ZX55U-5A HYDRAULIC EXCAVATOR WORKSHOP MANUAL

PART NO. WAEB-EN-00

HITACHI

Reliable solutions

Workshop Manual

ZX55U-5A

Hydraulic Excavator

Hitachi Construction Machinery Co., Ltd.

URL:http://www.hitachi-c-m.com

PRINTED IN JAPAN (K) 2013, 10

WAEB-EN-00

Service Manual consists of the following separate Part No.

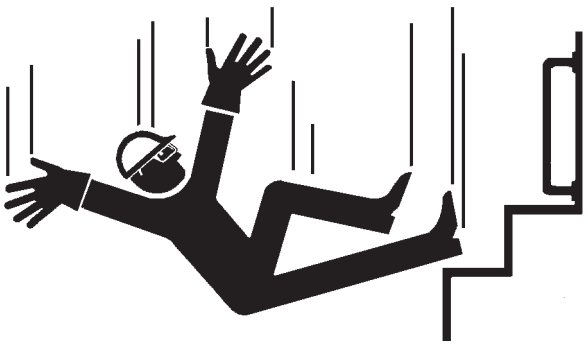
Technical Manual	: Vol. No.TAEB-EN
Workshop Manual	: Vol. No.WAEB-EN
Engine Manual	: Vol. No.ETADB-EN, EWADB-EN

General Precautions for Cab

- Always keep inside the cab clean by observing instructions below, to prevent any personal accidents from occurring.
  - Before entering the cab, thoroughly remove all dirt and/or oil such as mud, grease, soil or stones that may mess up the cab from the soles of your work boots. If any controls such as a pedal is operated while with dirt and/or oil on the soles of the operator's work boots, the operator's foot may slip off the pedal, possibly resulting in a personal accident.
  - Do not mess up around the operator's seat with parts, tools, soil, stones, obstacles that may fold up or turn over, cans or lunch box. The levers or pedals become inoperable if obstacle jams in operation stroke of the travel levers/pedals, pilot control shut-off lever or control levers, which may result in serious injury or death.
  - Avoid storing transparent bottles in the cab. Do not attach any transparent type window decorations on the windowpanes as they may focus sunlight, possibly starting a fire.
  - Refrain from listening to the radio, or using music headphones or mobile telephones in the cab while operating the machine.
  - Keep all flammable objects and/or explosives away from the machine.
  - After using the ashtray, always cover it to extinguish the match and/or tobacco.
  - Do not leave cigarette lighters in the cab. If the temperature in the cab increases, the lighter may explode.
  - Use proper floor mat dedicated to the machine. If another floor mat is used, it may be displaced and contact with the travel pedals during operation, resulting in serious injury or death.

Use Handrails and Steps

- Falling is one of the major causes of personal injury.
  - When you get on and off the machine, always use the crawler instead of the step for safety. Also get on and off from the position of the crawler that can secure your feet space enough.
  - When you get on and off the machine, always face the machine.
  - Maintain a three-point contact with the steps and handrails.
  - Do not use any controls as handholds.
  - Never jump on or off the machine. Never mount or dismount a moving machine.
  - In case adhered slippery material such as oil, grease, or mud is present on steps, handrails, or platforms, thoroughly remove such material.

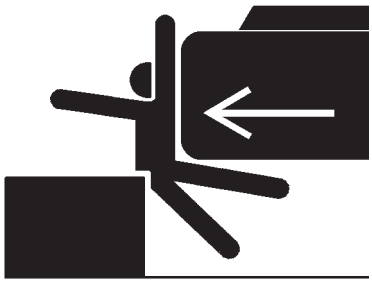


SA-439

Avoid Injury From Back-over and Swing Accidents

- If any person is present near the machine when backing or swinging the upperstructure, the machine may hit or run over that person, resulting in serious injury or death.
  To avoid back-over and swing accidents:
  - Always look around BEFORE YOU BACK UP AND SWING THE MACHINE. BE SURE THAT ALL BYSTANDERS ARE CLEAR.
  - Keep the travel alarm in working condition (if equipped). ALWAYS BE ALERT FOR BYSTANDERS MOVING INTO THE WORK AREA. USE THE HORN OR OTHER SIGNAL TO WARN BYSTANDERS BEFORE MOVING MACHINE.
  - USE A SIGNAL PERSON WHEN BACKING UP IF YOUR VIEW IS OBSTRUCTED. ALWAYS KEEP THE SIGNAL PERSON IN VIEW.
    Use hand signals, which conform to your local regulations, when work conditions require a signal person.
  - No machine motions shall be made unless signals are clearly understood by both signal person and operator.
  - Learn the meanings of all flags, signs, and markings used on the job and confirm who has the responsibility for signaling.
  - Keep windows, mirrors, and lights clean and in good condition.
  - Dust, heavy rain, fog, etc., can reduce visibility. As visibility decreases, reduce speed and use proper lighting.
  - Read and understand all operating instructions in the operator's manual.

SA-383



SA-384

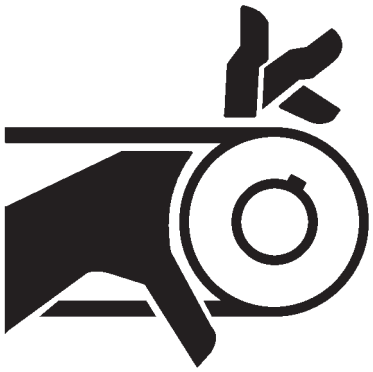
Support Machine Properly

- Never attempt to work on the machine without securing the machine first.
  - Always lower the attachment to the ground before you work on the machine.
  - If you must work on a lifted machine or attachment, securely support the machine or attachment with stays or blocks strong enough to support the machine and/or attachment weight.

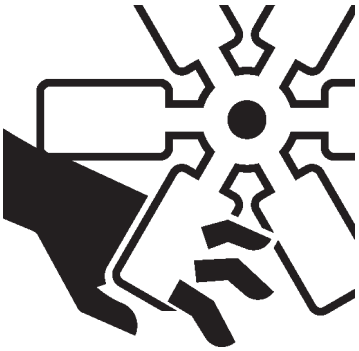
SA-527

Stay Clear of Moving Parts

- Contact with moving parts can cause serious injury or death due to amputation or entanglement.
  - To prevent accidents, care should be taken to ensure that hands, feet, clothing, jewelry and hair do not become entangled when working around rotating parts.



SA-026



SA-2294

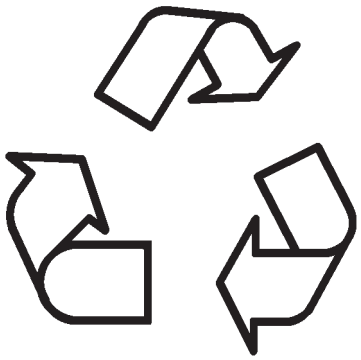
Handle Chemical Products Safely

- Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with your machine include such items as lubricants, electrolyte, coolants, paints, and adhesives.
  - A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.
  - Check the MSDS before you start any job using a hazardous chemical. Then follow the correct procedures and use recommended equipment.
  - See your authorized dealer for MSDS.

SA-309

Dispose of Waste Properly

- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with HITACHI equipment includes such items as oil, fuel, coolant, brake fluid, filters, and battery.
  - When draining fluid, use a leakproof container with a capacity larger than the drained fluid volume to receive it.
  - Do not pour waste onto the ground, down a drain, or into any water source.
  - Inquire on the proper way to dispose of harmful waste such as oil, fuel, coolant, brake fluid, filters, and battery from your local environmental or recycling center.

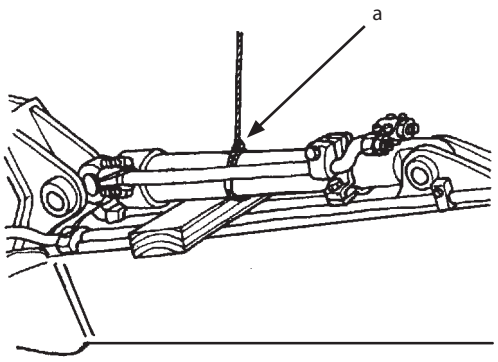


SA-226

Precautions for Using Nylon Sling

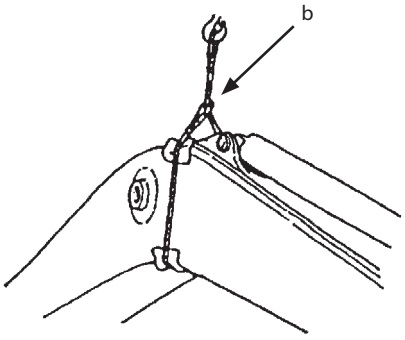
1. Follow the precautions below to use nylon slings safely.

- Attach protectors (soft material) on the corners of the load so that the nylon sling does not directly contact the corners. This will prevent the nylon sling from being damaged and the lifted load from slipping.
- Lower the temperature of the lifted load to lower than 100 °C (212 °F). If unavoidably lifting a load with a temperature of 100 °C (212 °F) or more, reduce the load weight.
- Do not lift acid or alkali chemicals.
- Take care not to allow the sling to become wet. The load may slip.
- When required to use more than one sling, use slings with the same width and length to keep the lifted load balanced.
- When lifting a load using an eyehole, be sure to eliminate any gaps between the sling and load. (Refer to the right illustration.) Reduce the load weight so that it is less than 80 % of the sling breaking force.
- Avoid using twisted, bound, connected, or hitched slings.
- Do not place any object on twisted or bent slings. (Refer to the right illustration.)
- When removing the slings from under the load, take care not to damage the nylon slings. Avoid contact with protrusions.
- Avoid dragging slings on the ground, throwing slings, or pushing slings with a metal object.
- When using with other types of slings (wire rope) or accessories (shackle), protect the joint so that the nylon sling is not damaged.
- Store the nylon slings indoors so that they won't deteriorate with heat, sun light, or chemicals.



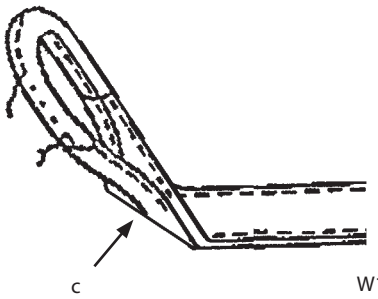
W102-04-02-016

a - Correct Eyehole Lifting Method



W105-04-01-008

b - Incorrect Eyehole Lifting Method



W162-01-01-009

c - Bent of Sling

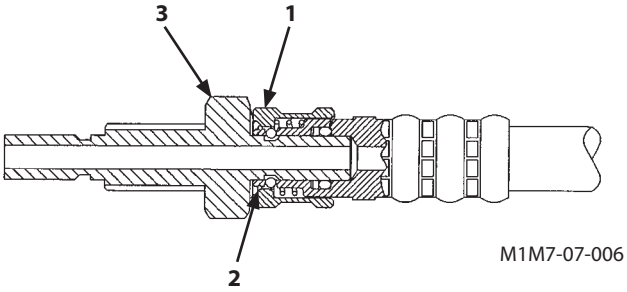
Quick Coupling

1. Coupling procedure

- Push socket ring (1) into plug (3) by rotating it fully counterclockwise and then pulling it toward you.
- Release socket ring (1). Check that socket ring (1) is returned by the spring force and the coupling is locked completely by ball (2). At this time, check if socket ring (1) is returned to the original position (to the rightmost direction).

2. Separating procedure

- Remove the hose by rotating socket ring (1) fully counterclockwise and then pulling it. Because no check function is attached inside, be careful that oil flows out.
- Cap the removed hoses using special plug.



M1M7-07-006

CAUTION:

- **When disconnecting, do not damage joint surface.**
- **When disconnecting, clean the joint part and thoroughly wipe off the cleaning solution to prevent any foreign material from entering.**
- **Complete the joint disconnecting / connecting procedure. Check enough if oil leaks especially after installation.**
- **After installation, check if socket ring (1) is returned to the original position (to the rightmost direction).**

Releasing Pressure in Hydraulic Circuit

Release any remaining pressure in the following procedures when removing and installing the front attachment.

1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)

⚠ CAUTION: Bleed air from the hydraulic oil tank. (Refer to W1-4-1.)

2. Tilt up the floor. (Refer to the operator's manual.)

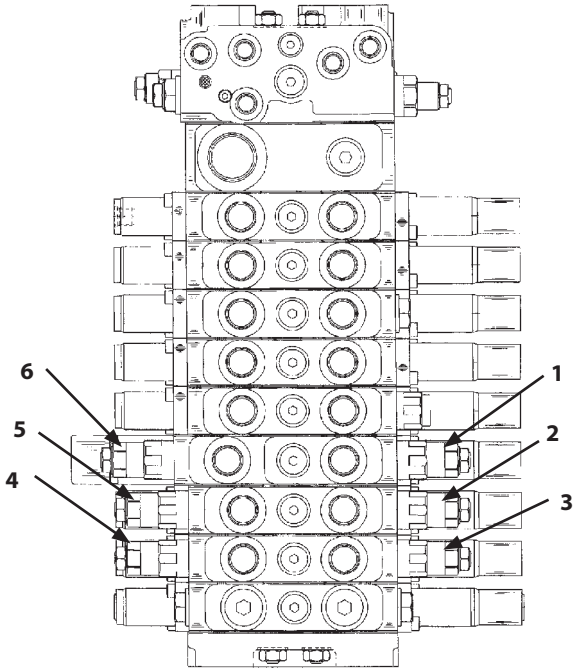
⚠ CAUTION: Each attachment may move rapidly in case the overload relief valve is loosened rapidly. Check that the machine has set in the position for inspection and maintenance and loosen it slowly. Do not loosen it more than 3/4 turns as hydraulic oil may spout.

IMPORTANT: Do not turn lock nut (8) and adjusting screw (9). If turning, the setting changes.

3. Slowly loosen body (7) of the overload relief valve in which any remaining pressure will be released.

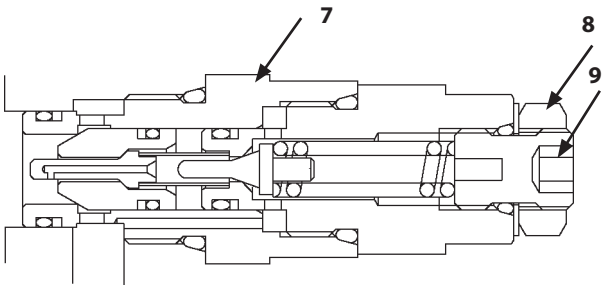
: 24 mm

: 70 to 80 N·m (7 to 8 kgf·m, 52 to 59 lbf·ft)



TAEA-03-04-003

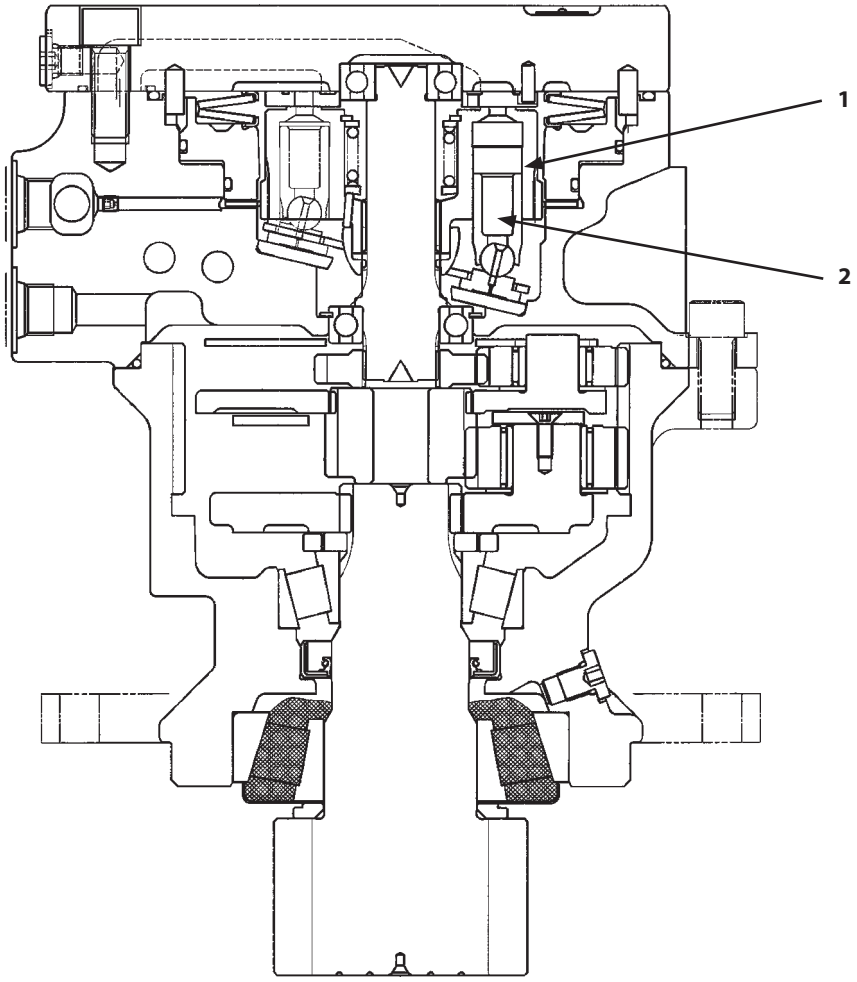
1- Overload Relief Valve (Boom Lower)
2- Overload Relief Valve (Arm Roll-In)
3- Overload Relief Valve (Bucket Roll-Out)
4- Overload Relief Valve (Bucket Roll-In)
5- Overload Relief Valve (Arm Roll-Out)
6- Overload Relief Valve (Boom Raise)



TAEA-03-04-013

7- Body
8- Lock Nut
9 - Adjusting Screw

Swing Motor



WADB-03-07-002

1- Rotor
2- Plunger (9 Used)

Track

Rubber Crawler Crack

1. Outside of Rubber Crawler

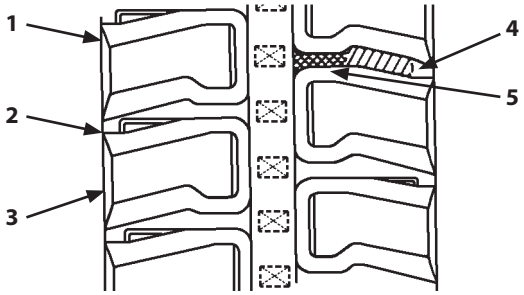
   If there is a crack on lug base (1) with depth of 3 mm (0.12 in) or more, repair the track.

   If there is a crack between lugs (2) with depth of 3 mm (0.12 in) or more, repair the track.

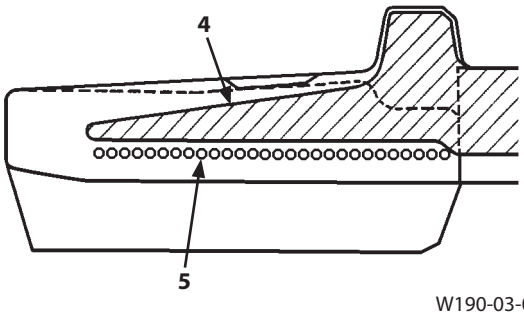
   If there is a crack on lugs (3) or between lugs (2) and it reaches steel code (5) or steel core (4) with length of 30 mm (1.18 in) or more, immediately repair the track.

2. Inside of Rubber Crawler (Roller (6) Side)

   If there is a crack that reaches steel code (5) or steel core (4), immediately repair the track.



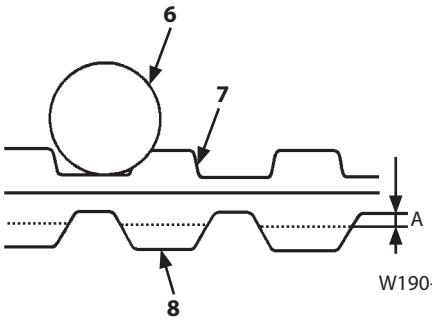
W190-03-07-001



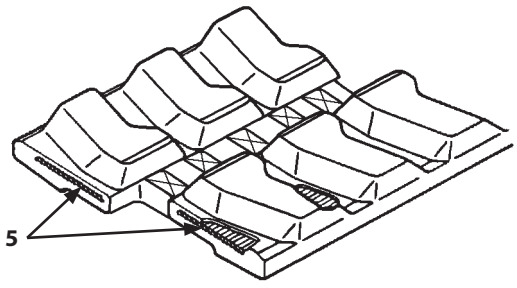
W190-03-07-002

Lug Wear

1. If height (A) of lug (8) is less than 5 mm (0.2 in), replace rubber crawler (7) as an assembly.
2. If any part of steel code (5) appeared on the track, replace the worn rubber crawler as an assembly.



W190-03-07-003



W190-03-07-004

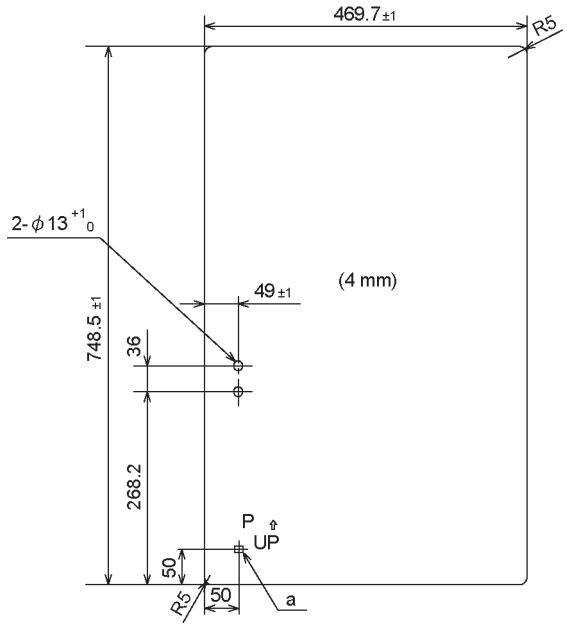
SECTION 3

UPPERSTRUCTURE

CONTENTS

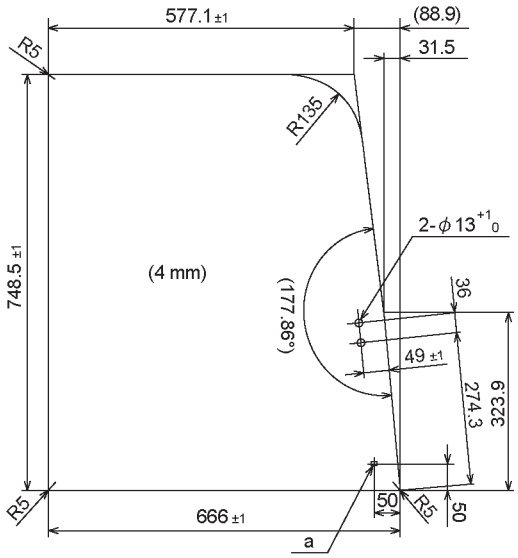
Dimensions of Cab Glass

Unit: mm



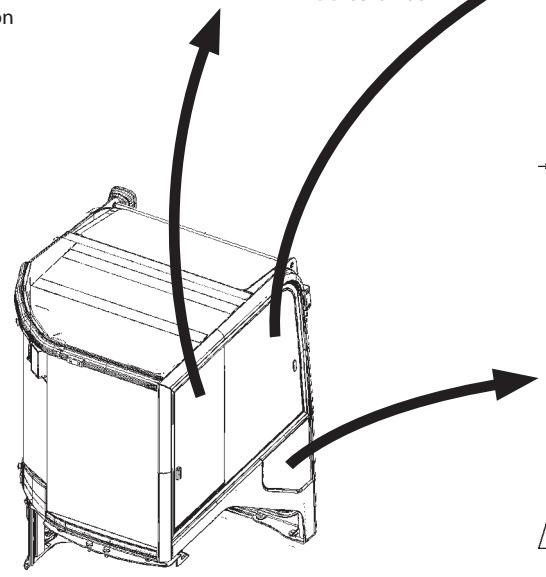
WADB-03-01-001

a - Mark Position

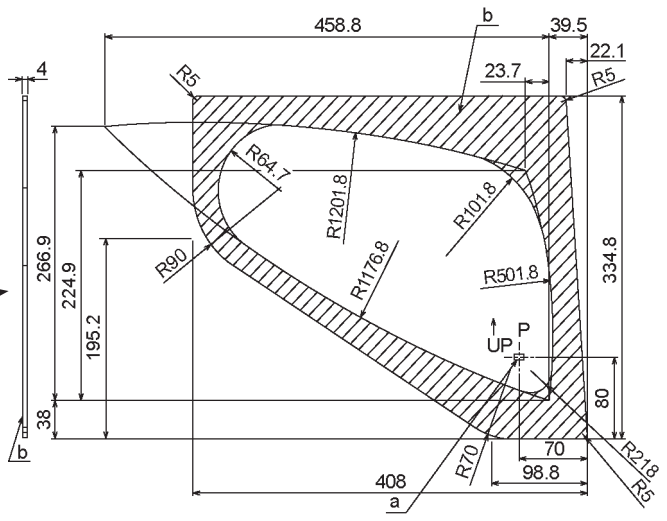


WADB-03-01-002

a - Mark Position



WADB-03-01-003

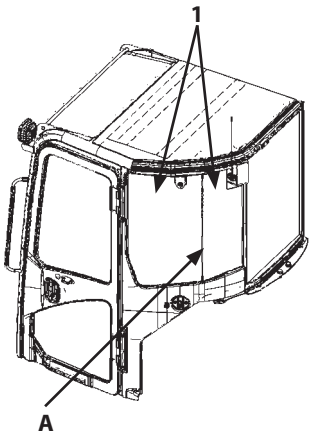


WADB-03-01-004

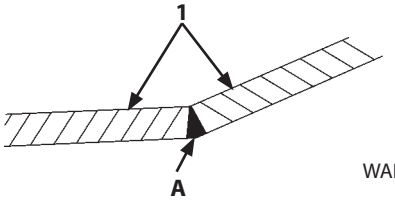
a - Mark Position

b - Black Ceramic Coating Surface

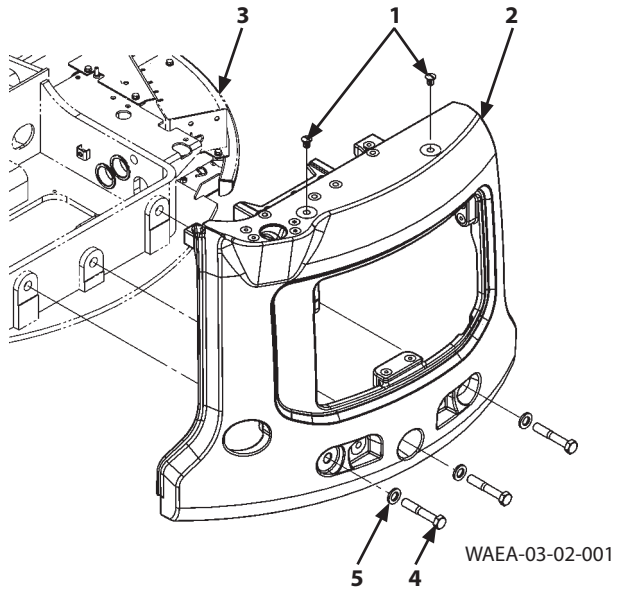
13. Evenly apply adhesive (SUNSTAR Penguin Seal #2505) to part A of rear left-hand glass (1).



WADB-03-01-009



WADB-03-01-020



CAUTION: Counterweight (2) weight: 700 kg (1550 lb)

9. Remove caps (1) (2 used). Install eyebolts (M20, Pitch 2.5 mm) (2 used) to the cap (1) mounting holes (2 places). Hoist and hold counterweight (2).
10. Remove bolts (4) (3 used) and washers (5) (3 used) from counterweight (2).

    : 36 mm
11. Raise counterweight (2) a little. Slide counterweight (2) to the rear side. Remove counterweight (2) from main frame (3).

9. Remove coupling (47) from the shaft (5) assembly.
10. Remove spring guide (32) from body H (39). Remove spring (31), spring holder (30), and the cylinder block (23) assembly from body S (10).

IMPORTANT: When replacing component parts (18 to 23, 25) of the cylinder block (23) assembly and valve plate (28), replace them as an assembly.

11. Remove plungers (18) (11 used), retainer (19), holder (20), washer (21), and needles (22) (3 used) from cylinder block (23).

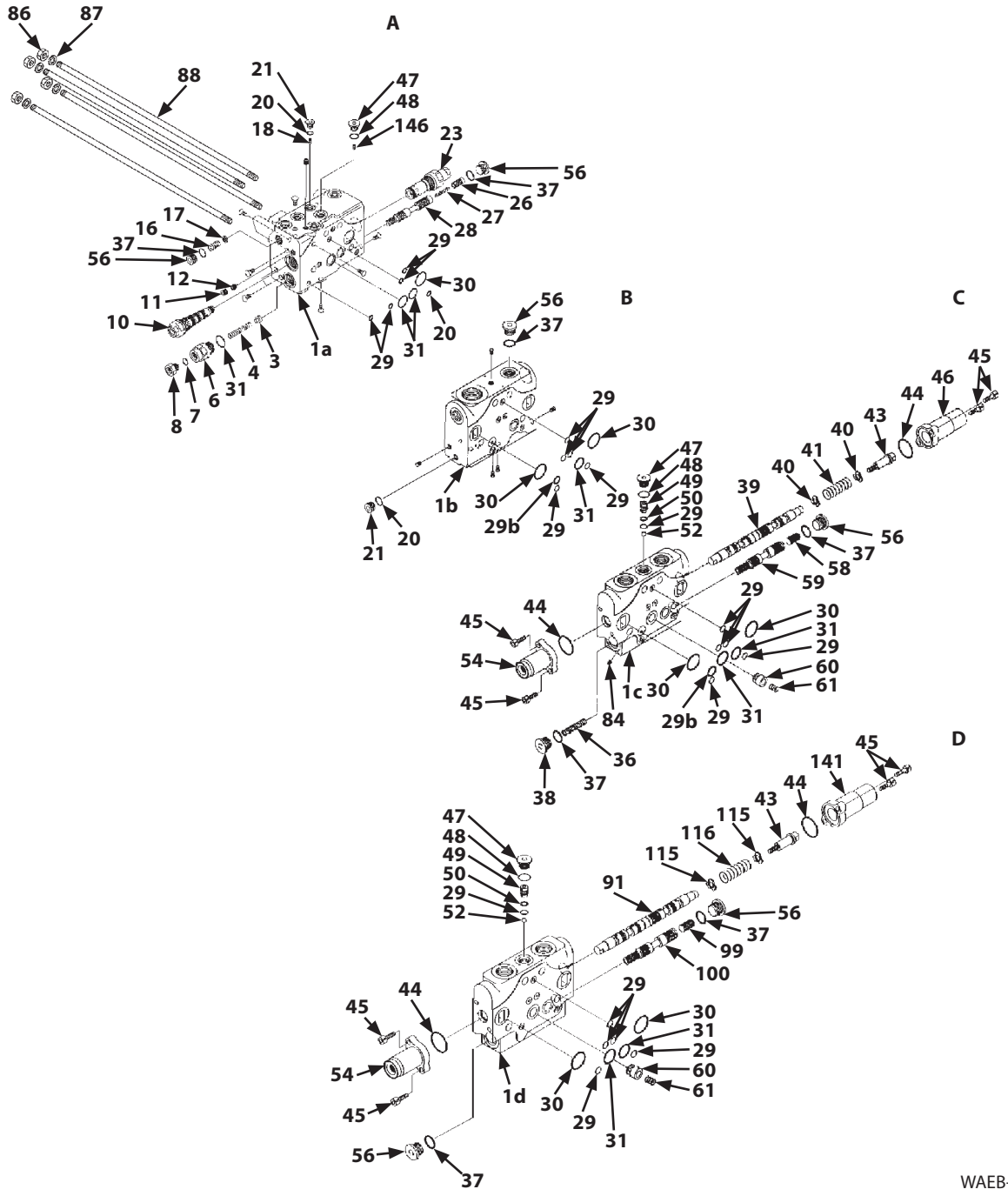
CAUTION: Push spring (25) by using a press in order not to fly out and remove retaining ring (27).

12. Remove retaining ring (27) from cylinder block (23). Remove washers (21) (2 used) and spring (25).
13. Remove swash plate (17) and ceramic balls (16) (2 used) from body S (10).
14. Remove stopper pin (14), spring (13), and control pistons (15) (2 used) from body S (10).

IMPORTANT: Do not remove ball bearing (6) and retaining ring (7) unless necessary.

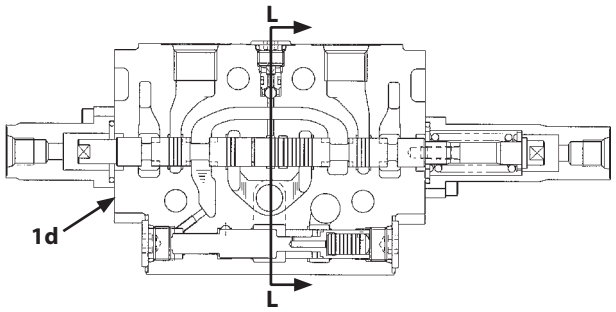
15. Remove retaining ring (1) from body S (10). Remove the shaft (5) assembly by tapping the body H (39) side by using a plastic hammer.
16. Remove the seal holder (3) assembly from shaft (5). Remove oil seal (4) and O-ring (2) from seal holder (3).

Disassembly and Assembly of Control Valve



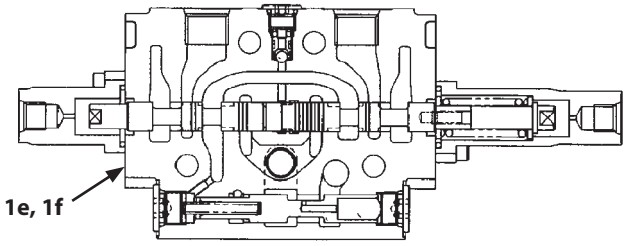
WAEB-03-06-001

Section D-D (Blade)



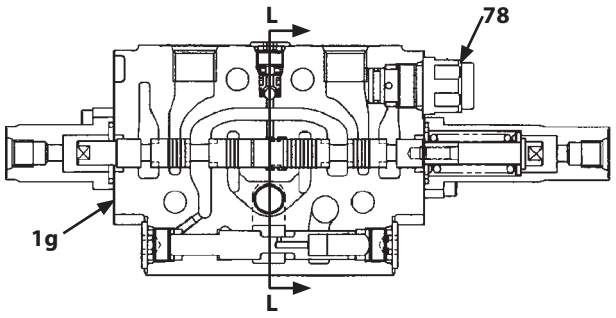
TAEA-03-04-004

Section E-E (Travel (Left))
Section F-F (Travel (Right))



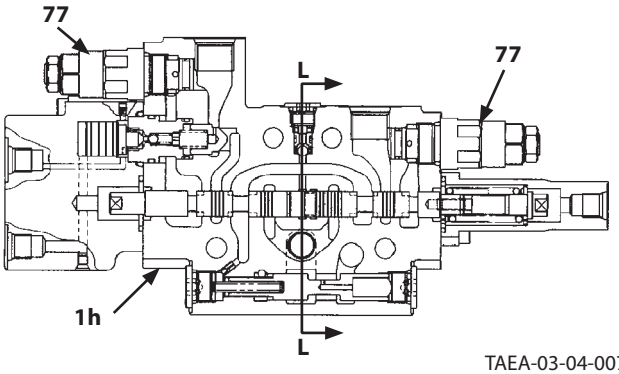
TAEA-03-04-005

Section G-G (Boom Swing)



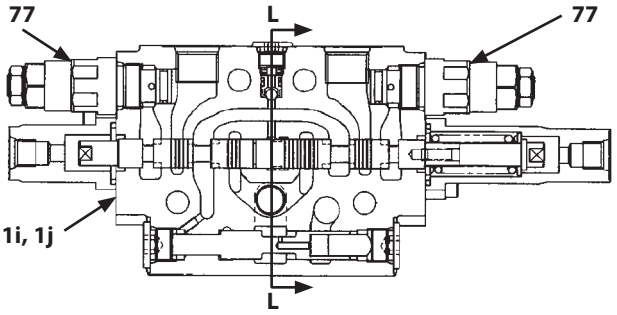
TAEA-03-04-006

Section H-H (Boom)



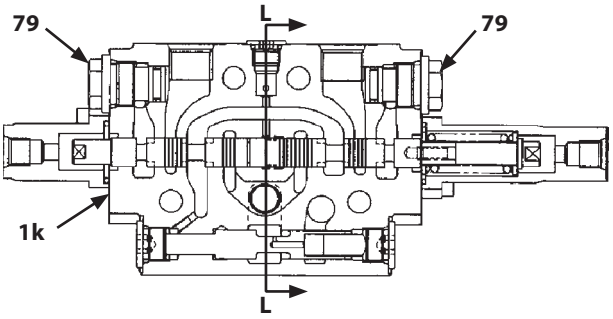
TAEA-03-04-007

Section I-I (Arm)
Section J-J (Bucket)



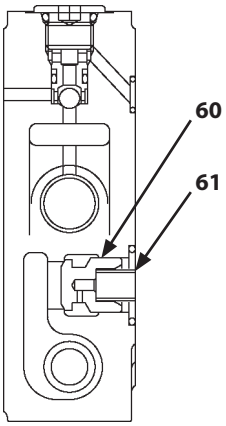
TAEA-03-04-008

Section K-K (Auxiliary)



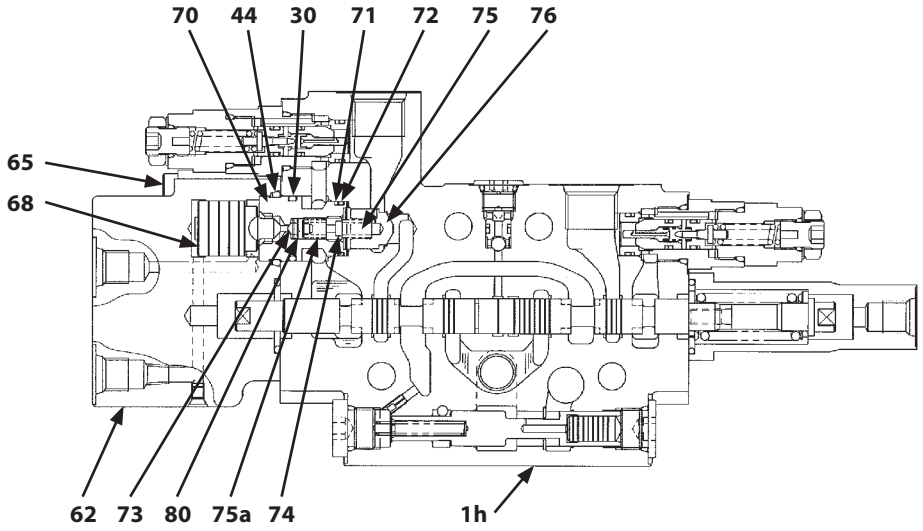
TAEA-03-04-009

Section L-L



T566-03-03-009

Assembly of Boom Anti-Drift Valve

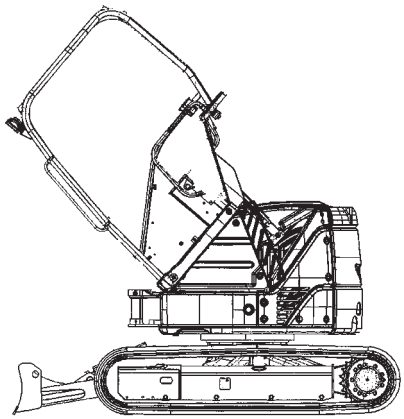


W1NG-02-04-012

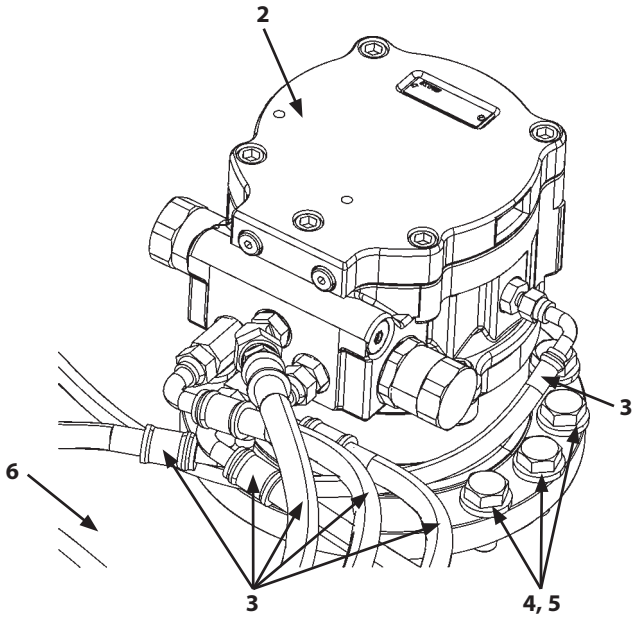
1h- Body (Boom)
30- O-Ring
44- O-Ring
62- Cover
64- *Socket Bolt (2 Used)
65- Socket Bolt (2 Used)
68- Piston
70- Sleeve
71- Backup Ring
72- O-Ring
73- Steel Ball
74- Orifice
75- Spring
75a- Spring
76- Poppet
80- Spring Guide
83- *Orifice

*NOTE: As for the item with mark *, refer to W3-6-5-1*

Removal and Installation of Swing Device



M1M7-07-067



WAEB-03-07-001

IMPORTANT: The hose and pipe contain hydraulic oil. When removing the hose and pipe, receive oils with a container in order to avoid spilling oils.

IMPORTANT: Cap the open ends in case the hoses and pipes have been disconnected. Attach an identification tag onto the hoses and the pipe for assembling. Connect the hoses and install the clips in case the clips which secure the hoses have been removed.

Removal

1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)

CAUTION: Bleed air from the hydraulic oil tank. (Refer to W1-4-1.)

2. Tilt up the floor. (Refer to the operator's manual.)
3. Disconnect hoses (3) (6 used) from swing device (2).

: 17 mm, 19 mm, 22 mm, 27 mm

CAUTION: Swing device (2) weight: 44 kg (98 lb)

4. Remove bolts (4) (8 used) and washers (5) (8 used). Remove swing device (2) from main frame (6).

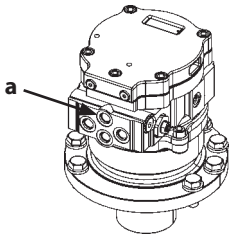
: 24 mm

5. Remove the adapters with swing device (2) attached if necessary.

12. Remove disc springs (19) (2 used) and spring seats (18) (2 used) from casing (1).

CAUTION: When removing brake piston (15) by using air, hold brake piston (15) with a cloth in order not to fly out.

13. Put the matching marks on casing (1) and brake piston (15). Apply air through parking brake port (a) of casing (1). Raise and remove brake piston (15).



W1NG-02-05-001

a- Parking Brake Port

14. Remove O-rings (16, 17) from brake piston (15).

IMPORTANT: Do not damage the sliding surfaces of rotor (5) and plunger (13).

15. Remove the rotor (5) assembly from shaft (3).

IMPORTANT: Replace rotor (5) and plunger (13) as an assembly.

16. Remove plungers (13) (9 used), retainer (12), holder (11), and pins (10) (3 used) from rotor (5).

CAUTION: When removing retaining ring (9), push washer (8) and spring (7) by using a press in order not to fly out.

17. Remove retaining ring (9), washer (8), spring (7), and collar (6) from rotor (5) by using a press.

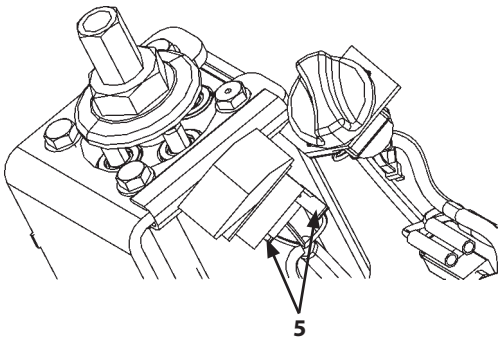
IMPORTANT: Do not damage the sliding surface of swash plate (4).

18. Remove disc plate (14) and swash plate (4) from casing (1).

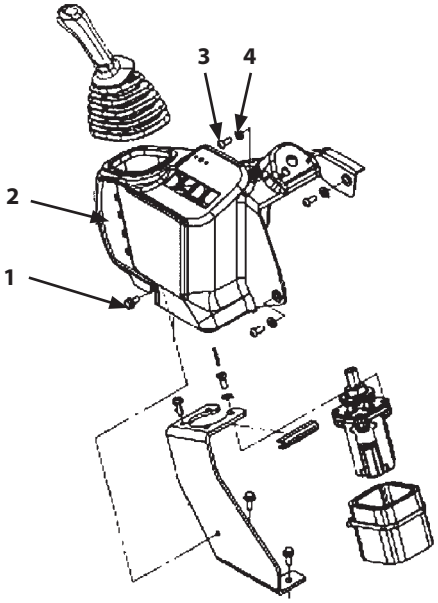
19. Place the casing (1) assembly horizontally with the orifice (28) mounting side down. Tap the ball bearing (2) mounting side by using a plastic hammer and remove the shaft (3) assembly from casing (1).

20. Remove ball bearing (2) from shaft (3) by using a press.

21. Remove retaining ring (47) from ball bearing (2).



WADB-03-08-016



WADB-03-08-015

5. Install cover (2).
6. Raise cover (2). Connect all connectors (5).
7. Install cover (2) with washers (4) (4 used), screws (3) (4 used), and bolt, washer (1).

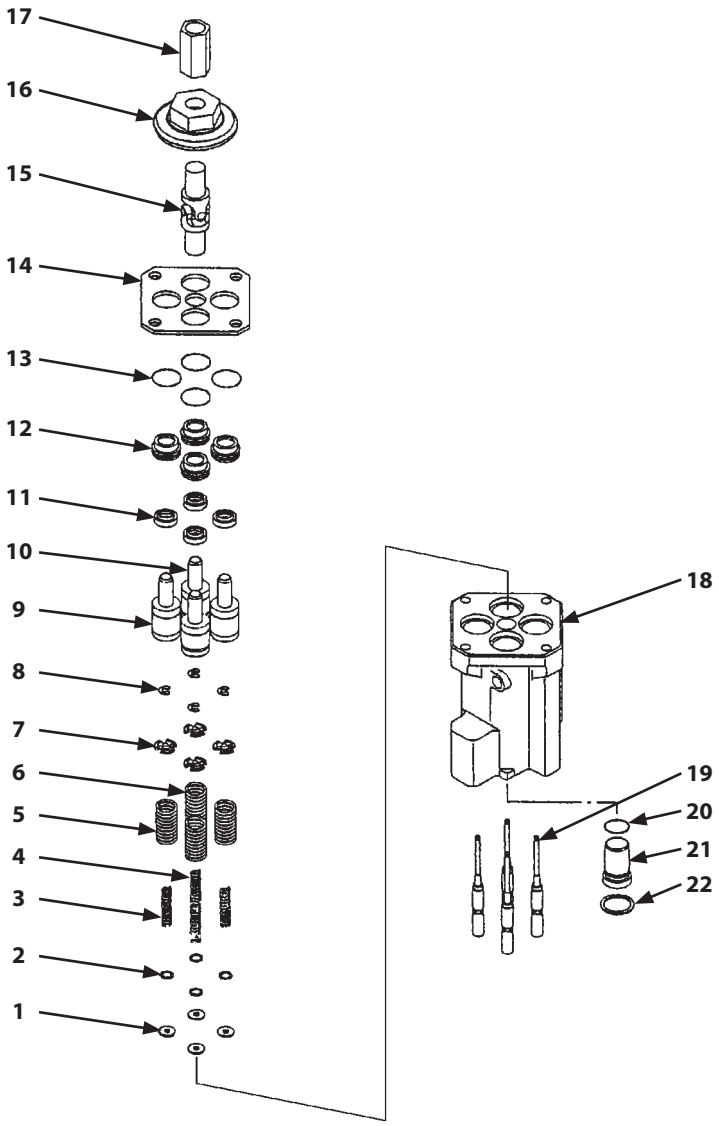
: 13 mm

: 10 N·m (1 kgf·m, 7.4 lbf·ft)

: 5 mm

: 10 N·m (1 kgf·m, 7.4 lbf·ft)

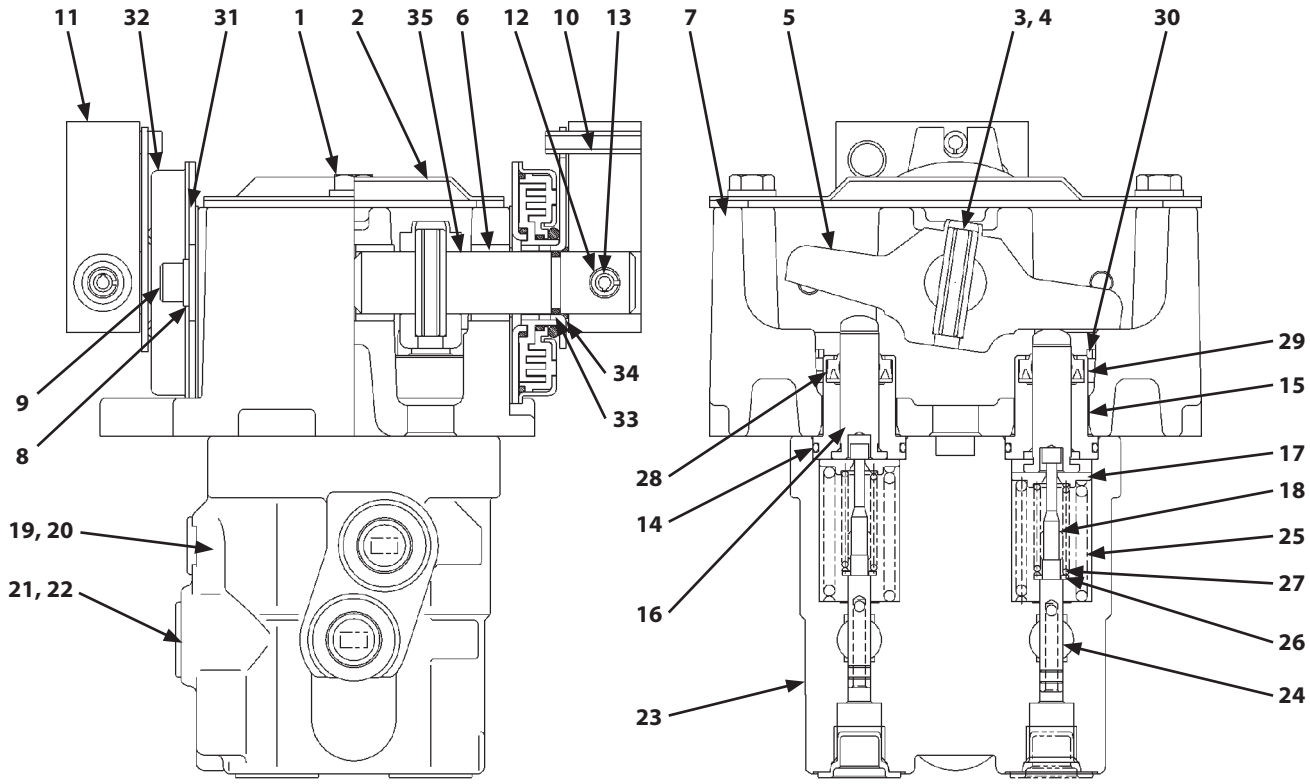
Disassembly of Pilot Valves (Right and Left)



WADB-03-08-003

1- Spacer (4 Used)
2- Shim (Several)
3- Balance Spring (2 Used)
4- Balance Spring (2 Used)
5- Return Spring (2 Used)
6- Return Spring (2 Used)
7- Spring Guide (4 Used)
8- Retaining Ring (4 Used)
9- Pusher (2 Used)
10- Pusher (2 Used)
11- Oil Seal (4 Used)
12- Sleeve (4 Used)
13- O-Ring (4 Used)
14- Plate
15- Universal Joint
16- Cam
17- Screw Joint
18- Casing
19- Spool (4 Used)
20- O-Ring
21- Plug
22- Retaining Ring

Assembly of Travel Pilot Valve



WADB-03-08-005

1- Bolt, Washer (2 Used)
2- Cover
3- Spring Pin (2 Used)
4- Spring Pin (2 Used)
5- Cam (2 Used)
6- Bushing (4 Used)
7- Holder
8- Spring Washer (4 Used)
9- Socket Bolt (4 Used)
10- Spring Pin (2 Used)
11- Bracket (2 Used)
12- Spring Pin (2 Used)
13- Spring Pin (2 Used)
14- O-Ring (4 Used)
15- Bushing (4 Used)
16- Pusher (4 Used)
17- Spring Guide (4 Used)
18- Balance Spring (4 Used)
19- O-Ring (2 Used)
20- Plug (2 Used)
21- Plug (2 Used)
22- O-Ring (2 Used)
23- Casing
24- Spool (4 Used)
25- Spring (4 Used)
26- Spacer (4 Used)
27- Shim (12 Used)
28- Oil Seal (4 Used)
29- Spring Washer (2 Used)
30- Socket Bolt (2 Used)
31- Rubber Seat (2 Used)
32- Damper (2 Used)
33- O-Ring (2 Used)
34- O-Ring (2 Used)
35- Pin (2 Used)

Assembly of Pilot Valve

IMPORTANT: Before assembling, apply hydraulic oil onto parts in order to prevent them from seizing.

IMPORTANT: The pilot valve is the susceptible hydraulic component to contamination. Keep the parts clean when assembling.

IMPORTANT: Install shim (01) as the same quantity before disassembling.

1. Install spacer (00), shims (01) (3 used), and balance spring (02) to spool (15B) in sequnce.

IMPORTANT: Install spring guide (03) with the stepped part down.

2. Compress balance spring (02) by hand. Install spring guide (03) to spool (15B).

IMPORTANT: When installing the parts to holder (06) and casing (15A), apply hydraulic oil.

3. Secure casing (15A) in a vise. Install return spring (16) to casing (15A).

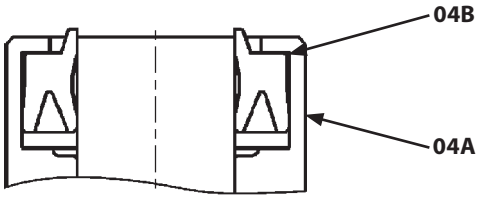
IMPORTANT: Install the spool (15B) assembly to the original port before disassembling.

4. Install the spool (15B) assembly to casing (15A) by rotating.

IMPORTANT: Do not deform and damage the sliding surface when installing oil seal (04B).

IMPORTANT: Check the direction to install oil seal (04B).

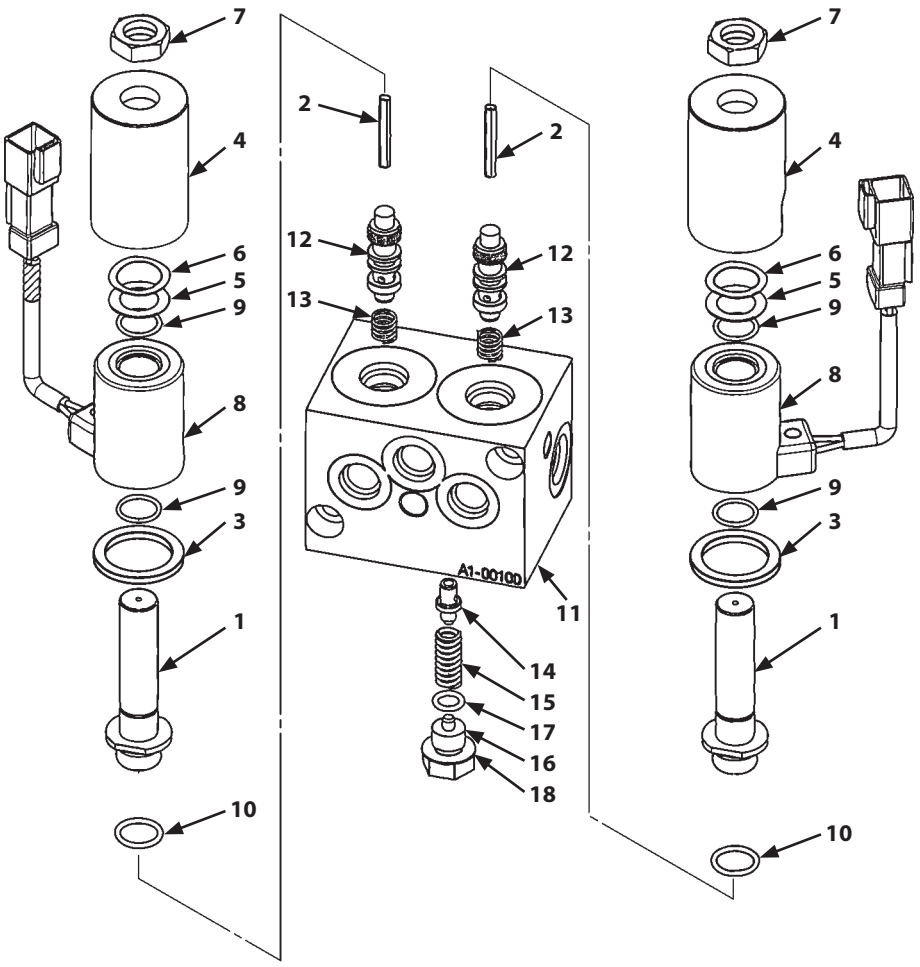
5. Apply grease onto oil seal (04B). Install oil seal (04B) to bushing (04A).



WDAD-03-11-003

6. Apply grease onto the bushing (04A) sliding surface and O-ring (04C). Install O-ring (04C) and pusher (04D) to bushing (04A).
7. Install the pusher (04D) assembly to cashing (15A).
8. Install other spool (15B) and pusher (04D) in the same way as step 1 to step 7.

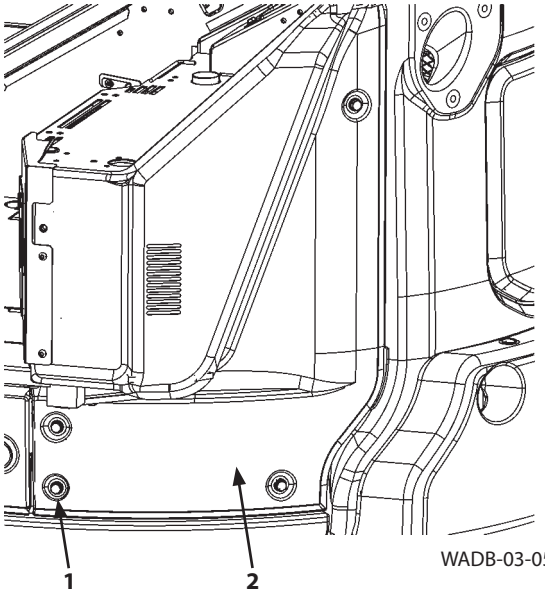
Disassembly of 2-Spool Solenoid Valve



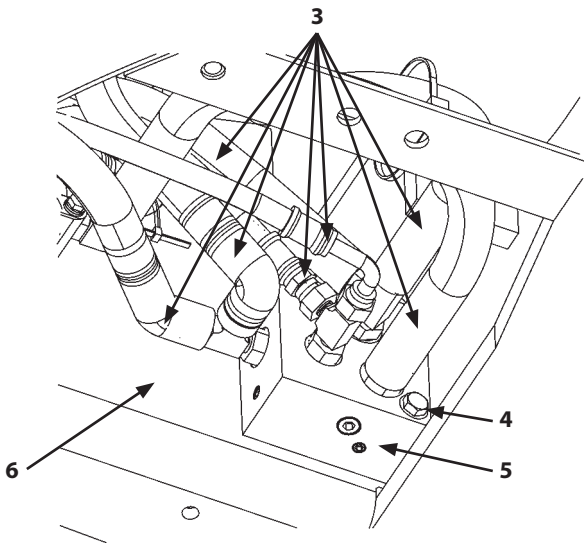
WADB-03-09-001

1- Piston (2 Used)
2- Pin (2 Used)
3- Plate (2 Used)
4- Casing (2 Used)
5- Plate (2 Used)
6- Wave Washer (2 Used)
7- Lock Nut (2 Used)
8- Solenoid (2 Used)
9- O-Ring (4 Used)
10- O-Ring (2 Used)
11- Body
12- Spool (2 Used)
13- Spring (2 Used)
14- Check Valve
15- Spring
16- Adjuster
17- O-Ring
18- Lock Nut

Removal and Installation of Revolution Sensing Valve



WADB-03-05-005



WAEB-03-10-002

IMPORTANT: The hose and pipe contain hydraulic oil. When removing the hose and pipe, receive oils with a container in order to avoid spilling oils.

IMPORTANT: Cap the open ends in case the hoses and pipes have been disconnected. In addition, attach an identification tag onto the connectors, hoses, and pipes for assembling. Connect the hoses and install the clips in case the clips which secure the hoses have been removed.

Removal

1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)

CAUTION: Bleed air from the hydraulic oil tank. (Refer to W1-4-1.)

2. Remove bolts, washers (1) (4 used). Remove cover (2).

: 17 mm

3. Disconnect hoses (3) (7 used) from revolution sensing valve (5).

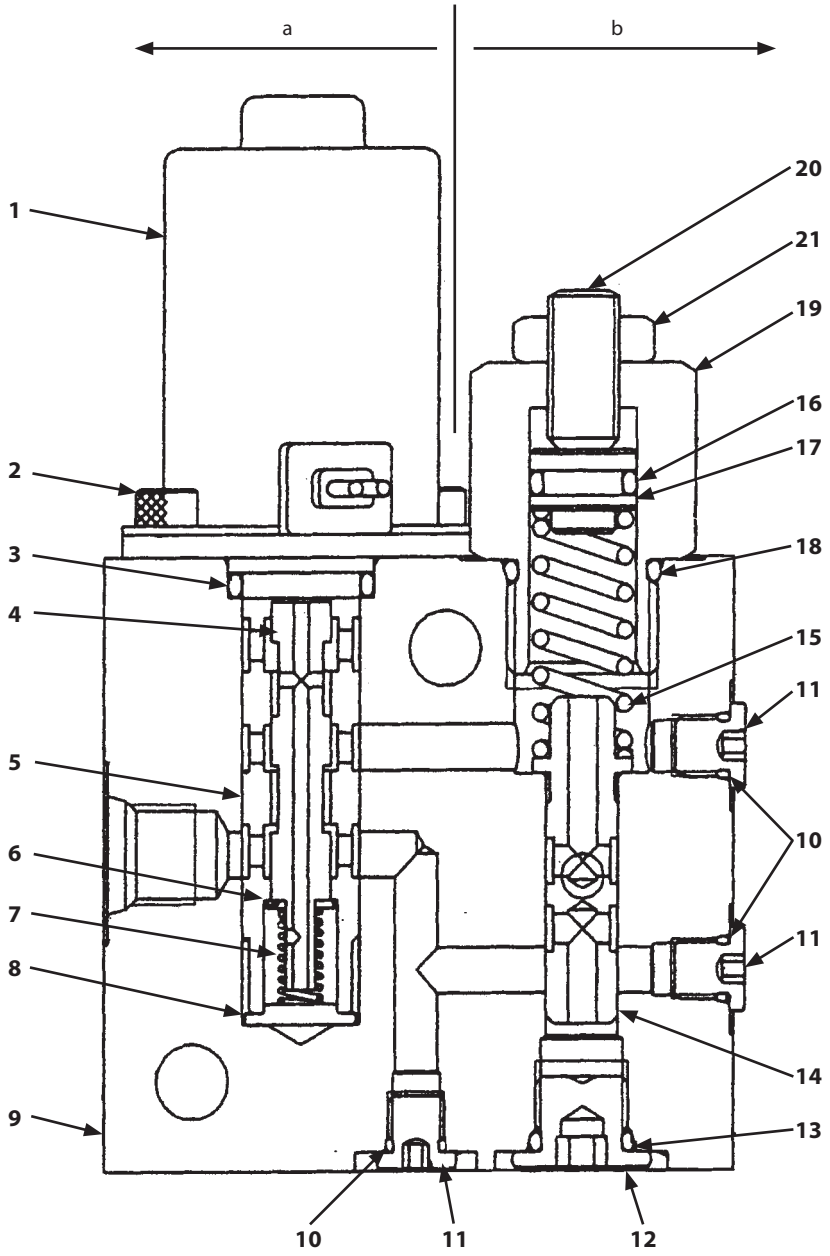
: 17 mm, 19 mm

4. Remove bolts, washers (4) (2 used). Remove revolution sensing valve (5) from frame (6).

: 13 mm

5. Remove the adapters with revolution sensing valve (5) attached if necessary.

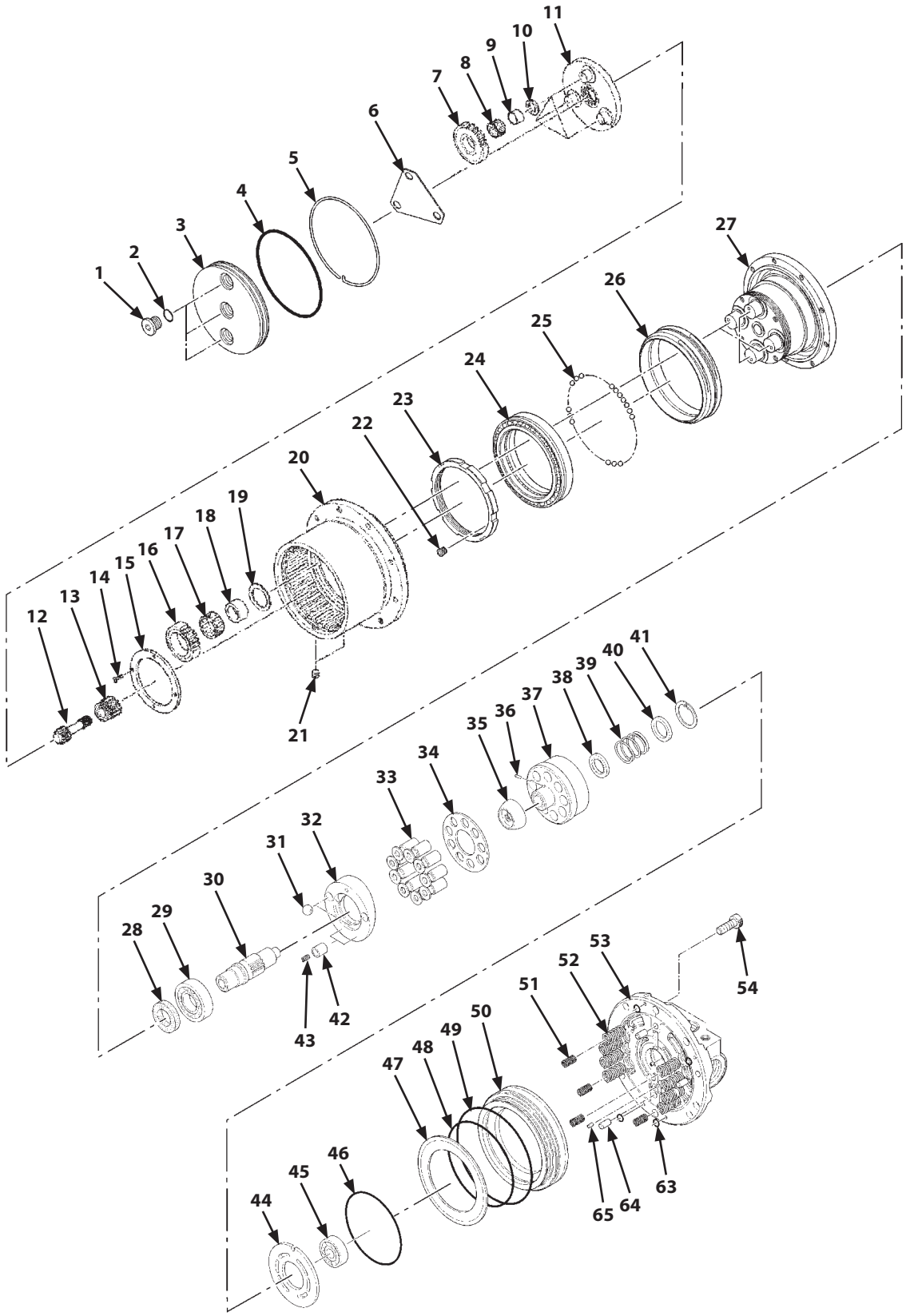
Assembly of Auxiliary Flow Rate Selector Valve (OP)



a- Flow Rate Selector Solenoid Valve
b- Reducing Valve

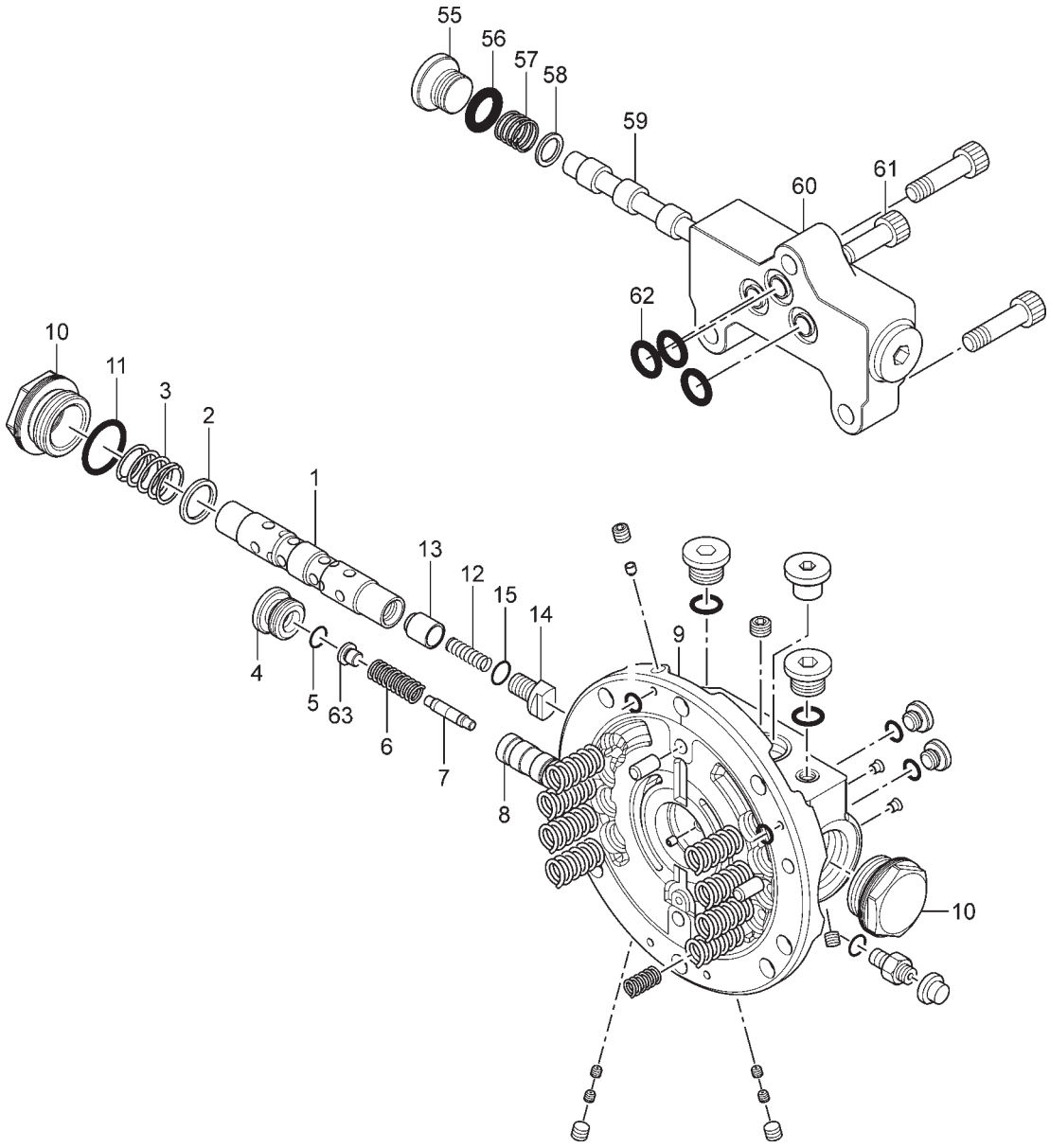
1- Solenoid
2- Socket Bolt (2 Used)
3- O-Ring
4- Spool
5- Sleeve
6- Washer
7- Spring
8- Stopper
9- Body
10- O-Ring (4 Used)
11- Plug (4 Used)
12- Plug
13- O-Ring
14- Spool
15- Spring
16- O-Ring
17- Plug
18- O-Ring
19- Plug
20- Adjusting Screw
21- Lock Nut

Disassembly of Travel Device



W1NG-03-02-003

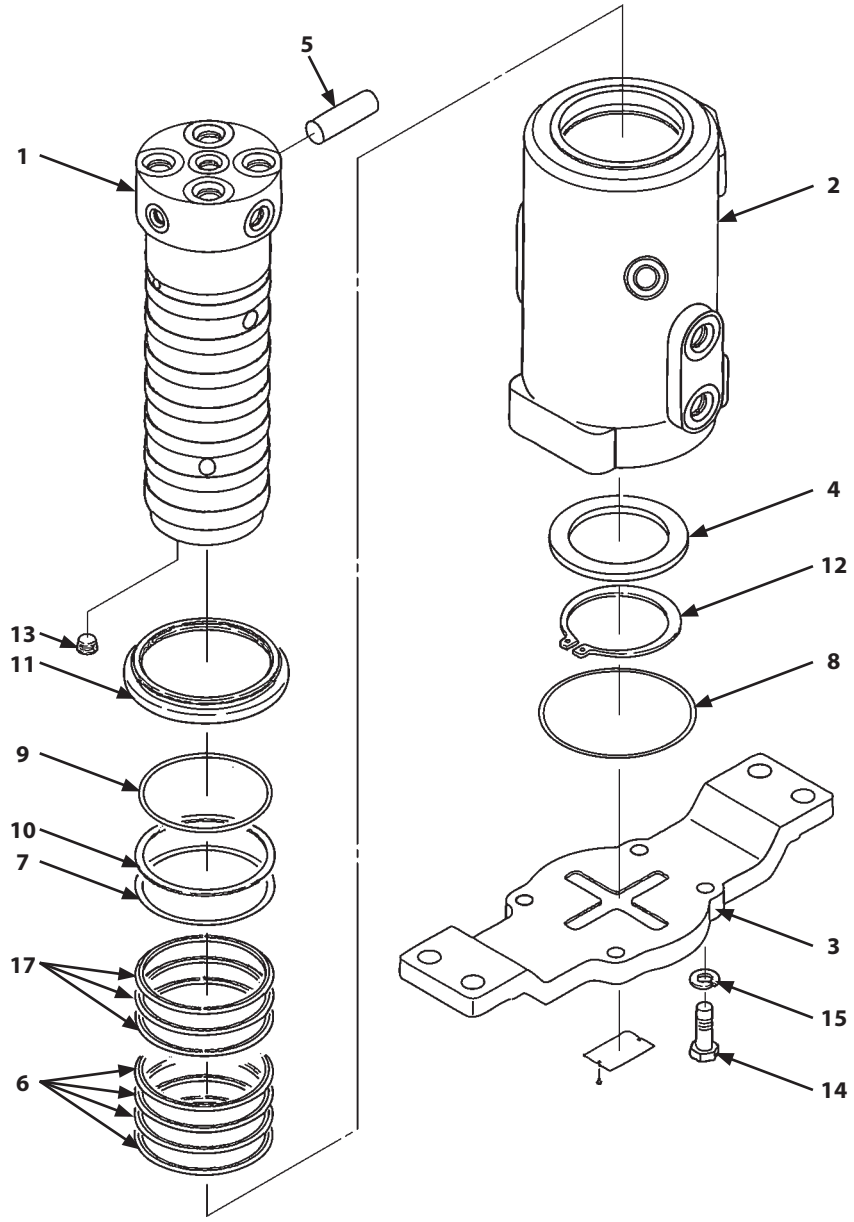
Disassembly of Brake Valve



WAEA-04-02-001

1- Spool
2- Spring Seat (2 Used)
3- Spring (2 Used)
4- Plug
5- O-Ring
6- Spring
7- Spool
8- Spool
9- Body
10- Cap (2 Used)
11- O-Ring (2 Used)
12- Spring (2 Used)
13- Check Valve (2 Used)
14- Plug (2 Used)
15- O-Ring (2 Used)
55- Plug (2 Used)
56- O-Ring (2 Used)
57- Spring (2 Used)
58- Spring Seat (2 Used)
59- Spool
60- Valve Body
61- Socket Bolt (3 Used)
62- O-Ring (3 Used)
63- Spring Seat

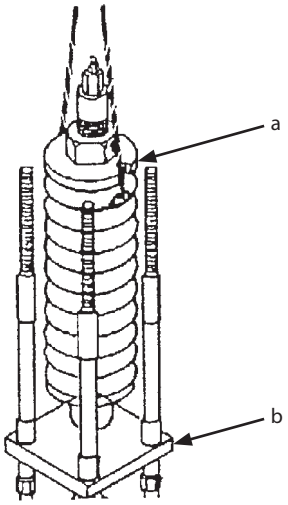
Disassembly of Center Joint



WADB-04-03-001

1- Spindle
2- Body
3- Flange
4- Ring
5- Pin
6- Oil Seal (4 Used)
7- O-Ring
8- O-Ring
9- O-Ring
10- Backup Ring
11- Dust Seal
12- Retaining Ring
13- Plug (3 Used)
14- Bolt (4 Used)
15- Spring Washer (4 Used)
17- Oil Seal (3 Used)

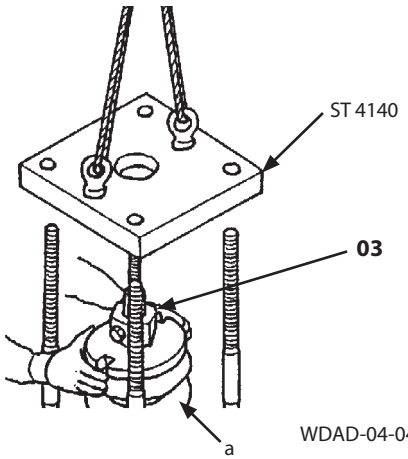
3. Attach the nylon slings onto track adjuster (a). Hoist track adjuster (a). Install track adjuster (a) to holder (b) of the special tool (ST 4943).



WDAD-04-04-002

a- Track Adjuster b- Holder

4. Install the special tool (ST 4140) to the special tool (ST 4943) in order to cover track adjuster (a). Operate the oil jack. Raise until nut (03) comes out from the center hole of the special tool (ST 4140).



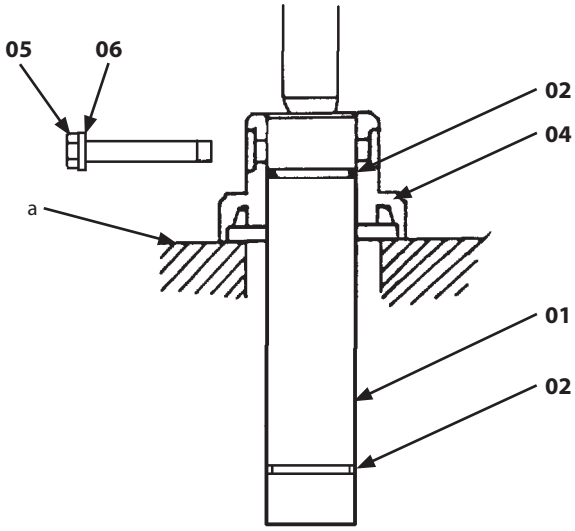
WDAD-04-04-003

a- Track Adjuster

IMPORTANT: Place wooden blocks (a) under bearing (00) in order not to damage yoke (04).

7. Place yoke (04) onto wooden blocks (a). Remove bolt (05) and washer (06) from yoke (04) at the other side. Put the matching marks on yoke (04) and axle (01). Remove axle (01) from yoke (04) by using a press.

: 17 mm



WADB-04-05-004

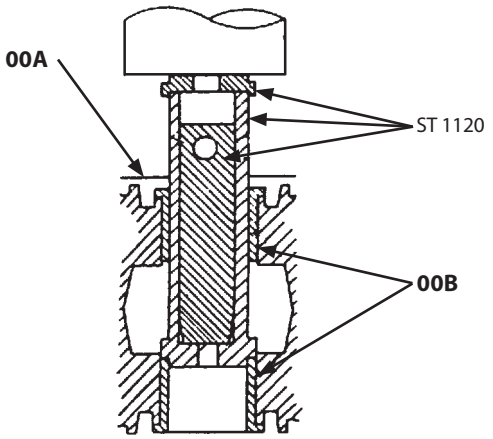
a - Wooden Block

8. Remove O-rings (02) (2 used) from axle (01).

CAUTION: Idler (00A) weight: 20 kg (44 lb)

IMPORTANT: Do not remove bushing (00B) unless necessary.

9. When replacing bushing (00B), remove bushings (00B) (2 used) from idler (00A) by the special tool (ST 1120) and a press.



W105-03-05-011

Removal and Installation of Track

Removal

CAUTION: Rubber crawler weight: 230 kg (510 lb)

CAUTION: Securely support the raised machine by using the blocks.

1. Raise the machine off the ground by using the front attachment.

CAUTION: The pressure inside cylinder of the track adjuster is high. As valve (1) may fly out and the high-pressure grease may spout out from the grease outlet (c), do not loosen valve (1) quickly and/or excessively. Keep body parts and face away from valve (1) and loosen valve (1) carefully. Do not loosen grease fitting (2).

IMPORTANT: Loosening valve (1) 1 to 1.5 turns is enough. Do not loosen valve (1) over those turns.

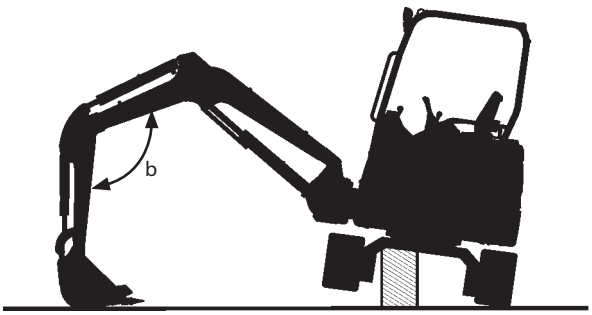
IMPORTANT: When gravel or mud is packed between sprockets and track links, remove them before loosening.

2. Loosen valve (1) in the track adjuster slowly and drain grease.

: 19 mm

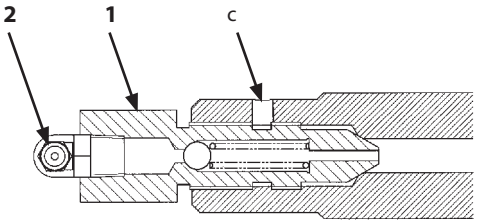
NOTE: If rotating the track in forward and reverse direction with valve (1) loosened, the track can be removed and installed easily.

3. Insert steel pipe (3) into the track. Rotate the sprocket in reverse direction. After the track is floated from the front idler by steel pipe (3), slide and remove the track transversely.



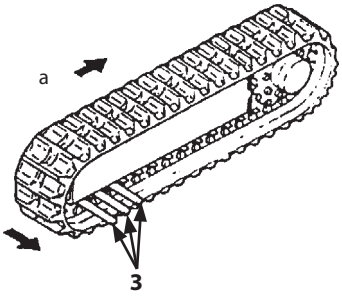
M1M7-04-006

b- 90 to 110 °



W1NC-03-06-001

c- Grease Outlet



M503-07-062

a- Rotating Direction

Assembly of Blade Cylinder

1. Install bushing (6) to cylinder head (5).

   Special Tool for Bushing (Rod Outer Diameter): ST 8040: 50 mm

IMPORTANT: Check the direction to install the U-packing (7).

2. Install U-packing (7) and backup ring (8) to cylinder head (5).
3. Install dust wiper (9) to cylinder head (5) by using a plastic hammer.

   Special Tool for Dust Wiper (Rod Outer Diameter):

   ST 8047: 50 mm
4. Install O-rings (10, 12) and backup ring (11) to cylinder head (5).
5. Install seal (14) to piston (13) by using the special tool (ST 2977). After installing seal (14), adjust seal (14) by using the special tool (ST 2332).

   Special Tool for Seal (Tube Inner Diameter): ST 2977: 105 mm
6. Install wear ring (15), O-ring (16), and backup rings (17) (2 used) to piston (13).
7. Install the cylinder head (5) assembly to cylinder rod (3).

   Special Tool for Cylinder Head (Rod Outer Diameter):

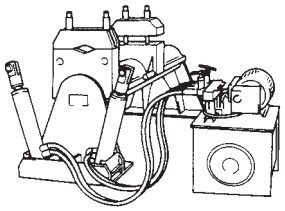
   ST 8076: 50 mm
8. Install the piston (13) assembly to cylinder rod (3).

   Special Tool for Piston: ST 3440: 75 mm

   : 491±49 N·m (50±5.0 kgf·m, 362±36 lbf·ft)
9. Fit the matching marks before disassembling and tighten piston nut (18) by using the special tool (ST 5908) for cylinder and the special tool for nut.

   Special Tool for Nut: ST 3239: 60 mm

   : 736±74 N·m (75±7.5 kgf·m, 543±55 lbf·ft)



Special Tool for Cylinder: ST 5908

W158-04-02-022

Removal and Installation of Boom Cylinder

IMPORTANT: The hose and pipe contain hydraulic oil. When removing the hose and pipe, receive oils with a container in order to avoid spilling oils.

IMPORTANT: Cap the open ends in case the hoses and pipes have been disconnected. In addition, attach an identification tag onto the connectors, hoses, and pipes for assembling. Connect the hoses and install the clips in case the clips which secure the hoses have been removed.

Removal

1. Park the machine on a solid and level surface. Fully retract the arm cylinder and bucket cylinder and lower the boom. Place the arm end onto the ground.

CAUTION: Boom cylinder (5) weight: 55 kg (125 lb)

2. Remove bolts (7) (2 used), spring washers (8) (2 used), and plane washers (9) (2 used). Remove cover (6) from boom cylinder (5).

: 17 mm

CAUTION: Metal fragments may fly off when a hammer is used. Wear necessary protection, such as goggles, helmets, etc in order to prevent personal injury.

3. Attach the nylon slings onto boom cylinder (5). Hoist and hold boom cylinder (5). Remove bolt (1), spring washer (2), and bushing (3). Remove pin (4) by using a bar and a hammer.

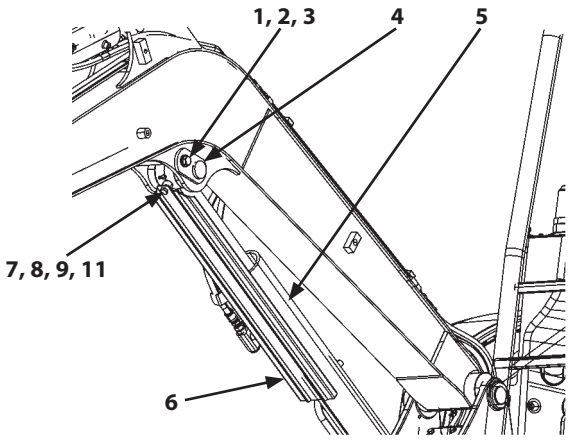
: 22 mm

NOTE: LOCTITE #262 has been applied on bolt (1).

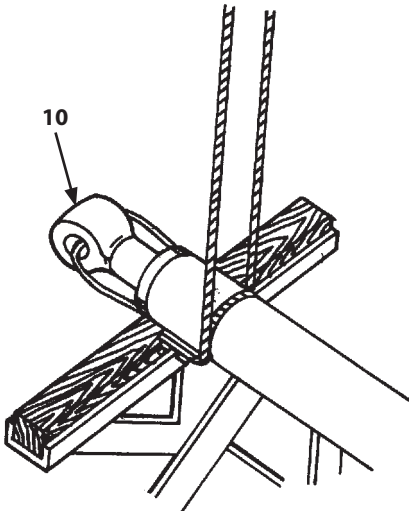
4. Remove shims (11) from on both sides of the cylinder rod (10) boss. Start the engine. Retract cylinder rod (10) to the stroke end. Pass the wires through the cylinder rod (10) boss and secure cylinder rod (10) in order not to extend.
5. Place boom cylinder (5) on the stands.

CAUTION: Bleed air from the hydraulic oil tank. (Refer to W1-4-1.)

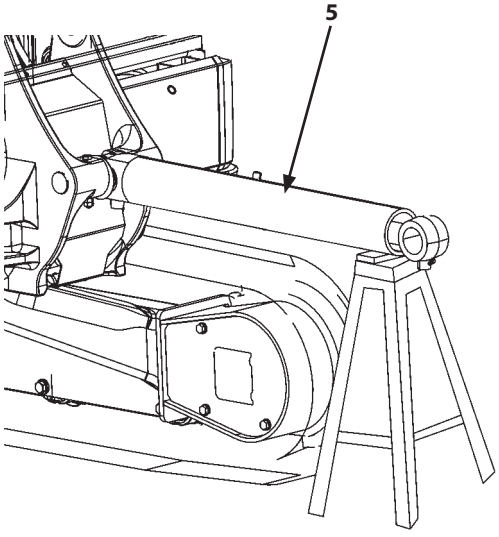
CAUTION: Release any pressure in the hydraulic circuit. (Refer to W1-5-1.)



W1MJ-04-02-007



W554-02-03-007



WAEB-05-01-002

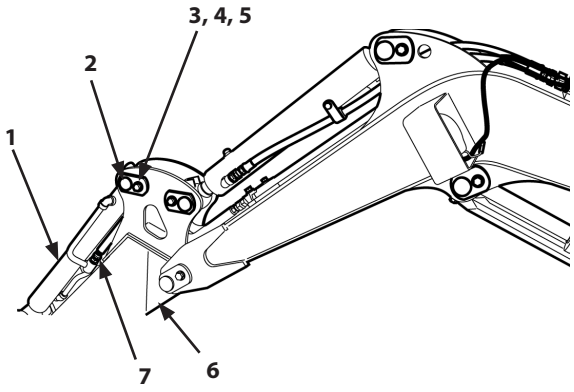
Installation

CAUTION: Bucket cylinder (1) weight: : 28 kg (62 lb)

IMPORTANT: Insert at least one shim to both left and right sides of all pins respectively. When the shims should be used in order to adjust the clearance, the shims should be inserted at both sides respectively. (Clearance: 0.5 mm or less)

IMPORTANT: Apply grease onto the lip part of the dust seal for bucket cylinder (1), the boss side, and the bushing inside (both bottom and rod sides).

1. Attach the nylon sling onto bucket cylinder (1). Hoist bucket cylinder (1). Fit the pin (2) holes of bucket cylinder (1) and arm (6). Insert the shims to both sides of the cylinder tube boss.



W1L7-04-02-005

CAUTION: Metal fragments may fly off when a hammer is used. Wear necessary protection, such as goggles, helmets, etc in order to prevent personal injury.

2. Apply LOCTITE #262 onto bolt (3). Install pin (2) by using a hammer. Secure pin (2) with bolt (3), spring washer (4), and bushing (5).

   : 22 mm

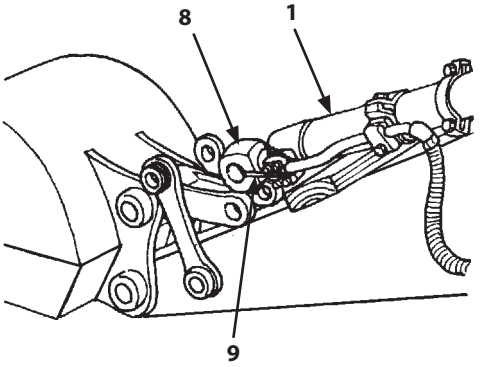
   : 140 N·m (14 kgf·m, 103 lbf·ft)

3. Connect hoses (7) (2 used) to bucket cylinder (1).

   : 27 mm

   : 80 N·m (8 kgf·m, 59 lbf·ft)

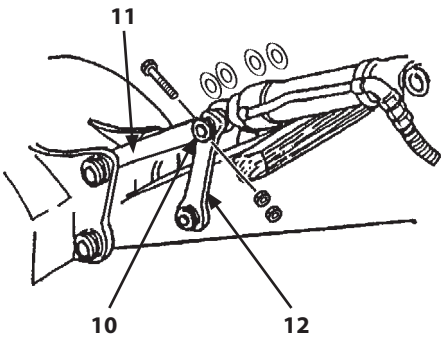
4. Remove wires (9) from rod (8) of bucket cylinder (1).



W102-04-02-005

5. Start the engine with the cylinder rod retracted to the stroke end. Slowly extend the cylinder rod. Fit the pin (10) holes of bucket cylinder (1), link A (11), and link B (12) (2 used).

NOTE: When the work in step 5 is finished, air in the cylinder has been released.



W158-04-02-006

5. Cut away the crimped part by using a hand drill. Remove set screw (22).

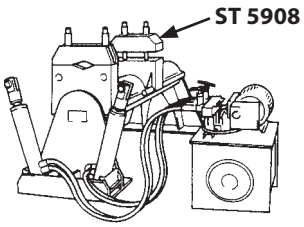
NOTE: Set screw (22) has been crimped by using a punch (2 places) after installing.

: 4 mm

6. Remove piston nut (21) by using the special tool (ST 5908) and the special tool for nut.

   Special Tool for Nut:

   ST 3239: 60 mm



W158-04-02-022

7. Remove piston (15) by using the special tool for piston. Remove cushion ring (14) from cylinder rod (3). (It is only for the boom cylinder to remove cushion ring (14))

   Special Tool for Piston:

   ST 3442: 70 mm (Boom Cylinder)

   ST 3443: 52 mm (Bucket Cylinder)

   ST 3444: 65 mm (Boom Swing Cylinder)

8. Remove dust ring (18) (bucket and boom swing cylinders: 2 used), piston seal (16), wear ring (17) (boom cylinder: 2 used), backup rings (20) (2 used), and O-ring (19) from piston (15).

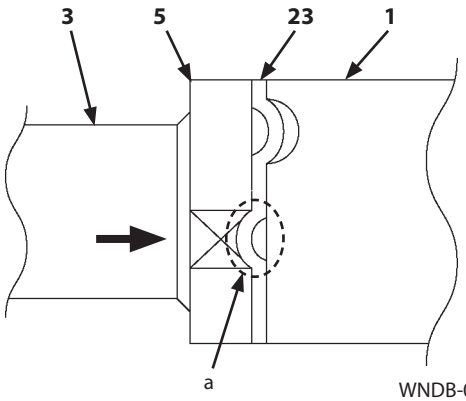
9. Remove cylinder head (5) from cylinder rod (3).

10. Remove dust wiper (10), U-packing (9), buffer seal (8), retaining ring (7), O-ring (13), backup ring (12) (boom cylinder: 3 used), and O-ring (11) (boom cylinder: 2 used) from cylinder head (5).

CAUTION: Metal fragments may fly off when a hammer is used. Wear necessary protection, such as goggles, helmets, etc in order to prevent personal injury.

IMPORTANT: Do not damage the sliding surface of cylinder rod (3).

11. Extend the stopper (a) part of washer (23) by using a chisel and a hammer. Make it flat. (only bucket cylinder)



WNDB-04-06-002

a- Stopper

12. Remove backup ring (24) (only boom swing cylinder) from cylinder head (5).

IMPORTANT: Bushing (6) cannot be reused. If bushing (6) has been removed, replace it with a new one when assembling.

13. Remove bushing (6).

NOTE: Bushing (6) cannot be tapped and removed from cylinder head (5). Cut off bushing (6) by using a lathe. Insert a screwdriver strongly and remove bushing (6).