

PART NO. WNDG-EN-00

HITACHI

Reliable solutions

Workshop Manual

ZW150-5B

Wheel Loader

ZW150-5B WHEEL LOADER WORKSHOP MANUAL

 **Hitachi Construction Machinery Co., Ltd.**

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

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WNDG-EN-00

Service Manual consists of the following separate Part No.
Technical Manual (Operational Principle) : Vol. No.TONDG-EN
Technical Manual (Troubleshooting) : Vol. No.TTNDG-EN
Workshop Manual : Vol. No.WNDG-EN

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SAFETY

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 accelerator pedal, brake pedals, control lever lock switch 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 accelerator or brake pedals during operation, resulting in serious injury or death.

SAFETY

Travel on Public Roads Safely

- This machine is not allowed to drive on public roads with the bucket loaded.
- Be sure to empty the bucket.
- Hold the bucket at mark (A) 300 mm (12 in) above the road surface as illustrated.



SA-453

Avoid Injury from Rollaway Accidents

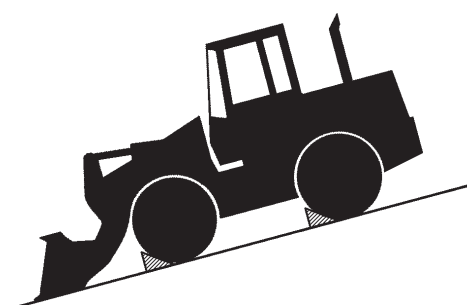
- Death or serious injury may result if you attempt to mount or stop a moving machine.

To avoid rollaways:

- Select level ground when possible to park machine.
- Do not park the machine on a grade.
- Lower the bucket to the ground.
- Put the forward / reverse lever (switch) in neutral, and pull up the parking brake switch (lever) in the ON (parking brake) position.
- Run the engine at low idle speed without load for 5 minutes to cool down the engine.
- Stop the engine and remove the key from the key switch.
- Turn the control lever lock switch to the lock (🔒) position.
- Block both tires and lower the bucket to the ground.
- Position the machine to prevent rolling.
- Park at a reasonable distance from other machines.



SA-457



SA-458

SAFETY

- Sufficiently illuminate the work site. Use a maintenance work light when working under or inside the machine.
- Always use a work light protected with a guard. In case the light bulb is broken, spilled fuel, oil, antifreeze fluid, or window washer fluid may catch fire.



SA-037

Warn Others of Service Work

- Unexpected machine movement can cause serious injury.
- Before performing any work on the machine, attach a “Do Not Operate” tag on the control lever. This tag is available from your authorized dealer.



SS2045102

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. Do not support the machine on cinder blocks, hollow tires, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack.



SA-527

SAFETY

Handle Chemical Products Safely

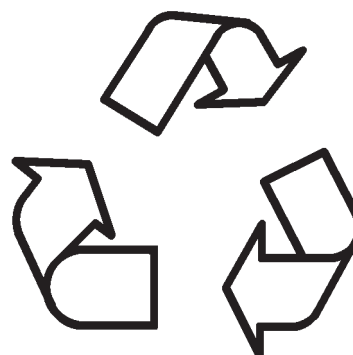
- Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with your machine include such items as lubricants, coolants, paints, and adhesives.
- A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.
- Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and use recommended equipment.
- See your authorized dealer for MSDS's (available only in English) on chemical products used with your machine.



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 batteries.
- Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.
- Do not pour waste onto the ground, down a drain, or into any water source.
- Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.
- Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your authorized dealer.



SA-226

SECTION 1 GENERAL

Group 1 Precautions for Disassembling and Assembling

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 an identification tag 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), 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 onto 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.

SECTION 1 GENERAL

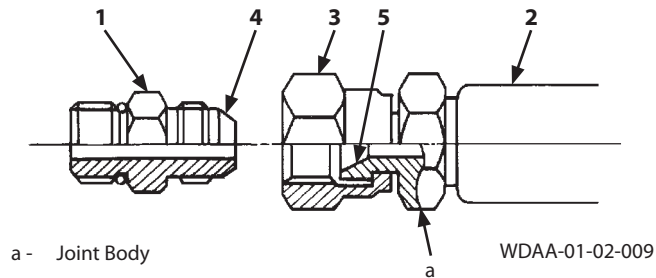
Group 2 Tightening

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.

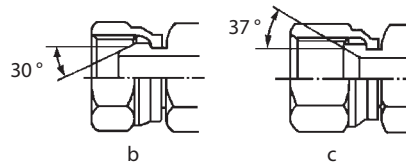
IMPORTANT:

- **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.**



2013/09


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



b - Male Union Joint

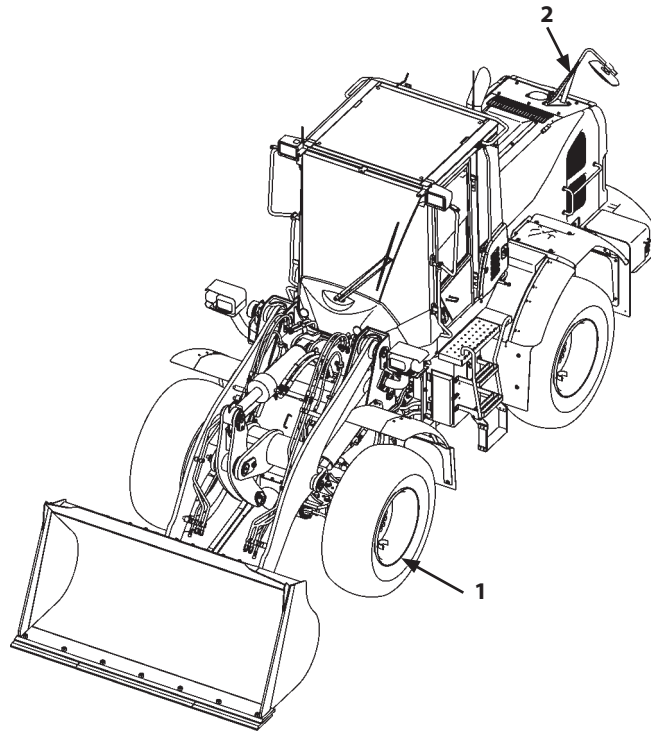
c - Female Union Joint

WDAA-01-02-010

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

SECTION 1 GENERAL

Group 3 Painting



WMDF-01-03-104

	Surfaces to Be Painted	Painting Color
1	Rim (17.5)	YR-01 [TAXI Yellow]
	Rim (20.5)	YR-01 [TAXI Yellow]
2	Bracket (Under Mirror)	High Grade Black

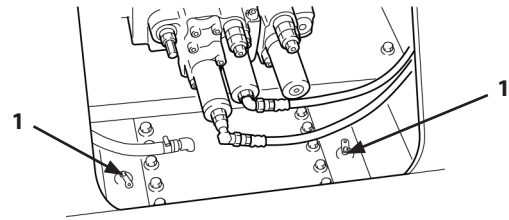
SECTION 1 GENERAL

Group 4 Bleeding Air

Bleeding Air from Brake (Axle)

CAUTION: If air is mixed in the brake system, the brake function is reduced and serious hazard may occur. Bleed air from the brake system after removing and installing the pipe lines and replacing hydraulic oil.

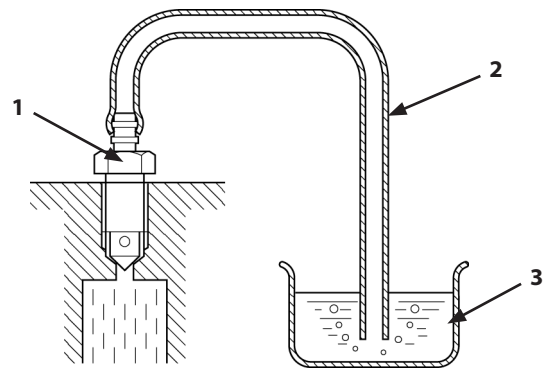
In addition, bleed air from the brake system until hydraulic oil (about 0.5 liters (0.53 US qt)) is drawn from each wheel (4 places) after bubbles stops.



T4GB-05-04-004

NOTE: Perform this work on all wheels (4 places) by two or more persons. Air bleed plug (1) is located around the center on front and rear axles.

1. Set the parking brake switch of front console to the ON position, start the engine, and increases service brake oil pressure.
2. Attach clear vinyl tube (2) onto one end of air bleed plug (1). Insert other of clear vinyl tube (2) into clear container (3) filled with hydraulic oil.
3. Depress brake pedal (4) several times. Then, depress and hold brake pedal (4) to the stroke end.
4. Loosen air bleed plug (1) under condition in step 3 and drain hydraulic oil and air for several seconds.
5. Tighten air bleed plug (1).
6. Drain hydraulic oil after bubbles stops in steps 3 to 5 repeatedly.

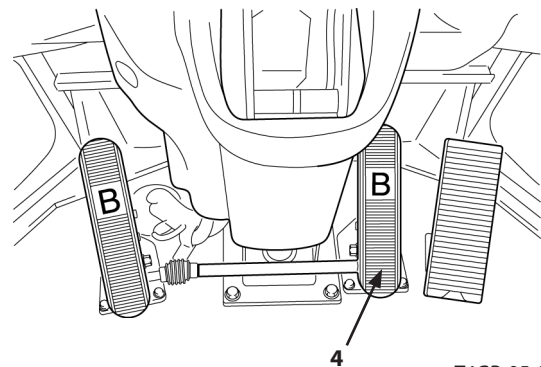


T4GB-05-04-005

- NOTE:** When bubbles does not stop after hydraulic oil (about 0.5 liters (0.53 US qt)) is drawn, repeat step 3 to step 5.
7. Bleed air at other 3 places in the same way as step 3 to step 5.

IMPORTANT: After air bleeding work is completed at 4 places, bleed air at 4 places again.

Bleed air in the same way as step 3 to step 5 twice and check that no air is remained inside.



T4GB-05-04-006

SECTION 2

MAINTENANCE STANDARD

CONTENTS

Group 1 Body

Center Hinge.....W2-1-1-1

Group 2 Travel System

AxleW2-2-1-1

Group 3 Front Attachment

Pin and Bushing.....W2-3-1-1

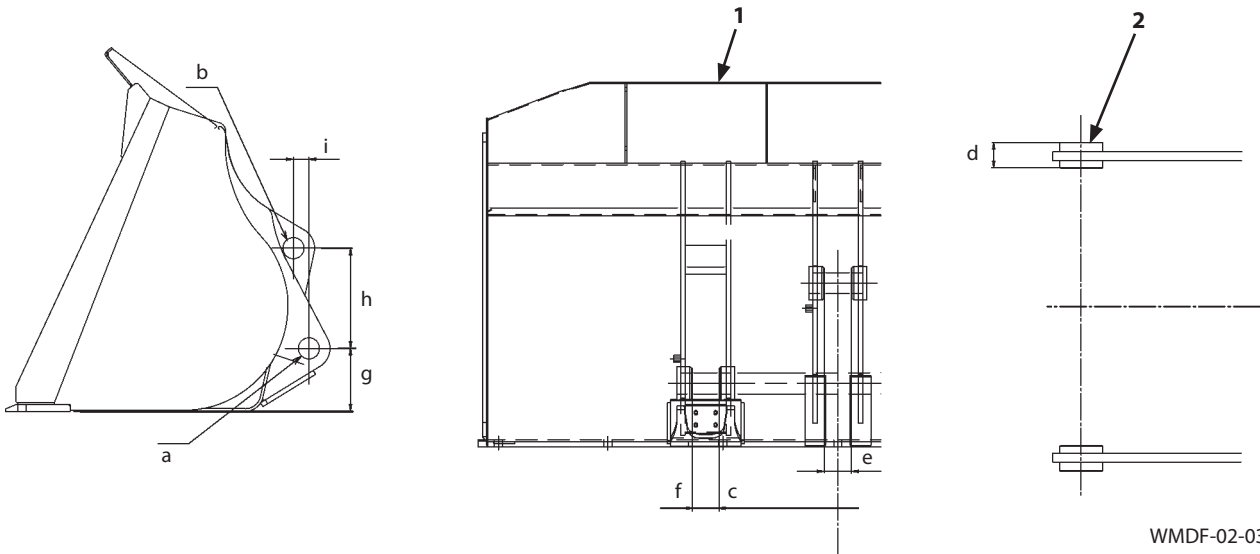
Standard Dimensions for Lift Arm and Bucket...W2-3-2-1

CylinderW2-3-3-1

SECTION 2 MAINTENANCE STANDARD

Group 3 Front Attachment

Standard Dimensions for Lift Arm and Bucket



WMDF-02-03-001

1- Bucket

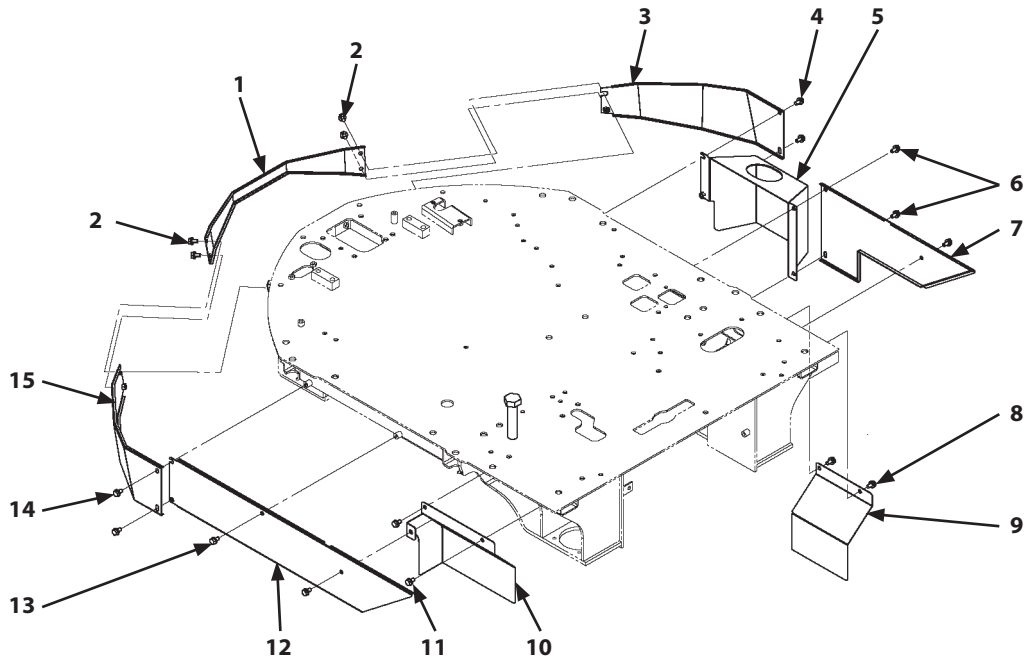
2- Lift Arm

Unit: mm (in)

	Dimensions
a	75 (2.95)
b	75 (2.95)
c	844 (9.23)
d	94 (3.70)
e	96 (3.78)
f	96 (3.78)
g	230 (9.06)
h	356 (2.02)
i	55 (2.17)


SECTION 3 BODY

Group 1 Cab




WMDF-03-06-006


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

 : 17 mm


11. Remove bolts, washers (14) (2 used). Remove cover (15).

 : 17 mm


12. Remove bolts, washers (13) (2 used). Remove cover (12).

 : 17 mm


13. Remove bolts, washers (11) (2 used). Remove cover (10).

 : 17 mm


14. Remove bolts, washers (4) (2 used). Remove cover (3).

 : 17 mm

15. Remove bolts, washers (6) (3 used). Remove covers (5, 7).

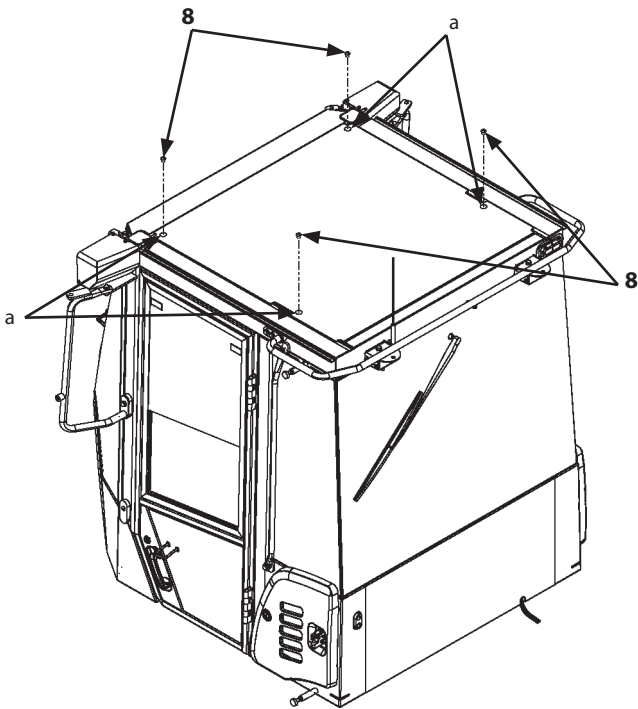
 : 17 mm

16. Remove bolts, washers (8) (2 used). Remove cover (9).

 : 17 mm

SECTION 3 BODY

Group 1 Cab





WMDF-03-01-014

a- Eyebolt Mounting Hole

7. Remove the eyebolts (4 used). Install caps (8) (4 used) to eyebolt mounting holes (a) (4 places).


8. Connect the pipe (6) side of hose (7).


 : 27 mm

 : 95 N·m (9.5 kgf·m, 70 lbf·ft)

IMPORTANT: Check the angle to install hose (4).

9. Connect the adapter (5) side of hose (4).


 : 27 mm


 : 80 N·m (8 kgf·m, 59 lbf·ft)

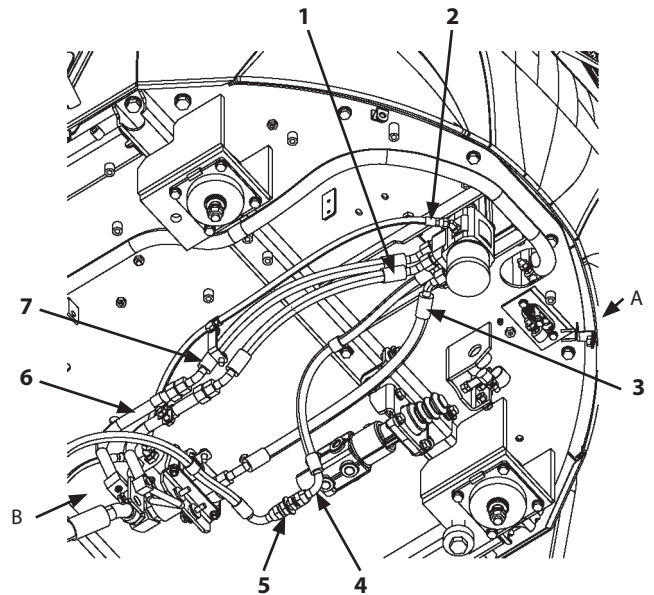
IMPORTANT: Check the angle to install hose (1).

IMPORTANT: Check the angle to install hose (3) as for the machine without the emergency steering.

10. Connect hoses (1, 3).

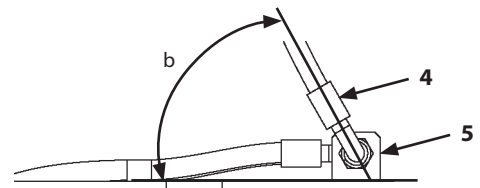
 : 27 mm

 : 95 N·m (9.5 kgf·m, 70 lbf·ft)



WMDF-03-01-009

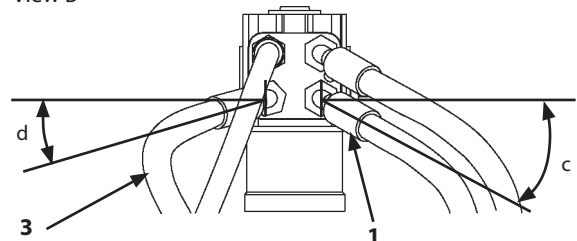
View A



b- 60°

WMDF-03-01-012

View B





c- 30°

d- 15°

WMDF-03-01-011

11. Connect hose (2).

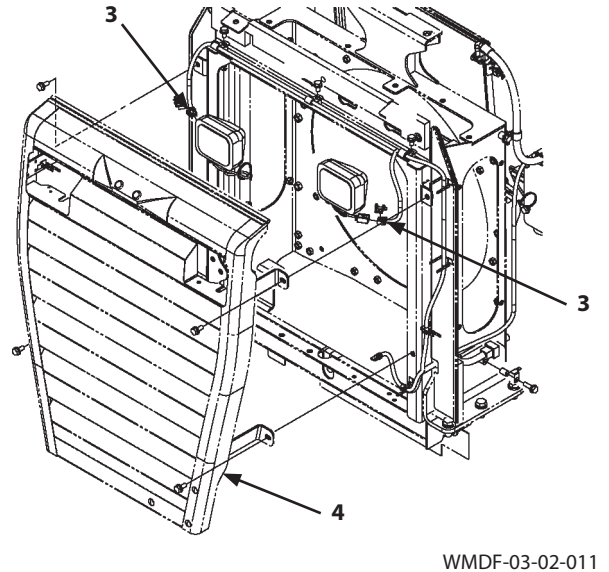
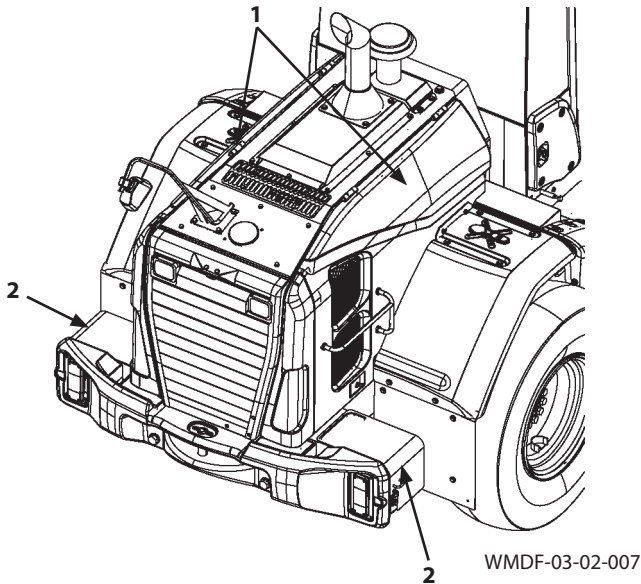
 : 19 mm

 : 30 N·m (3 kgf·m, 22 lbf·ft)

SECTION 3 BODY

Group 2 Counterweight

Removal and Installation of Counterweight



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.

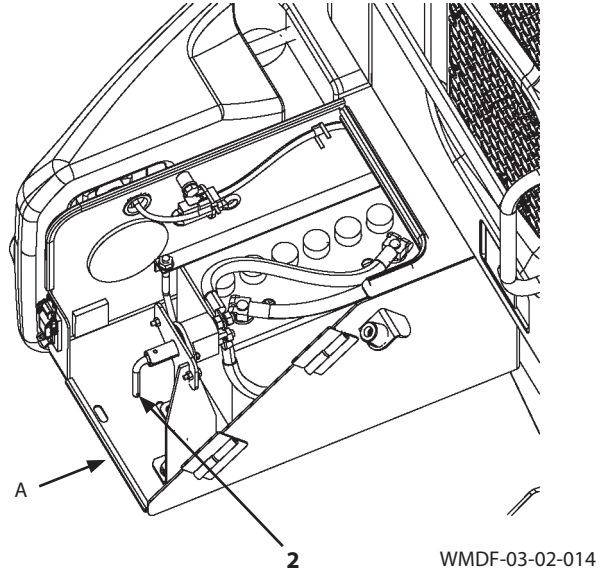
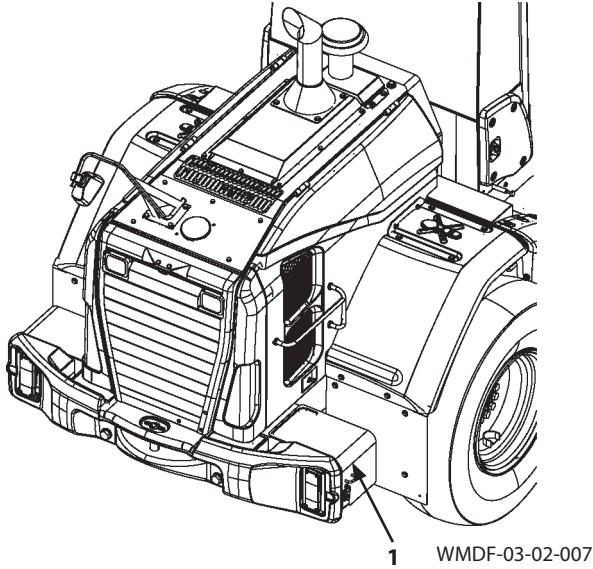
Removal

1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)
2. Open side covers (1) at left and right sides.
3. Disconnect connectors (3) (2 used).
4. Remove rear grill (4). (Refer to W3-4-2.)
5. Remove battery boxes (2) at left and right sides.
 - Without battery disconnect switch: Refer to W3-2-2.
 - Attached battery disconnect switch: Refer to W3-2-3.

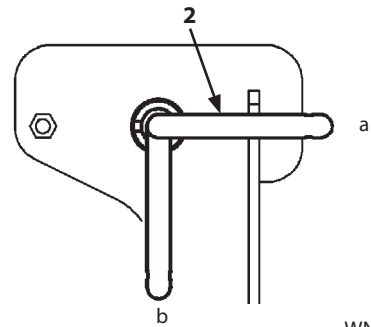
SECTION 3 BODY

Group 2 Counterweight

Removal and Installation of Battery Disconnect Switch



View A



WNEE-03-18-002

Removal

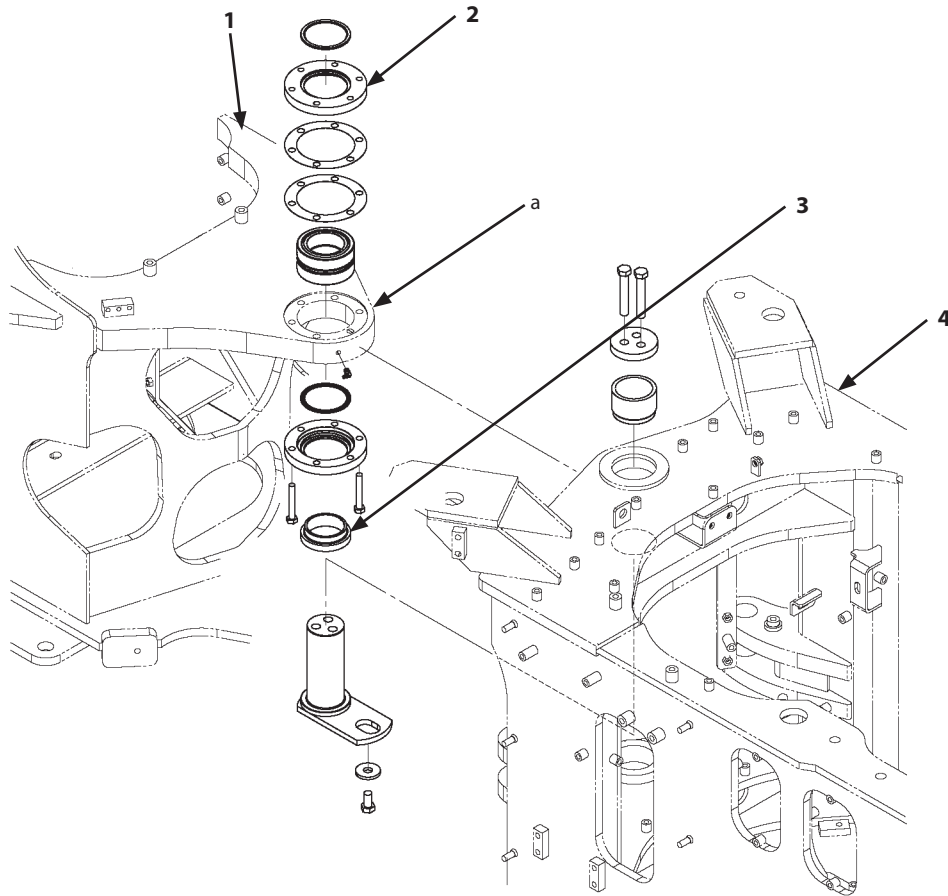
1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)
2. Open cover (1) of the battery box (right).
3. Set lever (2) to the OFF position.

a- OFF

b- ON

SECTION 3 BODY

Group 3 Center Hinge



WMDF-03-03-004

a- Upper Hinge

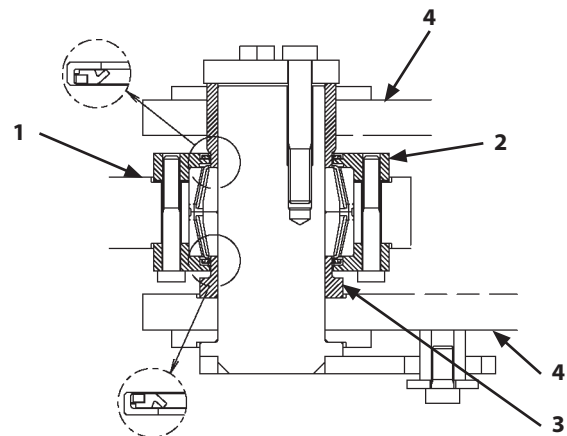
CAUTION: The front frame (1) assembly weight: 2300 kg (5080 lb)

CAUTION: Support front frame (1) by using stable stands.

IMPORTANT: Take care that cap (2) and bushing (3) do not come in contact with rear frame (4).

25. Attach nylon slings onto the front axle (1) assembly. Hoist and hold the front frame (1) assembly. Move the front frame (1) assembly forward. Remove the front frame (1) assembly from rear frame (4). Support it by using stands.

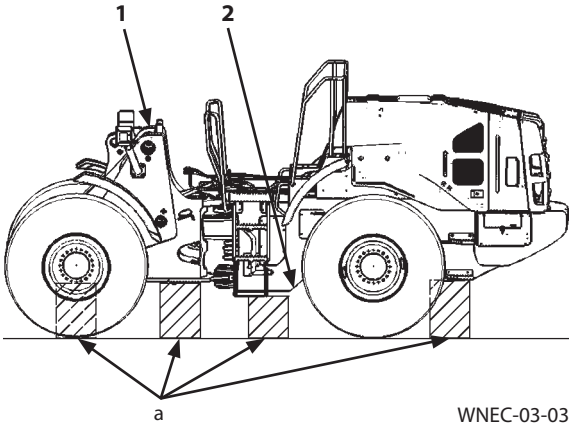
Upper Hinge (a) Part (Section)



WMDF-03-03-006

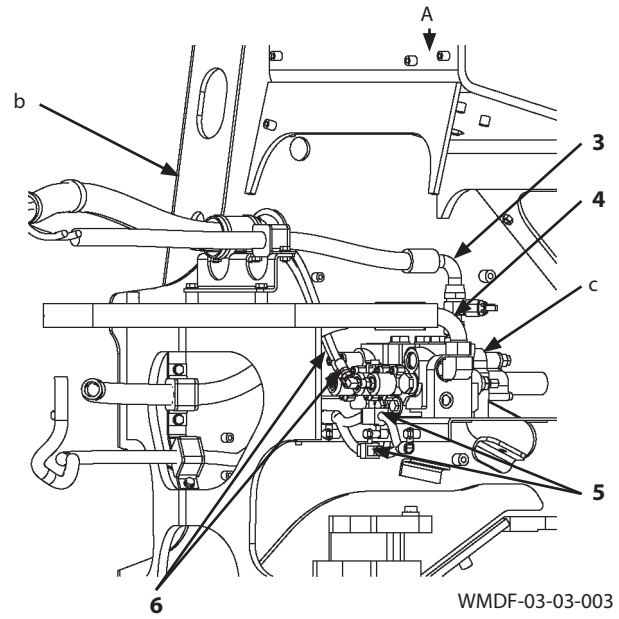
SECTION 3 BODY

Group 3 Center Hinge



WNEC-03-03-019

a- Stand



WMDF-03-03-003

b- Front Frame

c- Control Valve

⚠ CAUTION: Machine weight: 8000 kg (17700 lb)

16. Remove stands (a) from front frame (1) and rear frame (2). Secure tires (4 used) by using wheel stoppers.

IMPORTANT: Check the angle to install hose (4).

17. Connect hose (4).

: 50 mm

: 350 N·m (35 kgf·m, 260 lbf·ft)

IMPORTANT: Check the angle to install hose (3).

18. Connect hose (3).

: 41 mm

: 210 N·m (21 kgf·m, 155 lbf·ft)

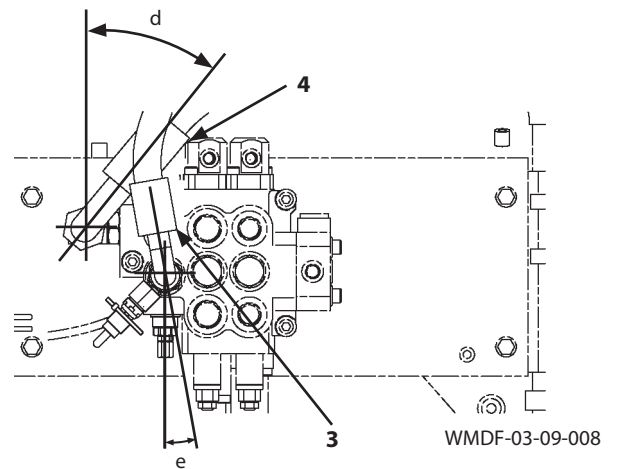
19. Connect hoses (6) (2 used).

: 19 mm

: 30 N·m (3 kgf·m, 22 lbf·ft)

20. Connect connectors (5) (2 used).

View A



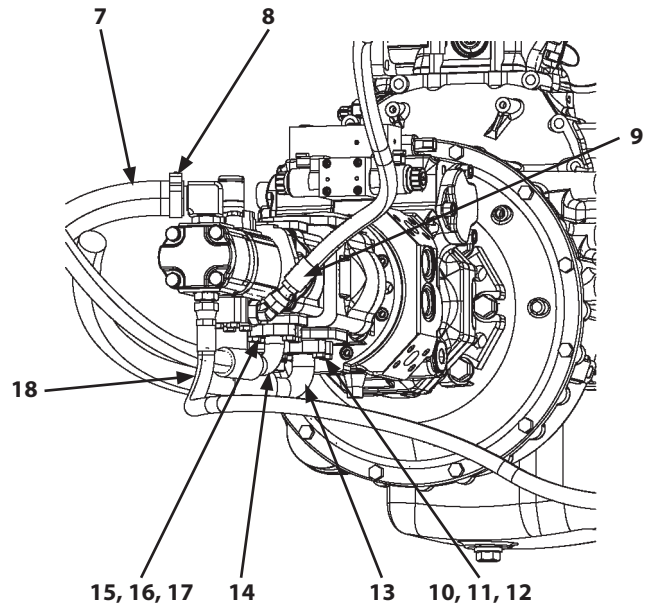
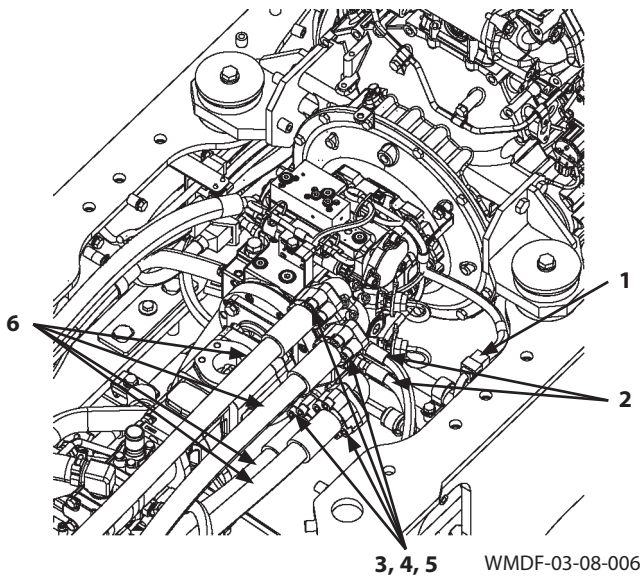
WMDF-03-09-008

d- 40°


e- 10°

SECTION 3 BODY


Group 4 Engine




31. Disconnect connector (1).
32. Remove socket bolts (3) (16 used) and flanges (4) (8 used). Disconnect hoses (6) (4 used). Remove O-rings (5) (4 used).

 : 10 mm


33. Disconnect hoses (2) (2 used).

 : 27 mm


34. Remove clamp (8). Disconnect hose (7).

 : 9.5 mm


35. Disconnect hose (9).

 : 27 mm

36. Disconnect hose (18).

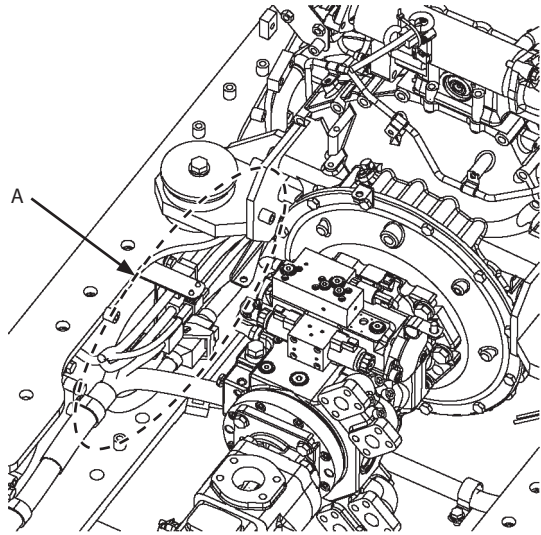
 : 27 mm

37. Remove bolts (10, 15) (4 used for each) and flanges (11, 16) (2 used for each). Disconnect hoses (13, 14). Remove O-rings (12, 17).

 : 14 mm

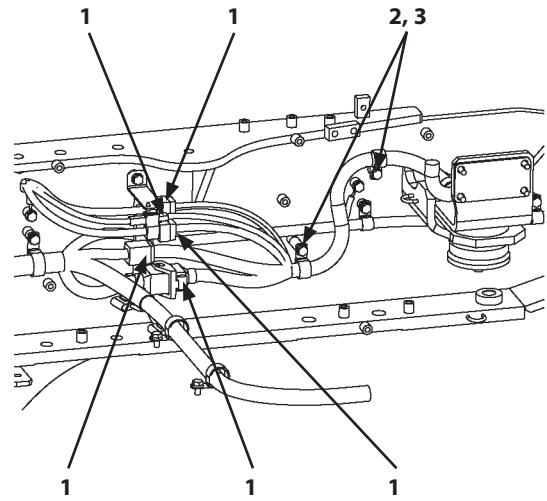
SECTION 3 BODY

Group 4 Engine




WMDF-03-04-023


Detail A



WMDF-03-04-024

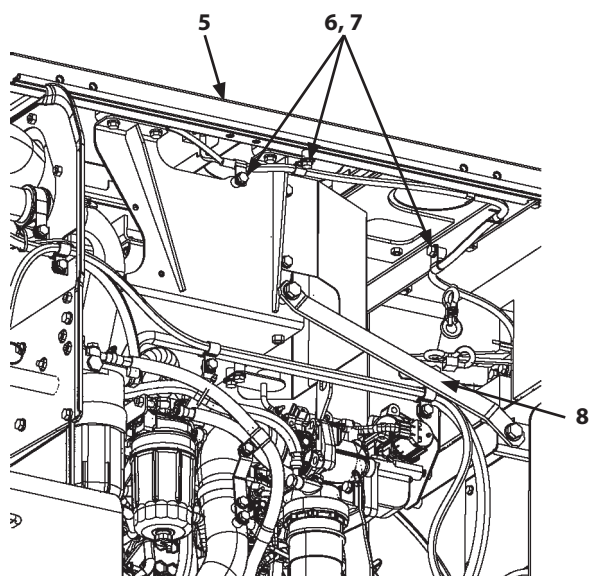
11. Connect connectors (1) (5 used).
12. Install clips (3) (2 used) with bolts, washers (2) (2 used).

 : 17 mm

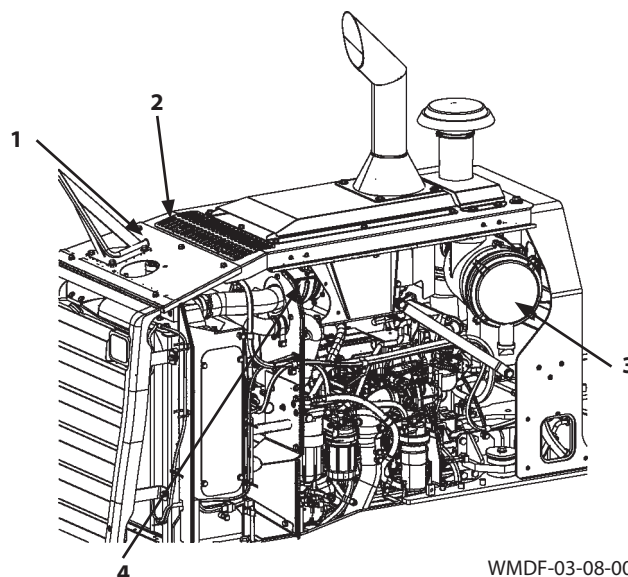
 : 50 N·m (5 kgf·m, 37 lbf·ft)

SECTION 3 BODY

Group 4 Engine




WMDF-03-08-002




WMDF-03-08-001

CAUTION: The cover (5) assembly weight: 53 kg (120 lb)

67. Install the cover (5) assembly. (Refer to W3-4-2.)
68. Install the wire harnesses to all clips of cover (5).
69. Install brackets (8) at right and left sides. (Refer to W3-4-2.)
70. Install clips (7) (3 used) with bolts, washers (6) (3 used).

 : 17 mm

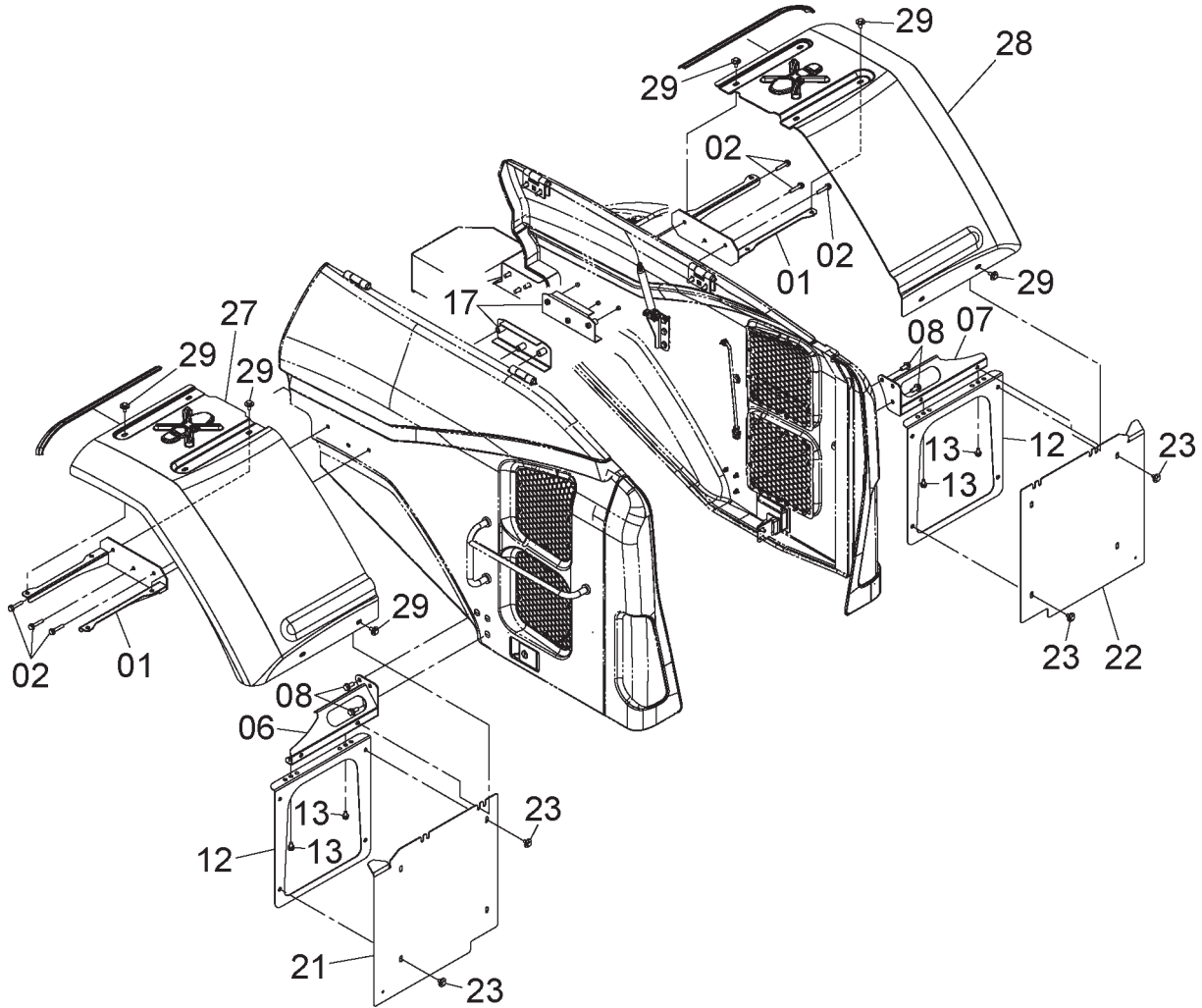
 : 50 N·m (5 kgf·m, 37 lbf·ft)

71. Install the muffler filter (4) assembly. (Refer to W3-17-1.)
72. Install the air cleaner (3) assembly. (Refer to W3-4-3.)
73. Install covers (1, 2). (Refer to W3-4-2.)

SECTION 3 BODY

Group 4 Engine

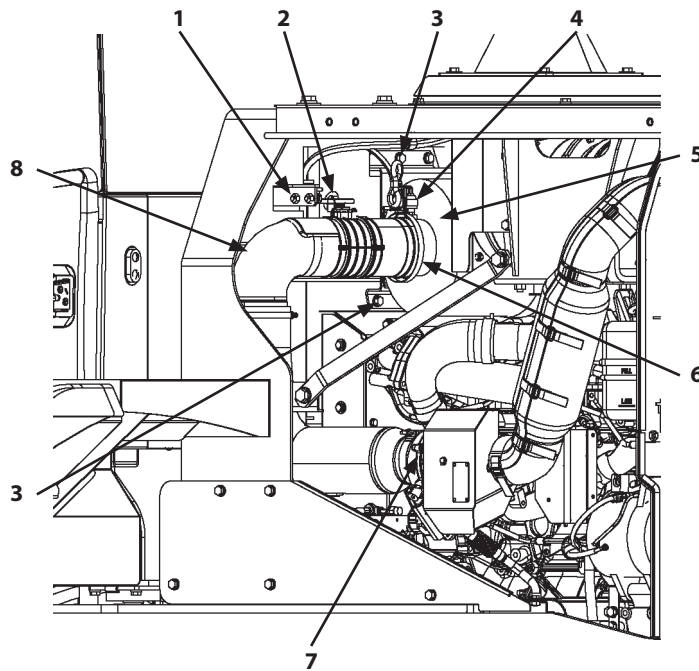
Removal and Installation of Rear Fender (Rear)



WMDF-03-04-006

SECTION 3 BODY

Group 4 Engine





WMDF-03-04-013

Installation


CAUTION: Remove and install the air cleaner (5) assembly while holding it. Do not drop the air cleaner (5) assembly.


1. Install the air cleaner (5) assembly with bolts, washers (3) (4 used).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

2. Temporarily install the both ends of the hose (8) assembly with clamps (6, 7) and bolts, washers (1) (2 used).

 : 11 mm


 : 12 N·m (1.2 kgf·m, 8.9 lbf·ft)


4. Tighten clamp (6).

 : 7 mm

 : 8 N·m (0.8 kgf·m, 5.9 lbf·ft)

5. Tighten bolts, washers (1) (2 used).

 : 17 mm

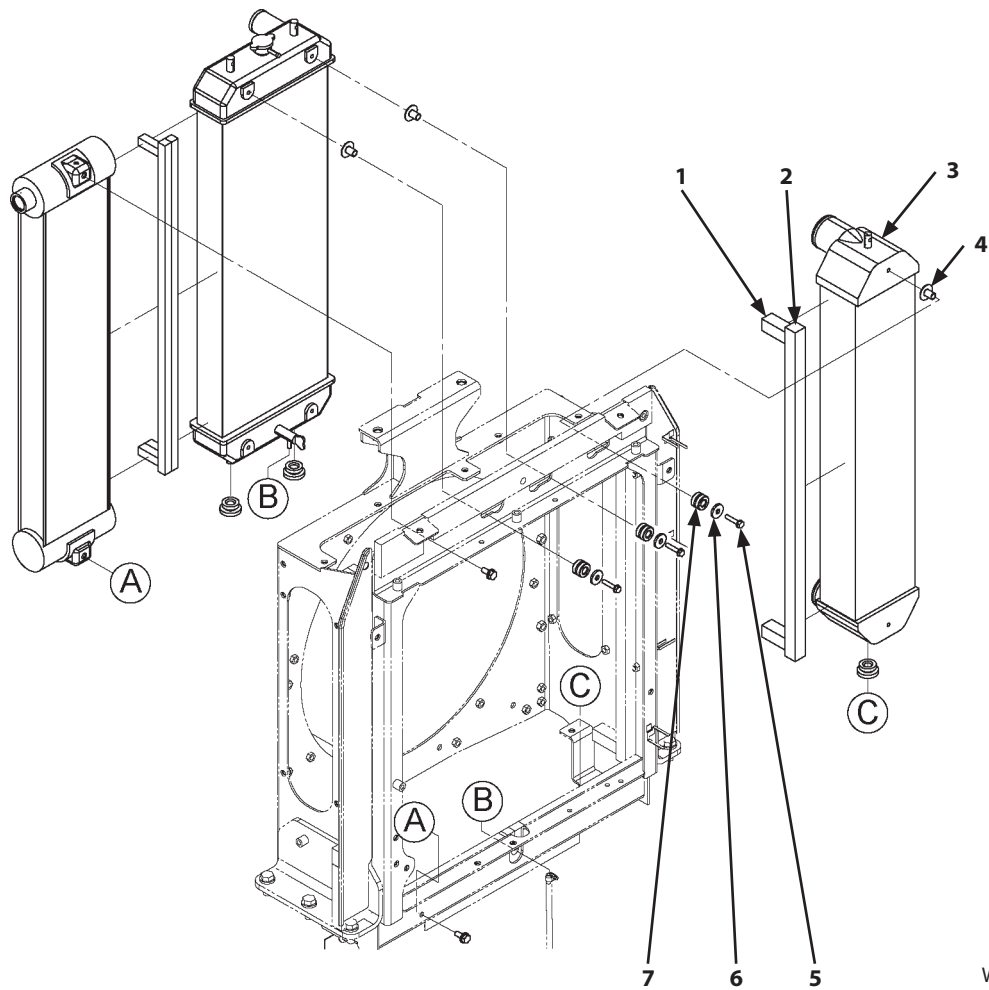
 : 50 N·m (5 kgf·m, 37 lbf·ft)

6. Connect connector (2).

7. Connect connectors (4) (2 used).

SECTION 3 BODY

Group 5 Radiator Assembly




WMDF-03-05-005

Installation

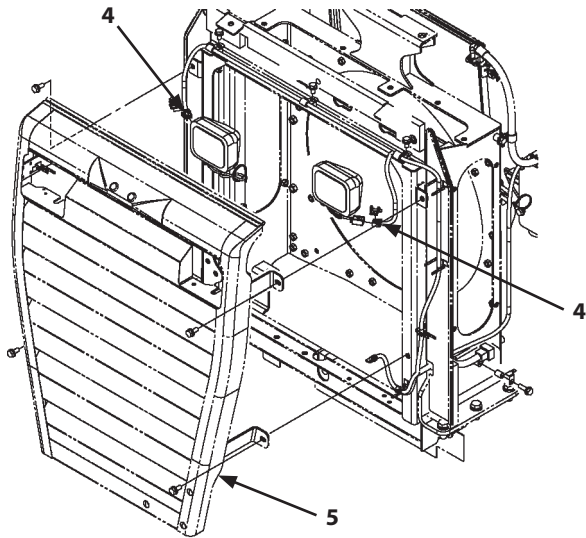
1. Install rubber seal (2) and rubber seals (1) (2 used) to intercooler (3).
2. Install intercooler (3) with tube (4), rubber (7), washer (6), and bolt, washer (5).

 : 13 mm

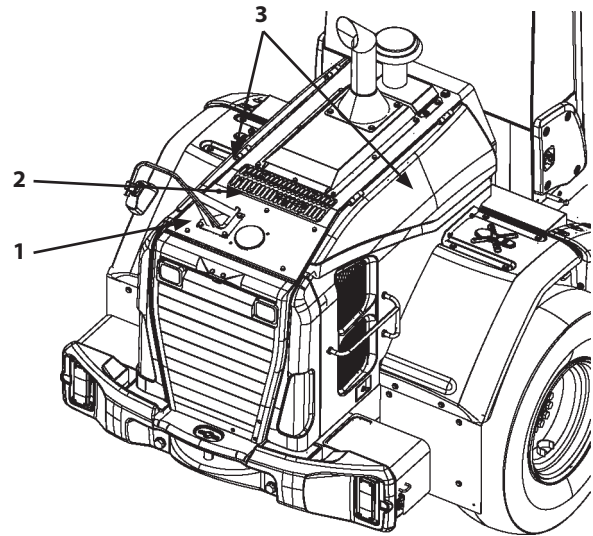
 : 17.6 N·m (1.8 kgf·m, 13 lbf·ft)

SECTION 3 BODY

Group 5 Radiator Assembly



WMDF-03-02-011

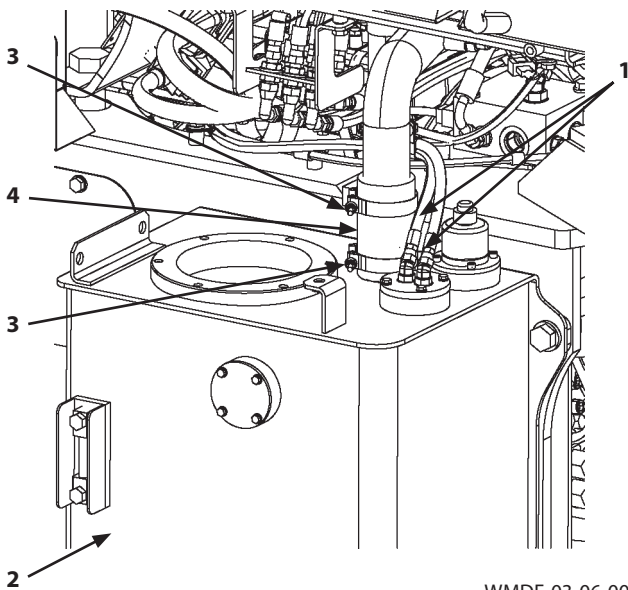


WMDF-03-02-007

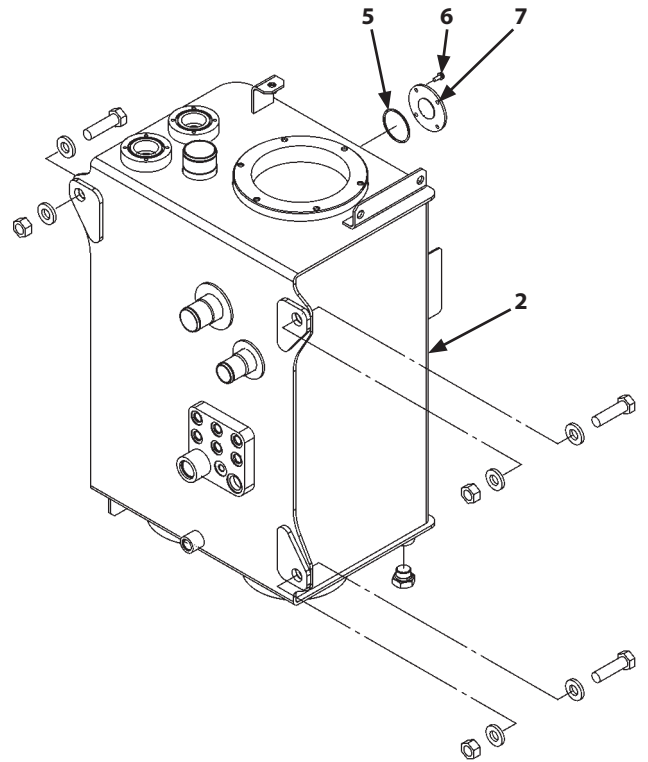
30. Install rear grill (5). (Refer to W3-4-2.)
31. Connect connectors (4) (2 used).
32. Close side covers (3) at left and right sides.
33. Install covers (1, 2). (Refer to W3-4-2.)

SECTION 3 BODY

Group 6 Hydraulic Oil Tank





WMDF-03-06-003




WMDF-03-06-012


16. Connect hose (4) with clamps (3) (2 used).

 : 11 mm


 : 9.8 N·m (1 kgf·m, 7.2 lbf·ft)

17. Connect hoses (1) (2 used).


 : 17 mm


 : 25 N·m (2.5 kgf·m, 18.5 lbf·ft)

18. Add hydraulic oil to hydraulic oil tank (2) through the cover (7) mounting part.

 **NOTE:** Total oil amount of hydraulic oil tank (2): 115 L (30.4 US gal)

19. Install O-ring (5) and cover (7) with bolts, washers (6) (4 used).

 : 10 mm

 : 3 to 4 N·m (0.3 to 0.4 kgf·m, 2.2 to 3 lbf·ft)

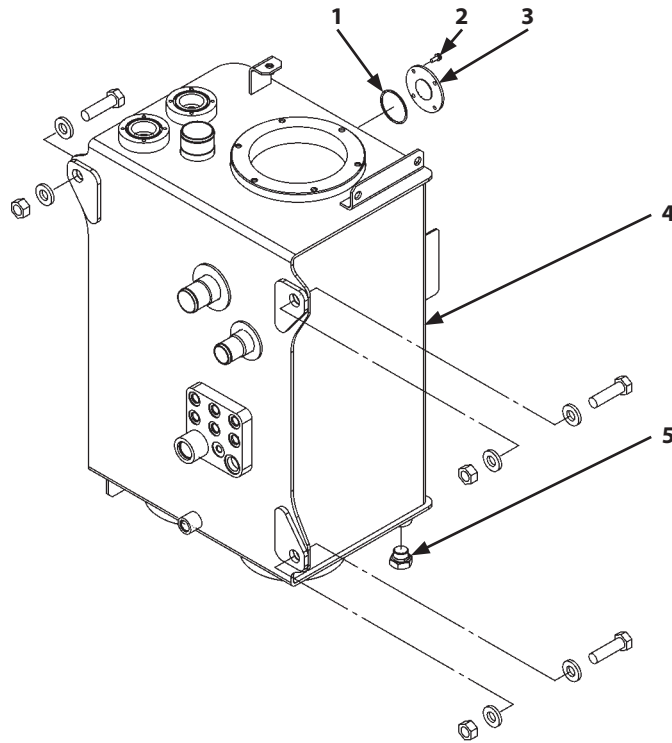
20. Bleed air from the hydraulic system. (Refer to W1-4-1.)

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

SECTION 3 BODY

Group 8 Pump Device

Removal and Installation of Pump Device



WMDF-03-06-012

CAUTION: Escaping fluid under pressure may penetrate the skin and eyes, and cause serious injury. Release the pressure before disconnecting the hydraulic pipings or removing other equipment. Hot hydraulic oil just after operation may spout out and cause severe burns. Allow oil to cool before starting any work.

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 hydraulic oil tank (4). (Refer to W1-4-1.)


2. Place a container under hydraulic oil tank (4). Remove drain plug (5). Remove bolts, washers (2) (4 used). Remove cover (3) and O-ring (1). Drain off hydraulic oil. Install drain plug (5).

Bolt, Washer (2):

 : 10 mm

Drain Plug (5):

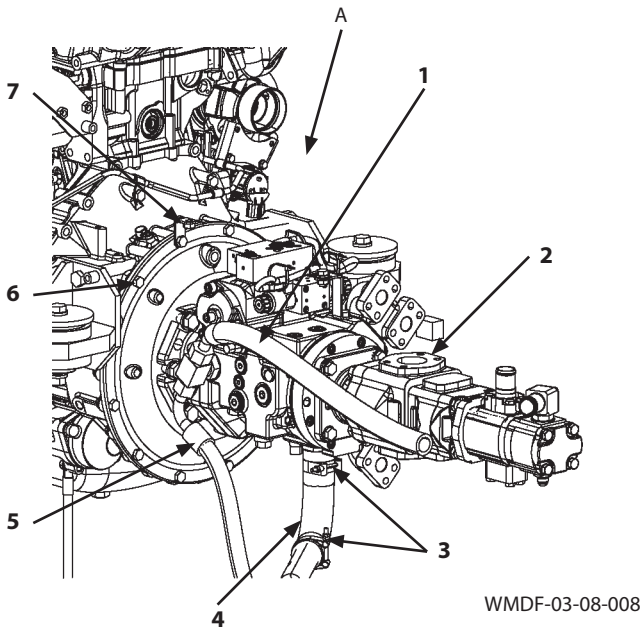
 : 36 mm

 : 140 N·m (14 kgf·m, 103 lbf·ft)

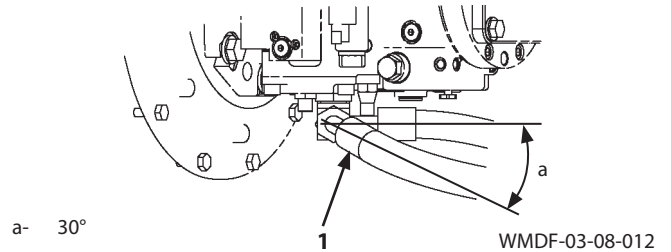
NOTE: Total oil amount of hydraulic oil tank (4): 115 L (30.4 US gal)

SECTION 3 BODY

Group 8 Pump Device



View A





7. Install all removed adapters to pump device (2).

CAUTION: Pump device (2) weight: 170 kg (375 lb)


8. Attach nylon slings onto pump device (2). Hoist pump device (2).


9. Install pump device (2) and bracket (7) with bolts (6) (12 used).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)


10. Connect the both ends of hose (4) with clamps (3) (2 used).

 : 11 mm

 : 9.8 N·m (1 kgf·m, 7.2 lbf·ft)


11. Connect hose (5).


 : 36 mm

 : 180 N·m (18 kgf·m, 133 lbf·ft)

IMPORTANT: Check the angle to install hose (1).

12. Connect hose (1).

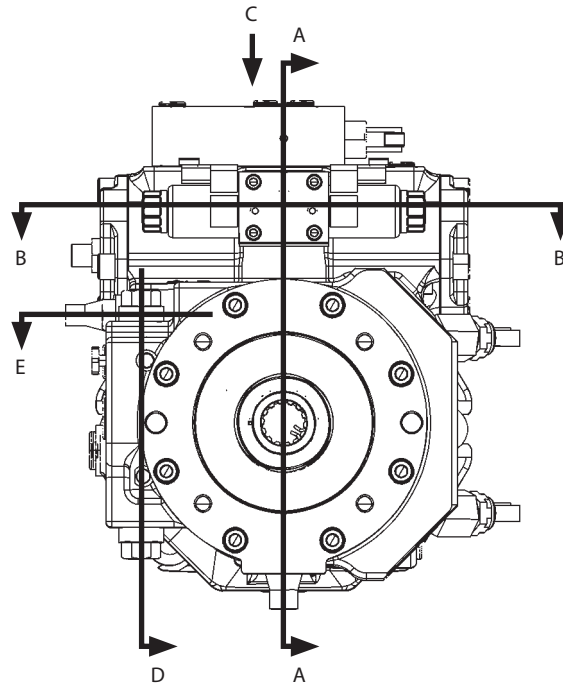
 : 41 mm

 : 210 N·m (21 kgf·m, 155 lbf·ft)

SECTION 3 BODY

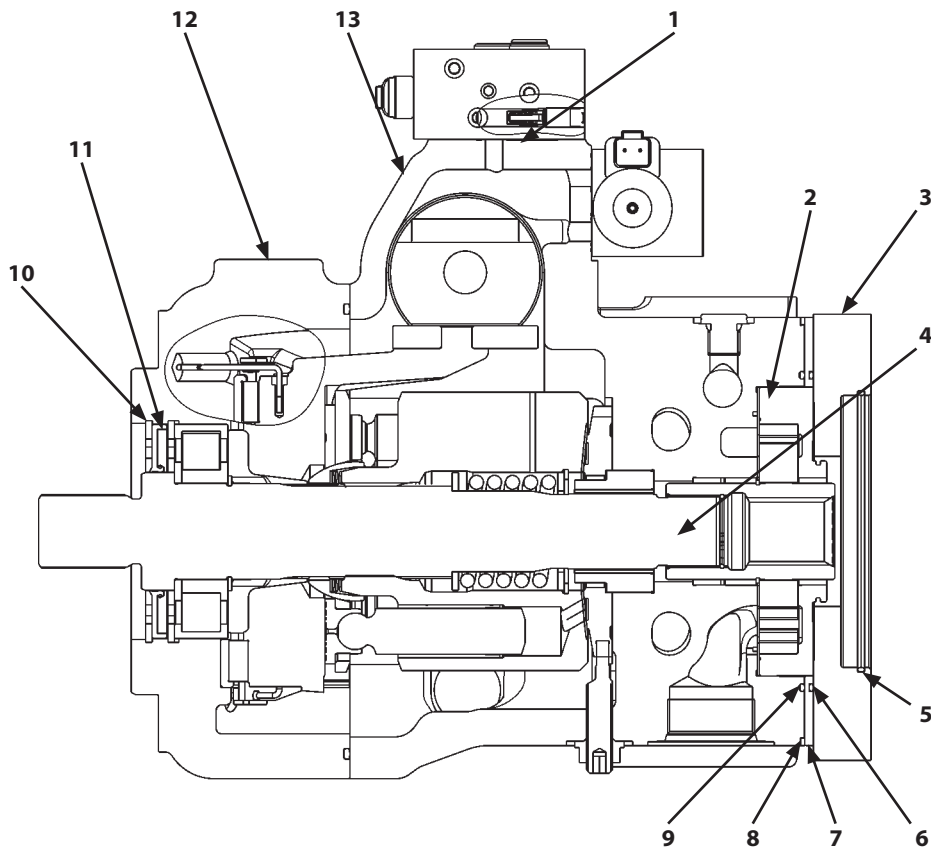
Group 8 Pump Device

Assembly of HST Pump



WMDF-03-08-032

Section A-A



WMDF-03-08-033

SECTION 3 BODY

Group 8 Pump Device

- Disassembly of Steering Pump (a)


IMPORTANT: When securing steering pump (a), do not fasten the port part.


37. Turn over steering pump (a). Secure steering pump (a) in a vise by using wooden pieces with flange (01) up.

IMPORTANT: Do not damage the mating surfaces of flange (01) and body (03) when removing flange (01).

IMPORTANT: Do not remove stud bolts (16) (4 used) and plug (33).

38. Remove nuts (17) (4 used) and washers (15) (4 used). Remove flange (01) from body (03).

 : 22 mm

 **NOTE:** LOCTITE #518 has been applied on the mating surfaces of body (03) and flange (01).

39. Remove seal (29) from flange (01).

IMPORTANT: If plates (26) (2 used) are not installed to the original position, the pump may be damaged.

40. Put the matching marks on plate (26) at the flange (01) side. Remove plates (26) at the flange (01) side from gears (07, 08).

41. Remove seals (27, 28) from plate (26).

IMPORTANT: If the meshed position of gears (07, 08) changes, volumetric efficiency of the pump may be decreased.

IMPORTANT: Do not remove gears (07, 08) by hitting them.

42. Put the matching marks on gears (07, 08). Remove gears (07, 08) from plate (26) at the body (04) side.

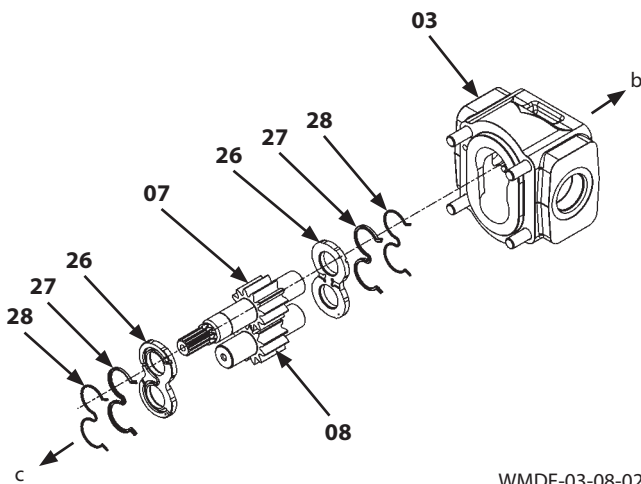
43. Put the matching marks on plate (26) at the body (04) side. Remove plate (26) at the body (04) side from body (03).

IMPORTANT: Do not remove bushings (47) (4 used).

44. Remove seals (27, 28) from plate (26).

IMPORTANT: Do not damage the mounting surfaces of seals (21, 56) when removing seals (21, 56).

45. Remove seals (21, 56) and retaining ring (22) from flange (01).



WMDF-03-08-025

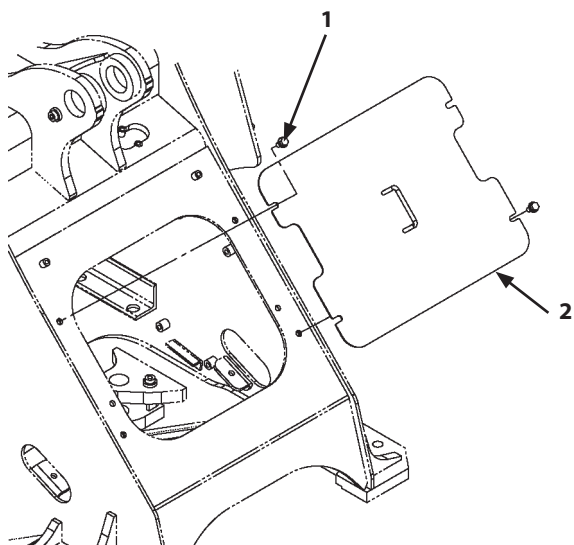
b- Body (04) Side

c- Flange (01) Side

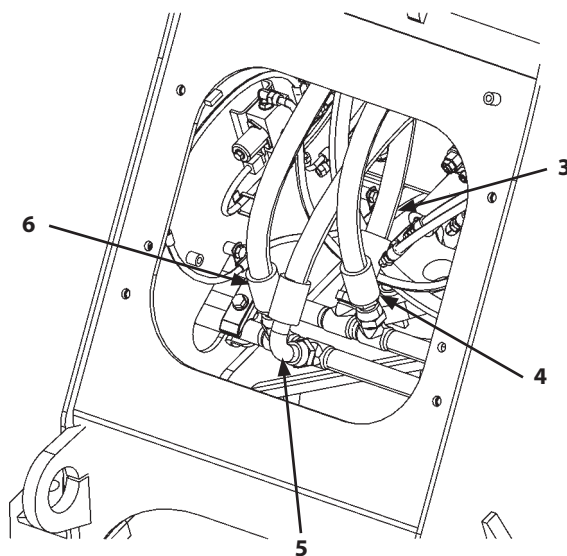
SECTION 3 BODY

Group 9 Control Valve

Removal and Installation of Control Valve



WMDF-03-09-005



WMDF-03-09-001

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. 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 (lift arm raise) 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 front attachment hydraulic circuit. (Refer to W1-5-1.)


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

 : 19 mm


3. Disconnect hose (6) (only the machine with the ride control device).

 : 41 mm

4. Disconnect the both ends of hoses (4, 5).

 : 41 mm

5. Disconnect hose (3) (only the machine with the ride control device).


 : 41 mm

SECTION 3 BODY


Group 9 Control Valve

Disassembly of Control Valve

1. Remove plug (77) from housing (01). Remove O-ring (77A) from plug (77).

 : 17 mm

- Disassembly of Low-Pressure Relief Valve (f)
 2. Remove plug (47) from housing (01). Remove spring (46) and poppet (45) from housing (01). Remove O-ring (25) from plug (47).


 : 36 mm

- Disassembly of Overload Relief Valve (Bucket: Rod Side) (k)

IMPORTANT: Do not disassemble the overload relief valve. If it has been disassembled, pressure should be adjusted. (Refer to TROUBLESHOOTING / Operational Performance Test in the separated volume, T/M.)

IMPORTANT: Attach a spanner onto the hexagonal part of the relief valve case.

3. Remove relief valve (30) from housing (01). Remove O-ring (30A) from relief valve (30).


 : 32 mm

- Disassembly of Overload Relief Valve (Quick Coupler Circuit) (o)


IMPORTANT: Do not disassemble the overload relief valve. If it has been disassembled, pressure should be adjusted. (Refer to TROUBLESHOOTING / Operational Performance Test in the separated volume, T/M.)

IMPORTANT: Attach a spanner onto the hexagonal part of the relief valve case.


4. Remove relief valve (36) from housing (56). Remove O-ring (36A) from relief valve (36).

 : 32 mm


- Disassembly of Orifice (Muffler Filter Regeneration) (p)
 5. Remove plug (29A) from housing (56). Remove O-rings (29B, 29D) and backup ring (29C) from plug (29A).

 : 24 mm

6. Remove socket bolts (15) (10 used) from pilot housings (17) (3 used) and pilot housings (10) (2 used). Remove pilot housings (17) (3 used) and pilot housings (10) (2 used) from housing (01).


 : 8 mm

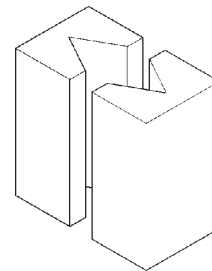
7. Remove O-rings (09) (5 used) from pilot housings (17) (3 used) and pilot housings (10) (2 used).
8. Remove socket bolts (16) (2 used) from pilot housing (14). Remove pilot housing (14) from pilot housing (19).

 : 8 mm

9. Remove O-ring (09) from pilot housing (14).
10. Put the matching marks on the spools (04, 05) assemblies and housing (01). Remove the spools (04, 05) assemblies from housing (01).
11. Put the matching marks on the spool (57) assembly and housing (56). Remove the spool (57) assembly from housing (56).

- Disassembly of Bucket Spool (h)
 12. Secure the spool (04) assembly in a vise by using wooden pieces as illustrated. Remove bolt (06), spring seats (07) (2 used), and spring (08) from spool (04).

 : 19 mm

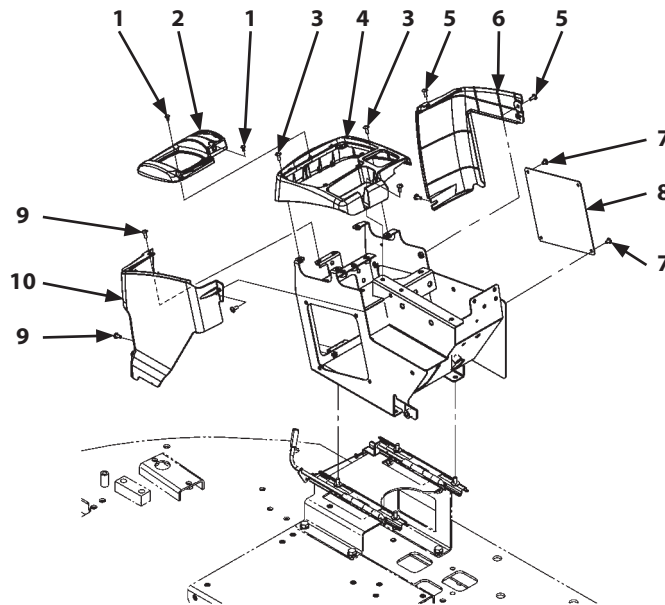


W4GB-02-05-002

SECTION 3 BODY

Group 10 Pilot Valve

Removal and Installation of Pilot Valve



WNEC-03-10-010

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.

5. Remove cover (10) and screws (9) (3 used).

6. Remove cover (8) and screws (7) (4 used).

Removal

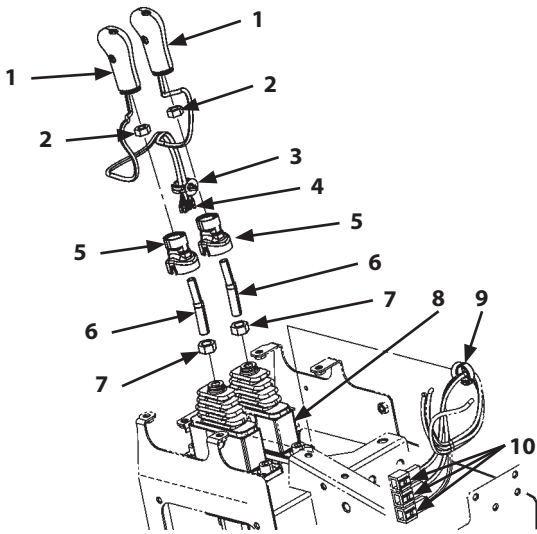
1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)

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

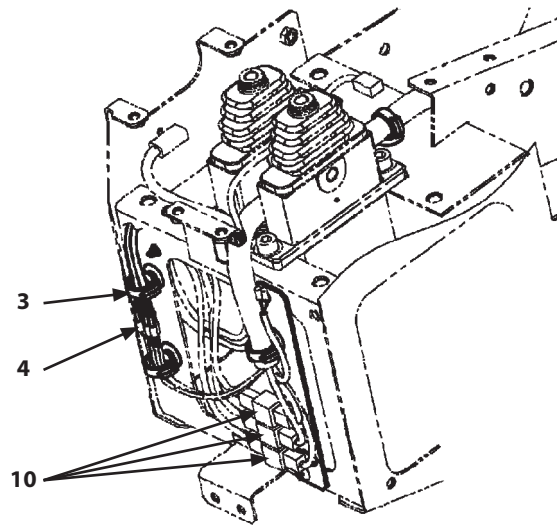
2. Remove cover (2) and screws (1) (2 used).
3. Remove cover (4) and screws (3) (5 used).
4. Remove cover (6) and screws (5) (3 used).

SECTION 3 BODY

Group 10 Pilot Valve




WNEC-03-10-015





WNEC-03-10-017

4. Temporarily tighten nuts (7) (2 used) to levers (6) (2 used).


 : 19 mm

5. Install levers (6) (2 used) to pilot valve (8). Tighten nuts (7) (2 used) to the specified torque.

 : 19 mm


 : 40 N·m (4 kgf·m, 30 lbf·ft)


6. Install covers (5) (2 used). Temporarily tighten nuts (2) (2 used).


 : 17 mm

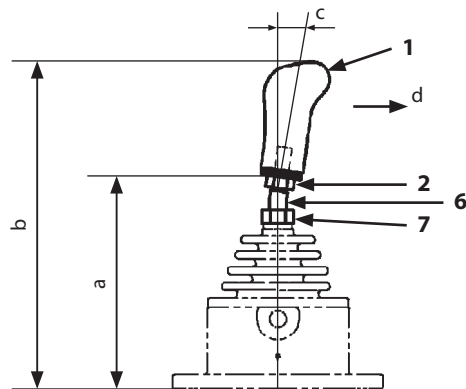
IMPORTANT: Check the mounting dimension to install grip (1).

7. Install harnesses of grips (1) (2 used) through covers (5) (2 used). Install grips (1) (2 used). Tighten nuts (2) (2 used) to the specified torque.

 : 17 mm

 : 20 N·m (2 kgf·m, 15 lbf·ft)

 **NOTE:** Install grip (1) while turning cover (5).



WNEC-03-10-020

a- 146 mm (5.7 in)

b- 223 mm (8.8 in)

c- (8")

d- Machine Front

8. Connect connectors (4) (8 used) and connectors (10) (3 used).

9. Install clips (3, 9).

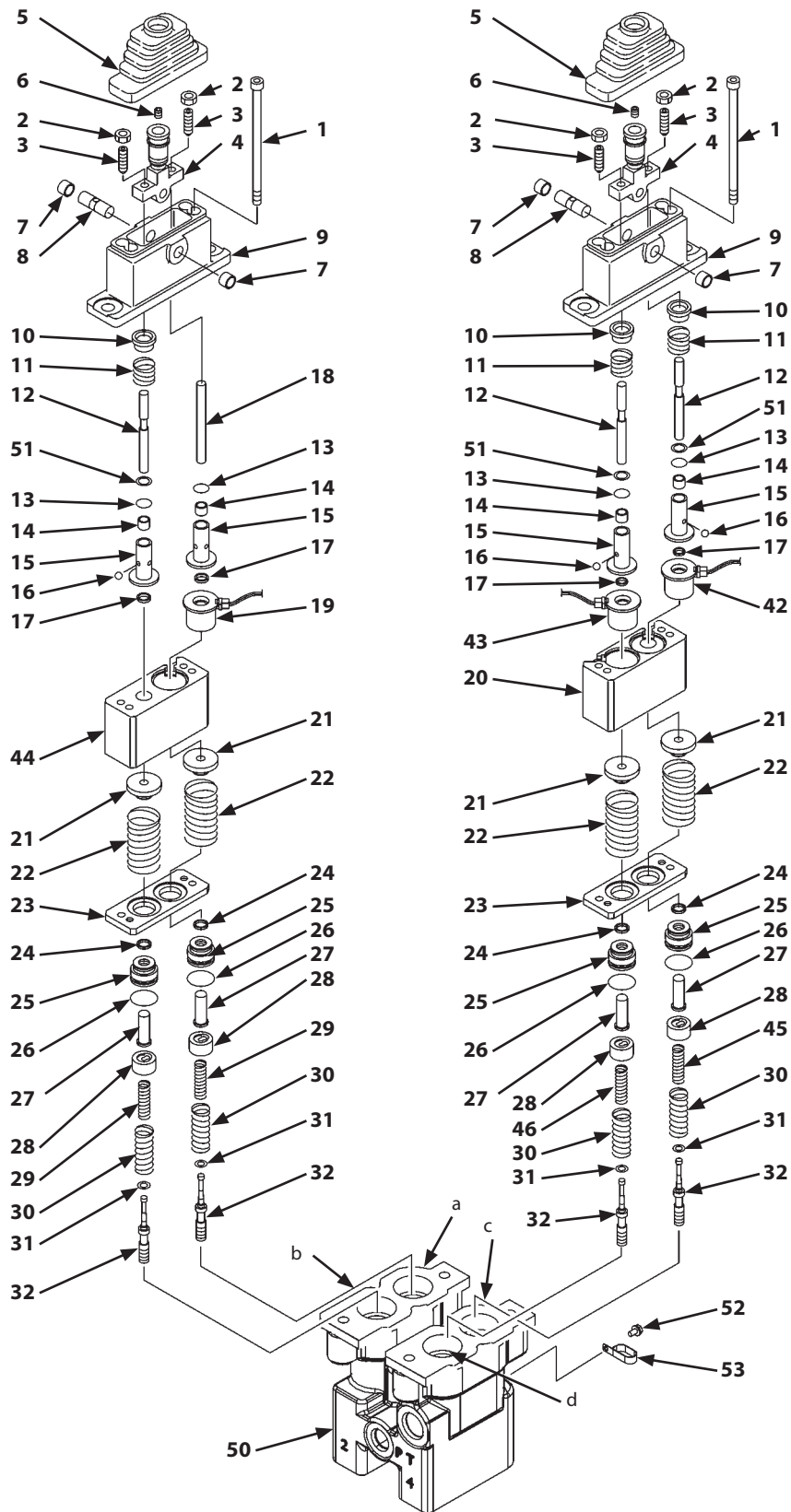
10. Bleed air from the hydraulic system. (Refer to W1-4-1.)

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

SECTION 3 BODY

Group 10 Pilot Valve

Disassembly of Pilot Valve (Two Lever Type)



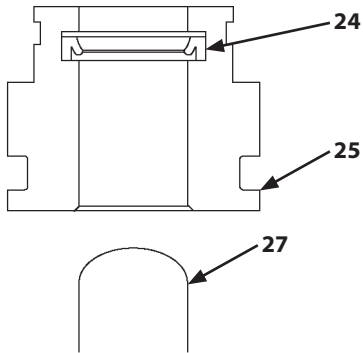
WNEC-03-10-006

SECTION 3 BODY

Group 10 Pilot Valve

IMPORTANT: Check the direction to install seal (24).

15. Install O-rings (26) (2 used), seals (24) (2 used), and push rods (27) (2 used) to plugs (25) (2 used).

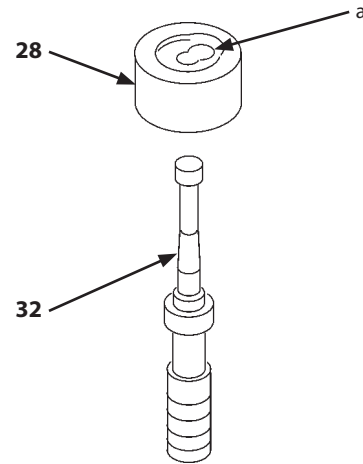


W4GB-02-06-015

16. Install springs (45, 46) and washers (31) (2 used) to spools (32) (2 used).

IMPORTANT: Take care that spring seats (28) (2 used) are not lowered 6 mm or more.

17. Install the spool (32) assembly to larger hole (a) of spring seats (28) (2 used). Lower spring seats (28) (2 used). Move spring seats (28) (2 used) sideways while compressing springs (45, 46).



a - Hole

WNEC-03-10-008

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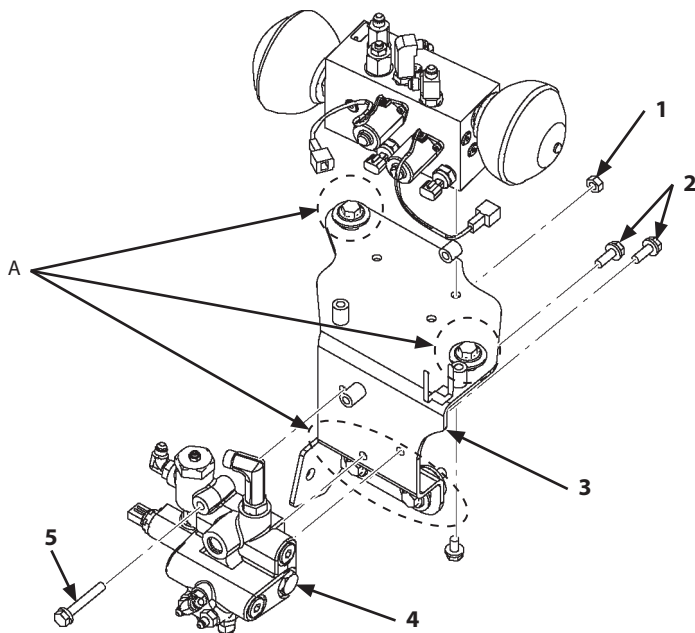


- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

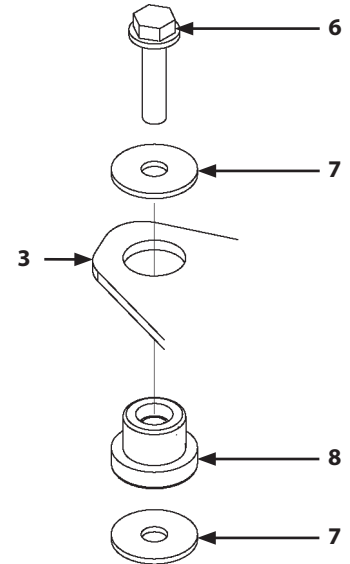
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SECTION 3 BODY

Group 11 Brake Charge Valve



Detail A





WMDF-03-12-004

WNEC-03-12-012

Installation


1. Install all removed adapters to brake charge valve (4).
2. Install bracket (3) to brake charge valve (4) with bolt, washer (5), nut (1), and bolts, washers (2) (2 used).


 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

⚠ CAUTION: The brake charge valve (4) assembly weight: 30 kg (67 lb)

3. Attach nylon slings onto the brake charge valve (4) assembly. Hoist the brake charge valve (4) assembly. Install the brake charge valve (4) assembly with rubber cushions (8) (4 used), washers (7) (8 used), and bolts, washers (6) (4 used).

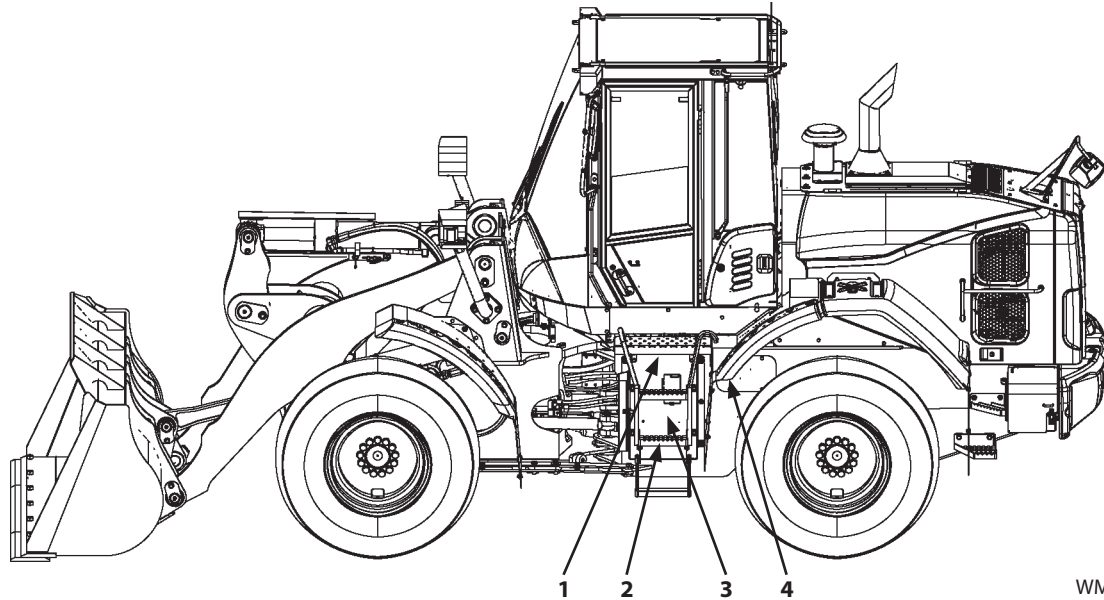
 : 19 mm

 : 40 N·m (4 kgf·m, 29.5 lbf·ft)

SECTION 3 BODY

Group 11 Brake Accumulator

Removal and Installation of Brake Accumulator



WMDF-03-04-001

CAUTION:

- Allow only qualified personnel to handle the accumulator.
- High-pressure nitrogen gas is enclosed in the accumulator. Caution is required to prevent fires from occurring.
- Never strike the accumulator. Keep the accumulator away from sparks and/or flames.
- Do not directly heat the accumulator. Do not weld the accumulator housing.
- Be sure to release pressure before starting to work on the piping lines.

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: Operate the brake pedal more than fifty times and release any pressure in the circuit.

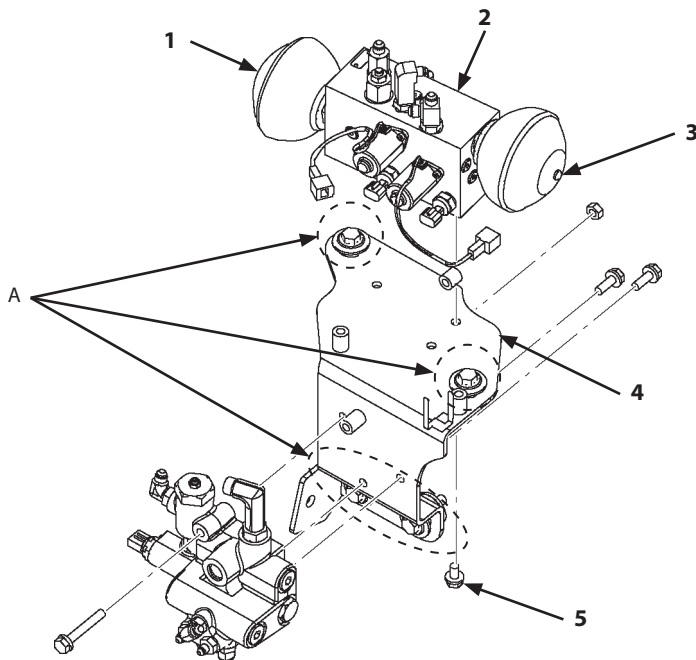
CAUTION: Bleed air from the hydraulic oil tank. (Refer to W1-4-1.)

2. Remove the following parts. (Refer to W3-4-2.)

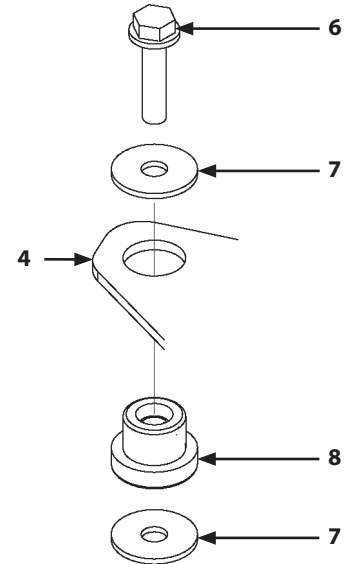
- Step (Front) (2)
- Rear Fender (Front) (4)
- Deck (1)
- Cover (3)

SECTION 3 BODY

Group 12 Manifold Valve



Detail A



WMDF-03-12-004


WNEC-03-12-012


Installation

1. Install all removed adapters to manifold valve (2).


IMPORTANT: The accumulated pressure in accumulators (1, 3) are different. Check the direction to install accumulator (1) (stamped mark: 5.94M) and accumulator (3) (stamped mark: 1.57M).


2. Install accumulators (1, 3) to manifold valve (2).

 : 36 mm

 : 98 N·m (9.8 kgf·m, 72 lbf·ft)

3. Install bracket (4) to manifold valve (2) with bolts, washers (5) (3 used).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

CAUTION: The manifold valve (2) assembly weight: 30 kg (67 lb)

4. Attach nylon slings onto the manifold valve (2) assembly. Hoist the manifold valve (2) assembly. Install the manifold valve (2) assembly with rubber cushions (8) (4 used), washers (7) (8 used), and bolts, washers (6) (4 used).

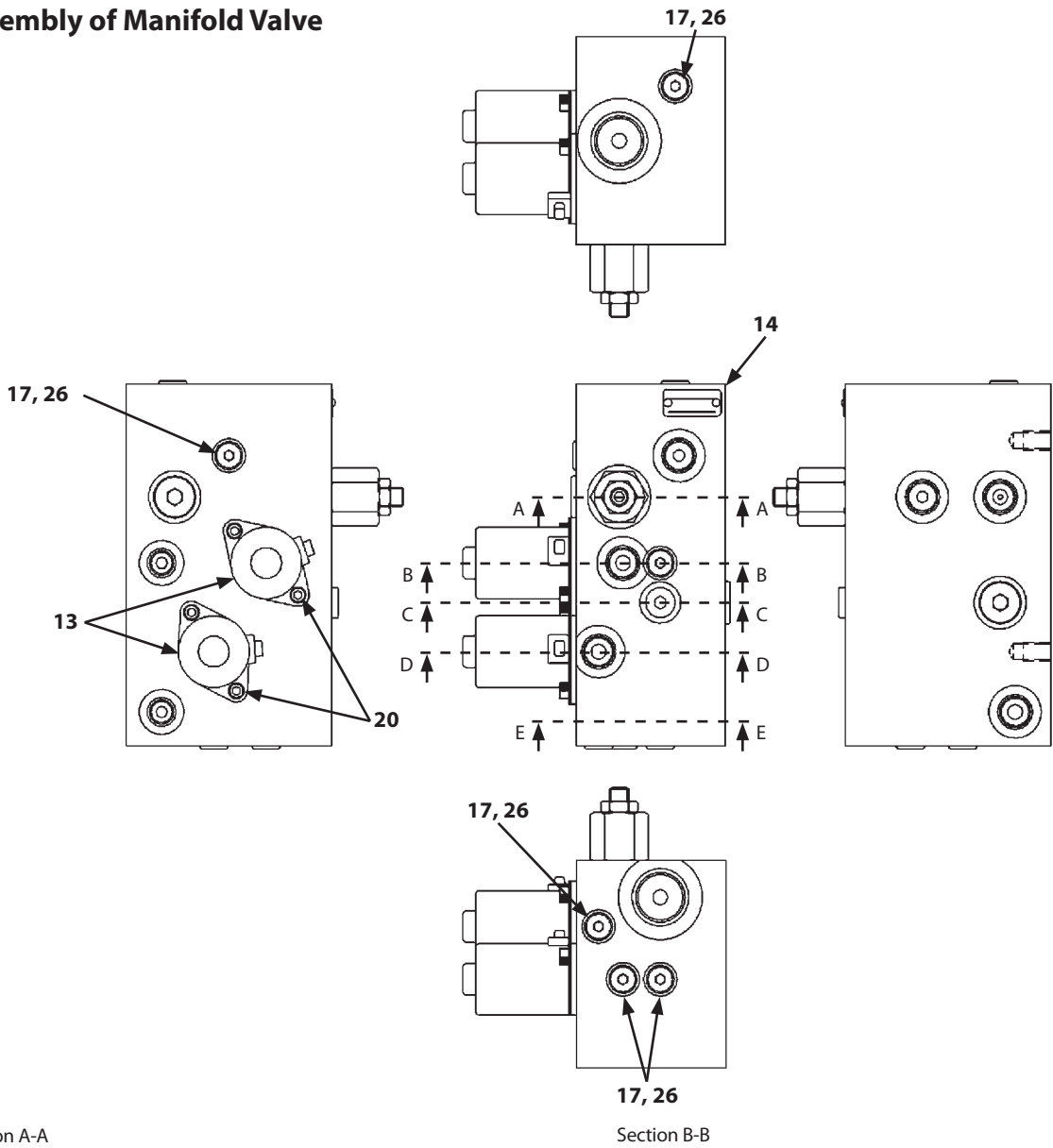
 : 19 mm

 : 40 N·m (4 kgf·m, 29.5 lbf·ft)

SECTION 3 BODY

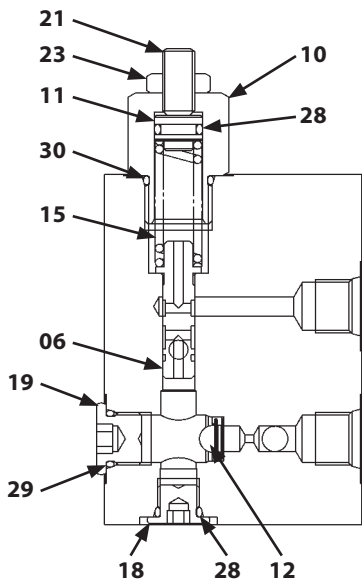
Group 12 Manifold Valve

Assembly of Manifold Valve

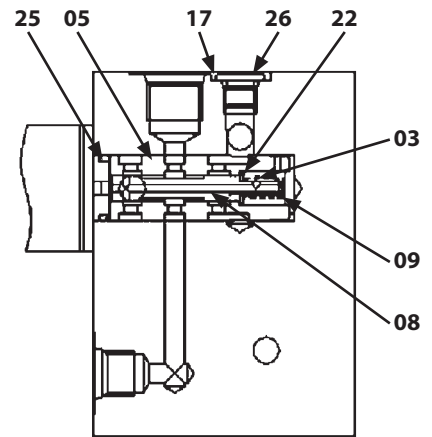


TNDF-03-09-002

Section A-A



WMDF-03-12-007

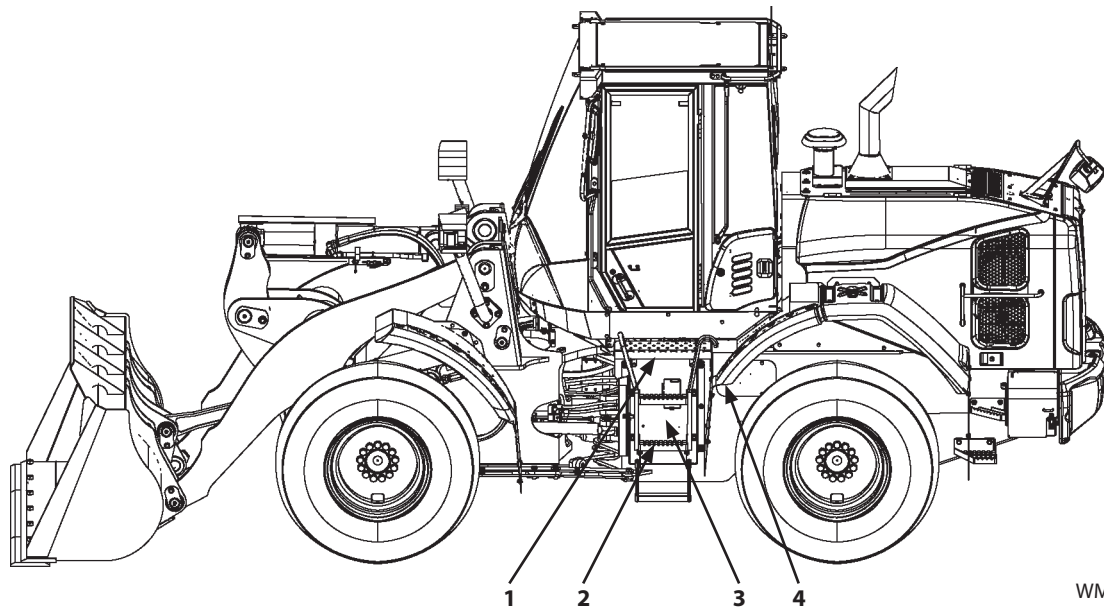


TNDF-03-09-006

SECTION 3 BODY

Group 14 Priority Valve

Removal and Installation of Priority Valve (without Emergency Steering)



WMDF-03-04-001

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. 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: Operate the brake pedal more than fifty times and release any pressure in the circuit.

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

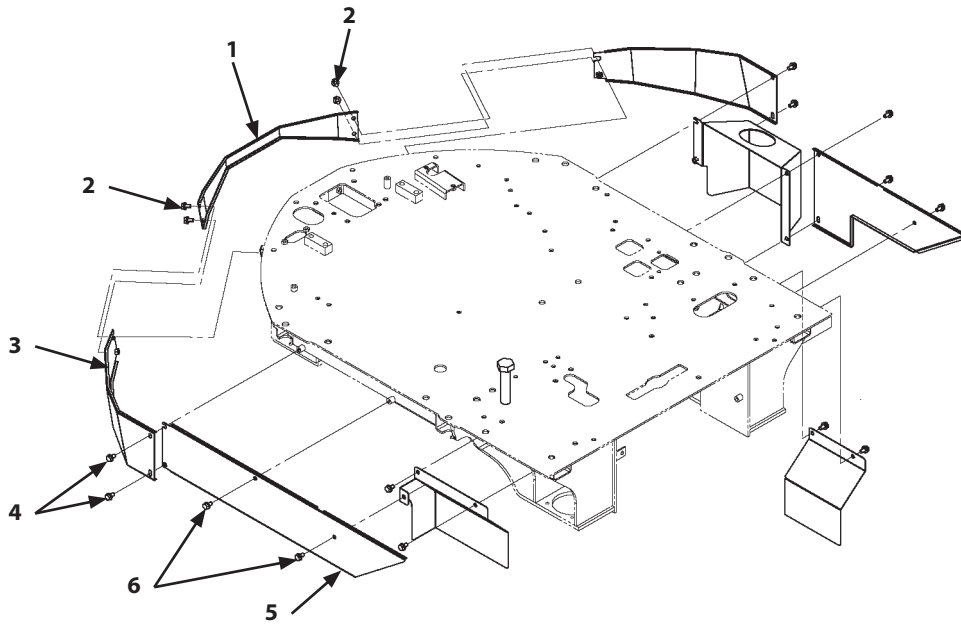
CAUTION: Release any pressure in the front attachment hydraulic circuit. (Refer to W1-5-1.)

2. Remove the following parts. (Refer to W3-4-2.)

- Step (Front) (2)
- Rear Fender (Front) (4)
- Deck (1)
- Cover (3)

SECTION 3 BODY

Group 14 Priority Valve





WMDF-03-06-006

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


10. Bleed air from the hydraulic system and brake (axle).
(Refer to W1-4-1.)


11. Install cover (5) with bolts, washers (6) (2 used).

 : 17 mm


 : 50 N·m (5 kgf·m, 37 lbf·ft)


12. Install cover (3) with bolts, washers (4) (2 used).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

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

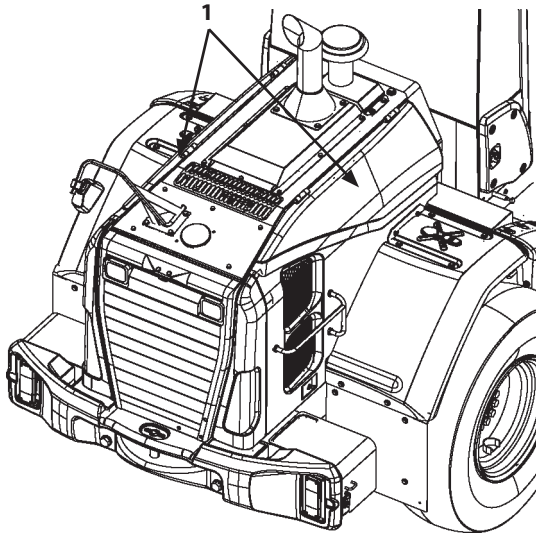
 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

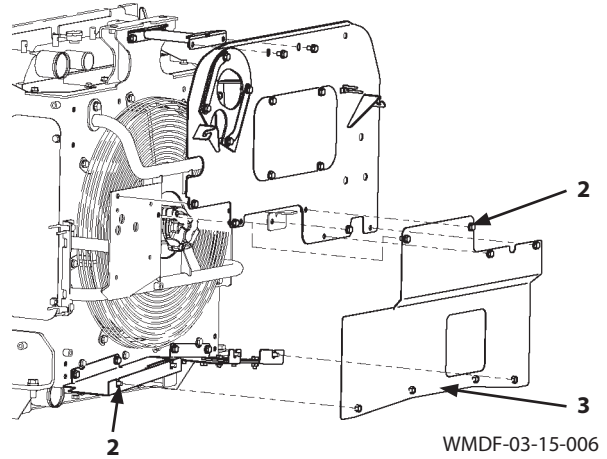
SECTION 3 BODY

Group 15 Cooling Fan System

Removal and Installation of Fan Motor



WMDF-03-02-007



WMDF-03-15-006

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.

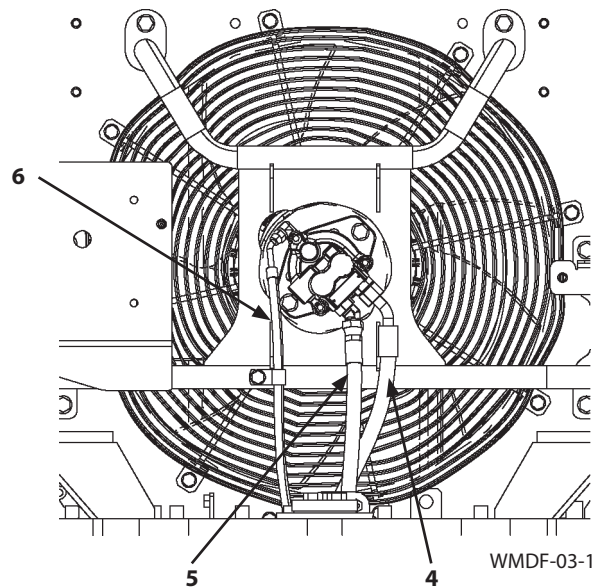
Removal

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. Open side covers (1) at the left and right sides.
3. Remove bolts, washers (2) (8 used). Remove cover (3).

: 17 mm



WMDF-03-15-002

4. Disconnect hose (6).

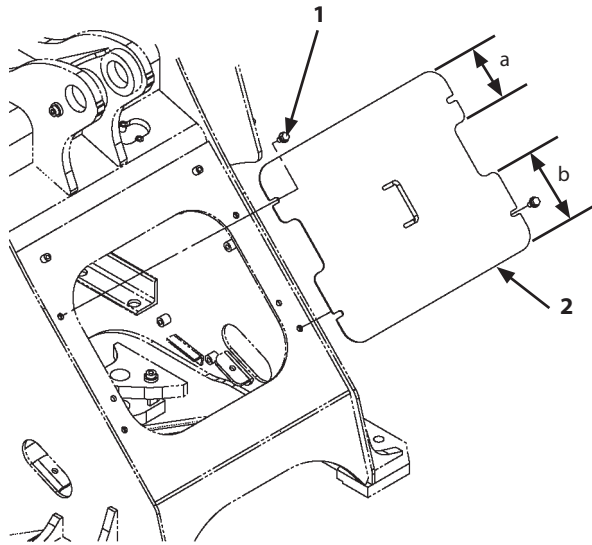
: 17 mm

5. Disconnect hoses (4, 5).

: 27 mm

SECTION 3 BODY

Group 16 Ride Control Device



a- 155 mm (6.1 in)


b- 210 mm (8.3 in)


WMDF-03-09-005

IMPORTANT: Check the direction to install cover (2).

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

 : 19 mm

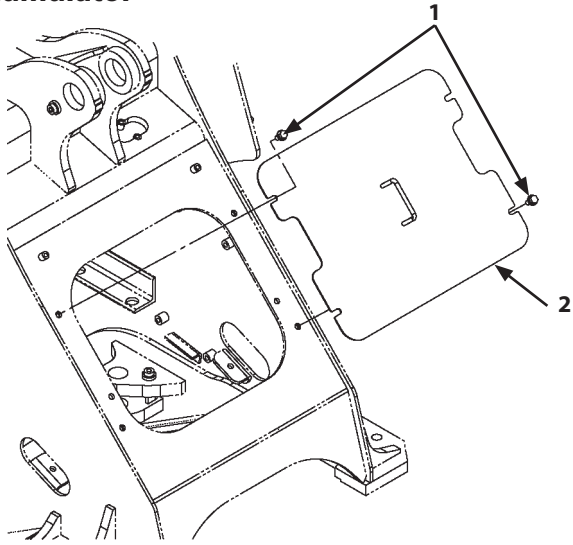
 : 90 N·m (9 kgf·m, 66 lbf·ft)

 **NOTE:** Turn cover (2) by 180 degrees and install it in case of the machine with the quick coupler.

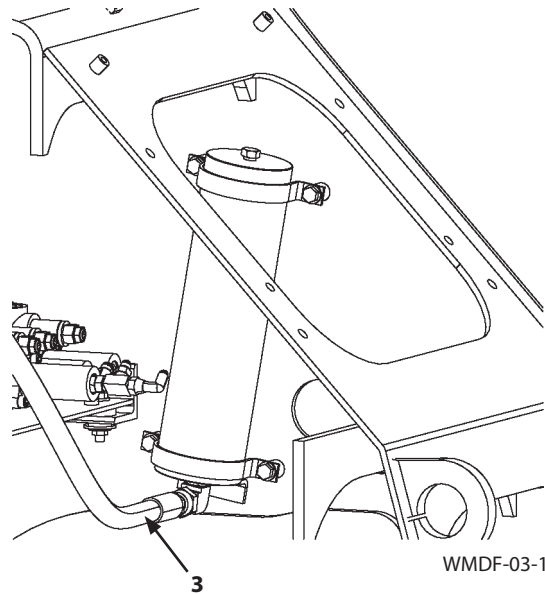
SECTION 3 BODY

Group 16 Ride Control Device

Removal and Installation of Ride Control Accumulator



WMDF-03-09-005



WMDF-03-16-003

CAUTION:

- Allow only qualified personnel to handle the accumulator.
- High-pressure nitrogen gas is enclosed in the accumulator. Caution is required to prevent fires from occurring.
- Never strike the accumulator. Keep the accumulator away from sparks and/or flames.
- Do not directly heat the accumulator. Do not weld the accumulator housing.
- Be sure to release pressure before starting to work on the piping lines.

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 (lift arm raise) 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 and the ride control accumulator. (Refer to W1-5-1.)

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

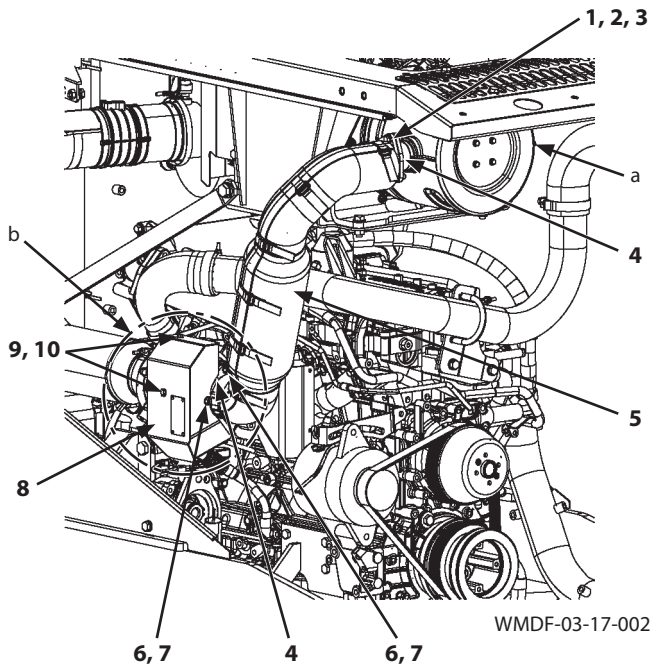
 : 19 mm

3. Disconnect hose (3).

 : 36 mm

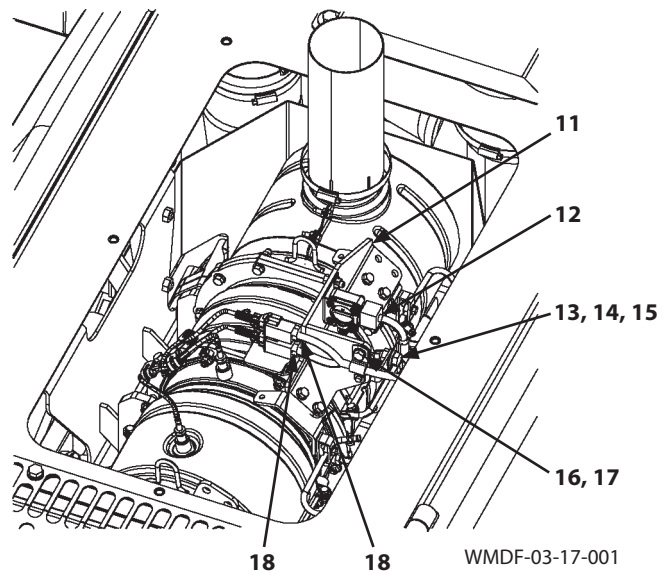
SECTION 3 BODY

Group 17 Muffler Filter



a- Muffler Filter

b- Turbocharger




IMPORTANT: Replace nuts (6) (3 used) and gasket (4) with the new ones.


9. Connect exhaust pipe (5), gasket (4), and cover (8) to turbocharger (b). Temporarily install washers (7) (3 used), nuts (6) (3 used), washers (10) (2 used), and bolts (9) (2 used).

IMPORTANT: Replace bolts (1) (3 used), nuts (3) (3 used), and gasket (4) with the new ones.


10. Connect exhaust pipe (5) and gasket (4) to muffler filter (a). Temporarily install nuts (3) (3 used), washers (2) (6 used), and bolts (1) (3 used).


11. Tighten nuts (3) (3 used) and bolts (1) (3 used).

 : 13 mm


 : 25 N·m (2.5 kgf·m, 18.5 lbf·ft)

12. Tighten nuts (6) (3 used).

 : 13 mm

 : 25 N·m (2.5 kgf·m, 18.5 lbf·ft)

13. Tighten bolts (9) (2 used).


 : 10 mm


 : 5 N·m (0.5 kgf·m, 3.7 lbf·ft)

14. Install connectors (18) (2 used) to bracket (11).


15. Connect connectors (18) (2 used) and connector (12).


16. Install clip (17) with bolt, washer (16).

 : 13 mm

 : 10 N·m (1 kgf·m, 7.4 lbf·ft)

17. Install clip (15) with nut (14) and bolt, washer (13).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)


SECTION 4 TRAVEL SYSTEM

Group 1 Tire

Removal and Installation of Front Tire

Removal

1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)
2. Remove front fender (1). (Refer to W3-4-2.)
3. Loosen wheel bolts (3) (13 used) one turn.


 : 36 mm

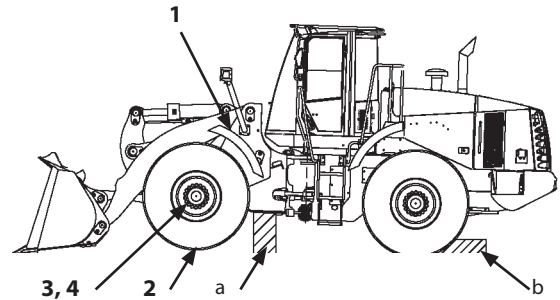
CAUTION: Machine weight: 11190 kg (26300 lb)

4. Raise the machine until tire (2) slightly gets away from the ground. Securely support the machine by using stand (a). Lower the bucket onto the ground.

CAUTION: Tire (2) weight: 360 kg (795 lb)

5. Attach lifting tools onto tire (2). Hoist and hold tire (2).
6. Remove wheel bolts (3) (13 used) and washers (4) (13 used). Remove tire (2).

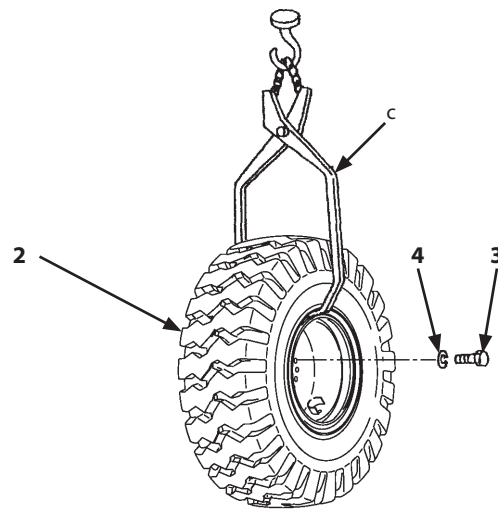
 : 36 mm



W4GB-03-03-101

a- Stand

b- Wheel Stopper



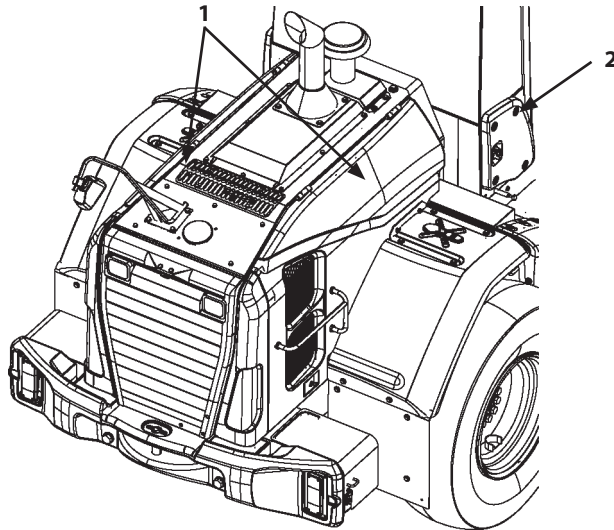
W4GB-03-01-003

c- Lifting Tool

SECTION 4 TRAVEL SYSTEM

Group 2 HST Motor

Removal and Installation of HST Motor



WMDF-03-02-007

CAUTION: Escaping fluid under pressure may penetrate the skin and eyes, and cause serious injury. Release the pressure before disconnecting the hydraulic pipings or removing other equipment. Hot hydraulic oil just after operation may spout out and cause severe burns. Allow oil to cool before starting any work.

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.

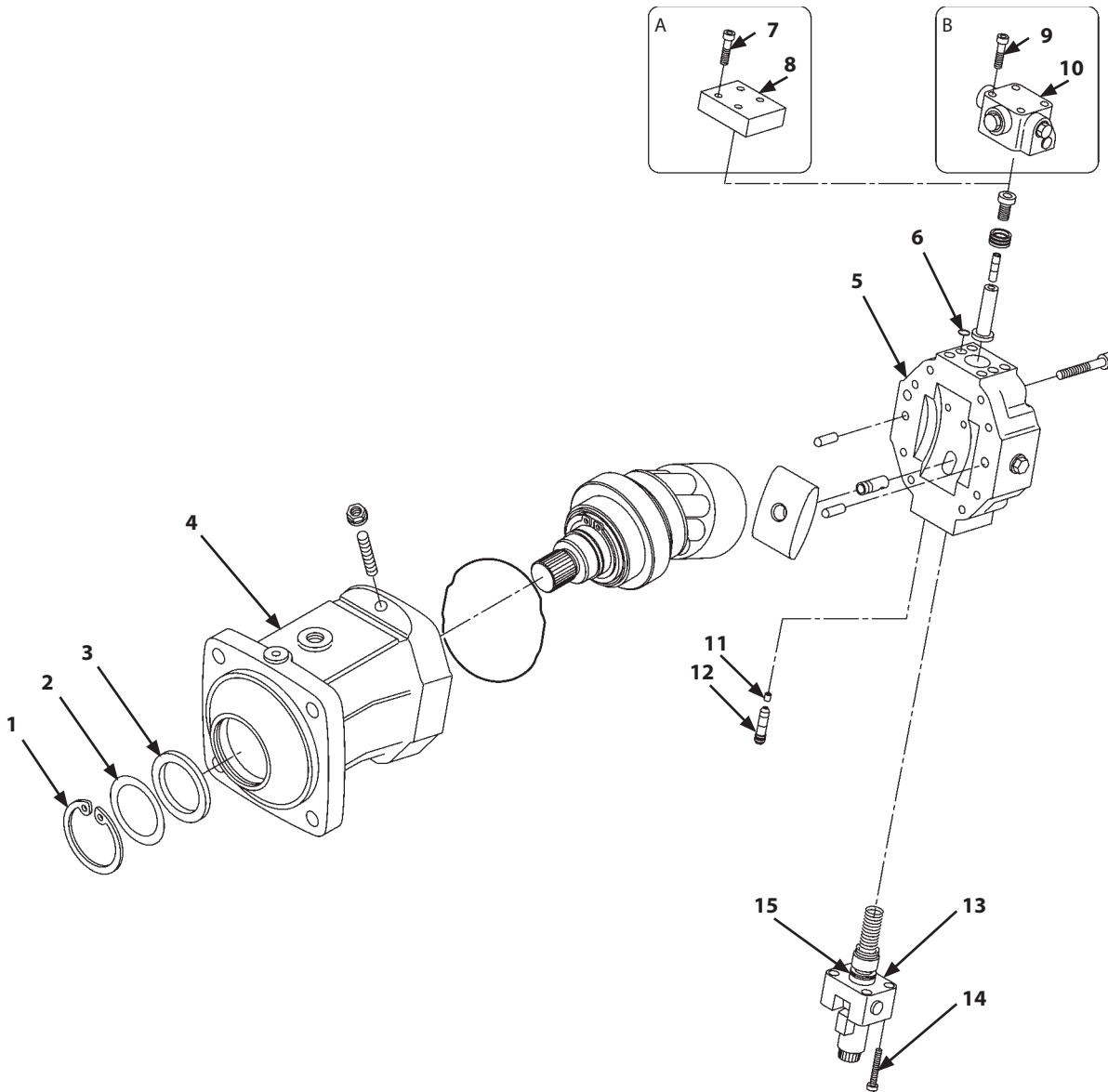
Removal

1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)
2. Remove side covers (1) at right and left sides. (Refer to W3-4-2.)
3. Remove cab (2). (Refer to W3-1-1.)

SECTION 4 TRAVEL SYSTEM

Group 2 HST Motor


Disassembly of HST Motors 1, 2



A: HST Motor 1
B: HST Motor 2

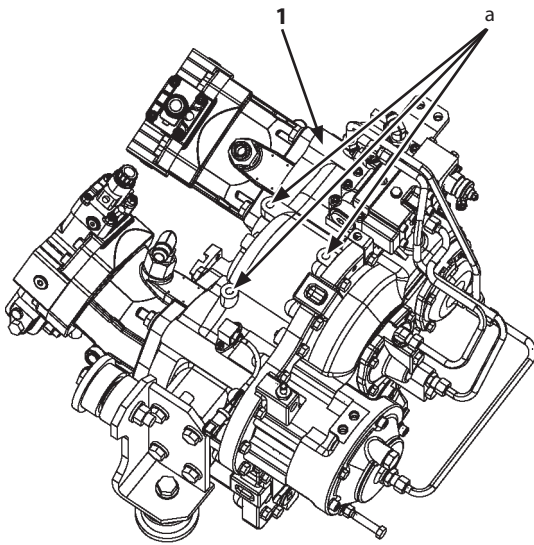
WMDF-04-02-003

- | | | | |
|--|--------------------------|---|--------------|
| 1- Retaining Ring | 7- Socket Bolt (4 Used) | 13- Motor Displacement Angle Control Solenoid Valve | 19- *Bushing |
| 2- Plate | 8- Cover Block | 14- Socket Bolt (4 Used) | 20- *Nut |
| 3- Shaft Seal Ring | 9- Socket Bolt (4 Used) | 15- O-Ring | 21- *Screw |
| 4- Housing | 10- Cover Block | 16- *Spring | 22- *Pin |
| 5- Valve Block | 11- Valve Seat (2 Used) | 17- *Collar | 23- *Spring |
| 6- O-Ring (3 Used) (HST Motor 2: 6 Used) | 12- Check Valve (2 Used) | 18- *Collar | 24- *Spring |

 NOTE: As for the item with mark*, refer to 4-2-2-3.

SECTION 4 TRAVEL SYSTEM

Group 3 Transmission




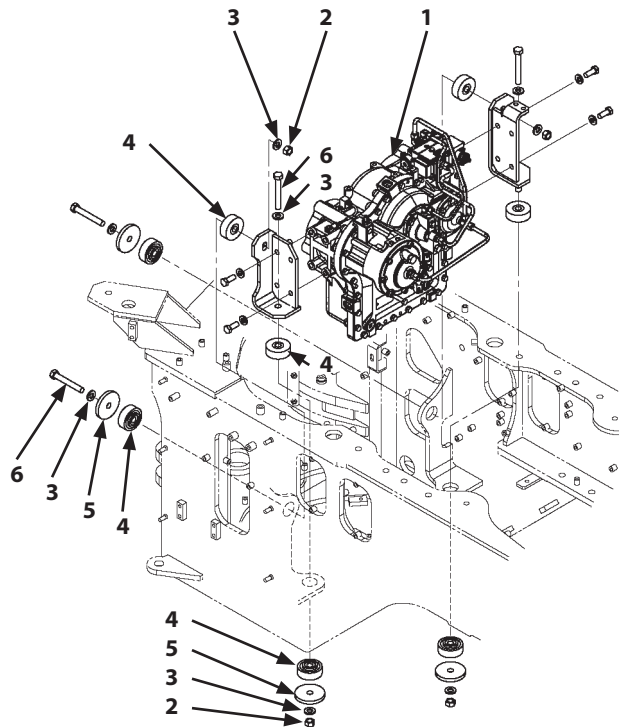
a- Lifting Hole

WMDF-04-03-021

CAUTION: The transmission (1) assembly weight: **330 kg (730 lb)**

21. Install the special tools (ST 0073) (3 used) to lifting holes (a) (3 places) of the transmission (1) assembly. Attach nylon slings onto the special tools (ST 0073) (3 used). Hoist and hold the transmission (1) assembly.
22. Remove bolts (6) (4 used), washers (3) (8 used), plates (5) (4 used), rubbers (4) (8 used), and nuts (2) (4 used). Remove the transmission (1) assembly. Place it onto a stable stand.

 : 27 mm



WMDF-04-03-023

23. Remove the adapters with the transmission (1) assembly attached if necessary.

SECTION 4 TRAVEL SYSTEM

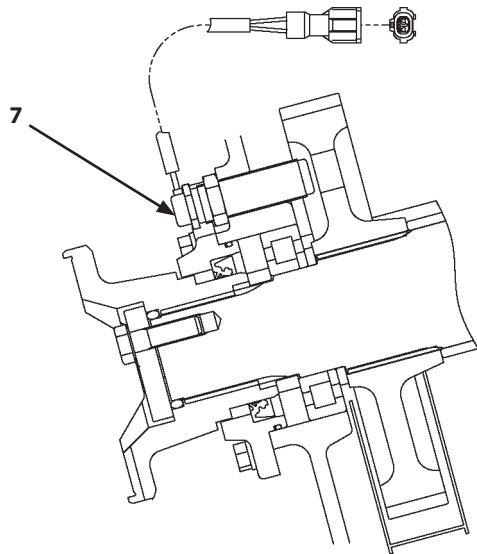
Group 3 Transmission

1- Bolt (3 Used)	32- Adapter	64- Bolt	94- Retaining Ring
2- Retainer Plate	33- Orifice	65- Nut	95- Clutch Assembly
3- Shim	34- Plug	66- Washer	95a- Retaining Ring
4- O-Ring	35- Orifice	67- Washer	96- Spacer
5- Flange	36- Bolt (4 Used)	68- Brake Cap	97- O-Ring (2 Used)
6- Bearing Cap	37- Plug	69- O-Ring	98- Oil Seal (2 Used)
7- Rotation Sensor	38- Distributor Cap	70- Piston	99- Spacer
8- Socket Bolt (2 Used)	39- Gasket (2 Used)	71- Piston Housing	100- Bearing
9- Sensor	40- Washer (5 Used)	72- End Plate	101- Spacer
10- Transmission Case	41- Bolt (5 Used)	73- Disc (6 Used)	102- Output Gear
11- Socket Bolt (2 Used)	42- Flange	74- Pin (2 Used)	103- Oil Baffle
12- Clutch Pressure Control Solenoid Valve	43- Plug	75- Socket Bolt (2 Used)	104- Washer (2 Used)
13- Gasket	44- Retaining Ring	76- Plug	105- Washer (2 Used)
14- Pin (2 Used)	45- Bearing Cap	77- O-Ring	106- Bolt (2 Used)
15- Bolt (27 Used)	46- O-Ring (2 Used)	78- Plug	107- Output Shaft
17- Plug	47- Brake Housing	79- Adapter	108- Bearing
18- O-Ring	49- Plate (7 Used)	80- Transmission Cover	109- Spacer
19- Bearing Cap	52- D-Ring	81- Strainer	110- Retaining Ring
20- Bolt (4 Used)	53- D-Ring	82- O-Ring	111- Spacer
21- Elbow (3 Used)	54- Pin (2 Used)	83- Gasket	114- Retaining Ring
22- Adapter	55- Spring (24 Used)	84- Bolt (4 Used)	115- Bearing
23- Pipe	56- Washer (4 Used)	85- Suction Tube	116- Input Gear 2
25- Pipe	57- Socket Bolt (4 Used)	86- Bolt (5 Used)	117- Bearing
26- Adapter	58- O-Ring	89- Retaining Ring	118- Retaining Ring
27- Tee	59- Plug	90- Bearing	119- Disc Hub
28- Orifice	60- Washer	91- Input Gear 1	120- Retaining Ring
29- Pipe	61- Orifice	92- Bearing	121- O-Ring
31- Pipe	62- Bolt (2 Used)	92a- Retaining Ring	122- Bracket
	63- Washer (2 Used)	93- Spacer	123- Socket Bolt (6 Used)

SECTION 4 TRAVEL SYSTEM

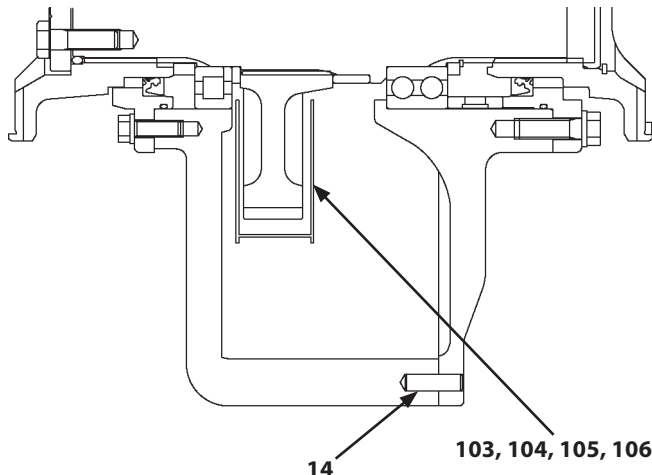
Group 3 Transmission

Section F-F



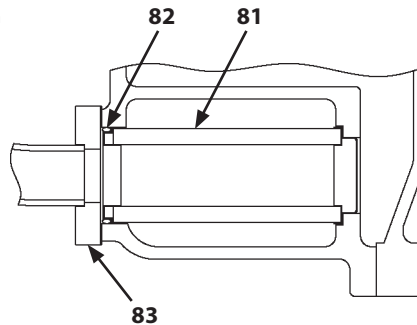
WMDF-04-03-013

Section E-E



WMDF-04-03-014

Section G-G



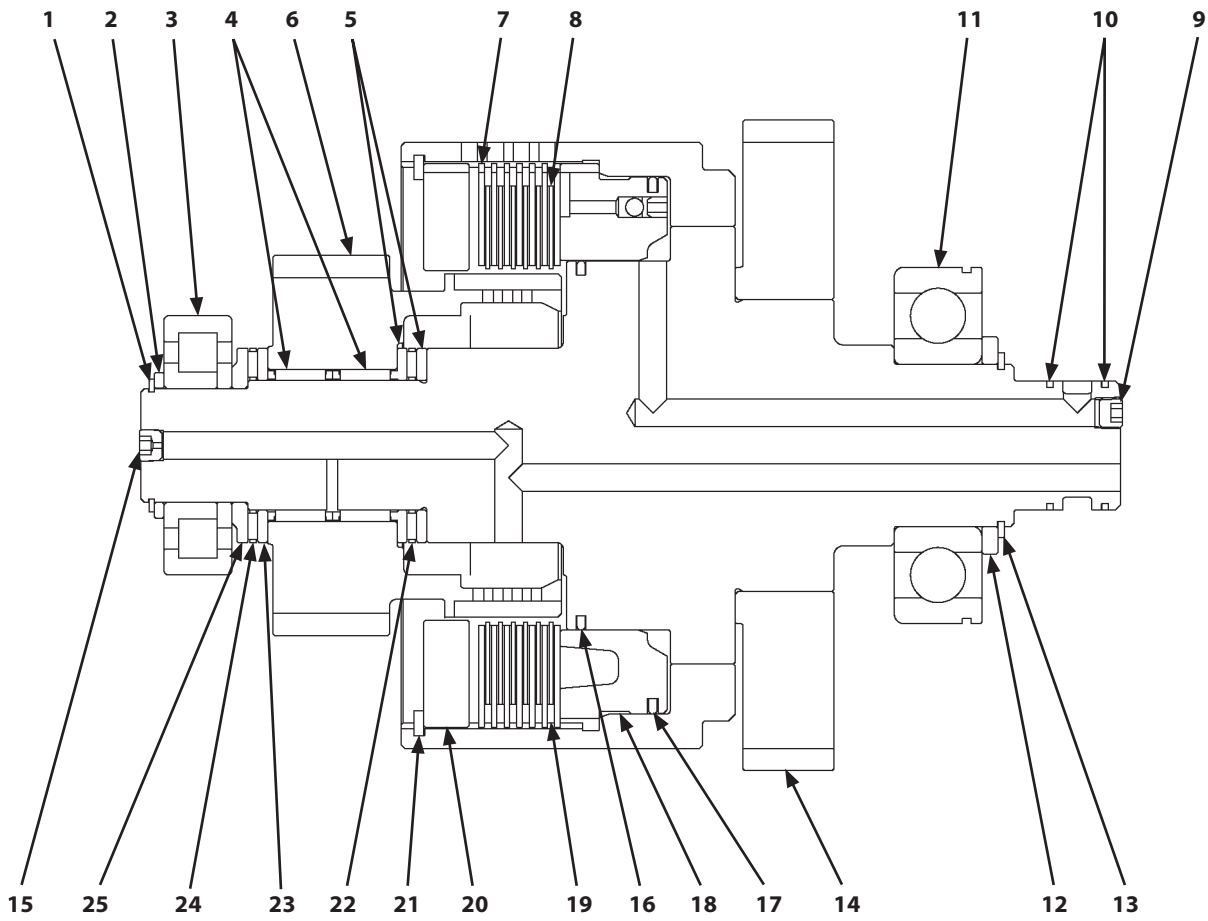
WMDF-04-03-015

- | | | | |
|--|--------------------------|--------------------------|---------------------------|
| 1- Bolt (3 Used) | 32- Adapter | 64- Bolt | 94- Retaining Ring |
| 2- Retainer Plate | 33- Orifice | 65- Nut | 95- Clutch Assembly |
| 3- Shim | 34- Plug | 66- Washer | 95a- Retaining Ring |
| 4- O-Ring | 35- Orifice | 67- Washer | 96- Spacer |
| 5- Flange | 36- Bolt (4 Used) | 68- Brake Cap | 97- O-Ring (2 Used) |
| 6- Bearing Cap | 37- Plug | 69- O-Ring | 98- Oil Seal (2 Used) |
| 7- Rotation Sensor | 38- Distributor Cap | 70- Piston | 99- Spacer |
| 8- Socket Bolt (2 Used) | 39- Gasket (2 Used) | 71- Piston Housing | 100- Bearing |
| 9- Sensor | 40- Washer (5 Used) | 72- End Plate | 101- Spacer |
| 10- Transmission Case | 41- Bolt (5 Used) | 73- Disc (6 Used) | 102- Output Gear |
| 11- Socket Bolt (2 Used) | 42- Flange | 74- Pin (2 Used) | 103- Oil Baffle |
| 12- Clutch Pressure Control Solenoid Valve | 43- Plug | 75- Socket Bolt (2 Used) | 104- Washer (2 Used) |
| 13- Gasket | 44- Retaining Ring | 76- Plug | 105- Washer (2 Used) |
| 14- Pin (2 Used) | 45- Bearing Cap | 77- O-Ring | 106- Bolt (2 Used) |
| 15- Bolt (27 Used) | 46- O-Ring (2 Used) | 78- Plug | 107- Output Shaft |
| 17- Plug | 47- Brake Housing | 79- Adapter | 108- Bearing |
| 18- O-Ring | 49- Plate (7 Used) | 80- Transmission Cover | 109- Spacer |
| 19- Bearing Cap | 52- D-Ring | 81- Strainer | 110- Retaining Ring |
| 20- Bolt (4 Used) | 53- D-Ring | 82- O-Ring | 111- Spacer |
| 21- Elbow (3 Used) | 54- Pin (2 Used) | 83- Gasket | 114- Retaining Ring |
| 22- Adapter | 55- Spring (24 Used) | 84- Bolt (4 Used) | 115- Bearing |
| 23- Pipe | 56- Washer (4 Used) | 85- Suction Tube | 116- Input Gear 2 |
| 25- Pipe | 57- Socket Bolt (4 Used) | 86- Bolt (5 Used) | 117- Bearing |
| 26- Adapter | 58- O-Ring | 89- Retaining Ring | 118- Retaining Ring |
| 27- Tee | 59- Plug | 90- Bearing | 119- Disc Hub |
| 28- Orifice | 60- Washer | 91- Input Gear 1 | 120- Retaining Ring |
| 29- Pipe | 61- Orifice | 92- Bearing | 121- O-Ring |
| 31- Pipe | 62- Bolt (2 Used) | 92a- Retaining Ring | 122- Bracket |
| | 63- Washer (2 Used) | 93- Spacer | 123- Socket Bolt (6 Used) |

SECTION 4 TRAVEL SYSTEM

Group 3 Transmission

Assembly of Clutch Assembly



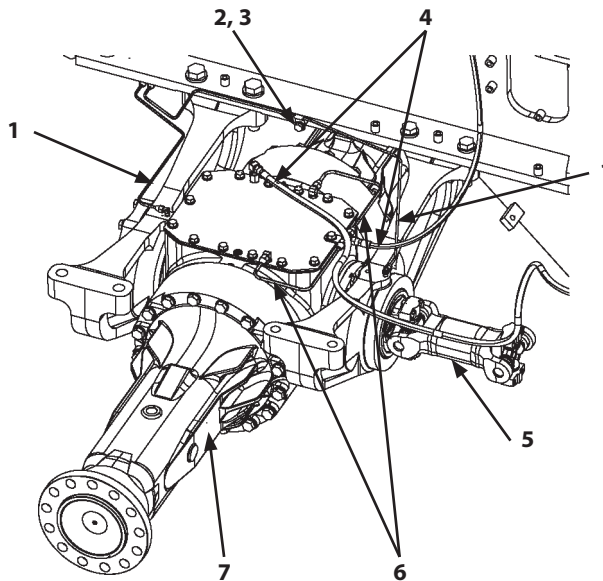
W4FC-03-04-024

- | | | | |
|----------------------------|------------------------|----------------------------|--------------------|
| 1- Retaining Ring | 8- Disc (6 Used) | 15- Orifice | 22- Thrust Bearing |
| 2- Spacer | 9- Plug | 16- Seal Ring | 23- Thrust Washer |
| 3- Bearing | 10- Seal Ring (2 Used) | 17- Seal Ring | 24- Thrust Bearing |
| 4- Needle Bearing (2 Used) | 11- Bearing | 18- Piston | 25- Spacer |
| 5- Thrust Washer (2 Used) | 12- Spacer | 19- Return Spring (6 Used) | |
| 6- Hub Gear | 13- Retaining Ring | 20- End Plate | |
| 7- Plate (7 Used) | 14- Shaft Drum | 21- Retaining Ring | |

SECTION 4 TRAVEL SYSTEM

Group 4 Axle

Removal and Installation of Rear Axle



WMDF-04-04-005

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: Operate the brake pedal more than fifty times and release any pressure in the circuit.


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

2. Remove the rear tires from rear axle (7). (Refer to W4-1-2.)
3. Remove propeller shaft (5). (Refer to W4-5-1.)


4. Disconnect hoses (4) (2 used).

 : 17 mm


5. Remove bolt, washer (2) and clip (3).

 : 17 mm

6. Disconnect the both ends of pipes (1) (2 used).

 : 17 mm

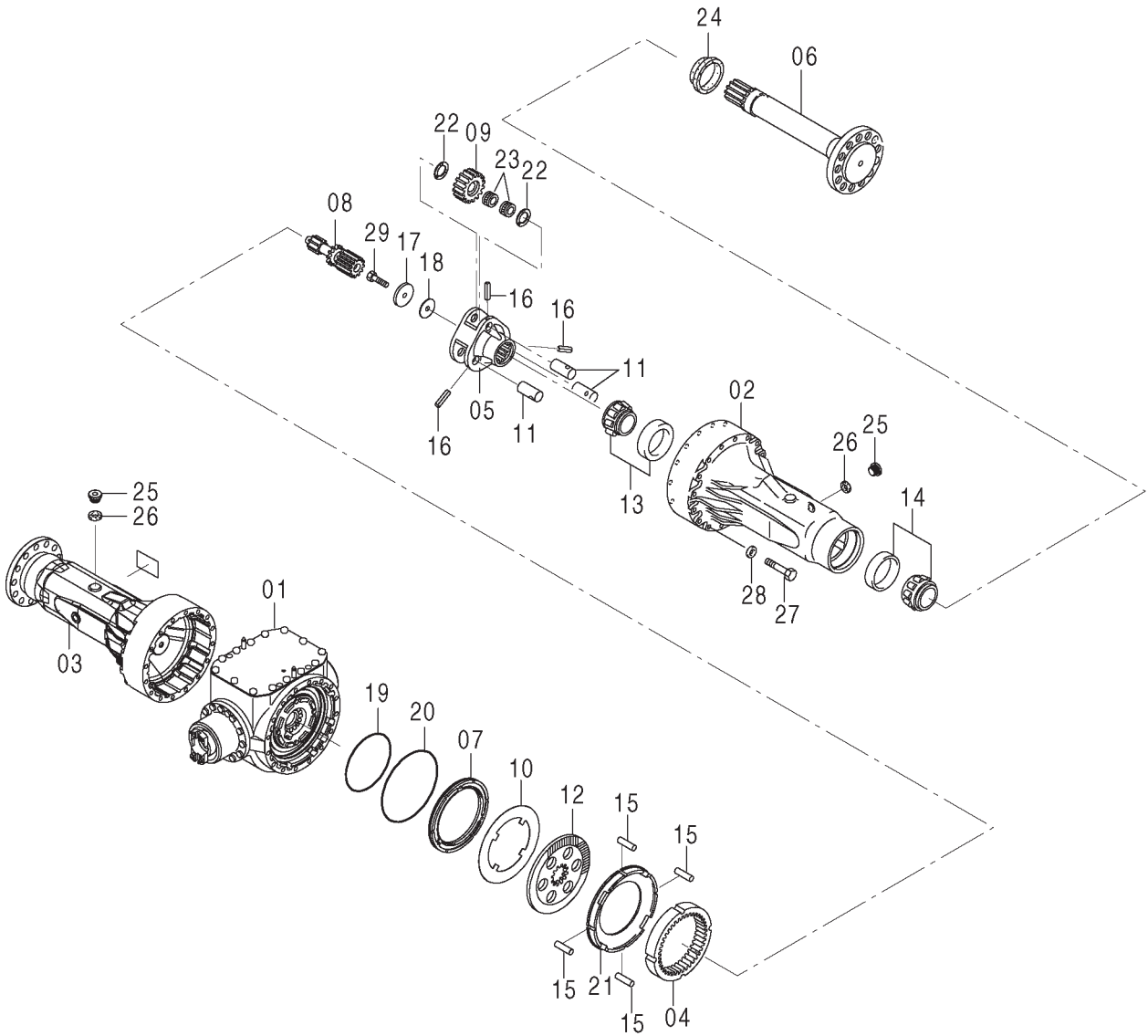
7. Disconnect the both ends of pipes (6) (2 used).

 : 17 mm

SECTION 4 TRAVEL SYSTEM

Group 4 Axle

- Axle Equipped with LSD



WMDF-04-04-011

SECTION 4 TRAVEL SYSTEM


Group 4 Axle


Removal of Housing (37) Assembly

40.

Front Axle


Remove bolts (62) (6 used) and washers (70) (6 used) from housing (37).


 : 19 mm

 **NOTE:** *THREEBOND #1327 has been applied on the thread part of bolts (62) (6 used).*


Rear Axle

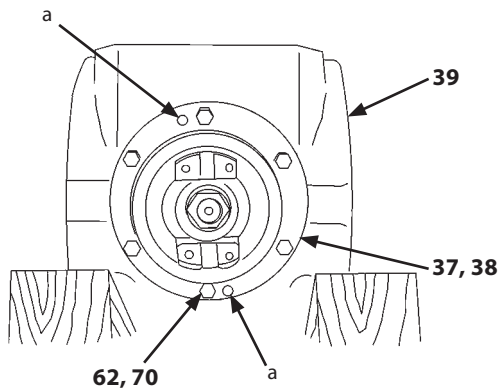
Remove bolts (62) (12 used) and washers (70) (12 used) from housing (37).

 : 19 mm

 **NOTE:** *THREEBOND #1327 has been applied on the thread part of bolts (62) (12 used).*

41. Install bolts (62) (2 used) which have been removed in step 40 to pulling-out bolt holes (a) (2 places) of housing (37). Tighten bolts (62) (2 used) evenly. Remove the housing (37) assembly and shims (38) from housing (39). Remove bolts (62) (2 used). Record the thickness and quantity of shims (38) which have been removed. Keep them.

 : 19 mm



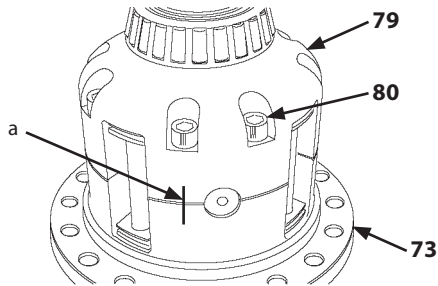
a- Pulling-Out Bolt Hole

WMDF-04-04-032

SECTION 4 TRAVEL SYSTEM

Group 4 Axle


22. Fit matching marks (a) made when disassembling and install housing A (79) to housing B (73). Tap housing A (79) and housing B (73) by using a plastic hammer so that each housing surfaces contact each other.




WMDF-04-04-071

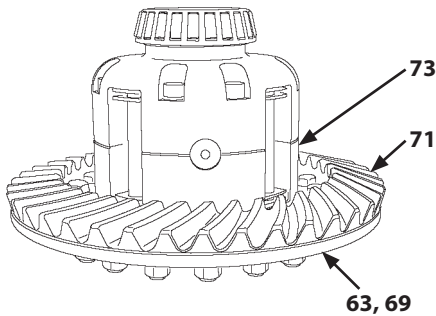
a- Matching Mark

23. Apply THREEBOND #1327 onto the thread part of socket bolts (80) (8 used). Install socket bolts (80) (8 used) in diagonal order.

 : 10 mm

 : 127 N·m (13 kgf·m, 94 lbf·ft)


24. Fit the bolt (63) holes (18 places for each) of ring gear (71) and housing B (73). Install ring gear (71) to housing B (73). Contact ring gear (71) to the flange surface of housing B (73) by using a plastic hammer.




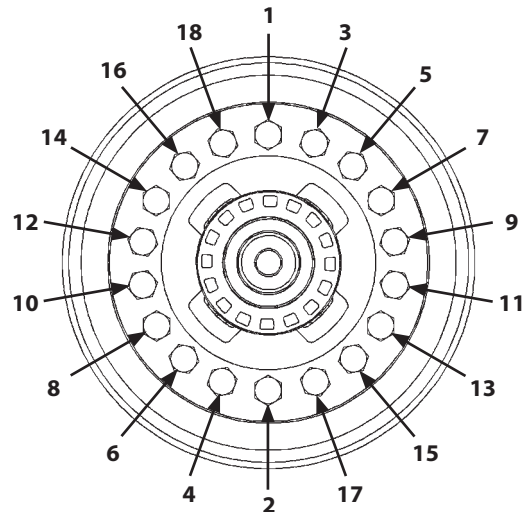
WMDF-04-04-070

25. Apply THREEBOND #1327 onto the thread part of bolts (63) (18 used). Install bolts (63) (18 used) and nuts (69) (18 used).

 **NOTE:** Refer to the illustration for the order to tighten bolts (63) (18 used).

 : 19 mm

 : 132 N·m (13.5 kgf·m, 97 lbf·ft)




WMDF-04-04-068

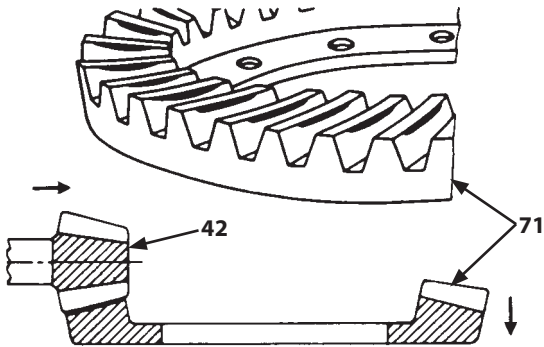
SECTION 4 TRAVEL SYSTEM

Group 4 Axle

D. Contact of Face Part

For the adjustment, decrease the shim (38) thickness of housing (37) and move pinion (42) close to ring gear (71). Next, loosen nut (47) at the housing B (72) side, tighten nut (47) at the housing A (60) side, and move ring gear (71) away from pinion (42).


 **NOTE:** Thickness of shim (38): 0.075 mm (0.003 in), 0.1 mm (0.004 in), 0.25 mm (0.010 in), 0.5 mm (0.020 in), 0.8 mm (0.031 in)

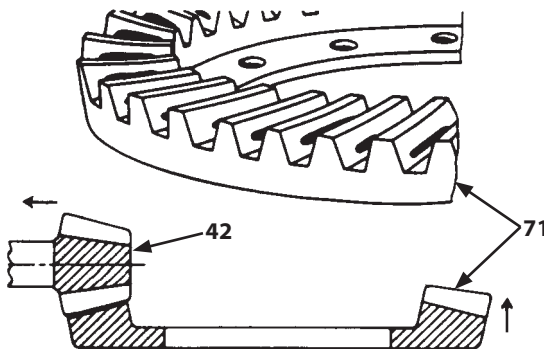


W4GB-03-03-059

E. Contact of Flank Part

For the adjustment, increase the shim (38) thickness of housing (37) and move pinion (42) away from ring gear (71). Next, loosen nut (47) at the housing A (60) side, tighten nut (47) at the housing B (72) side, and move ring gear (71) close to pinion (42).

 **NOTE:** Thickness of shim (38): 0.075 mm (0.003 in), 0.1 mm (0.004 in), 0.25 mm (0.010 in), 0.5 mm (0.020 in), 0.8 mm (0.031 in)

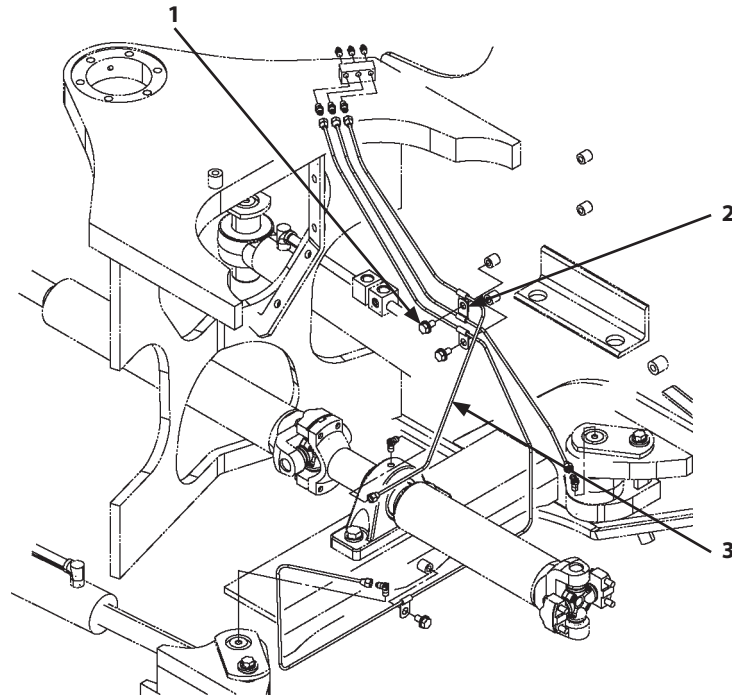


W4GB-03-03-060

SECTION 4 TRAVEL SYSTEM

Group 5 Propeller Shaft

Removal and Installation of Propeller Shaft




WMDF-04-04-001


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.)
2. Remove bolt, washer (1) and clips (2) (2 used).

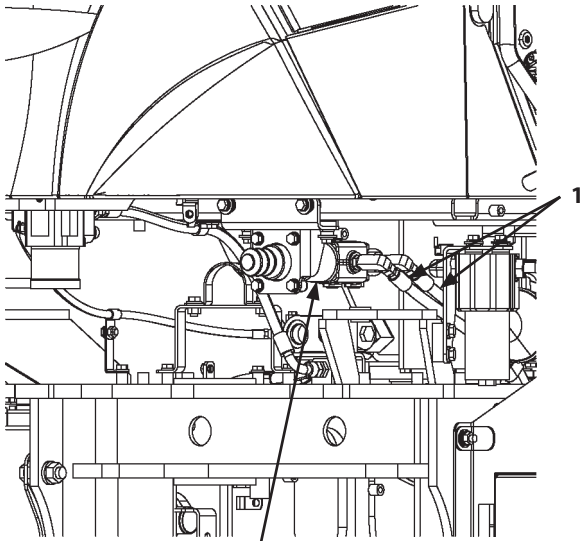
 : 17 mm

3. Disconnect the both ends of pipe (3).

 : 14 mm

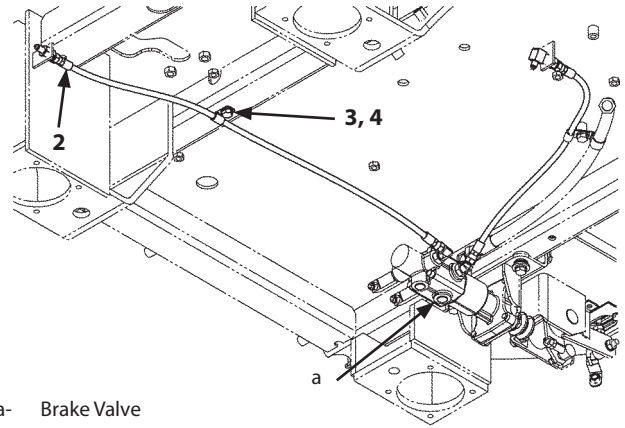
SECTION 4 TRAVEL SYSTEM

Group 6 Brake Valve



a- Brake Valve


WMDF-03-01-008




a- Brake Valve

WMDF-04-06-100


9. Disconnect hoses (1) (2 used).

 : 22 mm

10. Remove bolt, washer (3) and clip (4).

 : 17 mm

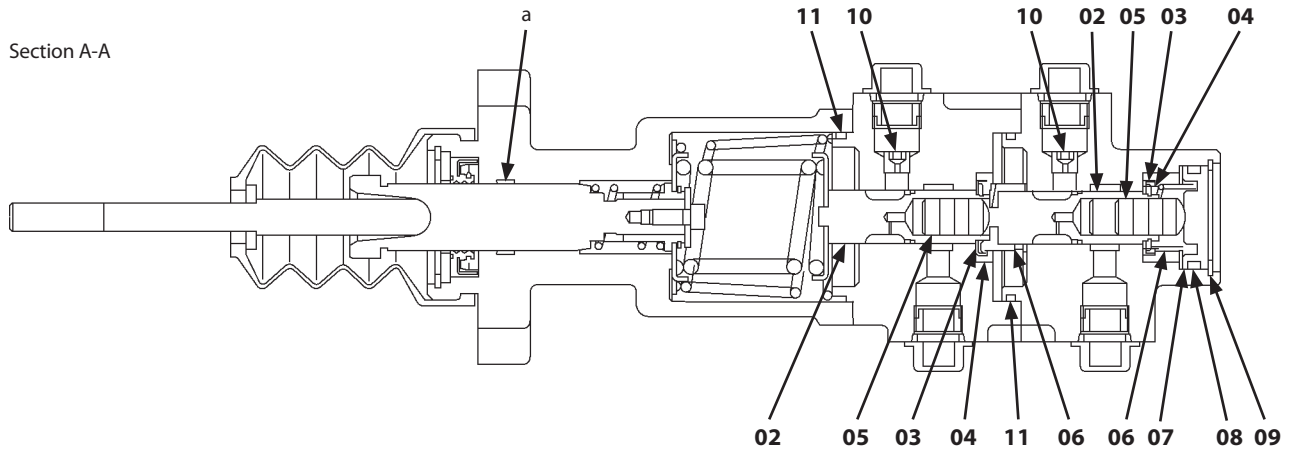
11. Disconnect hose (2).

 : 17 mm

SECTION 4 TRAVEL SYSTEM

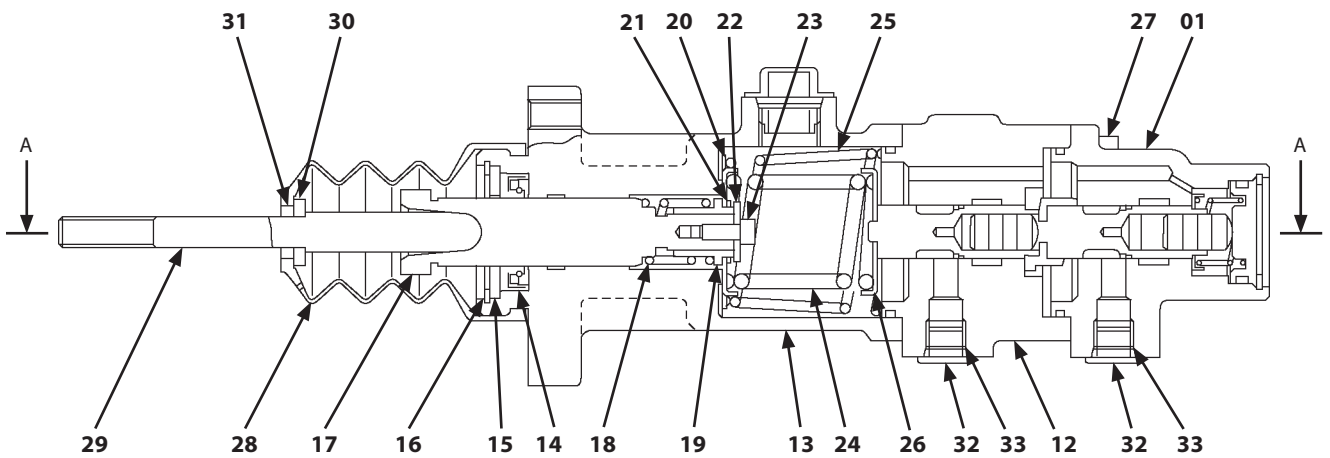
Group 6 Brake Valve

Assembly of Brake Valve



a- Lithium Grease Applying Position

WMDF-04-06-103



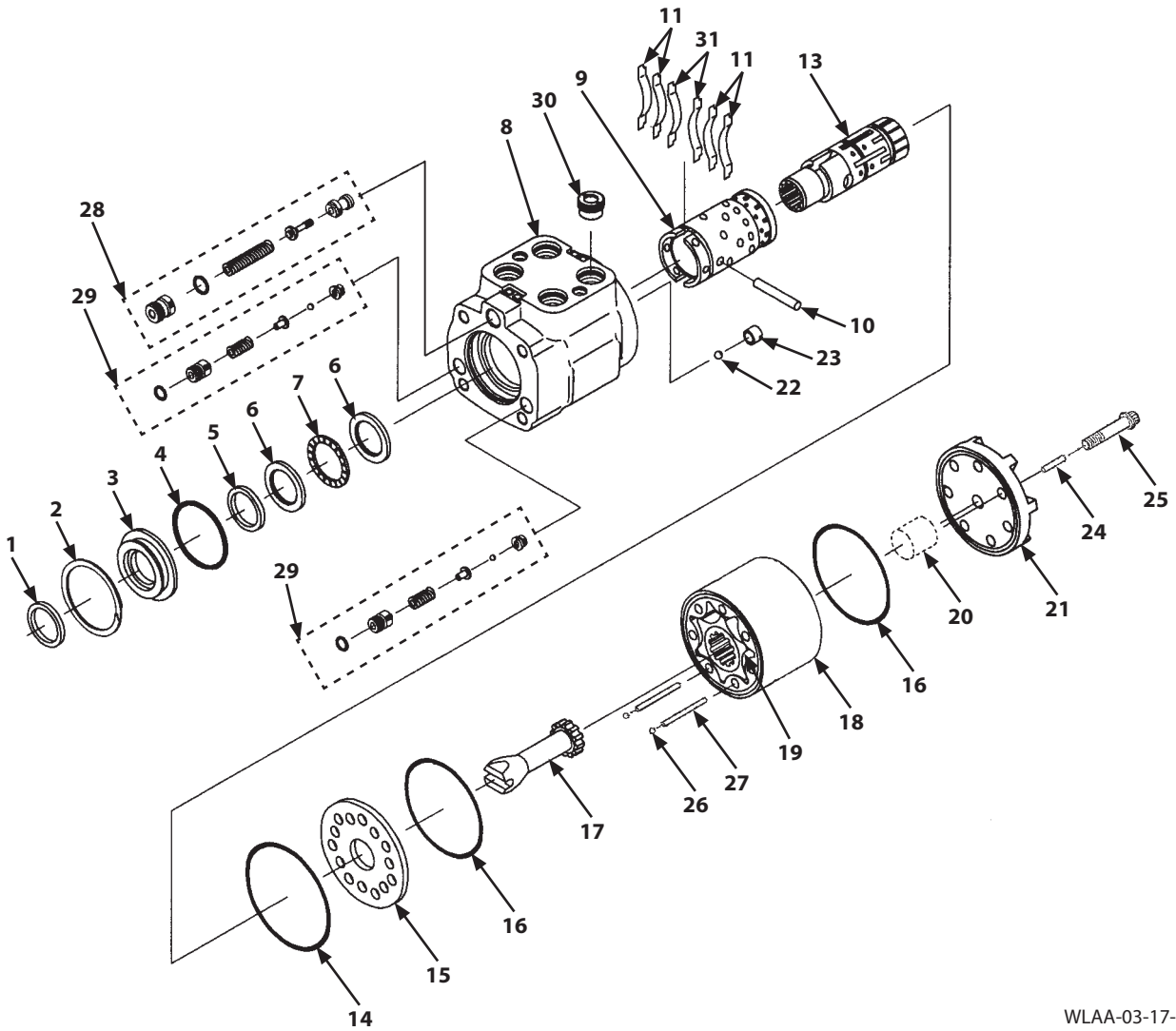
WMDF-04-06-104

- | | | | |
|-----------------------------|----------------------|--------------------------|---------------------|
| 01- Body | 10- Orifice (2 Used) | 19- Guide | 28- Boot |
| 02- Spool (2 Used) | 11- O-Ring (2 Used) | 20- Spring Seat | 29- Push Rod |
| 03- Spring Seat (2 Used) | 12- Body | 21- Retaining Ring | 30- Washer |
| 04- Retaining Ring (2 Used) | 13- Cover | 22- End Plate | 31- Retaining Ring |
| 05- Plunger (2 Used) | 14- Oil Seal | 23- Socket Bolt | 32- Plug (2 Used) |
| 06- Spring (2 Used) | 15- End Plate | 24- Spring | 33- O-Ring (2 Used) |
| 07- Plug | 16- Retaining Ring | 25- Spring | |
| 08- O-Ring | 17- Piston | 26- Spring Seat | |
| 09- Retaining Ring | 18- Spring | 27- Socket Bolt (4 Used) | |

SECTION 4 TRAVEL SYSTEM

Group 7 Steering Device

Disassembly of Steering Valve

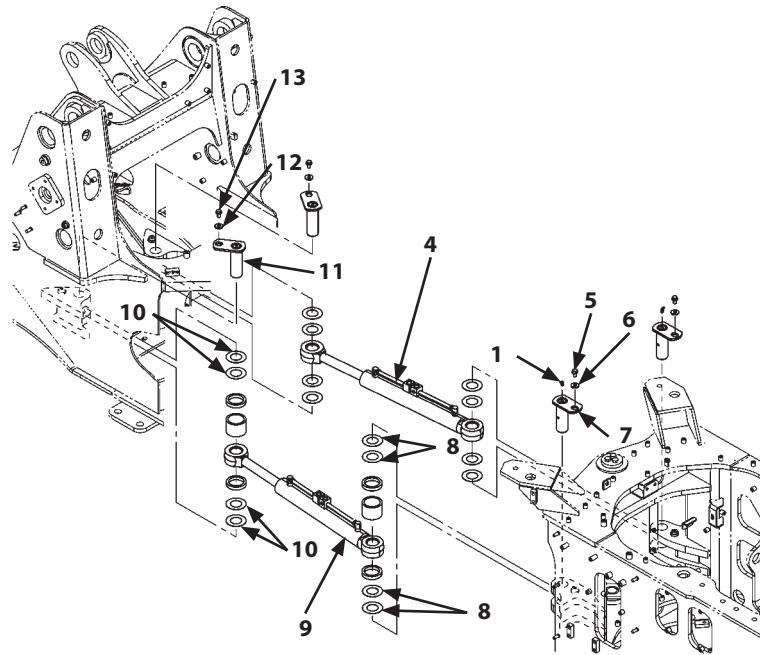


WLAA-03-17-001

- | | | | |
|--------------------------|-------------------------------|--------------------|------------------------------------|
| 1- Dust Seal | 9- Sleeve | 18- Gerotor Ring | 26- Ball (2 Used) |
| 2- Retaining Ring | 10- Pin | 19- Star | 27- Spring Pin (2 Used) |
| 3- Bushing | 11- Centering Spring (4 Used) | 20- Spacer | 28- Relief Valve |
| 4- O-Ring | 13- Spool | 21- Cap | 29- Overload Relief Valve (2 Used) |
| 5- Seal | 14- O-Ring | 22- Ball | 30- Check Valve |
| 6- Bearing Race (2 Used) | 15- Plate | 23- Adapter Screw | 31- Centering Spring (2 Used) |
| 7- Thrust Needle | 16- O-Ring (2 Used) | 24- Spring Pin | |
| 8- Housing | 17- Drive | 25- Screw (7 Used) | |


SECTION 4 TRAVEL SYSTEM

Group 7 Steering Device




WMDF-04-07-106

10. Remove grease fitting (1).

 : 10 mm

11. Attach nylon slings onto steering cylinder (9). Hoist and hold steering cylinder (9).


12. Remove bolt, washer (5) and washer (6).

 : 19 mm

⚠ 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.

13. Remove pin (7) and shim (8) by using a bar and a hammer.

14. Remove bolt, washer (13) and washer (12).

 : 19 mm

⚠ 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.

15. Remove pin (11) and shim (10) by using a bar and a hammer.

16. Remove steering cylinder (9).

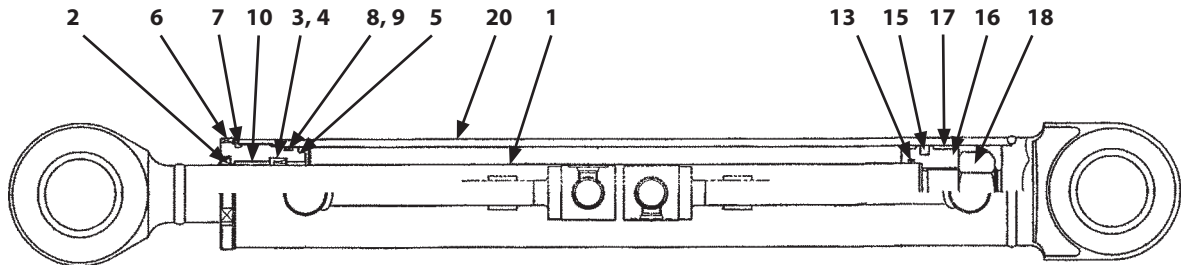
17. Remove the adapters with steering cylinder (9) attached if necessary.

18. Remove another steering cylinder (4) in the same way as step 10 to step 17.

SECTION 4 TRAVEL SYSTEM

Group 7 Steering Device

Assembly of Steering Cylinder

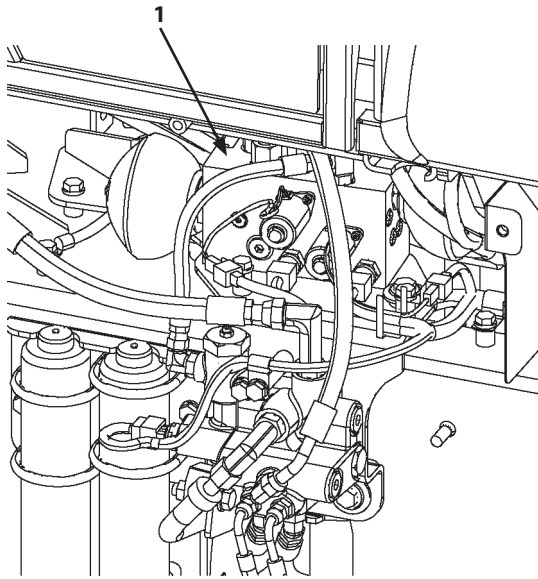


WMDF-04-07-101

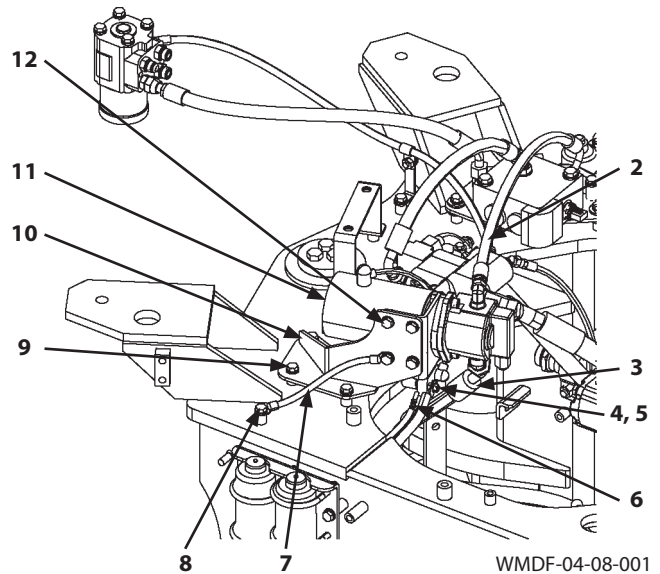
- | | | | |
|-----------------|------------------|----------------|-------------------|
| 1- Cylinder Rod | 5- Cylinder Head | 9- Backup Ring | 16- Piston |
| 2- Dust Seal | 6- Washer | 10- Bushing | 17- Wear Ring |
| 3- U-Ring | 7- O-Ring | 13- O-Ring | 18- Nut |
| 4- Backup Ring | 8- O-Ring | 15- Seal Ring | 20- Cylinder Tube |

SECTION 4 TRAVEL SYSTEM





Group 8 Emergency Steering Device





WMDF-03-12-001



WMDF-04-08-001

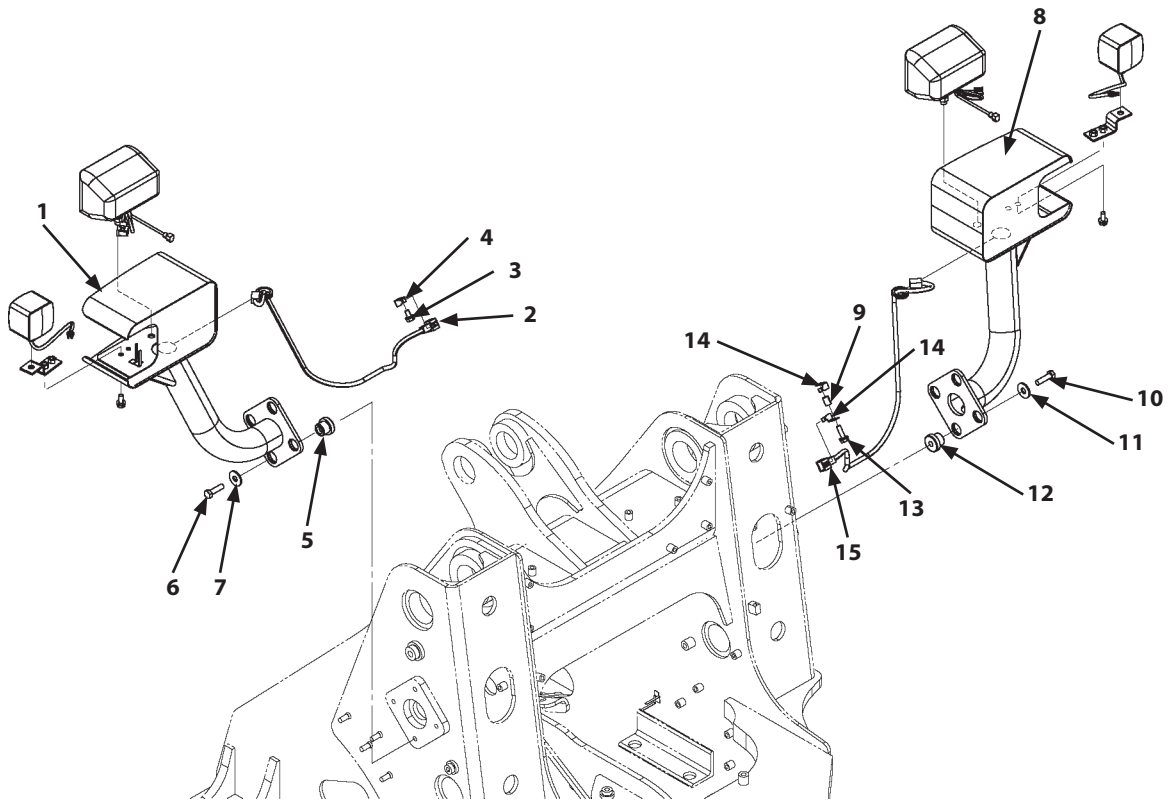
8. Remove the manifold valve (1) assembly. (Refer to W3-12-1.)
9. Remove bolt, washer (8). Disconnect ground (7).
 : 17 mm
10. Remove nut (4). Disconnect terminal (5).
 : 12 mm
11. Disconnect connector (6).
12. Disconnect hose (3).
 : 36 mm
13. Disconnect hose (2).
 : 22 mm

14. Remove bolts, washers (9) (3 used). Remove the emergency steering pump (11) assembly.
 : 17 mm
15. Remove bolts, washers (12) (4 used) and ground (7). Remove emergency steering pump (11) from bracket (10).
 : 17 mm
16. Remove the adapters with emergency steering pump (11) attached if necessary.

SECTION 5 FRONT ATTACHMENT

Group 1 Front Attachment

Removal and Installation of Front Attachment




WMDF-05-01-100

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 identification tags 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.)
2. Remove bolt, washer (3) and bracket (4).


 : 17 mm

3. Disconnect connector (2).

4. Remove bolts (6) (4 used) and washers (7) (4 used). Remove the head light (1) assembly and rubber cushions (5) (4 used).


 : 19 mm

5. Remove bolt, washer (13), brackets (14) (2 used) and tube (9).

 : 17 mm

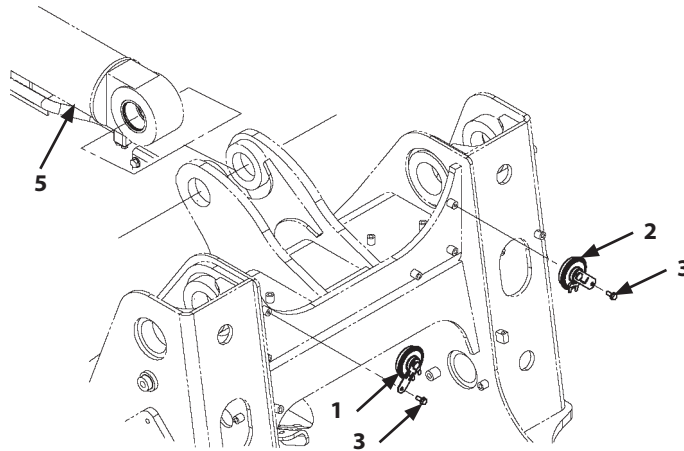
6. Disconnect connector (15).

7. Remove bolts (10) (4 used) and washers (11) (4 used). Remove the head light (8) assembly and rubber cushions (12) (4 used).

 : 19 mm

SECTION 5 FRONT ATTACHMENT


Group 1 Front Attachment




WMDF-05-01-102

16. Install bucket cylinder (5). (Refer to W5-2-2.)

17. Install horn (2) with bolt, washer (3).

 : 13 mm

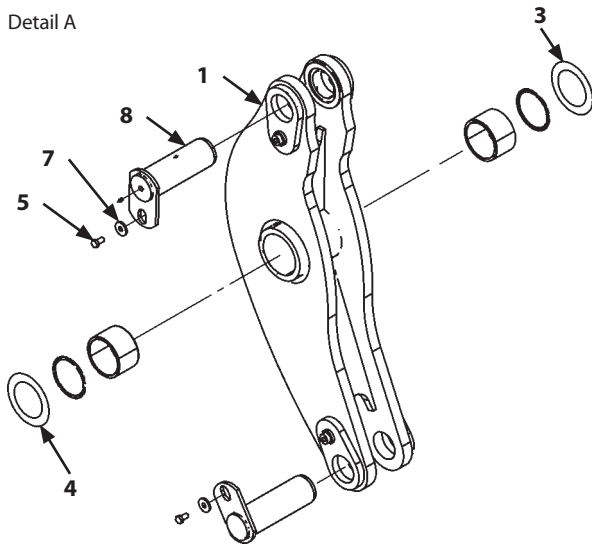
 : 10 N·m (1 kgf·m, 7.4 lbf·ft)

18. Install another horn (1) in the same way as step 17.

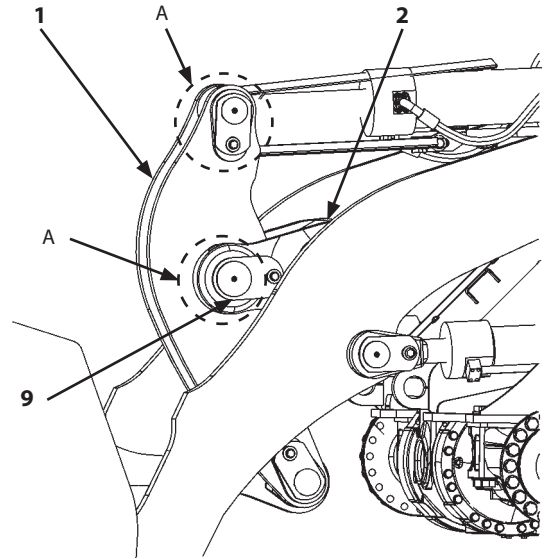
SECTION 5 FRONT ATTACHMENT

Group 1 Front Attachment

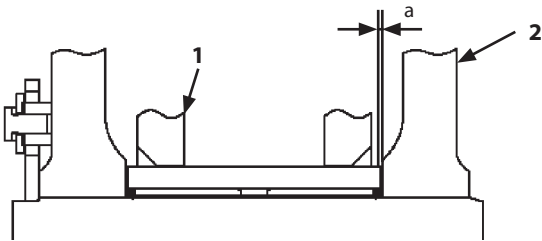
Detail A



WMDF-05-01-103



WNEC-05-01-016





WNEC-05-01-021

a- Clearance

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.

1. Install pin (8) to bell crank (1) by using a hammer. Install washer (7) and bolt, washer (5).

 : 19 mm

 : 90 N·m (9 kgf·m, 66 lbf·ft)


CAUTION: Bell crank (1) weight: 150 kg (335 lbf-ft)


2. Attach nylon slings onto pin (8) which has been installed in step 2. Hoist and hold bell crank (1). Fit bell crank (1) mounting holes to lift arm (2).

CAUTION: Pin (9) weight: 21 kg (47 lb)

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. Fit spacer (3) and shim (4) to bell crank (1) mounting holes so that clearance (a) is adjusted within 1.5 mm (0.059 in). Install pin (9) to lift arm (2) by using a hammer.

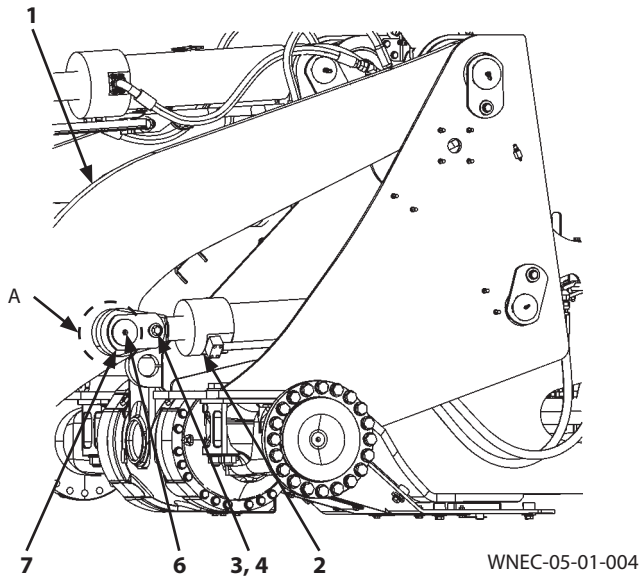
 **NOTE:** Fit at least one spacer (3) or shim (4) to the both side of bell crank (1) mounting hole.

 **NOTE:** Thickness of spacer (3): 2.3 mm (0.091 in), thickness of shim (4): 1.6 mm (0.063 in)

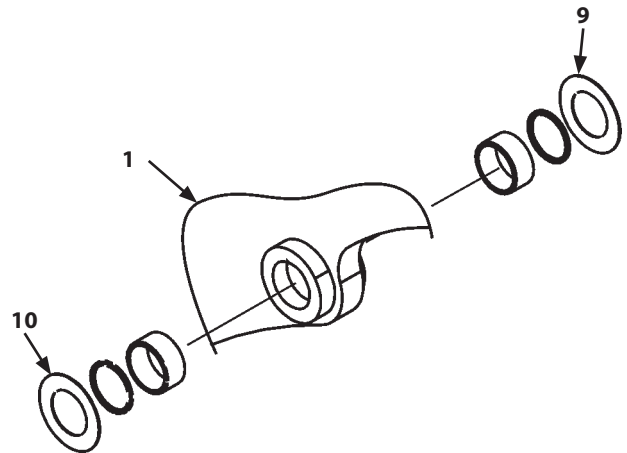
SECTION 5 FRONT ATTACHMENT

Group 2 Cylinder

Removal and Installation of Lift Arm Cylinder



Detail A



WMDF-05-02-115

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.)
2. Start the engine. Raise lift arm (1). Set lift arm cylinder (2) in the horizontal position. Operate the bucket cylinder. Dump and place the bucket on wooden blocks. Stop the engine.


CAUTION: Lift arm cylinder (2) weight: 120 kg (265 lb)

3. Attach nylon slings onto lift arm cylinder (2). Hoist and hold lift arm cylinder (2).
4. Remove grease fitting (6).

 : 10 mm

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.

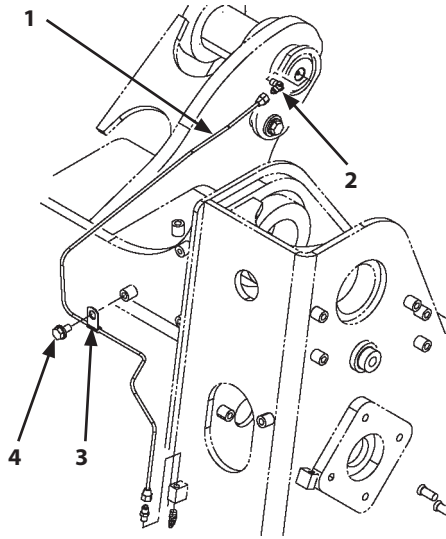
5. Remove bolt, washer (3) and washer (4). Remove pin (7) from lift arm cylinder (2) by using a round bar and a hammer.

 : 19 mm

6. Remove spacer (9) and shim (10) from lift arm (1).
7. Remove another lift arm cylinder (2) from lift arm (1) in the same way as step 3 to step 6.
8. Start the engine. Retract lift arm cylinders (2) in the right and left sides. Remove lift arm cylinders (2) in the right and left sides from lift arm (1).
9. Stop the engine. In order not to extend the rod, pass the wires through the rod hole of lift arm cylinders (2) in the right and left sides and secure the rod to the cylinder tube.


SECTION 5 FRONT ATTACHMENT

Group 2 Cylinder




WMDF-05-02-103


7. Remove bolt, washer (4) and clip (3).

 : 17 mm

8. Disconnect the both ends of pipe (1).

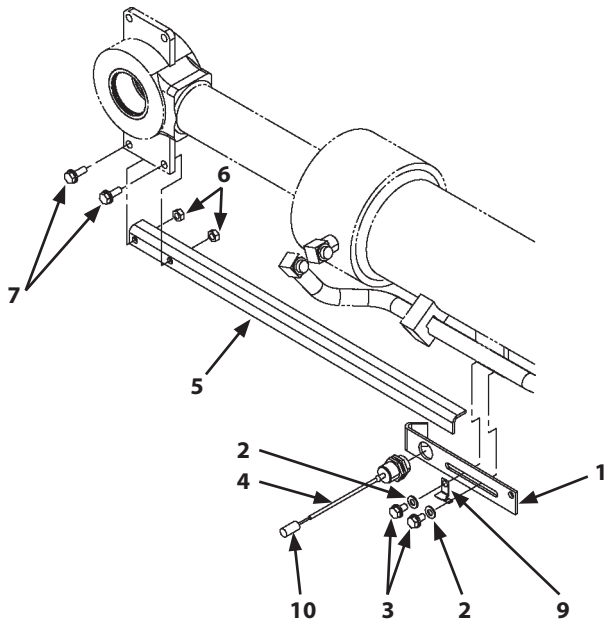
 : 17 mm

9. Remove elbow (2).

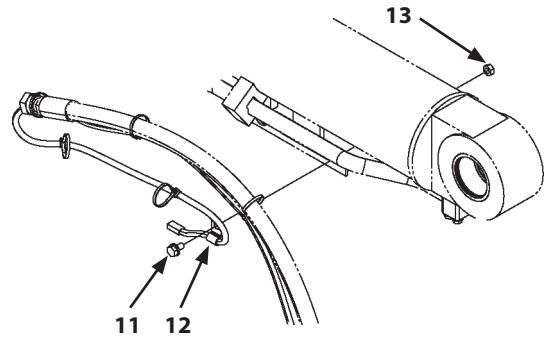
 : 12 mm

SECTION 5 FRONT ATTACHMENT

Group 2 Cylinder




WMDF-05-02-102




WMDF-05-02-108


13. Temporary tighten the proximity switch (4) assembly and brackets (1, 9) with washers (2) (2 used) and bolts, washers (3) (2 used).

 : 17 mm


14. Connect connector (10).


15. Install clip (12) with bolt, washer (11) and nut (13).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

16. Install bracket (5) with nuts (6) (2 used) and bolts, washers (7) (2 used).

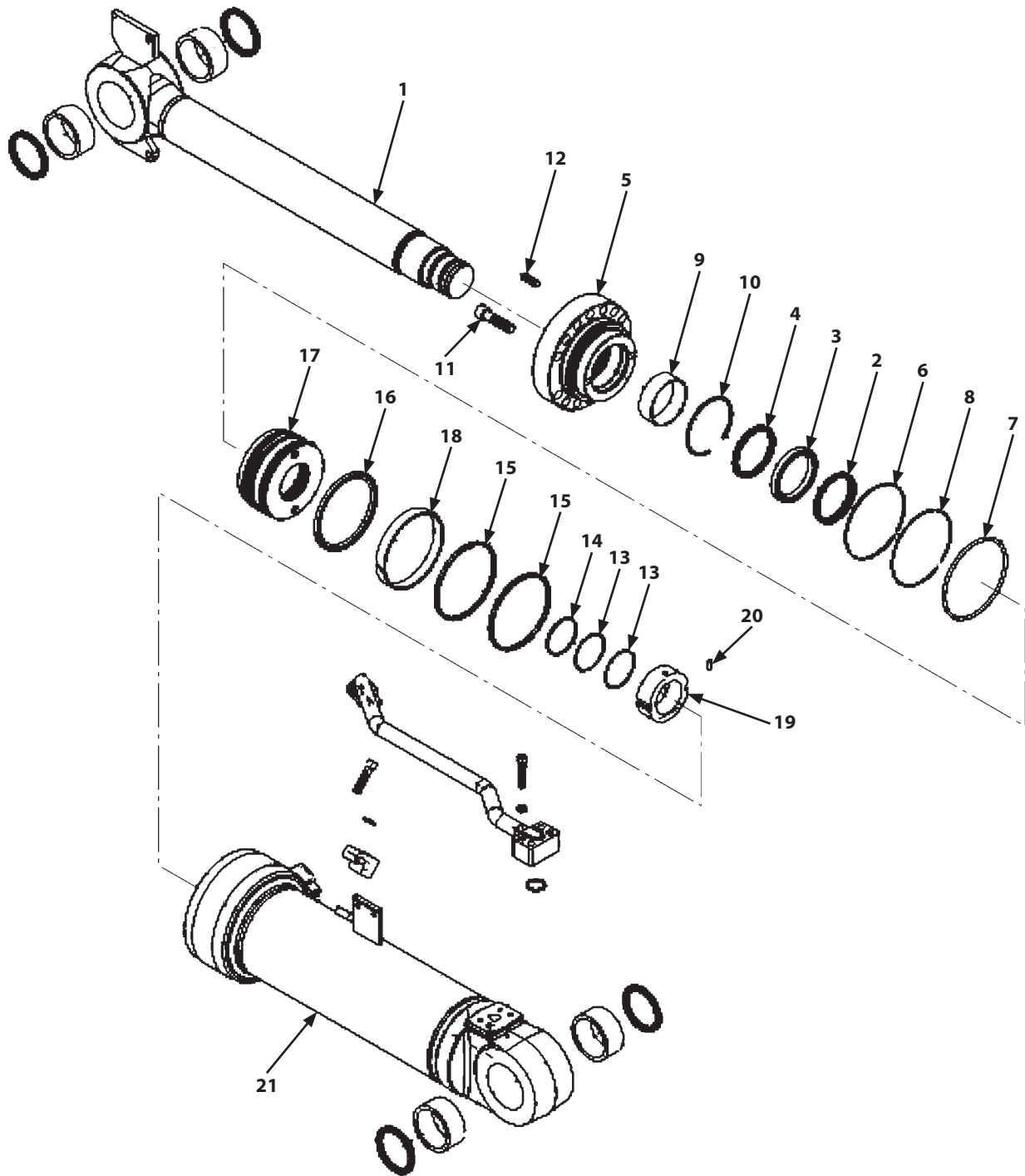
 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

SECTION 5 FRONT ATTACHMENT

Group 2 Cylinder

Disassembly of Bucket Cylinder



WMDF-05-02-107

- | | | | |
|------------------|---------------------------|--------------------------|-------------------|
| 1- Cylinder Rod | 7- O-Ring | 13- Backup Ring (2 Used) | 19- Nut |
| 2- Dust Seal | 8- Backup Ring | 14- O-Ring | 20- Set Screw |
| 3- U-Ring | 9- Bushing | 15- Dust Seal (2 Used) | 21- Cylinder Tube |
| 4- Buffer Ring | 10- Retaining Ring | 16- Seal Ring | |
| 5- Cylinder Head | 11- Socket Bolt (14 Used) | 17- Piston | |
| 6- O-Ring | 12- Screw | 18- Wear Ring | |

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