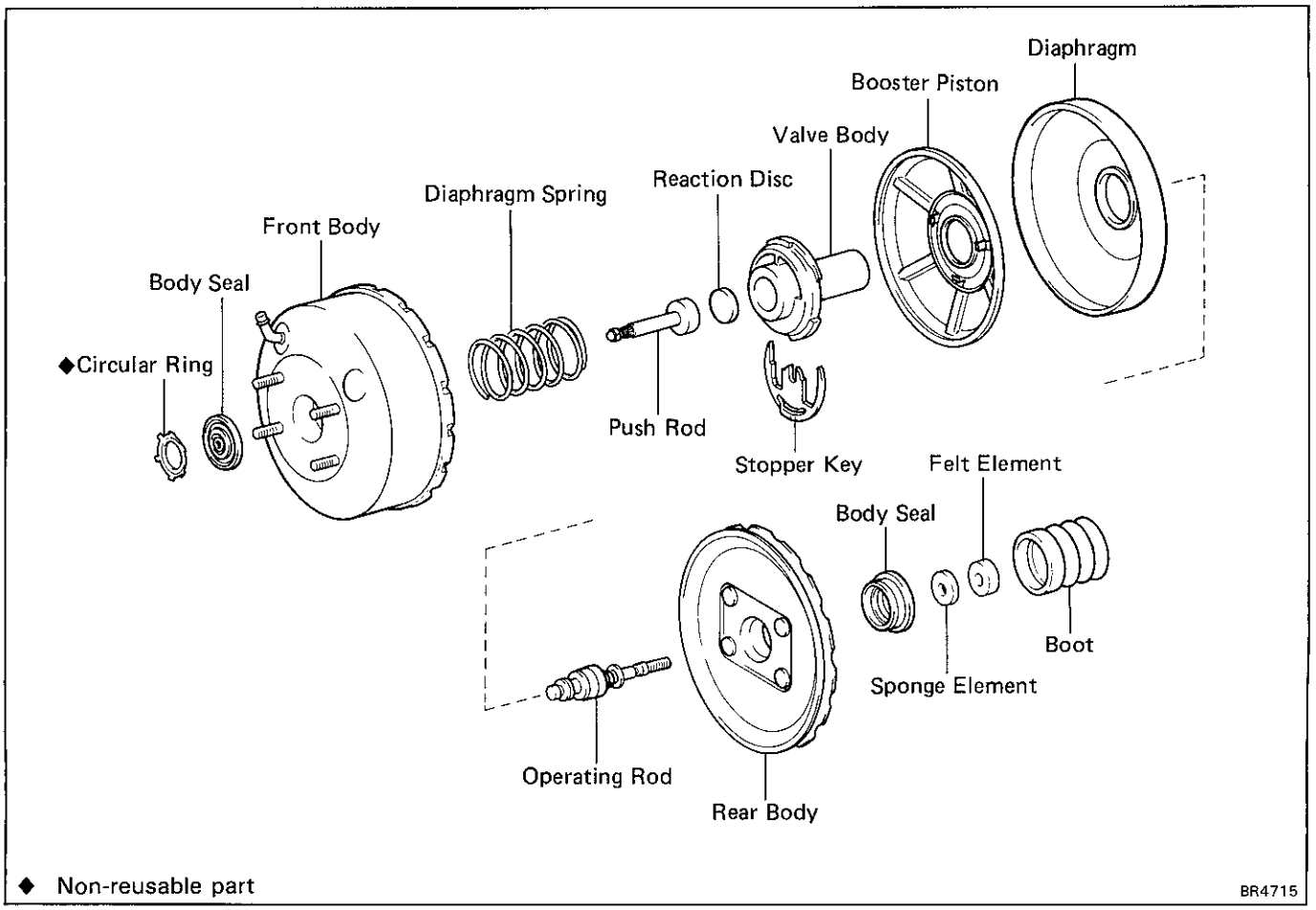
(b) Remove the clevis.

(c) Pull out the brake booster to underside.

Brake Booster

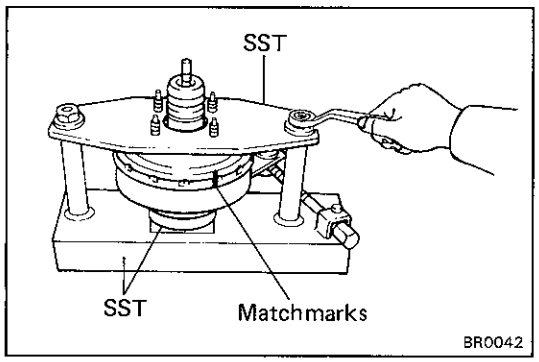
AISIN Type Single Booster

COMPONENTS

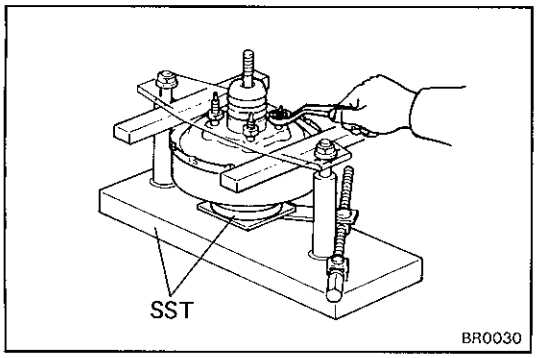


◆ Non-reusable part

BR4715



BR0042



BR0030

DISASSEMBLY OF BRAKE BOOSTER

1. SEPARATE FRONT AND REAR BODIES

(a) Put matchmarks on the front and rear bodies.

(b) Set the booster in SST.

SST 09753-00013 and 09753-40010

NOTICE: Be careful not to tighten the two nuts of SST too tight.

(c) Turn the front body clockwise until the front and rear bodies separate.

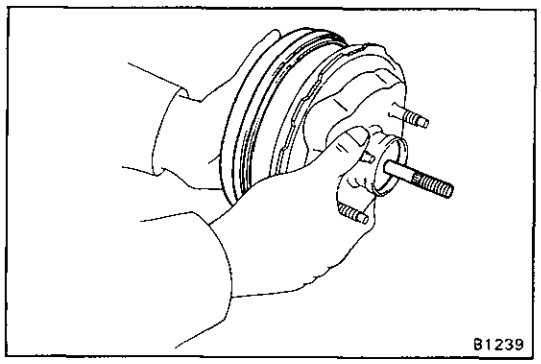
(d) Loosen the upper left and right nuts of SST, and insert pieces of wood between the front body and upper plate.

NOTICE: Be careful that the pieces of wood do not contact the rear body.

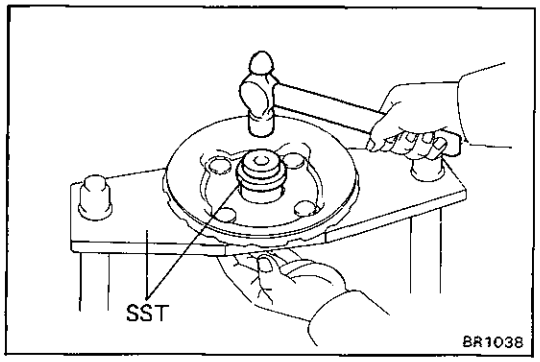
(e) Evenly tighten down the four booster mounting nuts to separate the front and rear bodies.

(f) Remove the diaphragm spring and push rod.

2. REMOVE BOOT FROM REAR BODY



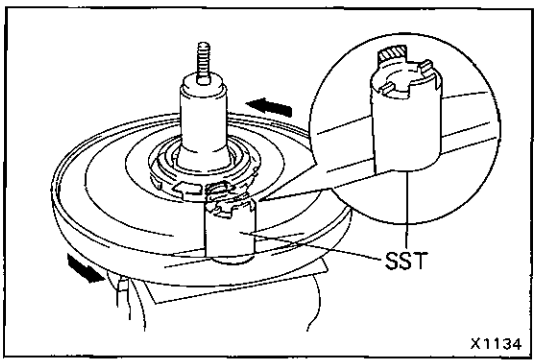
3. **REMOVE DIAPHRAGM ASSEMBLY FROM REAR BODY**



4. **REMOVE BODY SEAL FROM REAR BODY**

Using SST, remove the seal.

SST 09753-00013 and 09753-30020



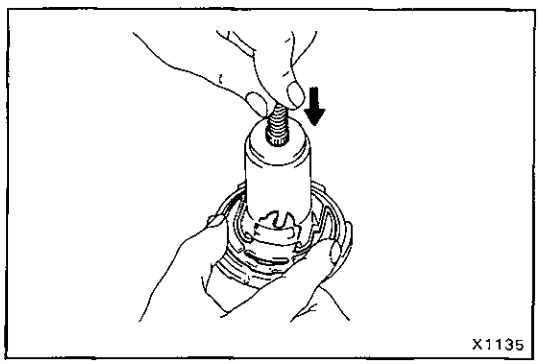
5. **REMOVE VALVE BODY AND DIAPHRAGM FROM BOOSTER PISTON**

(a) Mount SST in vise.

SST 09736-27010

(b) Put the diaphragm assembly on SST and turn it to separate the valve body and booster piston.

(c) Remove the diaphragm from the booster piston.

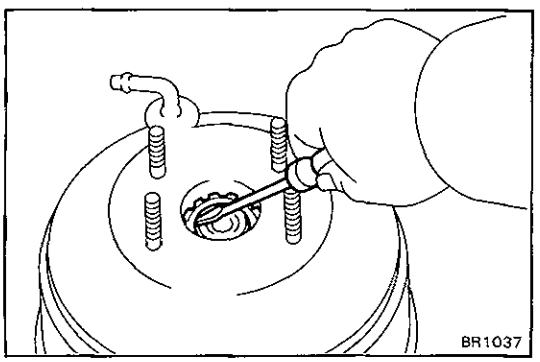


6. **REMOVE OPERATING ROD FROM VALVE BODY**

(a) Push the operating rod in the valve body and remove the stopper key.

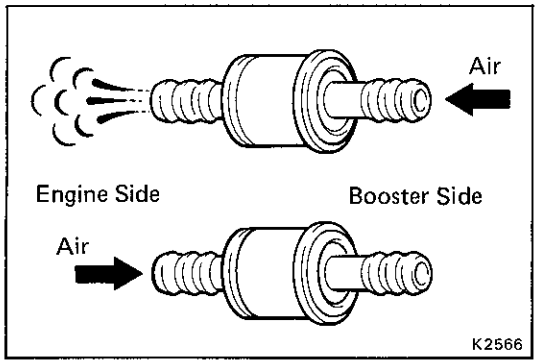
(b) Pull out the operating rod with the two elements.

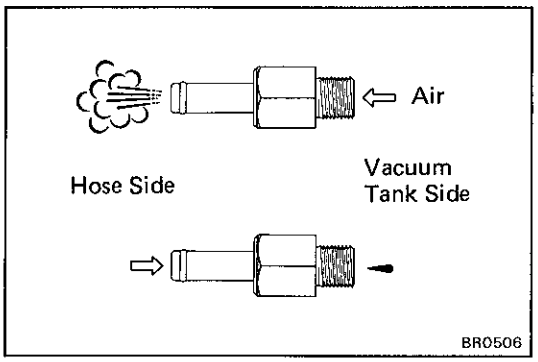
7. **REMOVE REACTION DISC FROM VALVE BODY**

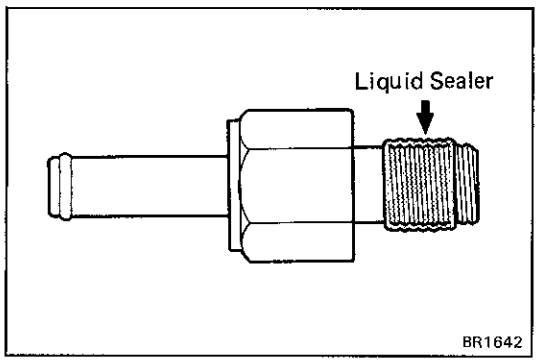


8. **REMOVE BODY SEAL FROM FRONT BODY**

Using a screwdriver, pry out the circular ring, and remove the seal.







INSPECTION OF BRAKE BOOSTER COMPONENTS

INSPECT CHECK VALVE OPERATION

(Gasoline Engine)

(a) Remove the check valve.

(b) Check that air flows from the booster side to the engine side.

(c) Check that air does not flow from the engine side to the booster side.

If necessary, replace the check valve.

(d) Install the check valve.

(Diesel Engine)

(a) Remove the check valve from the vacuum line.

(b) Check that air flows from the vacuum tank side to the hose side.

(c) Check that air dose not flow from the hose side to the vacuum tank side.

If necessary, replace the check valve.

(d) Apply liquid sealer to the check valve as shown.

Sealant: Part No. 08826-00080 or equivalent

(e) Install the check valve.

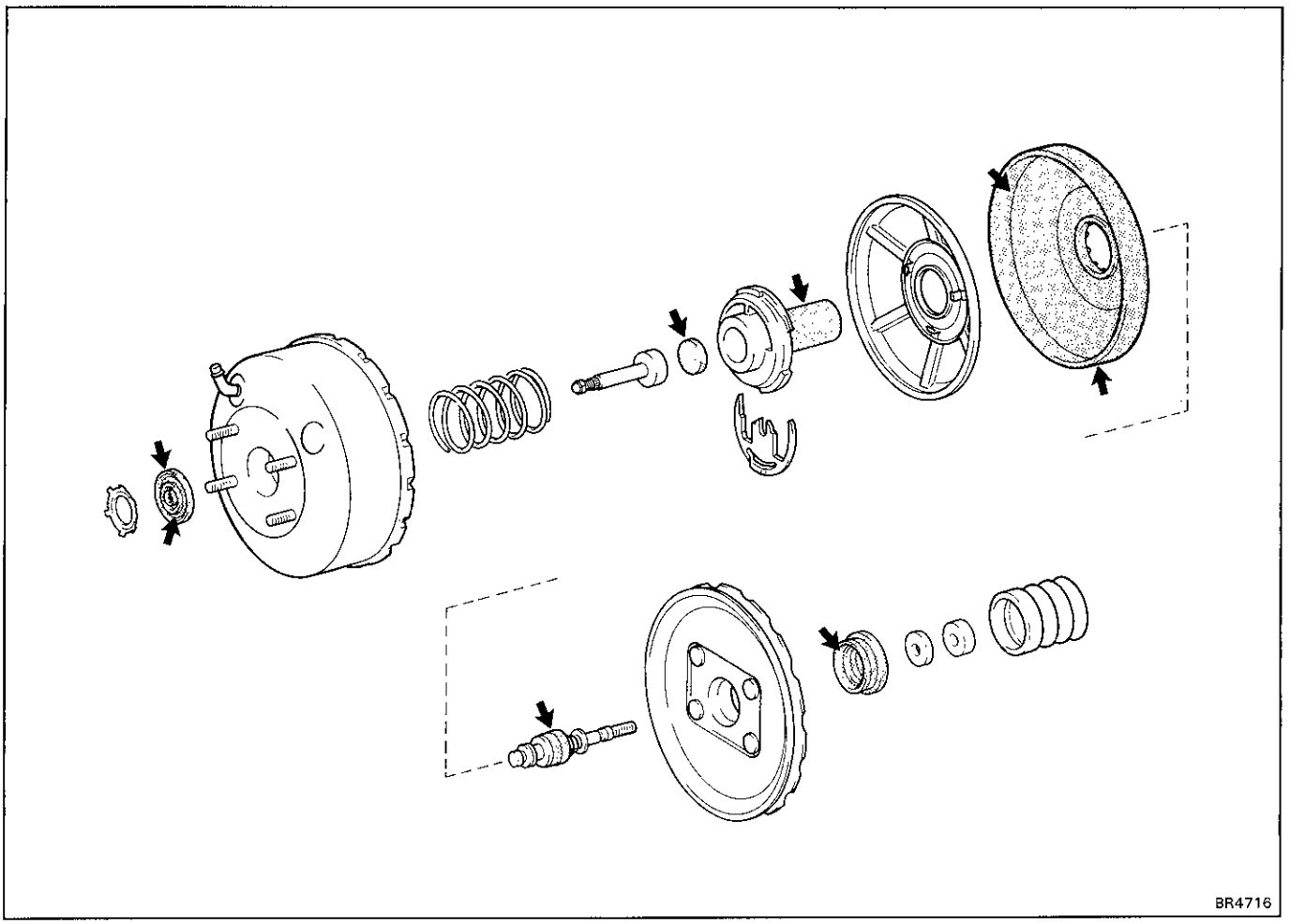
Torque: 300 kg-cm (22 ft-lb, 29 N·m)

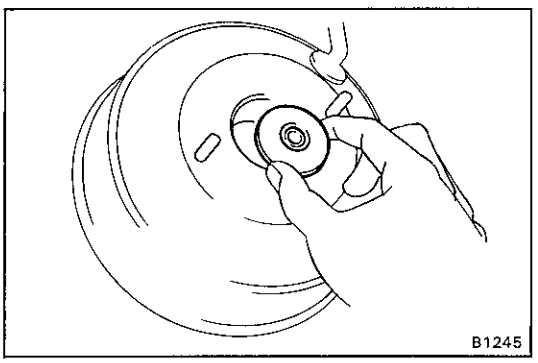
(f) Install the vacuum hose to the check valve with hose clamp.

ASSEMBLY OF BRAKE BOOSTER

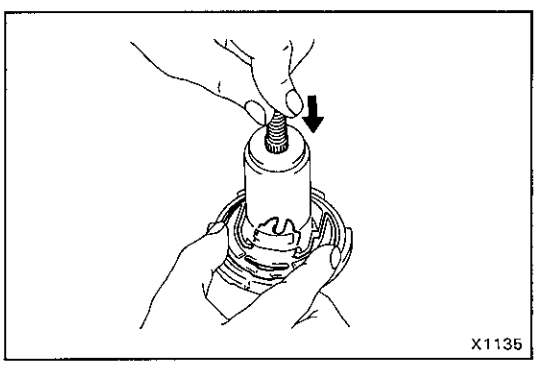
(See page BR-19)

1. APPLY SILICONE GREASE TO PARTS SHOWN BELOW



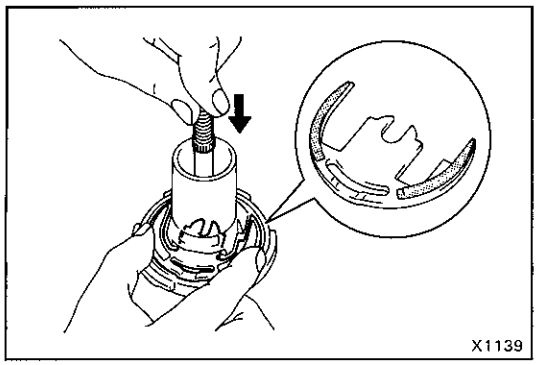


2. INSTALL BODY SEAL TO FRONT BODY
   (a) Place the body seal in position.
   (b) Secure the body seal with the circular ring.

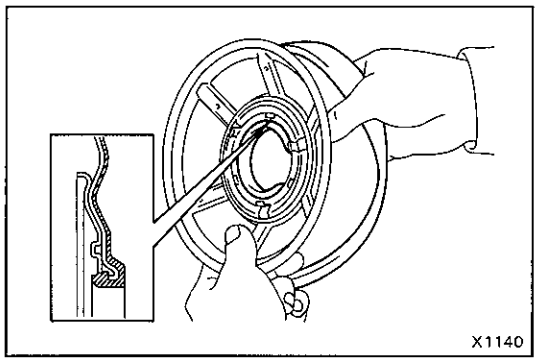


3. INSTALL OPERATION ROD TO VALVE BODY
   (a) Insert the operation rod in the valve body.
   (b) Push the operation rod in the valve body and install the stopper key.

   HINT: Install the stopper key as the stopper rubber on the key facing upward.

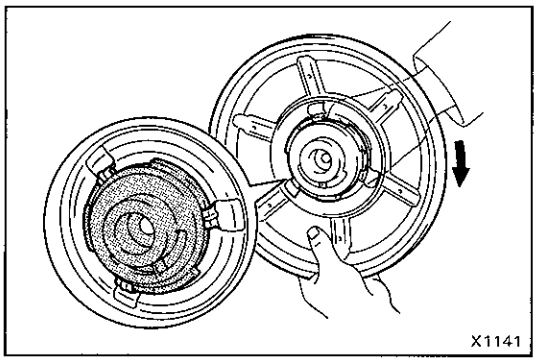


(c) Pull the operation rod and confirm that the stopper key is working.

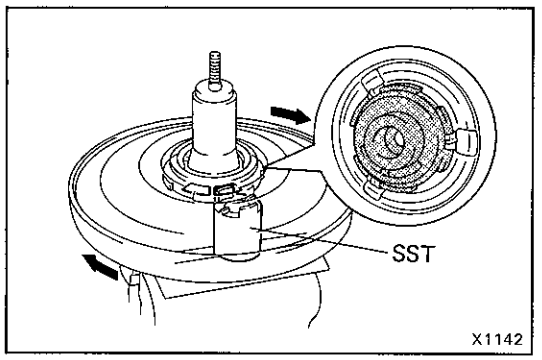


4. INSTALL VALVE BODY AND DIAPHRAGM TO BOOSTER PISTON

(a) Install the diaphragm to the booster piston as shown.



(b) Insert the valve body to the booster piston and turn the valve body as shown.

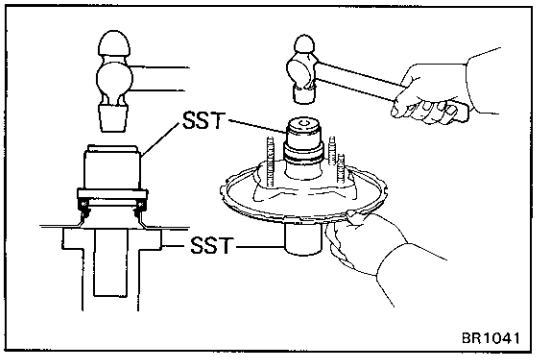


(c) Tape the protrusion of SST and mount it in vise.

SST 09753-30011

(d) Put the assembly on SST and turn the booster piston clockwise until it locks.

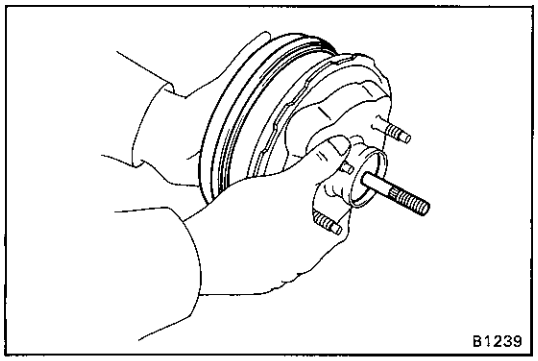
HINT: Turn the booster piston as the piston keeps horizontal condition.



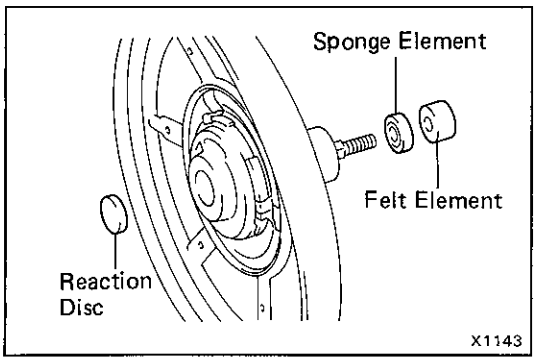
5. INSTALL BODY SEAL TO REAR BODY

Using SST, drive in the seal.

SST 09309-36010 and 09753-30020

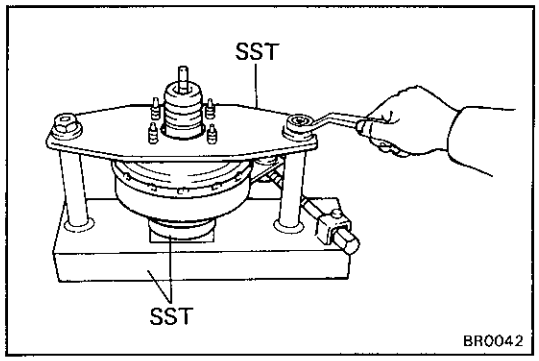


6. **INSTALL DIAPHRAGM ASSEMBLY TO REAR BODY**



7. **INSTALL FOLLOWING PARTS TO REAR BODY**
   (a) Felt element
   (b) Sponge element
   (c) Boot

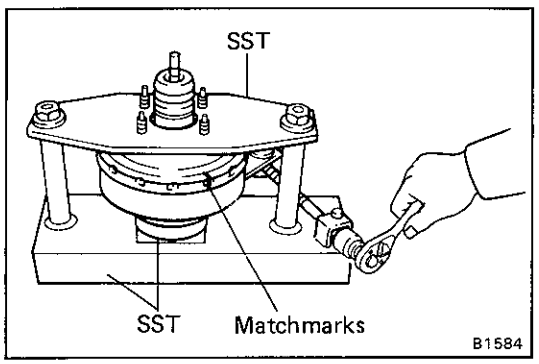
8. **INSTALL REACTION DISC TO VALVE BODY**



9. **ASSEMBLE FRONT AND REAR BODIES**
   (a) Place the spring and push rod in the front body.
   (b) Using SST, compress the spring between the front and rear bodies.

SST 09753-00013 and 09753-40010

NOTICE: Be careful not to tighten the two nuts of SST too tight.

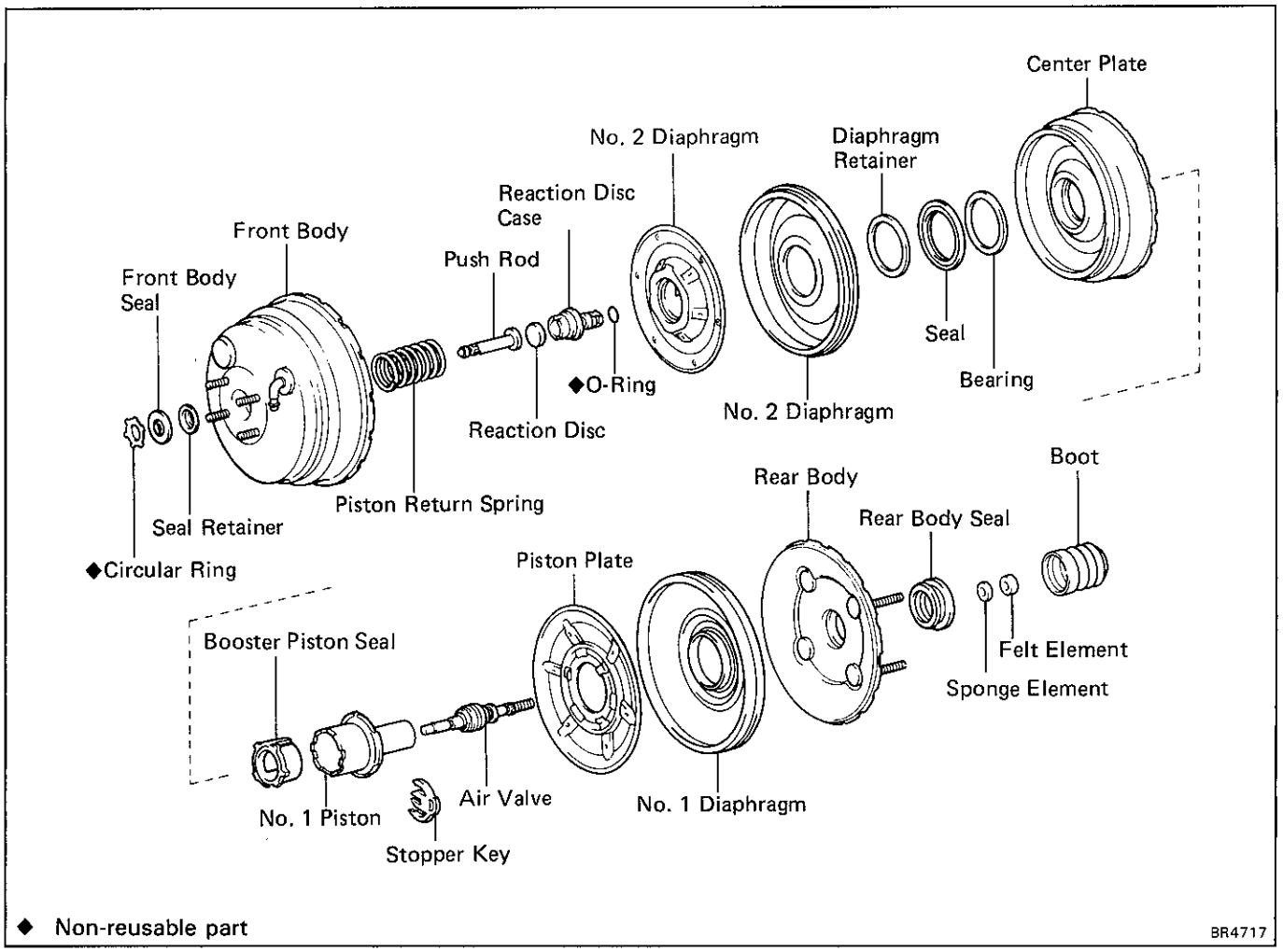


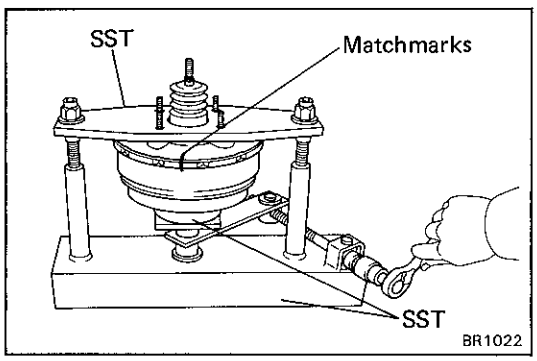
   (c) Assemble the front and rear bodies by turning the front body counterclockwise until the matchmarks match.

HINT: If the front body is too tight to be turned, apply more silicone grease on the diaphragm edge that contacts the front and rear bodies.

AISIN Type Tandem Booster

COMPONENTS





DISASSEMBLY OF BRAKE BOOSTER

1. **REMOVE CLEVIS AND LOCK NUT**

2. **SEPARATE FRONT AND REAR BODIES**

   (a) Set the booster in SST.

   SST 09753-00013 and 09753-40010

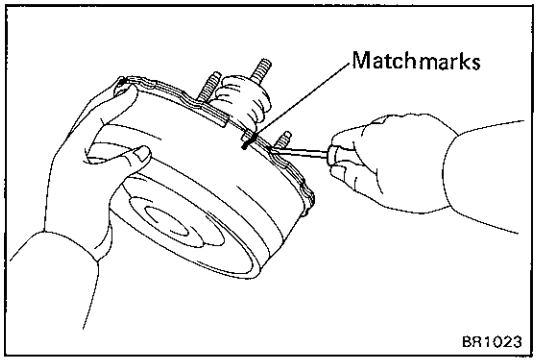
   (b) Put matchmarks on the front and rear bodies.

   NOTICE: Be careful not to tighten the two nuts of SST too tight.

   (c) Turn the front body clockwise to separate the front and rear bodies.

   (d) Remove the rear body, push rod and piston return spring from the front body.

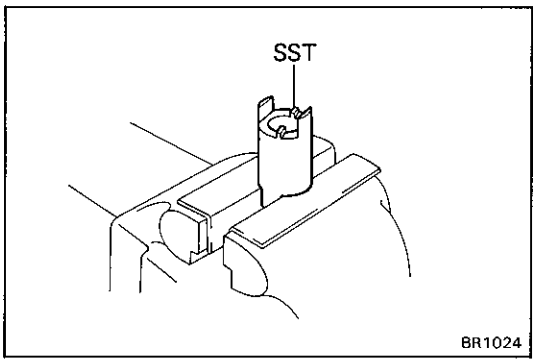
3. **REMOVE BOOT FROM REAR BODY**



4. REMOVE REAR BODY FROM CENTER PLATE ASSEMBLY

Before separating, put matchmarks on the rear body and center plate assembly.

Using a screwdriver, separate and remove the rear body from center plate assembly.

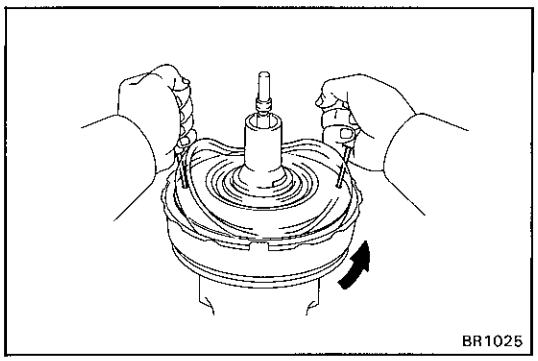


5. REMOVE NO.1 DIAPHRAGM AND PISTON PLATE FROM CENTER PLATE ASSEMBLY

(a) Mount SST in vise.

SST 09753-30011

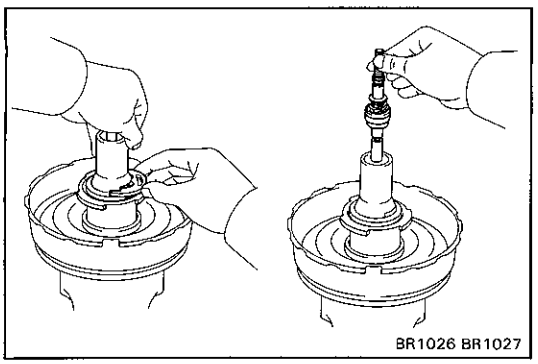
(b) Set the center plate assembly on SST.



(c) Fold the No.1 diaphragm upward, insert two pin punches into the holes on the piston plate.

(d) Turn the piston plate counterclockwise until the piston plate and No.1 diaphragm separate from the center plate assembly, and remove them.

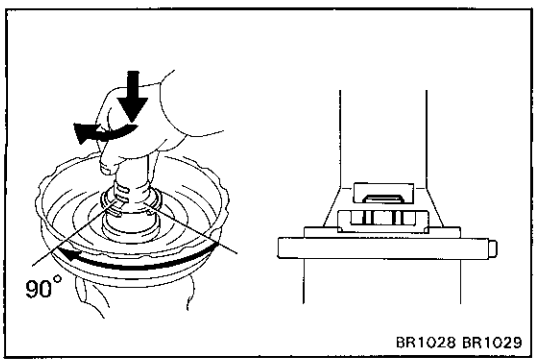
(e) Separate the No.1 diaphragm from the piston plate.



6. REMOVE STOPPER KEY AND AIR VALVE

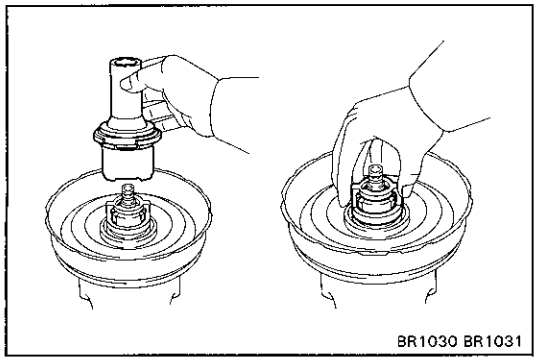
(a) Push in the valve operating rod and pull out the valve stopper key.

(b) Remove the air valve from the No.1 piston with a sponge and felt element.



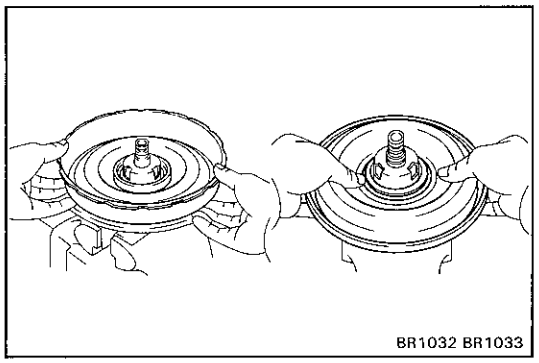
7. DISASSEMBLE CENTER PLATE ASSEMBLY

(a) While pushing in the No.1 piston, turn it a quarter of one turn and check that the sight in the stopper key hole is as shown in the illustration.


BR1030 BR1031

(b) Remove the No.1 piston from the No.2 piston.

(c) Remove the booster piston seal from the No.1 piston.

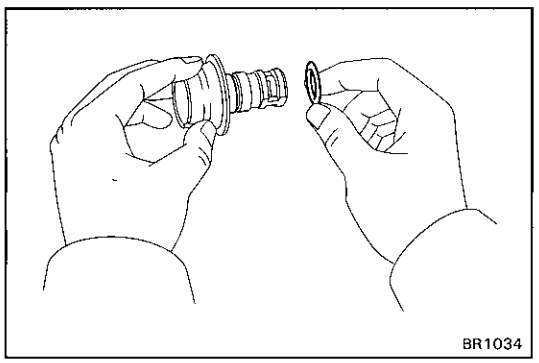

BR1032 BR1033

(d) Remove the center plate.

(e) Remove the No.2 diaphragm and No.2 piston.

(f) Remove the No.2 diaphragm from the No.2 piston.

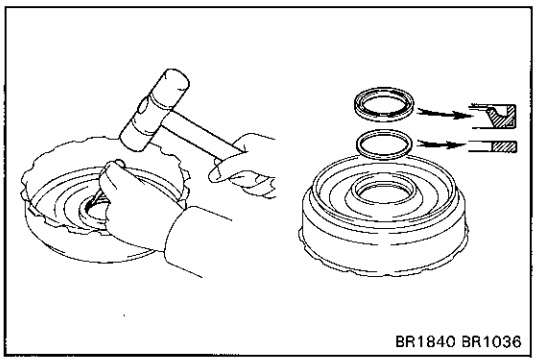
(g) Remove the diaphragm retainer from the No.2 diaphragm.


BR1034

8. REMOVE REACTION DISC AND O-RING

(a) Push out the reaction disc from the reaction disc case.

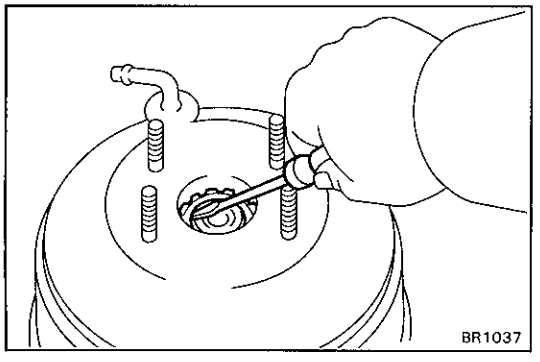
(b) Remove the O-ring from the reaction disc case.


BR1840 BR1036

9. REMOVE CENTER PLATE BEARING AND SEAL

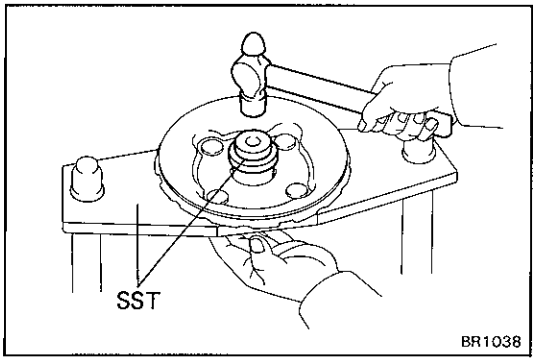
Using a screwdriver, tap out the bearing and seal.

NOTICE: Be careful not to scratch the center plate.


BR1037

10. REMOVE BODY SEAL FROM FRONT BODY

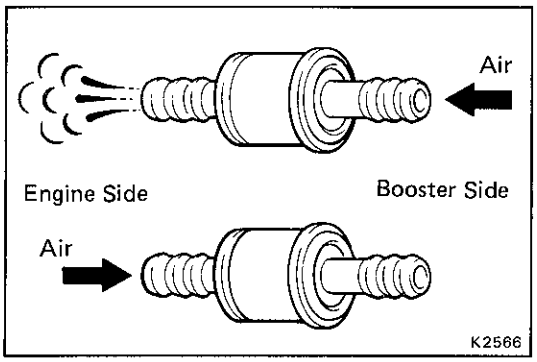
Using a screwdriver, pry out the circular ring, and remove the front body seal. Then remove the seal retainer from the seal.



11. REMOVE BODY SEAL FROM REAR BODY

Using SST, tap out the body seal from the rear body.

SST 09753-00013 and 09753-30020



INSPECTION OF BRAKE BOOSTER COMPONENTS

INSPECT CHECK VALVE OPERATION

(a) Remove the check valve.

(b) Check that air flows the booster side to the engine side.

(c) Check that air does not flow from the engine side to the booster side.

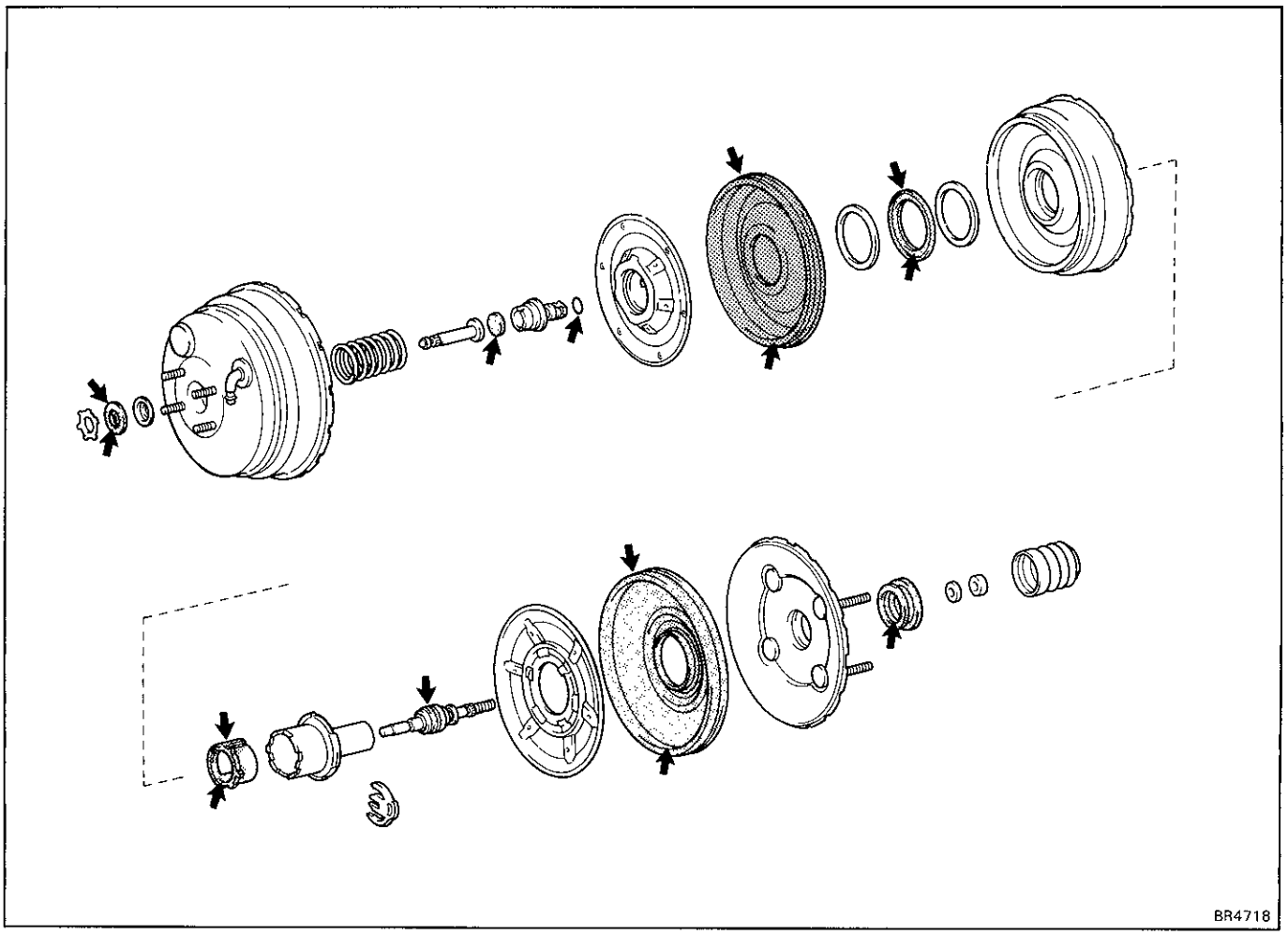
If necessary, replace the check valve.

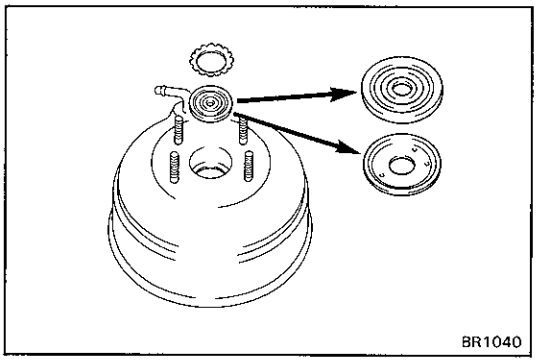
(d) Install the check valve.

ASSEMBLY OF BRAKE BOOSTER

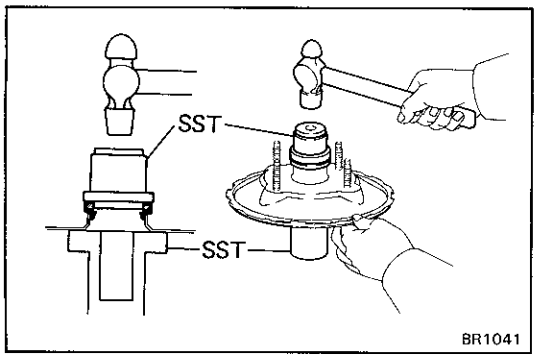
(See page BR-25)

1. APPLY SILICONE GREASE TO PARTS SHOWN BELOW



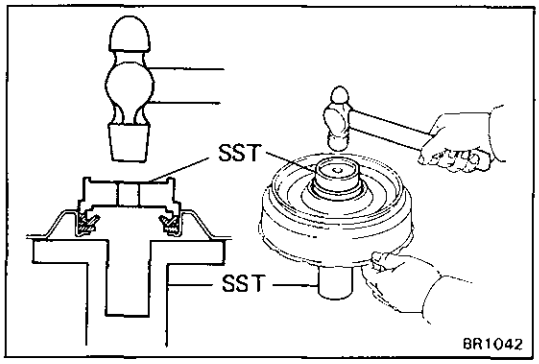


2. INSTALL BODY SEAL TO FRONT BODY
   (a) Install the seal retainer to the body seal.
   (b) Install the body seal to the front body.
   (c) Secure the body seal with the circular ring.



3. INSTALL BODY SEAL TO REAR BODY
   (a) Apply silicone grease to the rubber portion of the body seal.
   (b) Using SST, install the body seal.

   SST 09309-36010 and 09753-30020

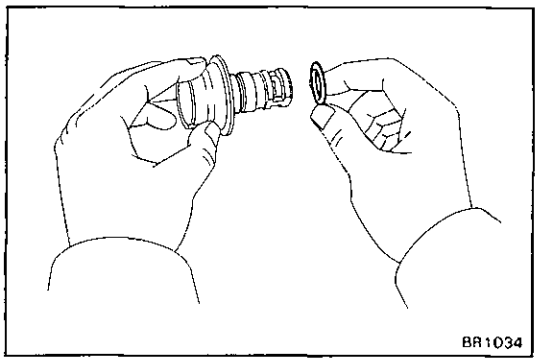


4. INSTALL CENTER PLATE BEARING AND SEAL

(a) Apply silicone grease to the seal.

(b) Using SST, install the bearing and seal in position.

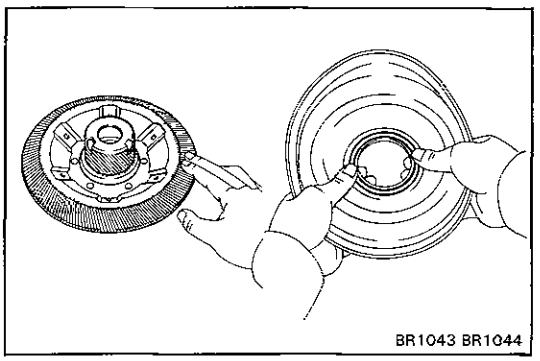
SST 09309-36010 and 09608-10010



5. INSTALL O-RING TO REACTION DISC CASE

(a) Install new O-ring to the reaction disc case.

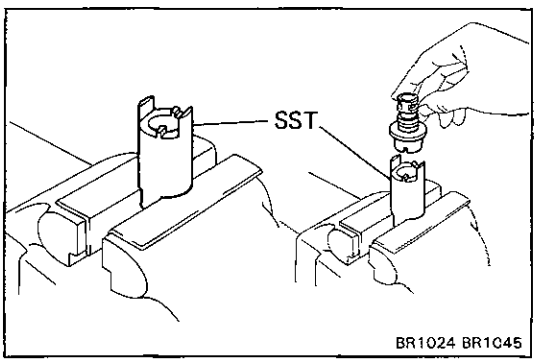
(b) Apply silicone grease to the O-ring portion.



6. ASSEMBLE CENTER PLATE ASSEMBLY

(a) Apply silicone grease to the No.2 piston as shown.

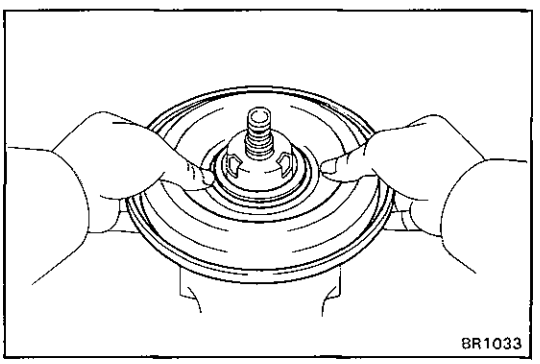
(b) Install diaphragm retainer to the No.2 diaphragm.



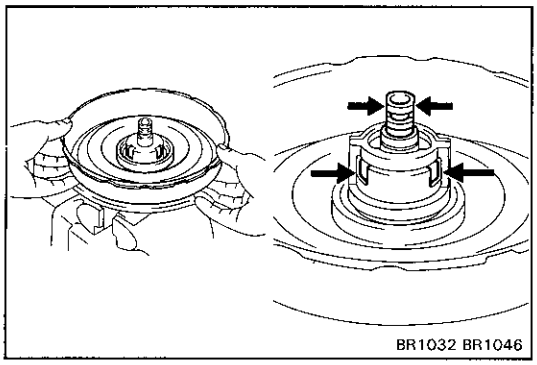
(c) Mount SST in vise.

SST 09753-30011

(d) Put the reaction disc case on SST.

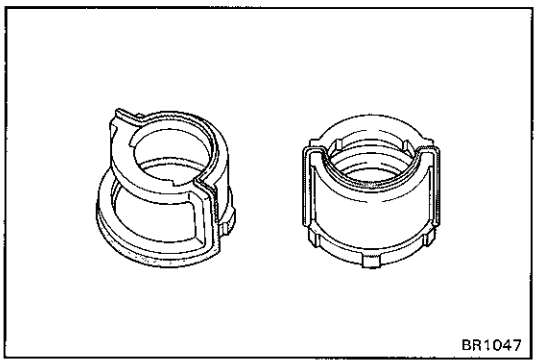


(e) Install the No.2 piston to the case, and install the No.2 diaphragm.

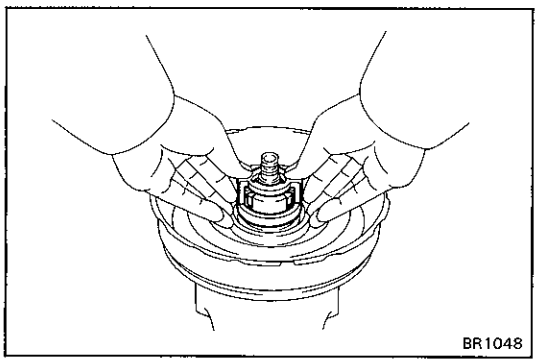

BR1032 BR1046

(f) Install the center plate and hook the No.2 diaphragm to the center plate outside ditch.

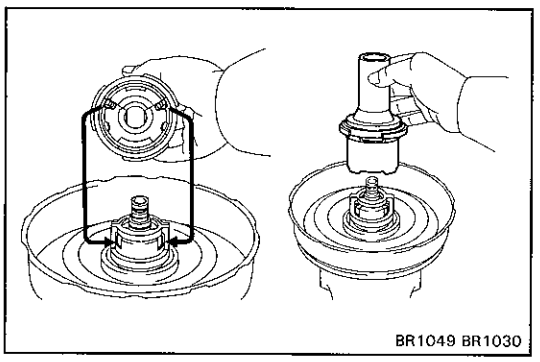
(g) Check that the positions of the reaction disc case and No.2 piston are as shown.


BR1047

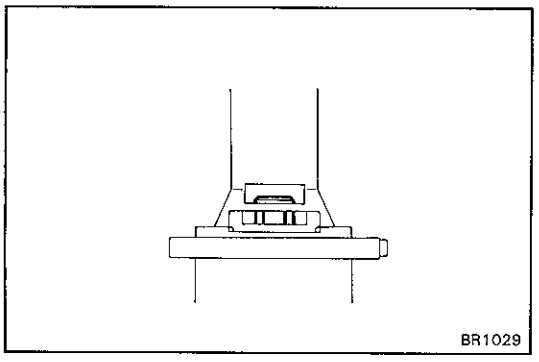
(h) Apply silicone grease to the booster piston seal as shown.


BR1048

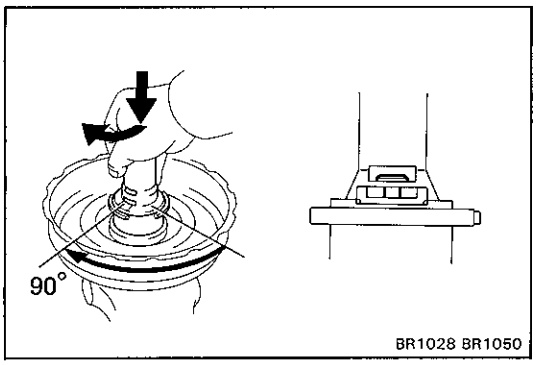
(i) Install the booster piston seal as shown, and check that there is no clearance between the No.2 piston and booster piston seal.


BR1049 BR1030

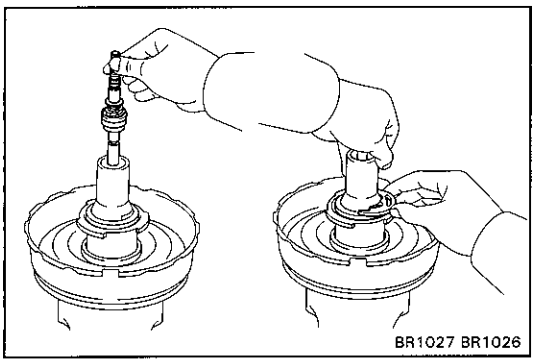
(j) Align the two holes of the No.2 piston and the matching protrusions on the No.1 piston as well as the cut portion of the reaction disc case head and matching portion inside the No.1 piston and install the No.1 piston.


BR1029

(k) Check that the sight in the stopper key hole is as shown in the illustration.



(l) While pushing in the No.1 piston, turn it a quarter of one turn, and check that the sight in the stopper key hole is as shown in the illustration.

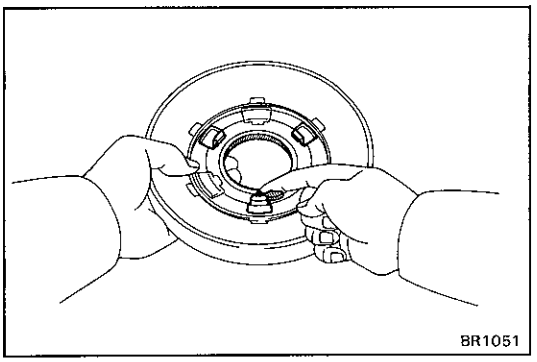


7. INSTALL AIR VALVE AND STOPPER KEY

(a) Install the air valve to the No.1 piston.

(b) Push in the valve operating rod and install the valve stopper key.

HINT: Install the stopper key as the stopper rubber on the key facing upward.

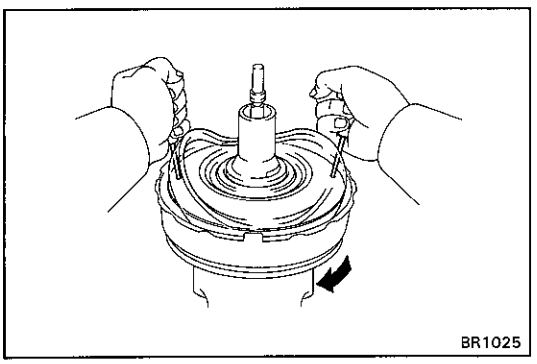


8. INSTALL NO.1 DIAPHRAGM AND PISTON PLATE TO CENTER PLATE ASSEMBLY

(a) Apply silicone grease to the piston plate where the No.1 diaphragm contacts.

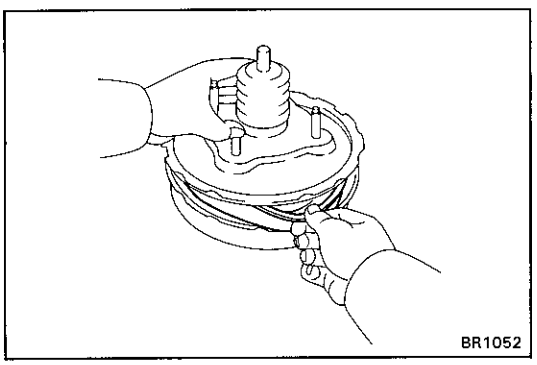
(b) Install the No.1 diaphragm to the piston plate.

(c) Apply silicone grease to the piston plate subassembly, where the No.1 piston contacts as shown.



(d) Install the piston plate subassembly in place, and fold the No.1 diaphragm upward, insert the two pin punches into the holes on the piston plate.

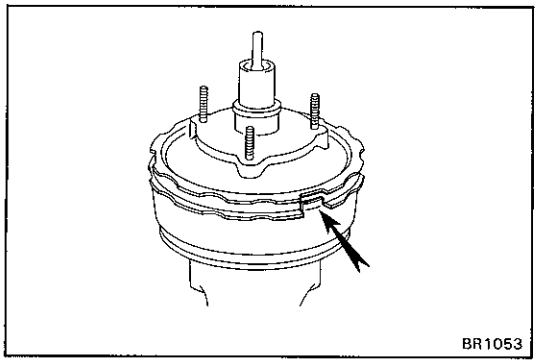
(e) Push in and turn the piston plate clockwise until the plate locks.



9. INSTALL REAR BODY TO CENTER PLATE ASSEMBLY

(a) Apply silicone grease to the inside of the rear body seal where the No.1 piston contacts.

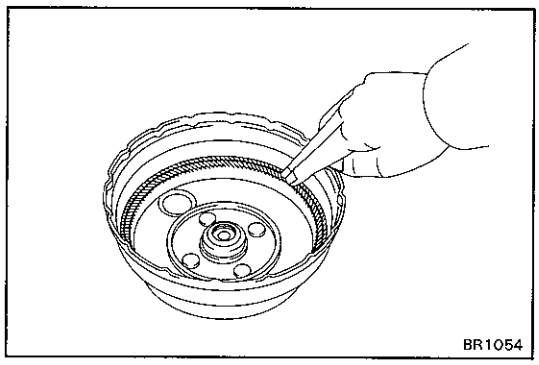
(b) Align the matchmarks, and temporarily install the rear body and align the four cut portions of the rear body and protrusions of the center plate. Then lift up the rear body and install the No.1 diaphragm to the rear body outside ditch.



(c) Recheck that the four cut portions of the rear body are in alignment with the protrusions of the center plate, and install the rear body.

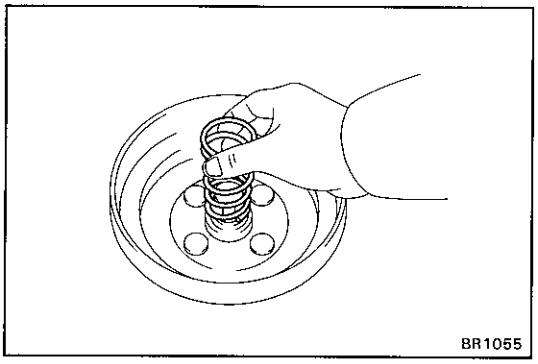
(d) Install the sponge element, felt element and boot to the No.1 piston.

(e) Apply silicone grease to the reaction disc and install it to the reaction disc case.



10. ASSEMBLE FRONT AND REAR BODIES

(a) Apply silicone grease to the front body as shown.



(b) Place the front body on SST.

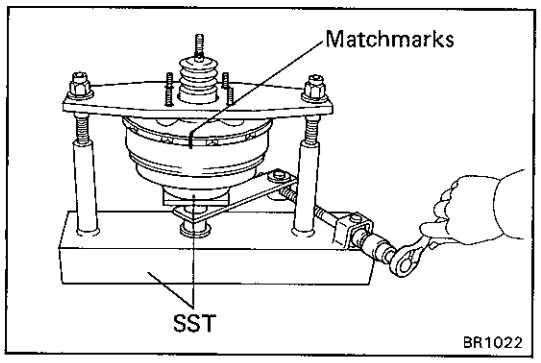
SST 09753-00013 and 09753-40010

(c) Place the spring and push rod in the front body.

(d) Place the rear body assembly in the front body.

(e) Using SST, compress the piston return spring between the front and rear bodies.

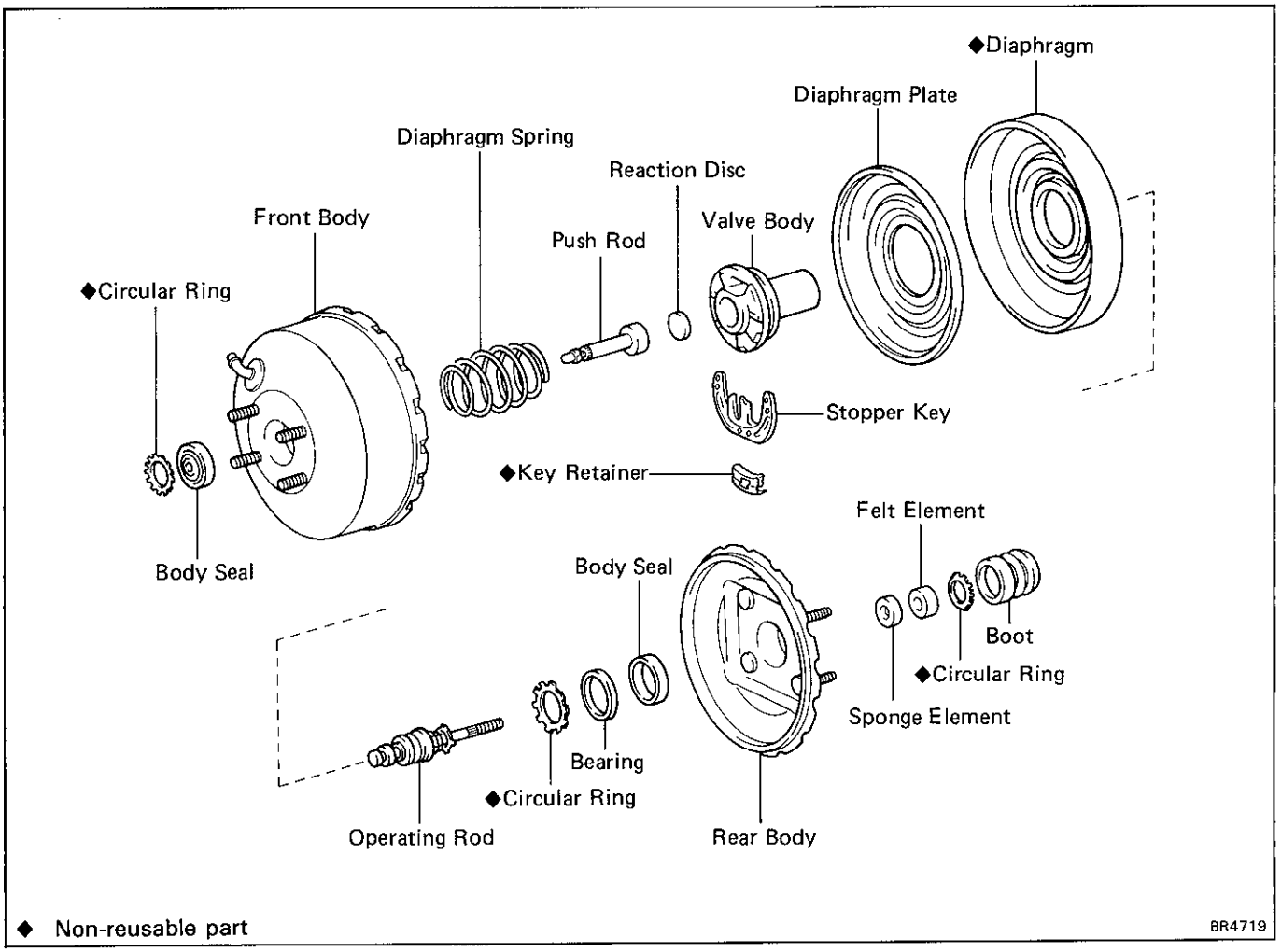
NOTICE: Be careful not to tighten the two nuts of SST too tight.

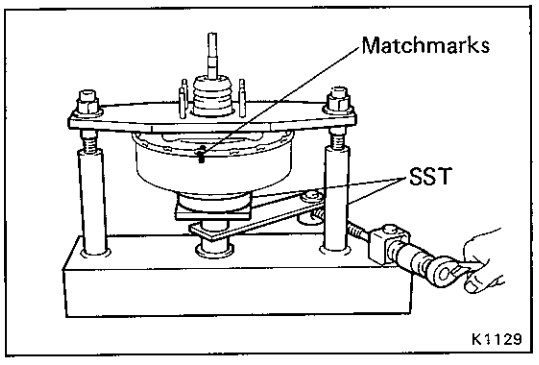


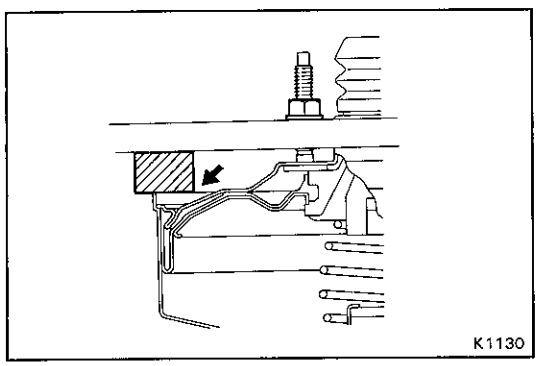
(f) Assemble the front and rear bodies by turning the front body counterclockwise until the matchmarks match.

JKC Type Single Booster

COMPONENTS







DISASSEMBLY OF BRAKE BOOSTER

1. SEPARATE FRONT AND REAR BODIES

(a) Put matchmarks on the front and rear bodies.

(b) Set the booster in SST.

SST 09753-00013 and 09753-40010

NOTICE: Be careful not to tighten the two nuts of SST too tight.

(c) Turn the front body clockwise until the front and rear bodies separate.

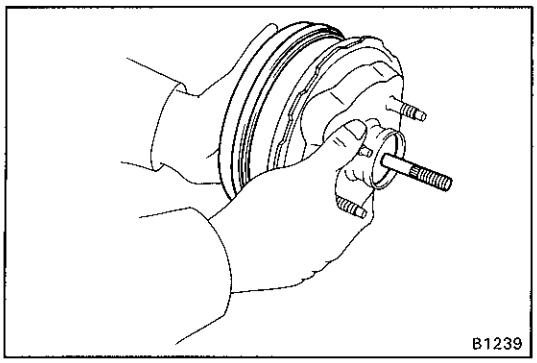
(d) Loosen the upper left and right nuts of SST, and insert pieces of wood between the front body and upper plate.

NOTICE: Be careful that the pieces of wood do not contact the rear body.

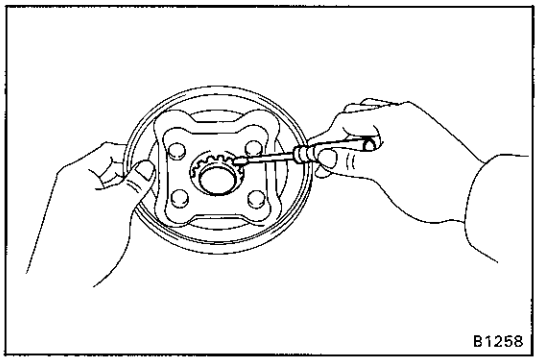
(e) Evenly tighten down the four booster mounting nuts to separate the front and rear bodies.

(f) Remove the diaphragm spring and push rod.

2. REMOVE BOOT FROM REAR BODY

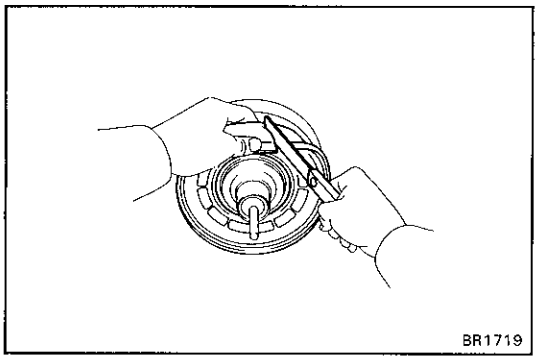


3. **REMOVE DIAPHRAGM ASSEMBLY FROM REAR BODY**



4. **REMOVE BEARING AND BODY SEAL FROM REAR BODY**

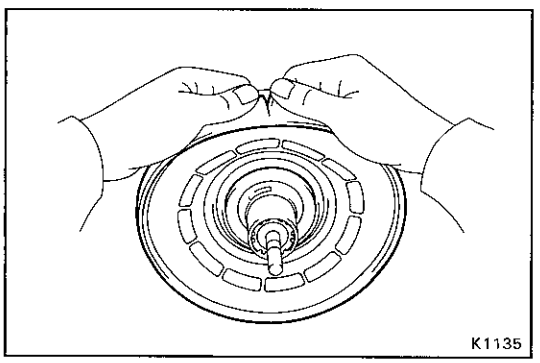
Using a screwdriver, pry out the circular ring , and remove the bearing and body seal.



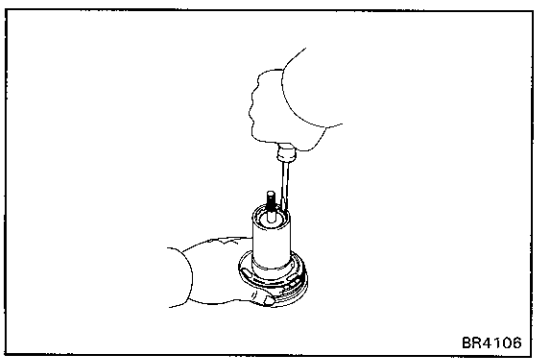
5. **REMOVE VALVE BODY AND DIAPHRAGM FROM DIAPHRAGM PLATE**

(a) Using a knife, cut off the diaphragm.

NOTICE: Be careful not to damage the valve body when cutting the diaphragm.

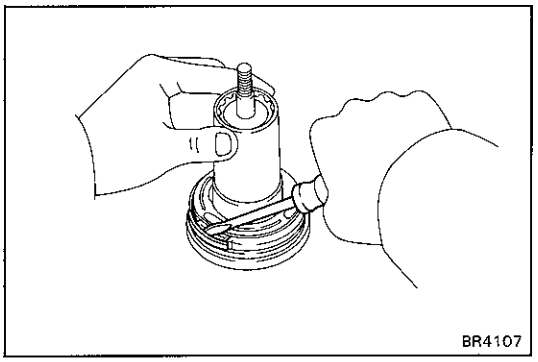


(b) Pull out diaphragm and remove the valve body.

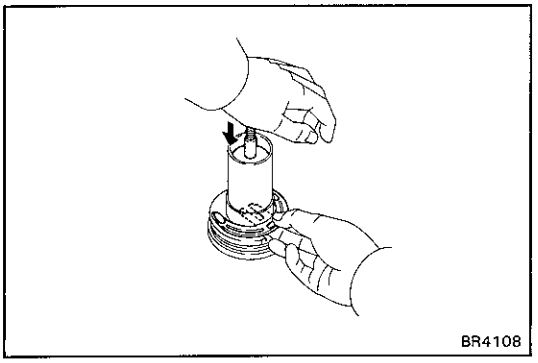


6. **REMOVE OPERATING ROD FROM VALVE BODY**

(a) Using a screwdriver, pry out the circular ring.



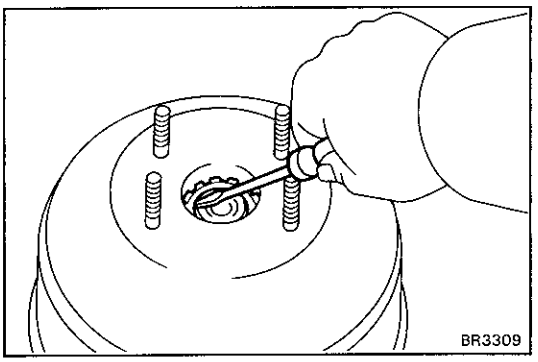
(b) Remove the key retainer.



(c) While pushing in the operating rod, remove the stopper key.

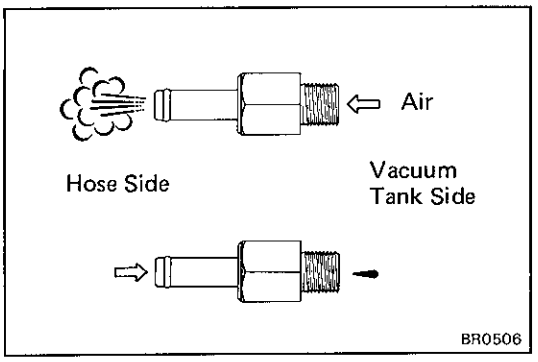
(d) Pull out the operating rod with the two elements.

7. REMOVE REACTION DISC FROM VALVE BODY



8. REMOVE BODY SEAL FROM FRONT BODY

Using a screwdriver, pry out the circular ring, and remove the body seal.



INSPECTION OF BRAKE BOOSTER COMPONENTS

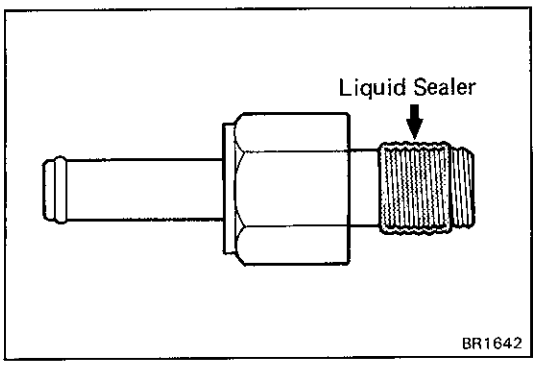
INSPECT CHECK VALVE OPERATION

(a) Remove the check valve from the vacuum line.

(b) Check that air flows from the vacuum tank side to the hose side.

(c) Check that air does not flow from the hose side to the vacuum tank side.

If necessary, replace the check valve.



(d) Apply liquid sealer to the check valve as shown.

Sealant: Part No. 08826-00080 or equivalent

(e) Install the check valve.

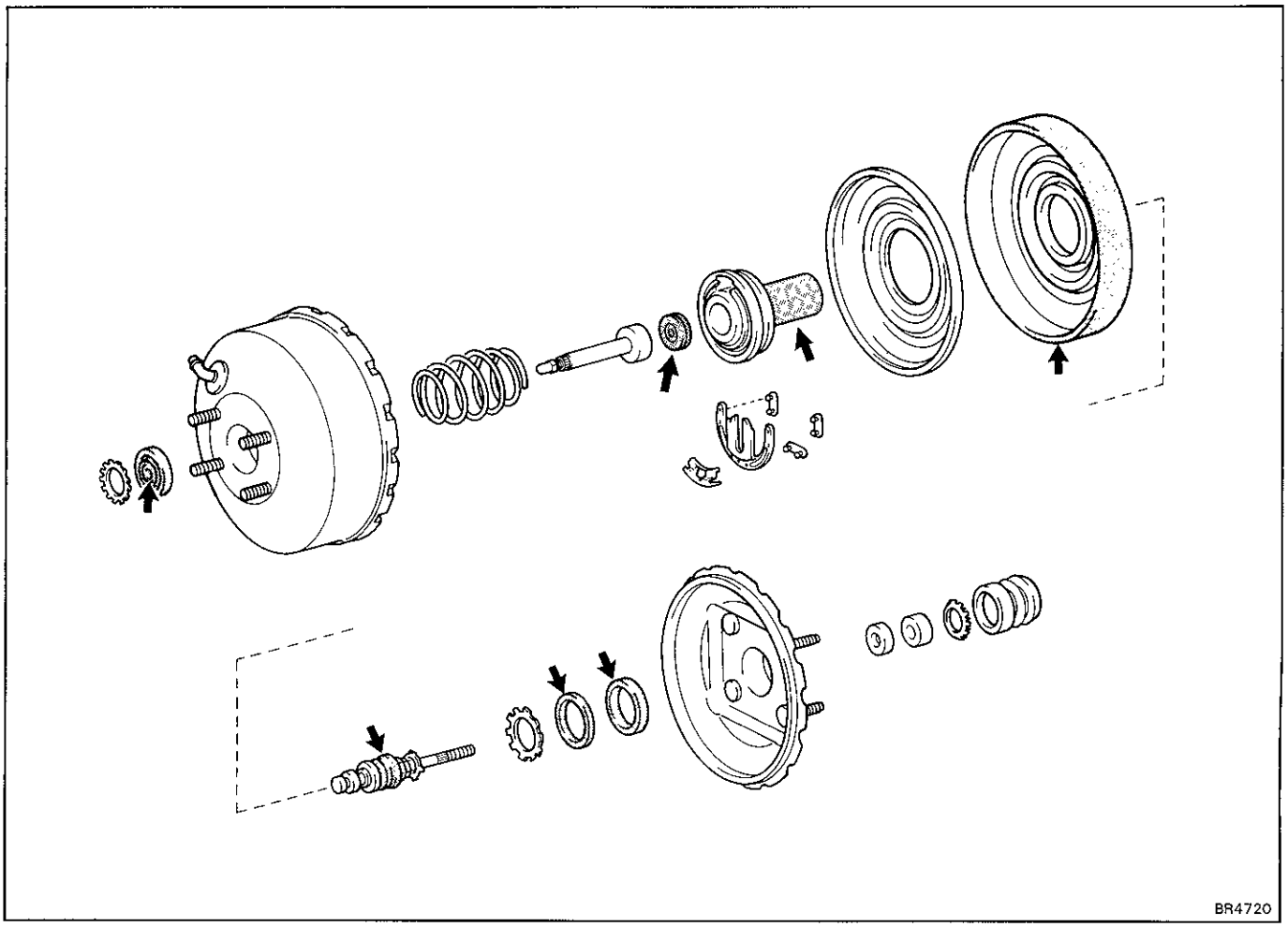
Torque: 300 kg-cm (22 ft-lb, 29 N·m)

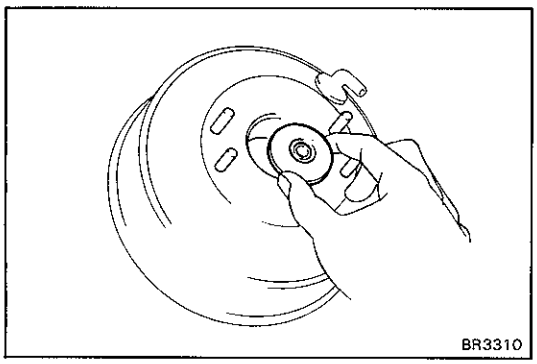
(f) Install the vacuum hose to the check valve with hose clamp.

ASSEMBLY OF BRAKE BOOSTER

(See page BR-34)

1. APPLY SILICONE GREASE TO PARTS SHOWN BELOW

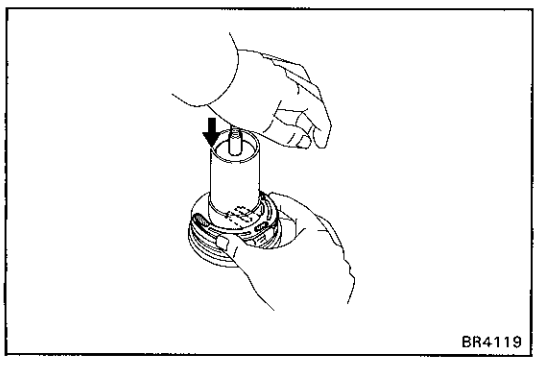




2. INSTALL BODY SEAL AND RETAINER TO FRONT BODY

(a) Place the body seal in position.

(b) Secure the body seal with a new circular ring.

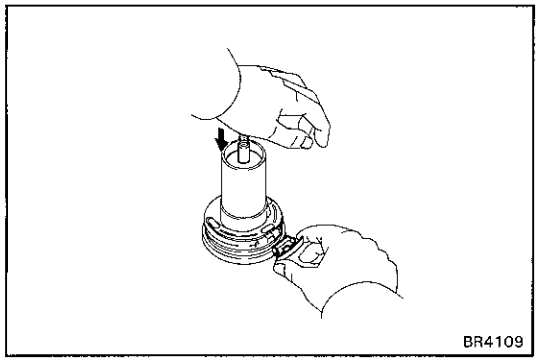


3. INSTALL OPERATING ROD TO VALVE BODY

(a) Insert the operating rod into the valve body.

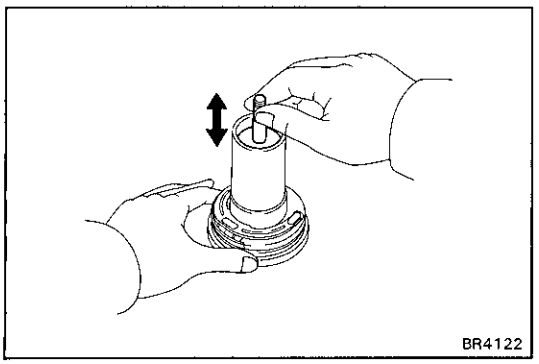
(b) Push the operating rod in the valve body and install the stopper key.

HINT: Install the stopper key as the stopper rubber on the key facing upward.



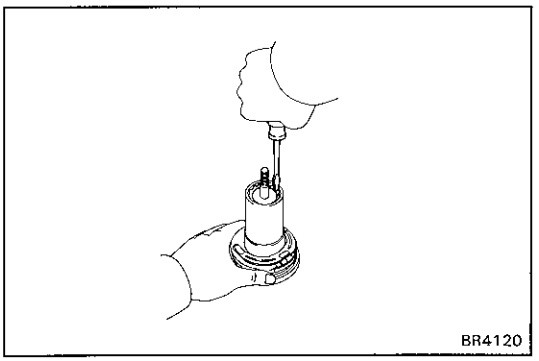
(c) Install a new key retainer.

HINT: Align the retainer protrusion and valve body groove, insert the key retainer into the valve body until the clicking sound is heared.



(d) Pull the operating rod and confirm that the stopper key is working.

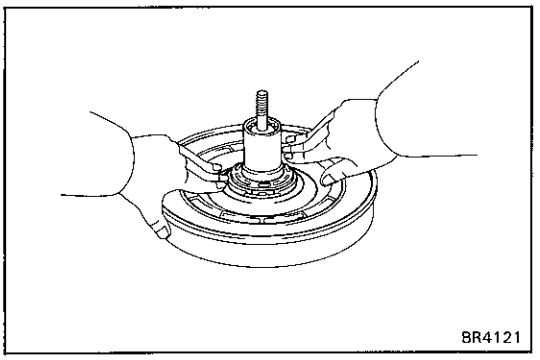
4. INSTALL REACTION DISC TO VALVE BODY



5. INSTALL ELEMENTS

(a) Install the sponge element and felt element.

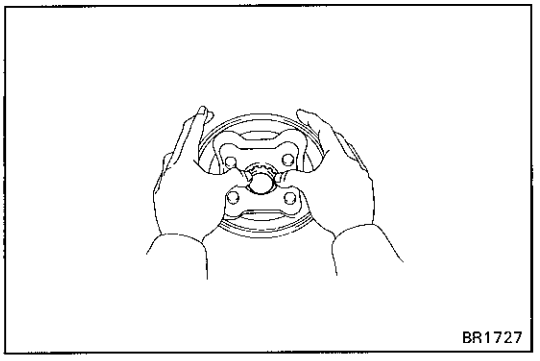
(b) Secure the elements with a new circular ring.



6. INSTALL VALVE BODY AND DIAPHRAGM TO DIAPHRAGM PLATE

(a) Insert the valve body in the diaphragm plate.

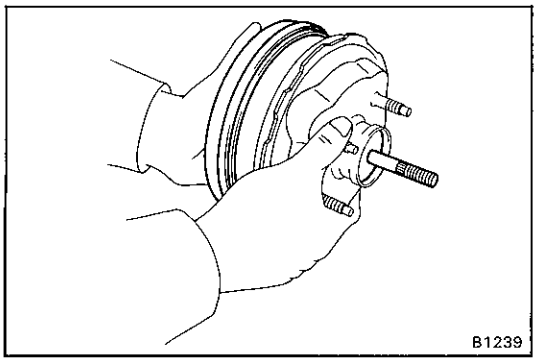
(b) Install the diaphragm between the diaphragm plate and valve body.



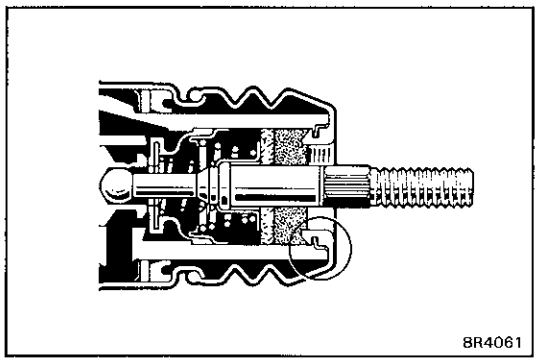
7. INSTALL BODY SEAL AND BEARING TO REAR BODY

(a) Place the body seal and bearing in position.

(b) Secure the bearing with a new circular ring.



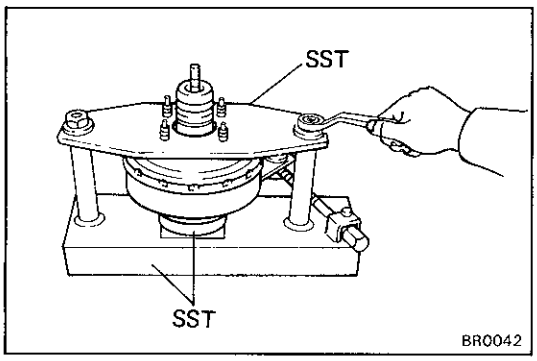
8. INSTALL DIAPHRAGM ASSEMBLY TO REAR BODY



9. INSTALL BOOT TO REAR BODY

(a) Install the boot to the assembly.

(b) Check that the circular ring fit into the groove of the boot as shown in the illustration.



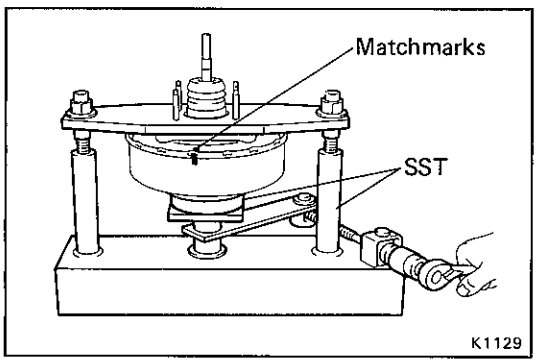
10. ASSEMBLE FRONT AND REAR BODIES

(a) Place the spring and push rod in the front body.

(b) Using SST, compress the spring between the front and rear bodies.

SST 09753-00013 and 09753-40010

NOTICE: Be careful not to tighten the two nuts of SST too tight.

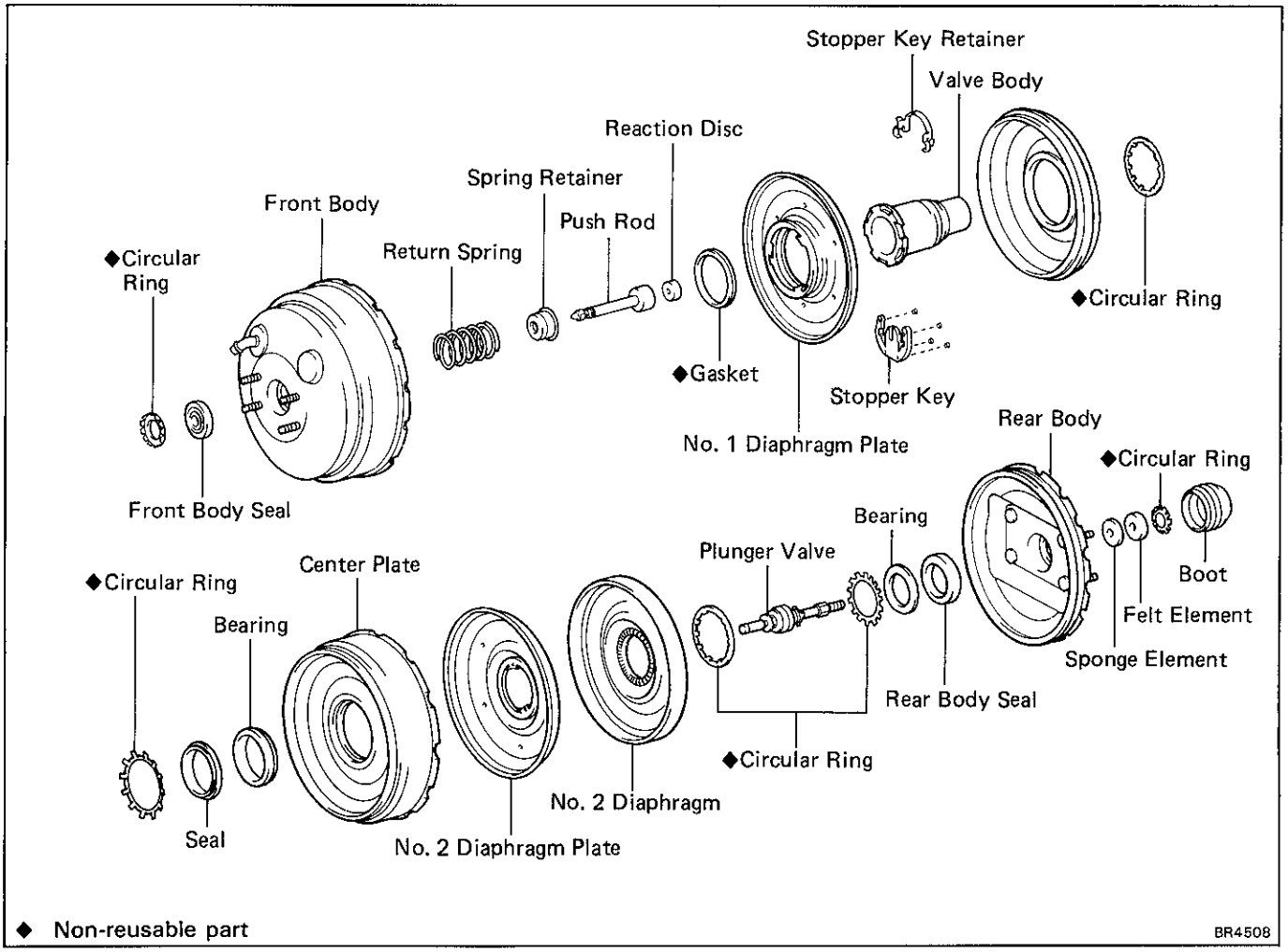


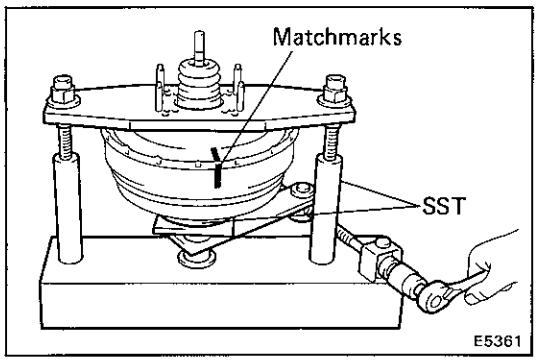
(c) Assemble the front and rear bodies by turning the front body counterclockwise until the matchmarks match.

HINT: If the front body is too tight to be turned, apply more silicone grease on the diaphragm edge that contacts the front and rear bodies.

JKC Type Tandem Booster

COMPONENTS





DISASSEMBLY OF BRAKE BOOSTER

1. SEPARATE FRONT AND REAR BODIES

(a) Set the booster in SST.

SST 09753-00013 and 09753-40010

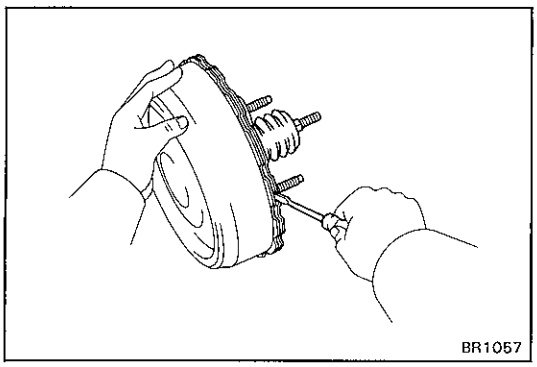
(b) Put matchmarks on the front and rear bodies.

NOTICE: Be careful not to tighten the two nuts of the SST too tight.

(c) Turn the front body clockwise to separate the front and rear bodies.

(d) Remove the rear body, push rod, spring retainer and piston return spring from the front body.

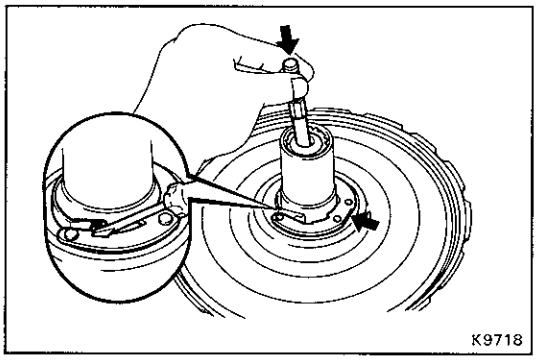
2. REMOVE BOOT FROM REAR BODY



3. REMOVE REAR BODY FROM CENTER PLATE ASSEMBLY

Using a screwdriver, separate and remove the rear body from center plate assembly.

HINT: Tape the screwdriver tip before use.

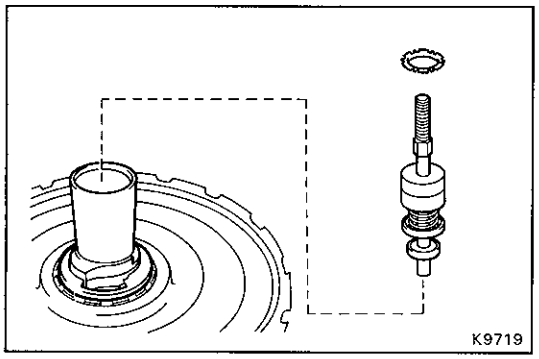


4. REMOVE PLUNGER VALVE

(a) Using a screwdriver, crush the protrusion of the stopper key retainer as shown in the illustration.

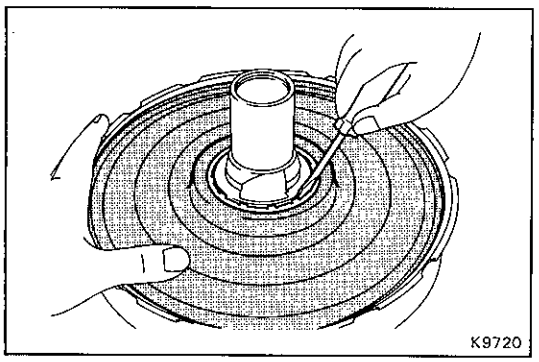
(b) While pushing in the plunger valve, remove the stopper key.

(c) Remove the stopper key retainer.



(d) Using a screwdriver, pry out the circular ring.

(e) Remove the plunger valve with the sponge and felt elements from the valve body.



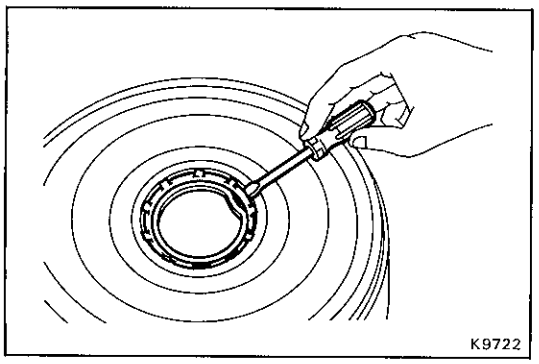
5. REMOVE NO.2 DIAPHRAGM

(a) Using a screwdriver, pry out the circular ring.

(b) Remove the No.2 diaphragm.

(c) Remove the No.2 diaphragm plate.

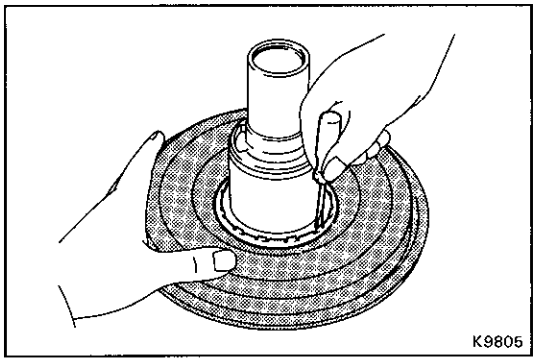
6. REMOVE CENTER PLATE FROM ASSEMBLY



7. REMOVE SEAL AND BEARING FROM CENTER PLATE

(a) Using a screwdriver, pry out the circular ring from the center plate.

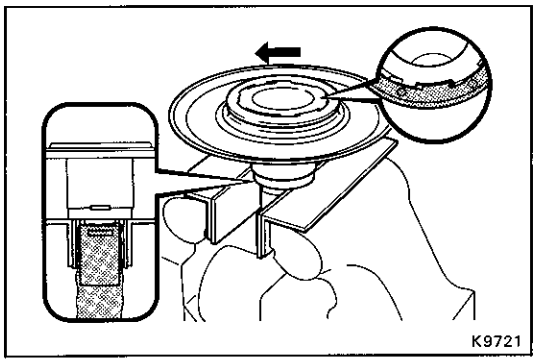
(b) Remove the seal and bearing.



8. REMOVE NO.1 DIAPHRAGM

(a) Using a screwdriver, pry out the circular ring.

(b) Remove the No.1 diaphragm.



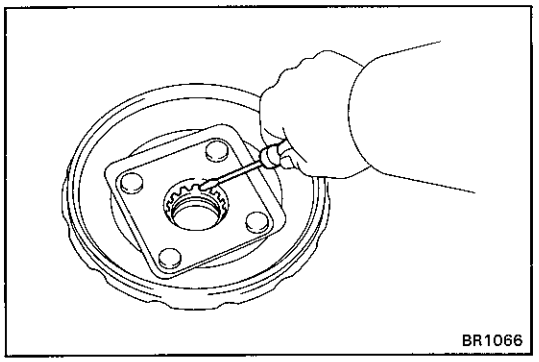
9. REMOVE NO.1 DIAPHRAGM PLATE

(a) Wind a cloth or an equivalent to the valve body, and using soft jaws, clamp the diaphragm plate assembly in the vise.

NOTICE: Do not tighten the vise too tight.

(b) Using a screwdriver, lift up the protrusion of the No.1 diaphragm plate and turn the plate one third of one turn counterclockwise.

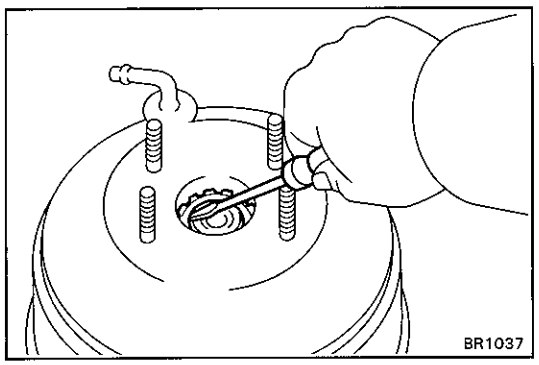
(c) Remove the No.1 diaphragm plate and O-ring.



10. REMOVE BODY SEAL AND BEARING FROM REAR BODY

(a) Using a screwdriver, pry out the circular ring from the rear body.

(b) Remove the body seal and bearing.

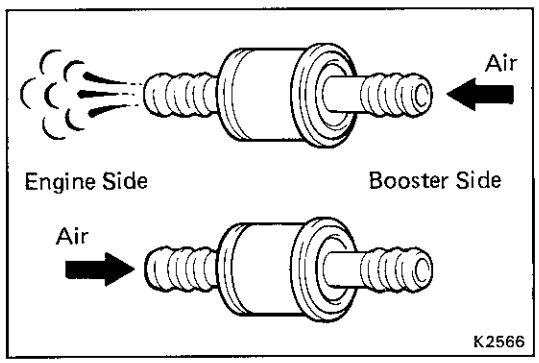


11. REMOVE BODY SEAL FROM FRONT BODY

(a) Using a screwdriver, pry out the circular ring.

(b) Remove the body seal.

INSPECTION OF BRAKE BOOSTER COMPONENTS



INSPECT CHECK VALVE OPERATION

(a) Remove the check valve.

(b) Check that air flows from the booster side to the engine side.

(c) Check that air does not flow from the engine side to the booster side.

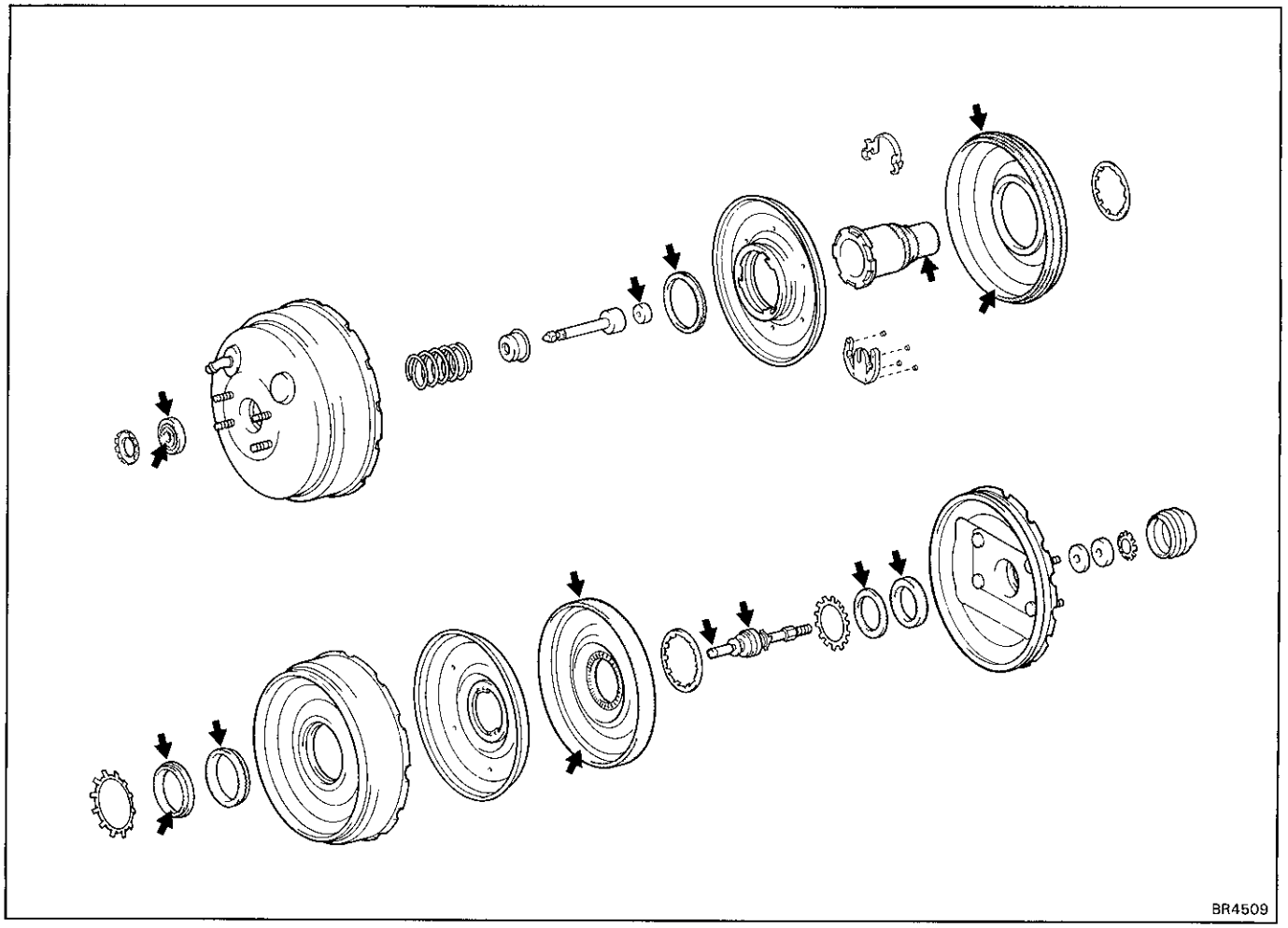
If necessary, replace the check valve.

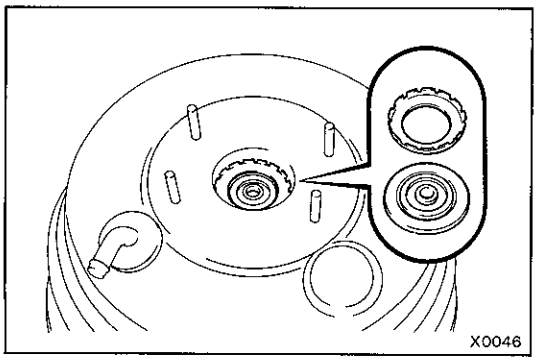
(d) Install the check valve in place.

ASSEMBLY OF BRAKE BOOSTER

(See page BR-40)

1. APPLY SILICONE GREASE TO PARTS SHOWN BELOW

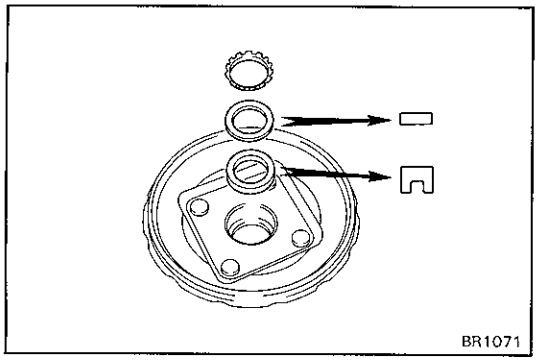




2. INSTALL BODY SEAL TO FRONT BODY

(a) Apply silicone grease to the body seal and install it to the front body.

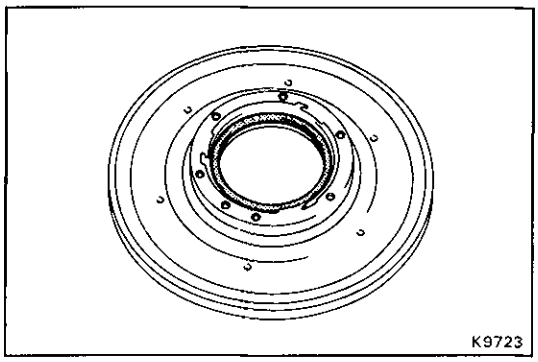
(b) Secure the body seal with a new circular ring.



3. INSTALL BODY SEAL TO REAR BODY

(a) Apply silicone grease to the body seal and install it to the rear body.

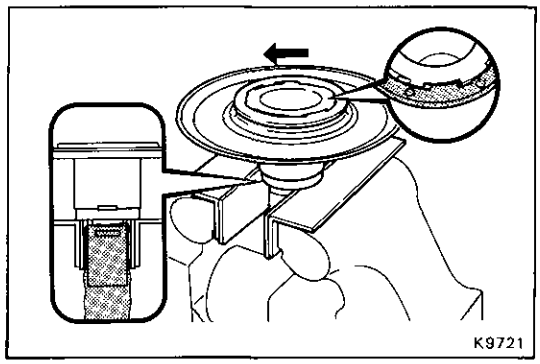
(b) Install the bearing and secure the body seal and bearing with a new circular ring.



4. INSTALL No.1 DIAPHRAGM PLATE TO VALVE BODY

(a) Install a new O-ring to the NO.1 diaphragm plate.

(b) Set the No.1 diaphragm plate on the valve body.

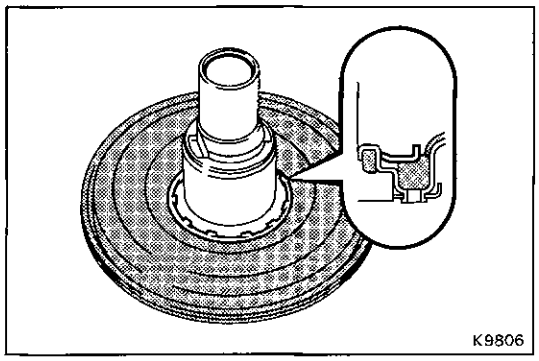


(c) Wind a cloth or an eguivalent to the valve body, and using soft jaws, clamp the diaphragm plate assembly in the vise.

NOTICE: Do not tighten the vise too tight.

(d) Align the protrusion of the No.1 diaphragm plate and cut portion of the valve body, then turn the plate one third of one turn counterclockwise.

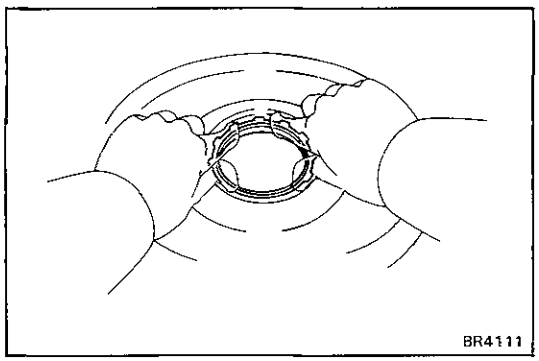
(e) Stake the protrusion of the No.1 diaphragm plate.



5. INSTALL NO.1 DIAPHRAGM

(a) Install the No.1 diaphragm onto the No.1 diaphragm plate.

(b) Secure the diaphragm with the new circular ring.

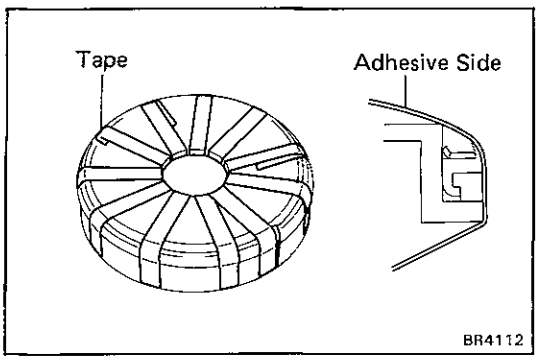


6. ASSEMBLE CENTER PLATE ASSEMBLY

(a) Install the bearing and a new circular ring to the seal.

(b) Install the seal assembly to the center plate.

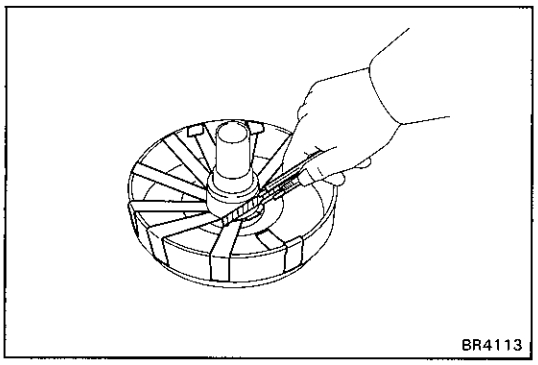
(c) Apply silicone grease on the circular ring with the thickness about 2.0 mm (0.79 in.).



(d) Wind the thin tape to the center plate as shown in the illustration so as not to the seal lip fold under when inserting the valve body.

HINT: Wind the tape so the adhesive side faces the outside.

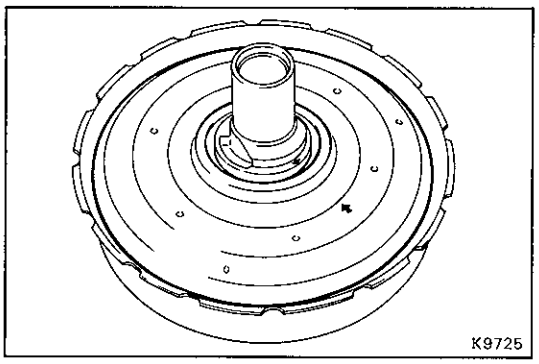
(e) Apply silicon grease to the tape and valve body contact portions.



(f) Install the center plate to the valve body.

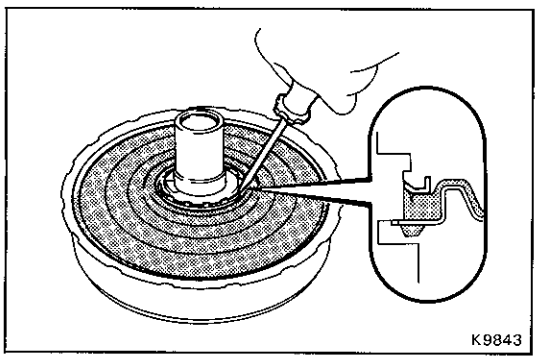
NOTICE: Be careful not to the seal lip fold under.

(g) Cut off the tapes and pull out them.



7. INSTALL NO.2 DIAPHRAGM PLATE

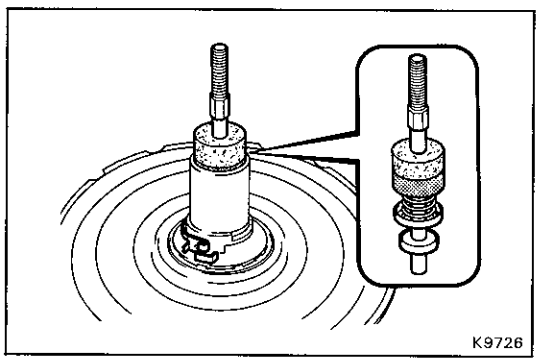
Align the arrows on the valve body and No.2 diaphragm plate, then install the diaphregm plate to the valve body.



8. INSTALL NO.2 DIAPHRAGM

(a) Install the No.2 diaphragm onto the No.2 diaphragm plate.

(b) Secure the diaphragm with a new circular ring.

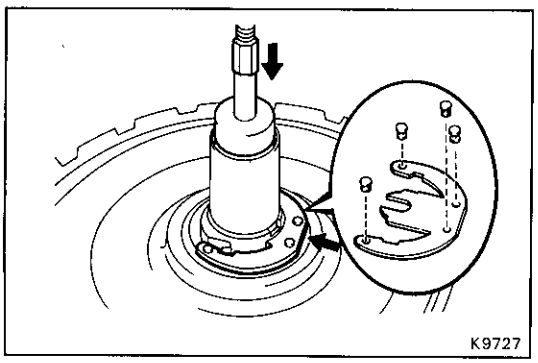


9. INSTALL PLUNGER VALVE

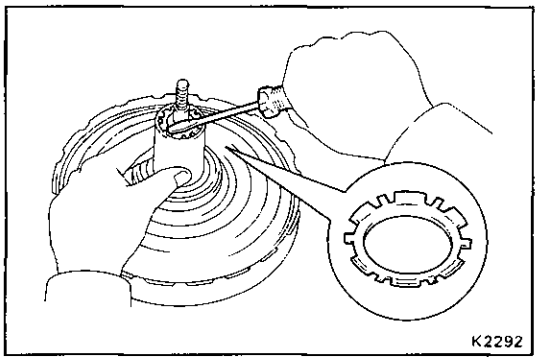
(a) Install the sponge and felt elements to the plunger valve.

(b) Install the plunger valve to the valve body.

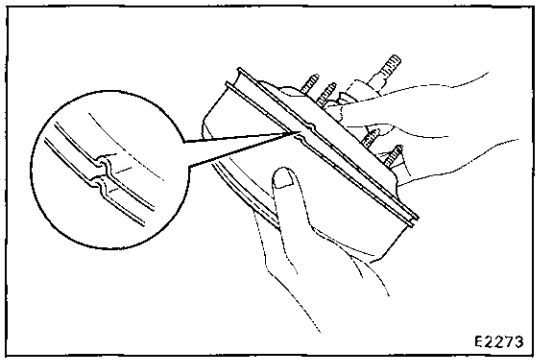
(c) Install the stopper key retainer to the valve body.



(d) While pushing in the plunger valve, install the stopper key.

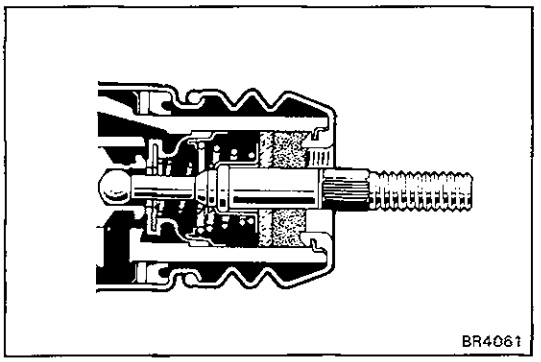


(e) Secure the plunger valve with a new circular ring.



10. INSTALL REAR BODY TO CENTER PLATE ASSEMBLY

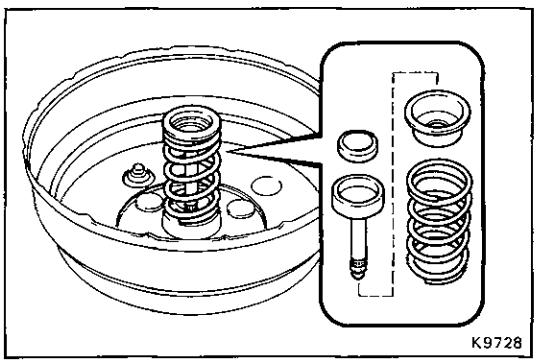
Align the each protrusions of the center plate and rear body, install the rear body to the center plate assembly.



11. INSTALL BOOT

(a) Install the boot to the assembly.

(b) Check that the circular ring fit into the groove of the boot as shown in the illustration.



12. ASSEMBLE FRONT AND REAR BODIES

(a) Place the front body on SST.

SST 09753-00013 and 09753-40010

(b) Install the following parts to the front body.

- Return spring
- Spring retainer
- Push rod
- Reaction disc

HINT: Before installing the reaction disc, apply silicon grease to the reaction disc.

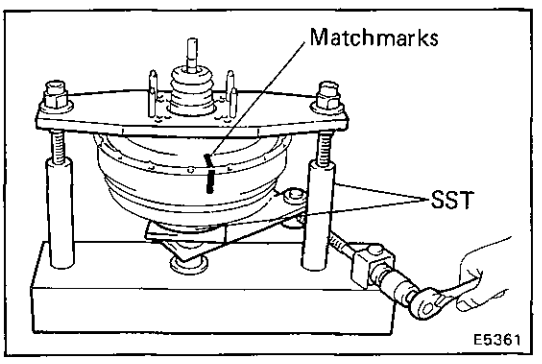
(c) Place the rear body assembly into the front body.

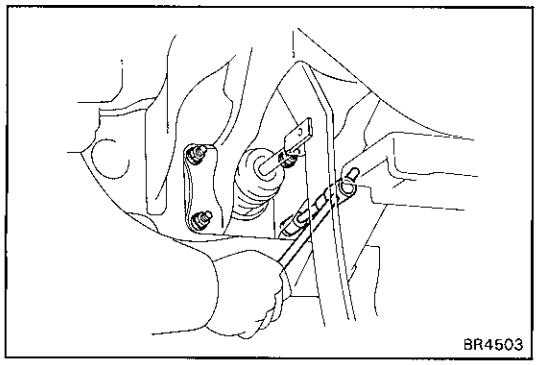
(d) Using SST, compress the spring between the front and rear bodies.

SST 09753-00013 and 09753-40010

NOTICE: Be careful not to tighten the two nuts of SST too tight.

(e) Assemble the front and rear bodies by turning the front body counterclockwise until the matchmarks match.





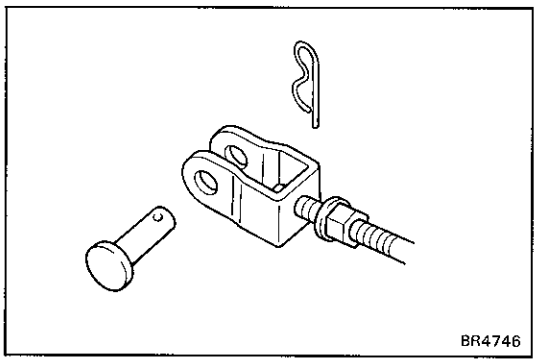
INSTALLATION OF BRAKE BOOSTER

(See page BR-17)

1. INSTALL BRAKE BOOSTER AND CLEVIS

Install the brake booster, and torque the four nuts.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

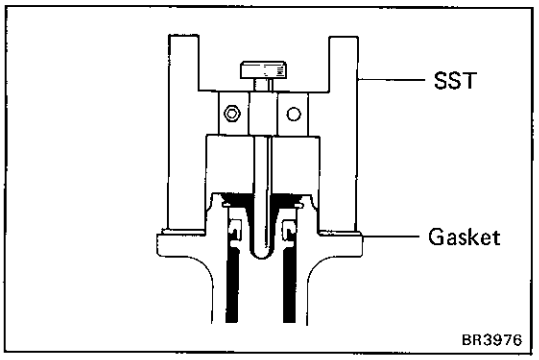


2. CONNECT CLEVIS TO BRAKE PEDAL

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

3. INSTALL PEDAL RETURN SPRING

4. CONNECT VACUUM HOSE TO BRAKE BOOSTER

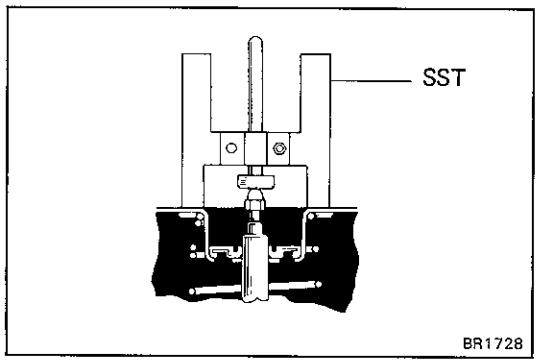


5. ADJUST LENGTH OF BOOSTER PUSH ROD

(a) Install the gasket on the master cylinder.

(b) Set the SST on the gasket, and lower the pin until its tip slightly touches the piston.

SST 09737-00010

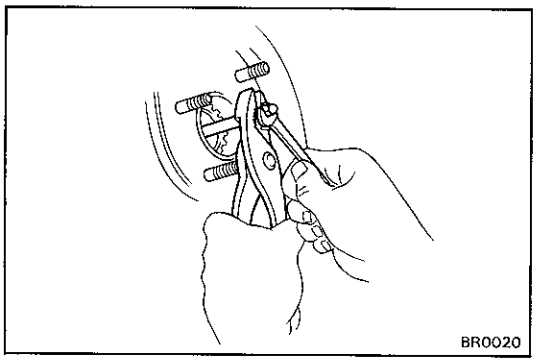


(c) Turn SST upside down, and position it on the booster.

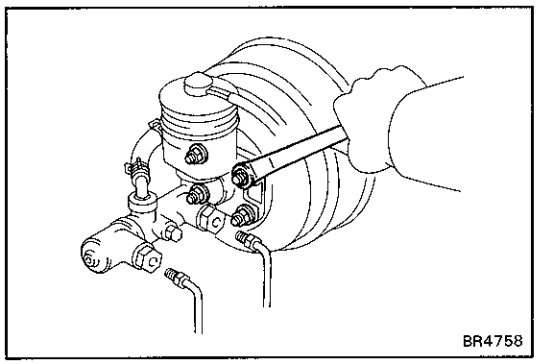
SST 09737-00010

(d) Measure for clearance between the booster push rod and pin head (SST).

Clearance: 0 mm (0 in.)



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



6. INSTALL MASTER CYLINDER
(See page BR-10)

7. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM
(See page BR-7)

8. CHECK FLUID LEAKAGE

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

10. PERFORM OPERATIONAL CHECK
(See page BR-7)