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–27
	Brake pads worn	Replace pads	BR–19, 36
	Leak in brake system	Repair leak	
	Master cylinder faulty	Repair or replace master cylinder	BR–9
	Air in brake system	Bleed brake system	BR–7
	Wheel cylinder faulty	Repair wheel cylinder	BR–27
	Brake cylinder faulty	Repair cylinder	BR–19, 36
	Piston seals worn or damaged	Repair cylinder	BR–19, 36
	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	
	Mal–adjustment of brake pedal or booster push rod	Inspect and adjust	BR–6,17
	Tension or return spring faulty	Replace spring	BR–27, 44
	Brake line restricted	Repair as necessary	
	Lining cracked or distorted	Replace shoe	BR–27
	Pad cracked or distorted	Replace pad	BR–19, 36
	wheel cylinder or caliper piston sticking	Repair as necessary	BR–19, 27 36
	Adjuster broken	Replace adjuster	
	Master cylinder faulty	Repair or replace master cylinder	BR–9
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–27
	Brake pads distorted, worn or glazed	Replace pads	BR–19, 36
	Drum or disc out of round	Replace drum or disc	BR–19, 27 36
	Tension or return spring faulty	Replace spring	BR–27, 44
	Wheel cylinder faulty	Repair wheel cylinder	BR–27
	Brake cylinder faulty	Repair cylinder	BR–19, 36
	Piston frozen in brake cylinder	Repair cylinder	BR–19, 36
	Brake pad sticking	Replace pads	BR–19, 36

TROUBLESHOOTING (Cont'd)

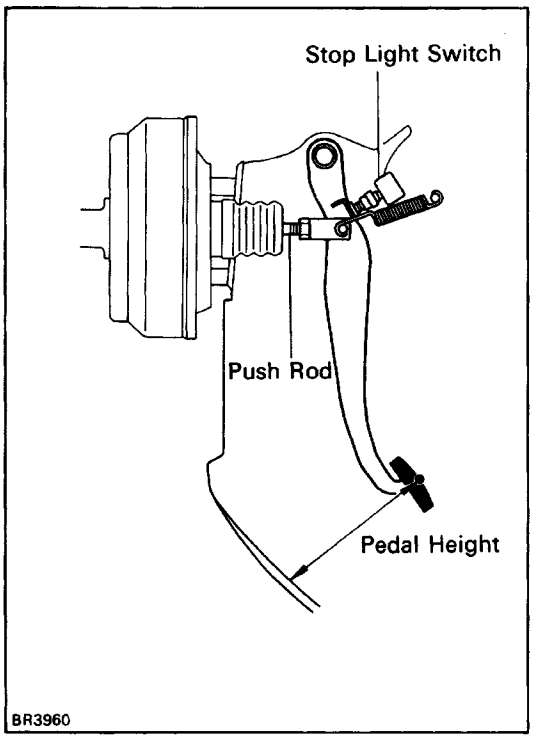
Problem	Possible cause	Remedy	Page
Hard pedal but brakes inefficient	Oil or grease on shoes or pads Brake shoes distorted, linings worn or glazed, drums worn Brake pads distorted, worn or glazed Piston frozen in brake cylinder Brake booster faulty Vacuum leaks Brake line restricted	Check for cause. Replace shoes or pads Replace brake shoes Replace pads Repair cylinder Repair booster Repair as necessary Repair as necessary	BR–19, 27 36 BR–27 BR–19, 36 BR–19, 36 BR–15
Snapping or clicking noise when brakes are applied	(Drum brake) Brake shoes binding at backing plate ledges Backing plate ledges worn Loose or missing shoes hold–down spring Loose set bolt at backing plate (Disc brake) Loose or missing pad support plate Loose installation bolt	Lubricate Replace and lubricate ledges Replace shoes hold–down spring Tighten Replace pad support plate Tighten	BR–27 BR–27 BR–27 BR–27 BR–19, 36 BR–19, 36
Scraping or grinding noise when brakes are applied	Worn brake linings or pads Caliper to wheel or rotor interference Dust cover to rotor or backing plate to drum interference Other brake system components faulty Tires rubbing against chassis and/or body	Replace or refinish drums or rotors if heavily scored Replace as required Correct or replace Repair or replace as necessary Repair as necessary	BR–19, 27 36 BR–19, 36 BR–19, 27 36

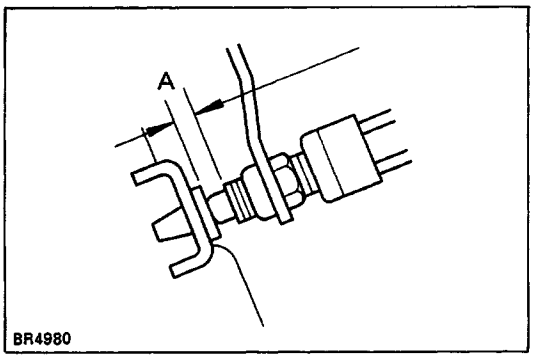
TROUBLESHOOTING (Cont'd)

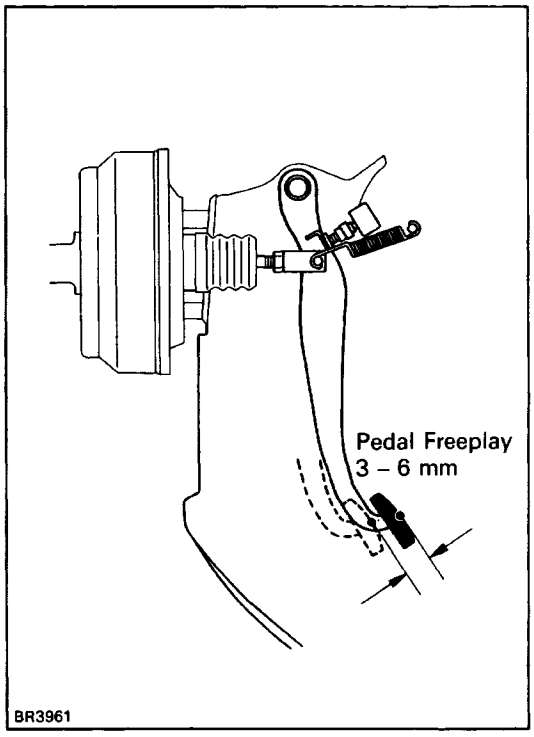
Problem	Possible cause	Remedy	Page
Squeaking, squealing groaning or chattering noise when brakes are applied Note: Brake friction materials inherently generate noise and heat in order to dissipate energy. As a result, occasional squeal is normal and is aggravated by severe environmental conditions such 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–19, 27 36
	Dirty, greased, contaminated or glazed linings or pads	Clean or replace	BR–19, 27 36
	Improper linings or pads using	Inspect for correct usage or replace	BR–19, 27 36
	Mal–adjustment of brake pedal or booster push rod	Inspect and adjust	BR–6,17
	(Disc brake) Missing or damaged brake pad anti–squeal shim	Replace	BR–19, 36
	Burred or rusted calipers	Clean or deburr	BR–36
	(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–27
Squealing and squeaking noise when brakes are not applied	Mal–adjustment of brake pedal or booster push rod	Inspect and adjust	BR–6,17
	Poor return of brake booster or master cylinder or wheel cylinder	Inspect, repair or replace	BR–9,15 27
	(Disc brake) Rusted or stuck piston	Inspect and lubricate as necessary	BR–19, 36
	Improper positioning of pad in caliper	Repair or replace	BR–19, 36
	Rotor rubbing against caliper housing	Repair or replace	BR–19, 36
	Improper installation of disc brake pad support plate	Repair or replace	BR–19, 36
	(Drum brake or parking brake) Weak, damaged or incorrect shoe hold down springs	Replace	BR–27, 44
	Grooved backing plate ledges	Repair or replace	BR–27, 44
	Bent or warped backing plate causing interference with drum	Repair or replace	BR–27, 44
	Improper machining of drum causing interference with backing plate or shoe	Replace drum	BR–27, 44
	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	
	Mal–adjustment of brake pedal or booster push rod	Inspect and adjust	BR–6,17
	Worn, damaged or dry wheel bearings (Disc brake)	Inspect and lubricate or replace	
	Loose or missing anti–rattle spring or pad support plate or crimping on outer pad	Inspect, repair or replace	BR–19, 36
	Failure of shim	Inspect, replace if necessary	BR–19, 36
	Wear on slide bushing	Inspect, replace if necessary	BR–19, 36
	Loose installation bolt	Inspect, tighten is necessary	BR–19, 36
	Poor return of piston (Drum brake or parking brake)	Inspect, repair or replace	BR–19, 36
	Loose or extra parts	Inspect and repair	BR–27, 44







CHECKS AND ADJUSTMENTS

CHECK AND ADJUSTMENT OF BRAKE PEDAL

1. CHECK THAT PEDAL HEIGHT IS CORRECT, AS SHOWN

Pedal height from rib of floor panel:

M/T 168.6 –178.6 mm (6.638 – 7.031 in.)

A/T 168.0 –178.0 mm (6.614 – 7.008 in.)

If the pedal height is incorrect, adjust it.

2. IF NECESSARY, ADJUST PEDAL HEIGHT

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

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

(e) Loosen the push rod lock nut.

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

(e) Tighten the push rod lock nut.

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

(f) Install the stop light switch and turn it until it lightly contacts the pedal stopper.

(g) Return the stop light switch one turn.

(h) Check that the clearance (A) between stop light switch and pedal.

Clearance: 0.5 – 2.4 mm (0.02 – 0.09 in.)

(i) Tighten the stop light switch lock nut.

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

(k) Check that the stop lights come on when the brake pedal is depressed, and go off when the brake pedal is released.

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

HINT: If clearance (A) between the stop light switch and the brake pedal stopper has been adjusted correctly, the pedal freeplay will meet the specifications.

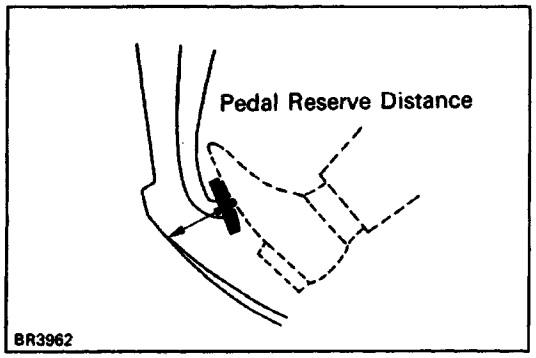
3. CHECK THAT PEDAL FREEPLAY IS CORRECT, AS SHOWN

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

(b) Push in the pedal by hand until the beginning of the resistance is felt, then measure the distance, as shown.

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

If incorrect, check the stop light switch clearance. And if the clearance is OK, then troubleshoot the brake system.



4. CHECK THAT PEDAL RESERVE DISTANCE IS CORRECT, AS SHOWN

Release the parking brake.

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

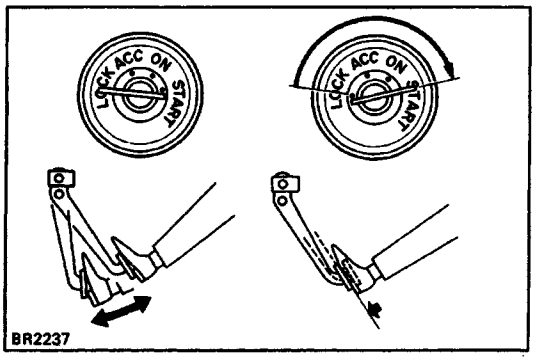
Pedal reserve distance from asphalt sheet at 490 N (50 kgf, 110.2 lbf):

w/o ABS More than 85 mm (3.35 in.)

w/ ABS More than 90 mm (3.54 in.)

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

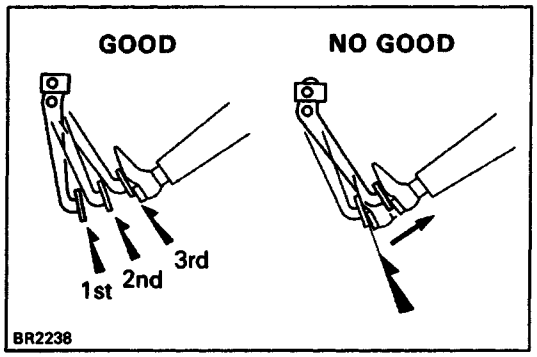
OPERATIONAL TEST OF BRAKE BOOSTER



1. OPERATING CHECK

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

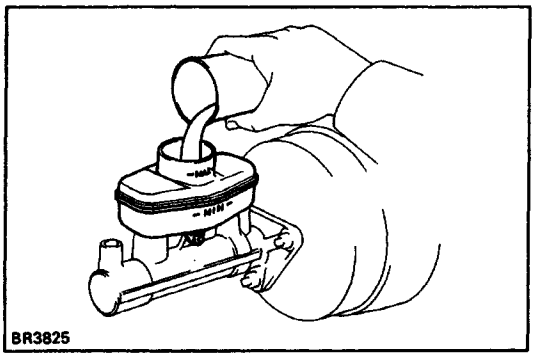
(b) Depress the brake pedal and start the engine. If the pedal goes down slightly, operation is normal.



2. AIR TIGHTNESS

(a) Start the engine and stop it after one or two minutes. Depress the brake pedal several times slowly. If the pedal goes down the farthest 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 the engine with the pedal depressed. If there is no change in the pedal reserve travel after holding the pedal for thirty seconds, the booster is air tight.



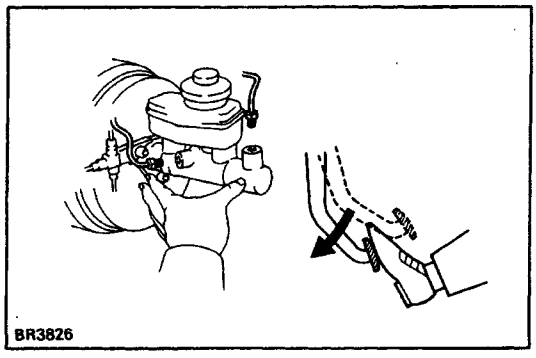
BLEEDING OF BRAKE SYSTEM

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

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

1. FILL BRAKE RESERVOIR TANK WITH BRAKE FLUID

Fluid: SAEJ1703 or FMVSS No. 116 DOT3

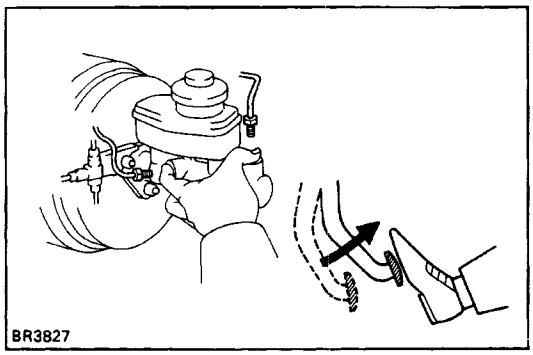


2. BLEED MASTER CYLINDER

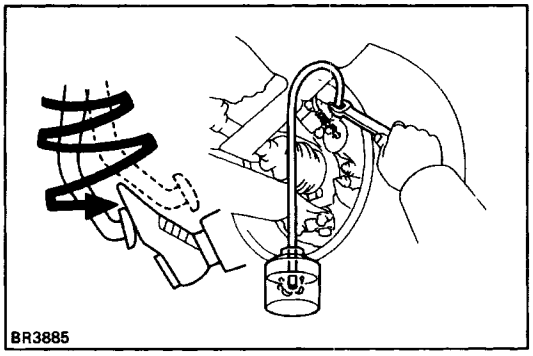
HINT: If the master cylinder has been disassembled or if the reservoir tank becomes empty, bleed the air from the master cylinder.

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

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



(c) Block off the outlet plug with your finger and release the brake pedal.
(d) Repeat (b) and (c) three or four times.



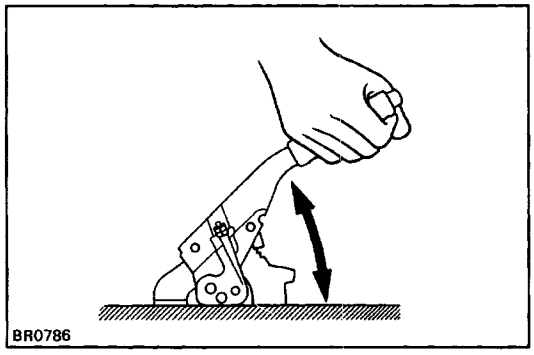
3. BLEED BRAKE LINE

(a) Connect the vinyl tube to the brake cylinder.
(b) Depress the brake pedal several times, then loosen the bleeder plug with the pedal held down.
(c) At the point when fluid stops coming out, tighten the bleeder plug, then release the brake pedal.
(d) Repeat (b) and (c) until all the air in the fluid has been bled out.
(e) Repeat the above procedure to bleed the air out of the brake line for each wheel.

4. CHECK FLUID LEVEL IN RESERVOIR TANK

Check the fluid level and add fluid if necessary.
Fluid: SAEJ1703 or FMVSS No. 116 DOT3

CHECK AND ADJUSTMENT OF PARKING BRAKE

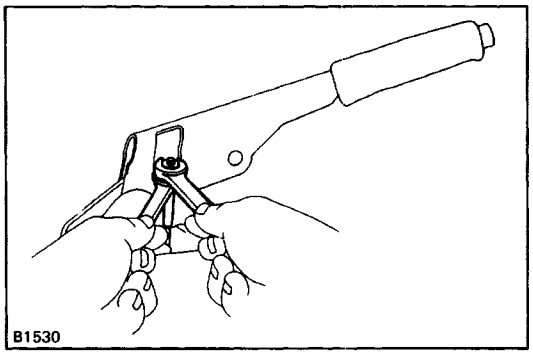


1. CHECK THAT PARKING BRAKE LEVER TRAVEL IS CORRECT

Pull the parking brake lever all the way up, and count the number of clicks.
Parking brake lever travel
at 796 N (20 kgf, 44.1 lbf): 4 – 7 clicks
If incorrect, adjust the parking brake.

2. IF NECESSARY, ADJUST PARKING BRAKE

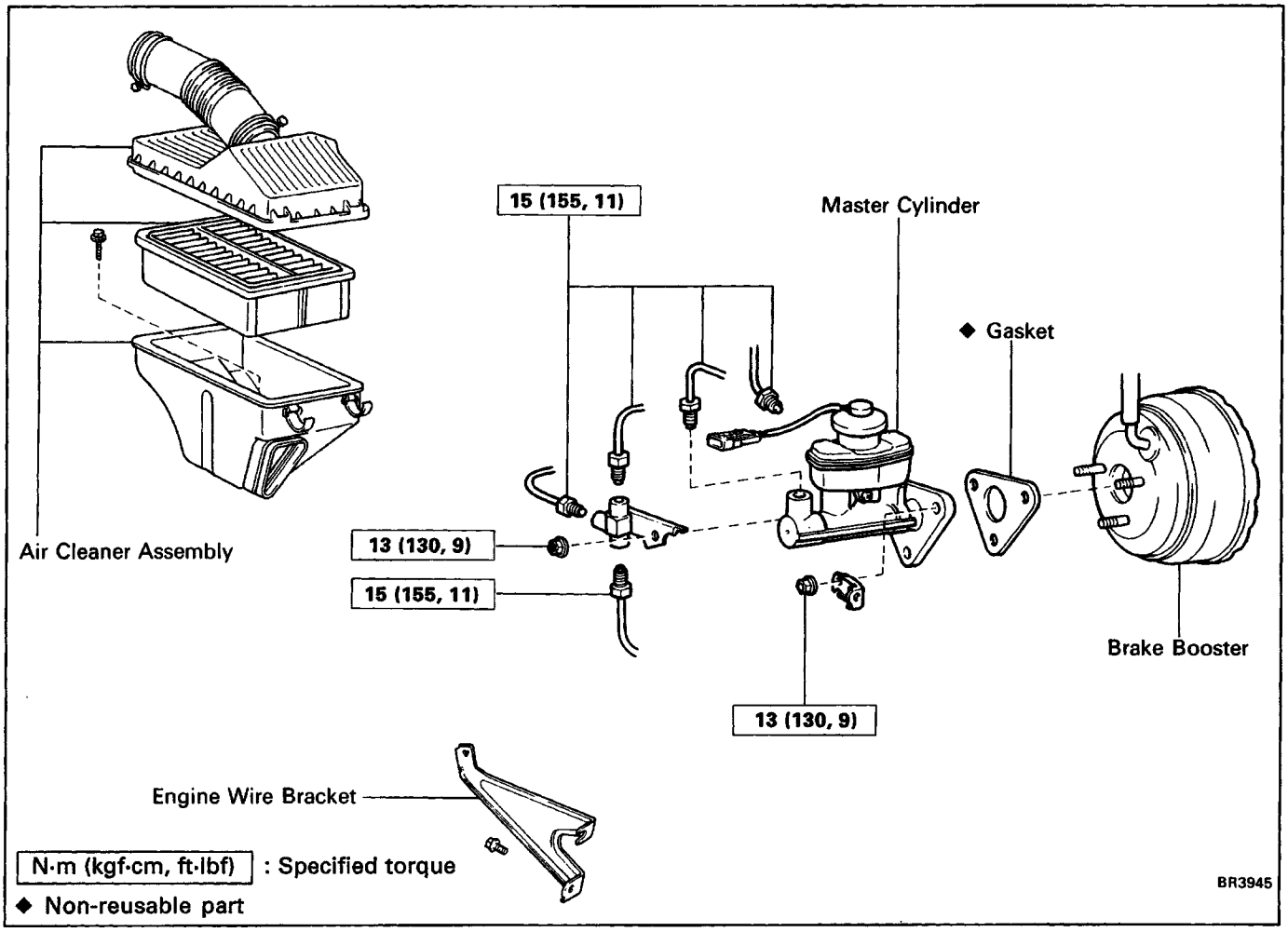
HINT: Before adjusting the parking brake, make sure that the rear brake shoe clearance has been adjusted.
For shoe clearance adjustment, see step 8 to 9 on pages BR–34 and BR–35, step 8 on page BR–50.

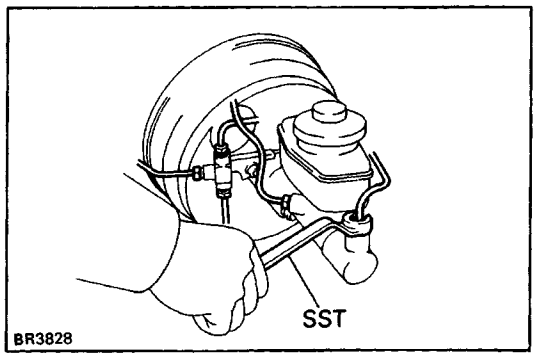


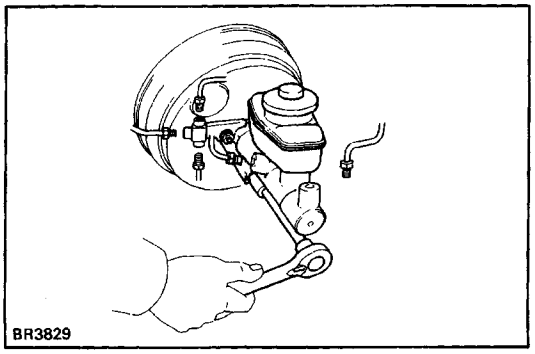
(a) Remove the console box.
(b) Loosen the lock nut and turn the adjusting nut until the lever travel is correct.
(c) Tighten the lock nut.
Torque: 5.4 N–m (55 kgf–cm, 48 in.–lbf)
(d) Install the console box.

MASTER CYLINDER

REMOVAL OF MASTER CYLINDER







1. REMOVE AIR CLEANER ASSEMBLY

2. REMOVE ENGINE WIRE BRACKET

3. DISCONNECT LEVEL WARNING SWITCH CONNECTOR

4. DRAW OUT FLUID WITH SYRINGE

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

5. DISCONNECT BRAKE TUBES

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

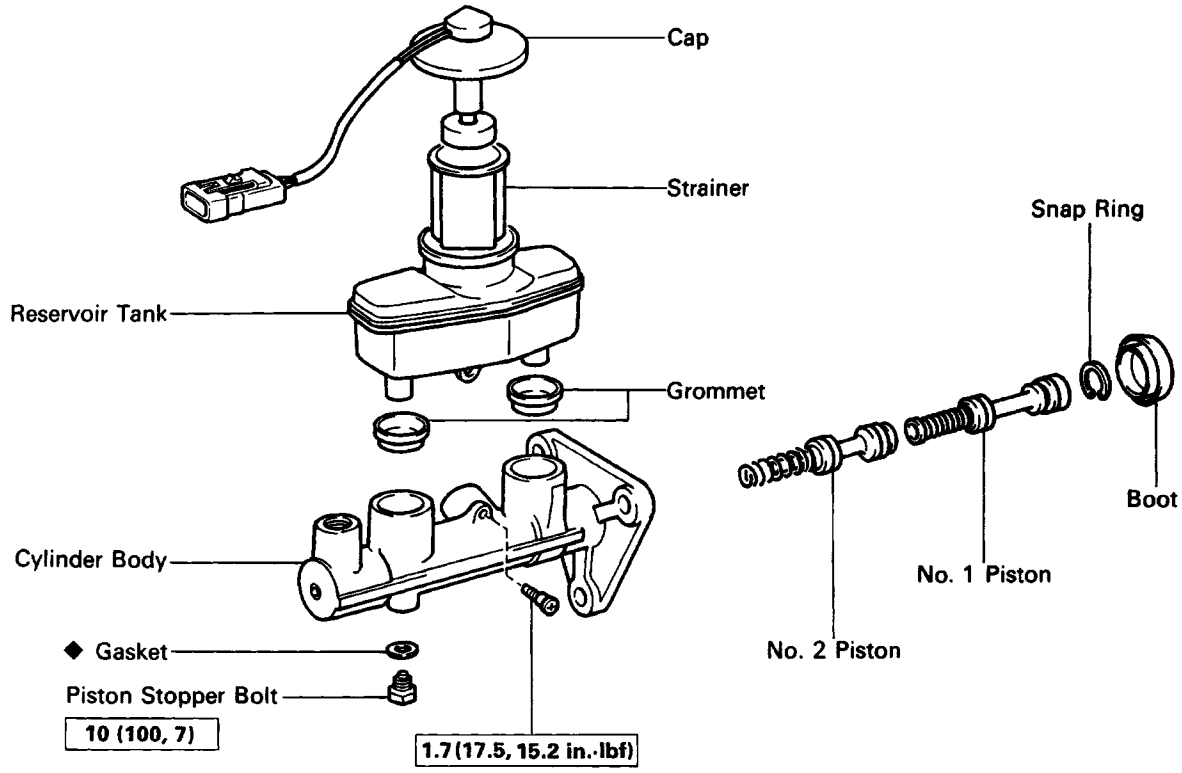
SST 09751–36011

6. REMOVE MASTER CYLINDER

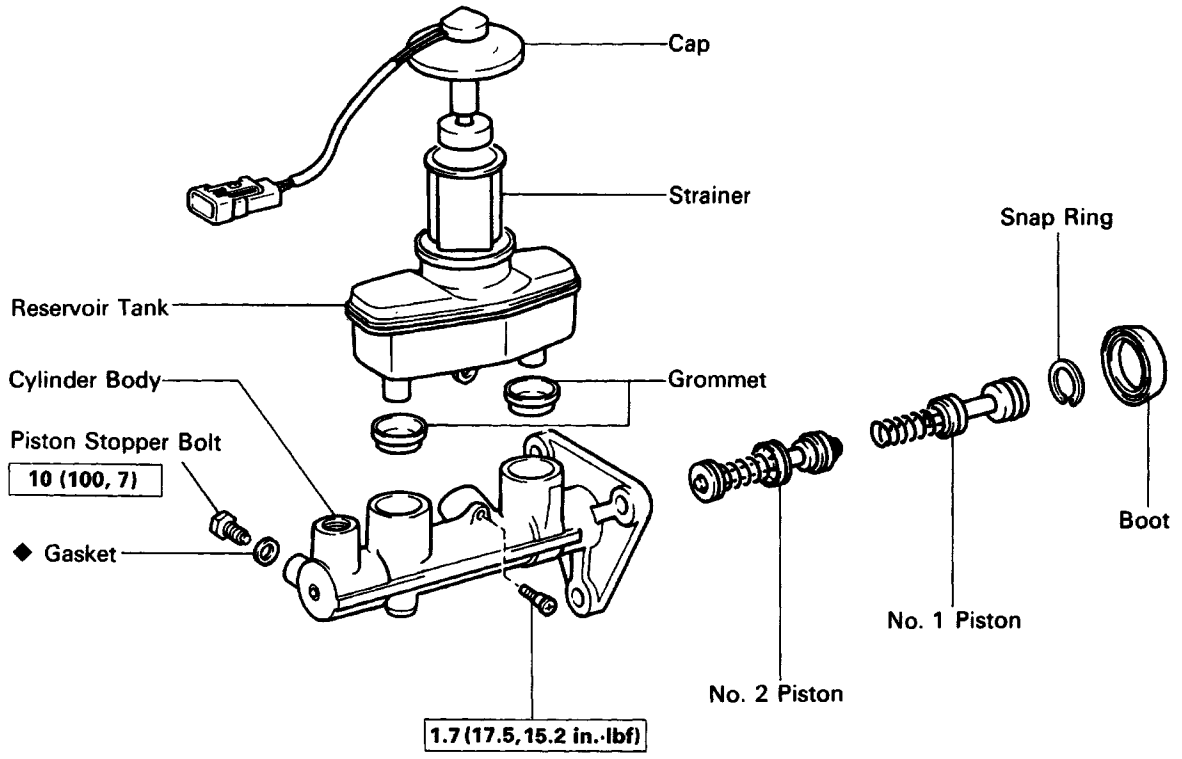
Remove the mounting nuts and pull out the master cylinder and gasket.

COMPONENTS

w/o ABS



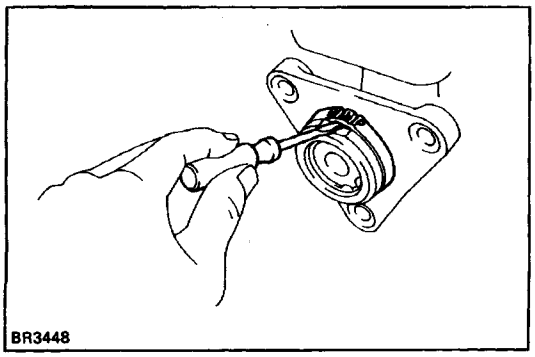
w/ ABS



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

◆ Non-reusable part

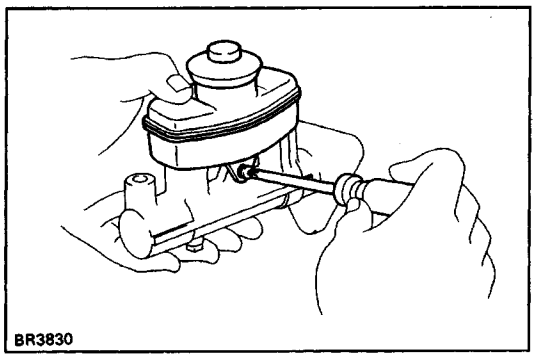
BR3963
BR3946



DISASSEMBLY OF MASTER CYLINDER

1. REMOVE MASTER CYLINDER BOOT

Using a screwdriver, remove the master cylinder boot.



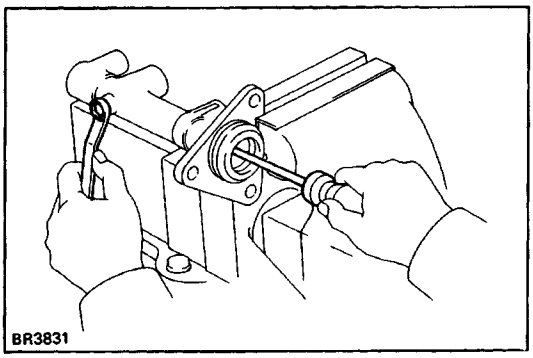
2. REMOVE RESERVOIR TANK

(a) Remove the set screw and pull out the reservoir tank.

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

3. REMOVE TWO GROMMETS

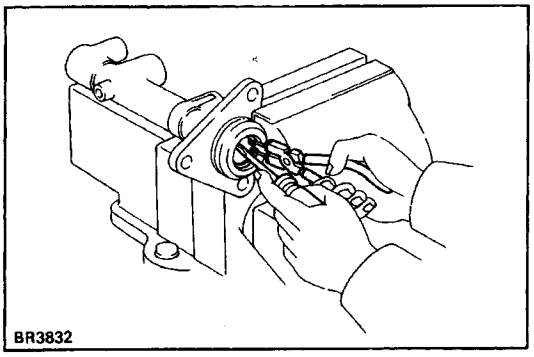
4. PLACE CYLINDER IN VISE



5. REMOVE PISTON STOPPER BOLT

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

HINT: Tape the screwdriver tip before use.

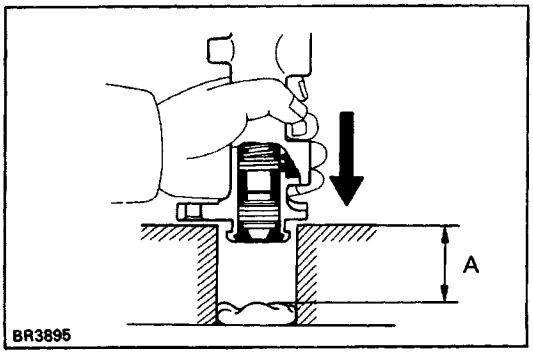


6. REMOVE TWO PISTONS

(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.

NOTICE: If pulled out at an angle, there is possibility that the cylinder bore could be damaged.



(c) Place a rag and two wooden blocks on the work table and lightly tap the cylinder flange against the block edges until the piston drops out of the cylinder.

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

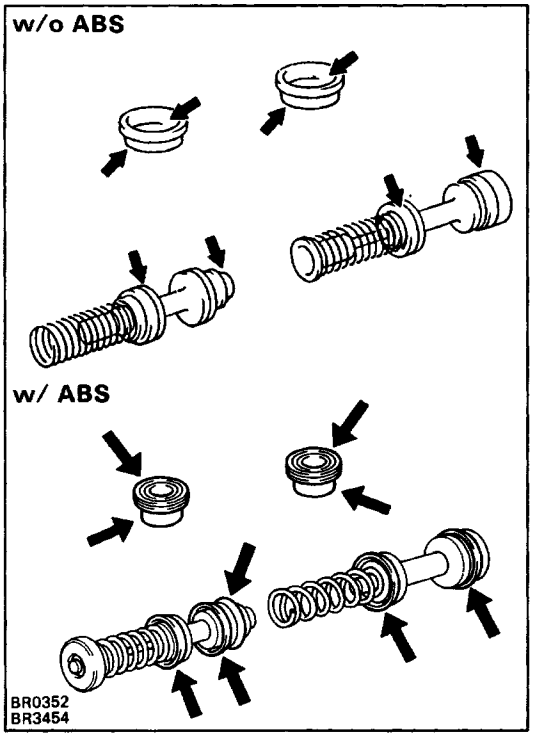
INSPECTION OF MASTER CYLINDER COMPONENTS

HINT: Clean the disassembled parts with compressed air.

1. INSPECT CYLINDER BORE FOR RUST OR SCORING

2. INSPECT CYLINDER FOR WEAR OR DAMAGE

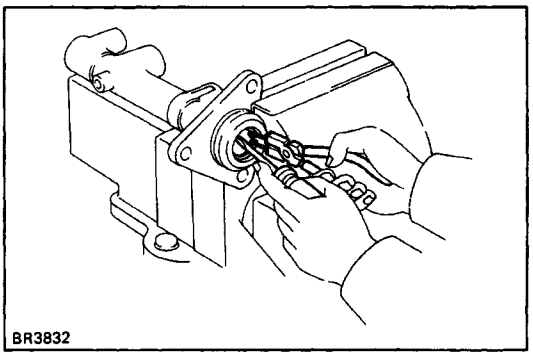
If necessary, clean or replace the cylinder.



ASSEMBLY OF MASTER CYLINDER

(See page BR–10)

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



2. INSTALL TWO PISTONS

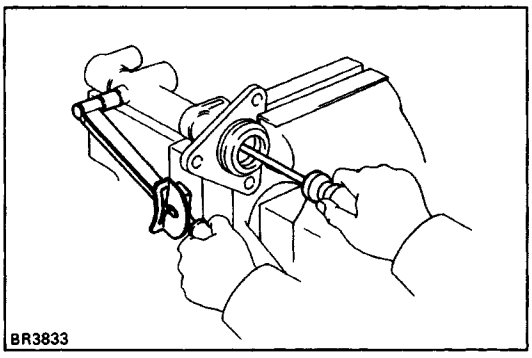
NOTICE: Be careful not to damage the rubber lips on the pistons.

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

NOTICE: If inserted at an angle, there is a possibility that the cylinder bore could be damaged.

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

HINT: Tape the screwdriver tip before use.

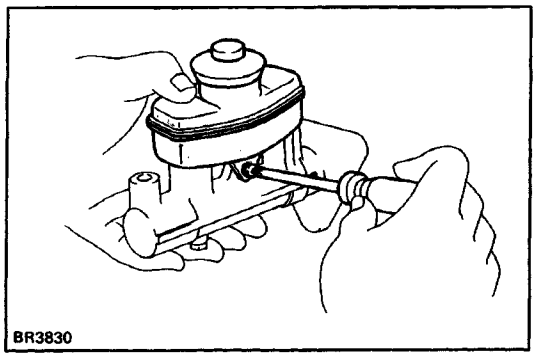


3. INSTALL PISTON STOPPER BOLT

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

Torque: 10 N–m (100 kgf–cm, 7 ft–lbf)

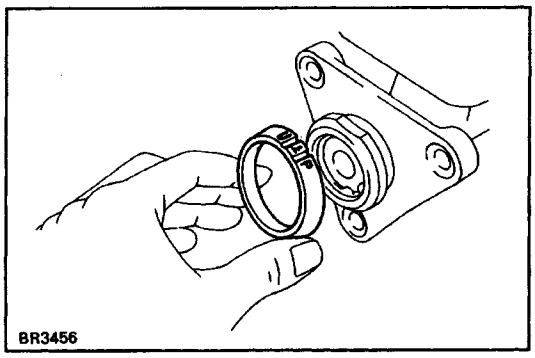
4. INSTALL TWO GROMMETS



5. INSTALL RESERVOIR TANK

(a) Install the cap and strainer to the reservoir tank.
(b) Push the reservoir tank onto the cylinder.
(c) Install the set screw while pushing on the reservoir tank.

Torque: 1.7 N–m (17.5 kgf–cm, 15.2in–lbf)



6. INSTALL MASTER CYLINDER BOOT

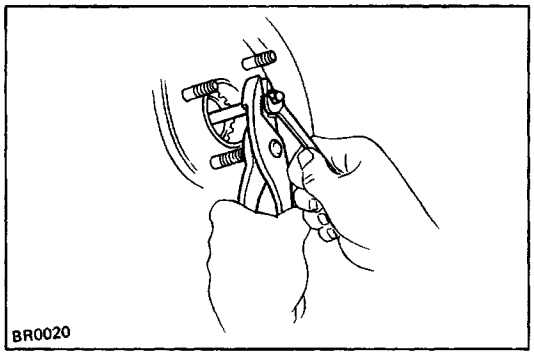
With the U P mark on the master cylinder boot facing upwards, install the cylinder boot on the master cylinder.

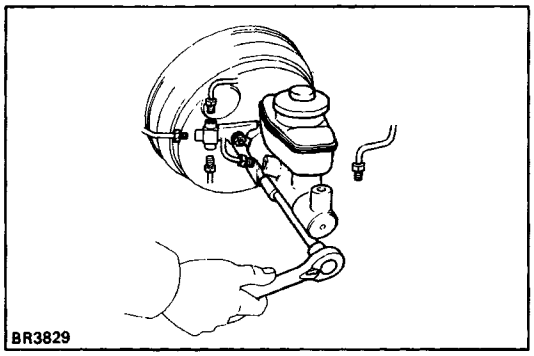
INSTALLATION OF MASTER CYLINDER

(See page BR–9)

1. ADJUST LENGTH OF BRAKE BOOSTER PUSH ROD BEFORE INSTALLING MASTER CYLINDER

(See page BR–17)

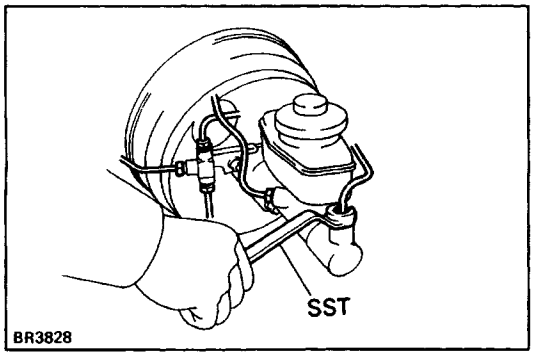




2. INSTALL MASTER CYLINDER

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

Torque: 13 N–m (130 kgf–cm, 9 ft–lbf)



3. CONNECT TWO BRAKE TUBES

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

SST 09751–36011

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

4. CONNECT LEVEL WARNING SWITCH CONNECTOR

5. INSTALL ENGINE WIRE BRACKET

6. INSTALL AIR CLEANER ASSEMBLY

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

(See page BR–7)

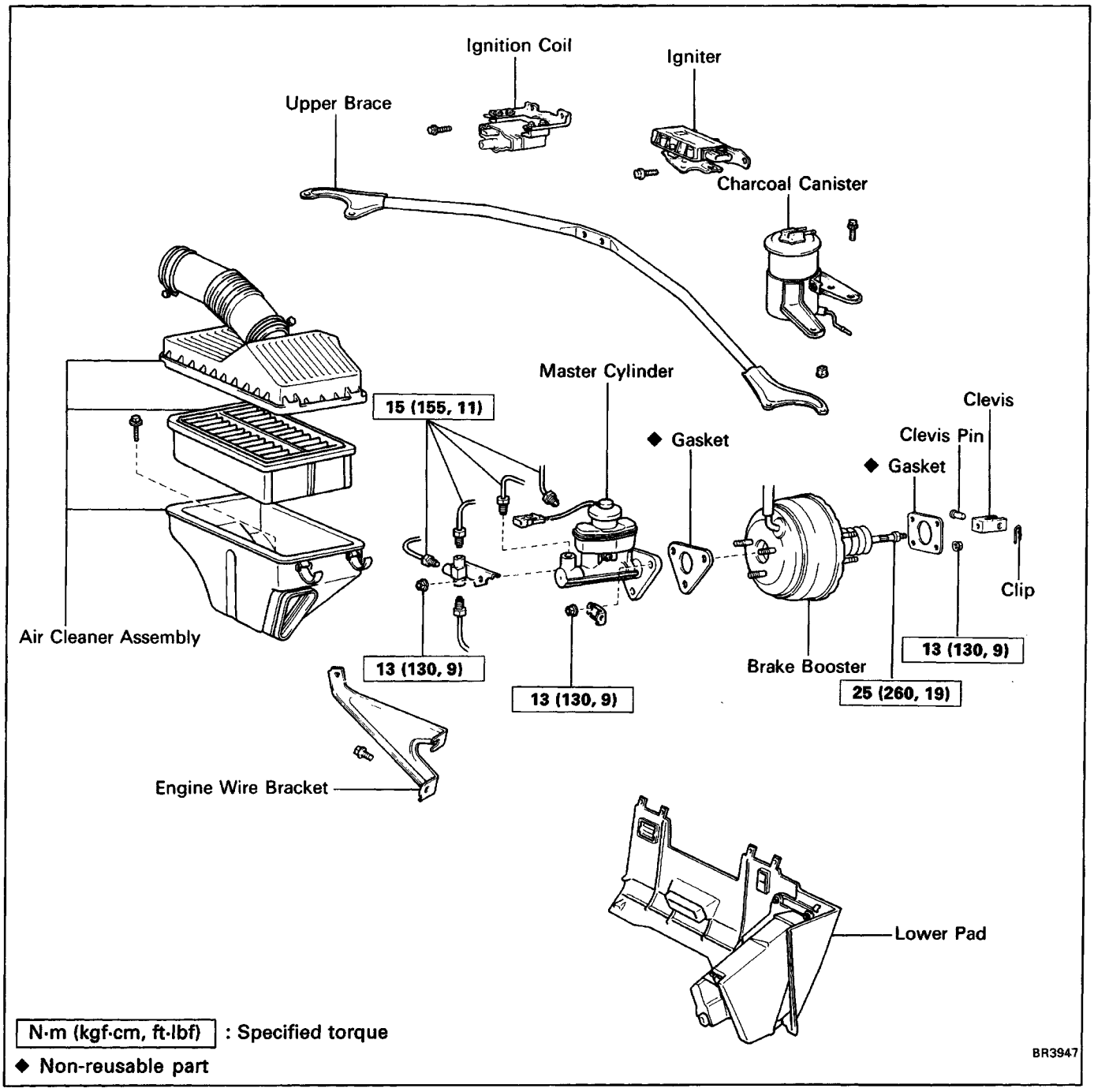
8. CHECK FOR FLUID LEAKAGE

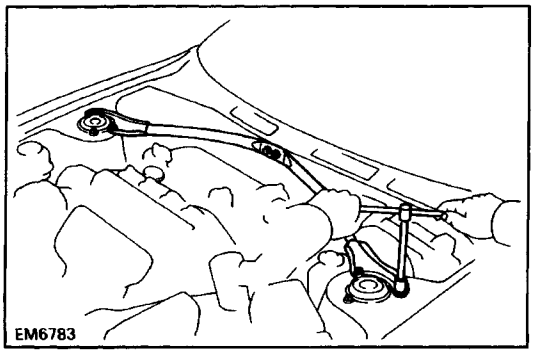
9. CHECK AND ADJUST BRAKE PEDAL

(See page BR–6)

BRAKE BOOSTER

REMOVAL OF BRAKE BOOSTER





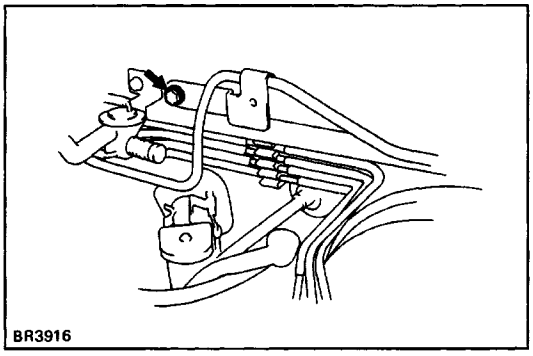
1. REMOVE SUSPENSION UPPER BRACE

(a) Remove the two wiper arms.
(b) Remove the outside lower windshield moulding.
(c) Remove the two bolts, four nuts and upper brace.
(d) Temporarily fasten the shock absorber with the four nuts.

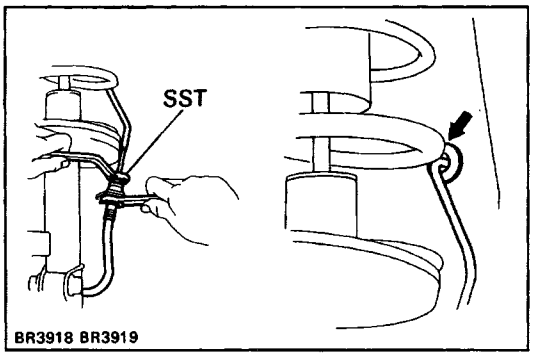
2. REMOVE LH FRONT WHEEL

3. REMOVE MASTER CYLINDER

4. REMOVE CHARCOAL CANISTER
5. REMOVE LOWER PAD
6. REMOVE VACUUM HOSE
7. REMOVE PEDAL RETURN SPRING
8. REMOVE CLIP, CLEVIS PIN AND CLEVIS

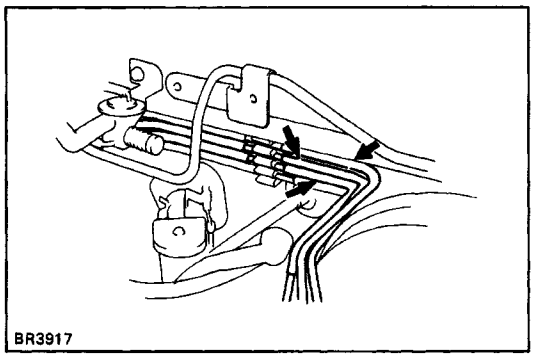

BR3916

9. REMOVE IGNITION COIL AND IGNITER
(a) Remove the ignition coil with the bracket.
(b) Remove the vacuum tube installation bolt.
(c) Remove the igniter with the bracket.

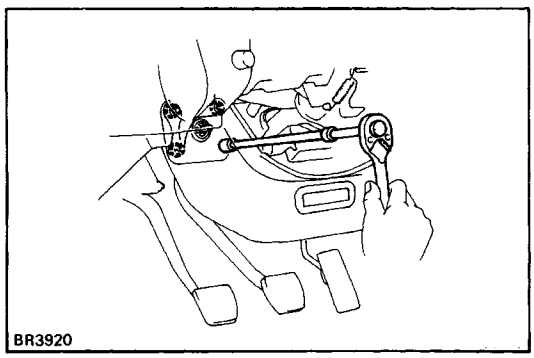


BR3918 BR3919

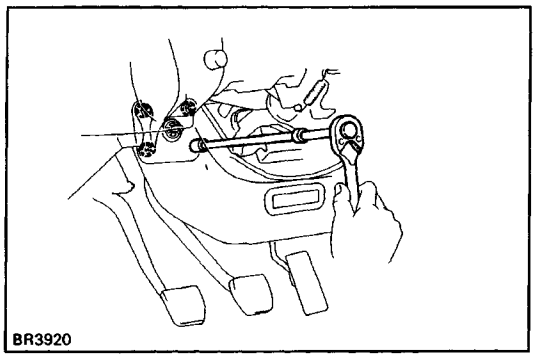
10. REMOVE BRAKE BOOSTER
(a) Using SST and spanner, disconnect the brake tube from the flexible hose of LH front brake.
SST 09751–36011
(b) Remove the brake tube grommet from the body.


BR3917

(c) (w/ ABS)
Remove the three brake tubes as shown in the illustration from the No. 1 brake tube clamp.


BR3920

(d) Remove the four nuts.
(e) Remove the booster and gasket.


BR3920

INSTALLATION OF BRAKE BOOSTER

(See page BR–15)

1. INSTALL BRAKE BOOSTER

(a) Install booster and gasket.

(b) Install the clevis to the operating rod.

(c) Install and torque the booster installation nuts.

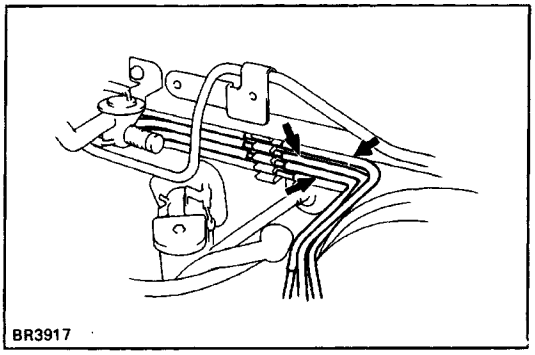
Torque: 13 N–m (130 kgf–cm, 9 ft–lbf)

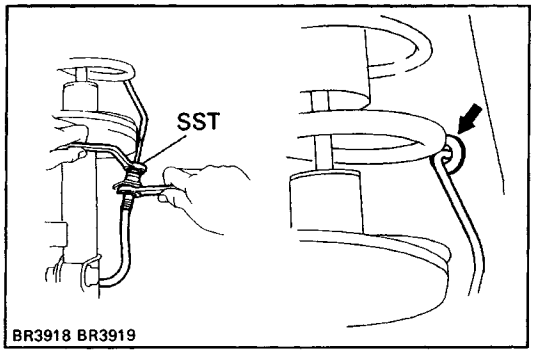
(d) Insert the clevis pin into the clevis and brake pedal, and install the clip to the clevis pin.

(e) Install the pedal return spring.

(f) (w/ ABS)

Install the three brake tubes to the No. 1 brake tube clamp.


BR3917



BR3918 BR3919

(g) Using SST and spanner, connect the brake tube to the flexible hose of LH front brake.
SST 09751–36011

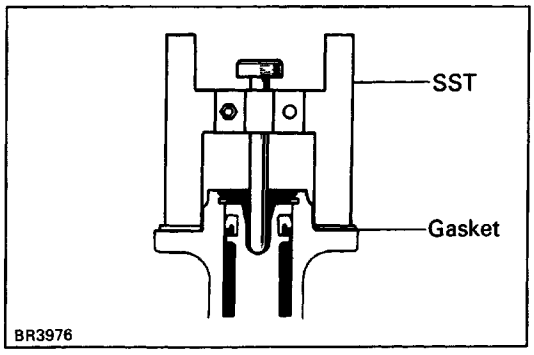
Torque: 15 N–m (155 kgf–cm, 11 ft–lbf)

(h) Install the brake tube grommet to the body.

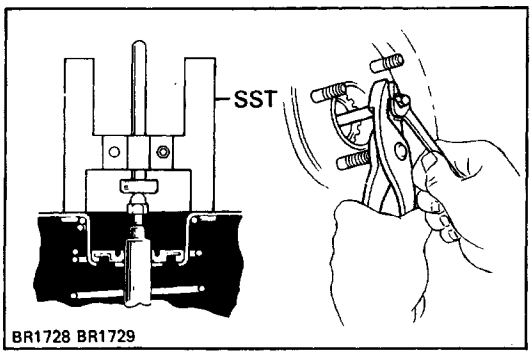
2. ADJUST LENGTH OF BOOSTER PUSH ROD

(a) Install the gasket on the master cylinder.

(b) Set the SST on the gasket, and lower the pin until its tip slightly touches the piston.
SST 09737–00010



BR3976



BR1728 BR1729

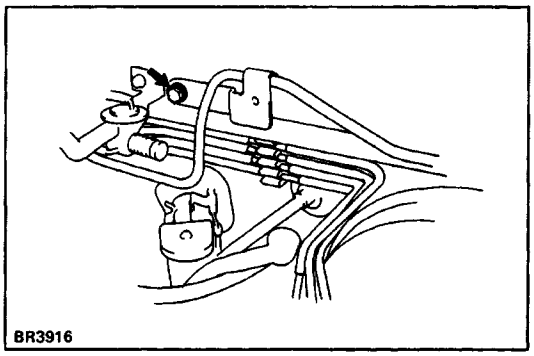
(c) Turn the SST upside down, and set it on the booster.
SST 09737–00010

(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.

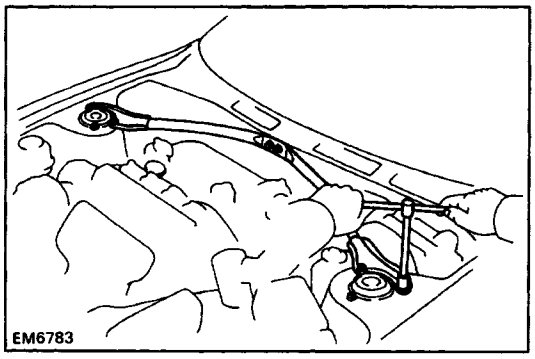
HINT: When adjusting the push rod, depress the brake pedal enough so that the push rod sticks out.



3. INSTALL IGNITER AND IGNITION COIL

(a) Install the igniter with the bracket.
(b) Install the vacuum tube installation bolt.
(c) Install the ignition coil with the bracket.

4. INSTALL VACUUM HOSE
5. INSTALL MASTER CYLINDER
(See page BR–9**)**
6. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM
(See page BR–7**)**
7. CHECK FOR FLUID LEAKAGE
8. CHECK AND ADJUST BRAKE PEDAL
(See page BR–6**)**
Check and adjust the brake pedal, then tighten the clevis lock nut.
Torque: 25 N–m (260 kgf–cm, 19 ft–lbf)
9. PERFORM OPERATIONAL CHECK
(See page BR–7**)**
10. INSTALL LOWER PAD
11. INSTALL LEFT SIDE FRONT WHEEL

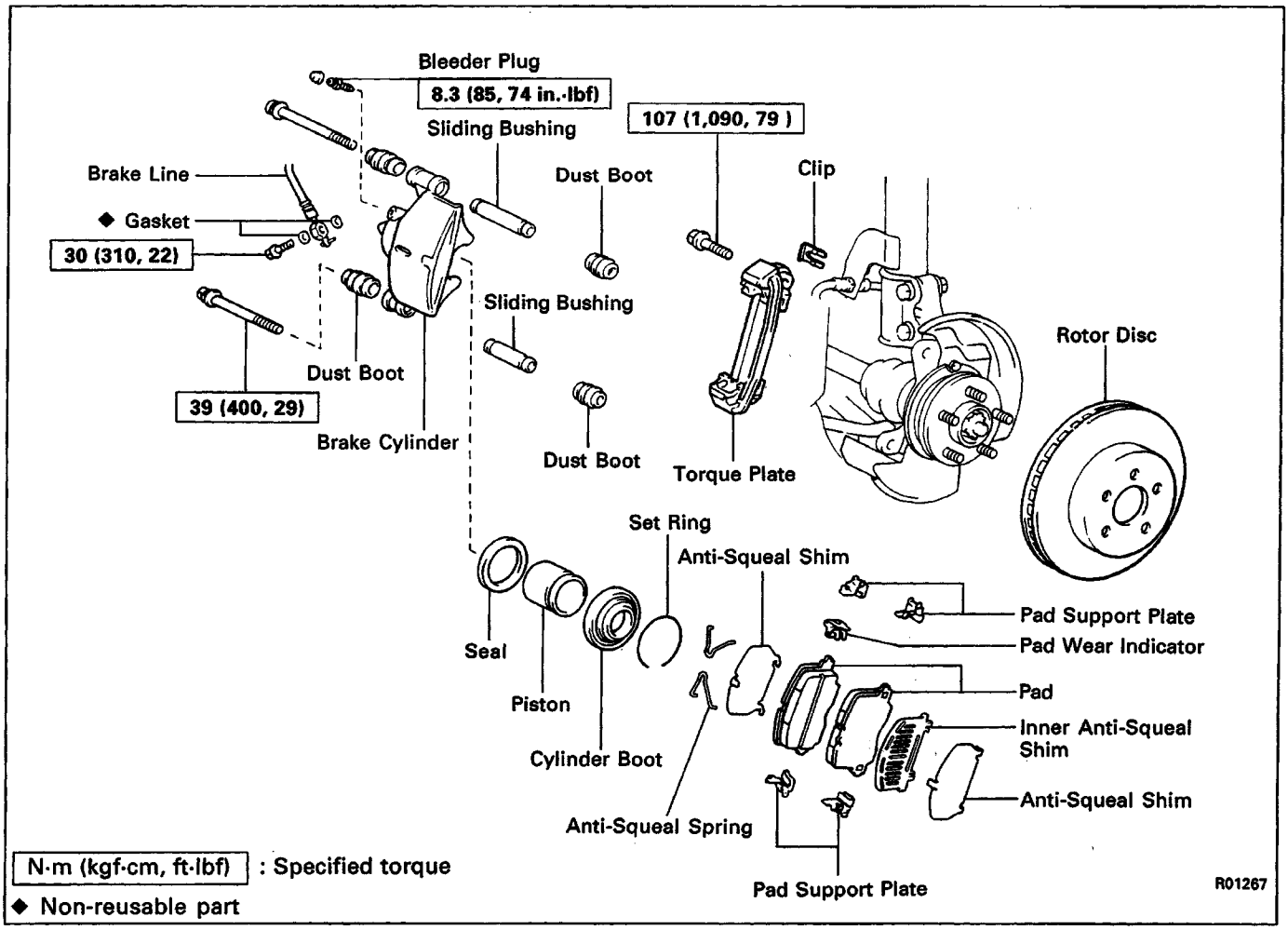


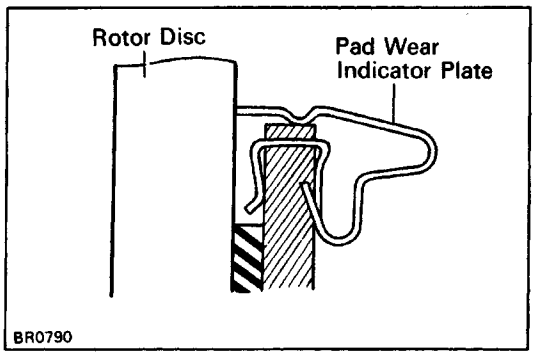
12. INSTALL SUSPENSION UPPER BRACE

(a) Remove the four nuts from the shock absorber.
(b) Install the suspension upper brace with the two bolts and four bolts.
Torque: Bolt 21 N–m (210 kgf–cm, 75 ft–lbf)
Nut 37 N–m (375 kgf–cm, 27 ft–lbf)
(c) Install the outside lower windshield moulding.
(d) Install the two wiper arms.

FRONT BRAKE

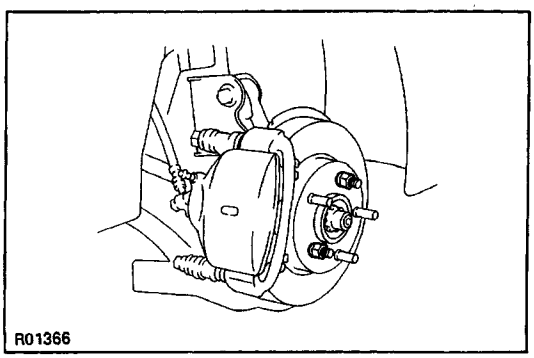
COMPONENTS





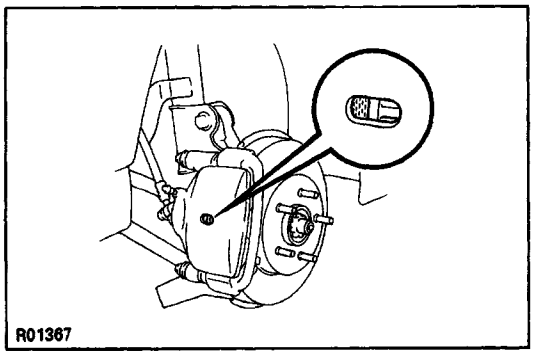
REPLACEMENT OF BRAKE PADS

HINT: If a squealing noise is made by the front brakes while driving, check the pad wear indicator. If there is evidence of the indicator contacting the rotor disc, the brake pad should be replaced.



1. REMOVE FRONT WHEEL

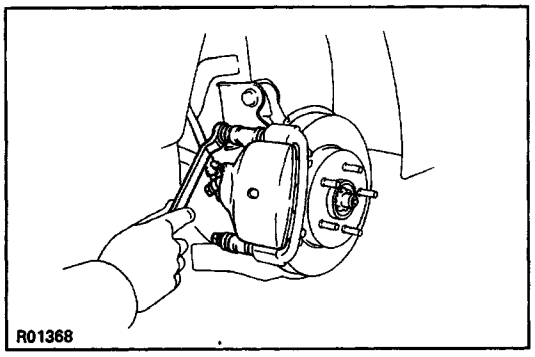
Remove the wheel and temporarily fasten the rotor disc with the hub nuts.



2. INSPECT PAD LINING THICKNESS

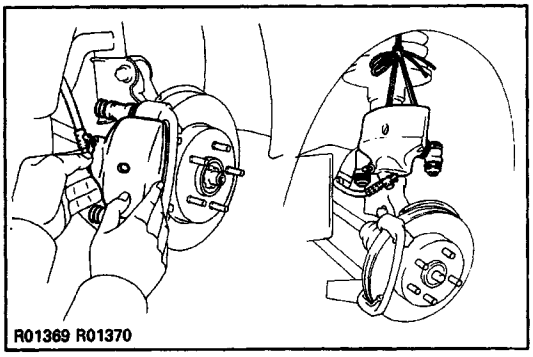
Check the pad thickness through the cylinder inspection hole and replace the pads if it is not within specification.

Minimum thickness: 1.0 mm (0.039 in.)



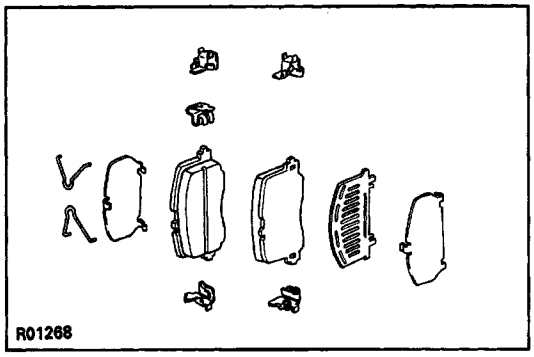
3. REMOVE CYLINDER FROM TORQUE PLATE

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



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

HINT: 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) Pad wear indicator plate
(e) Four pad support plates

5. CHECK ROTOR DISC THICKNESS

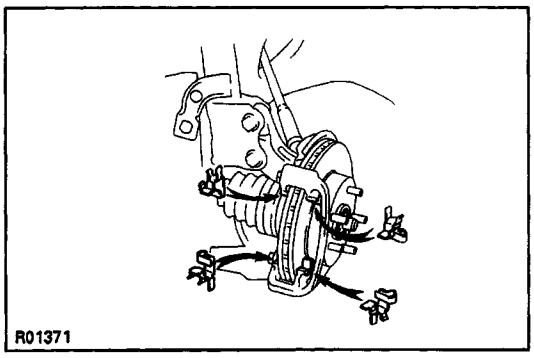
(See step 2 on page BR–24)

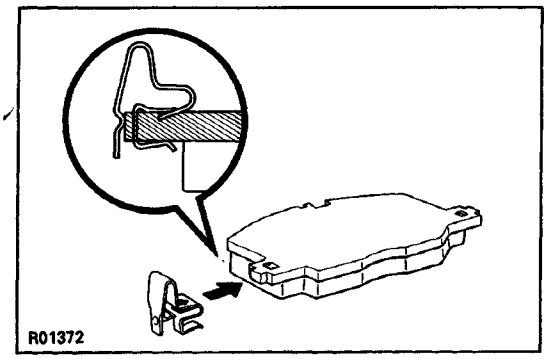
6. CHECK ROTOR DISC RUNOUT

(See step 3 on page BR–24)

7. INSTALL PAD SUPPORT PLATES

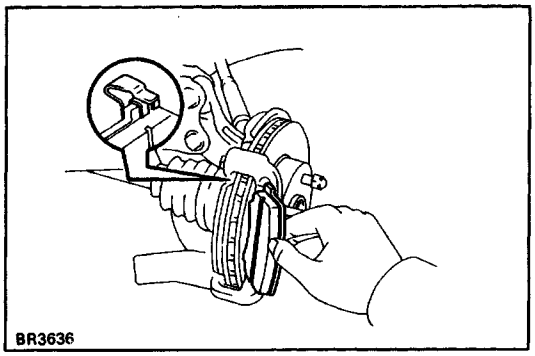
Install the four pad support plates.





8. INSTALL NEW PADS

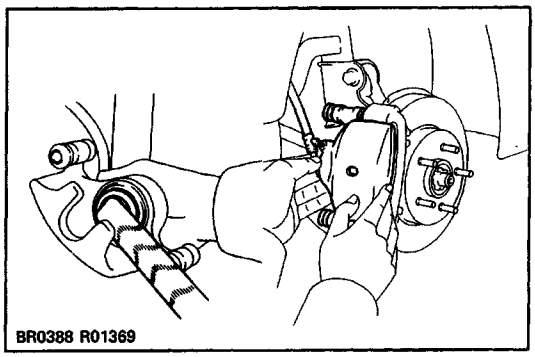
(a) Install a pad wear indicator plate on the inside pad.
(b) Apply disc brake grease to both sides of the inner anti–squeal shim.
(c) Install the two anti–squeal shims to the outside pad.
(d) Install the anti–squeal shim to the inside pad.



(e) Install inside pad with the pad wear indicator plate facing upward.
(f) Install outside pad.

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

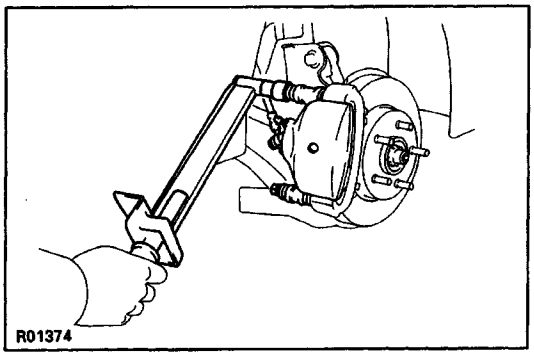
(g) Install the two anti–squeal springs.



9. INSTALL CYLINDER

(a) Draw out a small amount of brake fluid from the reservoir tank.
(b) Press in the piston with a hammer handle or an equivalent.

HINT: If the piston is heavy and difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

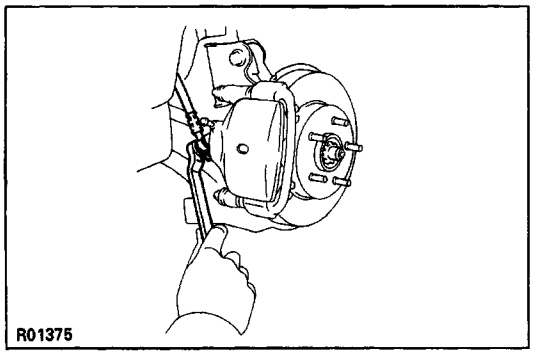


(c) Install the brake cylinder.
(d) Install and torque the two installation bolts.

Torque: 39 N–m (400 kgf–cm, 29 ft–lbf)

10. INSTALL FRONT WHEEL

11. CHECK THAT FLUID LEVEL IS MAX LINE



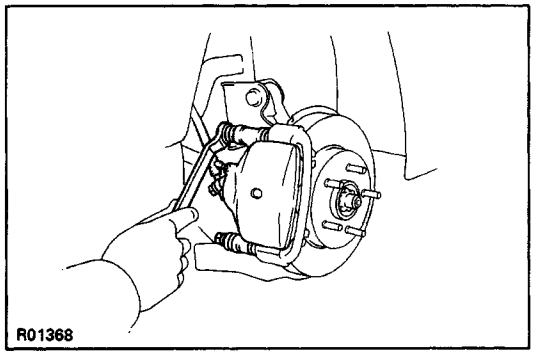
REMOVAL OF CYLINDER

(See page BR–19)

1. DISCONNECT FLEXIBLE HOSE

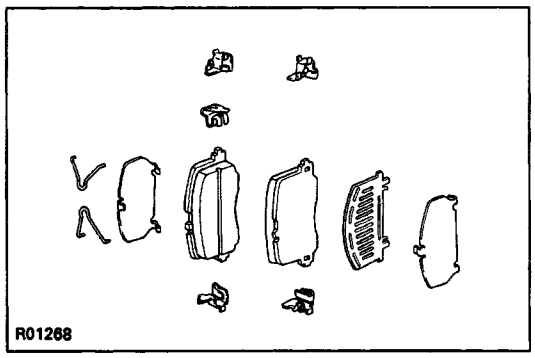
(a) Remove the union bolt and two gaskets from the brake cylinder, then disconnect the flexible hose from the brake cylinder.

(b) Use a container to catch the brake fluid as it drains out.



2. REMOVE CYLINDER FROM TORQUE PLATE

Remove the two installation bolts and cylinder.



3. REMOVE FOLLOWING PARTS:

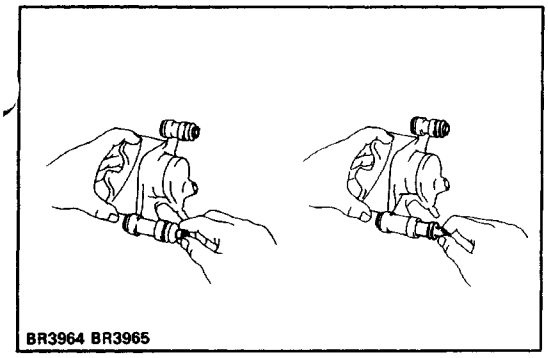
(a) Two anti–squeal springs

(b) Two brake pads

(c) Three anti–squeal shims

(d) Pad wear indicator

(e) Four pad support plates



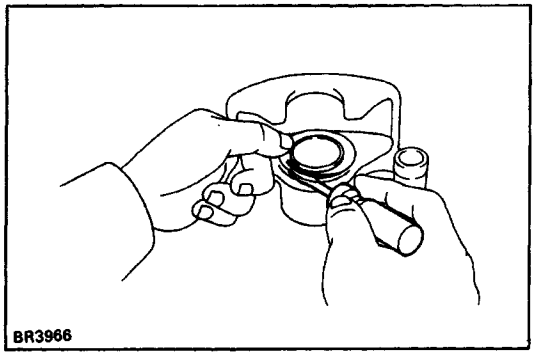
DISASSEMBLY OF CYLINDER

(See page BR–19)

1. REMOVE FOLLOWING PARTS:

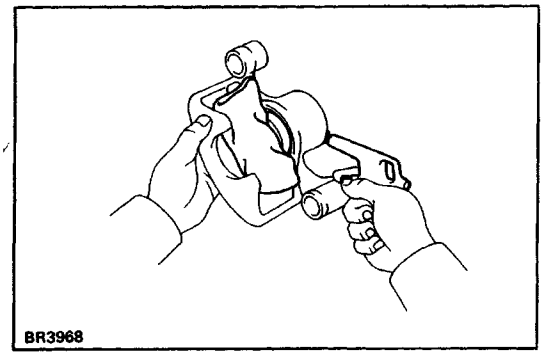
(a) Two sliding bushings

(b) Four dust boots



2. REMOVE CYLINDER BOOT SET RING AND CYLINDER BOOT

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

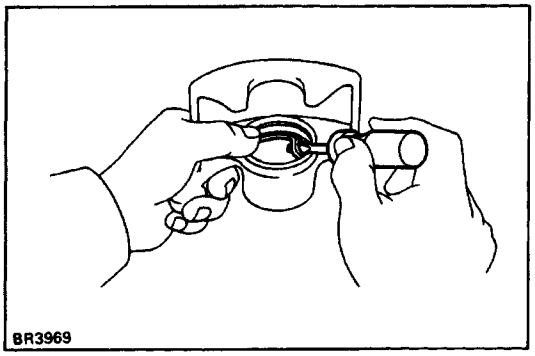


3. REMOVE PISTON FROM CYLINDER

(a) Put a piece of cloth or an equivalent between the piston and the cylinder.

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

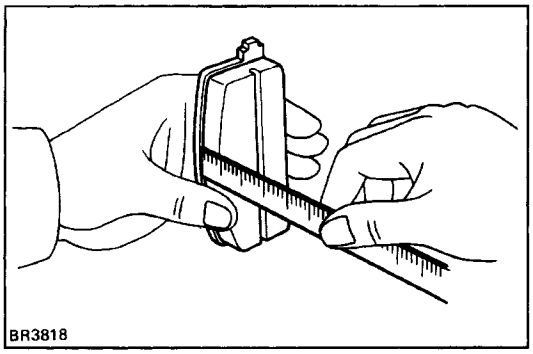
CAUTION: Do not place your fingers in front of the piston when using compressed air.



4. REMOVE PISTON SEAL FROM BRAKE CYLINDER

Using a screwdriver, remove the piston seal.

INSPECTION OF FRONT BRAKE COMPONENTS

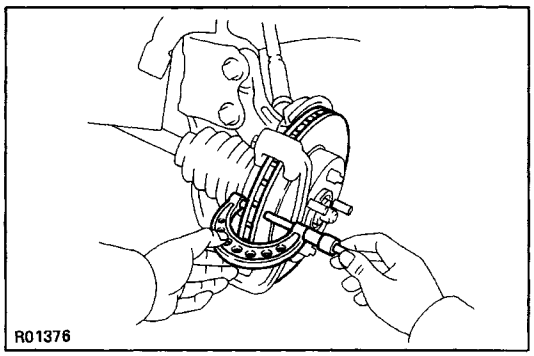


1. MEASURE PAD LINING THICKNESS

Standard thickness: 10.0 mm (0.39 in.)

Minimum thickness: 1.0 mm (0.039 in.)

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

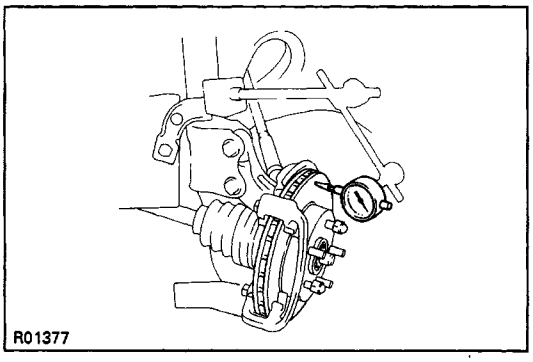


2. MEASURE ROTOR DISC THICKNESS

Standard thickness: 25.0 mm (0.984 in.)

Minimum thickness: 23.0 mm (0.906 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

HINT: 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 if following the procedure 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.

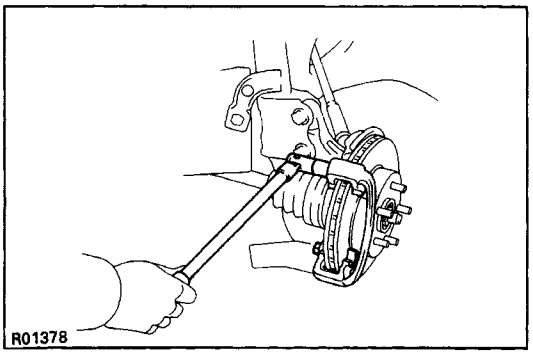
(c) Check that the hub axial play is within specification, and replace the bearing if not within specification. (See page SA–8)

(d) Install the rotor disc and measure the disc runout, then shift the rotor disc one fifth of a turn or one fourth of 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.

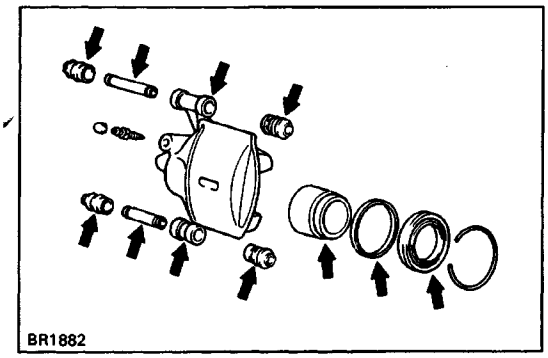
Torque: 107 N–m (1,090 kgf–cm, 79 ft–lbf)

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

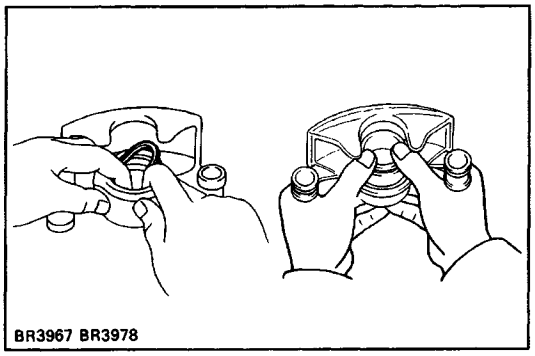


ASSEMBLY OF CYLINDER

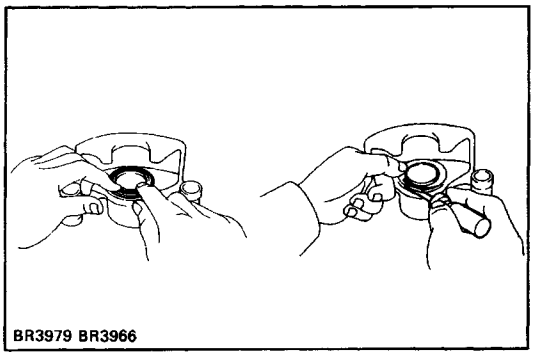
(See page BR–19)



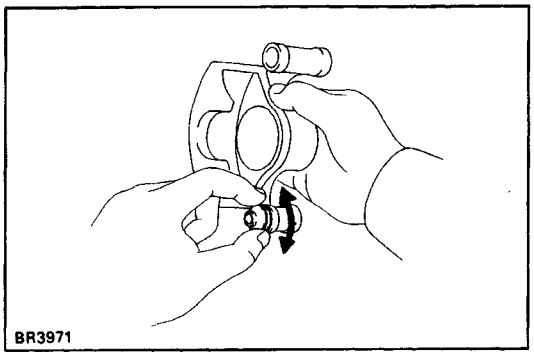
1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO PARTS INDICATED WITH ARROWS



2. INSTALL PISTON SEAL AND PISTON IN CYLINDER



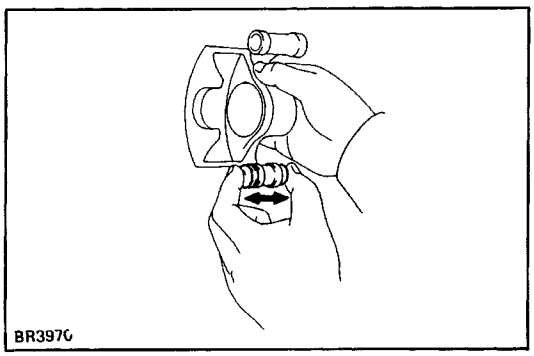
3. INSTALL CYLINDER BOOT AND SET RING IN CYLINDER



4. INSTALL DUST BOOTS AND CYLINDER SLIDING BUSHINGS

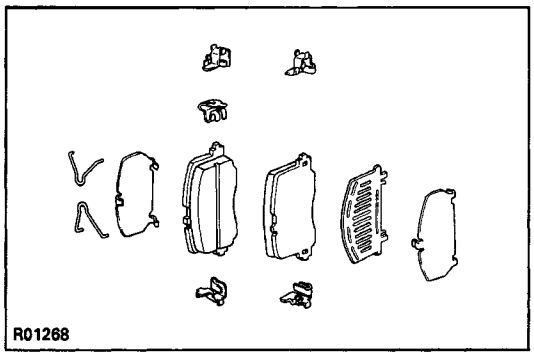
(a) Install the dust boots into the brake cylinder.

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



(c) Install the bushing into the boots.

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



INSTALLATION OF CYLINDER

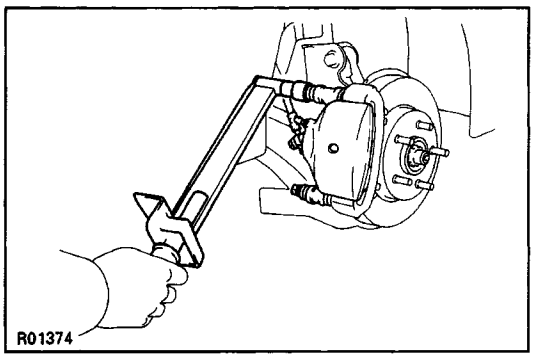
(See page BR–19)

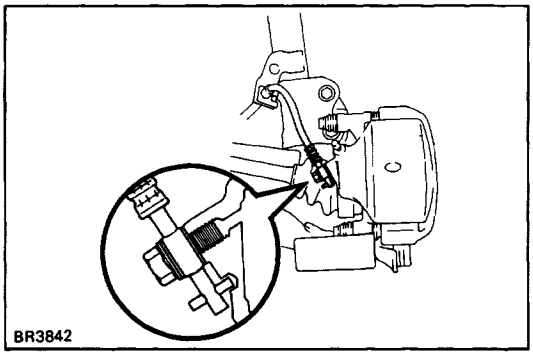
1. INSTALL FOLLOWING PARTS:

(a) Four pad support plates
(b) Pad wear indicator
(c) Three anti–squeal shims
(d) Two brake pads
(e) Two anti–squeal springs
(See steps 7 and 8 on pages BR–20 and 21)

2. INSTALL CYLINDER

(a) Install the brake cylinder.
(b) Install and torque the two installation bolts.
Torque: 39 N–m (400 kgf–cm, 29 ft–lbf)





3. INSTALL FLEXIBLE HOSE

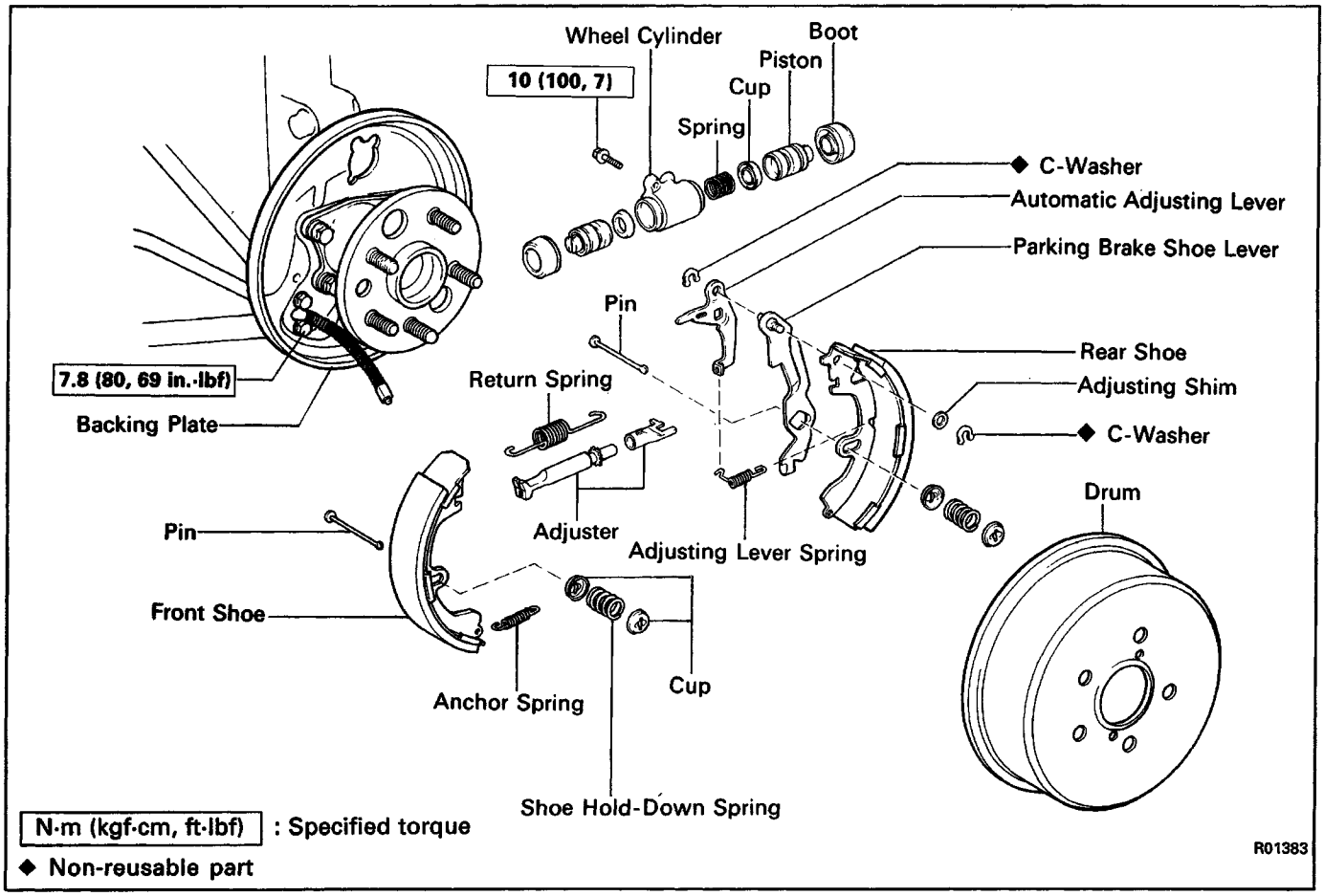
Install the flexible hose on the brake cylinder with two new gaskets.
Torque: 30 N–m (310 kgf–cm, 22 ft–lbf)
HINT: Insert the flexible hose lock securely in the lock hole in the brake cylinder.

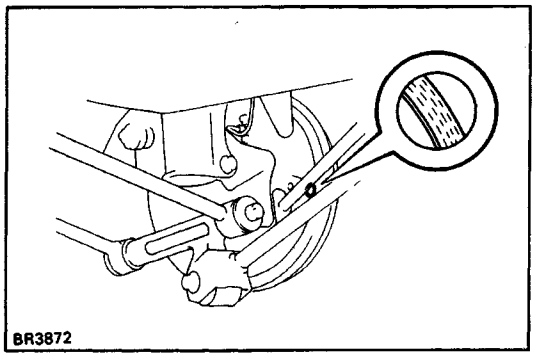
4. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM

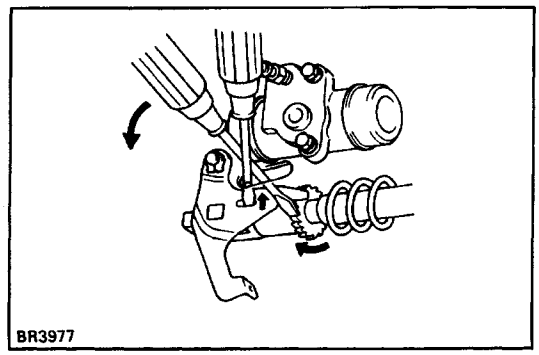
(See page BR–7)

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.)

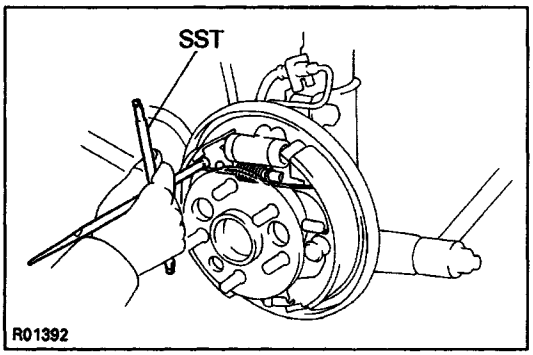
2. REMOVE REAR WHEEL

3. REMOVE BRAKE DRUM

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

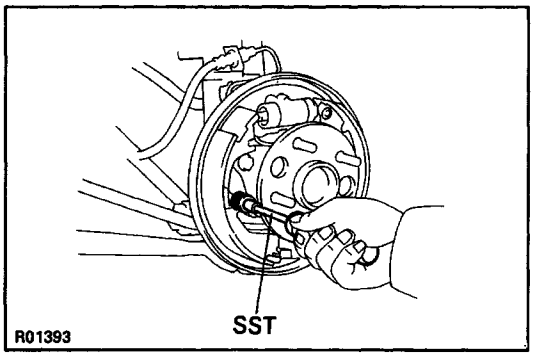
(a) Insert a screwdriver through the hole in the backing plate, and hold the automatic adjusting lever away from the adjuster.

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

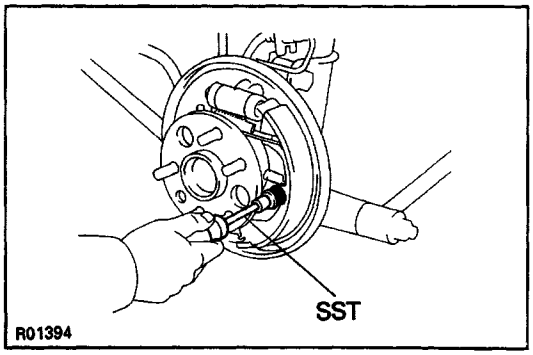


4. REMOVE FRONT SHOE

(a) Using SST, disconnect the return spring.
SST 09703–30010

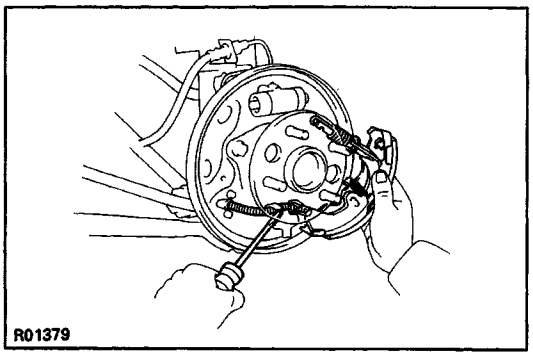


(b) Using SST, remove the shoe hold–down spring and
pin from the front shoe.
SST 09718–00010
(c) Disconnect the anchor spring from the front shoe and remove the front shoe.
(d) Remove the anchor spring from the rear shoe.

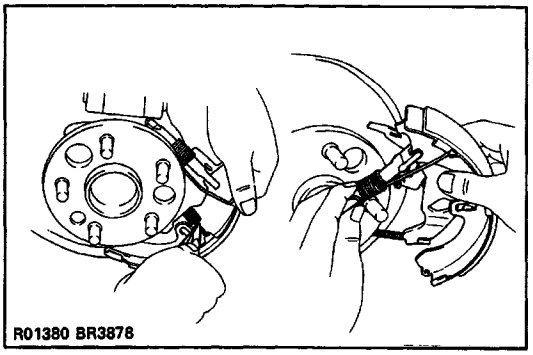


5. REMOVE REAR SHOE

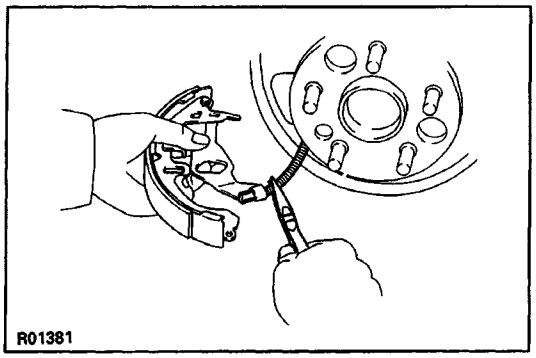
(a) Using SST, remove the shoe hold–down spring, cups and pin.
SST 09718–00010



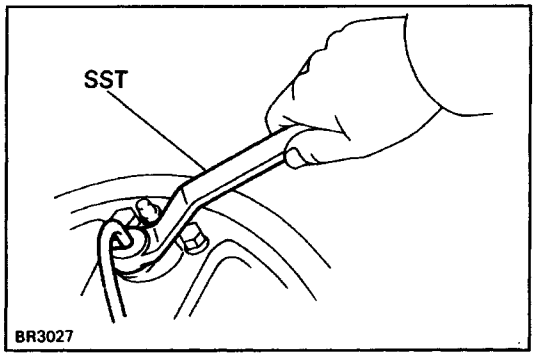
(b) Using a screwdriver, disconnect the parking brake cable from the anchor plate.



(c) Using pliers, remove the adjusting lever spring.
(d) Remove the adjuster together with the return spring.



(e) Using pliers, disconnect the parking brake cable from the lever and remove the rear shoe.

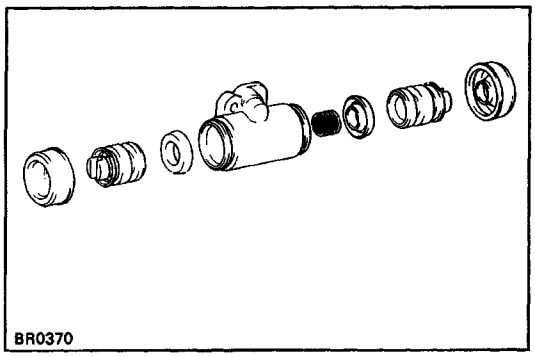


6. REMOVE WHEEL CYLINDER

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

SST 09751–36011

(b) Remove the two bolts and the wheel cylinder.



7. DISASSEMBLE WHEEL CYLINDER

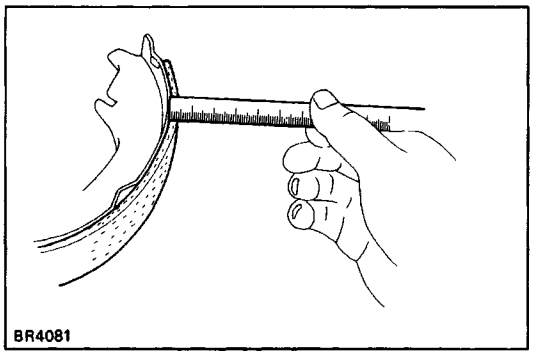
Remove the following parts from the wheel cylinder:

- 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.

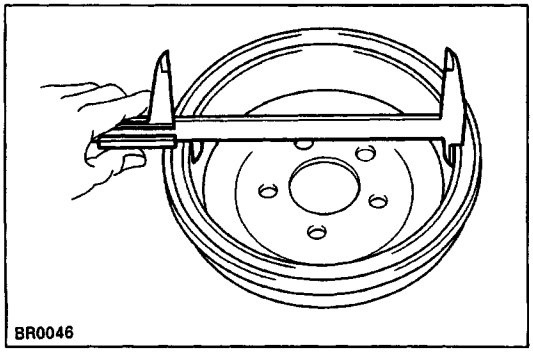


2. MEASURE BRAKE SHOE LINING THICKNESS

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.

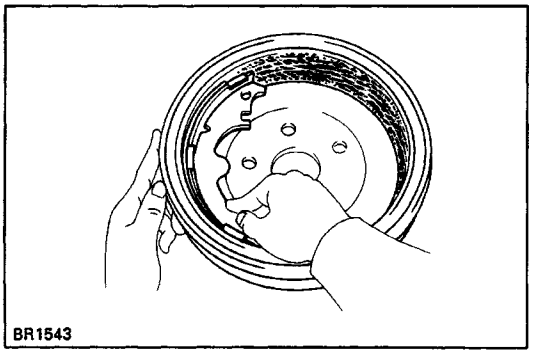
HINT: If any of the brake shoes have to be replaced, replace all of the rear shoes in order to maintain even braking.



3. MEASURE BRAKE DRUM INSIDE DIAMETER

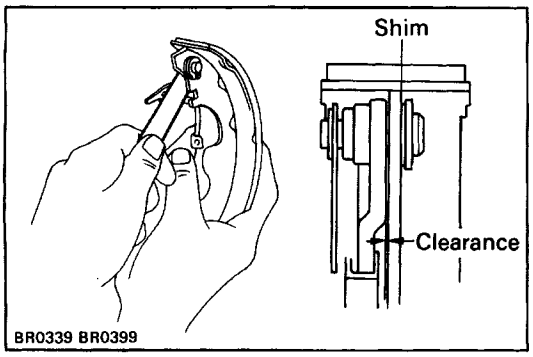
Standard inside diameter: 200.0 mm (7.874 in.)
Maximum inside diameter: 201.0 mm (7.913 in.)

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.



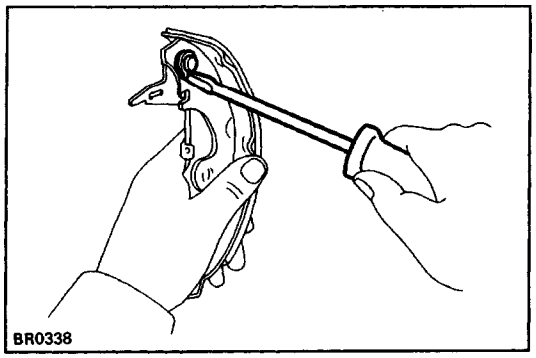
5. MEASURE CLEARANCE BETWEEN BRAKE SHOE AND LEVER

Using a feeler gauge, measure the clearance.

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

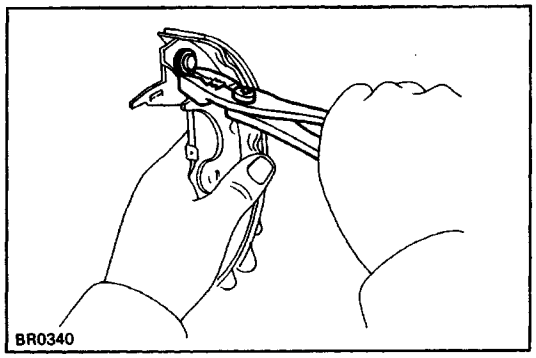
If the clearance is not within specification, replace the shim with one of the correct size.

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.



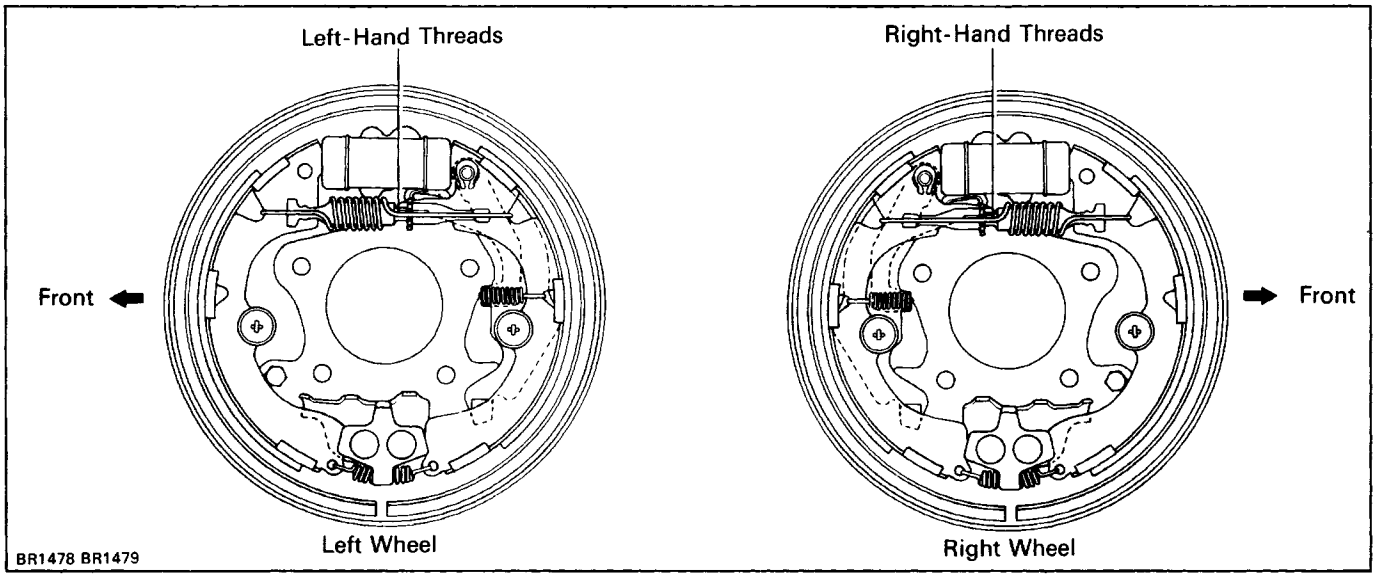
(b) Install the parking brake lever with a new C–washer.

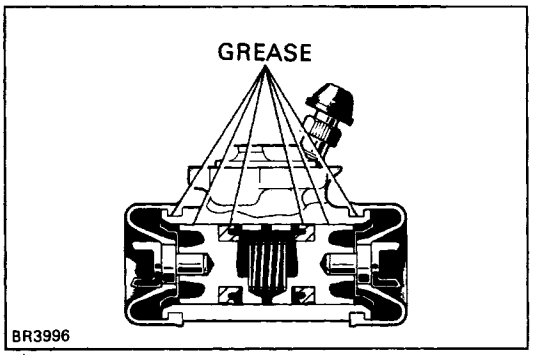
(c) Measure the clearance.

INSTALLATION OF REAR BRAKE

(See page BR–27)

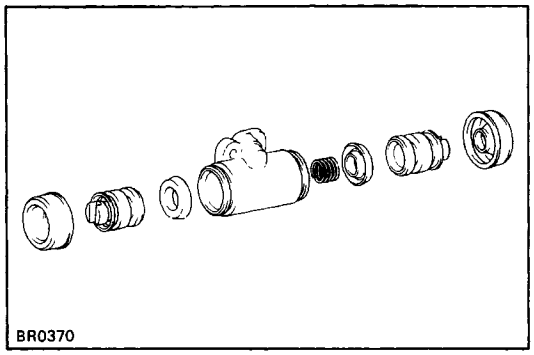
HINT: Assemble the parts in the correct direction as shown.





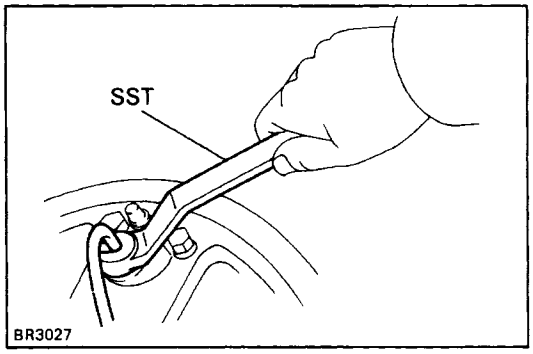
1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO FOLLOWING PARTS:

(a) Two piston cups
(b) Two pistons
(c) Two boots



2. ASSEMBLE WHEEL CYLINDER

(a) Install two piston cups to the pistons.
(b) Install the spring and two pistons into the wheel cylinder. Check that the flanges of the piston are pointed inward.
(c) Install two boots.



3. INSTALL WHEEL CYLINDER

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

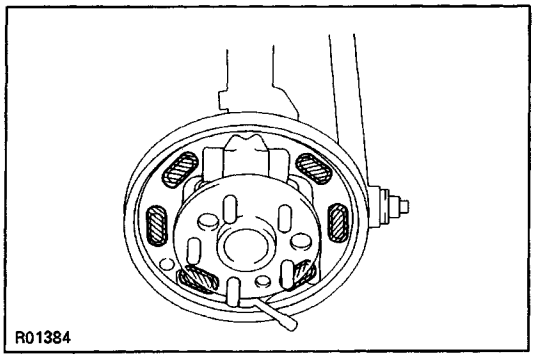
Torque: 10 N–m (100 kgf–cm, 7 ft–lbf)

4. CONNECT BRAKE TUBE TO WHEEL CYLINDER

Using SST, connect the brake tube.

SST 09751–36011

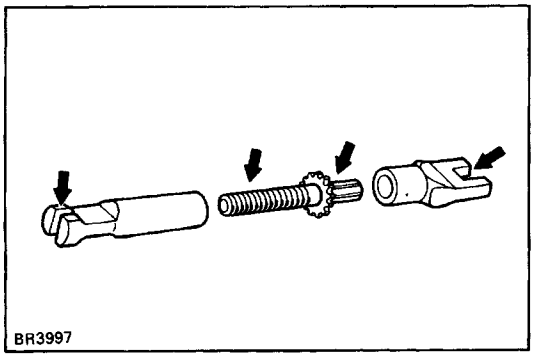
Torque: 15 N–m (155 kgf–cm, 11 ft–lbf)



5. APPLY HIGH TEMPERATURE GREASE TO FOLLOWING PARTS:

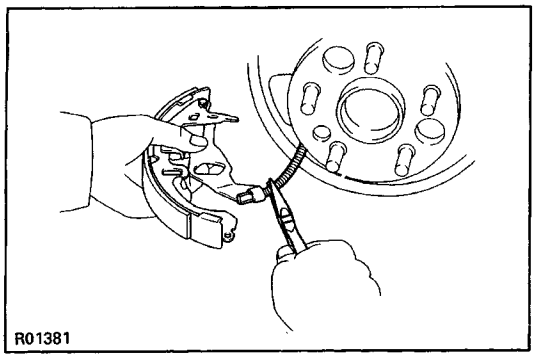
(a) Backing plate and brake shoe contact points

(b) Anchor plate and brake shoe contact points



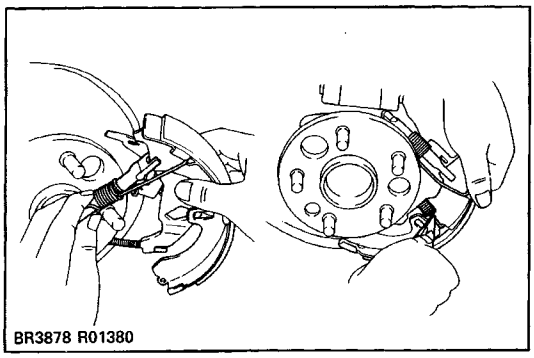
(c) Adjusting bolt

(d) Adjuster and brake shoe contact points



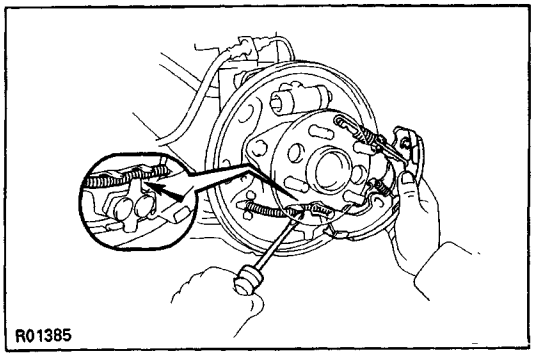
6. INSTALL ADJUSTER AND REAR SHOE

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



(b) Set the adjuster and return spring.

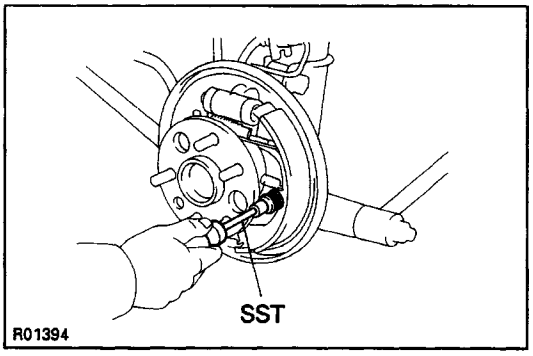
(c) Install the adjusting lever spring.



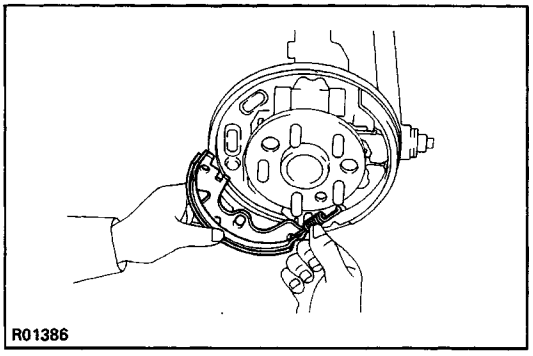
(d) Pass the parking brake cable through the notch in the anchor plate.

(e) 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.

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



(f) Using SST, install the shoe hold–down spring and pin.
SST 09718–00010

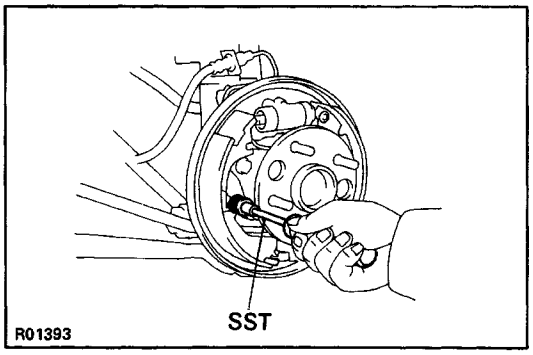


7. INSTALL FRONT SHOE

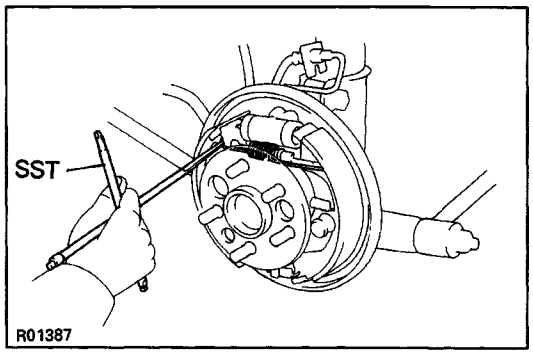
(a) Install the anchor spring between the front and rear shoes.

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

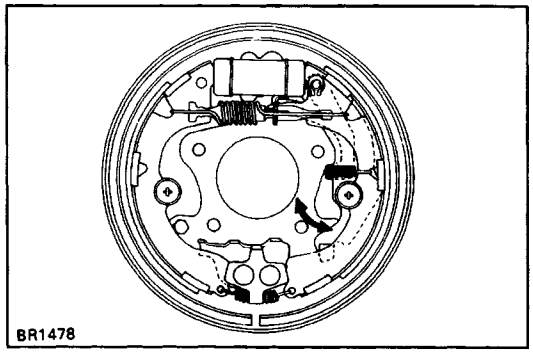
CAUTION: Do not allow oil or grease to get on the rubbing face.



(c) Using SST, install the shoe hold–down spring and pin.
SST 09718–00010

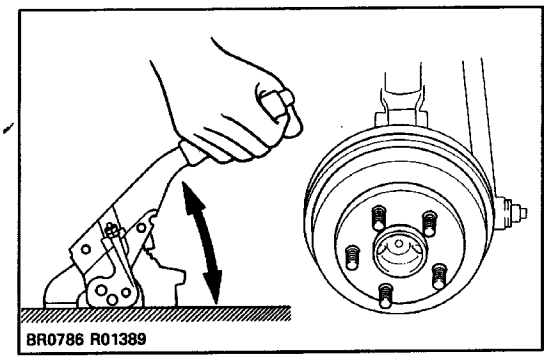


(d) Using SST, connect the return spring.
SST 09703–30010

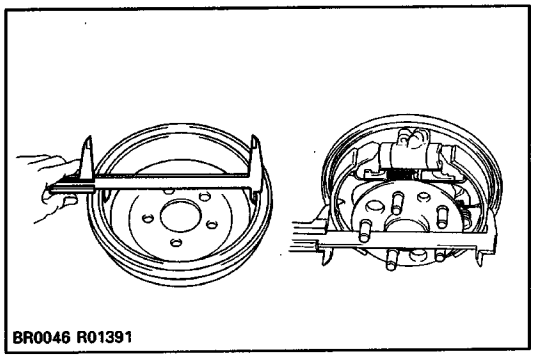


8. CHECK OPERATION OF AUTOMATIC ADJUSTING MECHANISM

(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.


BR0786 R01389

(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.


BR0046 R01391

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

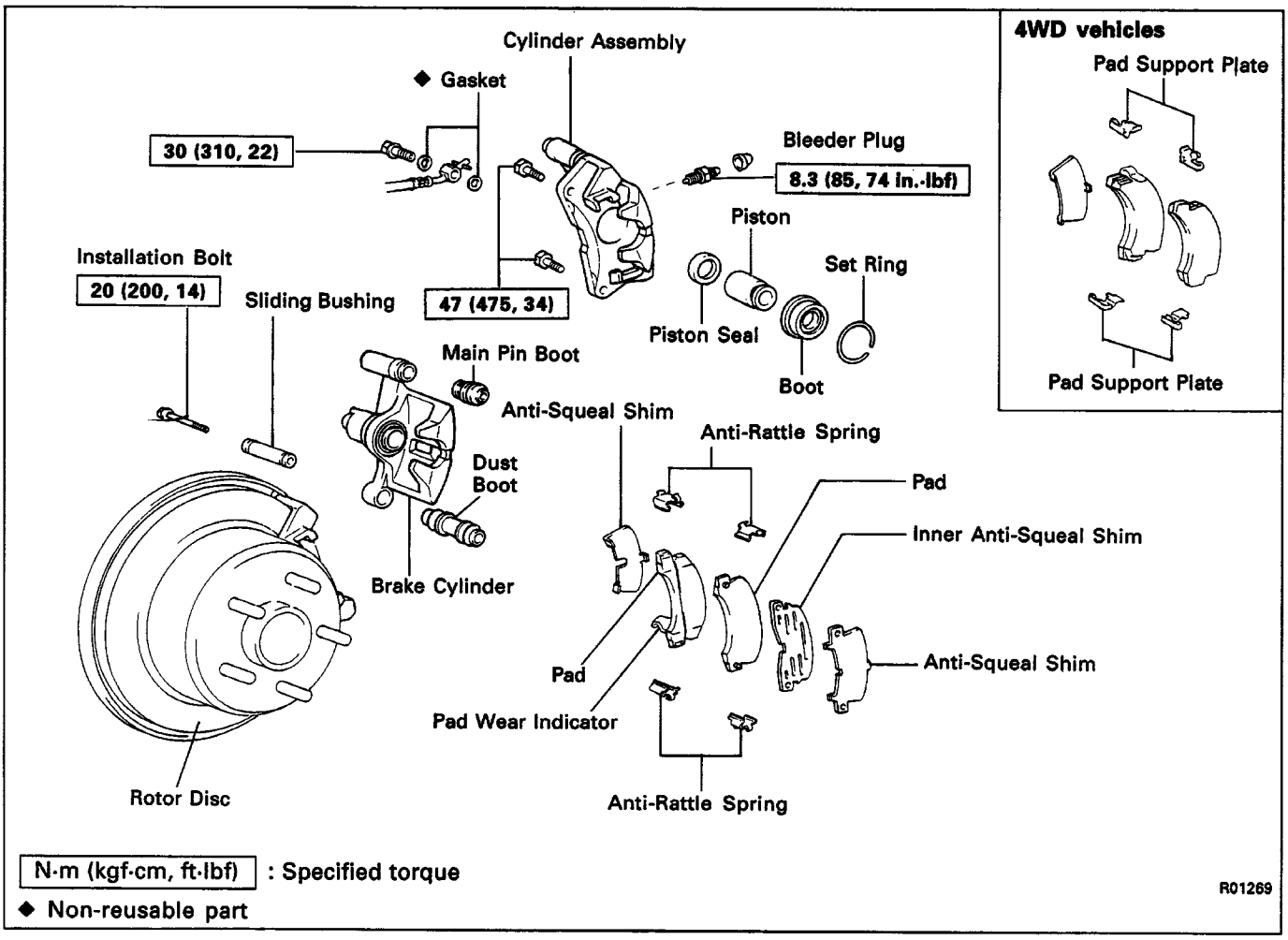
11. INSTALL REAR WHEEL

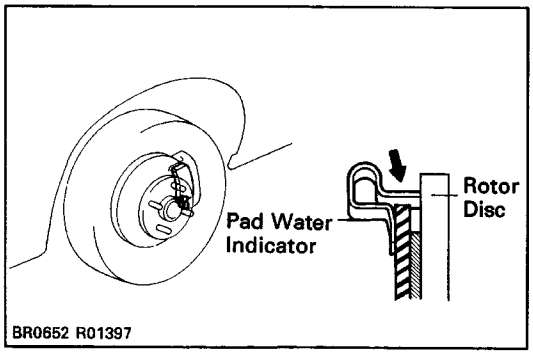
12. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR–7)

13. CHECK FOR FLUID LEAKAGE

Disc Brake

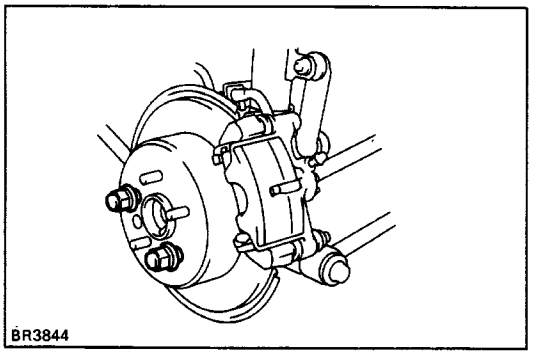
COMPONENTS





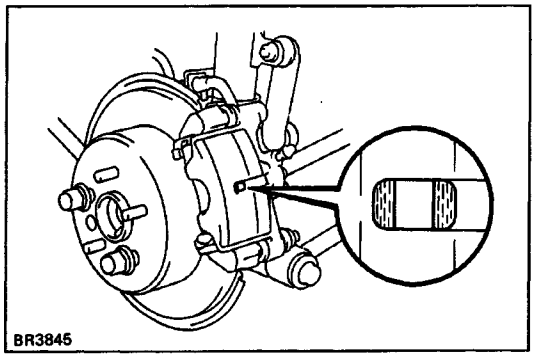
REPLACEMENT OF BRAKE PADS

HINT: If a squealing noise is made by the rear brakes while driving, check the pad wear indicator. If there is evidence of the indicator contacting the rotor disc, the brake pad should be replaced.



1. REMOVE REAR WHEEL

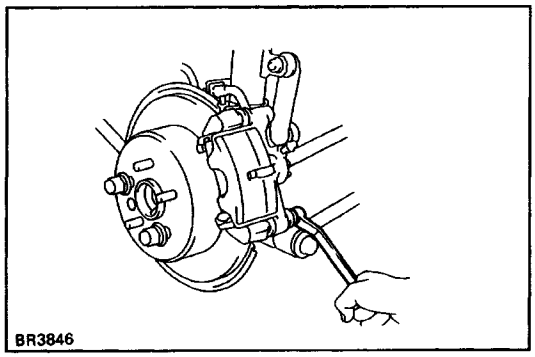
Remove the wheel and temporarily fasten the rotor disc with the hub nuts.



2. INSPECT PAD LINING THICKNESS

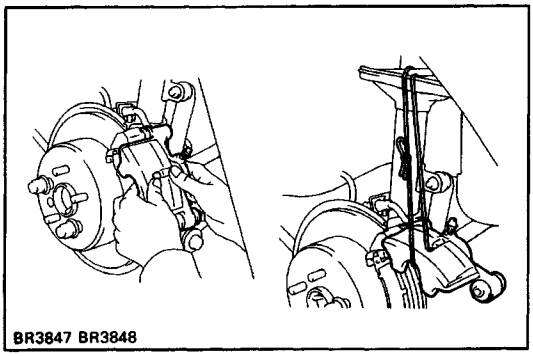
Check the pad thickness through the cylinder inspection hole and replace the pads if the thickness is not within specification.

Minimum thickness: 1.0 mm (0.039 in.)



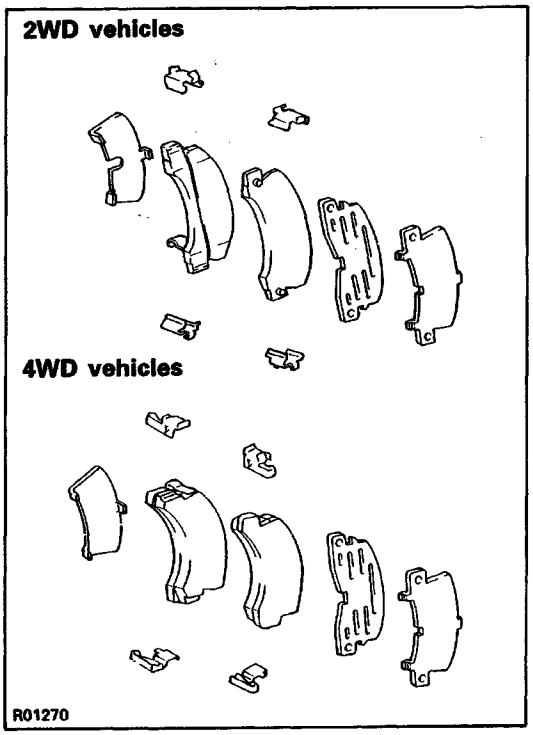
3. LIFT UP CYLINDER

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



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

HINT: Do not disconnect the brake hose.



4. REMOVE FOLLOWING PARTS:

(a) Two brake pads
(b) Three anti–squeal shims
(e) Four anti–rattle springs (2WD vehicles)
(d) Four pad support plates (4WD vehicles)

5. CHECK ROTOR DISC THICKNESS

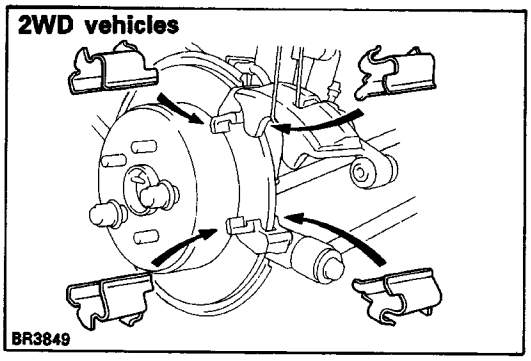
(See step 2 on page BR–41)

6. CHECK ROTOR DISC RUNOUT

(See step 3 on page BR–41)

7. INSTALL ANTI–RATTLE SPRINGS

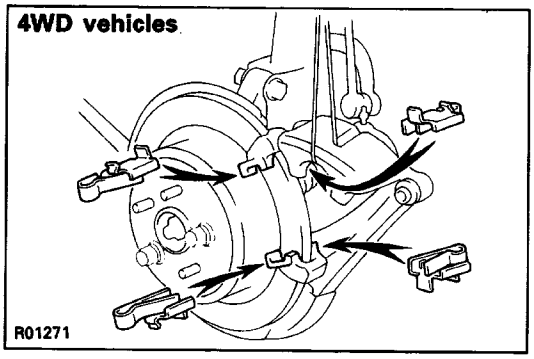
Install the four anti–rattle springs.



7. (2WD vehicles)

INSTALL ANTI–RATTLE SPRINGS

Install the four anti–rattle springs.



8. (4WD vehicles)

INSTALL PAD SUPPORT PLATES

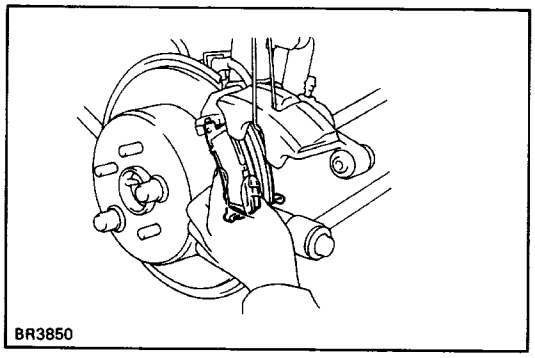
Install four pad support plates.

9. INSTALL NEW PADS

(a) Apply disc brake grease to both sides of the inner anti–squeal shim.

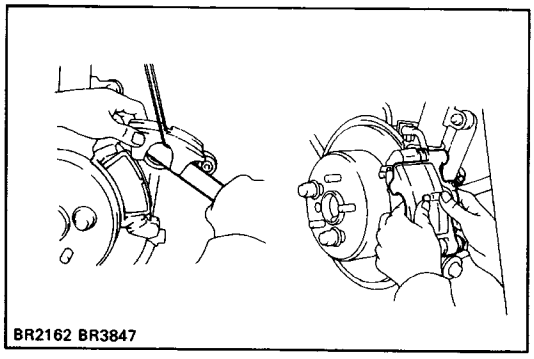
(b) Install the two anti–squeal shims to the outside pad.

(c) Install the anti–squeal shim to the inside pad.



(d) Install the two pads with the pad wear indicator plates facing downward.

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



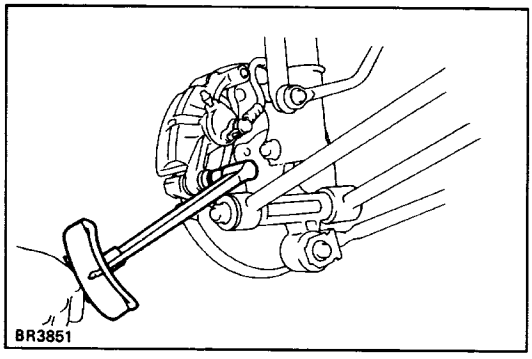
9. INSTALL CYLINDER

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

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

HINT: If the piston is heavy and difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

(c) Install the brake cylinder.

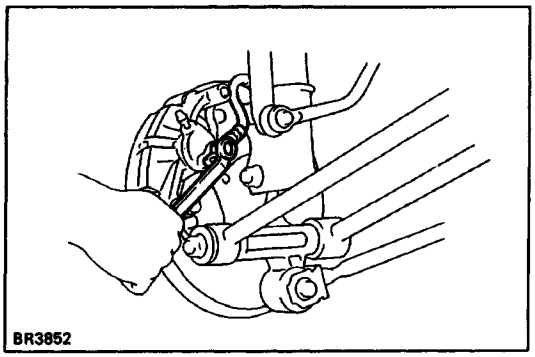


(d) Install and torque the installation bolt.

Torque: 20 N–m (200 kgf–cm, 14 ft–lbf)

10. INSTALL REAR WHEEL

11 . FILL BRAKE FLUID



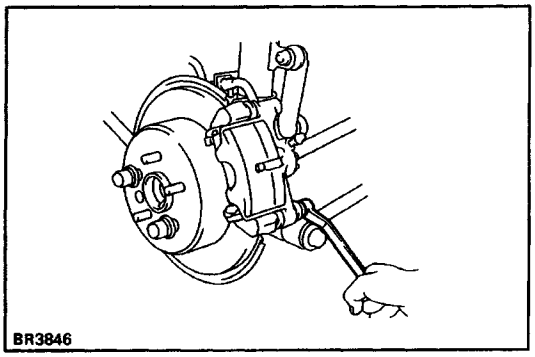
REMOVAL OF CYLINDER

(See page BR–36)

1. DISCONNECT FLEXIBLE HOSE

(a) Remove the union bolt and two gaskets from the brake cylinder, then disconnect the flexible hose from the brake cylinder.

(b) Use a container to catch the brake fluid as it drains out.

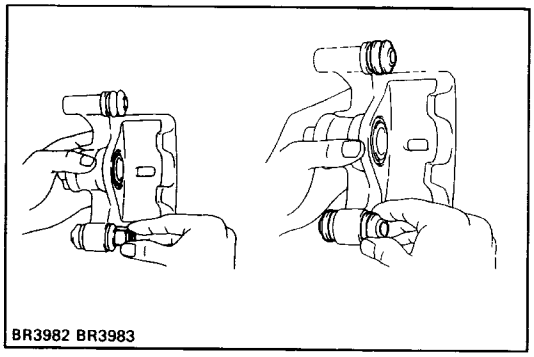


2. REMOVE CYLINDER FROM TORQUE PLATE

Remove the installation bolt and cylinder.

3. REMOVE PADS

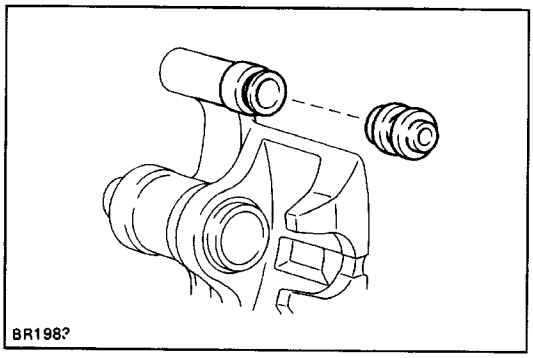
(See page BR–37)



DISASSEMBLY OF CYLINDER

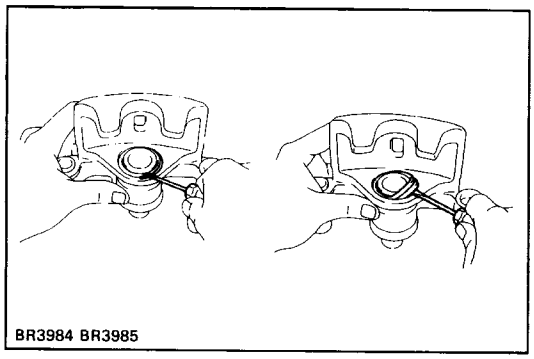
(See page BR–36)

1. REMOVE SLIDING BUSHING AND DUST BOOT



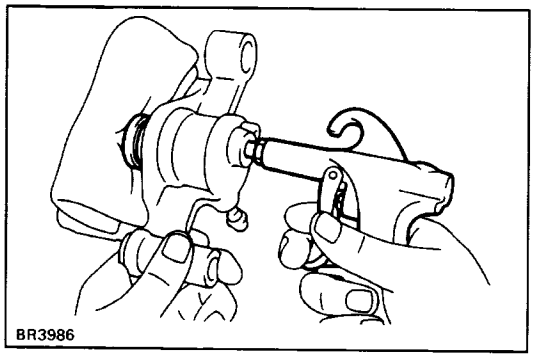
2. REMOVE MAIN PIN BOOT

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.

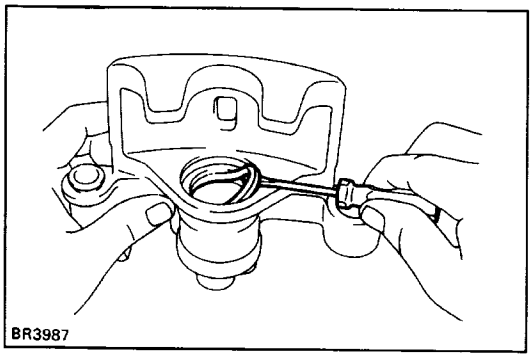


4. REMOVE PISTON FROM CYLINDER

(a) Put a piece of cloth or an equivalent between the piston and cylinder.

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

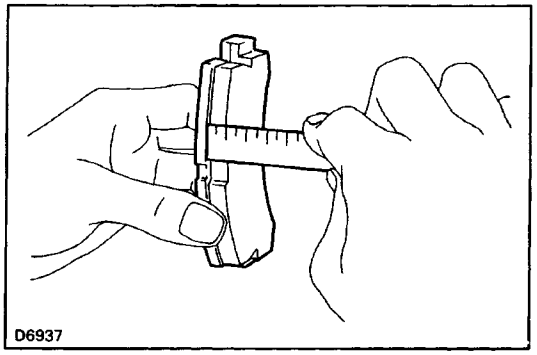
CAUTION: Do not place your fingers in front of the piston when using compressed air.



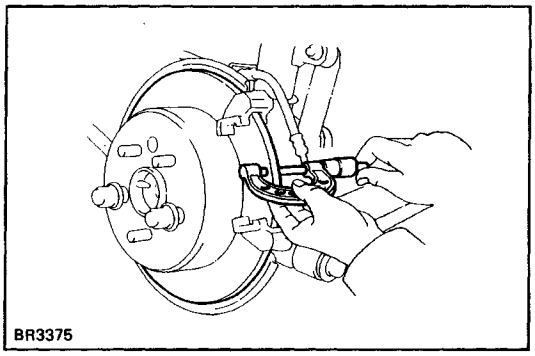
5. REMOVE PISTON SEAL FROM BRAKE CYLINDER

Using a screwdriver, remove the piston seal.

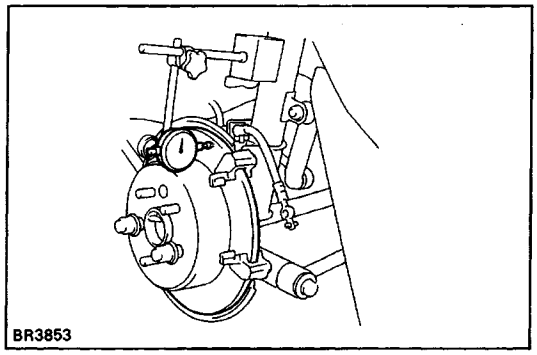
INSPECTION AND REPAIR OF REAR BRAKE COMPONENTS


D6937

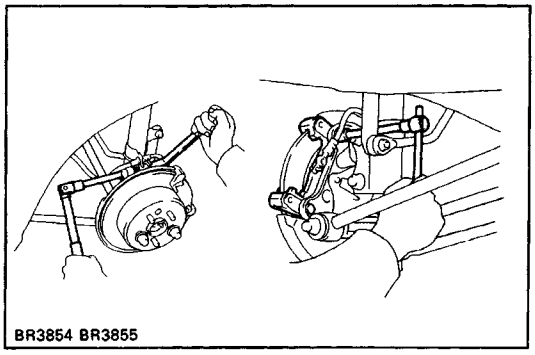
1. MEASURE PAD LINING THICKNESS
Standard thickness: 10.0 mm (0.394 in.)
Minimum thickness: 1.0 mm (0.039 in.)
Replace the pad if the thickness is less than the minimum or if it shows sign of uneven wear.


BR3375

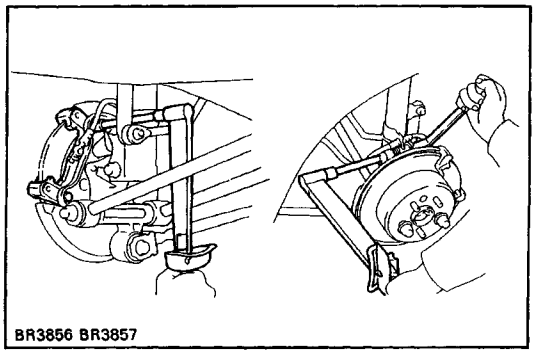
2. MEASURE ROTOR DISC THICKNESS
Standard thickness: 10.0 mm (0.394 in.)
Minimum thickness: 9.0 mm (0.354 in.)
If the disc is scored or worn, or if thickness is less than minimum, repair or replace the disc.


BR3853

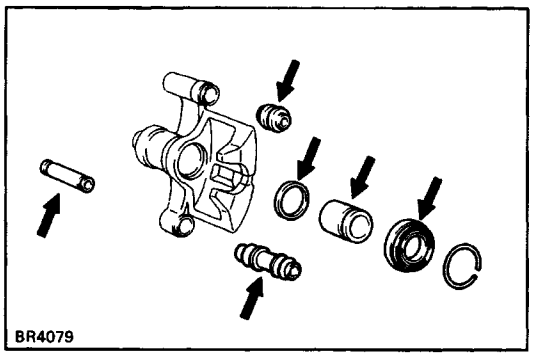
3. MEASURE ROTOR DISC RUNOUT
Measure the rotor disc runout at 10 mm (0.39 in.) from the outer edge of the rotor disc.
Maximum disc runout: 0.15 mm (0.0059 in.)
If the runout is greater than the maximum, replace the disc.
HINT: Before measuring the runout, confirm that the hub bearing play is within specification.


BR3854 BR3855

4. IF NECESSARY, REPLACE ROTOR DISC
(a) Remove the axle carrier mounting bolt and nut of upper side.
(b) Remove the torque plate.
(c) Remove the hub nuts of the temporarily installed disc and pull off the rotor disc.
(d) Install a new rotor disc and loosely install the hub nuts.


BR3856 BR3857

(e) Install the torque plate and tighten the mounting bolt.
Torque: 47 N–m (475 kgf–cm, 34 ft–lbf)
(f) Install the axle carrier mounting bolt and nut of upper side.
Torque: 226 N–m (2,300 kgf–cm, 166 ft–lbf)

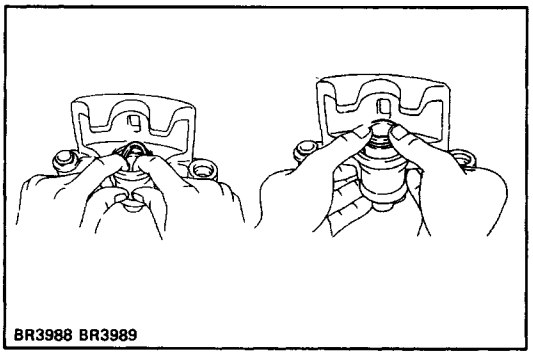


ASSEMBLY OF CYLINDER

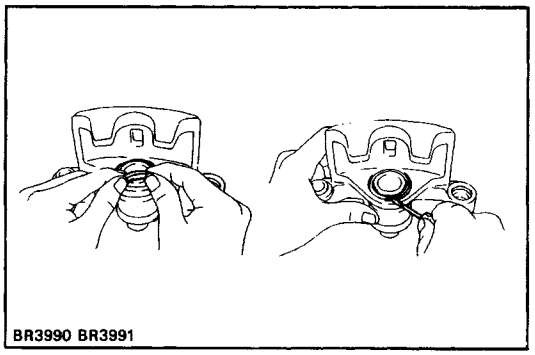
(See page BR–36)

1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO FOLLOWING PARTS:

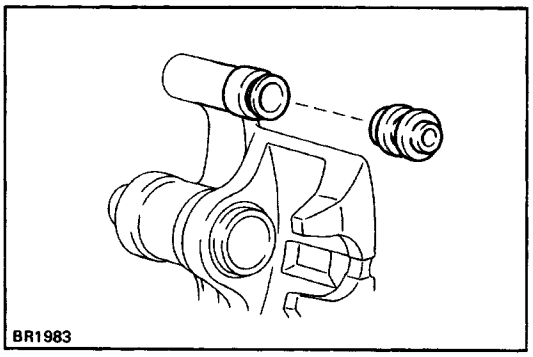
(a) Main pin boot
(b) Sliding bushing and dust boot
(c) Piston, piston seal and cylinder boot



2. INSTALL PISTON SEAL AND PISTON IN CYLINDER

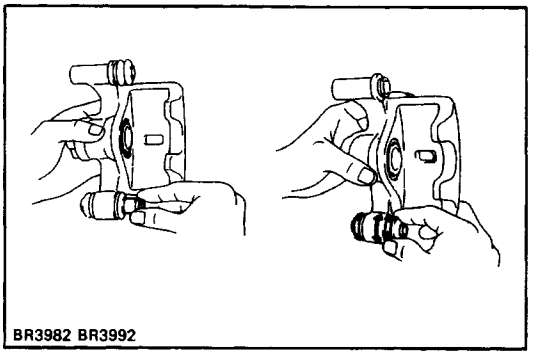


3. INSTALL CYLINDER BOOT AND SET RING IN CYLINDER



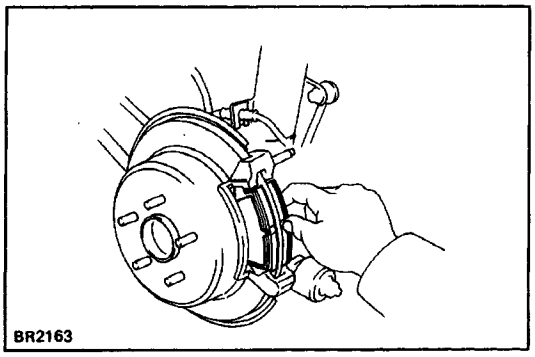
4. INSTALL MAIN PIN BOOT

Install the main pin boot in place.



5. INSTALL SLIDING BUSHING AND DUST BOOT

Install the sliding bushing and dust boot into the brake cylinder.



INSTALLATION OF CYLINDER

(See page BR–36)

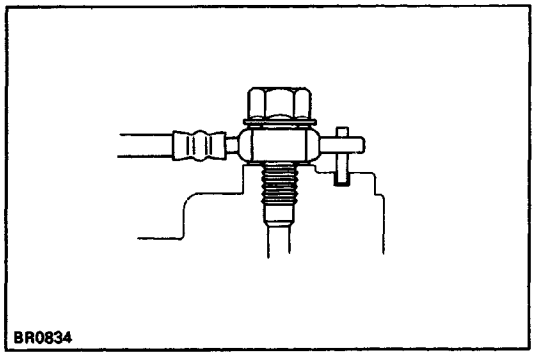
1. INSTALL PADS

2. INSTALL CYLINDER

(a) Install the brake cylinder:

(b) Install and torque the installation bolt.

Torque: 20 N–m (200 kgf–cm, 14 ft–lbf)



3. INSTALL FLEXIBLE HOSE TO BRAKE CYLINDER

Install the flexible hose on the brake cylinder with two new gaskets.

Torque: 30 N–m (310 kgf–cm, 22 ft–lbf)

HINT: Insert the flexible hose lock securely in the lock hole in the brake cylinder.

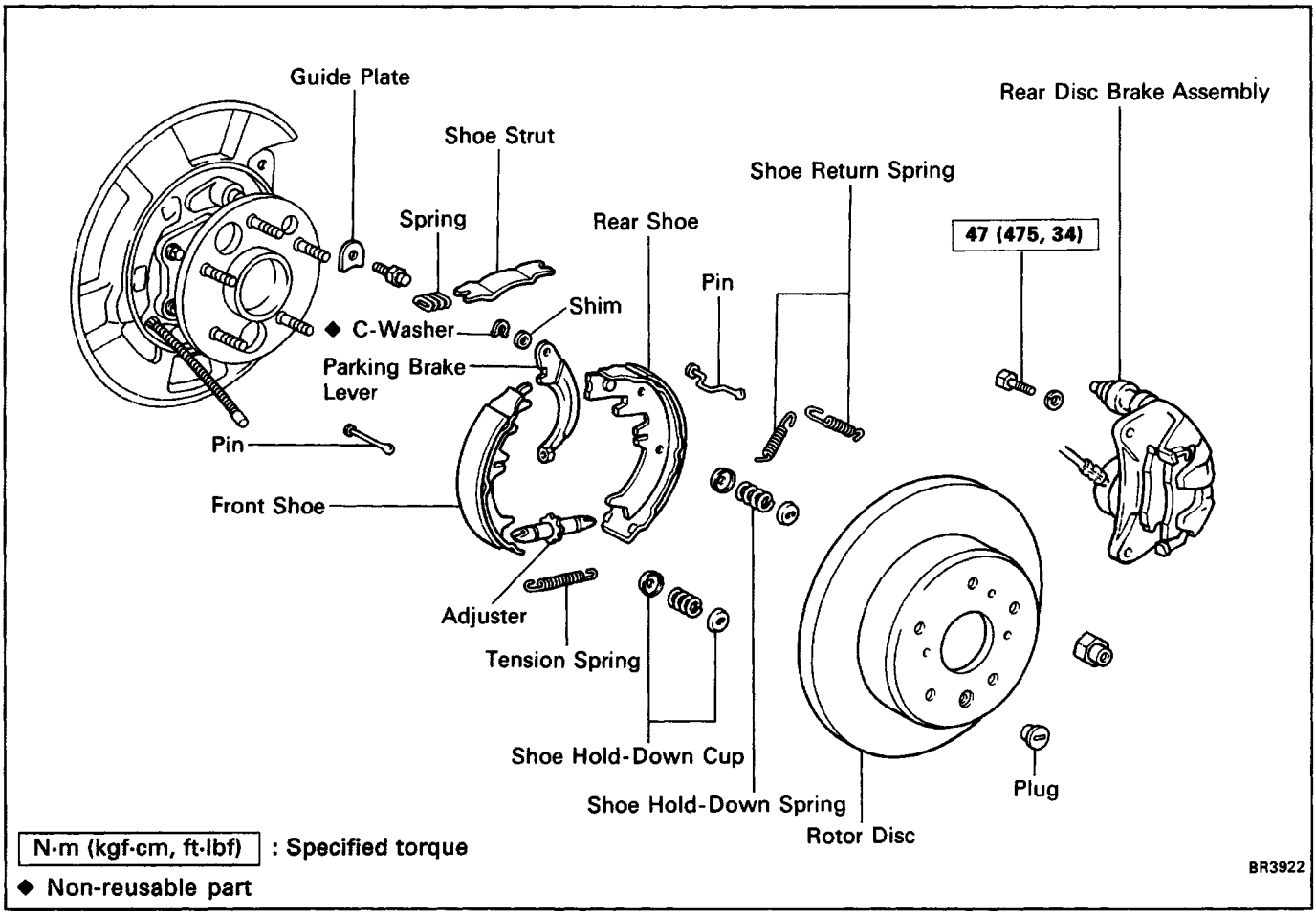
4. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM

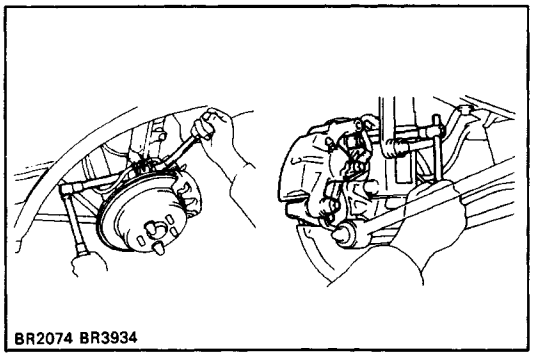
(See page BR–7)

5. CHECK FOR LEAKS

Parking Brake (For Rear Disc Brake)

COMPONENTS

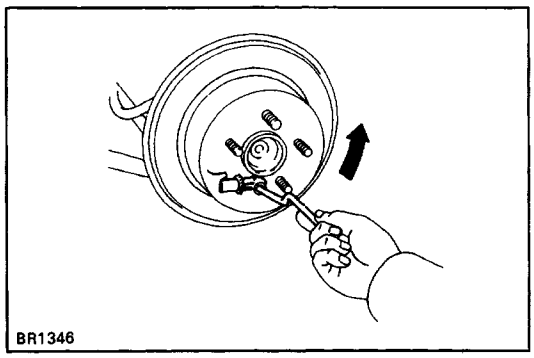




DISASSEMBLY OF PARKING BRAKE

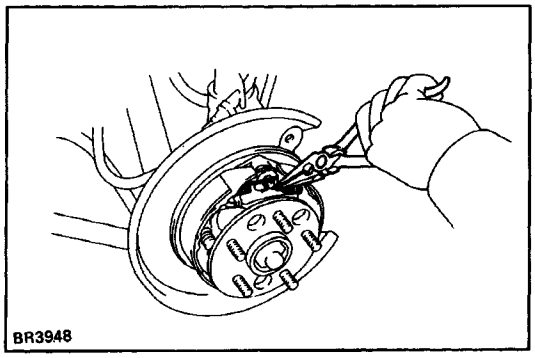
1. REMOVE REAR DISC BRAKE ASSEMBLY

(a) Remove the axle carrier mounting bolt and nut of upper side.
(b) Remove the two mounting bolts and remove the disc brake assembly.
(c) Suspend the disc brake so the hose is not stretched.



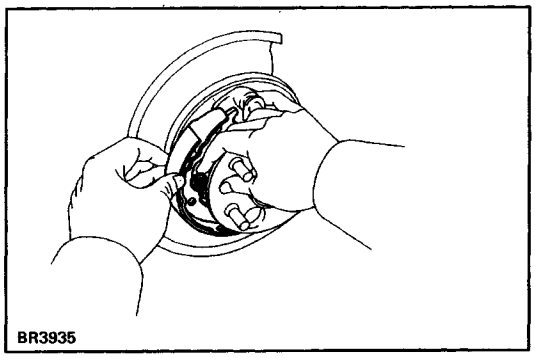
2. REMOVE ROTOR DISC

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



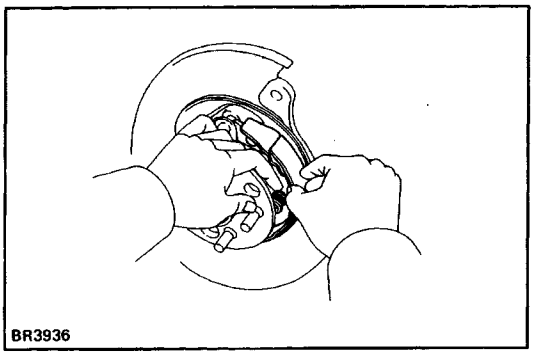
3. REMOVE SHOE RETURN SPRINGS

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



4. REMOVE FRONT SHOE, ADJUSTER AND TENSION SPRING

(a) Slide out the front shoe–and remove the shoe adjuster.
(b) Remove the shoe strut with spring.
(c) Disconnect the tension spring and remove the front shoe.



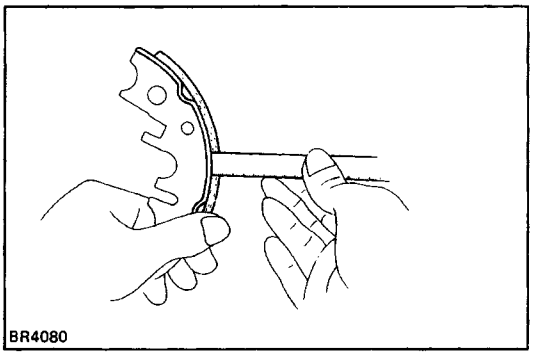
5. REMOVE REAR SHOE

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

INSPECTION AND REPAIR OF PARKING BRAKE COMPONENTS

1. INSPECT DISASSEMBLED PARTS

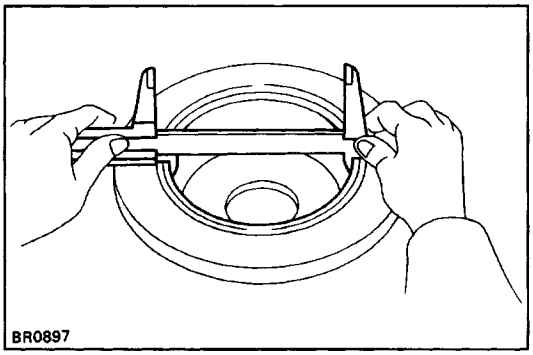
Inspect the disassembled parts for wear, rust or damage.



2. MEASURE BRAKE SHOE LINING THICKNESS

Standard thickness: 2.0 mm (0.079 in.)
Minimum thickness: 1.0 mm (0.039 in.)

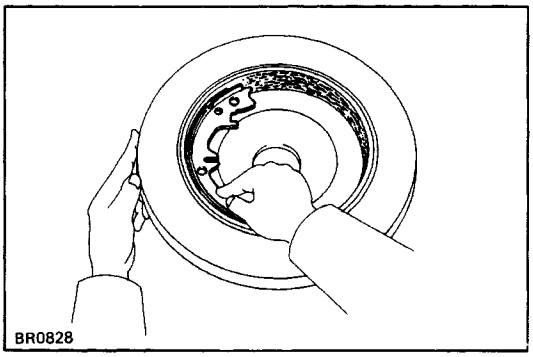
If the shoe lining is less than minimum or shows signs of uneven wear, replace the parking brake shoes.



3. MEASURE BRAKE DISC INSIDE DIAMETER

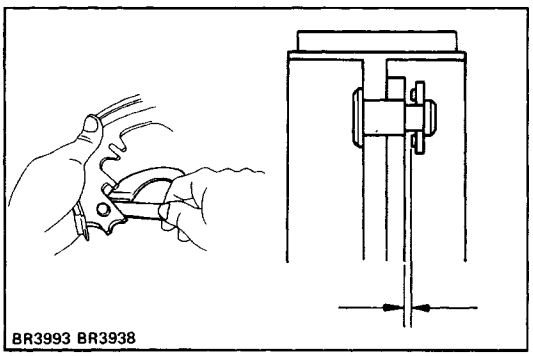
Standard inside diameter: 170 mm (6.69 in.)
Maximum inside diameter: 171 mm (6.73 in.)

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.

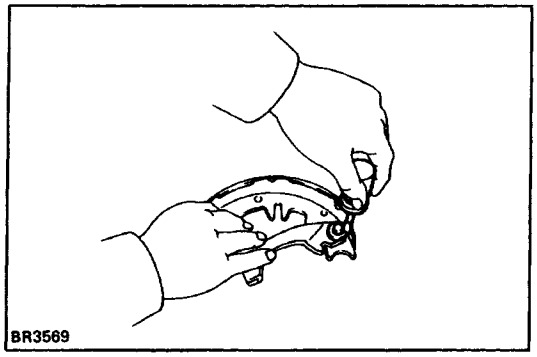


5. MEASURE CLEARANCE BETWEEN PARKING BRAKE SHOE AND LEVER

Using a feeler gauge, measure the clearance.

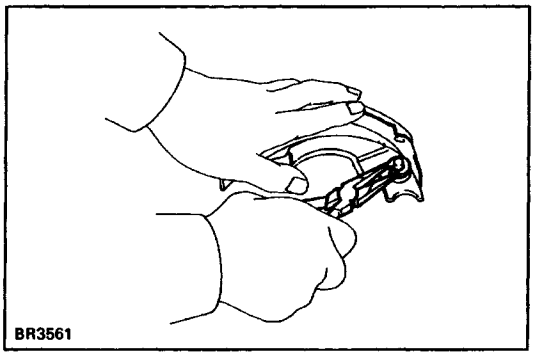
Standard clearance: Less than 0.35 mm (0.0138 in.)

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



6. IF NECESSARY, REPLACE SHIM

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



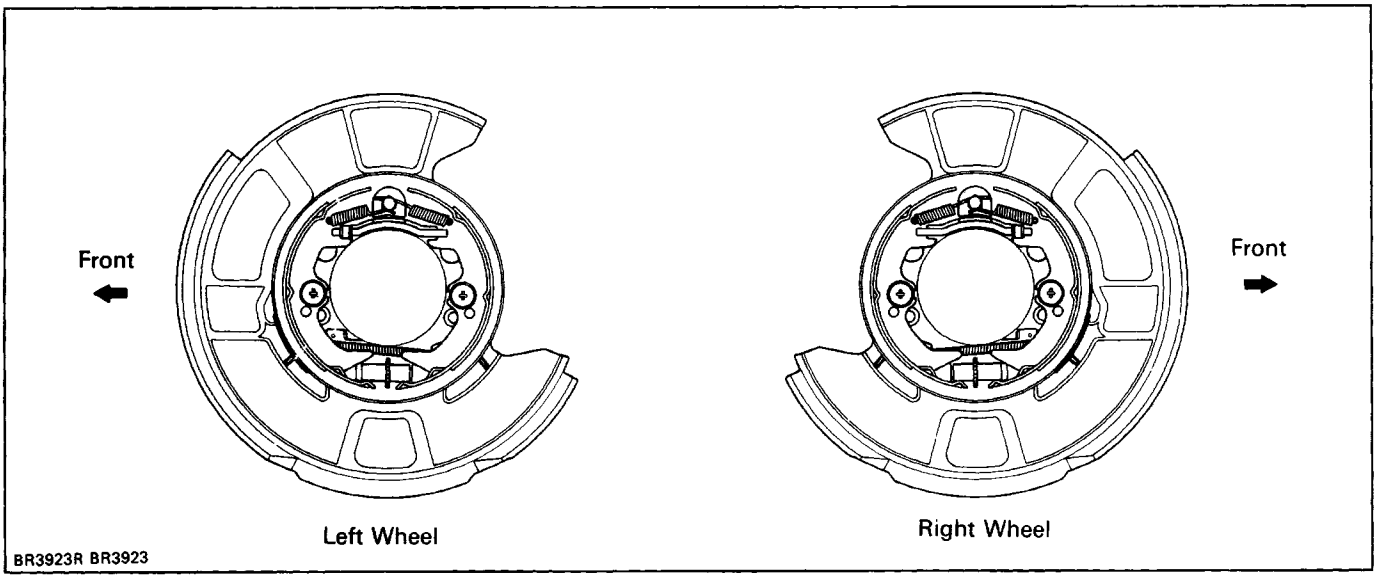
(b) Install the parking brake lever with a new C–washer.

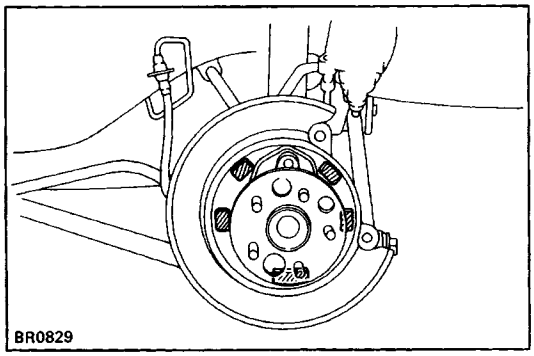
(c) Remeasure the clearance.

ASSEMBLY OF PARKING BRAKE

(See page BR–44)

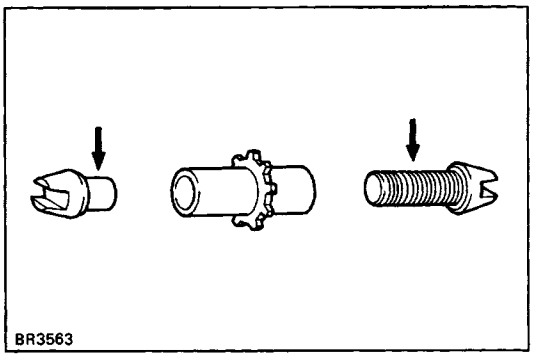
HINT: Assemble the parts in the correct direction as shown.



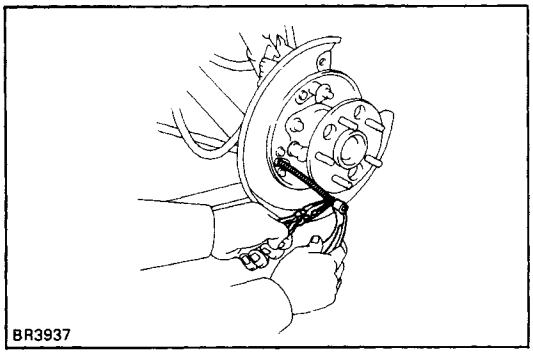


1. APPLY HIGH TEMPERATURE GREASE ON BACKING PLATE AS SHOWN

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



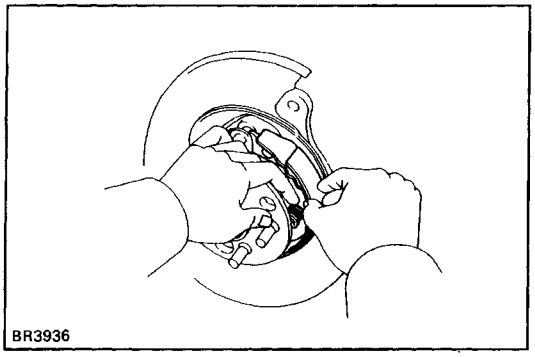
2. APPLY HIGH TEMPERATURE GREASE TO ADJUSTER AS SHOWN



3. CONNECT PARKING BRAKE CABLE TO PARKING BRAKE LEVER

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

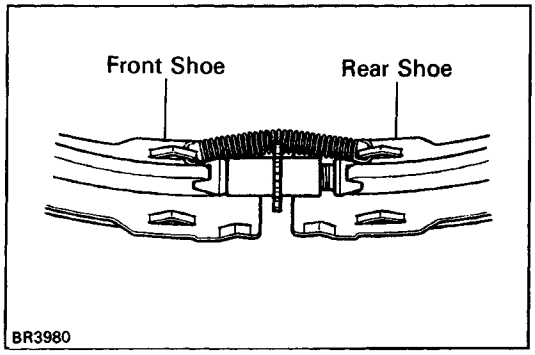
(b) Connect the parking brake cable to the parking brake lever of the rear shoe.



4. INSTALL REAR SHOE

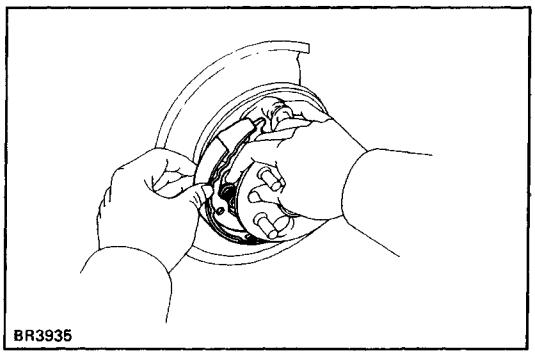
Slide in the rear shoe between the shoe hold–down spring cup and the backing plate.

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

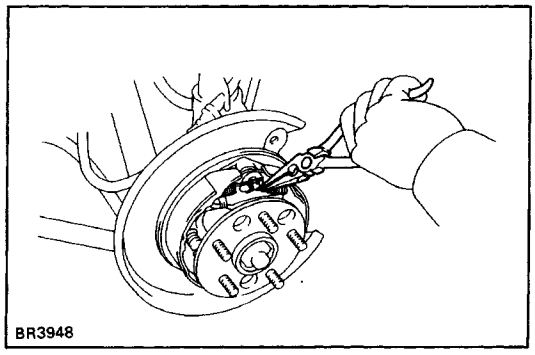


5. INSTALL TENSION SPRING, FRONT SHOE AND ADJUSTER

(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) Install the shoe strut with spring.

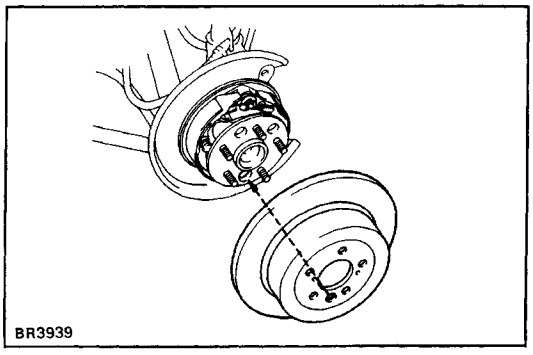


(e) Slide in the front shoe between the shoe hold–down spring cup and the backing plate.



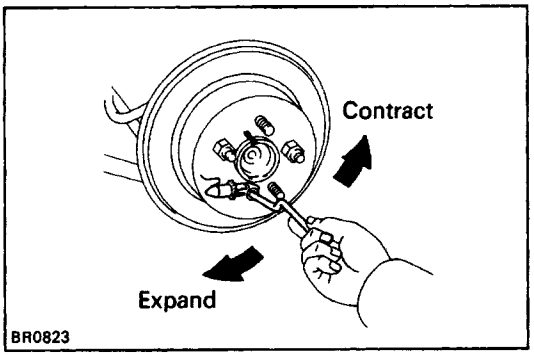
6. INSTALL SHOE RETURN SPRINGS

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



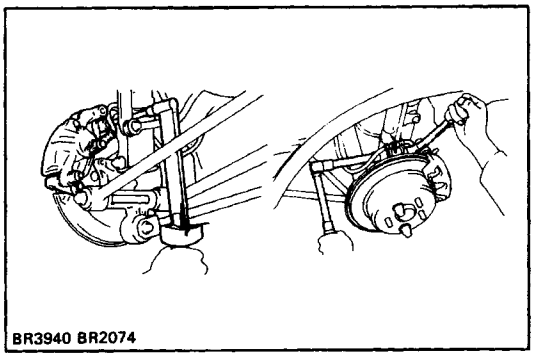
7. INSTALL ROTOR DISC

(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.



8. 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.



9. INSTALL REAR DISC BRAKE ASSEMBLY

(a) Install the disc brake assembly and torque the two mounting bolts.
Torque: 47 N–m (475 kgf–cm, 34 ft–lbf)
(b) Install the axle carrier bolt and nut of upper side.
Torque: 226 N–m (2,300 kgf–cm, 166 ft–lbf)

10. INSTALL REAR WHEEL

11. SETTLING PARKING BRAKE SHOES AND DISC

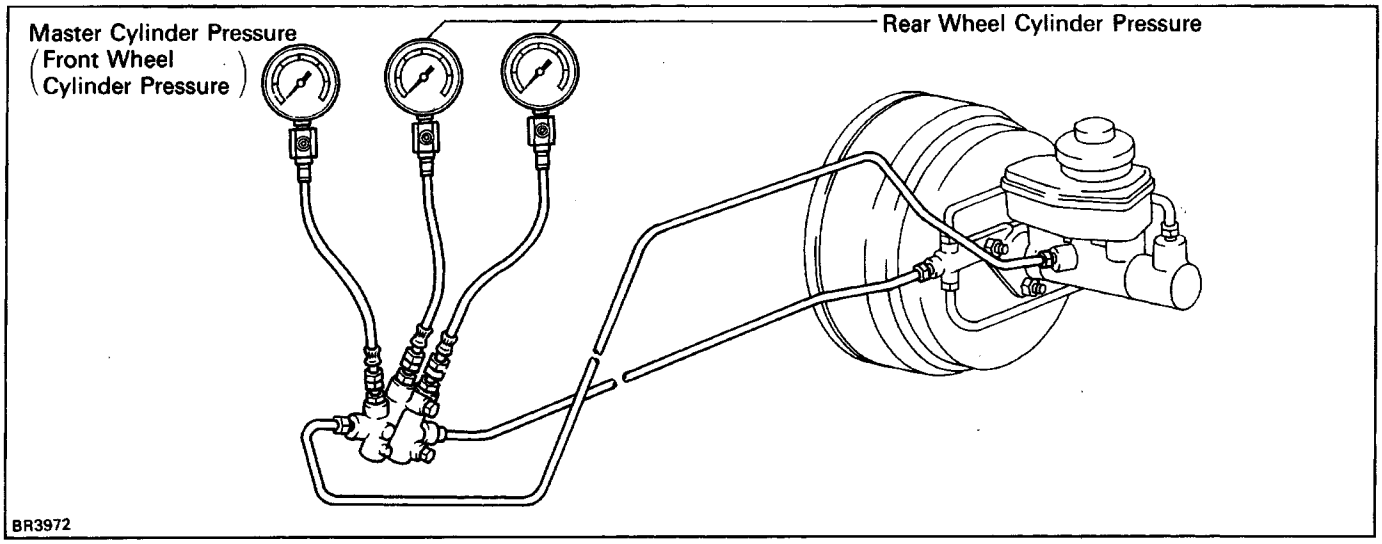
(a) Drive the vehicle at about 50 km/h (31 mph) on a safe, level and dry road.
(b) With the parking brake release button pushed in, pull on the lever with 88 N (9 kgf, 19.8 lbf) of force.
(c) Drive the vehicle for about 400 meters (0.25 mile) in this condition.
(d) Repeat this procedure two or three times.

12. RECHECK AND ADJUST PARKING BRAKE LEVER TRAVEL

PROPORTIONING VALVE (P VALVE)

CHECK OF FLUID PRESSURE

1. CONNECT FLUID PRESSURE GAUGE TO P VALVE



2. BLEED AIR FROM FLUID PRESSURE GAUGE

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

Specifications

			Master cylinder pressure	Rear Wheel cylinder pressure
2WD	4A–FE		2,942 kPa (30 kgf/cm², 427 psi)	2,942 kPa (30 kgf/cm², 427 psi)
			7,845 kPa (80 kgf/cm², 1,138 psi)	4,167.8 kPa (42.5 kgf/cm², 604.5 psi)
	5S–FE	Coupe and Liftback	2,942 kPa (30 kgf/cm², 427 psi)	2,942 kPa (30 kgf/cm², 427 psi)
			7,845 kPa (80 kgf/cm², 1,138 psi)	4,756 kPa (48.5 kgf/cm², 690 psi)
		Con–vertible	2,452 kPa (25 kgf/cm², 356 psi)	2,452 kPa (25 kgf/cm², 356 psi)
			7,845 kPa (80 kgf/cm², 1,138 psi)	4,452 kPa (45.4 kgf/cm², 646 psi)
4WD			3,923 kPa (40 kgf/cm², 569 psi)	3,923 kPa (40 kgf/cm², 569 psi)
			8,826 kPa (90 kgf/cm², 1,280 psi)	5,737 kPa (58.5 kgf/cm², 832 psi)

If the rear wheel cylinder pressure is incorrect, replace the P valve assembly.

4. BLEED BRAKE SYSTEM

5. CHECK FLUID LEAKAGE

ANTI–LOCK BRAKE SYSTEM (ABS)

Description

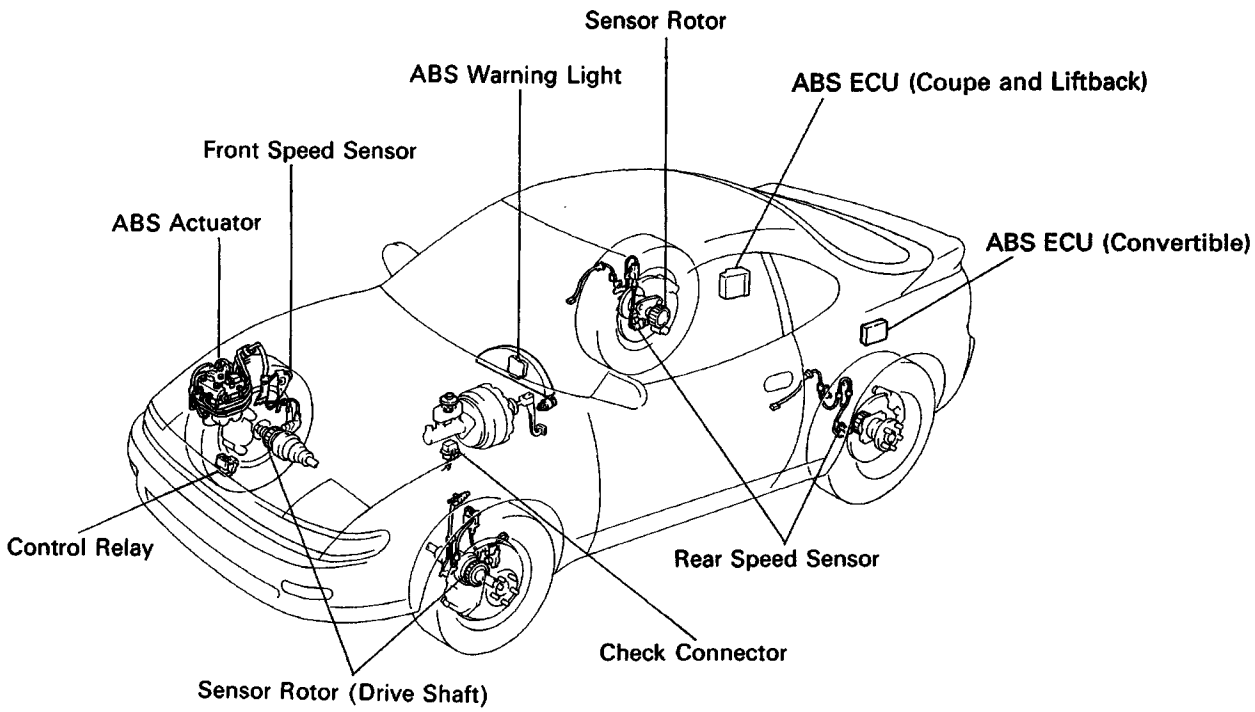
- The ABS is a brake system which controls the wheel cylinder hydraulic pressure of all four wheels during sudden braking and braking on slippery road surfaces, preventing the wheels from locking. This ABS provides the following benefits:
  (1) Enables steering round an obstacle with a greater degree of certainly even when panic braking.
  (2) Enables stopping in a panic brake while keeping effect upon stability and steerability to a minimum, even on curves.
- The function of the ABS is to help maintain 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 ABS 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 ABS to increase serviceability.

FUNCTION OF COMPONENTS

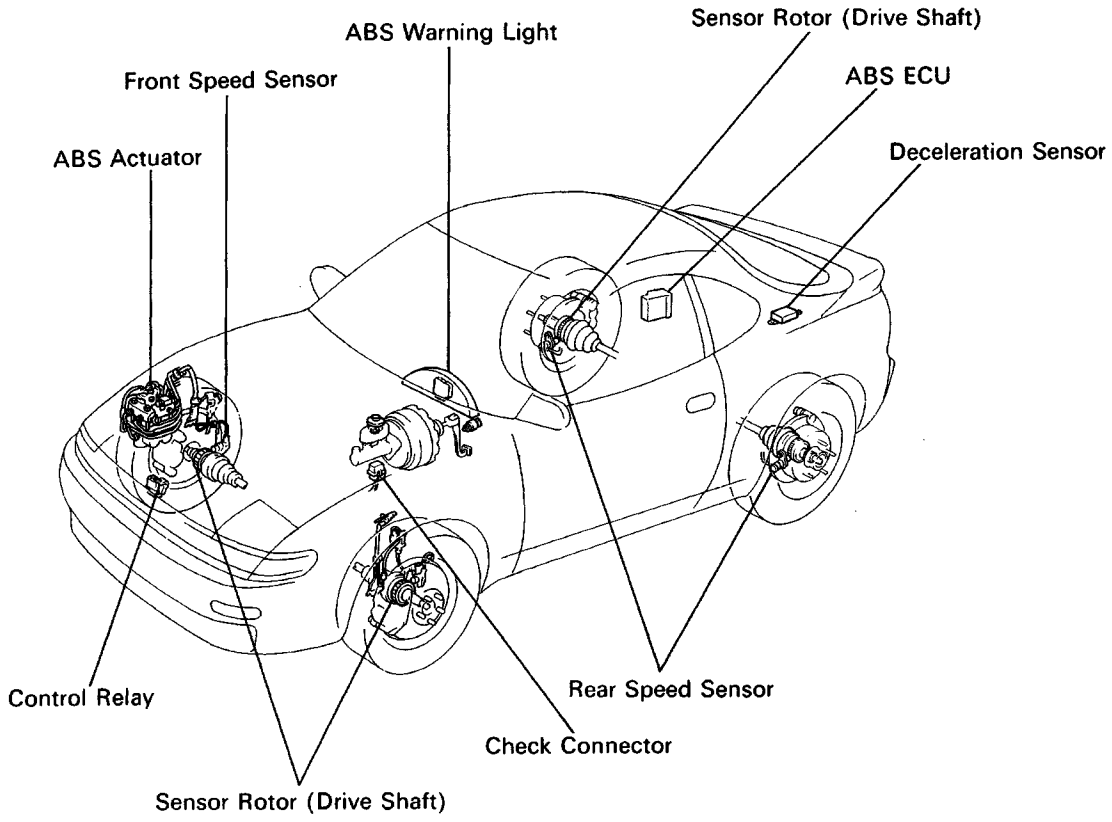
Component	Function
Front Speed Sensor	Detects the wheel speed of each of the left and right front wheels.
Rear Speed Sensor	Detects the wheel speed of each of the left and right rear wheels.
Deceleration Sensor (For 4WD)	Detects the deceleration speed of the vehicle and sends a signal accordingly to the ABS ECU.
ABS Warning Lamp	Lights up to alert the driver when trouble has occurred in the Antilock Brake System.
Actuator	Controls the brake fluid pressure to each disc brake cylinder through signals from the ECU.
ABS ECU	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

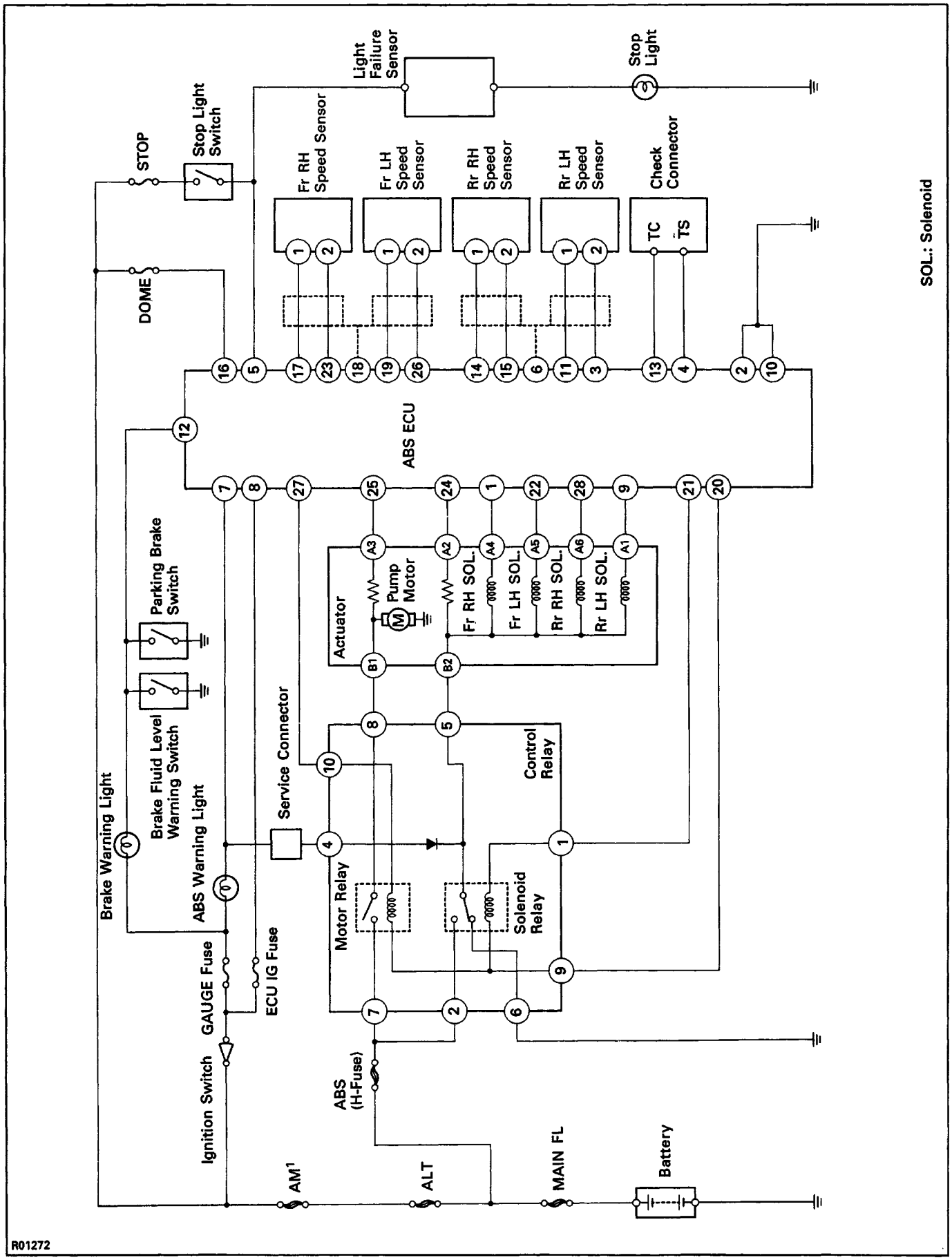


4WD



R01395
BR4159

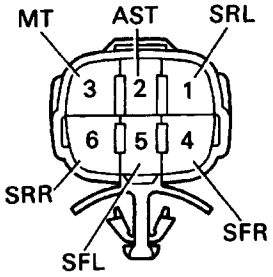
WIRING DIAGRAM (2WD)



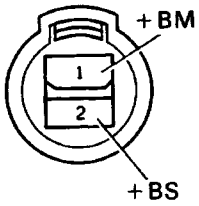
CONNECTORS (2WD)

ABS Actuator

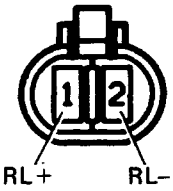
CONNECTOR A



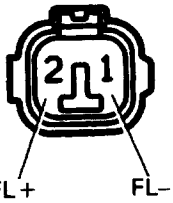
CONNECTOR B



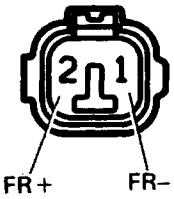
Rear Speed Sensor (LH)



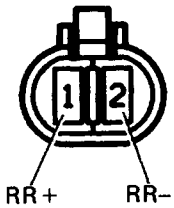
Front Speed Sensor (LH)



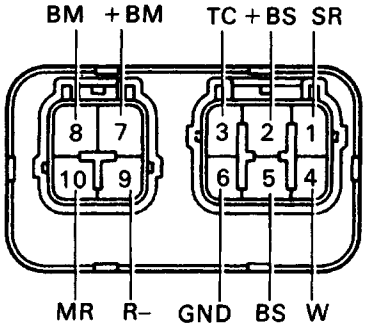
Front Speed Sensor (RH)



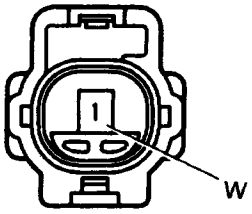
Rear Speed Sensor (RH)



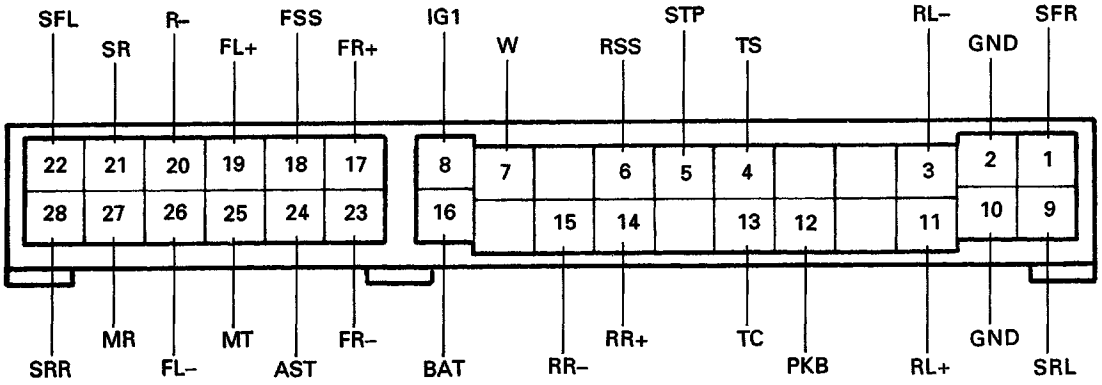
Control Relay



Service Connector (Wire Harness Side)

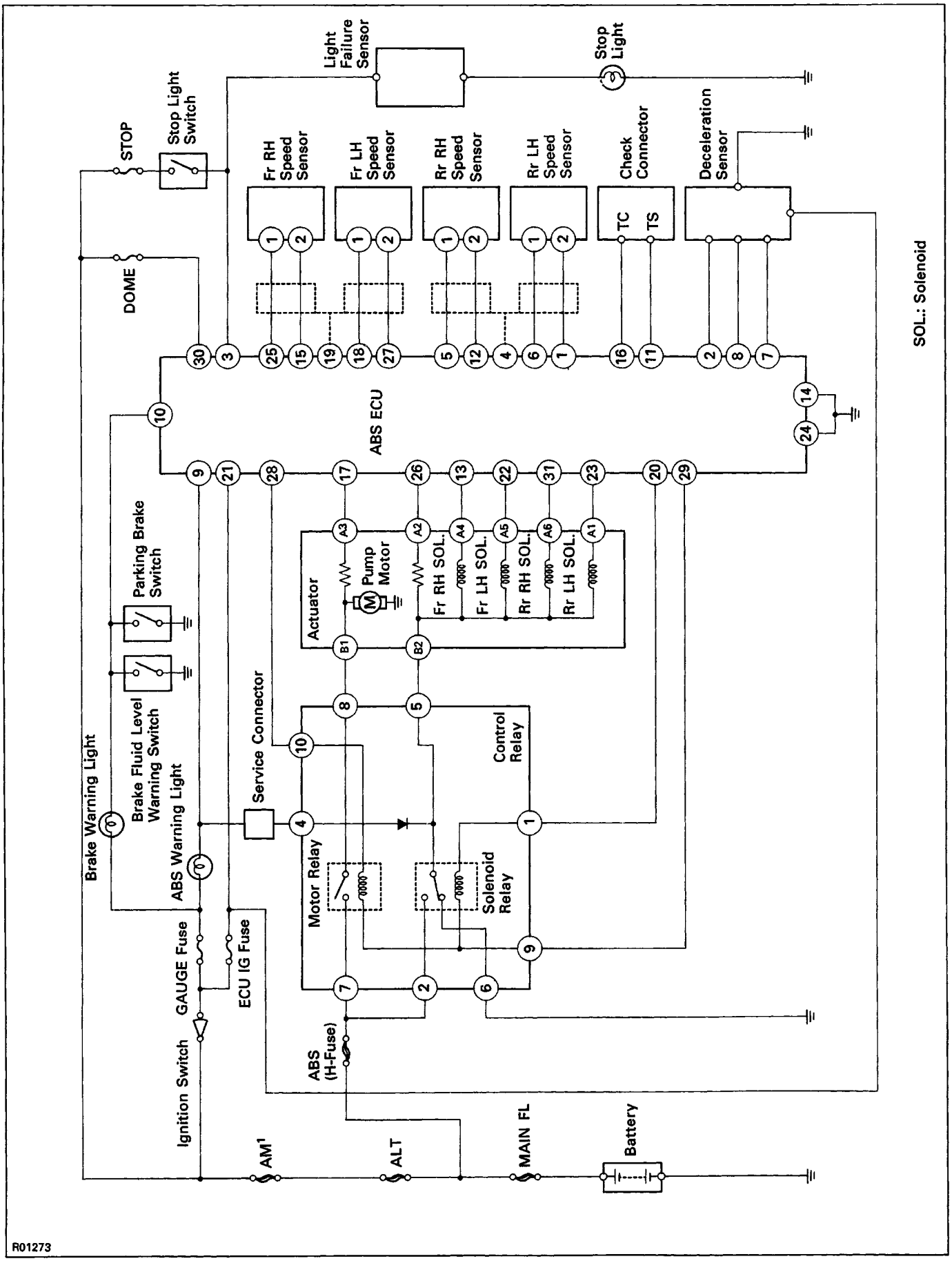


ABS ECU



E2402 ID-2-2 IS-2-1-B
IS-2-2-0 IS-2-2-0 IS-2-1-B
BR3999 Ie-1-1
R01274

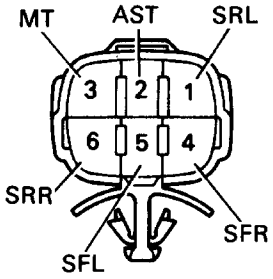
WIRING DIAGRAM (4WD)



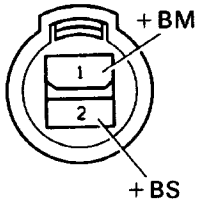
CONNECTORS (4WD)

ABS Actuator

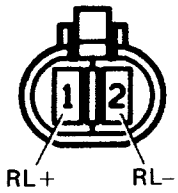
CONNECTOR A



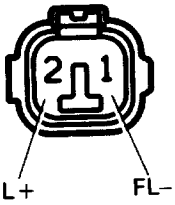
CONNECTOR B



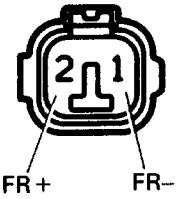
Rear Speed Sensor (LH)



Front Speed Sensor (LH)



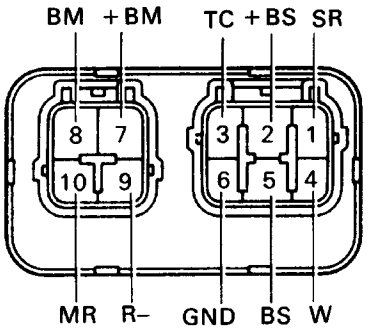
Front Speed Sensor (RH)



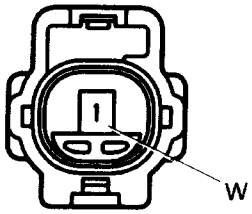
Rear Speed Sensor (RH)



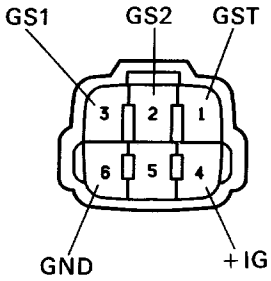
Control Relay



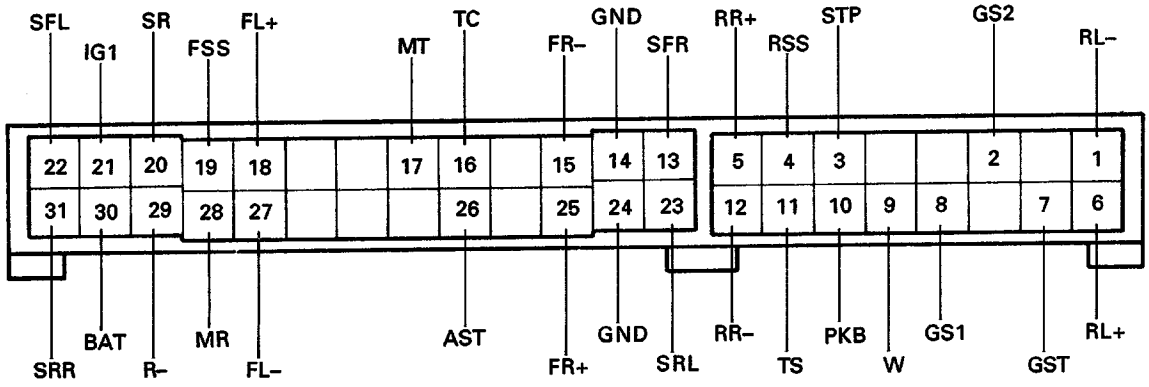
Service Connector (Wire Harness Side)



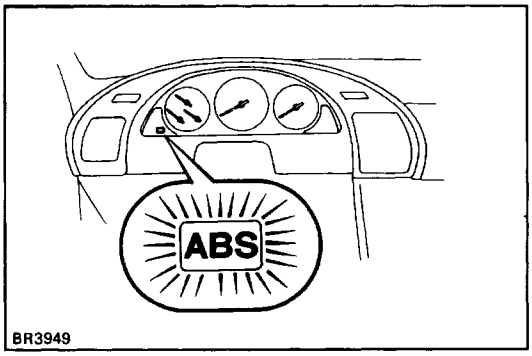
Deceleration Sensor

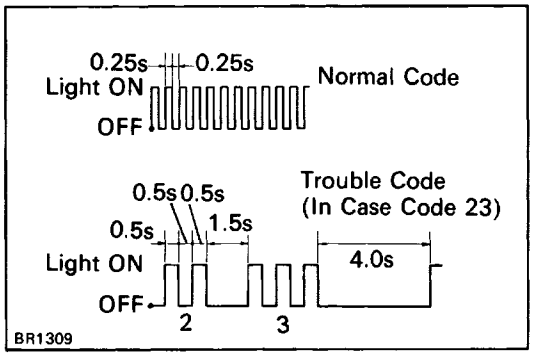


ABS ECU



E2402 ID-2-2 IS-2-18
IS-2-2-0 IS-2-2-0 IS-2-1-B
BR3999 Ie-1-1 IS-6-2-B
R01275





Diagnosis System

DESCRIPTION

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

At the same time, the system informs the driver of a malfunction via the ”ABS” warning light in the combination meter.

To identify the trouble by the number of blinks (diagnostic code) of the warning light turn on the ignition switch, disconnect the service connector, and use SST to connect Tc and E1 of the check connector.

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

HINT: The warning light does not show the diagnostic codes while the vehicle is running.

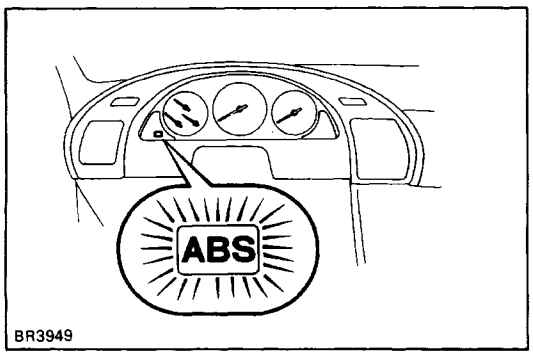
INITIAL CHECK

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.

HINT: 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

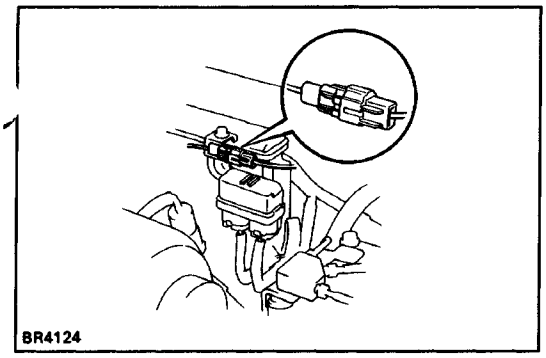
Inspect that the battery voltage is about 12 V.

2. CHECK THAT WARNING LIGHT TURNS ON

(a) Turn the ignition switch on.

(b) Check that the ”ABS” warning light turns on for 3 seconds.

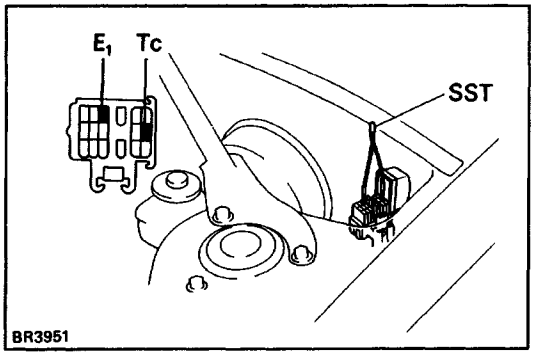
If not, inspect and repair or replace the fuse, bulb and wire harness.



3. READ DIAGNOSTIC CODE

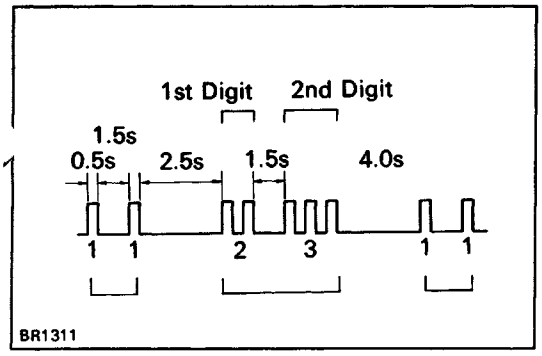
(a) Turn the ignition switch on.

(b) Disconnect the service connector.



(c) Using SST, connect terminals Te and E1 of the check connector.

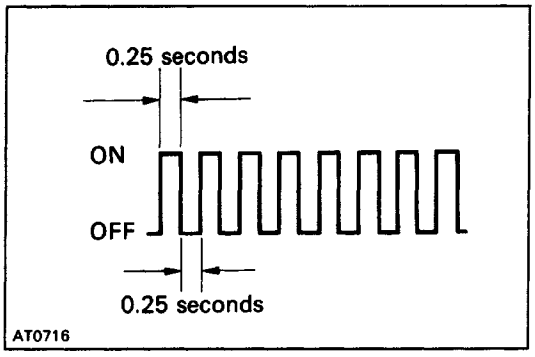
SST 09843–18020



(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 page BR–60)

HINT: 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.



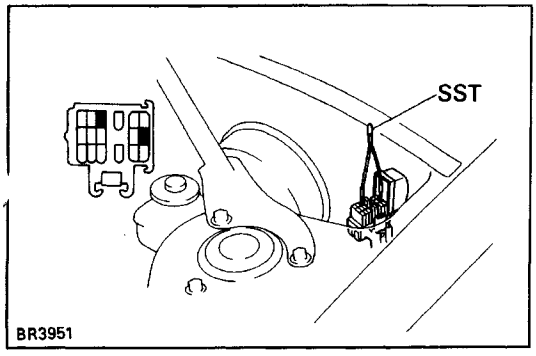
(e) If the system is operating normally (no malfunction), the warning light will blink once every 0.5 seconds.

(f) Repair the system.

(g) After the malfunctioning components has been repaired, clear the diagnostic codes stored in the ECU.

(See page BR–61)

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



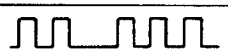
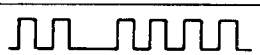
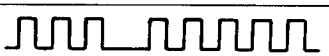
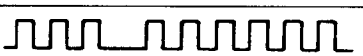
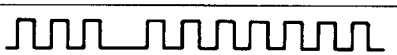
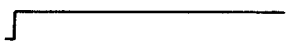
(h) Remove the SST from terminals Te and E1 of the check connector.

SST 09843–18020

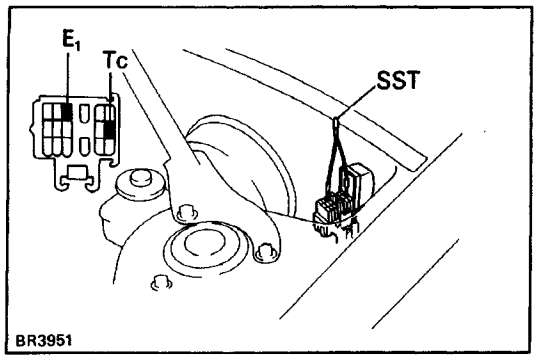
(i) Connect the service connector.

(j) Turn the ignition switch on, and check that the ”ABS” warning light goes off after the warning light goes on for 3 seconds.

B R4154

Code No.	Light Pattern	Diagnosis	Trouble Part
11		Open circuit in control relay circuit	• Actuator inside wire harness • Control relay • Wire harness and connector of control relay circuit
12		Short circuit in control relay circuit	
13		Open circuit in control relay circuit	• Actuator inside wire harness • Control relay • Wire harness and connector of control relay circuit
14		Short circuit in control 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		Abnormal battery voltage (9.5 V less than or 16.2 V more than)	• Battery • Voltage regulator
*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 ECU	• ECU

*: For 2WD
*: For 4WD



CLEARING OF DIAGNOSTIC CODES

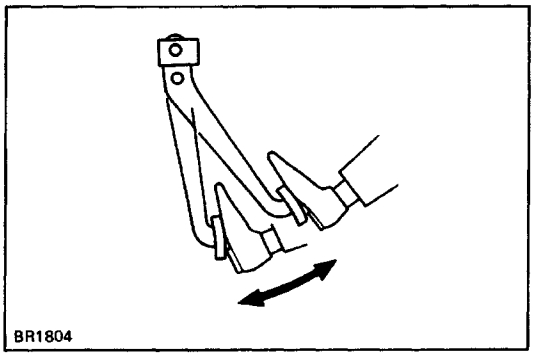
CLEAR DIAGNOSTIC CODES

(a) Turn the ignition switch on.

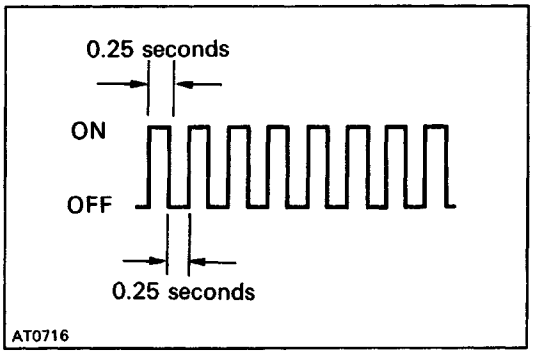
(b) Using SST, connect terminals Te and E1 of the check connector.

SST 09843–18020

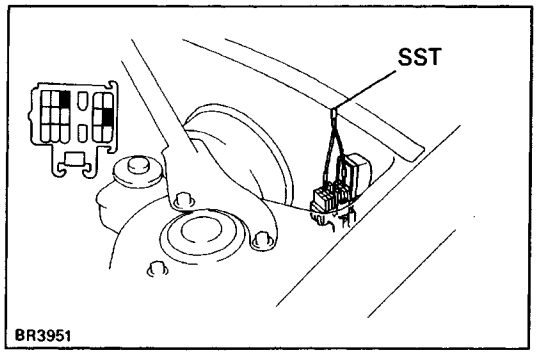
HINT: Keep the vehicle stopped vehicle speed 0 km/h (0 mph).



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

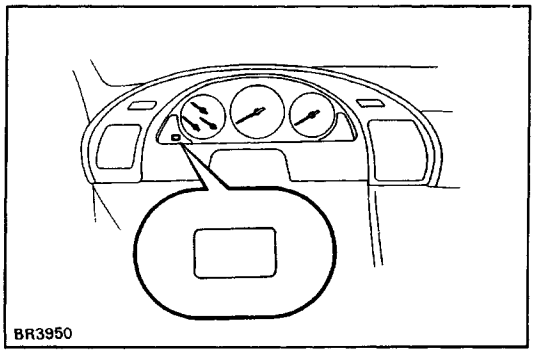


(d) Check that the warning light shows the normal code.



(e) Remove the SST from terminals Tc and E1 of the check connector.

SST 09843–18020



(f) Check that the warning light goes off.

Troubleshooting

Problem		No.
”ABS” 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
	ABS operates at ordinary braking.	4
	ABS operates just before stopping at ordinary braking.	4
	Brake pedal pulsates abnormally while ABS is operating.	4
	Skidding noise occurs while ABS working. (ABS works inefficiently)	5

1	”ABS” warning light comes on.

Disconnect service connector and connect terminals Tc and E1 of check connector. (See page BR–59)

↓

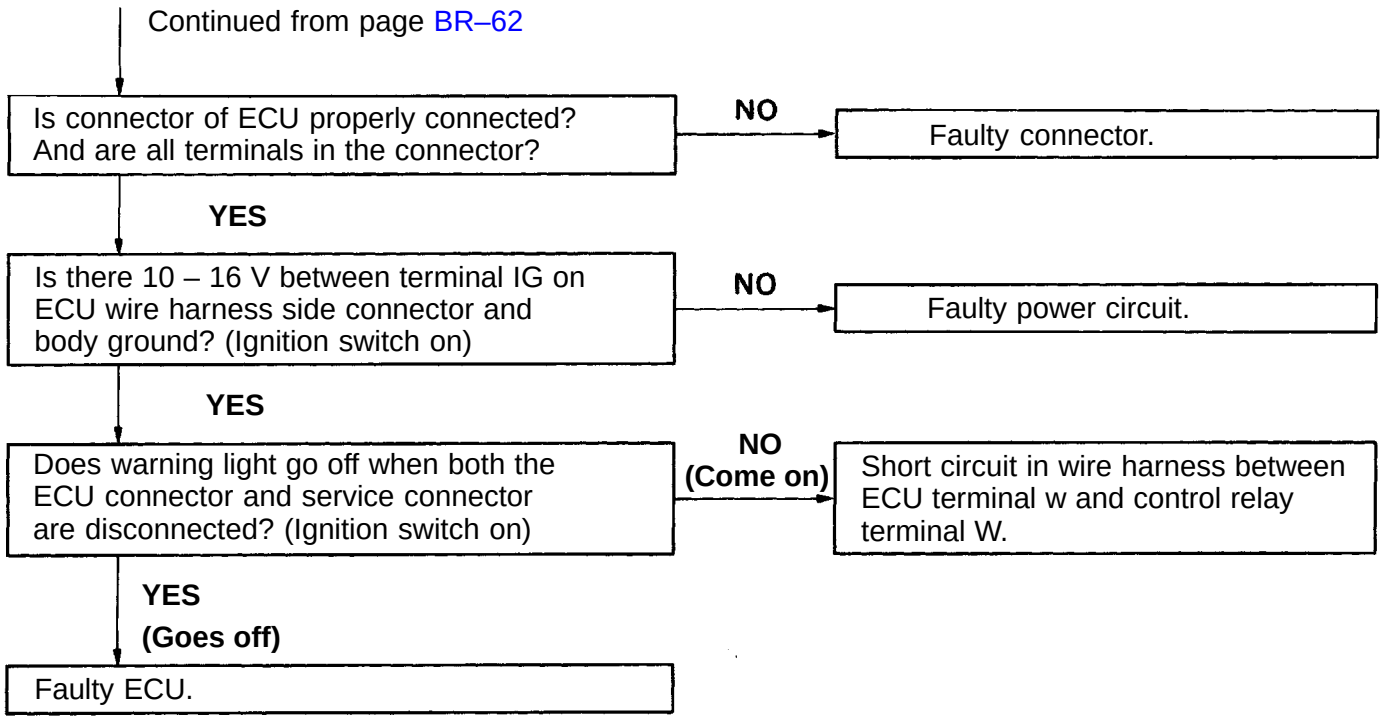
Does warning light always come on or show the normal code? (Ignition switch on)

NO → See diagnostic code. (See page BR–60)

↓ YES

Continued on page BR–63

Continued from page BR–62



2	”ABS” warning light does not come on for 3 seconds after ignition switch on.

Disconnect service connector, and ground the terminal W of the female 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 ECU and control relay, and ground terminal W of ECU 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 actuator side.

↓

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

↓ YES

Faulty ECU.

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

3	”ABS” warning light comes on and off.

- Check for short circuit in wire harness between terminal Tc and E1 or Ts and E1 of check connector.

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

Disconnect service connector and connect terminals Tc and E1of check connector. (See page BR–59)

↓

Does warning light show the diagnostic normal code? (Ignition switch on)

NO → See diagnostic code. (See page BR–60)

YES ↓

(For 4WD) Try deceleration sensor operation diagnosis system. Is sensor operation OK? (See page BR–84)

NO → Faulty deceleration sensor or sensor installation faulty.

YES ↓

Try speed sensor diagnosis system. Is sensor signal change OK? (See page BR–68)

NO → Inspect sensor rotor, and replace if necessary.

YES ↓

Are each speed sensors installed in place? And are each installation bolts tightened securely?

NO → Speed sensor installation faulty.

YES ↓

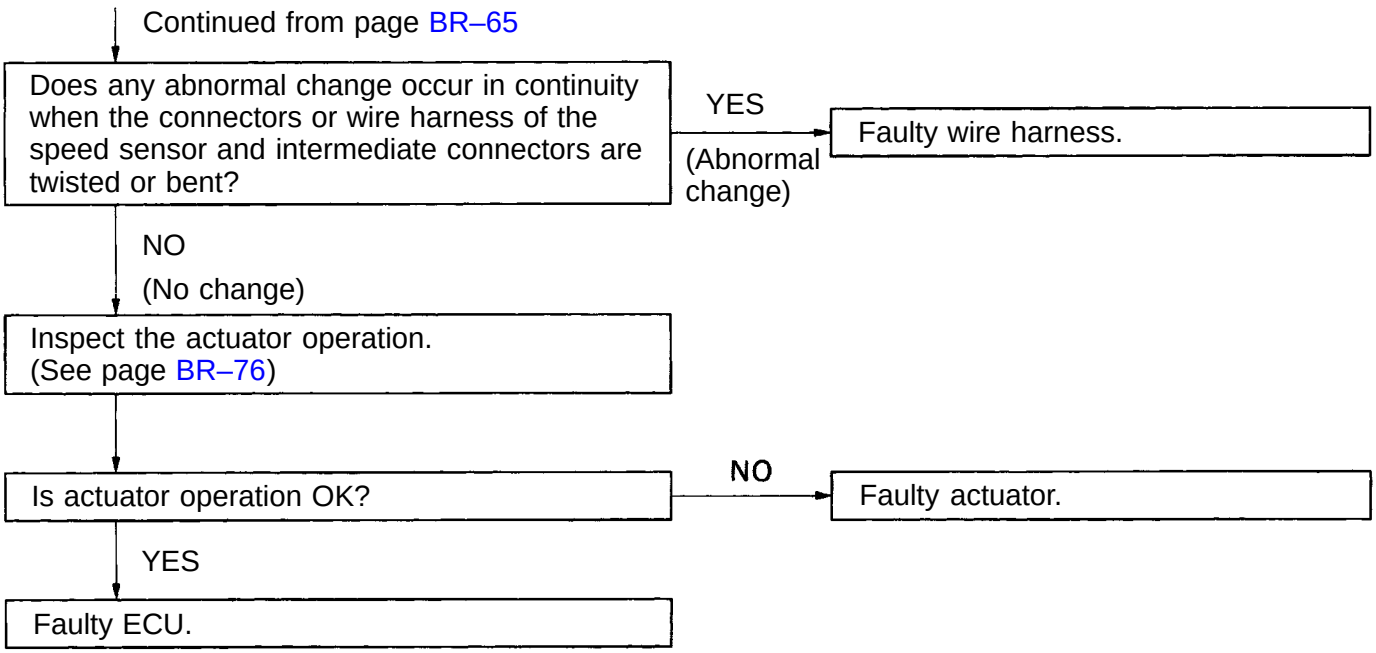
Is there foreign material or ferric chips on the sensor tip?

YES → Clean chips from the speed sensor.

NO ↓

Disconnect connector from ECU, inspect continuity between each speed sensor terminals on wire harness side. (See page BR–86)

Continued on page BR–66


Continued from page BR–65
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)
Inspect the actuator operation.
(See page BR–76)
Is actuator operation OK?
NO
Faulty actuator.
YES
Faulty ECU.

5	Antilock brake system works inefficiently.

Disconnect service connector and connect terminals Te and E1 of check connector. (See page BR–59)

↓

Does warning light show the diagnostic normal code? (Ignition switch on)

NO → See diagnostic code. (See page BR–60)

↓ YES

Is there battery voltage between ECU terminal STP and body ground when depressing brake pedal?

NO → Open circuit in stop light switch and/ or wire harness.

↓ YES

Inspect actuator. (See page BR–76)

Speed Sensor and Deceleration Sensor Diagnosis System

PRECAUTION

While checking the speed sensor and deceleration sensor diagnosis system, ABS 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

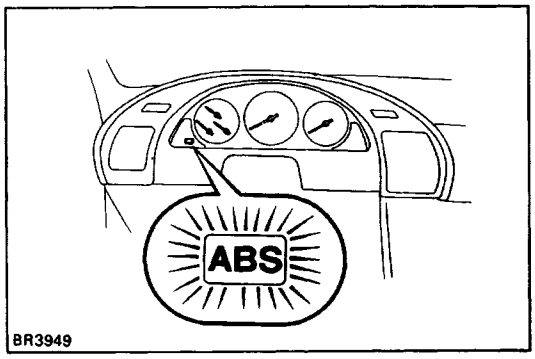
(a) Turn the ignition switch on.

(b) Check that the ”ABS” warning light turns on for 3 seconds.

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

(c) Check that the ”ABS” warning light turns off.

(d) Turn the ignition switch off.



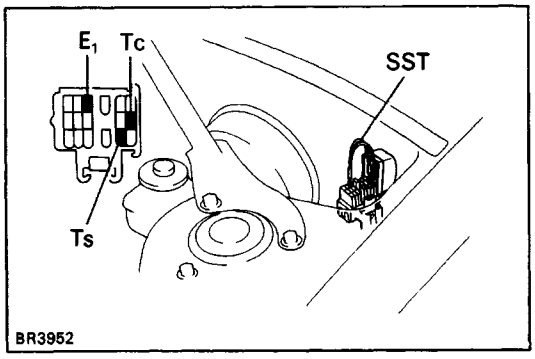
3. PERFORM FOLLOWING STEPS

(a) Using SST, connect terminals Ts to E1 of the check connector.

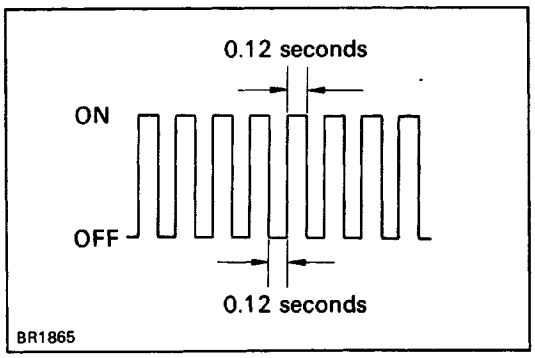
SST 09843–18020

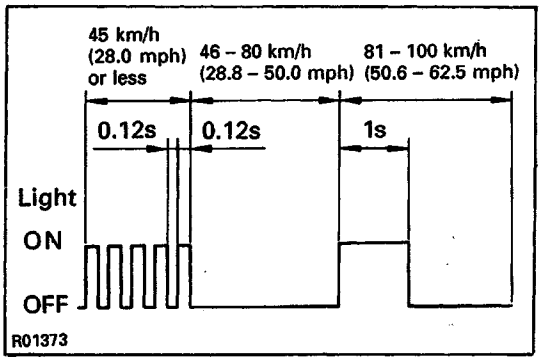
(b) Pull the parking brake lever up, and start the engine.

HINT: Do not depress the brake pedal.



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





4. INSPECT SPEED SENSOR SIGNAL

(a) Drive the vehicle straight ahead at about 45 km/h (28.1 mph) or less, and check that the warning light blinks about 4 times very 1 second.

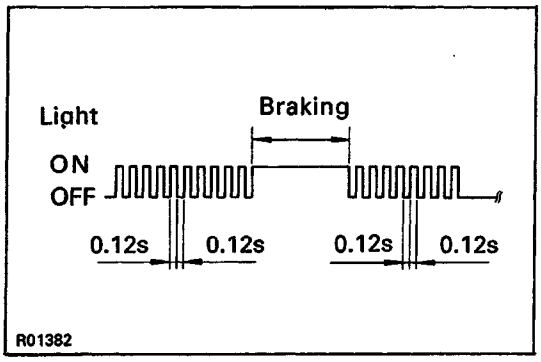
(b) Up the vehicle speed to 45 – 80 km/h (28.8 – 50.0 mph), and check that the warning light turn off.

If the warning light is blinking, read the diagnostic code at the step 6.

(c) Up the vehicle speed to 81 – 100 km/h (50.6 – 62.5 mph), and check that the warning light turns on for 1 second, and then turn off.

If the warning light is blinking, read the diagnostic code at the step 6.

(d) Stop the vehicle.



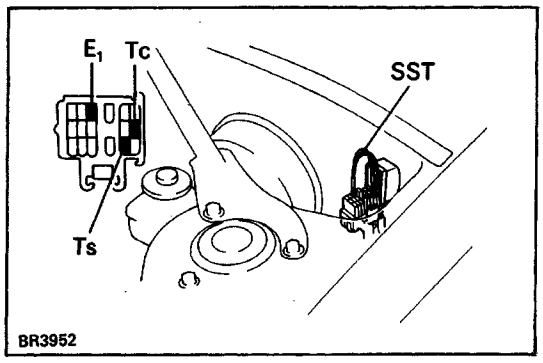
5. (4WD vehicles)

INSPECT DECELERATION SENSOR SIGNAL

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

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

(c) Stop the vehicle.

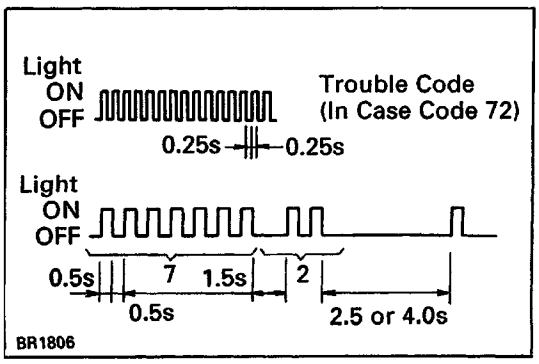


6. READ DIAGNOSTIC CODE

(a) Using SST, connect the terminals Tc to E1 of the check connector.

SST 09843–18020

HINT: Do not disconnect the terminal Ts to E1.



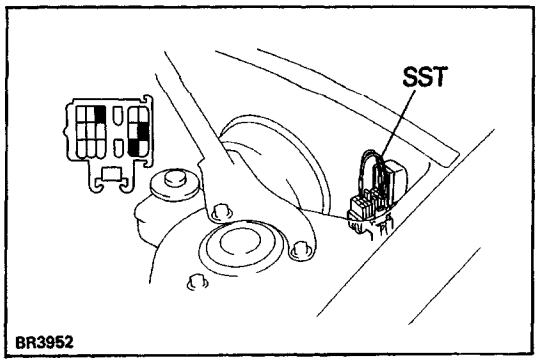
(b) Read the number of blinks.

(See DIAGNOSTIC CODE on page BR–70)

HINT: 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.

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



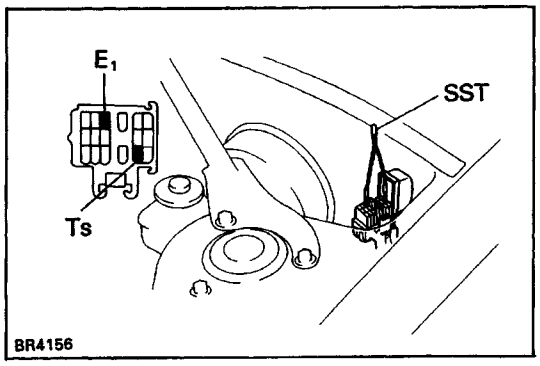
7. REPAIR MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

8. PERFORM FOLLOWING STEPS

(a) Turn the ignition switch off.

(b) Remove the SST from terminals E1 and Tc, Ts of the check connector.



INSPECTION OF DECELERATION SENSOR INSTALLATION

1. INSPECT BATTERY VOLTAGE

Inspect that the battery voltage is about 12 V.

2. INSPECT SENSOR DETECTION POINT

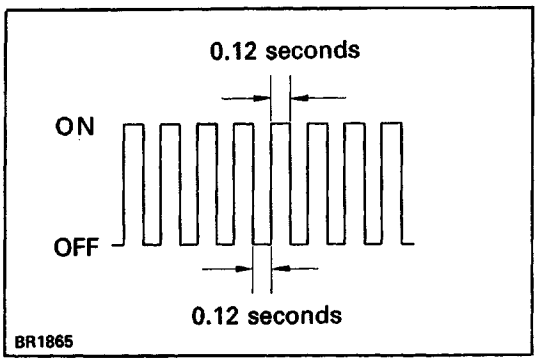
(a) Turn the ignition switch off.

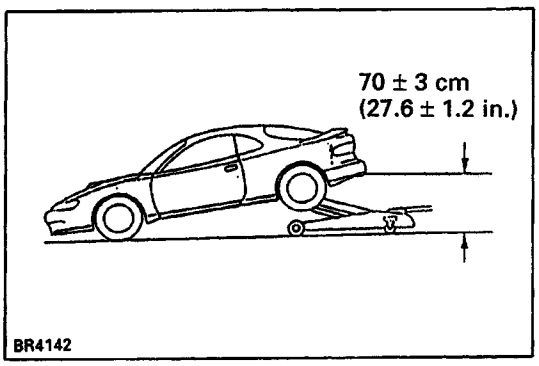
(b) Using SST, connect terminals Ts and E1 of the check connector.

SST 09843–18020

(c) Pull the parking brake lever up and depress the brake pedal, and turn the ignition switch on.

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



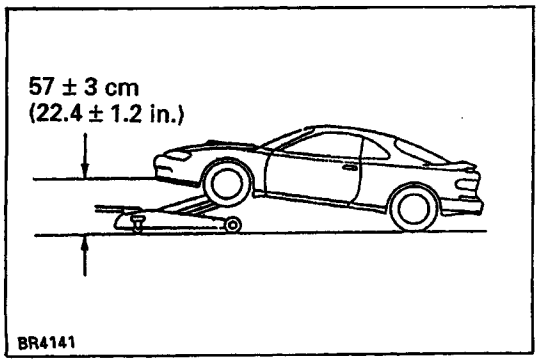


(e) Jack up the rear side of the vehicle slowly as shown.

HINT: When measuring the height, measure at the center of the rear bumper lower edge.

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

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



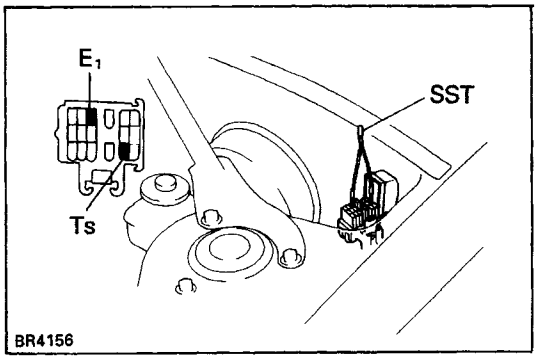
(h) Jack up the front side of the vehicle slowly as shown.

HINT: When measuring the height, measure at the center of the lower body or spoiler edge of the vehicle.

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

(j) 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.

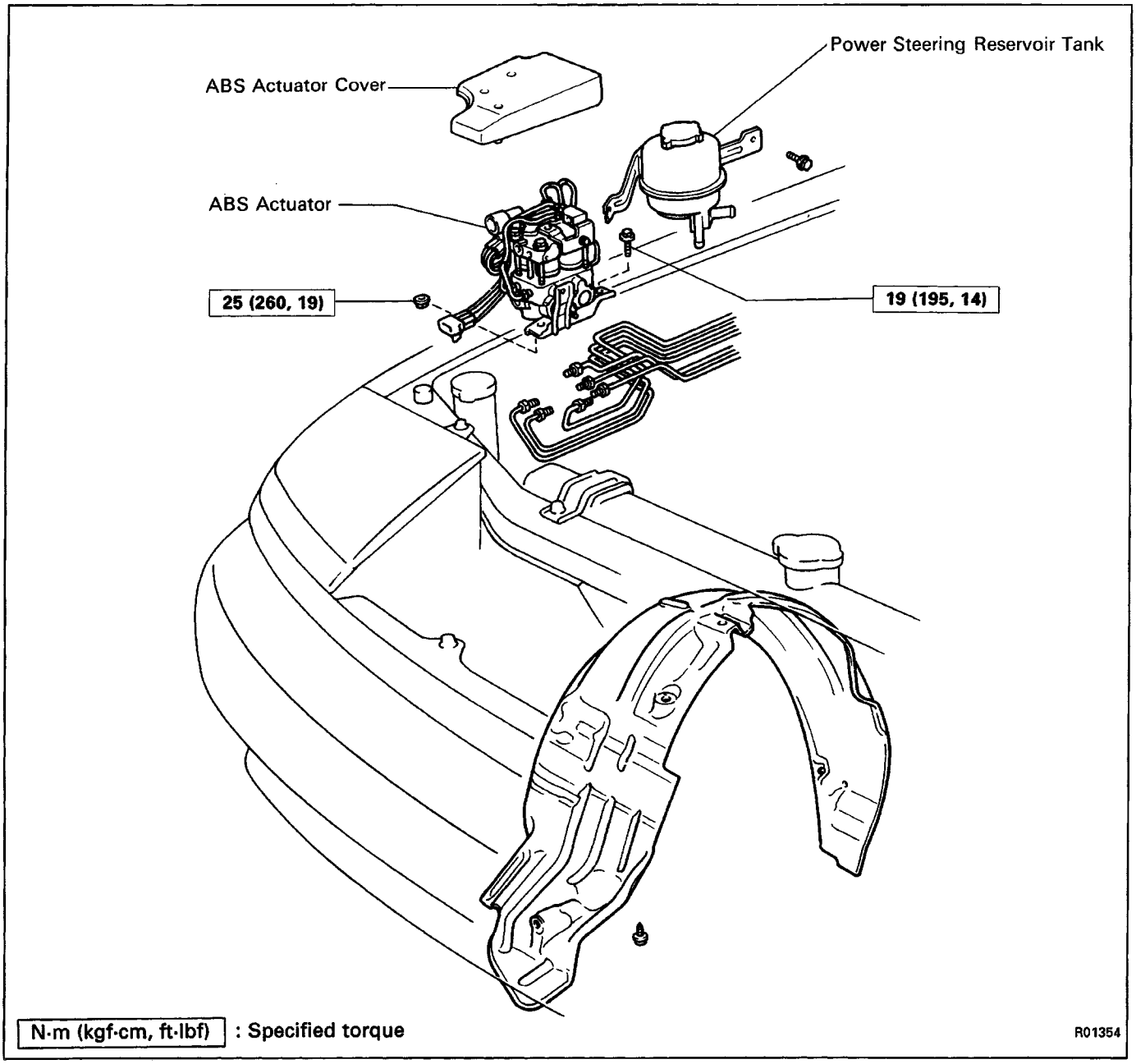


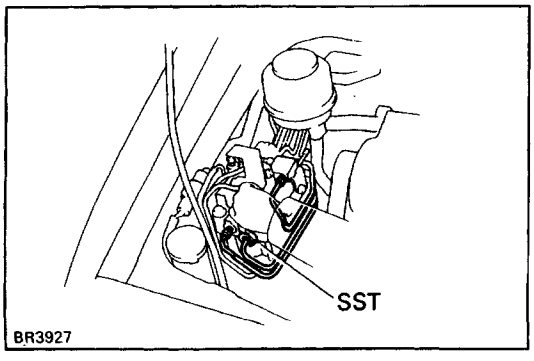
(k) Turn the ignition switch off.
(l) Remove the SST from terminal Ts and E1 of the check connector.

ABS Actuator

REMOVAL AND INSTALLATION OF ABS ACTUATOR

Remove and install the parts as shown.





1. DISCONNECT AND CONNECT BRAKE TUBE

Using SST, disconnect and connect the brake tubes from/to the ABS actuator.

SST 09751–36011

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

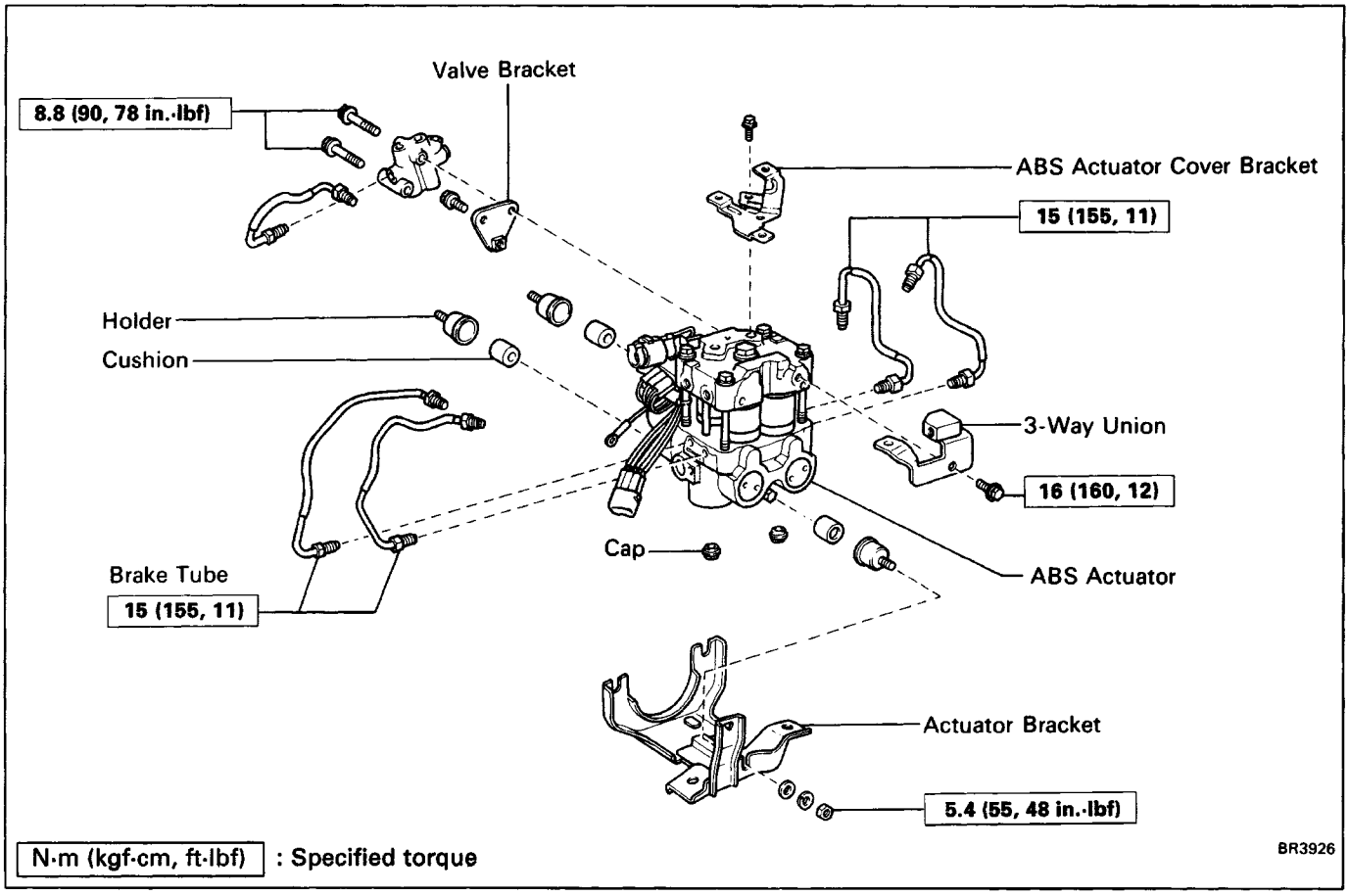
2. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM

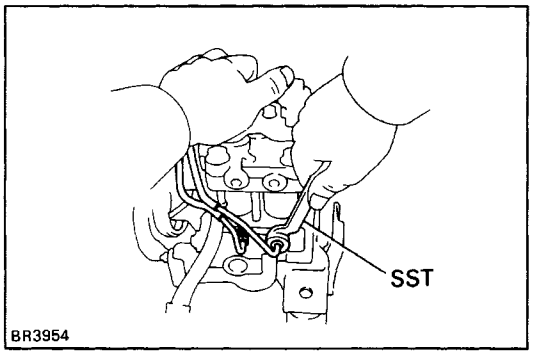
(See page BR–7)

DISASSEMBLY AND ASSEMBLY OF ABS ACTUATOR

Remove and install the parts as shown.

COMPONENTS





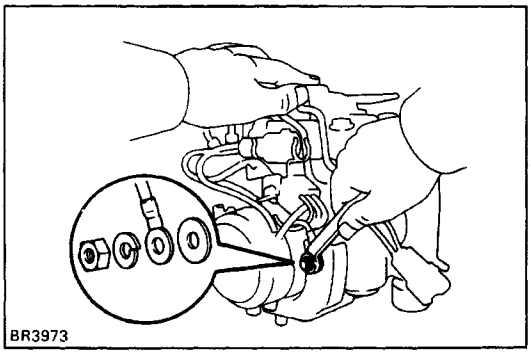
(MAIN POINT OF REMOVAL AND INSTALLATION)

1. DISCONNECT AND CONNECT BRAKE TUBE

Using SST, disconnect and connect the brake tubes from/to the ABS actuator.

SST 09751–36011

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



2. INSTALL ACTUATOR

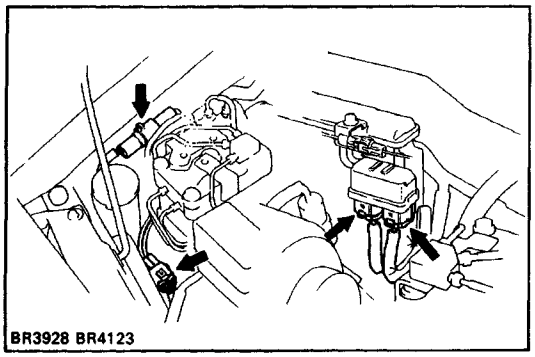
(a) Install the actuator to the actuator bracket in place.

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

(c) Tighten the three nuts.

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

HINT: Before installing the front right side nut, install the motor ground terminal between the plate washer and spring washer.


BR3928 BR4123

INSPECTION OF ABS ACTUATOR OPERATION

1. INSPECT BATTERY VOLTAGE

Battery voltage: 10 – 14.5 V

2. REMOVE ACTUATOR COVER

3. DISCONNECT CONNECTORS

Disconnect the four connectors from the actuator and control relay.

4. CONNECT ACTUATOR CHECKER (SST) TO ACTUATOR

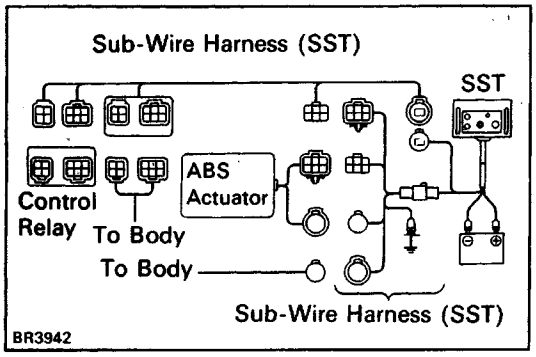
(a) Connect the actuator checker (SST) to the actuator, control relay and body side wire harness through the sub–wire harness (SST) as shown.

SST 09990–00150 and 09990–00200

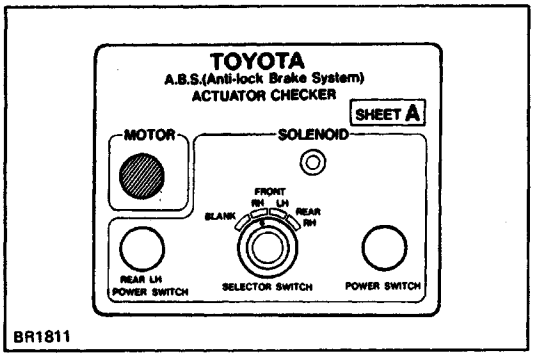
(b) Connect the red cable of the checker to the battery positive (+.) terminal and black cable to the negative (–) terminal. Connect the black cable of the sub–wire harness to the battery negative (–) terminal or body ground.

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

SST 09990–00163



BR3942



BR1811

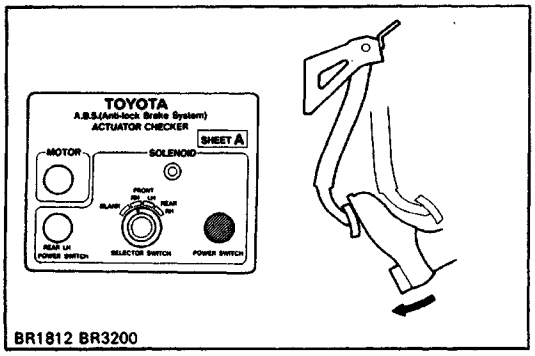
5. INSPECT BRAKE ACTUATOR OPERATION

(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.

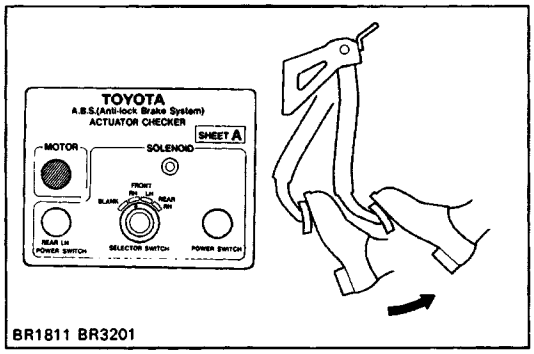


BR1812 BR3200

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

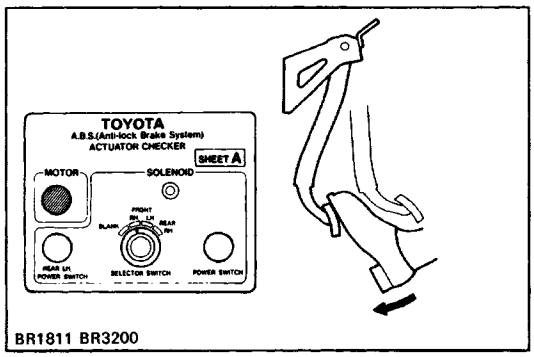
NOTICE: Do not keep the POWER SWITCH pushing more than 10 seconds.

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



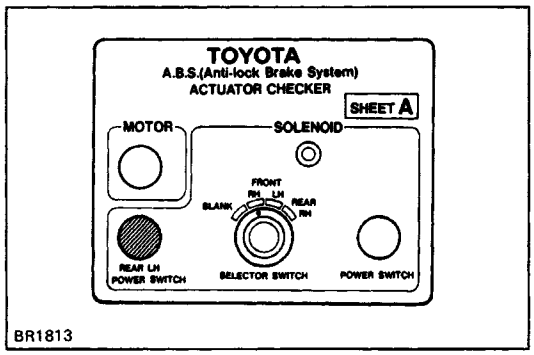
BR1811 BR3201

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



BR1811 BR3200

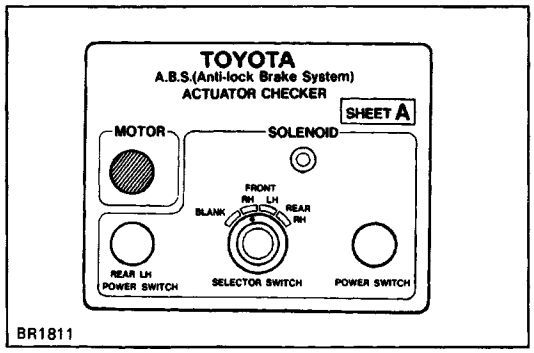
(i) Push and hold in the MOTOR switch for a few seconds.
(j) Depress the brake pedal and hold it for about 15 seconds. As you hold the pedal down, push the MOTOR switch for a few seconds. Check that the brake pedal does not pulsate.



BR1813

6. INSPECT FOR OTHER WHEELS

(a) Turn the selector switch to ”FRONT LH” position.
(b) Repeating (c) to (j) of the step 5, check the actuator operation similarly.
(c) Similarly, inspect ”REAR RH” and ”REAR LH” position.
HINT: When inspecting ”REAR LH” position, push the REAR LH switch instead of the POWER SWITCH, and you can inspect in any selector switch position.



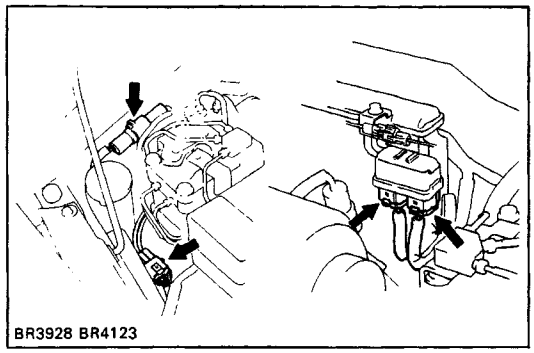
BR1811

7. PUSH MOTOR SWITCH

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

8. DISCONNECT ACTUATOR CHECKER (SST) FROM ACTUATOR

Remove the ”SHEET A” (SST) and disconnect the actu–tor checker (SST) and sub–wire harness (SST) from the actuator, control relay and body side wire harness.
SST 09990–00150, 09990–00200 and 09990–00163


BR3928 BR4123

9. CONNECT ACTUATOR CONNECTORS

Connect the four connectors to actuator and control relay.

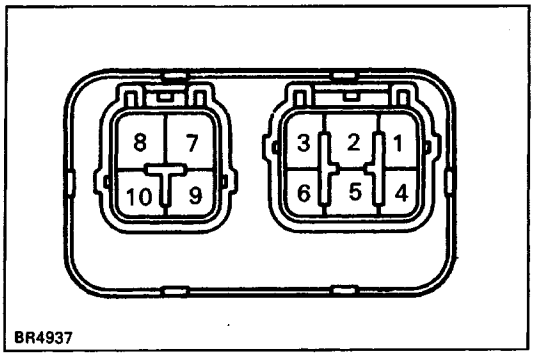
10. INSTALL CONNECTOR

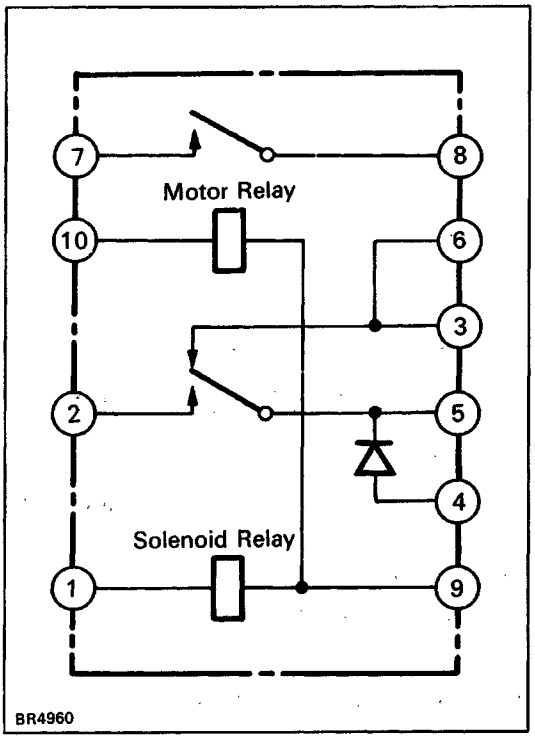
Install the connector to the actuator bracket.

11. INSTALL ACTUATOR COVER

12. CLEAR DIAGNOSTIC CODES

(See page BR–61**)**





Control Relay

INSPECTION OF CONTROL RELAY

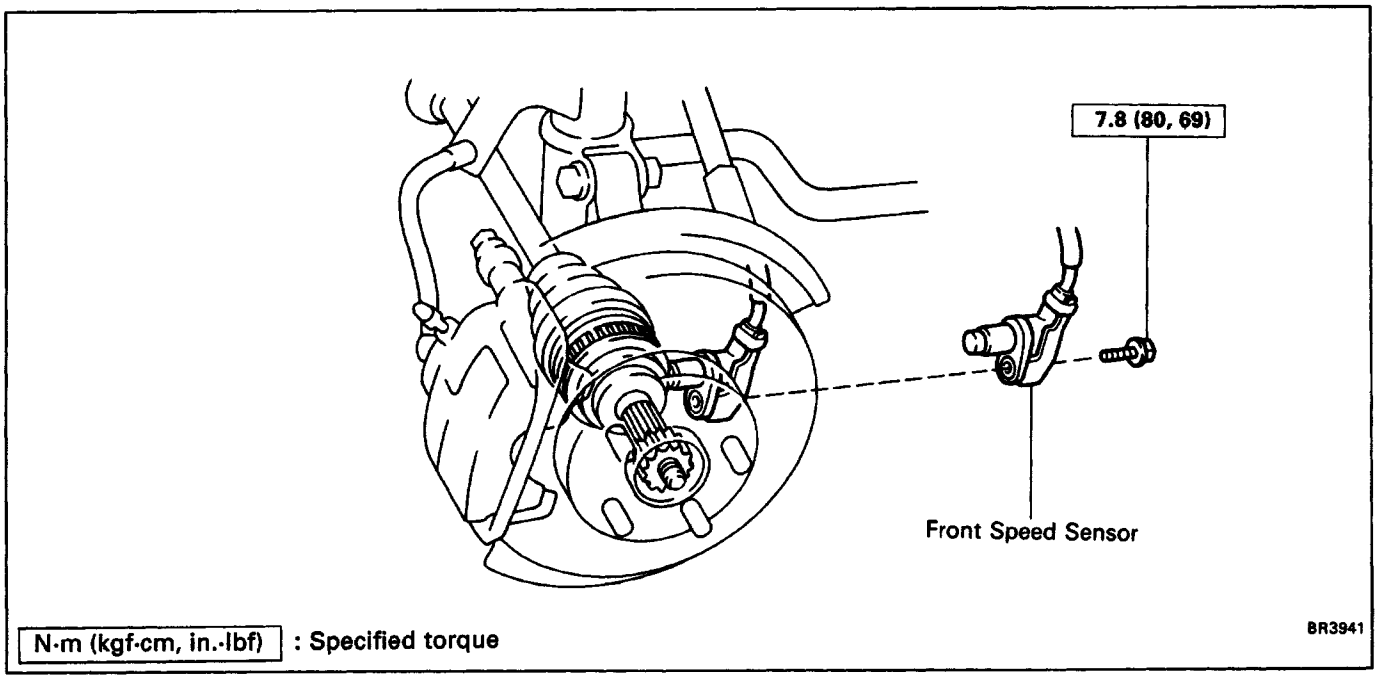
INSPECT CONTROL RELAY OPERATION

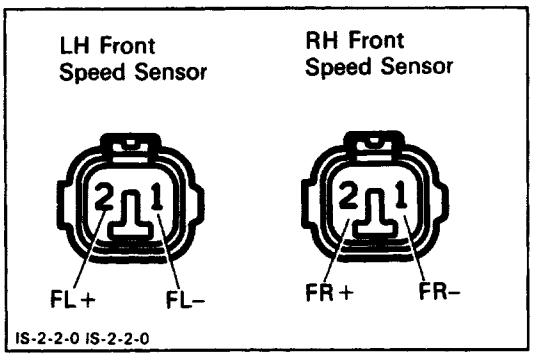
Inspect the relay continuity between terminals.

Terminal / Condition	1	2	3	4	5	6	7	8	9	10
Constant			●		●	●				
				●	●	●				
				●	●	●				
Apply battery voltage between terminals 9 and 10.							●	●		
Apply battery voltage between terminals 1 and 9.		●			●					
				✕	●					

If operation is not as specified, replace the relay.

Front Speed Sensor





INSPECTION OF FRONT SPEED SENSOR

1. INSPECT SPEED SENSOR

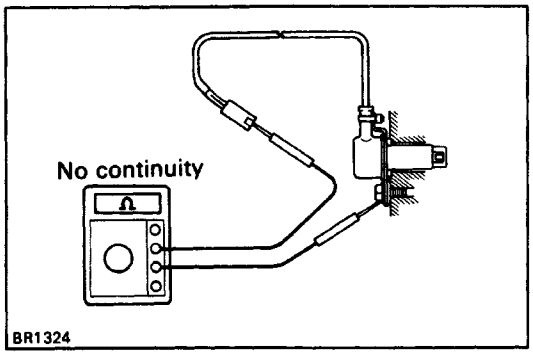
(a) Remove the bolt from the pipe clamp of the wire harness.

(b) Disconnect the speed sensor connector.

(c) Measure the resistance between terminals.

Resistance: 0.8 –1.3 kΩ

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

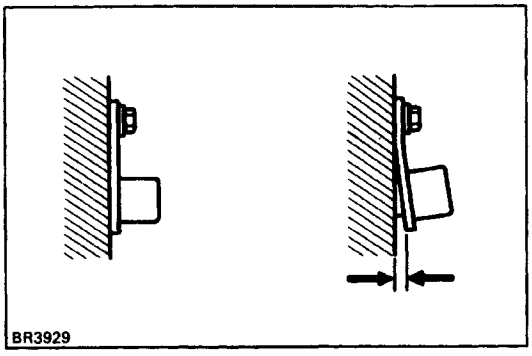


(d) Check that there is no continuity between each terminal and sensor body.

If there is continuity, replace the sensor.

(e) Connect the speed sensor connector.

(f) Install the bolt of the pipe clamp.



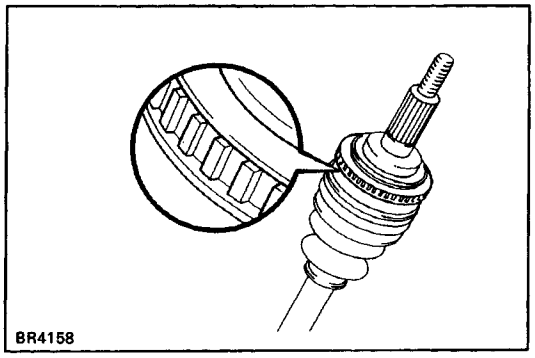
2. INSPECT SENSOR INSTALLATION

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

Torque: 7.8 N–m (80 kgf–cm, 69 in–lbf).

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

If there is clearance, replace the sensor.



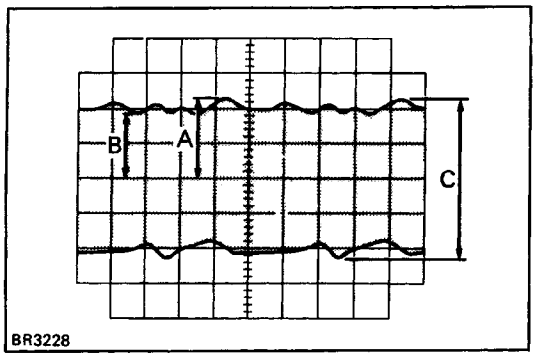
3. VISUALLY INSPECT SENSOR ROTOR SERRATIONS

(a) Remove the drive shaft.
(See page SA–17 or 33)

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

(c) Install the drive shaft.
(See page SA–30 or 44)

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



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

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

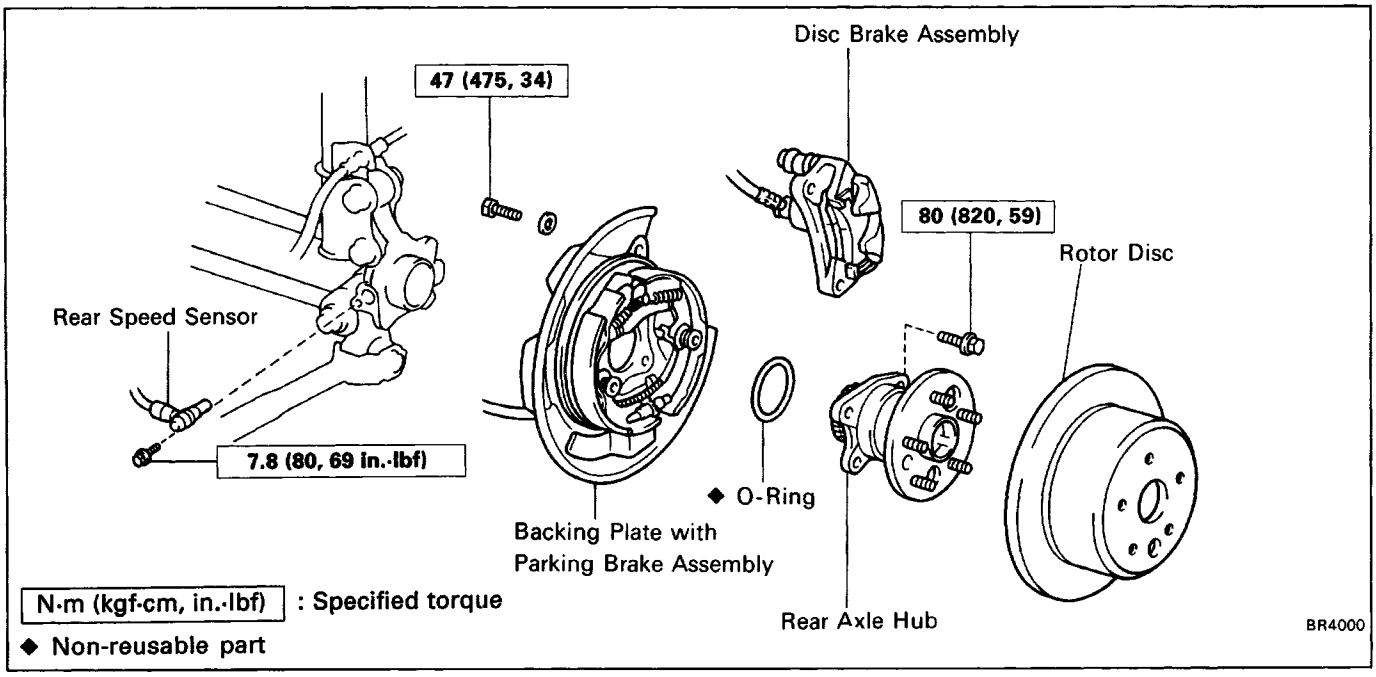
(a) Connect an oscilloscope to the speed sensor connector.

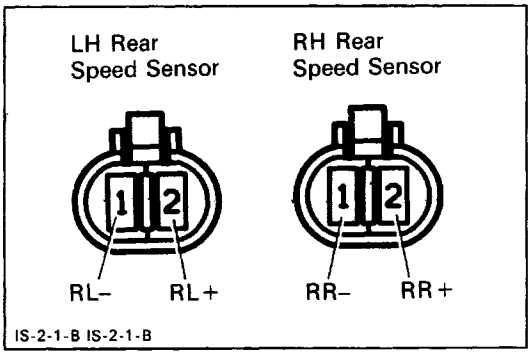
(b) Run the vehicle at 20 km/h (12.4 mph), and inspect speed sensor output wave.

(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 drive shaft.

Rear Speed Sensor (2WD)





INSPECTION OF REAR SPEED SENSOR

1. INSPECT SPEED SENSOR

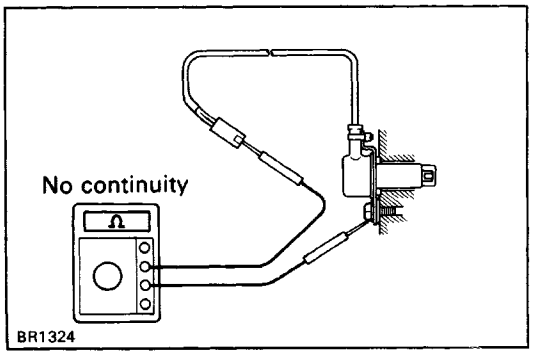
(a) Remove the seat cushion.

(b) Disconnect the speed sensor connector.

(c) Measure the resistance between terminals.

Resistance: 1.1 –1.7 KΩ

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

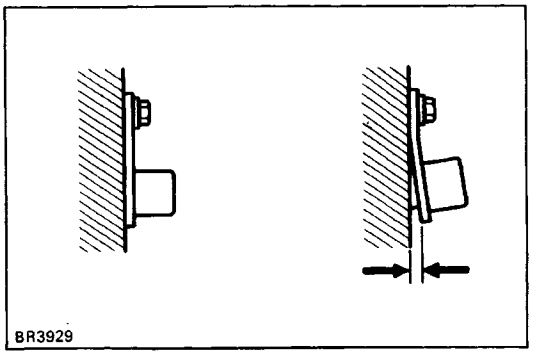


(d) Check that there is no continuity between each terminal and sensor body.

If there is continuity, replace the sensor.

(e) Connect the speed sensor connector.

(f) Install the seat back and seat cushion.



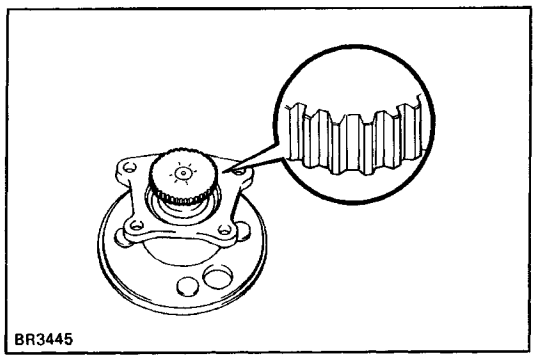
2. INSPECT SENSOR INSTALLATION

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

Torque: 7.8 N–m (80 kgf–cm, 69 in.–lbf)

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

If there is clearance, replace the sensor.


BR3445

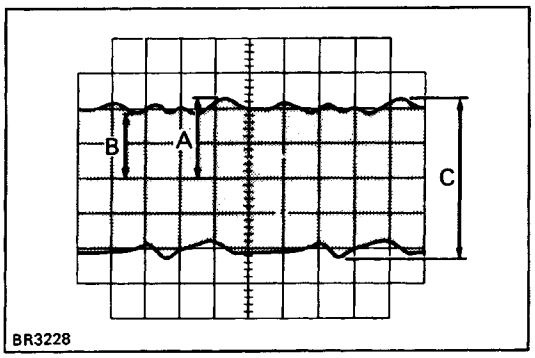
3. VISUALLY INSPECT SENSOR ROTOR SERRATIONS

(a) Remove the axle hub assembly.
(See page SA–59)

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

(c) Install the axle hub assembly.
(See page SA–64)

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



BR3228

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.

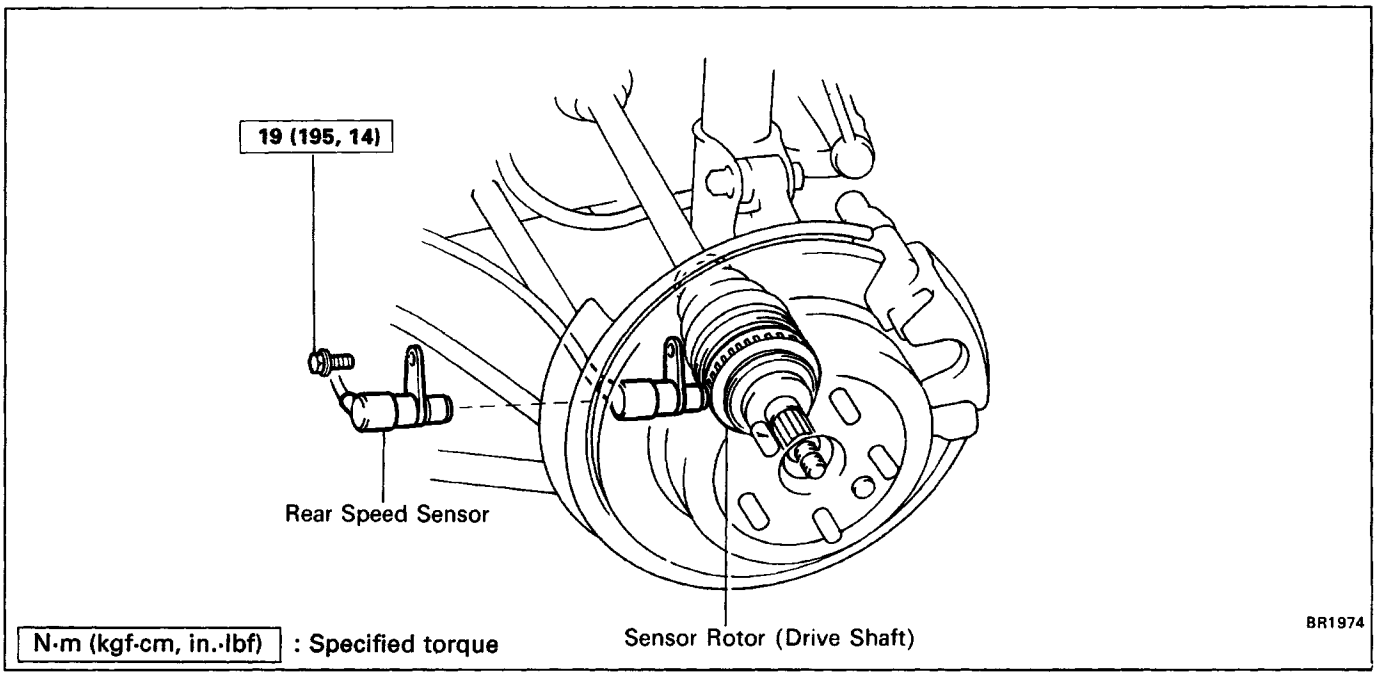
(c) Check that C is 0.5 V or more.

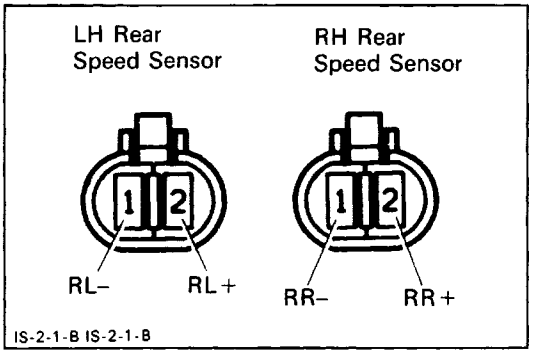
If not as specified, replace the speed sensor.

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

If not as specified, replace the rear axle hub.

Rear– Speed Sensor (4WD)

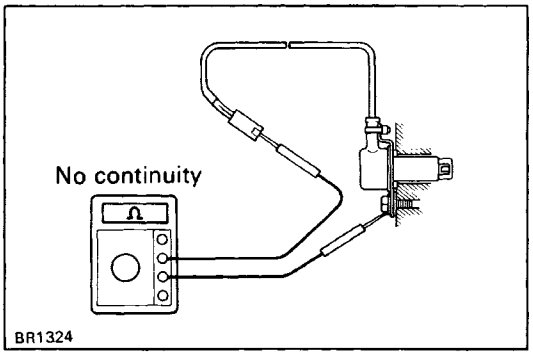




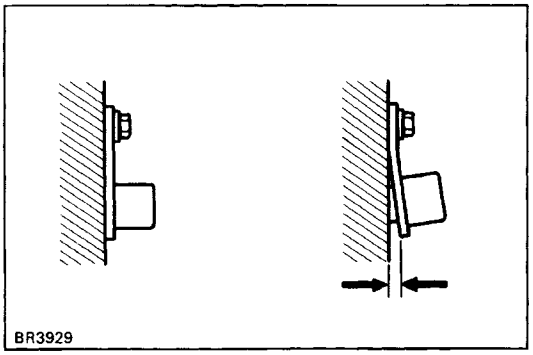
INSPECTION OF REAR SPEED SENSOR

1. INSPECT SPEED SENSOR

(a) Remove the seat cushion.
(b) Disconnect the speed sensor connector.
(c) Measure the resistance between terminals.
Resistance: 0.8 –1.5 KΩ
If resistance value is not as specified, replace the sensor.

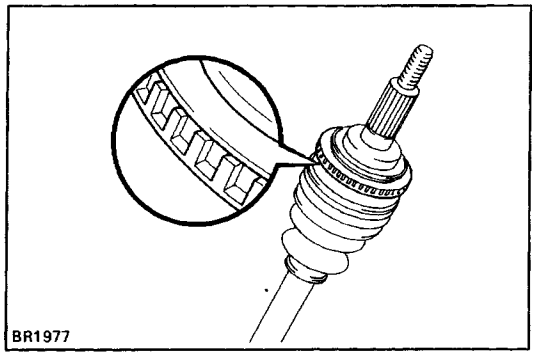


(d) Check that there is no continuity between each terminal and sensor body.
If there is continuity, replace the sensor.
(e) Connect the speed sensor connector.
(f) Install the seat back and seat cushion.



2. INSPECT SENSOR INSTALLATION

(a) Check that the sensor installation bolt is tightened properly. If not, tighten the bolt.
Torque: 19 N–m (195 kgf–cm, 14 ft–lbf)
(b) Check that there is no clearance between the sensor and rear axle carrier as shown.
If there is clearance, replace the sensor.



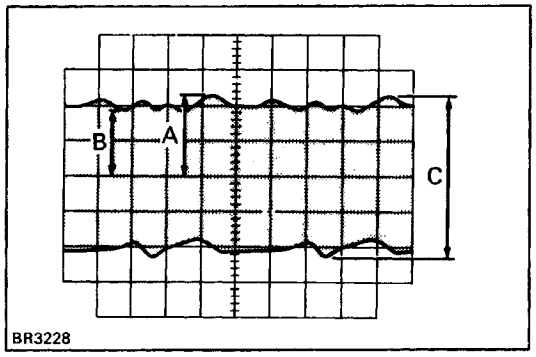
3. VISUALLY INSPECT SENSOR ROTOR SERRATIONS

(a) Remove the drive shaft.
(See page SA–78)

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

(c) Install the drive shaft.
(See page SA–85)

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



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

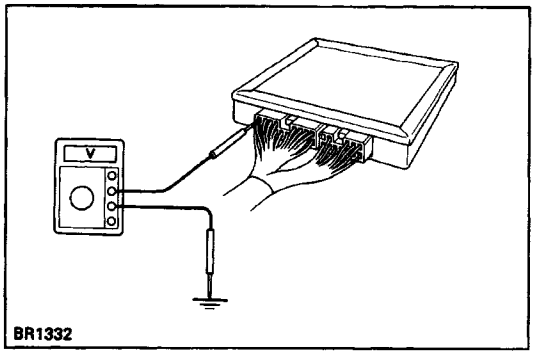
INSPECT REAR SPEED SENSOR AND SENSOR ROTOR SERRATIONS BY USING AN OSCILLOSCOPE

(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 drive shaft.



Anti–Lock Brake System Circuit

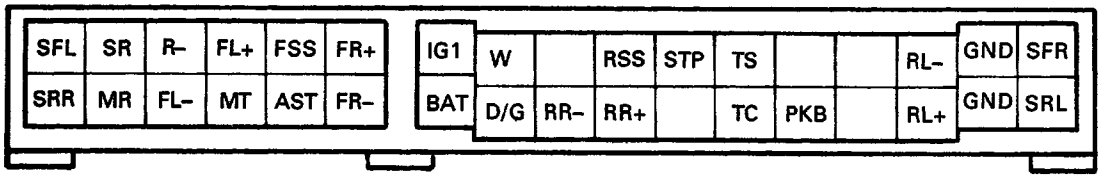
INSPECTION OF SYSTEM CIRCUIT

(2WD vehicles)

1. INSPECT SYSTEM CIRCUIT WITH CONNECTOR CONNECTED

(a) Remove the ABS ECU.

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



R01274

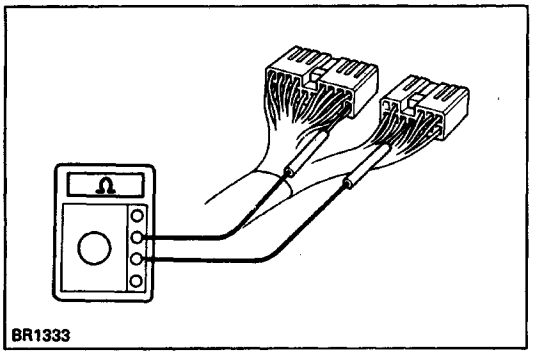
Tester Connection	Check Item	Condition	Specified Value	Trouble Part
SFR	Voltage	IG switch on and "ABS" warning light goes on	About OV	Actuator
		IG switch on and "ABS" warning light goes off	Battery voltage	
RL–	Continuity	IG switch off	Continuity	ABS ECU
TS	Voltage	IG switch on and check connector Ts–E1 not connected	Battery voltage	
		IG switch on and check connector Ts–E1 connected	About OV	
STP	Voltage	IG switch off and brake pedal depressed	Battery voltage	Stop light switch Stop light
	Continuity	IG switch o and brake pedal returned	Continuity	
RSS	Continuity	IG switch off	Continuity	ABS ECU
W	Voltage	IG switch on and "ABS" warning light goes on	About OV	ABS ECU "ABS" warning light
		IG switch on and "ABS" warning light goes off	Battery voltage	
IG1	Voltage	IG switch on	Battery voltage	ECU–IG Fuse
SRL	Voltage	IG switch on and "ABS" warning light goes on	About OV	Actuator
		IG switch on and "ABS" warning light goes off	Battery voltage	
GND	Continuity	IG switch off	Continuity	Wiring harness
PK6	Voltage	IG switch on and PKB lever pulled	About OV	Parking brake switch Level warning switch
		IG switch on and PKB lever returned	Battery voltage	
TC	Voltage	IG switch on and check connector Tc–E1 not connected	Battery voltage	ABS ECU
		IG switch on and check connector Tc–E1 connected	About OV	
RR–	Continuity	IG switch off	Continuity	
D/G	Voltage	IG switch on and check connector Ts–E1 not connected	About OV	
SAT	Voltage	IG switch off	Battery voltage	DOME Fuse
FSS	Continuity	IG switch off	Continuity	ABS ECU
R–	Continuity	IG switch off	Continuity	

Continued on page BR–85

Continued from page BR–84

Tester Connection	Check item	Conditon	Specified Value	Trouble Part
SR	Voltage	IG switch on and "ABS" warning light goes on	About OV	ABS ECU
		IG switch on and "ABS" warning light goes off	Battery voltage	
SFL	Voltage	IG switch on and "ABS" warning light goes on	About OV	Actuator
		IG switch on and "ABS" warning light goes off	Battery voltage	
FR–	Continuity	IG switch off	Continuity	ABS ECU
AST	Voltage	IG switch on and "ABS" warning light goes on	About OV	Actuator
		IG switch on and "ABS" warning light goes off	Battery voltage	
FL–	Continuity	IG switch off .	Continuity	ABS ECU
SRR	Voltage	IG switch on and. "ABS" warning light goes on	About OV	Actuator
		IG switch on and "ABS" warning light goes off	Battery voltage	

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



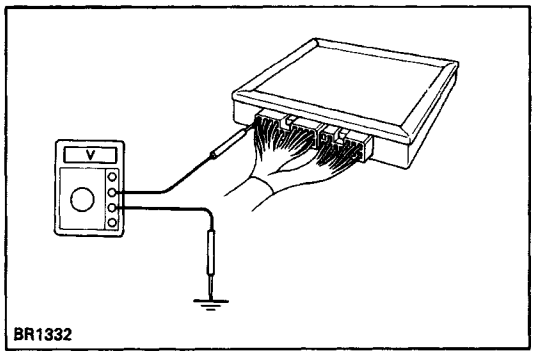
2. INSPECT SYSTEM CIRCUIT WITH CONNECTOR DISCONNECTED

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

Tester Connection	Check Item	Specified Value	Trouble Part	Tester Connection	Check Item	Specified Value	Trouble Part
SFR ↔ AST	Resistance	About 6 Ω	Actuator	SR ↔ R–	Resistance	60 ~ 100 Ω	Control relay
SRL ↔ AST	Resistance	About 6 Ω	Actuator	SFL ↔ AST	Resistance	About 6 Ω	Actuator
RL+ ↔ RL–	Resistance	1.1 ~ 1.7 kΩ	Rear LH speed sensor	AST ↔ Body ground	Resistance	About 5 Ω	Actuator
RR+ ↔ RR–	Resistance	1.1 ~ 1.7 kΩ	Rear RH speed sensor	MT ↔ Body ground	Continuity	Continuity	Actuator
FR+ ↔ FR–	Resistance	0.8 ~ 1.3 kΩ	Front RH speed sensor	MR ↔ R–	Resistance	50 ~ 80 Ω	Control relay
FL+ ↔ FL–	Resistance	0.8 ~ 1.3 kΩ	Front LH speed sensor	SRR ↔ AST	Resistance	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 ECU in place.

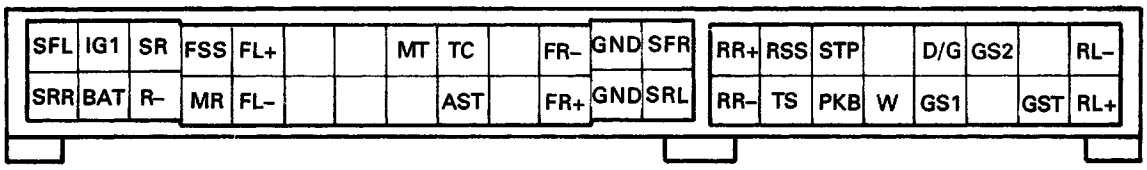


(4WD vehicles)

1. INSPECT SYSTEM CIRCUIT WITH CONNECTOR CONNECTED

(a) Remove the ABS ECU.

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



R01275

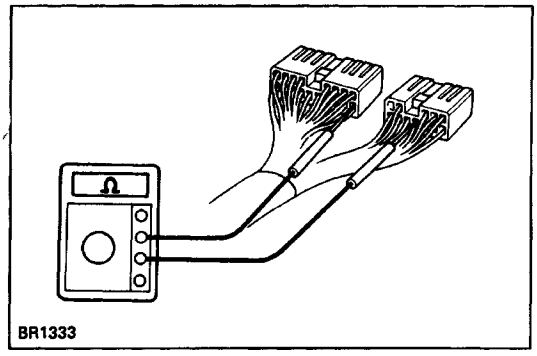
Tester Connection	Check item	Condition	Specified Value	Trouble Part
R L–	Continuity	IG switch off	Continuity	ABS ECU
GS2	Voltage	IG switch on	4–6V	Deceleration Sensor
D/G	Voltage	IG switch on and check connector Ts–E1not connected	About OV	ABS ECU
STP	Voltage	IG switch off and brake pedal depressed	Battery voltage	Stop light switch Stop light
	Continuity	IG switch off and brake pedal returned	Continuity	
RSS	Continuity	IG switch off	Continuity	ABS ECU
GS 1	Voltage	IG switch on	4–6V	Deceleration Sensor
W	Voltage	IG switch on and ”ABS” warning light goes on	About OV	ABS ECU ”ABS” warning light
		IG switch on and ”ABS” warning light goes off	Battery voltage	
PKB	Voltage	IG switch on and PKB lever pulled	About OV	Parking brake switch Level warning switch
		IG switch on and PKB lever returned	Battery voltage	
TS	Voltage	IG switch on and check connector Ts–E1not connected	Battery voltage	ABS ECU
		IG switch on and check connector Ts–E1connected	About OV	
RR–	Continuity	IG switch off	Continuity	
SFR	Voltage	IG switch on and “ABS” warning light goes on	About OV	Actuator
		IG switch on and ”ABS” warning light goes off	Battery voltage	
GND	Continuity	IG switch off	Continuity	Wiring harness
FR–	Continuity	IG switch off	Continuity	ABS ECU
TC	Voltage	IG switch on and check connector Tc–E1 not connected	Battery voltage	
		IG switch on and check connector Tc–E1 connected	About OV	
FSS	Continuity	IG switch off	Continuity	
SR	Voltage	IG switch on and ”ABS” warning light goes on	About OV	
		IG switch on and ”ABS” warning light goes off	Battery voltage	
IG1	Voltage	IG switch on	Battery voltage	ECU–IG Fuse

Continued on page BR–87

Continued from page BR–86

Tester Connection	Check Item	Condition	Specified Value	Trouble Part
SFL	Voltage	IG switch on and "ABS" warning tight goes on	About OV	Actuator
		IG switch on and "ABS" warning light goes off	Battery voltage	
SRL	Voltage	IG switch on and "ABS" warning light goes on	About OV	
		IG switch on and "ABS" warning light goes off	Battery voltage	
AST	Voltage	IG switch on and "ABS" warning light goes on	About OV	
		IG switch on and "ABS" warning light goes off	Battery voltage	
FL–	Continuity	IG switch off	Continuity	ABS ECU
R–	Continuity	IG switch off	Continuity	
BAT	Voltage	IG switch off	Battery voltage	DOME Fuse
SRR	Voltage	IG switch on and "ABS" warning light goes on	About OV	Actuator
		IG switch on and "ABS" warning light goes off	Battery voltage	

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 ECU, inspect at the wire harness side connector.

Tester Connection	Check Item	Specified Value	Trouble Part	Tester Connection	Check Item	Specified Value	Trouble Part
RR+ ↔ RR–	Resistance	1.1 ~ 1.7 kΩ	Rear RH speed sensor	SFL ↔ AST	Resistance	About 6 Ω	Actuator
RL+ ↔ RL–	Resistance	1.1 ~ 1.7 kΩ	Rear LH speed sensor	SRL ↔ AST	Resistance	About 6 Ω	Actuator
SFR ↔ AST	Resistance	About 6 Ω	Actuator	FR+ ↔ FR–	Resistance	0.8 ~ 1.3 kΩ	Front RH speed sensor
MT ↔ Body ground	Continuity	Continuity	Actuator	AST ↔ Body ground	Resistance	About 5 Ω	Actuator
FL+ ↔ FL–	Resistance	0.8 ~ 1.3 kΩ	Front LH speed sensor	MR ↔ R–	Resistance	50 ~ 80 Ω	Control relay
SR ↔ R–	Resistance	60 ~ 100 Ω	Control relay	SRR ↔ AST	Resistance	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 ECU in place.