



95ZV

SHOP MANUAL

Disassembly & Reassembly  
Service Standard

93215-00242



93215-00242  
June 2011

# SHOP MANUAL

## WHEEL LOADER

# 95ZV

### *Disassembly & Reassembly Service Standard*

Powered by CUMMINS QSX15 ENGINE

Serial No. 97C4-0101 and up  
97C4-9001 and up

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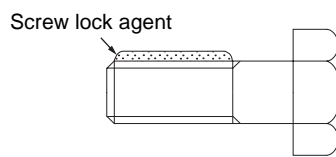
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## Screw lock agent application procedure

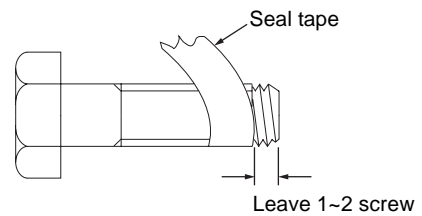
### Through-hole

Apply screw lock agent one or two lines on the male threads.



65ZV00002

## How to wind a seal tape

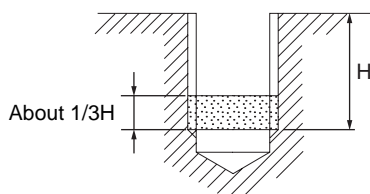


65ZV00004

To avoid a piece of seal tape left in the circuit, leave 1 or 2 screws from the end of the thread and start threading it clockwise.

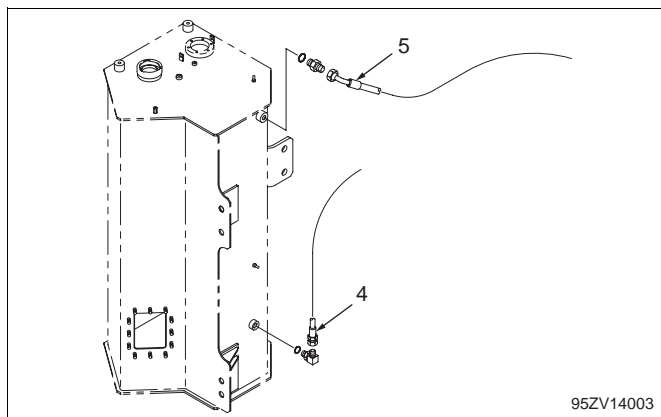
### Blind hole

Apply screw lock agent all-round on the female threads at  $\frac{1}{3}$  of the female thread length from the bottom.



65ZV00003

14-4  
95ZV Disassembly & Reassembly Chassis Group  
Fuel Tank



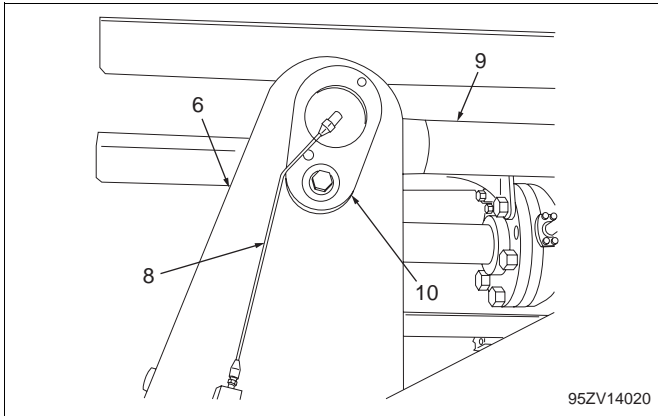
4. Slightly pull out fuel tank (2) to disconnect suction hose (4), return hose (5). Plug the fuel line to prevent dirt entry.

### Fuel tank installing

For reinstallation, follow the above procedure in reverse order.

### Fuel tank installation cautions

After reinstallation, be sure to completely bleed air from the fuel line.



4. Disconnect grease pipe (8) for lever (6).

**CAUTION**

You have to work at a high position to remove the grease pipe. Always use a stepladder for this work.

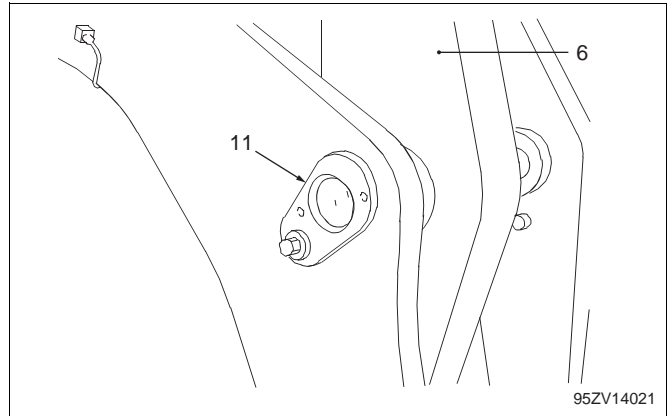
5. Temporarily sling bucket cylinder (9), and remove connection pin (10) from lever (6) and bucket cylinder (9).

 : Bucket cylinder: 180 kg (400 lbs)

**IMPORTANT**


Never rest cylinder rods on surfaces that may damage them. This may cause cylinder seal to leak.

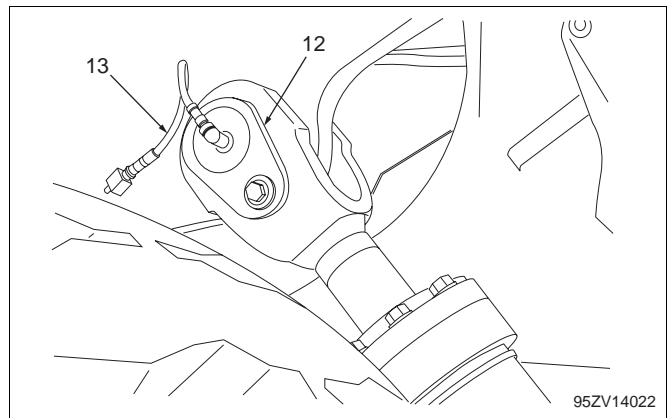
6. Start the engine and shorten the bucket cylinder rod. Stop the engine.



7. Temporarily sling lever (6), and then remove lever pin (11).

8. Remove lever (6).

 : Lever: 290 kg (640 lbs)



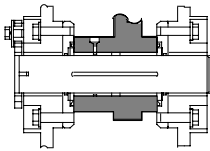
9. Remove grease hose (13) from pin (12).  
 Insert a wooden block between the boom cylinders and the hydraulic piping.  
 Remove pins (12) from the cylinder rods on both the right and left sides of the boom.

**Note**

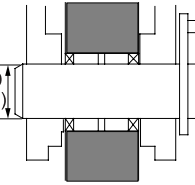
Placing a wooden support piece between the boom cylinder and the hydraulic pipe helps to reinstall the pin to the boom easily.

# Linkage

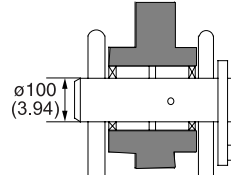
1. Bucket - Boom



2. Boom - Lever

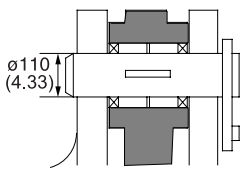


3. Boom - Boom cylinder

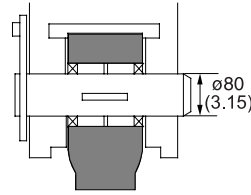


mm (in)

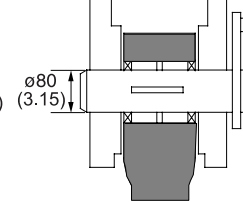
4. Front chassis - Boom



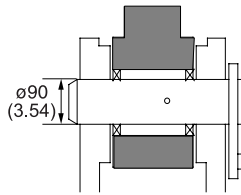
5. Bucket - Rod



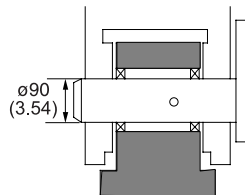
6. Lever - Rod



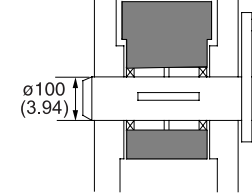
7. Lever - Bucket cylinder



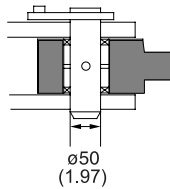
8. Bucket cylinder - Front chassis



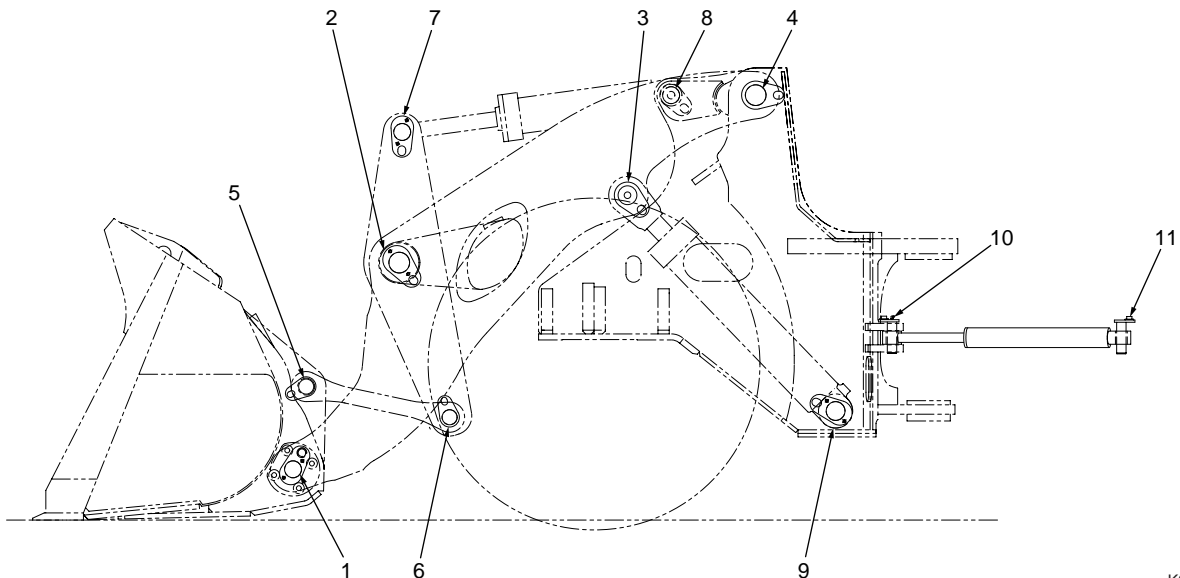
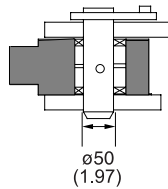
9. Boom cylinder - Front chassis



10. Front chassis - Steering cylinder

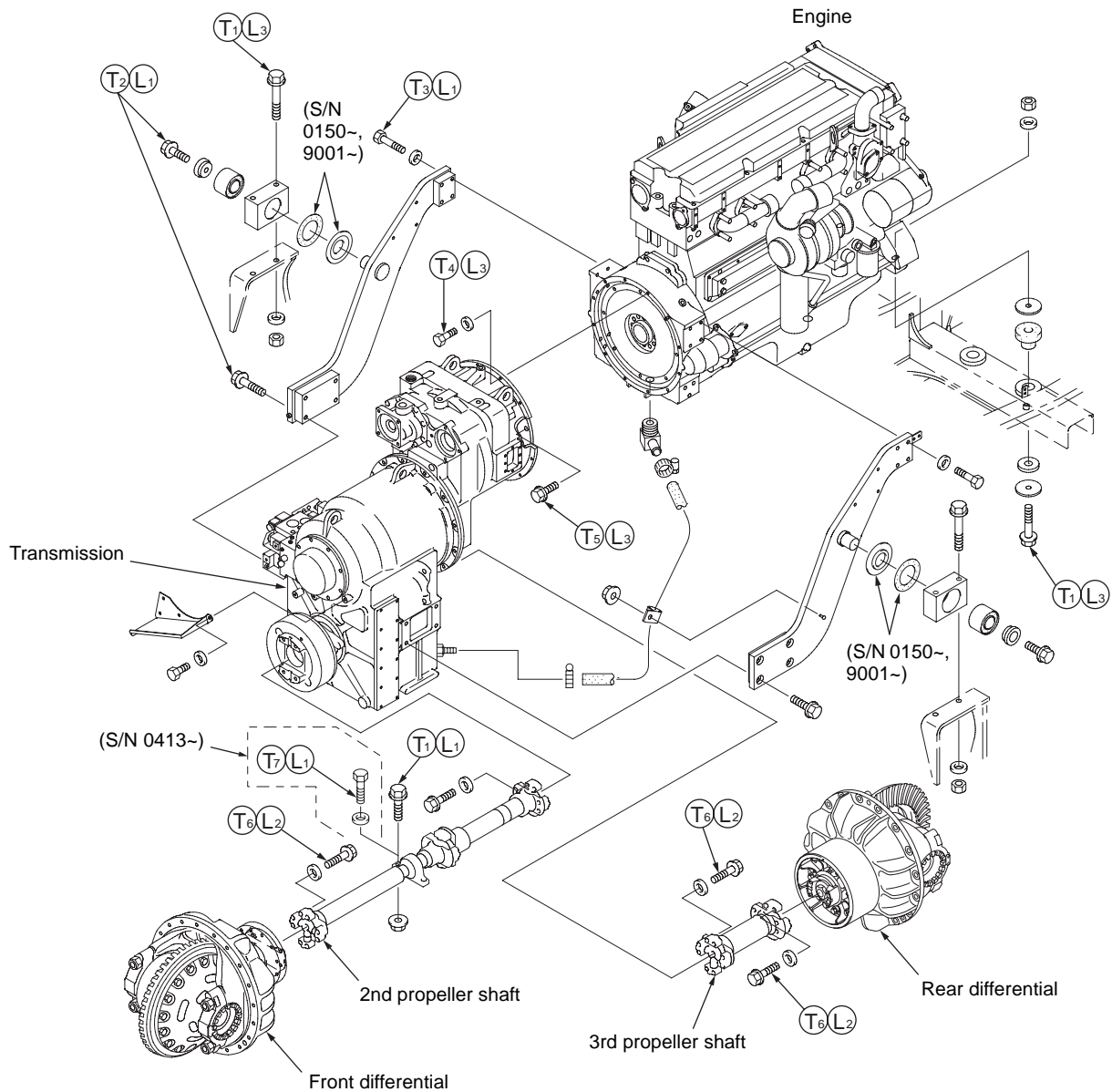


11. Steering cylinder - Rear chassis



# Power Line

## Power line tightening torque



95ZV24001a



- T<sub>1</sub>: 441 N-m (45.0 kgf-m) (325 lb-ft)
- T<sub>2</sub>: 230 N-m (23.5 kgf-m) (170 lb-ft)
- T<sub>3</sub>: 201 N-m (20.5 kgf-m) (148 lb-ft)
- T<sub>4</sub>: 67 N-m (6.85 kgf-m) (50 lb-ft)
- T<sub>5</sub>: 157 N-m (16.0 kgf-m) (116 lb-ft)
- T<sub>6</sub>: 142 N-m (14.5 kgf-m) (105 lb-ft)
- T<sub>7</sub>: 417 N-m (42.5 kgf-m) (307 lb-ft)



- L<sub>1</sub>: With liquid adhesive (Loctite® 262)
- L<sub>2</sub>: With liquid adhesive (Three Bond 1327)
- L<sub>3</sub>: With lubricating oil (Engine oil or gear oil)

### Note

Always replace drive shaft bolts with new ones - never reuse them.

## Air Cleaner

### Air cleaner removing and installing

#### Air cleaner removing

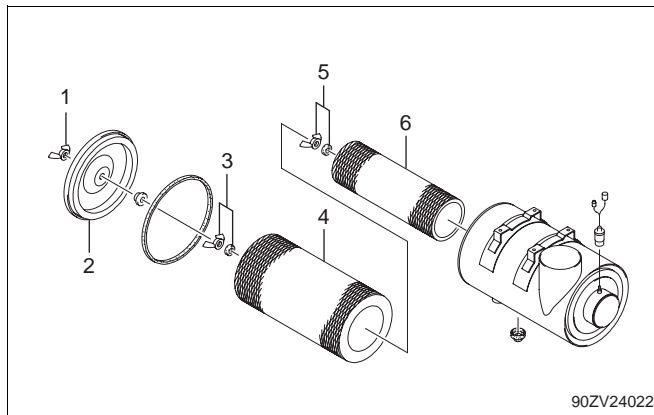
#### WARNING

Unexpected movement of the machine could cause an accident resulting in injury or death. To prevent such an accident, observe the following items:

- Park the machine on level ground.
- Lower the attachment onto the ground.
- Apply the articulation stopper.
- Block the front wheels with chocks or the like to prevent the wheels from moving.
- Before starting work, be sure to remove the engine key, and hang a "DO NOT START!" tag on the steering wheel, or disconnect the negative side of the battery.

#### IMPORTANT

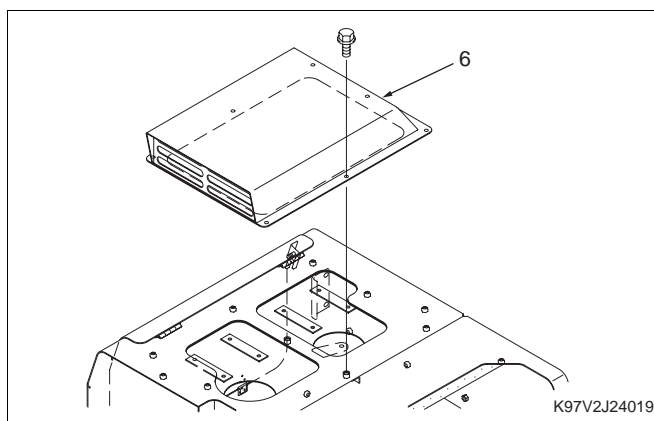
If a battery terminal is removed from a machine in less than 30 seconds after the key is put into the "OFF" position, it can corrupt the ECM program, which can disable the engine. Always wait 1 full minute to be sure to be past this "write to memory function" prior to removing battery terminals.



1. Release wing nut (1), and then remove cover (2).
2. Release wing nut (3), and then remove outer element (4).
3. Release wing nut (5), and then remove inner element (6).
4. Remove the rubber valve on the bottom of the air cleaner case, and inspect it for any damage. Replace it if necessary.

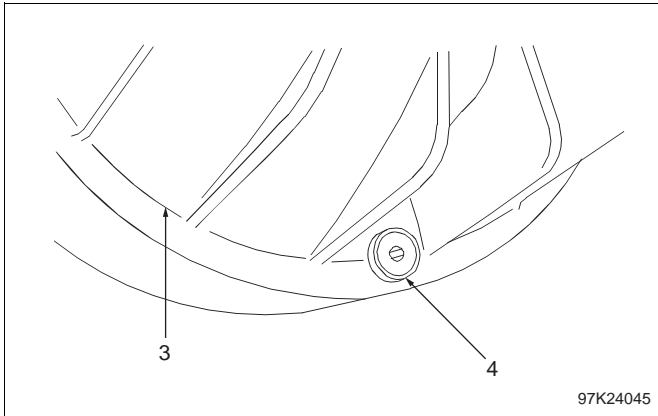
#### Note

Removing inside elements reduces the weight and makes air cleaner case removal work easier.



5. Remove cover (6) installed on the screen board.


24-22  
 95ZV Disassembly & Reassembly Power Group  
 Front Axle Assembly



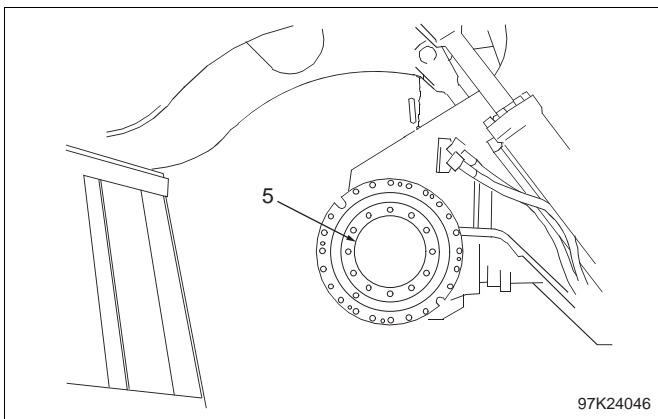
3. Turn drain plug (4) to the bottom of wheel hub (3) to drain oil.

 : Gear oil: Approx. 20 L (5.3 gal)



**Note**  
 To replace the oil, refer to the oil amount described below.

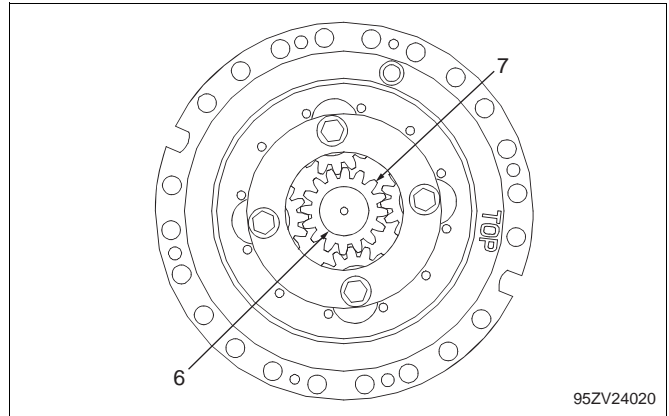
 : Wheel hub section:  
 20 L (5.3 gal) for left side,  
 20 L (5.3 gal) for right side

Differential section: 60 L (15.9 gal)  
 Total oil amount for front axle: 100 L (26.4 gal)

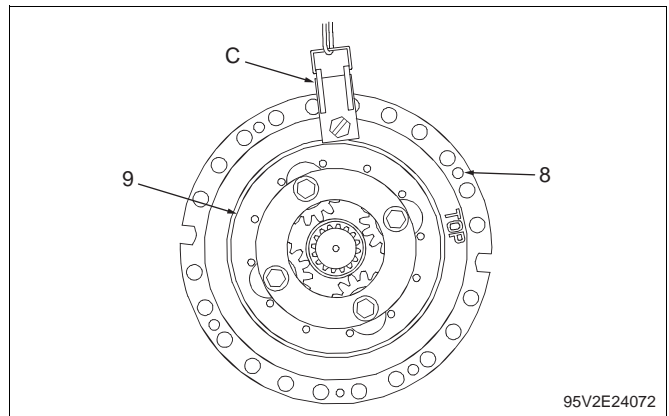


4. Remove cover (5).



 : Retainer bolt: 90 N-m (9.15 kgf-m) (66 lb-ft)  
 : Screw lock agent (Three Bond 1327)



5. Remove snap ring (6), and then remove sun gear (7).



6. Temporarily sling the spider using hoisting tool (C). Remove four spider retainer bolts (8) to remove spider assembly (9).

 : Retainer bolt: 86 N-m (8.8 kgf-m) (64 lb-ft)  
 : Spider assembly: 125 kg (275 lbs)

**Note**  
 The brake backing plate is fixed behind the spider assembly. Do not forget the brake retainer when re-installing the spider assembly.

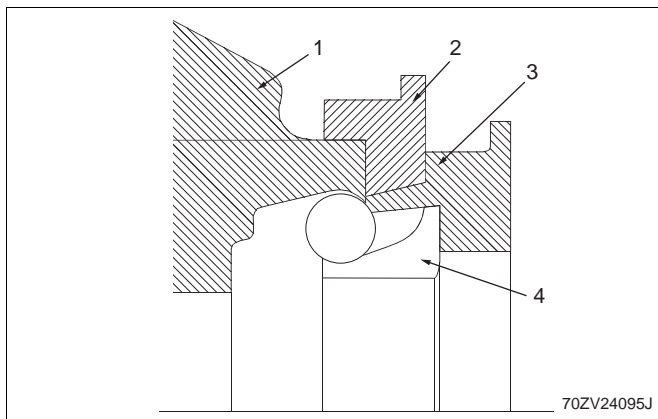
## 2. Assembling procedure

## (a) In case jig (G) is not used

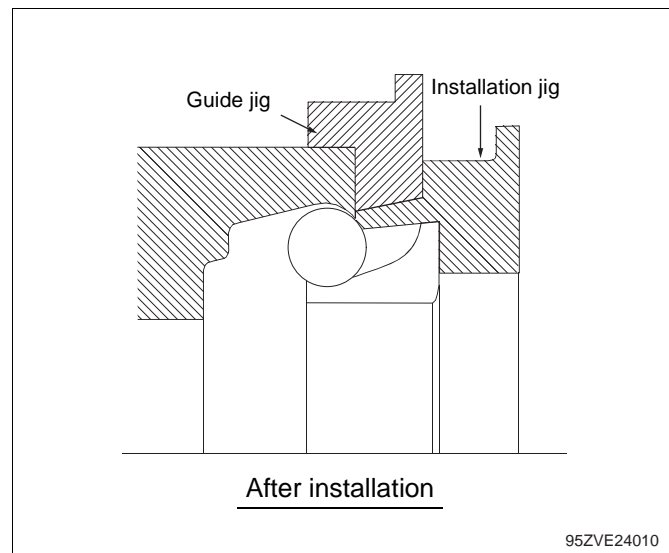
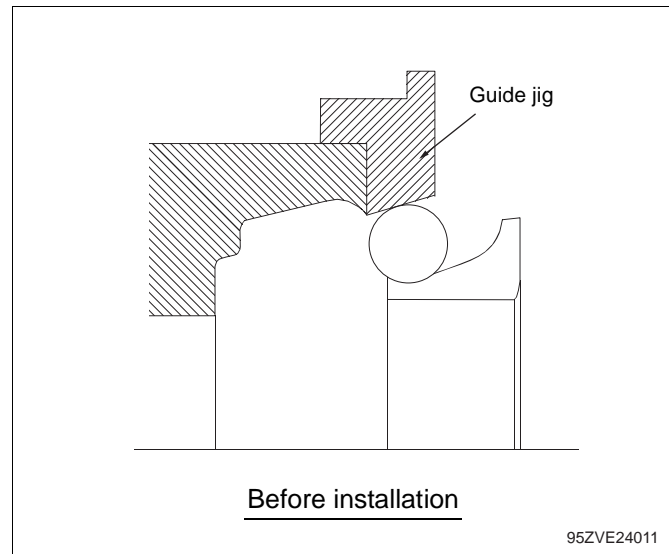
- Install the O-ring on the seal ring.
- Put thin gear oil on the O-ring.
- Insert the floating seal into the ring and the wheel hub pushing the O-ring with fingers. (Make sub-assembly)
- Check if the seal ring is correctly positioned and that the O-ring is not twisted.
- Clean the surface and put thin gear oil on it.
- Install the ring and the wheel hub to the axle housing.

## (b) In case jig (G) is used

- Install the guide jig to the wheel hub and / or the ring.
- Put thin gear oil on the O-ring.
- Insert the floating seal into the guide jig.
- Fix the installation jig to the floating seal, and push it until it reaches to the guide jig. (Make sub assembly)
- Remove the guide jig and the installation jig from the floating seal.
- Clean the surface and put thin gear oil on it.
- Install the ring and the wheel hub to the axle housing.



1. Wheel hub
2. Guide jig
3. Installation jig
4. Floating seal



## 3. Caution before operation

- After assembling, turn the wheel hub 2~3 turns by hands.
- Check if it turns lightly by hand. If it is tight and hard to turn the wheel hub, the O-ring may be twisted. In this case it is necessary to disassemble the floating seal.

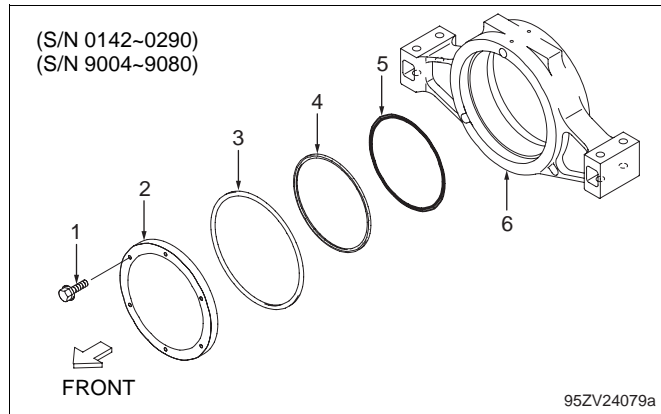
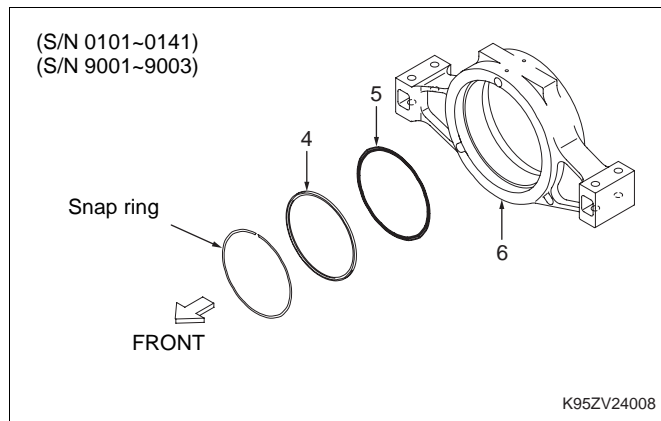


## Axle support disassembling and assembling

### Axle support disassembling (S/N 0101~0290, 9001~9080)


Before starting work

- Remove the rear axle assembly from the rear chassis.




1. (S/N 0101~0141, 9001~9003)  
 Remove snap ring.

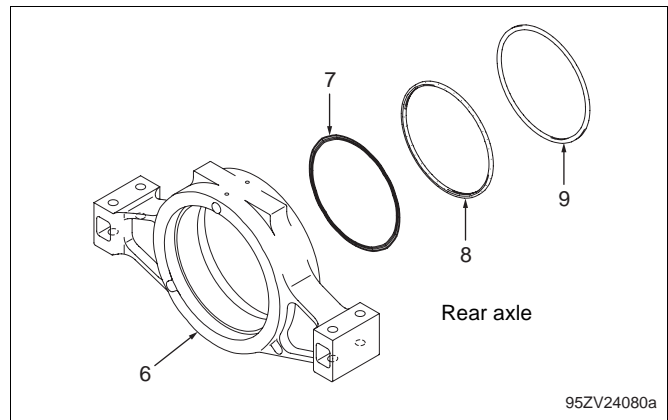
(S/N 0142~0290, 9004~9080)  
 Remove bolt (1), plate (2) and ring (3).

 Bolt (1): 53 N-m (5.4 kgf-m) (40 lb-ft)

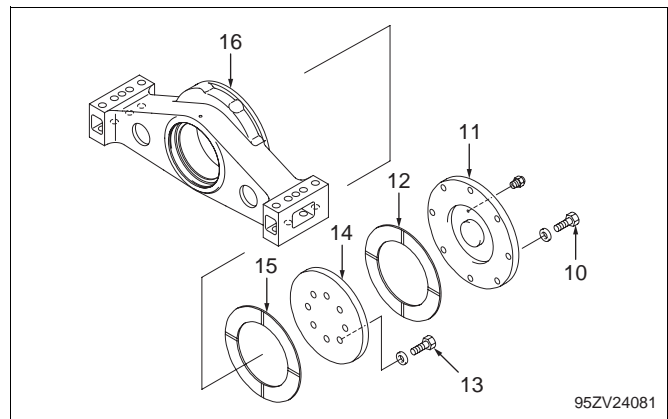
2. Remove packing (4) and O-ring (5).

3. Remove front axle support (6) from the rear axle assembly.


 Axle support (6): 90 kg (200 lbs)




4. Remove O-ring (7) and packing (8).  
 Remove ring (9) (S/N 0142~, 9004~ only)




5. Remove bolt (10).


 Bolt (10): 608 N-m (62.0 kgf-m) (449 lb-ft)

 Screw lock agent (Three Bond 1327)  
 application

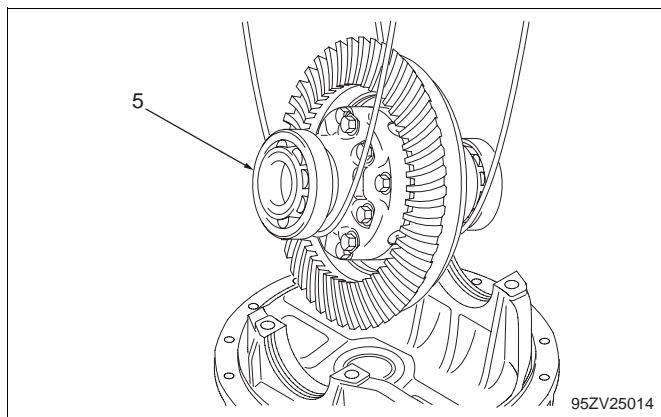
6. Remove plate (11) and wear ring (12).

7. Remove bolt (13). Remove plate (14) and wear ring (15) from rear axle support (16).

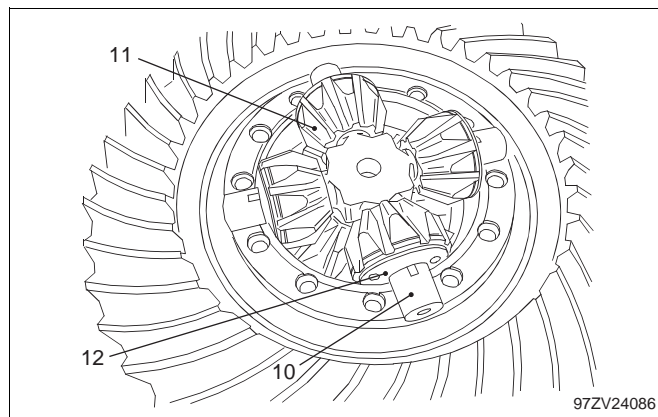
 Bolt (13): 608 N-m (62.0 kgf-m) (449 lb-ft)

 Screw lock agent (Three Bond 1327)  
 application

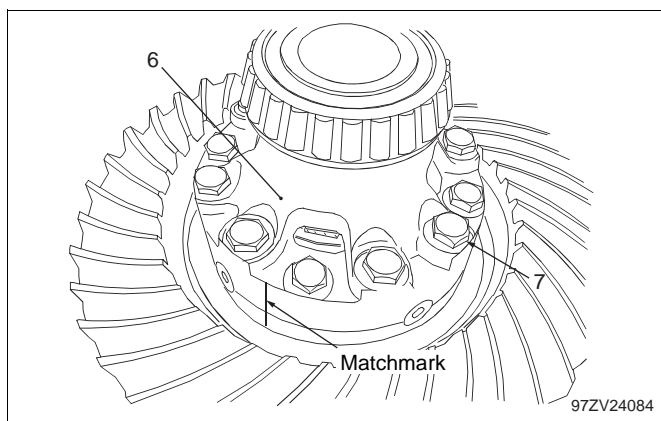
24-62  
95ZV Disassembly & Reassembly Power Group  
Differential Assembly



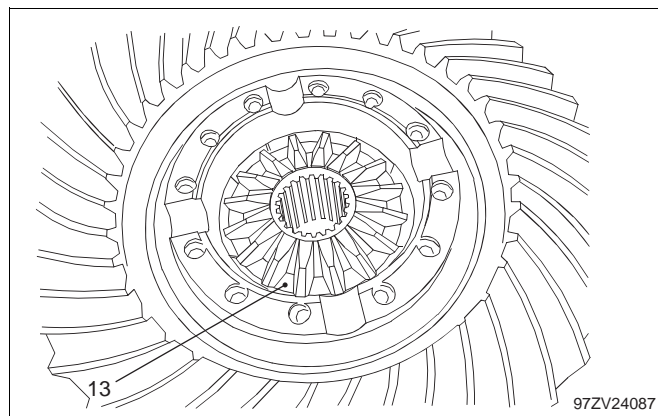
3. Lift differential cage assembly (5) to remove it.





6. Remove spider (10) with pinion gears (11) and thrust washers (12) as a unit.

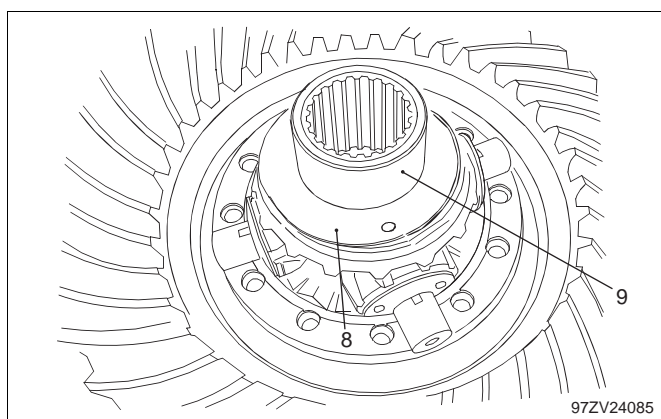


4. Put a matchmark on the alignment point of differential cage (6). Remove bolts (7), and then separate the differential cage.



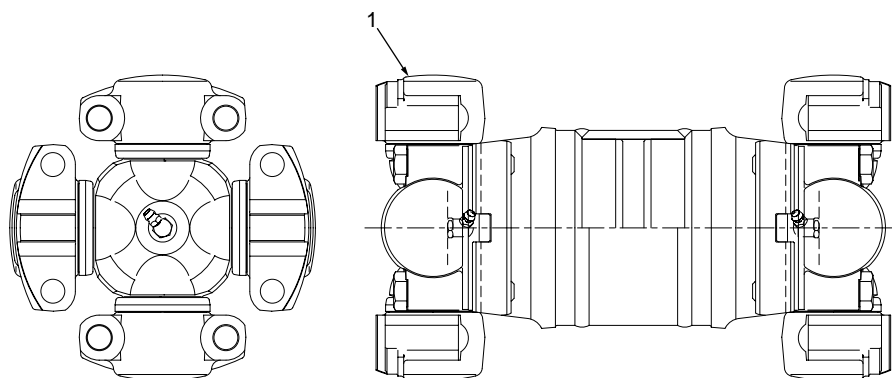
7. Remove side gear (13).

-  Bolt (7): 216 N-m (22.0 kgf-m) (159 lb-ft)
-  Screw lock agent (Three Bond 1327)



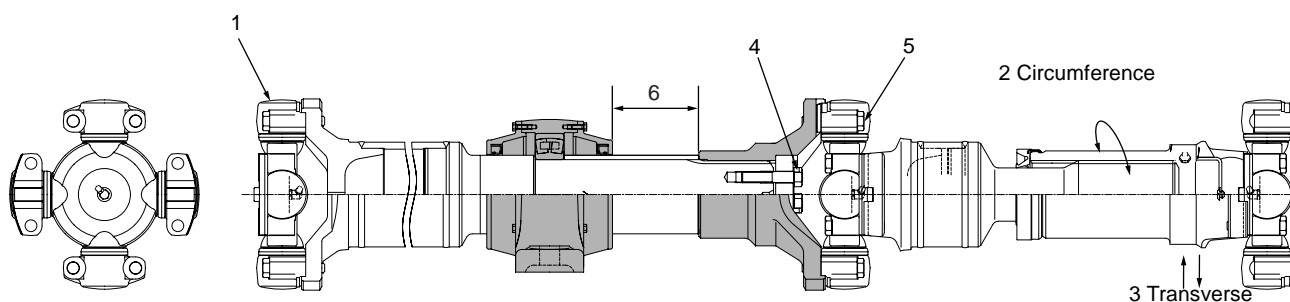
5. Remove bushing (8) and side gear (9).

## Propeller Shaft Service Standard



Third propeller shaft

95ZV25032



Second propeller shaft

95ZV25033

Unit: mm (in)

No.	Item		Tolerance	Solution
1	Spider bearing play	Second, third propeller shaft	0.25 (0.0098)	Replacement
2	Spline circumferential play	Second propeller shaft	0.8 (0.0315)	Replacement
3	Spline transverse play	Second propeller shaft	1.0 (0.0394)	Replacement
4	Bolt tightening torque		162N-m (16.5 kgf-m) (119 lb-ft)	Tightening
5	Bolt tightening torque		162N-m (16.5 kgf-m) (119 lb-ft)	Tightening
6	Clearance		Standard 76.0±3 (3±0.1)	—

## Transmission assembly installation cautions

- Be sure to replace the O-ring at the connecting part between the engine and the transmission with new one.
- After reinstallation, check operation of the transmission assembly by the following procedure.

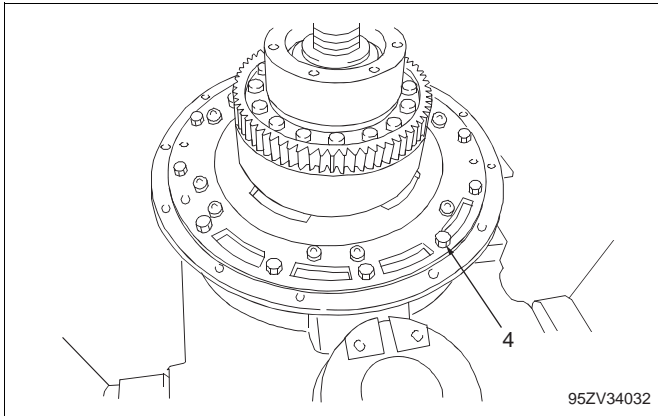
### **WARNING**

Unexpected movement of the machine could cause an accident resulting in injury or death.

To prevent such an accident, be sure to stop the engine, and block to the tires with chocks before you start service work. During the service work clearly communicate with the person in the operator seat using signals as agreed upon before hand.

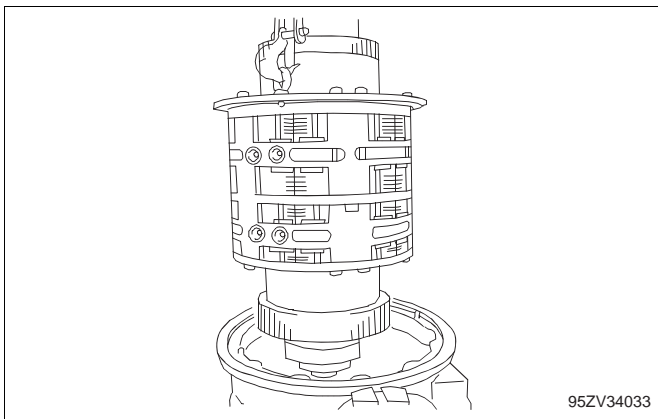
1. At the completion of reinstallation, start the engine, and check that the shift lever properly functions at all the positions.
2. Check each section for oil leakage.
3. Adjust the transmission oil level to the specified point with the level gauge.
4. Perform the start-up tests as shown on the attached sheet.

95ZV Disassembly & Reassembly Torque Converter and Transmission Group  
Transmission Assembly



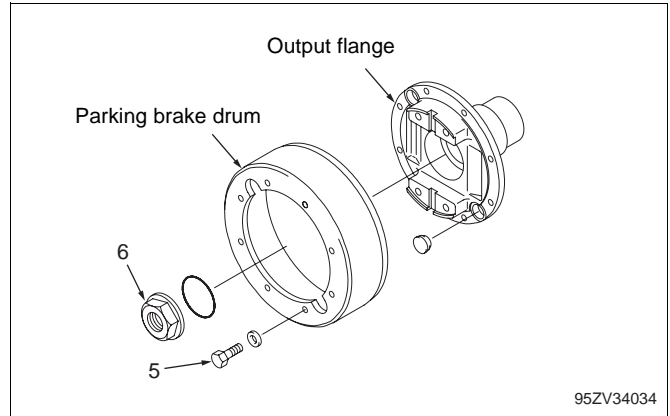
4. Remove 12 each of bolt (4) of the clutch pack assembly.

- : Bolt (4): 94 N-m (9.55 kgf-m) (69 lb-ft)
- : With lubrication oil (Engine oil or gear oil)



5. Lift and remove the clutch pack assembly.

- : Clutch pack assembly: 390 kg (860 lbs)

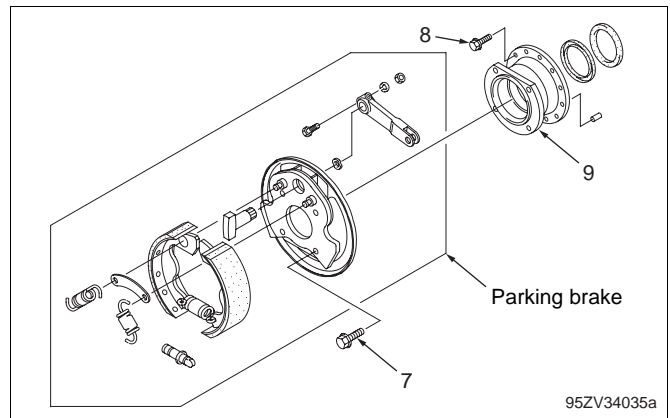


6. Remove bolt (5), and then remove the parking brake drum.

- : Bolt (5): 132 N-m (13.5 kgf-m) (98 lb-ft)
- : Screw lock agent (Loctite® 262)

7. Remove nut (6), and then remove the output flange.

- : Nut (6): 882 N-m (90.0 kgf-m) (651 lb-ft)  
(Nut width across flats: 60 mm (2.36 in))

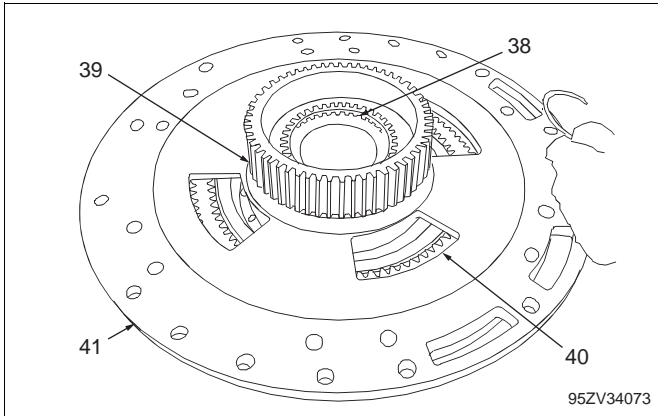


8. Remove bolts (7) and then remove the parking brake.

- : Bolt (7): 230 N-m (23.5 kgf-m) (39 lb-ft)
- : Screw lock agent (Loctite® 262)

9. Remove bolts (8) and then remove housing (9).

- : Bolt (7): 53 N-m (5.4 kgf-m) (39 lb-ft)
- : With lubrication oil (Engine oil or gear oil)



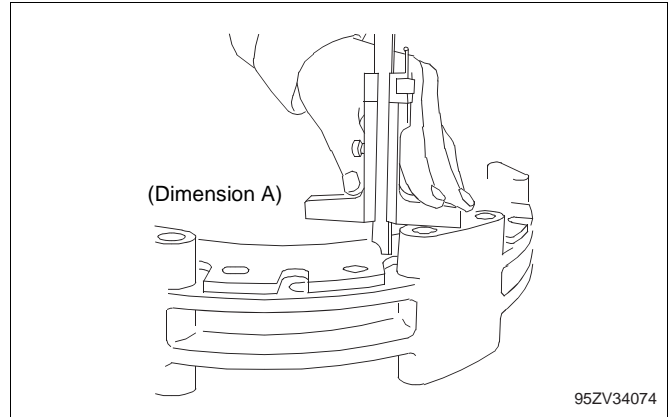
23. Turn over the reverse housing. Remove snap ring (38) then pull out clutch gear (39).
24. Remove reverse housing (41) from reverse spider assembly (40).

### Clutch assembly assembling

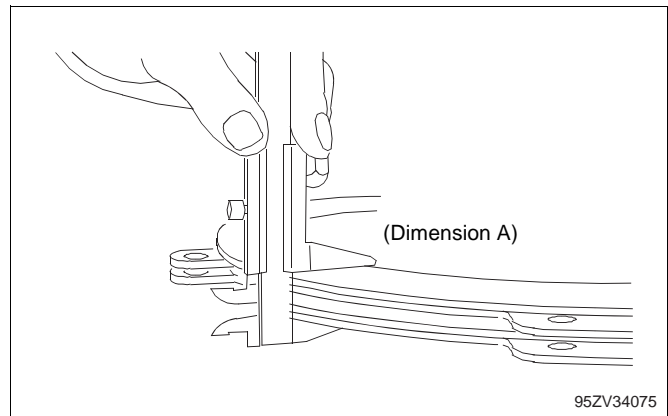
Before starting work:

- Clean and check each part, and replace part with a new one if necessary. (Refer to Section 35 for the limit.)
- Be sure to apply transmission oil to each necessary point when reassembling the clutch assembly.
- Replace the packing and the seals with new ones.
- Check each steel plate for flatness. If there is any warpage, replace the plate.
- Measure each piston stroke of 2nd, 3rd, low and reverse. Refer to the following procedure.

### Measurement of piston stroke



- (a) Assemble the desired clutch piston to each clutch housing, and measure the dimension as shown in the illustration. (This is dimension A.)



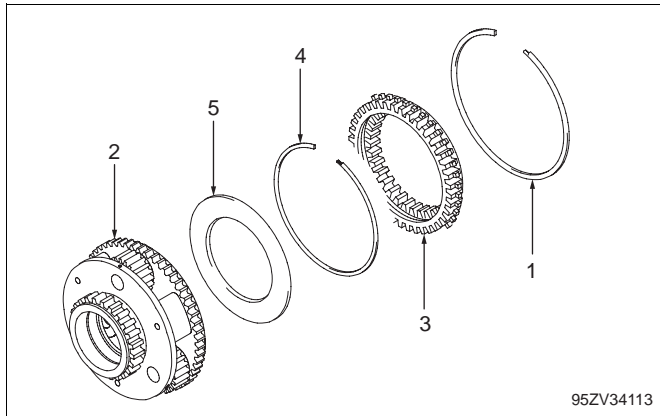
- (b) Set the necessary quantity of friction plates and steel plates referring to the following table and measure the total thickness. (This is dimension B.)
- (c) The dimension A-B is the piston stroke and the piston stroke should be within the range shown in the following table.

	Friction plate	Steel plate	Piston stroke, mm (in)
2nd	3 pcs	2 pcs	2.0±0.5 (0.0787±0.0196)
3rd	3 pcs	3 pcs	2.5±0.5 (0.0984±0.0196)
Low	6 pcs	5 pcs	3.5±0.5 (0.1378±0.0196)
Reverse	6 pcs	5 pcs	3.5±0.5 (0.1378±0.0196)

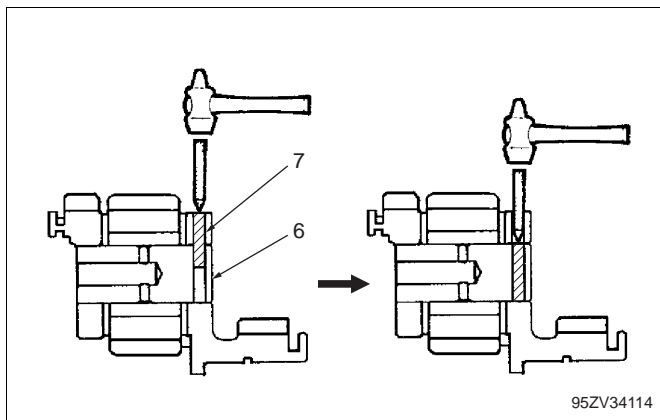
- (d) Replace the related parts or check the assembly condition if the piston stroke is out of the above range.

## 2nd clutch spider disassembling and assembling

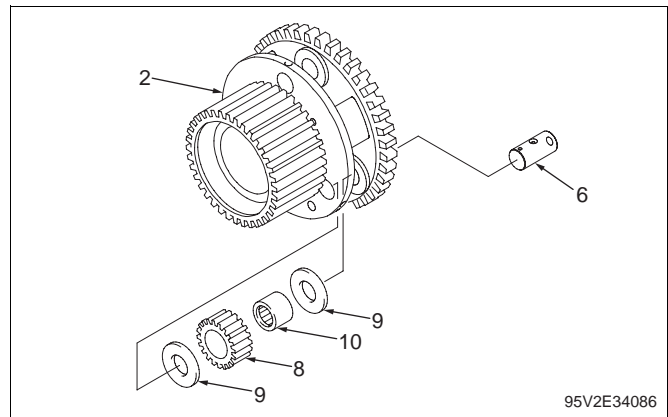
### 2nd clutch spider disassembling



1. Force snap ring (1) inward using a round bar to separate spider (2) and ring gear (3).
2. Remove snap ring (4), then remove plate (5).



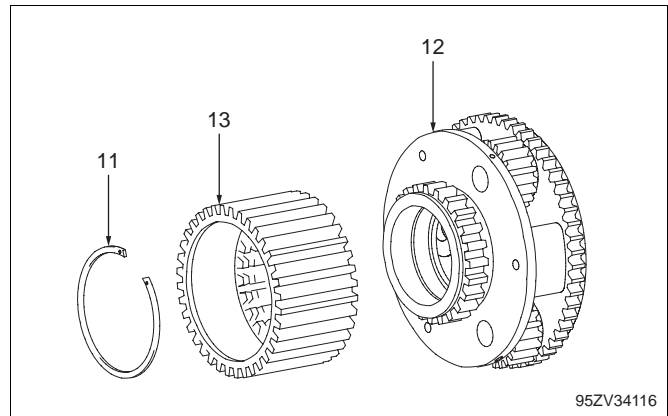
3. Drive spring pin (7) that locks pin (6) all the way into the pin to unlock it (3 positions).



4. Pull out planetary pin (6), and remove planetary gear (8), washer (9), and needle bearing (10).

#### Note

- Once the planetary pin has been removed, take the spring pin out.
- Washer (9) has grooves on its surface on T/M S/N 857 and thereafter.



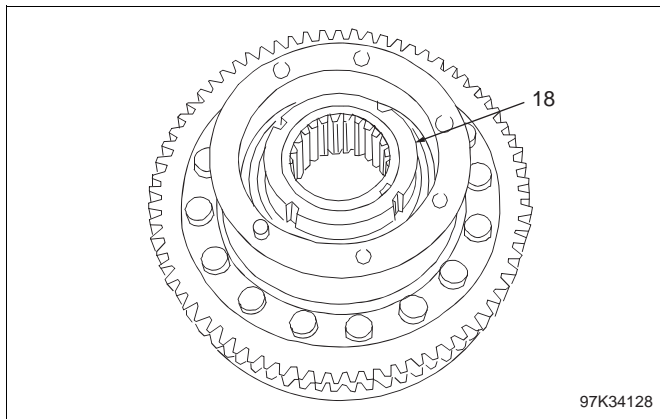
5. Force snap ring (11) inward with a round bar to separate spider (12) and the 1st speed clutch gear (13).

### 2nd clutch spider assembling


To reassemble the 2nd clutch spider, follow the procedure described above in reverse order.

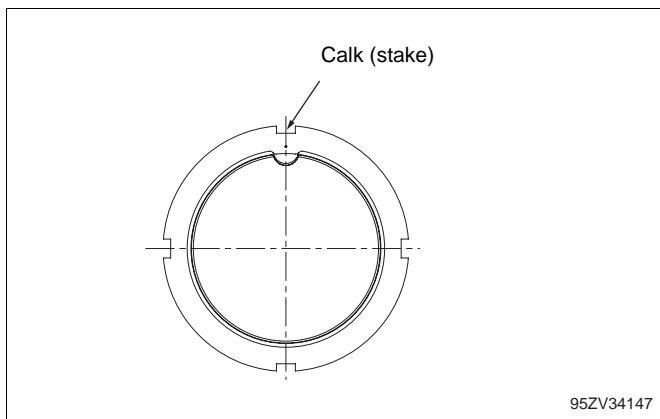
#### Before starting work:

- Clean and inspect each part, replace if necessary. For inspection and wear standard, refer to Section 35.
- Replace the bearing with new one, if necessary, manually turn the bearing to check that the bearing rotates properly.



11. Install bearing nut (18).

: Tighten the bearing nut so as to the pre-load at the point A is 78.5 ~ 88.3 N (8 ~ 9 kgf) (18 ~ 20 lbf).



12. After confirming the pre-load, stake bearing nut (18) to lock it.

## Hydraulic Parts Removal and Installation Warning

Disassembly and reassembly work of hydraulic parts greatly depends on the working area and working condition (soon after operation or not).

Understand the following items well and work safely.

### **WARNING**

Unexpected movement of machine could cause serious injury or death. To prevent such an accident, observe the following items:

- Park machine on level and solid ground.
- Apply the parking brake and block tires with chocks to prevent wheels from moving.
- Be sure to remove the engine key, and hang a "DO NOT START!" tag on the steering wheel or the operator's seat.
- Relieve the internal pressure from the hydraulic line and hydraulic tank.
- Use signals as agreed upon before starting work.
- Do not enter the hazardous area.
- When removing a heavy load over 20 kg (44 lbs), use a crane or a lift device.
- Stay out of the working area while using a crane.
- While working with the boom raised, put safety blocks or supports to prevent it from dropping suddenly.
- The temperature at each part may be high soon after the engine is stopped. Be careful not to get burned.
- When removing pipes, place a container to catch the drained oil.

### **IMPORTANT**

- Cover disconnected hoses and pipes with plastic caps or plugs to protect them from dust, water and dirt.
- Apply the specified torque to tighten each part.

## Boom cylinder installing

To reinstall the boom cylinder, follow the above removal procedure in reverse order.

## Boom cylinder installation cautions

Be sure the pins accept grease after installation.

## Cylinder air bleeding procedure

<b>IMPORTANT</b>
------------------

After repairing or replacing a cylinder, be sure to bleed the cylinder of air, or the piston seal or back-up ring may be seized.
--

- (a) While operating the engine at low-idling speed, operate the cylinder piston for 4 to 5 strokes.

### Note

Stop the piston about 100 mm (4.0 in) before stroking fully.

- (b) After that, stroke the cylinder piston fully to both ends 4 to 5 times.
- (c) Add hydraulic oil to the tank, and check the cylinder and its piping for oil leakage.

## Pilot Valve

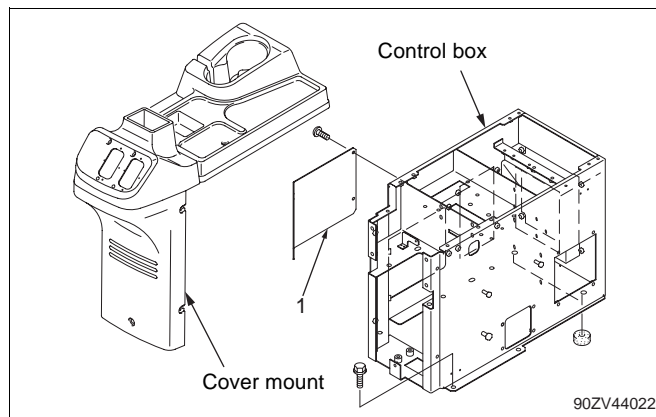
### Pilot valve removing and installing

#### Pilot valve removing (S/N ~0290, ~9080)

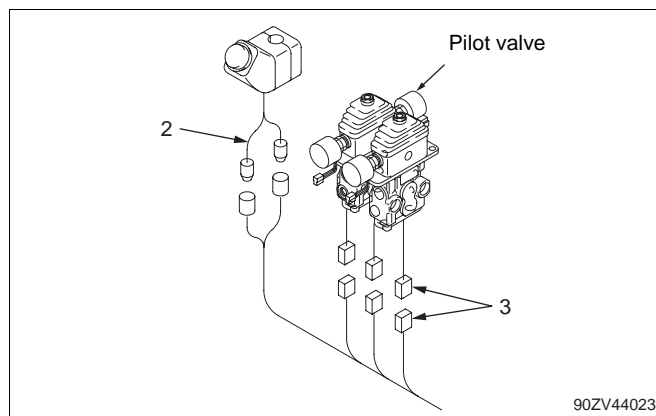
#### WARNING

Unexpected movement of machine could cause serious injury or death. To prevent such an accident, observe the following items:

- Park the machine on level ground, and then block the tires with chocks to prevent the wheels from moving. In addition, apply the parking brake.
- Lower the attachment onto the ground, and then relieve the internal pressure from the line.
- Relieve the internal pressure from the hydraulic tank.



1. Open the cab door (the right hand side). Remove cover (1) from the control box.



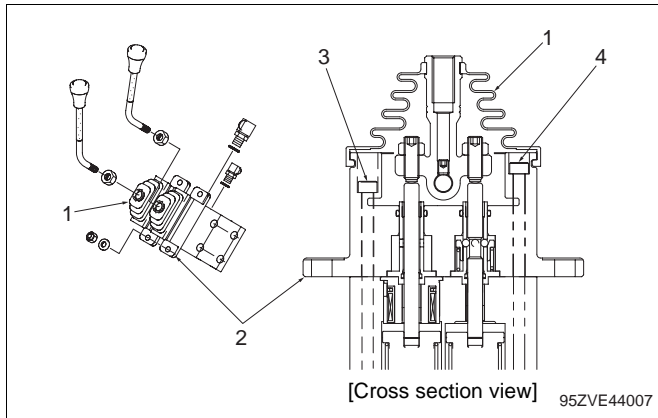
2. Disconnect electrical line (2) of the QUAD switch.
3. Disconnect electrical line coupler (3) from the pilot valve.

#### Note

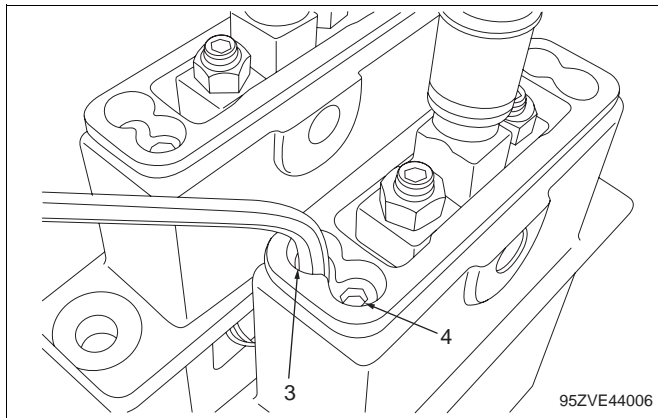
Before disconnecting the electrical couplers, be sure to put matchmarks on them.

## Pilot valve disassembling


(Illustrated on the bucket side. Disassemble the boom side in the same manner.)



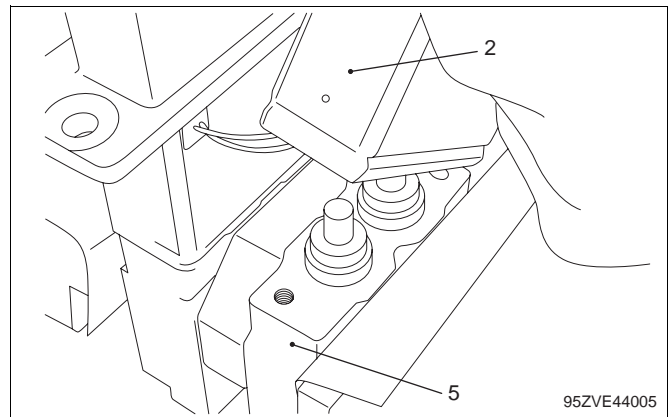
1. Plug all ports of the pilot valve and rinse it with illuminating kerosene.
2. Clamp the pilot valve in a vise.  
Pull up boot (1) to remove it from cover (2).



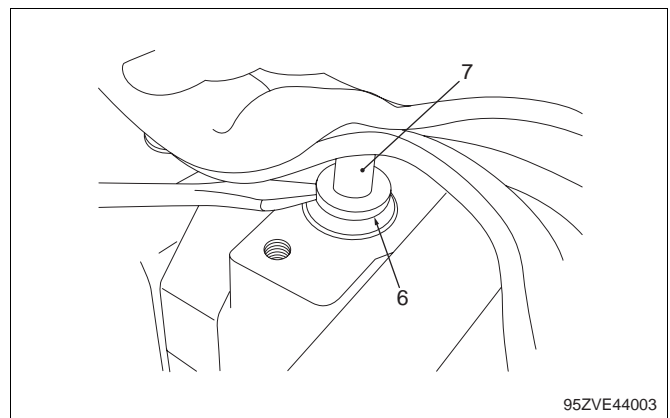
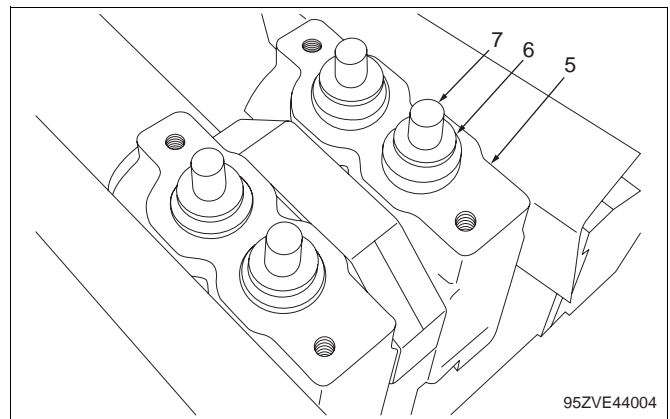
3. Loosen socket bolts (3), which look deeper, with a hexagon (Allen) wrench.

: Socket bolt (3):  
 8.8 N-m (0.90 kgf-m) (6.5 lb-ft)

**Note**  
 Do not loosen bolt (4) here, which is later loosened in step 18.



4. Put match-marks on cover assembly (2) and case assembly (5). Then remove the cover from the case assembly.



5. Remove plug (6) by carefully pushing it up with a screwdriver while pressing push rod (7) with a cloth.

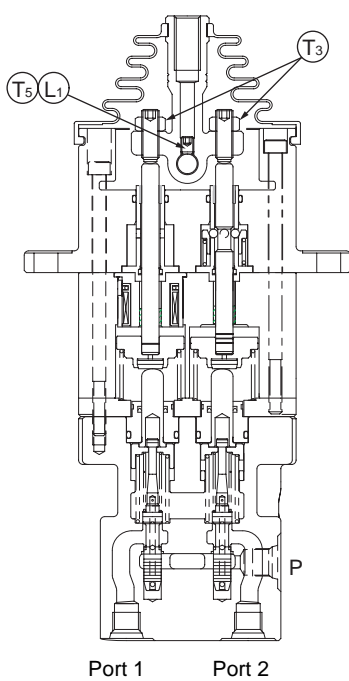
**Note**  
 Carefully remove plug (6) as plug (6) and push rod (7) may spring out by the force of return spring inside.

## Pilot valve disassembling and assembling (S/N 0411~)

### IMPORTANT

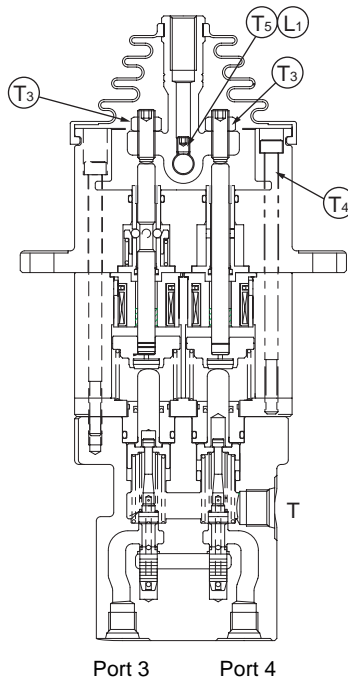
Before disassembly or reassembly, read and understand the aforementioned "Hydraulic Parts Disassembly and Assembly Cautions" page 44-3.

### Pilot valve cross section and tightening torque



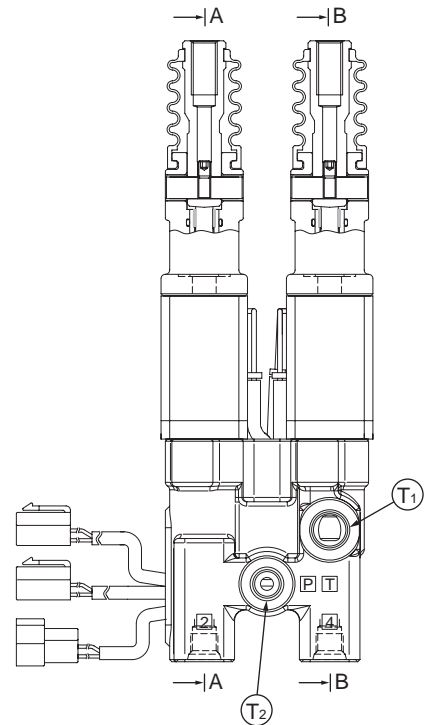
Port 1 Port 2

Cross section A-A



Port 3 Port 4

Cross section B-B



Port 1, 2 Port 3, 4

K90Z544002



- T<sub>1</sub>: 49.0 N-m (5.0 kgf-m) (36.0 lb-ft)
- T<sub>2</sub>: 29.5 N-m (3.0 kgf-m) (22.0 lb-ft)
- T<sub>3</sub>: 17.0 N-m (1.7 kgf-m) (12.3 lb-ft)
- T<sub>4</sub>: 9.0 N-m (0.9 kgf-m) (6.5 lb-ft)
- T<sub>5</sub>: 7.0 N-m (0.7 kgf-m) (5.1 lb-ft)



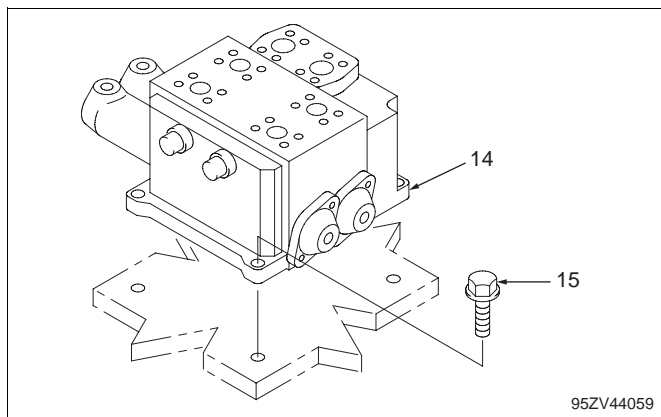
L<sub>1</sub>: Screw lock agent (Loctite® 241) application





: Pilot valve: 6.5 kg (14.5 lbs)



: Port 1~4 (adapter)  
 29.5 N-m (3.0 kgf-m) (22.0 lb-ft)



7. Remove bolts (15) for control valve (14).  
Use a hoist to remove the control valve.

 : Bolt (15): 94 N-m (9.6 kgf-m) (69 lb-ft)  
 : Multiple control valve: 100 kg (220 lbs)

### Multiple control valve installing

To reinstall the multiple control valve, follow the above removal procedure in reverse order.

### Multiple control valve installation cautions

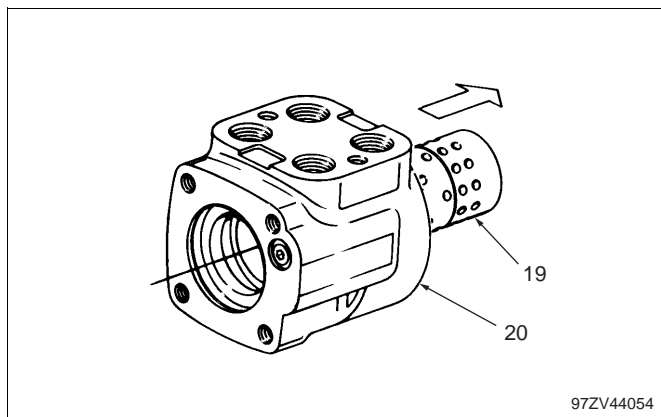
1. Replace all the O-rings with new ones.
2. Wash the multiple control valve mounting area.

### WARNING

Unexpected movement of the machine may cause serious injury or death.

To prevent such an accident, be sure to stop the engine before you start working. In addition, block the tires with chocks to prevent the wheels from moving. While working, carefully keep contact with the person in the cab by giving signals to each other.

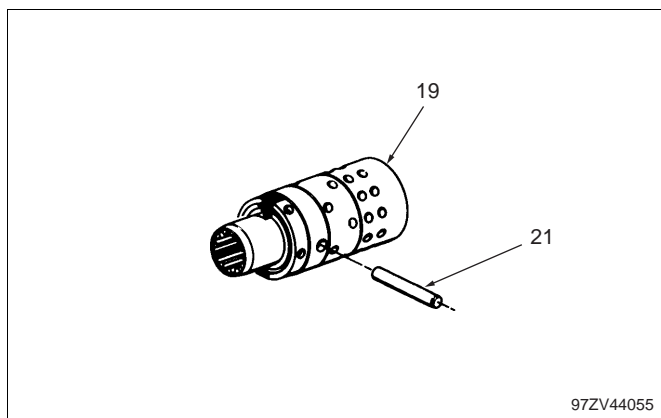
3. Attach the pressure gauge, and then start the engine. Measure the pressure, and adjust it to the specified value. For a detailed description of pressure adjustment, refer to the Section 03.
4. Operate the attachment and the boom, and check that they operate correctly.
5. Check each section for oil leakage.
6. Add hydraulic oil to the tank until the oil level rises to the specified point.



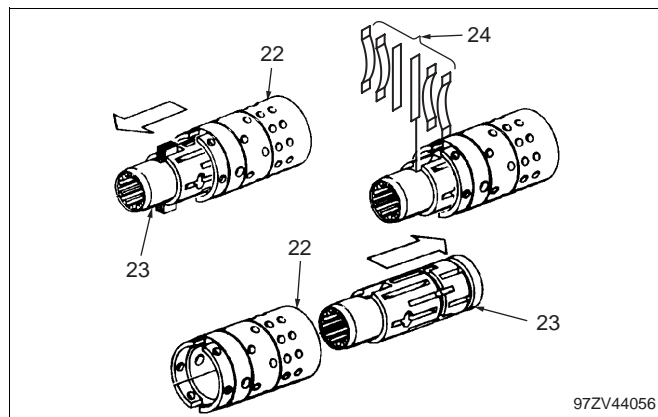
9. Pull spool and sleeve assembly (19) out slowly, turning it clockwise and counterclockwise from housing (20).

**Note**

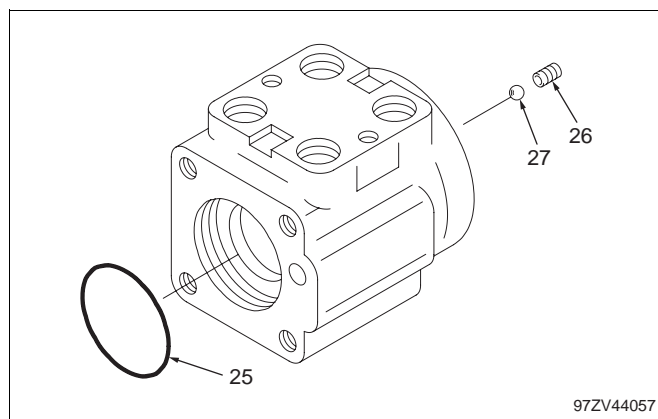
Take care so that the spool and sleeve do not damage the housing.



10. Pull out pin (21) from the spool and sleeve assembly (19).



11. Push spool (23) slightly out of sleeve (22), and remove centering springs (24). Pull the spool from the sleeve while slowly turning the spool clockwise and counterclockwise.



12. Remove O-ring (25) from the housing.

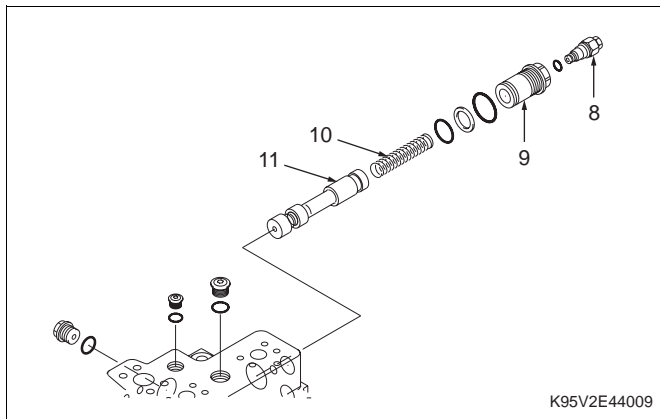
13. Remove adapter (26) to take out ball (27).

**Note**

Do not disassemble, unless absolutely necessary.

44-72

95ZV Disassembly & Reassembly Hydraulic Group  
Steering Valve




### Steering valve assembling

To reassemble the steering valve, follow the above disassembly procedure in reverse order.

5. Remove relief valve (8) and plug (9).  
Pull out spring (10) and flow control spool (11) from the casing.

Width across flat: (8): 19 mm (0.748 in)

(9): 41 mm (1.614 in)

: (8): 79 N-m (8 kgf-m) (59 lb-ft)

(9): 98 N-m (10 kgf-m) (72 lb-ft)

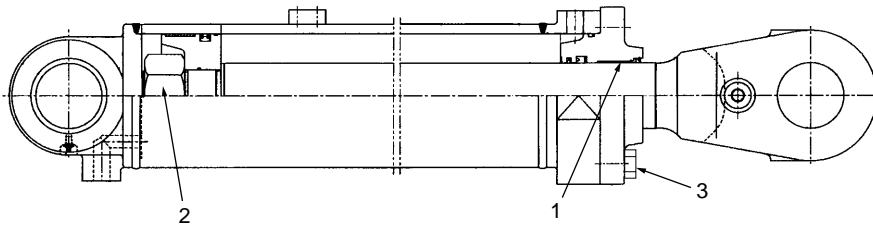
#### Note

- Carefully remove plug (9). It may spring out by the spring force.
- Carefully pull out flow control spool (11) so that the casing and flow control spool are not scratched.

6. Remove plug (7) loosened on paragraph 4.

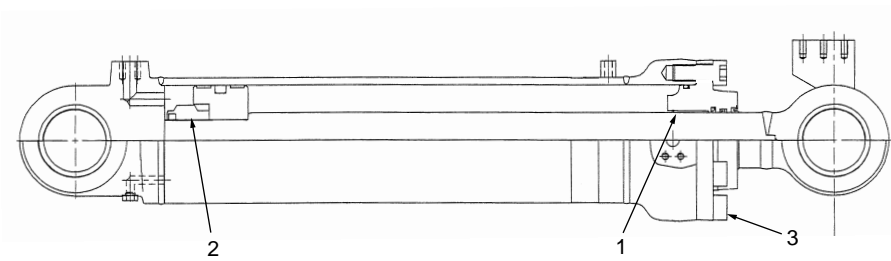
# Hydraulic Cylinder

## Boom cylinder



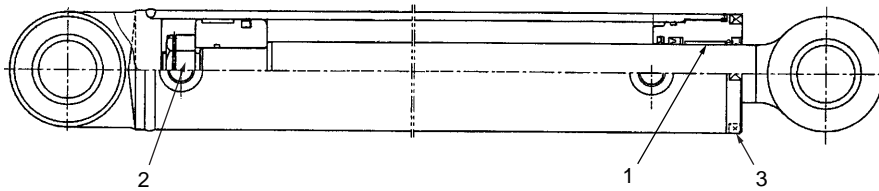
97ZV45004

## Bucket cylinder



95V2E45001

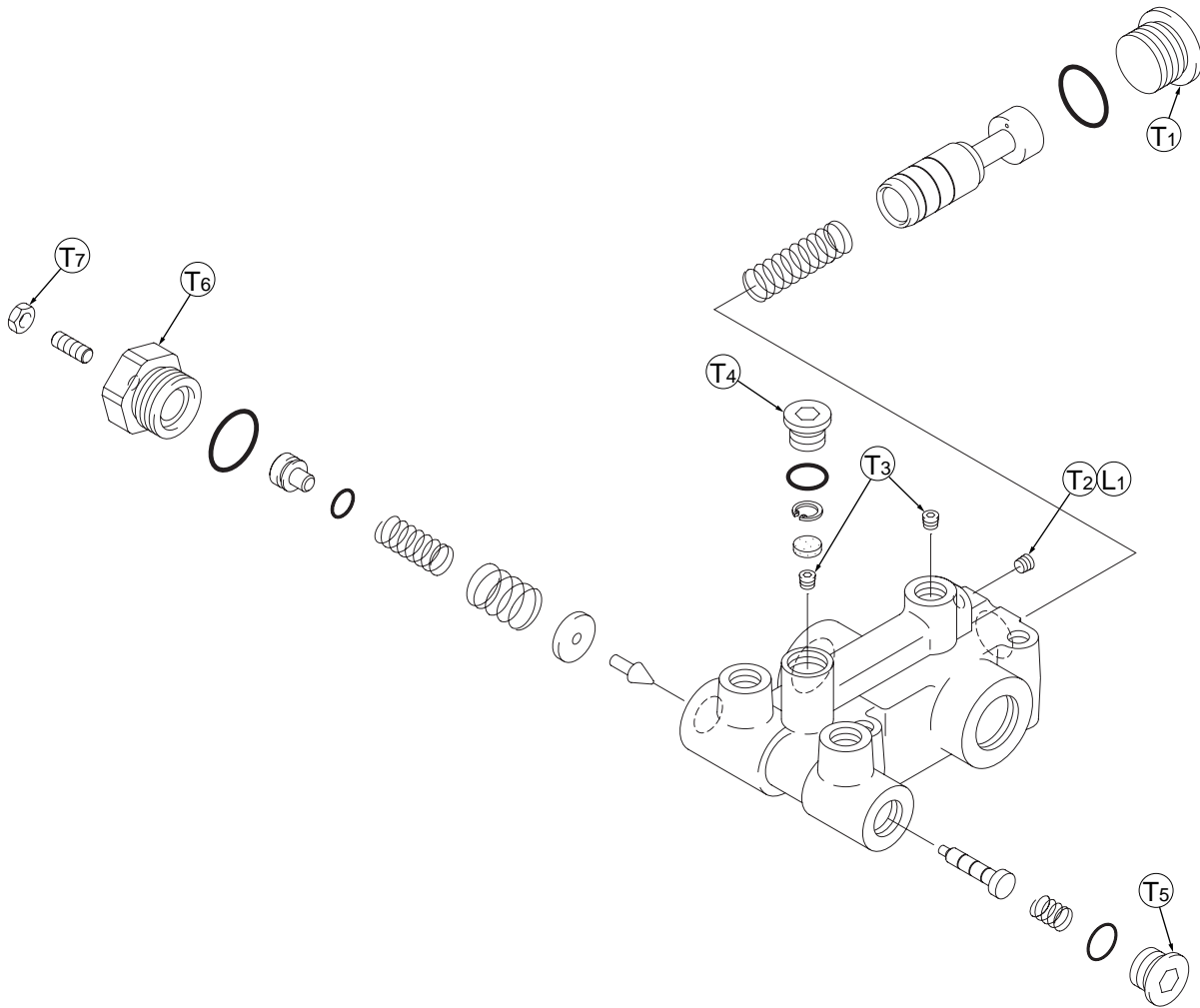
## Steering cylinder



97ZV45005

54-6  
 95ZV Disassembly & Reassembly Brake Group  
 Unloader Valve

(S/N 0329~)



K95V2E54014



T <sub>1</sub> : 137 N-m (14 kgf-m) (101 lb-ft)	Width across flats	17 mm (0.669 in)
T <sub>2</sub> : 14.7 N-m (1.5 kgf-m) (11 lb-ft)	Width across flats	5 mm (0.197 in)
T <sub>3</sub> : 14.7 N-m (1.5 kgf-m) (11 lb-ft)	Width across flats	5 mm (0.197 in)
T <sub>4</sub> : 58.8 N-m (6 kgf-m) (43 lb-ft)	Width across flats	8 mm (0.315 in)
T <sub>5</sub> : 83.4 N-m (8.5 kgf-m) (62 lb-ft)	Width across flats	10 mm (0.394 in)
T <sub>6</sub> : 118 N-m (12 kgf-m) (87 lb-ft)	Width across flats	36 mm (1.417 in)
T <sub>7</sub> : 16.7 N-m (1.7 kgf-m) (12 lb-ft)	Width across flats	12 mm (0.472 in)



L<sub>1</sub>: Screw lock agent (Loctite® 262) application

## Brake Valve

### Brake valve removing and installing

#### Brake valve removing

#### WARNING

Unexpected movement of machine could cause an accident resulting in injury or death. To prevent such an accident, observe the following items:

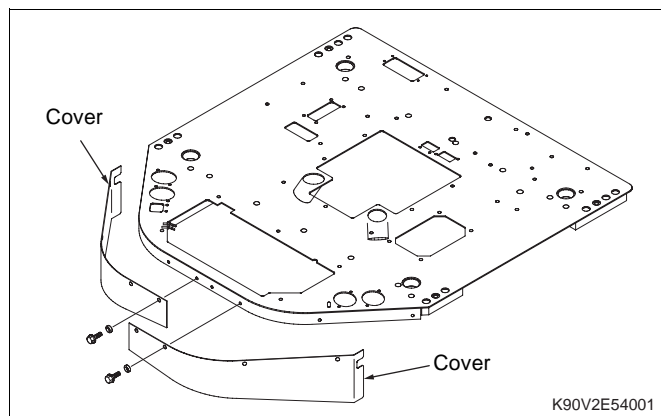
- Park machine on level ground.
- Block front wheels with chocks to prevent wheels from moving.
- Before starting work, be sure to remove the engine key, and hang a "DO NOT START!" tag on the steering wheel or the operator's seat, or disconnect the negative side of the battery.

#### IMPORTANT

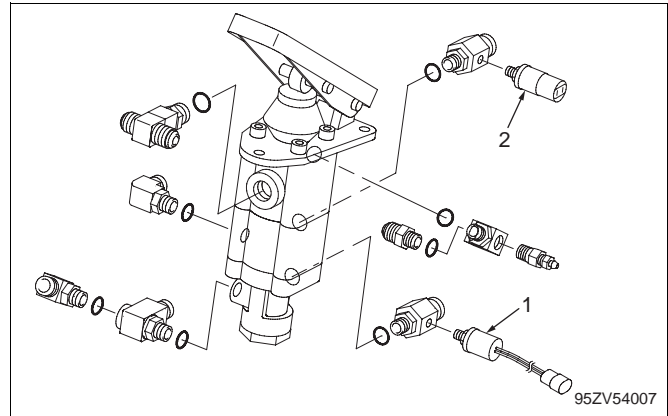
If a battery terminal is removed from a machine in less than 30 seconds after the key is put into the "OFF" position, it can corrupt the ECM program, which can disable the engine. Always wait 1 full minute to be sure to be past this "write to memory function" prior to removing battery terminals.

Before starting work:

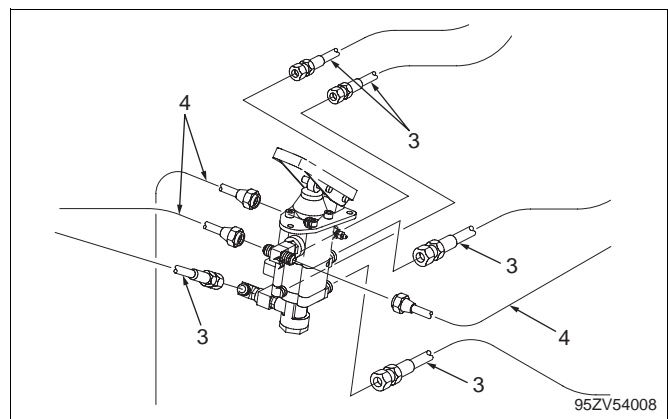
- Stop the engine. Depress the brake pedal many times until there is no brake pressure.
- Press the hydraulic tank cap, and relieve the internal pressure from the hydraulic tank.



- Remove the covers.



1. Remove pressure switches (1)(2).



2. Disconnect hoses (3) and pipes (4) from the brake valve.

#### Note

Cover the disconnected hoses and pipes with plastic, plugs or caps to protect them from dust and dirt.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

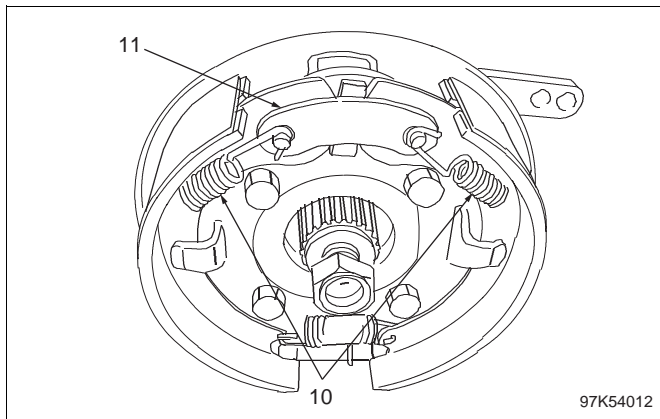
- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: [www.heydownloads.com](http://www.heydownloads.com) by clicking the link below



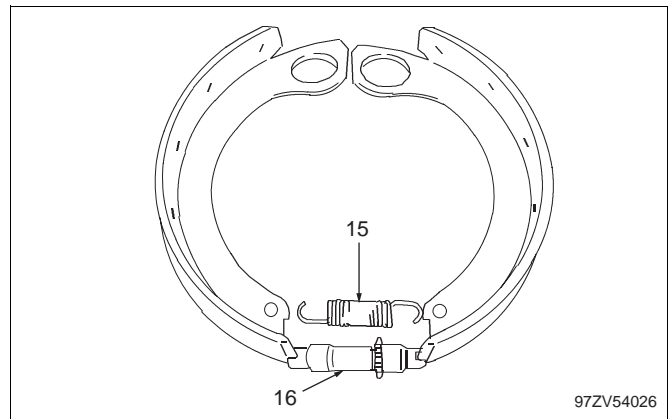
- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

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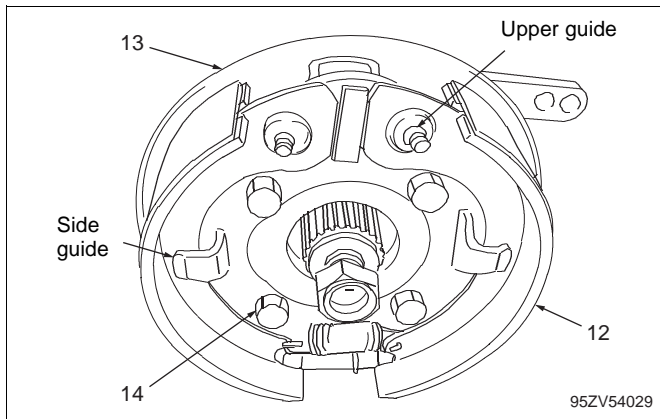
54-26  
 95ZV Disassembly & Reassembly Brake Group  
 Parking Brake (Rear)





6. Remove right and left springs (10) using pliers. Remove plate (11).



8. Remove spring (15), and then remove adjusting screw (16)



7. Pull out upper guides to the front to open brake shoes (12), and then remove shoes (12) from the side guides.  
 If it is necessary to remove back plate (13), remove bolt (14).

-  Bolt (14): 230 N-m (23.5 kgf-m) (170 lb-ft)
-  Screw lock agent application (Loctite® 262)

**Note**

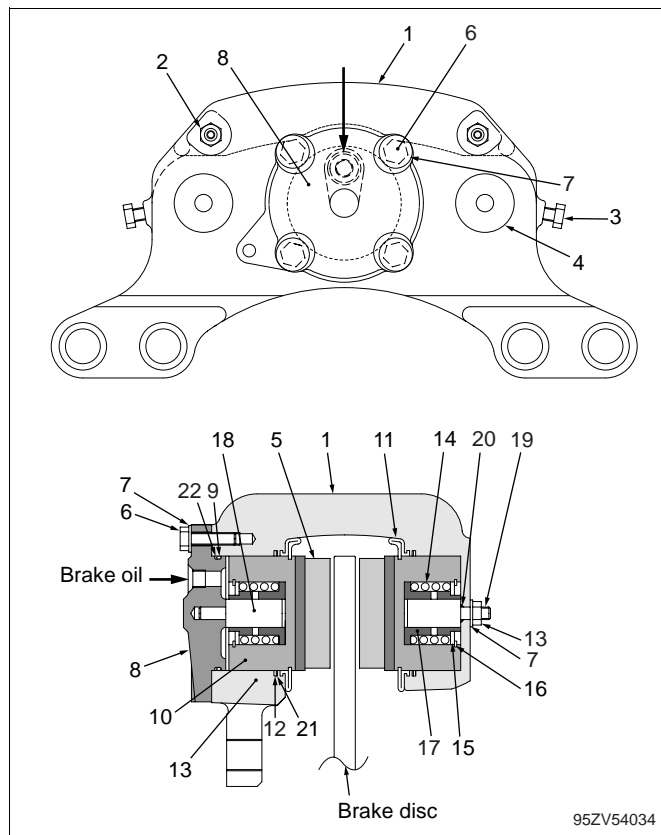
Measure the wear of the brake shoes. If the shoes are extremely worn, replace them.  
 Refer to Section 53 or 55 for inspection standards.

**Parking brake (rear) assembling and installing**

To reassemble and reinstall the rear parking brake, follow the above procedure in the reverse order.

To check performance of the parking brake, refer to 95ZV Shop Manual, Function and Structure, Section 53.

95ZV Disassembly & Reassembly Brake Group  
Parking Brake (Front) (for Europe only)



12. Reassemble the brake head in reverse order of disassembly.

13. Install packings (12) and boots (11) in the piston bore grooves of torque plate assembly (1). Install packing (9) in the groove of cap (8).

**Note**

If guide (18) was removed from cap (8), clean the screw threads. Coat the screw threads with Loctite® sealant and reinstall it in cap (8), tightening securely.

14. Install cap (8) with guide (18) and secure it in place with four each bolts (6) and washers (7b).

15. Assemble packing (20) over the threaded end of guide (19) and seat against the shoulder of guide. Insert the guide through closed piston bore (opposite the capped piston bore) with threaded end protruding from back of torque plate assembly (1). Secure in place with nut (13) and washer (7a).

16. Center and insert pistons (10) with attached adjuster parts over guides (18) (19). Push pistons through previously installed boots (11) and packings (12) by hand. With pistons centered over guides, use a C-clamp or other suitable device to force pistons over guides and into piston bores.

**Note**

Pistons (10) must be installed from center of the brake head. Any other method will damage boots (11) and packings (12).

17. Install bleeder valve screw (2).

18. Install new brake pad assemblies (5) by placing friction material next to the disc and rotating into position in the brake head.

19. Lubricate the outer diameter of pins (4) with a good anti-seize compound and install in torque plate assembly (1). Push the pins toward the disc.

**Note**

Lubricate pins (4) with a corrosion resistant lubricant prior to installation for easier pin removal.

1. Tighten the loosened bolts (3) until they fit in the pin (4) grooves. This can be checked by limited axial movement of pins as the bolts are being seated in the grooves.

2. After bolts (3) are fit in grooves, tighten to 51 N-m (5.2 kgf-m) (38 lb-ft).

## Air Conditioner

### Air conditioner removing and installing

#### Air conditioner removing

#### IMPORTANT

In case that it is necessary to replace the air conditioner parts, be sure to set the air conditioner mode as below before removing the air conditioner unit from the machine.

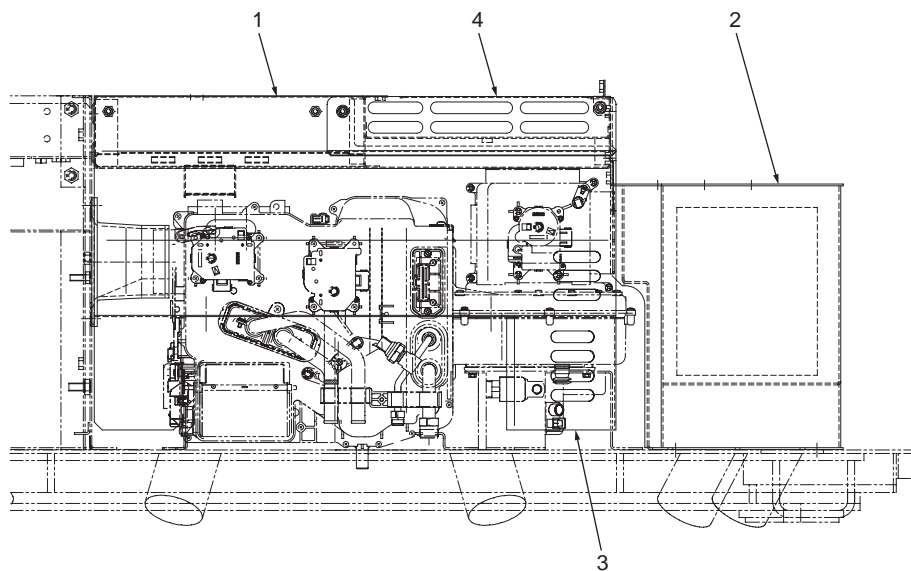
Temperature control: Max cool

Ventilation mode: Foot

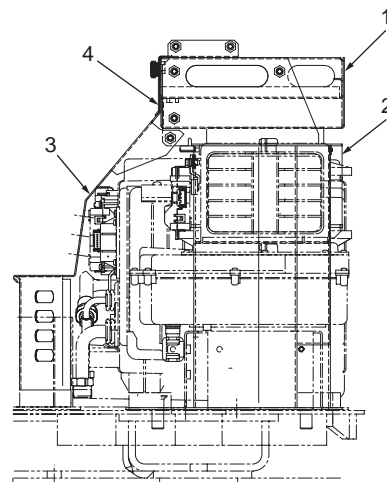
Air intake control: Inside air circulation

Before starting work:

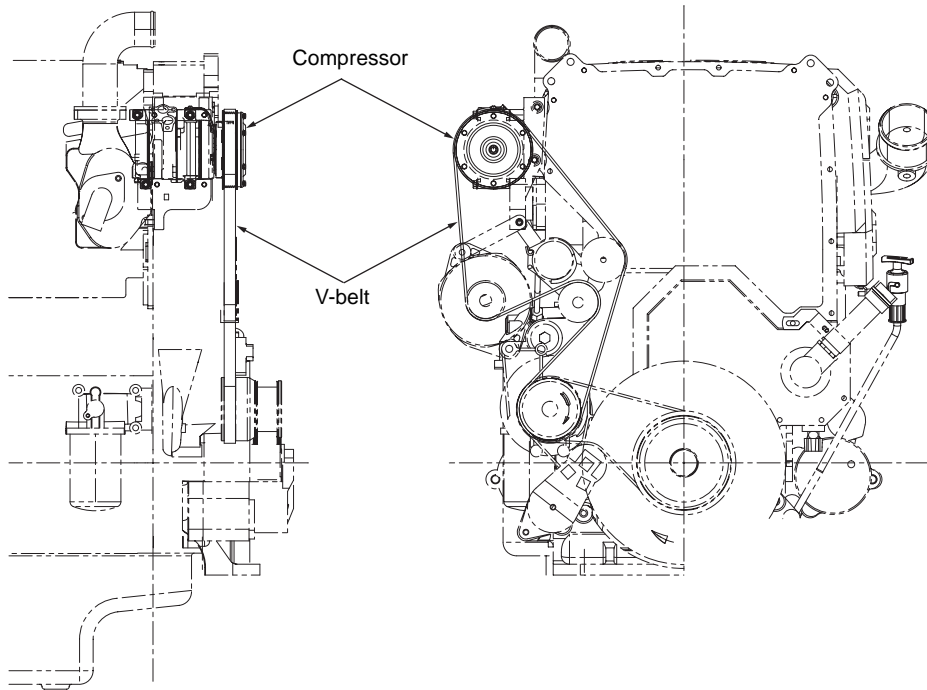
- Remove the seat in the cab.
- Collect the air conditioner refrigerant using the proper recovery method.
- Remove the floor mat in the cab.



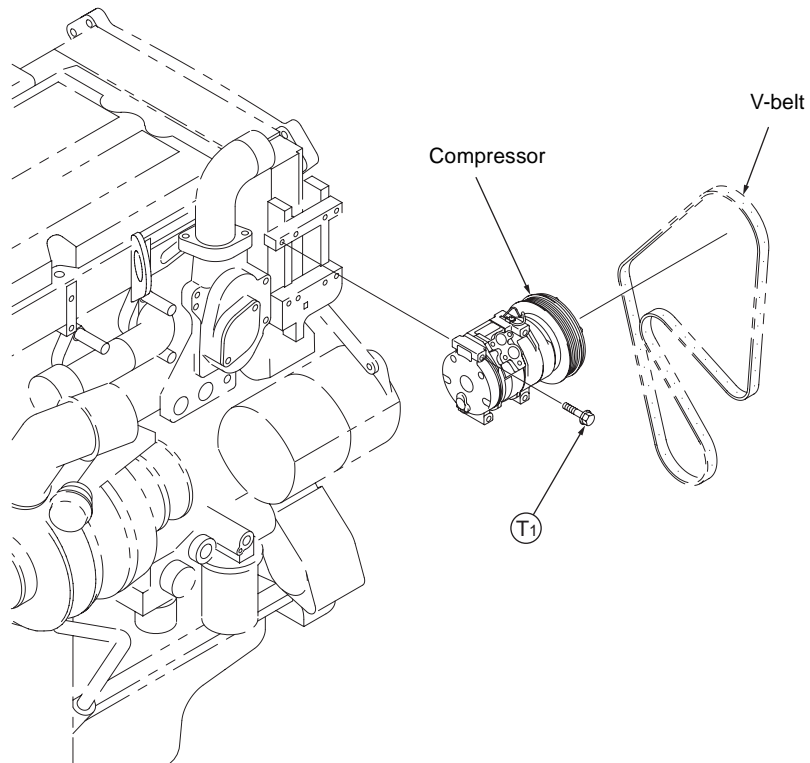
View from operator's seat




## Compressor V-belt



K95V2U74006



K95V2U74007

 : T<sub>1</sub>: 27.9 N-m (2.85 kgf-m) (20.6 lb-ft)



# Bolt Tightening Torque

## Hexagon Bolt

- 1) Thread type: Metric thread  
Unified thread
- 2) Bolt strength: 8.8 (8T) ~ 10.9 (11T)
- 3) Thread pitch: Metric thread: Coarse pitch thread (C), fine pitch thread (F)  
Unified thread: Coarse pitch thread (UNC), fine pitch thread (UNF)

(N-m)

Type	Bolt size			Bolt strength	
	Nominal Dimension	Nominal Dia.	Pitch	8.8 (8T)	10.9 (11T)
Metric thread	M8	8	(C) 1.25	26	38
	M10	10	(C) 1.5	53	76
			(F) 1.25	55	80
	M12	12	(C) 1.75	90	132
			(F) 1.25	96	142
	M14	14	(C) 2.0	142	206
			(F) 1.5	152	221
	M16	16	(C) 2.0	216	314
			(F) 1.5	226	330
	M18	18	(C) 2.5	299	436
			(F) 1.5	324	476
	M20	20	(C) 2.5	417	608
			(F) 1.5	451	662
	M22	22	(C) 2.5	559	814
			(F) 1.5	598	878
	M24	24	(C) 3.0	721	1,030
			(F) 2.0	770	1,128
	M27	27	(C) 3.0	1,030	1,520
			(F) 2.0	1,128	1,618
	M30	30	(C) 3.5	1,422	2,109
(F) 2.0			1,569	2,256	
M33	33	(C) 3.5	1,912	2,844	
		(F) 2.0	2,059	3,040	
Unified thread	5/16	05	18 UNC	25	35
	3/8	06	16 UNC	44	65
	7/16	07	14 UNC	71	103
	1/2	08	13 UNC	103	147
	9/16	09	12 UNC	147	216
	5/8	10	11 UNC	201	294
	3/4	12	10 UNC	358	525
	7/8	14	9 UNC	554	809
	1	16	8 UNC	868	1,275

Note: Tighten the bolts according to the above list, unless otherwise specified.

## CHASSIS GROUP

Disassembly & Reassembly.....14-1

Service Standard .....15-1

## POWER GROUP

Disassembly & Reassembly.....24-1

Service Standard .....25-1

## TORQUE CONVERTER

### & TRANSMISSION GROUP

Disassembly & Reassembly.....34-1

Service Standard .....35-1

## HYDRAULIC GROUP

Disassembly & Reassembly.....44-1

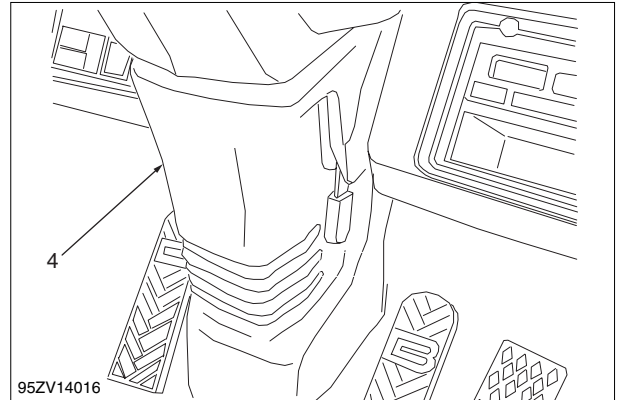
Service Standard .....45-1

## BRAKE GROUP

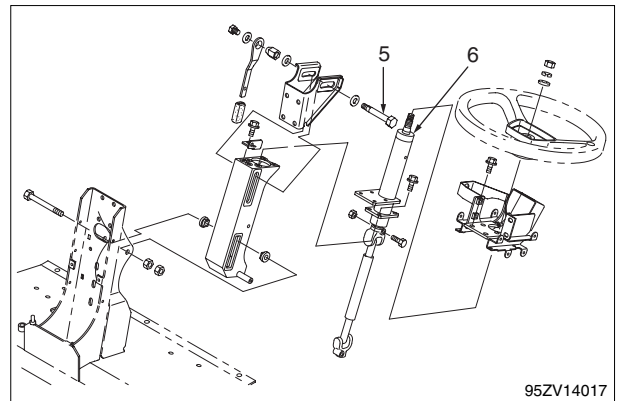
Disassembly & Reassembly.....54-1

Service Standard .....55-1

3) Remove cover (4).



4) Remove bolt (5). Tilt steering shaft (6) backward.




5) Remove bolts (7).

Front Right/Left 3pcs each

Rear Right/Left 4pcs each

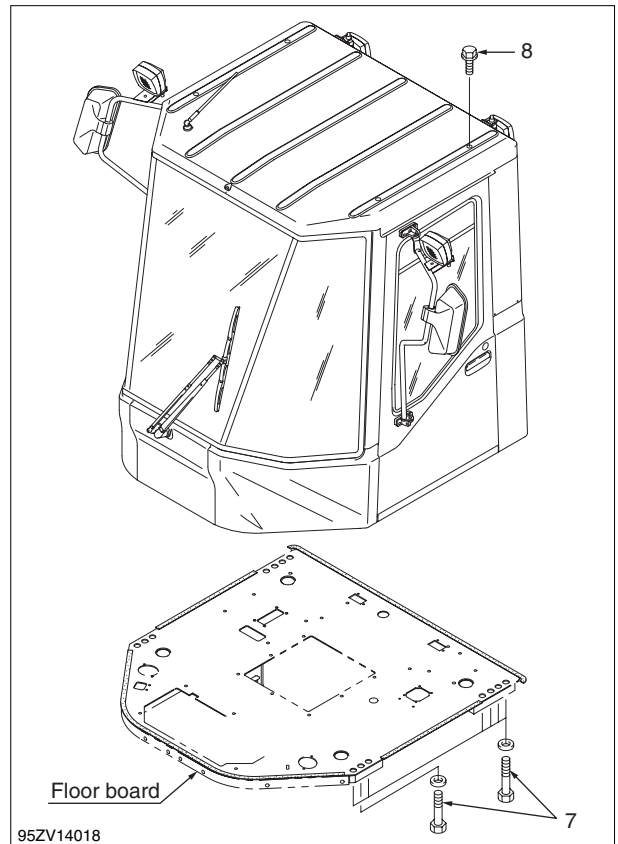
Torque for assembly:

 : Bolt: 765 N-m (78.0 kgf-m) (562 lb-ft)

6) Remove the bolts (8).

Install eye bolt (M16 x 2.0) on cab. Attach sling and remove cab.

 : Cab: 620 kg (1,370 lbs)



## 2. Reinstalling cab

For reinstallation, follow the above procedure in the reversed direction.

# CHASSIS GROUP

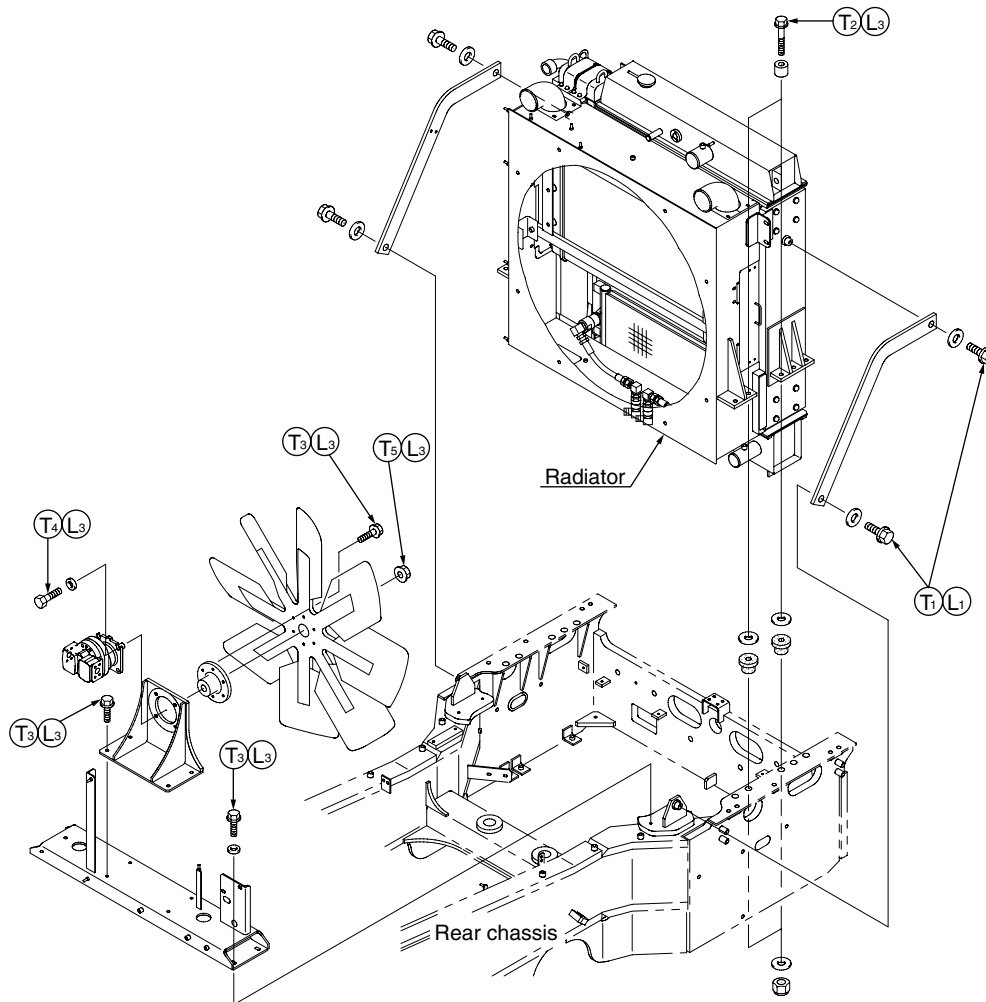
## 15

### **Service Standard**

Linkage .....	15-2
Linkage Pin Standard Clearance Values .....	15-3
Center Pin .....	15-4
Bucket Positioner and Boom Kick-Out .....	15-5

# Radiator

## Tightening torque



95ZV24002

 : Bolt tightening torque

T<sub>1</sub>: 230 N-m (23.5 kgf-m) (170 lb-ft)

T<sub>2</sub>: 49 N-m ( 5.0 kgf-m) ( 36 lb-ft)

T<sub>3</sub>: 94 N-m ( 9.6 kgf-m) ( 69 lb-ft)

T<sub>4</sub>: 142 N-m (14.5 kgf-m) (105 lb-ft)

T<sub>5</sub>: 474 N-m (48.5 kgf-m) (349 lb-ft)

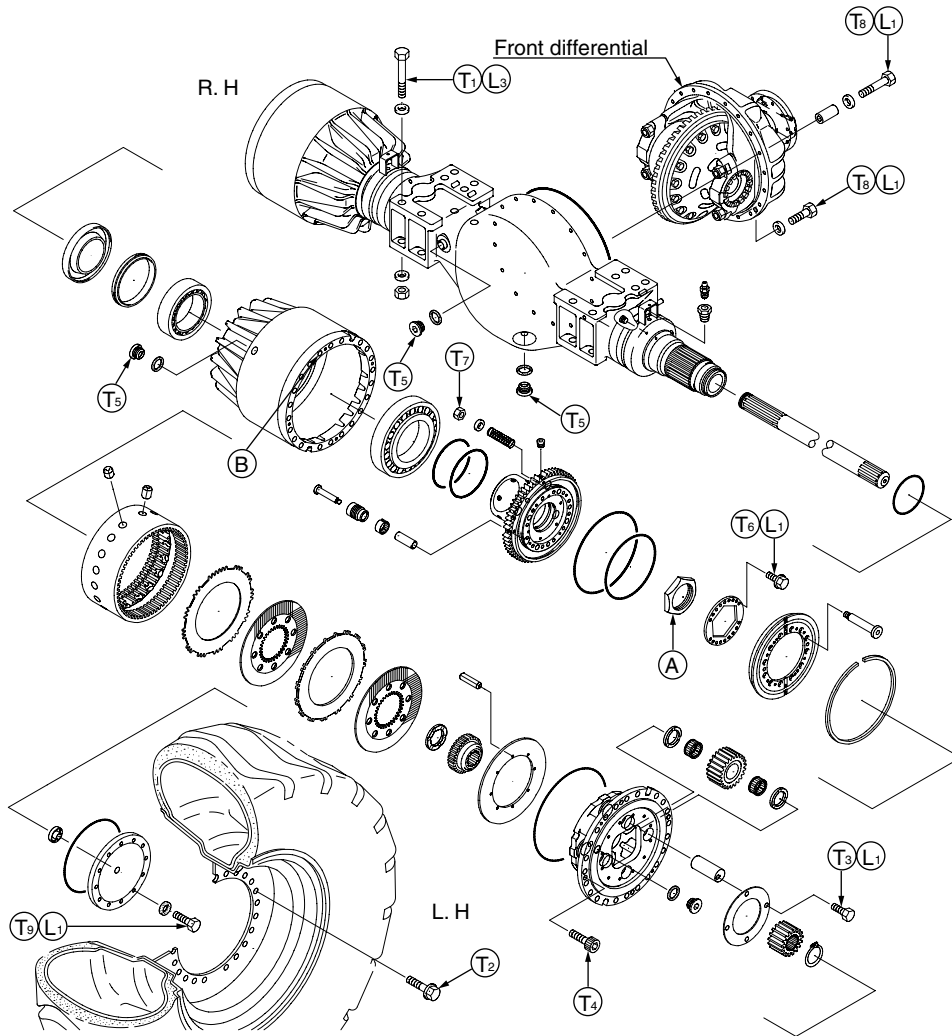


L<sub>1</sub>: With liquid adhesive (Loctite® 262)

L<sub>3</sub>: With lubricating oil (Engine oil or gear oil)

# Front Axle Assembly

## Tightening torque



95ZV24016

 : Bolt tightening torque

- T<sub>1</sub>: 1,420 N-m ( 145.0 kgf-m ) ( 1,049 lb-ft )
- T<sub>2</sub>: 892 N-m ( 91.0 kgf-m ) ( 658 lb-ft )
- T<sub>3</sub>: 417 N-m ( 42.5 kgf-m ) ( 307 lb-ft )
- T<sub>4</sub>: 86 N-m ( 8.8 kgf-m ) ( 64 lb-ft )
- T<sub>5</sub>: 78 N-m ( 8.0 kgf-m ) ( 58 lb-ft )
- T<sub>6</sub>: 53 N-m ( 5.4 kgf-m ) ( 39 lb-ft )
- T<sub>7</sub>: 33 N-m ( 3.4 kgf-m ) ( 25 lb-ft )
- T<sub>8</sub>: 314 N-m ( 32.0 kgf-m ) ( 232 lb-ft )
- T<sub>9</sub>: 90 N-m ( 9.15 kgf-m ) ( 66 lb-ft )

**Note:** Tighten **(A)** while measuring the preload applied to section **(B)** .

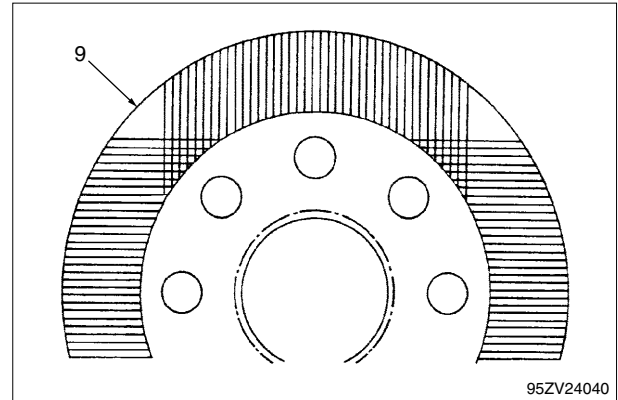
Preload of section **(B)** : 324 ~ 363 N  
 ( 33 ~ 37 kgf )  
 ( 73 ~ 81 lbs )

\*This is "breakaway" force. The force required to start the wheel turning.

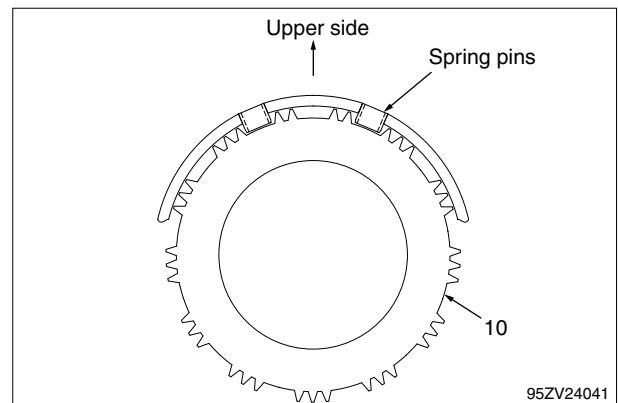


- L1: Screw lock agent (Three Bond 1327) application
- L3: With lubricating oil (Engine oil or gear oil)

14) Install friction plate (9).

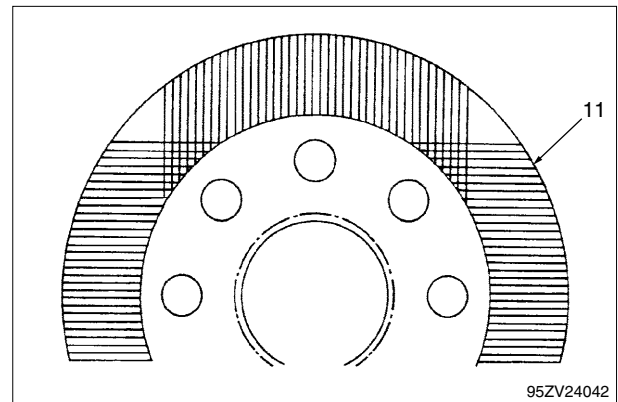
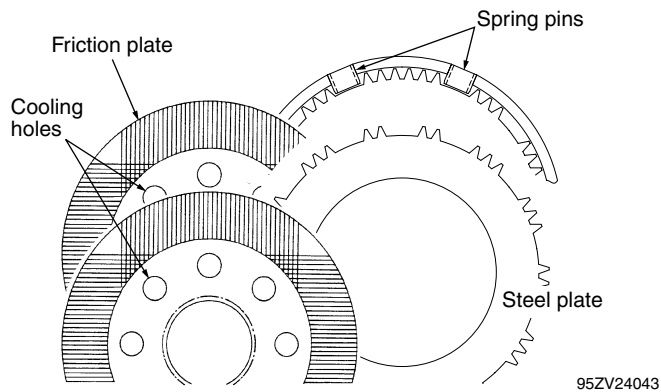


15) Install steel plate with two 2-teeth sections (10).




16) Install friction plate (11).

**Note:** Align the cooling holes of two friction plates with each other.



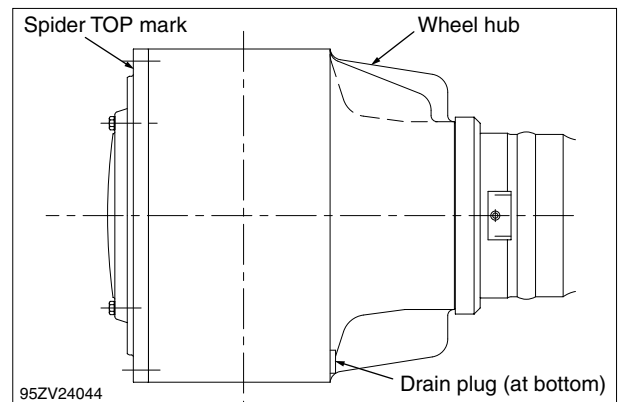
17) The spider TOP mark should be placed as shown.

18) Fill the oil to the specified level.

-  : Wheel hub (right and left) 20 ℓ ( 5 gal.)
- Differential 60 ℓ (16 gal.)

19) After reinstalling the tires, be sure to completely bleed the brake from air.

**Note:** Check that manual rotation of the tires is possible. Also check the wheels for oil leakage.



## 2. Reassembling spider assembly

To reassemble the spider assembly, follow the procedure described in the reversed direction.

Before starting work:

- Clean all the parts.
- Check the brake retainer, pins, bearings, planetary gears for distortion and wear.
- Replace the wear rings and defective parts with new ones.
- Inspect the internal bores of the spider for wear.

## 3. Cautions regarding reassembly

- To reinstall the brake retainer, check that there is no clearance between the spider and the brake retainer.
- The brake retainer may only be installed as it was removed. It may not be flipped over due to the roll pin hole design.
- To insert the planetary pin, align the core holes of the planetary gear with that of the wear ring.
- The lock bolt hole of the planetary pin is shifted from the center. Check that the bolt hole is shifted to the inside.
- Manually turn the planetary gear to check that the gear smoothly rotates.
- When refilling axle and planetaries with lubricant, use friction modifier (anti-chatter) additive.

# Disassembling and reassembling axle support


## 1. Disassembling axle support

Before starting work

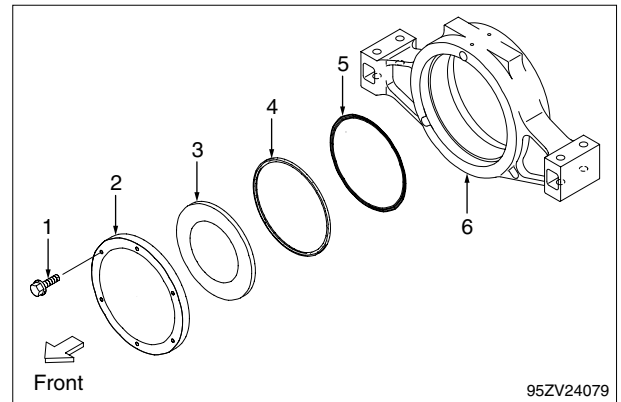
- Remove the rear axle assembly from the rear chassis.

1) Remove bolt (1).

Torque for assembly:

 : Bolt: 53 N-m (5.4 kgf-m) (40 lb-ft)

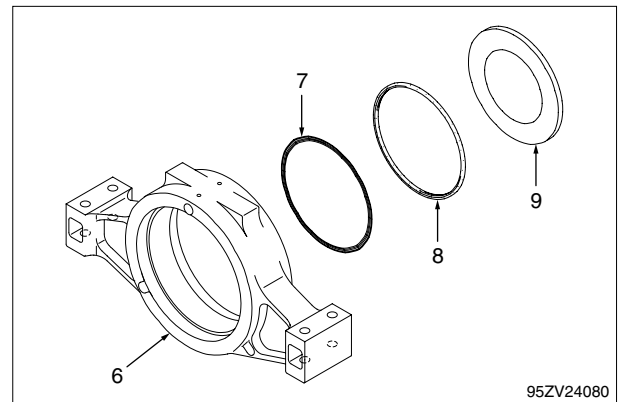
2) Remove plate (2), ring (3), packing (4) and O-ring (5).



3) Remove axle support (6) from the rear axle assembly.


 : Axle support: 90 kg (200 lbs)

4) Remove O-ring (7), packing (8) and ring (9).



5) Remove bolt (10).

Torque for assembly:


 : Bolt: 608 N-m (62.0 kgf-m) (449 lb-ft)

 : Screw lock agent (Three Bond 1327) application

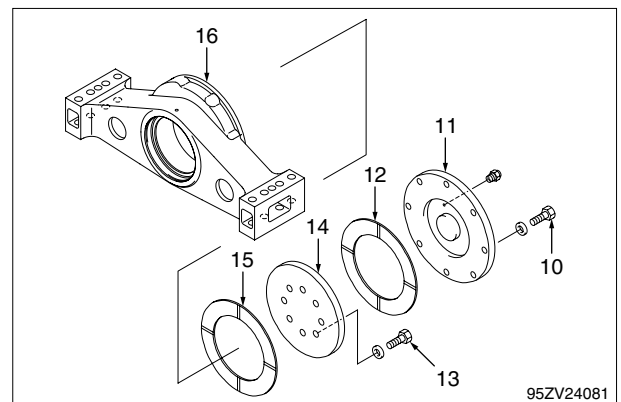
6) Remove plate (11) and wear ring (12).

7) Remove bolt (13). Remove plate (14) and wear ring (15).

Torque for assembly:

 : Bolt: 608 N-m (62.0 kgf-m) (449 lb-ft)

 : Screw lock agent (Three Bond 1327) application



### 3. Reassembling differential assembly

To reassemble the differential assembly, follow the above procedure in the reversed direction.

**IMPORTANT**

- Clean and check all the parts. If a part is worn or damaged, replace it.
- Be sure to replace O-rings and seals with new ones.

### 4. Cautions regarding reassembly

1) Check the preload of the pinion section by following the procedure below:

- ① Install new roller bearing (2) and snap ring (9) on pinion (1) if replacement is needed.

**Note:** The bearing ring part should be faced to the pinion.

- ② Install new taper roller bearing (3) and spacer (4) on pinion (1) if replacement is needed.

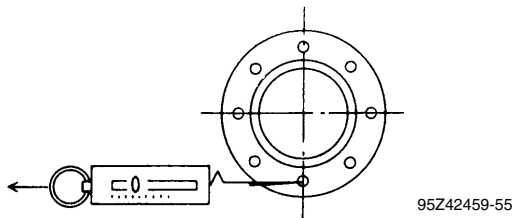
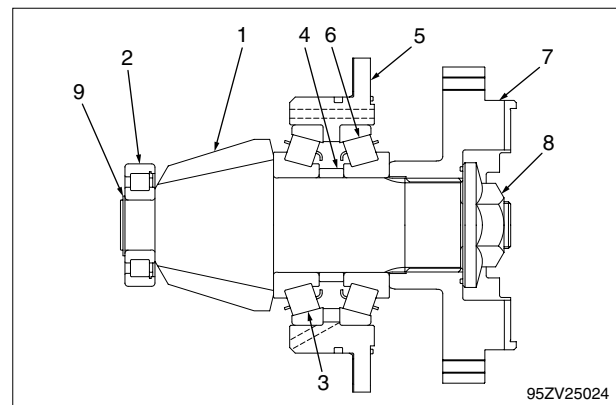
- ③ Install cage (5) and taper roller bearing (6).

- ④ Put yoke (7) and nut (8) on pinion (1).

**Note:** Do not install the oil seal and O-ring of the nut.

🔧 : Nut: 883 N-m (90 kgf-m) (651 lb-ft)

- ⑤ Secure yoke in a vise. Measure the preload at section (A) (bolt hole).



🔧 : Standard preload\*: 36 to 45 N  
 (3.7 to 4.6 kgf)  
 (8 to 10 lbs)

If the preload is out of the above range, replace spacer (4) to adjust the preload to the specified range.

\* Preload is the force required to start the cage moving-breakaway force. (Not rolling force.)

**Note:** There are 15 types of spacers from 22.20 mm (0.874 in.) to 22.48 mm (0.885 in.) in increments of 0.02 mm (0.0007 in.). Thicker spacers reduce preload; thinner spacers increase preload.

- ⑥ Remove nut (8) and flange yoke (7).

# TORQUE CONVERTER AND TRANSMISSION GROUP

## 34

### **Disassembly and Reassembly**

Torque Converter and Transmission Assembly .....	34-2
Torque Converter Assembly .....	34-10
Transmission Assembly .....	34-15
Clutch Assembly .....	34-23
Clutch Spider Assembly .....	34-39
Reverse Clutch Spider .....	34-42
1st Clutch Assembly .....	34-43
High Clutch Assembly .....	34-47
Control Valve Assembly .....	34-52

## Disassembling and reassembling torque converter assembly

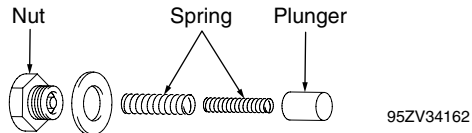
### 1. Disassembling torque converter assembly

Before starting work:

- Drain oil from the transmission drain port and also from the torque converter drain port.
- Clean the transmission assembly.


1) Remove pipe (1) and the hoses (2) (3).

Remove nut, spring and plunger for T/C outlet relief valve (A).



2) Remove control valve (4) to install the transmission assembly to the work bench or roll-over stand.

Torque for assembly:

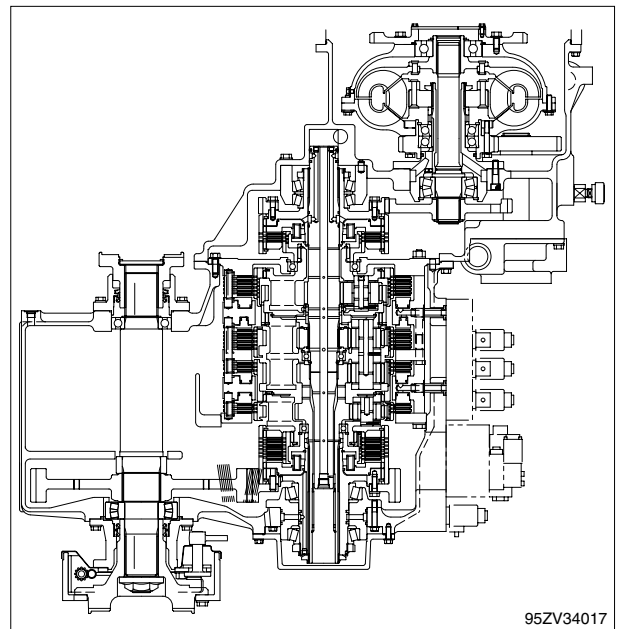
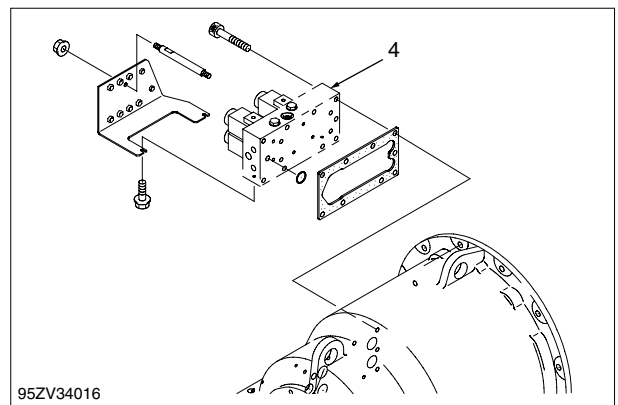
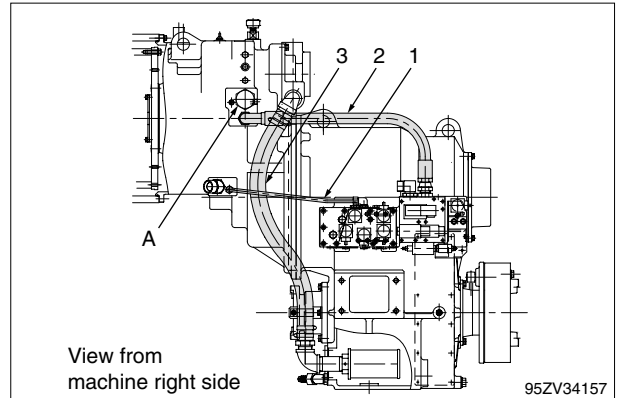
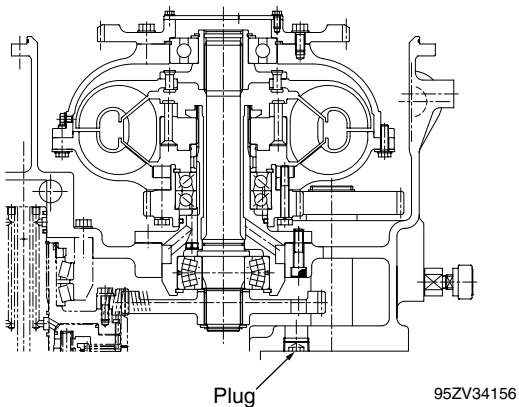
 : Socket bolt: 50 N-m (5.10 kgf-m) (37 lb-ft)

3) Install the transmission assembly to the work bench or roll-over stand as shown.


Remove plugs (3 pcs).

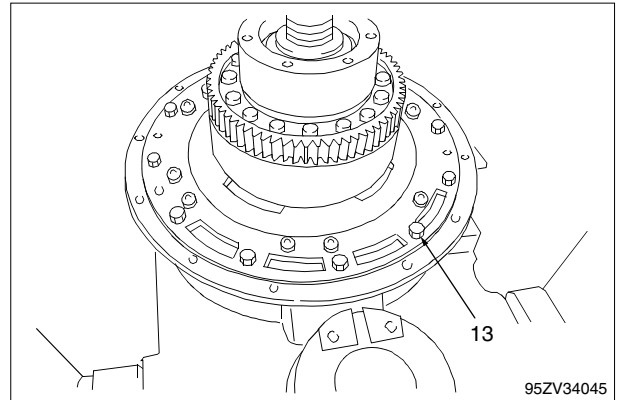
**Note:** When reinstalling, apply Teflon tape to plugs for sealant.

Do not use Loctite® or other thread lock compounds.

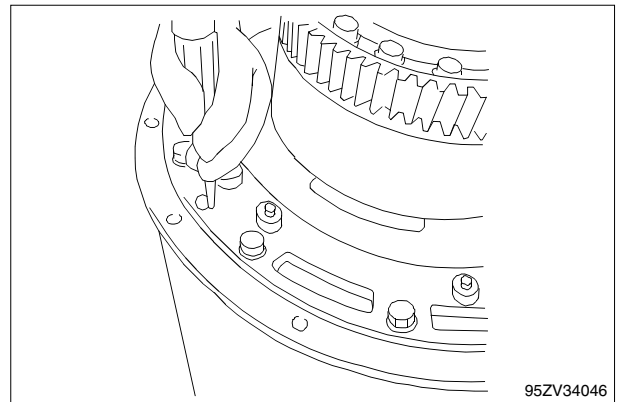


5) Tighten clutch pack retainer bolts (13).

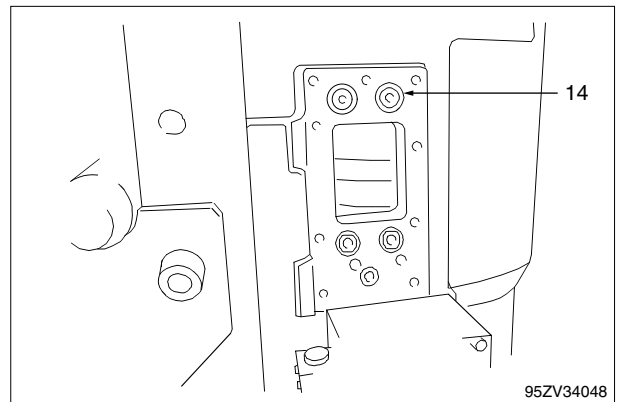
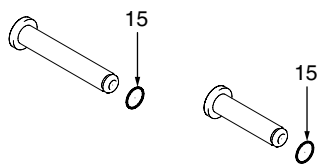
 : Bolts (16): 93.7 N-m (9.55 kgf-m) (69 lb-ft)



6) Calk (stake) the clutch pack body at two points around knock pin (4 pcs) as shown in the illustration.





7) Attach O-ring (15) to each of four sleeves (14), and install each sleeve into the oil hole of transmission housing.

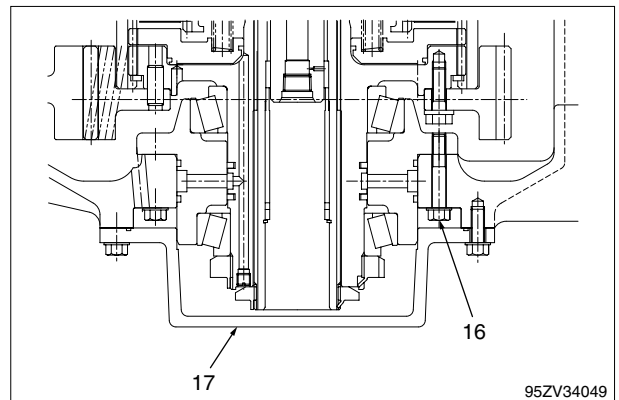


8) Tighten bolt (16) and install cover (17).

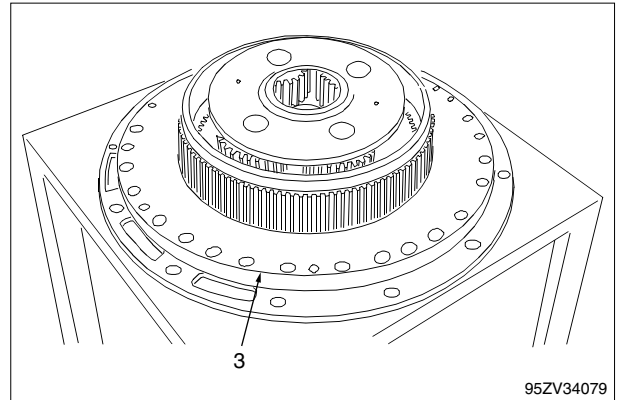
Torque for assembly:

 : Bolt: 93.7 N-m (9.55 kgf-m) (69 lb-ft)

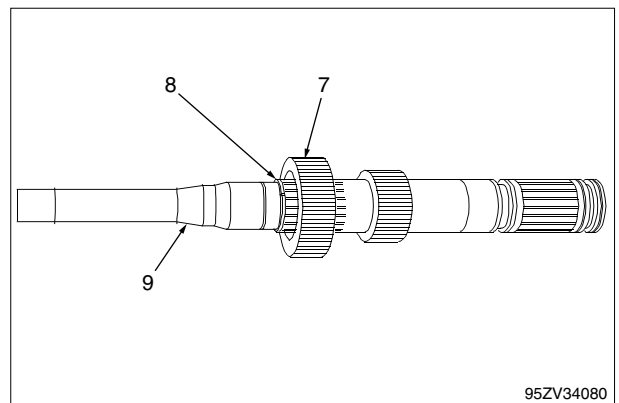
 : With lubricating oil (Engine oil or gear oil)



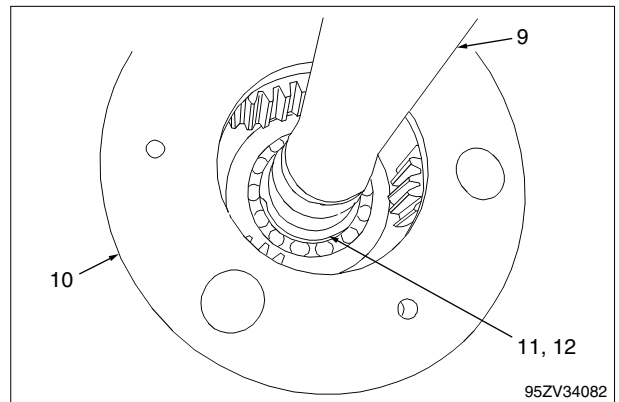
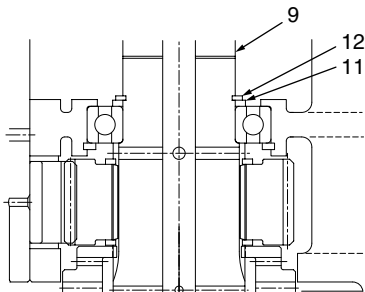
5) Fix reverse housing (3) on the work bench up side down.



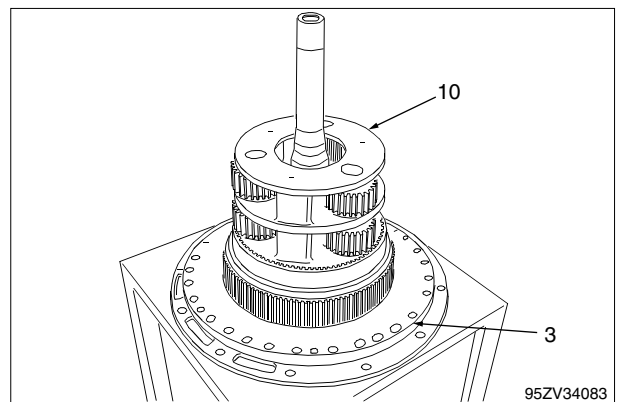
6) Install sun gear (7) and snap ring (8) to main shaft (9).



7) Install main shaft (9) to the low and 3rd spider assembly (10). After that install spacer (11) and snap ring (12) to main shaft (9).



8) Install the low and 3rd spider assembly (10) onto reverse housing assembly (3).



## **2. Reassembling 2nd clutch spider**

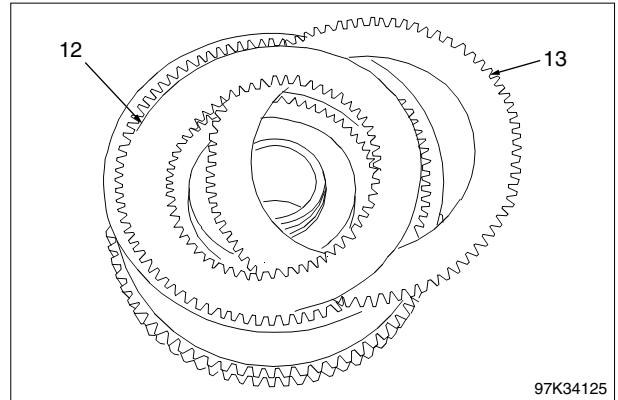
To reassemble the 2nd clutch spider, follow the procedure described above in the reversed direction.

Before starting work:

- Clean and inspect each part, replace if necessary.  
For inspection and wear standard, refer to Section 35.
- Replace the bearing with new one if necessary, manually turn the bearing to check that the bearing rotates properly.

7) Install three friction plates (12) and two steel plates (13) alternately after the piston.

**Note:** Be sure that the friction plate comes after piston.

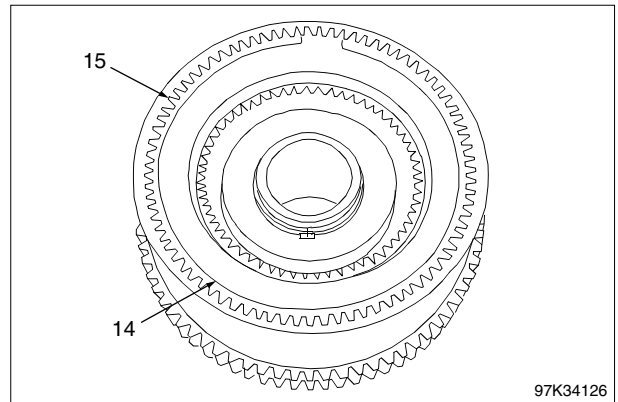


97K34125

8) Install pressure plates (14) and then install snap ring (15).

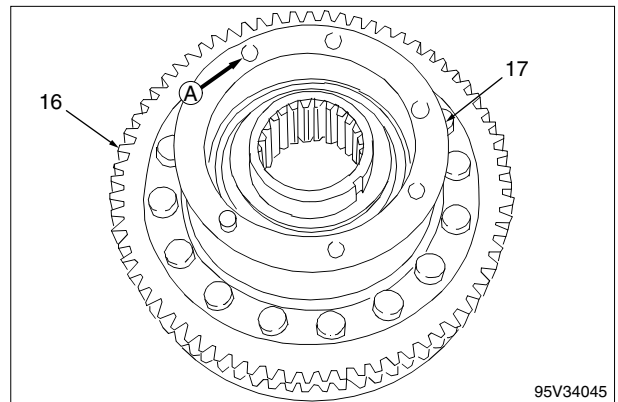
9) Measure piston stroke.

Standard piston stroke:  $2.5 \pm 0.5$  mm  
 (0.0984 ± 0.0196 in.)




97K34126

10) Invert clutch assembly (16) and install sleeve (17).

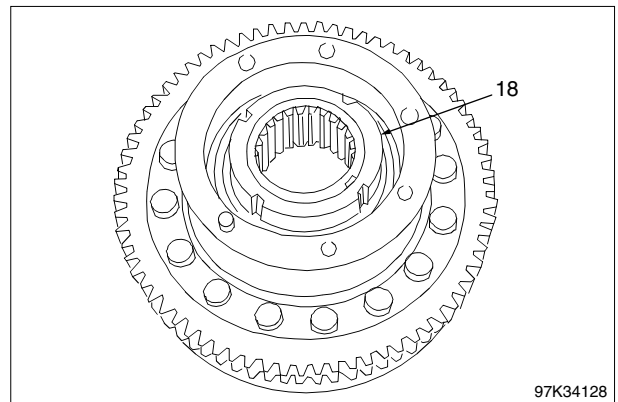


95V34045

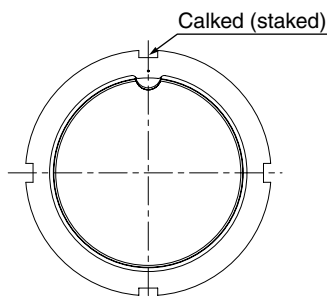
11) Install bearing nut (18).

 : Tighten the bearing nut so as to the pre-load at the point (A) is between 78.5 and 88.3 N (8 ~ 9 kgf) (18 ~ 20 lbf).

12) After confirming the pre-load, stake bearing nut (18) to lock it.



97K34128



95ZV34147

# HYDRAULIC GROUP

## 44

### Disassembly and Reassembly

Warning Regarding Removing and Reinstalling

Hydraulic Parts .....44-2

Cautions Regarding Disassembly and Reassembly of

Hydraulic Parts .....44-3

Hydraulic Pump Assembly .....44-4

Hydraulic Cylinder .....44-10

Pilot Valve .....44-23

Multiple Control Valve .....44-30

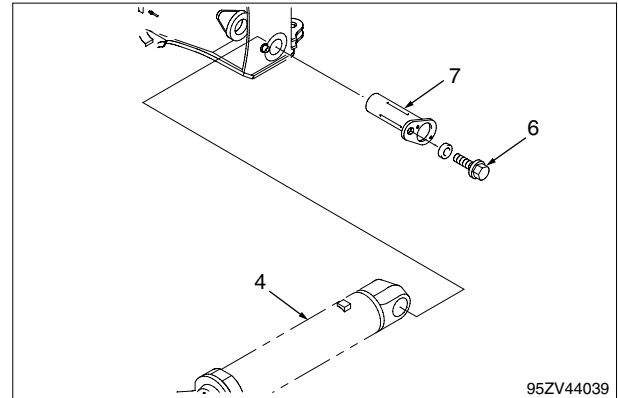
Orbitrol® .....44-37

Steering Valve .....44-47

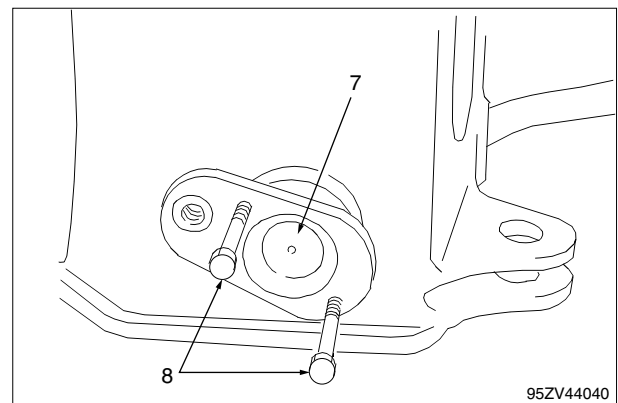
Stop Valve .....44-52

Fan Motor .....44-56

4) Remove lock bolt (6) for pin (7).



5) Insert jack bolts (8) to pin (7), and then remove pin (7).



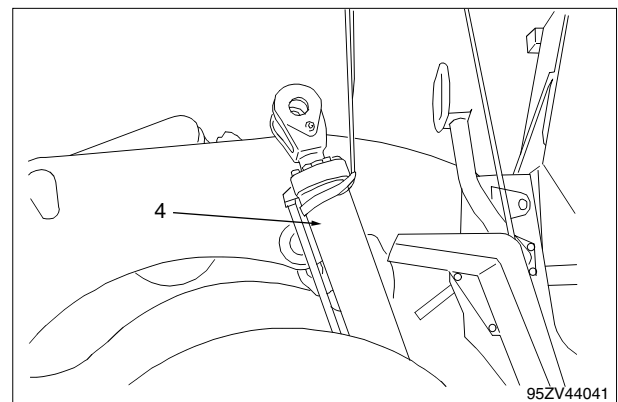
6) Sling boom cylinder (4), and lower it onto the ground.

For a detailed description of cylinder disassembly and reassembly, refer to "Disassembling and reassembling hydraulic cylinder".

## 2.Reinstalling boom cylinder

To reinstall boom cylinder, follow the above removal procedure in the reversed direction.

**Note:** Be sure the pins accept grease after installation.



### IMPORTANT

After repairing or replacing a cylinder, be sure to bleed the cylinder of air, or the piston seal or back-up ring may be seized.

#### Air bleeding procedure

a) While operating the engine at low-idling speed, operate the cylinder piston for 4 to 5 strokes.

**Note:** Stop the piston about 100 mm (4.0 in.) before stroking fully.

b) After that, stroke the cylinder piston fully to both ends 4 to 5 times.

c) Add hydraulic oil to the tank, and check the cylinder and its piping for oil leakage.

#### 4. Cautions regarding reassembling

Before starting work:

- a) Be sure to replace all the seals and packings.
- b) Clean and check all the parts. If a part is damaged, replace it.
- c) Before reassembling parts, apply a coat of hydraulic oil to the parts.

### ⚠ CAUTION

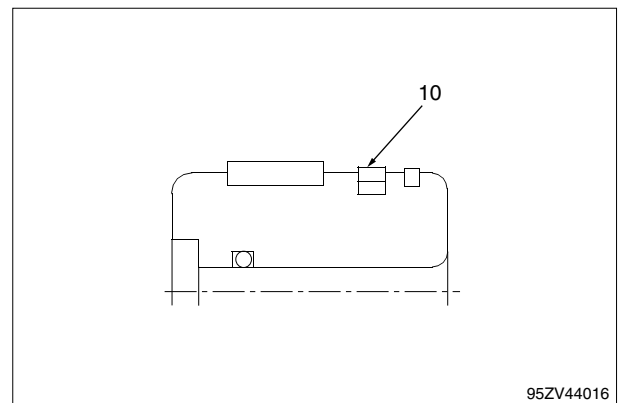
**Hot oil can cause injury or burns.  
Avoid contact with hot oil.**

**Note:** Put slipper ring (10) into hot oil to heat ring to 120 to 150 °C.

(This is because the inner diameter of the slipper ring is smaller than the outer diameter of the piston. Therefore, heat slipper ring to expand its inner diameter for easy attachment.)

: Attach the slipper ring while taking care not to damage by over expansion.

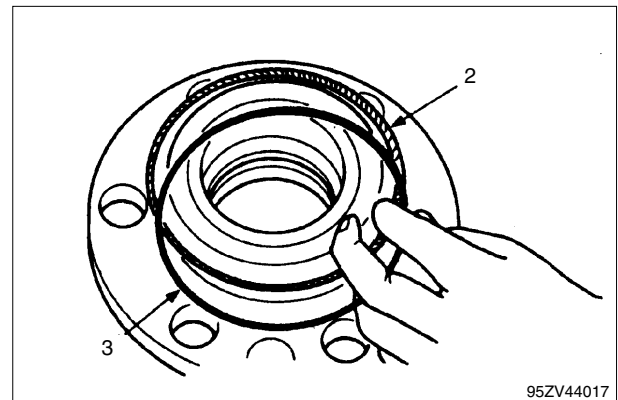
: After attaching slipper ring, cool slipper ring so that it is contracted to the original size.



**Note:** Before installing back-up ring (2) and O-ring (3), heat back-up ring.

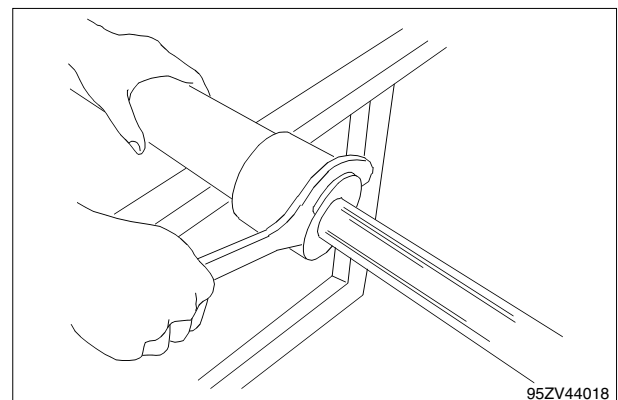
(This is because the inner diameter of the back-up ring is smaller than the outer diameter of the rod cover. To easily attach back-up ring to the rod cover, heat ring to soften it. The soft ring can be easily expanded.)

Be careful not to over expand back-up ring. After installation, wait until the back-up ring is cooled, and then insert rod cover into the cylinder tube.

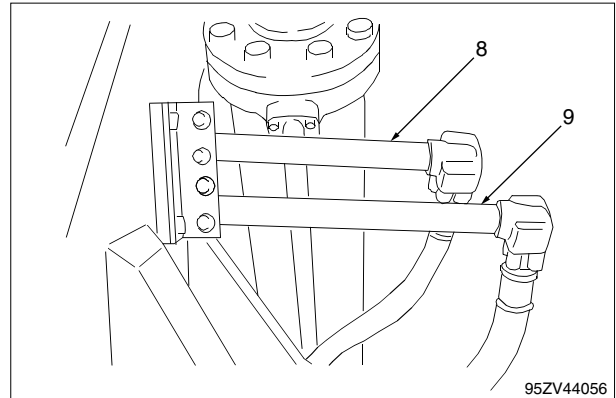


**Note:** Reinstall rod cover of the steering cylinder, screw rod cover using a spanner wrench. Screw in and tighten set screw. Stake set screw.

🔧 : 1,765 N-m (180 kgf-m) (1,302 lb-ft)

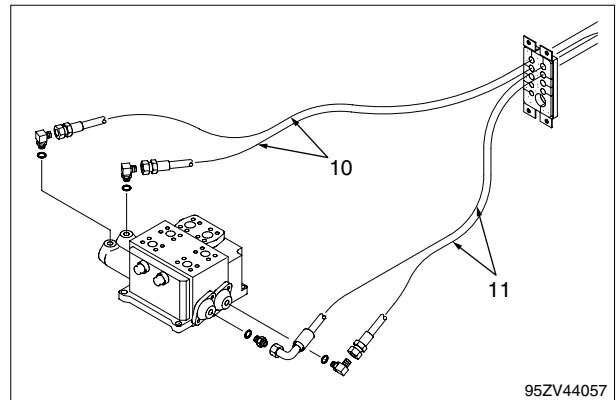


4) Slide boom cylinder oil pipes (8) (9) to the right.




5) Put matchmarks on pilot line hoses (10) (11), and then disconnect them.

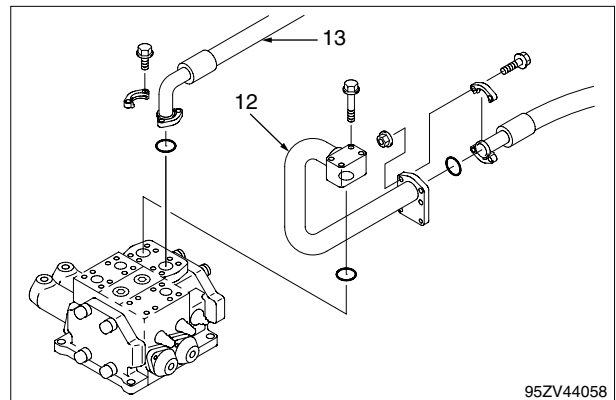
**Note:** Cover disconnected hoses with plastic, caps or plugs to protect them from dust, water and dirt.



6) Remove pipe (12) and hose (13), and then clamp them on the front chassis.


 : Hydraulic oil :Approx. 8 ℓ (2.1 gal.)


**Note:** Cover disconnected hoses with plastic, caps or plugs to protect them from dust, water and dirt.

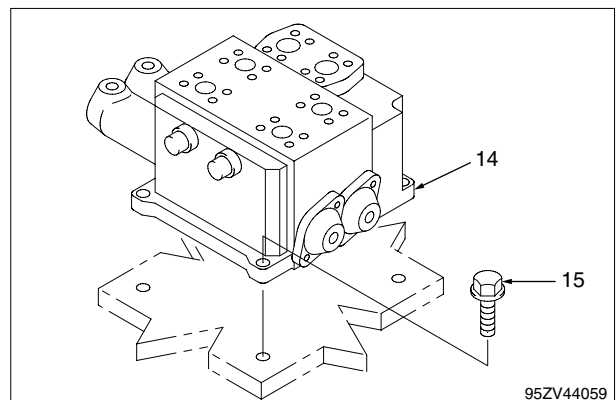


7) Remove bolts (15) for control valve (14).  
Use a hoist to remove the control valve.

Torque for assembly:

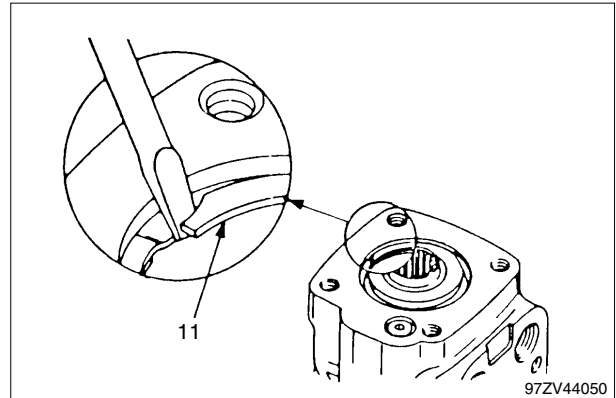
 : Bolt: 94 N-m (9.6 kgf-m) (69 lb-ft)

 : Multiple control valve: 100 kg (220 lbs)

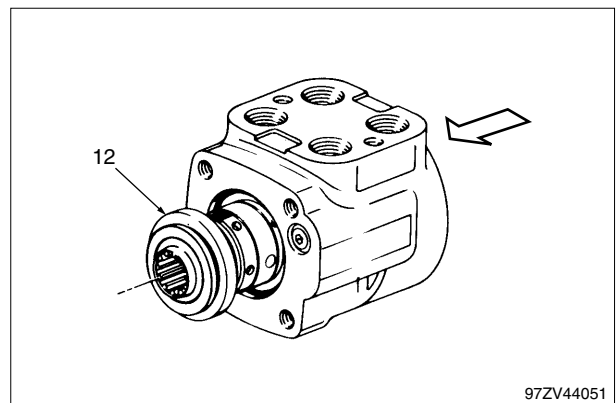


**(Disassembling valve)**

- 5) Remove the housing from the vise and put it on a clean cloth not to damage the finished surface.  
Remove retainer ring (11) by a screw driver.

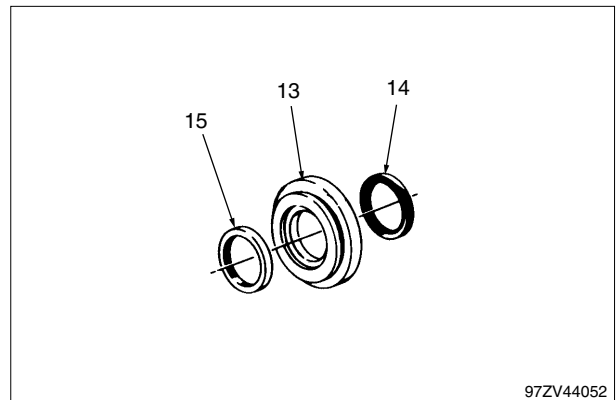


- 6) Rotate the spool and sleeve so that the pin can be in a horizontal position.  
Remove seal retainer (12) by pressing the spool and sleeve from behind with your fingers.

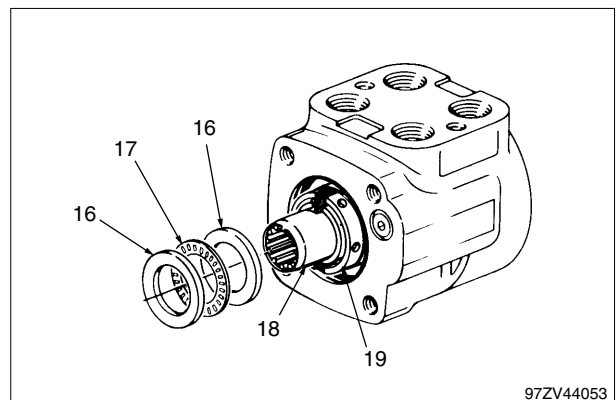


- 7) Remove X-ring seal (14) and dust seal (15) from seal retainer (13).

**Note:** Take care not to damage seal retainer (13).



- 8) Remove races (16) and needle bearing (17) from spool (18) and sleeve (19).



5) Remove relief valve (8) and plug (9).

Pull out spring (10) and flow control spool (11) from the casing.


**Note:** - Carefully remove plug (9). It may spring out by the spring force.

- Carefully pull out flow control spool (11) so that the casing and flow control spool are not scratched.

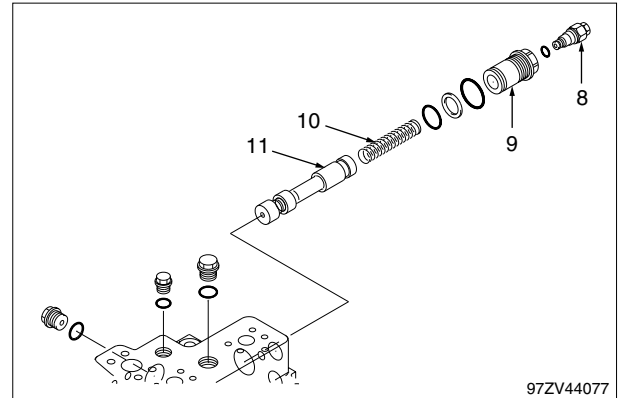
Width across flat: #8: 19 mm (0.748 in)

#9: 41 mm (1.614 in)

Torque for assembly:

 : #8: 79 N-m ( 8 kgf-m) (59 lb-ft)

#9: 98 N-m (10 kgf-m) (72 lb-ft)



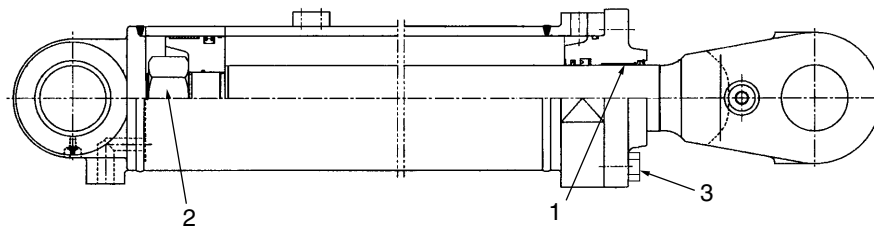
6) Remove plug (7) loosened on paragraph 4).

### 3.Reassembling steering valve

To reassemble the steering valve, follow the above disassembly procedure in the reversed direction.

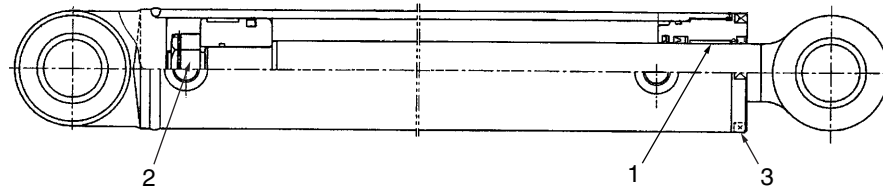
# Hydraulic Cylinder

## Boom cylinder



97ZV45004

## Steering cylinder



97ZV45005

Unit : mm (in.)

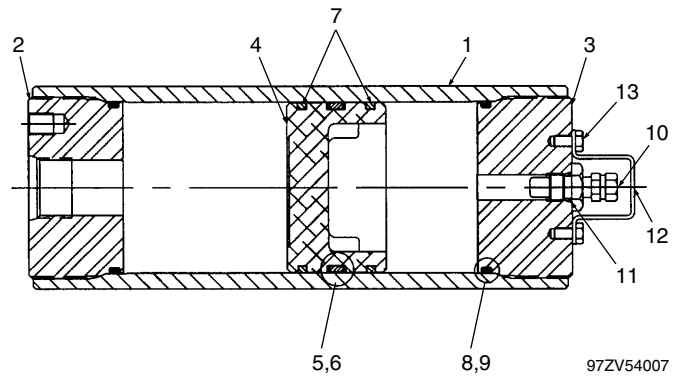
No	Item	Judgment standard						Solution
		Standard dimension of rod dia.	Standard value		Standard clearance	Standard		
			Rod	Bushing		Bushing	Clearance	
1	Boom cylinder	ø 100 (3.937)	-0.036 (-0.0014)	+0.195 (+0.0076)	0.096 (0.0037)	+0.295 (+0.0116)	0.385 (0.0151)	Replacement
	-0.090 (-0.0035)		+0.060 (+0.0023)	0.285 (0.0112)				
	Bucket cylinder	ø 80 (3.1496)	-0.030 (-0.0011)	+0.195 (+0.0076)	0.096 (0.0037)	+0.295 (+0.0116)	0.371 (0.0146)	
-0.076 (-0.0030)	+0.060 (+0.0023)		0.271 (0.0107)					
Steering cylinder	ø 50 (1.9685)	-0.025 (-0.0010)	+0.110 (+0.0043)	0.025 (0.0010)	+0.210 (+0.0083)	0.274 (0.0108)	Replacement	
		-0.064 (-0.0025)	0 (0)					0.174 (0.0068)

No.	Item	Boom cylinder	Bucket cylinder	Steering cylinder
2	Piston nut tightening torque N-m (kgf-m) (lb-ft)	M75 x 2 6,669 (680) (4,920)	M62 x 2 4,217 (430) (3,111)	M36 x 1.5 1,275 (130) (941)
	Piston nut width across flat mm (in.)	110 (4.33)	90 (3.54)	55 (2.17)
3	Rod cover bolt tightening torque N-m (kgf-m) (lb-ft)	M24 x 3 843 (86) (622)	M24 x 3 883 (90) (651)	(Rod cover) 1,765 (180) (1,302)

- 4) Insert three bolts into hydraulic cap (2) and remove it by using a long bar.

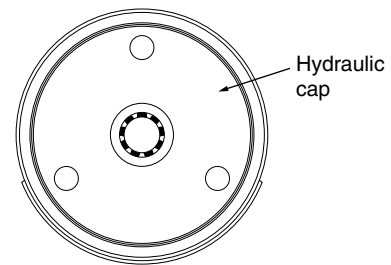
Screw size: 1/2-20UNF-2B

- 5) Push out piston (4) toward the hydraulic end by using a bar.



## 2.Reassembling accumulator

To reassemble the accumulator, follow the above disassembly procedure in the reversed direction.  
After reassembly, carry out the gas charging.



95ZV54003

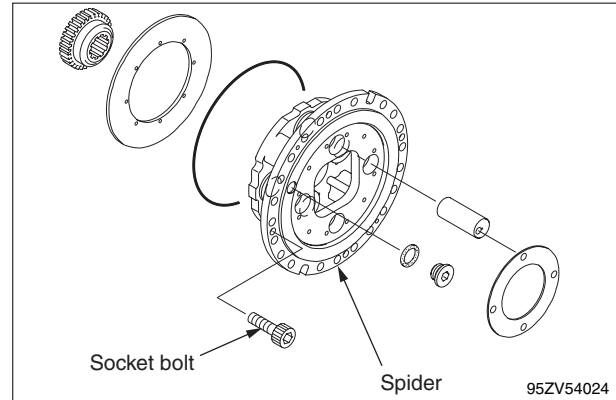
# Service Brake

## Disassembling and reassembling service brake

Refer to "Disassembling and Reassembling Front Axle" in Power group.

### ⚠ WARNING

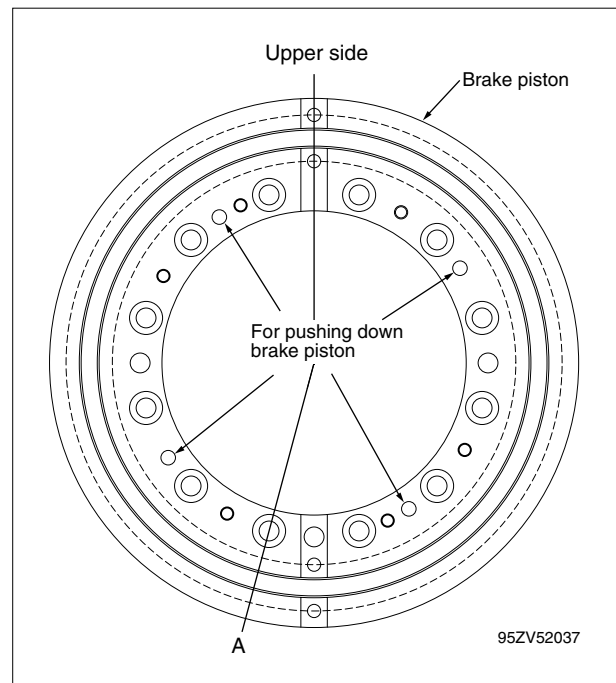
Before air bleeding in the brake oil line, be sure that the wheel and tire assemblies are installed on the wheel hub. If fail to do, the bolts (4 pcs) temporarily tighten the spider and the wheel hub may be broken by the brake piston. Finally the spider and the cover may fall off and it could cause serious injury or death.



## Cautions on installing brake discs

### ⚠ CAUTION

When only the friction plates or the steel plates are to be replaced, if the brake piston and brake stroke adjusting mechanism are installed as they are, the brake may drag and the brake discs may seize. Push back the brake piston and brake stroke adjusting mechanism by using the following procedure.



- 1) Loosen the axle housing air bleeder nipple.
- 2) Insert bolts into four holes for pushing back the brake piston, then tighten the four bolts evenly. The piston should return evenly.

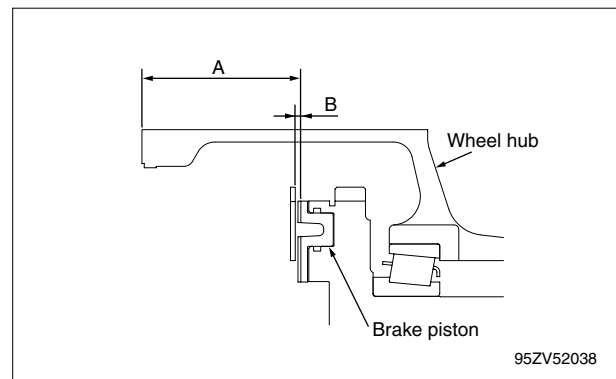
Bolt size for pushing brake piston back (4 required)  
 M10 x 1.5 - 45 to 50 ℓ (1.8 to 1.97 in.) (Fully threaded)

- 3) After pushing back the piston, confirm dimension A from the piston end face to the wheel hub end face.

A ... 162.45 to 163.85 mm (6.4 to 6.45 in.)

**Note:** Piston stroke B

1.15 to 3.65 mm (0.045 to 0.144 in.)



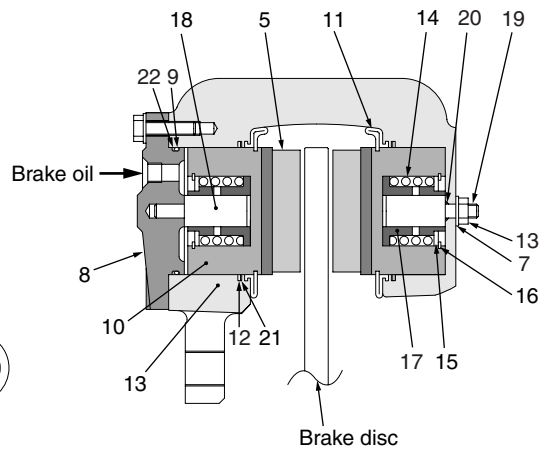
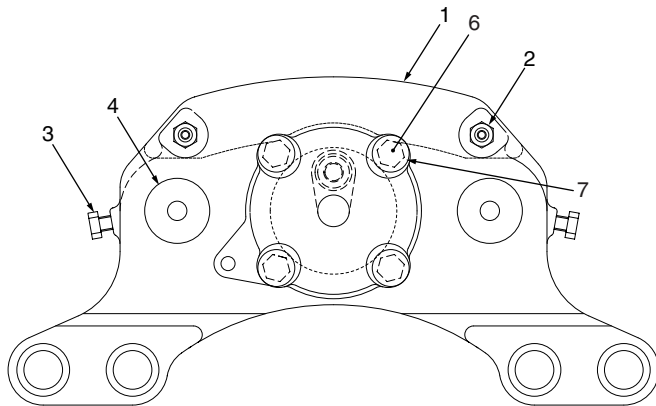
- 4) After finishing the installation work, bleed air completely from the brake line.

## Disassembling and reassembling parking brake (for front)

### IMPORTANT

Before disassembly or reassembly, read and understand the aforementioned "Cautions regarding disassembly and reassembly of hydraulic parts."

### 1. Cross section and tightening torque



95ZV54035

- |                            |                    |                      |
|----------------------------|--------------------|----------------------|
| + 1. Torque plate assembly | ★ 9. Packing       | 17. Sleeve, adjuster |
| 2. Bleeder valve           | 10. Piston         | 18. Guide, adjuster  |
| 3. Bolt                    | ★ 11. Boot         | 19. Guide, adjuster  |
| 4. Pin                     | ★ 12. Packing      | ★ 20. Packing        |
| 5. Pad assembly            | 13. Nut            | ★ 21. Ring, back-up  |
| 6. Bolt                    | 14. Spring         | ★ 22. Ring, back-up  |
| 7. Washer                  | 15. Washer         |                      |
| 8. Cap, inlet              | 16. Retaining ring |                      |

+ Not a repairable or replaceable item.

★ These items are not sold separately;

The parts kit contains the following components;  
item 9, 11, 12, 20, 21, 22.

Torque for assembly

- ☞ : #2: 25 N-m (2.6 kgf-m) (19 lb-ft)
- #3: 51 N-m (5.2 kgf-m) (38 lb-ft)
- #6: 54 N-m (5.5 kgf-m) (40 lb-ft)

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