

BRAKE SYSTEM

SECTION BR

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BR

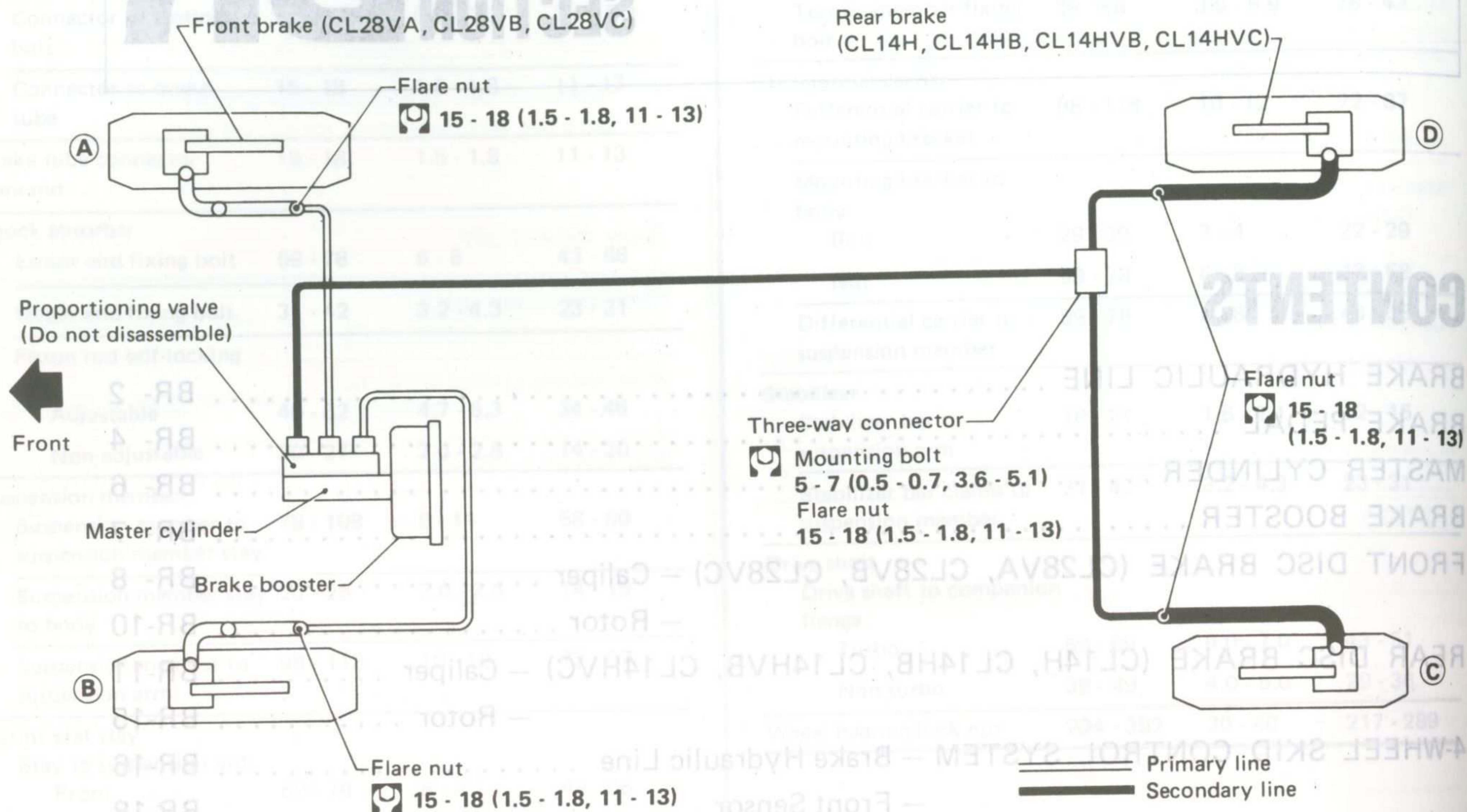


- Carefully monitor brake fluid level at master cylinder during bleeding operation.
- Bleed air according to the following procedure:
 - Left rear caliper (C) → Right rear caliper (D)
 - Right front caliper (A) → Left front caliper (B)
- Connect a transparent vinyl tube to air bleeder valve of caliper.

BRAKE HYDRAULIC LINE

Precautions

- Recommended fluid is brake fluid "DOT 3".
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.



WARNING:

Clean pad and shoe dust using a dust collector after cleaning with waste cloth.

Ⓜ: N·m (kg·m, ft·lb)

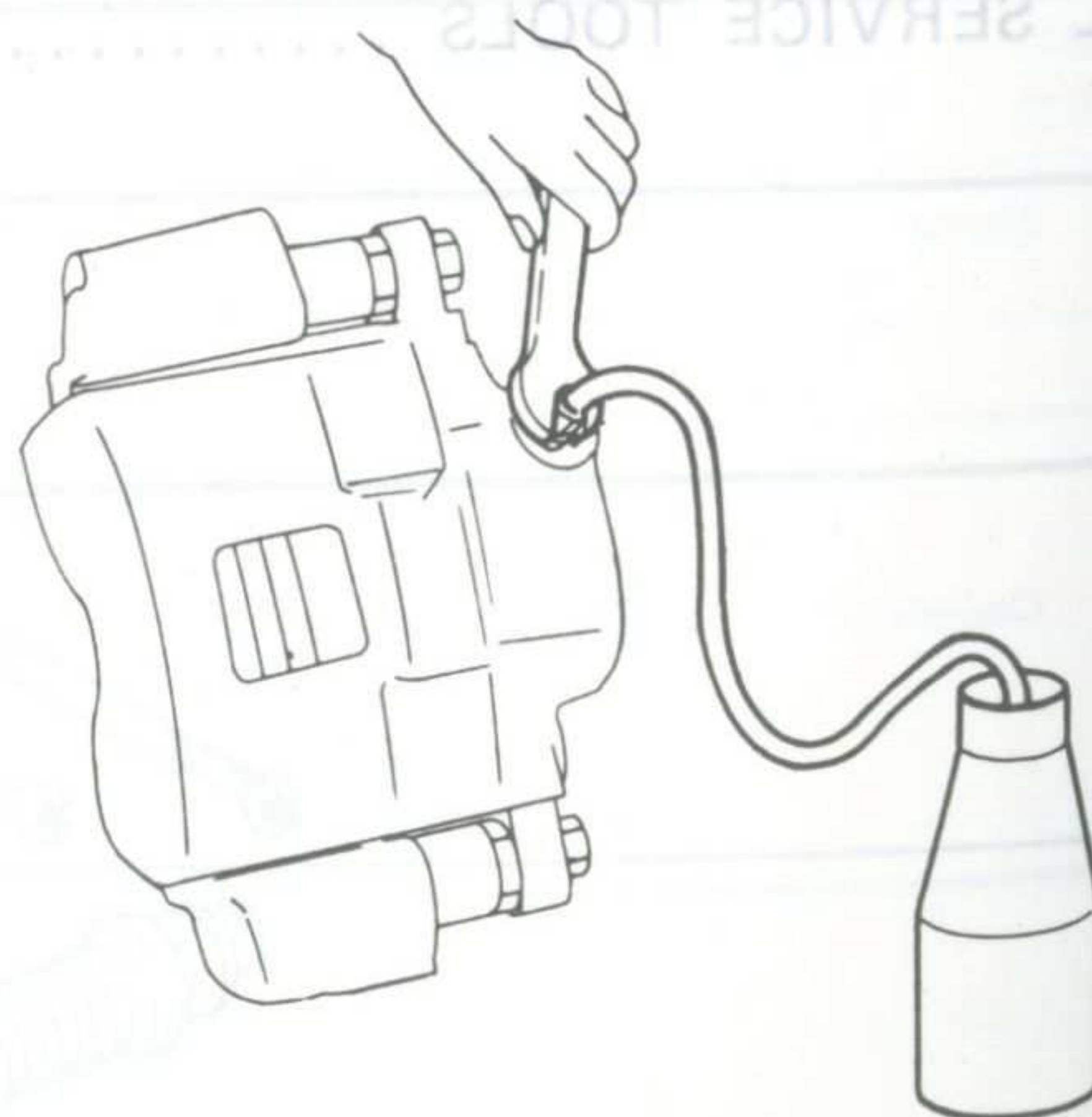
SBR821

Bleeding Procedure

Precautions

Carefully monitor brake fluid level at master cylinder during bleeding operation.

- Bleed air according to the following procedure:
Left rear caliper ③ → Right rear caliper ④
→ Right front caliper ① → Left front caliper ②
- Connect a transparent vinyl tube to air bleeder valve of caliper.



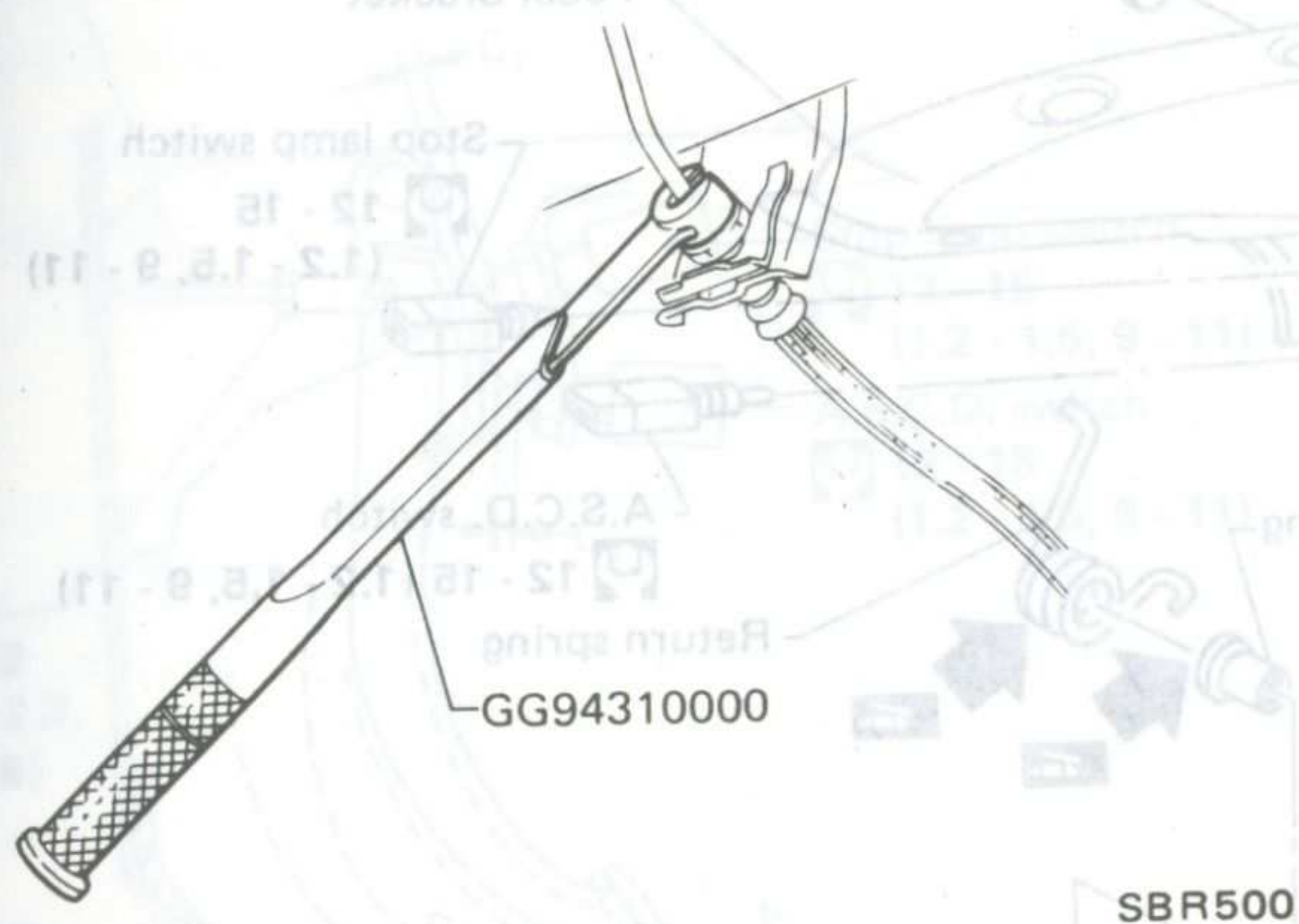
SBR606

BRAKE HYDRAULIC LINE

Removal and Installation

CAUTION:

- Use Tool when removing and installing brake tube.

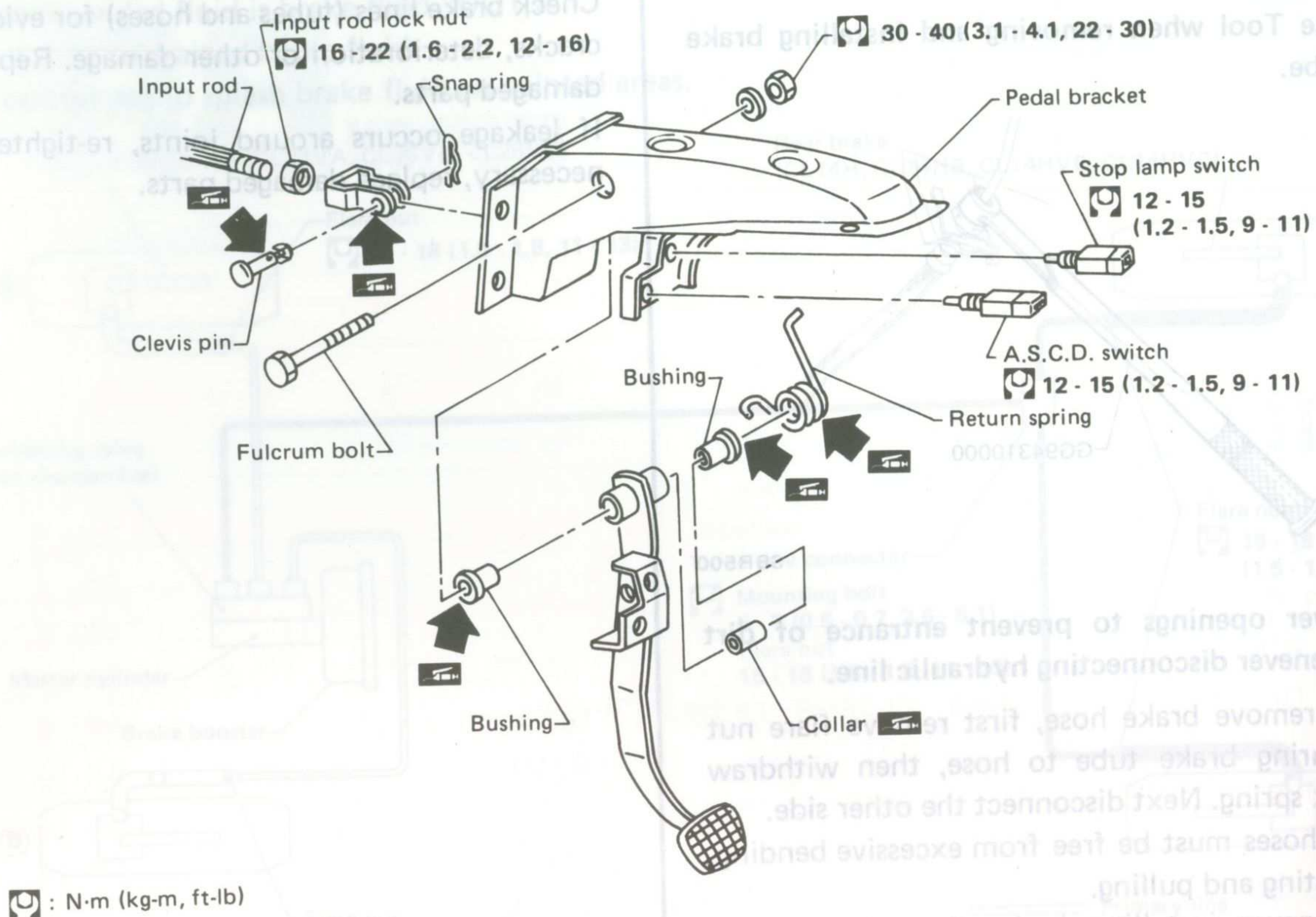


- Cover openings to prevent entrance of dirt whenever disconnecting hydraulic line.
 - To remove brake hose, first remove flare nut securing brake tube to hose, then withdraw lock spring. Next disconnect the other side.
 - All hoses must be free from excessive bending, twisting and pulling.
 - Whenever installing brake lines, be sure to check for oil leakage by fully depressing brake pedal.

Inspection

Check brake lines (tubes and hoses) for evidence of cracks, deterioration or other damage. Replace any damaged parts.
If leakage occurs around joints, re-tighten or, if necessary, replace damaged parts.

BRAKE PEDAL



Inspection

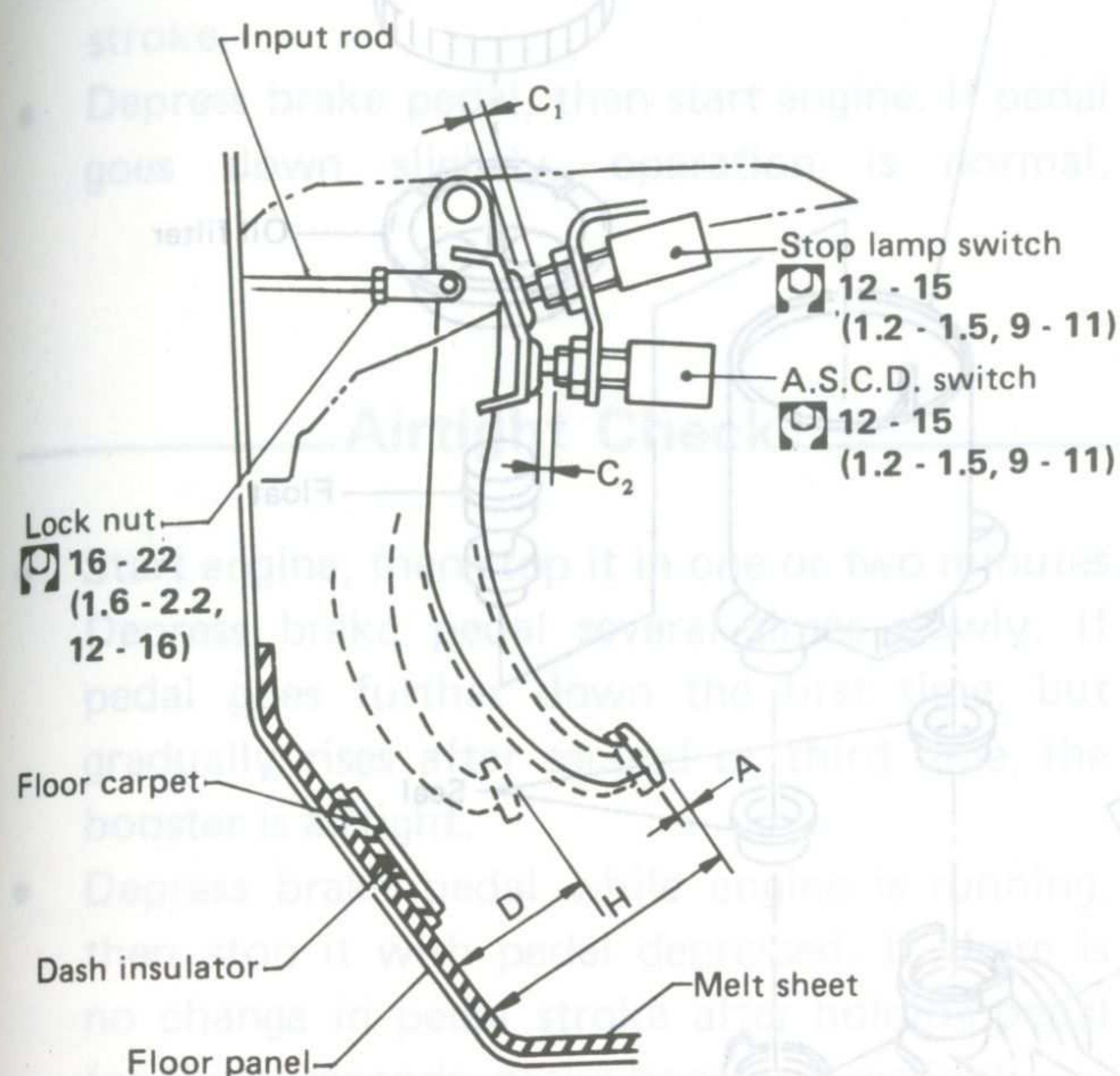
Check brake pedal for the following items, servicing as necessary.

- Bending of brake pedal
- Clevis pin deformation
- Cracks in any welded portion

BRAKE PEDAL

Adjustment

Check brake pedal free height from melt sheet.
Adjust if necessary.



⊗ : N·m (kg-m, ft-lb)

SBR838

H: Free height

M/T 182 - 192 mm (7.17 - 7.56 in)

A/T 184 - 194 mm (7.24 - 7.64 in)

D: Depressed height

M/T More than 90 mm (3.54 in)

A/T More than 90 mm (3.54 in)

Under force of 490 N (50 kg, 110 lb) with engine running.

C₁: Clearance between pedal stopper and threaded end of stop lamp switch.

0.3 - 1.0 mm (0.012 - 0.039 in)

C₂: Clearance between pedal stopper and threaded end of A.S.C.D. switch.

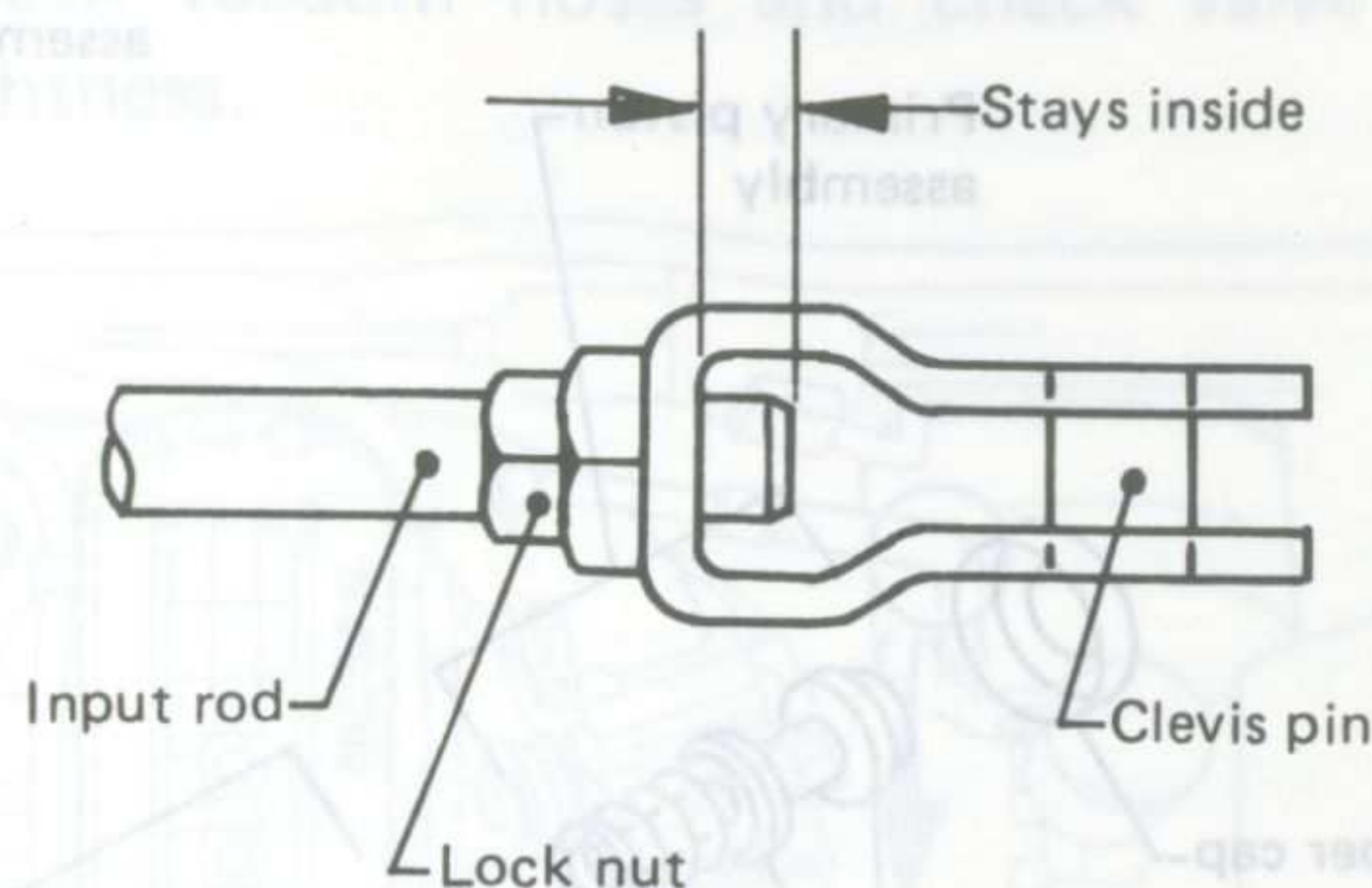
0.3 - 1.0 mm (0.012 - 0.039 in)

A: Pedal free play

0.3 - 3.8 mm (0.012 - 0.150 in)

(1) Adjust pedal free height with brake booster input rod. Then tighten lock nut.

Be sure that the tip of input rod stays inside.



SBR930

(2) Adjust clearance "C₁" and "C₂" with stop lamp switch and A.S.C.D. switch respectively. Then tighten lock nuts.

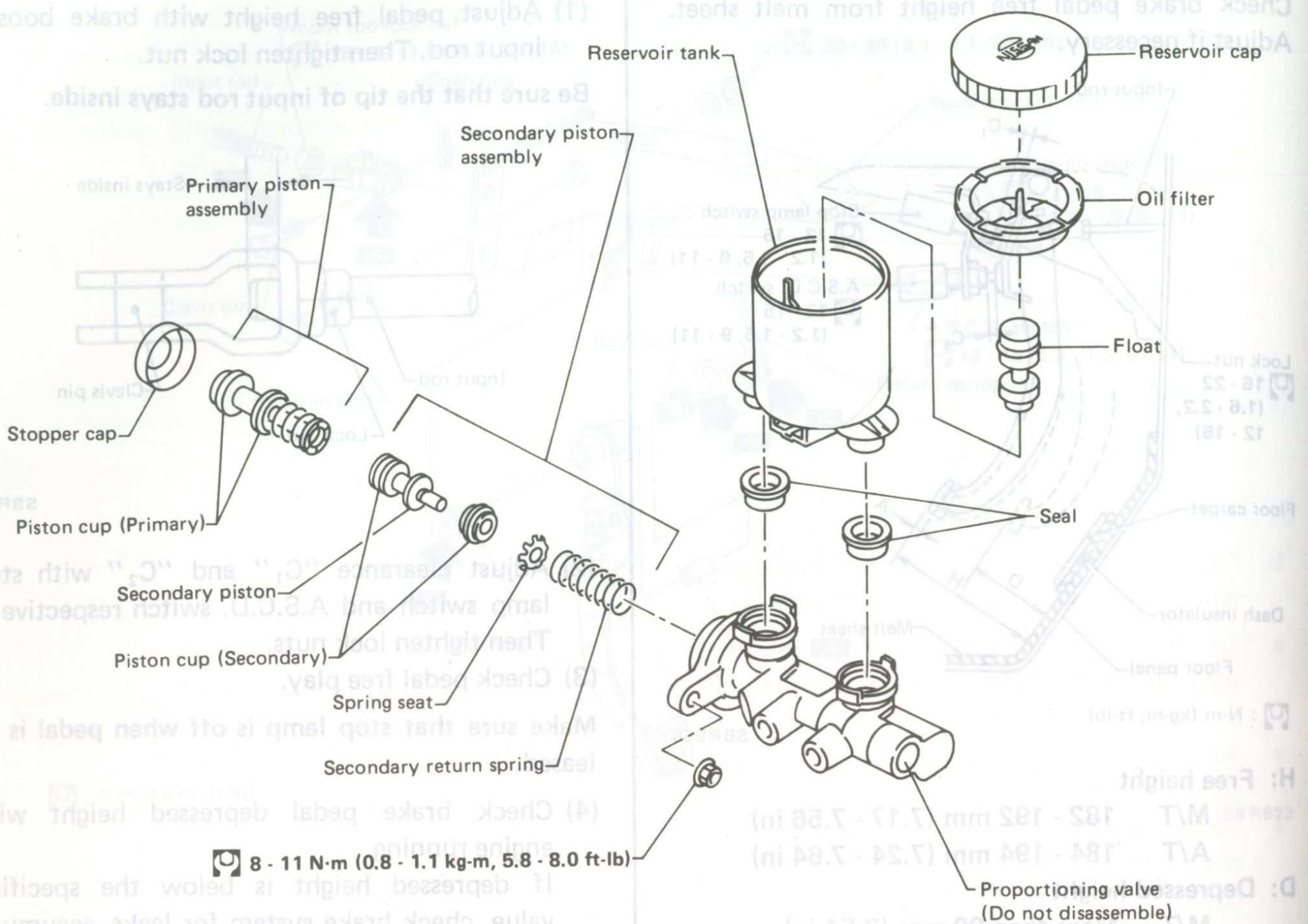
(3) Check pedal free play.

Make sure that stop lamp is off when pedal is released.

(4) Check brake pedal depressed height with engine running.

If depressed height is below the specified value, check brake system for leaks, accumulation of air or any damage regarding component parts (master cylinder, wheel cylinder, etc.), and make the necessary repairs.

MASTER CYLINDER



- Apply brake fluid or rubber grease to sliding contact surface when assembling master cylinder.
- Check parts for wear or damage. Replace if any of above conditions are observed.
- Replace piston assembly when disassembled.

BRAKE BOOSTER

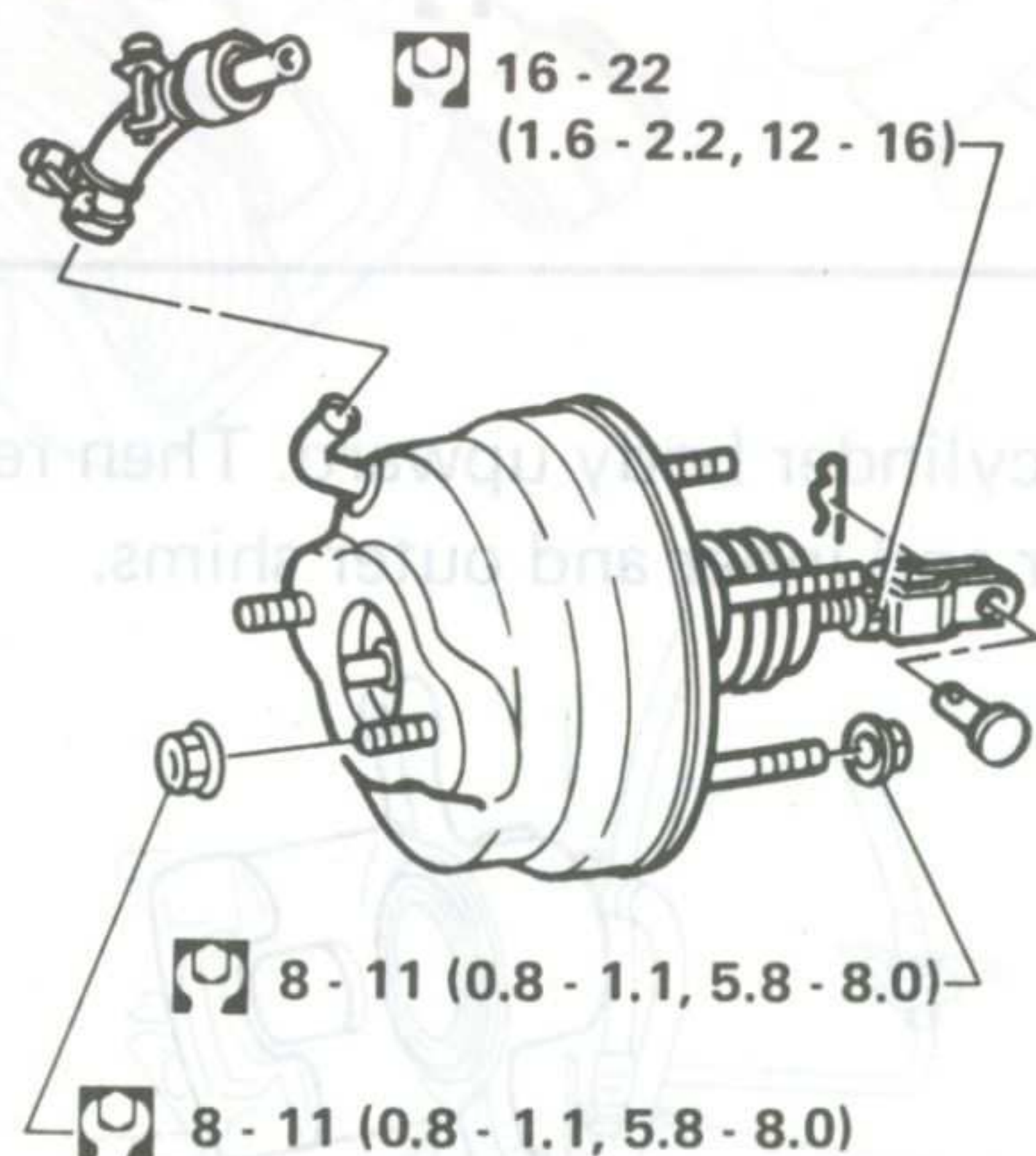
Operating Check

- Depress brake pedal several times with engine off, then check that there is no change in pedal stroke.
- Depress brake pedal, then start engine. If pedal goes down slightly, operation is normal.

Airtight Check

- Start engine, then stop it in one or two minutes. Depress brake pedal several times slowly. If pedal goes further down the first time, but gradually rises after second or third time, the booster is airtight.
- Depress brake pedal while engine is running, then stop it with pedal depressed. If there is no change in pedal stroke after holding pedal for thirty seconds, brake booster is airtight.

Removal and Installation



: N·m (kg-m, ft-lb)

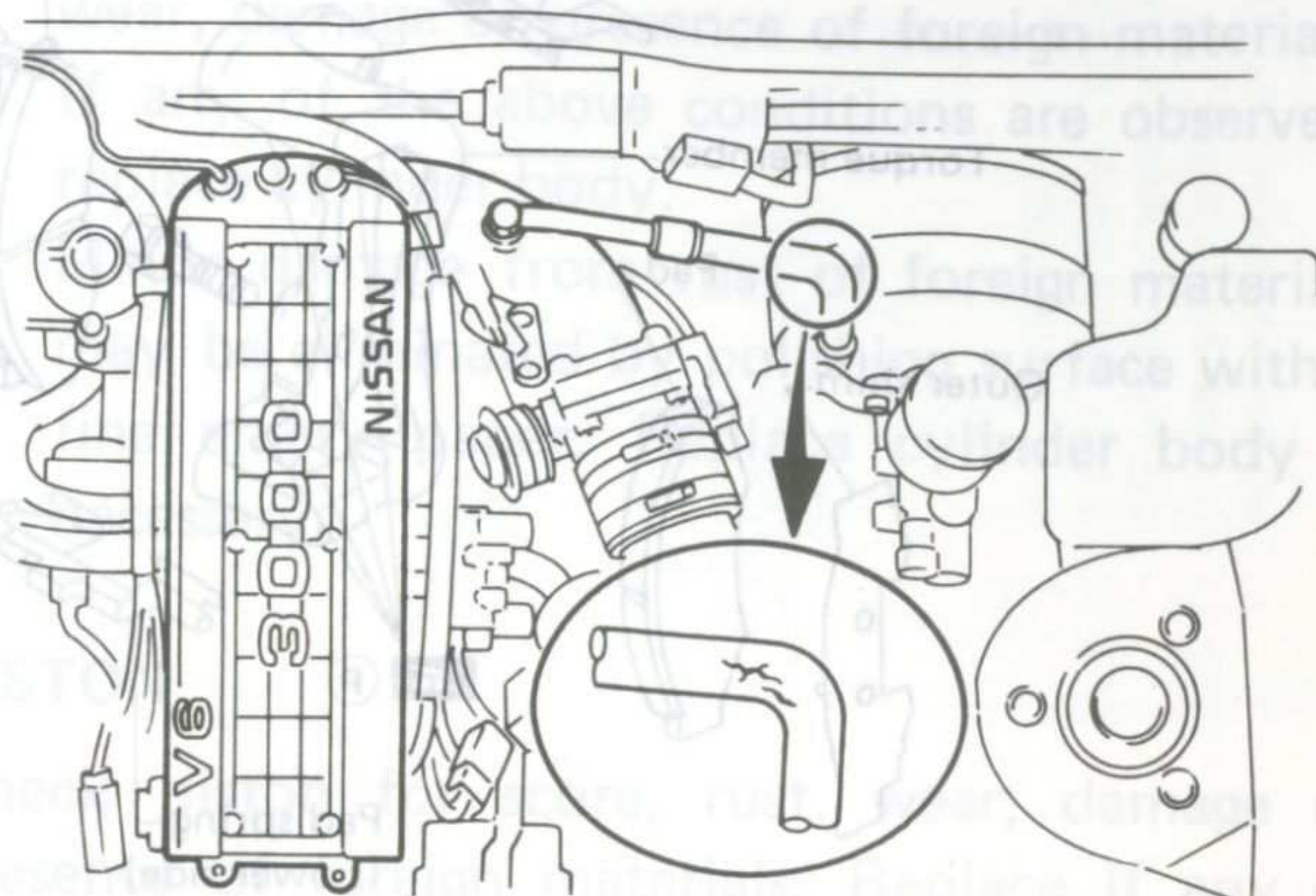
SBR831

Do not apply any oil or lubricants to vacuum hose when checking valve.

Inspection

HOSES AND CONNECTORS

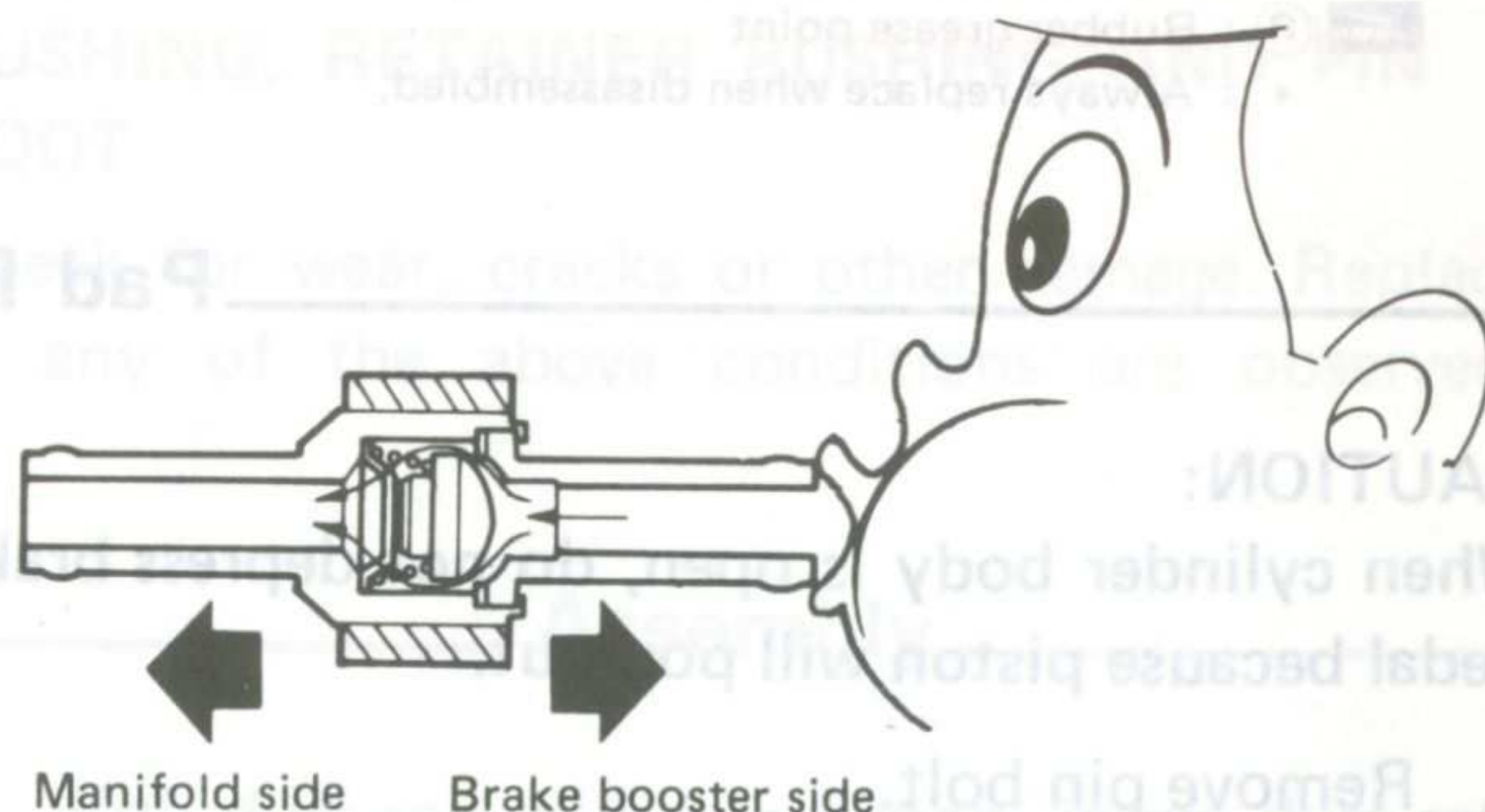
- Check condition of vacuum hoses and connectors.
- Check vacuum hoses and check valve for air tightness.



SBR832

CHECK VALVE

- When pressure is applied to the brake booster side of check valve and valve does not open, replace check valve with a new one.

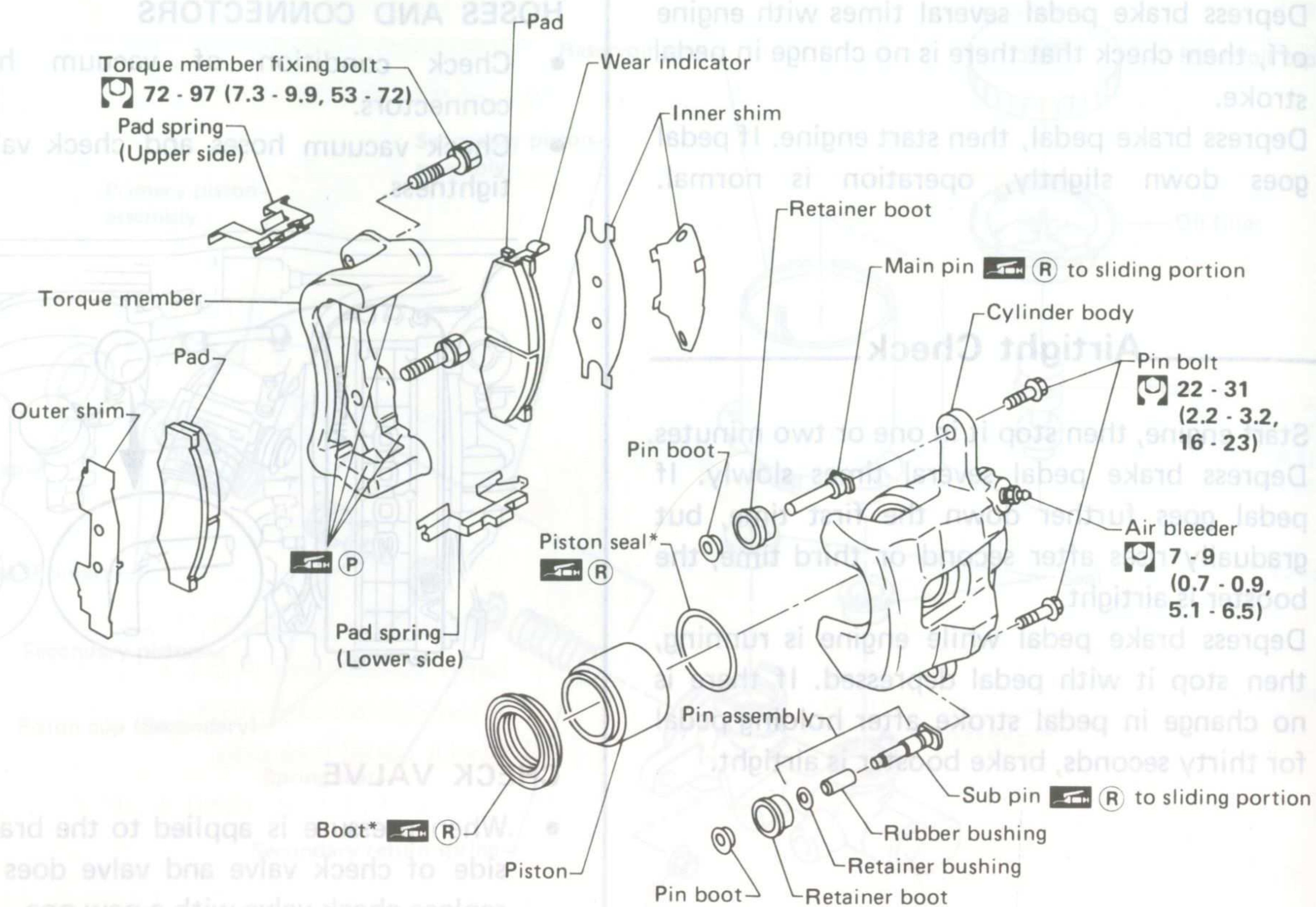


SBR846

OUTPUT ROD LENGTH

PV servo cannot be adjusted.

FRONT DISC BRAKE (CL28VA, CL28VB, CL28VC) — Caliper



(P) : P.B.C. (Poly Butyl Cuprysil) grease or silicone-based grease point

(R) : Rubber grease point

* : Always replace when disassembled.

: N·m (kg-m, ft-lb)

SBR824

Pad Replacement

CAUTION:

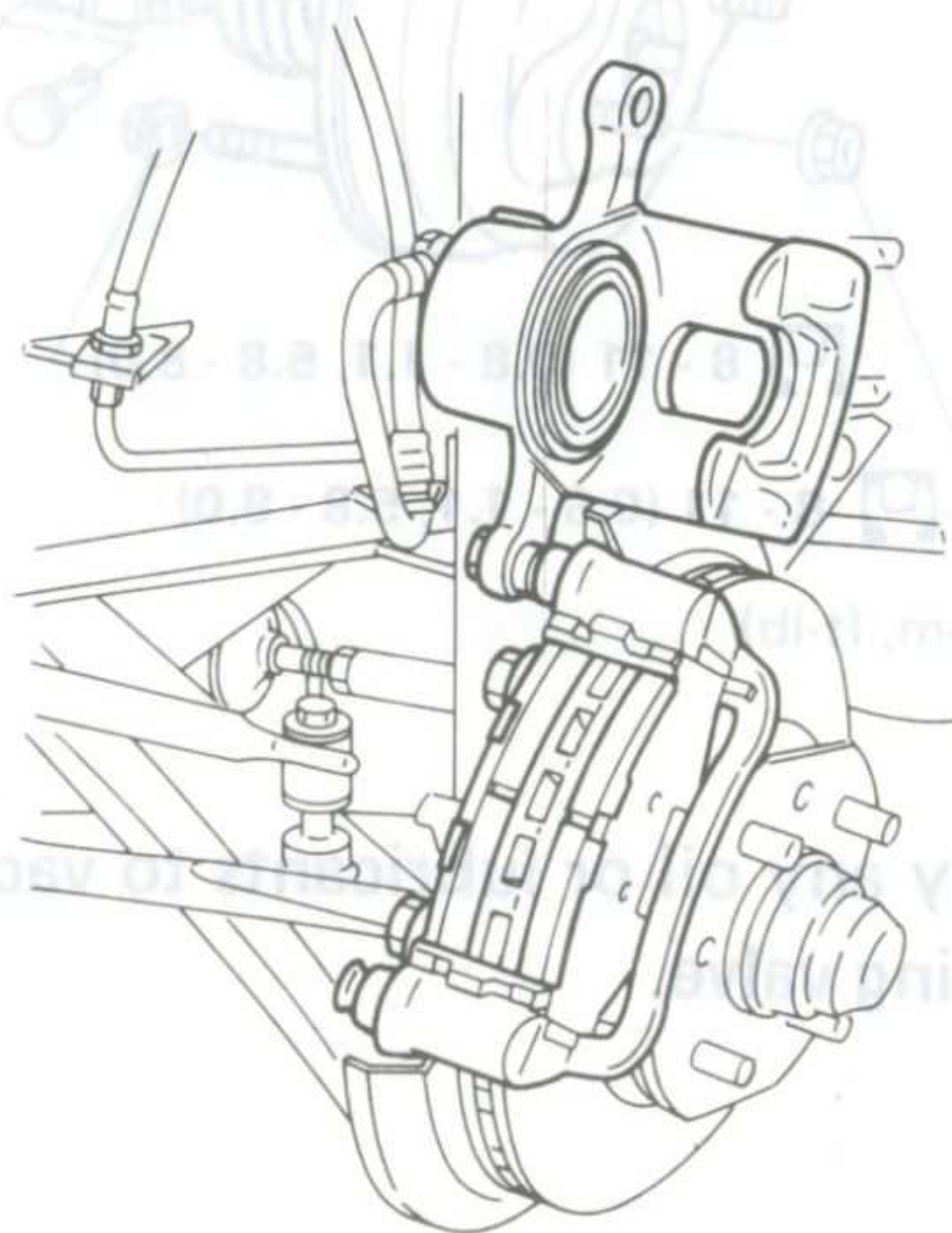
When cylinder body is open, do not depress brake pedal because piston will pop out.

1. Remove pin bolt.



SBR732

2. Swing cylinder body upward. Then remove pad retainer and inner and outer shims.



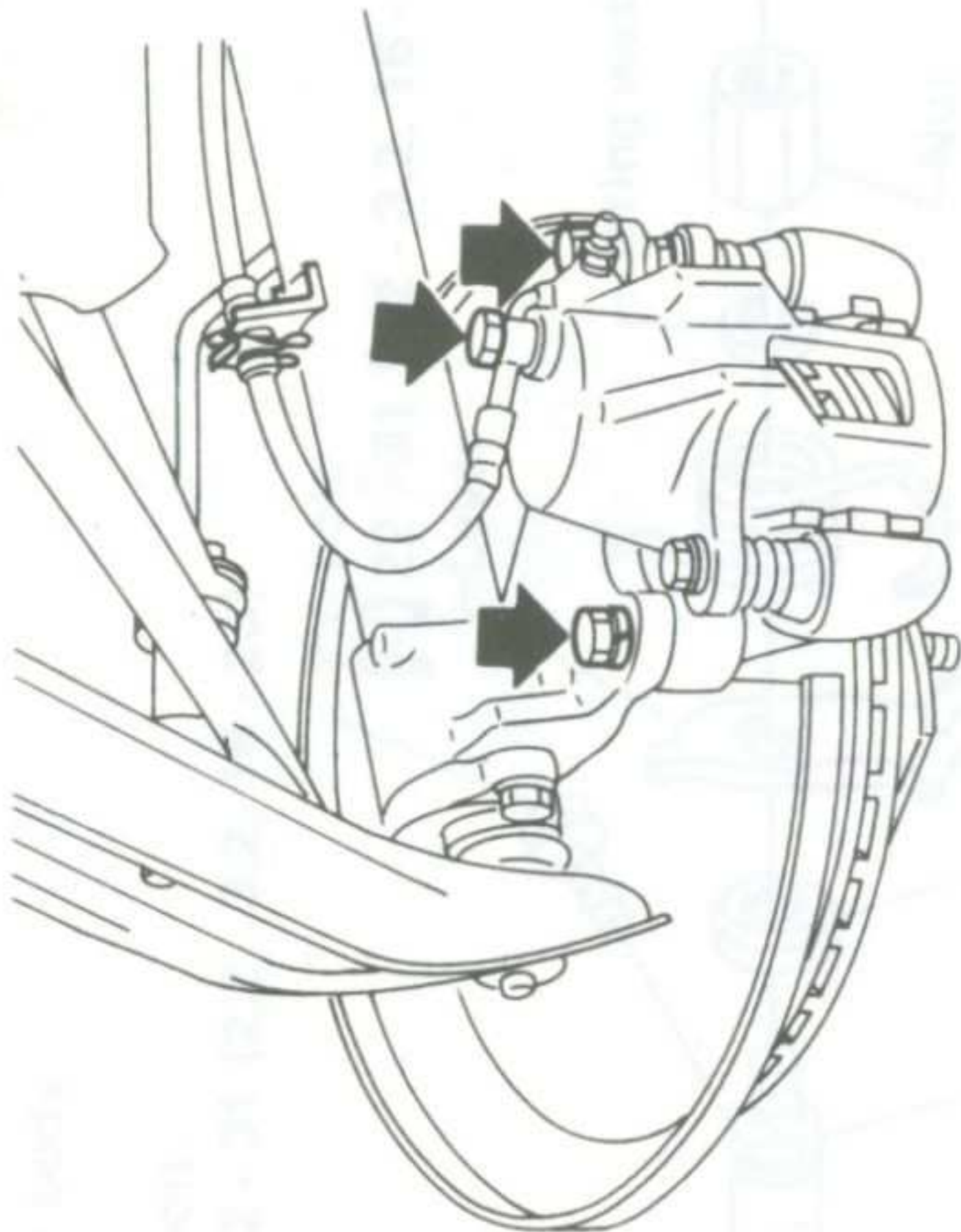
SBR825

Be careful not to damage piston boot or get oil on rotor. Always replace shims when replacing pads.

FRONT DISC BRAKE (CL28VA, CL28VB, CL28VC) — Caliper

Removal and Installation

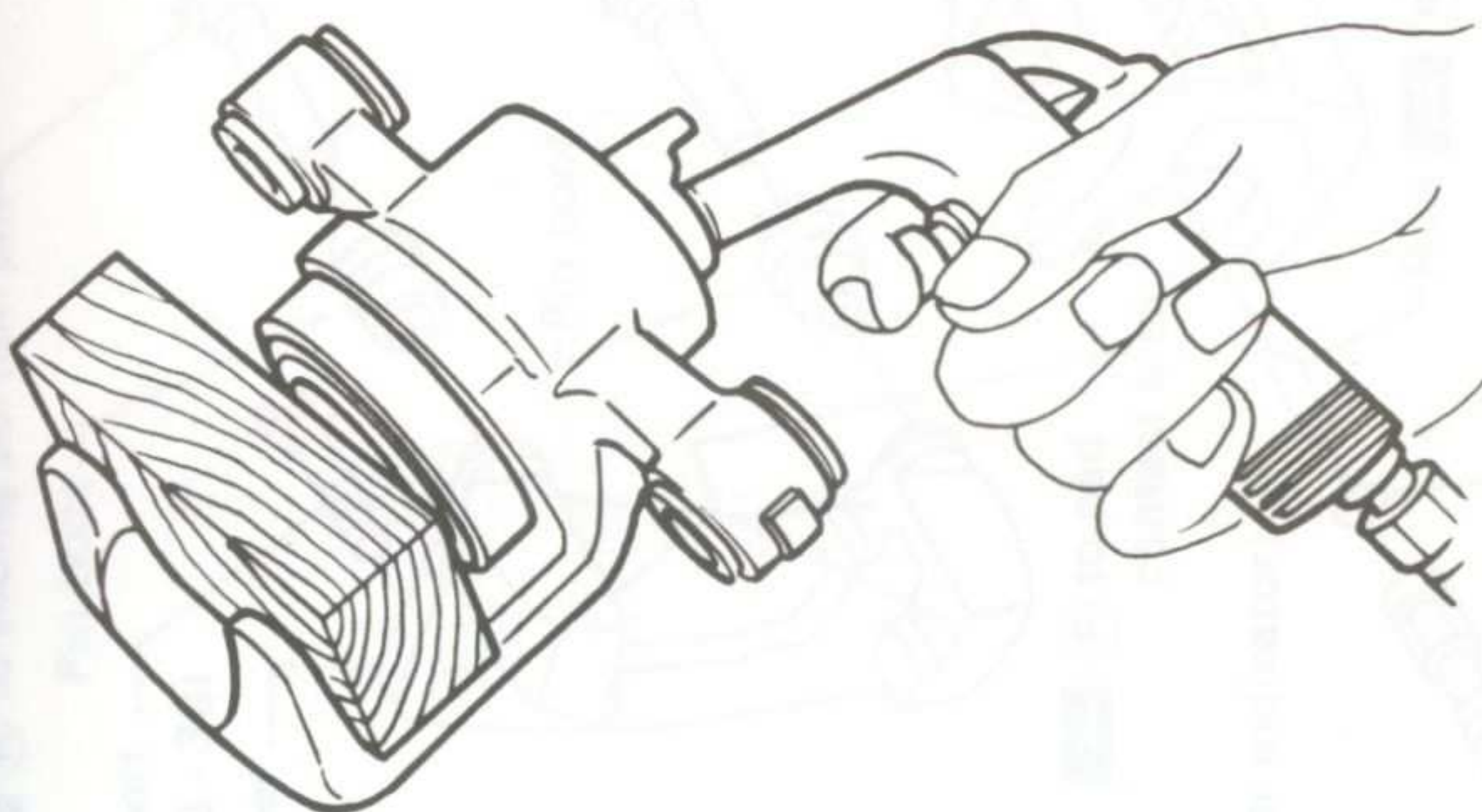
Remove torque member fixing bolts and brake hose connector.



SBR839

Disassembly

Push out piston with dust seal using compressed air.



SBR772

Inspection

CAUTION:

Use brake fluid to clean. Never use mineral oil.

CYLINDER BODY

- Check inside surface of cylinder for score, rust, wear, damage or presence of foreign materials. If any of the above conditions are observed, replace cylinder body.
- Minor damage from rust of foreign materials may be eliminated by polishing surface with a fine emery paper. Replace cylinder body if necessary.

PISTON

Check piston for score, rust, wear, damage or presence of foreign materials. Replace if any of the above conditions are observed.

CAUTION:

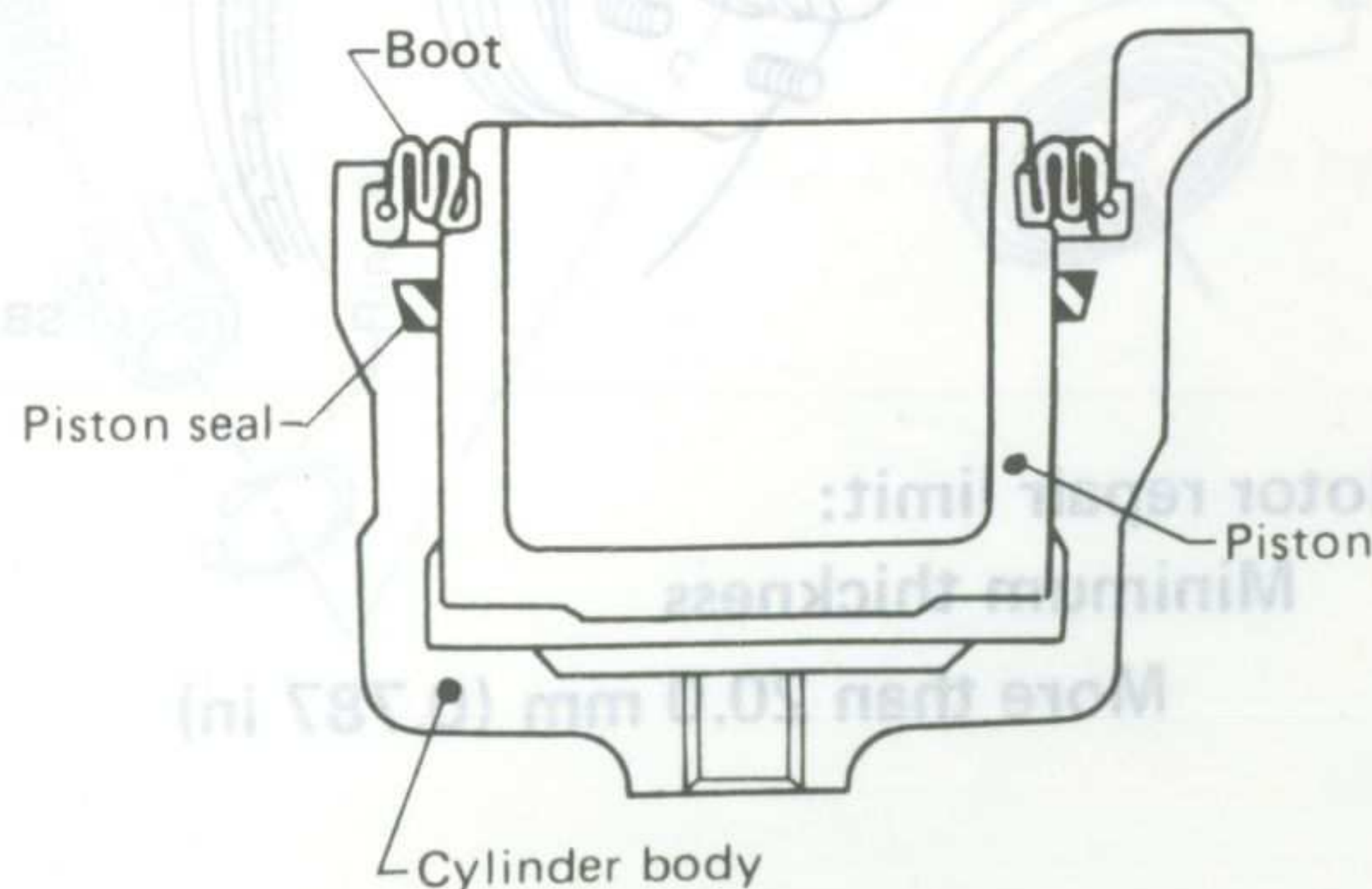
Piston sliding surface is plated. Do not polish with emery paper even if rust or foreign materials are stuck to sliding surface.

PIN, PIN BOLT, RETAINER BOOT, RUBBER BUSHING, RETAINER BUSHING AND PIN BOOT

Check for wear, cracks or other damage. Replace if any of the above conditions are observed.

Assembly

- With dust seal fitted to piston, insert dust seal into groove on cylinder body and install piston.
- Properly secure dust seal.



SBR574

FRONT DISC BRAKE (CL28VA, CL28VB, CL28VC) — Rotor

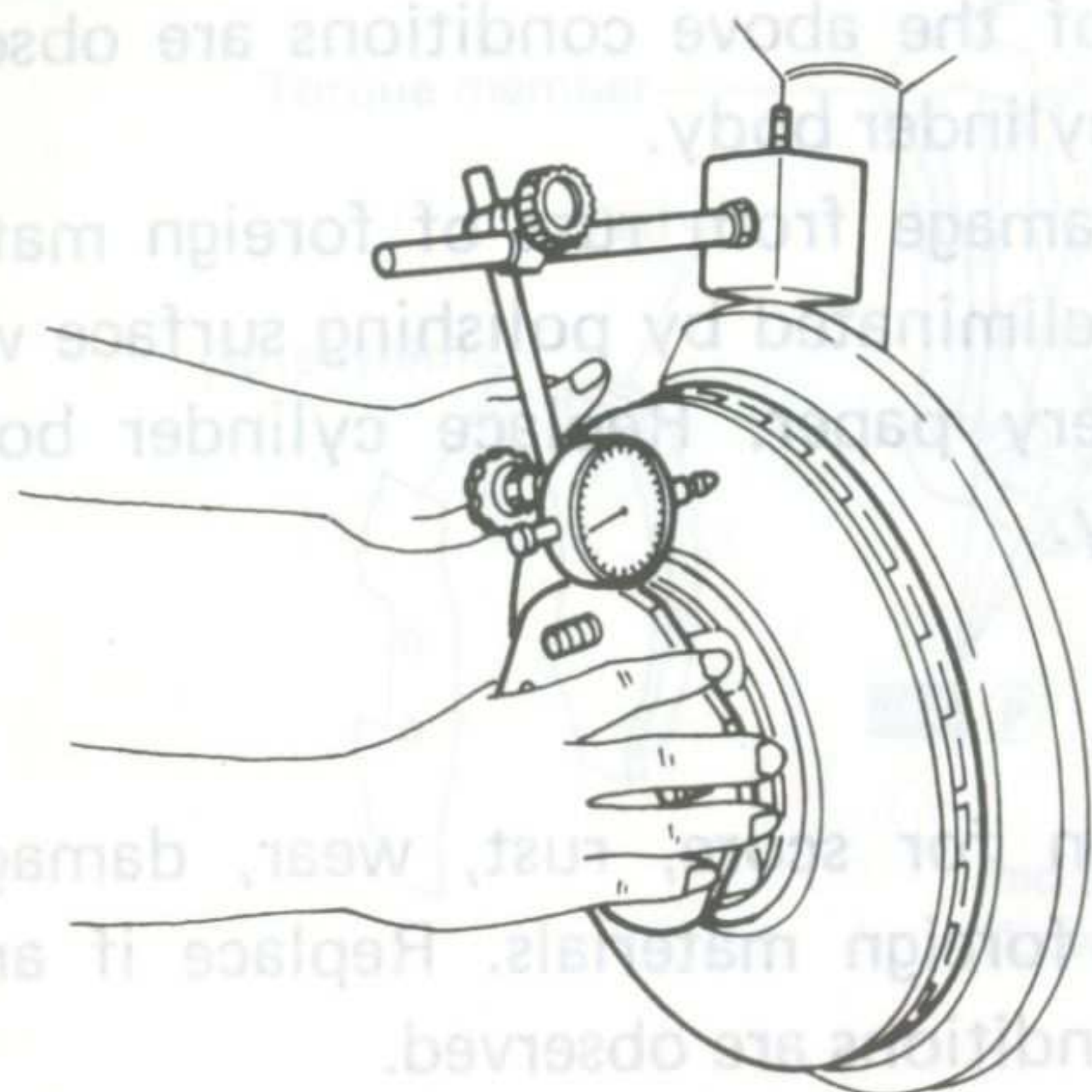
Inspection

RUBBING SURFACE

Check rotor for roughness, cracks or chips.

RUNOUT

Make sure axle shaft has no axial end play. Then check runout using a dial guage.



SBR826

Rotor repair limit:

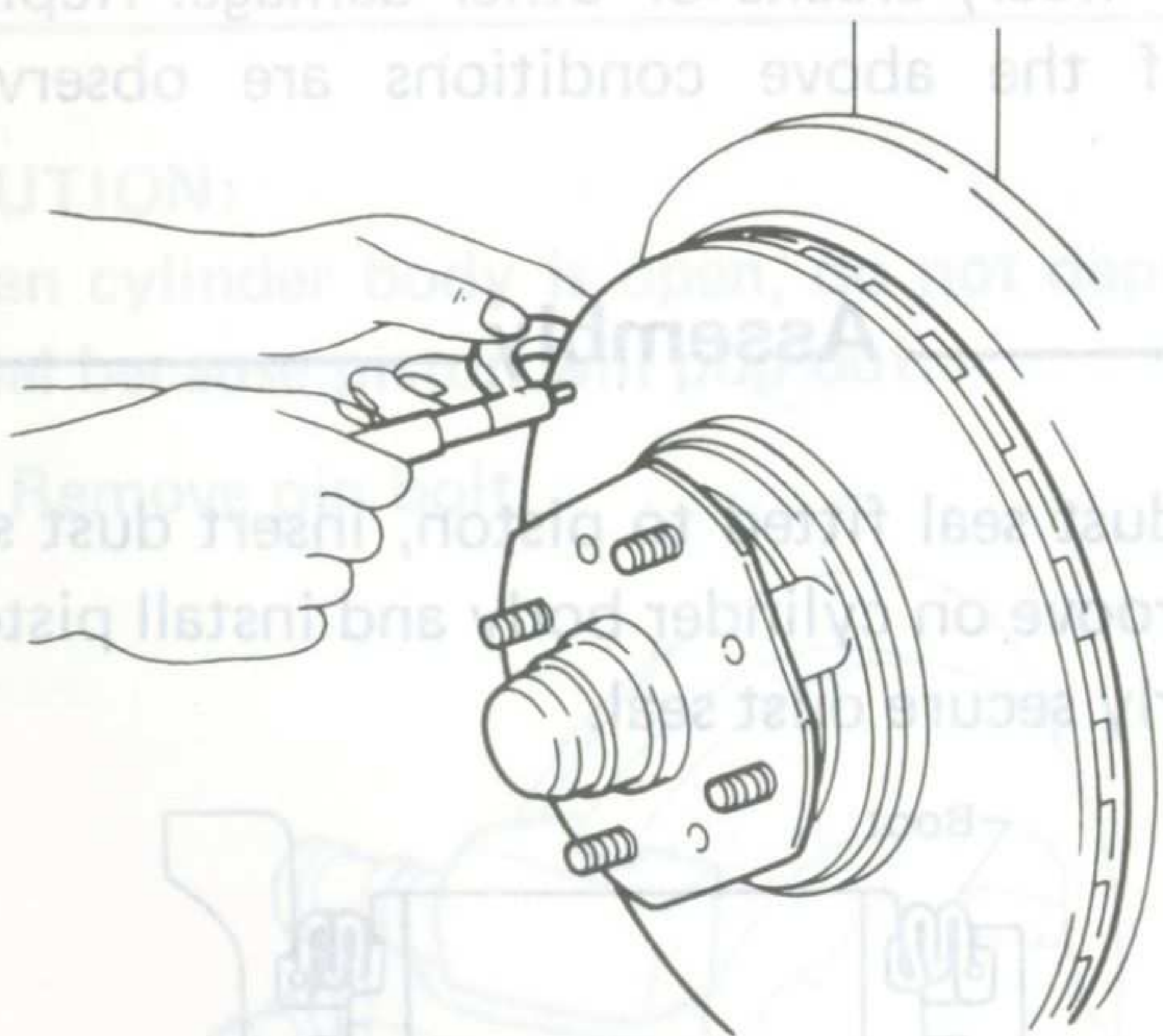
Maximum runout

(Total indicator reading at

center of rotor pad contact surface)

Less than 0.07 mm (0.0028 in)

THICKNESS



SBR827

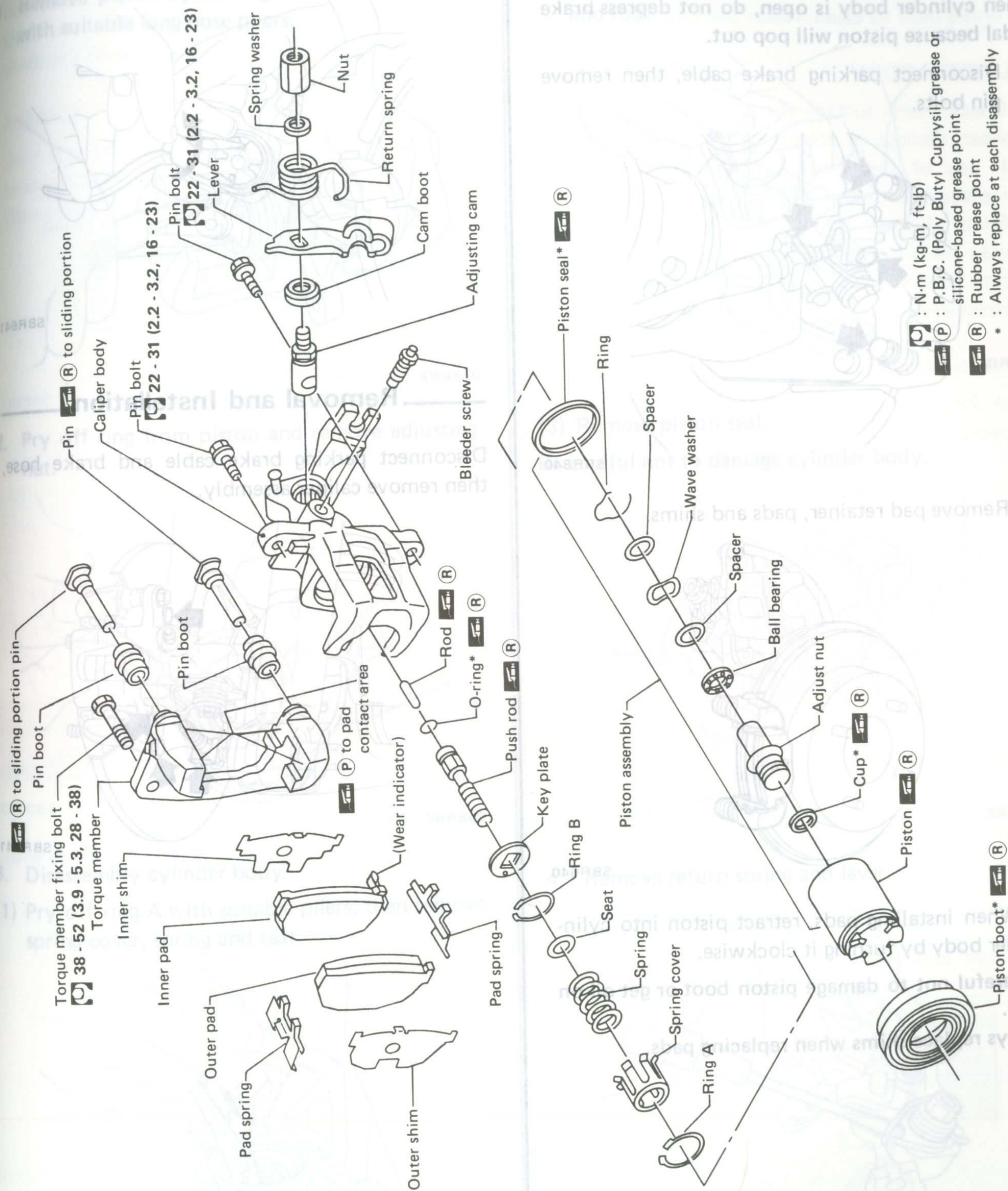
Rotor repair limit:

Minimum thickness

More than 20.0 mm (0.787 in)

REAR DISC BRAKE (CL14H, CL14HB, CL14HVB, CL14HVC)

— Caliper



SBR828

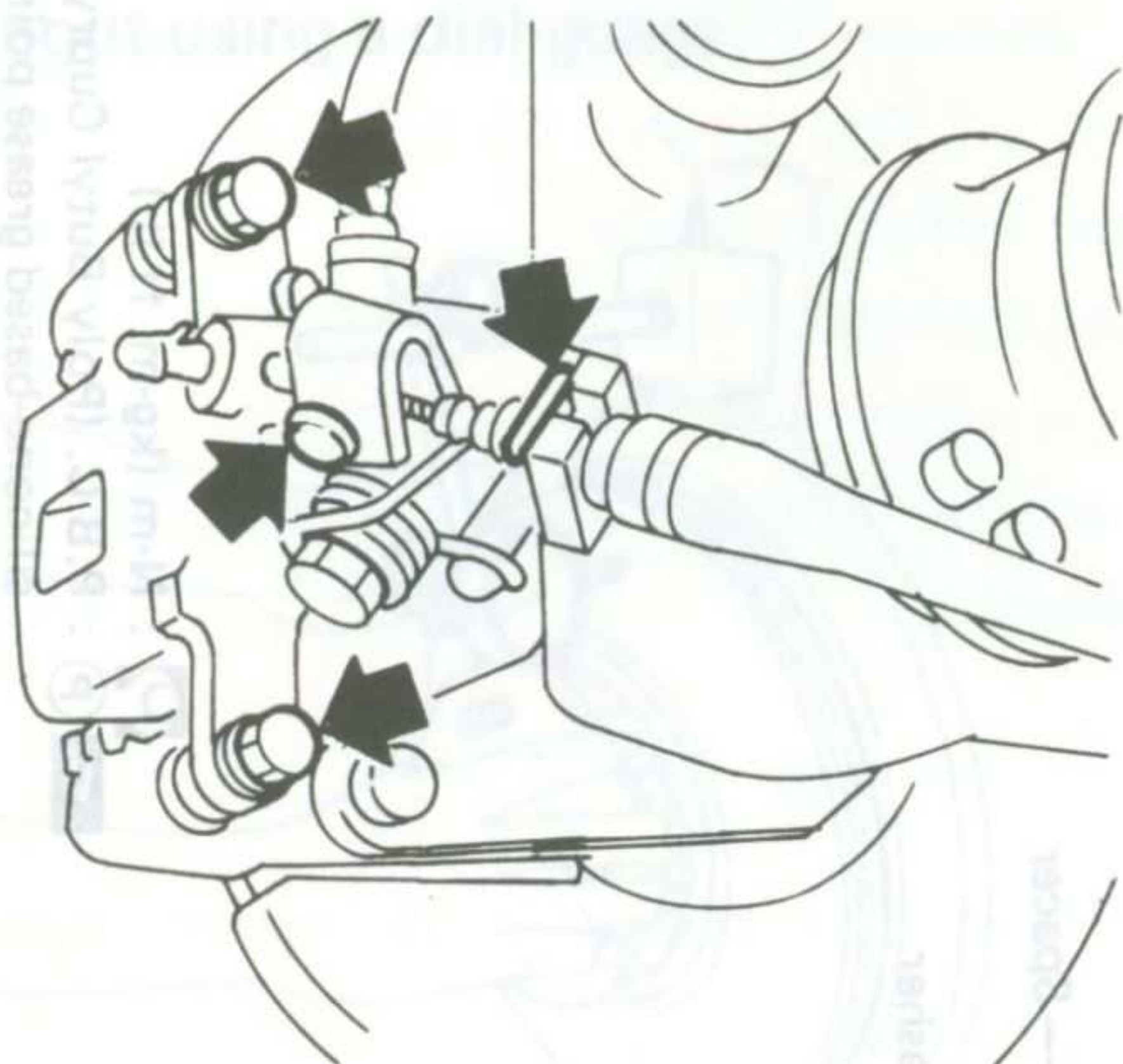
REAR DISC BRAKE (CL14H, CL14HB, CL14HVB, CL14HVC) — Caliper

Pad Replacement

CAUTION:

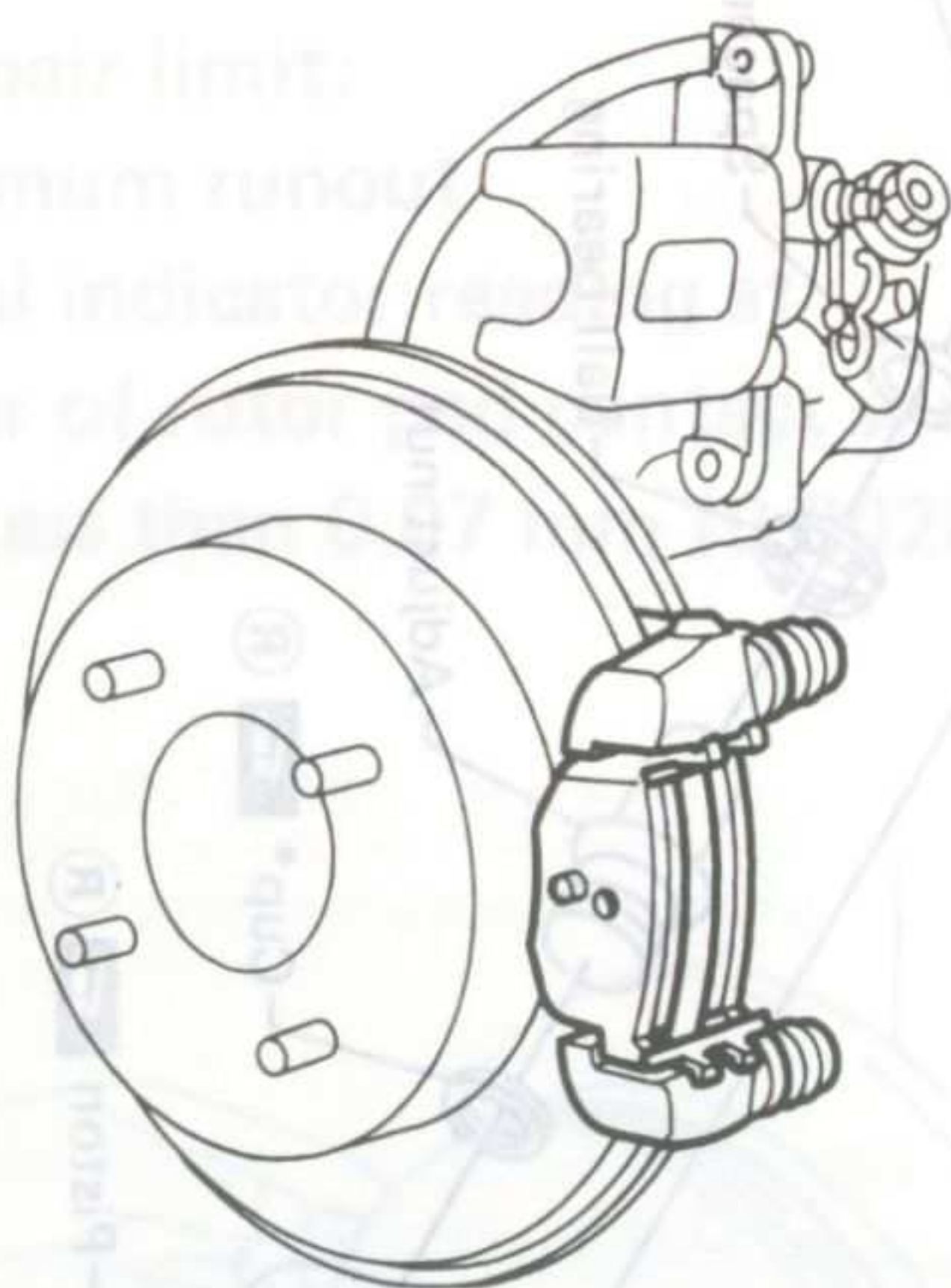
When cylinder body is open, do not depress brake pedal because piston will pop out.

1. Disconnect parking brake cable, then remove pin bolts.



SBR840

2. Remove pad retainer, pads and shims.

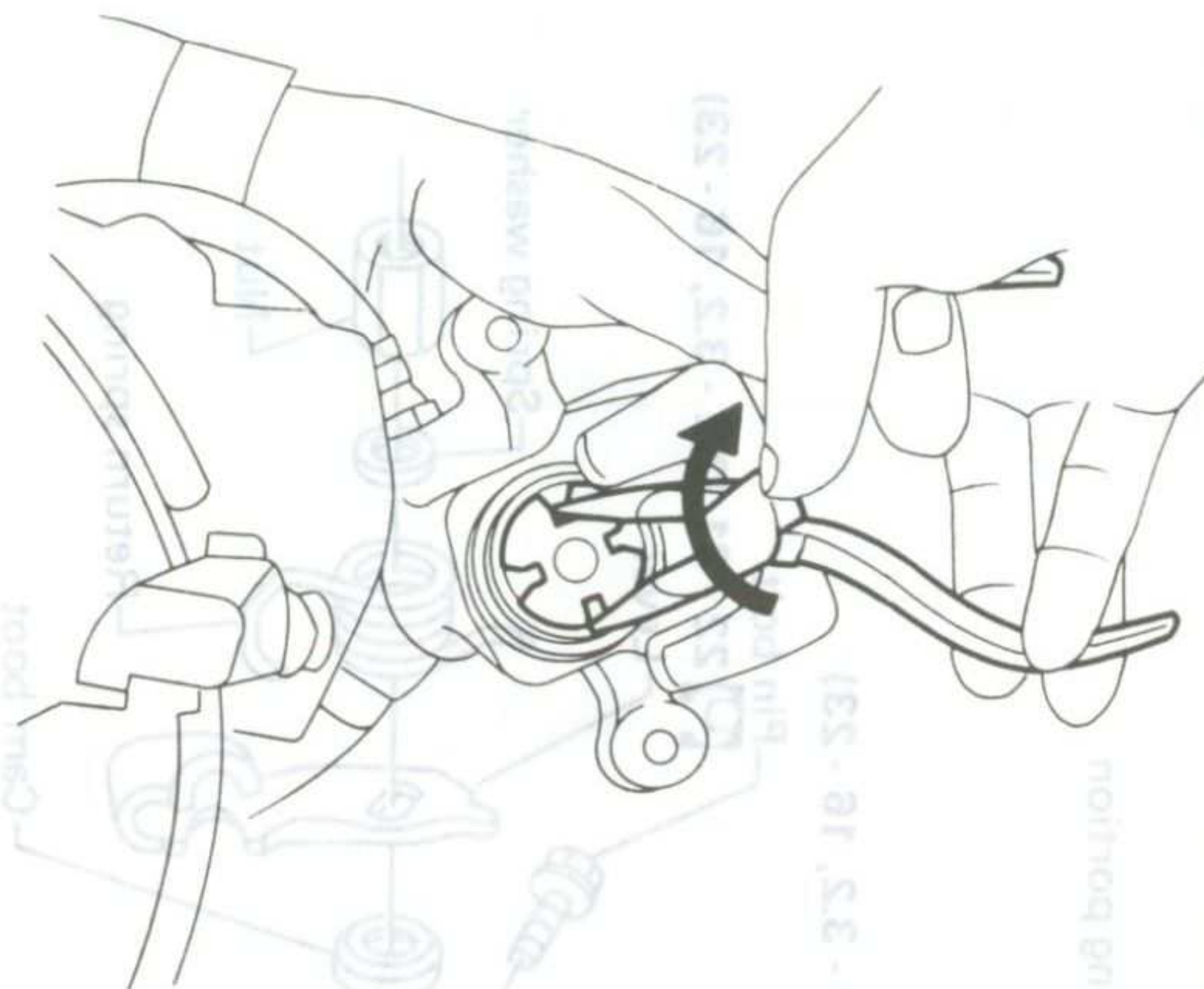


SBR640

3. When installing pads, retract piston into cylinder body by turning it clockwise.

Be careful not to damage piston boot or get oil on rotor.

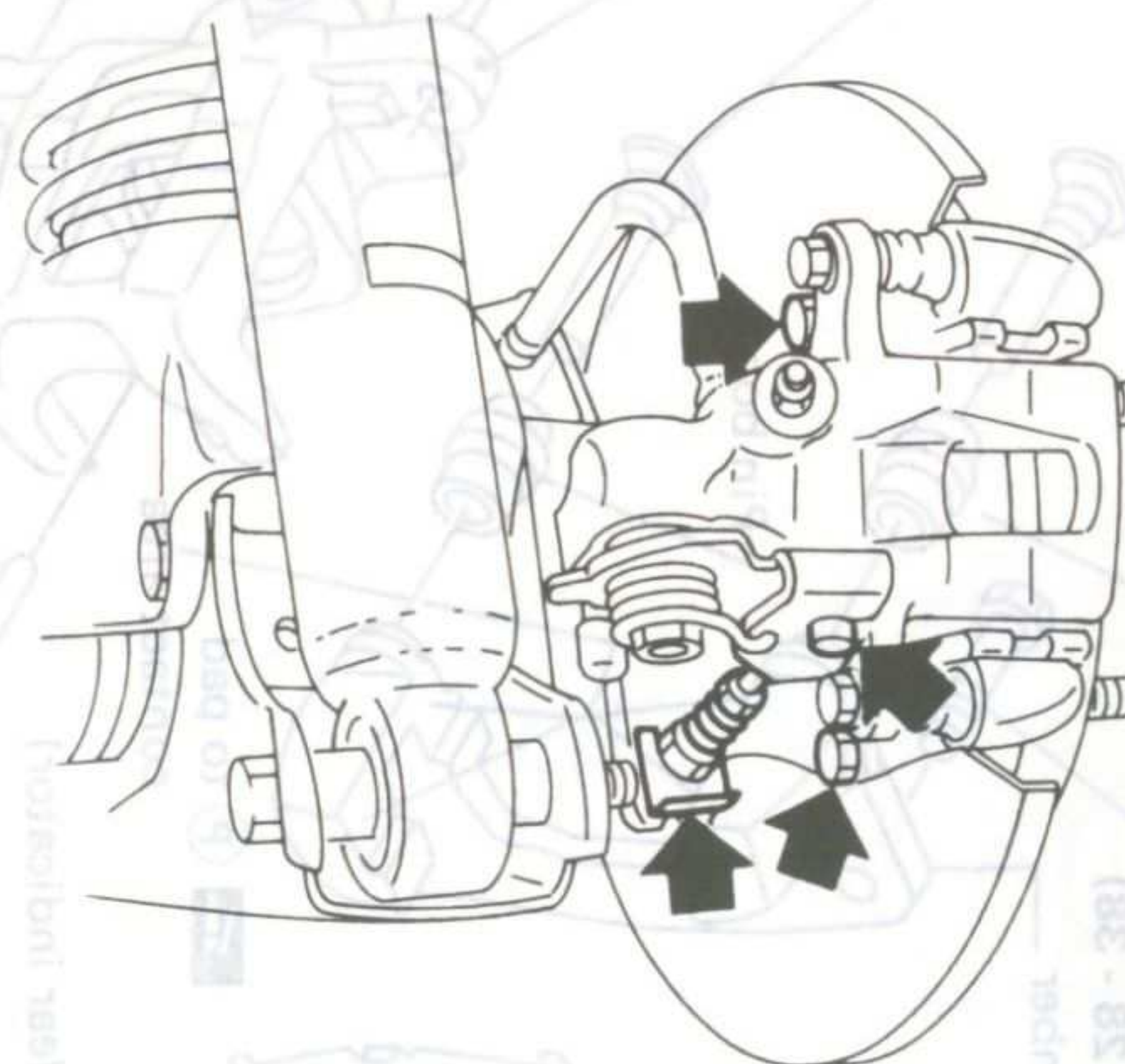
Always replace shims when replacing pads.



SBR641

Removal and Installation

Disconnect parking brake cable and brake hose, then remove caliper assembly.

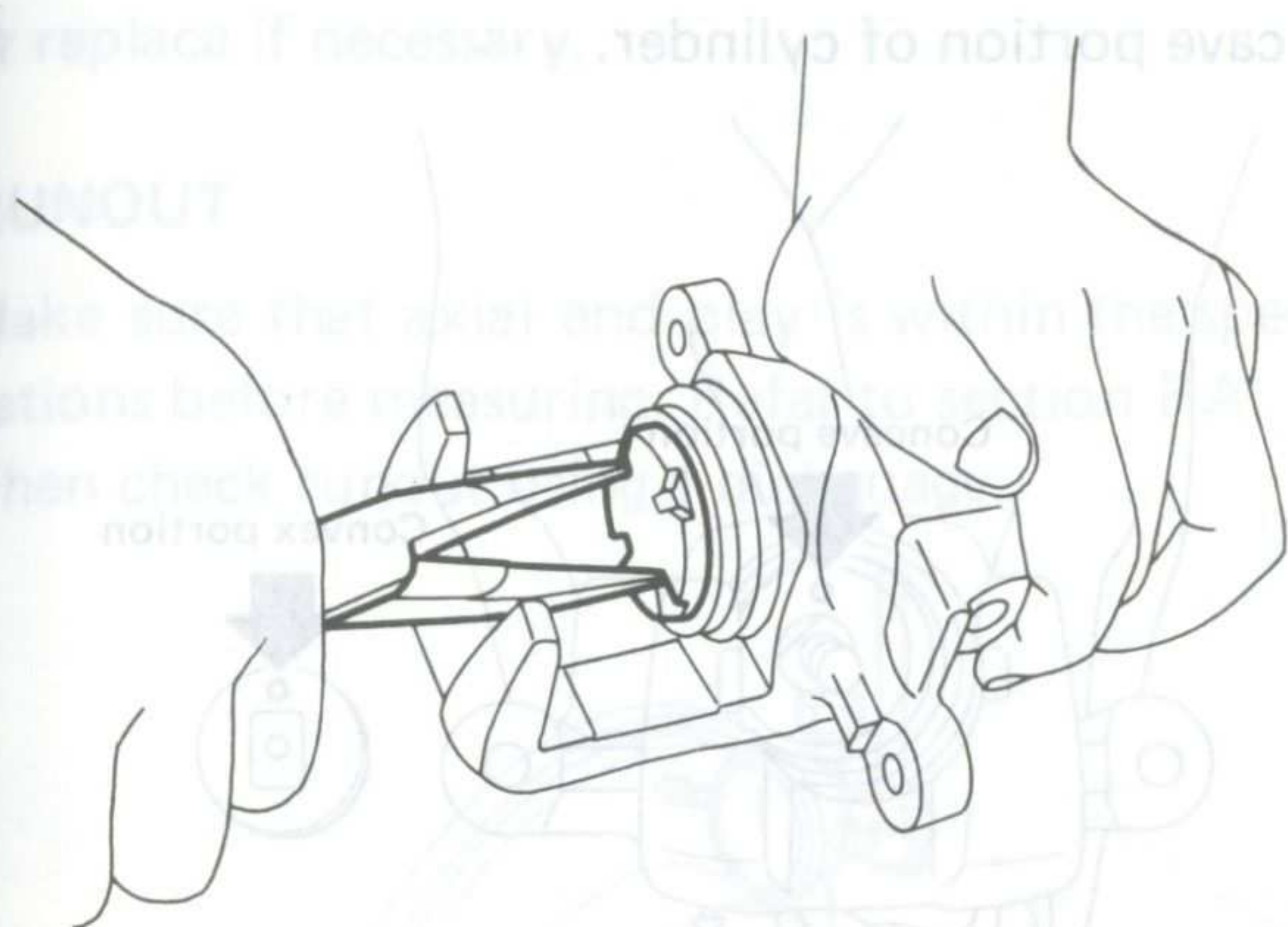


SBR841

REAR DISC BRAKE (CL14H, CL14HB, CL14HVB, CL14HVC) — Caliper

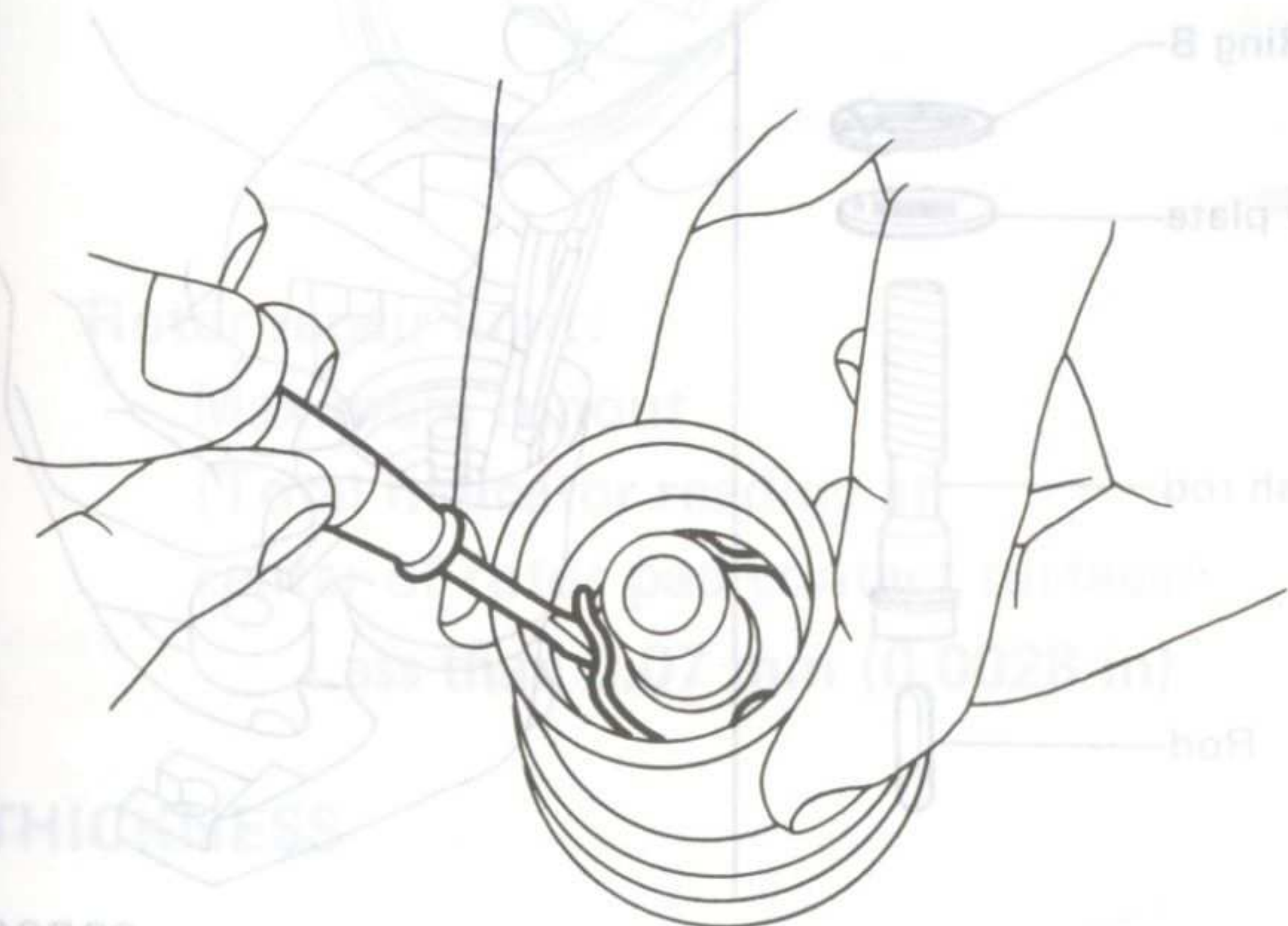
Disassembly

1. Remove piston by turning it counterclockwise with suitable long nose pliers.



SBR646

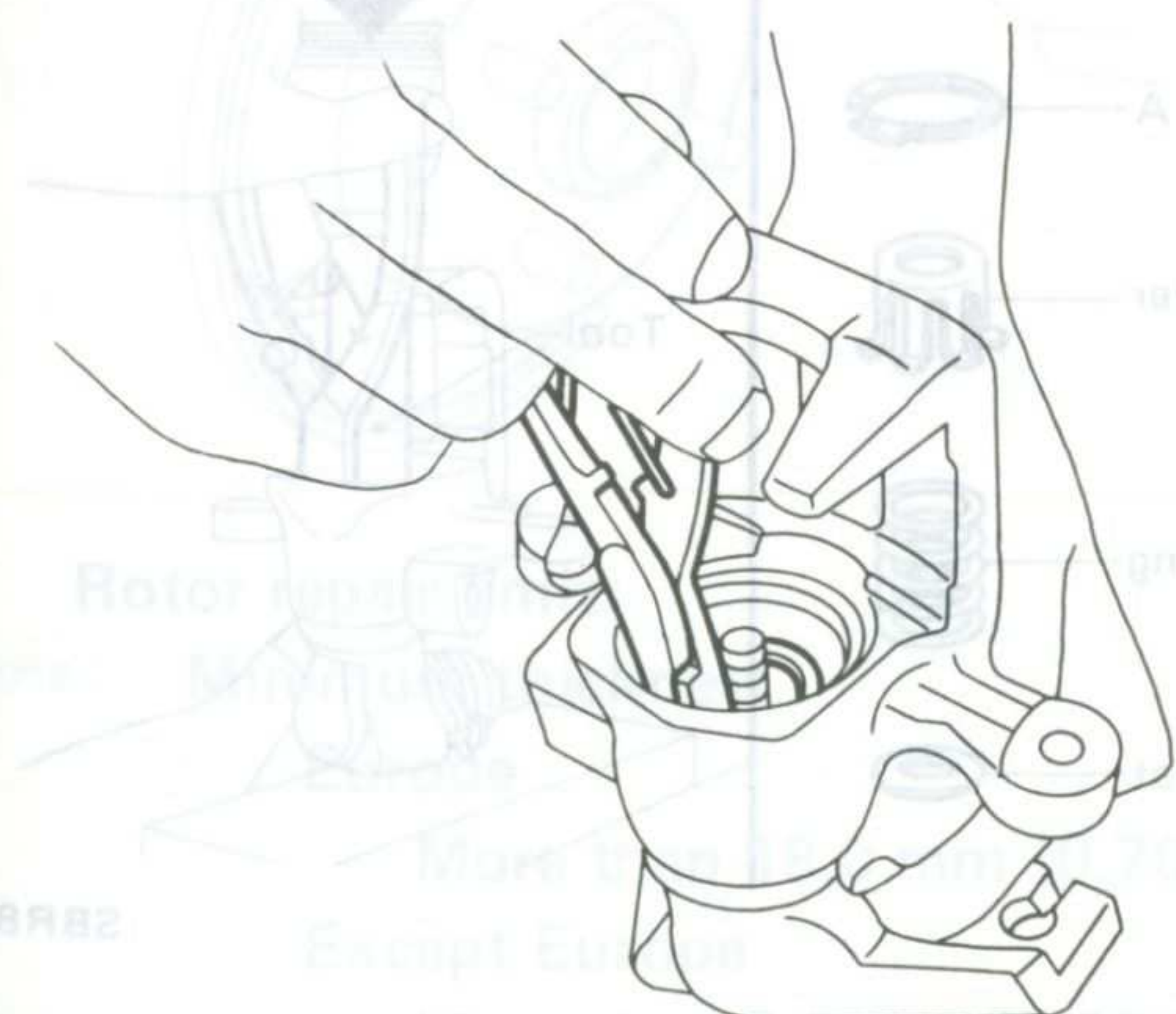
2. Pry off ring from piston and remove adjusting nut.



SBR648

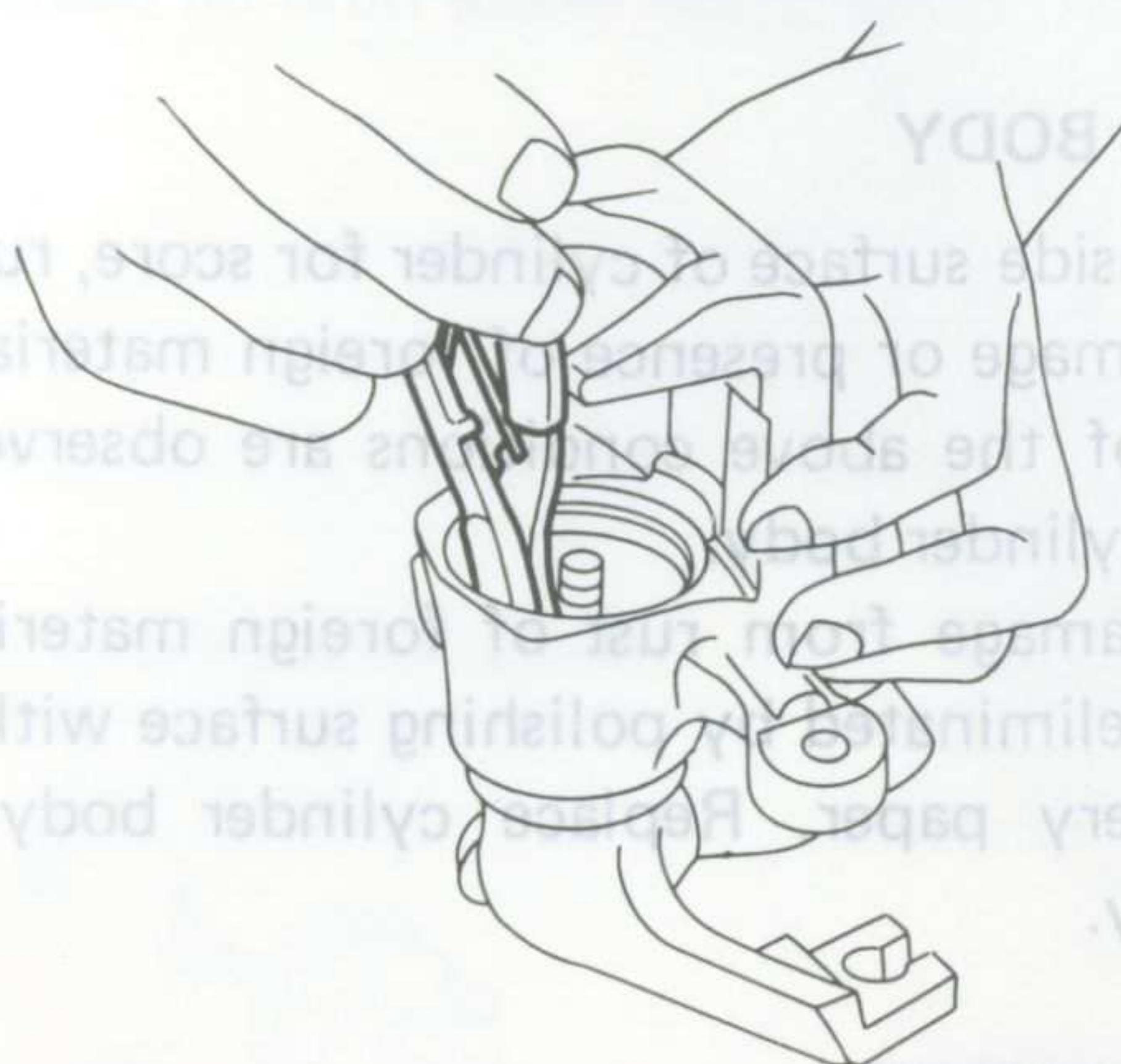
3. Disassembly cylinder body.

- (1) Pry off ring A with suitable pliers, then remove spring cover, spring and seat.



SBR651

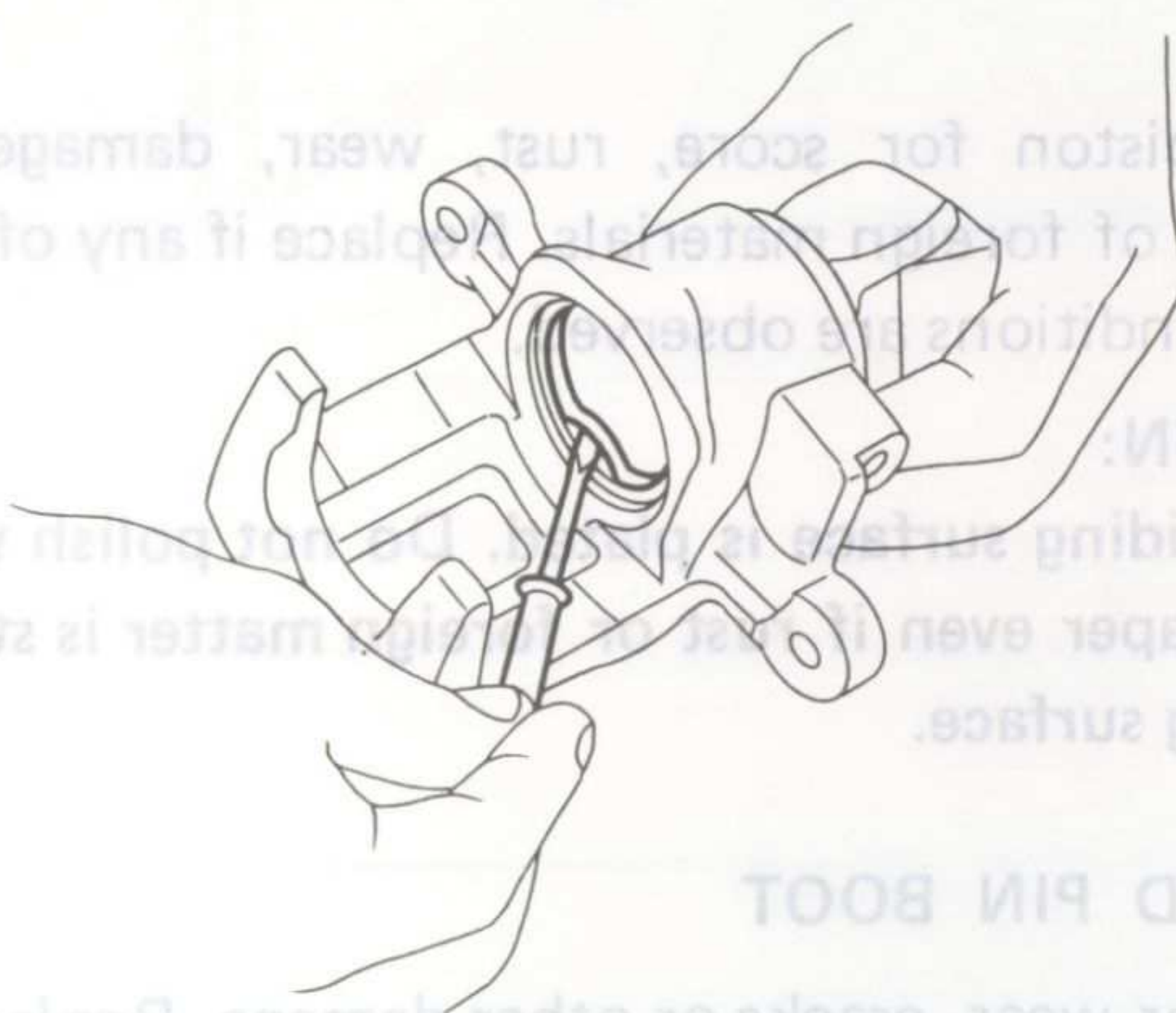
- (2) Pry off ring B, then remove key plate, push rod and rod.



SBR653

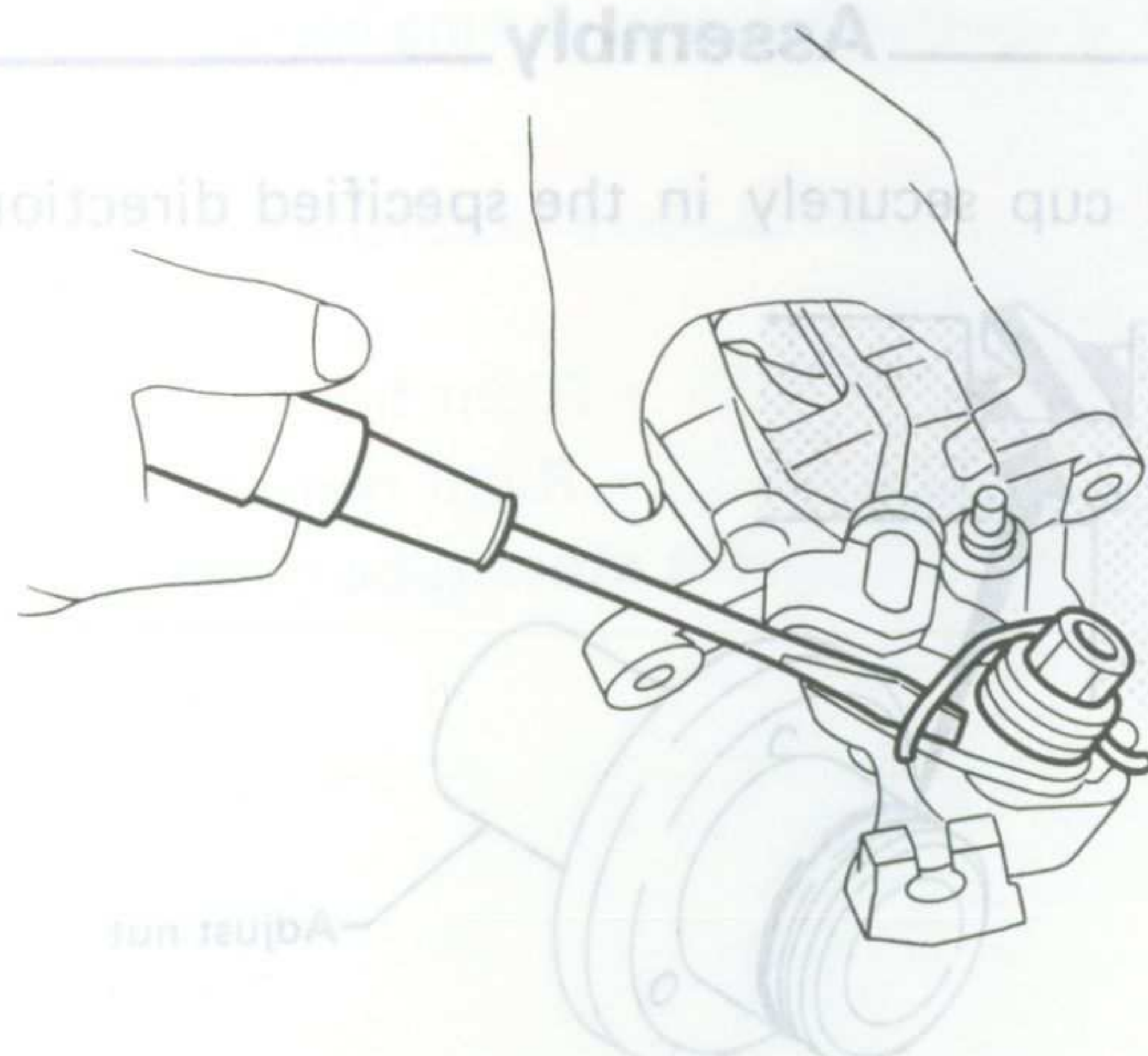
- (3) Remove piston seal.

Be careful not to damage cylinder body.



SBR656

4. Remove return spring and lever.



SBR657

REAR DISC BRAKE (CL14H, CL14HB, CL14HVB, CL14HVC)

— Caliper

Inspection

CAUTION:
Use brake fluid to clean. Never use mineral oil.

CYLINDER BODY

- Check inside surface of cylinder for score, rust, wear, damage or presence of foreign materials. If any of the above conditions are observed, replace cylinder body.
- Minor damage from rust of foreign materials may be eliminated by polishing surface with a fine emery paper. Replace cylinder body if necessary.

TORQUE MEMBER

Check for wear, cracks or other damage. Replace if necessary.

PISTON

Check piston for score, rust, wear, damage or presence of foreign materials. Replace if any of the above conditions are observed.

CAUTION:

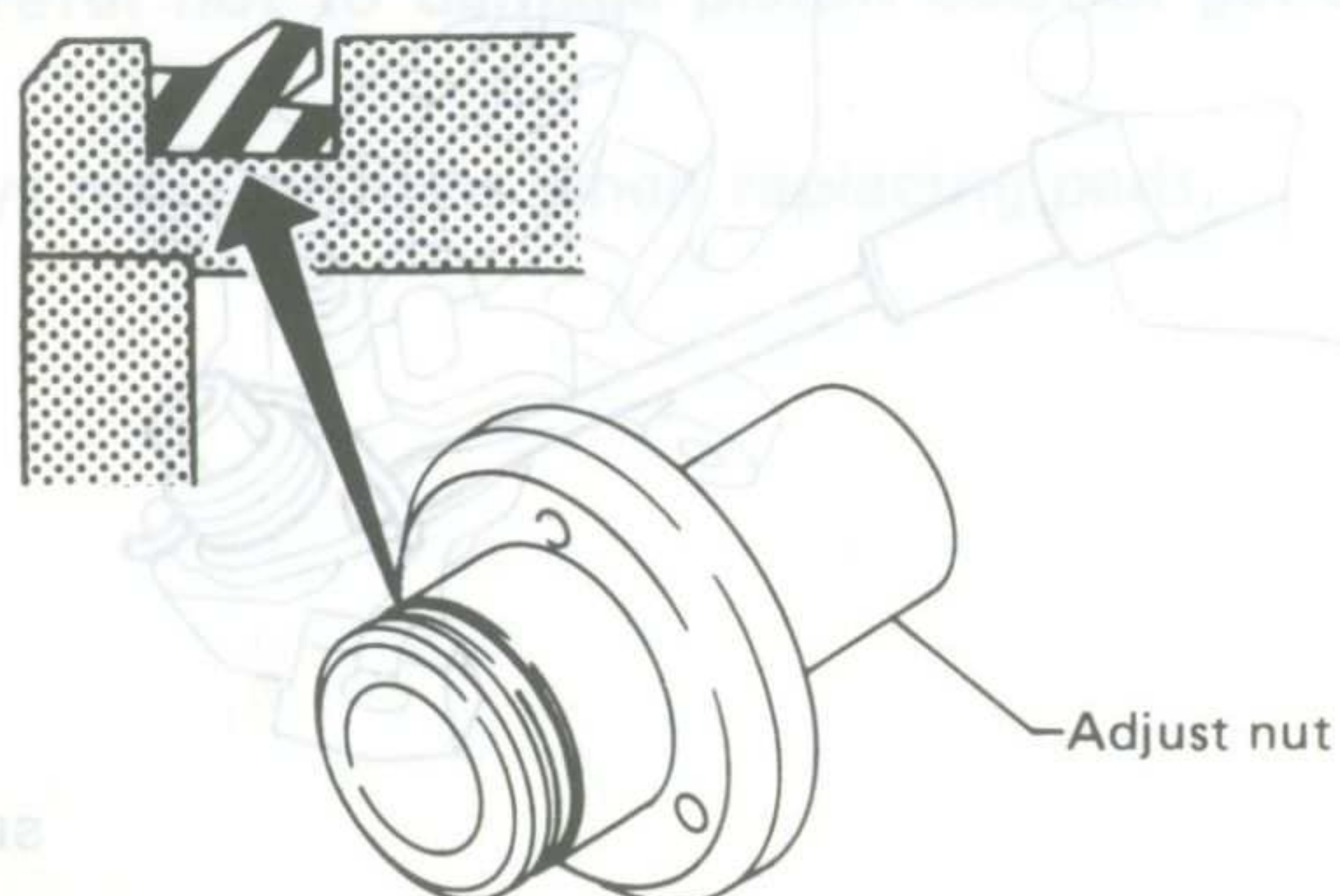
Piston sliding surface is plated. Do not polish with emery paper even if rust or foreign matter is stuck to sliding surface.

PIN AND PIN BOOT

Check for wear, cracks or other damage. Replace if any of the above conditions are observed.

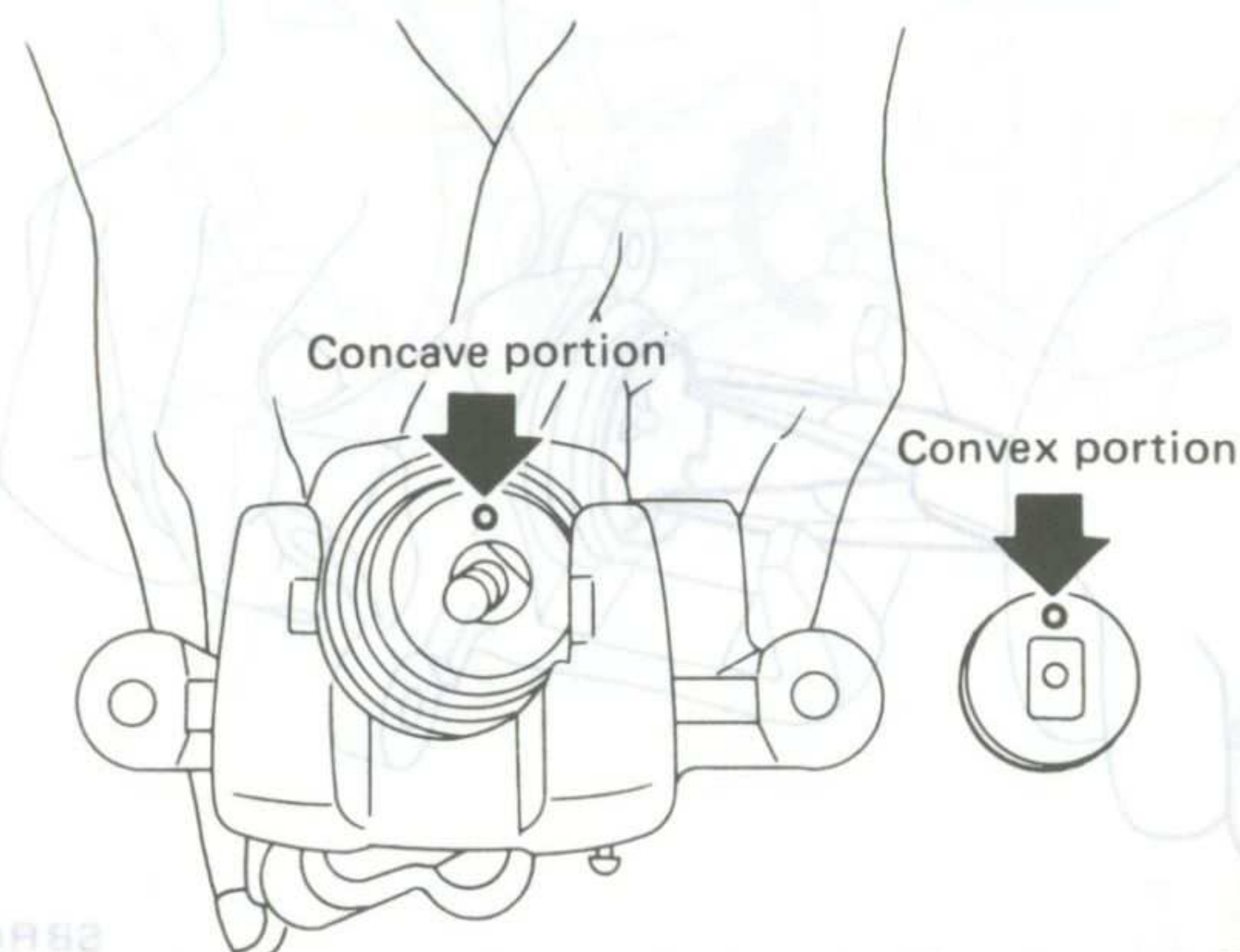
Assembly

- Install cup securely in the specified direction.



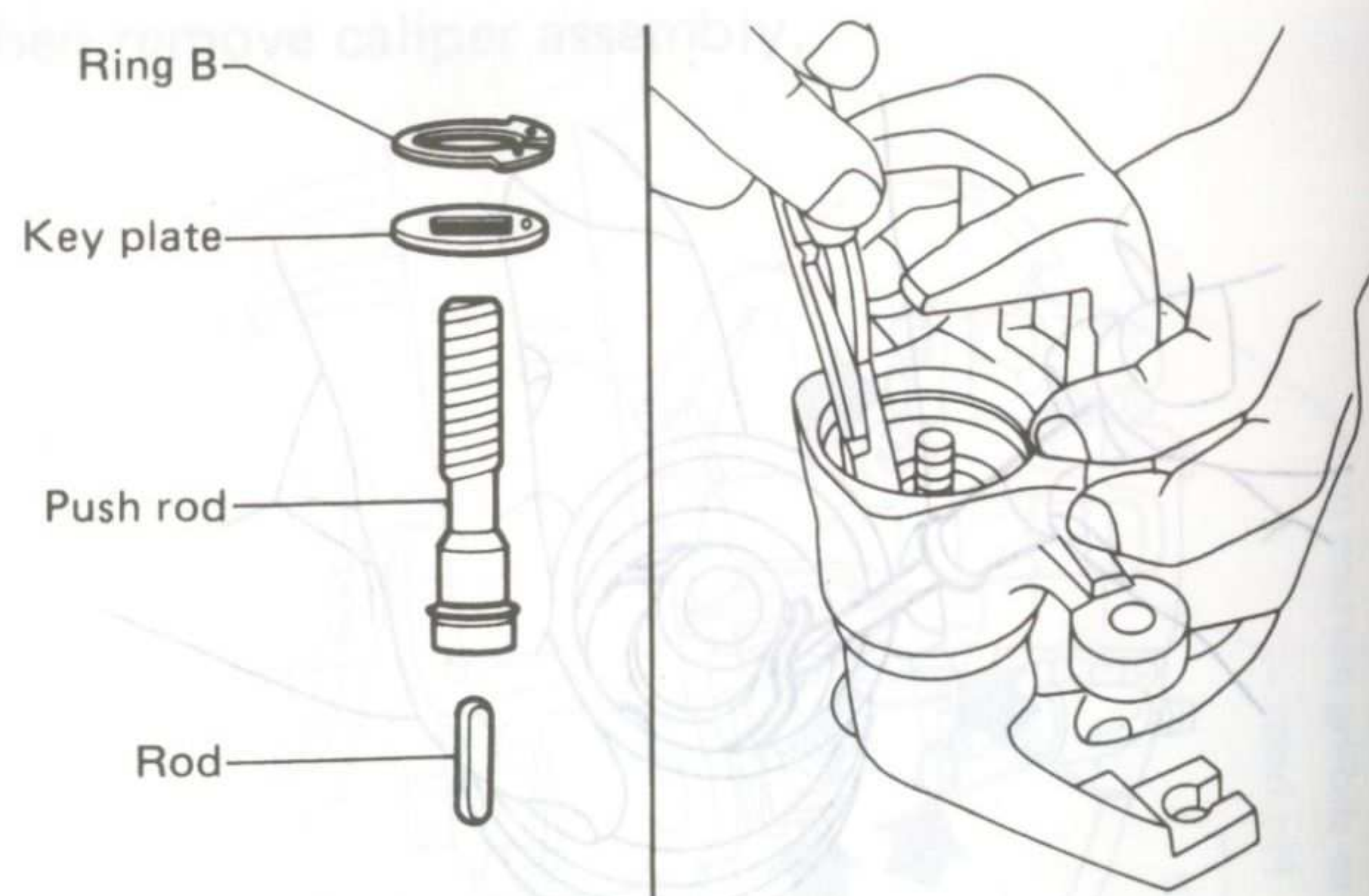
SBR849

- Fit push rod into square hole in key plate. Also match convex portion of key plate with concave portion of cylinder.



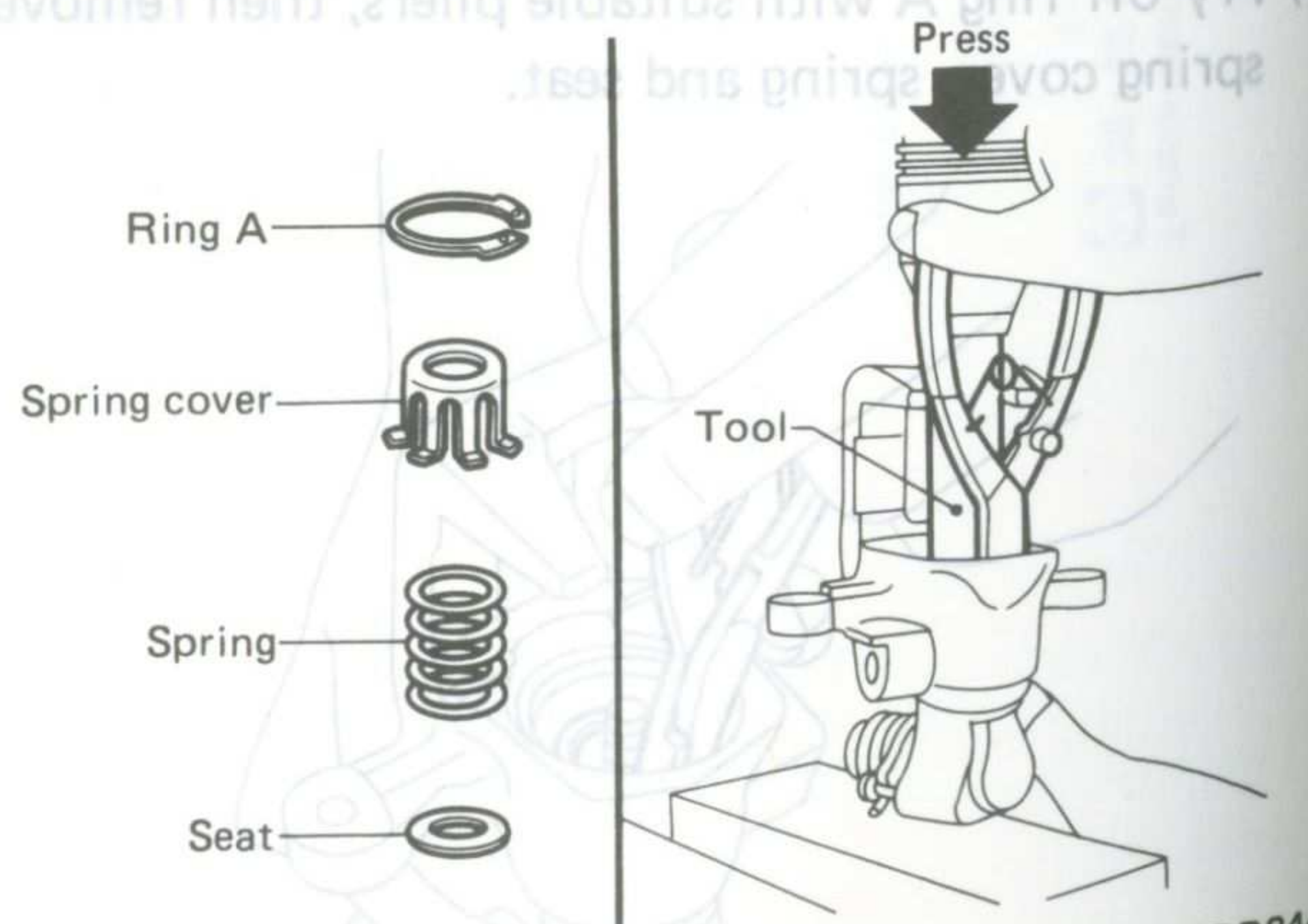
SBR842

- Install ring B with suitable tool.



SBR843

- Install seat, spring, spring cover and ring A with suitable press and drift.

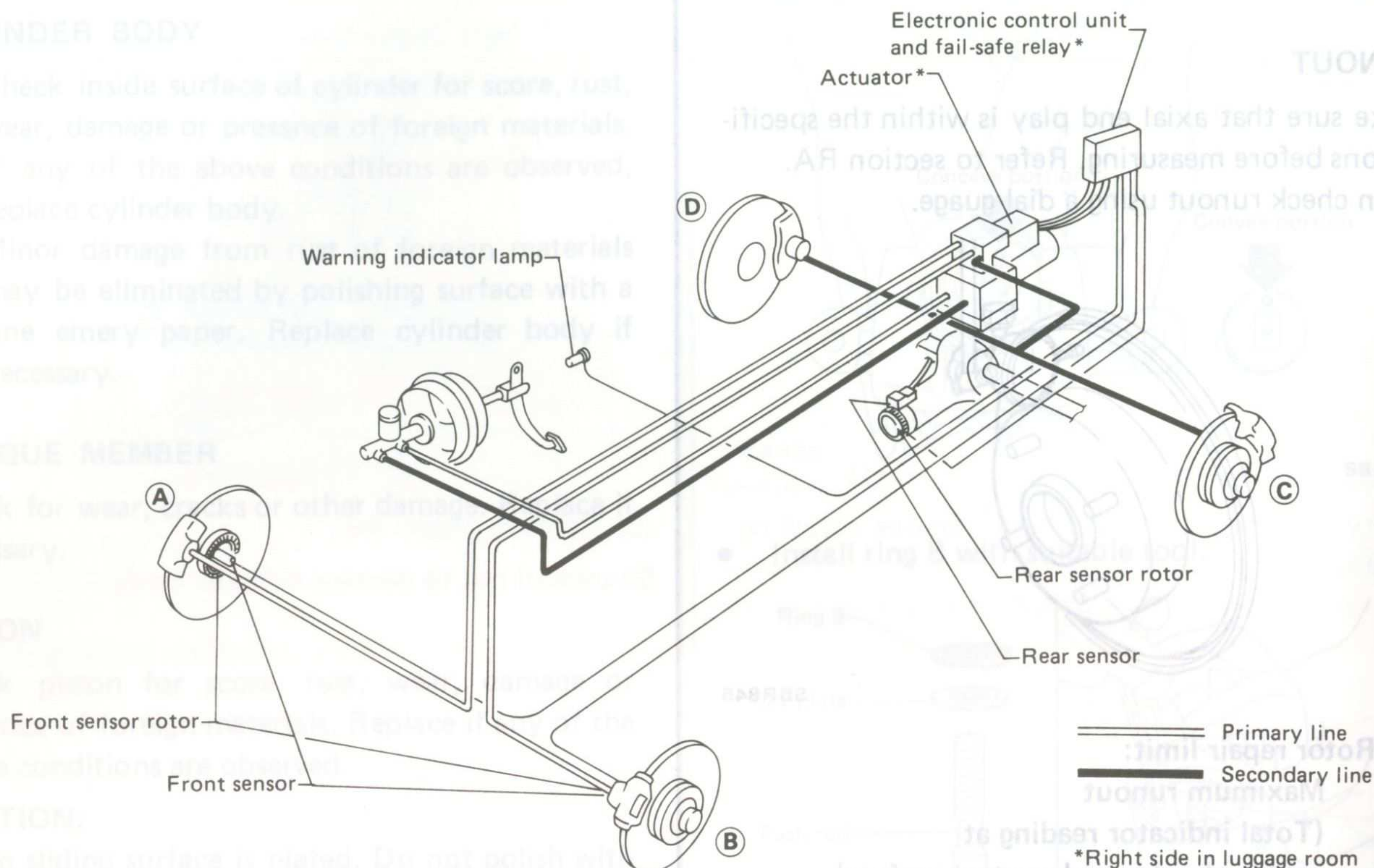


SBR844

4-WHEEL SKID CONTROL SYSTEM — Brake Hydraulic Line

Precautions

- Recommended fluid is brake fluid "DOT 3".
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.



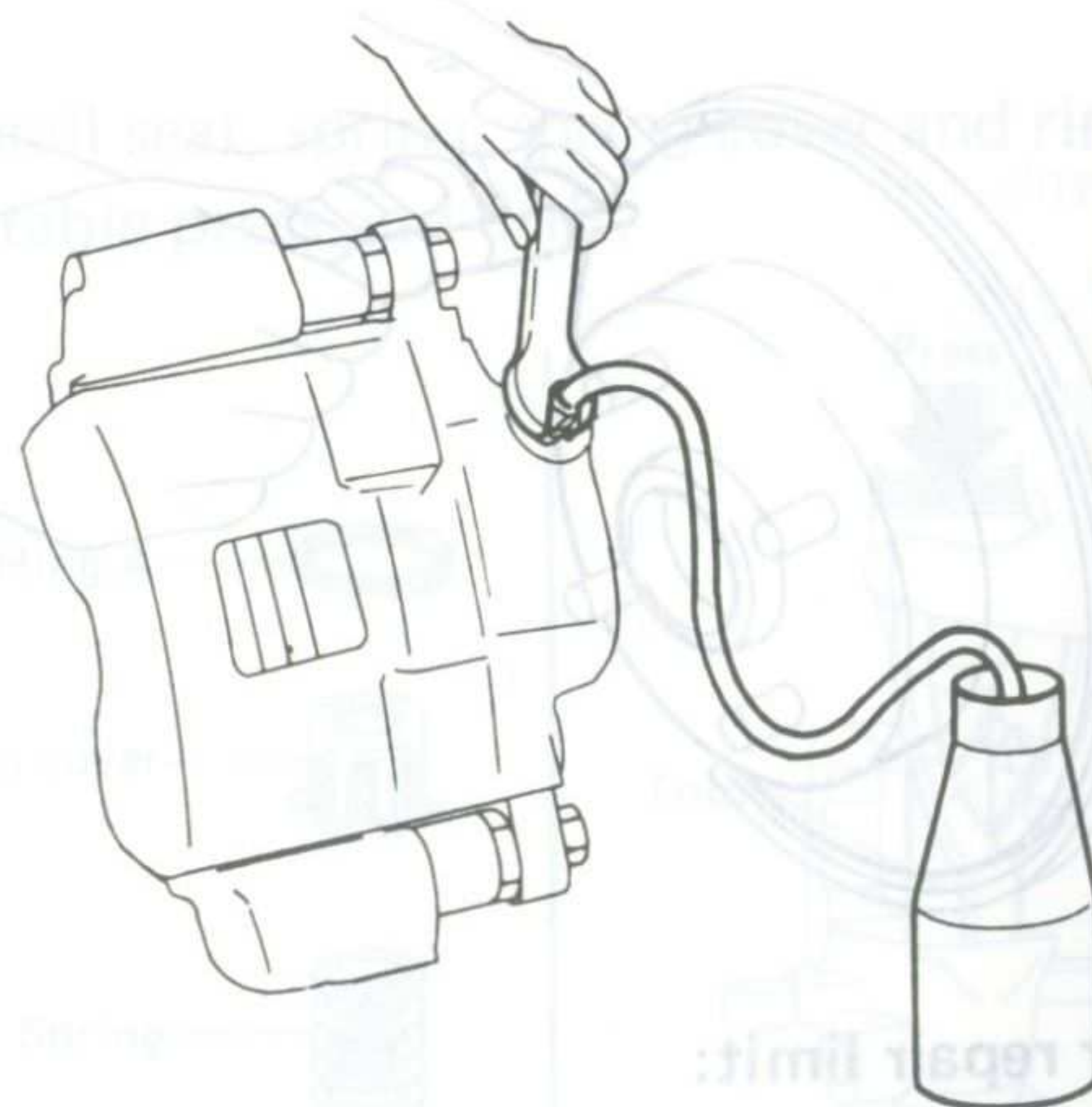
SBR933

Bleeding Procedure

Precautions:

Make sure that ignition switch is off and actuator connector is disconnected. Carefully monitor brake fluid level at master cylinder during bleeding operation.

- Bleed air out of calipers according to the following procedure:
Left front caliper (B) → Right front caliper (A) → Left rear caliper (C) → Right rear caliper (D).
- Connect a transparent vinyl tube to air bleeder valve of caliper.

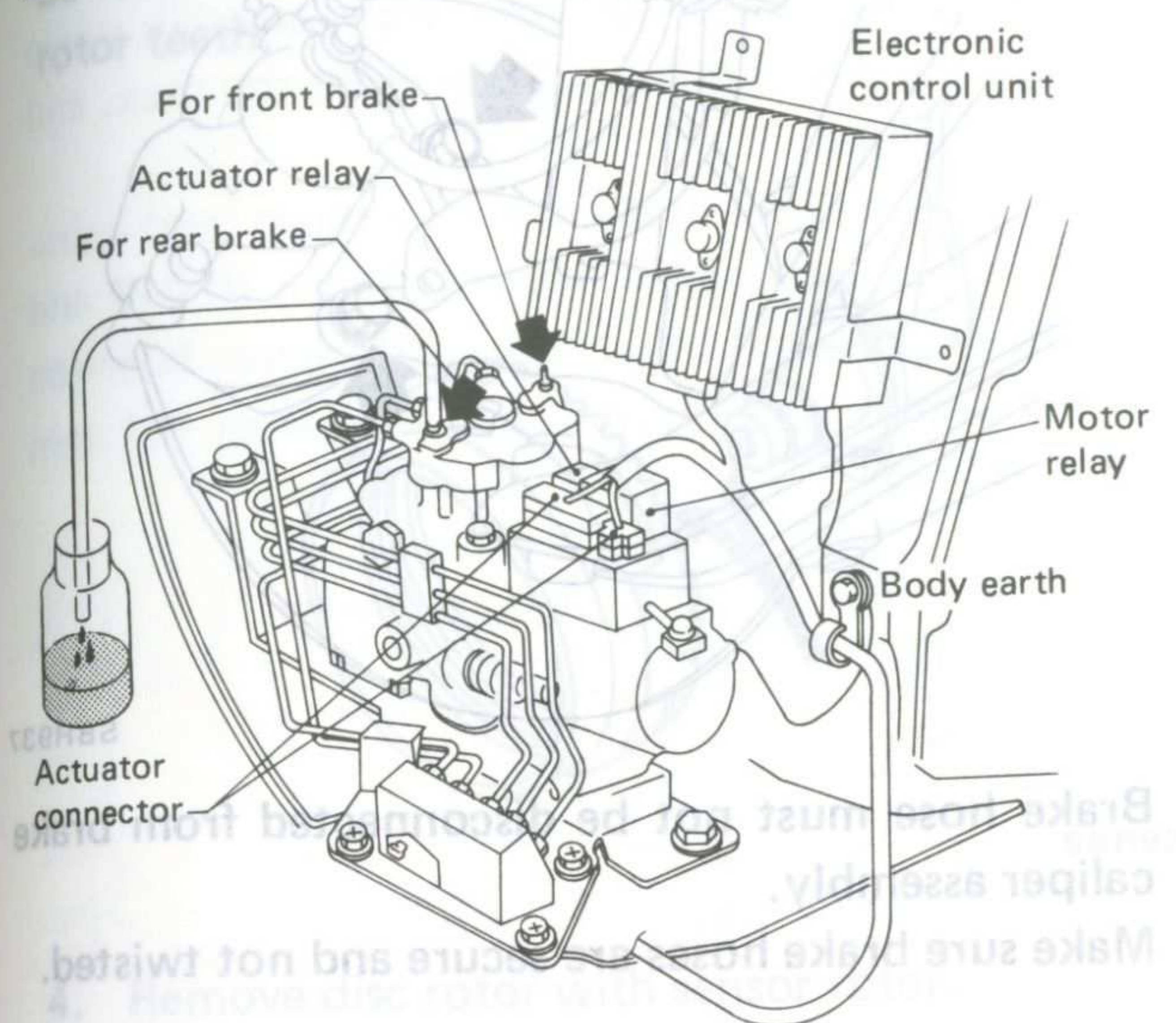


SBR606

4-WHEEL SKID CONTROL SYSTEM — Brake Hydraulic Line

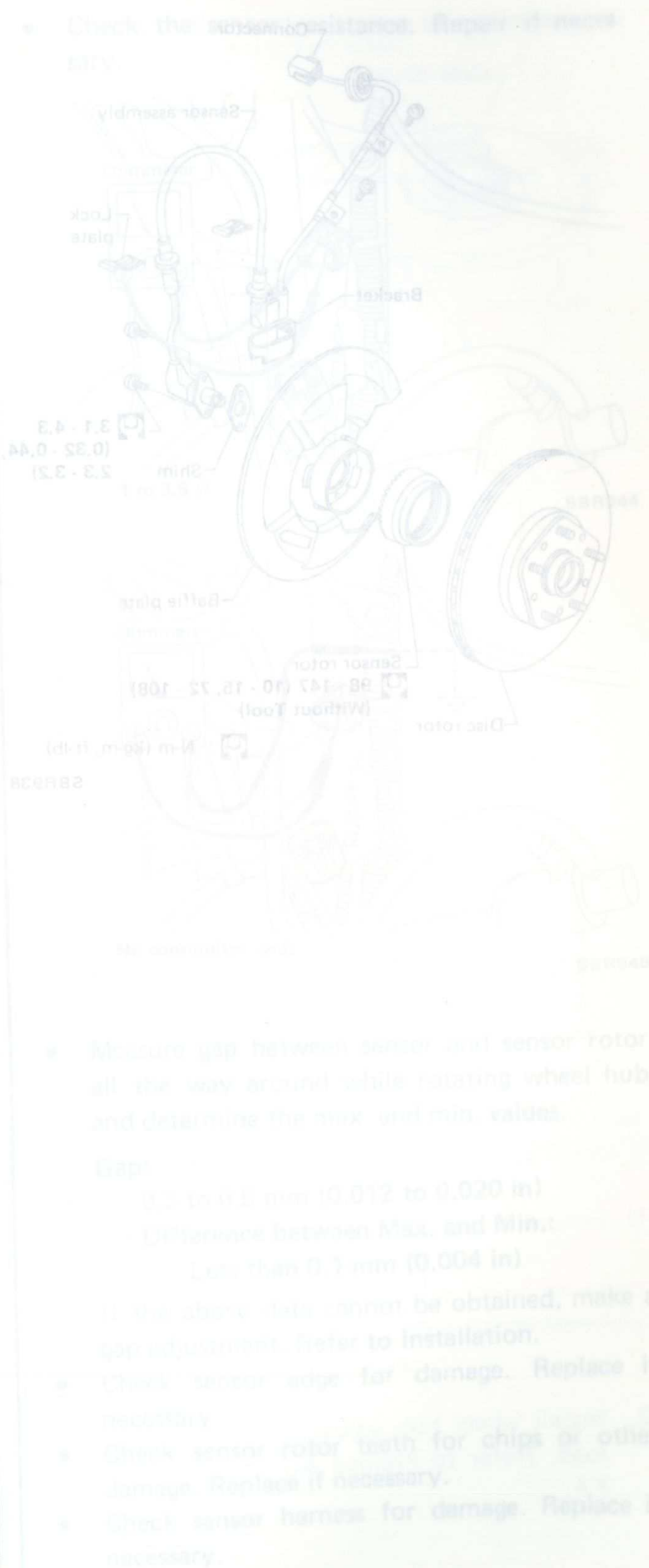
Bleeding Procedure (Cont'd)

After bleeding air out of calipers, bleed air out of actuator according to the following procedure.



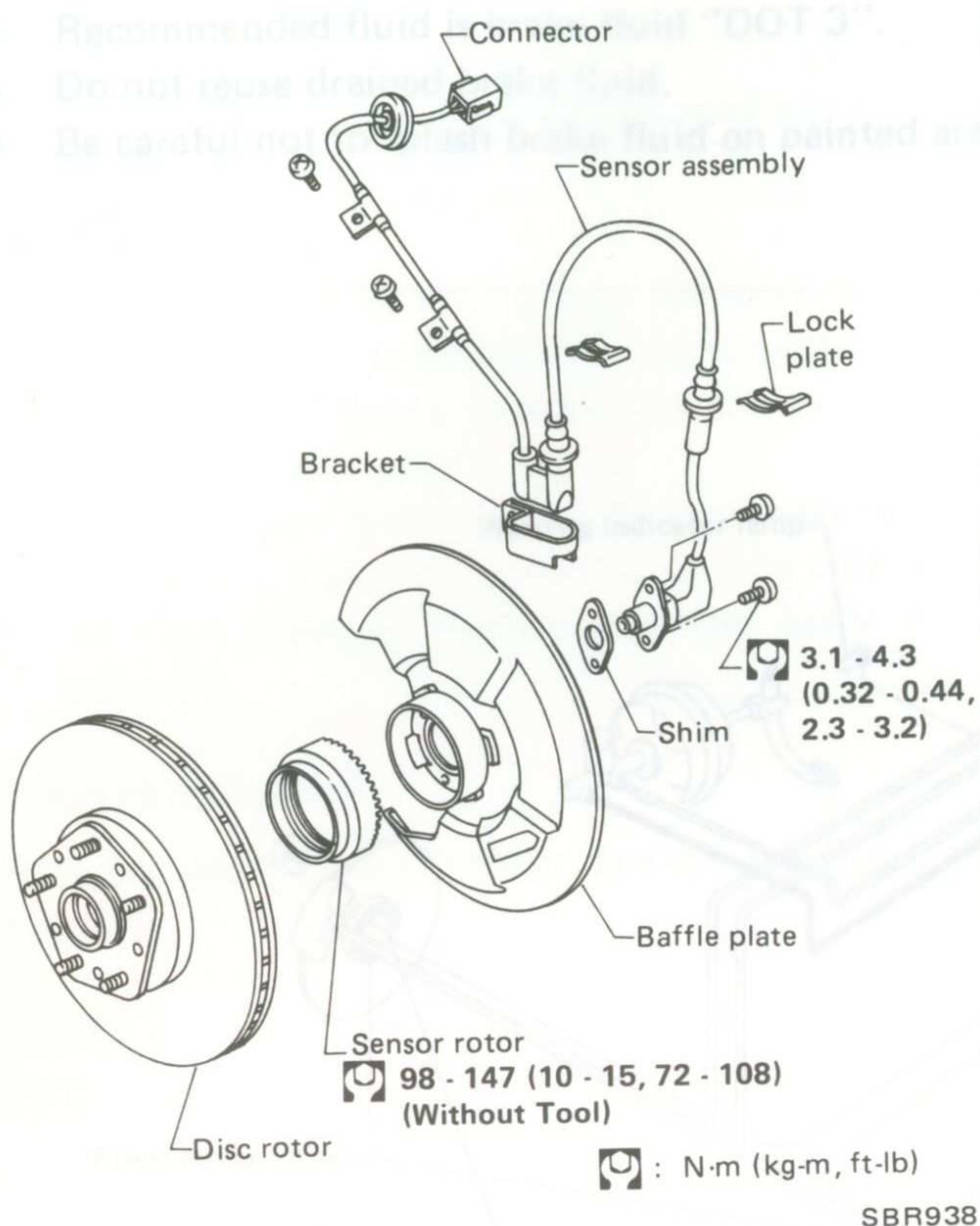
SBR934

- 1) Connect a transparent vinyl tube to air bleeder valve for front wheels on actuator.
- 2) Depress brake pedal several times slowly.
- 3) Open air bleeder valve with brake pedal depressed.
- 4) Close air bleeder valve.
- 5) Repeat steps 2) through 4) above until clear brake fluid comes out of air bleeder valve. Then tighten air bleeder valve.
- 6) Connect a transparent vinyl tube to air bleeder valve for rear wheels on actuator.
- 7) Depress brake pedal several times slowly.
- 8) Open air bleeder valve with brake pedal depressed.
- 9) Close air bleeder valve.
- 10) Repeat steps 7) through 9) above until clear brake fluid comes out of air bleeder valve. Then tighten air bleeder valve.

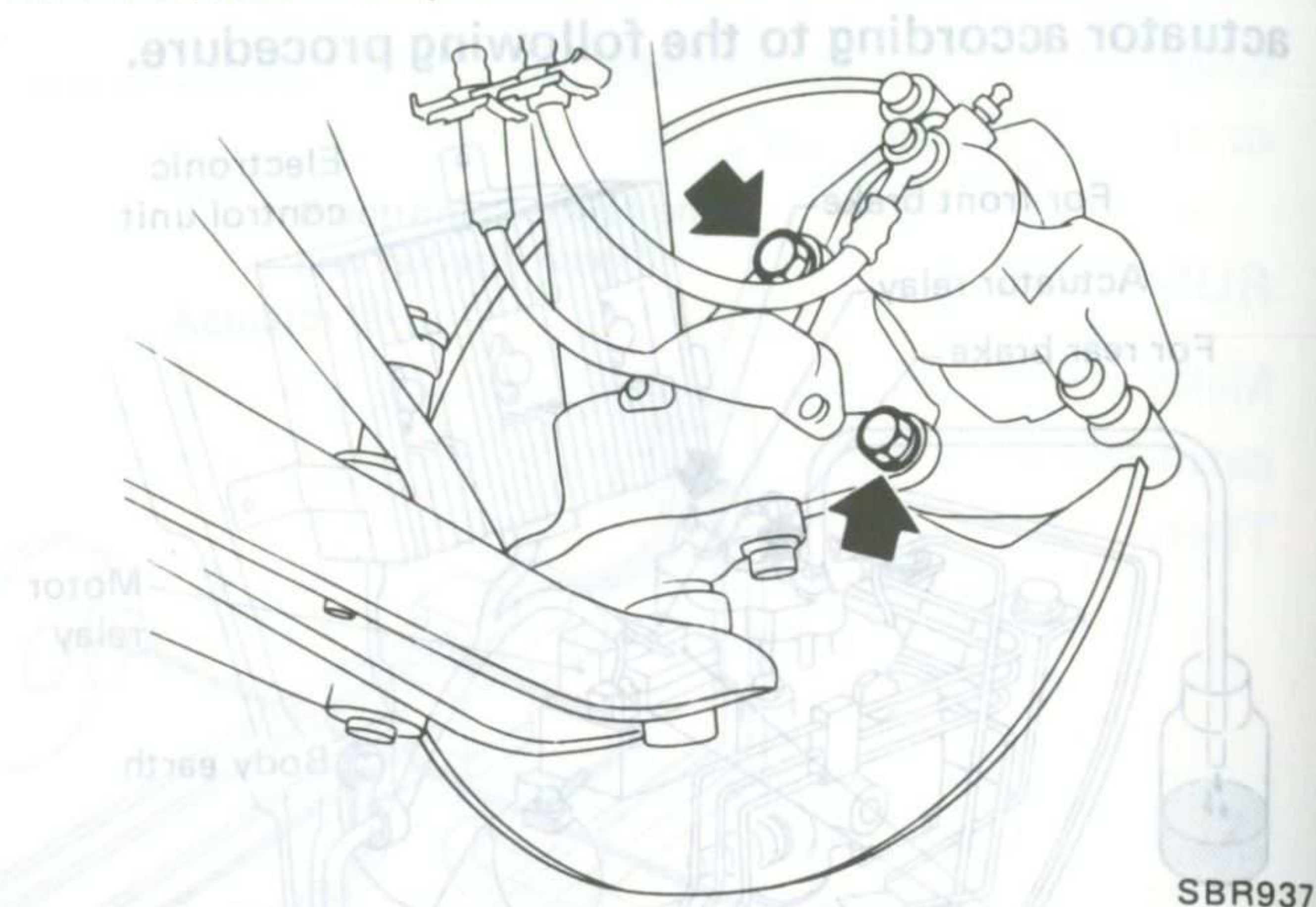


4-WHEEL SKID CONTROL SYSTEM — Front Sensor

Removal

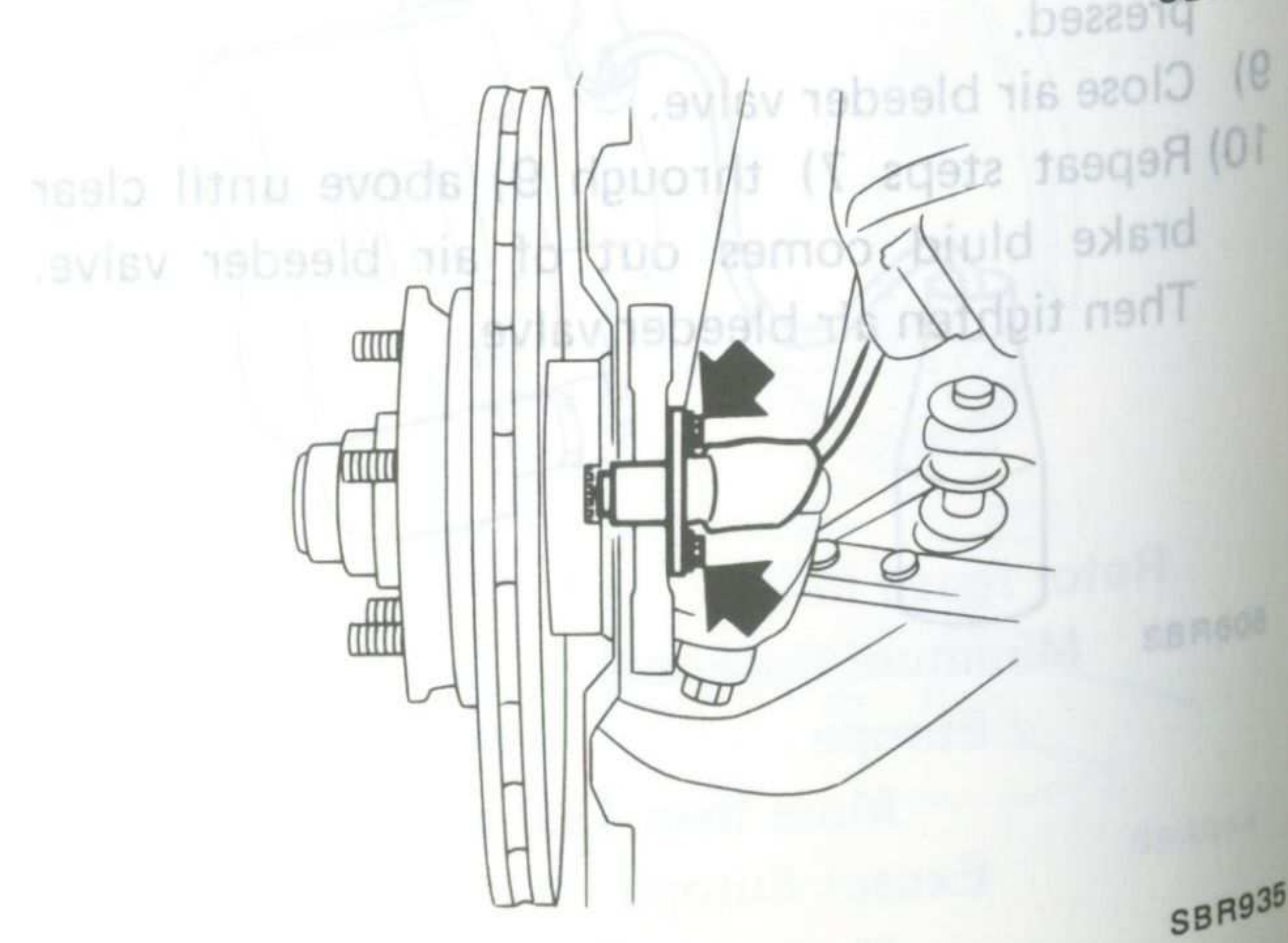
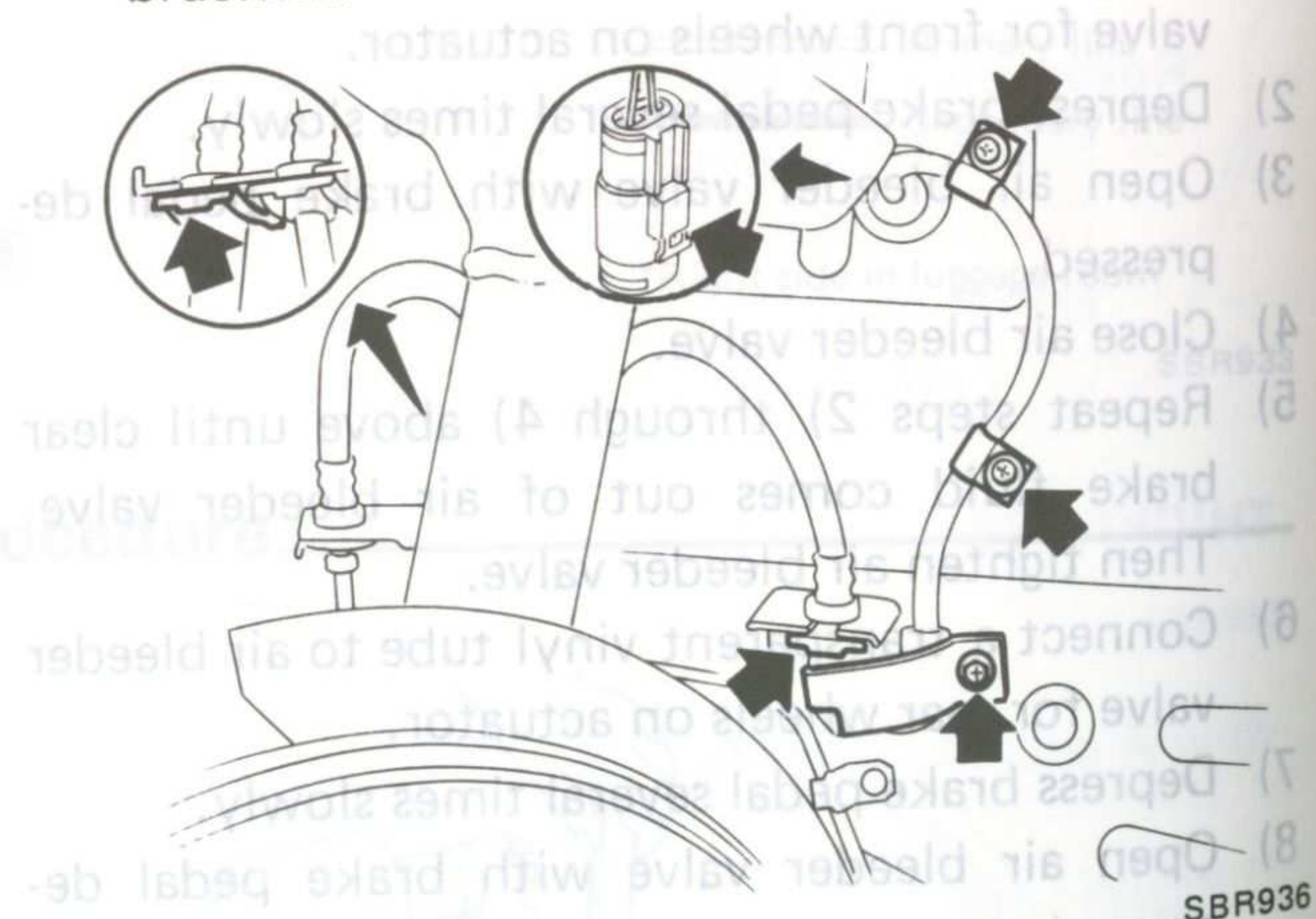


1. Remove caliper with brake hose connector.



Brake hose must not be disconnected from brake caliper assembly.
Make sure brake hoses are secure and not twisted.

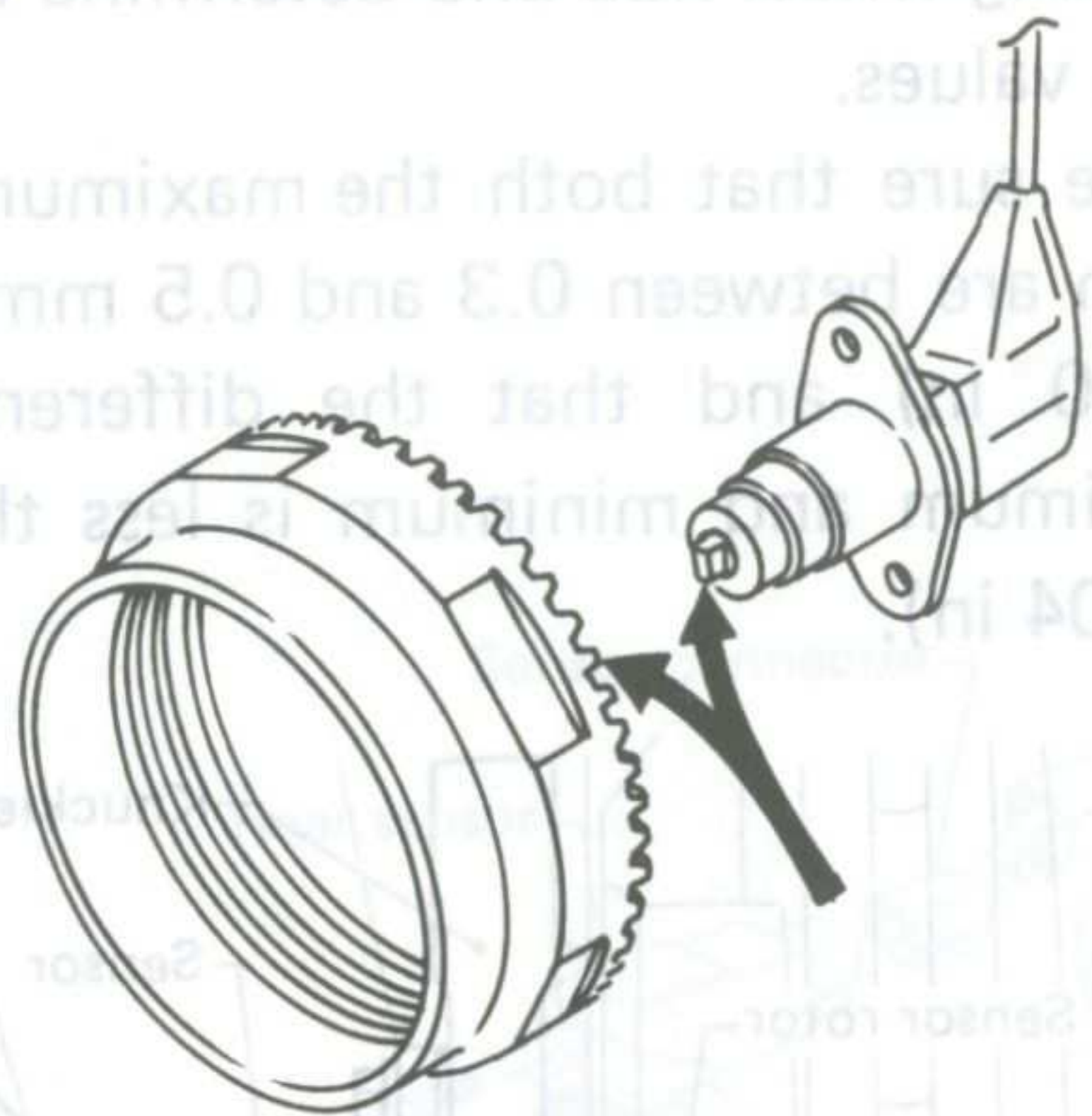
2. Disconnect sensor connector. Then remove sensor bolts, brake hose lock plates and harness brackets.



4-WHEEL SKID CONTROL SYSTEM — Front Sensor

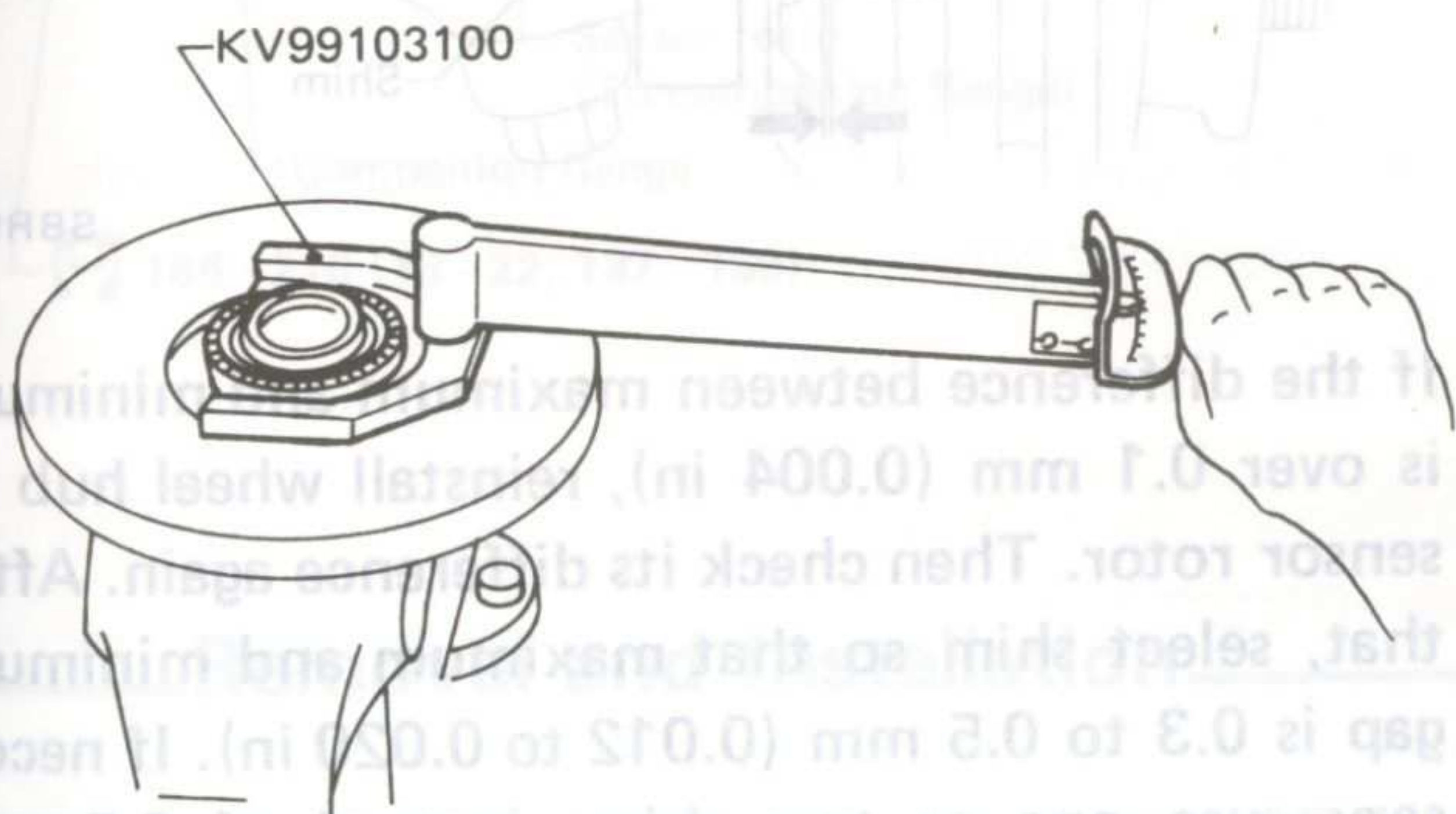
Removal (Cont'd)

3. Remove sensor assembly.
Be careful not to damage sensor edge and sensor rotor teeth.



SBR939

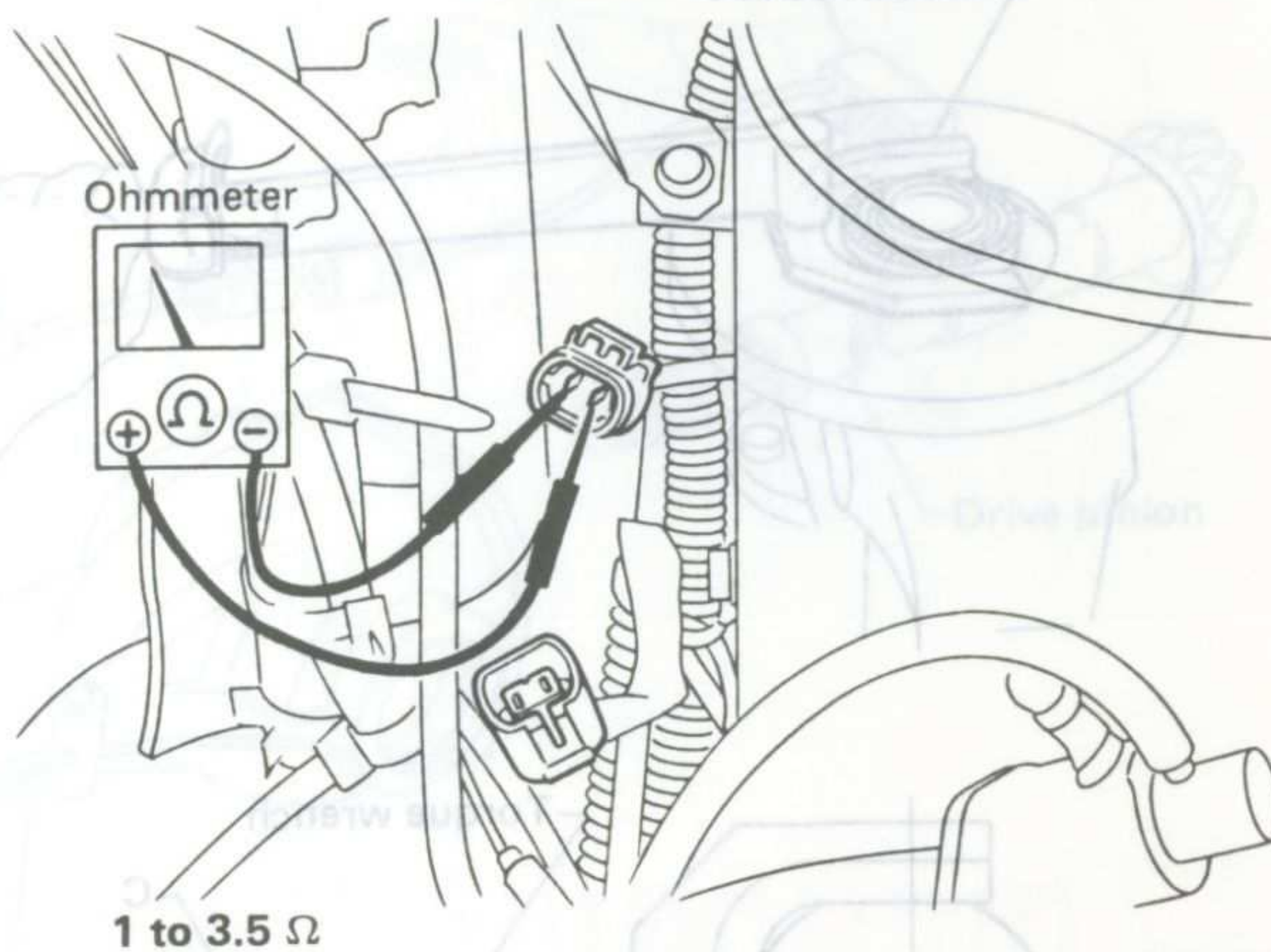
4. Remove disc rotor with sensor rotor.
5. Remove sensor rotor with Tool.



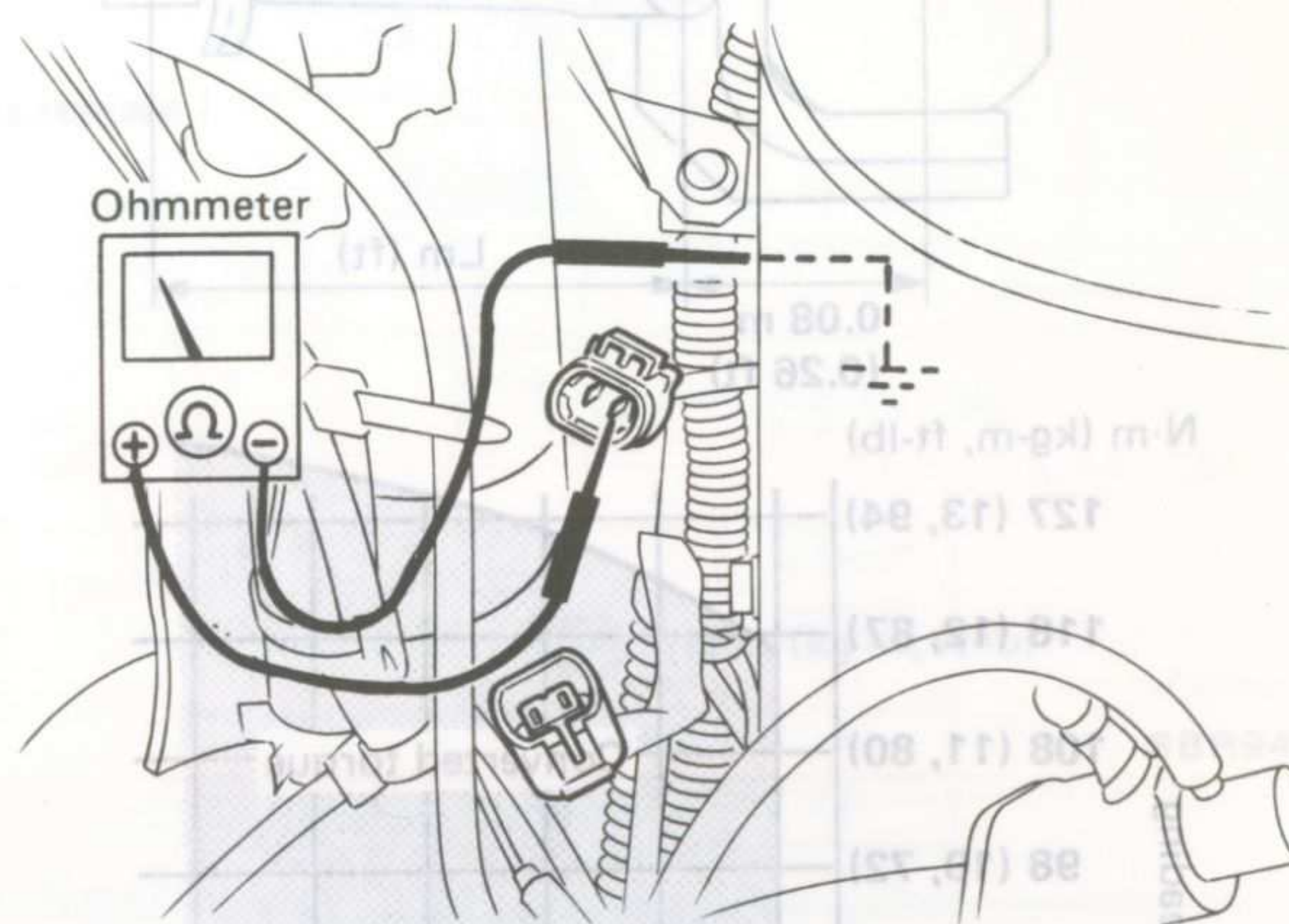
SBR940

Inspection

- Check the sensor resistance. Repair if necessary.



SBR944



SBR945

- Measure gap between sensor and sensor rotor all the way around while rotating wheel hub and determine the max. and min. values.

Gap:

0.3 to 0.5 mm (0.012 to 0.020 in)

Difference between Max. and Min.:

Less than 0.1 mm (0.004 in)

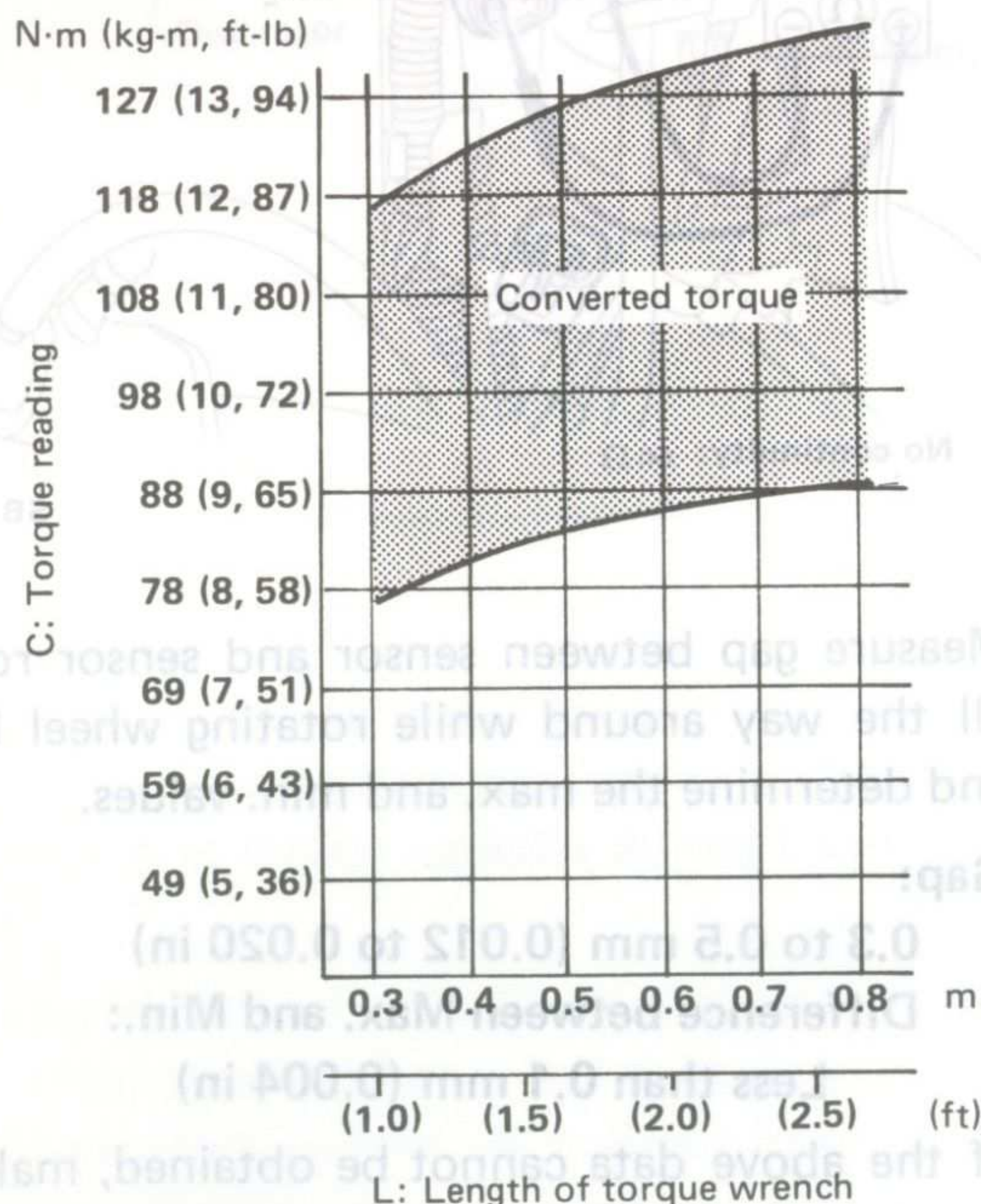
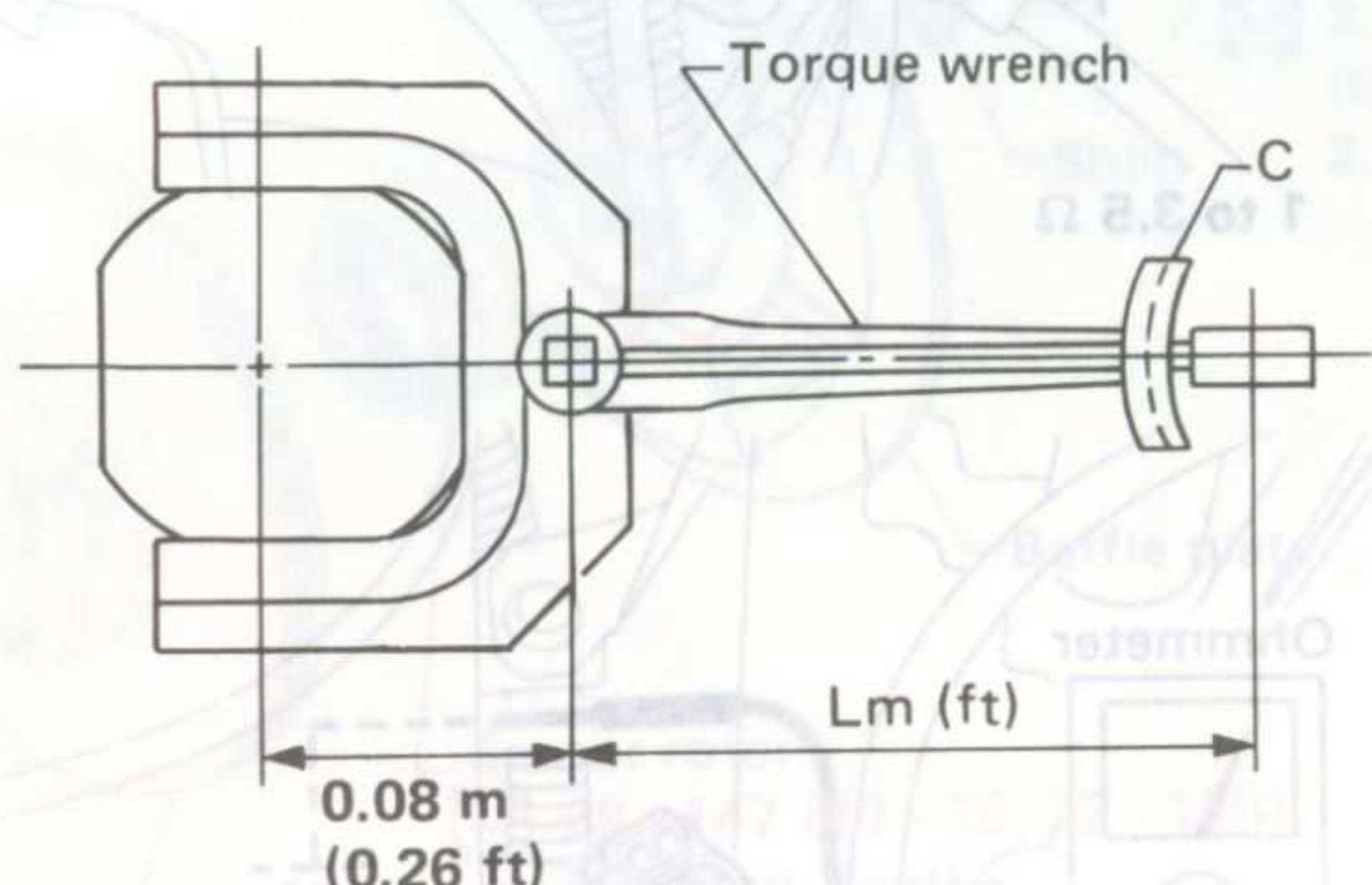
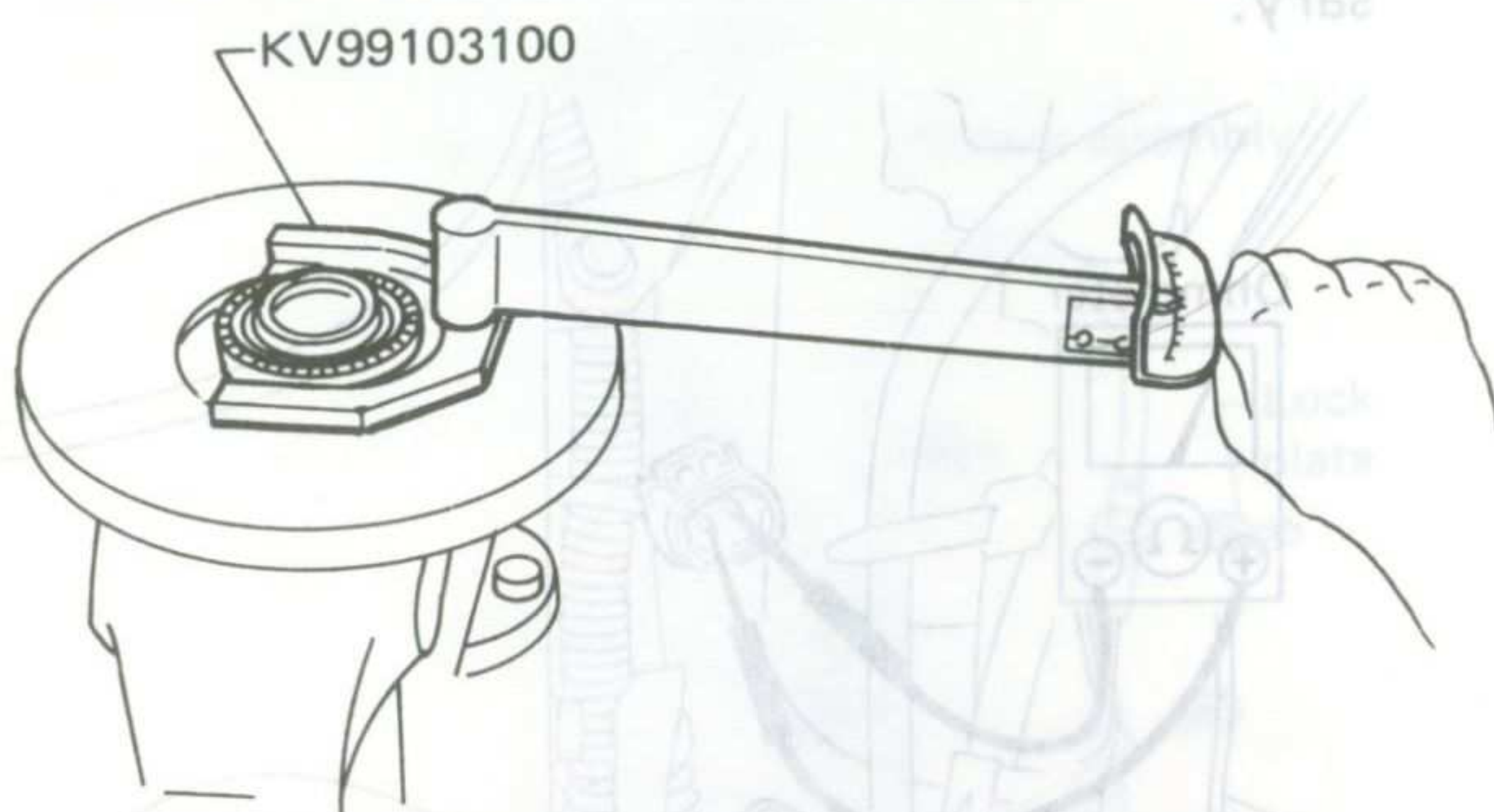
If the above data cannot be obtained, make a gap adjustment. Refer to Installation.

- Check sensor edge for damage. Replace if necessary.
- Check sensor rotor teeth for chips or other damage. Replace if necessary.
- Check sensor harness for damage. Replace if necessary.

4-WHEEL SKID CONTROL SYSTEM — Front Sensor

Installation

1. Install sensor rotor to wheel hub with Tool.

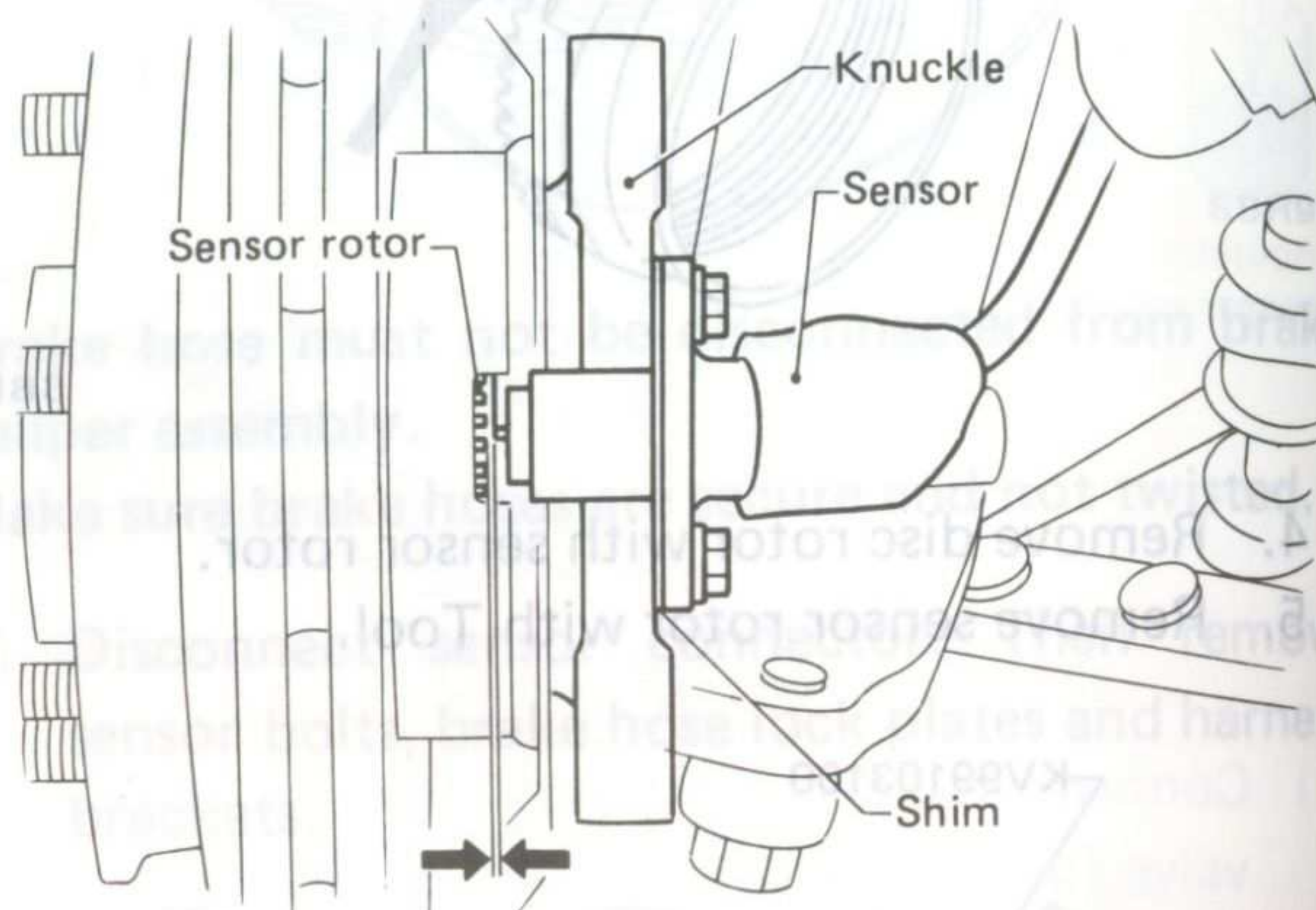


SBR941

2. Install wheel hub adjusting wheel bearing preload. Refer to Preload Adjustment in section FA.

3. After installing 0.5 mm (0.020 in) shim and sensor assembly, measure gap between sensor and sensor rotor all the way around while rotating wheel hub and determine the max. and min. values.

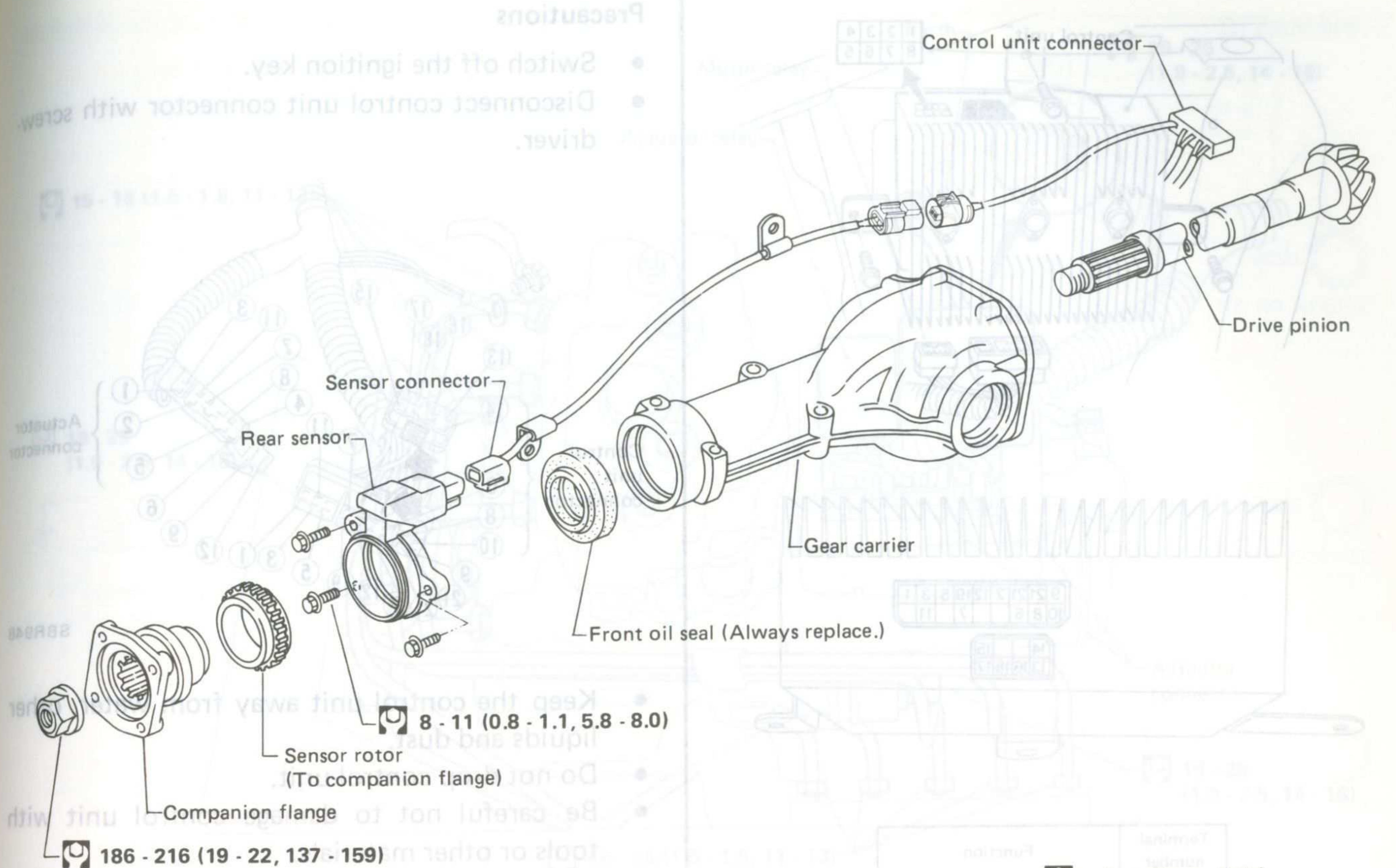
Make sure that both the maximum and minimum are between 0.3 and 0.5 mm (0.012 and 0.020 in) and that the difference between maximum and minimum is less than 0.1 mm (0.004 in).



SBR943

If the difference between maximum and minimum is over 0.1 mm (0.004 in), reinstall wheel hub or sensor rotor. Then check its difference again. After that, select shim so that maximum and minimum gap is 0.3 to 0.5 mm (0.012 to 0.020 in). If necessary, use one or two shims instead of 0.5 mm (0.020 in) shim to get the above clearance.

4-WHEEL SKID CONTROL SYSTEM — Rear Sensor



: N·m (kg-m, ft-lb)

SBR946

Removal and Installation

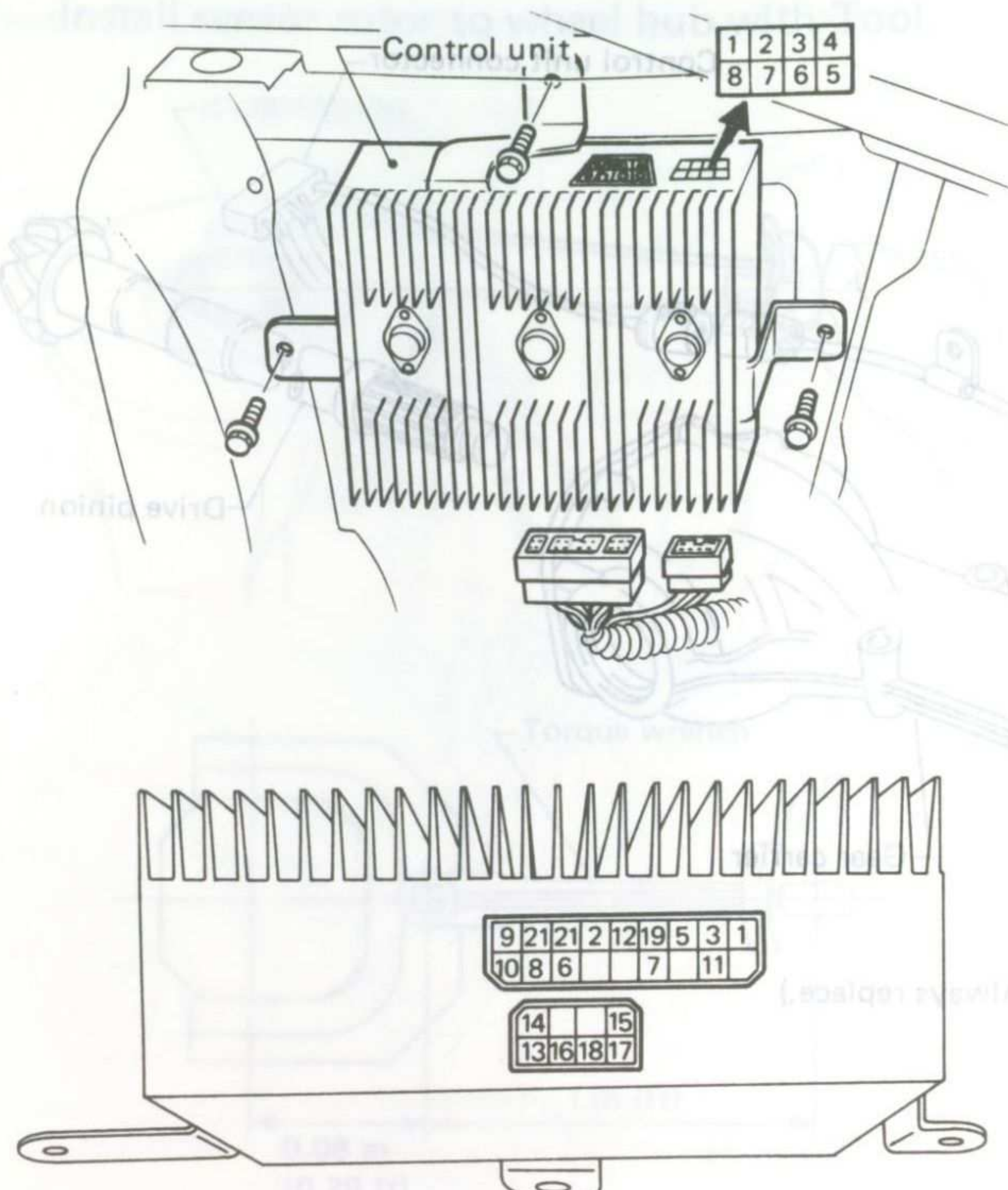
- Remove propeller shaft. Refer to section PD.
- Remove companion flange with rear sensor rotor. Refer to section PD.
- Remove sensor bolts and connectors.
- Adjust bearing preload of drive pinion. Refer to section PD.

Inspection

- Check rear sensor harnesses for open circuit. Replace if necessary.
1 to 3.5 k Ω
- Make sure that no continuity exists between sensor connector terminal and body. Replace if necessary.
- Check sensor edge for damage. Replace if necessary.
- Check sensor rotor teeth for chips or other damage. Replace as companion flange assembly with sensor rotor if necessary.

4-WHEEL SKID CONTROL SYSTEM — Control Unit

Removal and Installation

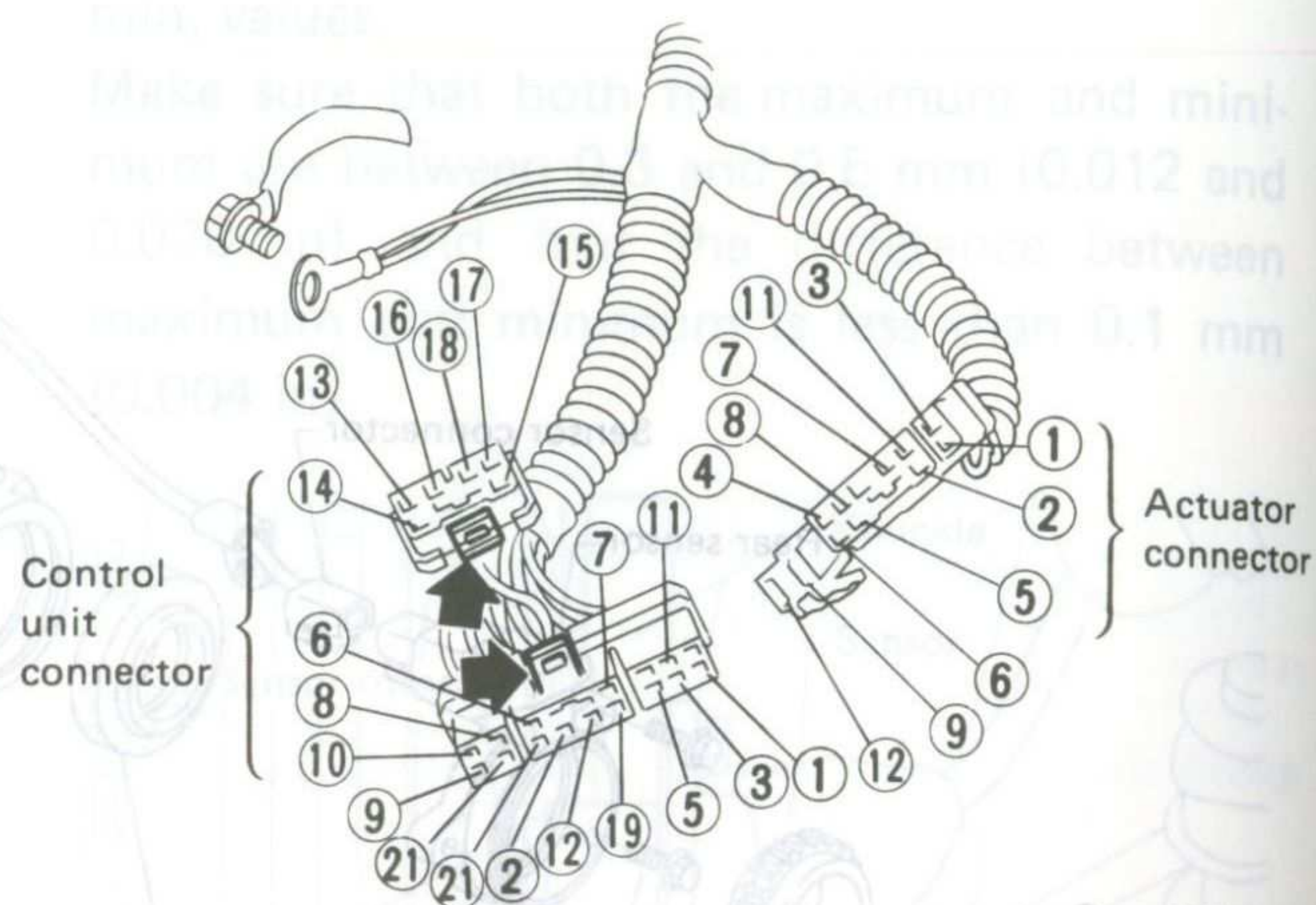


Terminal number	Function
①	IGN ⊕
②	GND 1
③	BATT ⊕
⑤	MOTOR RELAY ⊖
⑥	ACTUATOR RELAY ⊖
⑦	SOLENOID ⊕ MONITOR
⑧	FR RH SOLENOID ⊖
⑨	RR SOLENOID ⊖
⑩	FR LH SOLENOID ⊖
⑪	MOTOR ⊕ MONITOR
⑫	FAIL LAMP ⊖
⑬	FR RH SENSOR
⑭	SENSOR GND
⑮	RR SENSOR
⑯	SENSOR GND
⑰	FR LH SENSOR
⑱	SENSOR GND
⑲	START ⊕
⑳	GND 2

SBR947

Precautions

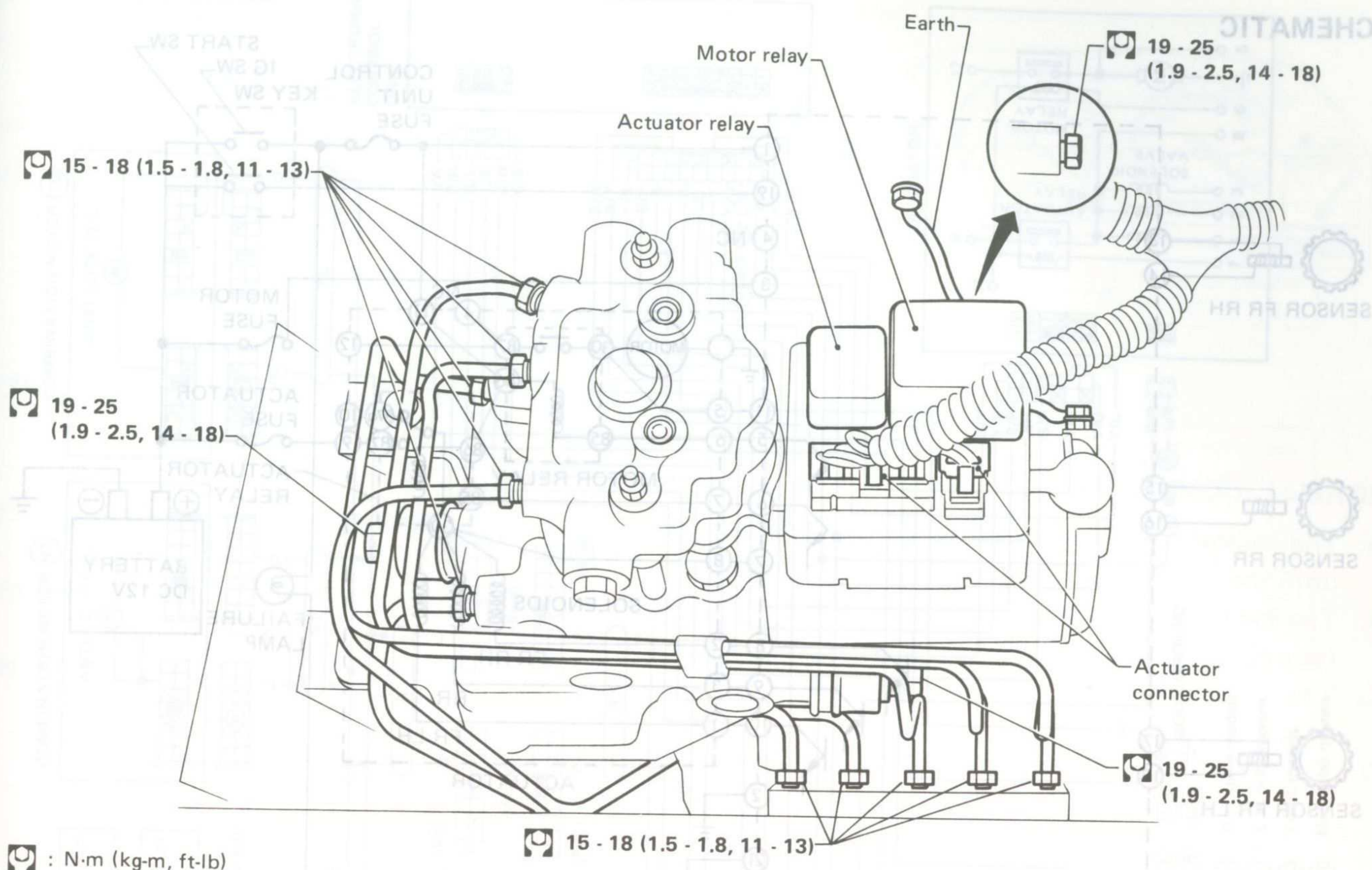
- Switch off the ignition key.
- Disconnect control unit connector with screwdriver.



SBR948

- Keep the control unit away from water, other liquids and dust.
- Do not drop control unit.
- Be careful not to damage control unit with tools or other materials.

4-WHEEL SKID CONTROL SYSTEM — Actuator



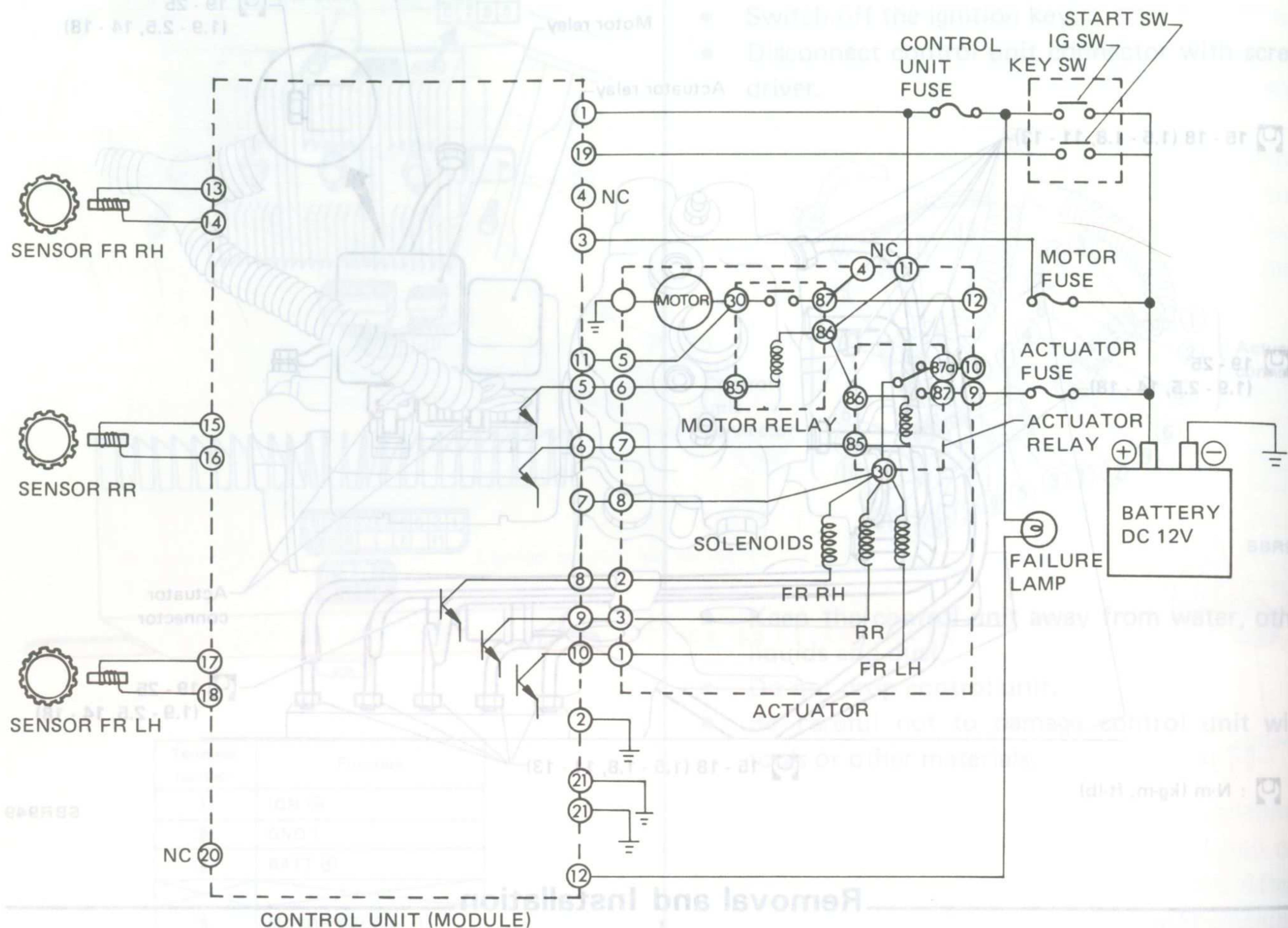
SBR949

Removal and Installation

- Disconnect actuator connector.
- Remove earth, brake tubes and actuator fixing nuts.
- Be sure that brake tubes are installed properly.
- Bleed air after installing actuator.
Refer to Bleeding Procedure.
- When removing and installing brake tube, use Tool GG94310000.

4-WHEEL SKID CONTROL SYSTEM — Electrical Circuit

SCHEMATIC

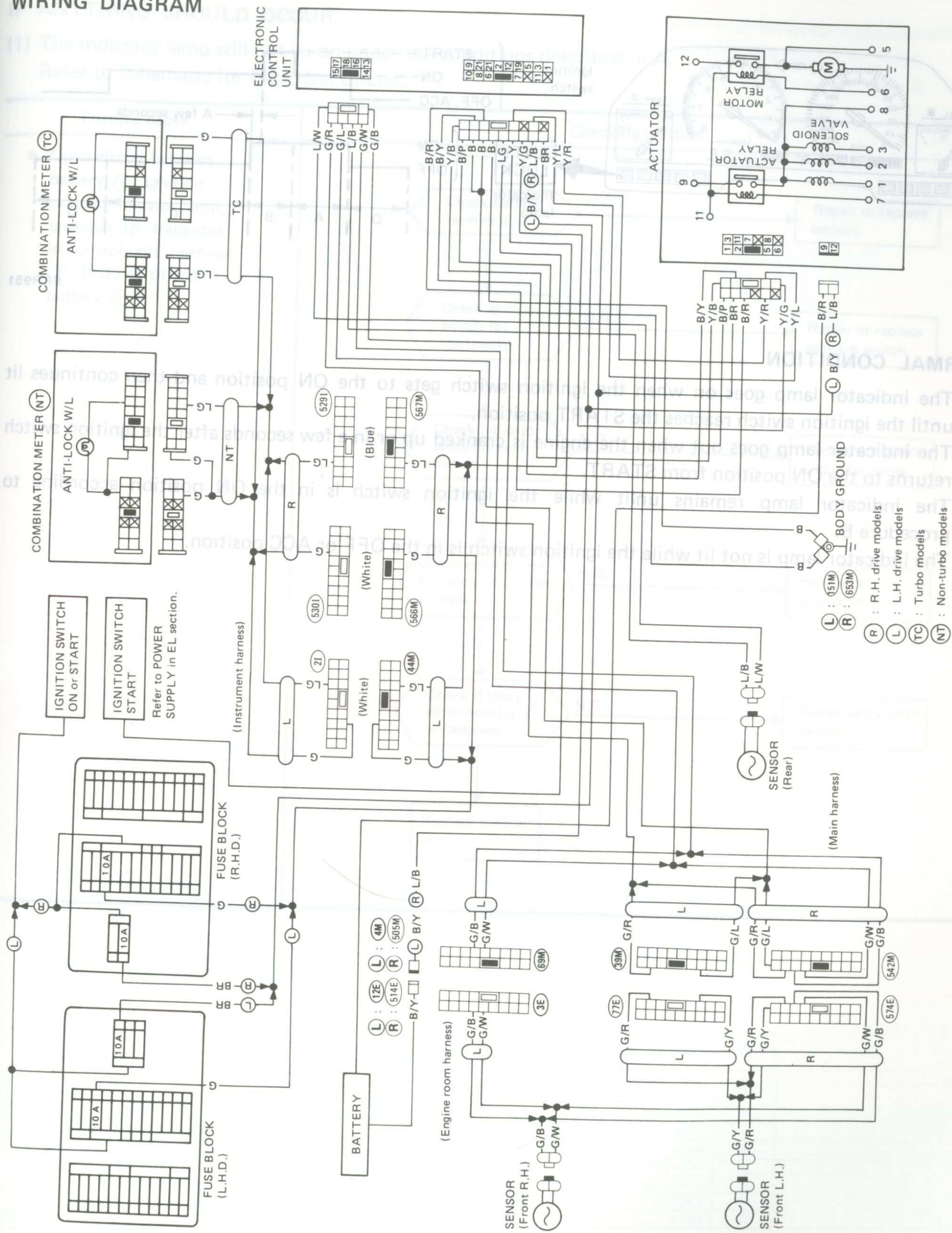


SBR950

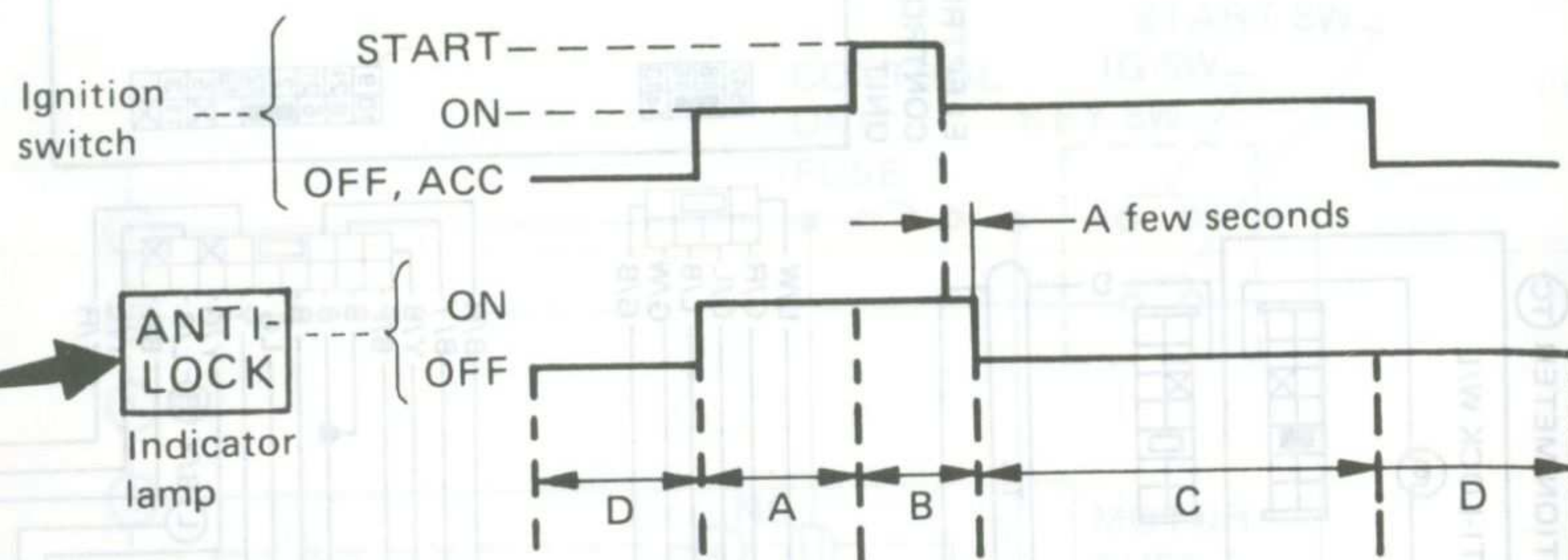
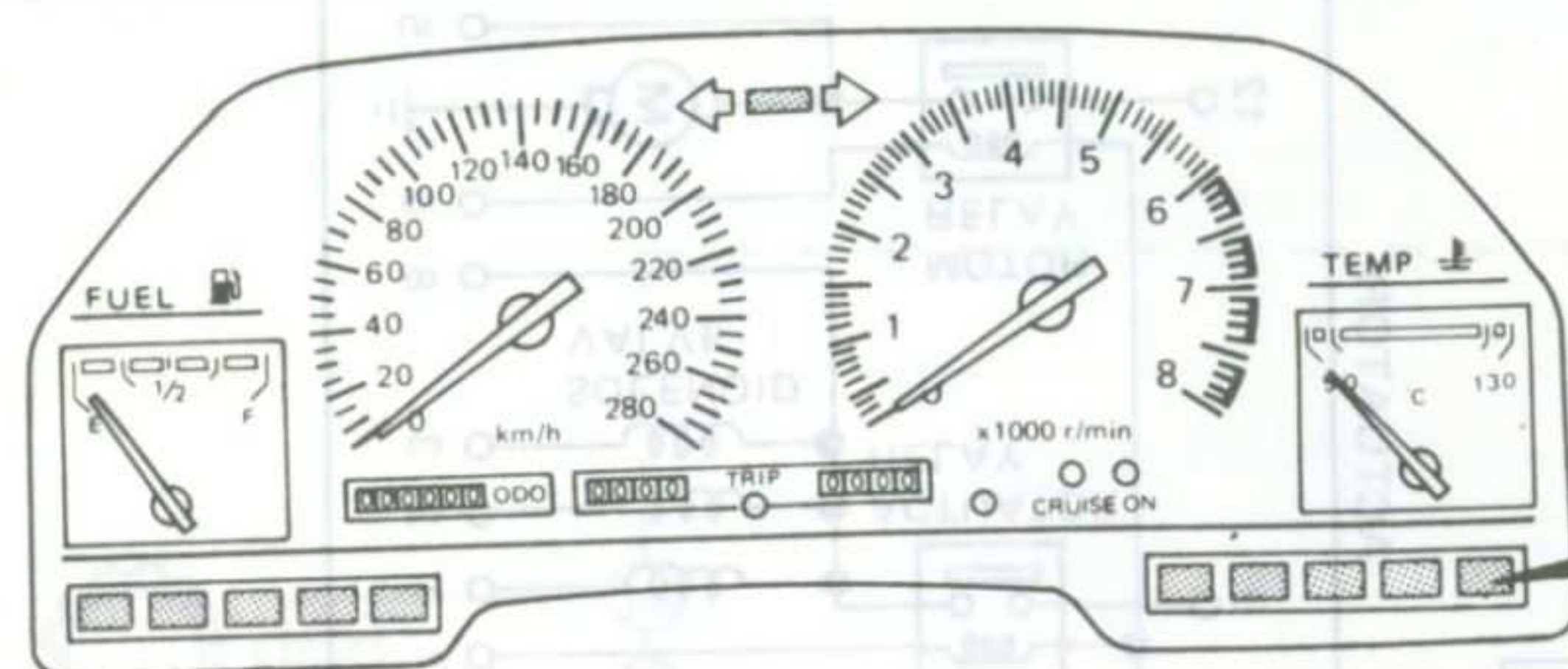
- Disconnect actuator connector.
- Remove earth, brake tubes and actuator fixing nuts.
- Be sure that brake tubes are installed properly.
- Bleed air after installing actuator.
- Refer to Bleeding Procedure.
- When removing and installing brake tube, use Tool GG431000.

Electrical Circuit

WIRING DIAGRAM



4-WHEEL SKID CONTROL SYSTEM — Trouble Diagnoses



SBR951

NORMAL CONDITION

- A: The indicator lamp goes on when the ignition switch gets to the ON position and then continues lit until the ignition switch reaches the START position.
- B: The indicator lamp goes out when the engine is cranked up or in a few seconds after the ignition switch returns to the ON position from START.
- C: The indicator lamp remains unlit while the ignition switch is in the ON position according to procedure B.
- D: The indicator lamp is not lit while the ignition switch is in the OFF or ACC position.

4-WHEEL SKID CONTROL SYSTEM — Trouble Diagnoses

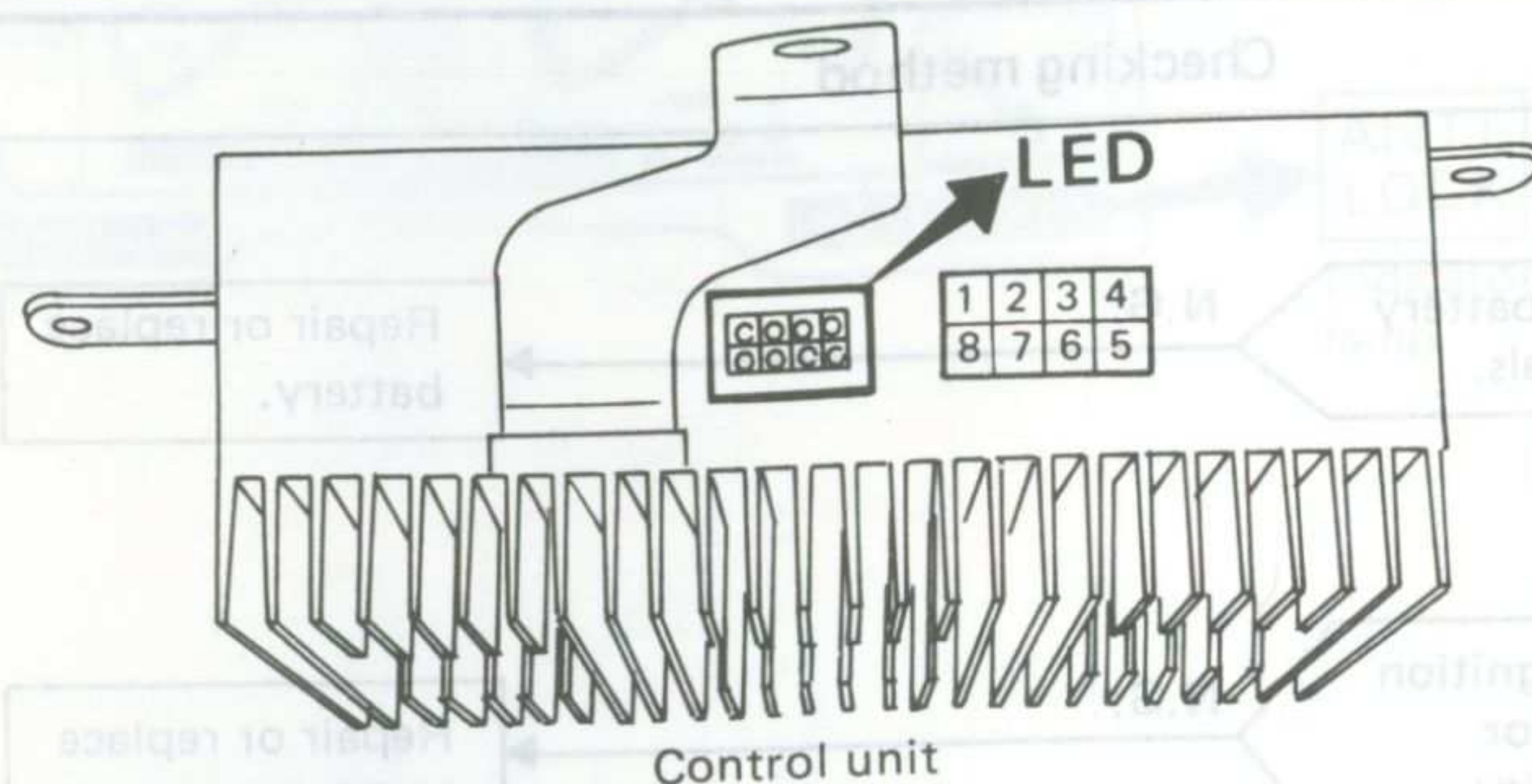
IF ANYTHING SHOULD OCCUR

- (1) The indicator lamp will not go on under the conditions described in A.
Refer to Schematic for Electrical Circuit.

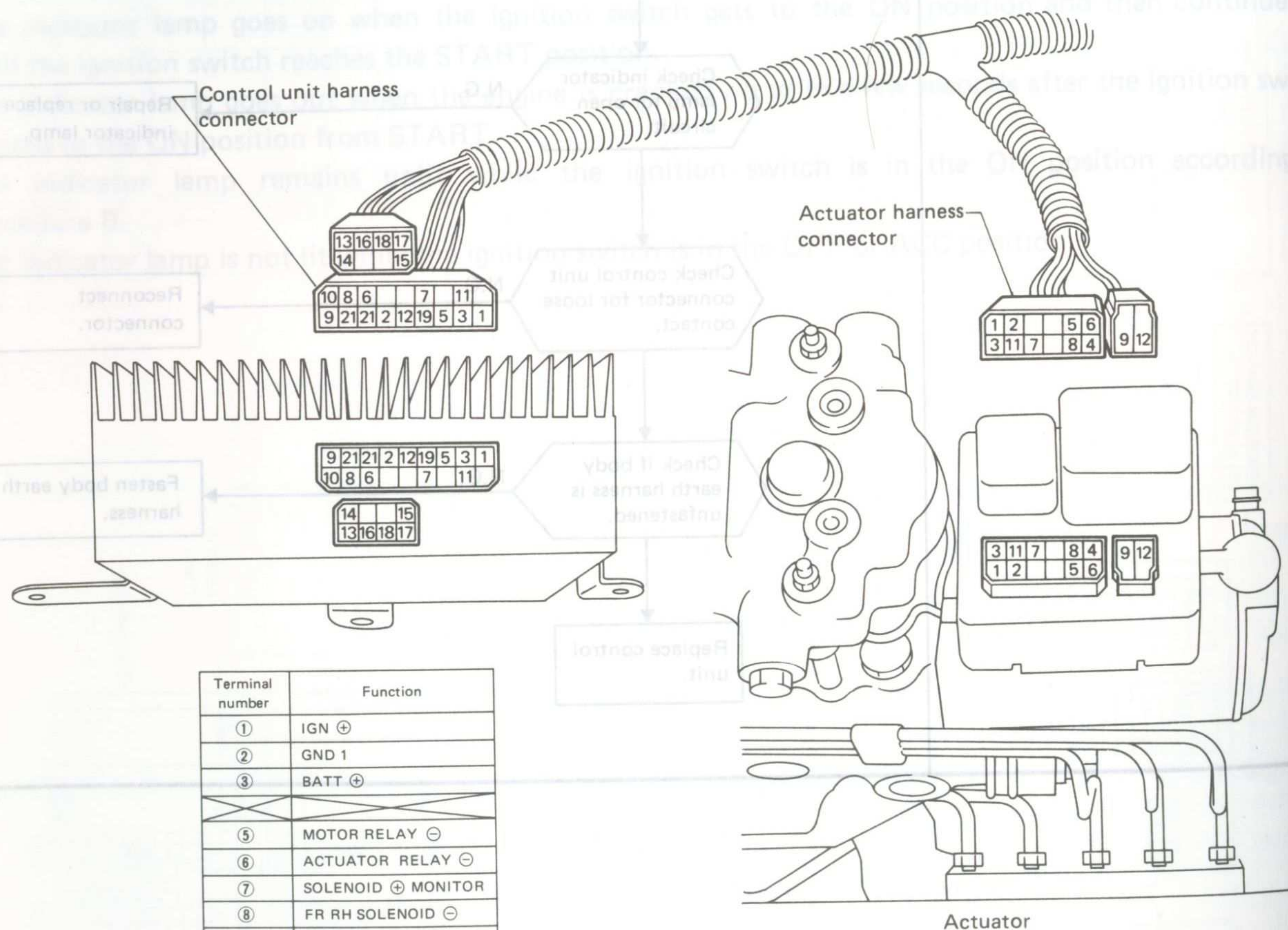
Possible cause	Checking method
Open circuit between battery ⊕, ignition switch, indicator lamp, terminal ⑫, transistor in control unit, terminal ②, body earth and battery ⊖	Check battery terminals. N.G. → Repair or replace battery.
	Check ignition switch for continuity. N.G. → Repair or replace ignition switch.
	Check indicator lamp for open circuit. N.G. → Repair or replace indicator lamp.
	Check control unit connector for loose contact. N.G. → Reconnect connector.
	Check if body earth harness is unfastened. N.G. → Fasten body earth harness.
	Replace control unit.

4-WHEEL SKID CONTROL SYSTEM — Trouble Diagnoses

- (2) The indicator lamp remains lit or goes on again under the conditions described in B and C respectively.
- Refer to Schematic for Electrical Circuit.
 - Check light emitting diodes (L.E.D.) on control unit.



L.E.D. No.	Possible cause
1	FR LH SENSOR
2	RR SENSOR
3	CONTROL UNIT
4	FR RH SENSOR
5	MOTOR
6	BATTERY
7	ACTUATOR RELAY
8	SOLENOID (ACTUATOR)



Terminal number	Function
①	IGN ⊕
②	GND 1
③	BATT ⊕
④	
⑤	MOTOR RELAY ⊖
⑥	ACTUATOR RELAY ⊖
⑦	SOLENOID ⊕ MONITOR
⑧	FR RH SOLENOID ⊖
⑨	RR SOLENOID ⊖
⑩	FR LH SOLENOID ⊖
⑪	MOTOR ⊕ MONITOR
⑫	FAIL LAMP ⊖
⑬	FR RH SENSOR
⑭	SENSOR GND
⑮	RR SENSOR
⑯	SENSOR GND
⑰	FR LH SENSOR
⑱	SENSOR GND
⑲	START ⊕
⑳	GND 2

SBR952

4-WHEEL SKID CONTROL SYSTEM — Trouble Diagnoses

L.E.D. No.	Possible cause	Checking method
1	- Open circuit or short circuit of left front sensor - Output lowering of left front sensor due to improper clearance between sensor and sensor rotor - Open circuit of harness or connectors between terminal ⑰ of control unit harness connector, sensor and terminal ⑱ of control unit harness connector	<pre> graph TD A{{Check resistance between terminals ⑰ and ⑱ of 6-terminal control unit harness connector.}} -- "1 to 3.5 kΩ" --> B[Ohmmeter] B -- "N.G." --> C{{Check sensor resistance.}} C -- "1 to 3.5 kΩ" --> D[Replace harness.] C -- "N.G." --> E[Replace sensor.] F{{Check clearance between sensor and sensor rotor.}} -- "N.G." --> G[Adjust clearance. Refer to Front Sensor and Sensor Rotor.] F -- "Clearance: 0.3 to 0.5 mm (0.012 to 0.020 in) Difference between Max. and Min.: Less than 0.1 mm (0.004 in)" --> H[Replace sensor.] H --> I{{Check L.E.D. "1".}} I -- "Remains lit" --> J[Replace control unit.] I -- "Goes off" --> K[END] </pre>
2	- Open circuit or short circuit of rear sensor - Output lowering of rear sensor - Open circuit of harness or connectors between terminal ⑮ of control unit harness connector, sensor and terminal ⑯ of control unit harness connector	<pre> graph TD A{{Check resistance between terminals ⑮ and ⑯ of 6-terminal control unit harness connector.}} -- "1 to 3.5 kΩ" --> B[Ohmmeter] B -- "N.G." --> C{{Check sensor resistance.}} C -- "1 to 3.5 kΩ" --> D[Replace harness.] C -- "N.G." --> E[Replace sensor.] F{{Check L.E.D. "2".}} -- "Remains lit" --> G[Replace control unit.] F -- "Goes off" --> H[END] </pre>

4-WHEEL SKID CONTROL SYSTEM — Trouble Diagnoses

L.E.D. No.	Possible cause	Checking method
3	• Damaged control unit • Output lowering or short circuit of rear sensor • Driving on an excessively low surface resistance road such as ice This is not a trouble even if L.E.D. 3 might go on under this condition.	<pre> graph TD A{Warning indicator lamp goes on when vehicle is stopped.} -- Yes --> B[Replace control unit.] A -- No --> C{Warning indicator lamp goes on in about 3 seconds when vehicle is accelerated to over 10 km/h (6 MPH) after starting.} C -- Yes --> D[Replace rear sensor.] C -- No --> E[END] </pre>
4	• Open circuit or short circuit of right front sensor • Output lowering of right front sensor due to improper clearance between sensor and sensor rotor • Open circuit of harness or connectors between terminal ⑬ of control unit harness connector, sensor and terminal ⑭ of control unit harness connector	<pre> graph TD A{Check resistance between terminals ⑬ and ⑭ of 6-terminal control unit harness connector.} -- N.G. --> B{Check sensor resistance.} A -- 1 to 3.5 kΩ --> C{Check clearance between sensor and sensor rotor.} B -- N.G. --> D[Replace sensor.] B -- 1 to 3.5 kΩ --> E[Replace harness.] C -- N.G. --> F[Adjust clearance. Refer to Front Sensor and Sensor Rotor.] C -- Clearance: 0.3 to 0.5 mm (0.012 to 0.020 in) Difference between Max. and Min.: Less than 0.1 mm (0.004 in) --> G[Replace sensor.] G --> H{Check L.E.D. "4".} H -- Remains lit --> I[Replace control unit.] H -- Goes off --> J[END] </pre> Ohmmeter diagram showing terminals 13, 14, 15, 16, 17, 18. Label: SBR955.

4-WHEEL SKID CONTROL SYSTEM — Trouble Diagnoses

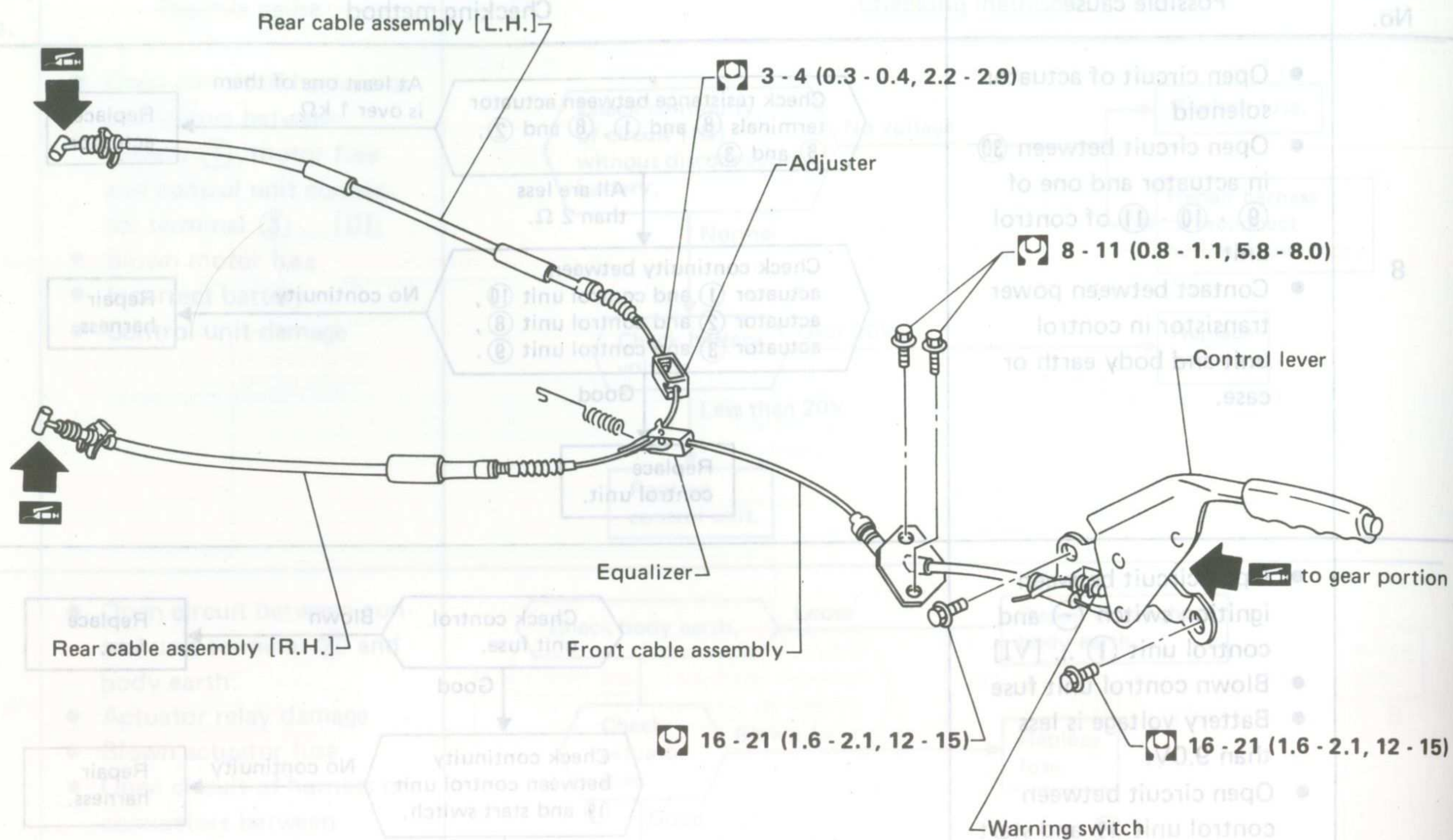
L.E.D. No.	Possible cause	Checking method
5	- Open circuit of harness or connectors between terminal ⑪ of control unit harness connector, ⑤ of actuator harness connector, ③⑩ in actuator, motor and body earth ... [I] - Motor relay damage - Blown motor fuse - Control unit damage - Open circuit of harness or connectors between motor fuse, terminal ⑪ on actuator, motor relay, terminal ⑥ on actuator and terminal ⑤ of control unit harness connector ... [II] - Actuator damage	Check motor fuse. Blown → Replace fuse. (Fuse box) O.K. → Listen to motor when cranking up engine. Motor does not operate. → Check resistance of circuit [I]. Over 1 kΩ → Check harness and connectors. Open circuit → Repair harness or connector. Less than several ohms → Check resistance between terminal ⑤ on actuator and motor ⊖. Over 1 kΩ → Replace actuator. Less than 100 Ω → Check motor relay resistance. Less than 100 Ω → Replace motor relay. Over 1 kΩ → Check resistance between terminals ⑪ and ⑥ on actuator. Less than 100 Ω → Replace motor relay. Over 1 kΩ → Replace actuator. Ohmmeter 3 11 7 8 4 1 2 5 6 9 12 ... Connector on actuator SBR956

4-WHEEL SKID CONTROL SYSTEM — Trouble Diagnoses

L.E.D. No.	Possible cause	Checking method
6	• Open circuit of harness or connectors between battery $\oplus$, motor fuse and control unit connector terminal ③ ... [III] • Blown motor fuse • Incorrect battery • Control unit damage	<pre> graph TD A{{Check continuity of circuit [III] without disconnecting battery.}} -- No voltage --> B[Replace fuse.] A -- No voltage --> C[Repair harness or reconnect harness connector.] A -- Normal --> D{{Check battery voltage.}} D -- Over 20V --> E[Replace battery.] D -- Less than 20V --> F[Replace control unit.] </pre>
7	• Open circuit between control unit terminal ②① and body earth. • Actuator relay damage • Blown actuator fuse • Open circuit of harness or connectors between battery $\oplus$, actuator fuse and terminal ⑦ of control unit connector ... [IV] • Open circuit of harness or connectors between control unit fuse, actuator connector ⑪, actuator relay, actuator ⑦ and control unit connector ⑥ ... [V]	<pre> graph TD A{{Check body earth.}} -- Loose --> B[Repair or retighten body earth.] A -- Good --> C{{Check actuator fuse.}} C -- Blown --> D[Replace fuse.] C -- Good --> E{{Check resistance of circuit [V].}} E -- Over 1 kΩ --> F{{Check resistance between actuators ⑪ and ⑦.}} E -- Less than 200 Ω --> G{{Check actuator relay.}} F -- Less than 200 Ω --> H{{Check harness and connectors.}} H --> I[Repair harness or connector.] G -- Loosen --> J[Refit.] G -- Good --> K{{Check resistance between actuators ② and ⑧.}} K -- Over 1 kΩ --> L[Replace actuator.] K -- Less than 2 Ω --> M[Replace actuator relay.] M --> N{{Check continuity between actuator harness connector ⑧ and control unit harness connector ⑦.}} N -- O.K. --> O[] N -- No continuity --> P[Repair harness or connector.] F -- Over 1 kΩ --> Q{{Check resistance between actuator relays ⑧⑤ and ⑧⑥.}} Q -- Less than 40 Ω or over 120 Ω --> R[Replace actuator or relay.] Q -- 40 to 120 Ω --> O </pre>

4-WHEEL SKID CONTROL SYSTEM — Trouble Diagnoses

L.E.D. No.	Possible cause	Checking method
8	- Open circuit of actuator solenoid - Open circuit between ③⑩ in actuator and one of ⑨ · ⑩ · ⑪ of control unit - Contact between power transistor in control unit and body earth or case.	<pre> graph TD A[Check resistance between actuator terminals ⑧ and ①, ⑧ and ②, ⑧ and ③.] -- "At least one of them is over 1 kΩ." --> B[Replace actuator.] A -- "All are less than 2 Ω." --> C[Check continuity between actuator ① and control unit ⑩, actuator ② and control unit ⑧, actuator ③ and control unit ⑨.] C -- "No continuity" --> D[Repair harness.] C -- "Good" --> E[Replace control unit.] </pre>
No indicator lamp goes on.	- Open circuit between ignition switch ① and control unit ① ... [VI] - Blown control unit fuse - Battery voltage is less than 9.0V. - Open circuit between control unit ①⑨ and start switch - Damaged start switch - Control unit	<pre> graph TD A[Check control unit fuse.] -- "Blown" --> B[Replace fuse.] A -- "Good" --> C[Check continuity between control unit ①⑨ and start switch.] C -- "No continuity" --> D[Repair harness.] C -- "Good" --> E[Check start switch operation.] E -- "N.G." --> F[Repair or replace start switch.] E -- "Good" --> G[Check voltage between control unit harness connectors ① and ②.] G -- "Over 9V" --> H[Replace control unit.] G -- "Over 0 to 9V" --> I[Recharge or replace battery.] G -- "0V" --> J[Check harness or connectors for circuit [IV].] J --> K[Reconnect or repair harness or connectors.] </pre>



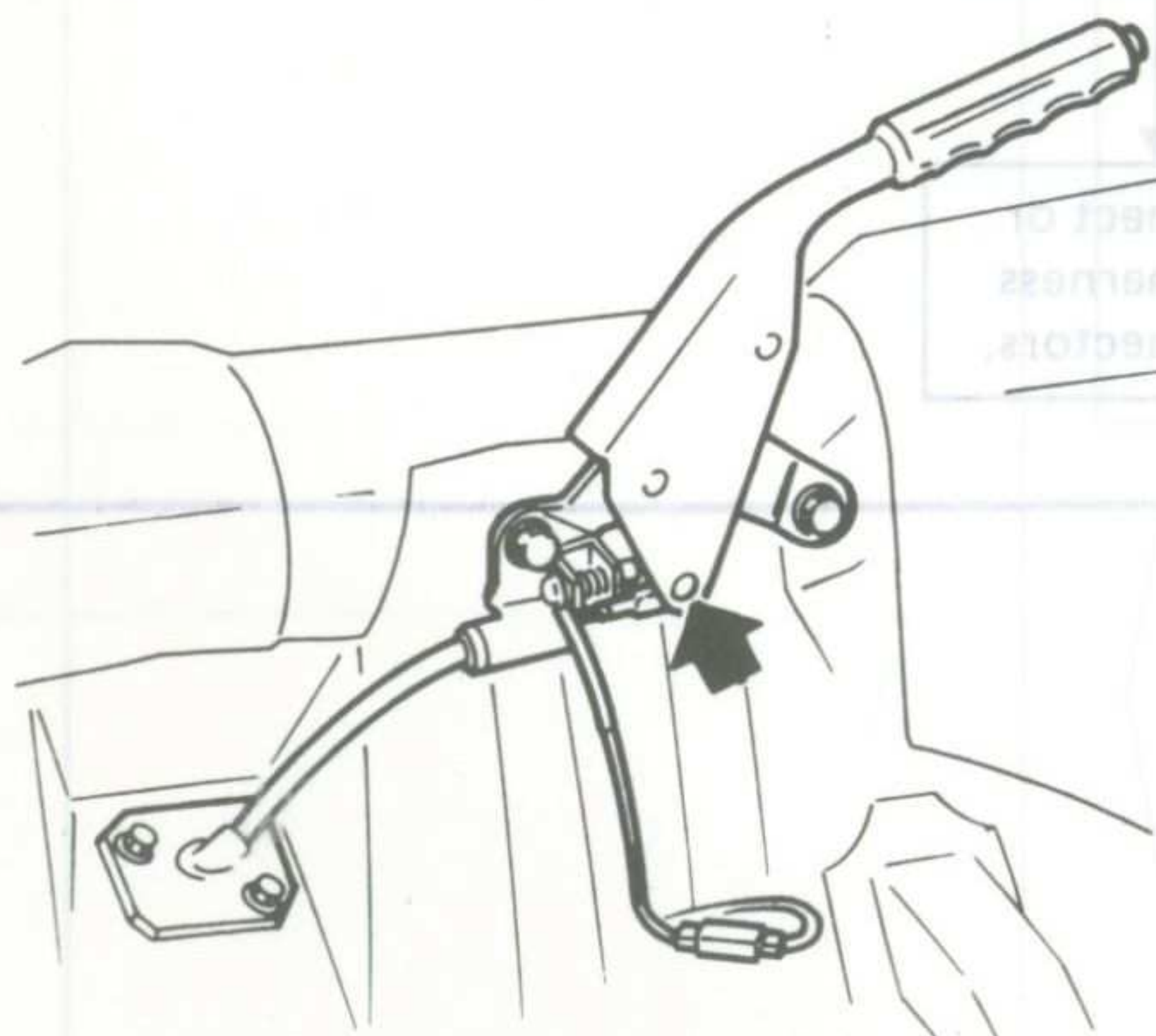
□ : N·m (kg-m, ft-lb)

SBR834

Removal

If necessary, separate front cable from parking brake lever by breaking pin.

Front cable, clevis pin and cotter pin are available as service parts.



SBR835

Inspection

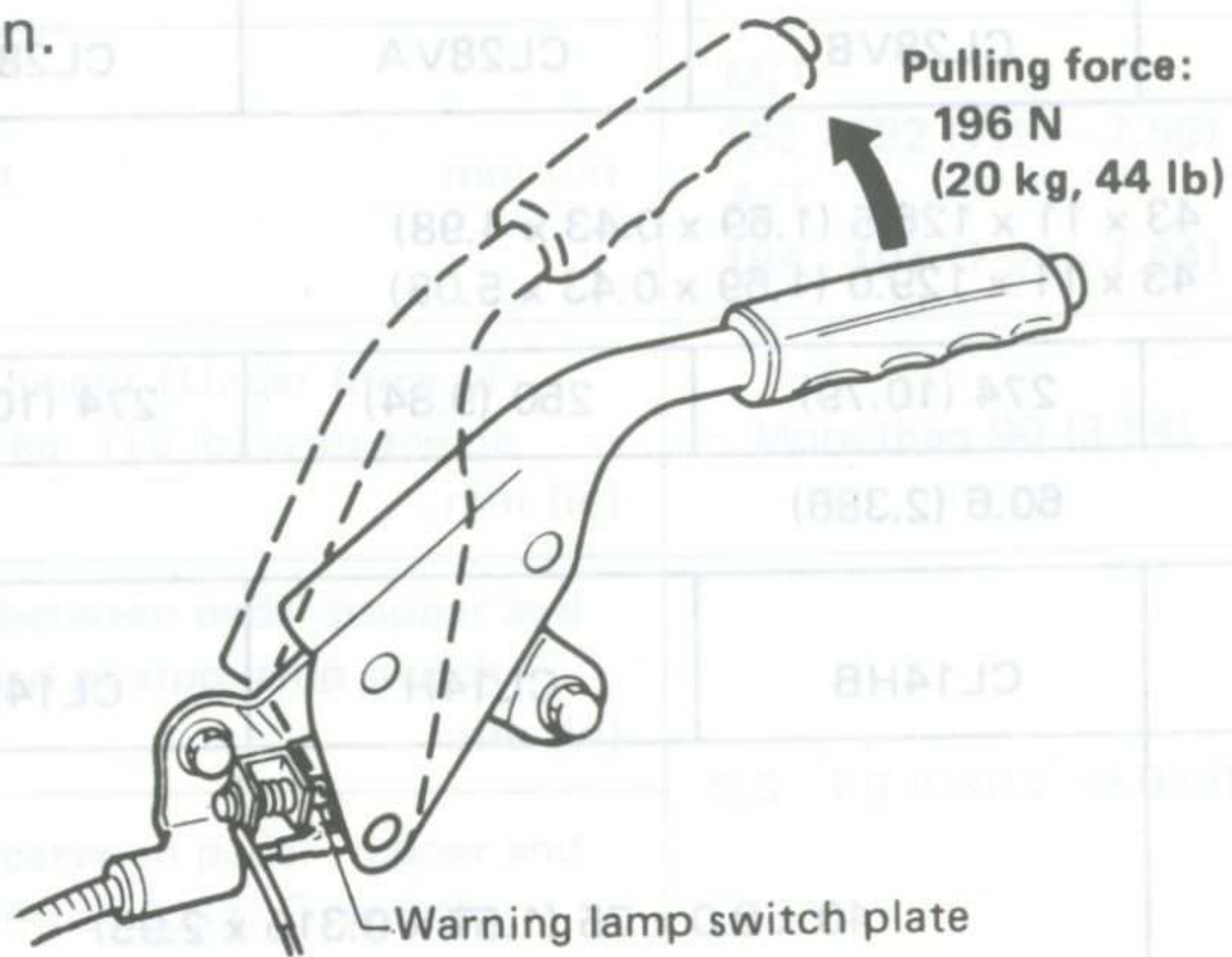
1. Check control lever for wear or other damage. Replace if necessary.
2. Check wires for discontinuity or deterioration. Replace if necessary.
3. Check warning lamp and switch. Replace if necessary.
4. Check parts at each connecting portion and, if found deformed or damaged, replace.

PARKING BRAKE

Adjustment

STROKE

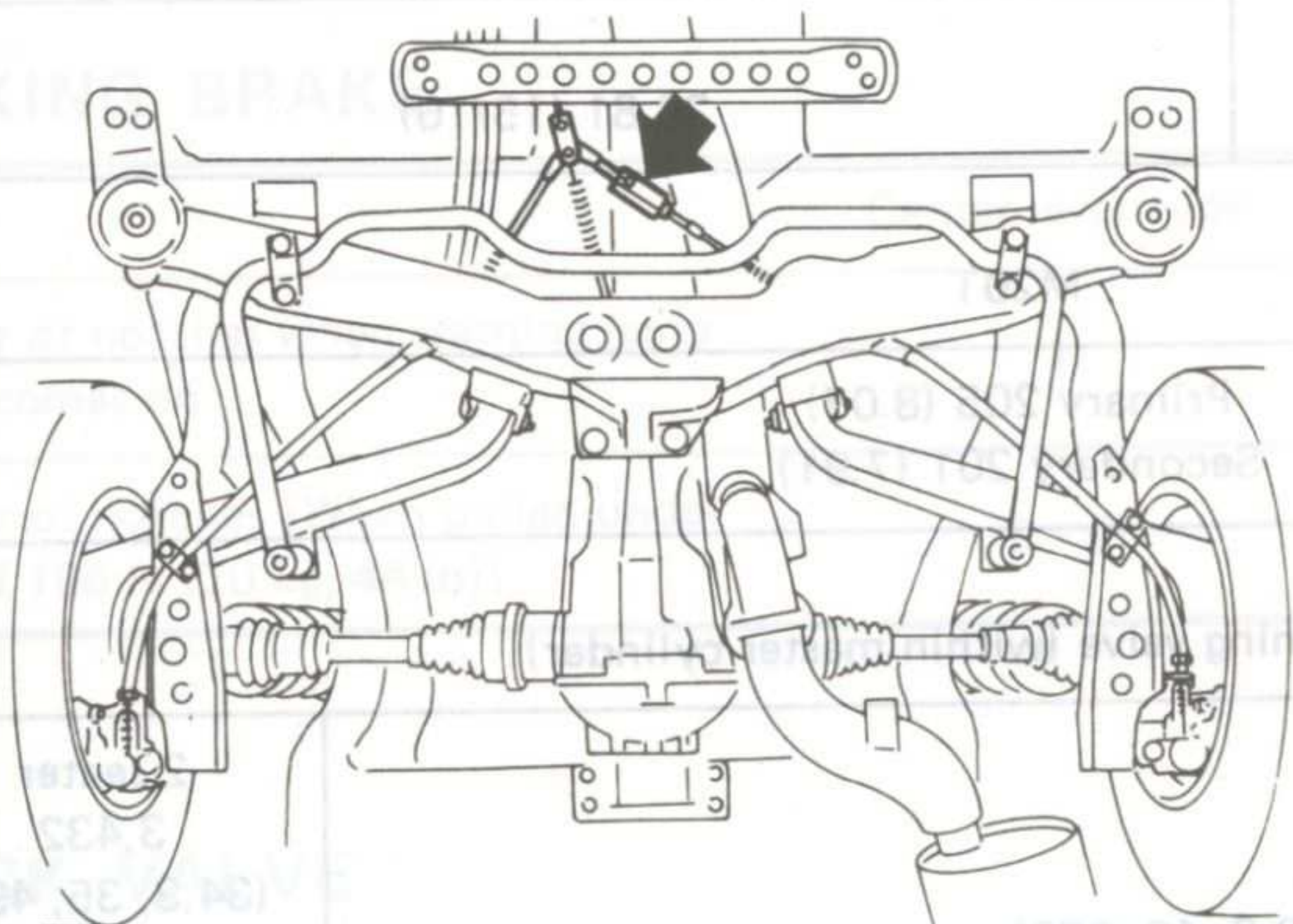
- Pull lever with specified amount of force. Check lever stroke and ensure smooth operation.



Number of notches: 8 - 9

SBR836

- Adjust lever stroke.



SBR837

WARNING LAMP SWITCH

Bend parking brake warning lamp switch plate so that brake warning light comes on when ratchet at parking brake lever is pulled one notch and goes out when fully released.

SERVICE DATA AND SPECIFICATIONS

General Specifications

Destination		Europe		Australia	Except Europe and Australia	
Item	Engine	VG30E	VG30ET	VG30E	VG30E	VG30ET
Front brake						
Brake model		CL28VB	CL28VC	CL28VB	CL28VA	CL28VB
Pad						
Width x thickness x length			Inner	43 x 11 x 126.5 (1.69 x 0.43 x 4.98)		
mm (in)			Outer	43 x 11 x 129.0 (1.69 x 0.43 x 5.08)		
Rotor outer diameter	mm (in)	274 (10.79)	300 (11.81)	274 (10.79)	250 (9.84)	274 (10.79)
Caliper inner diameter	mm (in)	60.6 (2.386)				
Rear brake						
Brake model		CL14HVB	CL14HVC	CL14HB	CL14H	CL14HB
Pad						
Width x thickness x length		39.5 x 8.0 x 75	42 x 8.0 x 75	40 x 8.0 x 75 (1.57 x 0.315 x 2.95)		
mm (in)		(1.555 x 0.315 x 2.95)	(1.65 x 0.315 x 2.95)			
Rotor outer diameter	mm (in)	282 (11.10)	304 (11.97)	290 (11.42)	258 (10.16)	290 (11.42)
Caliper inner diameter	mm (in)	42.8 (1.685)				
Master cylinder						
Inner diameter		23.81 (15/16)	25.4 (1)	23.81 (15/16)		
Brake booster						
Model		M20T				
Diaphragm diameter		Primary 205 (8.07) Secondary 201 (7.91)				
Control valve						
Model		Proportioning valve (within master cylinder)				
Split point		3,923 (39.2, 40, 569)				2 seater 3,432 (34.3, 35, 498)
						2+2 seater 3,923 (39.2, 40, 569)
Reducing ratio		0.4				
Recommended brake fluid		DOT3				

SERVICE DATA AND SPECIFICATIONS

Inspection and Adjustment

BRAKE PEDAL

Pedal ratio		3.8
Maximum stroke	mm (in)	More than 134 (5.28)
Free height	mm (in)	M/T 182 - 192 (7.17 - 7.56) A/T 184 - 194 (7.24 - 7.64)
Depressed height [Under force of 490 N (50 kg, 110 lb) with engine running]	mm (in)	More than 90 (3.54)
Clearance between pedal stopper and threaded end of stop lamp switch	mm (in)	0.3 - 1.0 (0.012 - 0.039)
Clearance between pedal stopper and threaded end of A.S.C.D. switch	mm (in)	
Pedal free play	mm (in)	0.3 - 3.8 (0.012 - 0.150)

PARKING BRAKE

Type	Center lever type
Number of notches when warning lamp switch comes on	1
Number of notches [When pulled under force of 196 N (20 kg, 44 lb)]	8 - 9

CHECK VALVE

Maximum vacuum leakage [15 seconds after 66.7 kPa (667 mbar, 500 mmHg, 19.69 inHg) is applied.]	1.3 (13, 10, 0.39)
kPa (mbar, mmHg, inHg)	

BRAKE BOOSTER

Maximum vacuum leakage (15 seconds after engine is stopped)	3.3 (33, 25, 0.98)
kPa (mbar, mmHg, inHg)	

DISC BRAKE

	Front brake	Rear brake
Pad repair limit		
Minimum thickness	2 (0.08)	2 (0.08)
mm (in)		
Rotor repair limit		
Maximum runout	Less than 0.07 (0.0028)	Less than 0.07 (0.0028)
mm (in)		
Minimum thickness	More than 20.0 (0.787)	Europe More than 18.0 (0.709) Except Europe More than 9.0 (0.354)
mm (in)		

4-WHEEL SKID CONTROL SYSTEM (Front sensor adjusting shim)

Part number	Thickness mm (in)
47976-11P11	0.10 (0.0039)
47976-11P12	0.15 (0.0059)
47976-11P13	0.20 (0.0079)
47976-11P14	0.25 (0.0098)
47976-11P15	0.30 (0.0118)
47976-11P16	0.35 (0.0138)
47976-11P17	0.40 (0.0157)
47976-11P18	0.45 (0.0177)
47976-11P19	0.50 (0.0197)
47976-11P21	0.60 (0.0236)
47976-11P23	0.70 (0.0276)
47976-11P26	0.85 (0.0335)
47976-11P29	1.00 (0.0394)

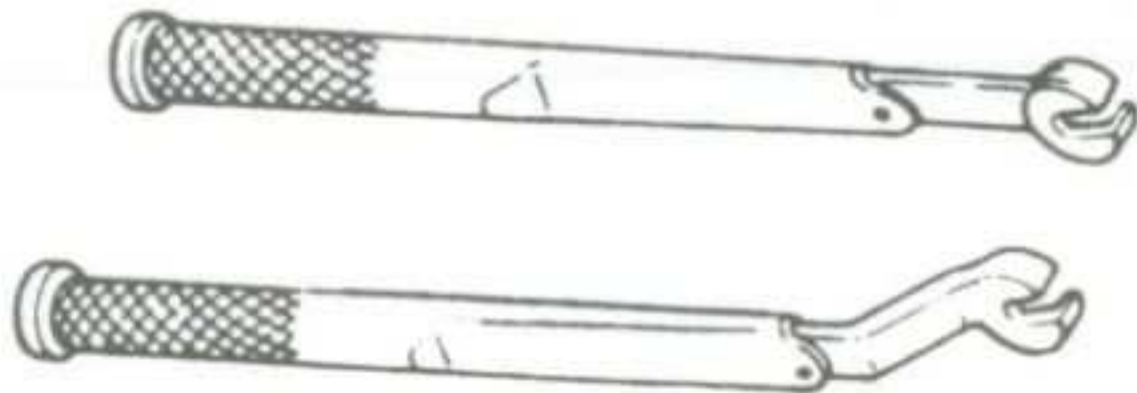
SERVICE DATA AND SPECIFICATIONS

Tightening Torque

Item	N·m	kg-m	ft-lb
Brake pedal			
Pedal bracket to body	16 - 21	1.6 - 2.1	12 - 15
Pedal bracket to pedal	30 - 40	3.1 - 4.1	22 - 30
Stop lamp switch lock nut	12 - 15	1.2 - 1.5	9 - 11
Brake booster			
Brake booster to pedal bracket	8 - 11	0.8 - 1.1	5.8 - 8.0
Input rod lock nut	16 - 22	1.6 - 2.2	12 - 16
Brake booster to master cylinder	8 - 11	0.8 - 1.1	5.8 - 8.0
Three-way connector			
Three-way connector to brake tube	15 - 18	1.5 - 1.8	11 - 13
Three-way connector mounting bolt	5 - 7	0.5 - 0.7	3.6 - 5.1
Brake hose connector	17 - 20	1.7 - 2.0	12 - 14
Brake tube flare nut	15 - 18	1.5 - 1.8	11 - 13
Wheel cylinder air bleeder	7 - 9	0.7 - 0.9	5.1 - 6.5
Front disc brake			
Baffle plate	3.1 - 4.3	0.32 - 0.44	2.3 - 3.2
Torque member fixing bolt	72 - 97	7.3 - 9.9	53 - 72
Torque member to cylinder body	22 - 31	2.2 - 3.2	16 - 23
Disc rotor to wheel hub	49 - 69	5.0 - 7.0	36 - 51
Rear disc brake			
Baffle plate	8 - 11	0.8 - 1.1	5.8 - 8.0
Torque member fixing bolt	38 - 52	3.9 - 5.3	28 - 38
Torque member to cylinder body	22 - 31	2.2 - 3.2	16 - 23
Parking brake			
Center lever type			
Control lever to body	16 - 21	1.6 - 2.1	12 - 15
Adjuster lock nut	3 - 4	0.3 - 0.4	2.2 - 2.9
Front cable clamp to body	8 - 11	0.8 - 1.1	5.8 - 8.0
4-wheel skid control system			
Front sensor rotor to wheel hub	98 - 147	10 - 15	72 - 108
Front sensor to knuckle	3.1 - 4.3	0.32 - 0.44	2.3 - 3.2
Rear sensor to differential carrier	8 - 11	0.8 - 1.1	5.8 - 8.0
Actuator to body	19 - 25	1.9 - 2.5	14 - 18

SPECIAL SERVICE TOOLS

*: Special tool or a commercial equivalent

Tool number	Tool name	
GG94310000*	Flare nut torque wrench	
KV99103100	Sensor rotor wrench	