BRAKE SYSTEM

PRECAUTIONS

1. **Care must be taken to replace each part properly as it could affect the performance of the brake system and result in a driving hazard. Replace the parts with parts of the same part number or equivalent.**

2. **It is very important to keep parts and the area clean when repairing the brake system.**

TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Low or spongy pedal	Linings worn	Replace brake shoes	BR-41, 59
	Brake pads worn	Replace pads	BR-25, 33, 50
	Leak in brake system	Repair leak	
	Master cylinder faulty	Repair or replace master cylinder	BR-10
	Air in brake system	Bleed brake system	BR-7
	Wheel cylinder faulty	Repair wheel cylinder	BR-41
	Brake cylinder faulty	Repair cylinder	BR-25, 33, 50
	Piston seals worn or damaged	Repair brake cylinder	BR-25, 33, 50
	Rear brake automatic adjuster faulty	Repair or replace adjuster	
Brakes drag	Parking brake out of adjustment	Adjust parking brake	BR-8
	Binding parking brake wire	Repair as necessary	
	Booster push rod out of adjustment	Adjust push rod	BR-23
	Tension or return spring faulty	Replace spring	BR-41, 59
	Brake line restricted	Repair as necessary	
	Lining cracked or distorted	Replace shoe	BR-41, 59
	Pad cracked or distorted	Replace pad	BR-25, 33, 50
	Wheel cylinder or caliper piston sticking	Repair as necessary	BR-25, 33, 41, 50
	Adjuster broken	Replace adjuster	
	Master cylinder faulty	Repair or replace master cylinder	BR-10
Brakes pull	Tires improperly inflated	Inflate tires to proper pressure	
	Oil or grease on shoes or pads	Check for cause. Replace shoes or pads	
	Brake shoes distorted, linings worn or glazed	Replace brake shoes	BR-41, 59
	Brake pads distorted, worn or glazed	Replace pads	BR-25, 33, 50
	Drum or disc out of round	Replace drum or disc	BR-25, 33, 41, 50, 67
	Tension or return spring faulty	Replace spring	
	Wheel cylinder faulty	Repair wheel cylinder	BR-41
	Brake cylinder faulty	Repair cylinder	BR-25, 33, 50
	Piston frozen in brake cylinder	Repair cylinder	BR-25, 33, 50
	Brake pad sticking	Replace pads	BR-25, 33, 50

TROUBLESHOOTING (Cont'd)

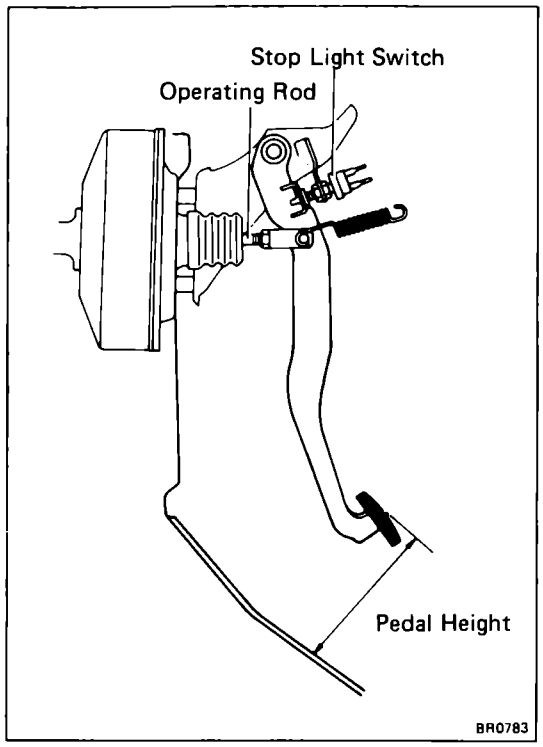
Problem	Possible cause	Remedy	Page
Hard pedal but brakes inefficient	Oil or grease on shoes or pads	Check for cause. Replace shoes or pads	BR-25, 33, 41, 50, 67
	Brake shoes distorted, linings worn or glazed, drums worn	Replace brake shoes	BR-41, 59
	Brake pads distorted, worn or glazed	Replace pads	BR-25, 33, 50
	Piston frozen in brake cylinder	Repair cylinder	BR-25, 33, 50
	Brake booster faulty	Replace booster	BR-22
	Vacuum leaks	Repair as necessary	
	Brake line restricted	Repair as necessary	
Snapping or clicking noise when brakes are applied	(Drum brake)		
	Brake shoes binding at backing plate ledges	Lubricate	BR-41, 59
	Backing plate ledges worn	Replace and lubricate ledges	BR-41, 59
	Loose or missing shoe hold-down spring	Replace shoe hold-down spring	BR-41, 59
	Loose set bolt at backing plate	Tighten	BR-41, 59
	(Disc brake)		
	Loose or missing pad support plate	Replace pad support plate	BR-25, 33, 50
	Loose installation bolt	Tighten	BR-25, 33, 50
	Wear on slide bushing	Replace slide bushing	BR-25, 33, 50
Scraping or grinding noise when brakes are applied	Worn brake linings or pads	Replace or refinish drums or rotors if heavily scored	BR-25, 33, 41, 50, 59
	Caliper to wheel or rotor interference	Replace as required	BR-25, 33, 50
	Dust cover to rotor or backing plate to drum interference	Correct or replace	BR-25, 33, 41, 50, 67
	Other brake system components faulty	Repair or replace as necessary	
	Tires rubbing against chassis and/or body	Repair as necessary	

TROUBLESHOOTING (Cont'd)

Problem	Possible cause	Remedy	Page
Squeaking, squealing groaning or chattering noise when brakes are applied Note: Brake friction materials inherently generate noise and heat in order to dissipate energy. As a result, occasional squeal is normal and is aggravated by severe environmental conditions such as cold, heat, wetness, snow, salt, mud, etc. This occasional squeal is not a functional problem and does not indicate any loss of brake effectiveness	Brake drums and linings, rotors and pads worn or scored	Inspect, repair or replace	BR-25, 33, 41 50, 67
	Dirty, greased, contaminated or glazed linings or pads	Clean or replace	
	Improper linings or pads using	Inspect for correct usage or replace	
	Maladjustment of brake pedal or booster push rod	Inspect and adjust	BR-6, 23
	(Disc brake)		
	Missing or damaged brake pad anti-squeal shim	Replace	BR-25, 33, 50
	Pad wear and pad wear indicator making contact with the rotor	Replace	BR-25, 33, 50
	Burred or rusted calipers	Clean or deburr	BR-25, 33, 50
	(Drum brake)		
	Weak damaged or incorrect shoe hold-down springs, loose or damaged shoe hold-down spring pins and springs and grooved backing plate ledges	Inspect, repair or replace	BR-41, 59
Squealing and squeaking noise when brakes are not applied	Maladjustment of brake pedal or booster push rod	Inspect and adjust	BR-6, 23
	Poor return of brake booster or master cylinder or wheel cylinder	Inspect, repair or replace	BR-10, 22
	(Disc brake)		
	Rusted or stuck piston	Inspect and lubricate as necessary	BR-25, 33, 50
	Improper positioning of pad in caliper	Repair or replace	BR-25, 33, 50
	Rotor rubbing against caliper housing	Repair or replace	BR-25, 33, 50
	Improper installation of disc brake pad support plate	Repair or replace	BR-25, 33, 50
	Pad wear and pad wear indicator making contact with the rotor	Replace	BR-25, 33, 50
	(Drum brake)		
	Weak, damaged or incorrect shoe hold-down springs	Replace	BR-41, 59
	Grooved backing plate ledges	Repair or replace	BR-41, 59
	Bent or warped backing plate causing interference with drum	Repair or replace	BR-41, 59
	Improper machining of drum causing Interference with backing plate or shoe	Replace drum	BR-41, 59
	Other brake system components: Loose or extra parts in brakes Rear drum adjustment too tight causing lining to glaze Worn, damaged or insufficiently lubricated wheel bearings	Inspect, repair or replace as necessary	

TROUBLESHOOTING (Cont'd)

Problem	Possible cause	Remedy	Page
Groaning, clicking or rattling noise when brakes are not applied	Stones or foreign material trapped inside wheel covers	Remove foreign material	
	Loose wheel nuts	Tighten to correct torque	
		Replace if stud holes are elongated	
	Maladjustment of brake pedal or booster push rod	Inspect and adjust	BR-6, 23
	Worn, damaged or dry wheel bearings	Inspect and lubricate or replace	
	(Disc brake)		
	Loose or missing anti-rattle spring or pad support plate or rimping on outer pad	Inspect, repair or replace	
	Failure of shim	Inspect , replace if necessary	BR-25, 33, 50
	Wear on slide bushing	Inspect , replace if necessary	BR-25, 33, 50
	Loose installation bolt	Inspect , tighten if necessary	BR-25, 33, 50
	Poor return of piston	Inspect , repair or replace	BR-25, 33, 50
	(Drum brake)		
	Loose or extra parts	Inspect and repair	BR-33, 50



CHECKS AND ADJUSTMENTS

CHECK AND ADJUSTMENT OF BRAKE PEDAL

1. CHECK THAT PEDAL HEIGHT IS CORRECT

Pedal height from asphalt sheet:

153 - 163 mm (6.02 - 6.42 in.)

If incorrect, adjust the pedal height.

2. IF NECESSARY, ADJUST PEDAL HEIGHT

(a) If necessary, remove the instrument lower finish panel and air duct.

(b) Loosen the stop light switch lock nut.

(c) Sufficiently loosen the stop light switch.

(d) Loosen the push rod lock nut.

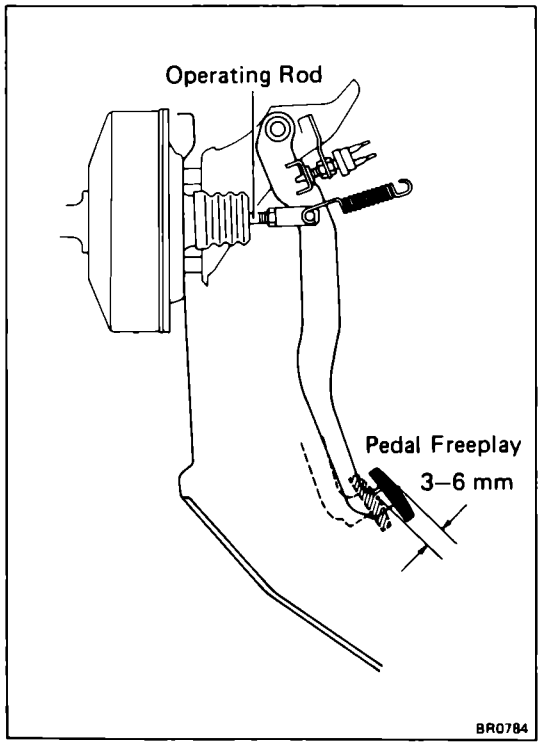
(e) Adjust the pedal height by turning the pedal push rod.

(f) Return the stop light switch until it lightly contacts the pedal stopper.

(g) Tighten the two lock nuts.

(h) Check that the stop lights light when the brake pedal depressed.

(i) After adjusting the pedal height, check and adjust the pedal freeplay.



3. CHECK THAT PEDAL FREEPLAY IS CORRECT

(a) Stop the engine and depress the brake pedal several times until there is no more vacuum left in the booster.

(b) Push in the pedal until the beginning of resistance is felt. Measure the distance, as shown.

Pedal freeplay: 3 — 6 mm (0.12 — 0.24 in.)

NOTE: The freeplay to the first resistance is due to the play between the clevis and pin. And it is 1 — 3 mm (0.04 — 0.12 in.) on the pedal.

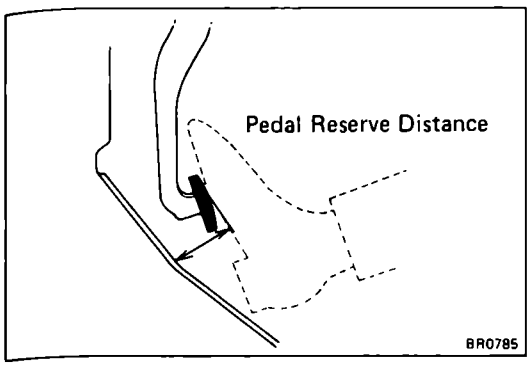
4. IF NECESSARY, ADJUST PEDAL FREEPLAY

(a) If incorrect, adjust the pedal freeplay by turning the pedal push rod.

(b) Start the engine and confirm that pedal freeplay exists.

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

(d) Install the air duct and instrument lower finish panel.



5. CHECK THAT PEDAL RESERVE DISTANCE IS CORRECT

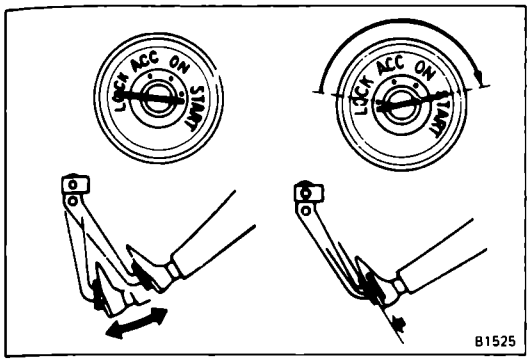
Release the parking brake. With engine running, depress the pedal and measure the pedal reserve distance, as shown.

Pedal reserve distance from asphalt sheet at

50 kg (110.2 lb, 490 N):

Rear disc brake	**More than 95 mm (3.74 in.)**
Rear drum brake	**More than 90 mm (3.58 in.)**

If incorrect, troubleshoot the brake system.



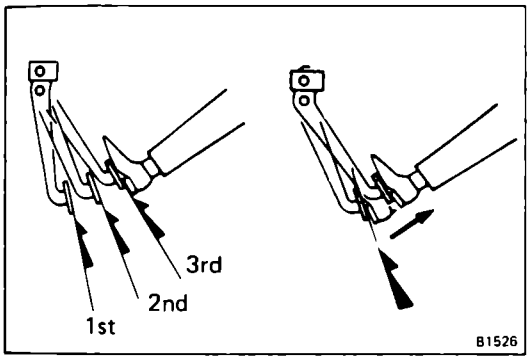
OPERATIONAL TEST OF BRAKE BOOSTER

NOTE: If there is leakage or lack of vacuum, repair before testing. If available, use a brake booster tester to check the booster operating condition.

1. OPERATING CHECK

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

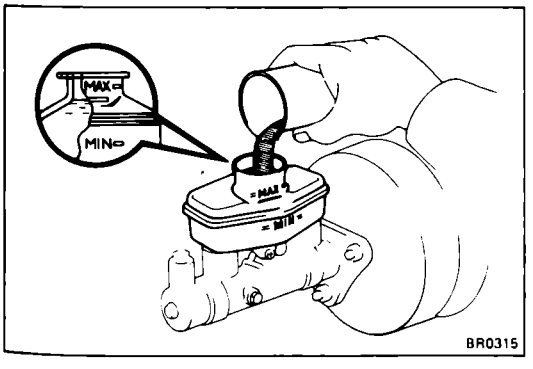
(b) Depress the brake pedal and start the engine . If the pedal goes down slightly, operation is normal.



2. AIR TIGHTNESS CHECK

(a) Start the engine and stop it after one or two minutes. Depress the brake pedal several times slowly. If the pedal goes down furtherest the first time, but gradually rises after the second or third time, the booster is air tight.

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



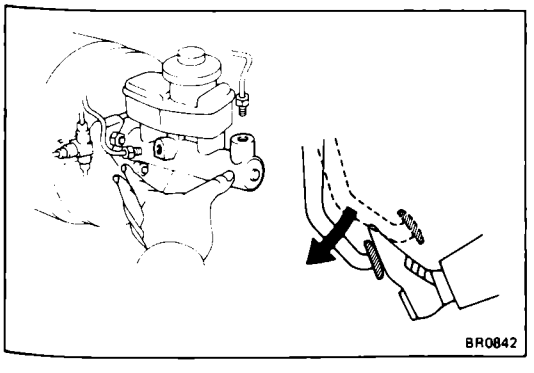
BLEEDING OF BRAKE SYSTEM

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

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

1. FILL BRAKE RESERVOIR WITH BRAKE FLUID

Check the fluid level in the reservoir. If necessary, add brake fluid.

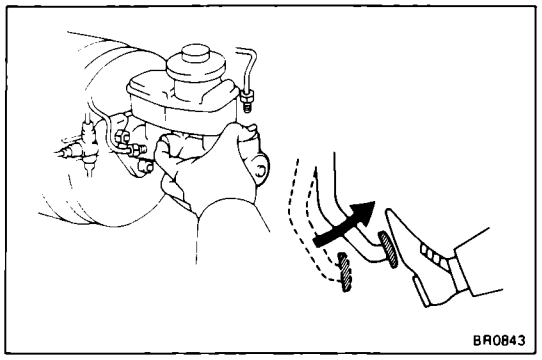


2. BLEED MASTER CYLINDER

NOTE: If the master cylinder was disassembled or if the reservoir becomes empty, bleed the air from the master cylinder.

(a) Disconnect the brake tubes from the master cylinder.

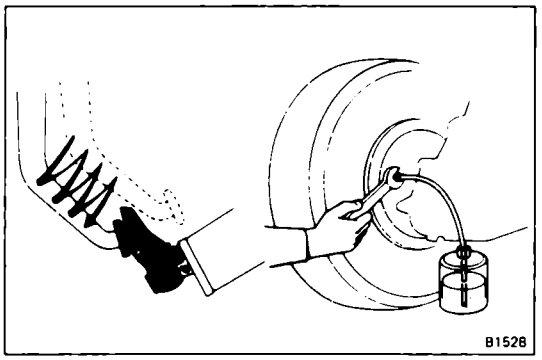
(b) Slowly depress the brake pedal and hold it.



(c) Block off the outer holes with your fingers, and release the brake pedal.

(d) Repeat (b) and (c) three or four times.

(e) Connect the brake tubes to the master cylinder.



3. BEGIN BLEEDING AIR FROM BRAKE OR WHEEL CYLINDER WITH LONGEST HYDRAULIC LINE

(a) Connect the vinyl tube to the brake or wheel cylinder bleeder plug, and insert the other end of tube in a half-full container of brake fluid.

(b) Slowly depress the brake pedal several times.

(c) While having an assistant press on the pedal, loosen the bleeder plug until fluid starts to run out. Then close the bleeder plug.

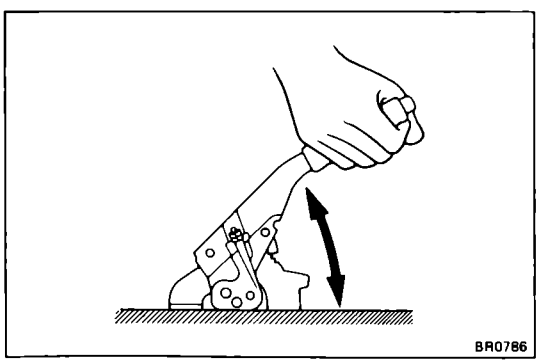
(d) Repeat (b) and (c) until there are no more air bubbles in the fluid.

(e) Tighten the bleeder plug.

Bleeder plug tightening torque:

85 kg-cm (74 in.-lb, 8 N·m)

4. REPEAT PROCEDURE FOR EACH WHEEL



CHECK AND ADJUSTMENT OF PARKING BRAKE

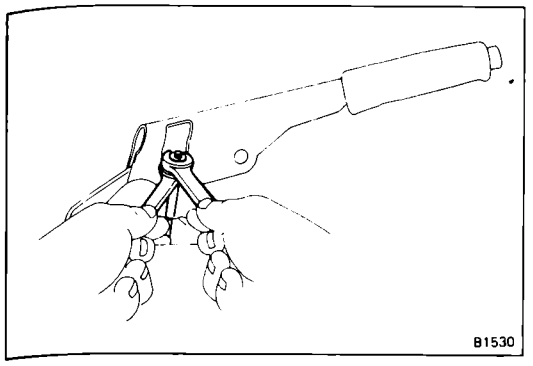
1. CHECK THAT PARKING BRAKE LEVER TRAVEL IS CORRECT

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

Parking brake lever travel at 20 kg (44.1 lb, 196 N):

4 - 7 clicks

If incorrect, adjust the parking brake.



2. IF NECESSARY, ADJUST PARKING BRAKE LEVER TRAVEL

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

For shoe clearance adjustment, see steps 8 and 9 on page BR-40, and step 9 on page BR-56.

(a) Remove the console box.

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

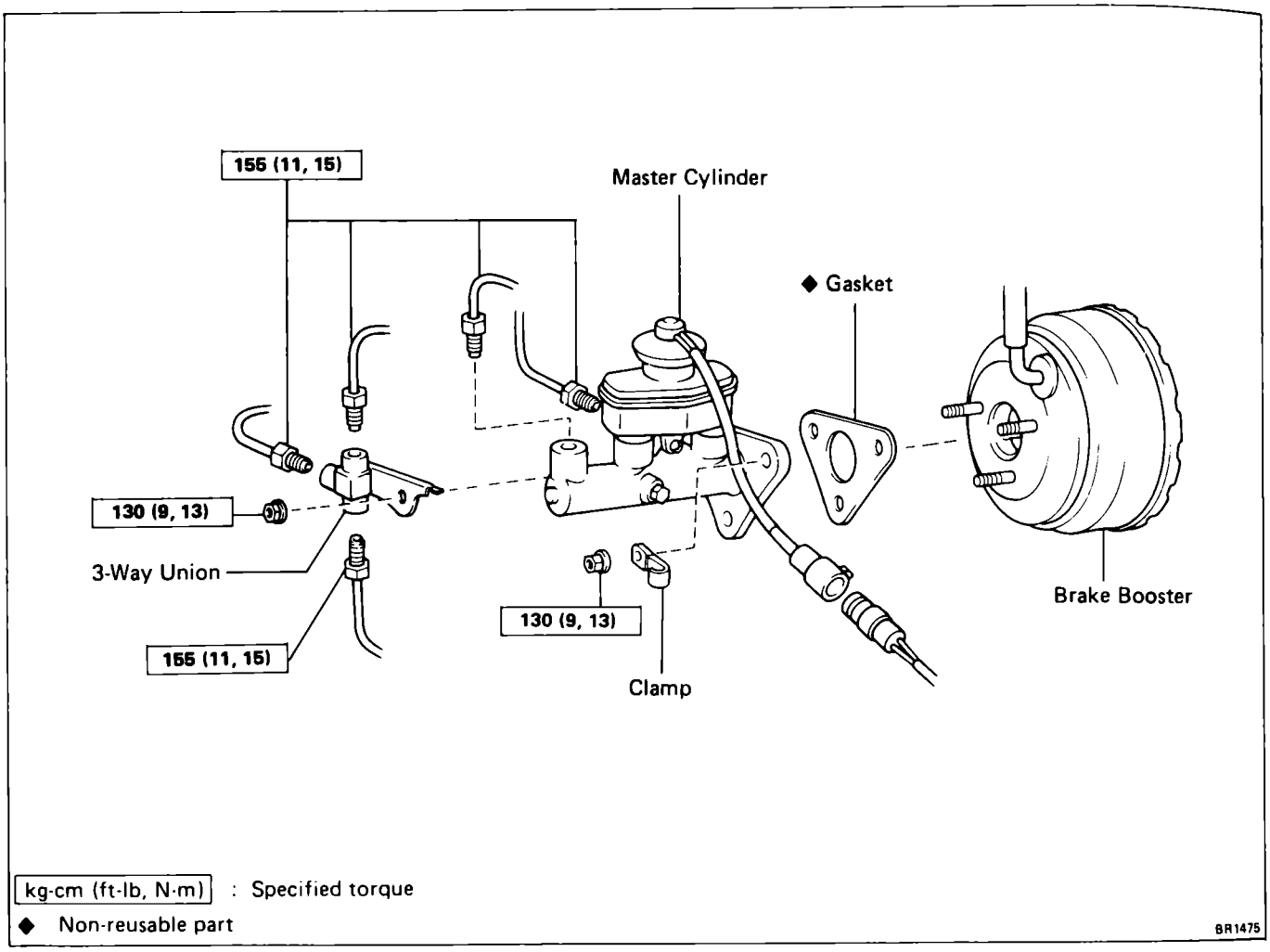
(c) Tighten the lock nut.

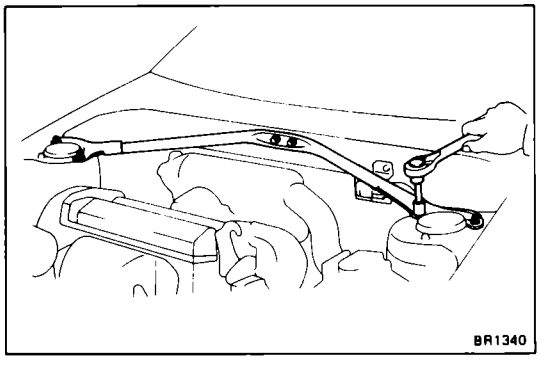
Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

(d) Install the console box.

MASTER CYLINDER

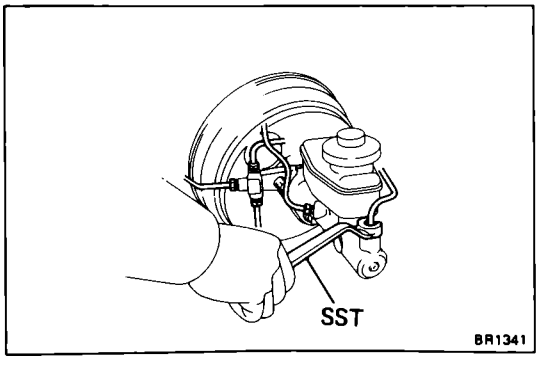
REMOVAL OF MASTER CYLINDER





1. **PERFORM FOLLOWING STEPS**
   (a) If necessary, remove the suspension upper brace.
   (b) Disconnect the connector from the air flow meter and remove the air flow meter with the air cleaner cap and hose.

2. **DISCONNECT LEVEL WARNING SWITCH CONNECTOR**



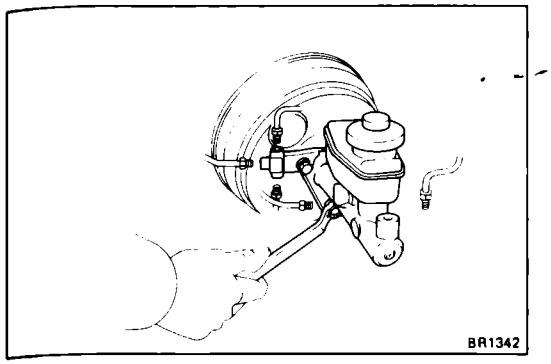
3. **TAKE OUT FLUID WITH SYRINGE**

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

4. **DISCONNECT TWO BRAKE TUBES**

   Using SST, disconnect five brake tubes from the master cylinder.

   SST 09751-36011



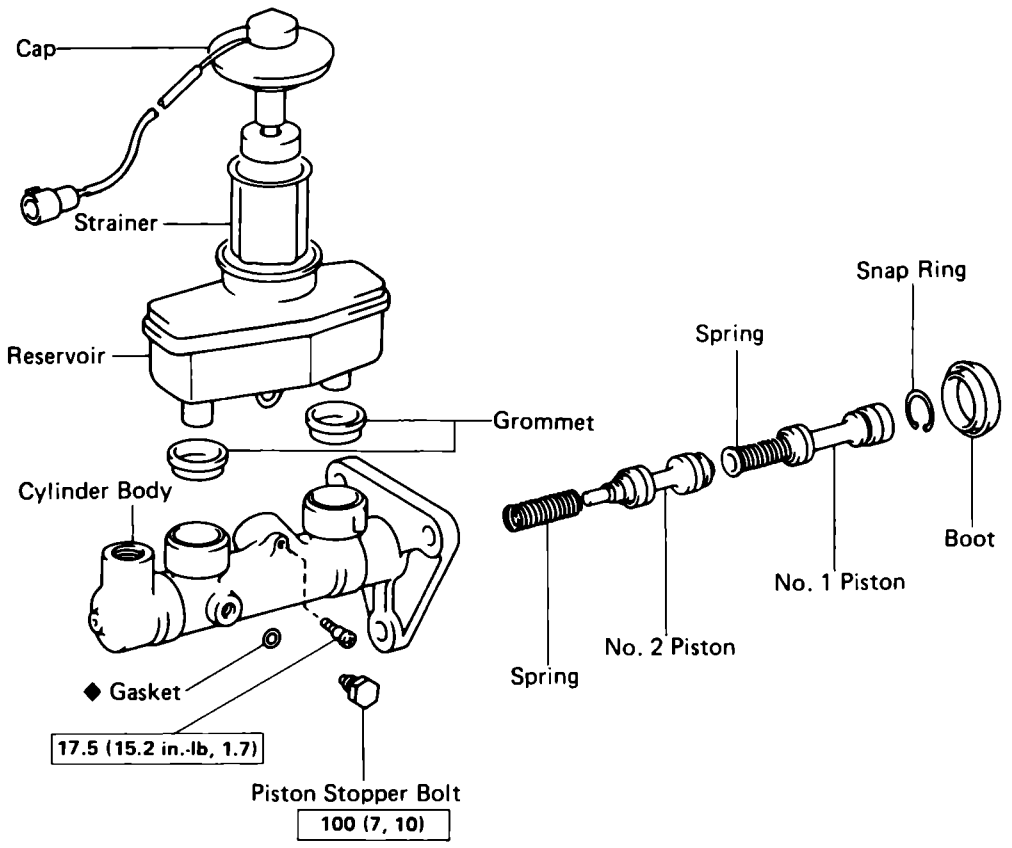
5. REMOVE MASTER CYLINDER

(a) Remove the three nuts.

(b) Remove the master cylinder from the brake booster and remove the gasket.

(w/o Anti-lock Brake System)

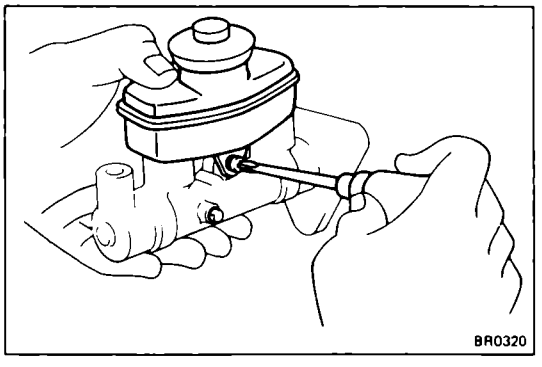
COMPONENTS



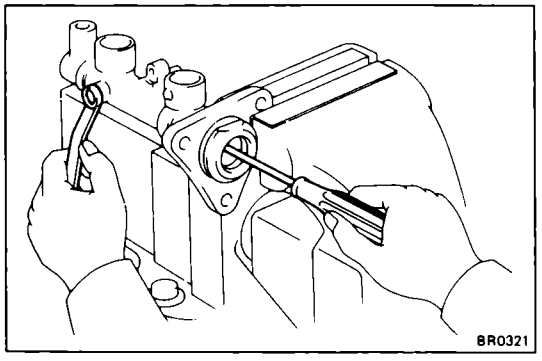
kg-cm (ft-lb, N·m) : Specified torque

◆ Non-reusable part

BR0866



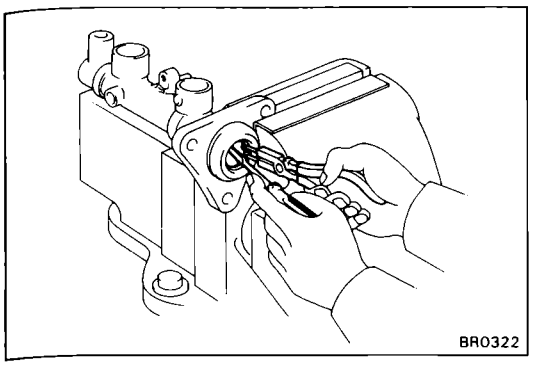
BR0320



BR0321

DISASSEMBLY OF MASTER CYLINDER

1. **REMOVE RESERVOIR**
   (a) Remove the set screw and pull out the reservoir.
   (b) Remove the cap and strainer from the reservoir.
2. **REMOVE TWO GROMMETS**
3. **PLACE CYLINDER IN VISE**
4. **REMOVE PISTON STOPPER BOLT**
   Using a screwdriver, push the pistons in all the way and remove the piston stopper bolt and gasket.
   NOTE: Tape the screwdriver tip before use.

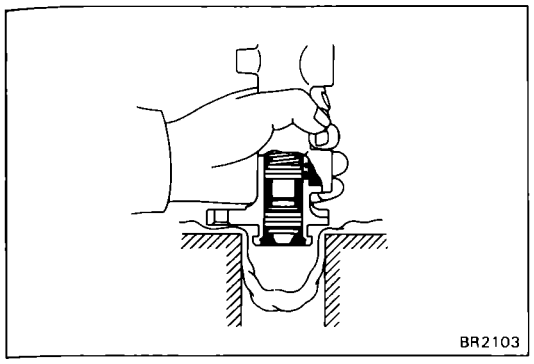


5. REMOVE PISTONS AND SPRINGS

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

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

CAUTION: If pulled out at an angle, there is a possibility of damaging the cylinder bore.



(c) Place a rag on two wooden blocks and lightly tap the cylinder flange between the blocks until the piston drops out of cylinder.

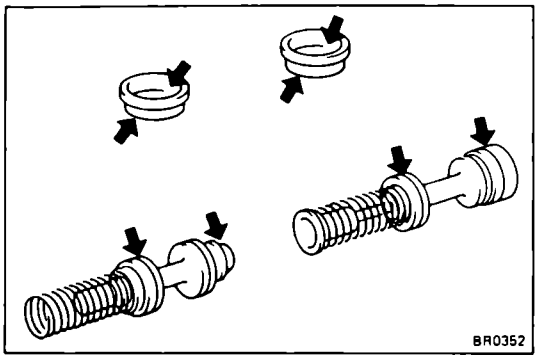
INSPECTION OF MASTER CYLINDER COMPONENTS

NOTE: Clean the disassembled parts with compressed air.

1. INSPECT CYLINDER BORE FOR RUST OR SCORING

2. INSPECT CYLINDER FOR WEAR OR DAMAGE

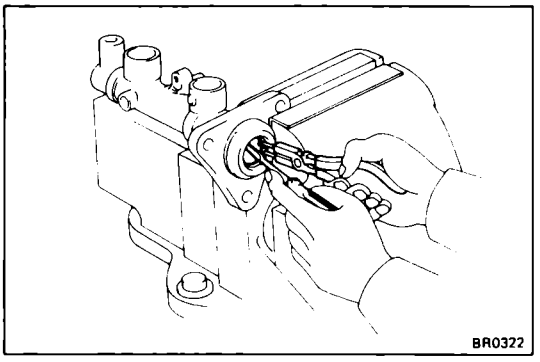
If necessary, clean or replace the cylinder.



ASSEMBLY OF MASTER CYLINDER

(See page BR-12)

1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO RUBBER PARTS INDICATED BY ARROWS



2. INSTALL TWO SPRINGS AND PISTONS

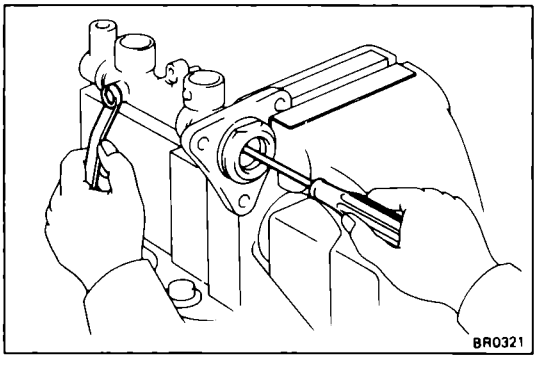
CAUTION: Be careful not to damage the rubber lips on the pistons.

(a) Insert the two springs and pistons straight in, not at an angle.

CAUTION: If insert at an angle, there is possibility of damaging the cylinder bore.

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

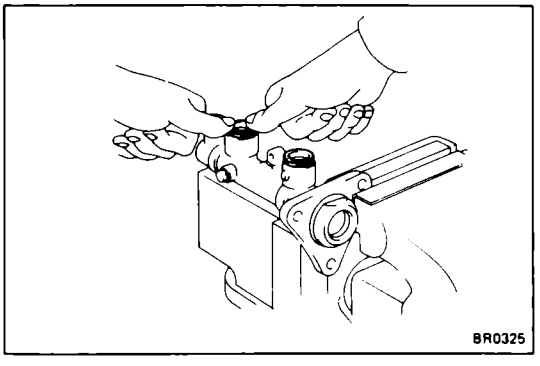
NOTE: Tape the screwdriver tip before use.



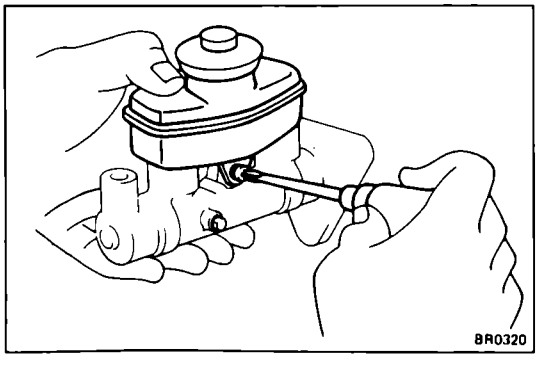
3. INSTALL PISTON STOPPER BOLT

Using a screwdriver, push the piston in all the way and install the piston stopper bolt over the gasket. Torque the bolt.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)



4. INSTALL TWO GROMMETS



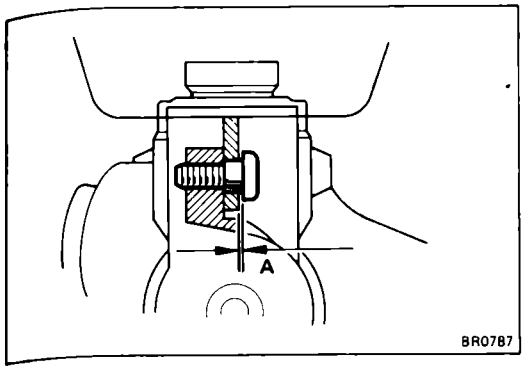
5. INSTALL RESERVOIR

(a) Install the cap and strainer to the reservoir.

(b) Push the reservoir onto the cylinder.

(c) Install the set screw while pushing on the reservoir.

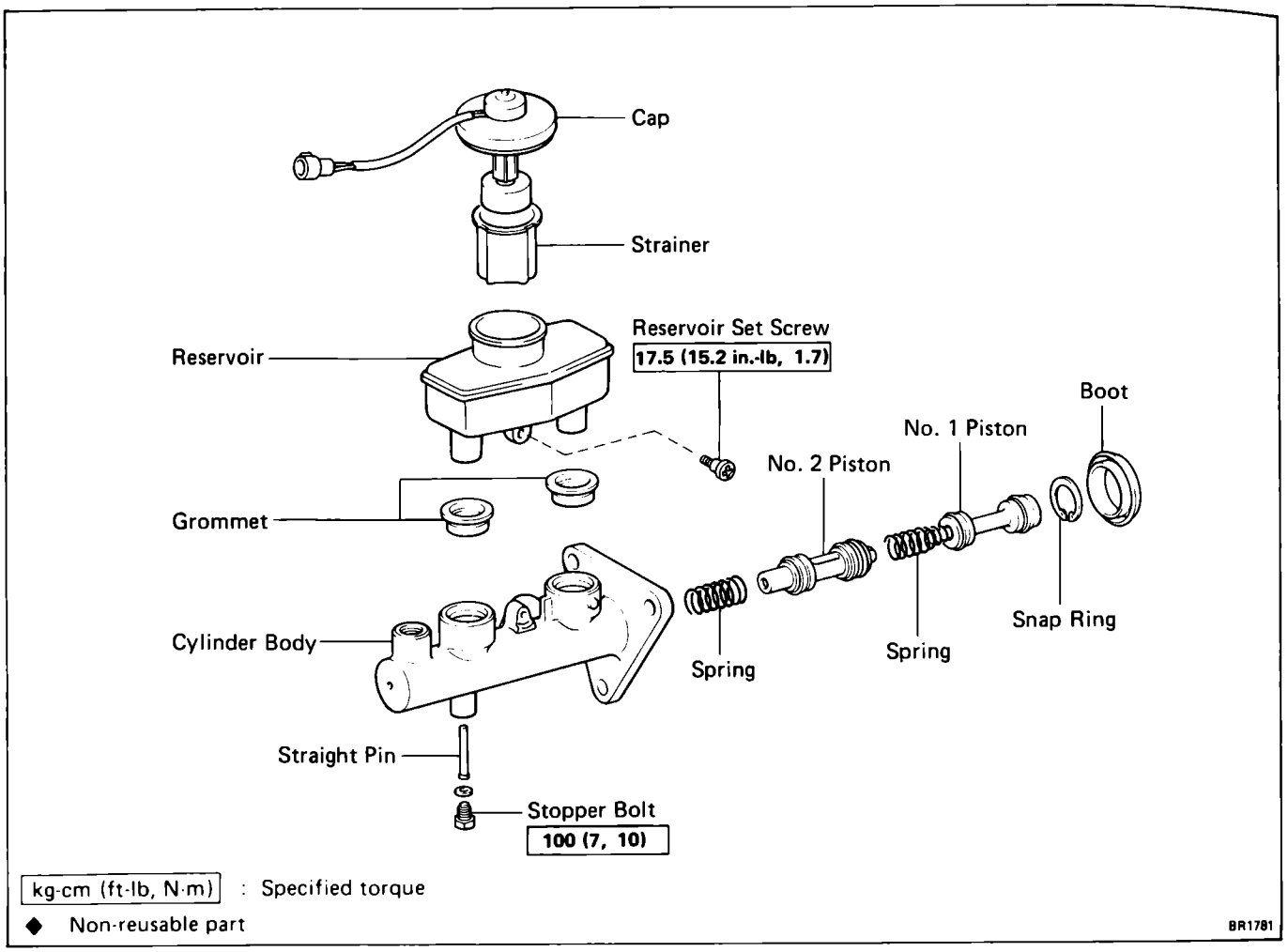
Torque: 17.5 kg-cm (15.2 in.-lb, 1.7 N·m)

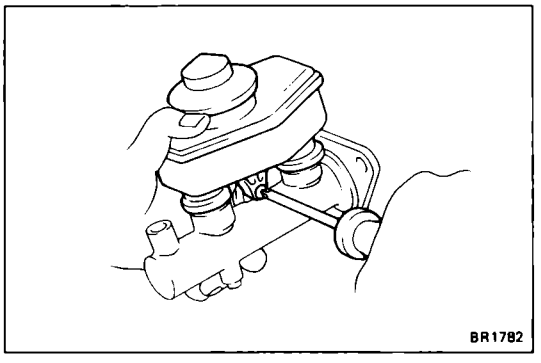


CAUTION: Because the master cylinder and reservoir tank union is a grommet type, the set screw is designed to not separate the reservoir from the cylinder and will not tighten down the reservoir. Therefore, there is a clearance at point A. Do not insert washers or an equivalent when tightening.

(w/Anti-lock Brake System)

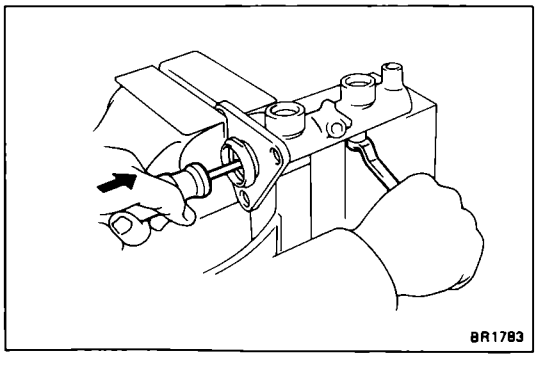
COMPONENTS





DISASSEMBLY OF MASTER CYLINDER

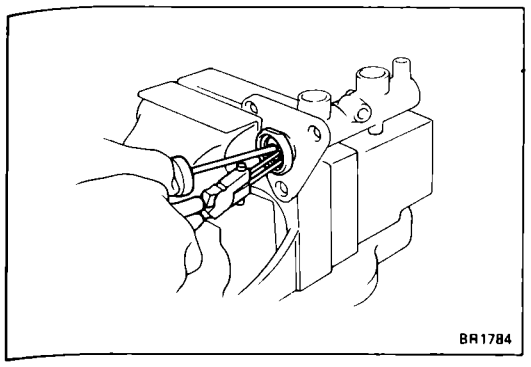
1. REMOVE RESERVOIR
   (a) Remove the set screw and pull out the reservoir.
   (b) Remove the cap and strainer from the reservoir.
2. REMOVE TWO GROMMETS
3. PLACE CYLINDER IN VISE



4. REMOVE PISTON STOPPER BOLT

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

   NOTE: Tape the screwdriver tip before use.

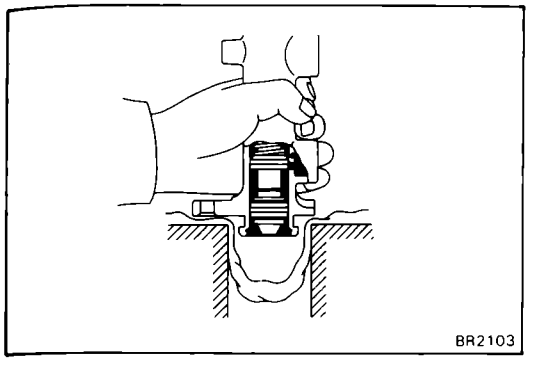


5. REMOVE TWO PISTONS AND SPRINGS

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

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

CAUTION: If pulled out at an angle, there is possibility of damaging the cylinder bore.



(c) Place a rag on two wooden blocks and lightly tap the cylinder flange between the blocks until the piston drops out of cylinder.

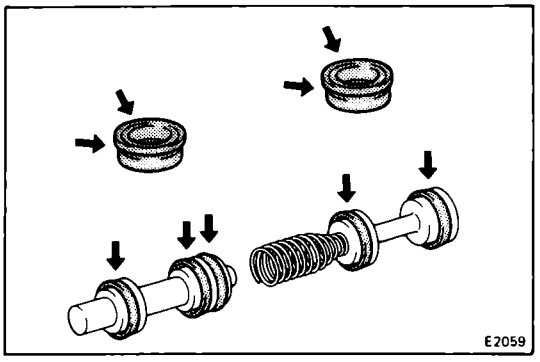
INSPECTION OF MASTER CYLINDER COMPONENTS

NOTE: Clean the disassembled parts with compressed air.

1. INSPECT CYLINDER BORE FOR RUST OR SCORING

2. INSPECT CYLINDER FOR WEAR OR DAMAGE

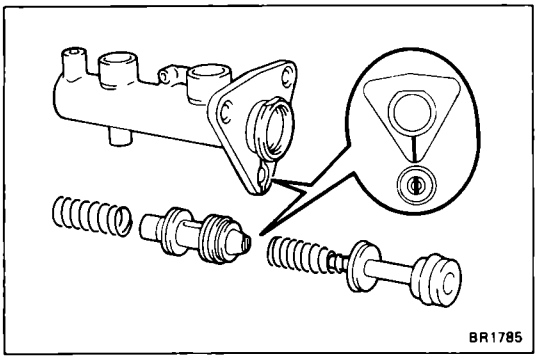
If necessary, clean or replace the cylinder.



ASSEMBLY OF MASTER CYLINDER

(See page BR-16)

1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO RUBBER PARTS INDICATED BY ARROWS



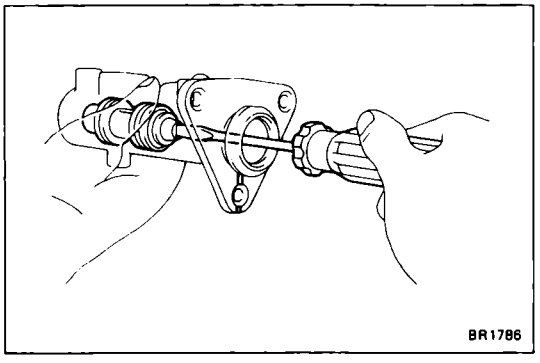
2. INSTALL TWO SPRINGS AND PISTONS

CAUTION: Be careful not to damage the rubber lips on the pistons.

(a) Insert the spring.

(b) Align the grooves on the No. 2 piston and master cylinder flange as shown, and insert the No. 2 piston straight in, not at an angle.

CAUTION: If insert at an angle, there is possibility of damaging the cylinder bore.



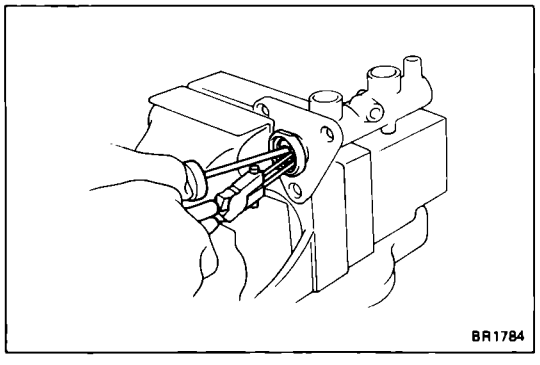
(c) Using a screwdriver, align the grooves again.

NOTE: Tape the screwdriver tip before use.

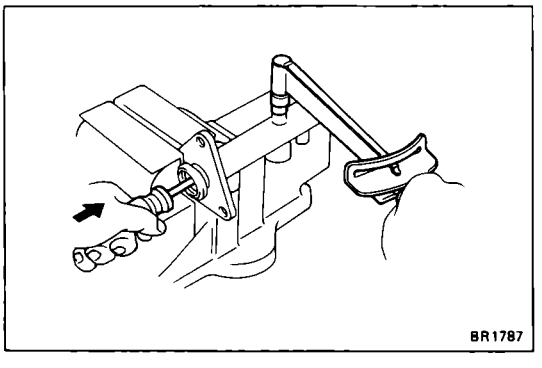
CAUTION: Be careful not to scratch the cylinder bore.

(d) Temporarily insert the straight pin, and check that it can be inserted easily.

(e) Insert the spring and No. 1 piston straight in, not at an angle.



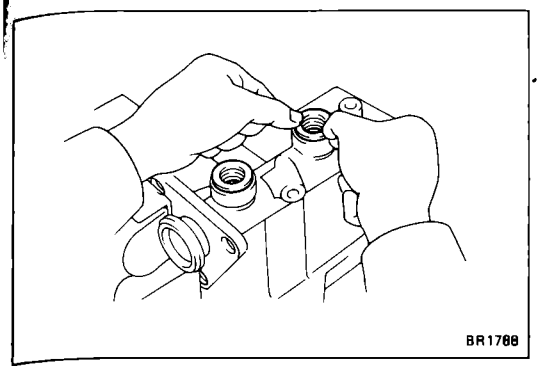
(f) Push in the piston with a screwdriver and install the snap ring with snap ring pliers.



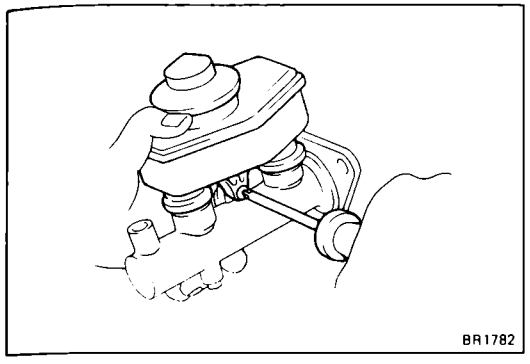
3. INSTALL PISTON STOPPER BOLT

Using a screwdriver, push the piston in all the way and insert the straight pin and then install the piston stopper bolt over the gasket. Torque the bolt.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)



4. INSTALL TWO GROMMETS



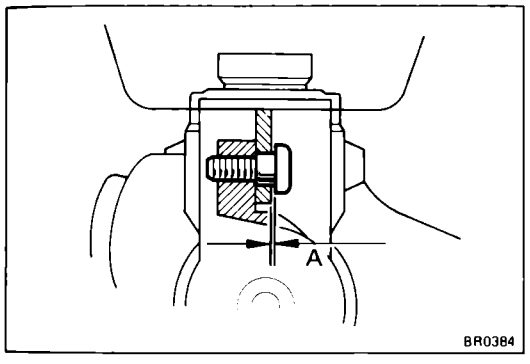
5. INSTALL RESERVOIR

(a) Install the cap and strainer to the reservoir.

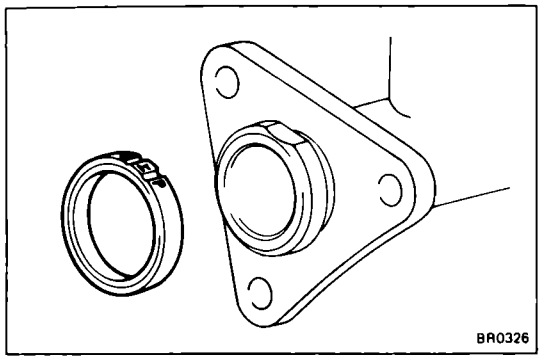
(b) Push the reservoir onto the cylinder.

(c) Install the set screw while pushing on the reservoir.

Torque: 17.5 kg-cm (15.2 in.-lb, 1.7 N·m)



CAUTION: Because the master cylinder and reservoir tank union is a grommet type, the set screw is designed to not separate the reservoir from the cylinder and will not tighten down the reservoir. Therefore, there is a clearance at point A. Do not insert washers or an equivalent when tightening.

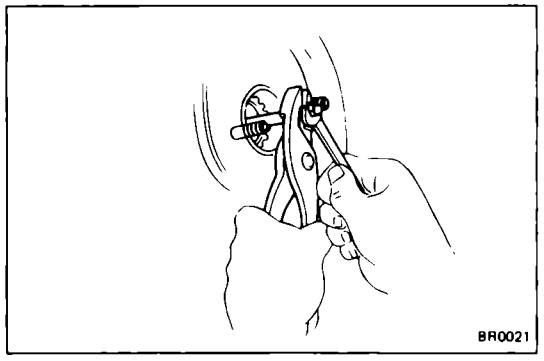

BR0326

INSTALLATION OF MASTER CYLINDER

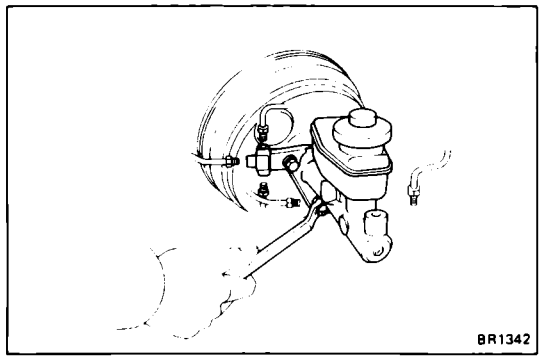
(See page BR-10)

1. CLEAN OUT GROOVE ON LOWER INSTALLATION SURFACE OF MASTER CYLINDER

2. CONFIRM THAT "UP" MARK ON MASTER CYLINDER BOOT IS IN CORRECT POSITION


BR0021

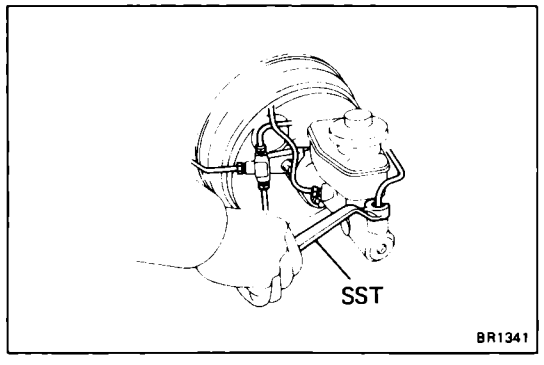
3. ADJUST LENGTH OF BRAKE BOOSTER PUSH ROD BEFORE INSTALLING MASTER CYLINDER
(See page BR-23)


BR1342

4. INSTALL MASTER CYLINDER

Install the master cylinder and gasket on the brake booster with three nuts.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)



BR1341

5. CONNECT BRAKE TUBES

Using SST, connect the brake tubes to the master cylinder. Torque the union nuts.

SST 09751-36011

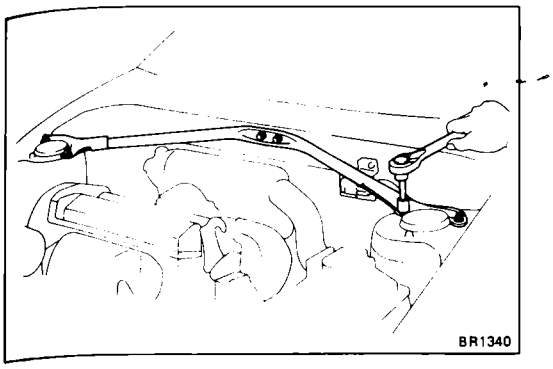
Torque: 155 kg-cm (11 ft-lb, 15 N·m)

6. CONNECT LEVEL WARNING SWITCH CONNECTOR

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

8. CHECK FOR FLUID LEAKAGE

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



10. PERFORM FOLLOWING STEPS

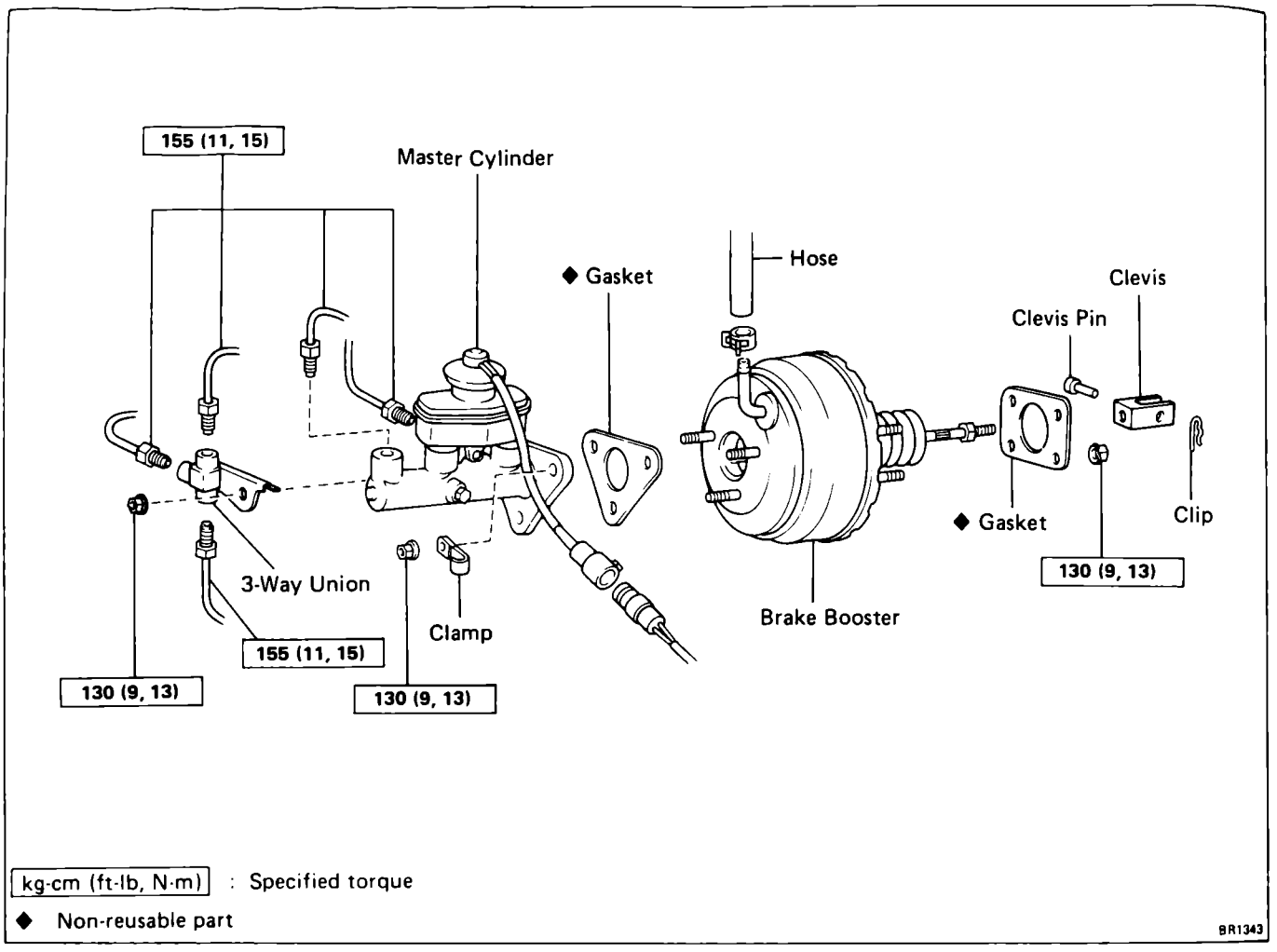
(a) Install the air flow meter with the air cleaner cap and hose, and connect the connector to air flow meter.

(b) Install the suspension upper brace, and torque the bolts and nuts.

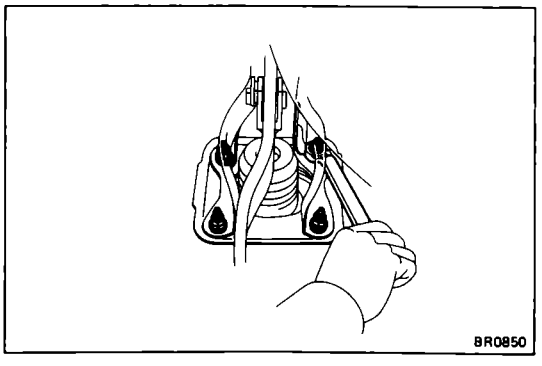
Torque: Nuts 650 kg-cm (47 ft-lb, 64 N·m)
Bolts 210 kg-cm (15 ft-lb, 21 N·m)

BRAKE BOOSTER

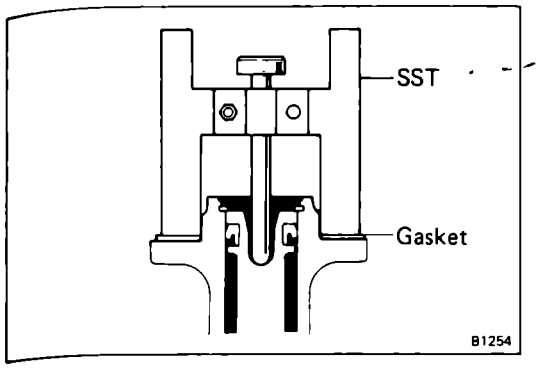
REMOVAL OF BRAKE BOOSTER



1. **REMOVE MASTER CYLINDER**
   (See page BR-10)
2. **DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER**
3. **REMOVE INSTRUMENT LOWER FINISH PANEL**
4. **REMOVE PEDAL RETURN SPRING**
5. **REMOVE CLIP AND CLEVIS PIN**



6. **REMOVE BRAKE BOOSTER, GASKET AND CLEVIS**
   (a) Remove the four nuts and clevis.
   (b) Pull out the brake booster and gasket.



INSTALLATION OF BRAKE BOOSTER

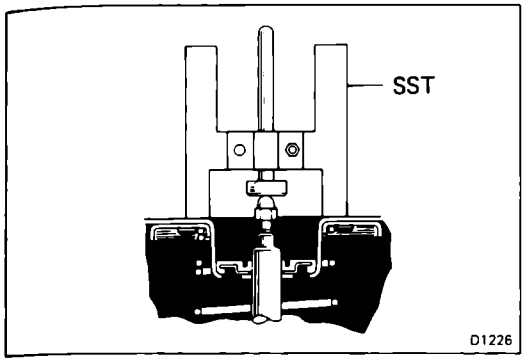
(See page BR-22)

1. ADJUST LENGTH OF BOOSTER PUSH ROD

(a) Install the gasket on the master cylinder.

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

SST 09737-00010

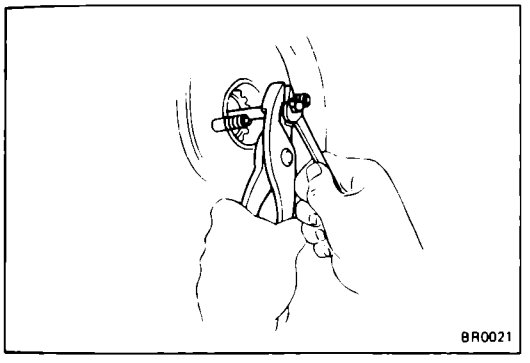


(c) Turn the SST upside down and set it on the booster.

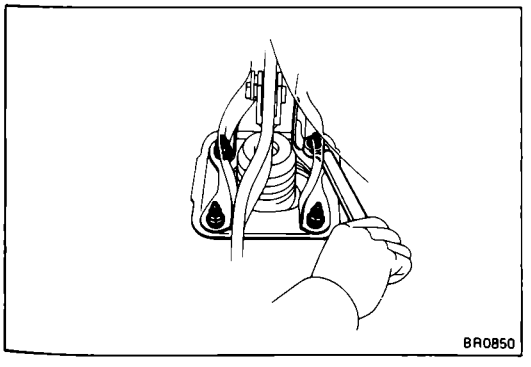
SST 09737-00010

(d) Measure the 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.



2. INSTALL BRAKE BOOSTER, GASKET AND CLEVIS

(a) Install the clevis lock nut and clevis to the brake booster.

(b) Install the brake booster and gasket.

(c) Install and torque the booster mounting nuts.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

3. CONNECT CLEVIS TO BRAKE PEDAL

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

4. INSTALL PEDAL RETURN SPRING

5. INSTALL INSTRUMENT LOWER FINISH PANEL

6. **INSTALL MASTER CYLINDER**
   (See page BR-20)

7. **CONNECT VACUUM HOSE TO BRAKE BOOSTER**

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

9. **CHECK FOR FLUID LEAKAGE**

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

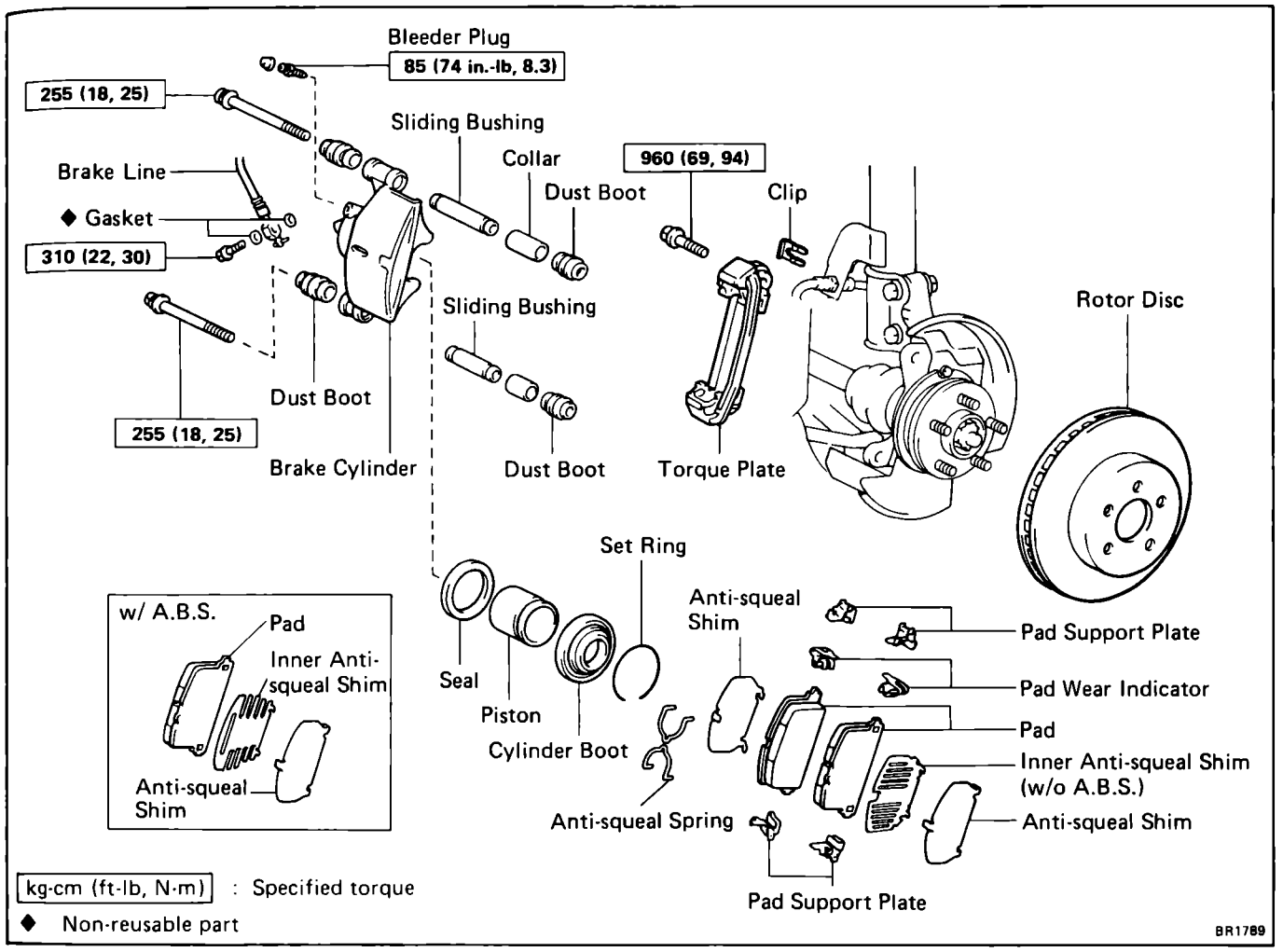
    Check and adjust the brake pedal, then tighten the clevis lock nut.

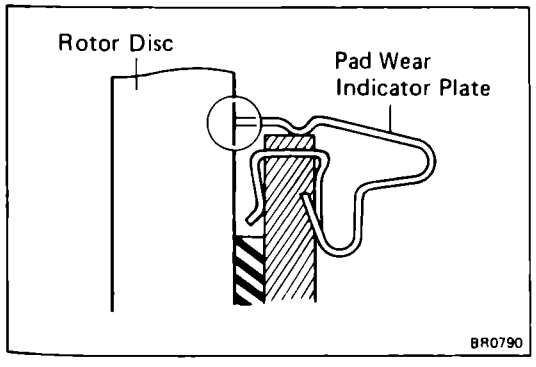
    Torque: 260 kg-cm (19 ft-lb, 25 N·m)

11. **PERFORM OPERATIONAL CHECK**
    (See page BR-7)

FRONT BRAKE (2WD)

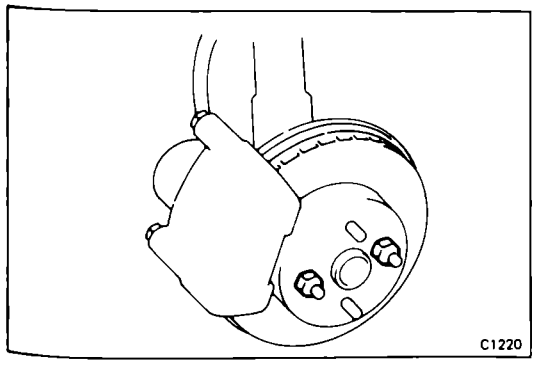
· COMPONENTS





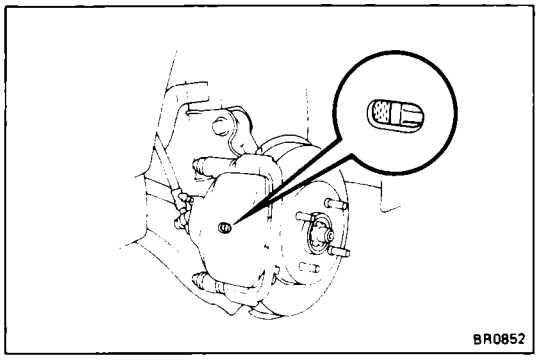
REPLACEMENT OF BRAKE PADS

NOTE: If a squealing noise occurs from the brakes while driving, check the pad wear indicator. If there are traces of the indicator contacting the rotor disc, the brake pad should be replaced.



1. REMOVE FRONT WHEEL

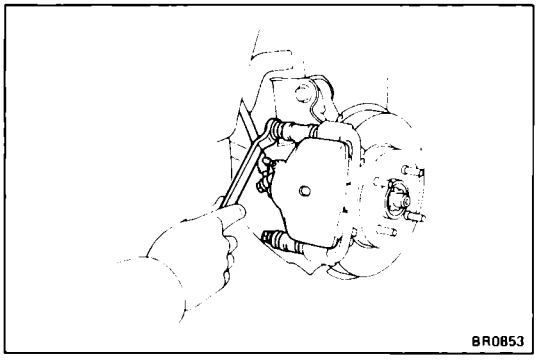
Remove the wheel and temporarily fasten the rotor disc with the hub nuts.



2. **INSPECT PAD LINING THICKNESS**

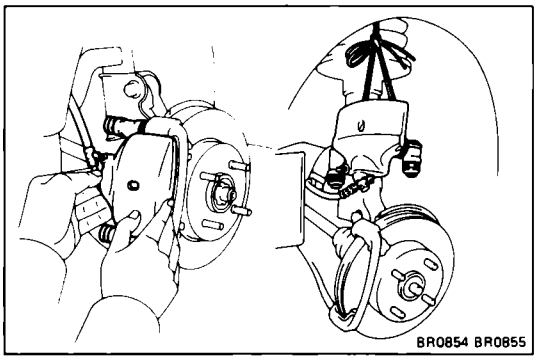
Check the pad thickness through the cylinder inspection hole and replace pads if not within specification.

Minimum thickness: 1.0 mm (0.039 in.)



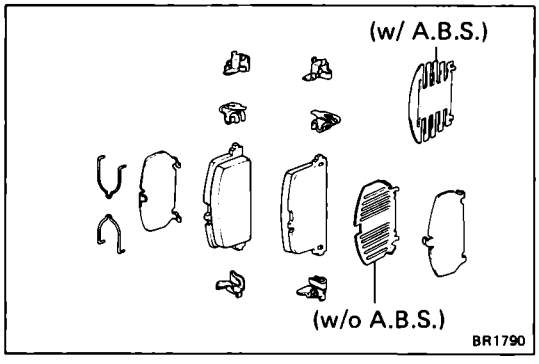
3. **REMOVE CYLINDER FROM TORQUE PLATE**

(a) Remove two installation bolts from the torque plate.



(b) Remove the brake cylinder and suspend it so the hose is not stretched.

NOTE: Do not disconnect the brake hose.

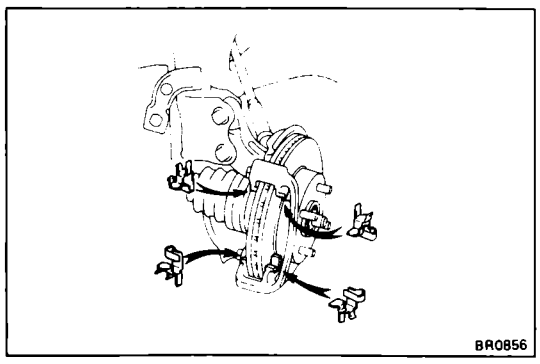


4. **REMOVE FOLLOWING PARTS:**

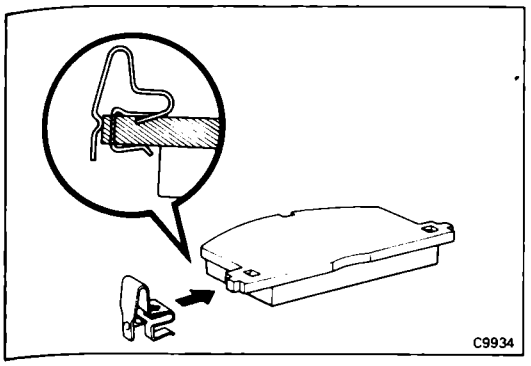
(a) Two anti-squeal springs
(b) Two brake pads
(c) Three anti-squeal shims
(d) Two pad wear indicator plates
(e) Four pad support plates

5. **CHECK ROTOR DISC THICKNESS**
(See step 2 on page BR-30)

6. **CHECK ROTOR DISC RUNOUT**
(See step 3 on page BR-30)



7. **INSTALL PAD SUPPORT PLATES**



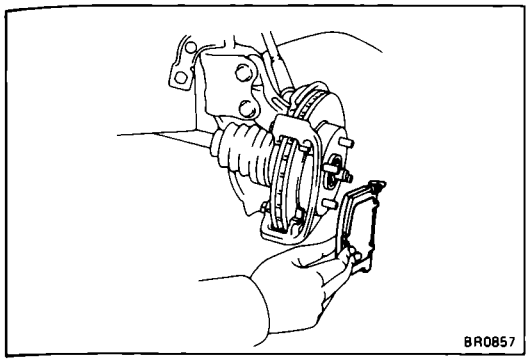
8. INSTALL NEW PADS

(a) Install a pad wear indicator plate to the pad.

NOTE: Be sure the arrow on the pad wear indicator plate is pointing in the rotating direction of the disc.

(b) Install the three anti-squeal shims to the pad.

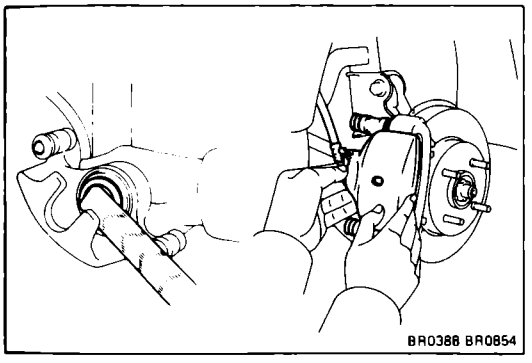
NOTE: Apply disc brake grease to both side of the inner anti-squeal shim of the outside pad.



(c) Install the pads onto each support plate.

CAUTION: Do not allow oil or grease to get on the rubbing face.

(d) Install the anti-squeal springs in position.



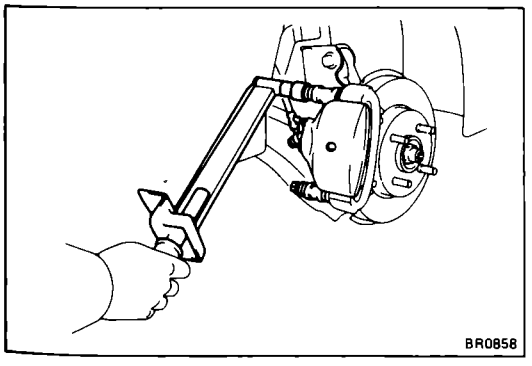
9. INSTALL CYLINDER

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

(b) Press in piston with a hammer handle or an equivalent.

NOTE: Always change the pad on one wheel at a time as there is a possibility of the opposite piston flying out.

(c) Insert the brake cylinder carefully so the boot is not wedged.

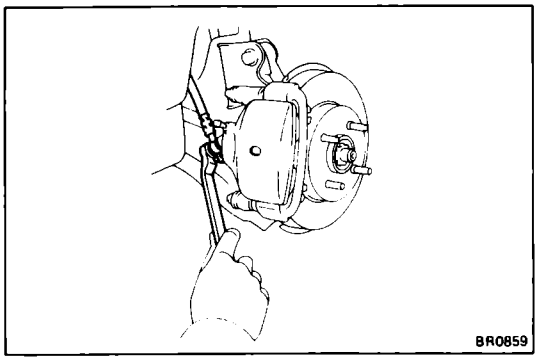


(d) Install and torque two installation bolts.

Torque: 255 kg-cm (18 ft-lb, 25 N·m)

10. INSTALL FRONT WHEEL

11. CHECK THAT FLUID LEVEL IS MAX LINE

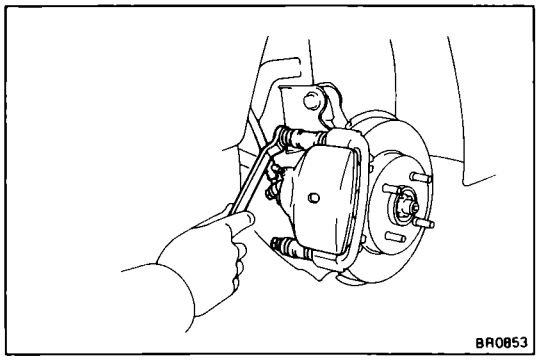


REMOVAL OF CYLINDER

(See page BR-25)

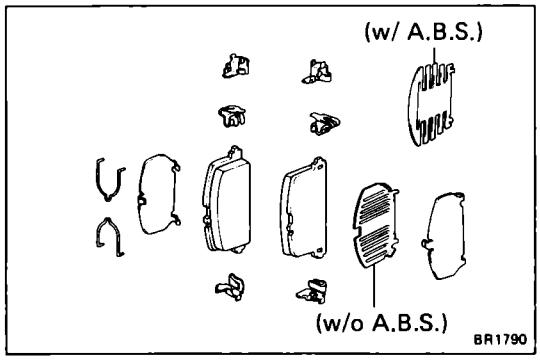
1. DISCONNECT BRAKE HOSE

Remove the union bolt and disconnect the brake hose. Use a container to catch the brake fluid.



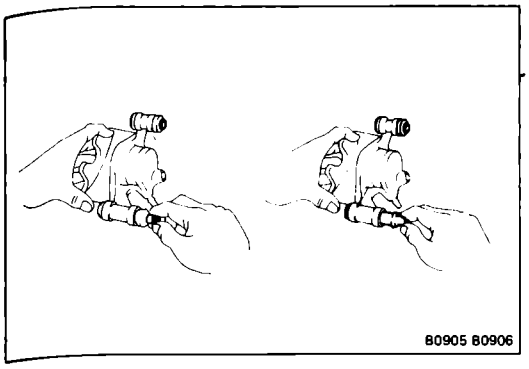
2. REMOVE CYLINDER FROM TORQUE PLATE

Remove the two installation bolts and cylinder.



3. REMOVE PADS

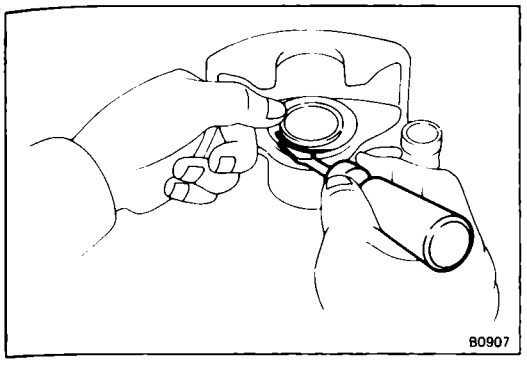
(See step 4 on page BR-26)



DISASSEMBLY OF CYLINDER

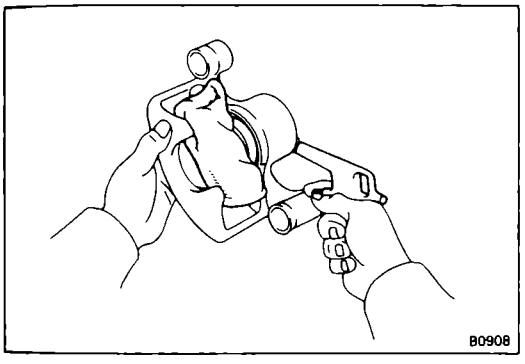
(See page BR-25)

1. **REMOVE FOLLOWING PARTS:**
   (a) Two cylinder bushings
   (b) Four dust boots
   (c) Two collars



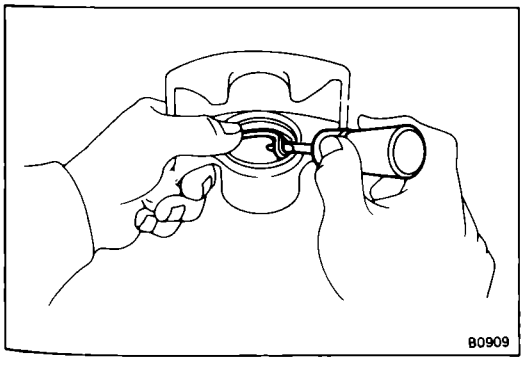
2. **REMOVE CYLINDER BOOT SET RING AND CYLINDER BOOT**

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



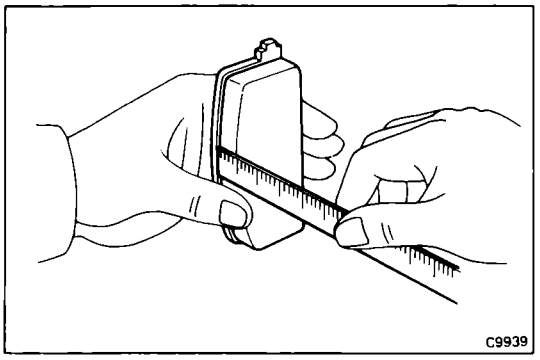
3. **REMOVE PISTON FROM CYLINDER**
   (a) Put a piece of cloth or an equivalent between the piston and cylinder.
   (b) Use compressed air to remove the piston from the cylinder.

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



4. **REMOVE PISTON SEAL FROM BRAKE CYLINDER**

   Using a screwdriver, remove the piston seal.



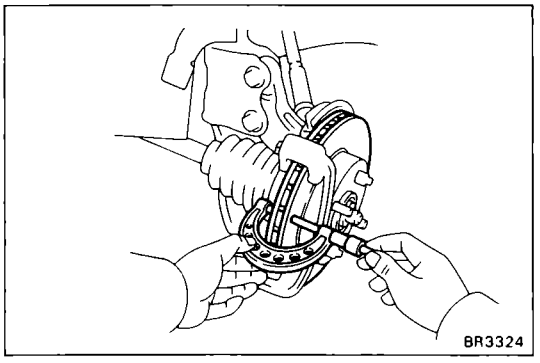
INSPECTION OF FRONT BRAKE COMPONENTS

1. MEASURE PAD LINING THICKNESS

Standard thickness: 10.0 mm (0.394 in.)

Minimum thickness: 1.0 mm (0.039 in.)

Replace the pad if the thickness is less than the minimum or if it shows sign of uneven wear.



2. MEASURE ROTOR DISC THICKNESS

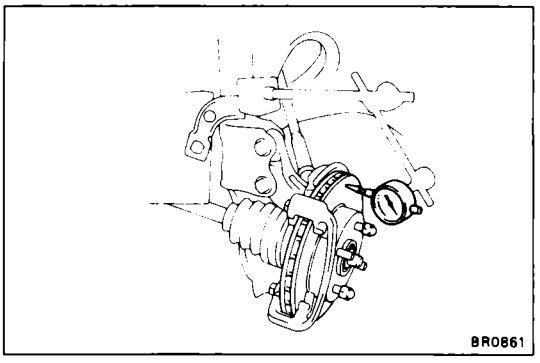
Standard thickness:

3S-FE	**22.0 mm (0.866 in.)**
3S-GE (w/o A.B.S.)	**22.0 mm (0.866 in.)**
3S-GE (w/ A.B.S.)	**25.0 mm (0.984 in.)**

Minimum thickness:

3S-FE	**21.0 mm (0.827 in.)**
3S-GE (w/o A.B.S.)	**21.0 mm (0.827 in.)**
3S-GE (w/ A.B.S.)	**24.0 mm (0.945 in.)**

If the disc is scored or worn, of if thickness is less than minimum, repair or replace the disc.



3. MEASURE ROTOR DISC RUNOUT

NOTE: Before measuring the runout, confirm that the front hub bearing play is within specification.

Measure the rotor disc runout at 10 mm (0.39 in.) from the outer edge of the rotor disc.

Maximum disc runout: 0.07 mm (0.0028 in.)

If the runout is greater than the maximum, inspect and adjust following the procedure listed below.

Then replace the disc if necessary.

(a) Remove the torque plate from the knuckle.

(b) Remove the hub nuts of the temporarily installed disc and pull off the rotor disc.

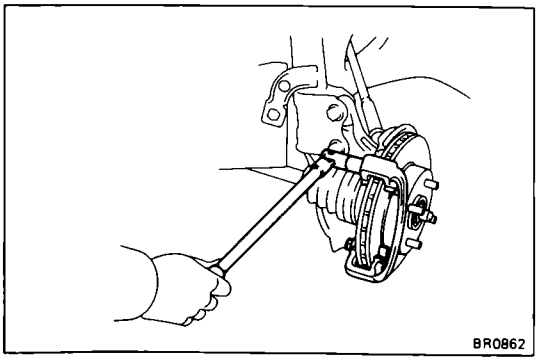
(c) Check that the hub axial play is within specification, and replace the bearing if not within specification. (See page FA-8)

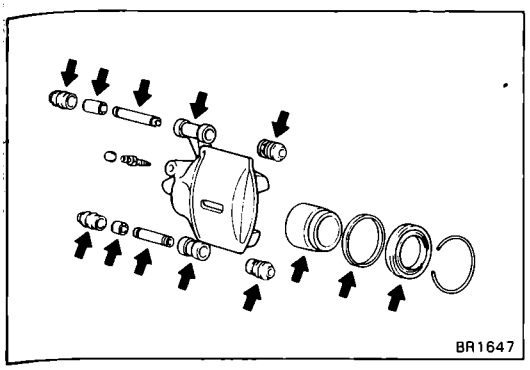
(d) Install the rotor disc and measure the disc runout, then shift the rotor disc one fifth a turn or one fourth a turn, and measure the disc runout. Similarly measure the runout at each position, and select the position where the runout is minimum.

(e) In this position, if the runout is within specification, install the torque plate and torque the mounting bolts.

Torque: 960 kg-cm (69 ft-lb, 94 N·m)

(f) If not within specification, replace the rotor disc, and repeat (d) and (e).

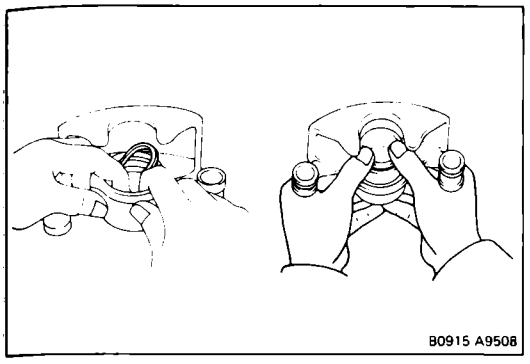




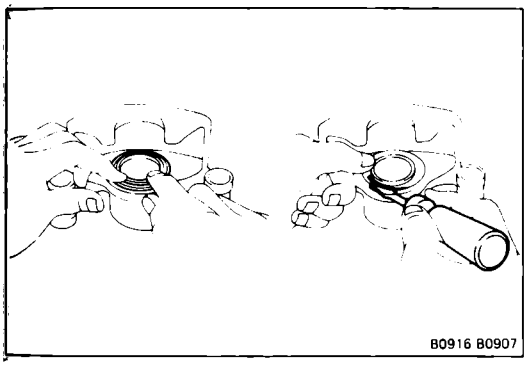
ASSEMBLY OF CYLINDER

(See page BR-25)

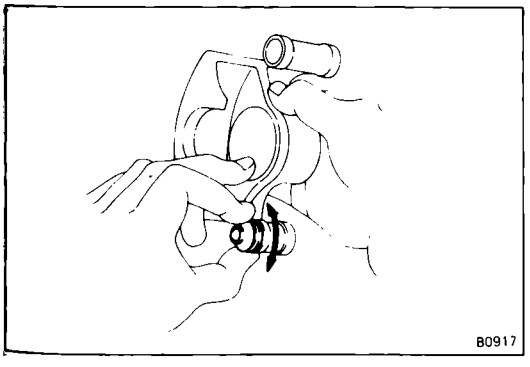
1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO PARTS INDICATED WITH ARROWS



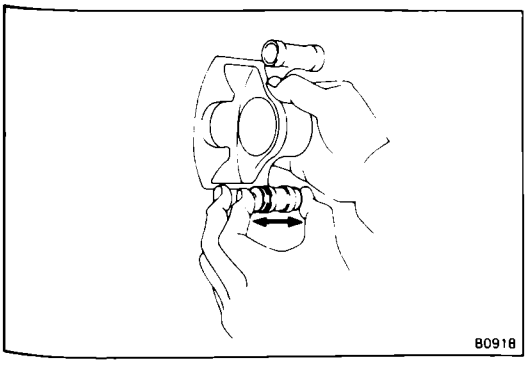
2. INSTALL PISTON SEAL AND PISTON IN CYLINDER



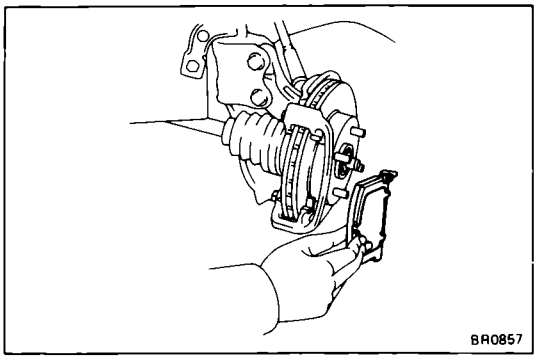
3. INSTALL CYLINDER BOOT AND SET RING IN CYLINDER



4. INSTALL COLLARS, DUST BOOTS AND CYLINDER SLIDING BUSHINGS
   (a) Install the collars and dust boots into the brake cylinder.
   (b) Insure that the boots is secured firmly to the brake cylinder grooves.



   (c) Install the bushings into the boots.
   (d) Insure that the boots is secured firmly to the bushing grooves.

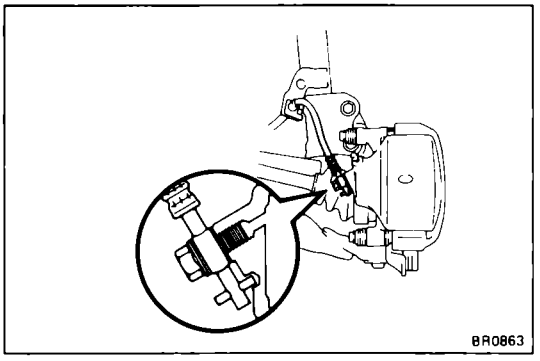


INSTALLATION OF CYLINDER

(See page BR-25)

1. INSTALL PADS
   (See steps 7 to 8 on pages BR-26 and 27)

2. INSTALL CYLINDER
   (See step 9 on page BR-27)



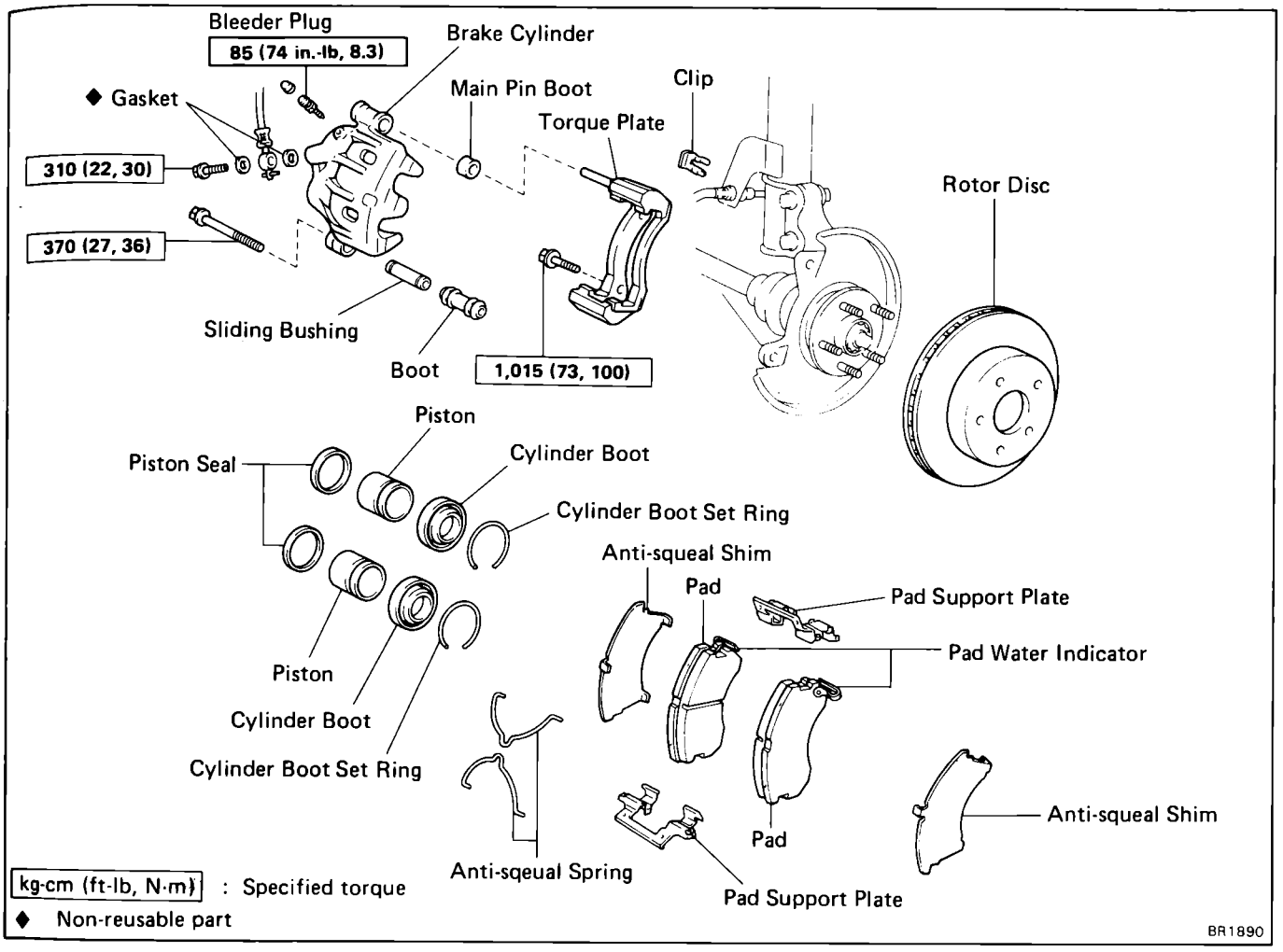
3. INSTALL FLEXIBLE HOSE TO BRAKE CYLINDER
   Torque: 310 kg-cm (22 ft-lb, 30 N·m)

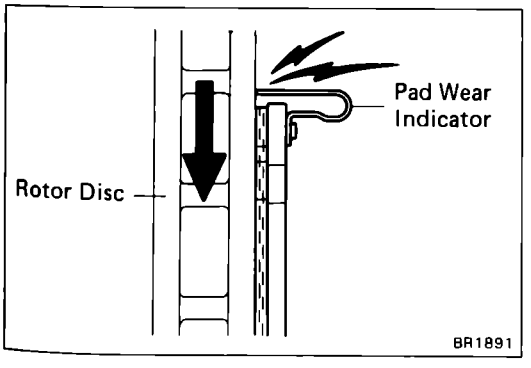
4. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM
   (See page BR-7)

5. CHECK FOR LEAKS

FRONT BRAKE (4WD)

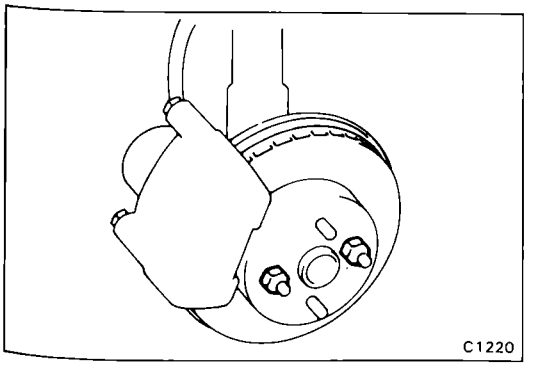
COMPONENTS





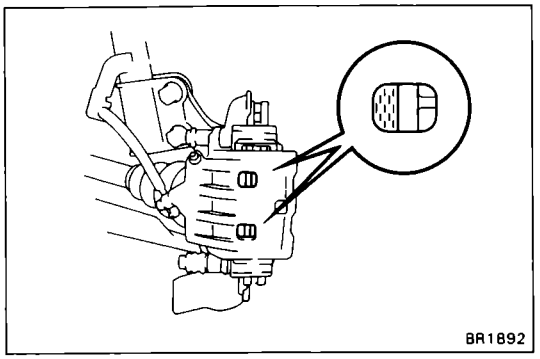
REPLACEMENT OF BRAKE PADS

NOTE: If a squealing noise occurs from the brakes while driving, check the pad wear indicator. If there are traces of the indicator contacting the rotor disc, the brake pad should be replaced.



1. REMOVE FRONT WHEEL

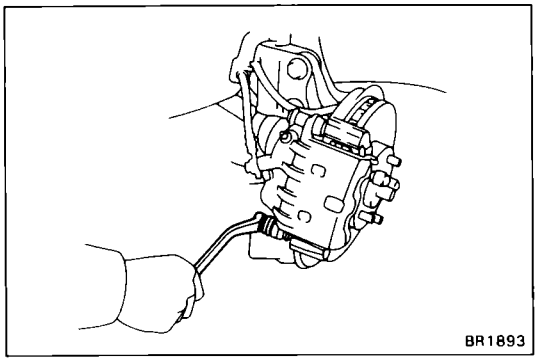
Remove the wheel and temporarily fasten the rotor disc with the hub nuts.



2. **INSPECT PAD LINING THICKNESS**

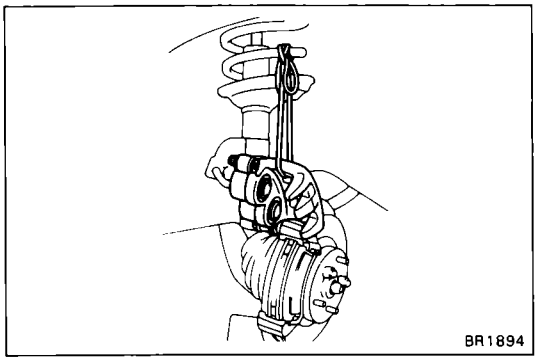
Check the pad thickness through the cylinder inspection hole and replace pads if not within specification.

Minimum thickness: 1.0 mm (0.039 in.)



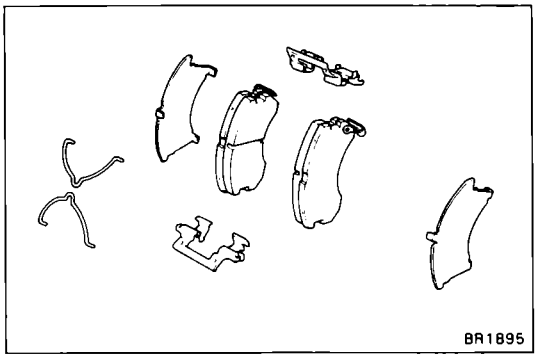
3. **REMOVE CYLINDER FROM TORQUE PLATE**

(a) Remove the installation bolt.



(b) Lift up the brake cylinder and suspend it so the hose is not stretched.

NOTE: Do not disconnect the brake hose.

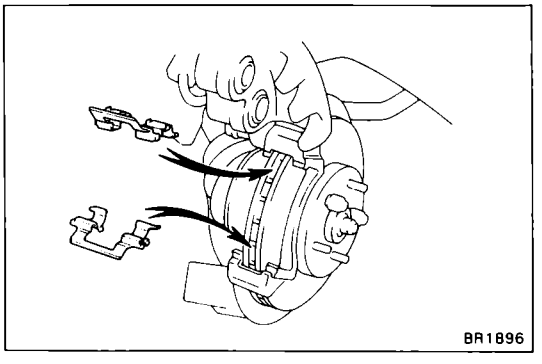


4. **REMOVE FOLLOWING PARTS:**

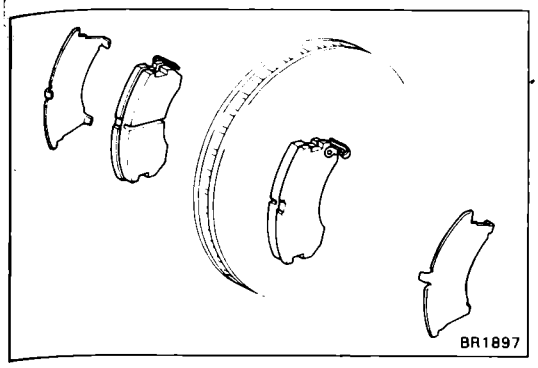
(a) Two anti-squeal springs
(b) Two brake pads
(c) Two anti-squeal shims
(d) Two pad support plates

5. **CHECK ROTOR DISC THICKNESS**
(See step 2 on page BR-38)

6. **CHECK ROTOR DISC RUNOUT**
(See step 3 on page BR-38)

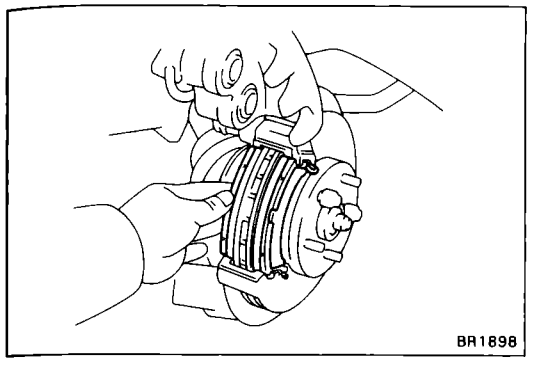


7. **INSTALL PAD SUPPORT PLATES**


BR1897

8. INSTALL NEW PADS

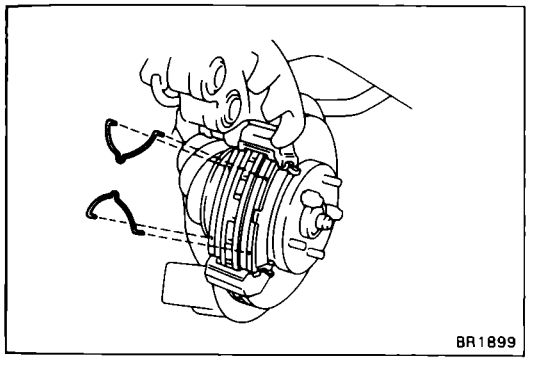
(a) Install the anti-squeal shims to the pads.


BR1898

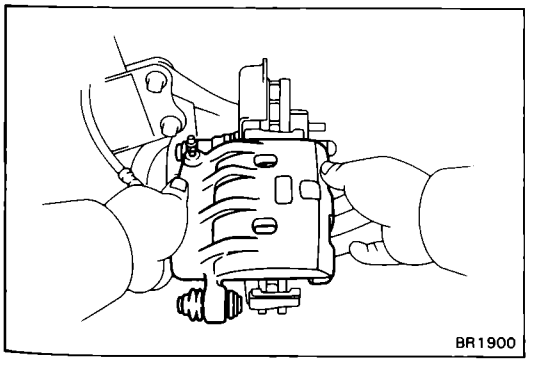
(b) Install the pads onto each support plate.

NOTE: Install the pads so the wear indicator is at the top side.

CAUTION: Do not allow oil or grease to get on the rubbing face.


BR1899

(c) Install the anti-squeal springs in position.


BR1900

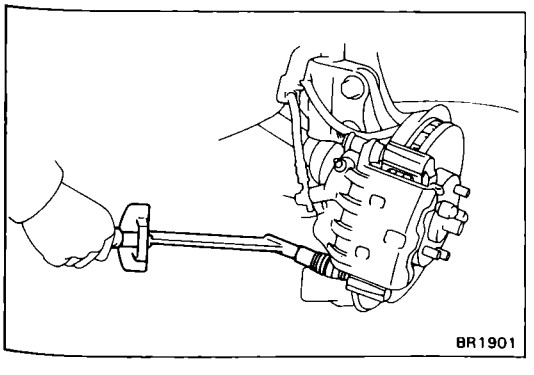
9. INSTALL CYLINDER

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

(b) Press in piston with a hammer handle or an equivalent.

NOTE: Always change the pad on one wheel at a time as there is a possibility of the opposite piston flying out.

(c) Insert the brake cylinder carefully so the boot is not wedged.

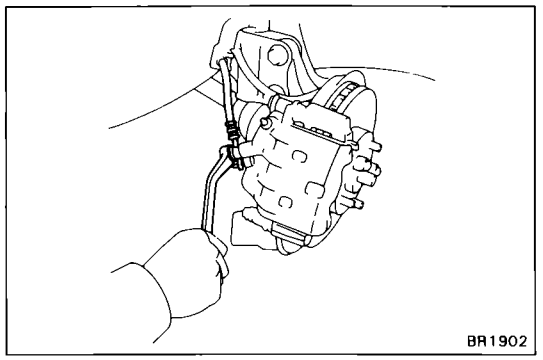

BR1901

(d) Install and torque the installation bolt.

Torque: 370 kg-cm (27 ft-lb, 36 N·m)

10. INSTALL FRONT WHEEL

11. CHECK THAT FLUID LEVEL IS MAX LINE

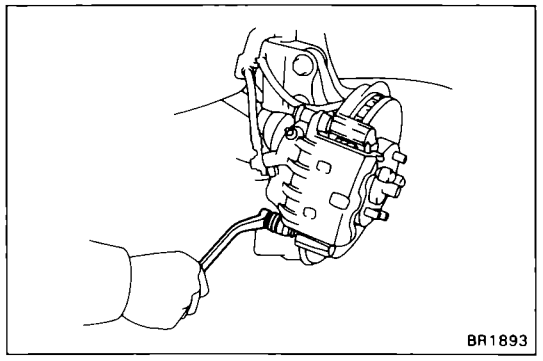


REMOVAL OF CYLINDER

(See page BR-33)

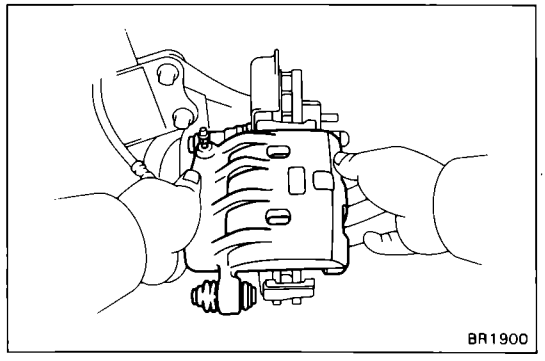
1. DISCONNECT BRAKE HOSE

Remove the union bolt and disconnect the brake hose. Use a container to catch the brake fluid.

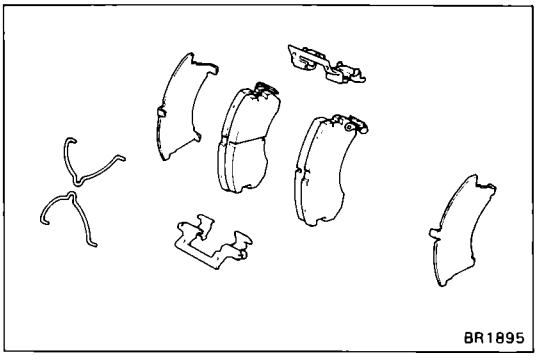


2. REMOVE CYLINDER FROM TORQUE PLATE

(a) Remove the installation bolt.

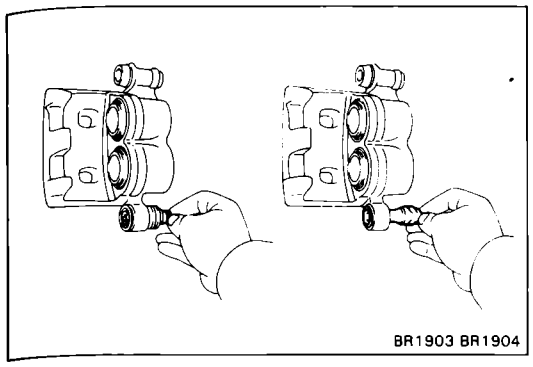


(b) Slide out the brake cylinder.



3. REMOVE PADS

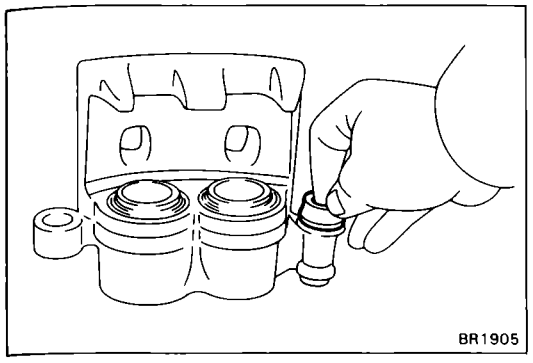
(See step 4 on page BR-34)


BR1903 BR1904

DISASSEMBLY OF CYLINDER

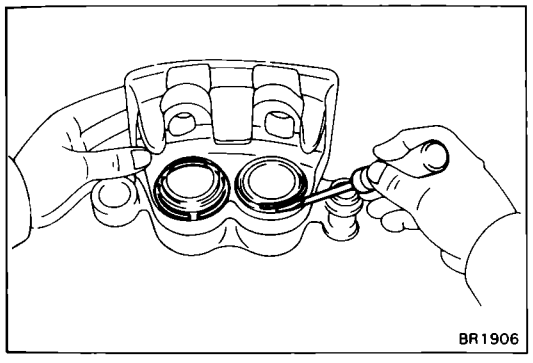
(See page BR-33)

1. **REMOVE SLIDING BUSHING AND BOOT**


BR1905

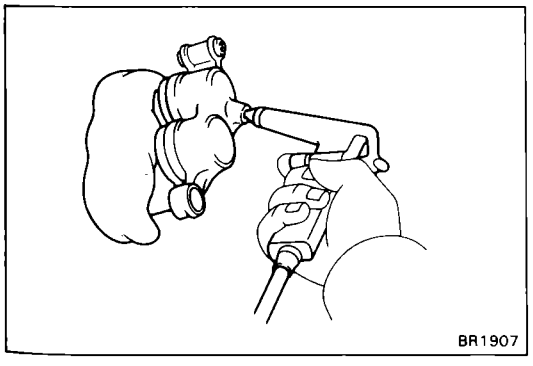
2. **REMOVE MAIN PIN BOOT**

Pull out the main pin boot.


BR1906

3. **REMOVE CYLINDER BOOT SET RINGS AND CYLINDER BOOTS**

Using a screwdriver, remove the two cylinder boot set rings and remove the two cylinder boots from the brake cylinder.

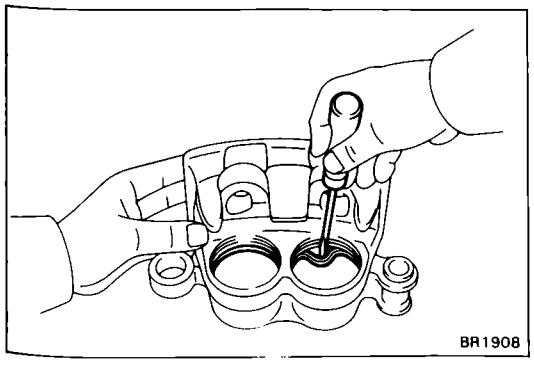

BR1907

4. **REMOVE PISTONS FROM CYLINDER**

(a) Put a piece of cloth or an equivalent as shown.

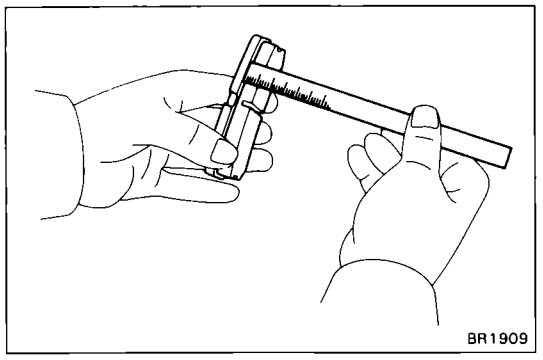
(b) Use compressed air to remove the pistons from the cylinder.

WARNING: Do not place your fingers in front of the pistons when using compressed air.


BR1908

5. **REMOVE PISTON SEALS FROM CYLINDER**

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


BR1909

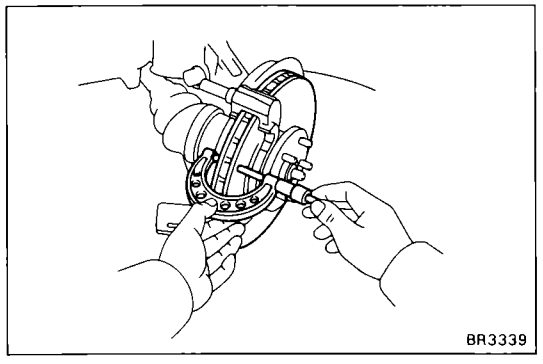
INSPECTION OF FRONT BRAKE COMPONENTS

1. MEASURE PAD LINING THICKNESS

Standard thickness: 10.0 mm (0.394 in.)

Minimum thickness: 1.0 mm (0.039 in.)

Replace the pad if the thickness is less than the minimum or if it shows sign of uneven wear.

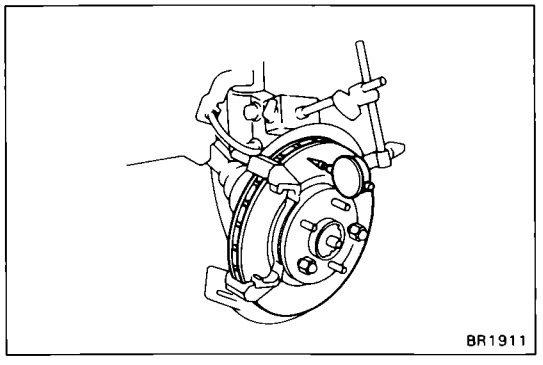

BR3339

2. MEASURE ROTOR DISC THICKNESS

Standard thickness: 25.0 mm (0.984 in.)

Minimum thickness: 24.0 mm (0.945 in.)

If the disc is scored or worn, or if thickness is less than minimum, repair or replace the disc.


BR1911

3. MEASURE ROTOR DISC RUNOUT

NOTE: Before measuring the runout, confirm that the front hub bearing play is within specification.
Measure the rotor disc runout at 10 mm (0.39 in.) from the outer edge of the rotor disc.

Maximum disc runout: 0.07 mm (0.0028 in.)

If the runout is greater than the maximum, inspect and adjust following the procedure listed below.

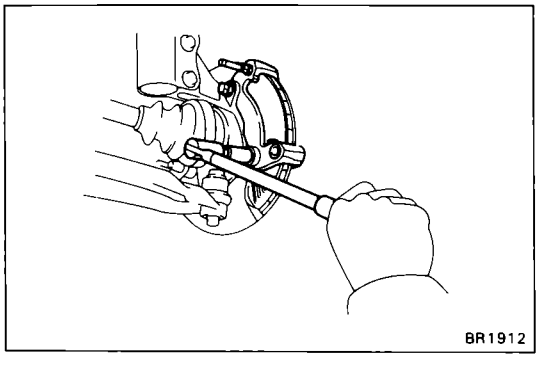
Then replace the disc if necessary.

(a) Remove the torque plate from the knuckle.

(b) Remove the hub nuts of the temporarily installed disc and pull off the rotor disc.

(c) Check that the hub axial play is within specification, and replace the bearing if not within specification. (See page FA-8)

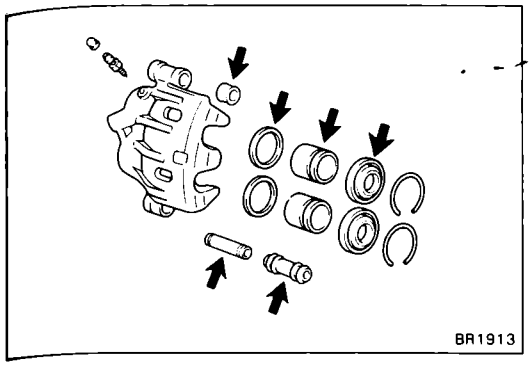
(d) Install the rotor disc and measure the disc runout, then shift the rotor disc one fifth a turn and measure the disc runout. Similarly measure the runout at each position, and select the position where the runout is minimum.


BR1912

(e) In this position, if the runout is within specification, install the torque plate and torque the mounting bolts.

Torque: 1,015 kg-cm (73 ft-lb, 100 N·m)

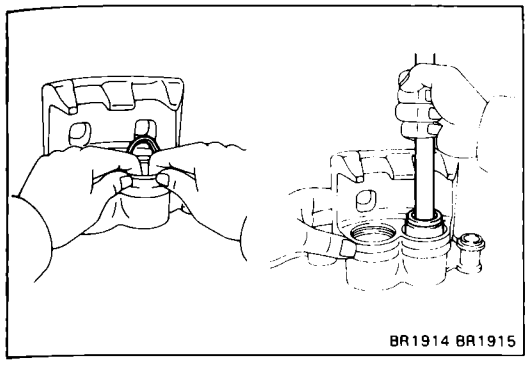
(f) If not within specification, replace the rotor disc, and repeat (d) and (e).


BR1913

ASSEMBLY OF CYLINDER

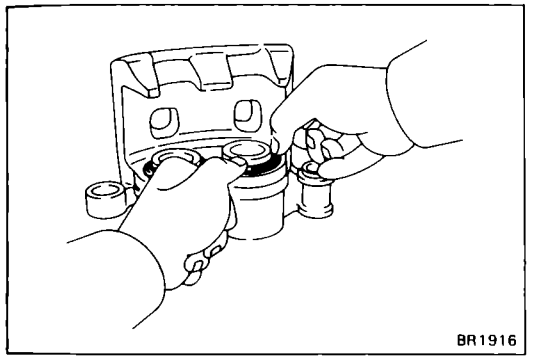
(See page BR-33)

1. **APPLY LITHIUM SOAP BASE GLYCOL GREASE TO PARTS INDICATED WITH ARROWS**


BR1914 BR1915

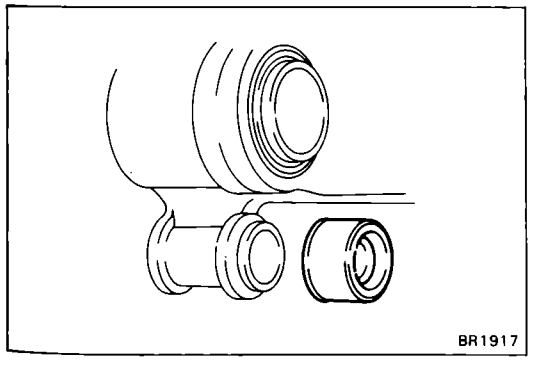
2. **INSTALL PISTON SEALS AND PISTONS IN CYLINDER**

   Install the two piston seals and two pistons into the brake cylinder.


BR1916

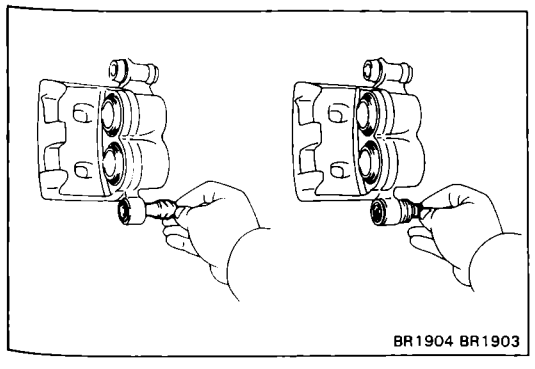
3. **INSTALL CYLINDER BOOTS AND SET RINGS IN CYLINDER**

   Install the cylinder boots and set rings to each piston.


BR1917

4. **INSTALL MAIN PIN BOOT**

   Install the main pin boot in place.


BR1904 BR1903

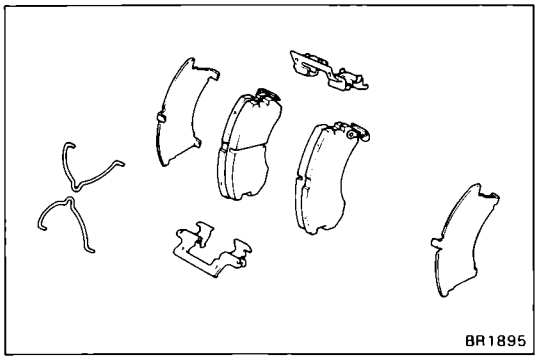
5. **INSTALL DUST BOOT AND SLIDING BUSHING**

   (a) Install the dust boot.

   (b) Insure that the boot is secured firmly to the brake cylinder grooves.

   (c) Install the bushing into the boot.

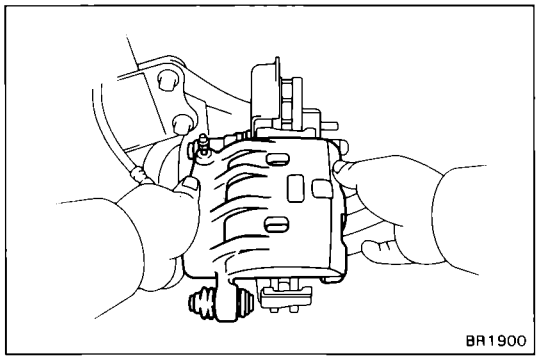
   (d) Insure that the boot is secured firmly to the bushing grooves.



INSTALLATION OF CYLINDER

(See page BR-33)

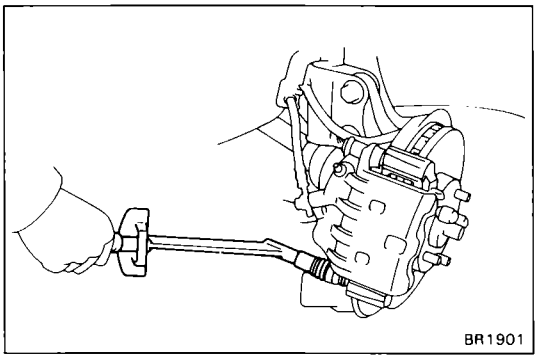
1. **INSTALL FOLLOWING PARTS**
   (a) Two pad support plates
   (b) Two brake pads
   (c) Two anti-squeal shims
   (d) Two anti-squeal springs



2. **INSTALL CYLINDER**
   (a) Install the brake cylinder onto the main pin.

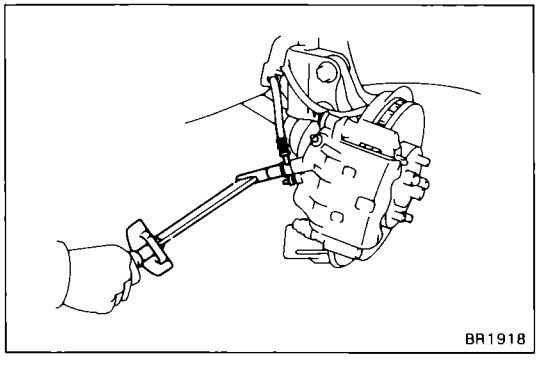
   NOTE: Make sure that the boot end is installed into the groove of the main pin.

   (b) Install the brake cylinder over the brake pads.



   (c) Install the cylinder installation bolt and torque the bolt.

   Torque: 370 kg-cm (27 ft-lb, 36 N·m)



3. **CONNECT FLEXIBLE HOSE TO BRAKE CYLINDER**

   Set the flexible hose and new gaskets in position and install the union bolt and torque it.

   Torque: 310 kg-cm (22 ft-lb, 30 N·m)

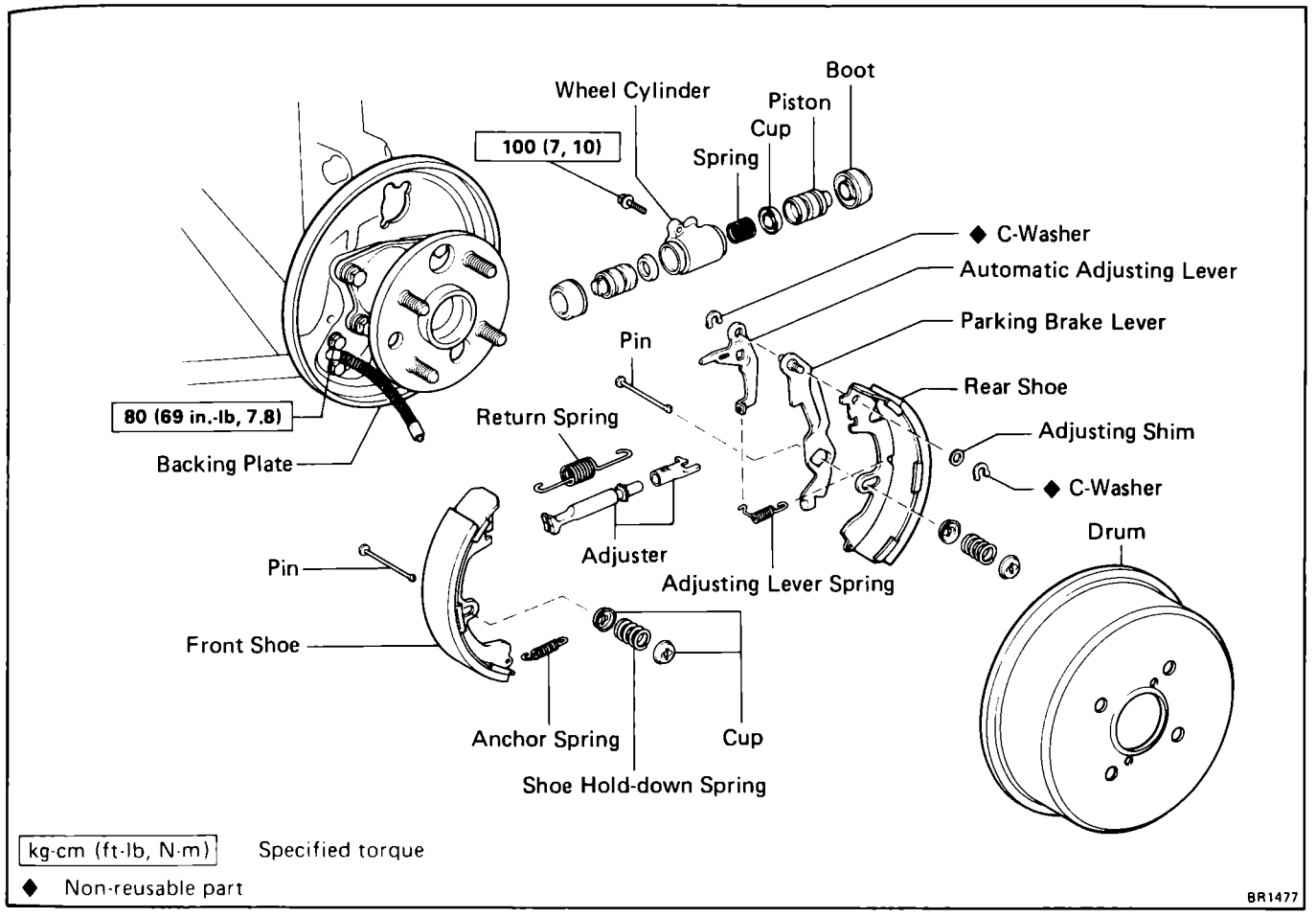
4. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM**
   (See page BR-7)

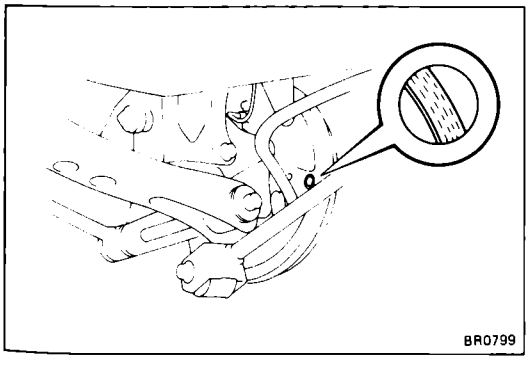
5. **CHECK FOR LEAKS**

REAR BRAKE

Drum Brake

COMPONENTS





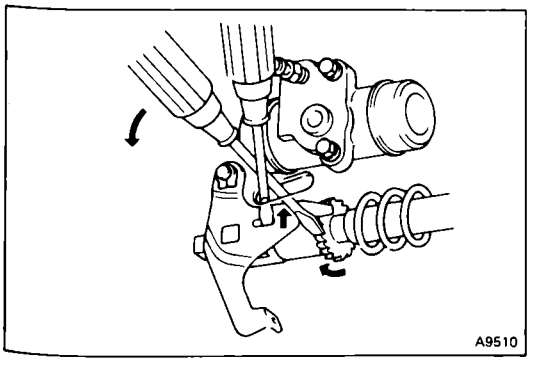
REMOVAL OF REAR BRAKE

1. INSPECT SHOE LINING THICKNESS

Remove the inspection hole plug, and check the shoe lining thickness through the hole.
If less than minimum, replace the shoes.

Minimum thickness: 1.0 mm (0.039 in.)

2. REMOVE REAR WHEEL

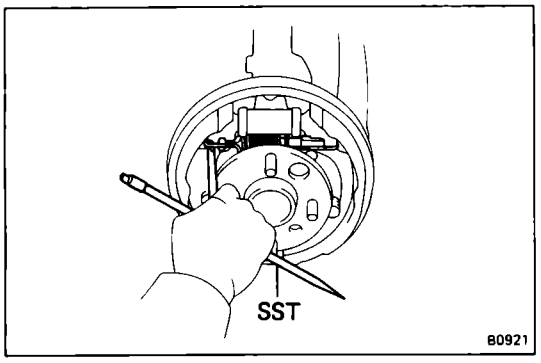


3. REMOVE BRAKE DRUM

NOTE: If the brake drum cannot be removed easily, perform the following steps.

(a) Insert a screwdriver through the hole in the backing plate, and hold the automatic adjusting lever away from the adjuster.

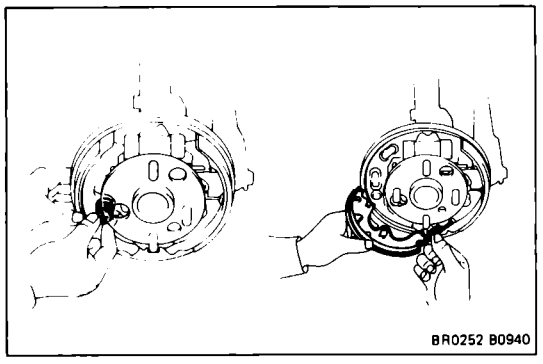
(b) Using another screwdriver, reduce the brake shoe adjuster by turning the adjusting bolt.



4. REMOVE FRONT SHOE

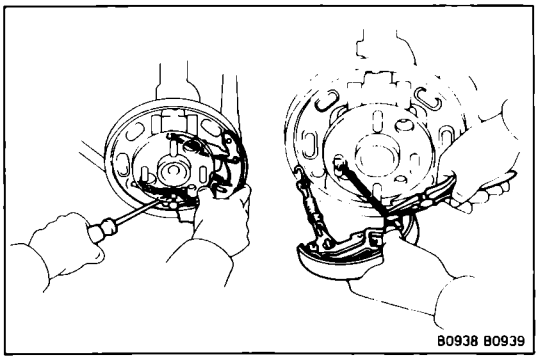
(a) Using SST, disconnect the return spring.

SST 09703-30010



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

(c) Disconnect the anchor spring from the front shoe and remove it.

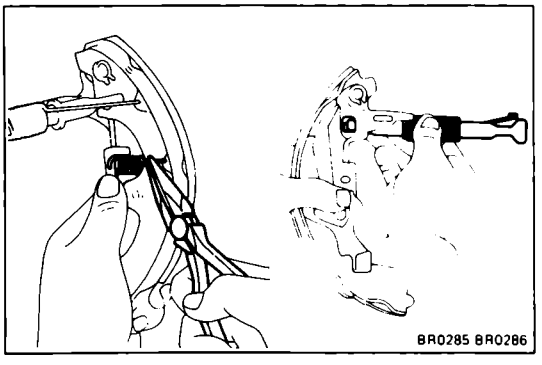


5. REMOVE REAR SHOE

(a) Remove the shoe hold-down spring, cups and pin.

(b) Using a screwdriver, disconnect the parking brake cable from the anchor plate.

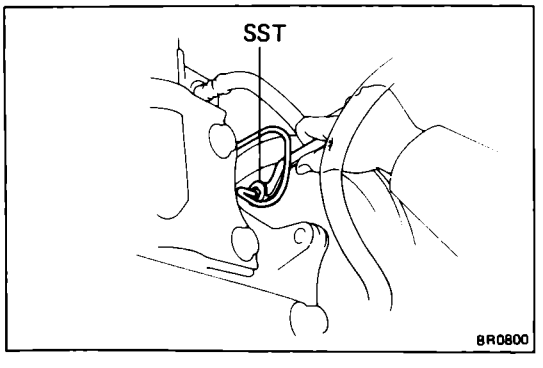
(c) Using pliers, disconnect the parking brake cable from the lever and remove the rear shoe together with the adjuster.



6. REMOVE ADJUSTER FROM REAR SHOE

(a) Remove the adjusting lever spring.

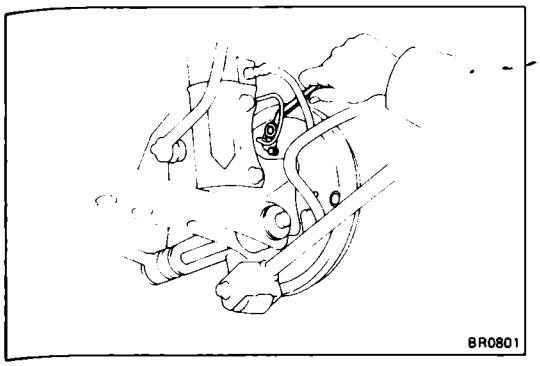
(b) Remove the adjuster together with the return spring.



7. DISCONNECT BRAKE TUBE FROM WHEEL CYLINDER

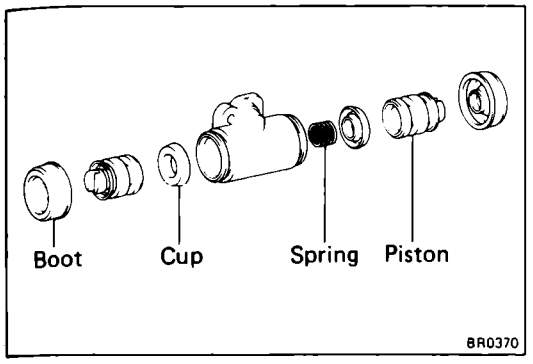
Using SST, disconnect the brake line. Use a container to catch the brake fluid.

SST 09751-36011



8. REMOVE WHEEL CYLINDER

Remove the two bolts and the wheel cylinder.



9. IF NECESSARY, DISASSEMBLE WHEEL CYLINDER

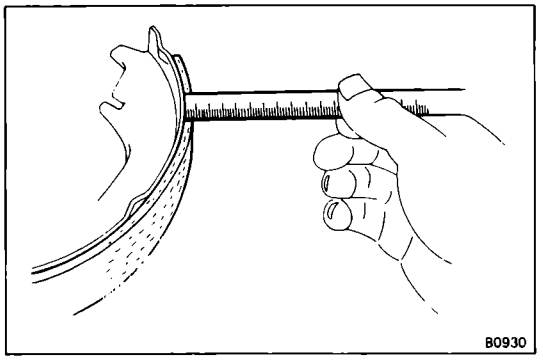
Remove the following parts from the wheel cylinder.

- Two boots
- Two pistons
- Two piston cups
- Spring

INSPECTION AND REPAIR OF REAR BRAKE COMPONENTS

1. INSPECT DISASSEMBLED PARTS

Inspect the disassembled parts for wear, rust or damage.



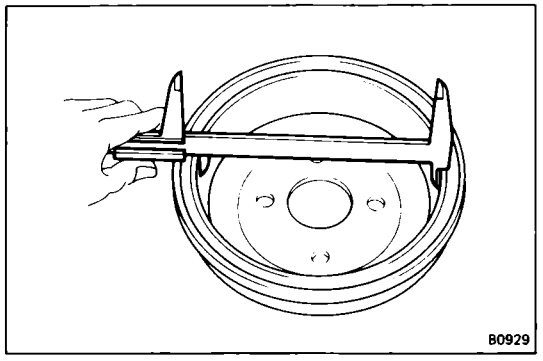
2. MEASURE BRAKE SHOE LINING THICKNESS

Standard thickness: 4.0 mm (0.157 in.)

Minimum thickness: 1.0 mm (0.039 in.)

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

NOTE: If any of the brake shoes have to be replaced, replace all of the rear shoes in order to maintain even braking.

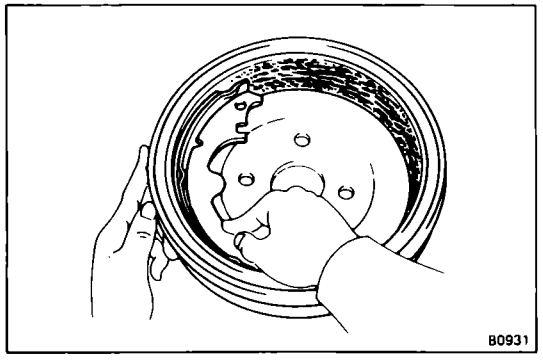


3. MEASURE BRAKE DRUM INSIDE DIAMETER

Standard inside diameter: 200.0 mm (7.874 in.)

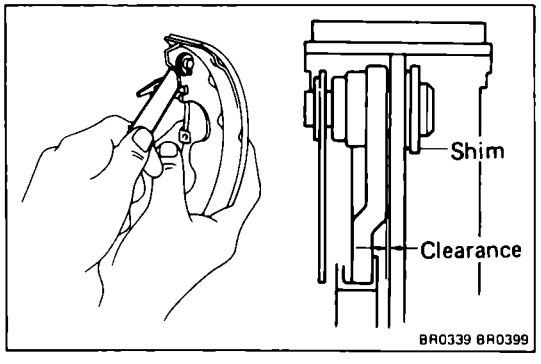
Maximum inside diameter: 201.0 mm (7.913 in.)

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



4. INSPECT REAR BRAKE LINING AND DRUM FOR PROPER CONTACT

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



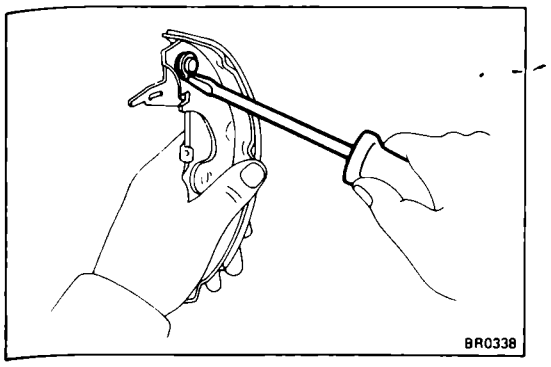
5. MEASURE CLEARANCE BETWEEN BRAKE SHOE AND LEVER

Using a feeler gauge, measure the clearance.

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

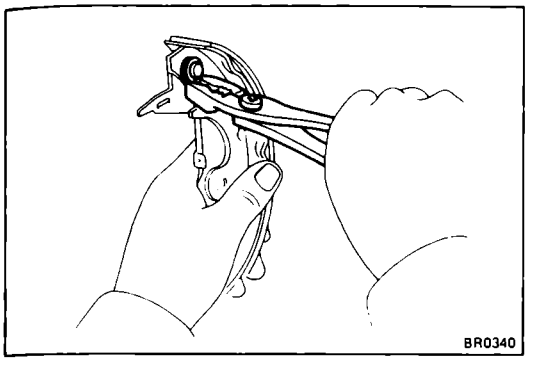
If the clearance is not within specification, replace the shim with one of the correct size.

Thickness		mm (in.)	
0.2	(0.008)	0.5	(0.020)
0.3	(0.012)	0.6	(0.024)
0.4	(0.016)	0.9	(0.035)



6. IF NECESSARY, REPLACE SHIM

(a) Remove the parking brake lever, and install the correct size shim.



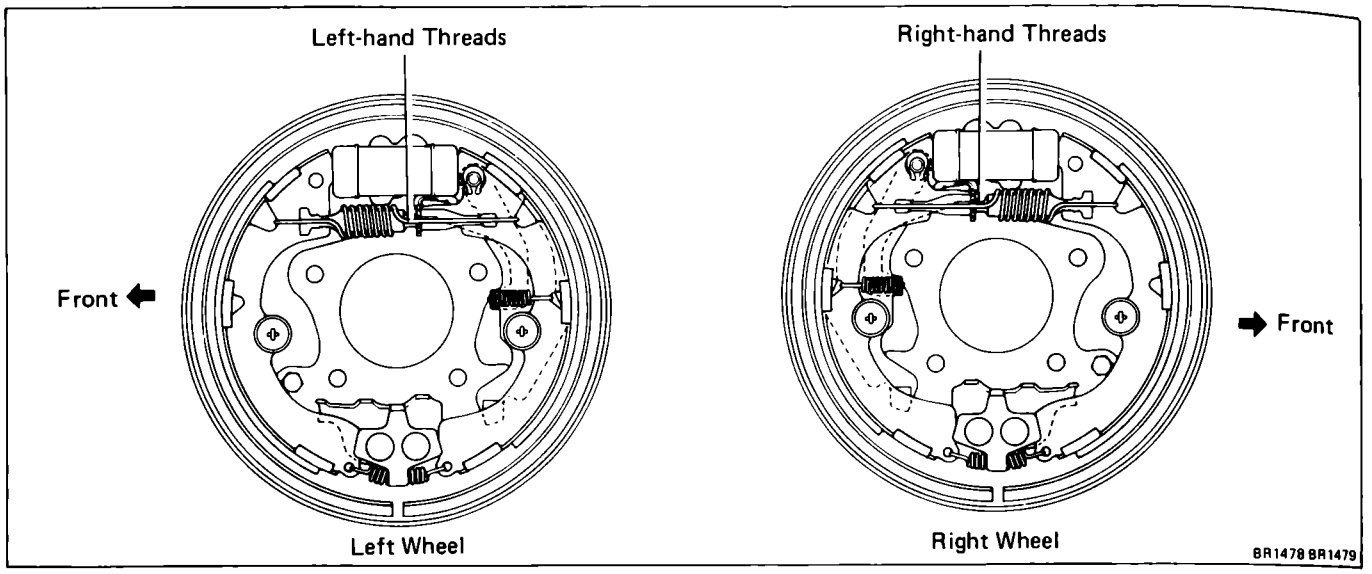
(b) Install the parking brake lever with a new C-washer.

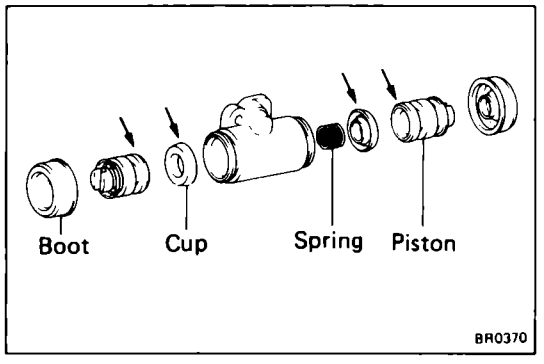
(c) Remeasure the clearance.

INSTALLATION OF REAR BRAKE

(See page BR-41)

NOTE: Assemble the parts in the correct direction as shown.





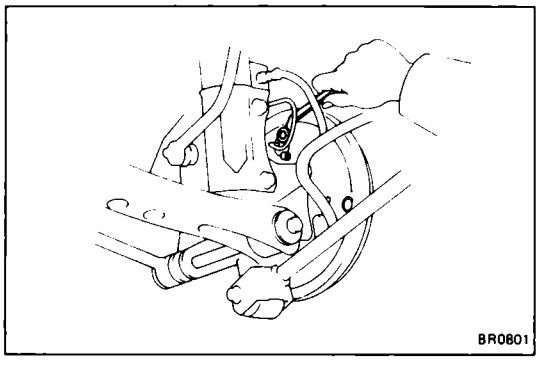
1. ASSEMBLE WHEEL CYLINDER

(a) Apply lithium soap base glycol grease to the cups and pistons as shown.

(b) Assemble the wheel cylinder.

NOTE: Install in proper direction only.

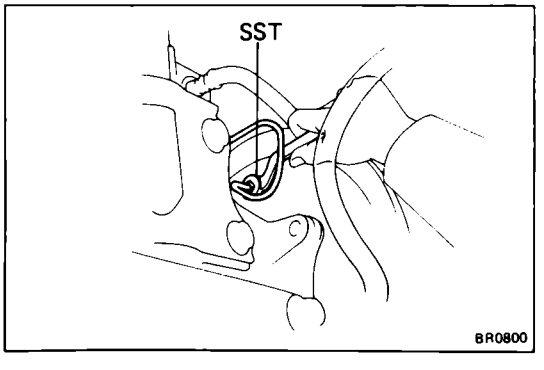
- Spring
- Two cups
- Two pistons
- Two boots



2. INSTALL WHEEL CYLINDER

Install the wheel cylinder on the backing plate with two bolts.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)

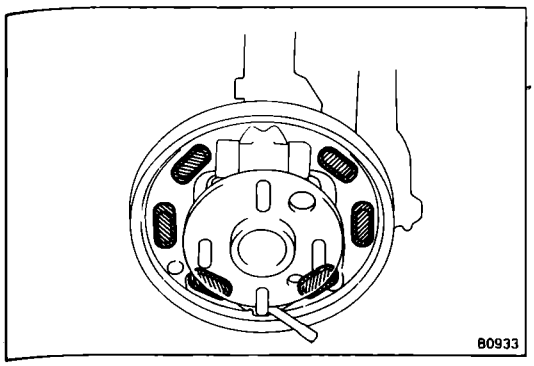


3. CONNECT BRAKE TUBE TO WHEEL CYLINDER

Using SST, connect the brake tube.

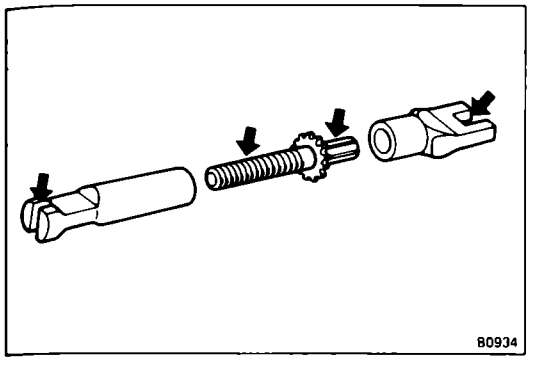
SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)

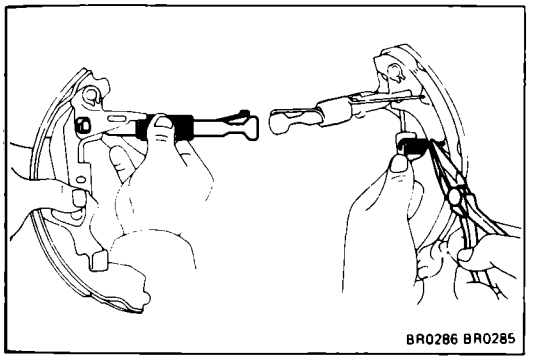


4. APPLY HIGH TEMPERATURE GREASE TO BACKING PLATE AND ADJUSTER

(a) Apply high temperature grease to the brake shoe contact surfaces as shown.

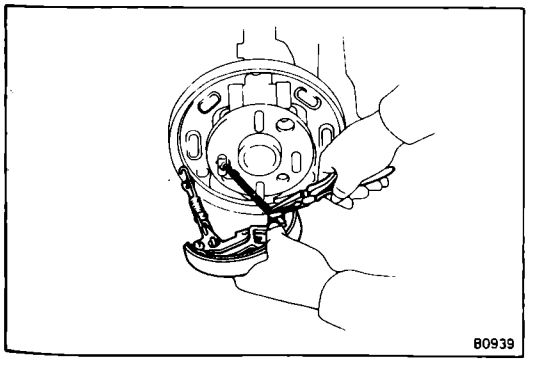


(b) Apply high temperature grease to the adjuster bolt threads and ends.



5. INSTALL ADJUSTER ONTO REAR SHOE

Set the adjuster and return spring in place and install the adjusting lever spring.

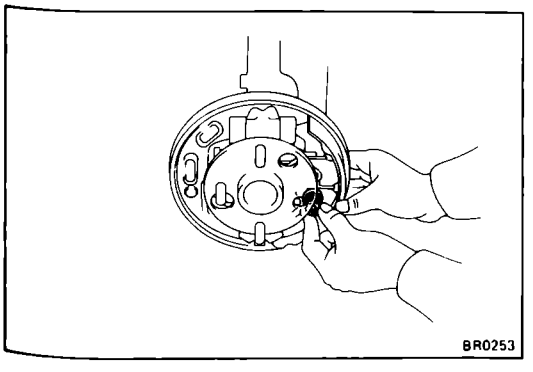


6. INSTALL REAR SHOE

(a) Using pliers, connect the parking brake cable to the lever.

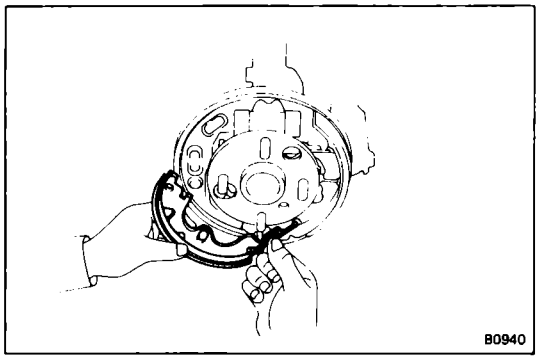
(b) Pass the parking brake cable through the notch in the anchor plate.

(c) Set the rear shoe in place with the end of the shoe inserted in the wheel cylinder and the other end in the anchor plate.



(d) Install the shoe hold-down spring, cups and pin.

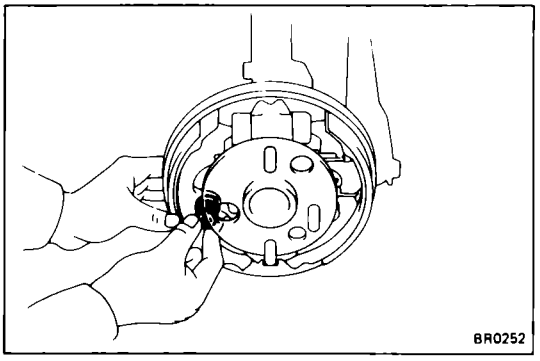
CAUTION: Do not allow oil or grease to get on the rubbing face.



7. INSTALL FRONT SHOE

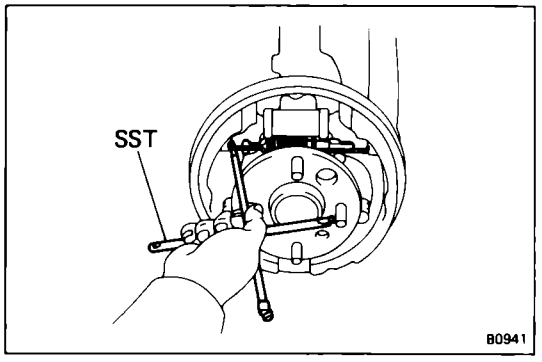
(a) Install the anchor spring between the front and rear shoes.

(b) Set the front shoe in place with the end of the shoe inserted in the wheel cylinder and the adjuster in place.



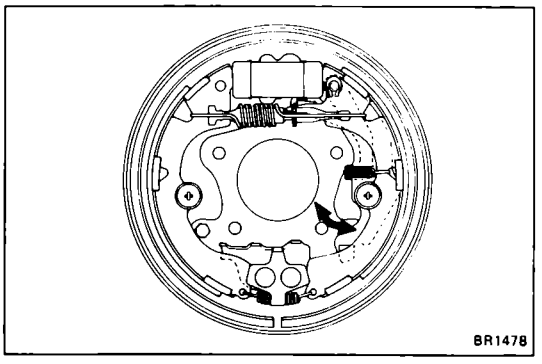
(c) Install the shoe hold-down spring, cups and pin.

CAUTION: Do not allow oil or grease to get on the rubbing face.



(d) Using SST, connect the return spring.

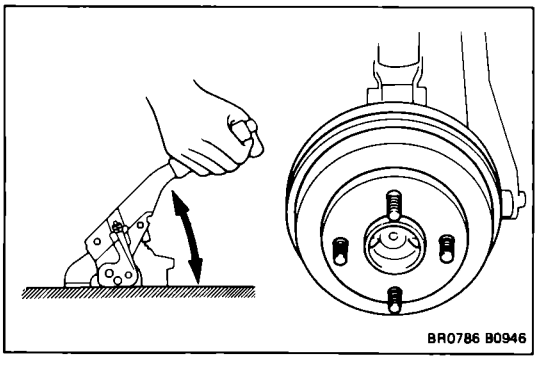
SST 09703-30010



8. CHECK OPERATION OF AUTOMATIC ADJUSTING MECHANISM

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

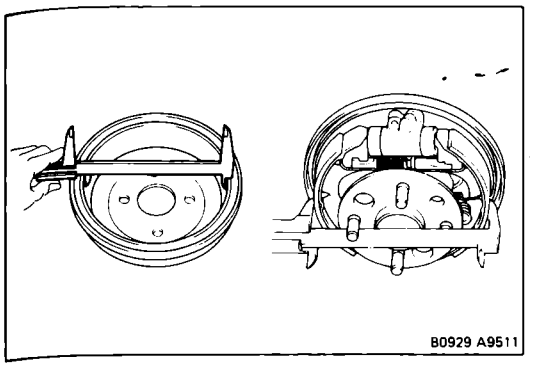
If the adjuster does not turn, check for incorrect installation of the rear brake.



(b) Adjust the adjuster length to the shortest possible amount.

(c) Install the brake drum.

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



9. **CHECK CLEARANCE BETWEEN BRAKE SHOES AND DRUM**

   (a) Remove the brake drum.

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

   Shoe clearance: 0.6 mm (0.024 in.)

   If incorrect, check the parking brake system.

10. **INSTALL BRAKE DRUM**

11. **INSTALL REAR WHEEL**

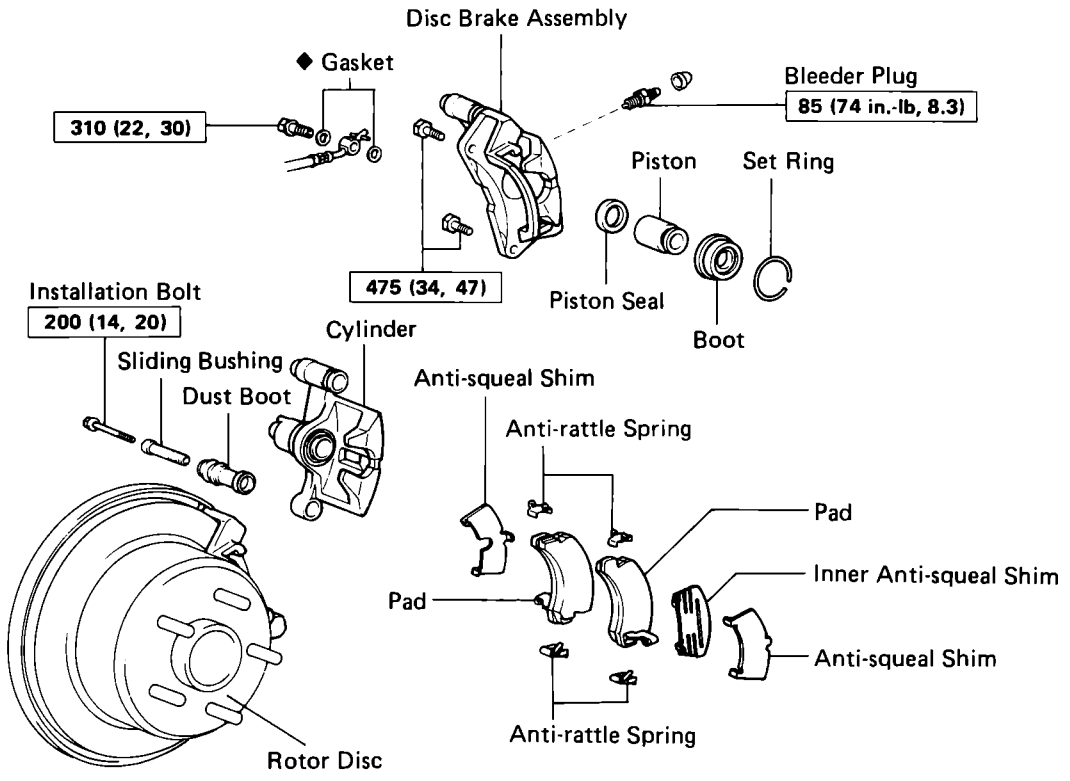
12. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM**
    (See page BR-7)

13. **CHECK FOR FLUID LEAKAGE**

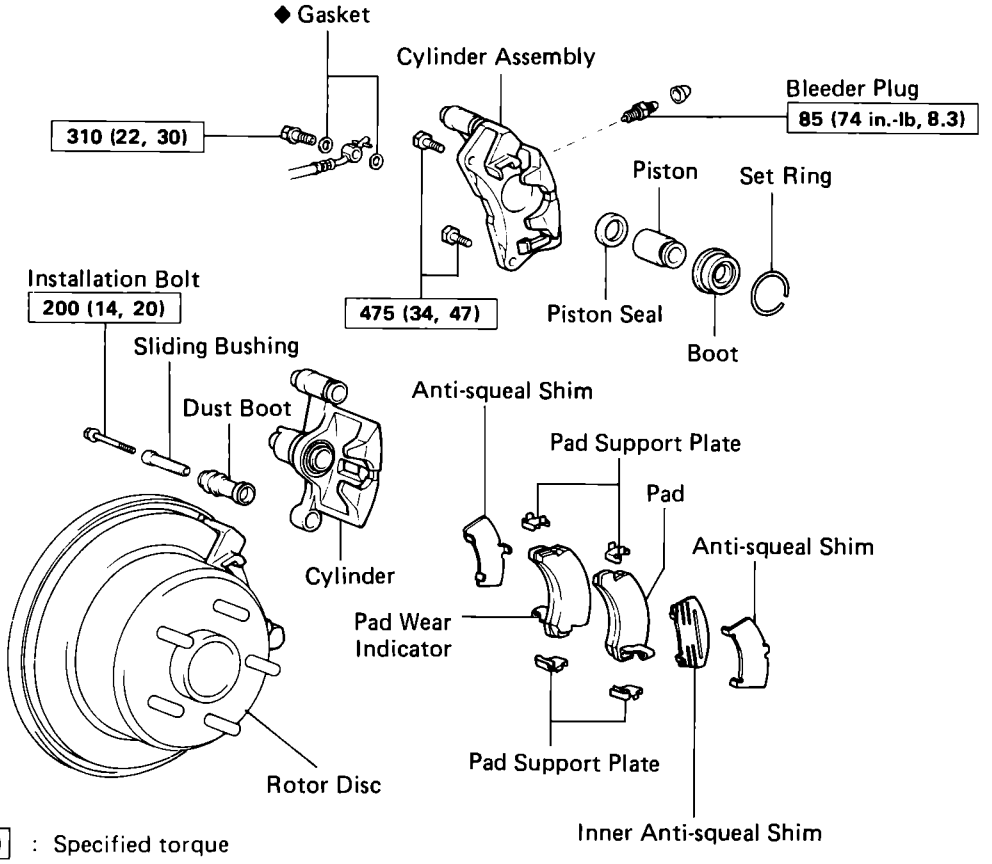
Disc Brake

COMPONENTS

2WD



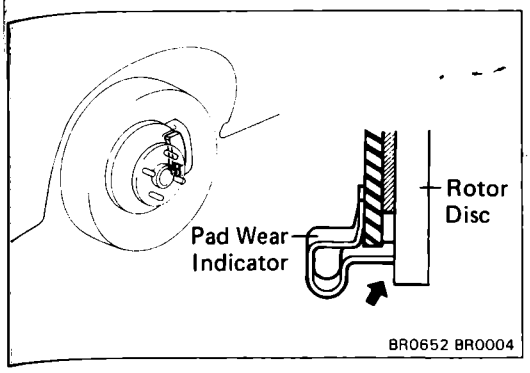
4WD



kg-cm (ft-lb, N·m) : Specified torque

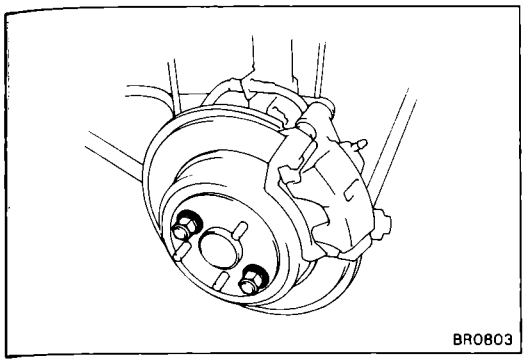
◆ Non-reusable part

BR3340
BR3341



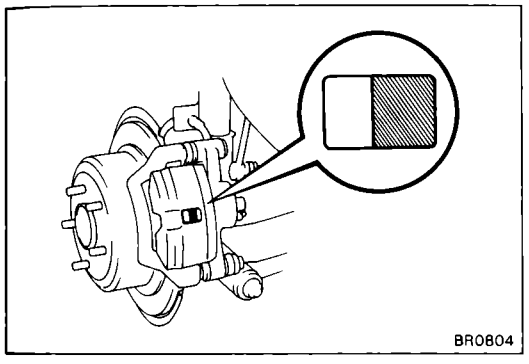
REPLACEMENT OF BRAKE PADS

NOTE: If a squealing noise occurs from the brakes while driving, check the pad wear indicator. If there are traces of the indicator contacting the rotor disc, the brake pad should be replaced.



1. REMOVE REAR WHEEL

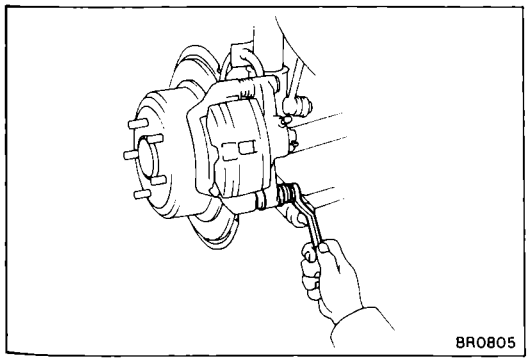
Remove the wheel and temporarily fasten the rotor disc with the hub nuts.



2. INSPECT PAD LINING THICKNESS

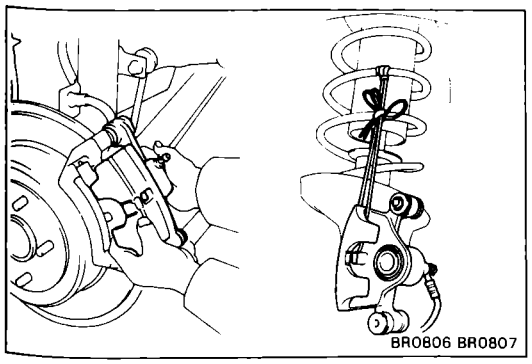
Check the pad thickness through the cylinder inspection hole and replace pads if not within specification.

Minimum thickness: 1.0 mm (0.039 in.)



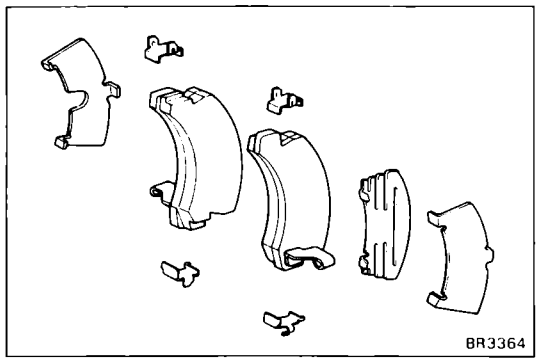
3. REMOVE CYLINDER FROM TORQUE PLATE

(a) Remove the installation bolt from the torque plate.



(b) Remove the brake cylinder and suspend it so the hose is not stretched.

NOTE: Do not disconnect the brake hose.


BR3364

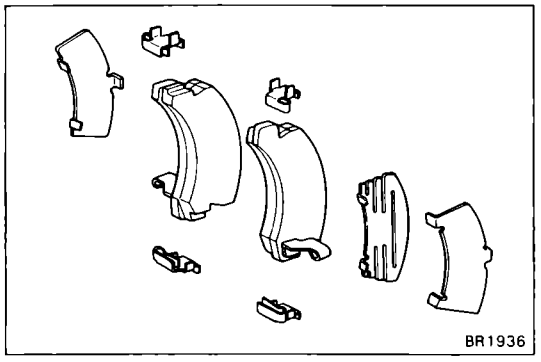
4. **REMOVE FOLLOWING PARTS:**

(2WD)

(a) Two brake pads

(b) Three anti-squeal shims

(c) Four anti-rattle springs


BR1936

(4WD)

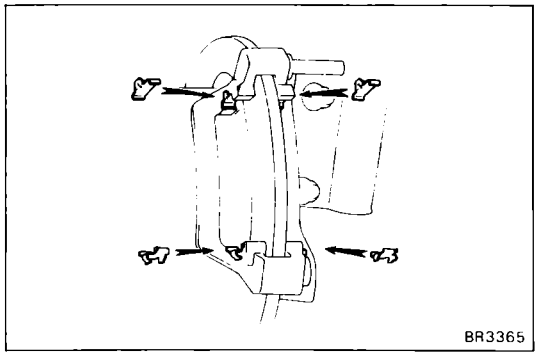
(a) Two brake pads

(b) Three anti-squeal shims

(c) Four pad support plates

5. **CHECK ROTOR DISC THICKNESS**
(See step 2 on page BR-47)

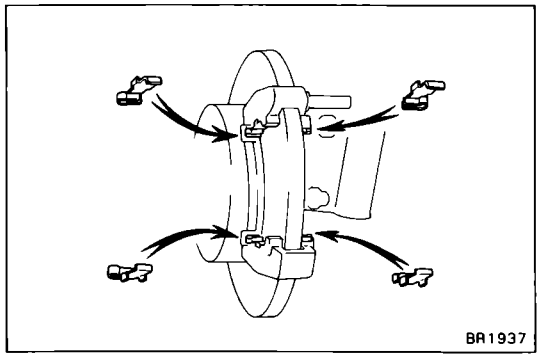
6. **CHECK ROTOR DISC RUNOUT**
(See step 3 on page BR-47)


BR3365

7. **INSTALL FOLLOWING PARTS:**

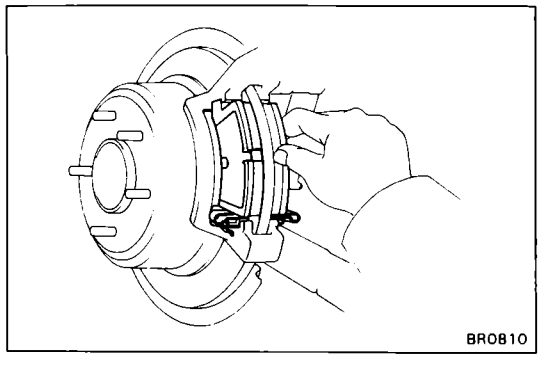
(2WD)

Four anti-rattle springs


BR1937

(4WD)

Four pad support plates


BR0810

8. **INSTALL NEW PADS**

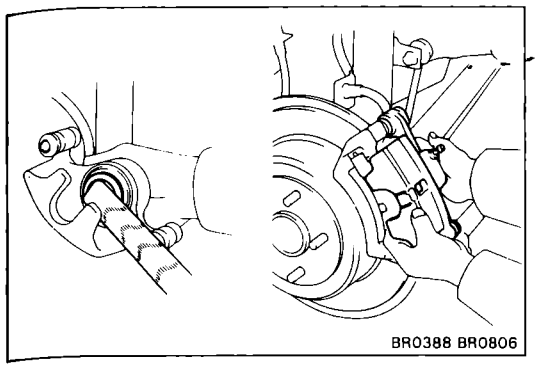
(a) Install the anti-squeal shims to the pads.

NOTE: Apply disc brake grease to both side of the inner anti-squeal shim of the outside pad.

(b) Install the pads onto each anti-rattle spring and guide plate.

NOTE: Install the pads so the wear indicator is at the bottom side.

CAUTION: Do not allow oil or grease to get on the rubbing face.


BR0388 BR0806

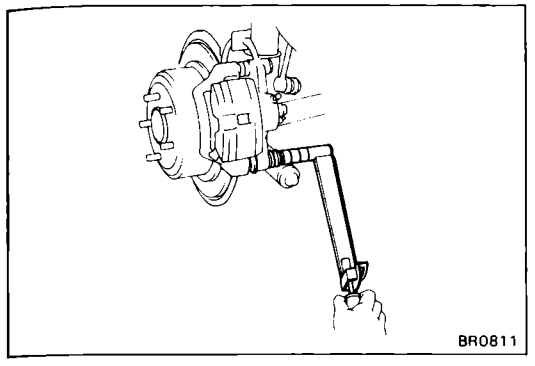
9. INSTALL CYLINDER

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

(b) Press in piston with a hammer handle or an equivalent.

NOTE: Always change the pads on one wheel at a time as there is a possibility of the opposite piston flying out.

(c) Insert the brake cylinder carefully so the boot is not wedged.

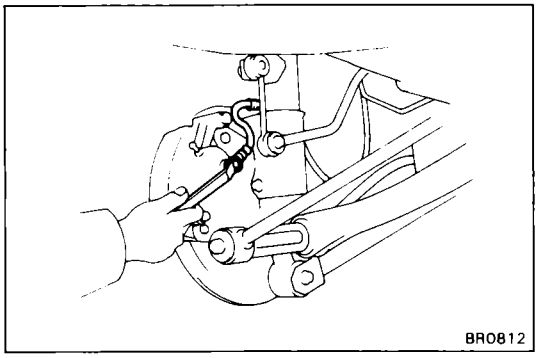

BR0811

(d) Install and torque the installation bolt.

Torque: 200 kg-cm (14 ft-lb, 20 N·m)

10. INSTALL REAR WHEEL

11. FILL BRAKE FLUID

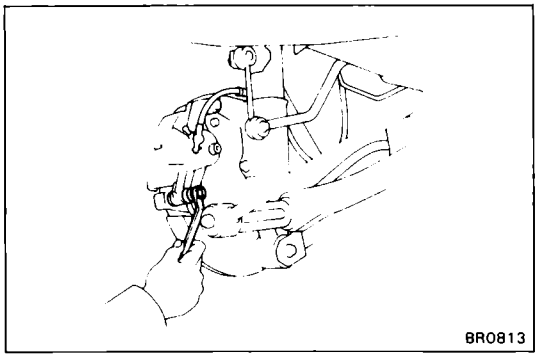


REMOVAL OF CYLINDER

(See page BR-50)

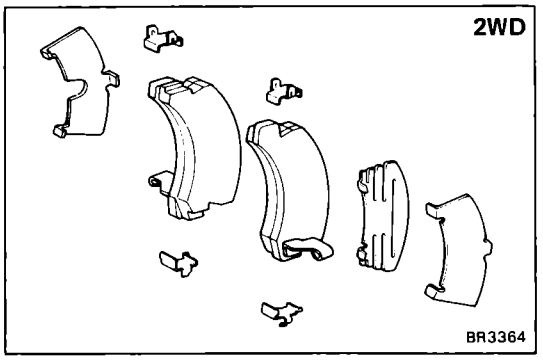
1. DISCONNECT BRAKE HOSE

Remove the union bolt and disconnect the brake hose. Use a container to catch the brake fluid.



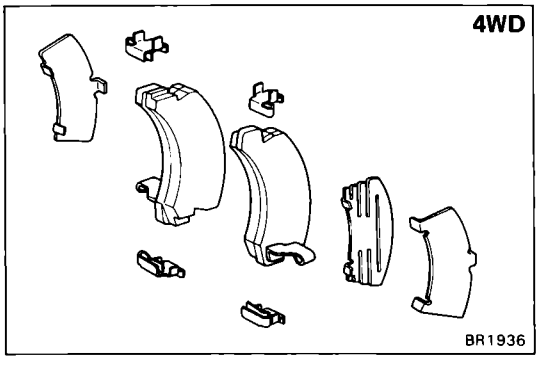
2. REMOVE CYLINDER FROM TORQUE PLATE

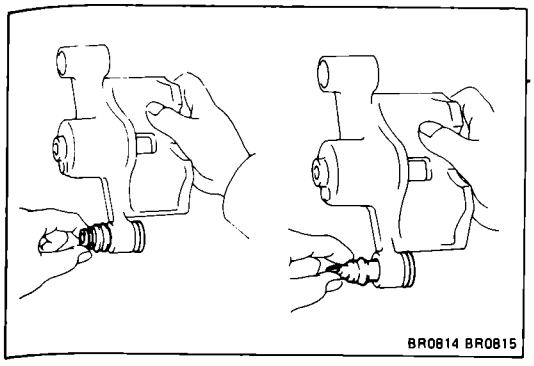
Remove the installation bolt and cylinder.



3. REMOVE PADS

(See step 4 on page BR-52)

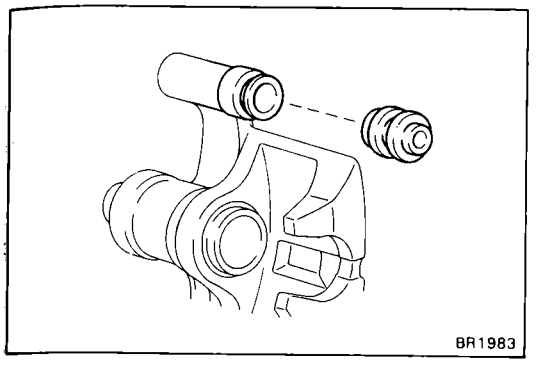




DISASSEMBLY OF CYLINDER

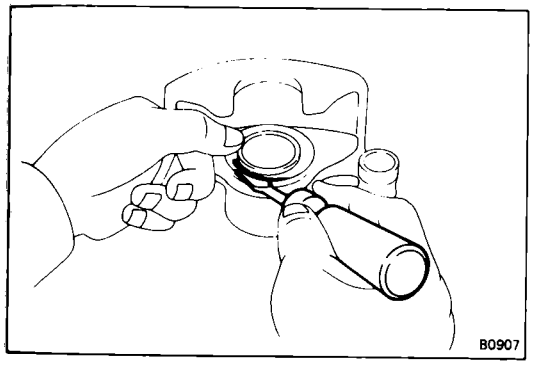
(See page BR-50)

1. **REMOVE SLIDING BUSHING AND DUST BOOT**



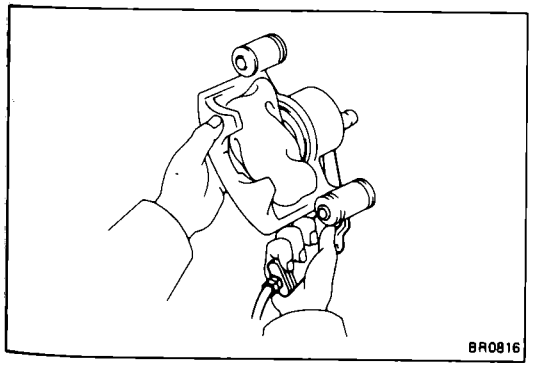
2. **REMOVE MAIN PIN BOOT**

Pull out the main pin boot.



3. **REMOVE CYLINDER BOOT SET RING AND CYLINDER BOOT**

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

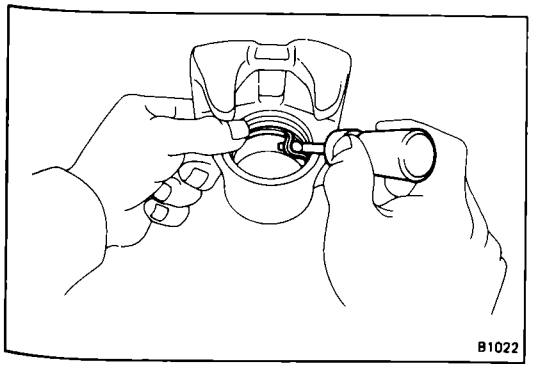


4. **REMOVE PISTON FROM CYLINDER**

(a) Put a piece of cloth or an equivalent as shown.

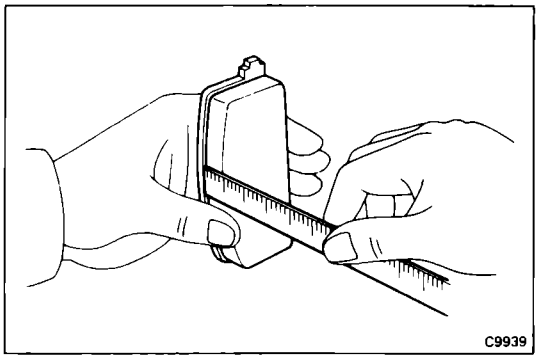
(b) Use compressed air to remove the piston from the cylinder.

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



5. **REMOVE PISTON SEAL FROM BRAKE CYLINDER**

Using a screwdriver, remove the piston seal.



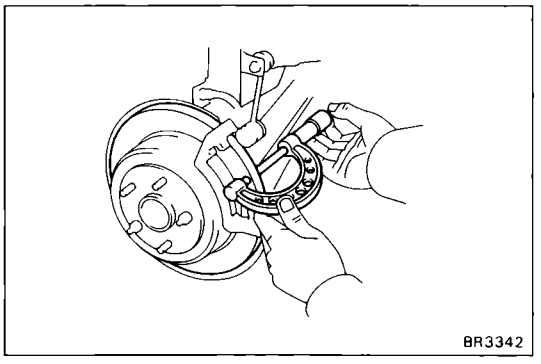
INSPECTION AND REPAIR OF REAR BRAKE COMPONENTS

1. MEASURE PAD LINING THICKNESS

Standard thickness: 10.0 mm (0.394 in.)

Minimum thickness: 1.0 mm (0.039 in.)

Replace the pad if the thickness is less than the minimum or if it shows sign of uneven wear.

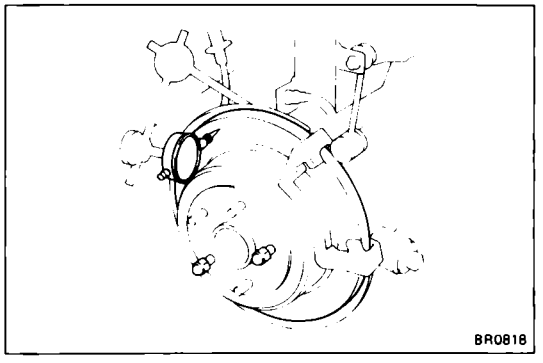


2. MEASURE ROTOR DISC THICKNESS

Standard thickness: 10.0 mm (0.394 in.)

Minimum thickness: 9.0 mm (0.354 in.)

If the disc is scored or worn, or if thickness is less than minimum, repair or replace the disc.



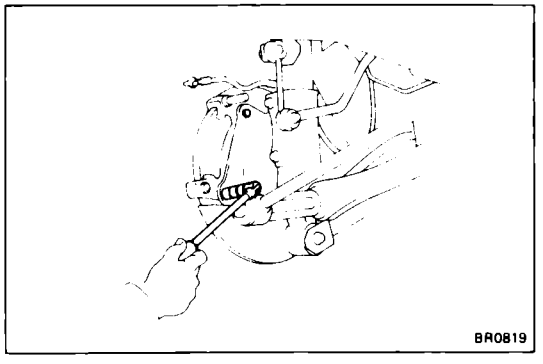
3. MEASURE ROTOR DISC RUNOUT

Measure the rotor disc runout at 10 mm (0.39 in.) from the outer edge of the rotor disc.

Maximum disc runout: 0.15 mm (0.0059 in.)

If the runout is greater than the maximum, replace the disc.

NOTE: Before measuring the runout, confirm that the hub bearing play is within specification.



4. IF NECESSARY, REPLACE ROTOR DISC

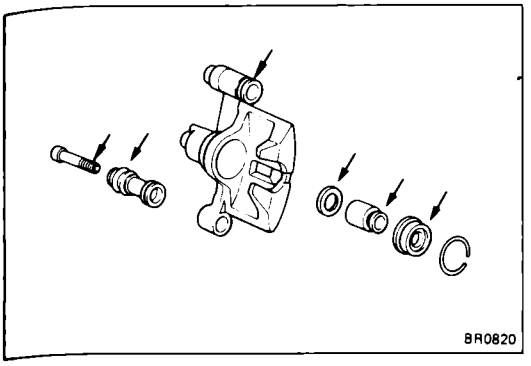
(a) Remove the torque plate.

(b) Remove the hub nuts of the temporarily installed disc and pull off the rotor disc.

(c) Install a new rotor disc and loosely install the hub nuts.

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

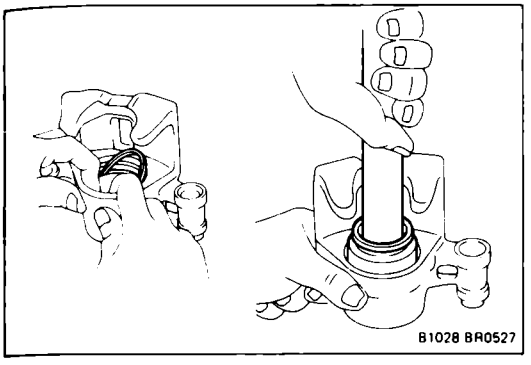
Torque: 475 kg-cm (34 ft-lb, 47 N·m)



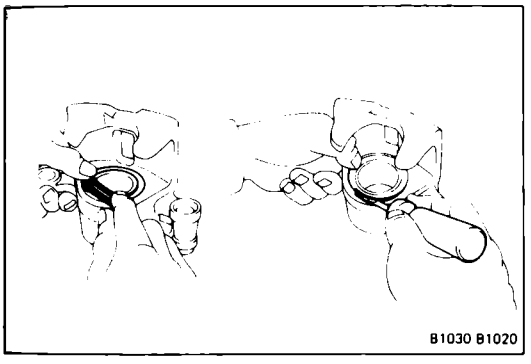
ASSEMBLY OF CYLINDER

(See page BR-42)

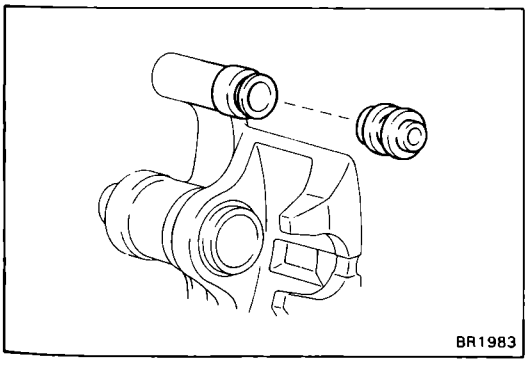
1. **APPLY LITHIUM SOAP BASE GLYCOL GREASE TO FOLLOWING PARTS**
   (a) Main pin boot
   (b) Sliding bushing and boot
   (c) Piston, piston seal and cylinder boot



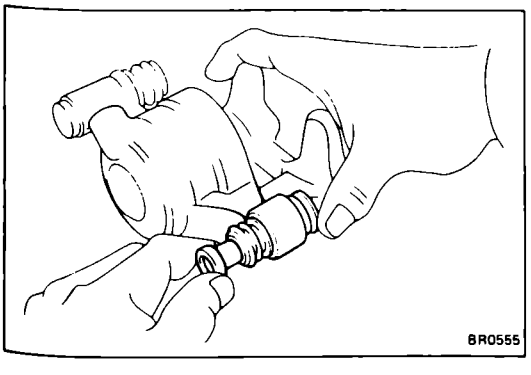
2. **INSTALL PISTON SEAL AND PISTON IN CYLINDER**



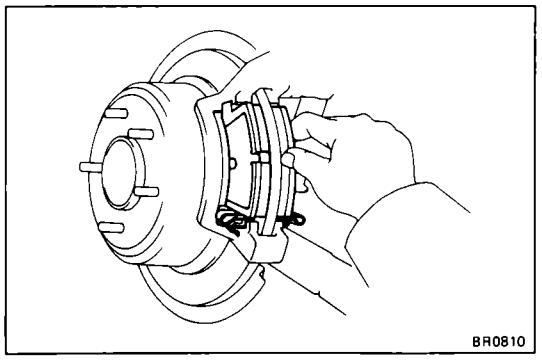
3. **INSTALL CYLINDER BOOT AND SET RING IN CYLINDER**



4. **INSTALL MAIN PIN BOOT**
   Install main pin boot in place.



5. **INSTALL SLIDING BUSHING AND DUST BOOT**
   (a) Install the sliding bushing and dust boot into the brake cylinder.
   (b) Insure that the boot is secured firmly to the brake cylinder groove.

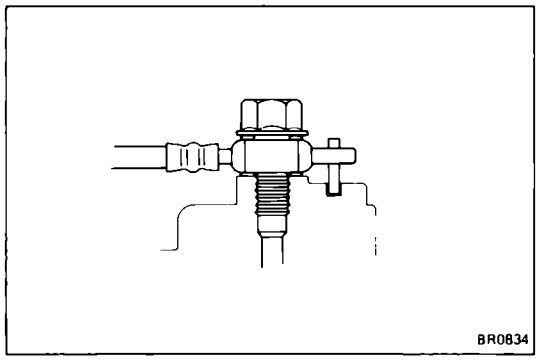


INSTALLATION OF CYLINDER

(See page BR-50)

1. INSTALL PADS
(See steps 7 to 8 on page BR-52)

2. INSTALL CYLINDER
(See step 9 on page BR-53)



3. INSTALL FLEXIBLE HOSE TO BRAKE CYLINDER
Torque: 310 kg-cm (22 ft-lb, 30 N·m)

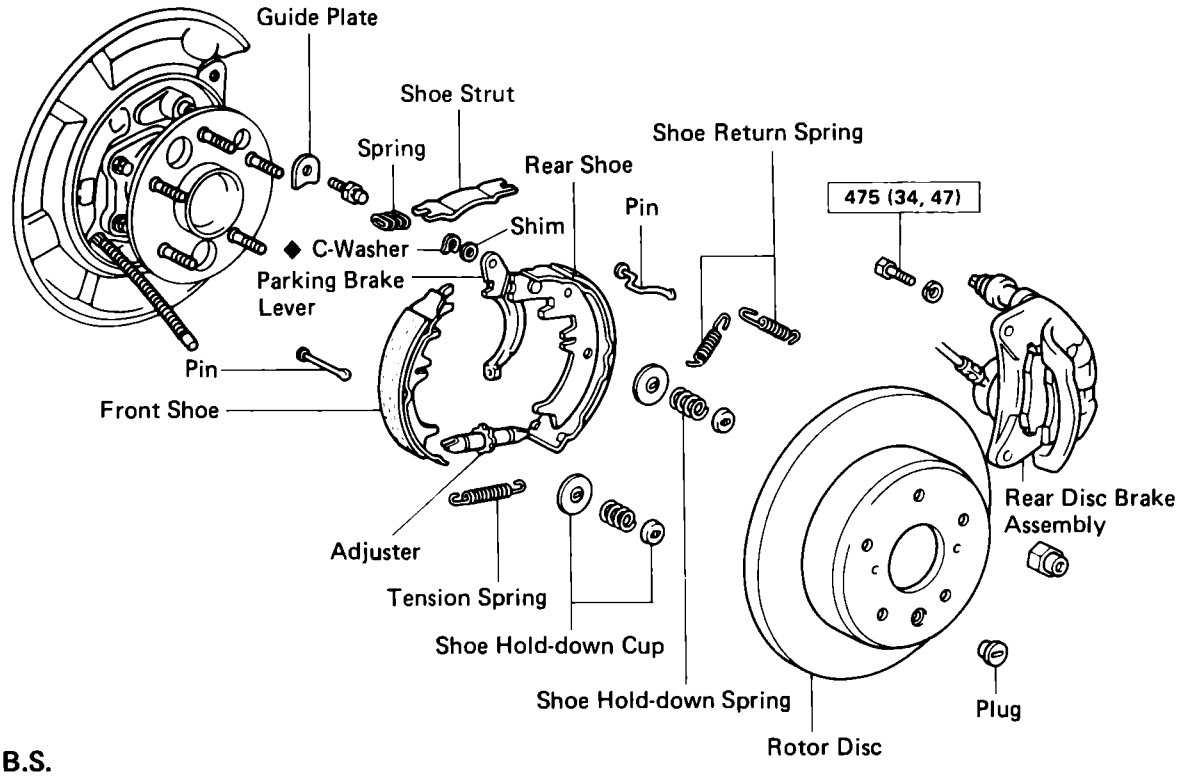
4. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM
(See page BR-7)

5. CHECK FOR LEAKS

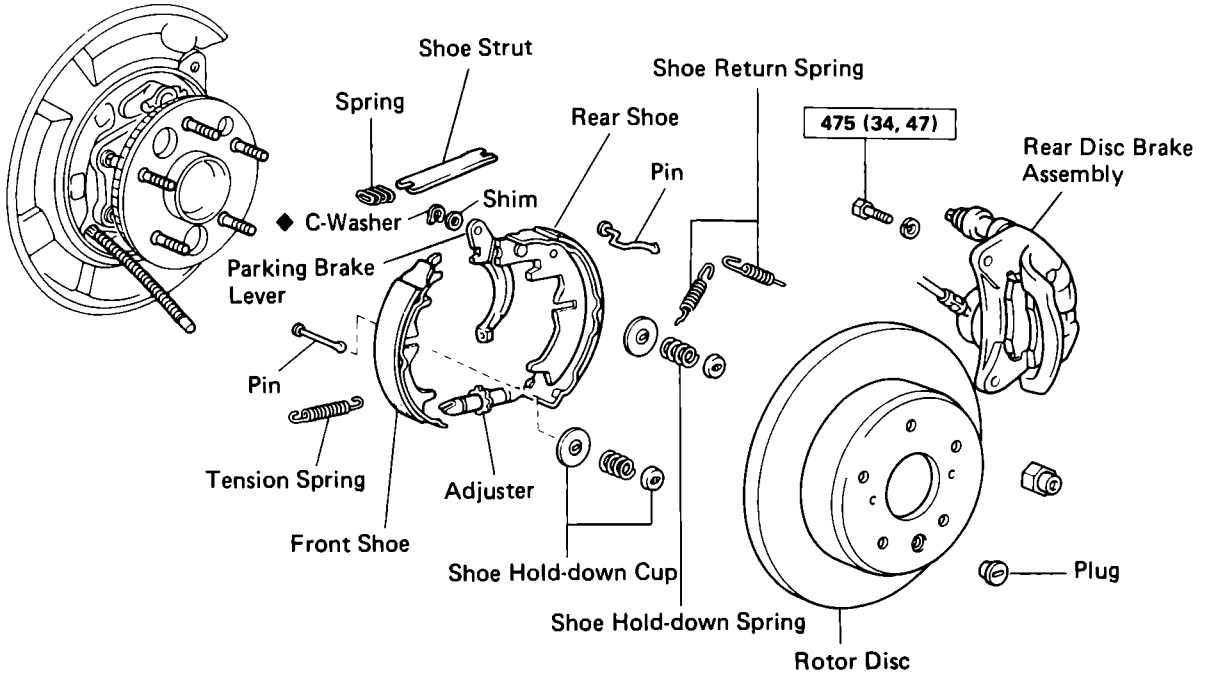
Parking Brake (For Rear Disc Brake)

COMPONENTS

w/o A.B.S. (FF) and 4WD



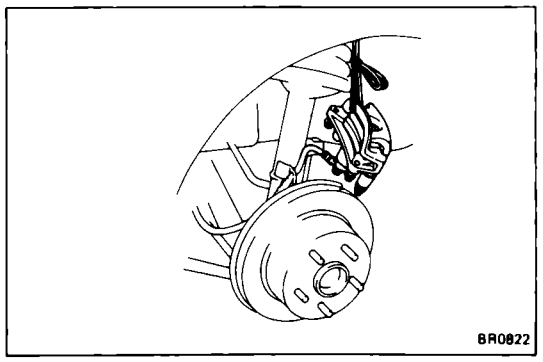
w/ A.B.S.



kg-cm (ft-lb, N·m) : Specified torque

◆ Non-reusable part

BR0821
BR1773

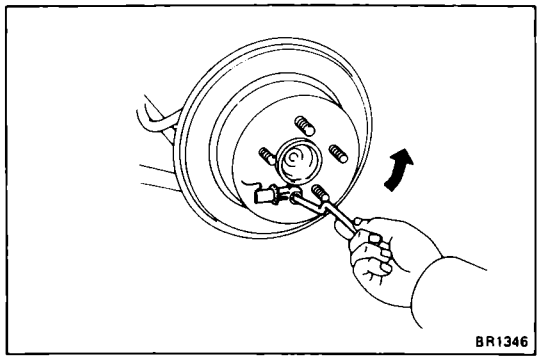


DISASSEMBLY OF PARKING BRAKE

1. REMOVE REAR DISC BRAKE ASSEMBLY

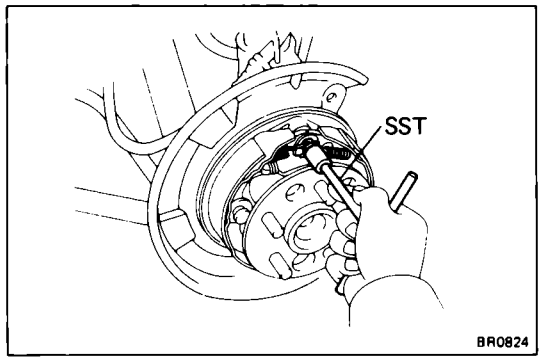
(a) Remove the two mounting bolts and remove the disc brake assembly.

(b) Suspend the disc brake so the hose is not stretched.



2. REMOVE ROTOR DISC

NOTE: If the rotor disc cannot be removed easily, return the shoe adjuster until the wheel turns freely.

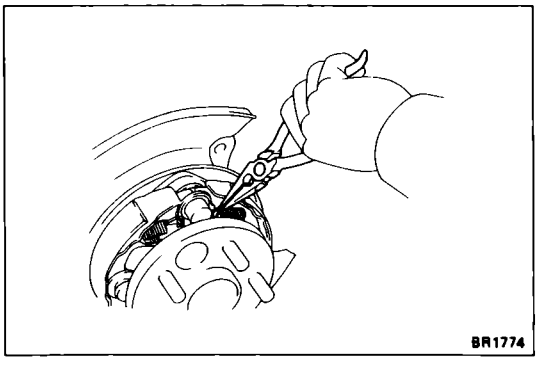


3. REMOVE SHOE RETURN SPRINGS

[w/o A.B.S. (FF) and 4WD]

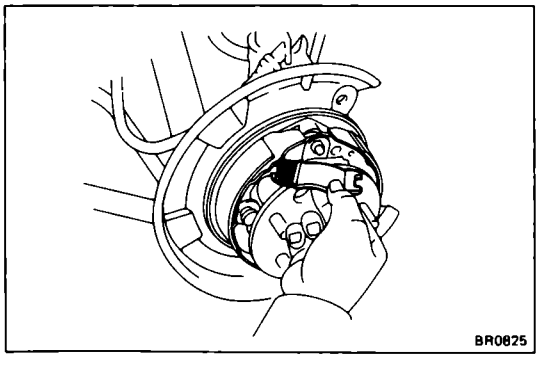
Using SST, remove the shoe return springs.

SST 09717-20010

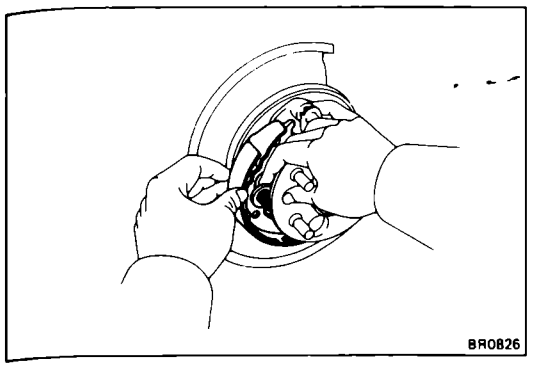


[w/ A.B.S.]

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



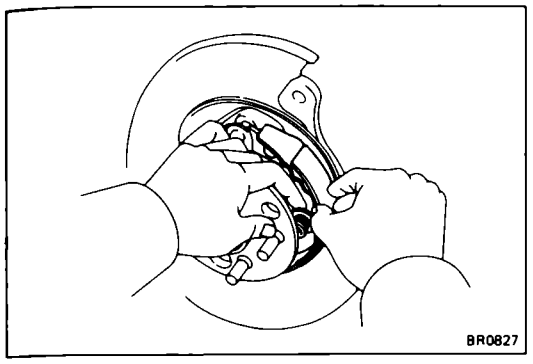
4. REMOVE SHOE STRUT WITH SPRING



5. **REMOVE FRONT SHOE, ADJUSTER AND TENSION SPRING**

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

(b) Disconnect the tension spring and remove the front shoe.



6. **REMOVE REAR SHOE**

(a) Slide out the rear shoe.

(b) Remove the tension spring from the rear shoe.

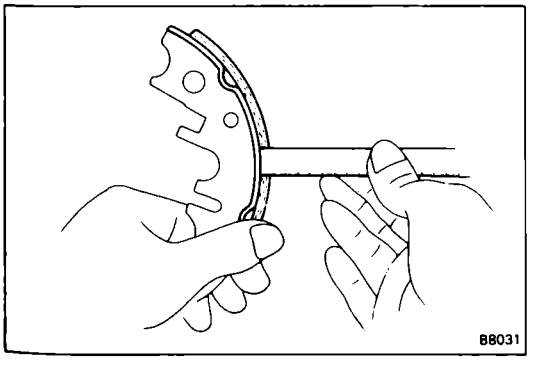
(c) Disconnect the parking brake cable from the parking brake lever.

(d) Remove the shoe hold-down spring cups, springs and pins.

INSPECTION AND REPAIR OF PARKING BRAKE COMPONENTS

1. **INSPECT DISASSEMBLED PARTS**

Inspect the disassembled parts for wear, rust or damage.

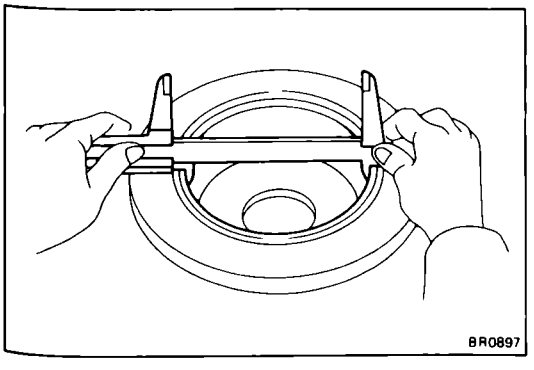


2. **MEASURE BRAKE SHOE LINING THICKNESS**

Standard thickness: 2.0 mm (0.079 in.)

Minimum thickness: 1.0 mm (0.039 in.)

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

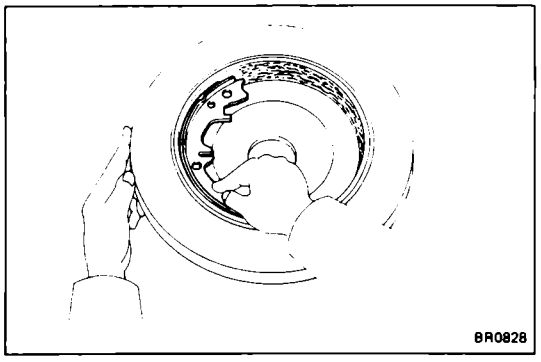


3. **MEASURE BRAKE DISC INSIDE DIAMETER**

Standard inside diameter: 170 mm (6.69 in.)

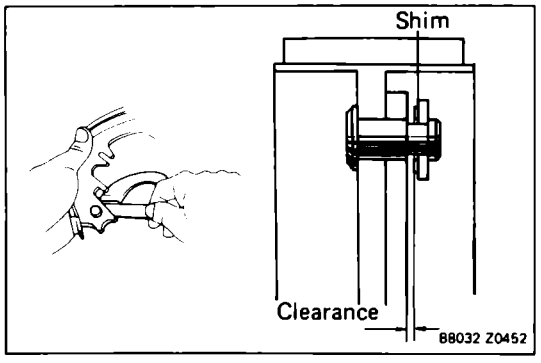
Maximum inside diameter: 171 mm (6.73 in.)

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



4. INSPECT PARKING BRAKE LINING AND DISC FOR PROPER CONTACT

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



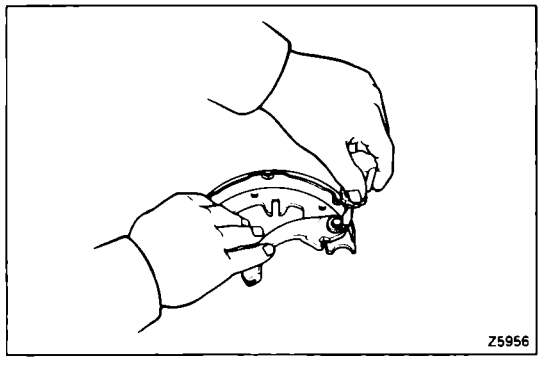
5. MEASURE CLEARANCE BETWEEN PARKING BRAKE SHOE AND LEVER

Using a feeler gauge, measure the clearance.

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

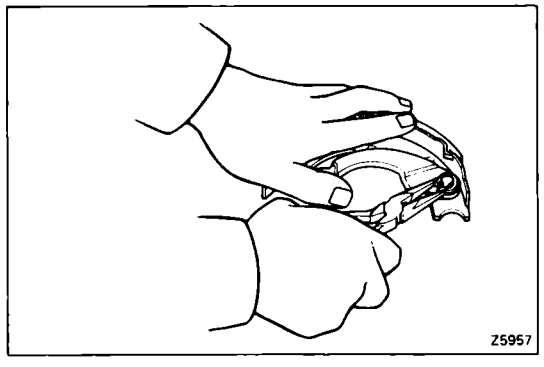
If the clearance is not within specification, replace the shim with one of the correct size.

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



6. IF NECESSARY, REPLACE SHIM

(a) Remove the parking brake lever, and install the correct size shim.



(b) Install the parking brake lever with a new C-washer.

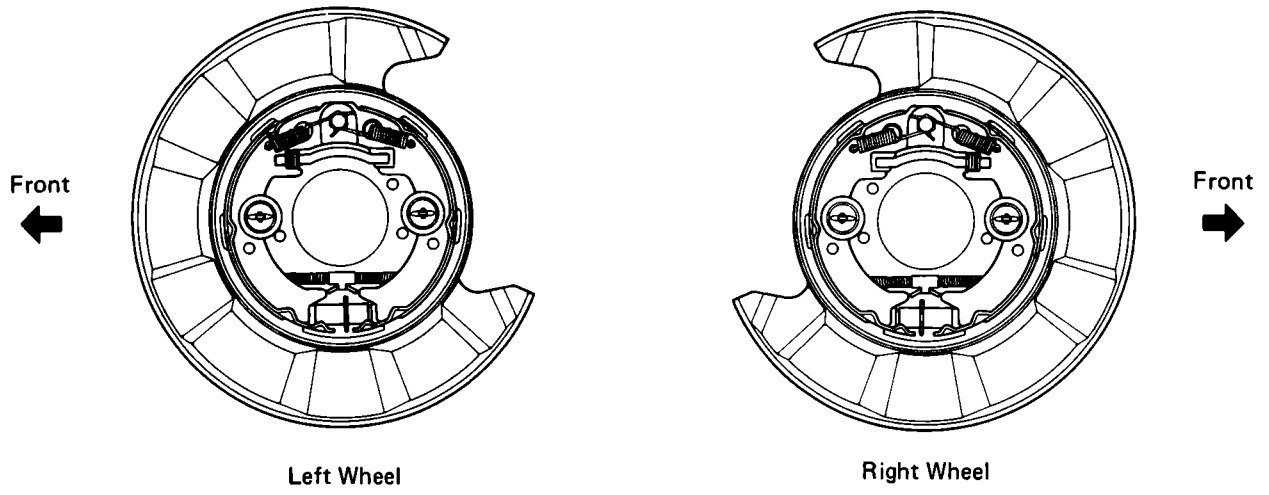
(c) Remeasure the clearance.

ASSEMBLY OF PARKING BRAKE

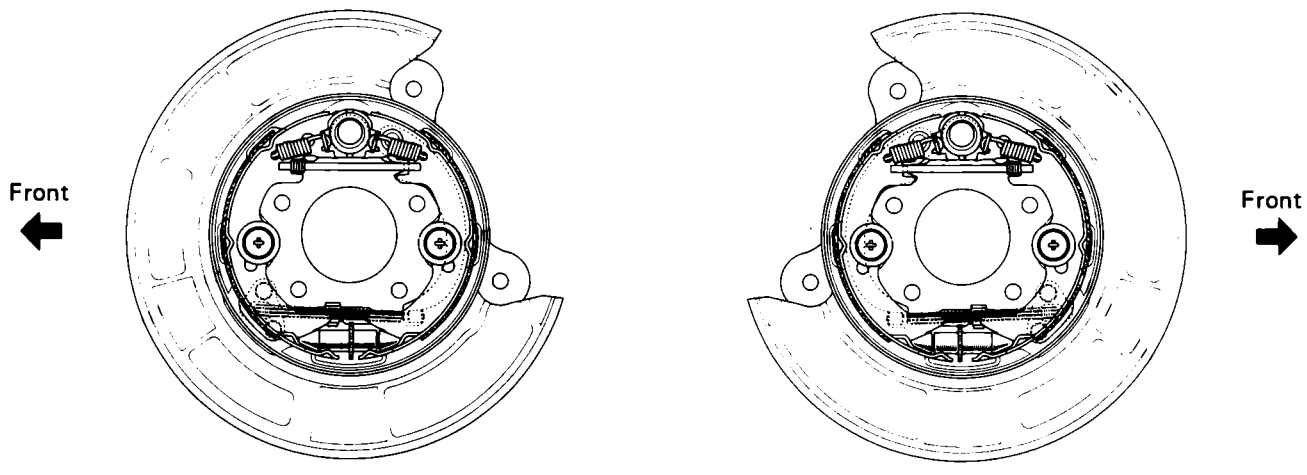
(See page BR-59)

NOTE: Assemble the parts in the correct direction as shown.

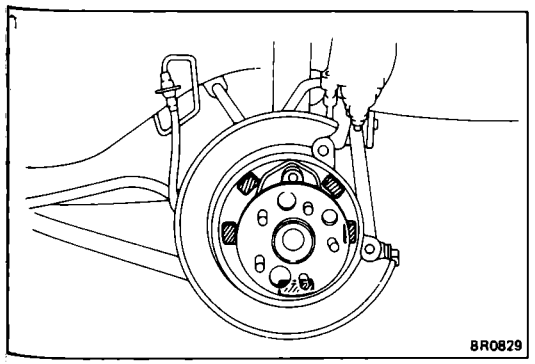
w/o A.B.S. (FF) and 4WD



w/ A.B.S.

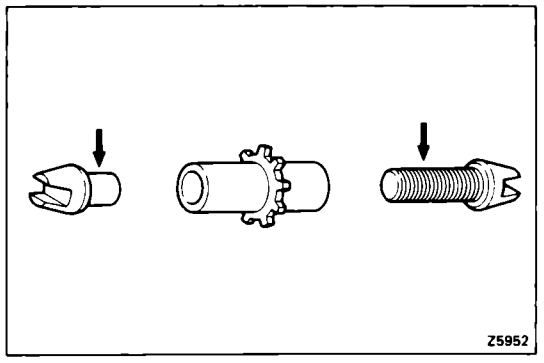


BR0898 BR0898-R
K0841-R K0841

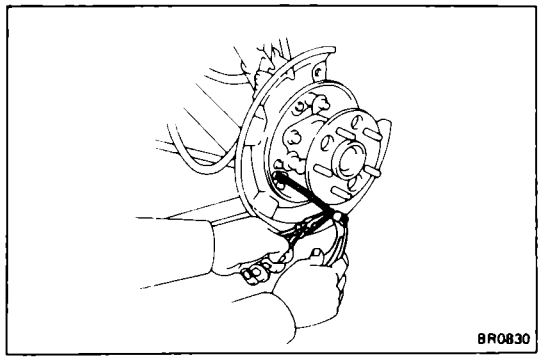


1. **APPLY HIGH TEMPERATURE GREASE ON BACKING PLATE AS SHOWN**

Apply high temperature grease to the sliding surfaces of the shoe.



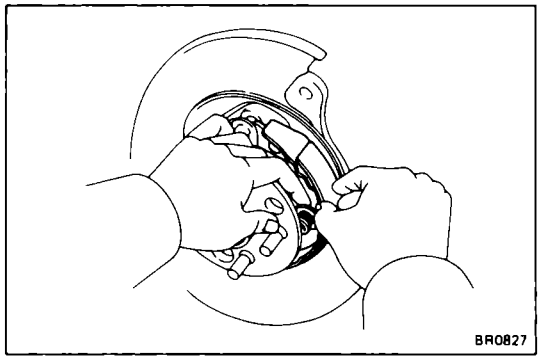
2. **APPLY HIGH TEMPERATURE GREASE TO ADJUSTER AS SHOWN**



3. **CONNECT PARKING BRAKE CABLE TO PARKING BRAKE LEVER**

(a) Install the shoe hold-down springs, cups and pins.

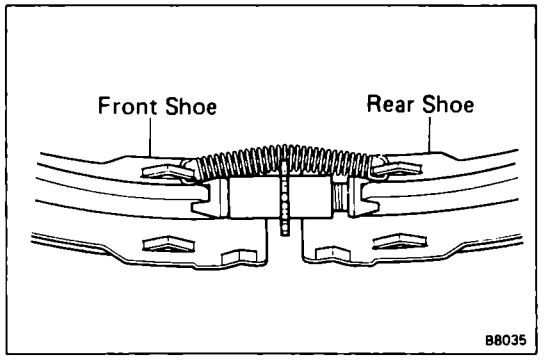
(b) Connect the parking brake cable to the parking brake lever of the rear shoe.



4. **INSTALL REAR SHOE**

Slide in the rear shoe between the shoe hold-down spring cup and the backing plate.

CAUTION: Do not allow oil or grease to get on the rubbing face.

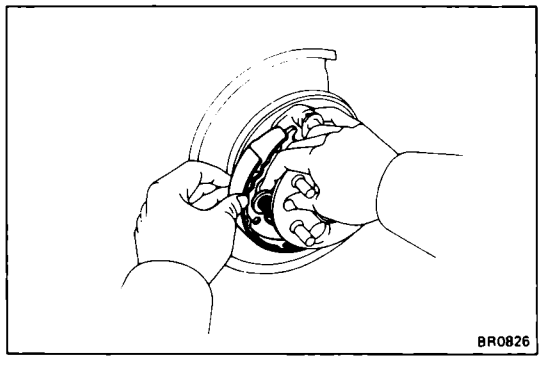


5. **INSTALL TENSION SPRING, FRONT SHOE AND ADJUSTER**

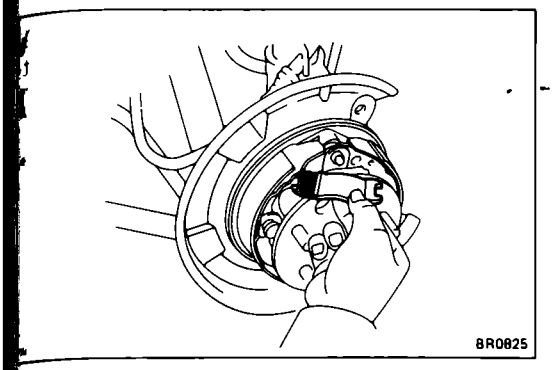
(a) Install the tension spring to the rear shoe.

(b) Install the front shoe to the tension spring.

(c) Install the adjuster between the front and rear shoes.

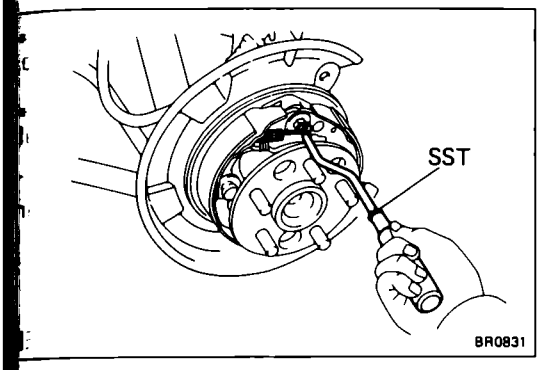


(d) Slide in the front shoe between the shoe hold-down spring cup and the backing plate.



6. INSTALL STRUT WITH SPRING

Install the strut with the spring forward.

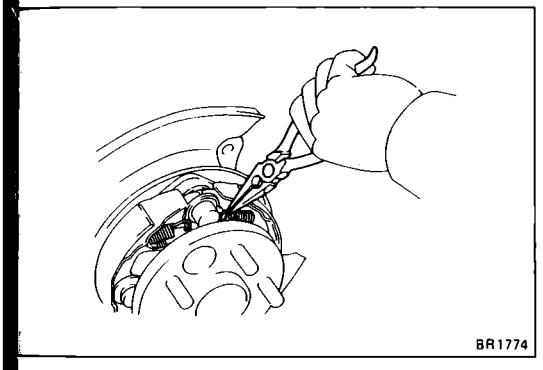


7. INSTALL SHOE RETURN SPRINGS

[w/o A.B.S. (FF) and 4WD]

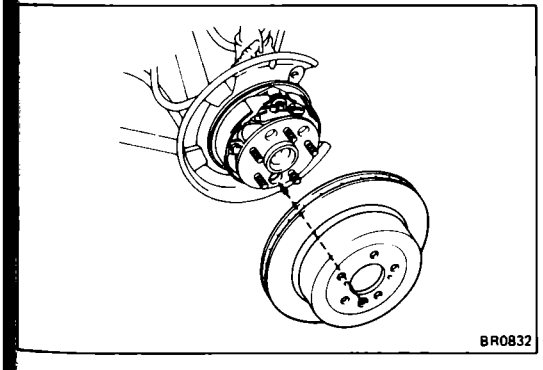
Using SST, install the front return spring and then install the rear return spring.

SST 09718-20010



[w/ A.B.S.]

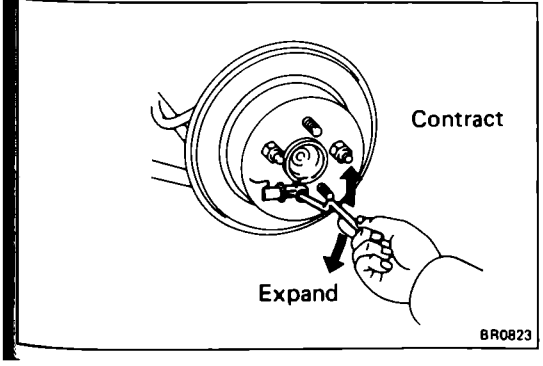
Using needle-nose pliers, install the shoe return springs.



8. INSTALL ROTOR DISC

(a) Before installing, polish the disc and shoe surfaces with sandpaper.

(b) Align the hole on the rear axle shaft flange and service hole on the disc.



9. ADJUST PARKING BRAKE SHOE CLEARANCE

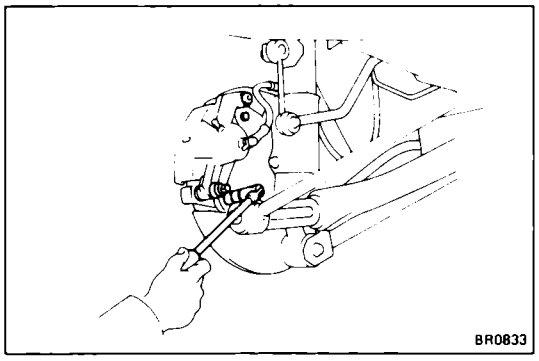
(a) Temporarily install the hub nuts.

(b) Remove the hole plug.

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

(d) Return the adjuster eight notches.

(e) Install the hole plug.



10. INSTALL REAR DISC BRAKE ASSEMBLY

Install the disc brake assembly and torque the two mounting bolts.

Torque: 475 kg-cm (34 ft-lb, 47 N·m)

11. INSTALL REAR WHEEL

12. BEDDING DOWN PARKING BRAKE SHOES AND DISC

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

(b) With the parking brake release button pushed in, pull on the lever with 9 kg (19.8 lb, 88 N) of force.

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

(d) Repeat this procedure two or three times.

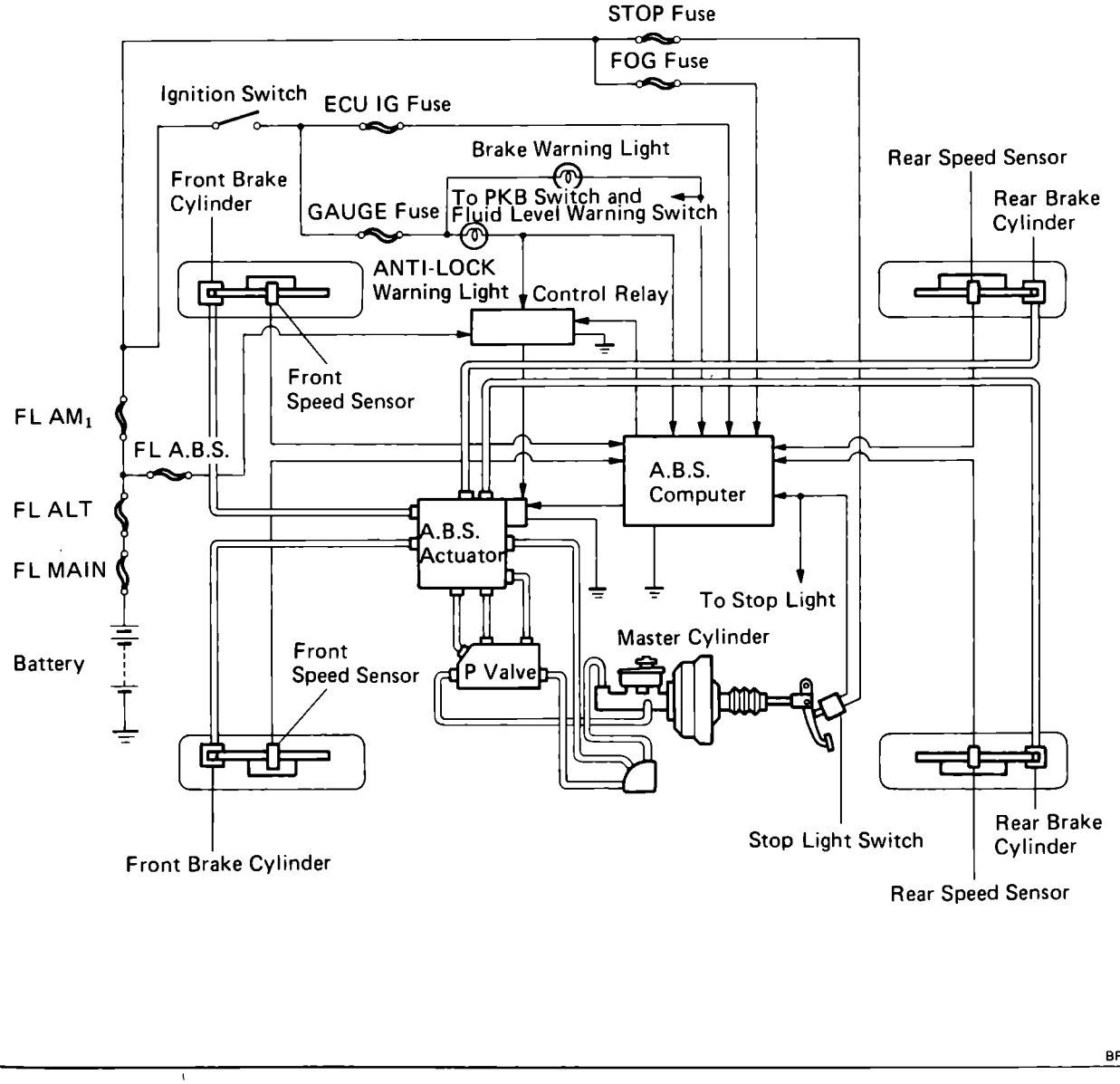
13. RECHECK AND ADJUST PARKING BRAKE LEVER TRAVEL
(See page BR-8)

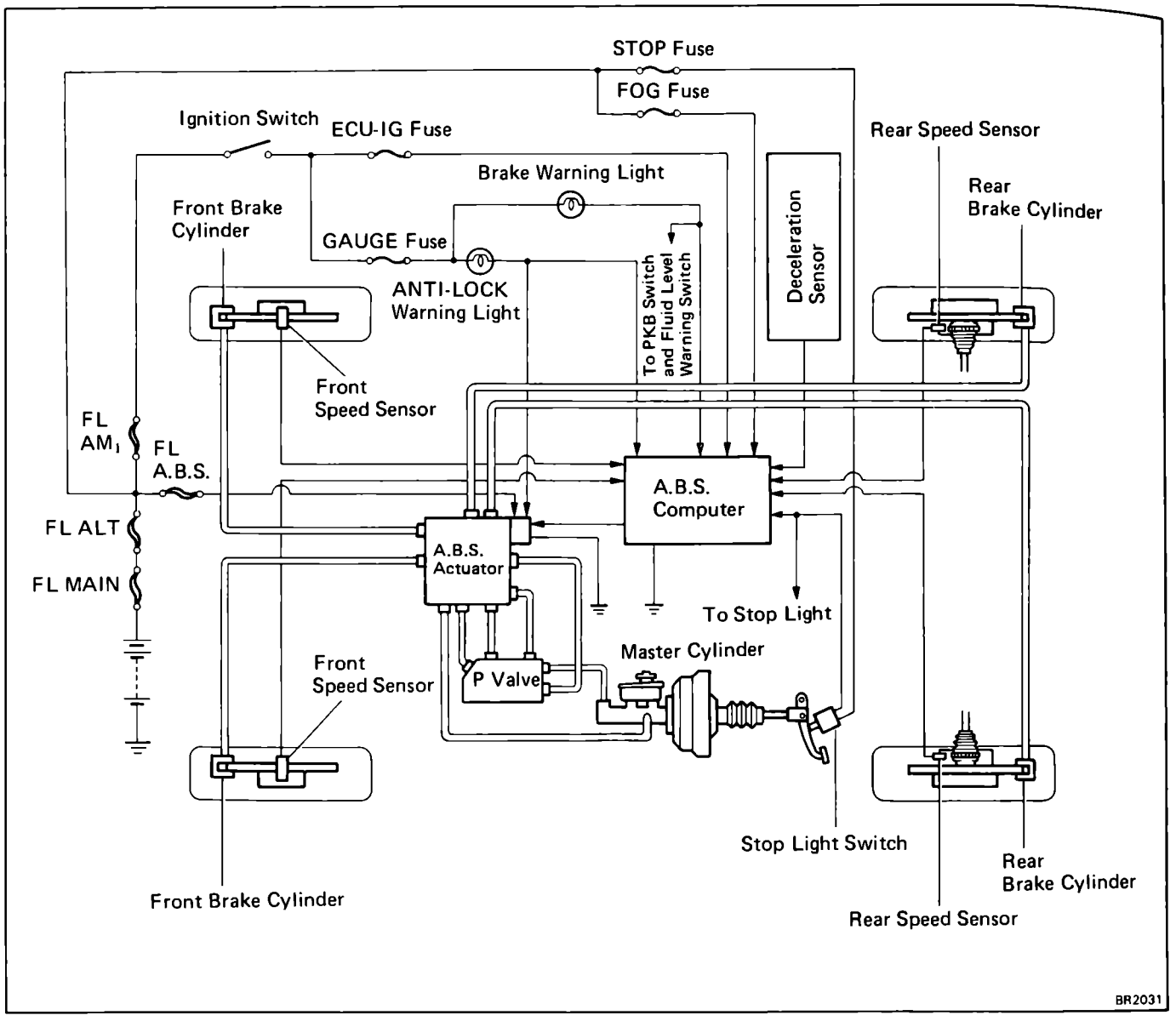
ANTI-LOCK BRAKE SYSTEM (A.B.S.)

Description

- The A.B.S. is a brake system which controls the wheel cylinder hydraulic pressure of all four wheels during sudden braking and braking on slippery road surfaces, preventing the wheels from locking. This A.B.S. provides the following benefits:
  (1) Enables steering round an obstacle with a greater degree of certainty even when panic braking.
  (2) Enables stopping in a panic brake without affecting stability and steerability, even on curves.
- The function of the A.B.S. is to improve directional stability and vehicle steerability on most road conditions. However, the system cannot prevent the vehicle from skidding if the cornering speed limit is exceeded.
- The A.B.S. has a longitudinal deceleration sensor to match braking characteristics to the full-time four-wheel drive. (For 4WD)
- In case a malfunction occurs, a diagnosis function and fail-safe system have been adopted for the A.B.S. to increase serviceability.

2WD



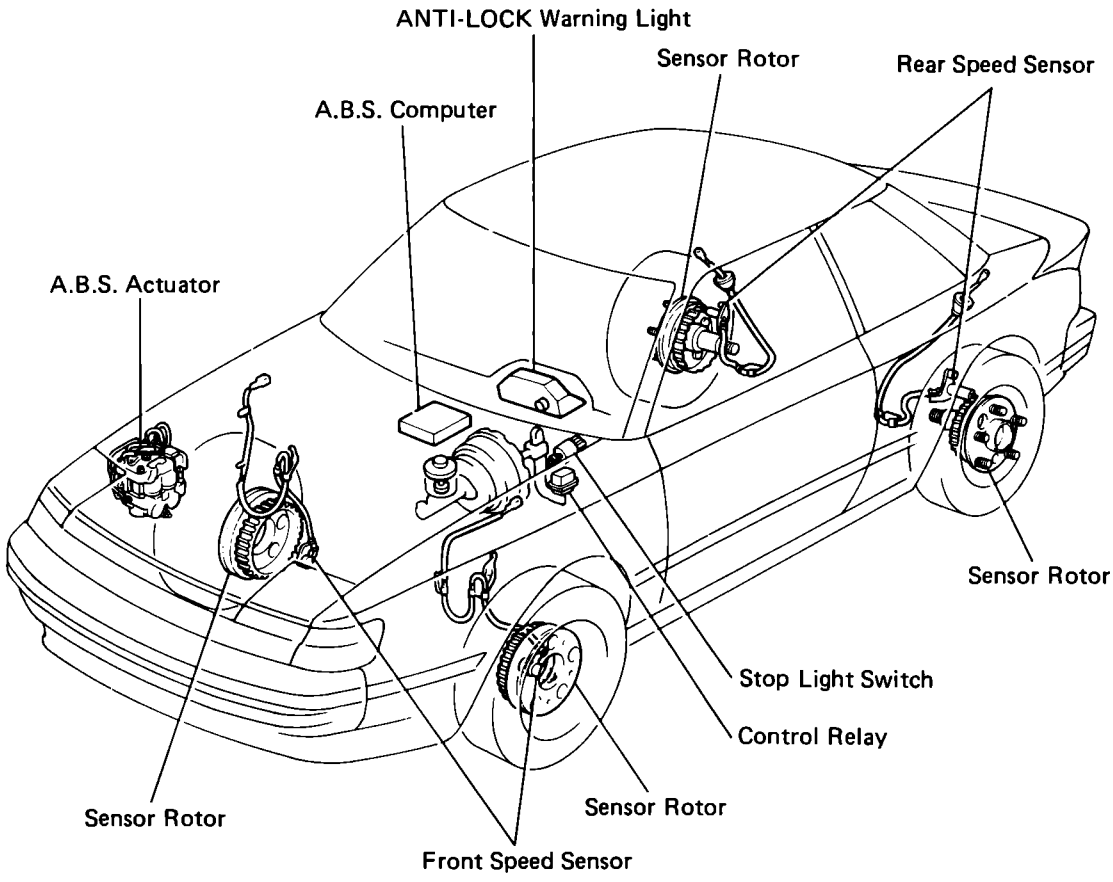


FUNCTION OF COMPONENTS

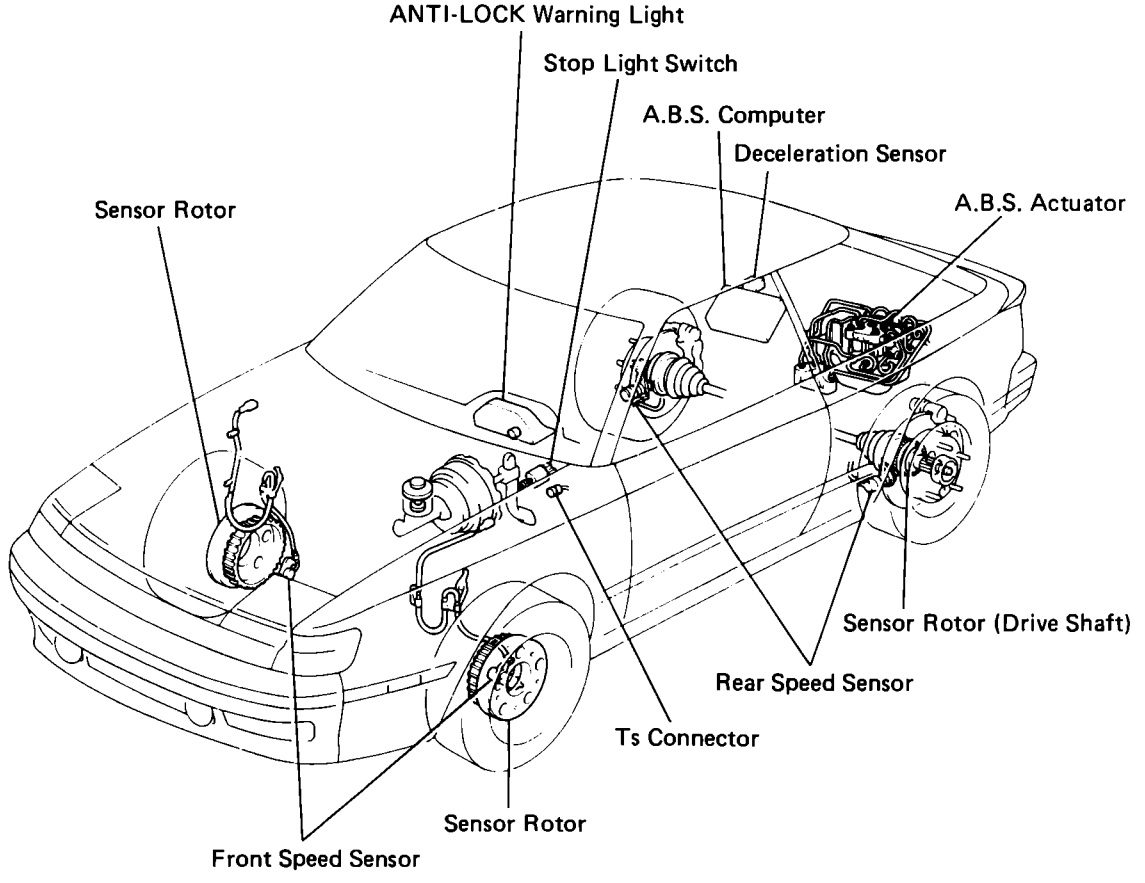
Component	Function
Front Speed Sensor	Detects the wheel speed of each of the left and right front wheels.
Rear Speed Sensor	Detects the wheel speed of each of the left and right rear wheels.
Deceleration Sensor (For 4WD)	Detects the deceleration speed of the vehicle and sends a signal accordingly to the A.B.S. computer.
Stop Light Switch	Detects the brake signal and sends it to the computer.
ANTI-LOCK Warning Light	Lights up to alert the driver when trouble has occured in the Anti-lock Brake System.
A.B.S. Actuator	Controls the brake fluid pressure to each disc brake cylinder through signals from the computer.
Anti-lock Brake System Computer	From the wheel speed signals from each sensor, it calculates acceleration, deceleration and slip values and sends signals to the actuator to control brake fluid pressure.

LOCATION OF SYSTEM PARTS

2WD

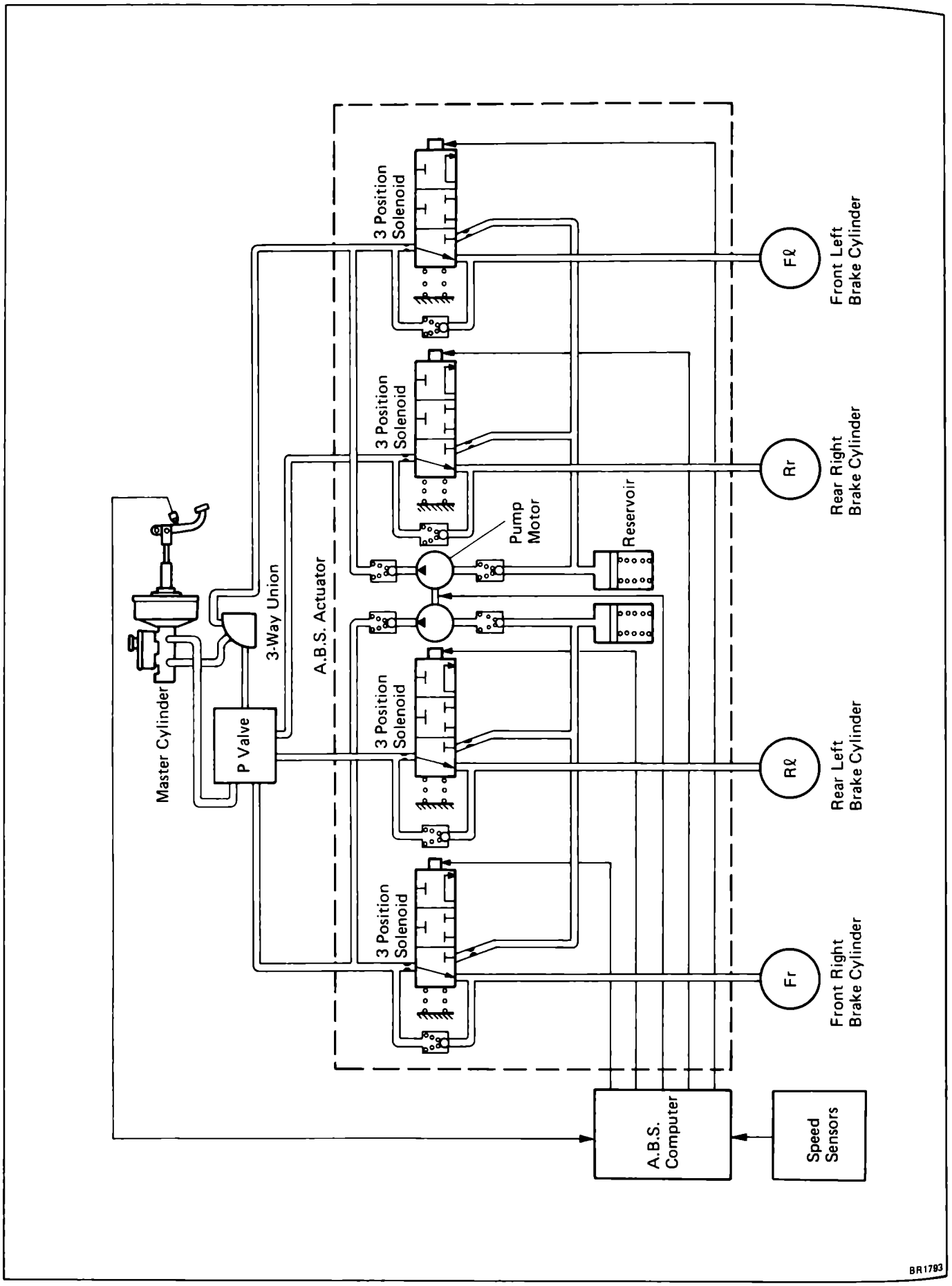


4WD

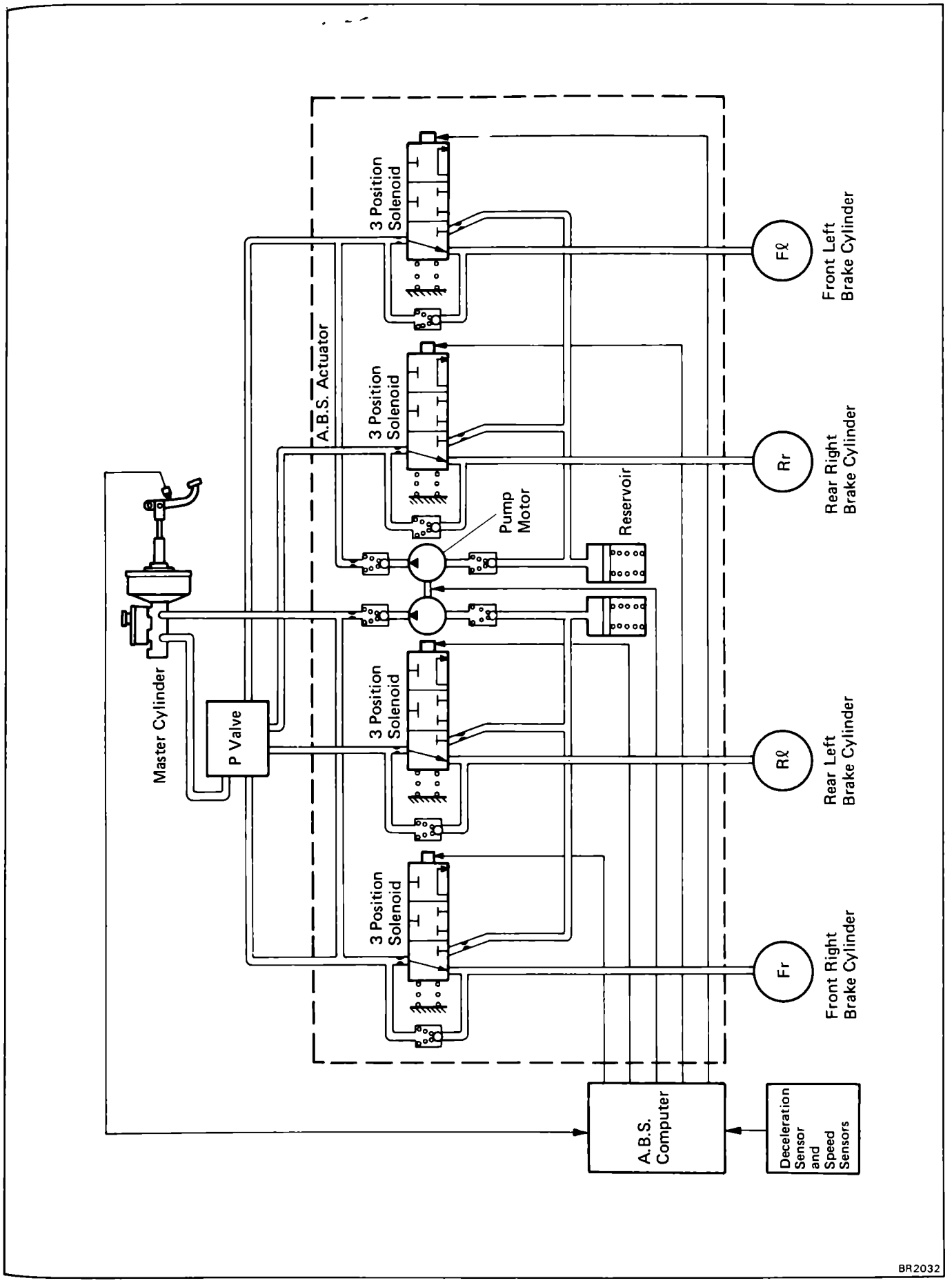


BR3235
BR3236

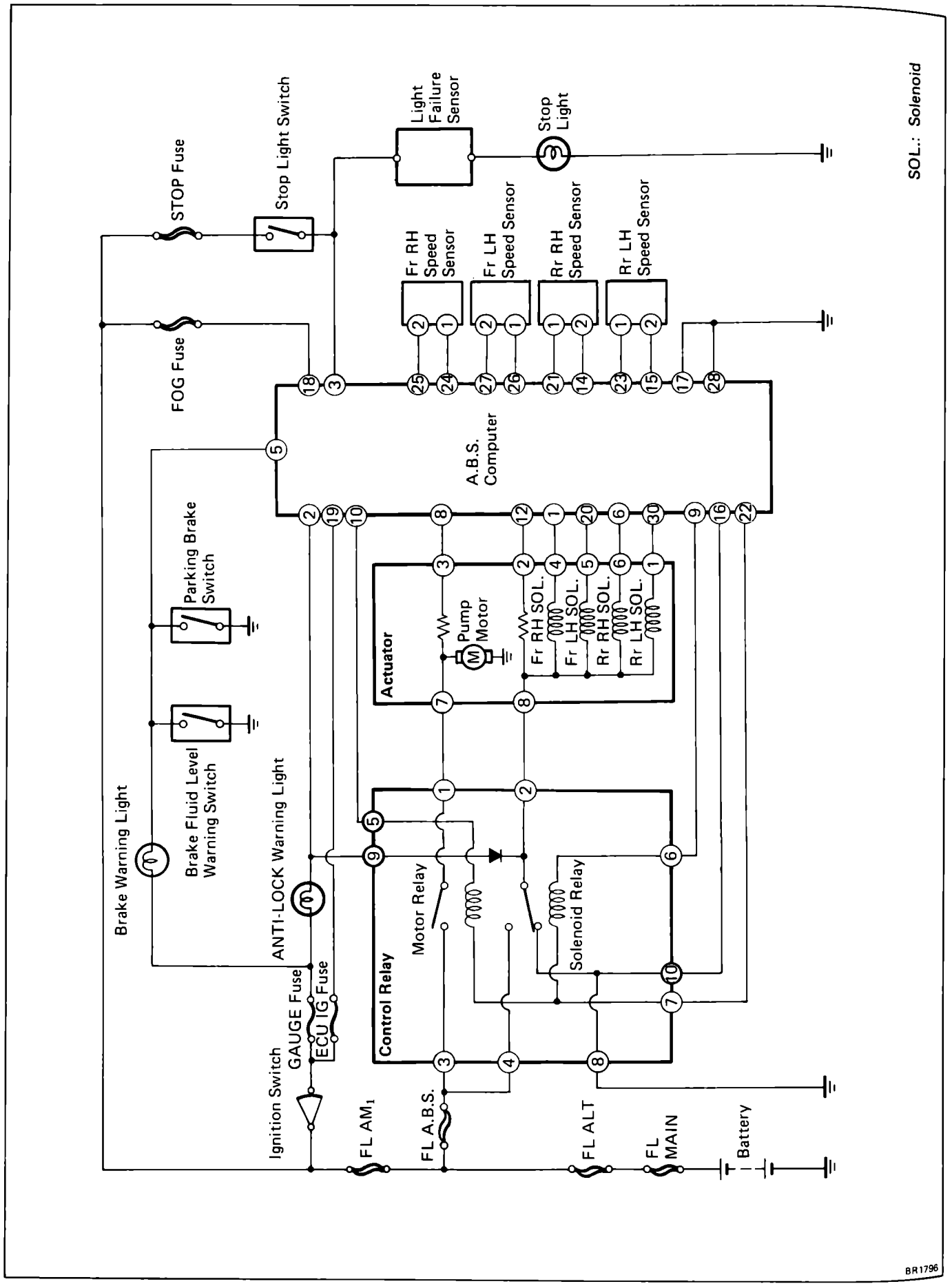
SYSTEM DIAGRAM (2WD)



SYSTEM DIAGRAM (4WD)



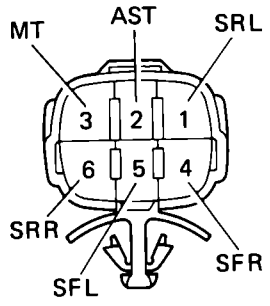
WIRING DIAGRAM (2WD)



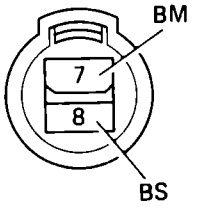
CONNECTORS (2WD)

Brake Actuator

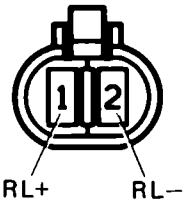
CONNECTOR A



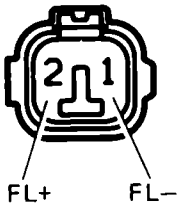
CONNECTOR B



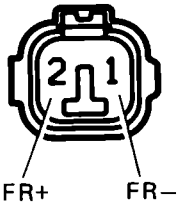
Rear Speed Sensor (LH)



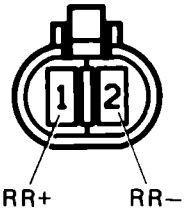
Front Speed Sensor (LH)



Front Speed Sensor (RH)

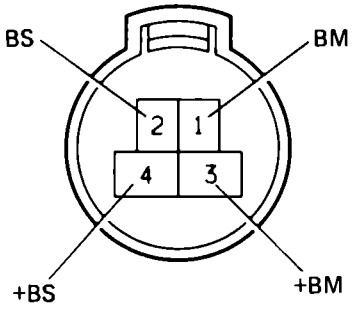


Rear Speed Sensor (RH)

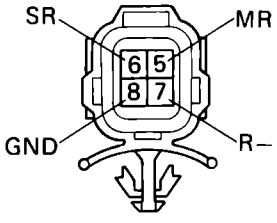


Control Relay

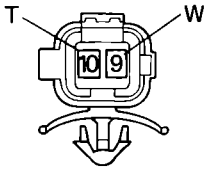
CONNECTOR A



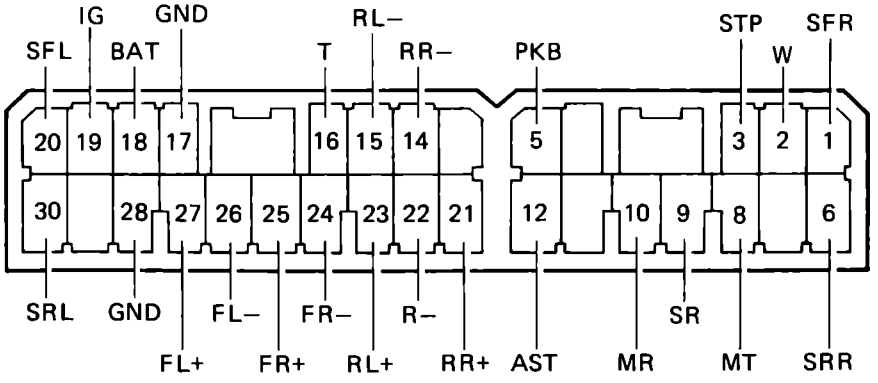
CONNECTOR B



CONNECTOR C
(Check Connector)

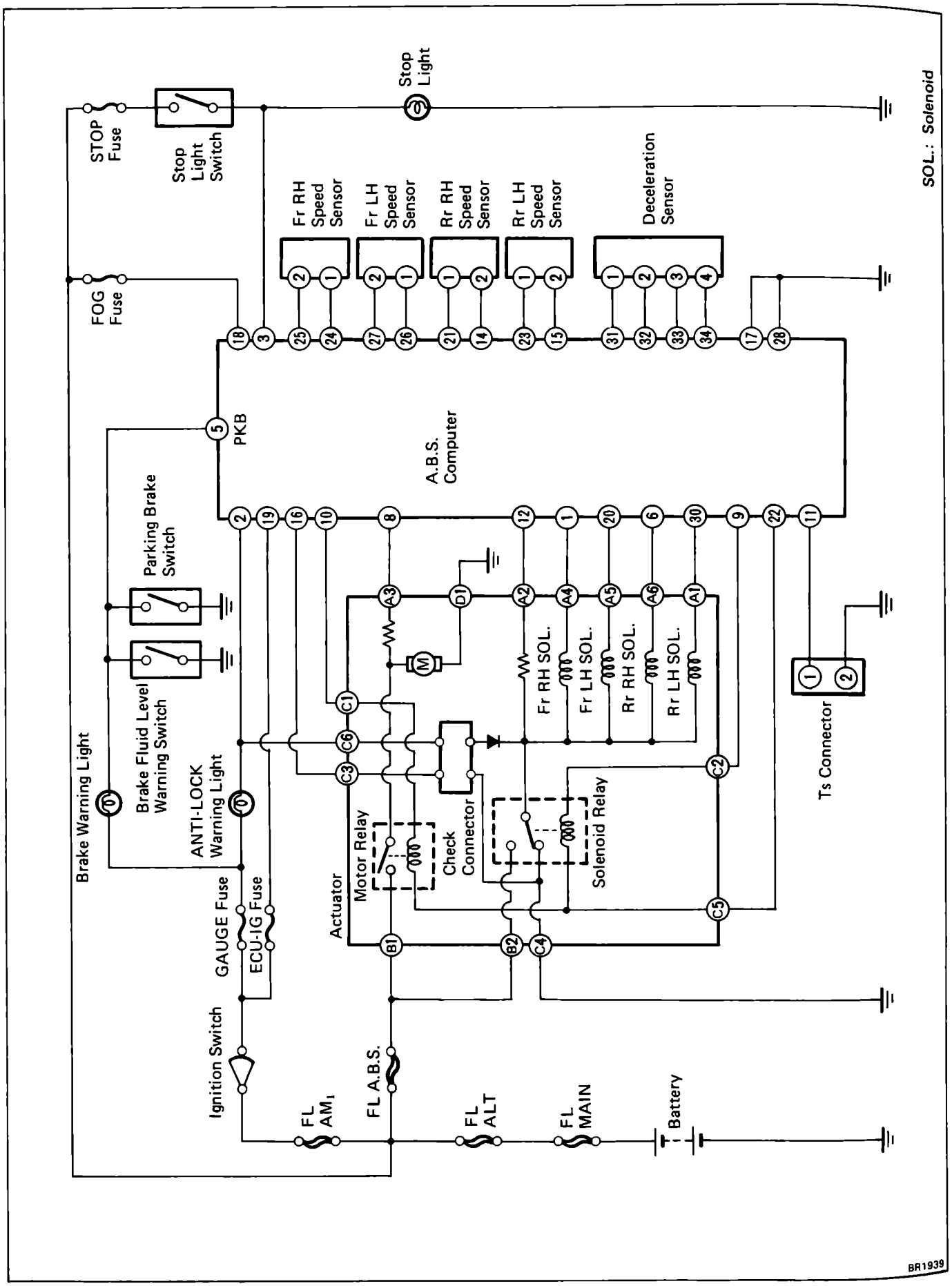


Anti-lock Brake System Computer



E2402 ID-2-2 IS-2-1-B
IS-2-2-0 IS-2-2-0 IS-2-1-B
IC-4-2 BR1797 BR1798
E2403

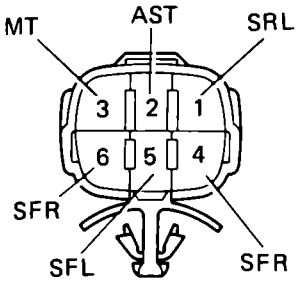
WIRING DIAGRAM (4WD)



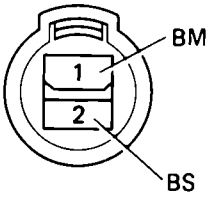
CONNECTORS (4WD)

Brake Actuator

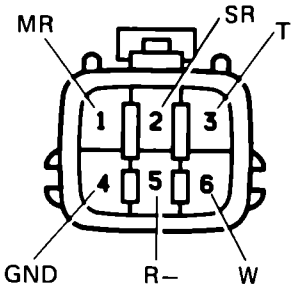
CONNECTOR A



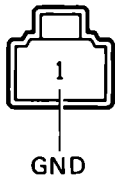
CONNECTOR B



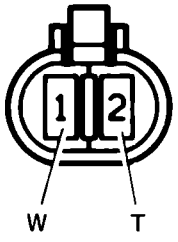
CONNECTOR C



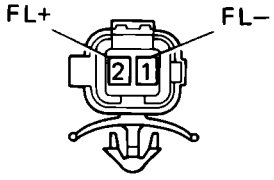
CONNECTOR D



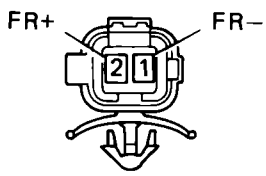
Check Connector



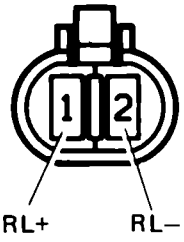
Front Speed Sensor (LH)



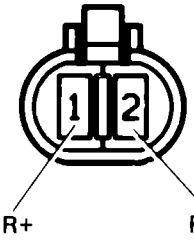
Front Speed Sensor (RH)



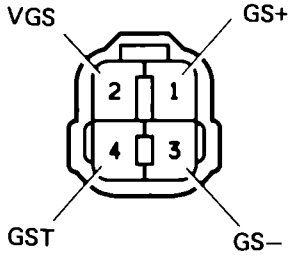
Rear Speed Sensor (LH)



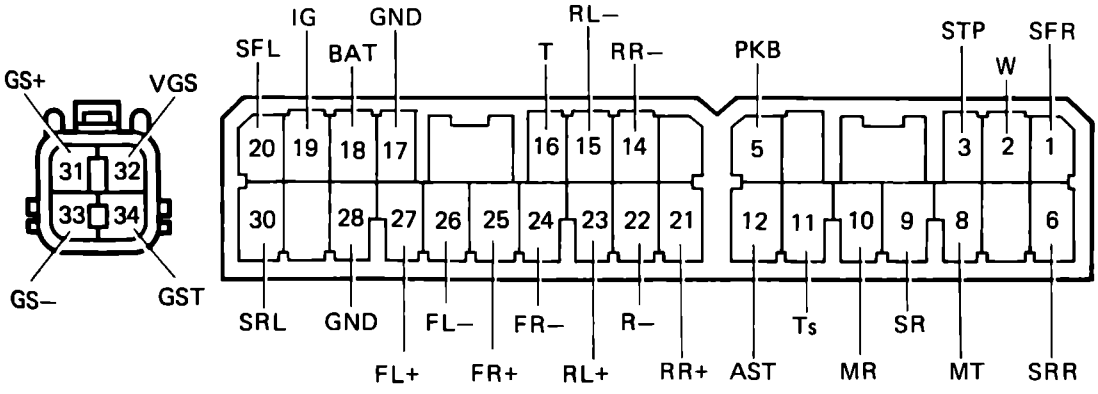
Rear Speed Sensor (RH)



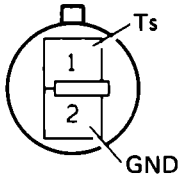
Deceleration Sensor



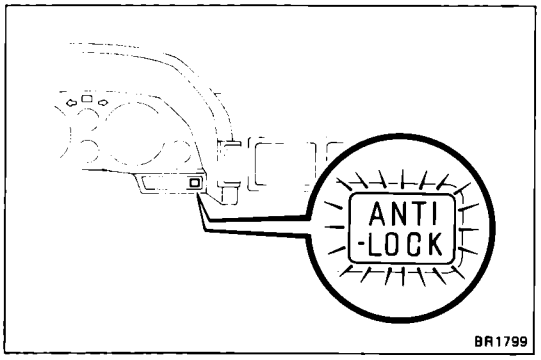
Anti-lock Brake System Computer

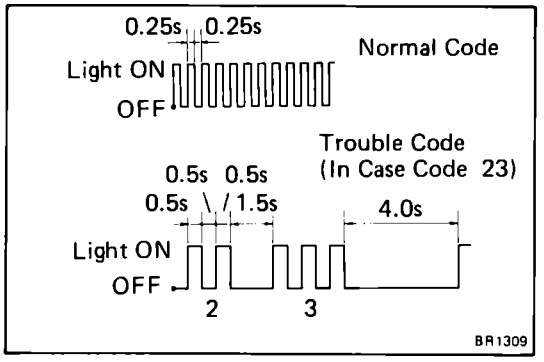


Ts Connector



E2402 ID-2-2 IS-6-1-B Q-1-2
IS-2-1-B BR1798 BR1798
IS-2-1-B IS-2-1-B IS-4-2-B
IS-4-1-B E2403 IC-2-1





Diagnosis System

DESCRIPTION

If a functional malfunction occurs, diagnosis system will identify the problem and computer stores the codes for the trouble items.

At the same time, the system informs the driver of a malfunction via the "ANTI-LOCK" warning light in the combination meter.

By turning on the ignition switch and disconnecting the check connector, the trouble can be identified by the number of blinks (diagnostic code) of the warning light.

In event of two codes, that having the smallest number (code) will be identified first.

NOTE: The warning light do not show the diagnostic codes while the vehicle is running.

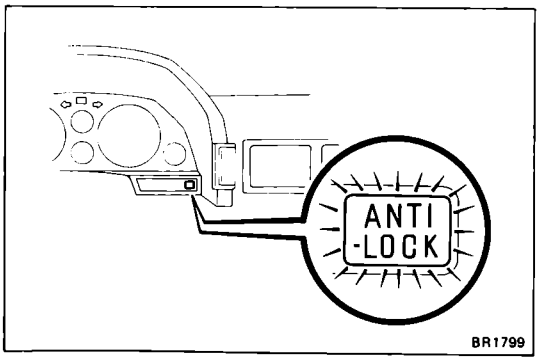
INITIAL CHECK

CHECK ACTUATOR OPERATION NOISE

(a) Start the engine and drive at a speed over 6 km/h (4 mph).

(b) Check that the actuator operation noise is heard.

NOTE: A initial check is carried out once each time after the engine has been started and initial speed exceeds 6 km/h (4 mph). The respective functions, in order, of the 3 position solenoid and pump motor in the actuator are checked. However, if the brake pedal is depressed, the initial check is not carried out, but is started after the pedal has been released.



INSPECTION OF DIAGNOSIS SYSTEM

1. INSPECT BATTERY VOLTAGE

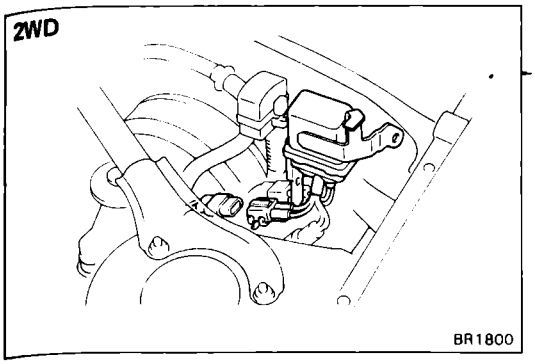
Inspect that the battery voltage is about 12 V.

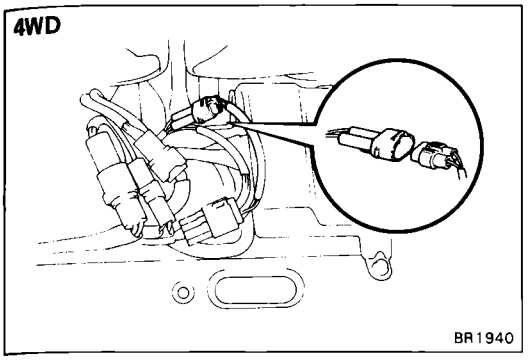
2. CHECK THAT WARNING LIGHT TURNS ON

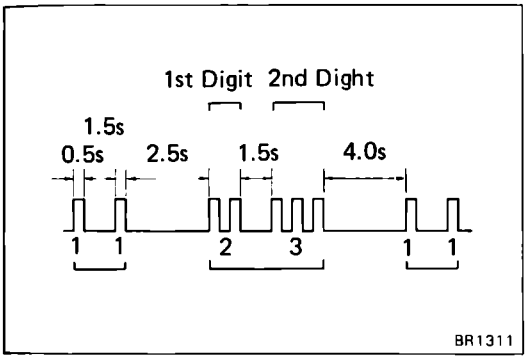
(a) Turn the ignition switch on.

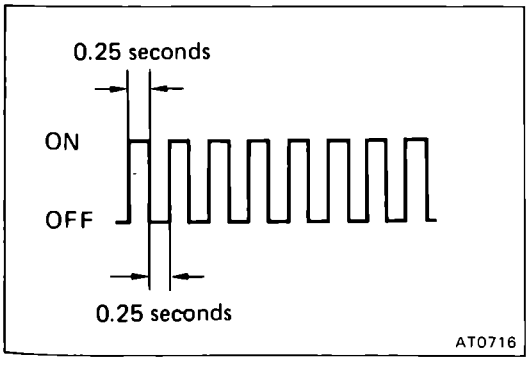
(b) Check that the "ANTI-LOCK" warning light turns on for 3 seconds.

If not, inspect and repair or replace the fuse, bulb and wire harness.









3. READ DIAGNOSTIC CODE

(a) Turn the ignition switch on.

(b) Remove the bolt, and pull out the control relay. (For 2WD)

(c) Disconnect the check connector.

(d) In event of a malfunction, 4 seconds later the warning light will begin to blink. Read the number of blinks. (See DIAGNOSTIC CODE on pages BR-79 or 80)

NOTE: The first number of blinks will equal the first digit of a two digit diagnostic code. After a 1.5 second pause, the 2nd number of blinks will equal the 2nd number of a two digit code. If there are two or more codes, there will be a 2.5 second pause between each, and indication will begin after 4.0 second pause from the smaller value and continue in order to larger.

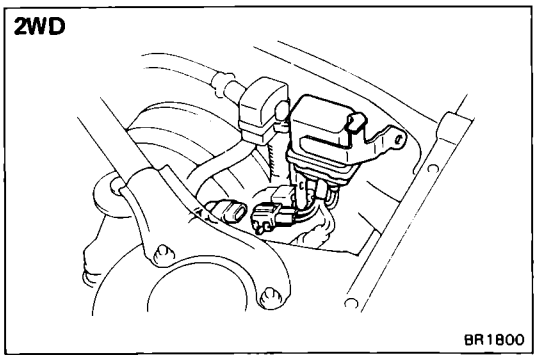
(e) If the system is operating normally (no malfunction), the warning light will blink 2 times per second.

(f) Repair the system.

(g) After the malfunctioning components has been repaired, clear the diagnostic codes stored in the computer. (See page BR-81)

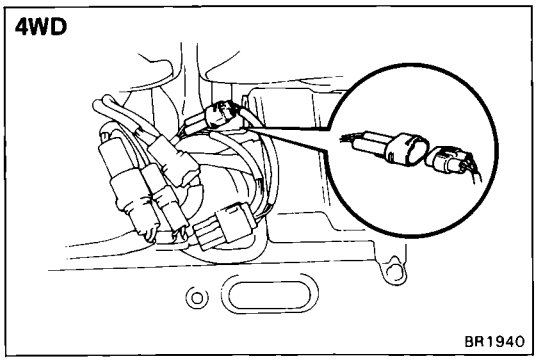
NOTE: If you disconnect the battery cable while repairing, all diagnostic codes in the computer will erased.

2WD



BR1800

4WD

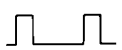
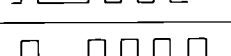
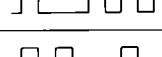
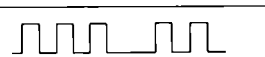
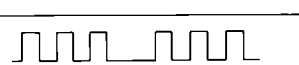
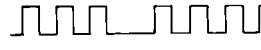


BR1940

(h) Connect the check connecter.

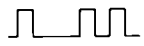
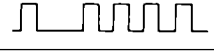
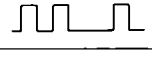
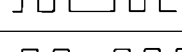
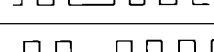
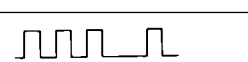
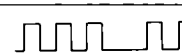
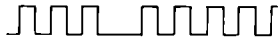
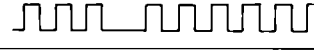
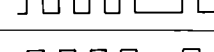
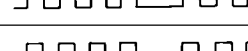
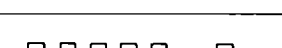
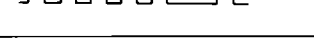
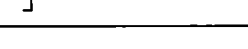
(i) Turn the ignition switch on, and check that the "ANTI-LOCK" warning light goes off after the warning light goes on for 3 seconds.

(j) Install the control relay with the bolt. (For 2WD)

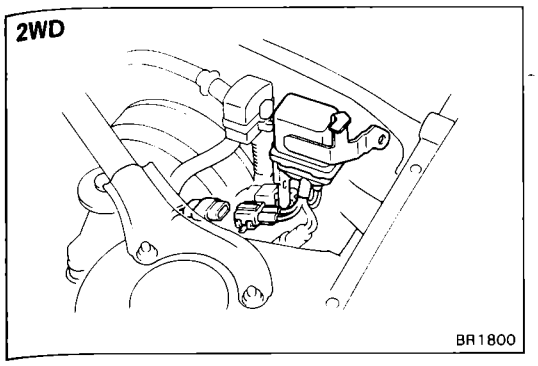
Code No.	Light Pattern	Diagnosis	Trouble Part
11		Open circuit in solenoid relay circuit	• Actuator inside wire harness • Control relay • Wire harness and connector of solenoid relay circuit
12		Short circuit in solenoid relay circuit	
13		Open circuit in pump motor relay circuit	• Actuator inside wire harness • Control relay • Wire harness and connector of pump motor relay circuit
14		Short circuit in pump motor relay circuit	
21		Open or short circuit in 3 position solenoid of front right wheel	• Actuator solenoid • Wire harness and connector of actuator solenoid circuit
22		Open or short circuit in 3 position solenoid of front left wheel	
23		Open or short circuit in 3 position solenoid of rear right wheel	
24		Open or short circuit in 3 position solenoid of rear left wheel	
31		Front right wheel speed sensor signal malfunction	• Speed sensor • Sensor rotor • Wire harness and connector of speed sensor
32		Front left wheel speed sensor signal malfunction	
33		Rear right wheel speed sensor signal malfunction	
34		Rear left wheel speed sensor signal malfunction	
35		Open circuit in front left or rear right wheel speed sensor	
36		Open circuit in front right or rear left wheel speed sensor	
37		Wrong both rear axle hubs	• Rear sensor rotors
41		Low battery voltage (9.5 V or lower)	• Battery • Voltage regulator
42		Abnormally high battery voltage (16.2 V or higher)	
51		Pump motor of actuator locked or open circuit in pump motor circuit in actuator	• Pump motor, relay and battery • Wire harness, connector and ground bolt or actuator pump motor circuit
Always on		Malfunction in computer	• Computer

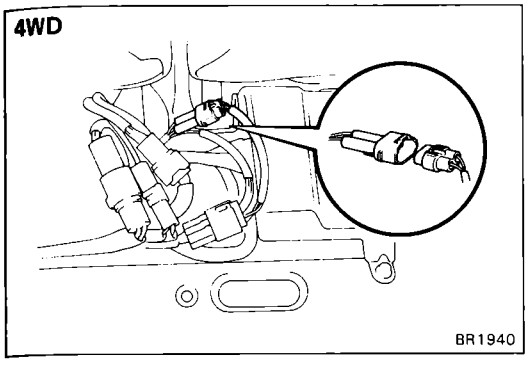
RR1051

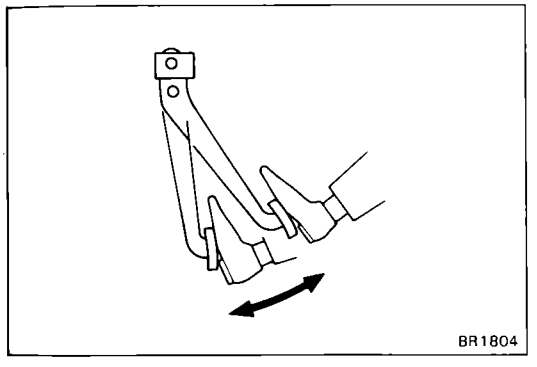
DIAGNOSTIC CODE (4WD)

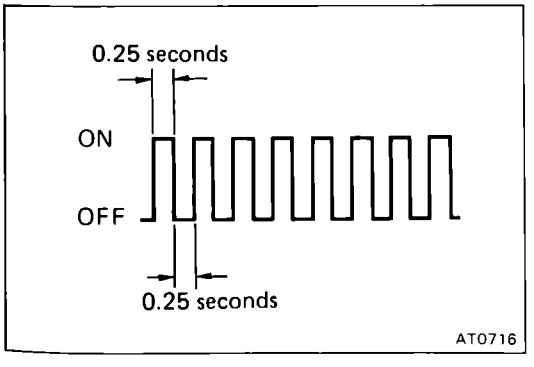
Code No.	Light Pattern	Diagnosis	Trouble Part
11		Open circuit in solenoid relay circuit	• Actuator inside wire harness • Solenoid relay • Wire harness and connector of solenoid relay circuit
12		Short circuit in solenoid relay circuit	
13		Open circuit in pump motor relay circuit	• Actuator inside wire harness • Pump motor relay • Wire harness and connector of pump motor relay circuit
14		Short circuit in pump motor relay circuit	
21		Open or short circuit in 3 position solenoid of front right wheel	• Actuator solenoid • Wire harness and connector of actuator solenoid circuit
22		Open or short circuit in 3 position solenoid of front left wheel	
23		Open or short circuit in 3 position solenoid of rear right wheel	
24		Open or short circuit in 3 position solenoid of rear left wheel	
31		Front right wheel speed sensor signal malfunction	• Speed sensor • Sensor rotor • Wire harness and connector of speed sensor
32		Front left wheel speed sensor signal malfunction	
33		Rear right wheel speed sensor signal malfunction	
34		Rear left wheel speed sensor signal malfunction	
35		Open circuit in front left or rear right wheel speed sensor	
36		Open circuit in front right or rear left wheel speed sensor	
41		Low battery voltage (9.5 V or lower)	• Battery • Voltage regulator
42		Abnormally high battery voltage (16.2 V or higher)	
43		Malfunction in deceleration sensor	• Deceleration sensor • Deceleration sensor installation • Wire harness and connector of deceleration sensor
44		Open or short circuit in deceleration sensor	
51		Pump motor of actuator locked or open circuit in pump motor circuit in actuator	• Pump motor, relay and battery • Wire harness, connector and ground bolt or actuator pump motor circuit
Always on		Malfunction in computer	• Computer

BR1941









CLEARING OF DIAGNOSTIC CODES

CLEAR DIAGNOSTIC CODES

(a) Turn the ignition switch on.

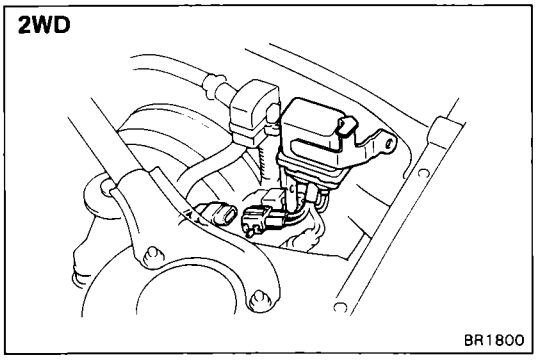
(b) Remove the bolt, and pull out the control relay. (For 2WD)

(c) Disconnect the check connector.

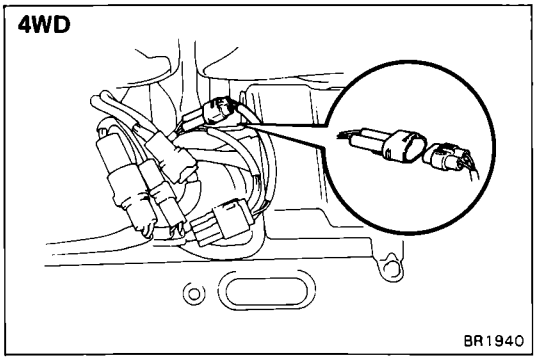
NOTE: Keep the vehicle stopped (vehicle speed 0 km/h (0 mph)).

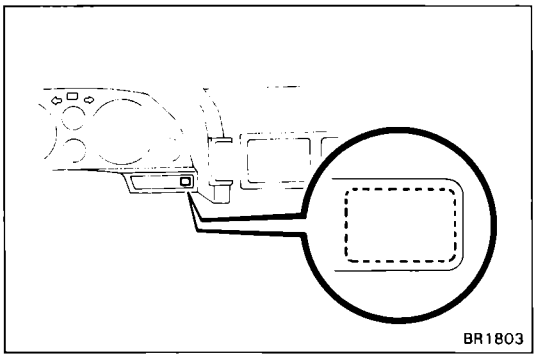
(d) Clear the diagnostic codes stored in computer by depressing the brake pedal 8 or more times within 3 seconds.

(e) Check that the warning light shows the normal code.



(f) Connect the check connector.





(g) Check that the warning light goes off.

(h) Install the control relay with the bolt. (For 2WD)

Troubleshooting

Problem		No.
"ANTI-LOCK" warning light	Always comes on after ignition switch is turned on.	1
	Does not come on for 3 seconds after ignition switch on.	2
	Comes on and off.	3
	Comes on while running.	1
Brake working	Brakes pull.	4
	Braking inefficient.	4
	A.B.S. operates at ordinary braking.	4
	A.B.S. operates just before stopping at ordinary braking.	4
	Brake pedal pulsates abnormally while A.B.S. is operating.	4
	Skidding noise occurs while A.B.S. working. (A.B.S. works inefficiently)	5

1	"ANTI-LOCK" warning light comes on.

Disconnect check connector.
(See page BR-77)

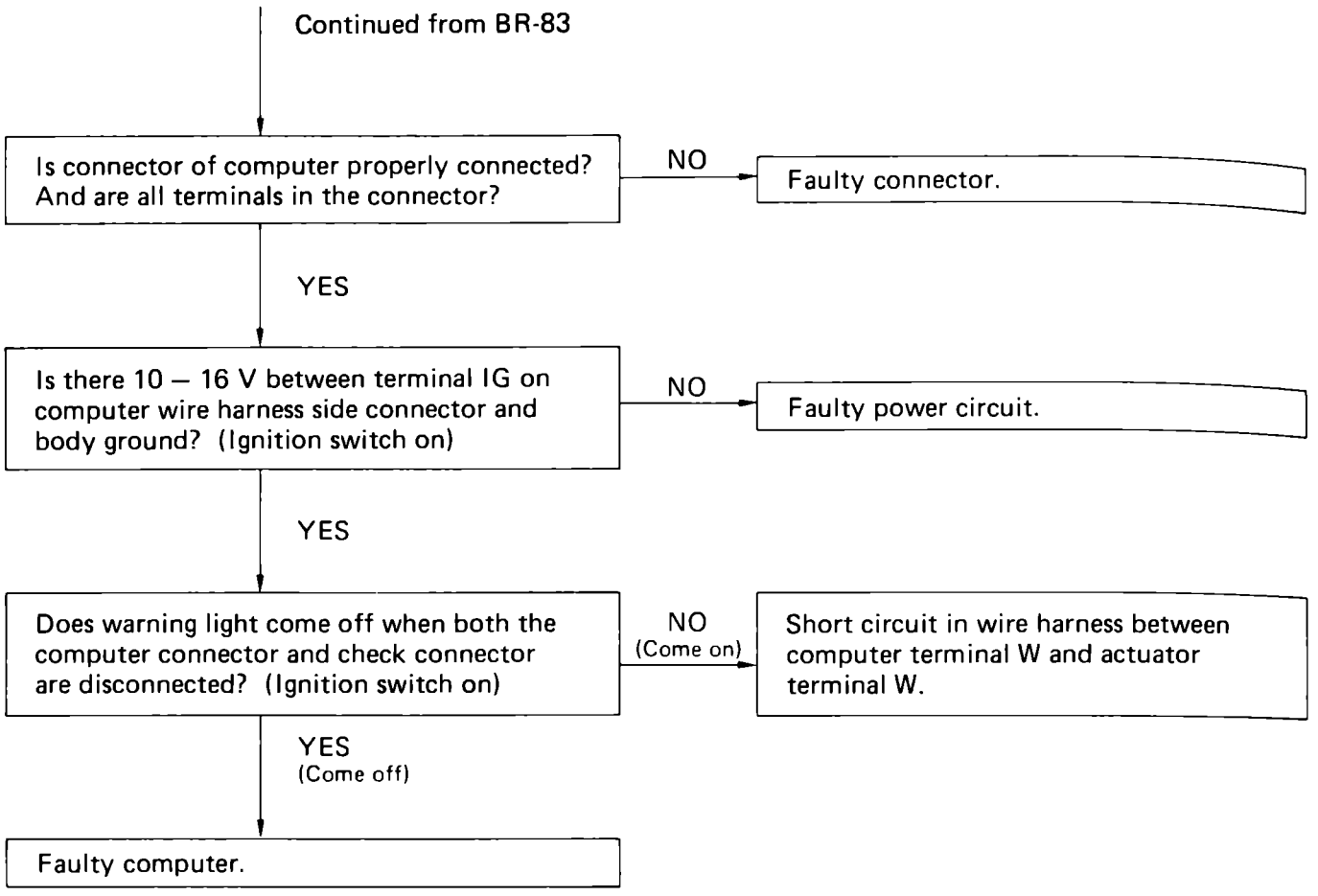
↓

Does warning light always come on or show the normal code?
(Ignition switch on)

NO → See diagnostic code.
(See page BR-79 or 80)

↓ YES

Continued on page BR-84


Continued from BR-83
Is connector of computer properly connected? And are all terminals in the connector?
NO
Faulty connector.
YES
Is there 10 — 16 V between terminal IG on computer wire harness side connector and body ground? (Ignition switch on)
NO
Faulty power circuit.
YES
Does warning light come off when both the computer connector and check connector are disconnected? (Ignition switch on)
NO
(Come on)
Short circuit in wire harness between computer terminal W and actuator terminal W.
YES
(Come off)
Faulty computer.

2	"ANTI-LOCK" warning light does not come on for 3 seconds after ignition switch on.

(2WD)

Disconnect check connector from control relay, and ground the terminal W of the wire harness side connector.
(Ignition switch on)

↓

Does warning light come on? — NO → Bulb burned out or open circuit in wire harness between warning light and control relay terminal W.

↓ YES

Disconnect connectors from computer and actuator, and ground terminal W of computer wire harness side connector.
(Ignition switch on)

↓

Does warning light come on? — NO → Open circuit in wire harness between computer terminal W and warning light.

↓ YES

With ignition switch off, disconnect control relay connectors, and check continuity between terminal W and BS on control relay side.

↓

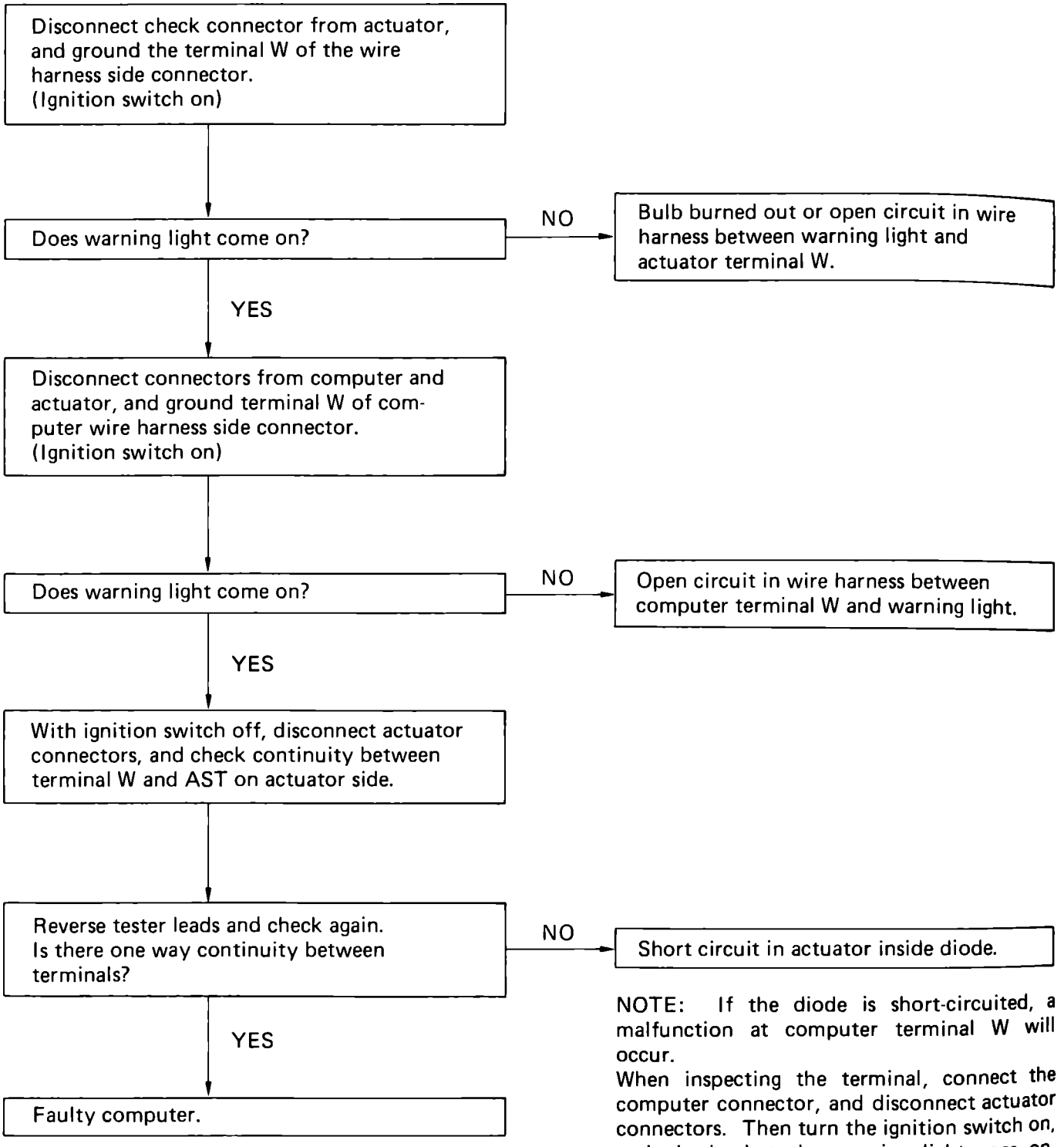
Reverse tester leads and check again.
Is there one way continuity between terminals? — NO → Short circuit in control relay inside diode.

↓ YES

Faulty computer.

NOTE: If the diode is short-circuited, a malfunction at computer terminal W will occur. When inspecting the terminal, connect the computer connector, and disconnect actuator connectors and check connector. Then turn the ignition switch on, and check that the warning light goes on.
If it does, the computer terminal is OK.

(4WD)



NOTE: If the diode is short-circuited, a malfunction at computer terminal W will occur.
When inspecting the terminal, connect the computer connector, and disconnect actuator connectors. Then turn the ignition switch on, and check that the warning light goes on. If it does, the computer terminal is OK.

3	"ANTI-LOCK" warning light comes on and off.

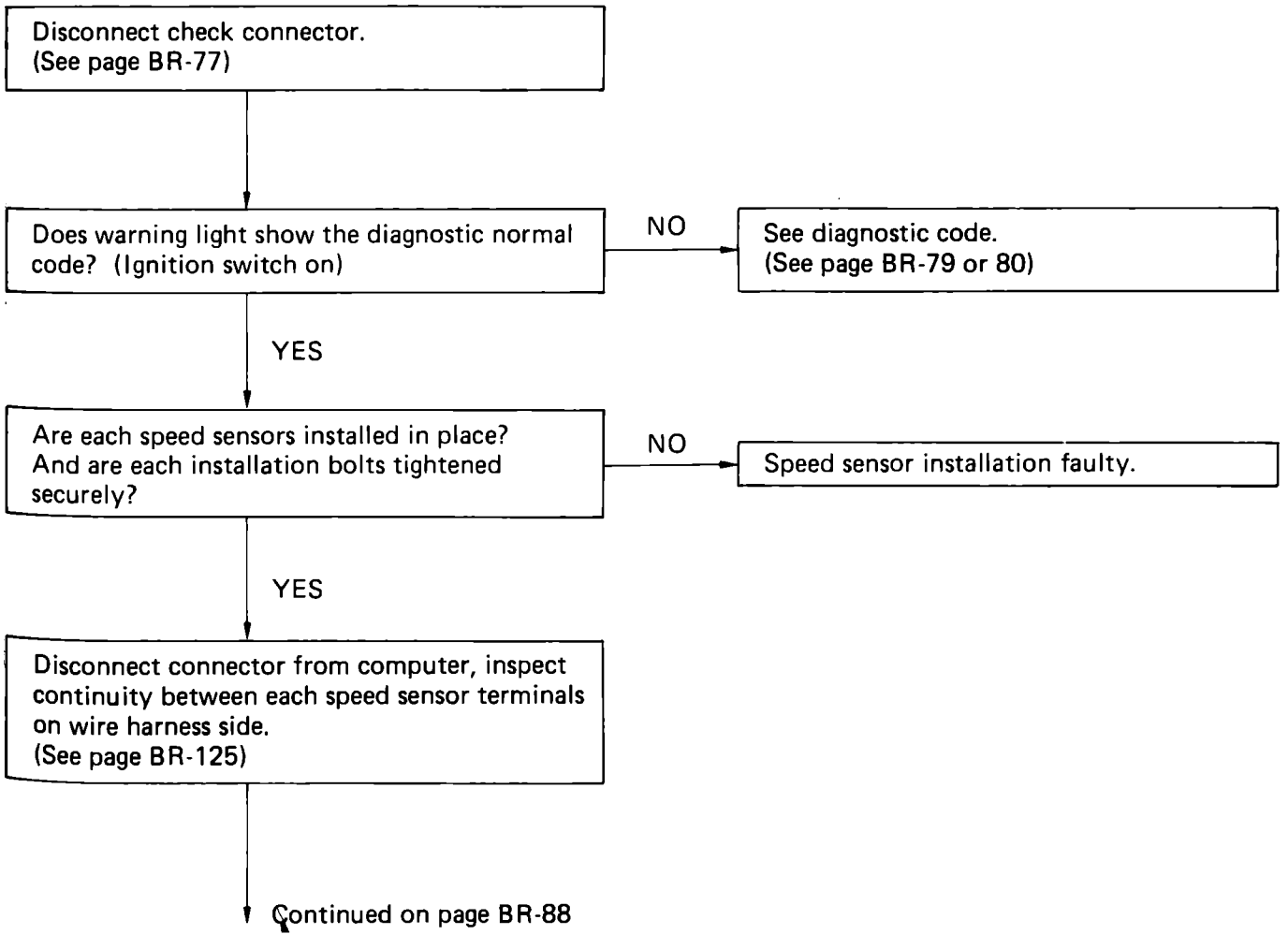
(2WD)

- Check connector is disconnected.
- Open circuit in wire harness between computer terminal T and control relay terminal T.
- Control relay terminal GND is improperly connected or open circuit in wire harness between control relay terminal GND and body ground.

(4WD)

- Check connector is disconnected.
- Open circuit in wire harness between computer terminal T and actuator terminal T.
- Actuator terminal GND is improperly connected or open circuit in wire harness between actuator terminal GND and body ground.
- Short circuit in wire harness between computer terminal Ts and Ts connector.

4	• Brakes pull. • Braking inefficient. • A.B.S. operates at ordinary braking. • A.B.S. operates just before stopping at ordinary braking. • Brake pedal pulsates abnormally while A.B.S. working.



Continued from page BR-87

Does any abnormal change occur in continuity when the connectors or wire harness of the speed sensor and intermediate connectors are twisted or bent?

YES (Abnormal change) → Faulty wire harness.

NO (No change)

Is there foreign material or ferric chips on the sensor tip?

YES → Clean chips from the speed sensor.

NO

Try speed sensor diagnosis system.
Is sensor signal level OK?
(See page BR-90)

NO → Inspect speed sensor, and replace if necessary.

YES

Try speed sensor diagnosis system.
Is sensor signal change OK?
(See page BR-90)

NO → Inspect sensor rotor, and replace if necessary.

YES

(For 4WD)
Try deceleration sensor operation diagnosis system. Is sensor operation OK?
(See page BR-95)

NO → Faulty deceleration sensor or sensor installation faulty.

YES

Inspect the actuator operation.
(See page BR-95)

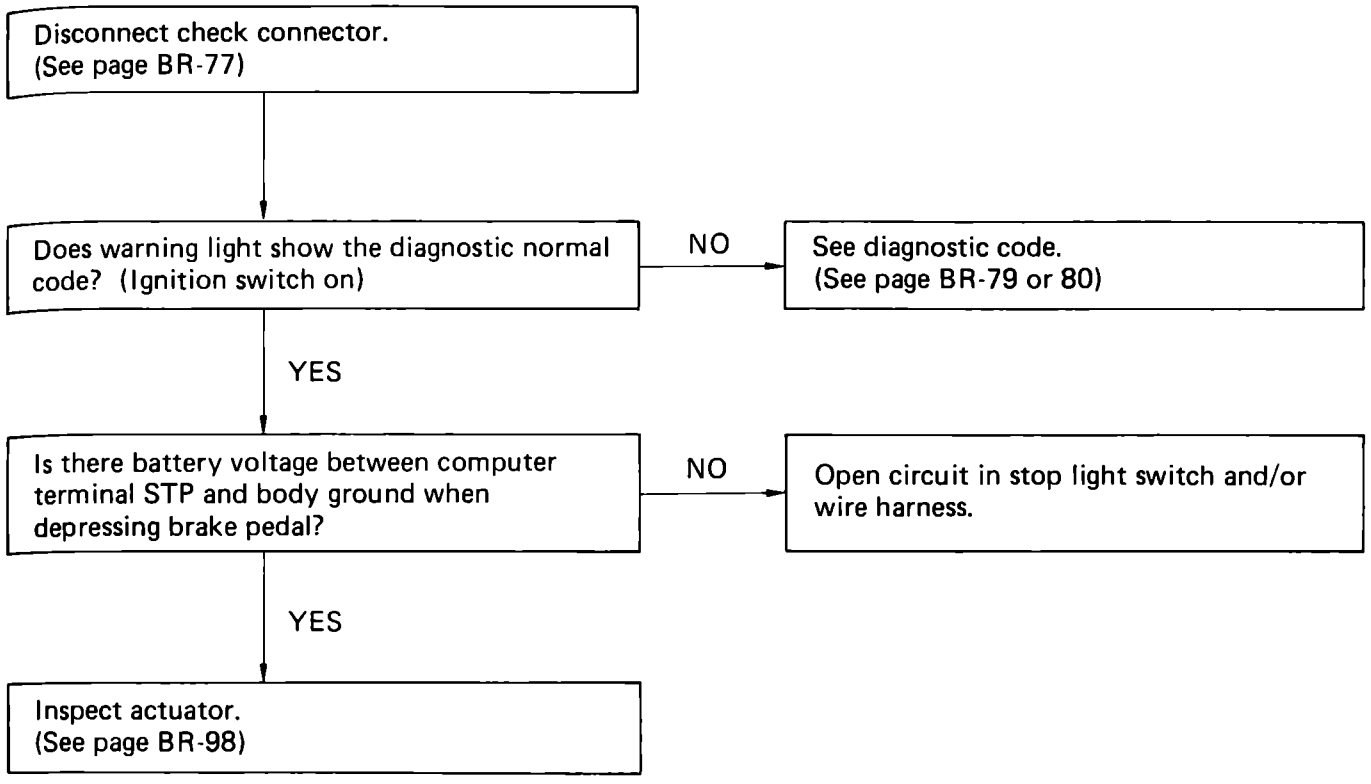
Is actuator operation OK?

NO → Faulty actuator.

YES

Faulty computer.

5	Anti-lock brake system works inefficiently.



Speed Sensor Diagnosis System

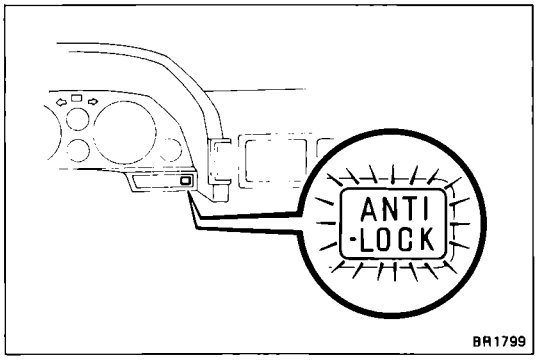
PRECAUTION

While checking the speed sensor diagnosis system, A.B.S. does not work and brake system works as normal brake system.

INSPECTION OF DIAGNOSIS SYSTEM

1. INSPECT BATTERY VOLTAGE

Inspect that the battery voltage is about 12 V.



2. CHECK THAT WARNING LIGHT TURNS ON

(a) Turn the ignition switch on.

(b) Check that the "ANTI-LOCK" warning light turns on for 3 seconds.

If not, inspect and repair or replace the fuse, bulb and wire harness.

(c) Check that the "ANTI-LOCK" warning light turns off.

(d) Turn the ignition switch off.

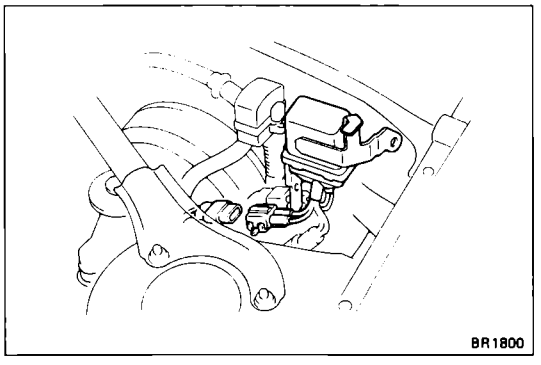
3. PERFORM FOLLOWING STEPS

(2WD)

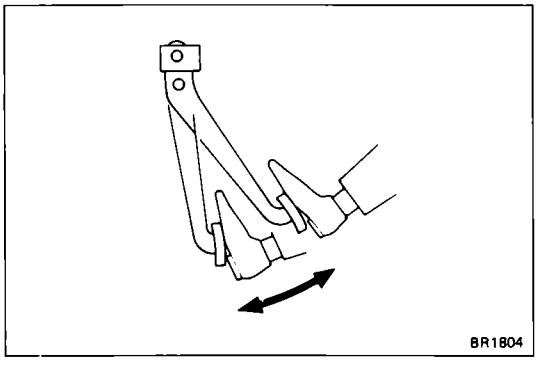
(a) Remove the bolt, and pull out the control relay.

(b) Disconnect the check connector from the control relay.

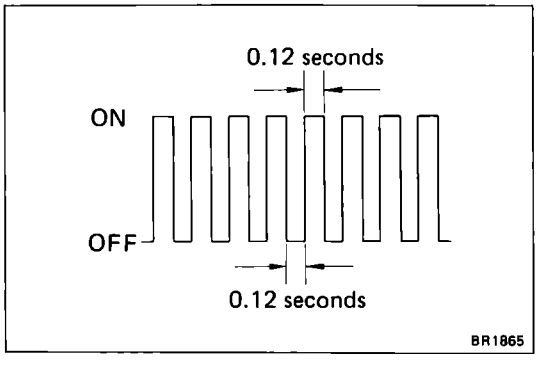
(c) Pull the parking brake lever up, and start the engine.

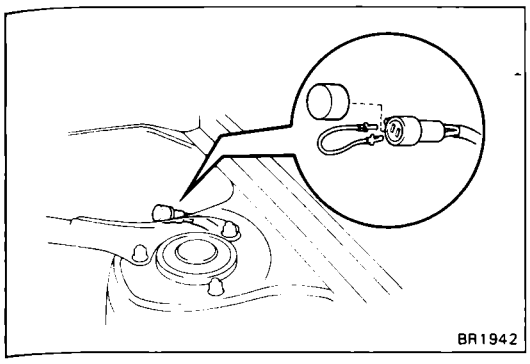


(d) Depress the brake pedal 4 to 6 times within 2 seconds.



(e) Check that the warning light blinks about 4 times every 1 second as shown.





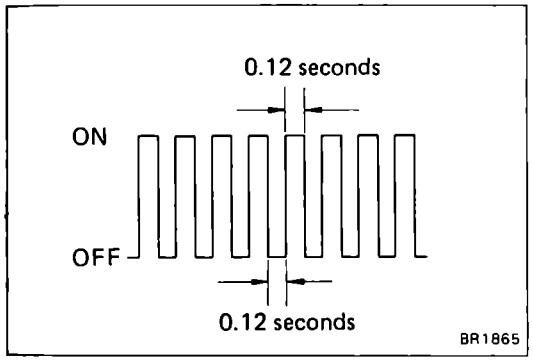
(4WD)

(a) Remove the rubber cap from the Ts connector located in back of the left side shock absorber protrusion in engine room.

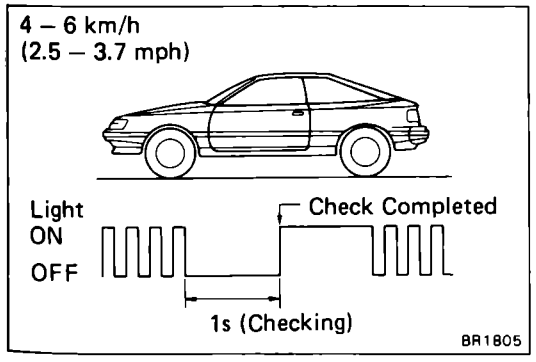
(b) Connect the terminals of Ts connector.

(c) Pull the parking brake lever up, and start the engine.

CAUTION: Do not depress the brake pedal.



(d) Check that the warning light blinks about 4 times every 1 second as shown.



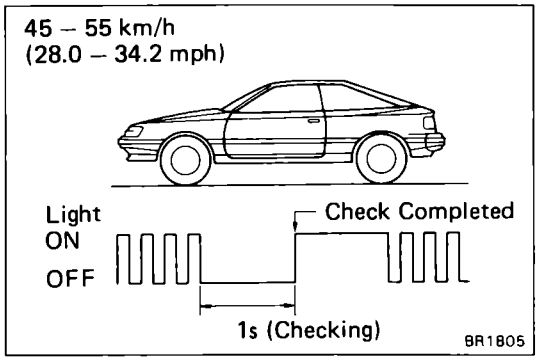
4. INSPECT SENSOR SIGNAL LEVEL

Drive the vehicle straight ahead at about 4 — 6 km/h (2.5 — 3.7 mph), and check that the warning light turns on after a 1 second pause.

If the warning light turns on without blinking when the vehicle speed is not within the specified speed range above, stop the vehicle and read the diagnostic code, and repair the malfunctioning parts.
(See step 6 on this page)

NOTE: If the warning light turns on while the vehicle speed is within specified speed range above, the check is completed. And when the vehicle speed exceeds 6 km/h (3.7 mph), the warning light will blink again. In this condition, speed sensors are OK.

CAUTION: While the warning light is off, do not give any shocks to vehicle such as acceleration, deceleration, braking, shift change, steering or shocks from the road condition.



5. INSPECT SENSOR SIGNAL CHANGE

Drive the vehicle straight ahead at about 45 — 55 km/h (28.0 — 34.2 mph), and check that the warning light turns on after a 1 second pause.

If the warning light turns on without blinking when the vehicle speed is not within the specified speed range above, stop the vehicle and read the diagnostic code, and repair the malfunctioning parts.
(See step 6 on this page)

NOTE: If the warning light turns on while the vehicle speed is within specified speed range above, the check is completed. And when the vehicle speed is not within specified speed range, the warning light will blink again. In this condition, sensor rotors are OK.

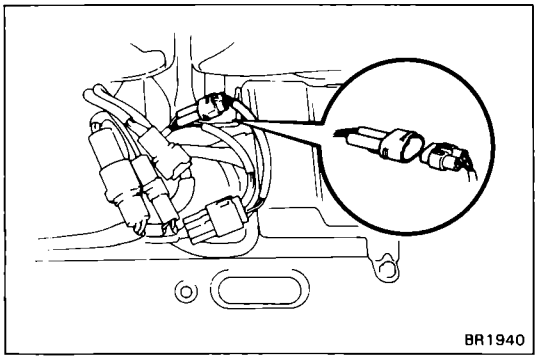
CAUTION: While the warning light is off, do not give any shocks to vehicle such as acceleration, deceleration, braking, shift change, steering or shocks from the road condition.

6. READ DIAGNOSTIC CODE

(2WD)

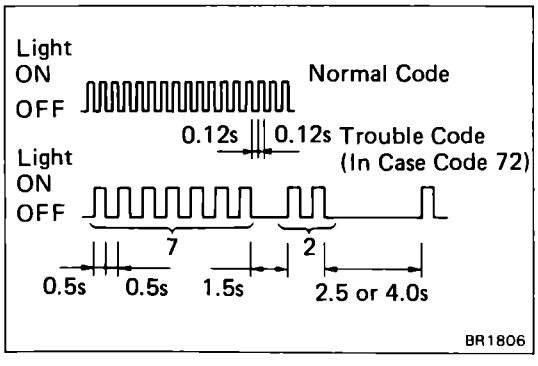
Stop the vehicle, and warning light will begin to blink. Read the number of blinks.
(See DIAGNOSTIC CODE on page BR-94)

CAUTION: Do not turn the ignition switch off, do not pull the PKB lever up and do not depress the brake pedal more than 16 times after the diagnosis system begins to work, or the diagnostic codes stored in computer will be cleared.



(4WD)

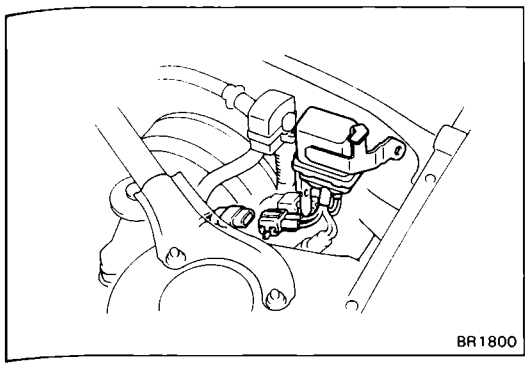
Stop the vehicle and disconnect the check connector, and warning light will begin to blink. Read the number of blinks.
(See DIAGNOSTIC CODE on page BR-94)



NOTE: The first number of blinks will equal the first digit of a two digit diagnostic code. After a 1.5 second pause, the 2nd number of blinks will equal the 2nd number of a two digit code. If there are two or more codes, there will be a 2.5 second pause between each code, and then indication will begin again after a 4.0 second pause, continuing in order from the smaller value up to the larger one.

7. REPAIR MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.


BR1800

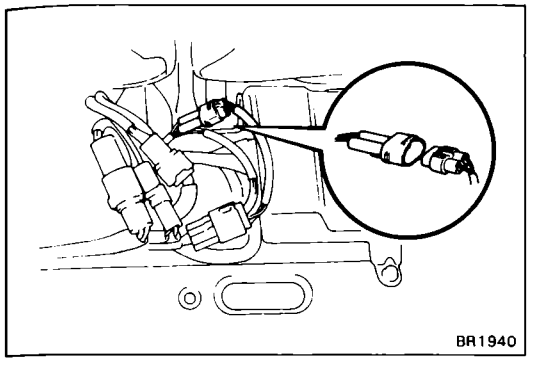
8. PERFORM FOLLOWING STEPS

(2WD)

(a) Turn the ignition swich off.

(b) Connect the check connector.

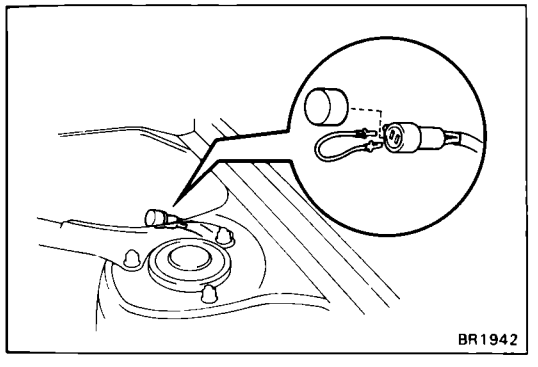
(c) Install the control relay in place with a bolt.


BR1940

(4WD)

(a) Turn the ignition switch on.

(b) Connect the check connector.


BR1942

(c) Remove the short pin or wire from the Ts connector and install the rubber cap to it.

(d) Turn the ignition switch off.

DIAGNOSTIC CODE

Code No.	Light Pattern	Diagnosis	Malfunctioning Part
	ON OFF 	All speed sensors and sensor rotors are normal	
71		Low voltage of front right speed sensor signal	• Front right speed sensor • Sensor installation
72		Low voltage of front left speed sensor signal	• Front left speed sensor • Sensor installation
73		Low voltage of rear right speed sensor signal	• Rear right speed sensor • Sensor installation
74		Low voltage of rear left speed sensor signal	• Rear left speed sensor • Sensor installation
75		Abnormal change of front right speed sensor signal	• Front right sensor rotor
76		Abnormal change of front left speed sensor signal	• Front left sensor rotor
77		Abnormal change of rear right speed sensor signal	• Rear right sensor rotor
78		Abnormal change of rear left speed sensor signal	• Rear left sensor rotor

BR1807

Deceleration Sensor Operation Diagnosis System (For 4WD)

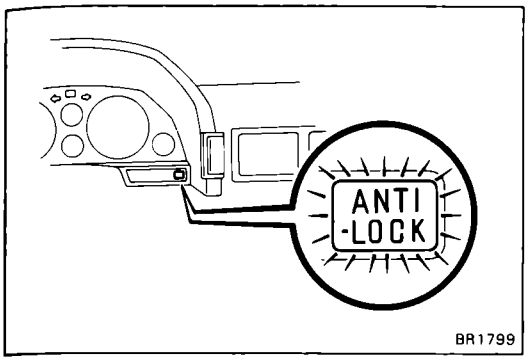
PRECAUTION

While checking the deceleration sensor diagnosis system, A.B.S. does not work and brake system works as normal brake system.

INSPECTION OF DIAGNOSIS SYSTEM

1. INSPECT BATTERY VOLTAGE

Inspect that the battery voltage is about 12 V.



2. CHECK THAT WARNING LIGHT TURNS ON

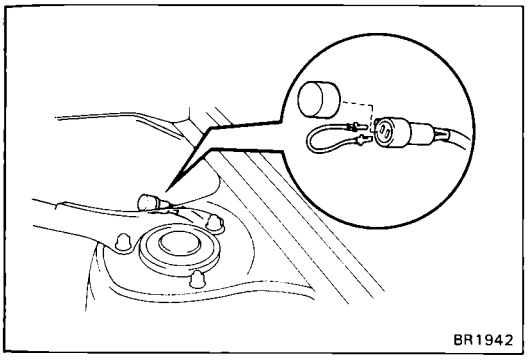
(a) Turn the ignition switch on.

(b) Check that the "ANTI-LOCK" warning light turns on for 3 seconds.

If not, inspect and repair or replace the fuse, bulb and wire harness.

(c) Check that the "ANTI-LOCK" warning light turns off.

(d) Turn the ignition switch off.

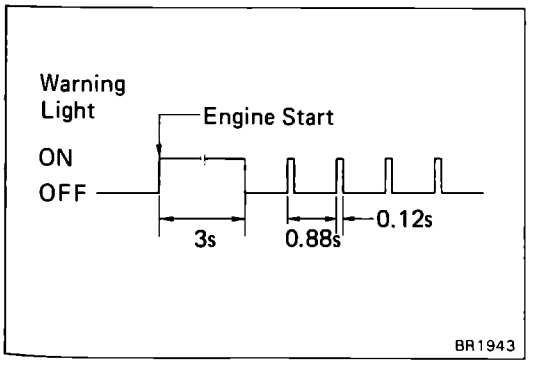


3. PERFORM FOLLOWING STEPS

(a) Remove the rubber cap from the Ts connector located in back of the left side shock absorber protrusion in engine room.

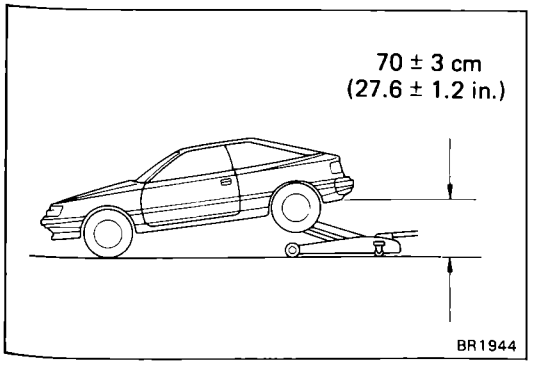
(b) Connect the terminals of Ts connector.

(c) Pull the parking brake lever up and depress the brake pedal, and start the engine.



(d) Check that the warning light blinks about 1 time every 1 second as shown.

If the warning light does not blink, inspect the parking brake switch, stop light switch, Ts connector, deceleration sensor installation and computer.



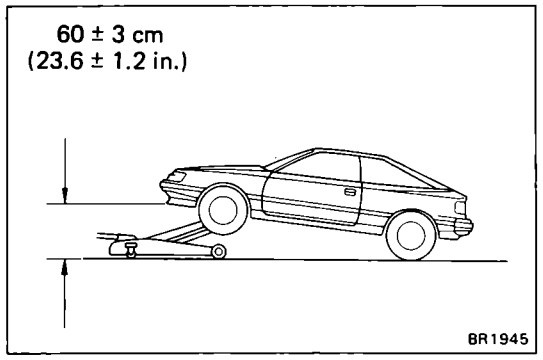
4. INSPECT SENSOR DETECTION POINT

(a) Jack up the rear side of the vehicle slowly as shown.

NOTE: When measuring the height, measure at the center of the lower body of the vehicle.

(b) Check that the warning light does not turn on.

(c) Jack down the vehicle and check that the warning light blinking.



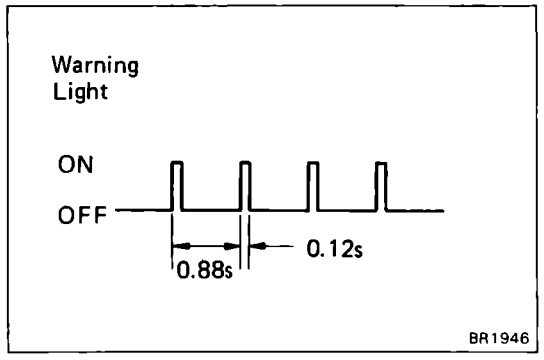
(d) Jack up the front side of the vehicle slowly as shown.

NOTE: When measuring the height, measure at the center of the lower body of the vehicle.

(e) Check that the warning light does not turn on.

(f) Jack down the vehicle and check that the warning light blinking.

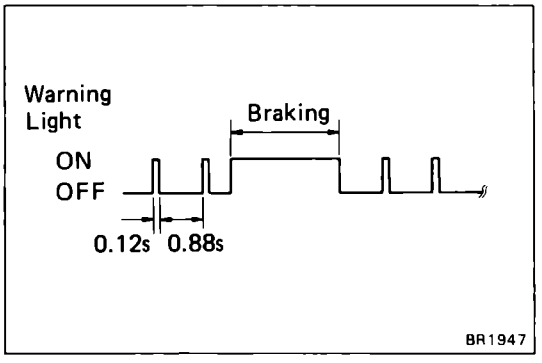
If the warning light turns on, inspect the deceleration sensor installation. And if the sensor installation is OK, replace the deceleration sensor.



5. INSPECT SENSOR OPERATION

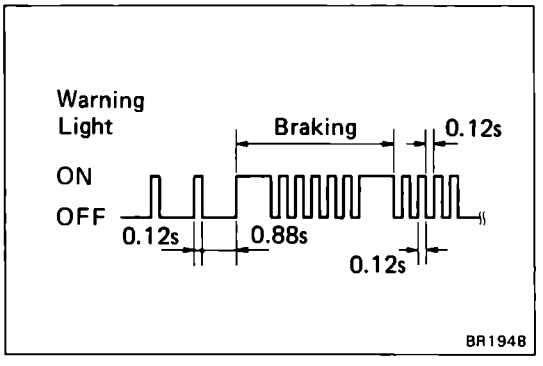
(a) Drive the vehicle straight ahead at about 10 km/h (6.2 mph) or more, lightly depress the brake pedal.

(b) Check that there is no change in the warning light light pattern.



(c) Drive the vehicle straight ahead at about 20 km/h (12.4 mph) or more, depress the brake pedal a little strong.

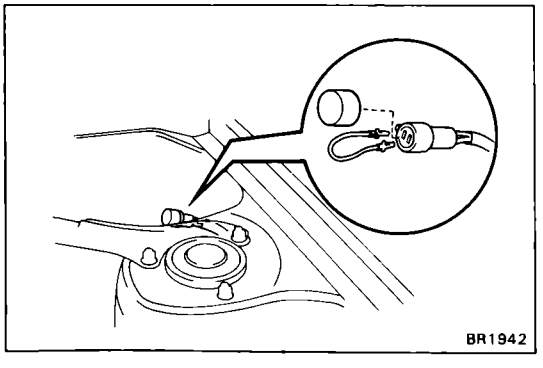
(d) Check that the warning light turns on while braking.



(e) Drive the vehicle straight ahead at about 20 km/h (12.4 mph) or more, depress the brake pedal strongly.

(f) Check that the warning light light pattern changes after braking as shown.

If the operation is not as specified, inspect the deceleration sensor installation. And if the sensor installation is OK, replace the deceleration sensor.



6. REMOVE SHORT PIN

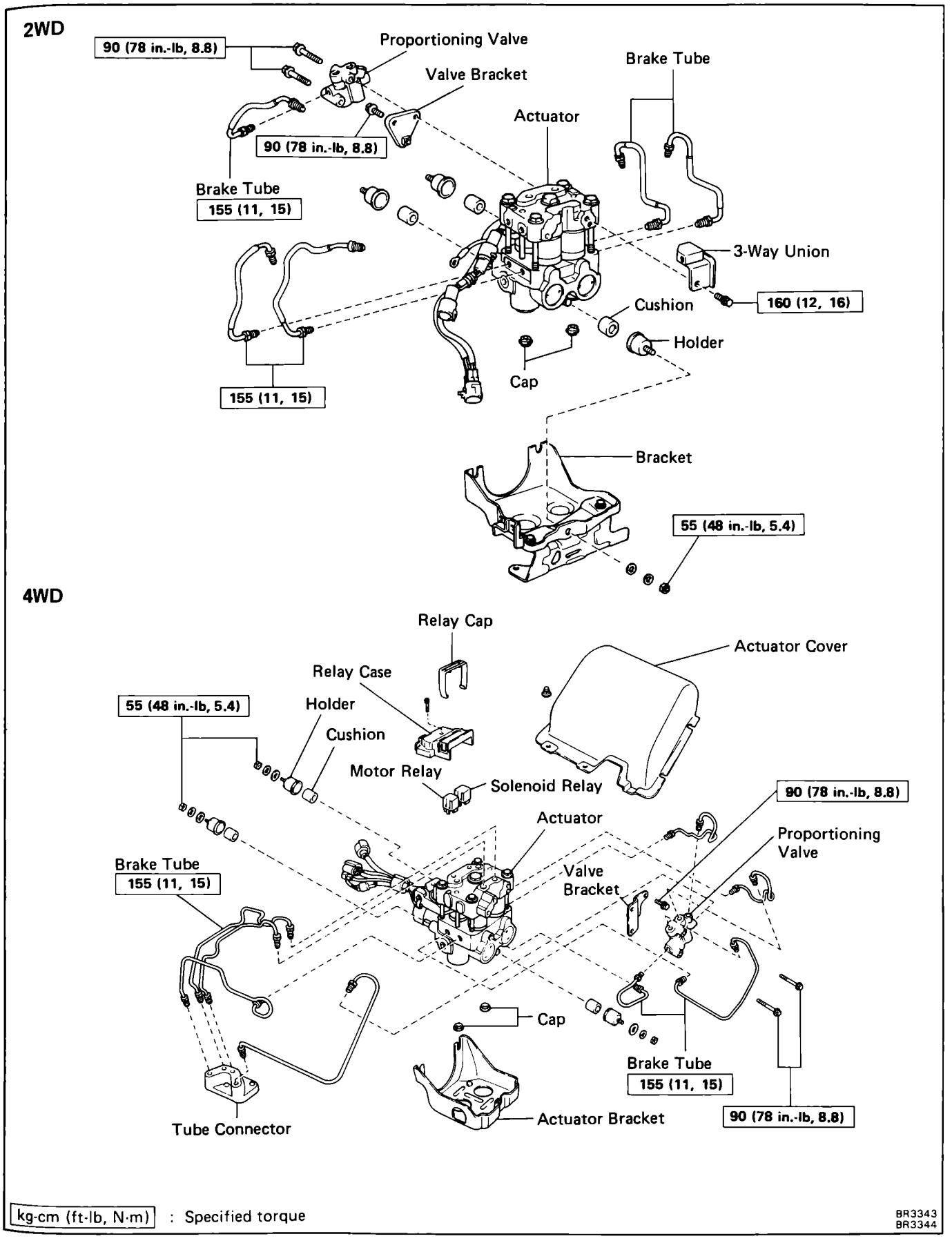
(a) Stop the engine.

(b) Remove the short pin or wire from the Ts connector.

(c) Install the rubber cap to the Ts connector.

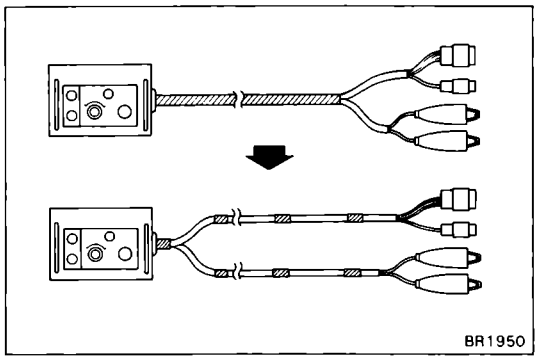
A.B.S. Actuator

COMPONENTS



kg-cm (ft-lb, N·m) : Specified torque

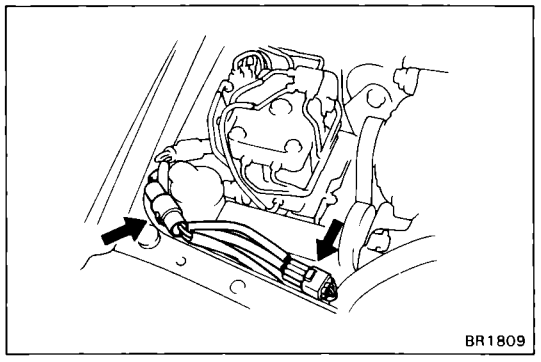
BR3343
BR3344



PREPARATION FOR INSPECTION (FOR 4WD)

Before inspecting actuator, tear off the vinyl tube which wrapped the wire harness of the actuator checker (SST). And then divide the clip mounted wire harnesses from the connector mounted wire harnesses, and wrap the tape at several points for each wire harness as shown.

SST 09990-00150



INSPECTION OF BRAKE ACTUATOR OPERATION

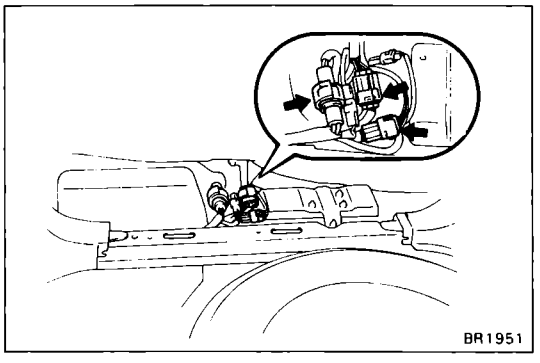
1. **INSPECT BATTERY VOLTAGE**

   Battery voltage: 10 – 14.5 V

2. **DISCONNECT CONNECTORS FROM ACTUATOR**

   (2WD)

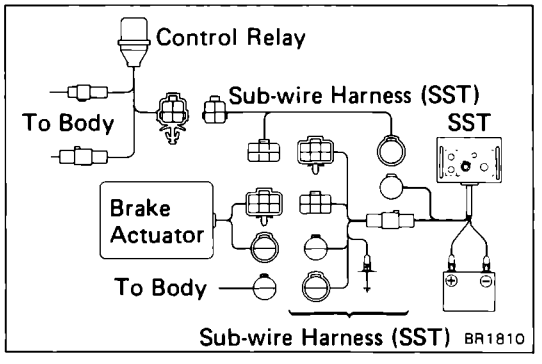
   Disconnect the two connectors from the actuator.



(4WD)

(a) Remove the three clips and turn over the luggage compartment mat.

(b) Disconnect the three connectors from the actuator as shown.



3. **CONNECT ACTUATOR CHECKER (SST) TO ACTUATOR**

   (2WD)

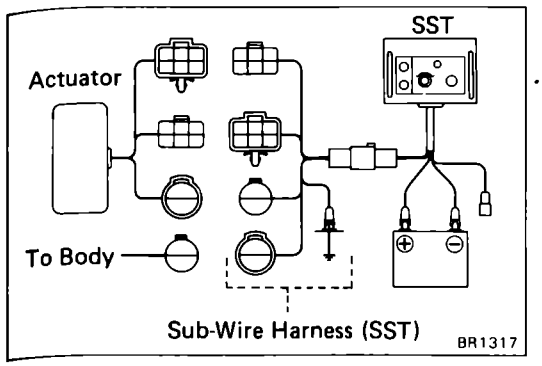
   (a) Connect the actuator checker (SST) to the actuator, control relay and body side wire harness through the sub-wire harness (SST) as shown.

   SST 09990-00150, 09990-00165

   (b) Connect the red cable of the checker to the battery positive (+) terminal and black to the negative (–) terminal. Connect the black cable of the sub-wire harness to the battery negative (–) terminal or body ground.

   (c) Place the "SHEET A" (SST) on the actuator checker.

   SST 09990-00163



(4WD)

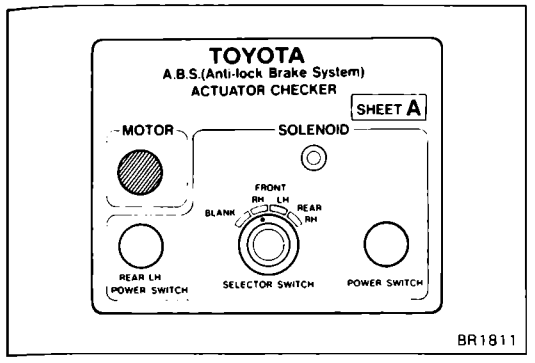
(a) Connect the actuator checker (SST) to the actuator and body side wire harness through the sub-wire harness (SST) as shown.

SST 09990-00150

(b) Connect the red cable of the checker to the battery positive (+) terminal and black to the negative (−) terminal. Connect the black cable of the sub-wire harness to the battery negative (−) terminal or body ground.

(c) Place the "SHEET A" (SST) on the actuator checker.

SST 09990-00163



4. INSPECT BRAKE ACTUATOR OPERATION

(a) Start the engine, and run it at idle.

(b) Turn the selector switch of the actuator checker to "FRONT RH" position.

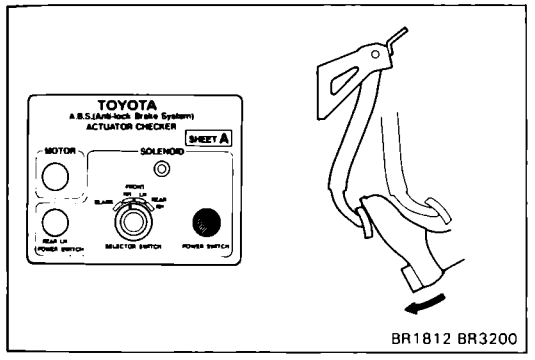
(c) Push and hold in the MOTOR switch for a few seconds.

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

(e) Push the POWER SWITCH, and check that the brake pedal does not go down.

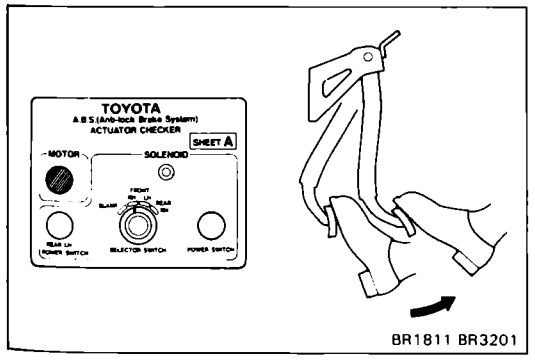
CAUTION: Do not keep the POWER SWITCH pushing more than 10 seconds.

(f) Release the switch, and check that the pedal go down.



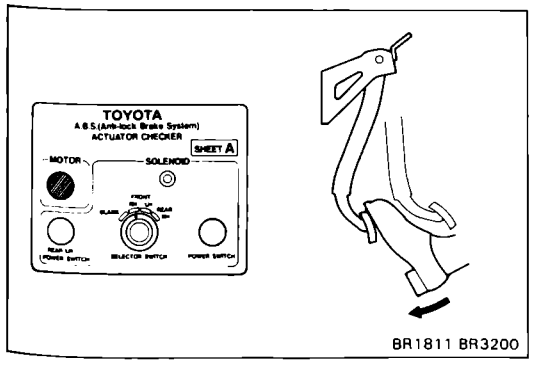
(g) Push and hold in the MOTOR switch for a few seconds, and check that the pedal returns.

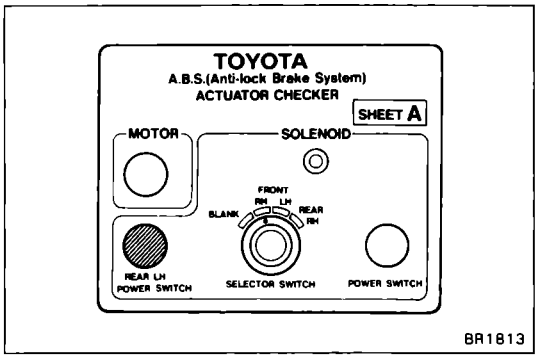
(h) Release the brake pedal.



(i) Push and hold in the MOTOR switch for a few seconds.

(j) Depress the brake pedal and hold it for about 15 seconds. As you hold the pedal down, push the MOTOR switch for a few seconds. Check that the brake pedal does not pulsate.





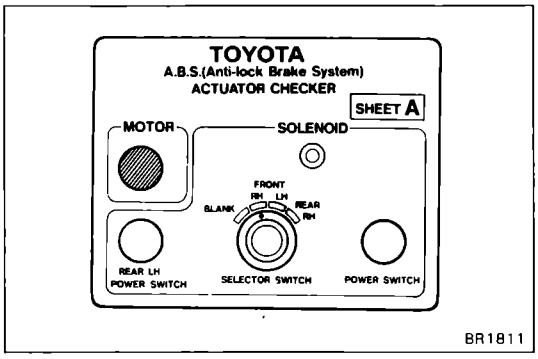
5. INSPECT FOR OTHER WHEELS

(a) Turn the selector switch to "FRONT LH" position.

(b) Repeating (c) to (j) of the step 4, check the actuator operation similarly.

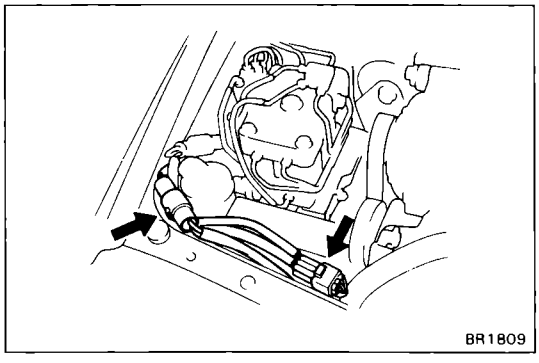
(c) Similarly, inspect "REAR RH" and "REAR LH" position.

NOTE: When inspecting "REAR LH" position, push the REAR LH switch instead of the POWER SWITCH, and you can inspect anywhere the selector switch position is.



6. PUSH SUB MOTOR SWITCH

Push and hold in the MOTOR switch for a few seconds.



7. DISCONNECT ACTUATOR CHECKER (SST) FROM ACTUATOR

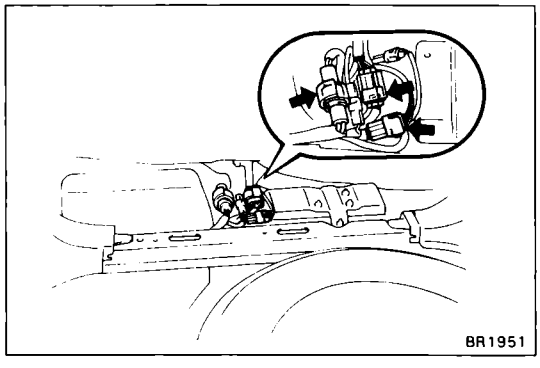
(2WD)

(a) Remove the "SHEET A" (SST) and disconnect the actuator checker (SST) and sub-wire harness (SST) from the actuator.

SST 09990-00150, 09990-00163 and 09990-00165

(b) Connect the actuator and control relay connectors.

(c) Clear the diagnostic codes.
(See page BR-66)



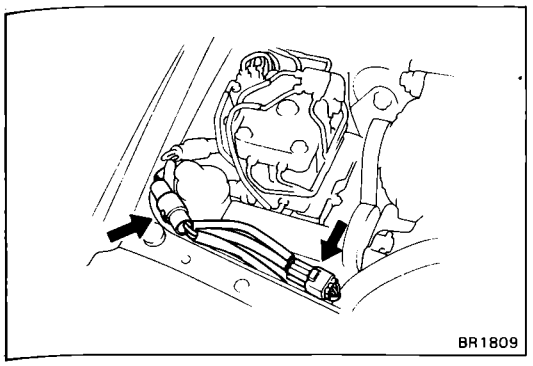
(4WD)

(a) Remove the "SHEET A" (SST) and disconnect the actuator checker (SST) and sub-wire harness (SST) from the actuator.

SST 09990-00150 and 09990-00163

(b) Connect the actuator connectors.

(c) Clear the diagnostic codes.
(See page BR-20)



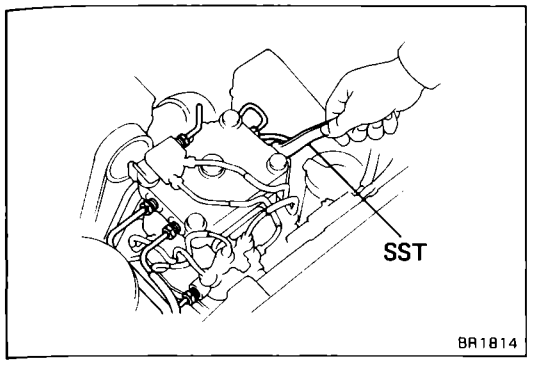
REMOVAL OF BRAKE ACTUATOR (2WD)

1. **TAKE OUT FLUID WITH SYRINGE OR AN EQUIVALENT**

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

2. **DISCONNECT ACTUATOR CONNECTORS**

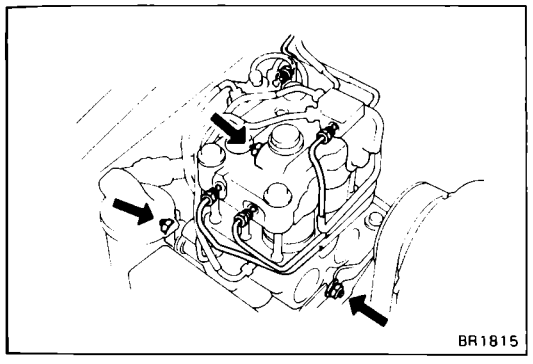
   Disconnect the two connectors from the actuator.



3. **DISCONNECT BRAKE TUBES FROM ACTUATOR**

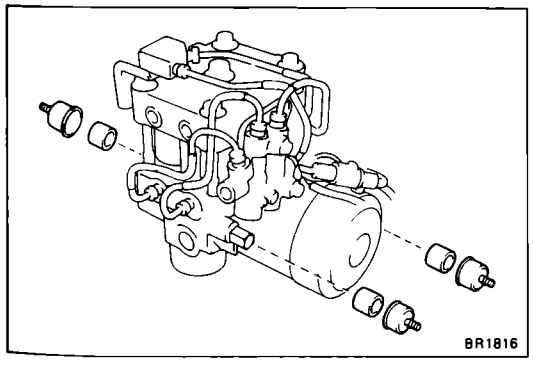
   Using SST, disconnect the six brake tubes from the actuator.

   SST 09751-36011



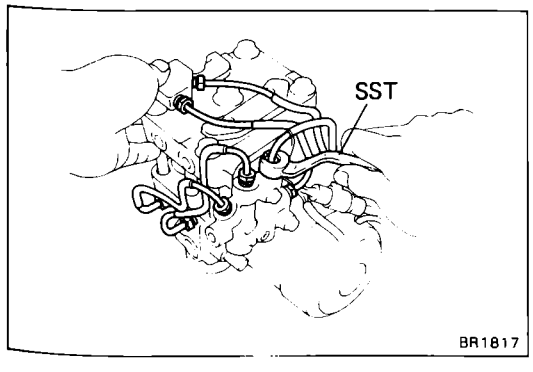
4. **REMOVE ACTUATOR**

   Remove the three nut and remove the actuator.



5. **REMOVE HOLDERS AND CUSHIONS**

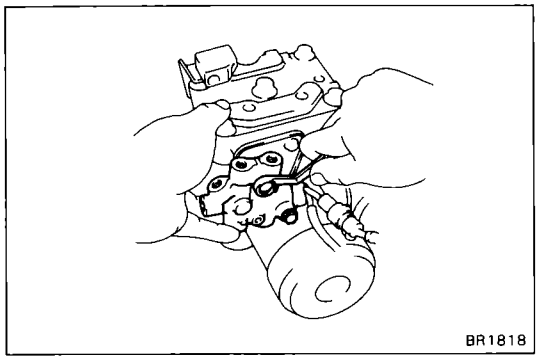
   Remove the three holders and cushions.



6. **REMOVE BRAKE TUBES**

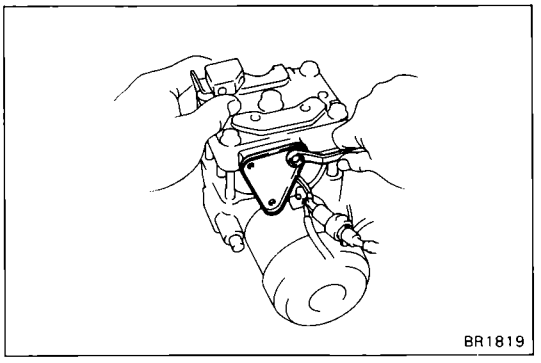
   Using SST, remove the five brake tubes in the assembly.

   SST 09751-36011

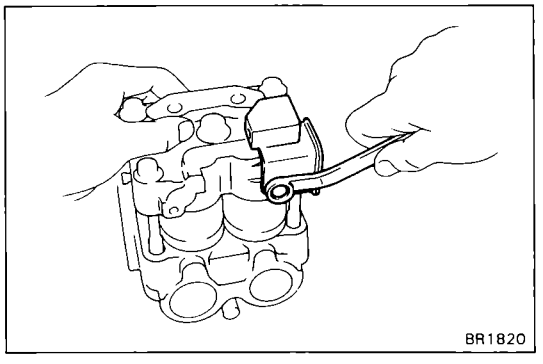


7. REMOVE PROPORTIONING VALVE

(a) Remove the two bolts and proportioning valve.



(b) Remove the bolt and bracket.

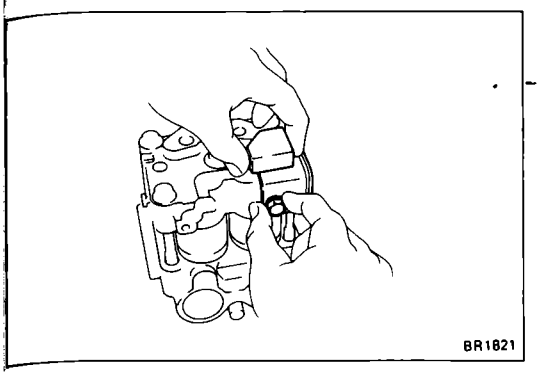


8. REMOVE THREE-WAY UNION

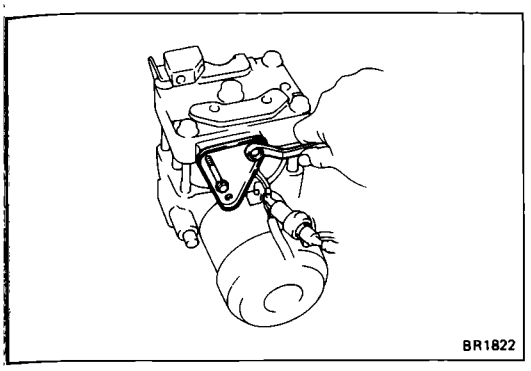
Remove the bolt and three-way union.

INSTALLATION OF BRAKE ACTUATOR

1. **TEMPORARILY INSTALL FOLLOWING PARTS**



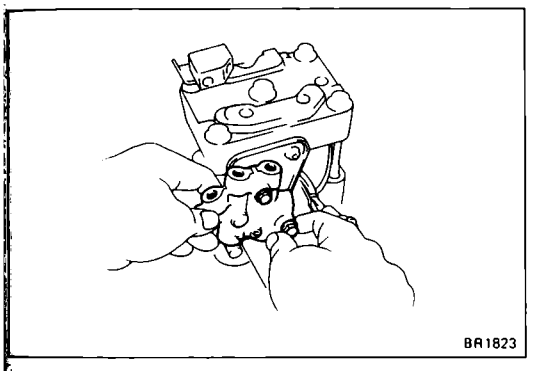
(a) Temporarily install the three way union with a bolt.



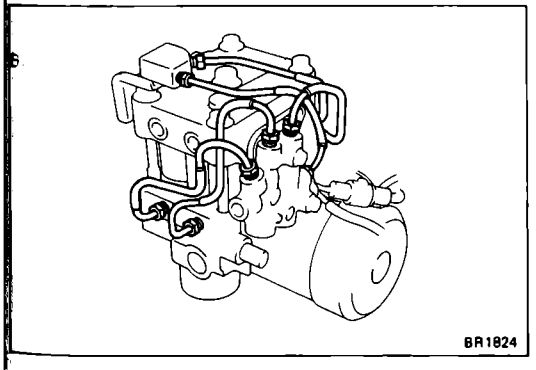
(b) Using a proportioning valve installation bolt, install the valve bracket in place and tighten the bolt.

Torque: 90 kg-cm (78 in.-lb, 8.8 N·m)

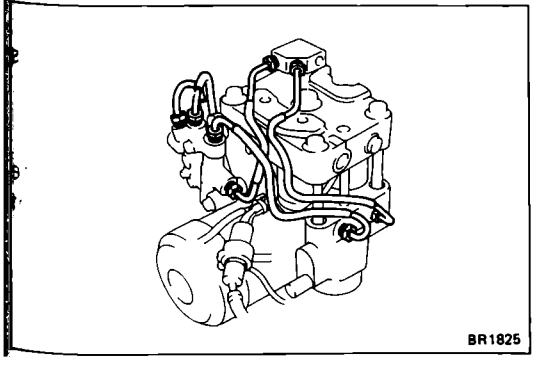
(c) Remove the proportioning valve installation bolt.

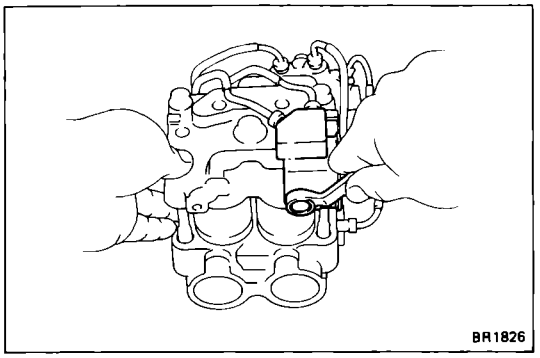


(d) Temporarily install the proportioning valve with the two bolts.



(e) Temporarily install the five brake tubes.

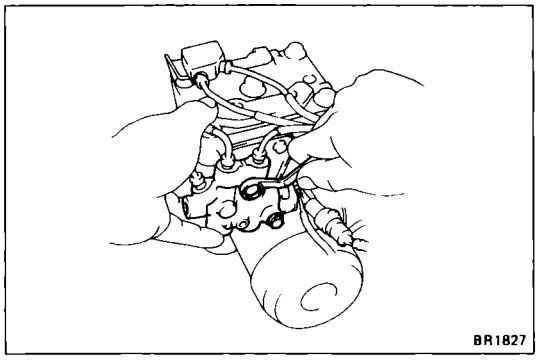




2. TIGHTEN FOLLOWING PARTS

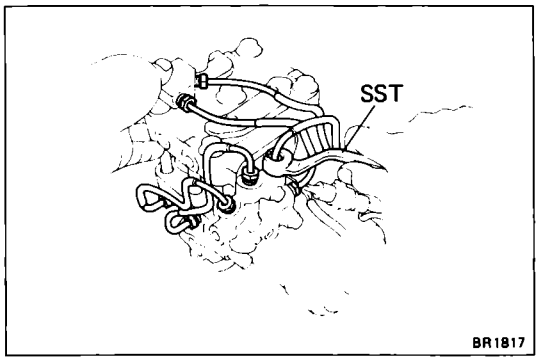
(a) Tighten the three-way union installation bolt.

Torque: 160 kg-cm (12 ft-lb, 16 N·m)



(b) Tighten the proportioning valve installation bolts.

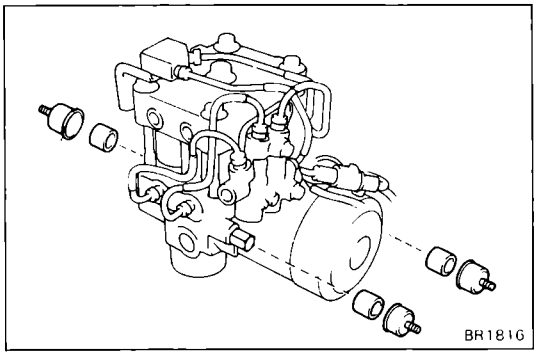
Torque: 90 kg-cm (78 in.-lb, 8.8 N·m)



(c) Using SST, tighten the five brake tubes.

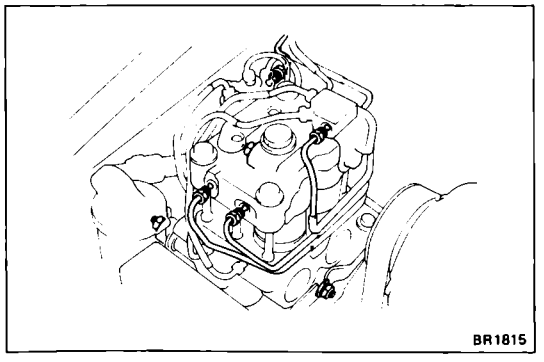
SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)



3. INSTALL CUSHIONS AND HOLDERS

Install the three cushions to holders and install them to the actuator.

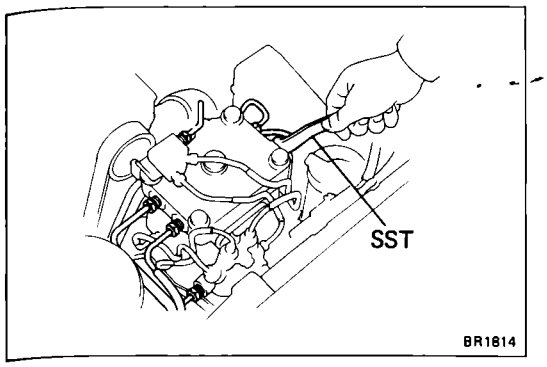


4. INSTALL ACTUATOR

Install the actuator to the actuator bracket with three nuts and washers, and tighten them.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

NOTE: Install the motor ground wire between the plate washer and spring washer before installing the front right side nut.

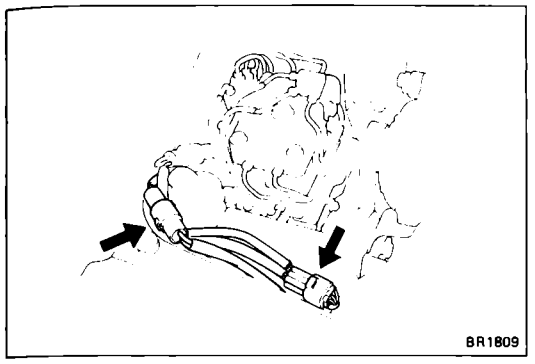


5. CONNECT BRAKE TUBES TO ACTUATOR

Connect the six brake tubes to the actuator by hand, and using SST, tighten them.

SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)



6. CONNECT ACTUATOR CONNECTORS

Connect the two connectors of the actuator.

7. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM

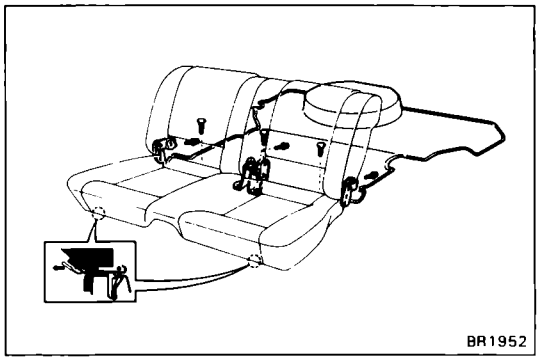
8. CHECK FOR FLUID LEAKAGE

9. CHECK ACTUATOR OPERATION
(See page BR-98)

REMOVAL OF A.B.S. ACTUATOR (4WD)

1. **TAKE OUT FLUID WITH SYRINGE OR AN EQUIVALENT**

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

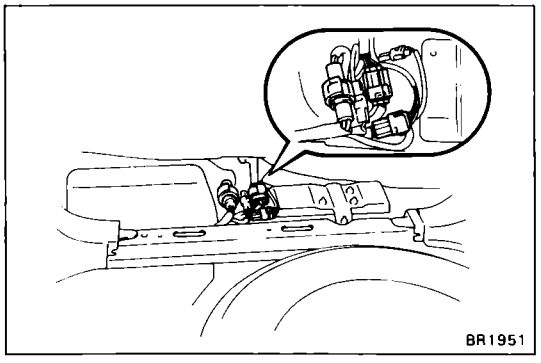

BR1952

2. **REMOVE REAR SEAT CUSHION AND SEAT BACKS**

(a) Remove the rear seat cushion.

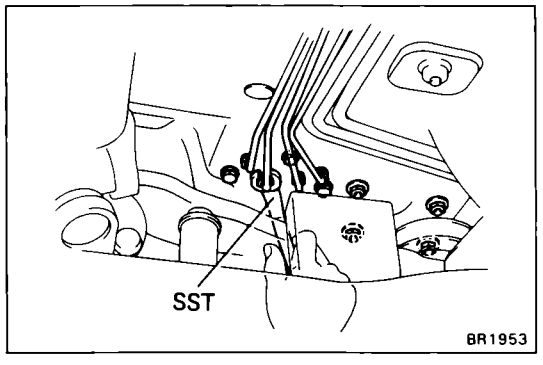
(b) Remove the three clips holding luggage compartment mat to the body.

(c) Remove the six bolts and remove the seat backs with luggage compartment cover.


BR1951

3. **DISCONNECT ACTUATOR CONNECTORS**

Disconnect the four connectors from the actuator.



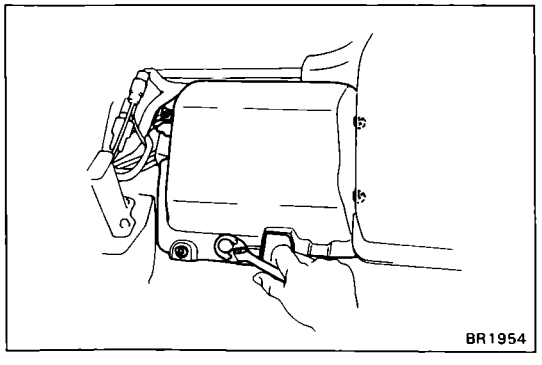
BR1953

4. **REMOVE ACTUATOR**

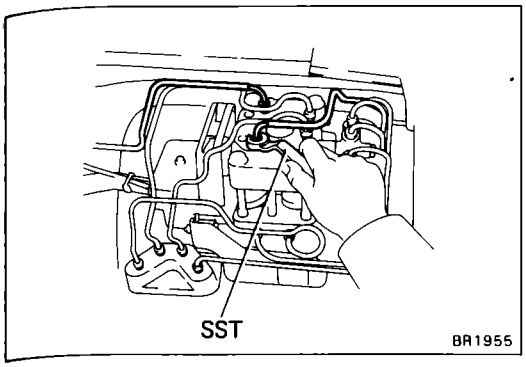
(a) Lift up the vehicle, and using SST, disconnect the four brake tubes from the tube connector.

SST 09751-36011

(b) Remove the three bolts and four nuts.


BR1954

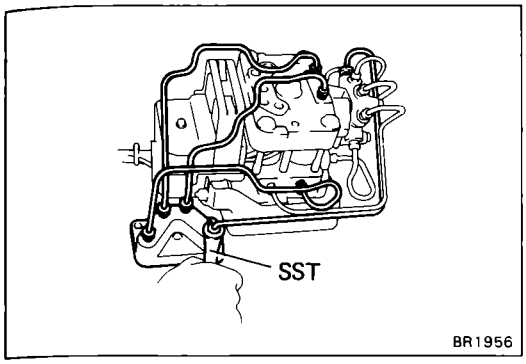
(c) Remove the five nuts, remove the actuator cover and rubber seat.



(d) Using SST, disconnect the two brake tubes from the actuator as shown.

SST 09751-36011

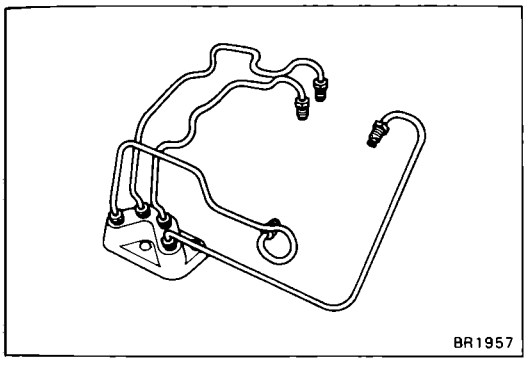
(e) Remove the actuator with bracket.



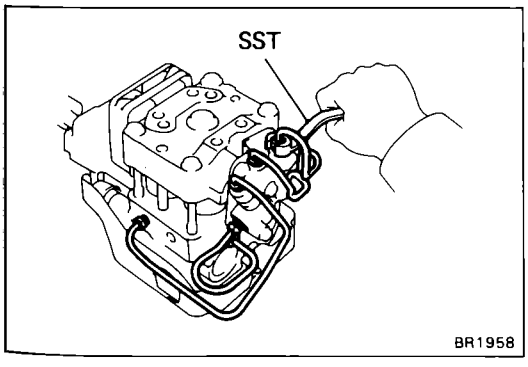
5. REMOVE BRAKE TUBES

(a) Using SST, remove the four brake tubes connecting to the tube connector and remove the tube connector.

SST 09751-36011

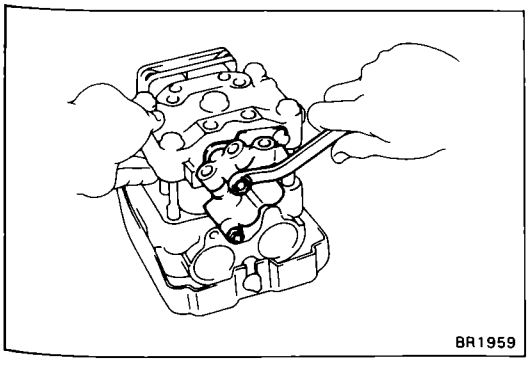


(b) Temporarily install the removed tubes to the tube connector.



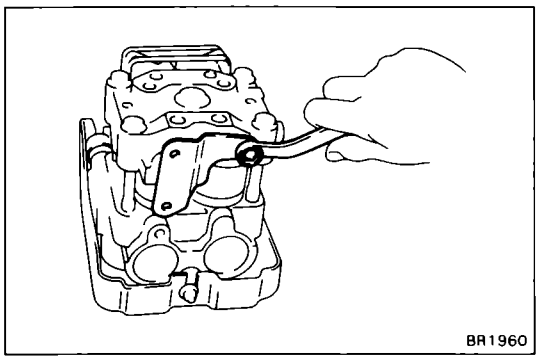
(c) Using SST, remove the four brake tubes from the actuator.

SST 09751-36011

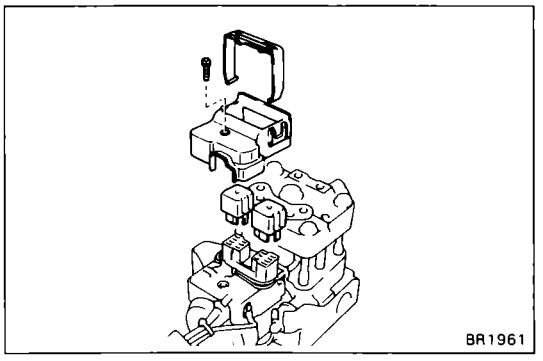


6. REMOVE PROPORTIONING VALVE

(a) Remove the two bolt and remove the proportioning valve from the actuator.



(b) Remove the bolt and remove the valve bracket.

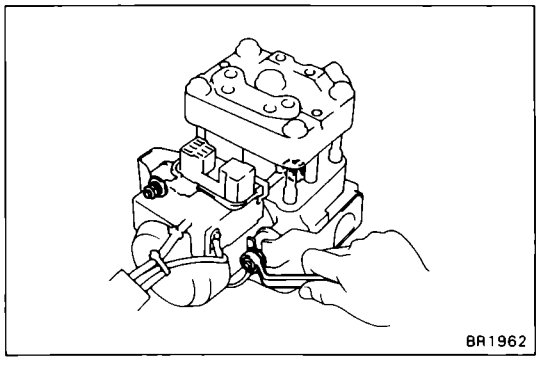


7. REMOVE CONTROL RELAYS

(a) Remove the screw and remove the relay case with relay cap.

(b) Remove the relay cap from the relay case.

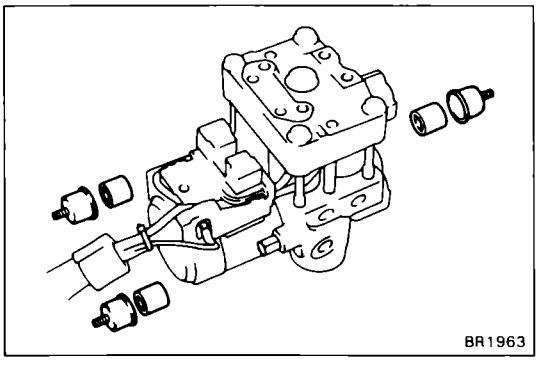
(c) Remove the two control relays from the actuator.



8. REMOVE ACTUATOR BRACKET

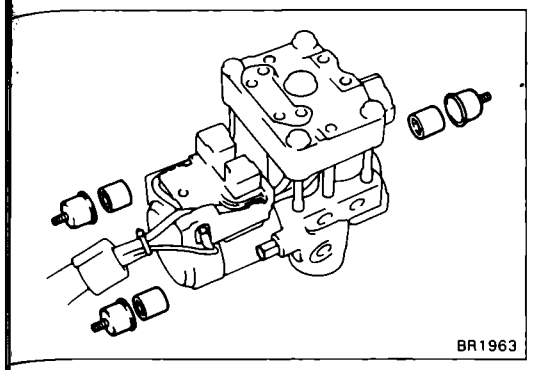
(a) Remove the three nuts, wave washers and washers.

(b) Remove the actuator from the actuator bracket.



9. REMOVE THREE HOLDERS AND CUSHIONS

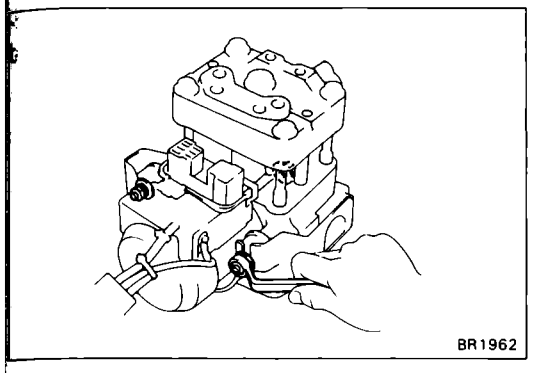
Remove the three holders and cushions.


BR1963

INSTALLATION OF BRAKE ACTUATOR

1. INSTALL THREE CUSHIONS AND HOLDERS

Install the three cushions to holders and install them to the actuator.


BR1962

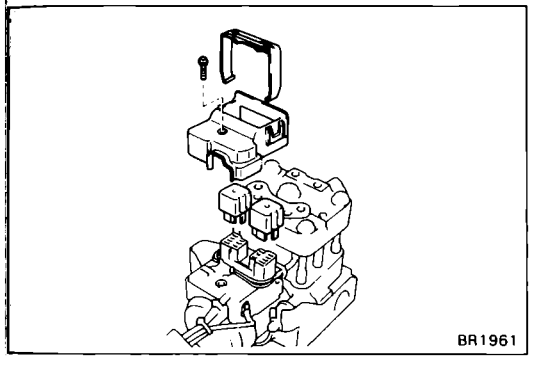
2. INSTALL ACTUATOR BRACKET

(a) Install the actuator to the actuator bracket in place.

(b) Install the washers, wave washers and nuts.

(c) Tighten the three nuts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

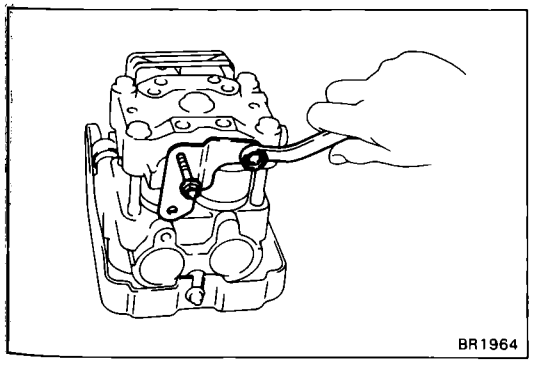

BR1961

3. INSTALL CONTROL RELAYS

(a) Install the two control relays in position.

(b) Install the relay case and tighten the screw.

(c) Install the relay cap onto the control relays.

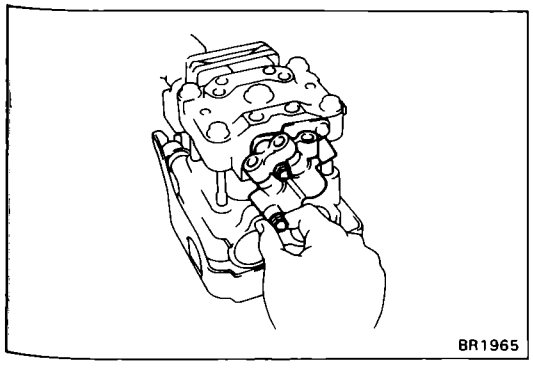

BR1964

4. INSTALL PROPORTIONING VALVE

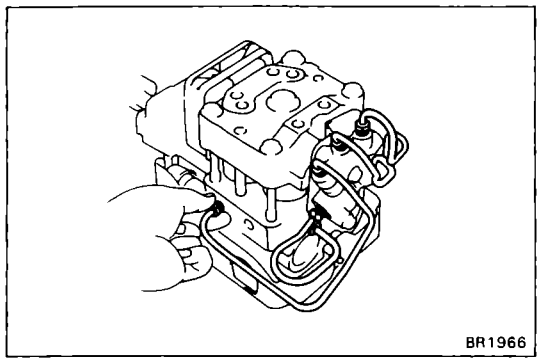
(a) Using a proportioning valve installation bolt, install the valve bracket in place and tighten the bolt.

Torque: 90 kg-cm (78 in.-lb, 8.8 N·m)

(b) Remove the proportioning valve installation bolt.

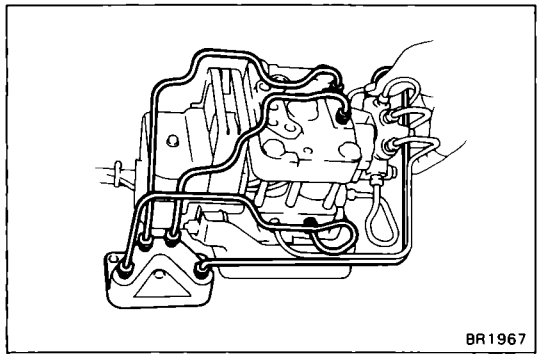

BR1965

(c) Temporarily install the proportioning valve.

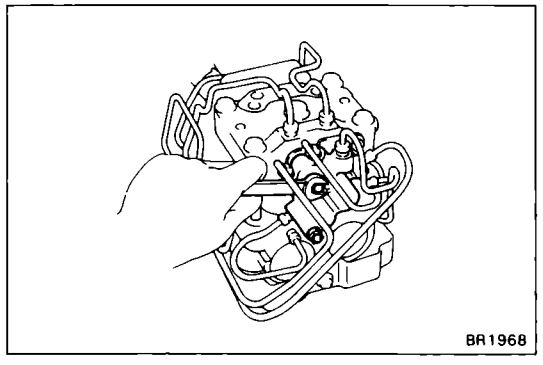

BR1966

5. INSTALL BRAKE TUBES

(a) Temporarily install the four brake tubes as shown.

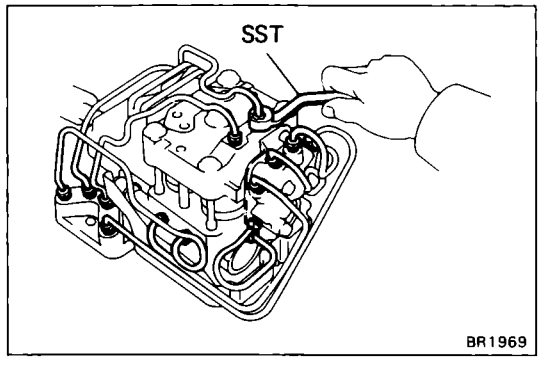

BR1967

(b) Remove the four brake tubes from the tube connector and temporarily install them to the actuator. And temporarily install the tube connector.


BR1968

(c) Tighten the two proportioning valve installation bolts.

Torque: 90 kg-cm (78 in.-lb, 8.8 N·m)

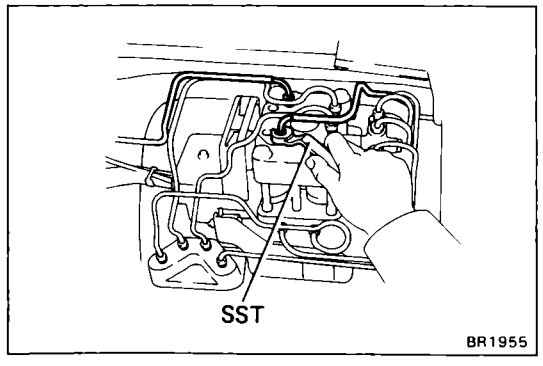


BR1969

(d) Using SST, tighten the eight brake tubes.

SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)



BR1955

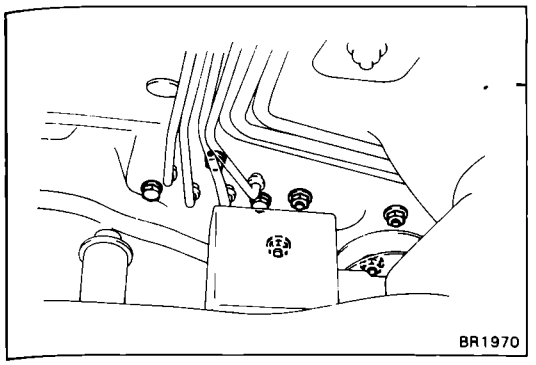
6. INSTALL ACTUATOR

(a) Install the actuator in place.

(b) Using SST, connect the two brake tubes to the actuator.

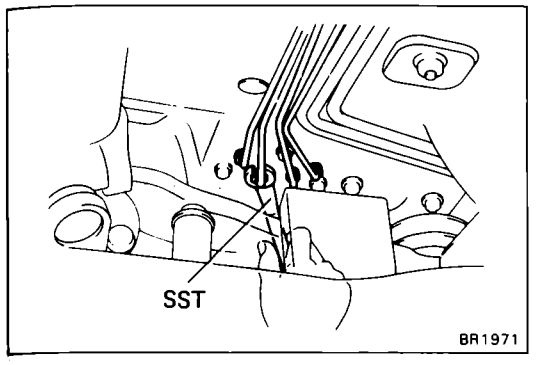
SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)



(c) Lift up the vehicle, install and tighten the three bolts and four nuts from the lower side of the vehicle.

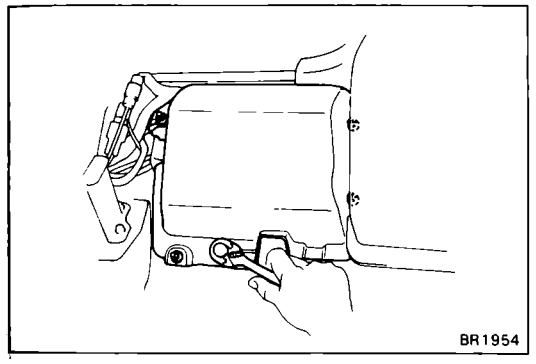
Torque: Bolt (Tube connector)
80 kg-cm (69 in.-lb, 7.8 N·m)
Nut (Actuator bracket)
130 kg-cm (9 ft-lb, 13 N·m)



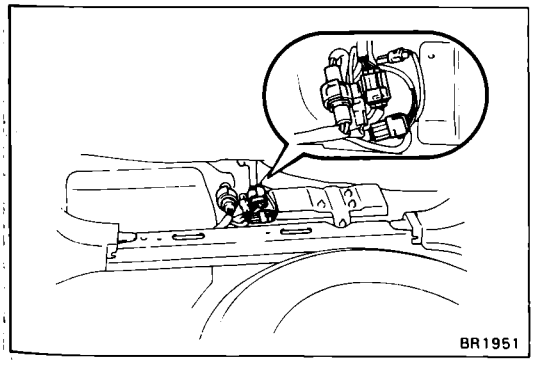
(d) Using SST, connect the four brake tubes to the tube connector.

SST 09751-36011

Torque: 260 kg-cm (19 ft-lb, 25 N·m)

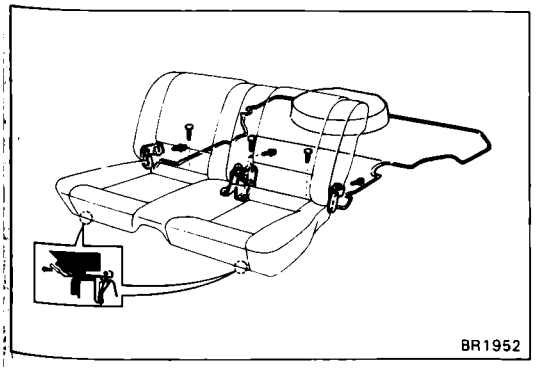


(e) Install the actuator cover and rubber seat in place, and tighten the five nuts.



7. CONNECT ACTUATOR CONNECTORS

Connect the four connectors to the actuator.



8. INSTALL REAR SEAT BACKS AND SEAT CUSHION

(a) Install the seat backs with the six bolts.

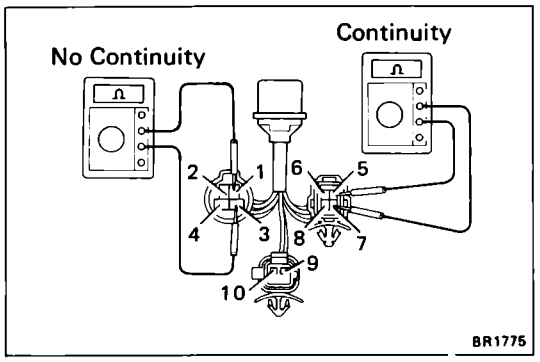
(b) Install the three clips.

(c) Install the seat cushion.

9. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM

10. CHECK FOR FLUID LEAKAGE

11. CHECK ACTUATOR OPERATION
(See page BR-98)



Control Relay (2WD)

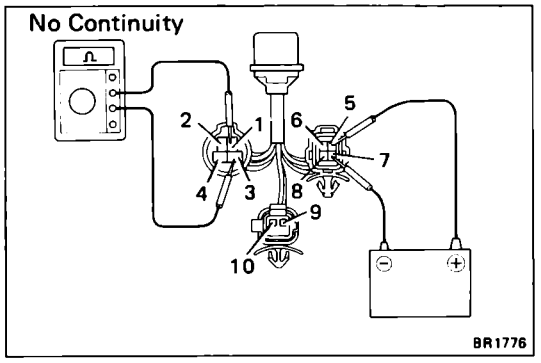
INSPECTION OF CONTROL RELAY

1. INSPECT CONTINUITY OF MOTOR RELAY CIRCUIT

(a) Check that there is continuity between terminals 5 and 7.

(b) Check that there is no continuity between terminals 1 and 3.

If continuity is not as specified, replace the relay.

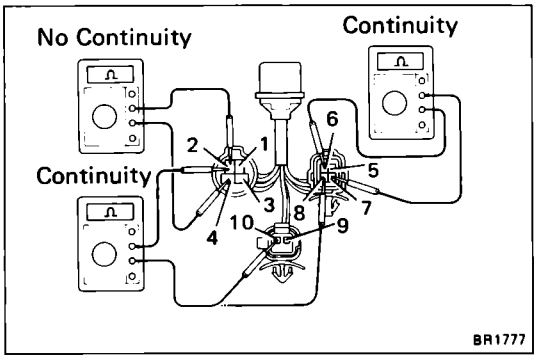


2. INSPECT OPERATION OF MOTOR RELAY CIRCUIT

(a) Connect the positive (+) lead from the battery to terminal 5 and negative (−) lead to terminal 7.

(b) Check that there is continuity between terminals 1 and 3.

If operation is not as specified, replace the relay.

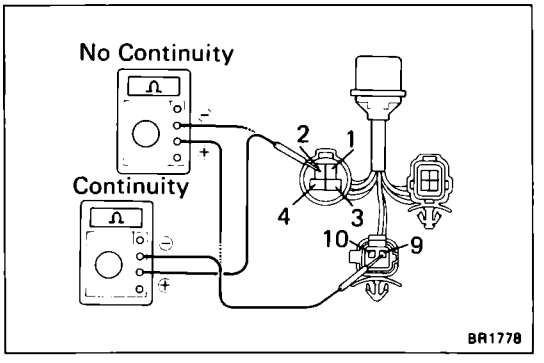


3. INSPECT CONTINUITY OF SOLENOID RELAY CIRCUIT

(a) Check that there is continuity between terminals 6 and 7.

(b) Check that there is no continuity between terminals 2 and 4.

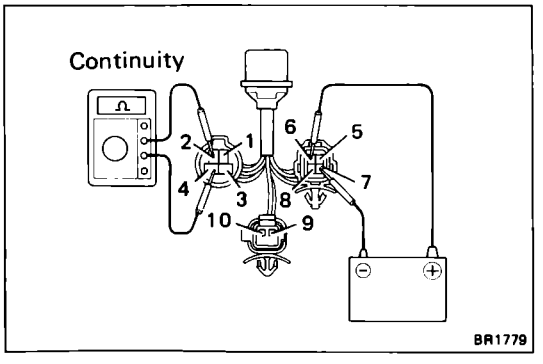
(c) Check that there is continuity between terminals 2 and 10 or 8.



(d) Connect the positive lead from the ohmmeter to terminal 2 and connect negative lead to terminal 9. Check that there is continuity between terminals.

(e) Connect the two leads in reverse, and check that there is no continuity between terminals.

If continuity is not as specified, replace the relay.

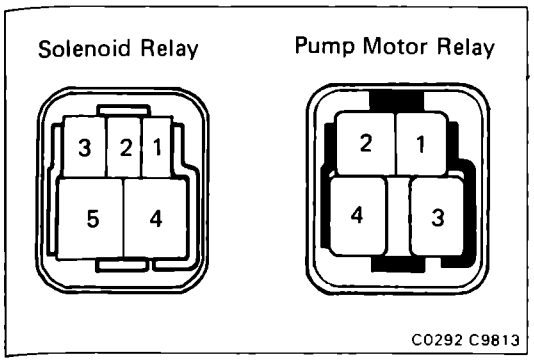


4. INSPECT OPERATION OF SOLENOID RELAY CIRCUIT

(a) Connect the positive (+) lead from the battery to terminal 6 and negative (−) lead to terminal 7.

(b) Check that there is continuity between terminals 2 and 4.

If operation is not as specified, replace the relay.

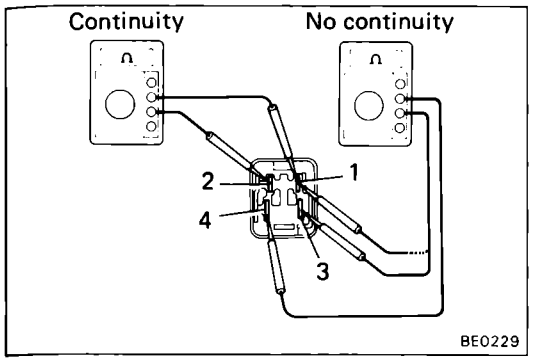


Control Relay (4WD)

INSPECTION OF CONTROL RELAYS

1. **REMOVE CONTROL RELAYS**

Remove the two control relays from the actuator.



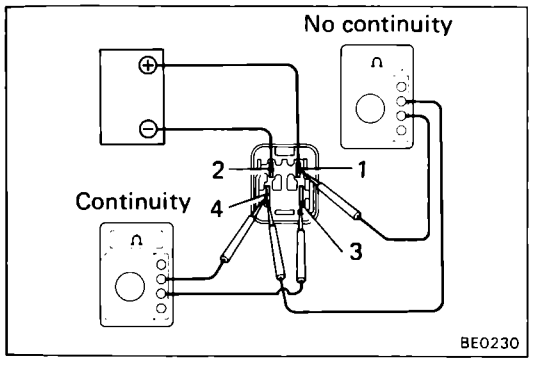
2. **INSPECT PUMP MOTOR RELAY CONTINUITY**

(a) Check that there is continuity between terminals 1 and 2.

(b) Check that there is no continuity between terminals 3 and 4.

(c) Check that there is no continuity between terminals 1 and 4.

If continuity is not as specified, replace the relay.



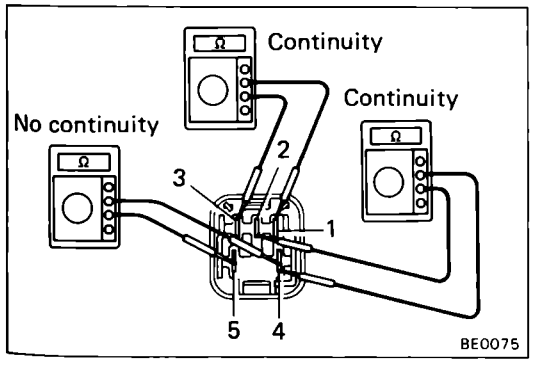
3. **INSPECT PUMP MOTOR RELAY OPERATION**

(a) Apply battery voltage to terminals 1 and 2.

(b) Check that there is continuity between terminals 3 and 4.

(c) Check that there is no continuity between terminals 1 and 4.

If operation is not as specified, replace the relay.



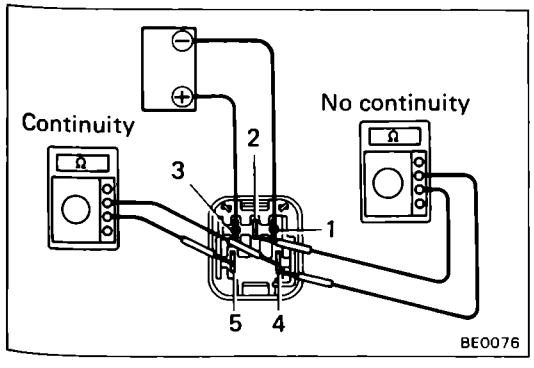
4. **INSPECT SOLENOID RELAY CONTINUITY**

(a) Check that there is continuity between terminals 1 and 3.

(b) Check that there is continuity between terminals 2 and 4.

(c) Check that there is no continuity between terminals 4 and 5.

If continuity is not as specified, replace the relay.



5. **INSPECT SOLENOID RELAY OPERATION**

(a) Apply battery voltage to terminals 1 and 3.

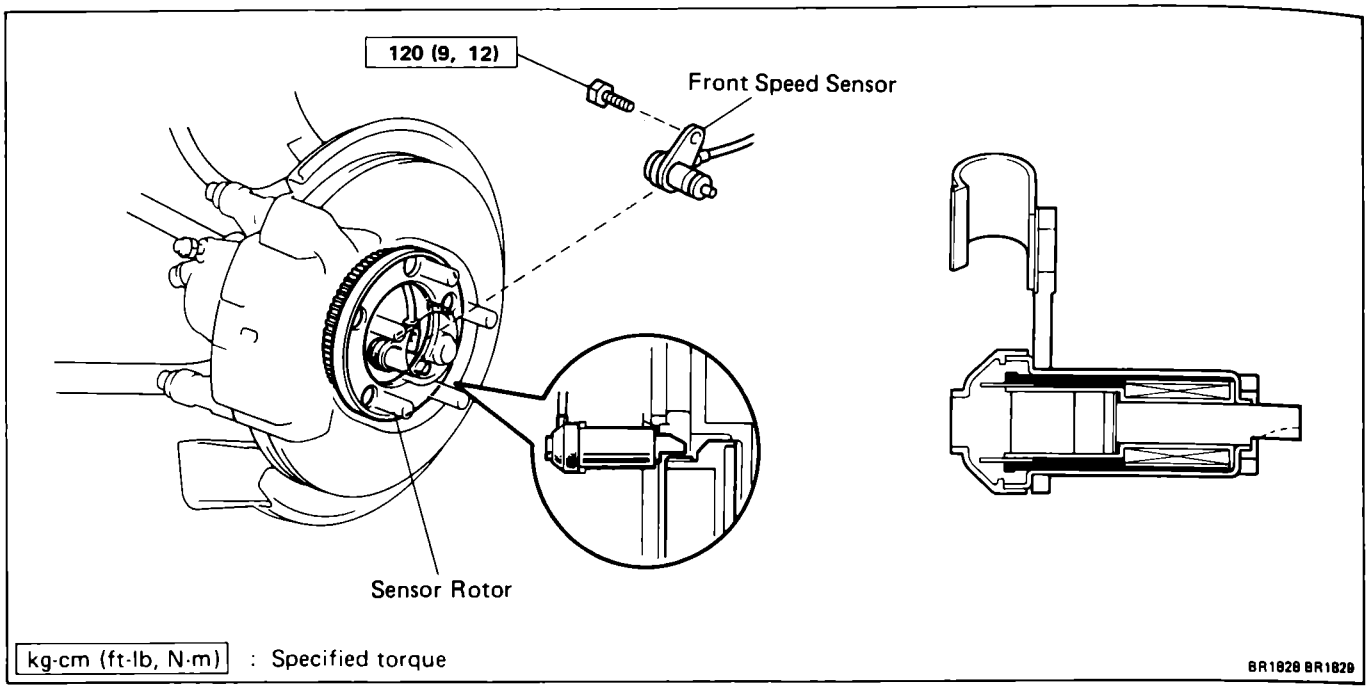
(b) Check that there is continuity between terminals 4 and 5.

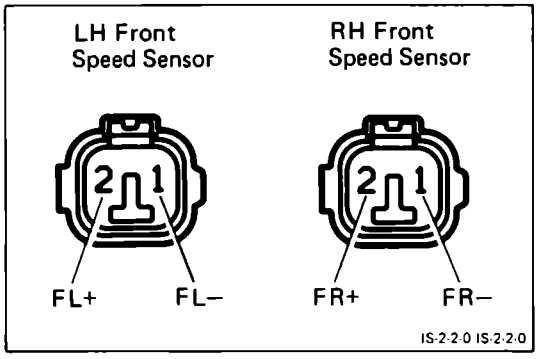
(c) Check that there is no continuity between terminals 2 and 4.

If operation is not as specified, replace the relay.

6. **INSTALL TWO CONTROL RELAYS**

Front Speed Sensor (2WD)





INSPECTION OF FRONT SPEED SENSOR

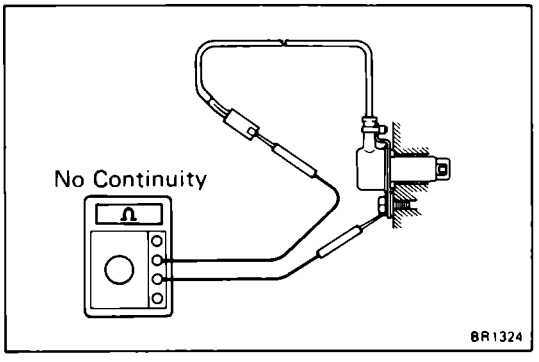
1. **INSPECT SPEED SENSOR**

(a) Disconnect the speed sensor connector.

(b) Measure the resistance between terminals.

Resistance: 0.85 — 1.30 kΩ

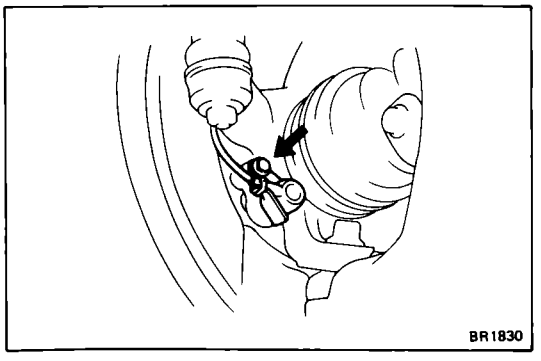
If resistance value is not as specified, replace the sensor.



(c) Check that there is no continuity between each terminal and sensor body.

If there is continuity, replace the sensor.

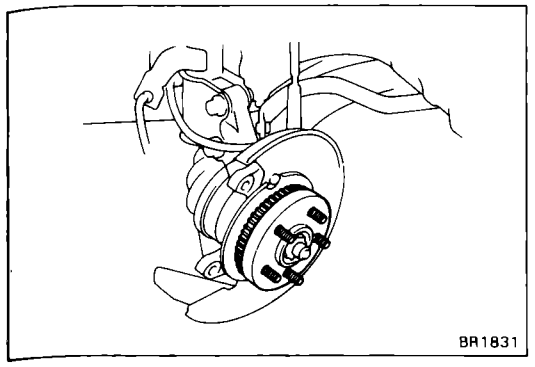
(d) Connect the speed sensor connector.

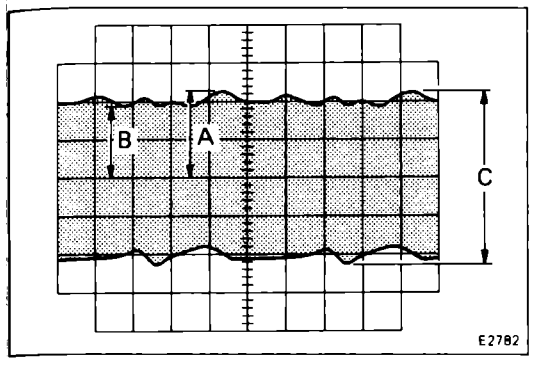


2. **INSPECT SENSOR INSTALLATION**

Check that the sensor installation bolt is tightened properly. If not, tighten the bolt.

Torque: 120 kg-cm (9 ft-lb, 12 N·m)





3. VISUALLY INSPECT SENSOR ROTOR SERRATIONS

(a) Remove the two bolts and remove the torque plate with brake cylinder.

(b) Remove the rotor disc.

(c) Inspect the sensor rotor serrations for scratches, cracks, warping or missing teeth.

(d) Install the rotor disc and brake clinder assembly with two bolts.

Torque: 960 kg-cm (69 ft-lb, 94 N·m)

CAUTION: To prevent damage to the serrations, do not strike the axle hub.

INSPECTION OF FRONT SPEED SENSOR AND SENSOR ROTOR SERRATIONS (REFERENCE)

INSPECT FRONT SPEED SENSOR AND SENSOR ROTOR SERRATIONS BY USING AN OSCILLOSCOPE

(a) Connect an oscilloscope to the speed sensor connector.

(b) Run the vehicle at 20 km/h (12.4 mph), and inspect speed sensor output wave.

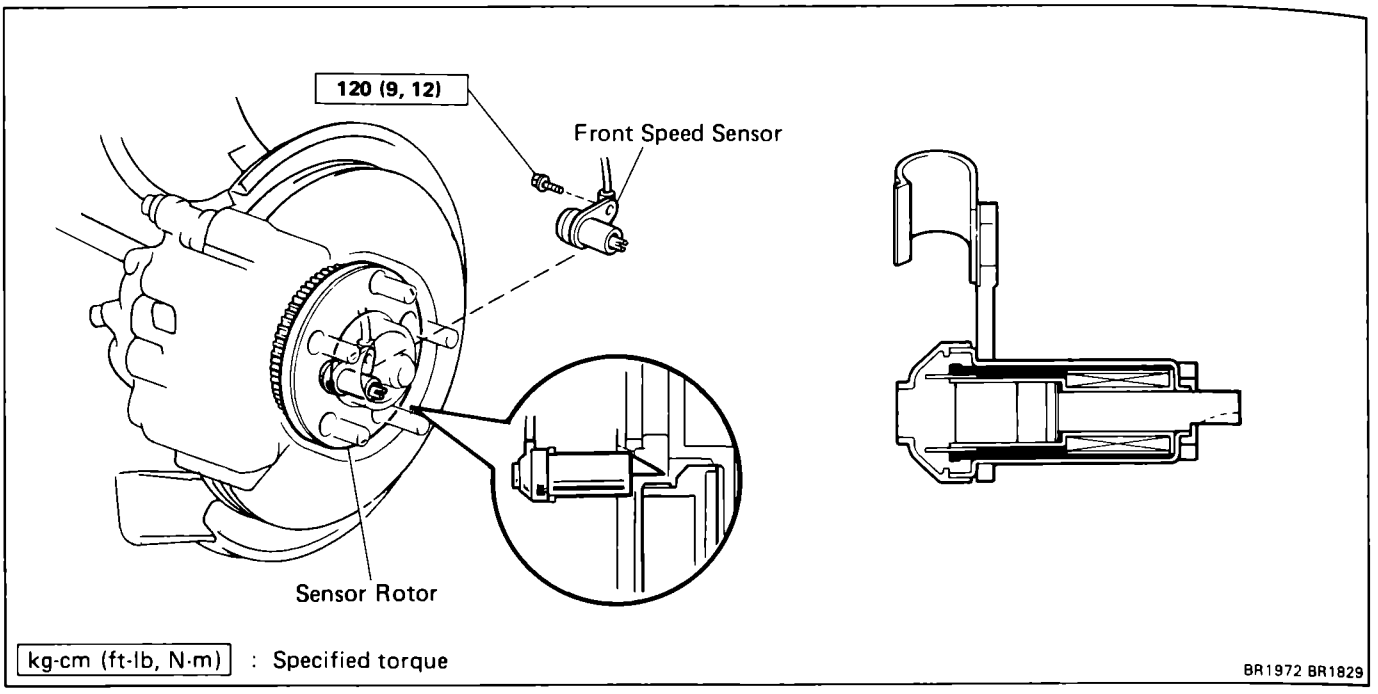
(c) Check that C is 0.5 V or more.

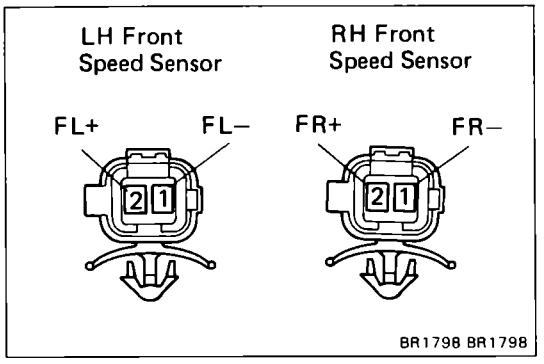
If not as specified, replace the speed sensor.

(d) Check that B is 70% or more of A.

If not as specified, replace the sensor rotor.

Front Speed Sensor (4WD)





INSPECTION OF FRONT SPEED SENSOR

1. INSPECT SPEED SENSOR

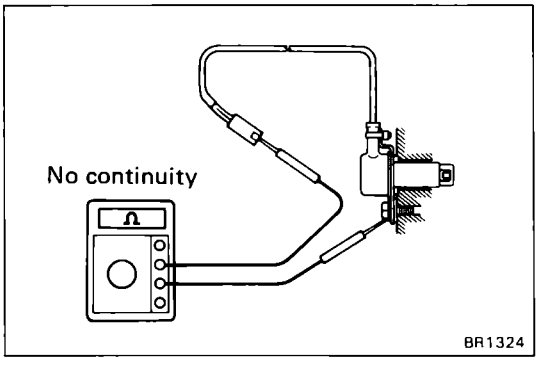
(a) Remove the screw and bolt from the pipe clamp of the wire harness.

(b) Disconnect the speed sensor connector.

(c) Measure the resistance between terminals.

Resistance: 0.85 — 1.30 kΩ

If resistance value is not as specified, replace the sensor.

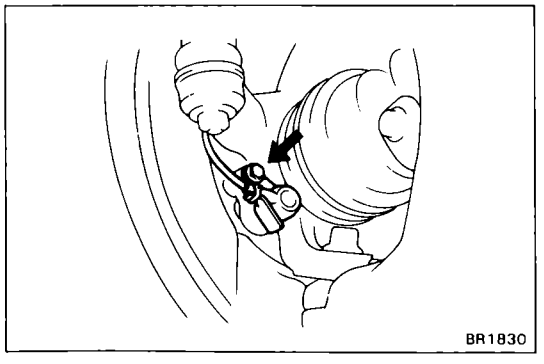


(d) Check that there is no continuity between each terminal and sensor body.

If there is continuity, replace the sensor.

(e) Connect the speed sensor connector.

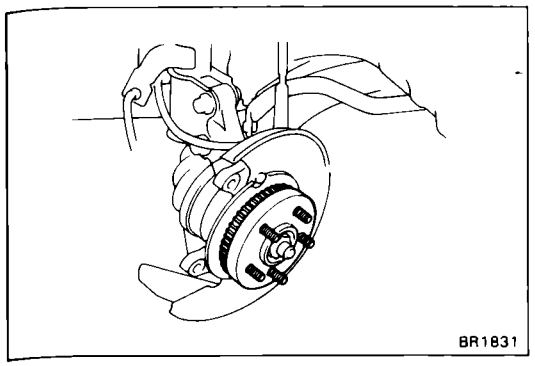
(f) Install the screw and bolt of the pipe clamp.



2. INSPECT SENSOR INSTALLATION

Check that the sensor installation bolt is tightened properly. If not, tighten the bolt.

Torque: 120 kg-cm (9 ft-lb, 12 N·m)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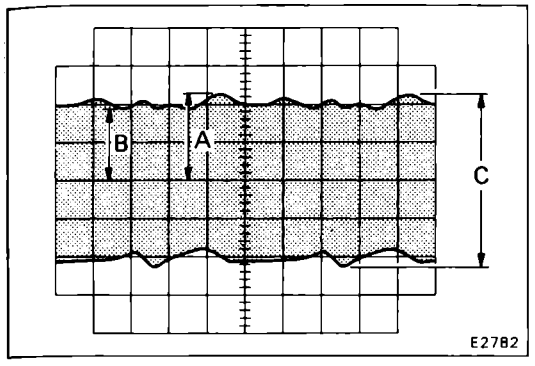

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3. **VISUALLY INSPECT SENSOR ROTOR SERRATIONS**

(a) Remove the two bolts and remove the torque plate with brake cylinder.

(b) Remove the rotor disc.

(c) Inspect the sensor rotor serrations for scratches, cracks, warping or missing teeth.

(d) Install the rotor disc and brake cylinder assembly with two bolts.

Torque: 1,015 kg-cm (73 ft-lb, 100 N·m)

CAUTION: To prevent damage to the serrations, do not strike the axle hub.

INSPECTION OF FRONT SPEED SENSOR AND SENSOR ROTOR SERRATIONS (REFERENCE)

INSPECT FRONT SPEED SENSOR AND SENSOR ROTOR SERRATIONS BY USING AN OSCILLOSCOPE

(a) Connect an oscilloscope to the speed sensor connector.

(b) Run the vehicle at 20 km/h (12.4 mph), and inspect speed sensor output wave.

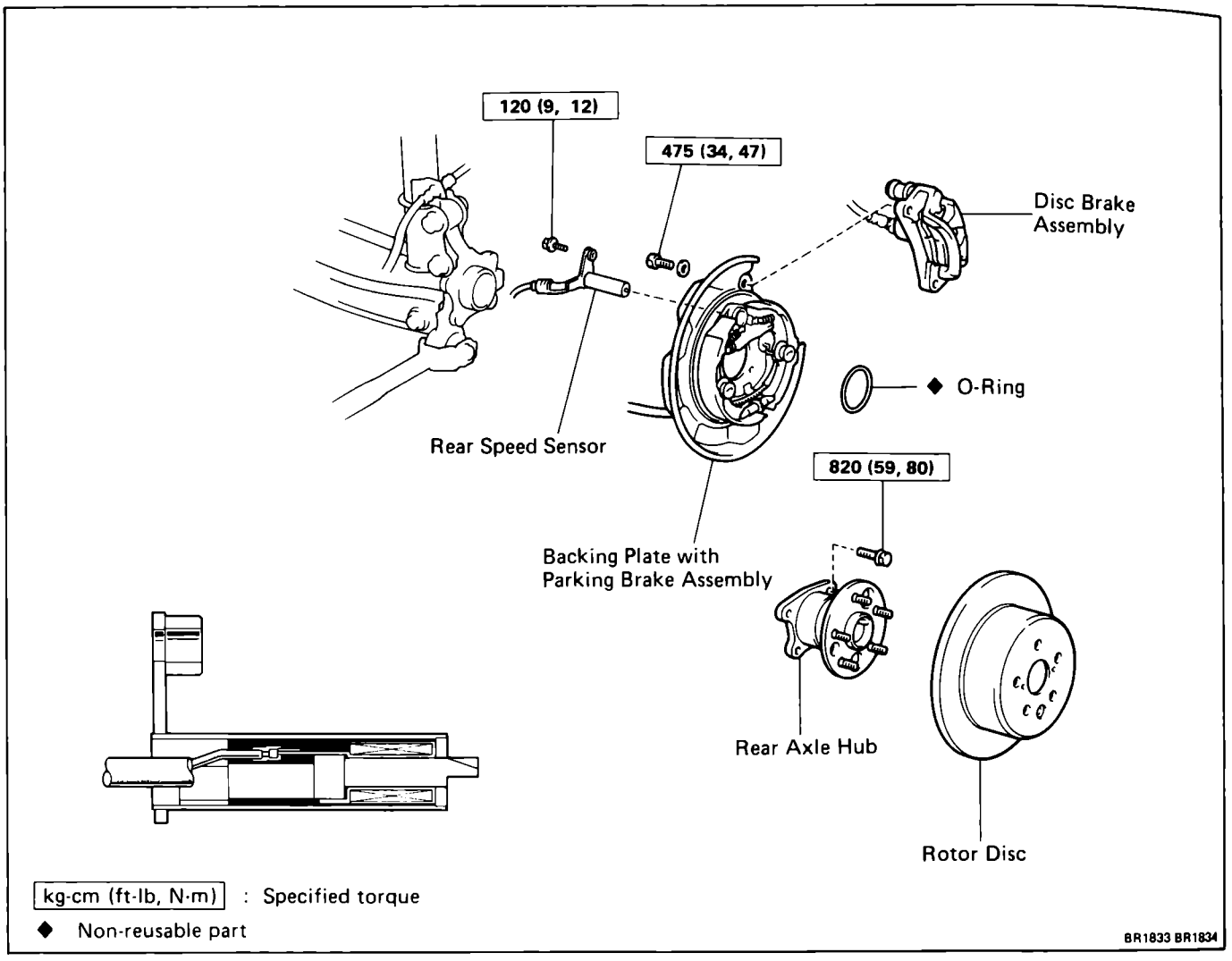
(c) Check that C is 0.5 V or more.

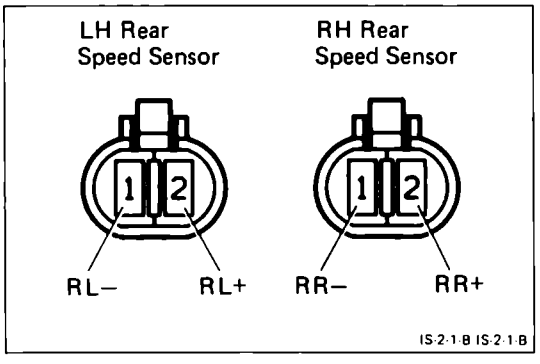
If not as specified, replace the speed sensor.

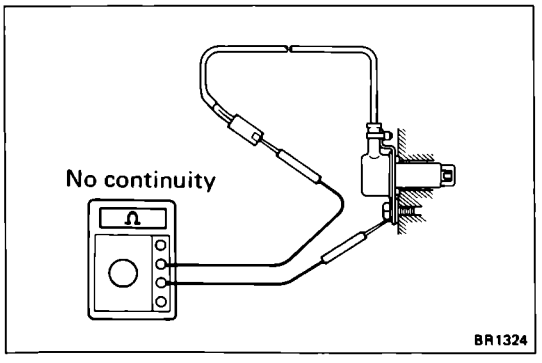
(d) Check that B is 70% or more of A.

If not as specified, replace the sensor rotor.

Rear Speed Sensor (2WD)







INSPECTION OF REAR SPEED SENSOR

1. **INSPECT SPEED SENSOR**

(a) Disconnect the speed sensor connector.

(b) Measure the resistance between terminals.

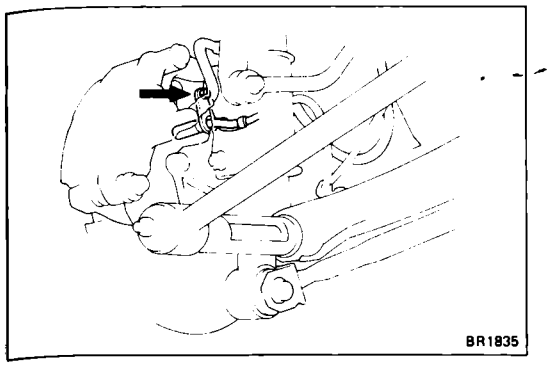
Resistance: 0.85 — 1.30 kΩ

If resistance value is not as specified, replace the sensor.

(c) Check that there is no continuity between each terminal and sensor body.

If there is continuity, replace the sensor.

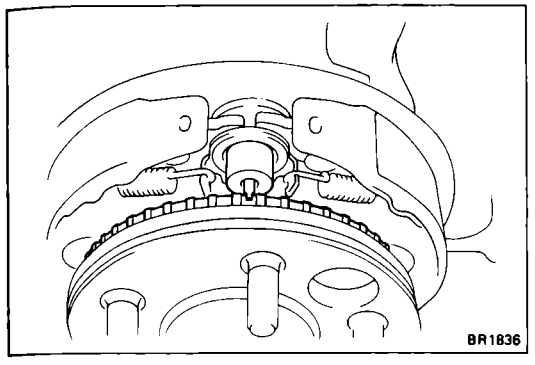
(d) Connect the speed sensor connector.



2. **INSPECT SENSOR INSTALLATION**

Check that the sensor installation bolt is tightened properly. If not, tighten the bolt.

Torque: 120 kg-cm (9 ft-lb, 12 N·m)



3. **VISUALLY INSPECT SENSOR ROTOR SERRATIONS**

(a) Remove the two bolts and remove the torque plate with brake cylinder.

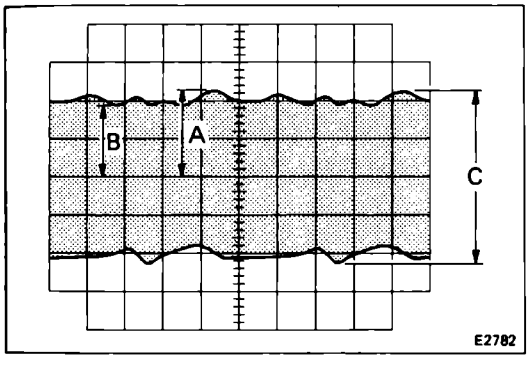
(b) Remove the rotor disc.

(c) Inspect the sensor rotor serrations for scratches, cracks, warps or missing teeth.

(d) Install the rotor disc and brake cylinder assembly with two bolts.

Torque: 475 kg-cm (34 ft-lb, 47 N·m)

CAUTION: To prevent damage to the serrations, do not strike the axle hub.



INSPECTION OF REAR SPEED SENSOR AND SENSOR ROTOR SERRATIONS (REFERENCE)

INSPECT REAR SPEED SENSOR AND SENSOR ROTOR SERRATIONS BY USING AN OSCILLOSCOPE

(a) Connect an oscilloscope to the speed sensor connector.

(b) Run the vehicle at 20 km/h (12.4 mph), and inspect speed sensor output wave.

(c) Check that C is 0.5 V or more.

If not as specified, replace the speed sensor.

(d) Check that B is 70% or more of A.

If not as specified, replace the rear axle hub.

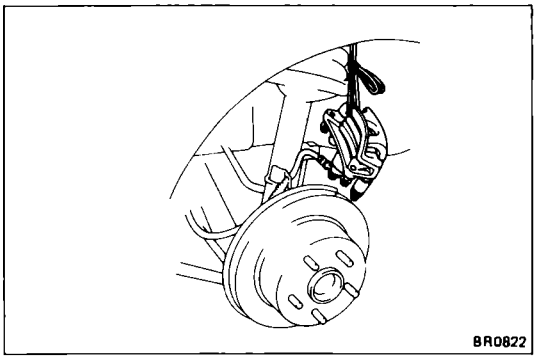
REMOVAL OF REAR SPEED SENSOR

1. DISCONNECT SPEED SENSOR CONNECTOR

(a) Remove the seat cushion.

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

(c) Remove the two clamp bolts holding the sensor wire harness to the body and suspension arm.

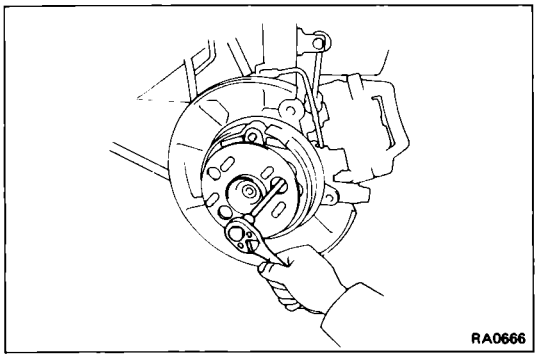


2. REMOVE REAR BRAKE ASSEMBLY

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

(b) Suspend the disc brake so the hose is not stretched.

3. REMOVE ROTOR DISC

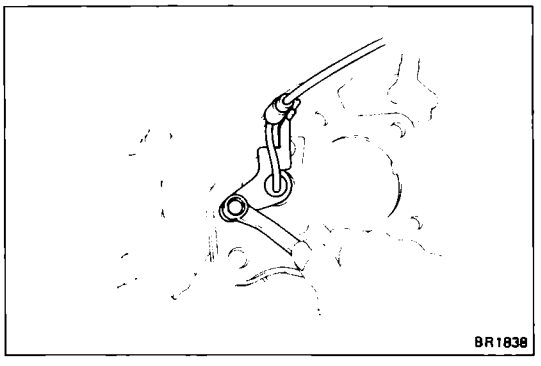


4. REMOVE REAR AXLE HUB

(a) Remove the four axle hub mounting bolts.

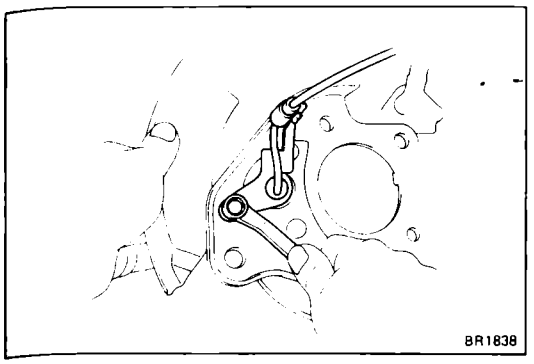
(b) Remove the rear axle hub.

(c) Remove the backing plate with parking brake assembly and O-ring.



5. REMOVE SPEED SENSOR

Remove the bolt and remove the speed sensor from the backing plate.

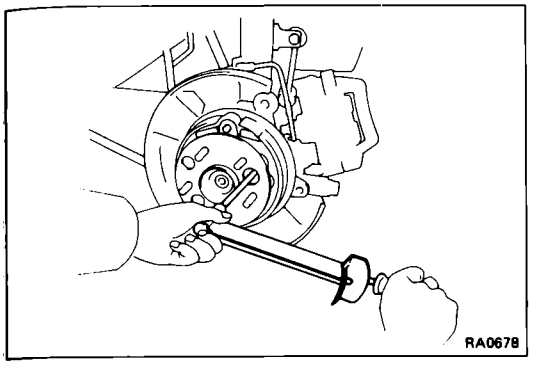


INSTALLATION OF REAR SPEED SENSOR

1. INSTALL SPEED SENSOR

Install the speed sensor to the backing plate with a bolt.

Torque: 120 kg-cm (9 ft-lb, 12 N·m)



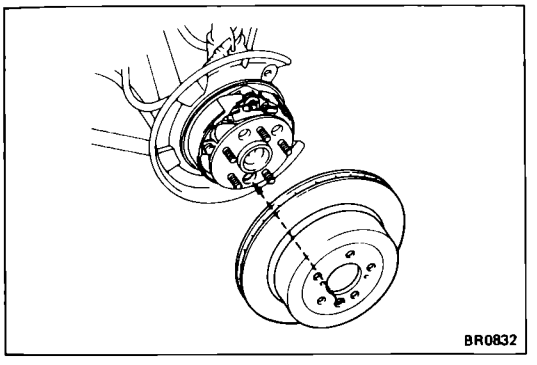
2. INSTALL REAR AXLE HUB

(a) Install the backing plate with parking brake assembly in place.

(b) Install a new O-ring to the axle carrier.

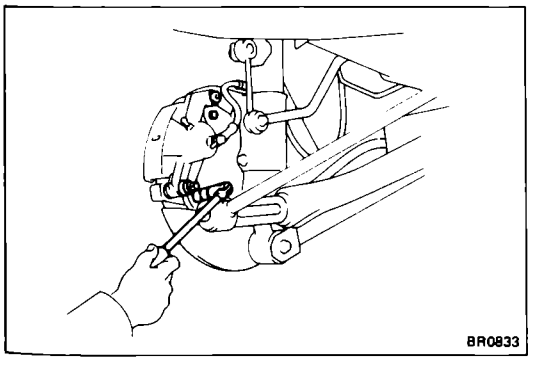
(c) Install the rear axle hub with the four bolts.

Torque: 820 kg-cm (59 ft-lb, 80 N·m)



3. INSTALL ROTOR DISC

Align the hole on the axle hub and service hole on the disc, and install the rotor disc.



4. INSTALL REAR BRAKE ASSEMBLY

Install the disc brake assembly and torque the two mounting bolts.

Torque: 475 kg-cm (34 ft-lb, 47 N·m)

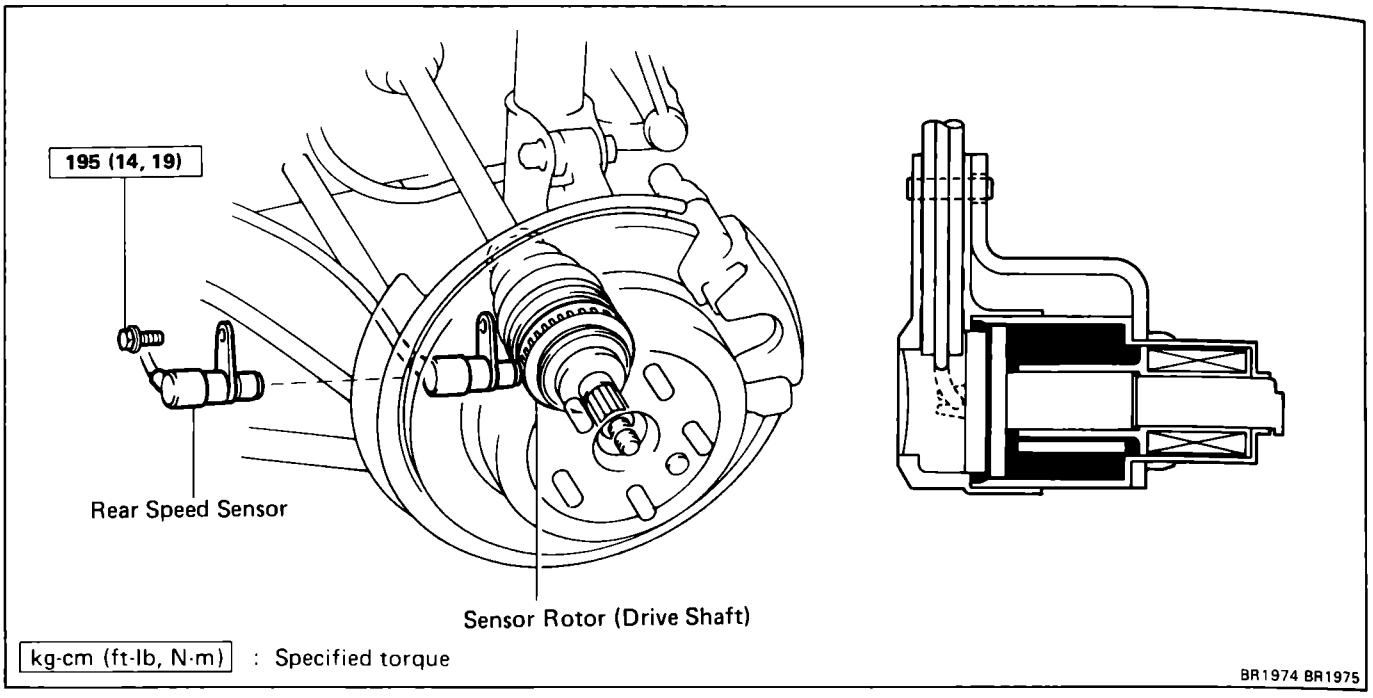
5. CONNECT SPEED SENSOR CONNECTOR

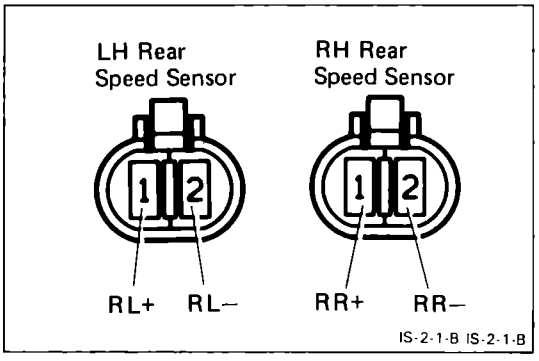
(a) Install the wire harness with clamps and bolts in place.

(b) Insert the wire harness connector to inside of the vehicle, and connect the connector.

(c) Install the seat cushion.

Rear Speed Sensor (4WD)





INSPECTION OF REAR SPEED SENSOR

1. **INSPECT SPEED SENSOR**

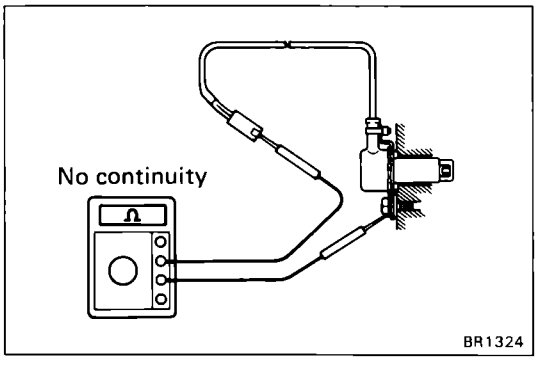
(a) Remove the rear seat cushion.

(b) Disconnect the speed sensor connector.

(c) Measure the resistance between terminals.

Resistance: 0.85 — 1.30 kΩ

If resistance value is not as specified, replace the sensor.

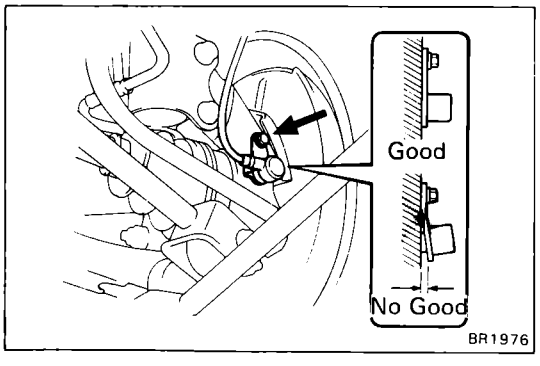


(d) Check that there is no continuity between each terminal and sensor body.

If there is continuity, replace the sensor.

(e) Connect the speed sensor connector.

(f) Install the rear seat cushion.



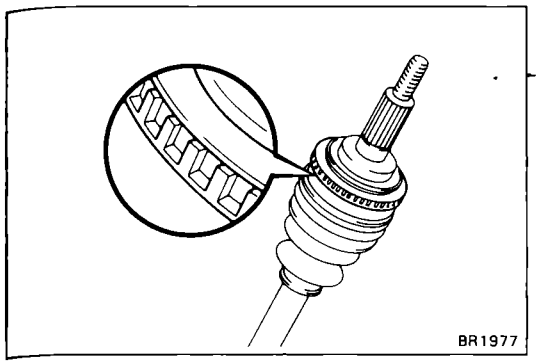
2. **INSPECT SENSOR INSTALLATION**

(a) Check that the sensor installation bolt is tightened properly. If not, tighten the bolt.

Torque: 195 kg-cm (14 ft-lb, 19 N·m)

(b) Check that there is no clearance between the sensor and rear axle carrier as shown.

If there is clearance, replace the sensor.



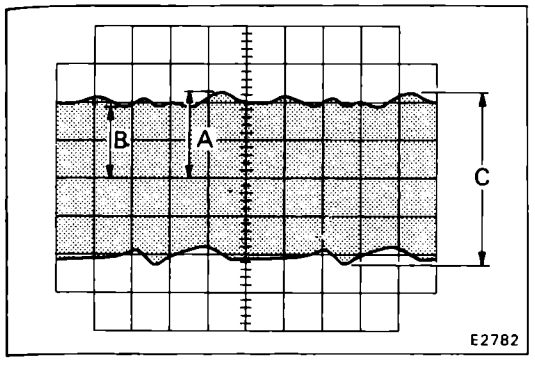
3. VISUALLY INSPECT SENSOR ROTOR SERRATIONS

(a) Remove the drive shaft.
(See page RA-21)

(b) Inspect the sensor rotor serrations for scratches, cracks, warping or missing teeth.

(c) Install the drive shaft.
(See page RA-26)

CAUTION: To prevent damage to the serrations, do not strike the drive shaft.



INSPECTION OF REAR SPEED SENSOR AND SENSOR ROTOR SERRATIONS (REFERENCE)

INSPECT REAR SPEED SENSOR AND SENSOR ROTOR SERRATIONS BY USING AN OSCILLOSCOPE

(a) Connect an oscilloscope to the speed sensor connector.

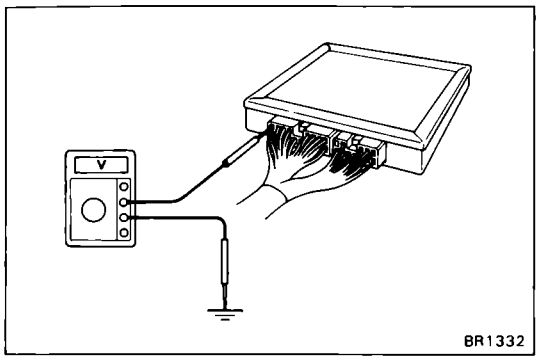
(b) Run the vehicle at 20 km/h (12.4 mph), and inspect speed sensor output wave.

(c) Check that C is 0.5 V or more.

If not as specified, replace the speed sensor.

(d) Check that B is 60 % or more of A.

If not as specified, replace the rear axle hub.



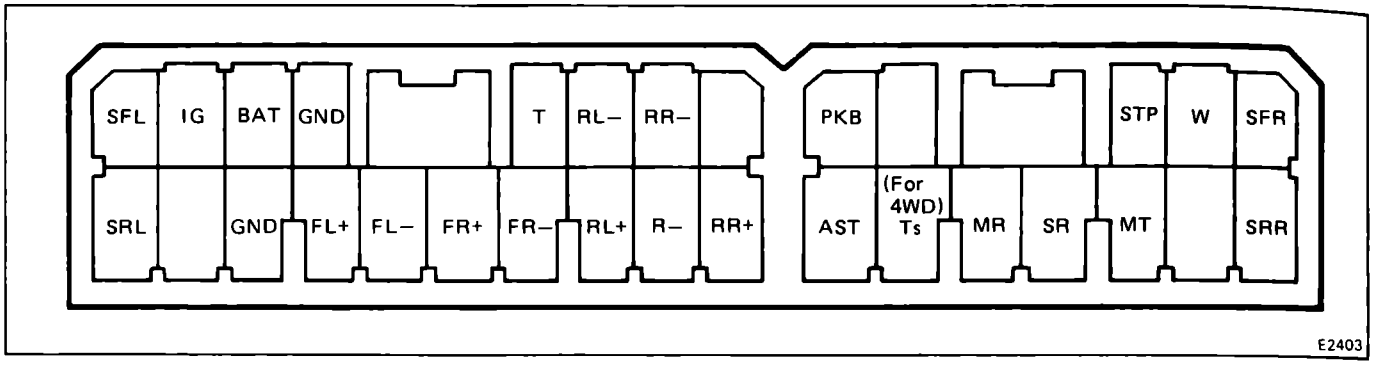
Anti-lock Brake System Circuit

INSPECTION OF SYSTEM CIRCUIT

1. INSPECT SYSTEM CIRCUIT WITH CONNECTOR CONNECTED

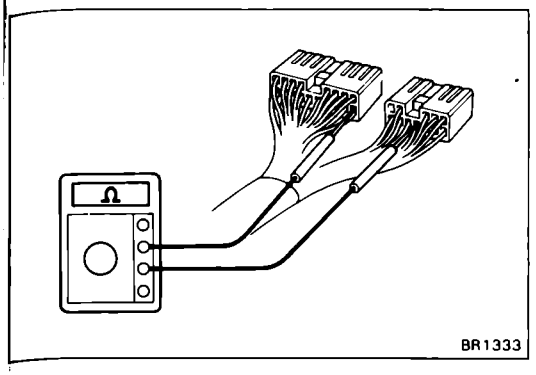
(a) Pull out the A.B.S. computer.

(b) Using a voltmeter with high impedance (10 kΩ/V minimum), measure the voltage at each terminal and body ground.



Tester Connection	Condition	Voltage	Trouble Part
SFL – Body ground	Ignition switch on	Battery voltage	Actuator, control relays
	Ignition switch on and "ANTI-LOCK" warning light goes on	About 0 V	
SFR – Body ground	Ignition switch on	Battery voltage	
	Ignition switch on and "ANTI-LOCK" warning light goes on	About 0 V	
SRL – Body ground	Ignition switch on	Battery voltage	
	Ignition switch on and "ANTI-LOCK" warning light goes on	About 0 V	
SRR – Body ground	Ignition switch on	Battery voltage	
	Ignition switch on and "ANTI-LOCK" warning light goes on	About 0 V	
AST – Body ground	Ignition switch on	Battery voltage	
	Ignition switch on and "ANTI-LOCK" warning light goes on	About 0 V	
W – Body ground	Ignition switch on	Battery voltage	"ANTI-LOCK" warning light bulb
	Ignition switch on and "ANTI-LOCK" warning light goes on	About 0 V	
T – Body ground	Check connector disconnected	Battery voltage	Check connector, computer
	Check connector connected	About 0 V	

If the circuit is not as specified, check and repair or replace the trouble part shown in the table above.



2. INSPECT SYSTEM CIRCUIT WITH CONNECTOR DISCONNECTED

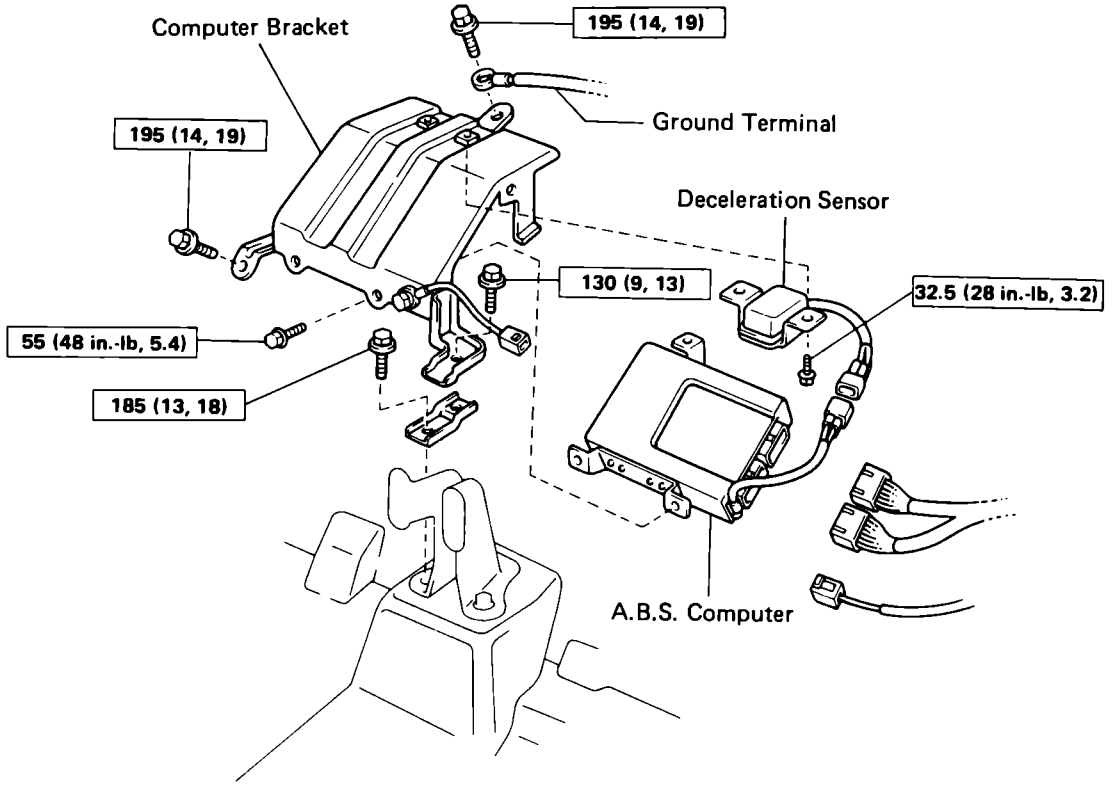
(a) Disconnect the connectors from the computer, inspect at the wire harness side connector.

Tester Connection	Check Item	Condition	Voltage or Resistance Value	Trouble Part
SFR – AST	Resistance	Ignition switch off	About 6 Ω	Actuator
STP – Body ground	Voltage	Ignition switch off and brake pedal depressed	Battery voltage	Stop light switch, stop light
	Continuity	Ignition switch off and brake pedal returned	Continuity	
PKB – Body ground	Voltage	Ignition switch on and PKB lever pulled	About 0 V	Parking brake switch, level warning switch
		Ignition switch on and PKB lever returned	Battery voltage	
SRR – AST	Resistance	Ignition switch off	About 6 Ω	Actuator
MT – Body ground	Continuity	Ignition switch off	Continuity	
SR – R⊖	Resistance	Ignition switch off	65 – 100 Ω	
MR – R⊖	Resistance	Ignition switch off	50 – 80 Ω	
Ts – Body ground (For 4WD)	Continuity	–	No continuity	Ts connector, wiring harness
		Ts connector shorted	Continuity	
AST – Body ground	Resistance	Ignition switch off	About 5 Ω	Wiring harness
RR⊖ – Body ground	Continuity	Ignition switch off	No continuity	Rear RH speed sensor
RL⊖ – Body ground	Continuity	Ignition switch off	No continuity	Rear LH speed sensor
T – Body ground	Continuity	Ignition switch off	Continuity	Check connector, wiring harness
GND – Body ground	Continuity	Ignition switch off	Continuity	Wiring harness
BAT – Body ground	Voltage	–	Battery voltage	FOG fuse
IG – Body ground	Voltage	Ignition switch on	Battery voltage	ECU-IG fuse
SFL – AST	Resistance	Ignition switch off	About 6 Ω	Actuator
RR⊕ – RR⊖	Resistance	–	0.85 – 1.30 kΩ	Rear RH speed sensor
R⊖ – Body ground	Continuity	Ignition switch off	No continuity	Wiring harness
RL⊕ – RL⊖	Resistance	–	0.85 – 1.30 kΩ	Rear LH speed sensor
FR⊖ – Body ground	Continuity	–	No continuity	Front RH speed sensor
FR⊕ – FR⊖	Resistance	–	0.85 – 1.30 kΩ	
FL⊖ – Body ground	Continuity	–	No continuity	Front LH speed sensor
FL⊕ – FL⊖	Resistance	–	0.85 – 1.30 kΩ	
SRL – AST	Resistance	Ignition switch off	About 6 Ω	Actuator

If the circuit is not as specified, check and repair or replace the trouble part shown in the table above.

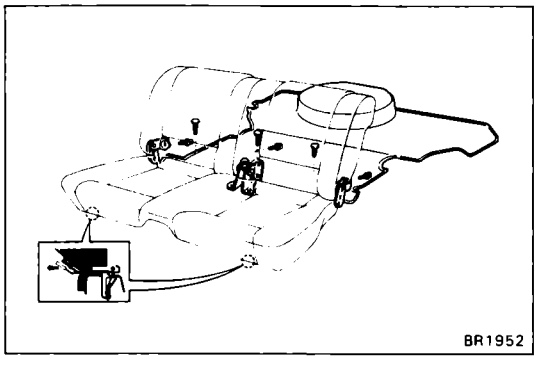
(b) Connect the connectors, and install the computer in place.

REMOVAL AND INSTALLATION OF A.B.S. COMPUTER AND DECELERATION SENSOR (FOR 4WD)



kg-cm (ft-lb, N·m) : Specified torque

BR1978



BR1952

1. **REMOVE A.B.S. COMPUTER**
   (a) Remove the rear seat cushion.
   (See page BR-106)
   (b) Remove the three bolts and ground terminal.
   (c) Disconnect the connectors and remove the three bolts and computer from the bracket.

2. **REMOVE DECELERATION SENSOR**
   Remove the two bolts and deceleration sensor.

   CAUTION: Do not drive without normal installation of deceleration sensor and computer assembly.

3. **INSTALL DECELERATION SENSOR**

Install the deceleration sensor to the bracket with the two bolts.

Torque: 32.5 kg-cm (28 in.-lb, 3.2 N·m)

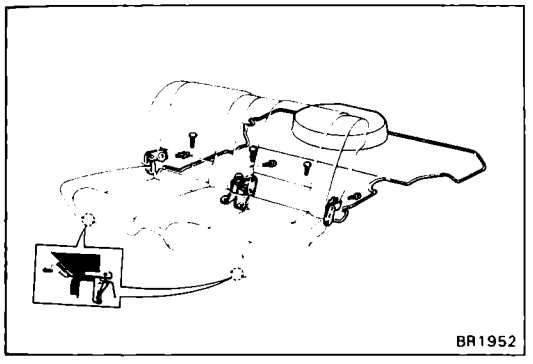
4. **INSTALL A.B.S. COMPUTER**

(a) Install the computer to the bracket with the three bolts.

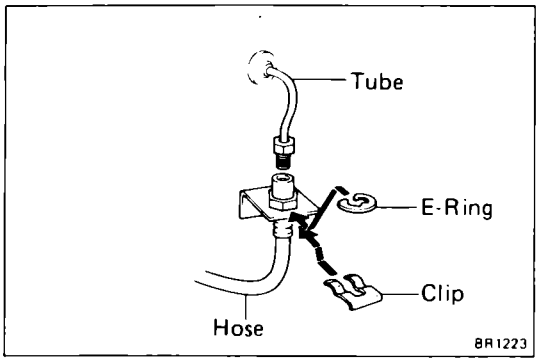
Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

(b) Connect the connectors and install the bracket and computer with the three bolts.

Torque:	**Front left**	**130 kg-cm (9 ft-lb, 13 N·m)**
	Front right	**195 kg-cm (14 ft-lb, 19 N·m)**
	Rear	**195 kg-cm (14 ft-lb, 19 N·m)**



(c) Install the rear seat cushion.



BRAKE HOSES AND TUBES

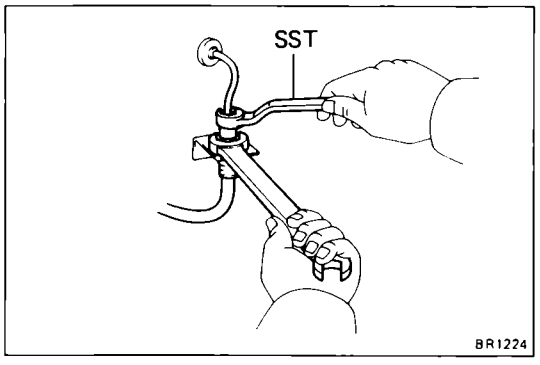
DISCONNECT AND CONNECT HOSE AND TUBE

1. DISCONNECT HOSE AND TUBE

(a) Remove the clip and E-ring.

(b) Using a wrench to hold the hose and SST to hold the tube, disconnect the tube and hose.

SST 09751-36011



2. CONNECT HOSE AND TUBE

(a) Connect the hose and tube by hand.

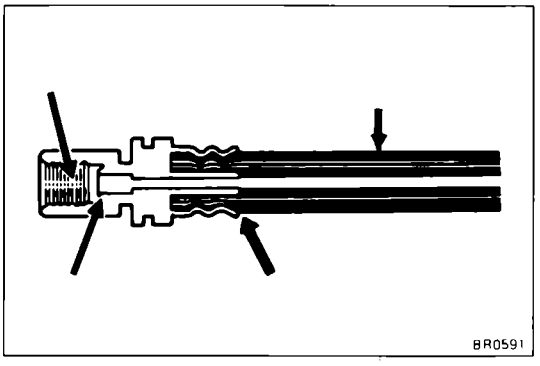
(b) Using a wrench to hold the hose and SST to hold the tube, torque the connection.

SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)

(c) Install a hose clip and E-ring.

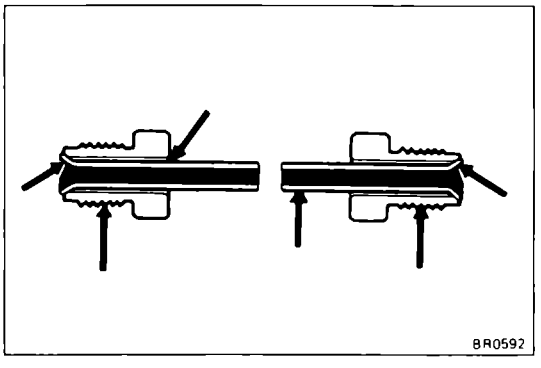
INSPECTION OF BRAKE HOSES AND TUBES



1. INSPECT BRAKE HOSES

(a) Inspect the hose for damage, cracks or swelling.

(b) Inspect the threads for damage.



2. INSPECT BRAKE TUBES

(a) Inspect the tube for damage, cracks, dents or corrosion.

(b) Inspect the threads for damage.