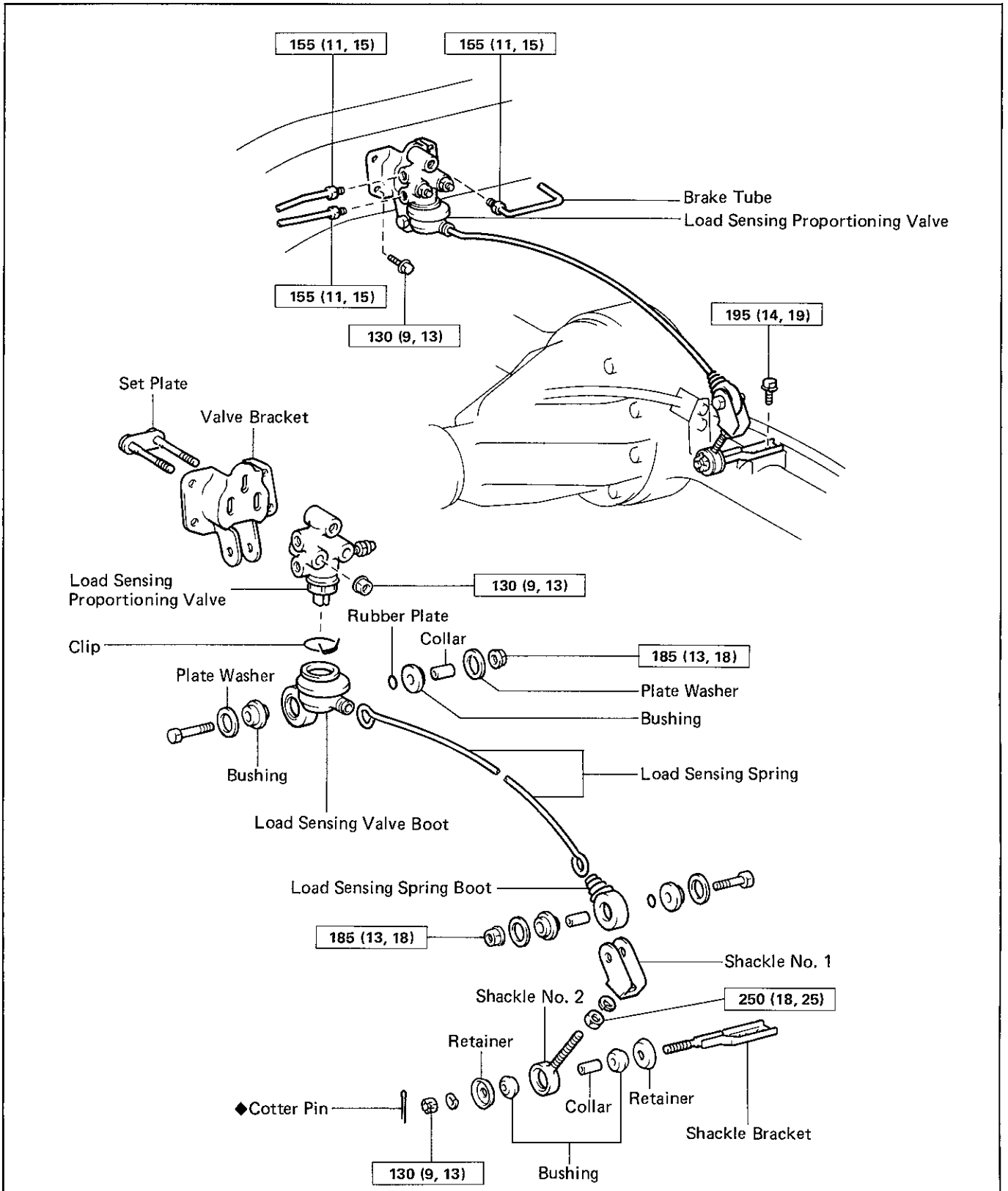
LOAD SENSING PROPORTIONING VALVE (LSPV)

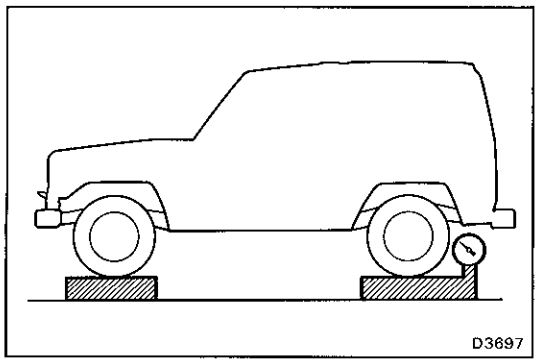
COMPONENTS



kg-cm (ft-lb, N·m) : Specified torque

◆ Non-reusable part

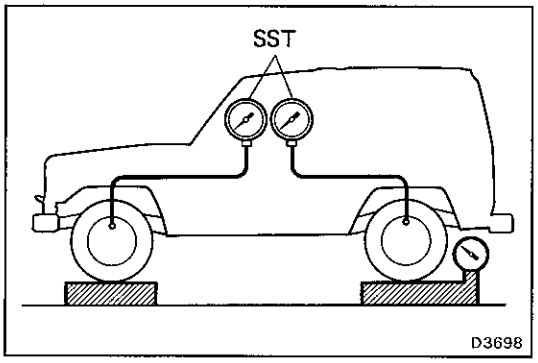
BR4739



CHECK AND ADJUSTMENT OF FLUID PRESSURE

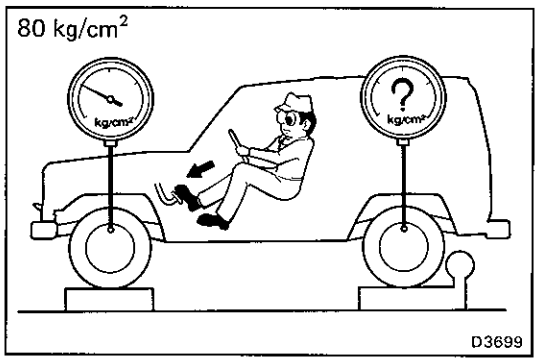
1. SET REAR AXLE LOAD

Rear axle load (include vehicle weight):
1,010 kg (2,227 lb)



2. INSTALL LSPV GAUGE (SST) AND BLEED AIR

SST 09709-29017



3. RAISE FRONT BRAKE PRESSURE TO 80 kg/cm² (1,138 psi, 7,845 kPa) AND CHECK REAR BRAKE PRESSURE

Rear brake pressure:
Heavy-Duty:
41.2 ± 6 kg/cm² (586 ± 85 psi, 4,040 ± 588 kPa)

Light-Duty:
40.8 ± 6 kg/cm² (580 ± 85 psi, 4,001 ± 588 kPa)

HINT: The brake pedal should not be depressed twice and/or returned while setting to the specified pressure.

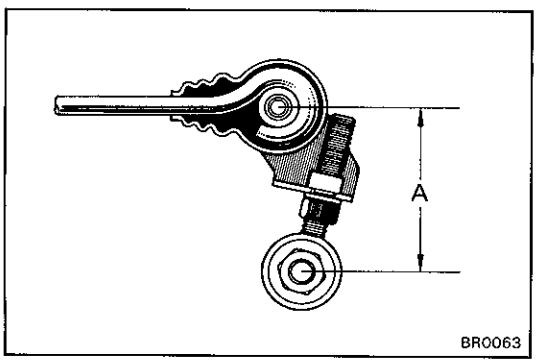
Read the value of rear brake pressure two seconds after adjusting the specified fluid pressure.

If the brake pressure is incorrect, adjust the fluid pressure.

4. IF NECESSARY, ADJUST FLUID PRESSURE

(a) Adjust the length of No. 2 shackle.

Low pressure — Lengthen A
High pressure — Shorten A

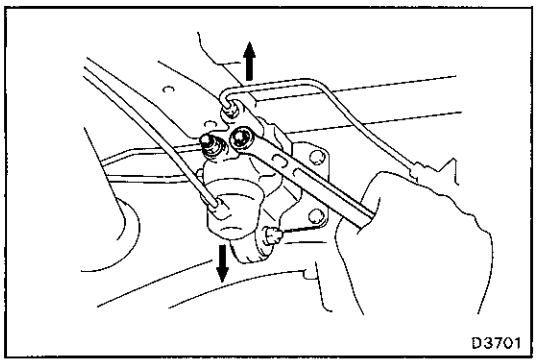


Initial set length:
Heavy-Duty: 78 mm (3.07 in.)
Light-Duty: 90 mm (3.54 in.)

Adjusting range:
Heavy-Duty: 72 — 84 mm (2.83 — 3.31 in.)
Light-Duty: 84 — 96 mm (3.31 — 3.78 in.)

HINT: One turn of the No. 2 shackle changes the fluid pressure about following specification.

Heavy-Duty: 0.84 kg/cm² (12.0 psi, 82.4 kPa)
Light-Duty: 0.67 kg/cm² (9.5 psi, 65.7 kPa)



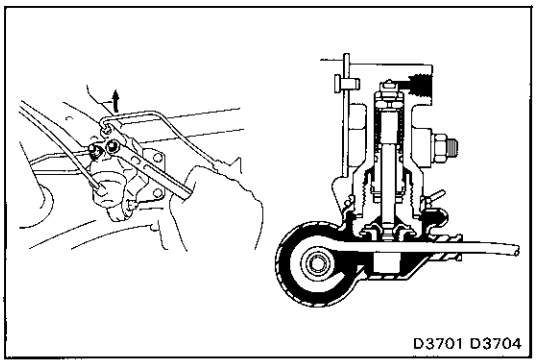
(b) In the event pressure cannot be adjusted by the No.2 shackle, raise or lower the valve body.
Low pressure — Lower
High pressure — Raise

(c) Torque the nuts.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

(d) Adjust the length of the No.2 shackle again.

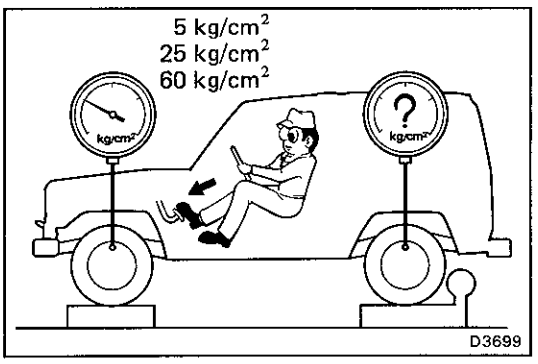
If it cannot be adjusted, inspect the valve housing.



6. IF NECESSARY, CHECK VALVE BODY

(a) Assemble the valve body in the uppermost position.

HINT: When the brakes are applied, the piston will move down about 1 mm (0.04 in.). Even at this time, the piston should not make contact with or move the load sensing spring.

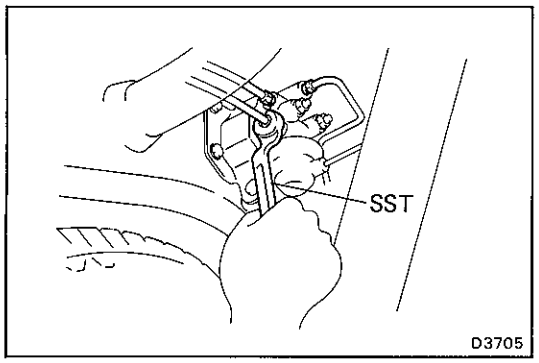


(b) In this position, check the rear brake pressure.

kg/cm² (psi, kPa)

Front brake pressure	Rear brake pressure
5 (71, 490)	5 (71, 490)
25 (356, 2,452)	8.0 — 12.0 (114 — 171, 785 — 1,177)
60 (853, 5,884)	15.3 — 22.3 (218 — 317, 1,500 — 2,187)

If the measured value is not within standard, replace the valve body.



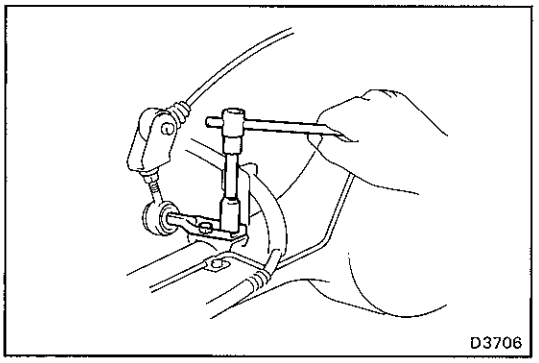
REMOVAL OF LSPV ASSEMBLY

(See page BR-102)

1. DISCONNECT BRAKE TUBES

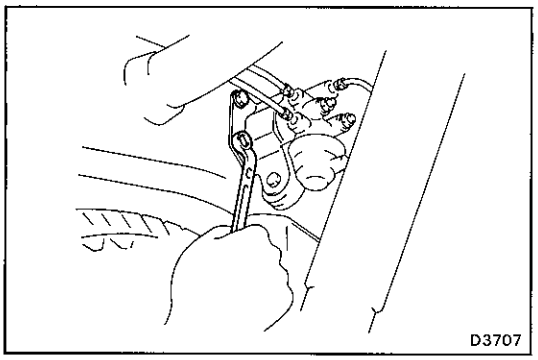
Using SST, disconnect the brake tubes from the valve body.

SST 09751-36011

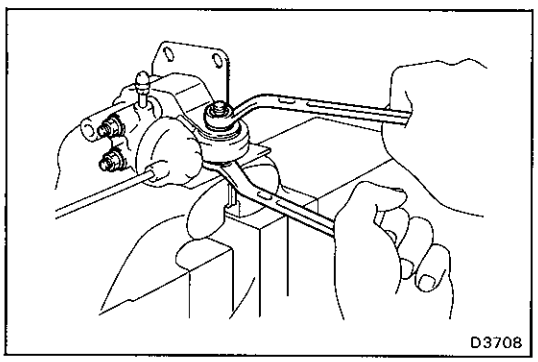


2. REMOVE LSPV ASSEMBLY

(a) Remove the two bolts and remove the shackle bracket.



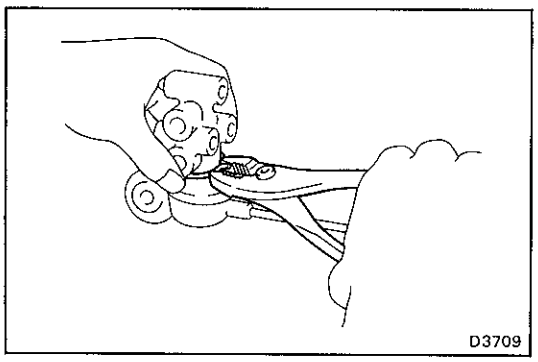
(b) Remove the valve bracket mounting bolts and remove the LSPV assembly.



DISASSEMBLY OF LOAD SENSING SPRING ASSEMBLY

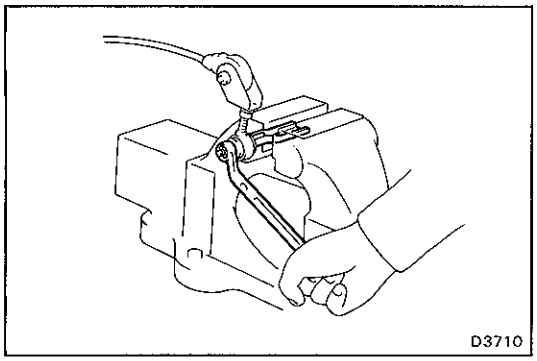
1. REMOVE VALVE BRACKET

Remove the three nuts, and remove the valve bracket.



2. DISCONNECT SPRING FROM VALVE

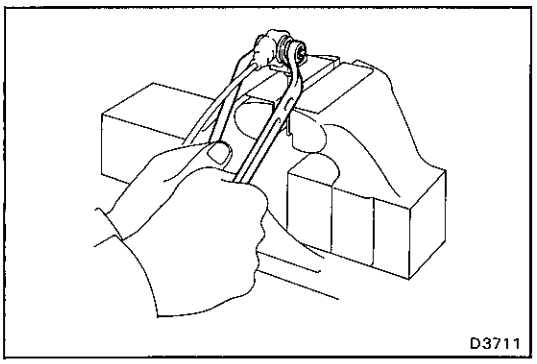
Using pliers, remove the clip and spring from the valve.



3. REMOVE SHACKLE BRACKET

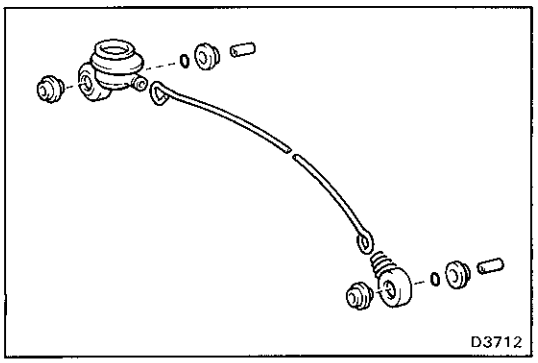
(a) Remove the cotter pin.

(b) Remove the nut, and remove the shackle bracket, two retainers, two bushings and a collar.



4. REMOVE SHACKLE NO.1 AND NO.2

Remove the nut and bolt, and then remove the shackle No. 1 and No. 2 and two plate washers from the load sensing spring assembly.



5. DISASSEMBLE LOAD SENSING SPRING

Disassemble the following parts.

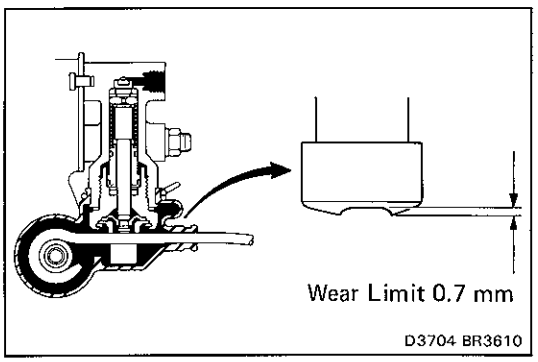
(a) Bushings

(b) Collars

(c) Rubber plates

(d) Load sensing valve boot

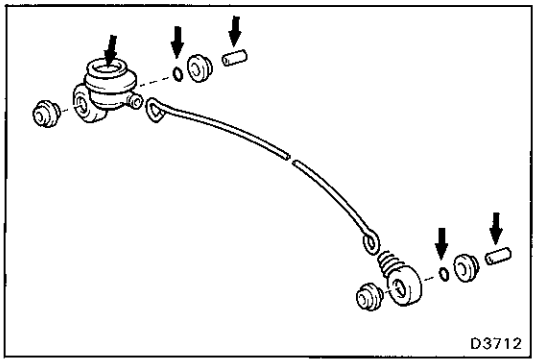
(e) Load sensing spring boot



INSPECTION OF LSPV

INSPECT VALVE PISTON PIN AND LOAD SENSING SPRING CONTACT SURFACE FOR WEAR

Wear limit: 0.7 mm (0.028 in.)



ASSEMBLY OF LSPV ASSEMBLY

(See page BR-102)

1. ASSEMBLE FOLLOWING PARTS TO LOAD SENSING SPRING

(a) Load sensing valve boot

(b) Load sensing spring boot

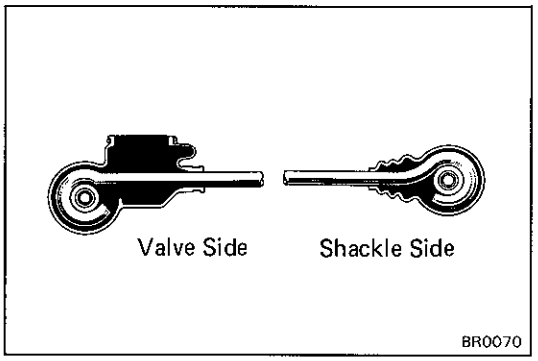
(c) Collars

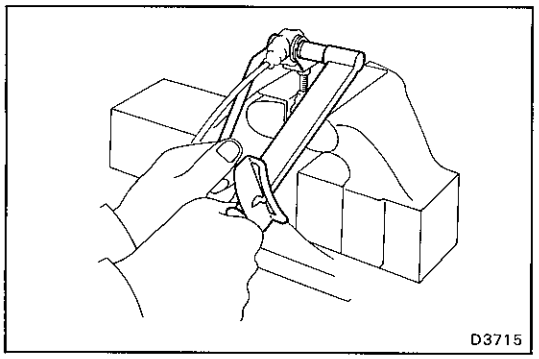
(d) Rubber plates

(e) Bushings

HINT:

- Apply lithium soap base glycol grease to all rubbing areas.
- Do not mistake the valve side for the shackle side of the load sensing spring.

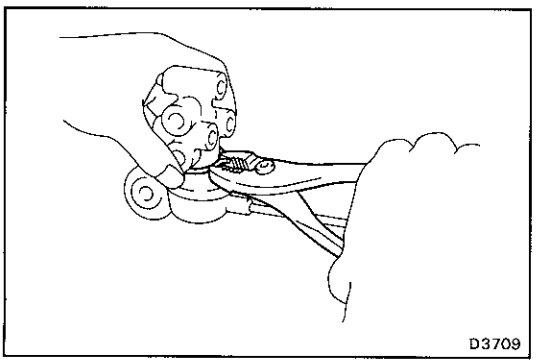




2. INSTALL SHACKLE NO.1 AND NO.2 TO LOAD SENSING SPRING

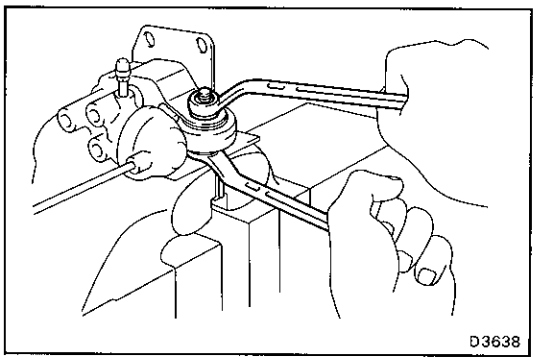
Install the shackle to the load sensing spring through the two plate washers.

Torque: 185 kg-cm (13 ft-lb, 18 N·m)



3. INSTALL LOAD SENSING SPRING TO VALVE BODY

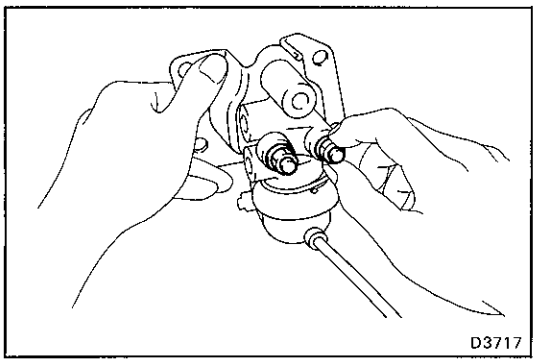
Install the load sensing spring assembly to the load sensing valve with a clip.



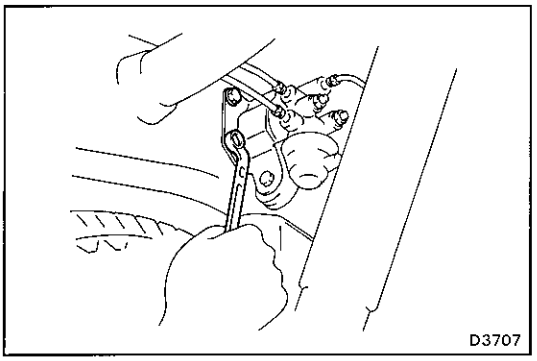
4. INSTALL VALVE BRACKET

(a) Install the load sensing spring assembly to the bracket, and torque the bolt and nut of load sensing spring boot through the two plate washers.

Torque: 185 kg-cm (13 ft-lb, 18 N·m)



(b) Install the set plate to the valve assembly and temporarily tighten the two valve body mounting nuts.

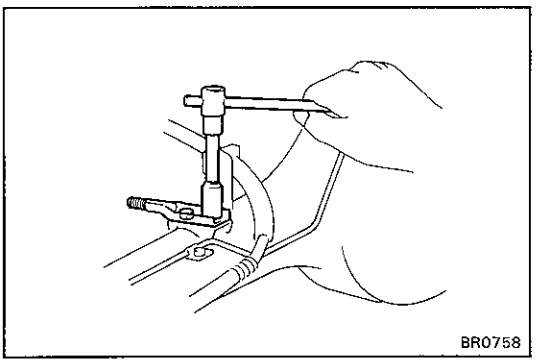


INSTALLATION OF LSPV

1. INSTALL LSPV ASSEMBLY

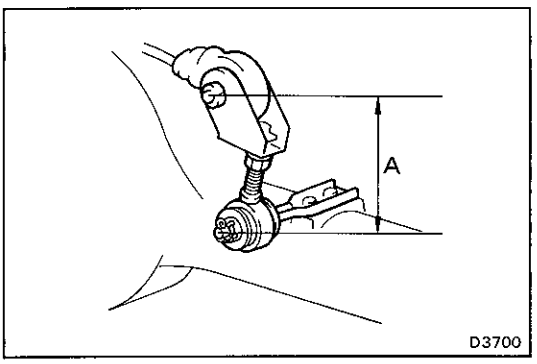
(a) Install the LSPV assembly to the No. 2 valve bracket with four bolts.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)



(b) Install the shackle bracket to rear axle housing with two bolts.

Torque: 195 kg-cm (14 ft-lb, 19 N·m)



2. CONNECT SHACKLE NO.2 TO BRACKET

(a) Set dimension A by turning shackle No. 2.

Initial set:
Heavy-Duty: 78 mm (3.07 in.)
Light-Duty: 90 mm (3.54 in.)

(b) Tighten the lock nut.

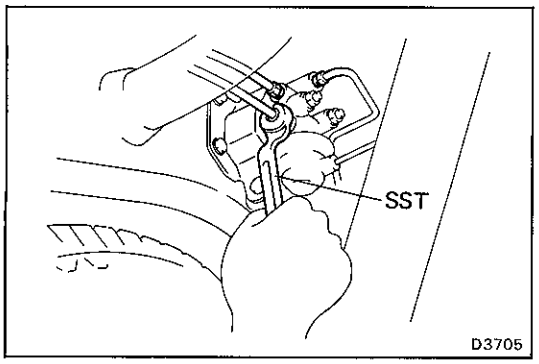
Torque: 250 kg-cm (18 ft-lb, 25 N·m)

(c) Install the two bushings and a collar to the load sensing spring shackle.

(d) Install the load sensing spring to the shackle bracket with the two retainers and a nut.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

(e) Install a new cotter pin.



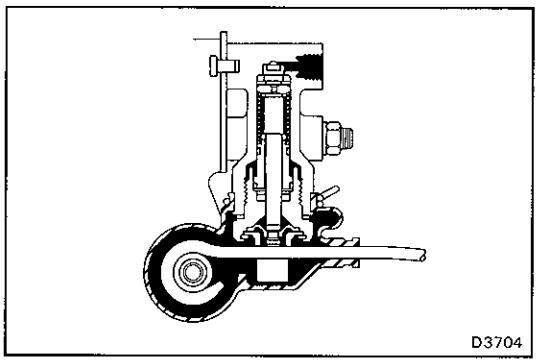
3. **CONNECT BRAKE TUBES**

Using SST, connect the brake tubes.

SST 09751-36011

Torque: 155 kg-cm (11 ft-lb, 15 N·m)

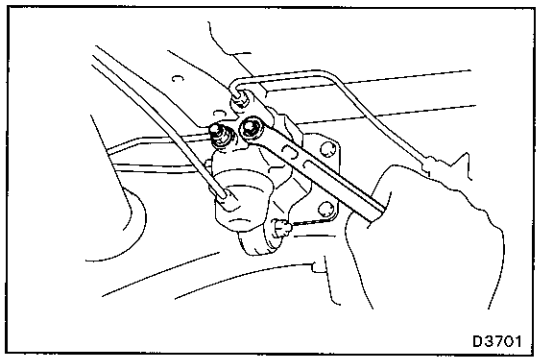
4. **SET REAR AXLE LOAD**
(See page BR-103)



5. **SET VALVE BODY**

(a) When pulling down the load sensing spring, confirm that the valve piston moves down smoothly.

(b) Position the valve body so that the valve piston lightly contacts the load sensing spring.



(c) Tighten the valve body mounting nuts.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

6. **BLEED BRAKE SYSTEM**
(See page BR-7)

7. **CHECK FOR FLUID LEAKAGE**

8. **CHECK AND ADJUST LSPV FLUID PRESSURE**
(See page BR-103)