PART NO. WACD90-EN-00

HITACHI

Reliable solutions

Workshop Manual

ZX20U-5A

Hydraulic Excavator

ZX20U-5A HYDRAULIC EXCAVATOR WORKSHOP MANUAL

Hitachi Construction Machinery Co., Ltd.
URL:http://www.hitachi-c-m.com

PRINTED IN JAPAN (K) 2017, 08

WACD90-EN-00

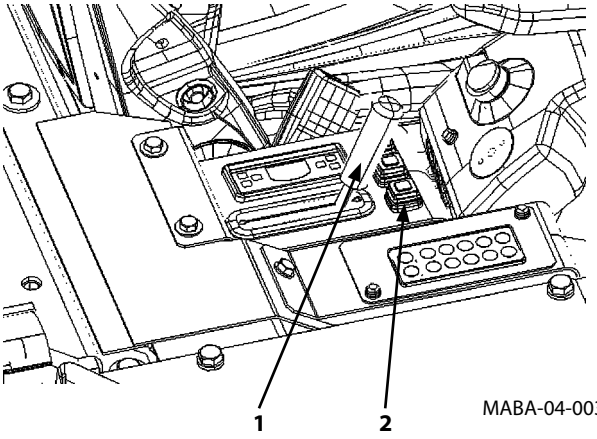
Service Manual consists of the following separate Part No.

Technical Manual	: Vol. No.TACD90-EN
Workshop Manual	: Vol. No.WACD90-EN
Engine Manual	: Vol. No.EACD-EN

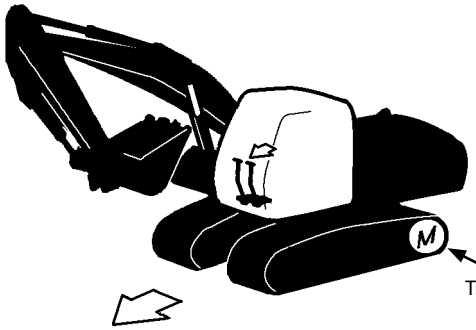
General Precautions for Cab

- 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. When 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.

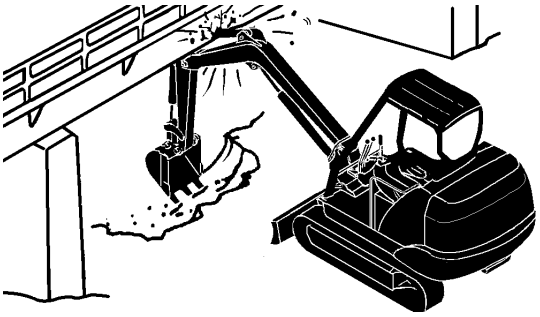
- When the machine descends a slope at high speed, machine weight accelerates descending speed. It may cause collision accident due to misjudging of braking distance or machine turnover due to running on an unexpected obstacle.
  Before descending a slope, always ensure that engine control lever (1) is in the slow idle position, and then reduce the engine speed. Turn the travel mode switch (2) to slow speed for ZX26U-5A.
- Be sure to thoroughly warm up the machine before ascending steep slopes. If hydraulic oil has not warmed up sufficiently, sufficient performance may not be obtained.
- Use a signal person when moving, swinging or operating the machine in congested areas. Coordinate hand signals before starting the machine.
- Before moving machine, determine which way to move travel pedals/levers for the direction you want to go. When the travel motors are in the rear, pushing down on the front of the travel pedals or pushing the levers forward moves the machine forward, towards the idlers. An arrow-mark seal is stuck on the inside surface of the side frame to indicate the machine front direction.
- Select a travel route that is as flat as possible. Steer the machine as straight as possible, making small gradual changes in direction.
- Before traveling on them, check the strengths of bridges and road shoulders, and reinforce if necessary.
- Use wood plates in order not to damage the road surface. Be careful of steering when operating on asphalt roads in summer.
- When crossing train tracks, use wood plates in order not to damage them.
- Do not make contact with electric wires or bridges.
- When crossing a river, measure the depth of the river using the bucket, and cross slowly. Do not cross the river when the depth of the river is deeper than the upper edge of the upper roller.
- When traveling on rough terrain, reduce engine speed. Select slow travel speed. Slower speed will reduce possible damage to the machine.
- Avoid operations that may damage the track and undercarriage components.
- During freezing weather, always clean snow and ice from track shoes before loading and unloading machine, to prevent the machine from slipping.

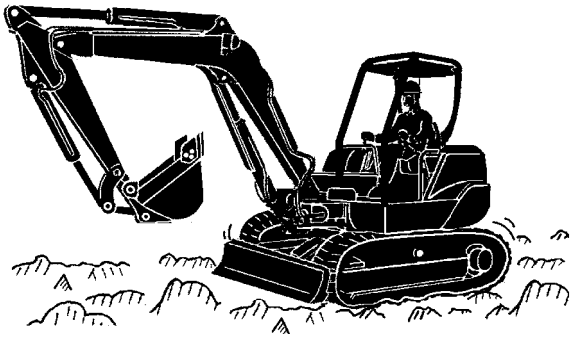


MABA-04-003



M104-05-008


SA-673

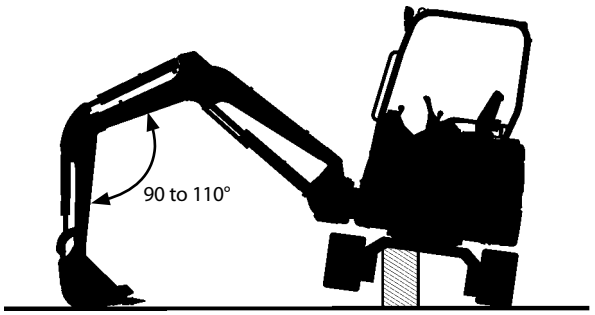

M586-05-002

Practice Safe Maintenance

To avoid accidents:
- Understand service procedures before starting work.
- Keep the work area clean and dry.
- Do not spray water or steam inside cab.
- Never lubricate or service the machine while it is moving.
- Keep hands, feet and clothing away from power-driven parts.

SA-028

Before servicing the machine:
1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Run the engine at slow idle speed without load for 5 minutes.
4. Turn the key switch to OFF to stop engine.
5. Relieve the pressure in the hydraulic system by moving the control levers several times.
6. Remove the key from the key switch.
7. Attach a "Do Not Operate" tag on the control lever.
8. Pull the pilot control shut-off lever to the LOCK position.
9. Allow the engine to cool.



M1M7-04-006

- If a maintenance procedure must be performed with the engine running, do not leave the machine unattended.
- If the machine must be raised, maintain a 90 to 110° angle between the boom and arm. Securely support any machine elements that must be raised for service work.
- Inspect certain parts periodically and repair or replace as necessary. Refer to the section discussing that part in the "MAINTENANCE" chapter of operator's manual.
- Keep all parts in good condition and properly installed.
- Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.
- When cleaning parts, always use nonflammable detergent oil. Never use highly flammable oil such as fuel oil and gasoline to clean parts or surfaces.
- Disconnect battery ground cable (–) before making adjustments to electrical systems or before performing welding on the machine.

SA-527

Avoid Heating Near Pressurized Fluid Lines

- Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders.
  - Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials.
  - Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area. Install temporary fire-resistant guards to protect hoses or other materials before engaging in welding, soldering, etc..

SA-030

Avoid Applying Heat to Lines Containing Flammable Fluids

- Do not weld or flame cut pipes or tubes that contain flammable fluids.
- Clean them thoroughly with nonflammable solvent before welding or flame cutting them.

Precautions for Handling Accumulator (ZX26U-5A)

High-pressure nitrogen gas is sealed in the accumulator and the gas damper. Inappropriate handling may cause explosion, possibly resulting in serious injury or death.

Strictly comply with the following items:

- Do not disassemble the unit.
- Keep the units away from open flames and fire.
- Do not attempt to bore a hole or cut by torch.
- Avoid giving shocks by hitting or rolling the unit.
- Before disposing the unit, sealed gas must be released. Consult your nearest Hitachi dealer.

Precautions for Disassembling and Assembling

Precautions for Disassembling

- Clean the Machine
  Thoroughly wash the machine before bringing it into the shop. Bringing a dirty machine into the shop may cause machine components to be contaminated during disassembling / assembling, resulting in damage to machine components as well as decreased efficiency in service work.

- Inspect the Machine
  Be sure to thoroughly understand all disassembling / assembling procedures beforehand to help avoid incorrect disassembling of components as well as personal injury.
  Check and record the items listed below to prevent problems from occurring in the future.
  - The machine model, machine serial number, and hour meter reading.
  - Reason for disassembly (symptoms, failed parts, and causes).
  - Clogging of filters and oil, water, or air leaks, if any. Capacities and condition of lubricants.
  - Loose or damaged parts.

- Prepare and Clean Tools and Disassembly Area
  Prepare the necessary tools to be used and the area for disassembling work.

Precautions for Disassembling and Assembling

- Precautions for Disassembling
  - Cap the open ends in case the hoses and pipes have been disconnected. In addition, attach identification tags onto the connectors, hoses, and pipes for assembling.
  - Before disassembling, clean the exterior of the components and place on a workbench.
  - Drain hydraulic oil and gear oil from the hydraulic components and reduction gear.
  - Be sure to provide appropriate containers for draining fluids.
  - Use matching marks for easier reassembling if necessary.
  - Be sure to use the specified special tools when instructed.
  - If a part or component cannot be removed after removing its securing nuts and bolts, do not attempt to remove it forcibly. Find the cause (s), and then take the appropriate measures to remove it.
  - Orderly arrange disassembled parts. Mark and tag them if necessary.
  - Store common parts, such as bolts and nuts with reference to where they are to be used and in a manner that will prevent loss.
  - Inspect the contact or sliding surfaces of disassembled parts for abnormal wear, sticking, or other damage.
  - Measure and record the degree of wear and clearances.

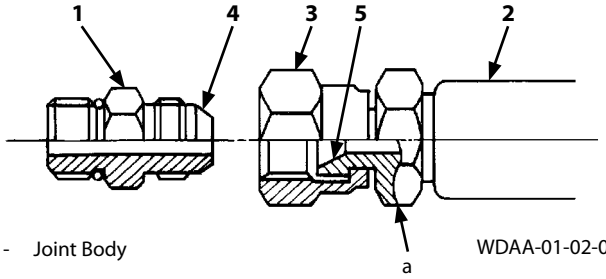
- Precautions for Assembling
  - Be sure to clean all parts and inspect them for any damage. If any damage is found, repair or replace part.
  - Dirt or debris on the contact or sliding surfaces may shorten the service life of the machine. Take care not to contaminate any contact or sliding surfaces.
  - Apply appropriate lubricant oil to parts in order to prevent them from seizing.
  - Be sure to replace O-rings, backup rings, oil seals, and floating seals with new ones once they have been disassembled. Apply grease before installing.
  - Be sure that liquid-gasket-applied surfaces are clean and dry.
  - If an anti-corrosive agent has been used on a new part, be sure to thoroughly clean the part to remove the agent.
  - Fit the matching marks made when disassembling and assemble them.
  - Be sure to use the designated tools to assemble bearings, bushings, and oil seals.
  - Keep a record of the number of tools used for disassembly / assembly. After assembling is completed, count the number of tools so as to make sure that no forgotten tools remain in the assembled machine.

Union Joint

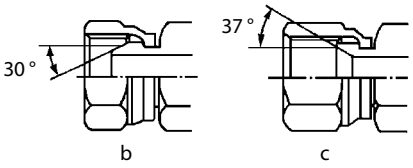
Metal sealing surfaces (4) and (5) of adapter (1) and hose (2) fit together to seal pressure oil. Union joints are used to join small-diameter lines.

IMPORTANT:

- **Do not over-tighten union nut (3). Excessive force will be applied to metal sealing surfaces (4) and (5), possibly cracking the adapter. Tighten union nut (3) to the specifications.**
- **Scratches or other damage to sealing surfaces (4) or (5) will cause oil leakage at the joint. Take care not to damage them when connecting / disconnecting.**



a - Joint Body WDAA-01-02-009



b - Male Union Joint c - Female Union Joint

WDAA-01-02-010

2013/09

Description	Wrench Size mm	Tightening Torque	
	Union Nut	N·m	(lbf·ft)
30 ° male	17	25	(18.5)
	19	30	(22)
	22	40	(29.5)
	27	80	(59)
	32	140	(103)
	36	180	(133)
	41	210	(155)
	50	350	(260)
	55	380	(280)
	60	380	(280)
37 ° female	17	25	(18.5)
	19	30	(22)
	22	40	(29.5)
	27	80	(59)
	32	140	(103)
	36	180	(133)
	41	210	(155)
	50	350	(260)

NOTE: Tightening torque of 37 ° male coupling without union is similar to tightening torque of 37° female.

Bleeding Air from Fuel System

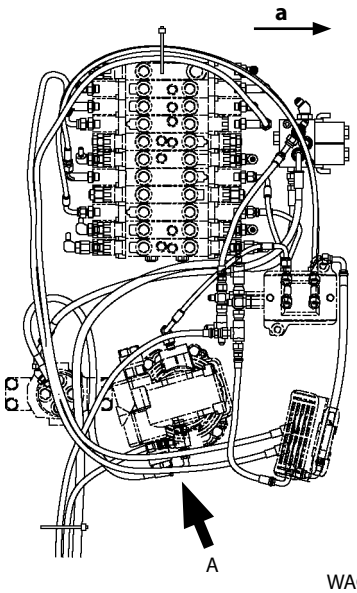
Air in the fuel system may make the engine hard to start or make it run irregularly. After draining water and sediment from the fuel filter, replacing the fuel filter, or running the fuel tank dry, be sure to bleed the air from the fuel system.

Air Bleeding Procedures

Automatic bleeding deveice is provided on this machine.

1. Confirm that the fuel level is more than one-half of the fuel tank capacity. If the fuel is lower, add fuel.
2. Set the key switch to the ON position and hold it for 10 to 15 seconds.
3. Start the engine and check the fuel system for fuel leaks.

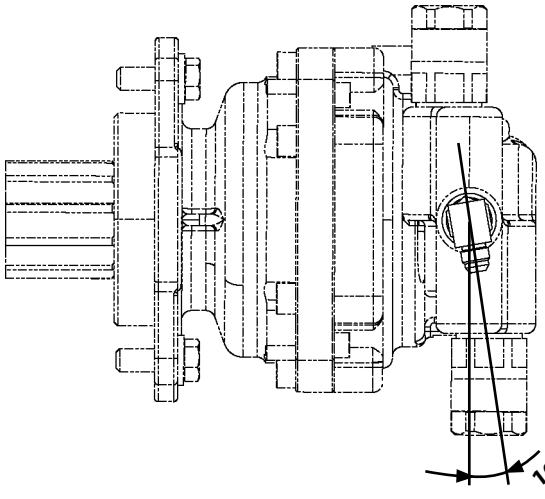
Swing Device



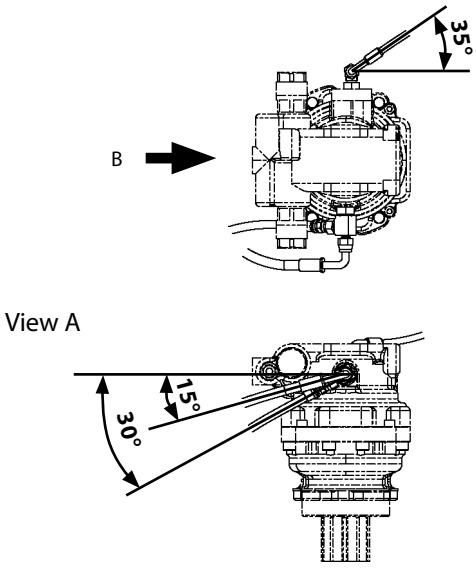
WACC50-01-07-028

a- Front Side

View B

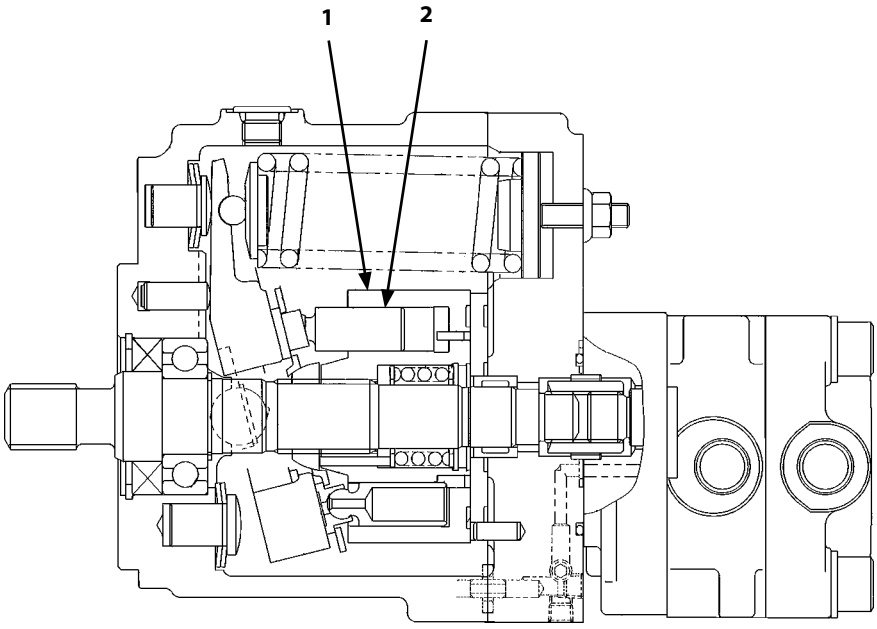


WACC50-01-07-014



WACC50-01-07-013

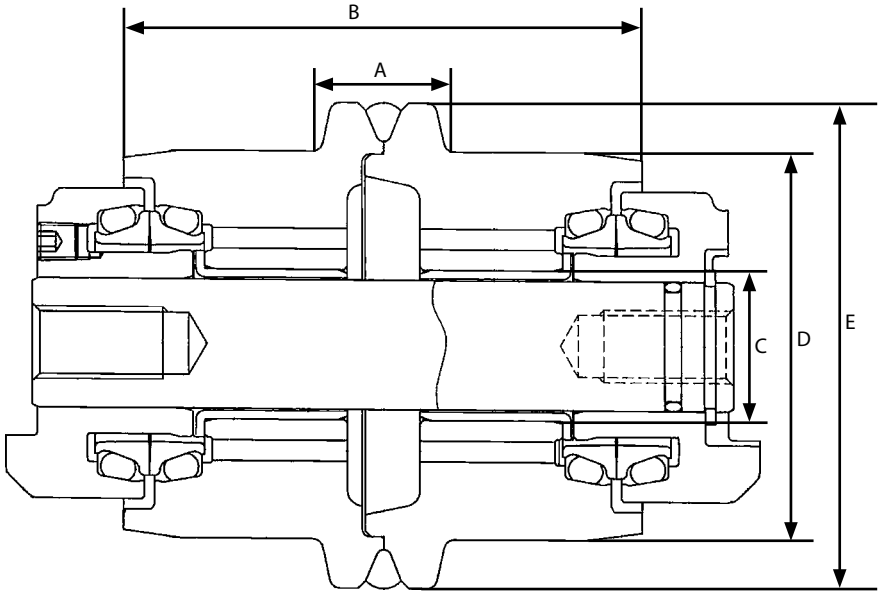
Pump Device



TACC-03-01-001

1- Cylinder Block
2- Plunger (10 Used)

Lower Roller



WABAA0-02-02-002

Unit: mm (in)

	Standard	Allowable Limit	Remedy
A	31 (1.22)	23 (0.906)	Replace
B	120 (4.72)	-	
C	36 (1.42)	-	
D	85 (3.35)	77 (3.03)	
E	107 (4.21)	-	

Axle and Bushing

Unit: mm (in)

		Standard	Allowable Limit	Remedy
Axle	Outer Diameter	30 (1.18)	29.2 (1.15)	Replace
Bushing	Inner Diameter	30 (1.18)	30.5 (1.20)	
	Flange Thickness	3 (0.118)	2.5 (0.098)	

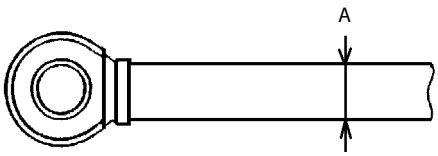
NOTE: Values in [ ] are just for reference.

Lubrication Oil

Engine Oil (API CD class, SAE #30)
Amount of oil: 65±10 ml (65±10 cm^3)

Cylinder

Rod

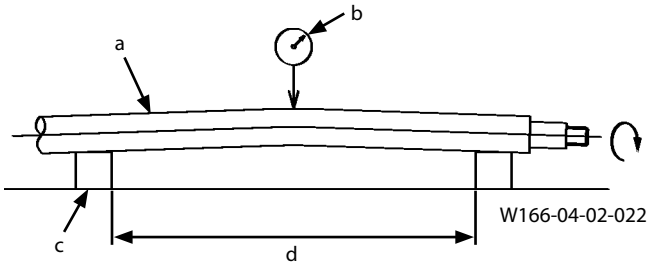


W105-04-02-094

Unit: mm (in)

Cylinder Name	Recommended Size After Re-manufacturing (A)
Boom	$40^{-0.025}_{-0.064}$ ($1.58^{-0.001}_{-0.003}$)
Arm	$40^{-0.025}_{-0.064}$ ($1.58^{-0.001}_{-0.003}$)
Bucket	$35^{-0.025}_{-0.064}$ ($1.38^{-0.001}_{-0.003}$)
Boom Swing	$35^{-0.025}_{-0.064}$ ($1.38^{-0.001}_{-0.003}$)
Blade	$35^{-0.025}_{-0.064}$ ($1.38^{-0.001}_{-0.003}$)

Rod Bend and Run Out

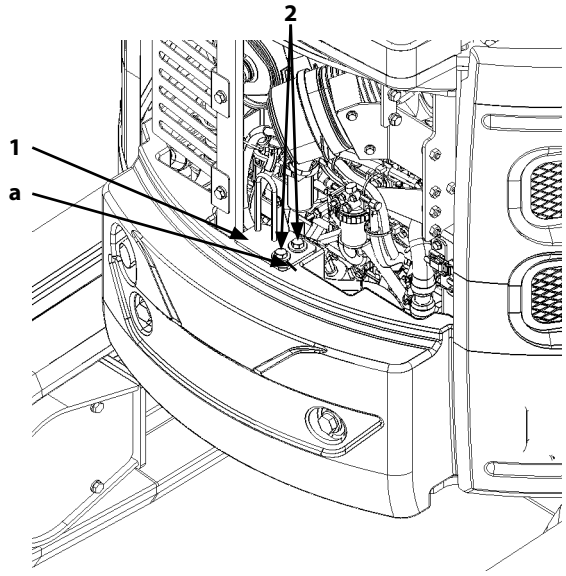


W166-04-02-022

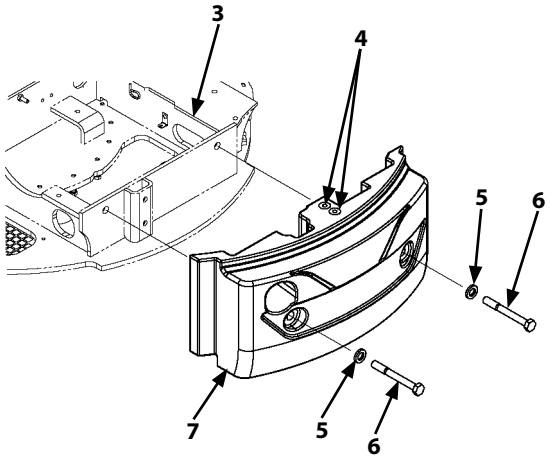
a- Cylinder Rod
b- Dial Gauge
c- V Block
d- Overall Length

Unit: mm (in)

Bend	Run Out	Remedy
1.0 (0.04)	2.0 (0.08)	Replace



WACC50-03-02-003



WACC50-03-02-004

a- Matching Mark

6. Put the matching mark (a) onto counterweight (7) and bracket (1). Remove bolts, washers (2) (2 used). Remove bracket (1).

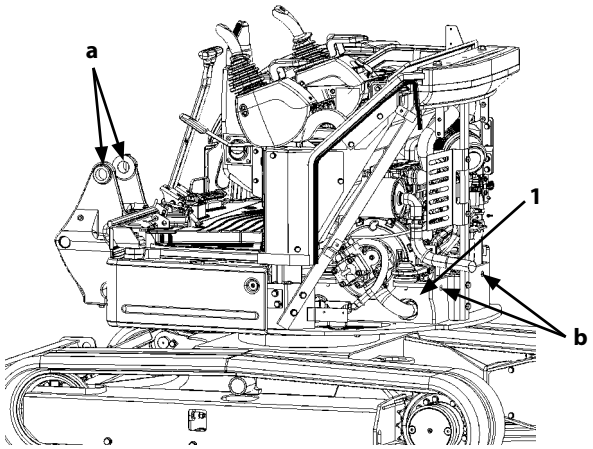
   : 19 mm

CAUTION: Counterweight (7) weight: 125 kg (280 lb)

7. Install the eyebolts (M12, Pitch 1.75 mm) (2 used) to bracket (1) mounting holes (4). Hoist and hold counterweight (7).
8. Remove bolts (6) (2 used) and washers (5) (2 used) from counterweight (7).

   : 30 mm

9. Raise counterweight (7) a little. Slide counterweight (7) to the rear side. Remove counterweight (7) from main frame (3).



WACC50-03-03-007

a- Boom Mounting Pin Hole

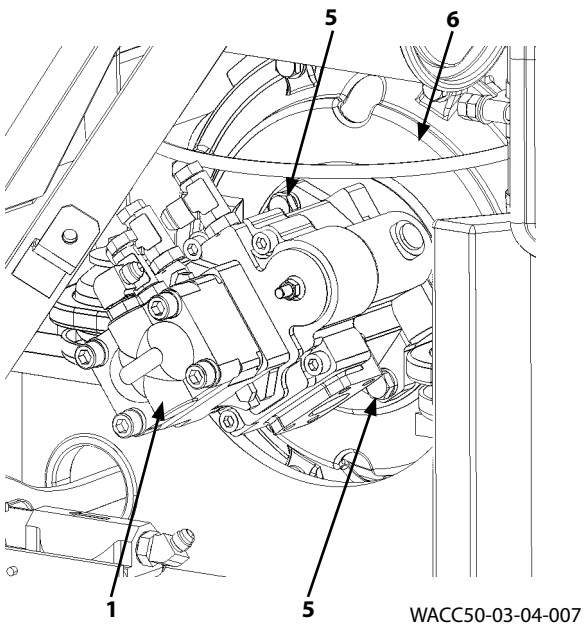
b- Counterweight Mounting Bolt Hole

IMPORTANT: Check the angles to connect the hose and to install the adapter. (Refer to W1-7-1.)

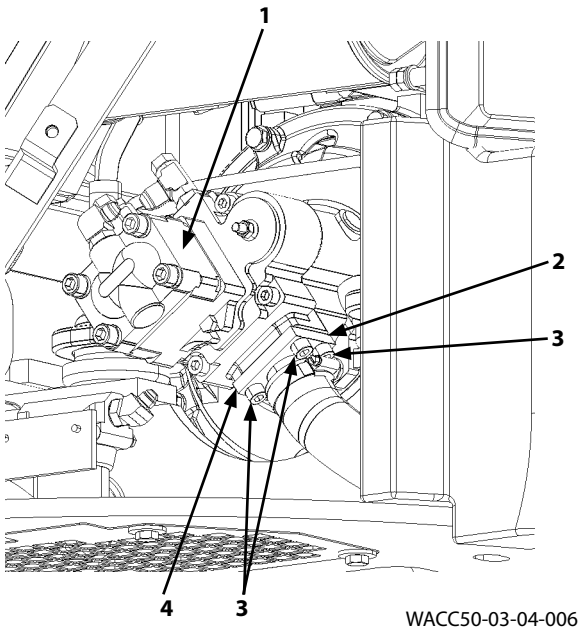
Installation

CAUTION: Main frame (1) weight: 900 kg (1990 lb)

1. Install Freno-Linkbolts (A-20: M20, Pitch 2.5 mm) to the counterweight mounting bolt holes (b) (2 places). Attach wire ropes onto the Freno-Linkbolts.
2. Attach wire ropes onto boom mounting pin holes (a) (2 places).



WACC50-03-04-007



WACC50-03-04-006

IMPORTANT: Check the angles to connect the hose and to install the adapter. (Refer to W1-7-1.)

Installation

1. Install all removed adapters to pump device (1).
2. Install pump device (1) to engine (6) with bolts, washers (5) (2 used).

: 19 mm

: 90 N·m (9 kgf·m, 66 lbf·ft)

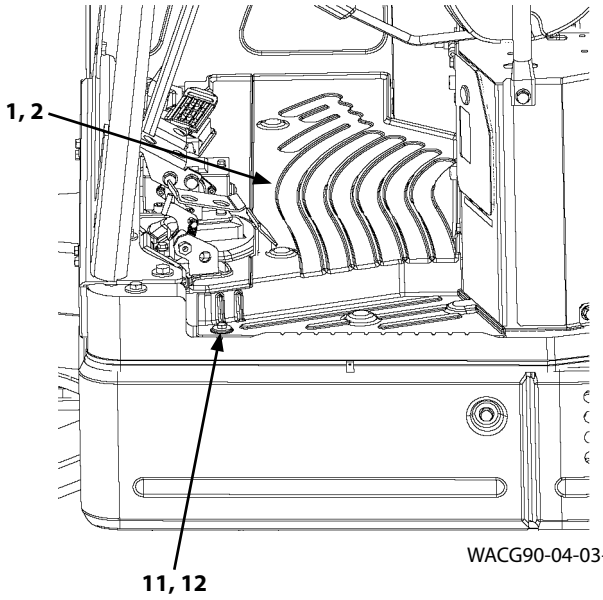
IMPORTANT: Apply grease to O-ring (2).

3. Install O-ring (2) to the groove on flange in suction pipe (4). Install the suction pipe (4) assembly to pump device (1) with socket bolts (3) (4 used).

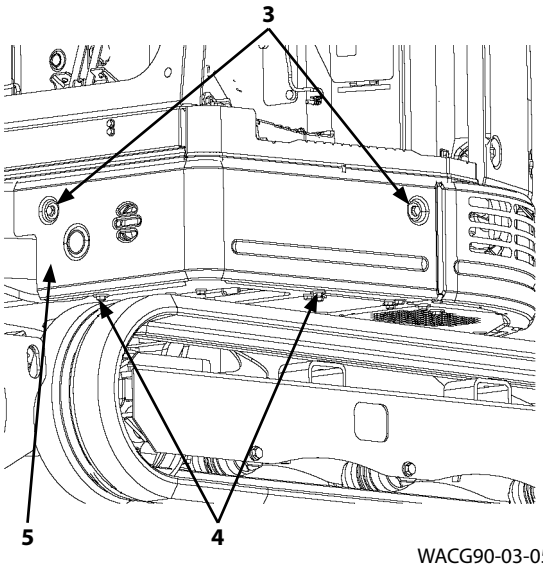
: 8 mm

: 50 N·m (5 kgf·m, 37 lbf·ft)

Removal and Installation of Control Valve



WACG90-04-03-001



WACG90-03-05-004

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

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

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.)

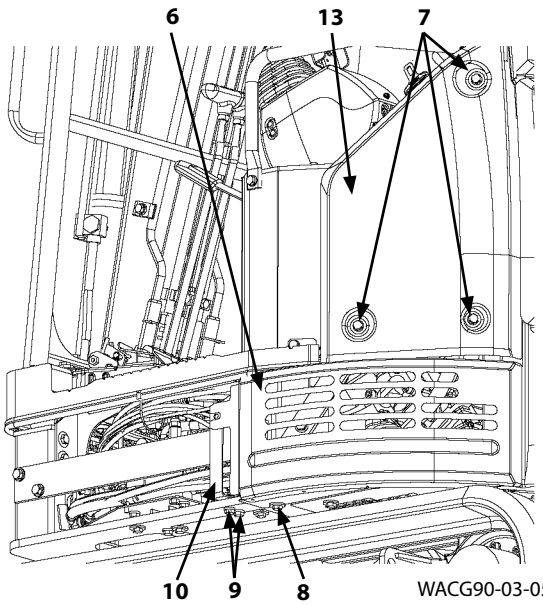
CAUTION: Release any pressure in the hydraulic circuit. (Refer to W1-5-1.)

2. Remove the canopy. (Refer to W3-1-1.)
3. Remove bolt (11) and washer (12). Remove floor mat (1) and plate (2).

   : 13 mm

4. Remove bolts, washers (3, 4) (2 used for each). Remove cover (5).

   : 17 mm



WACG90-03-05-007

5. Remove bolts, washers (7) (3 used) and bolt, washer (8). Remove covers (13, 6).

   : 17 mm

6. Remove bolts, washers (9) (2 used). Remove bracket (10).

   : 17 mm

A- Flow Combiner Valve Section
B- Blade Section
C- Swing Section
D- Boom Swing Section
E- Auxiliary Section
F- Arm Section
G- Travel (Right) Section
H- Inlet Section
I- Travel (Left) Section
J- Boom Section
K- Bucket Section
a- Check Valve
b- Arm Regenerative Valve

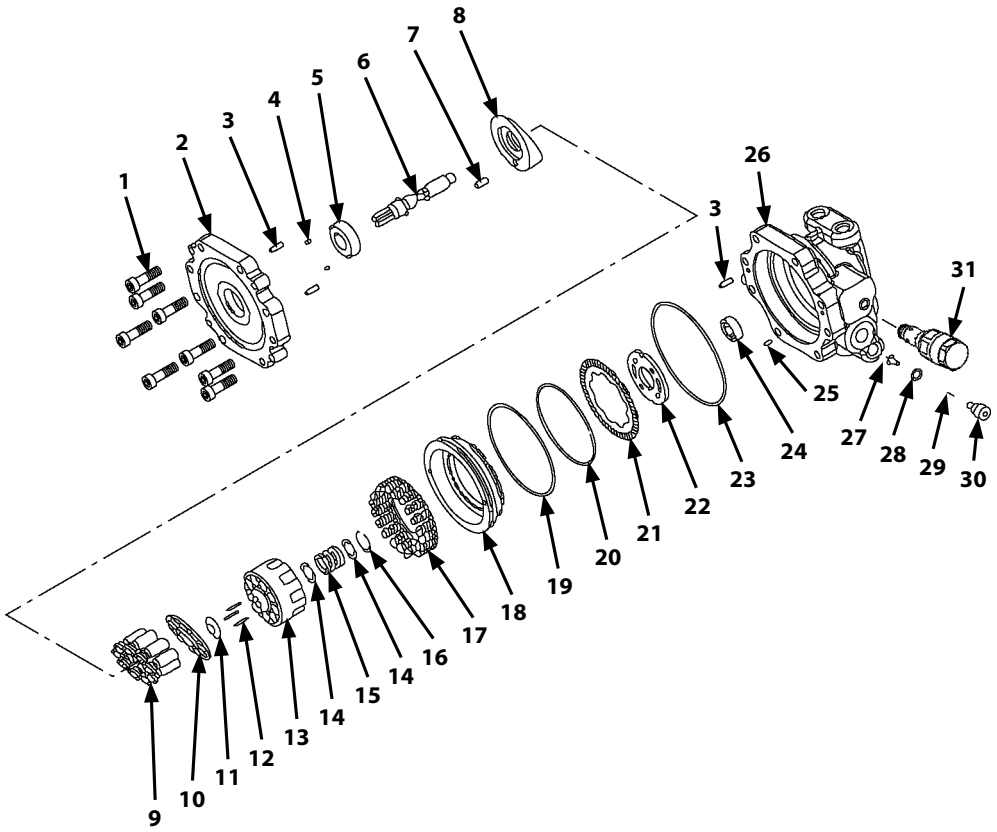
1a Body (Flow Combiner Valve)
1b Body (Blade)
1c Body (Swing)
1d Body (Boom Swing)
1e Body (Auxiliary)
1f Body (Arm)
1g Body (Travel (Right))
1h Body (Inlet)
1i Body (Travel (Left))
1j Body (Boom)
1k Body (Bucket)
1- Socket Bolt (40 Used)
2- Spring
3- O-Ring (20 Used)
4- Main Relief Valve
5- Nut (8 Used)
6- Plug (5 Used)
7- Plug (2 Used)
8- Cover
9- O-Ring (10 Used)
10- Spool
11- O-Ring (5 Used)
13- Cover (18 Used)
14- Spring (18 Used)
15- Plug (9 Used)
16- O-Ring (10 Used)
17- Spring (9 Used)
18- Check Valve (7 Used)
19- Cover
20- Spring Seat (19 Used)
21- Spring Seat (19 Used)
22- Spool
23- Spool
24- Spring (3 Used)
25- Check Valve (3 Used)
26- Spool
31- Check Valve
32- Spool
33- Overload Relief Valve (5 Used)
34- O-Ring
35- Orifice
36- O-Ring
38- Plug
39- Check Valve
40- Spring
42- Plug
43- Spool
46- Spool
47- Main Relief Valve (2 Used)
51- Spool
75- Spool
76- Check Valve
77- Rod (4 Used)
78- Spool
79- Make-Up Valve (2 Used)
80- Plug (2 Used)
81- O-Ring (2 Used)

A- Flow Combiner Valve Section
B- Blade Section
C- Swing Section
D- Boom Swing Section
E- Auxiliary Section
F- Arm Section
G- Travel (Right) Section
H- Inlet Section
I- Travel (Left) Section
J- Boom Section
K- Bucket Section

1a- Body (Flow Combiner Valve)
1b- Body (Blade)
1c- Body (Swing)
1d- Body (Boom Swing)
1e- Body (Auxiliary)
1f- Body (Arm)
1g- Body (Travel (Right))
1h- Body (Inlet)
1i- Body (Travel (Left))
1j- Body (Boom)
1k- Body (Bucket)
4- Main Relief Valve
5- Nut (8 Used)
6- Plug (5 Used)
7- Plug (2 Used)
9- *O-Ring (10 Used)
11- O-Ring (5 Used)
15- Plug (9 Used)
16- O-Ring (10 Used)
17- Spring (9 Used)
18- Check Valve (7 Used)
24- *Spring (3 Used)
25- *Check Valve (3 Used)
31- Check Valve
33- Overload Relief Valve (5 Used)
34- *O-Ring
36- *O-Ring
39- Check Valve
40- Spring
42- Plug
47- Main Relief Valve (2 Used)
76- Check Valve
77- Rod (4 Used)
79- Make-Up Valve (2 Used)
80- Plug (2 Used)
81- O-Ring (2 Used)

*NOTE: As for the item with mark *, refer to W3-5-3-1 and W3-5-3-2.*

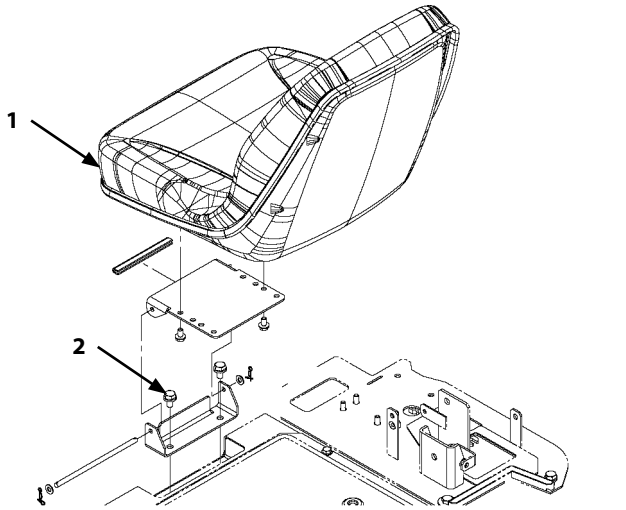
Disassembly of Swing Motor



WACB-03-06-002

1- Socket Bolt (8 Used)
2- Plate
3- Pin (3 Used)
4- Filter (2 Used)
5- Ball Bearing
6- Shaft
7- Pin
8- Swash Plate
9- Plunger (9 Used)
10- Retainer
11- Holder
12- Pin (3 Used)
13- Rotor
14- Retainer (2 Used)
15- Spring
16- Retaining Ring
17- Spring Assembly
18- Brake Piston
19- O-Ring
20- O-Ring
21- Disc Plate
22- Valve Plate
23- O-Ring
24- Ball Bearing
25- Spring Pin
26- Casing
27- Check Valve (2 Used)
28- O-Ring (2 Used)
29- Spring (2 Used)
30- Plug (2 Used)
31- Relief Valve (2 Used)

Removal and Installation of Pilot Valve (Right)



WABAA0-04-03-001

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

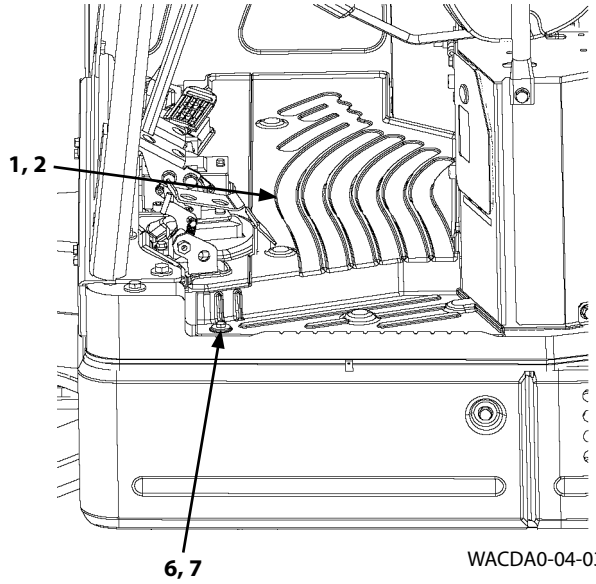
IMPORTANT: Cap the open ends in case the hoses and pipes have been disconnected. In addition, attach identification tags onto the connectors, hoses, and pipes for assembling. If the clips which secure the hoses have been removed, install the clips after connecting the hoses.

Removal

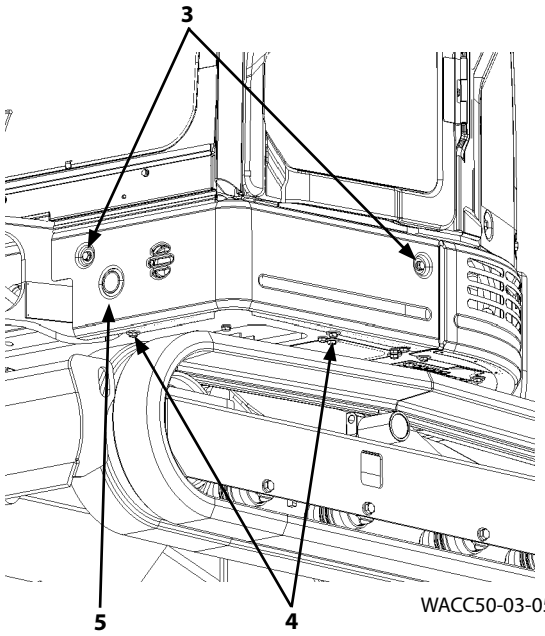
1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)
2. Recline seat (1).
3. Remove bolts (2) (2 used). Remove seat (1).

   : 17 mm

Removal and Installation of Travel Pilot Valve



WACDA0-04-03-001



WACC50-03-05-001

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

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

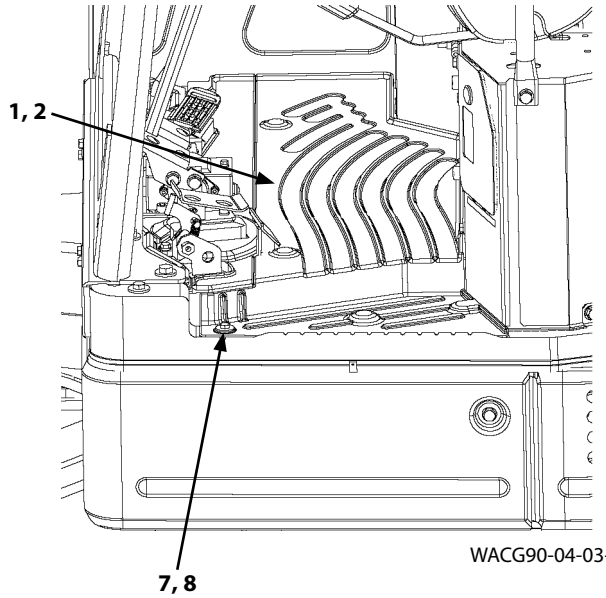
Removal

1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)
2. Remove bolt (6) and washer (7). Remove floor mat (1) and plate (2).

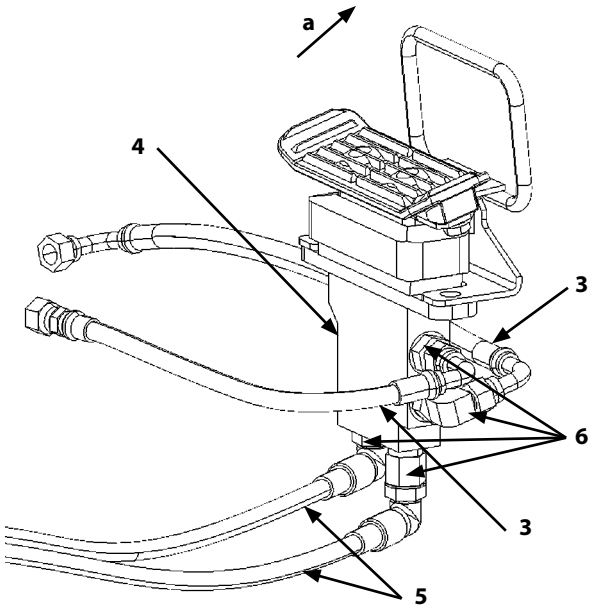
   : 13 mm
3. Remove bolts, washers (3, 4) (2 used for each). Remove cover (5).

   : 17 mm

Removal and Installation of Boom Swing Pilot Valve



WACG90-04-03-001



WACC50-03-07-008

a- Front Side

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

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

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 bolt (7) and washer (8). Remove floor mat (1) and plate (2).

   : 13 mm

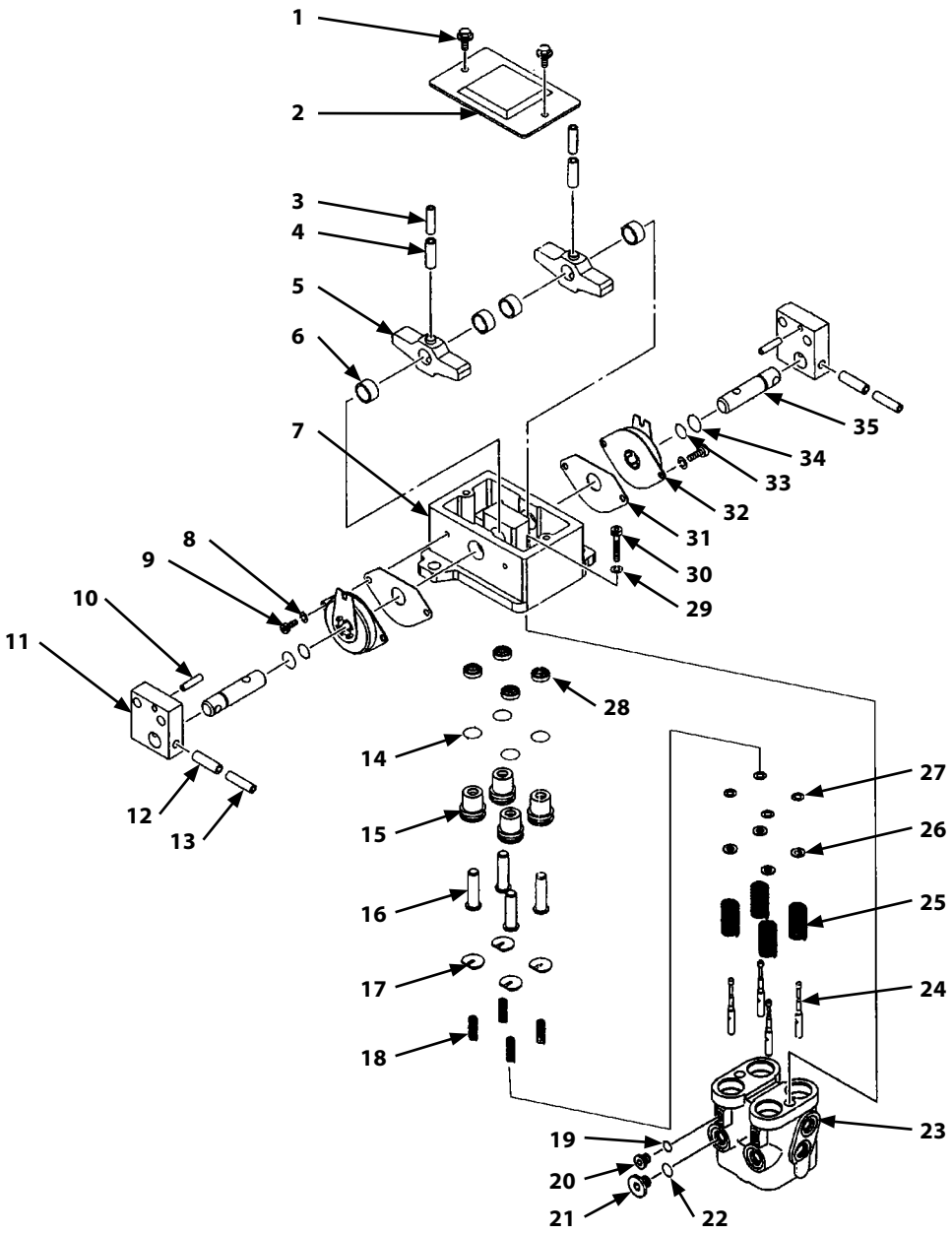
3. Disconnect hoses (3) (2 used) from pilot valve (4).

   : 17 mm

4. Disconnect hoses (5) (2 used) from pilot valve (4).
5. Remove adapters (6) (4 used) from pilot valve (4).

   : 19 mm

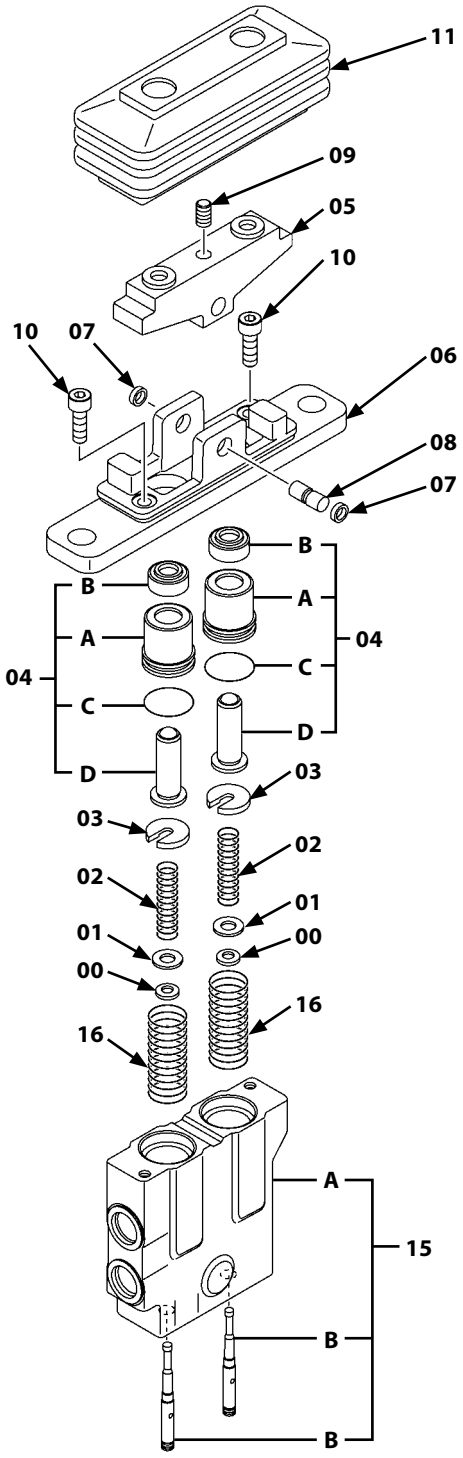
Disassembly of Travel Pilot Valve



WADB-03-08-004

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)

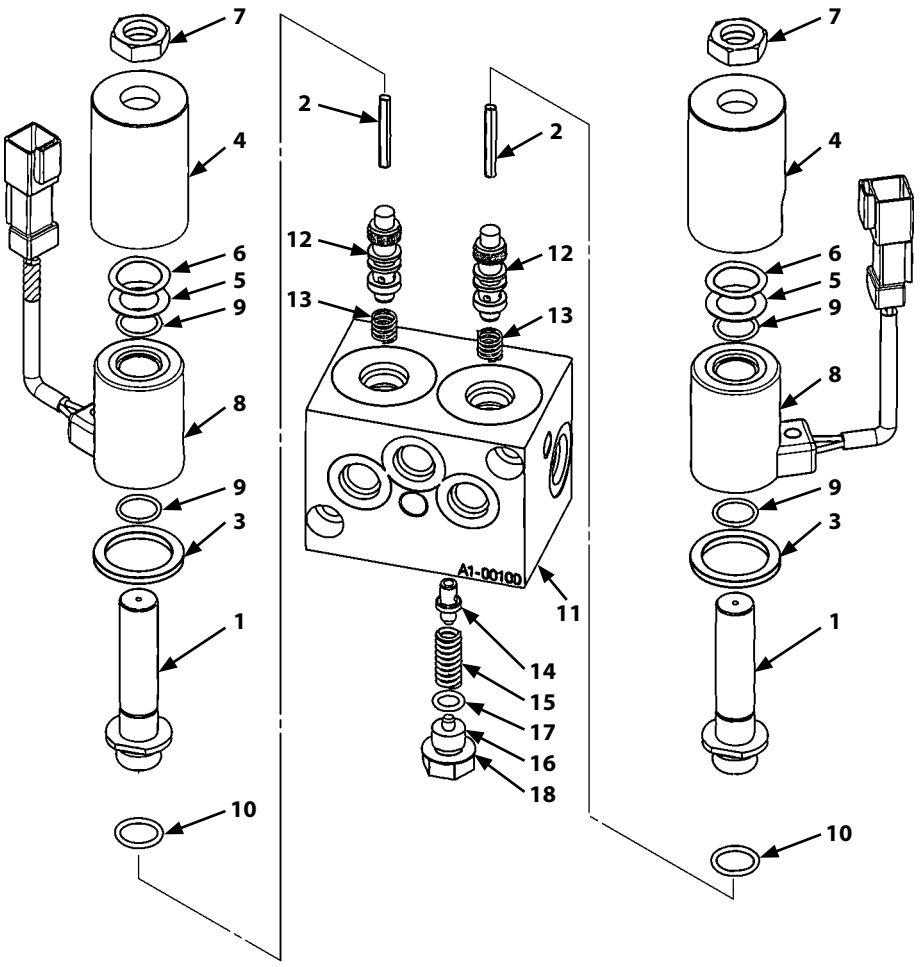
Disassembly of Pilot Valves for Boom Swing, Blade, Auxiliary (Optional)



WADB-03-08-001

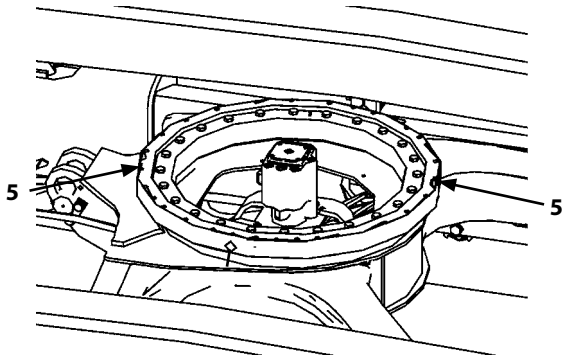
00- Spacer (2 Used)
01- Shim (6 Used)
02- Balance Spring (2 Used)
03- Spring Guide (2 Used)
04A- Bushing (2 Used)
04B- Oil Seal (2 Used)
04C- O-Ring (2 Used)
04D- Pusher (2 Used)
05- Cam
06- Holder
07- Bushing (2 Used)
08- Pin
09- Set Screw
10- Socket Bolt (2 Used)
11- Boot
15A- Casing
15B- Spool (2 Used)
16- Return Spring (2 Used)

Disassembly of 2-Spool Solenoid Valve

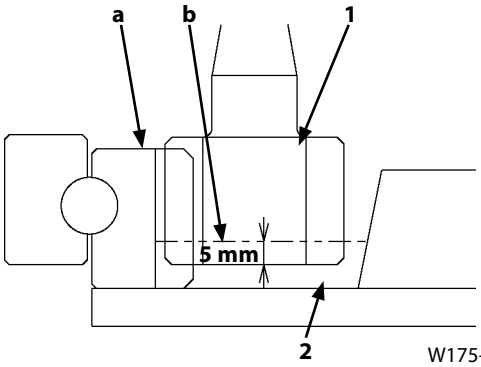


WADB-03-09-001

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



W1M9-03-01-002

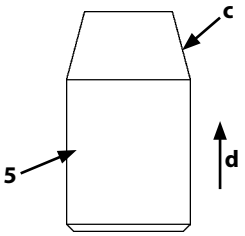


W175-03-01-002

a- Swing Bearing
b- Grease Level

IMPORTANT: Check the direction to install knock pin (5).

6. Install knock pins (5) (2 used) by using a plastic hammer.



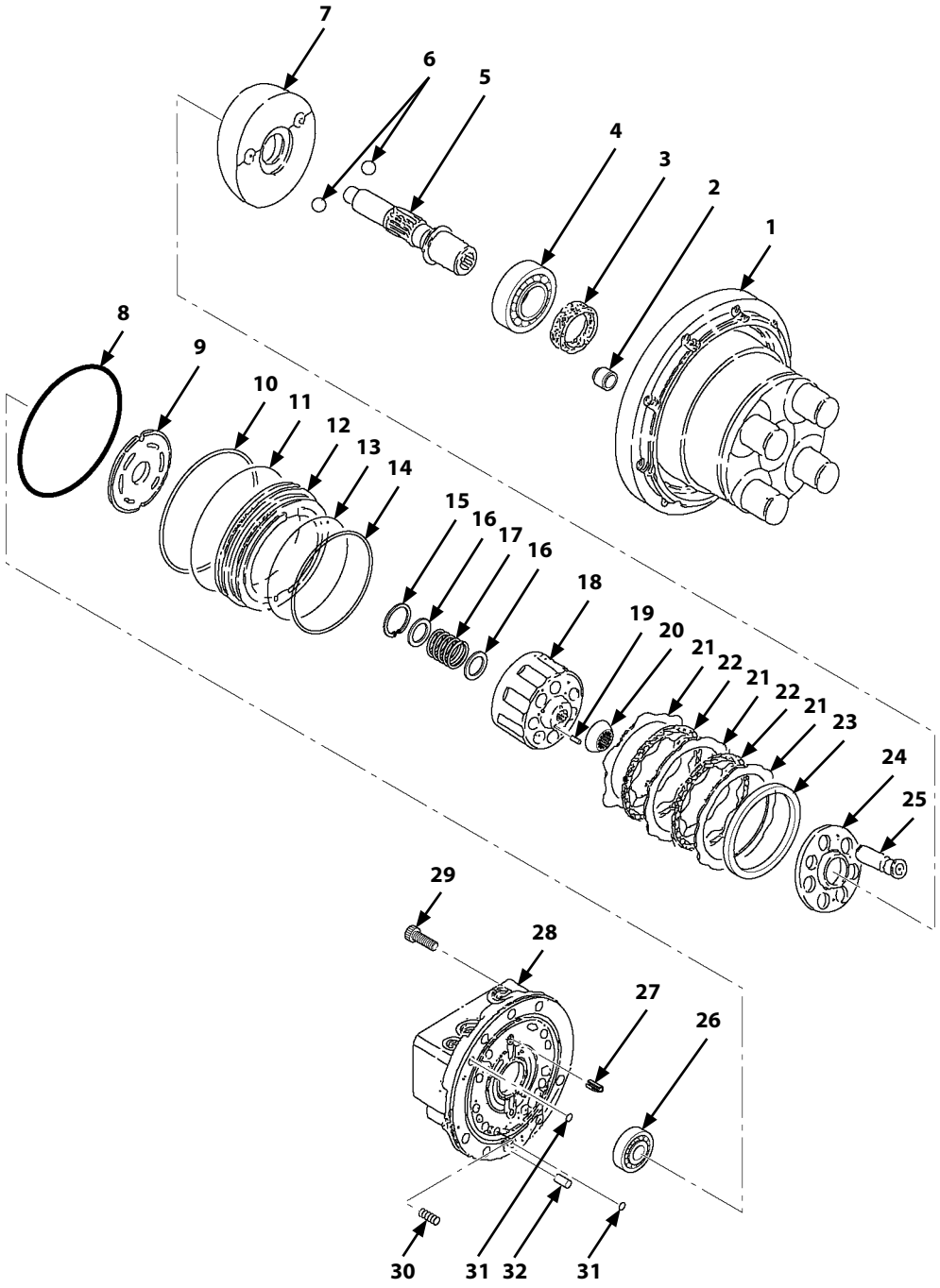
WDEA-03-10-018

c- Taper Part
d- Up

7. After installing swing bearing (a), add grease (Alvania EP2 or equivalent) to the gear part of swing bearing (a). Add grease (Alvania EP2 or equivalent) to grease bath (2) until the pinion (1) of swing device is 5 mm (0.2 in) under grease.

NOTE: Amount of grease: 3 to 3.3 L (3.17 to 3.49 US qt)

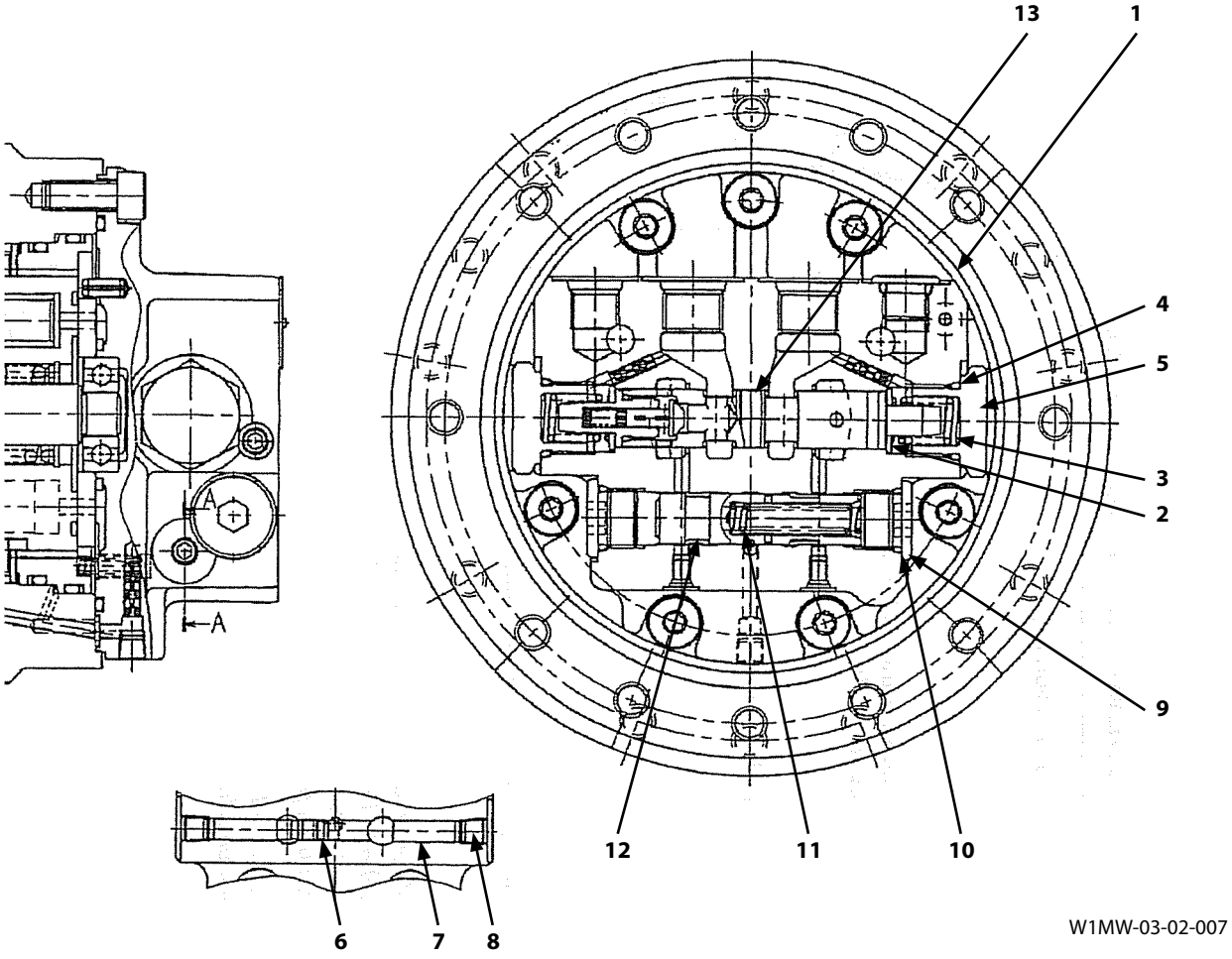
Disassembly of Travel Motor



WACG90-04-02-003

1- Housing
2- Piston
3- Oil Seal
4- Bearing
5- Shaft
6- Ball (2 Used)
7- Swash Plate
8- O-Ring
9- Valve Plate
10- Backup Ring
11- O-Ring
12- Brake Piston
13- O-Ring
14- Backup Ring
15- Retaining Ring
16- Washer (2 Used)
17- Spring
18- Cylinder Block
19- Pin (3 Used)
20- Holder
21- Plate (3 Used)
22- Friction Plate (2 Used)
23- Spacer
24- Holder
25- Plunger (7 Used)
26- Bearing
27- Spring Pin
28- Brake Valve
29- Socket Bolt (7 Used)
30- Spring (8 Used)
31- O-Ring (2 Used)
32- Pin

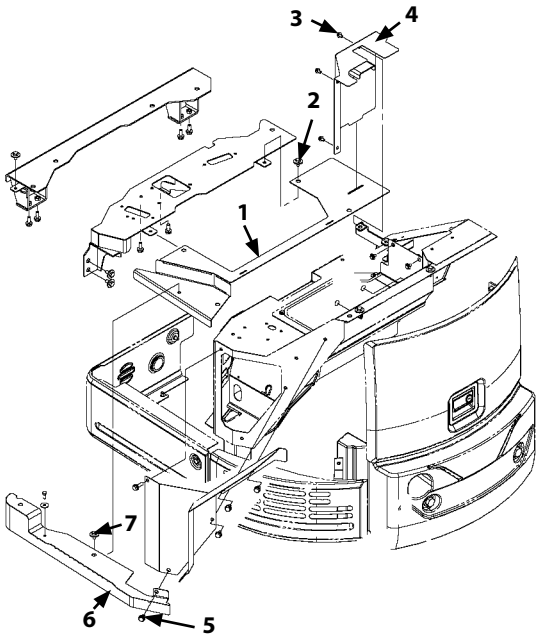
Assembly of Brake Valve



W1MW-03-02-007

Section A-A

1- Body
2- Plate (2 Used)
3- Spring (2 Used)
4- O-Ring (2 Used)
5- Plug (2 Used)
6- Shuttle
7- Pin (2 Used)
8- Plug (2 Used)
9- Plug (2 Used)
10- O-Ring (2 Used)
11- Spring
12- Spool
13- Counterbalance Valve



WACC50-03-07-009

8. Install cover (1) with bolts, washers (2) (4 used).

   : 17 mm

   : 50 N·m (5 kgf·m, 37 lbf·ft)

9. Install cover (6) with bolts, washers (5, 7).

   : 17 mm

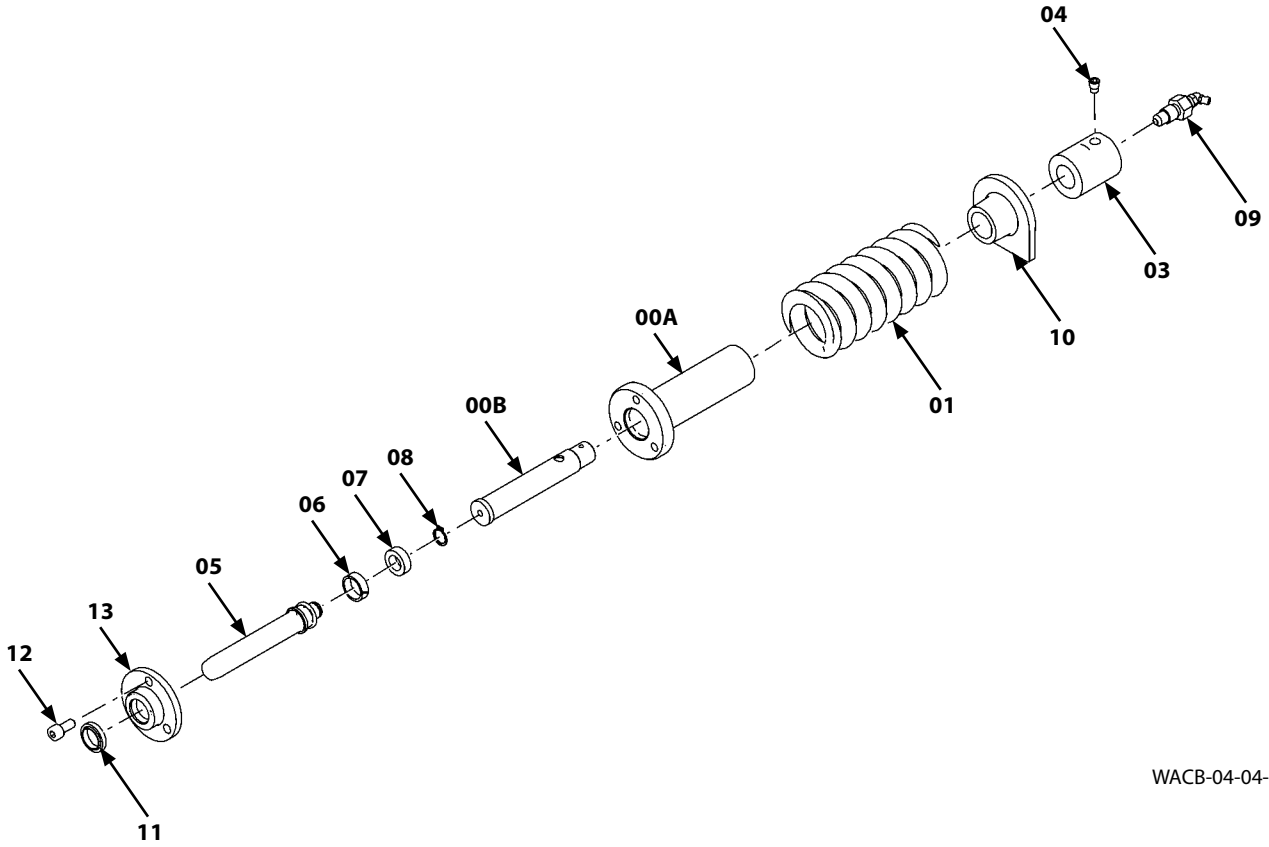
   : 50 N·m (5 kgf·m, 37 lbf·ft)

10. Install cover (4) with bolts, washers (3) (3 used).

    : 13 mm

    : 10 N·m (1 kgf·m, 7.4 lbf·ft)

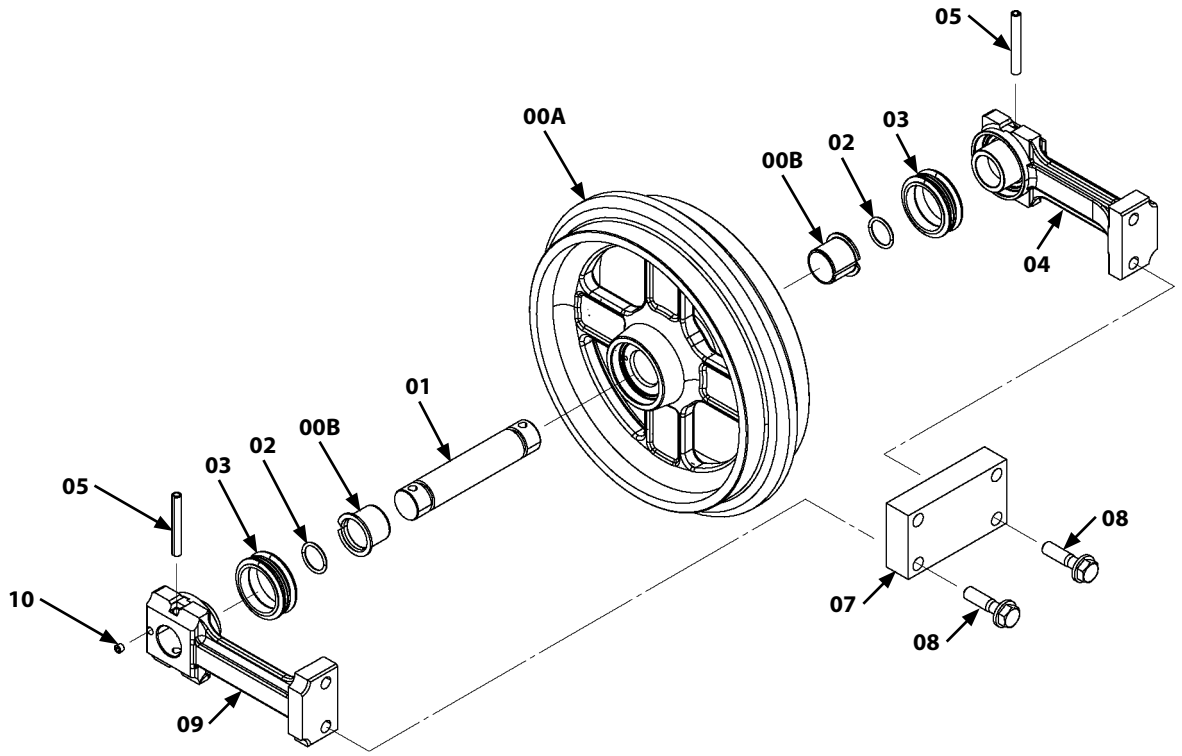
Disassembly of Track Adjuster



WACB-04-04-001

00A- Cylinder
00B- Rod
01- Spring
03- Nut
04- Plug
05- Piston Rod
06- Wear Ring
07- U-Packing
08- Retaining Ring
09- Valve
10- Washer
11- Dust Seal
12- Socket Bolt (3 Used)
13- Flange

Disassembly of Front Idler



WACB-04-05-001

00A- Idler
00B- Bushing (2 Used)
01- Axle
02- O-Ring (2 Used)
03- Floating Seal (2 Used)
04- Yoke
05- Pin (2 Used)
07- Plate
08- Bolt, Washer (4 Used)
09- Yoke
10- Plug

Removal and Installation of Track

Removal

CAUTION: Rubber crawler weight: 78 kg (175 lb)

CAUTION: Securely support the raised machine by using 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 it gradually. Do not loosen grease fitting (2).

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

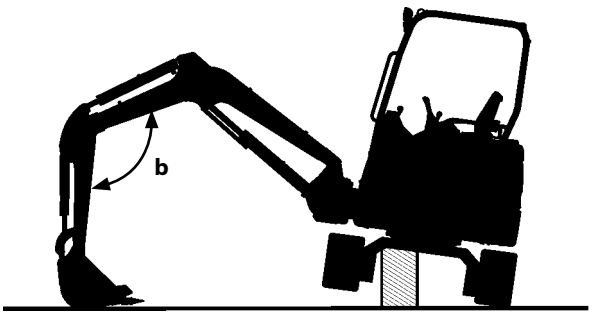
IMPORTANT: When gravel or mud is packed between sprockets and track links, remove them before loosening.

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

: 19 mm

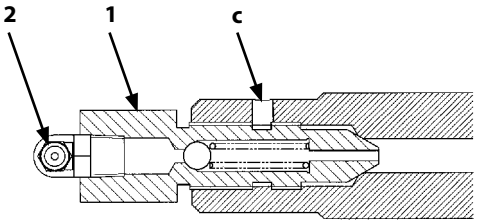
NOTE: If rotating the track in forward and reverse direction with valve (1) loosened, the track can be removed and installed easily.

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



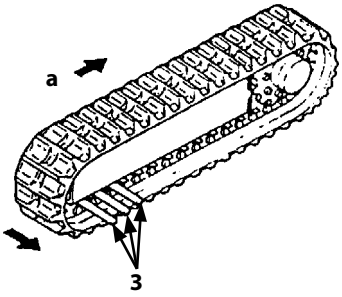
b- 90 to 110°

M1M7-04-006



c- Grease Outlet

W1NC-03-06-001



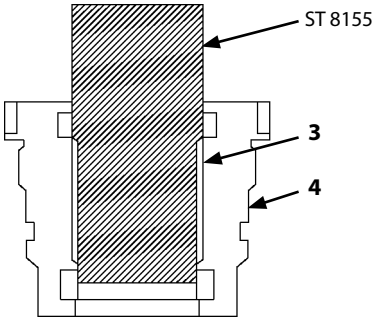
a- Rotating Direction

M503-07-062

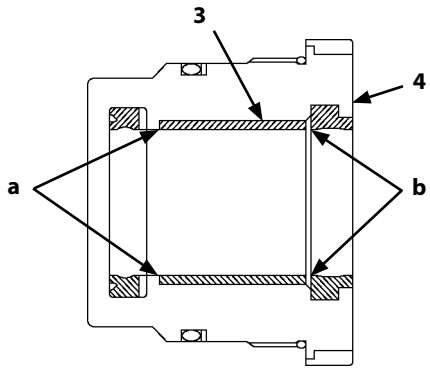
Assembly of Blade Cylinder

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

1. Install bushing (3) to cylinder head (4) by using the special tool (ST 8155).



WACG90-04-08-004



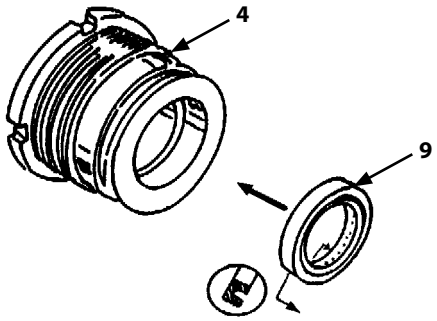
WACG90-04-08-003

a- Check that bushing (3) reaches the contacting surface.
b- Check that bushing (3) is not out.

2. Install O-rings (5, 7) and backup rings (6, 8) to cylinder head (4).

IMPORTANT: Check the direction to install packing (9).

3. Install packing (9) to the inside of cylinder head (4).



W1LD-04-02-004

4. Install dust seal (2) to cylinder head (4).

Installation

CAUTION: Front attachment weight: 250 kg (555 lb)

1. Hoist the front attachment. Fit the boom foot part to the mounting hole of the swing post. Insert shims (7) to both right and left of the boom foot parts and adjust the right and left clearances within 0.5 mm (0.02 in) respectively.

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

2. Install boom foot pin (3) by using a hammer.

IMPORTANT: Install nut (4) so that the clearance between nut (4) and the swing post boss should be 2 to 3 mm.

3. Apply LOCTITE #263 or equivalent to nuts (4) (2 used). Install bolt (2) and nuts (4) (2 used).

   : 17 mm

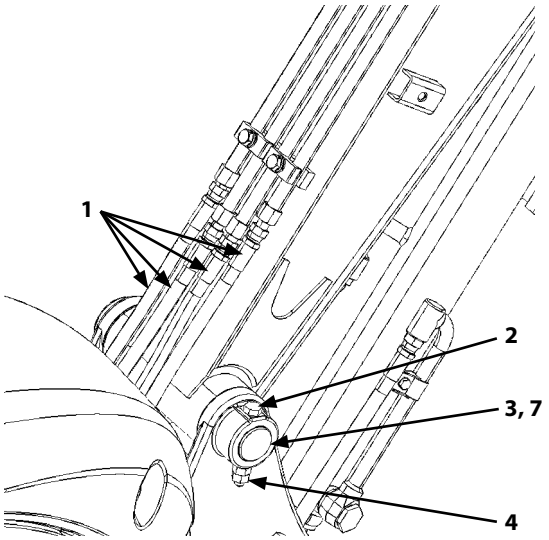
   : 50 N·m (5 kgf·m, 37 lbf·ft)

4. Apply grease to the grease fitting (a) of boom foot.
5. Connect hoses (1) (4 used).

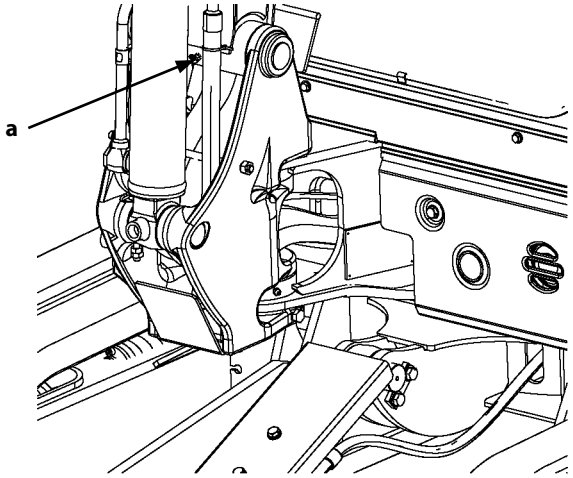
   : 22 mm

   : 40 N·m (4 kgf·m, 29.5 lbf·ft)

IMPORTANT: Check the hydraulic oil level. Start the engine and check for any oil leaks.



WACC50-05-01-001



MABC-07-005

a- Grease Fitting at the Boom Foot

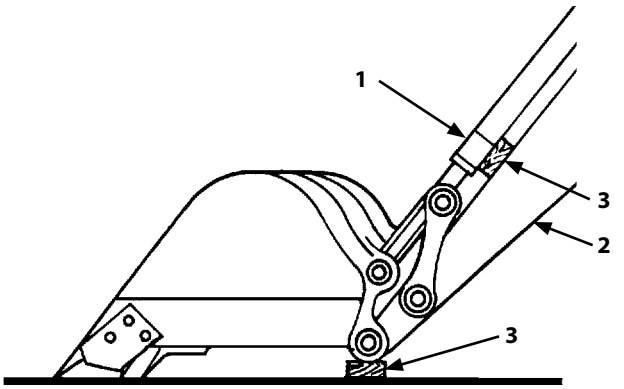
Removal and Installation of Bucket Cylinder

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

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

Removal

1. Park the machine on a solid and level surface. Retract the arm cylinder and bucket cylinder (1) and lower the end part of arm (2) onto the ground.
2. Set wooden blocks (3) under the arm (2) top and between bucket cylinder (1) and arm (2).



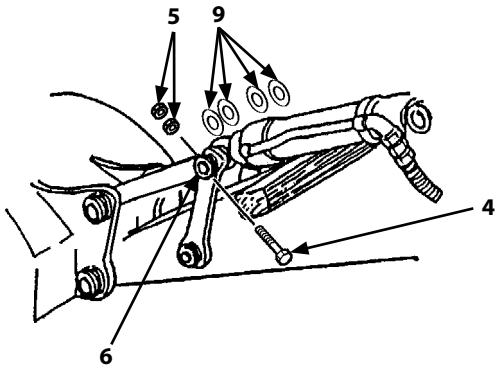
W554-04-02-006

CAUTION: Before removing pin (6), secure the link by using wires in order not to fall off.

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

3. Remove nuts (5) (2 used) and bolt (4). Remove pin (6) by using a bar and a hammer. Remove shims (9).

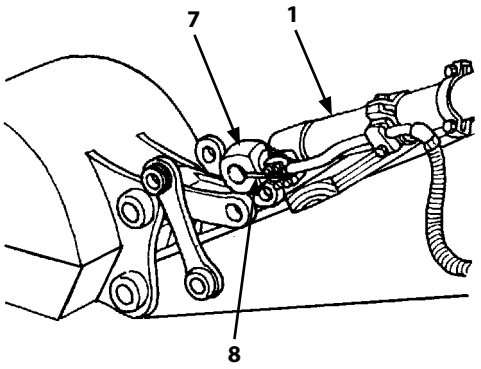
: 24 mm



WLAA-05-02-002

NOTE: LOCTITE #263 or equivalent has been applied to nut (5).

4. Start the engine. Operate the bucket control lever and retract bucket cylinder (1). In order not to extend rod (7), pass wires (8) through the rod hole and secure rod (7) to the bucket cylinder (1) tube. Stop the engine.



W102-04-02-005

4. Cut away the crimped part by using a hand drill. Remove set screw (21). Remove steel ball (20).

NOTE: Set screw (21) has been crimped by using a punch at two places after installing.

: 4 mm

5. Secure the cylinder on a workbench horizontally. Remove piston (19) and cushion bearing (17) by using the special tool (ST 3450).

   Special Tool for Piston: ST 3450: 50 mm

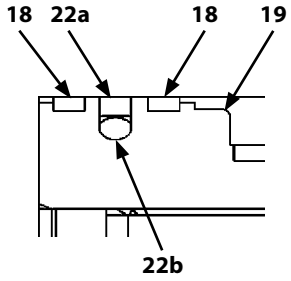
6. Remove stopper (10) from connector (9). Remove connector (9).
7. Install the protective tape onto the thread part of cylinder rod (1) in order to protect the seal of cylinder head (3). Remove the retainer (16) assembly, stopper (10), and cylinder head (3) from cylinder rod (1).

IMPORTANT: When removing the seals, do not damage parts.

8. Secure piston (19) in a vise. Remove slide rings (18) (2 used) from piston (19). Cut and remove seal ring (22a) from piston (19) by using a screwdriver. Remove O-ring (22b) by using a spatula.
9. Remove O-ring (11) from retainer (16) by using a spatula.
10. Remove backup ring (12) from retainer (16) by using a screwdriver.
11. Remove stopper (15), spacer (14), and cushion ring (13) from retainer (16).
12. Remove wiper ring (2) and U-ring (8) from cylinder head (3) by using a screwdriver.
13. Remove O-rings (4, 6) from cylinder head (3) by using a spatula. Remove backup ring (5) by using a screwdriver.

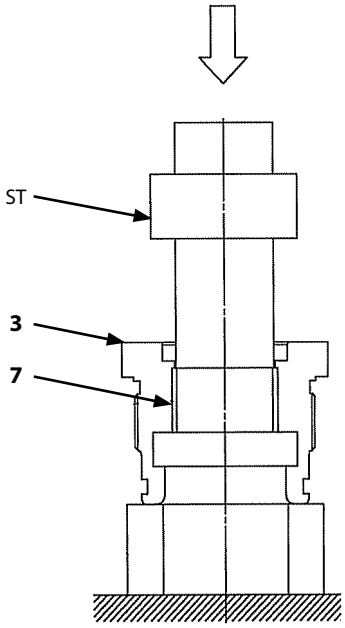
IMPORTANT: Bushing (7) cannot be reused. When bushing (7) has been removed, replace it with the new one when assembling.

14. Remove bushing (7) from cylinder head (3) by using a press and the special tool (ST 8158).



WACB-05-02-003

22a- Seal Ring
22b- O-Ring



W1MP-04-02-016