

PART NO. WNDF-EN-00

**HITACHI**

Reliable solutions

# Workshop Manual

# ZW140-5B Wheel Loader

ZW140-5B WHEEL LOADER WORKSHOP MANUAL

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

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

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WNDF-EN-00

Service Manual consists of the following separate Part No.  
Technical Manual (Operational Principle) : Vol. No.TONDF-EN  
Technical Manual (Troubleshooting) : Vol. No.TTNDf-EN  
Workshop Manual : Vol. No.WNDF-EN

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## SAFETY

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### General Precautions for Cab

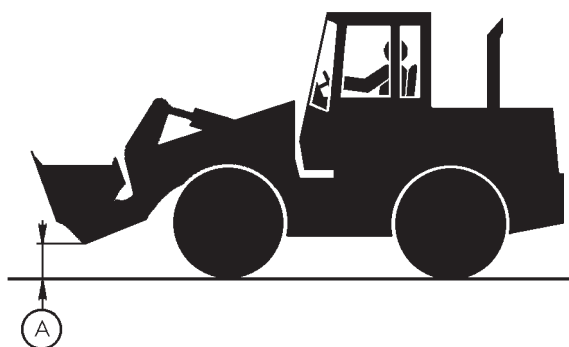
- Before entering the cab, thoroughly remove all dirt and/or oil such as mud, grease, soil or stones that may mess up the cab from the soles of your work boots. If any controls such as a pedal is operated while with dirt and/or oil on the soles of the operator's work boots, the operator's foot may slip 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

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### 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

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### Avoid Injury from Rollaway Accidents

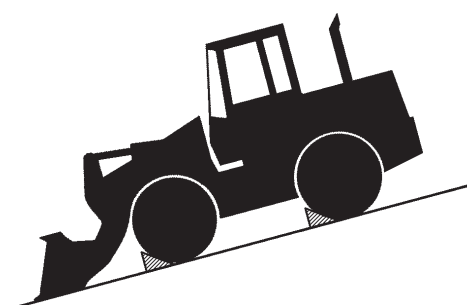
- Death or serious injury may result if you attempt to mount or stop a moving machine.

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

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- 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

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### 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.



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### 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

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### 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.

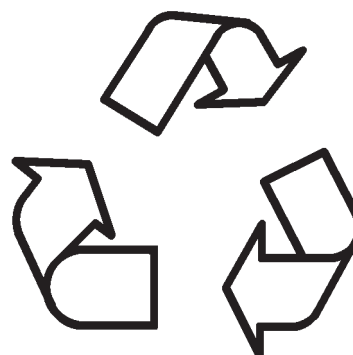


SA-309

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### 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

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#### 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

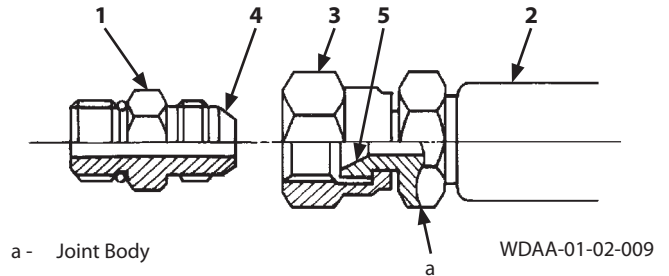
## Group 2 Tightening

### 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.

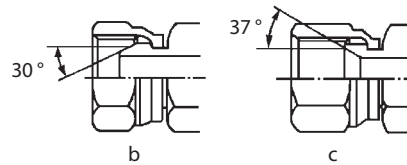
#### IMPORTANT:

- **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

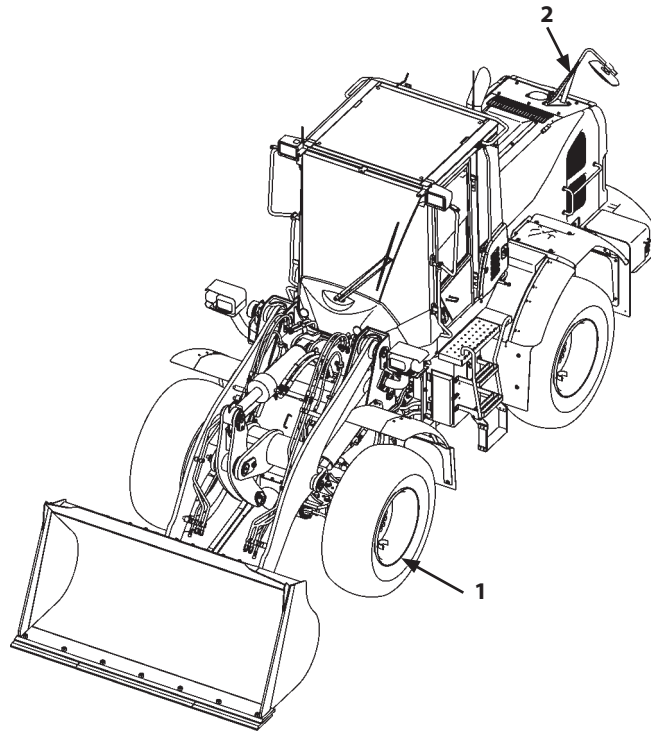
c - Female Union Joint

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

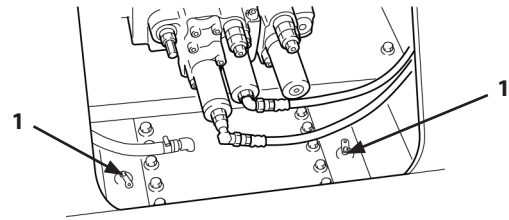
## SECTION 1 GENERAL

### 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.

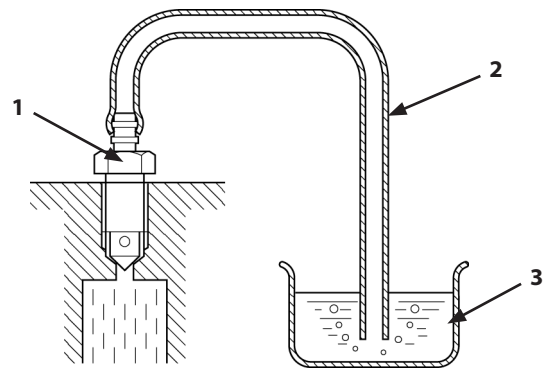
In addition, bleed air from the brake system until hydraulic oil (about 0.5 liters (0.53 US qt)) is drawn from each wheel (4 places) after bubbles stops.



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.

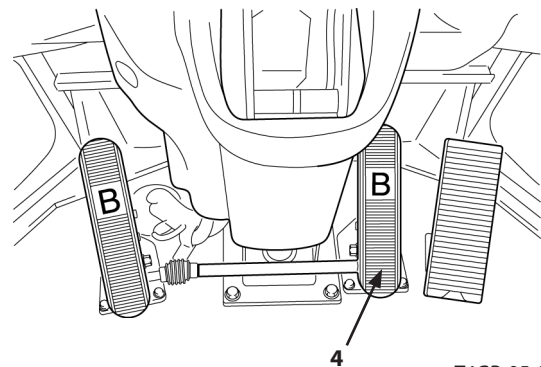


T4GB-05-04-005

- 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

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## SECTION 2

# MAINTENANCE STANDARD

### CONTENTS

#### Group 1 Body

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

#### Group 3 Front Attachment

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

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

Cylinder .....W2-3-3-1

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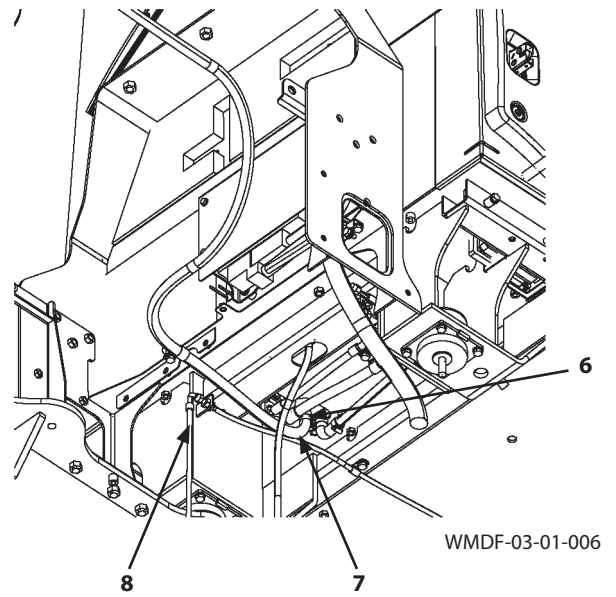
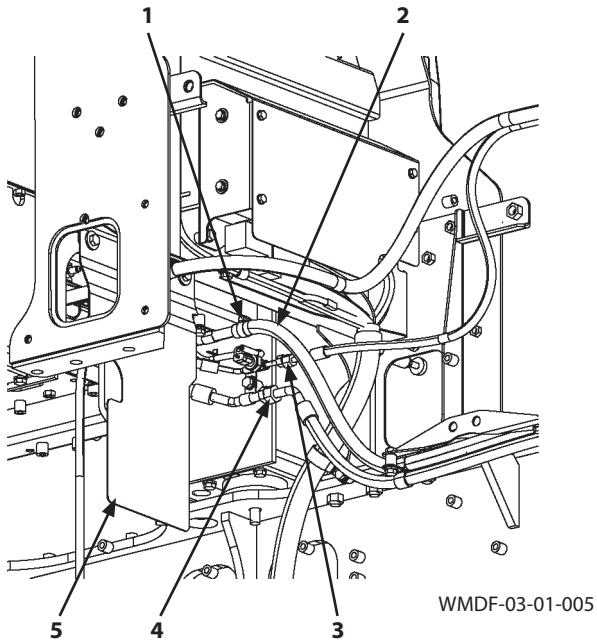
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**MEMO**


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## SECTION 3 BODY


### Group 1 Cab



27. Disconnect hose (4).

 : 27 mm

28. Disconnect hose (3).


 : 19 mm

29. Remove clamp (1). Disconnect hose (2).

 : 7 mm

30. Remove cover (5). (Refer to W3-4-2.)

31. Disconnect hose (8).

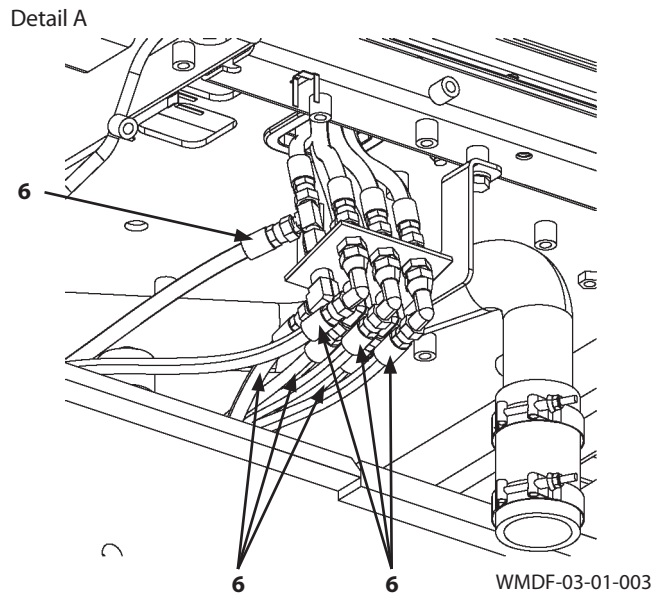
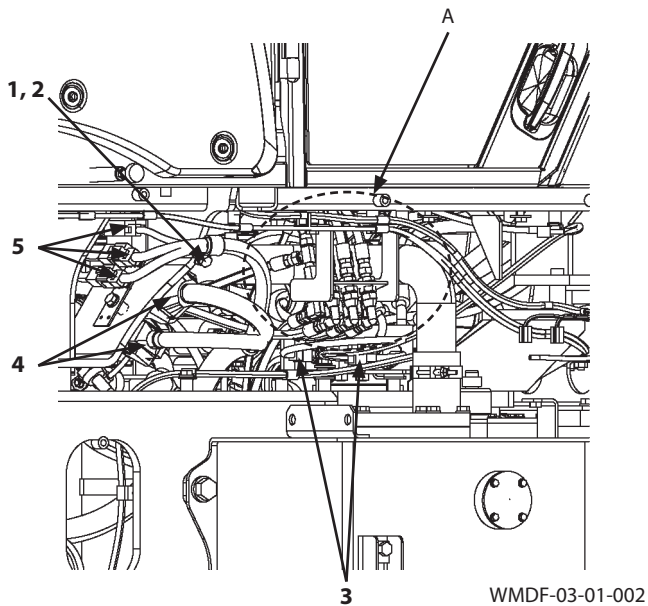
 : 17 mm

32. Remove clamp (6). Disconnect hose (7).


 : 7 mm


## SECTION 3 BODY

### Group 1 Cab



25. Connect hoses (6) (7 used).

 : 19 mm


 : 30 N·m (3 kgf·m, 22 lbf·ft)


26. Connect connectors (3) (2 used) only with the emergency steering attached.

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

28. Connect connectors (5) (3 used).

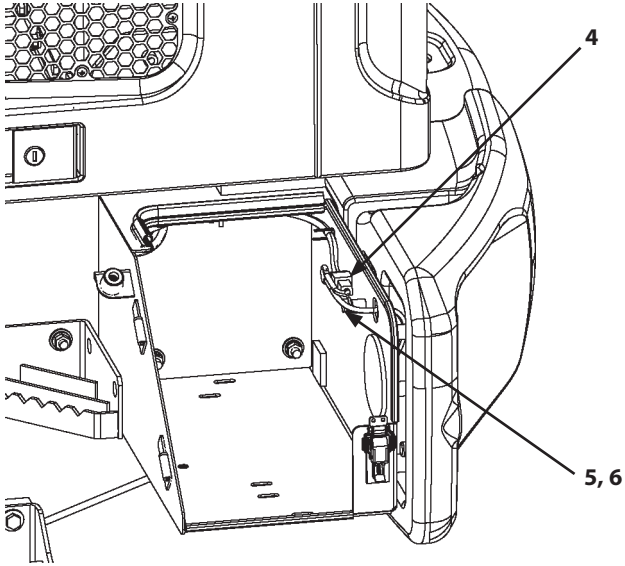
29. Install clip (2) with bolt, washer (1).

 : 17 mm

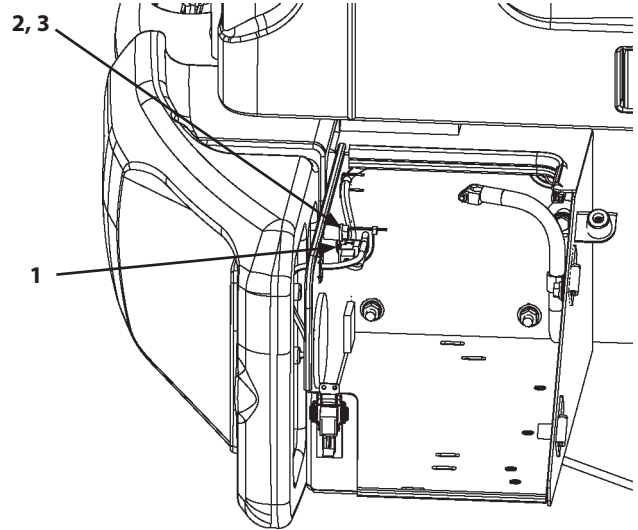
 : 50 N·m (5 kgf·m, 37 lbf·ft)

## SECTION 3 BODY

### Group 2 Counterweight





WMDF-03-02-004




WMDF-03-02-002


5. Connect connector (4).
6. Install bracket (6) with bolt, washer (5).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

7. Connect connector (1).
8. Install bracket (3) with bolt, washer (2).

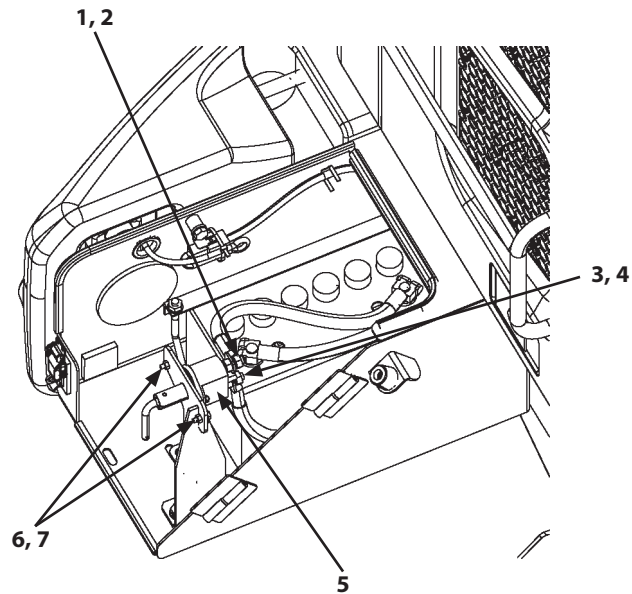
 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

## SECTION 3 BODY

### Group 2 Counterweight


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WMDF-03-02-014


#### Installation


1. Install battery disconnect switch (5) with nuts (6) (2 used) and bolts, washers (7) (2 used).

 : 10 mm


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


2. Connect ground (4) with nut (3).

 : 17 mm

 : 21 to 23 N·m (2.1 to 2.3 kgf·m, 15.5 to 17 lbf·ft)

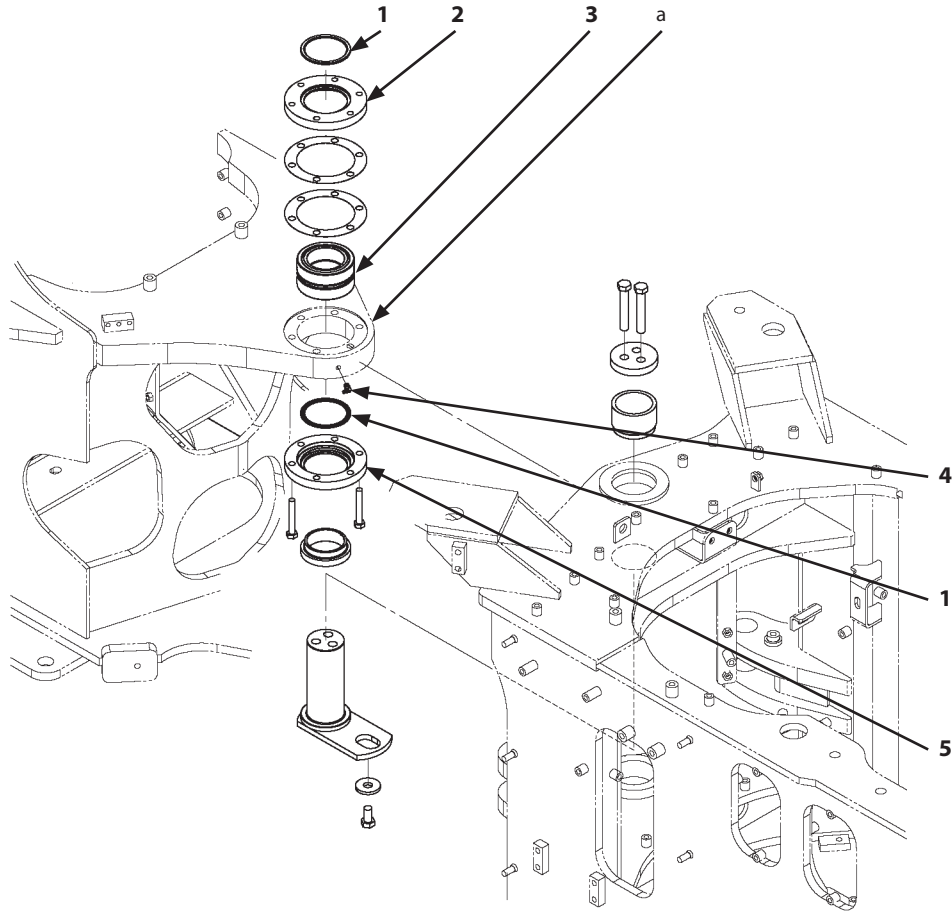
3. Connect terminal (2) with nut (1).

 : 17 mm

 : 21 to 23 N·m (2.1 to 2.3 kgf·m, 15.5 to 17 lbf·ft)

## SECTION 3 BODY

### Group 3 Center Hinge



WMDF-03-03-004

a- Upper Hinge


**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.

**IMPORTANT:** If dust seal (1) has been removed, replace it with a new one.

28. Remove dust seals (1) (2 used) from caps (2, 5) by using a screwdriver and a hammer.

**NOTE:** *LOCTITE #262 has been applied on the outer surface of dust seals (1) (2 used).*

29. Remove grease fitting (4).

 : 10 mm

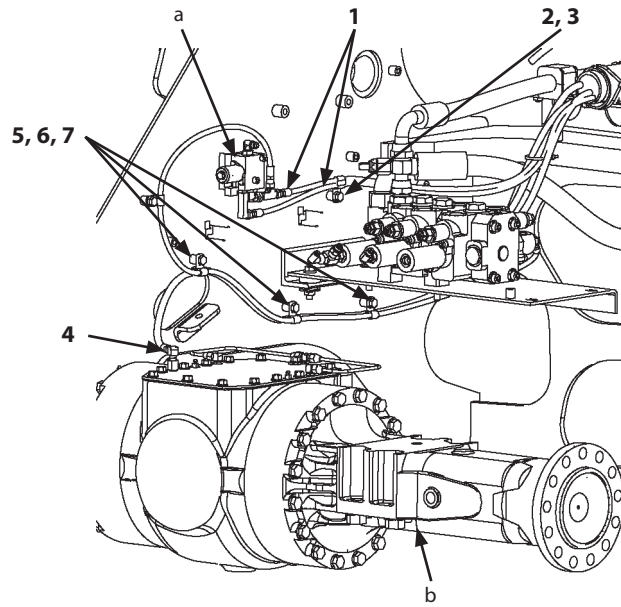
**CAUTION:** Metal fragments may fly off when a hammer is used. Wear necessary protection, such as goggles, hard hat, etc. in order to prevent personal injury.

30. Remove bearing (3) by using a round bar and a hammer.

## SECTION 3 BODY

### Group 3 Center Hinge


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WMDF-03-03-002


- a- Muffler Filter Regeneration Control Solenoid Valve      b- Front Axle


25. Connect hose (4).

 : 17 mm


 : 25 N·m (2.5 kgf·m, 18.5 lbf·ft)


26. Install clips (6, 7) (3 used for each) with bolts, washers (5) (3 used).

 : 17 mm


 : 50 N·m (5 kgf·m, 37 lbf·ft)


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

 : 17 mm

 : 25 N·m (2.5 kgf·m, 18.5 lbf·ft)

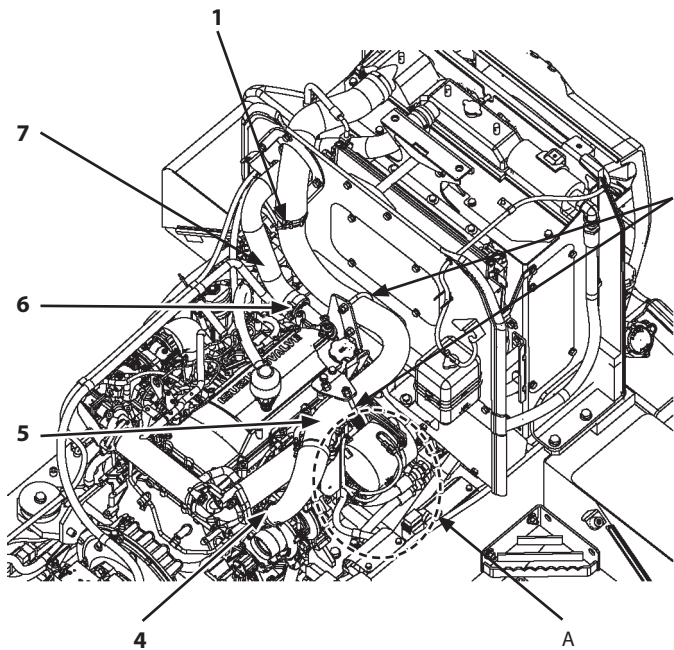
28. Install clip (3) with bolt, washer (2).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

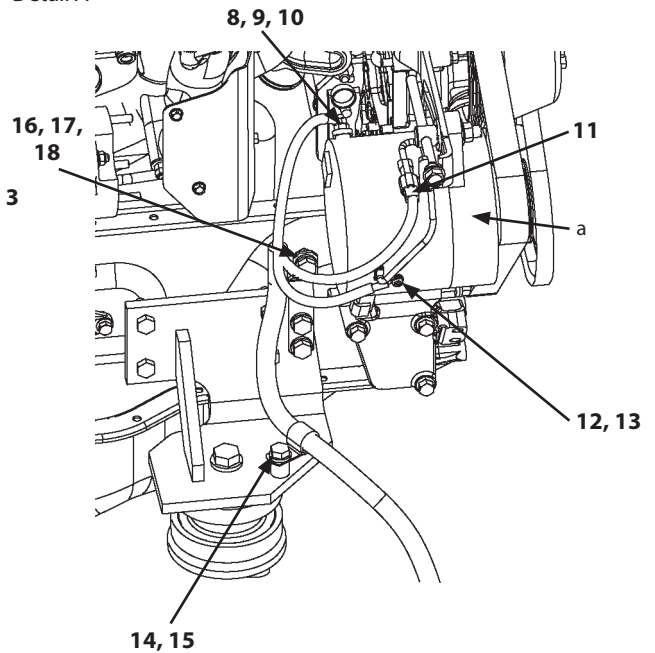
## SECTION 3 BODY

### Group 4 Engine



WMDF-03-04-016


Detail A




a- Alternator

WMDF-03-04-017


41. Remove nuts (2) (8 used) and U-bolts (3) (2 used).


 : 19 mm

42. Remove clamps (1, 4). Disconnect the both ends of the pipe (5) assembly.


 : 11 mm

43. Remove clamp (6). Disconnect hose (7).


 : 11 mm

 **NOTE:** *HERME-SEAL SS-80 has been applied on mounting surface of hose (7).*

44. Remove bolt, washer (14) and clip (15).


 : 17 mm

45. Remove bolt, washer (16), nut (17), and clip (18).

 : 17 mm

46. Disconnect connector (11).

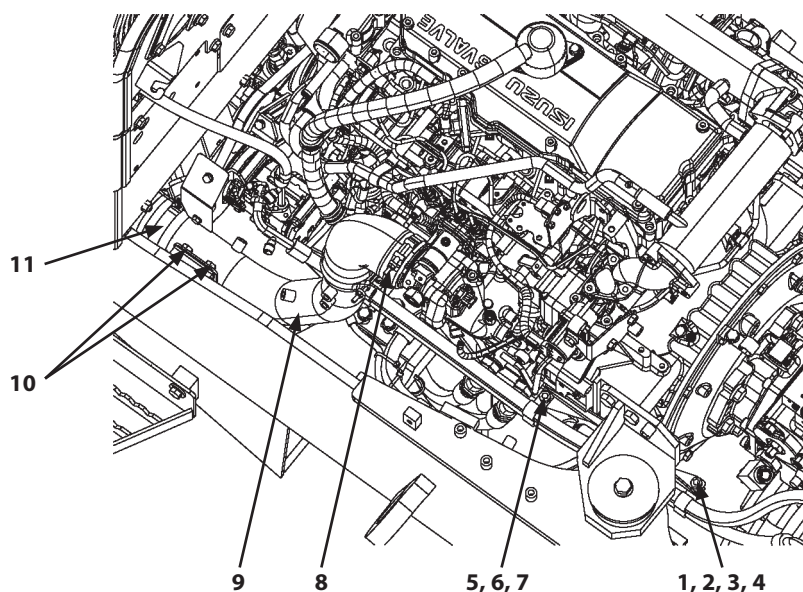
47. Remove nut (8) and washer (9). Disconnect terminal (10).

 : 10 mm

48. Remove screw (12). Disconnect terminal (13).


## SECTION 3 BODY


### Group 4 Engine




WMDF-03-04-021


21. Install clips (7) (2 used) with bolt, washer (5) and nut (6).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)


22. Install clips (4) (2 used) and collar (3) with bolt, washer (1) and nut (2).


 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)


23. Temporarily install the both ends of the pipe (9) assembly with clamps (8, 11) and bolts, washers (10) (2 used).


24. Tighten clamps (8, 11).

 : 11 mm

 : 12 N·m (1.2 kgf·m, 8.9 lbf·ft)

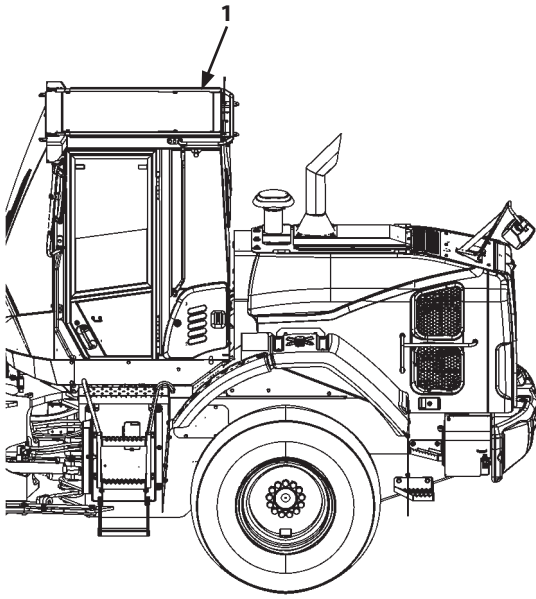
25. Tighten bolts, washers (10) (2 used).

 : 17 mm

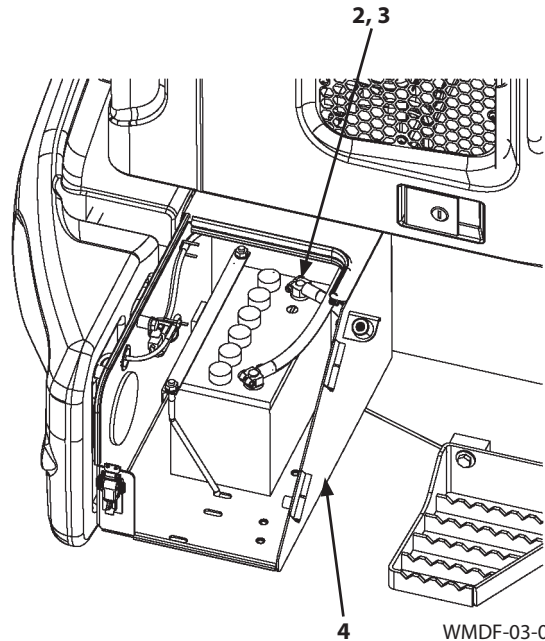
 : 50 N·m (5 kgf·m, 37 lbf·ft)

## SECTION 3 BODY

### Group 4 Engine



WMDF-04-08-002



WMDF-03-02-012


79. Install cab (1). (Refer to W3-1-1.)


80. Add coolant to the radiator.

 **NOTE:** Amount of coolant: 24 L (6.4 US gal)

81. Bleed air from the radiator. (Refer to W1-4-1.)

82. Connect ground (3). Tighten nut (2).

 : 10 mm

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

83. Close the cover of battery box (4).

84. Bleed air from the fuel system. (Refer to W1-4-1.)

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

86. Bleed air from the transmission charge pump. (Refer to W1-4-1.)

87. Operate the steering cylinder to the stroke end several times and bleed air from the circuit.

88. Bleed air from the brake (axle). (Refer to W1-4-1.)

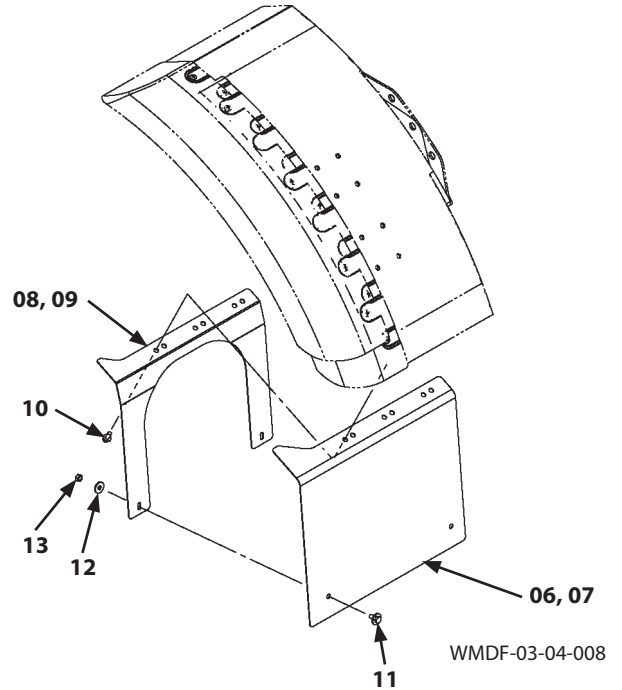
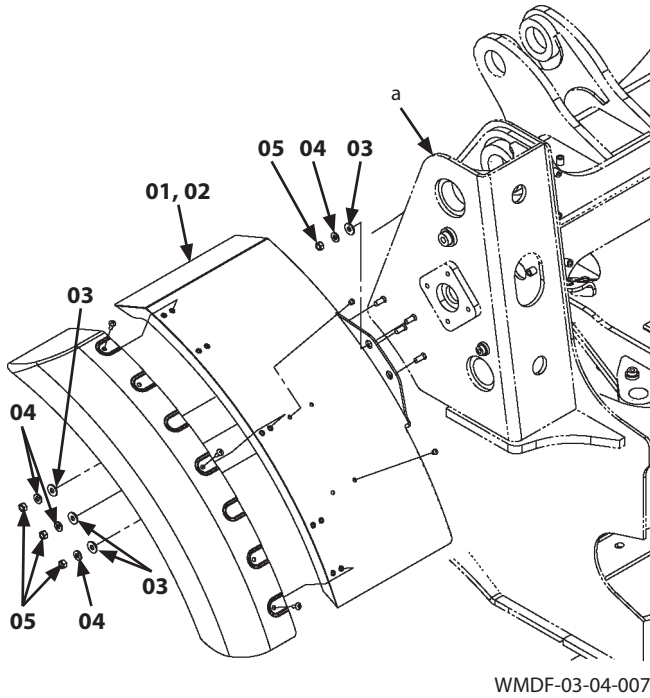
89. Fill refrigerant in the air conditioner. (Refer to T5-8 in the separated volume, Technical Manual.)

**IMPORTANT:** Check the hydraulic oil level, coolant level, transmission oil level, and engine oil level. Start the engine and check for any oil and coolant leaks.

# SECTION 3 BODY

## Group 4 Engine

### Removal and Installation of Front Fender



a- Front Frame

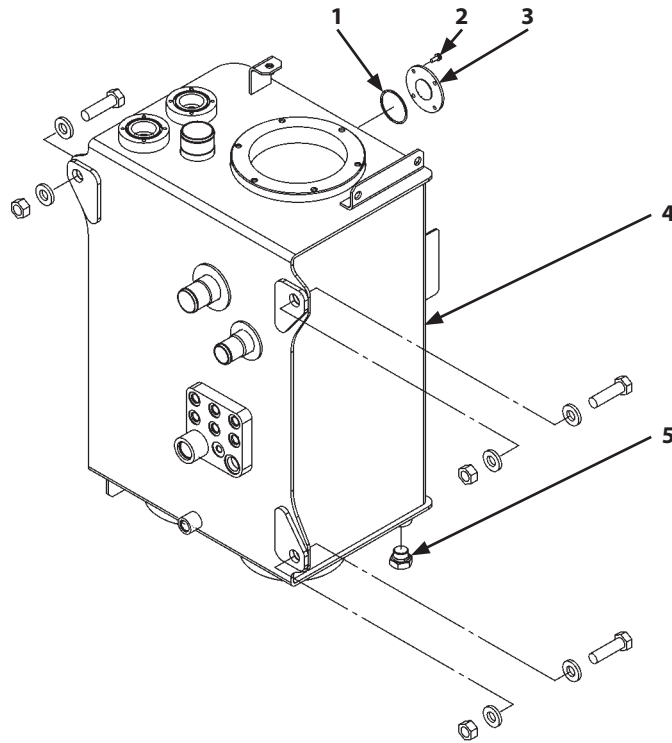
No.	Part Name	Q'ty	Wrench Size (mm)	Tightening Torque			Weight	
				N-m	kgf-m	lbf-ft	kg	lb
01	Front Fender (Left)	1					16	36
02	Front Fender (Right)	1					16	36
03	Washer	8						
04	Washer	8						
05	Nut	8	🔧 : 19	35	3.5	26		
06	Mud Guard (Left)	1						
07	Mud Guard (Right)	1						
08	Plate (Left)	1						
09	Plate (Right)	1						
10	Bolt, Washer	6	🔧 : 17	50	5	37		
11	Bolt, Washer	4	🔧 : 17	50	5	37		
12	Washer	4						
13	Nut	4	🔧 : 17	50	5	37		

**IMPORTANT:** Before installing bolt, washer (11), apply LOCTITE #262 onto it.

## SECTION 3 BODY

### Group 5 Radiator Assembly

#### Replacement of Radiator, Oil Cooler, and Intercooler



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):

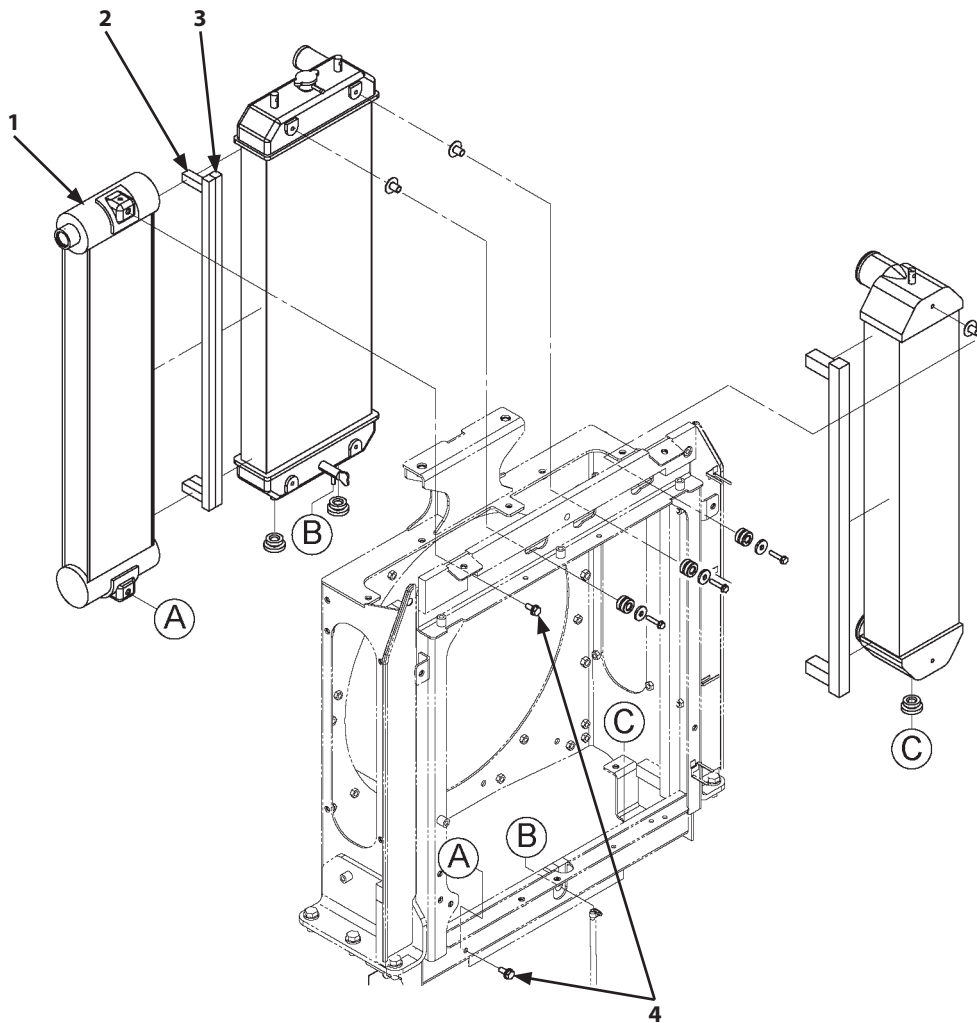
 : 36 mm

 : 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 5 Radiator Assembly



WMDF-03-05-005

4. Install all removed adapters to oil cooler (1).
5. Install rubber seals (3) (2 used) and rubber seals (2) (3 used) to oil cooler (1).
6. Install oil cooler (1) with bolts, washers (4) (2 used).

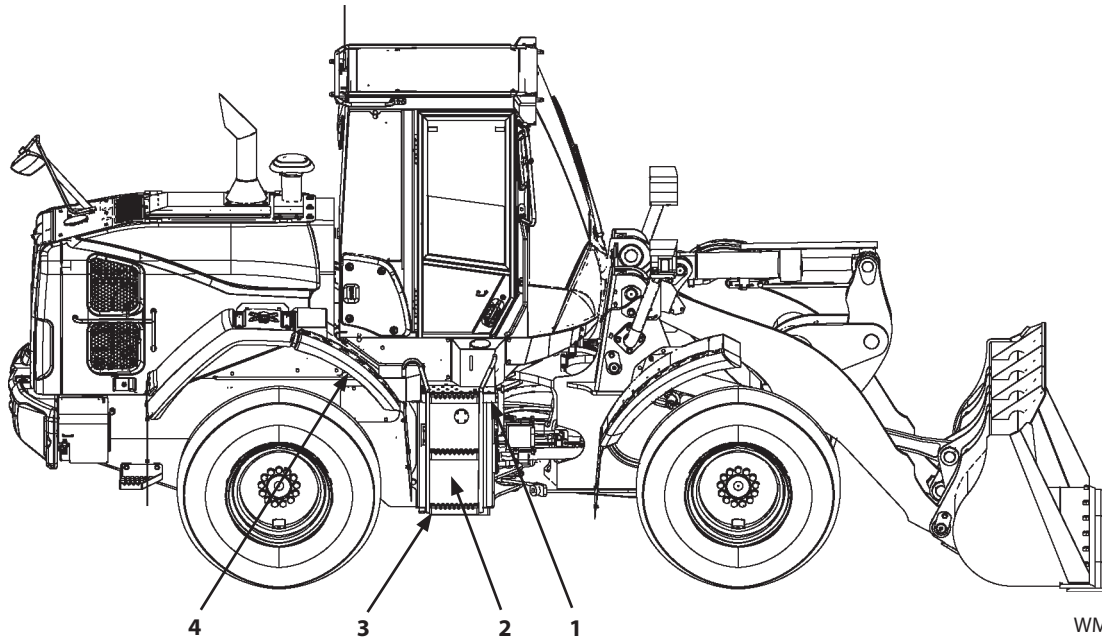
 : 17 mm

 : 36.2 N·m (3.6 kgf·m, 26.5 lbf·ft)

## SECTION 3 BODY

### Group 6 Hydraulic Oil Tank

#### Removal and Installation of Hydraulic Oil Tank



WMDF-03-06-001

**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. Wait for oil in order 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 (2). (Refer to W1-4-1.)

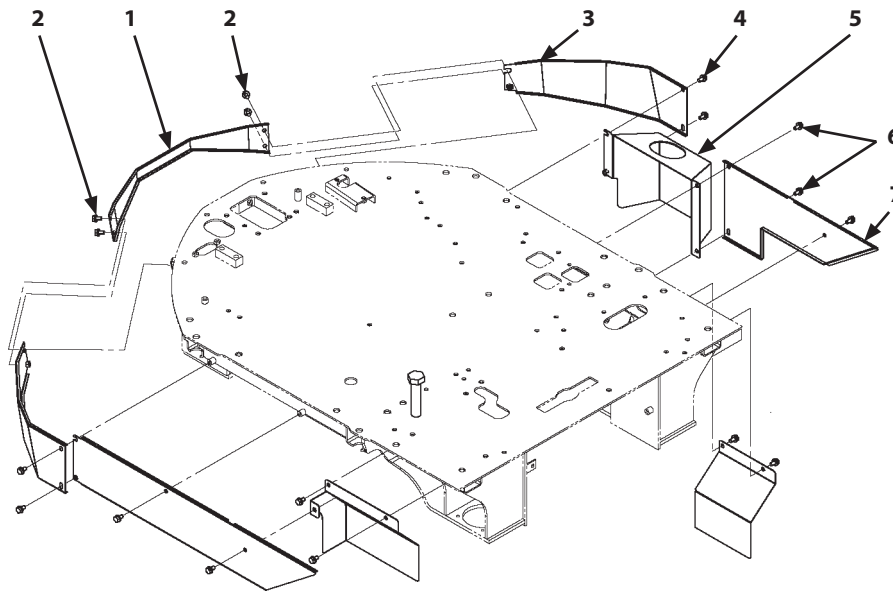
2. Remove the following parts. (Refer to W3-4-2.)

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

## SECTION 3 BODY

### Group 6 Hydraulic Oil Tank


---



WMDF-03-06-006


24. Install covers (5, 7) with bolts, washers (6) (3 used).

 : 17 mm


 : 50 N·m (5 kgf·m, 37 lbf·ft)


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

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

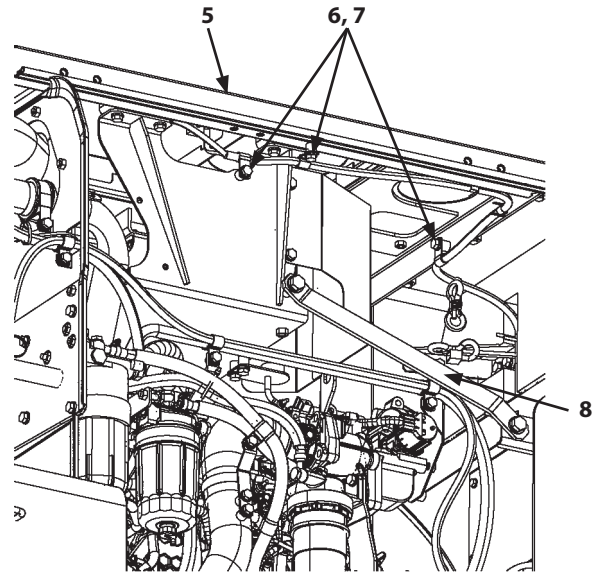
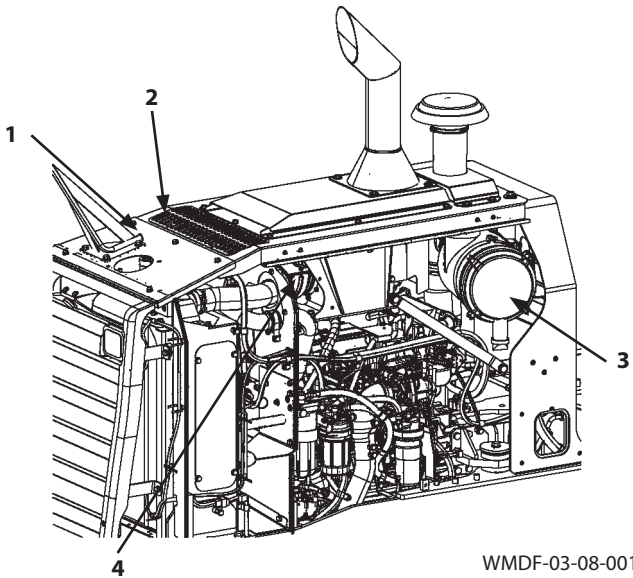
26. Install cover (1) with bolts, washers (2) (4 used).

 : 17 mm


 : 50 N·m (5 kgf·m, 37 lbf·ft)

## SECTION 3 BODY

### Group 8 Pump Device



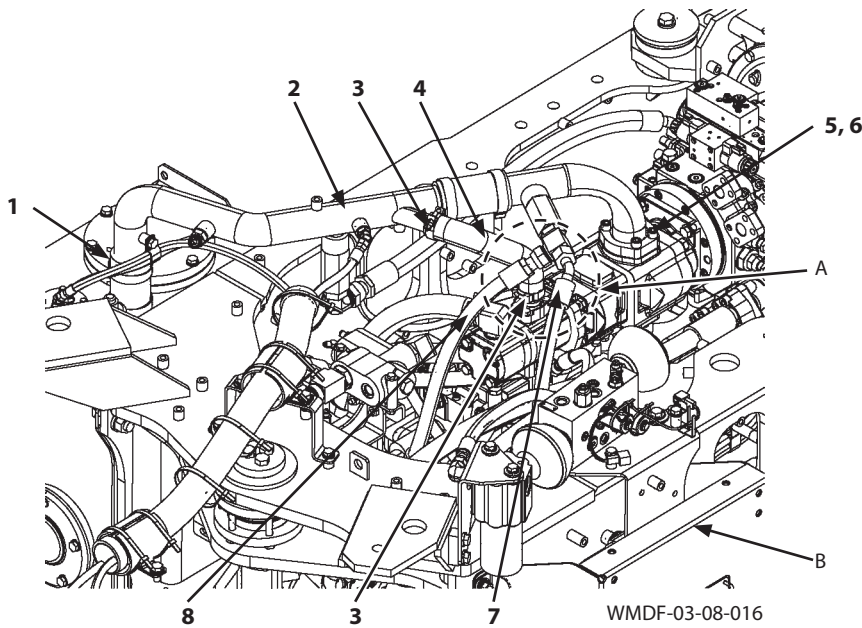
5. Remove the muffler filter (4) assembly. (Refer to W3-17-1.)
6. Remove the air cleaner (3) assembly. (Refer to W3-4-3.)
7. Remove brackets (8) at right and left sides. (Refer to W3-4-2.)
8. Remove bolts, washers (6) (3 used) and clips (7) (3 used).

 : 17 mm

9. Remove covers (1, 2). (Refer to W3-4-2.)
10. Remove the harnesses from all clips of cover (5).
- ⚠ CAUTION: The cover (5) assembly weight: 53 kg (120 lb)**
11. Remove the cover (5) assembly. (Refer to W3-4-2.)

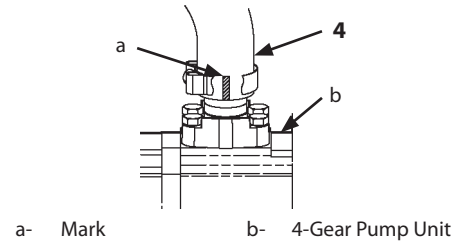
## SECTION 3 BODY

### Group 8 Pump Device



WMDF-03-08-016

Detail A

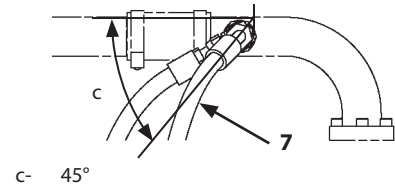


a- Mark

b- 4-Gear Pump Unit

WMDF-03-08-014

View B





c- 45°

WMDF-03-08-015


20. Temporarily install the suction pipe (2) assembly and O-ring (6) with socket bolts (5) (4 used) and clamp (1).


21. Tighten socket bolts (5) (4 used).

 : 10 mm

 : 105 N·m (10.5 kgf·m, 77 lbf·ft)


22. Tighten clamp (1).


 : 11 mm

 : 9.8 N·m (1 kgf·m, 7.2 lbf·ft)

**IMPORTANT: Connect hose (4) with mark (a) facing to the left side of body.**

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


 : 9.5 mm

 : 7.2 N·m (0.7 kgf·m, 5.3 lbf·ft)

**IMPORTANT: Check the angle to install hose (7).**

24. Connect hoses (7, 8).

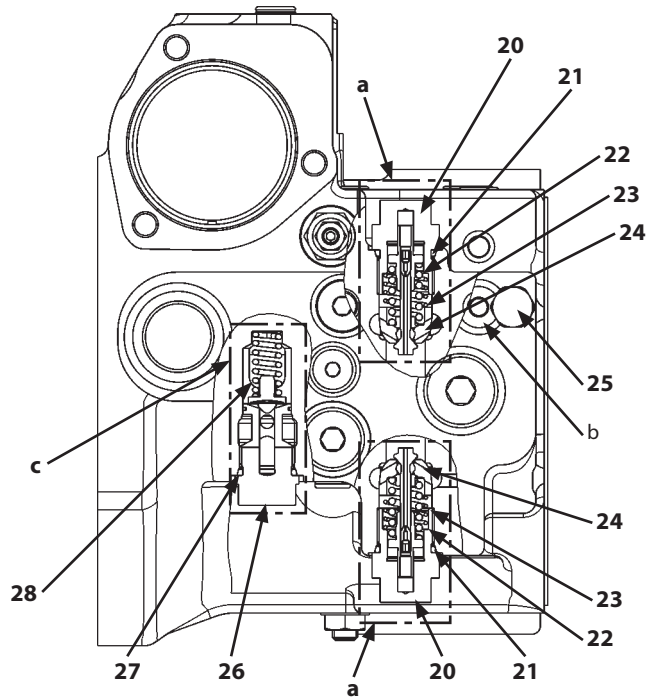
 : 36 mm

 : 180 N·m (18 kgf·m, 133 lbf·ft)

# SECTION 3 BODY

## Group 8 Pump Device

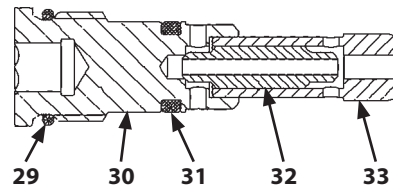
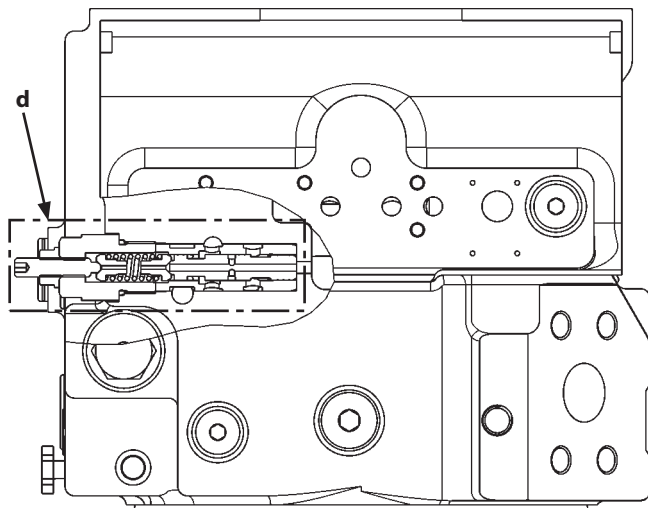
Section D



WMDF-03-08-036

Section E

Detail of Shuttle Valve (b)



WMDF-03-08-038

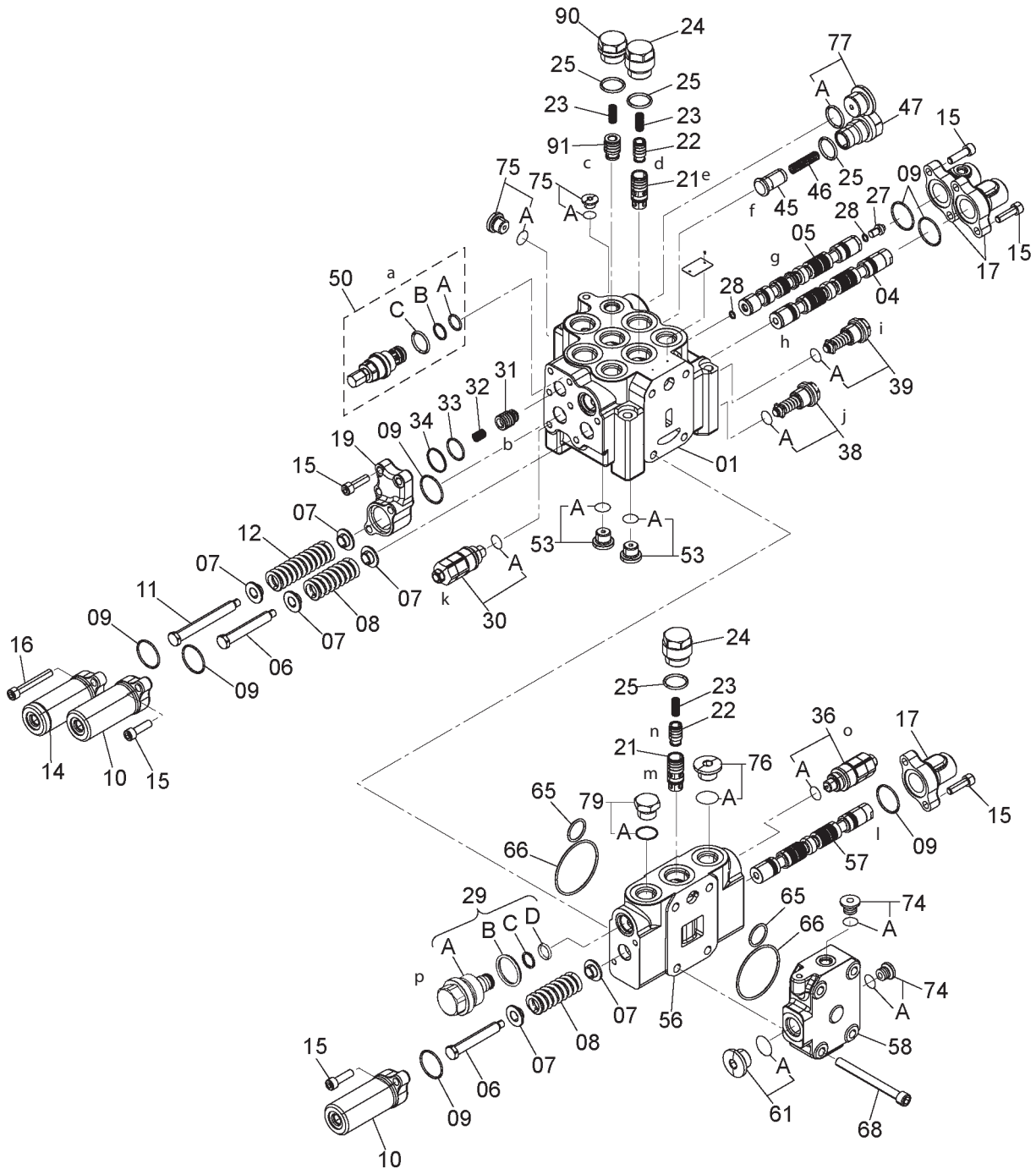
WMDF-03-08-037

- |                                        |                                            |                              |                 |
|----------------------------------------|--------------------------------------------|------------------------------|-----------------|
| 1- Gasket                              | 10- Retaining Ring                         | 18- Pump Displacement Angle  | 26- Valve       |
| 2- Gear Pump                           | 11- Shaft Seal                             | Control Solenoid Valve       | 27- O-Ring      |
| 3- Flange                              | 12- Flange                                 | 19- Socket Bolt (6 Used)     | 28- Spring      |
| 4- Drive Shaft                         | 13- Pump Case                              | 20- Screw (2 Used)           | 29- O-Ring      |
| 5- O-Ring                              | 14- Gasket                                 | 21- O-Ring (2 Used)          | 30- Screw       |
| 6- O-Ring                              | 15- Forward/Reverse Control Solenoid Valve | 22- O-Ring (2 Used)          | 31- O-Ring      |
| 7- Plate                               |                                            | 23- Spring (2 Used)          | 32- Piston      |
| 8- Kant Seal                           | 16- Socket Bolt (4 Used)                   | 24- Valve (2 Used)           | 33- Sleeve      |
| 9- O-Ring                              | 17- Socket Bolt (8 Used)                   | 25- Bolt                     |                 |
| a- High-Pressure Relief Valve (2 Used) | b- Shuttle Valve                           | c- Low-Pressure Relief Valve | d- Cutoff Valve |

# SECTION 3 BODY

## Group 9 Control Valve

### Disassembly of Control Valve



WMDF-03-09-011

## SECTION 3 BODY


### Group 9 Control Valve


- Assembly of Main Relief Valve (a)

**IMPORTANT: If the main relief valve 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.**


10. Install O-rings (50A, 50C) and backup ring (50B) to main relief valve (50). Install main relief valve (50) to housing (01).


 : 27 mm

 : 177 to 206 N·m (17.7 to 20.6 kgf·m, 131 to 152 lbf·ft)

- Assembly of Make-Up Valve (Lift Arm: Rod Side) (b)


11. Install poppet (31) and spring (32) to housing (01).
12. Install O-rings (09, 33) and backup ring (34) to pilot housing (19). Install pilot housing (19) to housing (01) with socket bolts (15) (3 used).


 : 8 mm

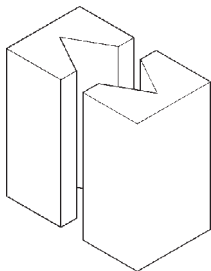
 : 49 to 54 N·m (4.9 to 5.4 kgf·m, 36 to 40 lbf·ft)

- Assembly of Muffler Filter Regeneration/Quick Coupler Spool (l)

13. Secure spool (57) in a vise by using wooden pieces as illustrated. Install spring seats (07) (2 used) and spring (08) to spool (57) with bolt (06).

 : 19 mm


 : 25 to 30 N·m (2.5 to 3 kgf·m, 18.5 to 22 lbf·ft)




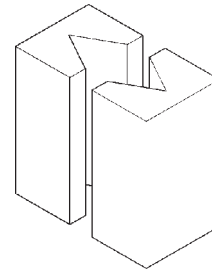
W4GB-02-05-002

- Assembly of Bucket Spool (h)

14. Secure spool (04) in a vise by using wooden pieces as illustrated. Install spring seats (07) (2 used) and spring (08) to spool (04) with bolt (06).

 : 19 mm


 : 25 to 30 N·m (2.5 to 3 kgf·m, 18.5 to 22 lbf·ft)




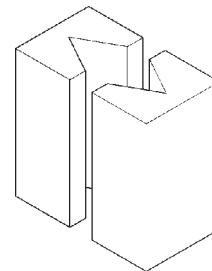
W4GB-02-05-002

- Assembly of Lift Arm Spool (g)

15. Secure spool (05) in a vise by using wooden pieces as illustrated. Install spring seats (07) (2 used), spring (12), and O-ring (28) to spool (05) with bolt (11).

 : 19 mm


 : 25 to 30 N·m (2.5 to 3 kgf·m, 18.5 to 22 lbf·ft)



W4GB-02-05-002

16. Install O-ring (28) to plug (27). Install plug (27) to spool (05).

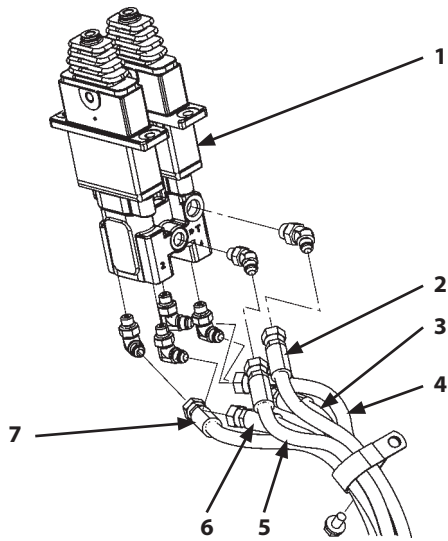
 : 8 mm

 : 25 to 30 N·m (2.5 to 3 kgf·m, 18.5 to 22 lbf·ft)

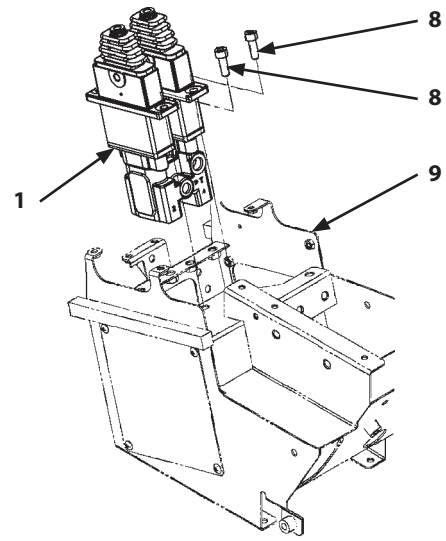
## SECTION 3 BODY

### Group 10 Pilot Valve

---




WNEC-03-10-014




WNEC-03-10-016

15. Disconnect hoses (2, 3, 4, 5, 6, and 7).

 : 19 mm

16. Remove socket bolts (8) (4 used).


 : 8 mm


17. Remove pilot valve (1) from frame (9).  
18. Remove the adapters with pilot valve (1) attached if necessary.

## SECTION 3 BODY

### Group 10 Pilot Valve

16. Tighten nut (11C) to the specified torque.

 : 19 mm

 :  $40\pm 4$  N·m ( $4\pm 0.4$  kgf·m,  $30\pm 3$  lbf·ft)

17. Install boot (13) to the lever (11A) assembly.

**IMPORTANT: Check the direction to install handle (1).**

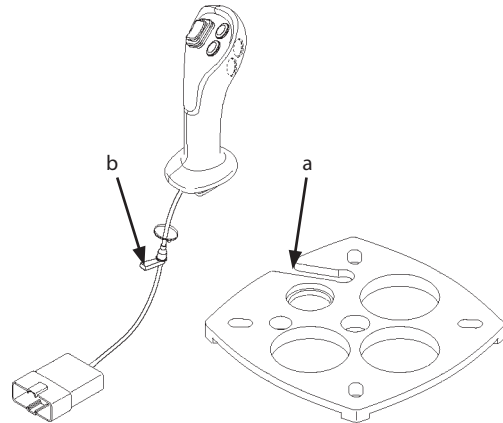
18. Install handle (1) to lever (11A).

**IMPORTANT: The thread part of handle (1) is made of resin. Take care not to tighten screw (11B) excessively.**

19. Install screw (11B) to handle (1) by using a star screwdriver.
20. Install boot (13) to handle (1).

**IMPORTANT: Install the harness of handle (1) by winding around lever (11A). At this time, adjust the harness in order not to rub.**

21. Install bracket (b) of the harness of handle (1) to groove (a) on plate (51). Secure the harness.



WNEC-03-10-005

a- Groove

b- Bracket

22. Lower and install boot (13) to handle (51).

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## SECTION 3 BODY

### Group 10 Pilot Valve

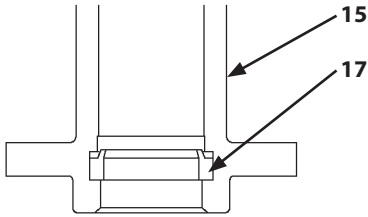
#### Assembly of Pilot Valve (Two Lever Type)

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

- Assembly of Pilot Valve Assemblies at Port 3 Section and Port 4 Section

**IMPORTANT:** Check the direction to install scraper (17).

1. Apply grease onto scrapers (17) (2 used). Install scrapers (17) (2 used) to detent bushings (15) (2 used).



W4GB-02-06-014

2. Apply grease onto the sliding surface of detent bushings (15) (2 used) and detent rings (10) (2 used). Install detent rings (10) (2 used) and springs (11) (2 used) to detent bushings (15) (2 used).

**IMPORTANT:** Check the direction to install push rods (12) (2 used).

3. Install push rods (12) (2 used) to the detent bushing (15) assemblies (2 used).

**CAUTION:** Take care that detent rings (10) (2 used) do not fly out due to springs (11) (2 used).

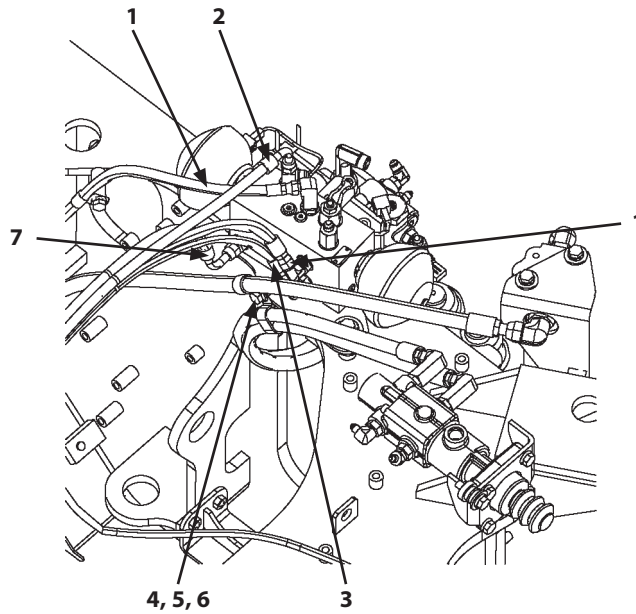
**IMPORTANT:** Adjust push rods (12) (2 used) so that steel balls (16) (8 used) fit on the constricted parts of push rods (12) (2 used).

4. Compress springs (11) (2 used) while holding detent rings (10) (2 used). Apply grease onto steel balls (16) (8 used). Install steel balls (16) (8 used) to the detent bushing (15) assemblies (2 used).
5. Install O-rings (13) (2 used) to cover (9).
6. Check the position before disassembling and install the detent bushing (15) assemblies (2 used) to cover (9).
7. Temporarily tighten screws (3) (2 used) and nuts (2) (2 used) to lever (4).

## SECTION 3 BODY


### Group 11 Brake Charge Valve

---




WMDF-03-12-003


18. Remove bolt, washer (4) and clips (5, 6).

 : 17 mm


19. Disconnect hose (2).

 : 19 mm


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

 : 19 mm

21. Disconnect hose (3).

 : 17 mm

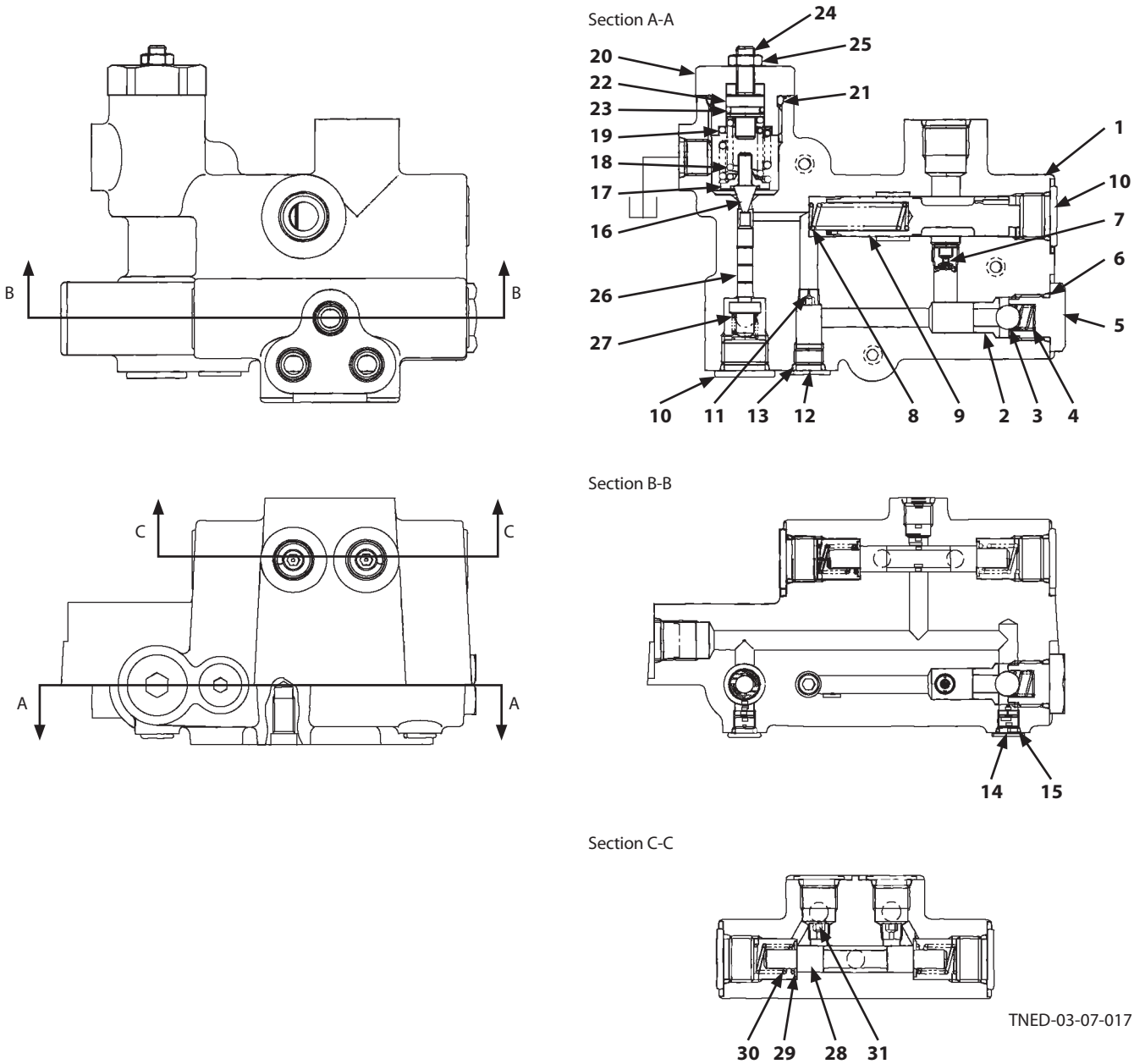
22. Disconnect hose (7).

 : 19 mm

# SECTION 3 BODY

## Group 11 Brake Charge Valve

### Structure of Brake Charge Valve



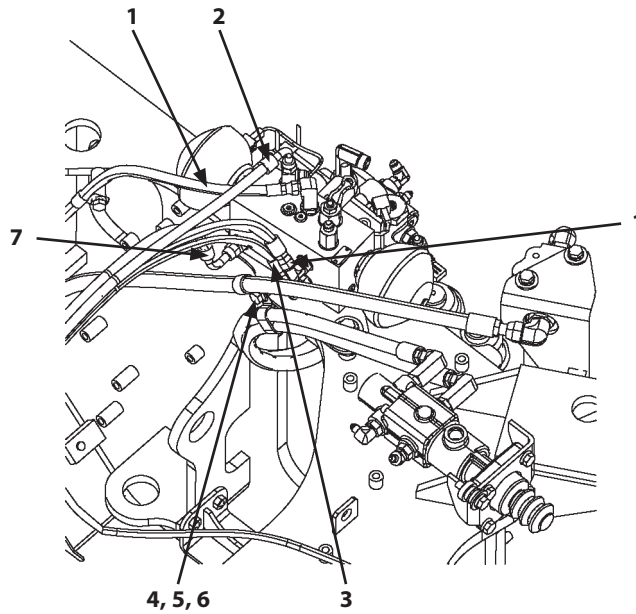
TNED-03-07-017

- |                |                   |                 |              |
|----------------|-------------------|-----------------|--------------|
| 1- Body        | 9- Priority Valve | 17- Spring Seat | 25- Lock Nut |
| 2- Valve Seat  | 10- Plug          | 18- Spring      | 26- Piston   |
| 3- Check Valve | 11- Orifice       | 19- Spring      | 27- Spring   |
| 4- Spring      | 12- Plug          | 20- Plug        | 28- Spool    |
| 5- Plug        | 13- O-Ring        | 21- O-Ring      | 29- Washer   |
| 6- O-Ring      | 14- Plug          | 22- Seat        | 30- Spring   |
| 7- Filter      | 15- O-Ring        | 23- O-Ring      | 31- Orifice  |
| 8- Spring      | 16- Pilot Piston  | 24- Screw       |              |

## SECTION 3 BODY


### Group 12 Manifold Valve

---




WMDF-03-12-003


16. Remove bolt, washer (4) and clips (5, 6).

 : 17 mm


17. Disconnect hose (2).

 : 19 mm


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

 : 19 mm

19. Disconnect hose (3).

 : 17 mm

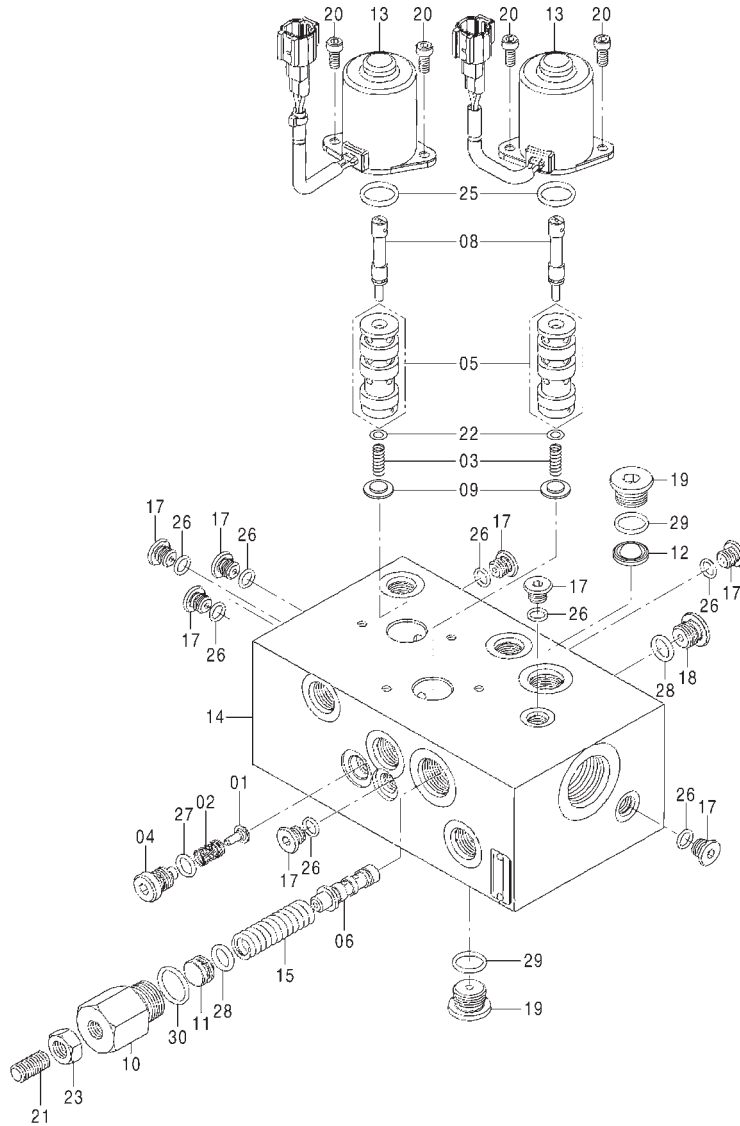
20. Disconnect hose (7).

 : 19 mm

## SECTION 3 BODY

### Group 12 Manifold Valve

#### Disassembly of Manifold Valve



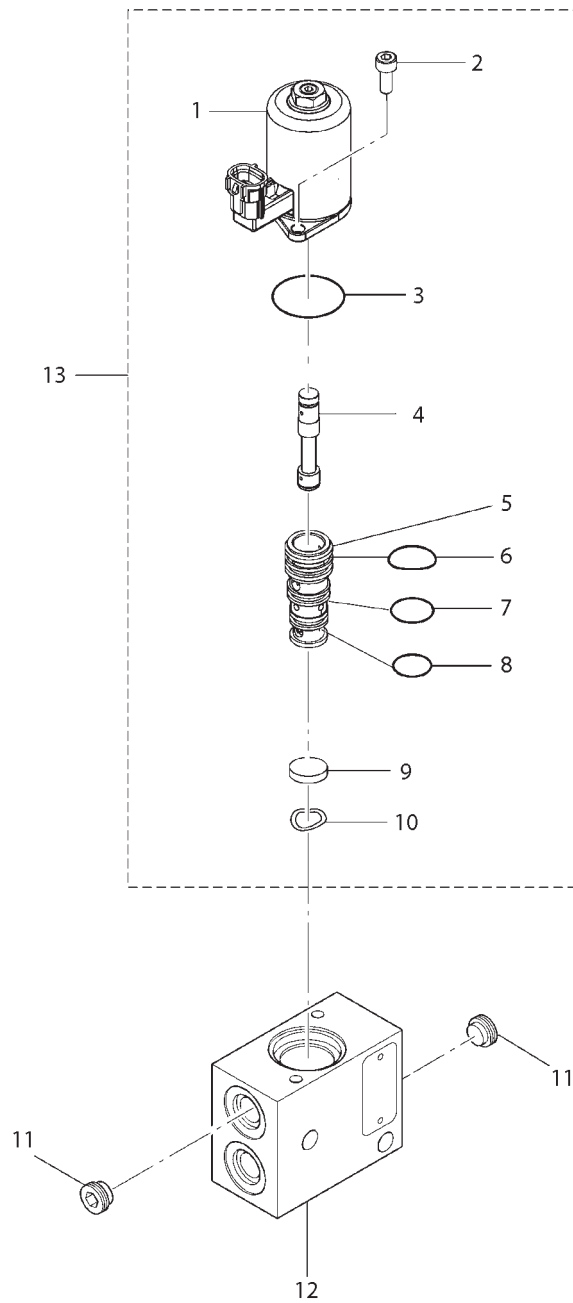
WMDF-03-12-006

- |                     |                       |                          |                     |
|---------------------|-----------------------|--------------------------|---------------------|
| 01- Plunger         | 09- Stopper (2 Used)  | 17- Plug (8 Used)        | 25- O-Ring (2 Used) |
| 02- Spring          | 10- Plug              | 18- Plug                 | 26- O-Ring (8 Used) |
| 03- Spring (2 Used) | 11- Plug              | 19- Plug (2 Used)        | 27- O-Ring          |
| 04- Plug            | 12- Filter            | 20- Socket Bolt (4 Used) | 28- O-Ring (2 Used) |
| 05- Sleeve (2 Used) | 13- Solenoid (2 Used) | 21- Screw                | 29- O-Ring (2 Used) |
| 06- Spool           | 14- Body              | 22- Washer (2 Used)      | 30- O-Ring          |
| 08- Spool (2 Used)  | 15- Spring            | 23- Nut                  |                     |

# SECTION 3 BODY

## Group 13 Solenoid Valve

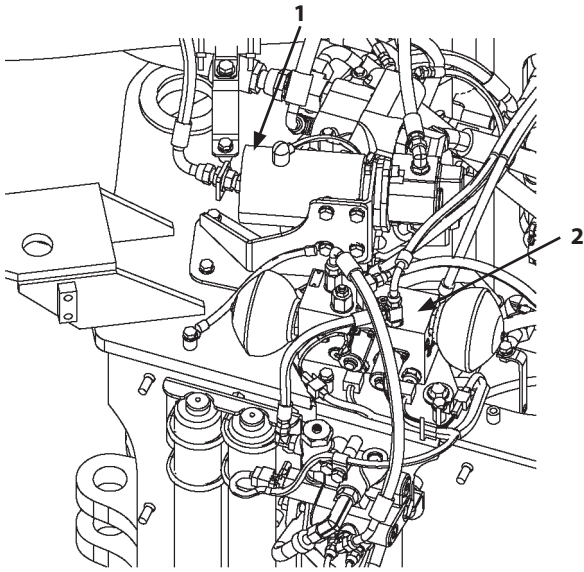
### Structure of Muffler Filter Regeneration Control Solenoid Valve



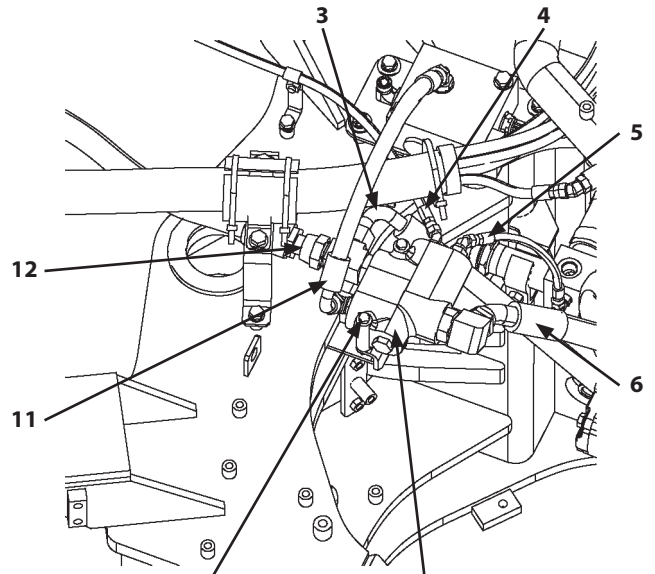
WMDF-03-13-001

## SECTION 3 BODY

### Group 14 Priority Valve



WMDF-03-14-001




WMDF-03-14-003


6. Remove the manifold valve (2) assembly. (Refer to W3-12-1.)

7. Remove emergency steering pump (1). (Refer to W4-8-1.)


8. Disconnect hose (11).

 : 27 mm


9. Disconnect hoses (6, 12).

 : 41 mm


10. Disconnect hose (3).

 : 36 mm


11. Disconnect hose (4).

 : 19 mm

12. Disconnect hose (5).

 : 17 mm

13. Remove bolts (8) (2 used), washers (9) (2 used), and nuts (10) (2 used). Remove priority valve (7).

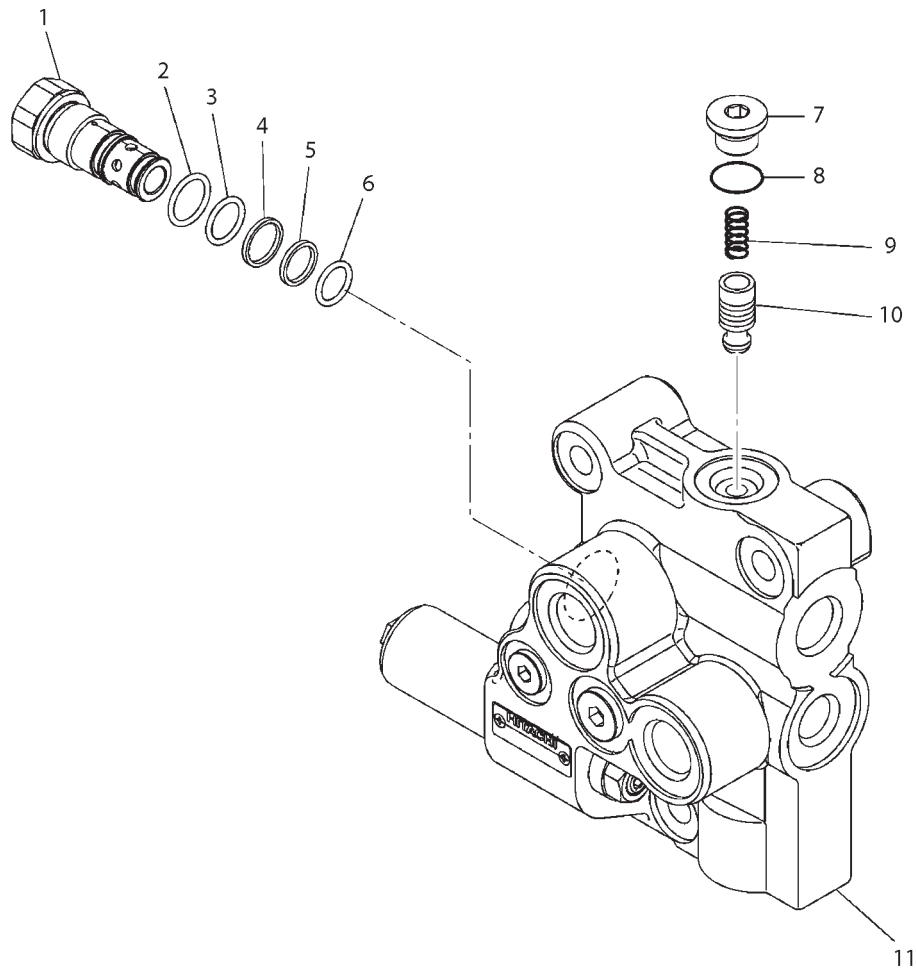
 : 13 mm

14. Remove the adapters with priority valve (7) attached if necessary.

## SECTION 3 BODY

### Group 15 Cooling Fan System

#### Structure of Fan Valve



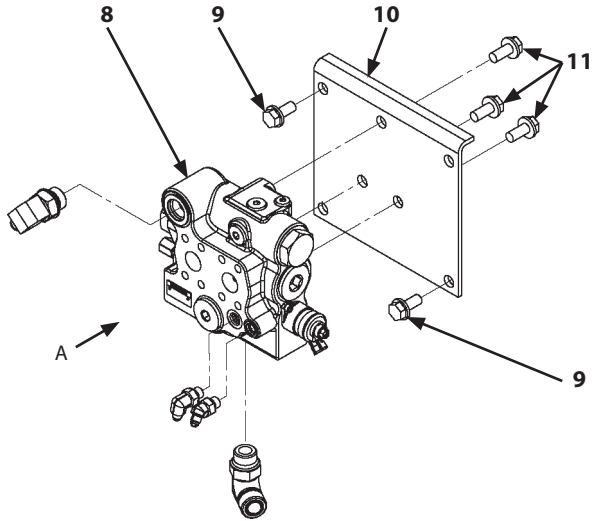
WMDF-03-15-004

No.	Part Name	Q'ty	Wrench Size (mm)	Tightening Torque			Remark
				N·m	kgf·m	lbf·ft	
1	Relief Valve	1	: 32	180 <sup>+30</sup> <sub>0</sub>	18 <sup>+3</sup> <sub>0</sub>	133 <sup>+22</sup> <sub>0</sub>	
2	O-Ring	1					
3	O-Ring	1					
4	Backup Ring	1					
5	Backup Ring	1					
6	O-Ring	1					
7	Plug	1	: 8	70 <sup>+15</sup> <sub>0</sub>	7 <sup>+1.5</sup> <sub>0</sub>	52 <sup>+11</sup> <sub>0</sub>	
8	O-Ring	1					
9	Spring	1					
10	Valve	1					
11	Housing	1					

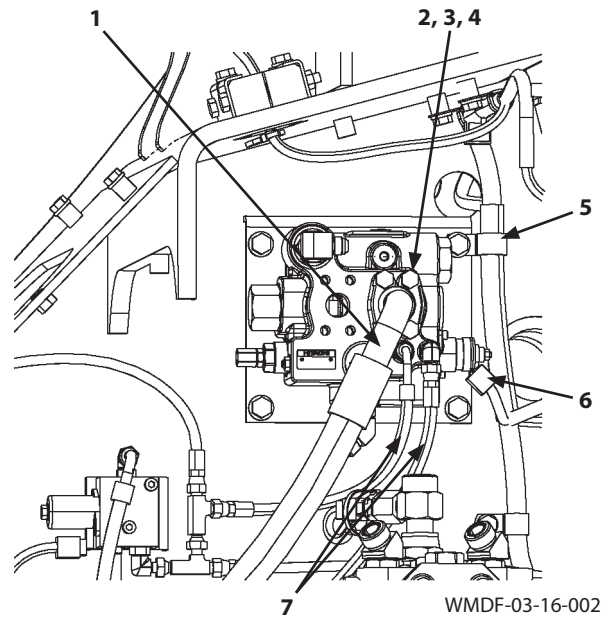
NOTE: Replace the parts except for O-rings (2, 3, 6, 8), backup rings (4, 5), and plug (7) as the fan valve assembly.

## SECTION 3 BODY

### Group 16 Ride Control Device

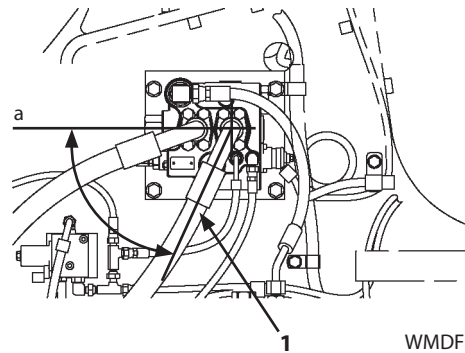


WNDB-03-16-007



WMDF-03-16-002

View A



a- 65°

WMDF-03-16-006

#### Installation

1. Install all removed adapters to ride control valve (8).
2. Install ride control valve (8) to bracket (10) with bolts, washers (11) (3 used).

: 19 mm

: 90 N·m (9 kgf·m, 66 lbf·ft)

3. Install the ride control valve (8) assembly and clip (5) with bolts, washers (9) (4 used).

: 19 mm

: 90 N·m (9 kgf·m, 66 lbf·ft)

4. Connect connector (6).
5. Connect hoses (7) (2 used).

: 17 mm

: 25 N·m (2.5 kgf·m, 18.5 lbf·ft)

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

6. Install O-ring (4). Install hose (1) with flanges (3) (2 used) and bolts (2) (4 used).

: 17 mm


: 50 N·m (5 kgf·m, 37 lbf·ft)


## SECTION 3 BODY

### Group 16 Ride Control Device


---

10. Install O-ring (26A) to plug (26). Install plug (26) to housing (32A).

 : 5 mm


 : 15 to 18 N·m (1.5 to 1.8 kgf·m, 11 to 13.5 lbf·ft)


11. Install O-ring (27A) to plug (27). Install plug (27) to housing (32A).

 : 8 mm


 : 69 to 74 N·m (7 to 7.6 kgf·m, 51 to 55 lbf·ft)


12. Install O-ring (28A) to plug (28). Install plug (28) to housing (32A).

 : 12 mm


 : 235 to 264 N·m (24 to 27 kgf·m, 175 to 195 lbf·ft)

13. Install O-rings (34A, 34C) and backup ring (34B) to relief valve (34). Install relief valve (34) to housing (32A).

 : 27 mm

 : 177 to 206 N·m (18 to 21 kgf·m, 131 to 152 lbf·ft)

14. Install plug (07) to housing (32A).

 : 6 mm

 : 10 to 13 N·m (1 to 1.3 kgf·m, 7.4 to 9.6 lbf·ft)

**IMPORTANT: Replace plate (08E) as the ride control valve assembly.**

15. Install washer (08F) and plate (08E) to housing (32A).


**IMPORTANT: Replace sleeve (08A) and spool (08B) as the ride control valve assembly.**


16. Install O-rings (08I, 08J, 08K) and spool (08B) to sleeve (08A). Install the sleeve (08A) assembly to housing (32A).

**IMPORTANT: When installing solenoid (08C), do not drop spring (08D) and O-ring (08H).**


**IMPORTANT: Replace solenoid (08C) and spring (08D) as the ride control valve assembly.**


17. Install O-ring (08H) to housing (32A). Install spring (08D) to solenoid (08C). Install solenoid (08C) to housing (32A) with socket bolts (08G) (2 used).

 : 4 mm


 : 5 to 7 N·m (0.5 to 0.7 kgf·m, 3.7 to 5.2 lbf·ft)

18. Install O-ring (23) to drain plug (22). Install drain plug (22) to housing (32A).

 : 4 mm

 : 7 to 9 N·m (0.7 to 0.9 kgf·m, 5.2 to 6.6 lbf·ft)

**IMPORTANT: Install nut (24) while securing drain plug (22) by using a hexagonal wrench in order not to turn them.**

 : 4 mm

19. Install nut (24) to drain plug (22).

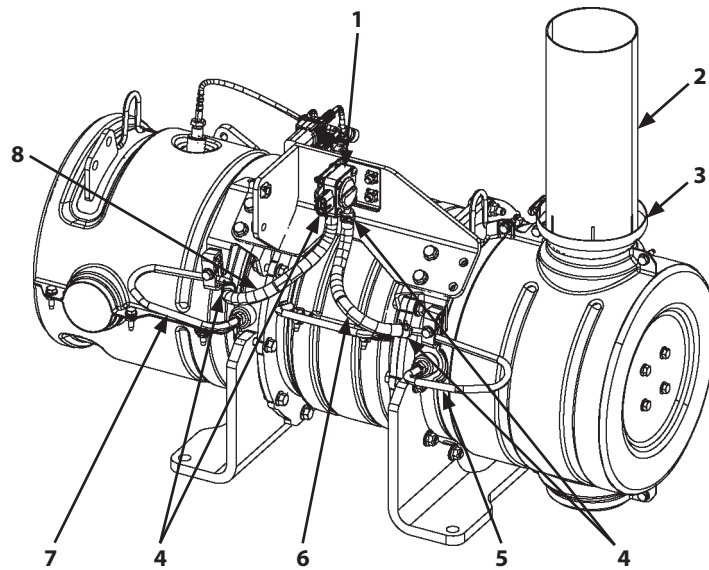
 : 13 mm

 : 10 to 12 N·m (1 to 1.2 kgf·m, 7.4 to 8.9 lbf·ft)

## SECTION 3 BODY

### Group 17 Muffler Filter

---



WMDF-03-17-004


**IMPORTANT:** The specified length of hoses (6, 8) are 210 mm (8.3 in). Cut YA00009338 (Length: 3000 mm (118 in)) for hoses (6, 8).

**IMPORTANT:** Replace clips (4) (4 used) and hoses (6, 8) with the new ones.

**IMPORTANT:** Insert the differential pressure sensor (1) sides of hoses (6, 8) until they comes in contact with differential pressure sensor (1). Insert the pipe (5, 7) sides of hoses (6, 8) 28 mm (1.1 in). After inserting, reduce slack of hoses (6, 8).

5. Connect hoses (6, 8) with clips (4) (4 used).
6. Install exhaust pipe (2) with clamp (3).

 : 7 mm

 : 13 N·m (1.3 kgf·m, 9.6 lbf·ft)

---

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## SECTION 4

# TRAVEL SYSTEM

### CONTENTS

#### Group 1 Tire

- Removal and Installation of Front Tire .....W4-1-1-1
- Removal and Installation of Rear Tire .....W4-1-2-1

#### Group 2 HST Motor

- Removal and Installation of HST Motor .....W4-2-1-1
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- Assembly of Clutch Assembly .....W4-3-3-3
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Solenoid Valve .....W4-3-4-1
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#### Group 6 Brake Valve

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#### Group 8 Emergency Steering Device

- Removal and Installation of Emergency  
Steering Pump.....W4-8-1-1

## SECTION 4 TRAVEL SYSTEM


### Group 1 Tire

#### Applicable Tire Size

 **NOTE:** The machine may vibrate while driving depending on the tread pattern of tires. This is a sympathetic vibration due to tread pattern, not a malfunction.

#### Applicable Tire Size

Radial Tires		
	Manufacturer	
Standard Size	-	20.5 R 25
Standard Air Pressure	-	400 kPa (4.00 kgf/cm <sup>2</sup> , 58 PSI)
Standard Tire	Michelin	L3 20.5 R 25 (XHA2)
Optional	Michelin	L5 (XLDD2)
		L5 (XMINE D2)
	Bridgestone	L3 (VJTZ)

 **NOTE:** Adjust air pressure according to the size and type of tires provided in the table above regardless of the tread pattern.

Adjust tire pressure in conformity with the work mode the machine is engaged in.

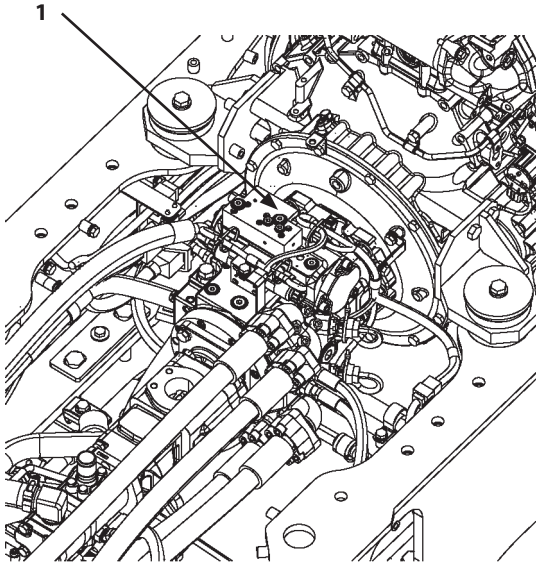
- Driving on Public Roads: ... Standard pressure
- Loading/excavation on normal ... Standard or slightly higher than standard pressure
- Heavy-duty excavation: ... Higher pressure in the standard pressure range
- Operation on soft terrain or sandy territory: ... Radial Tires: Standard pressure

Air pressure adjustment range

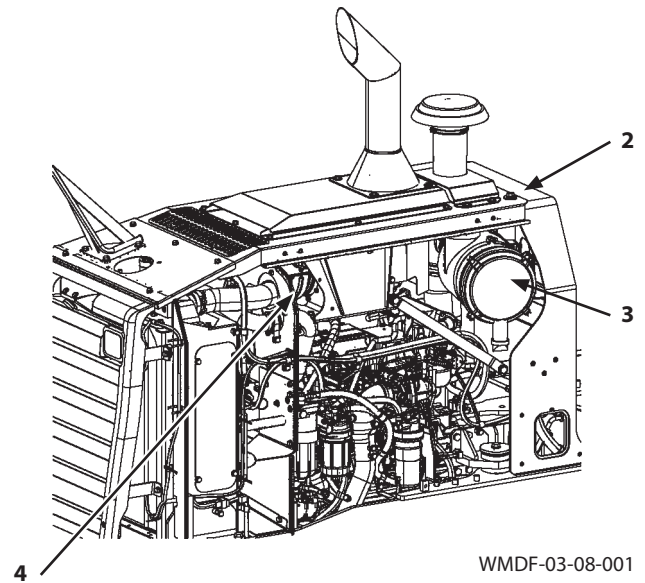
Radial Tires: 400 to 450 kPa (4.00 to 4.50 kgf/cm<sup>2</sup>, 58 to 65 PSI)

## SECTION 4 TRAVEL SYSTEM

### Group 2 HST Motor



WMDF-03-08-006

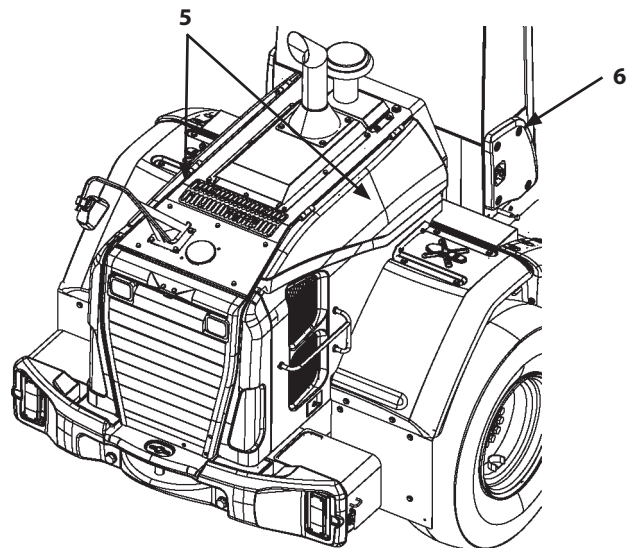


WMDF-03-08-001

14. Install pump device (1) and support (2). (Refer to W3-8-1.)
15. Install the air cleaner (3) assembly. (Refer to W3-4-3.)
16. Install the muffler filter (4) assembly. (Refer to W3-17-1.)
17. Install cab (6). (Refer to W3-1-1.)

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

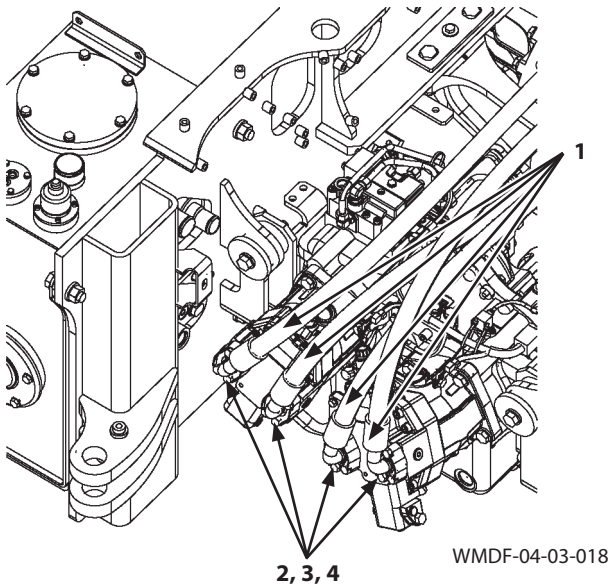
18. Install side covers (5) at right and left sides. (Refer to W3-4-2.)




WMDF-03-02-007

## SECTION 4 TRAVEL SYSTEM

### Group 3 Transmission

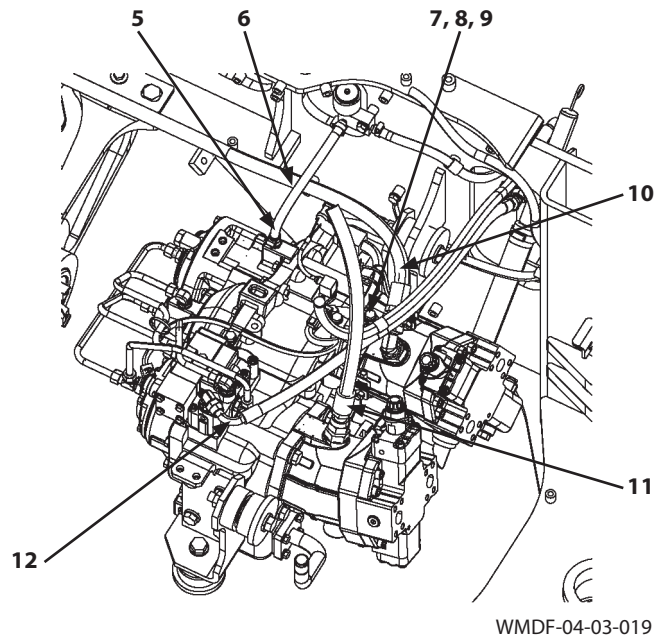


9. Remove bolts (2) (16 used) and flanges (3) (8 used). Disconnect hoses (1) (4 used). Remove O-rings (4) (4 used).


 : 19 mm

10. Remove clamp (5). Disconnect hose (6).


 : 7 mm




11. Remove bolt, washer (7), nut (8), and clips (9) (2 used).

 : 17 mm

12. Disconnect hose (12).

 : 27 mm

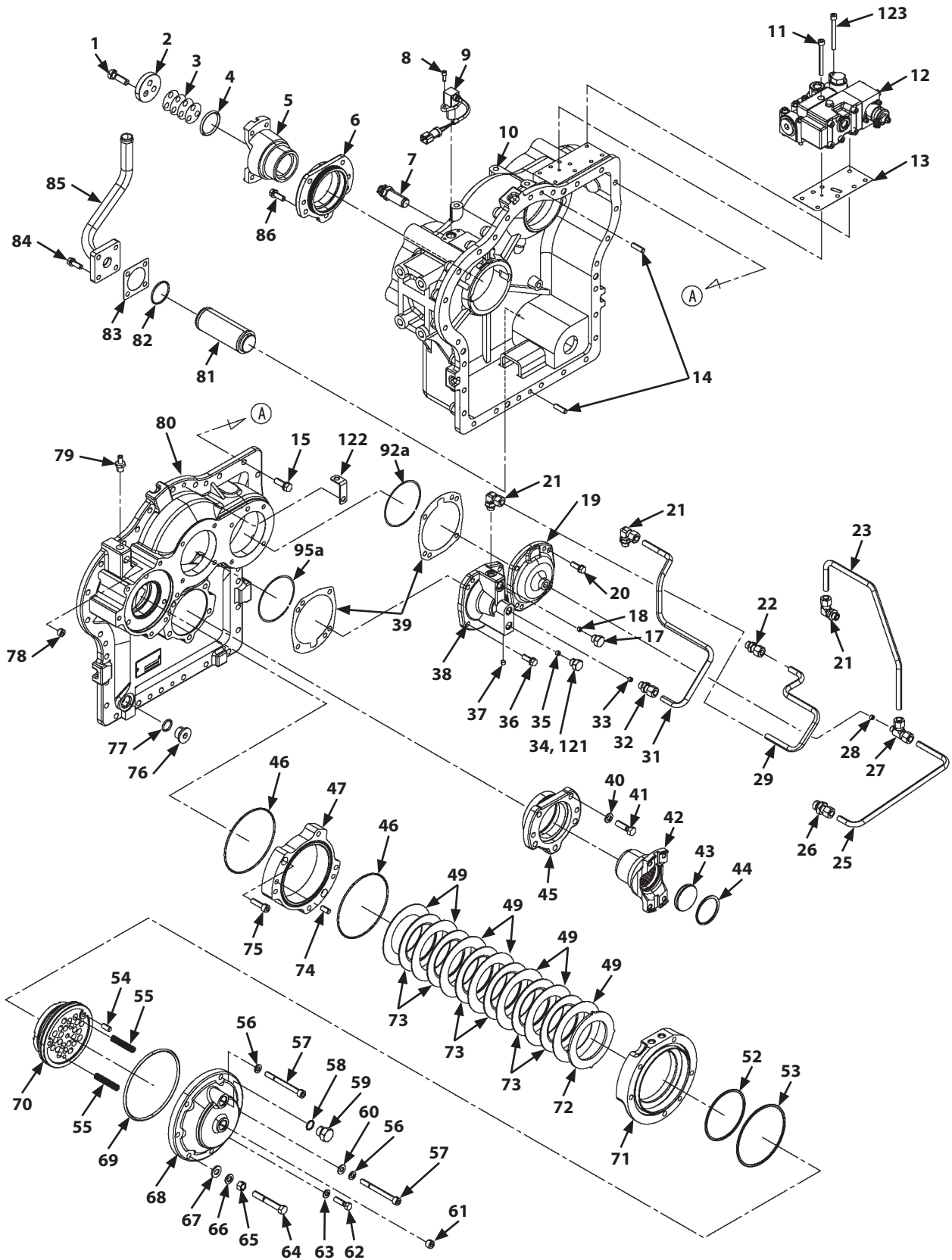
13. Disconnect hoses (10, 11).

 : 36 mm

# SECTION 4 TRAVEL SYSTEM

## Group 3 Transmission

### Disassembly of Transmission

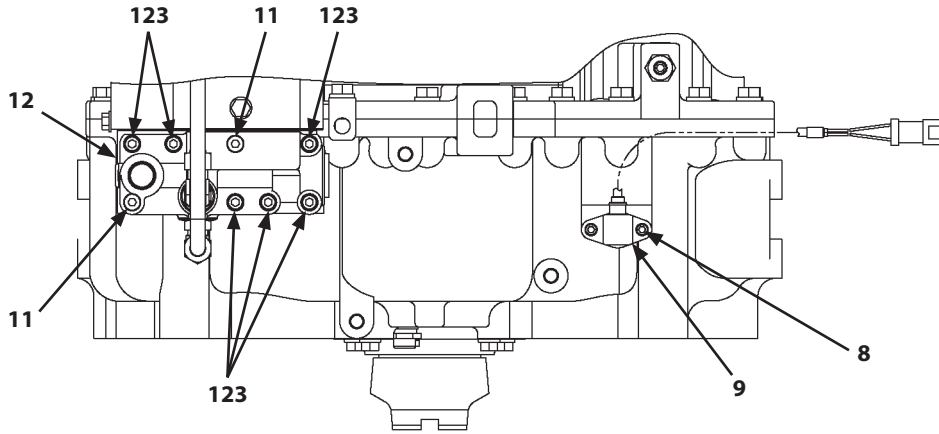


WMDF-04-03-003

# SECTION 4 TRAVEL SYSTEM

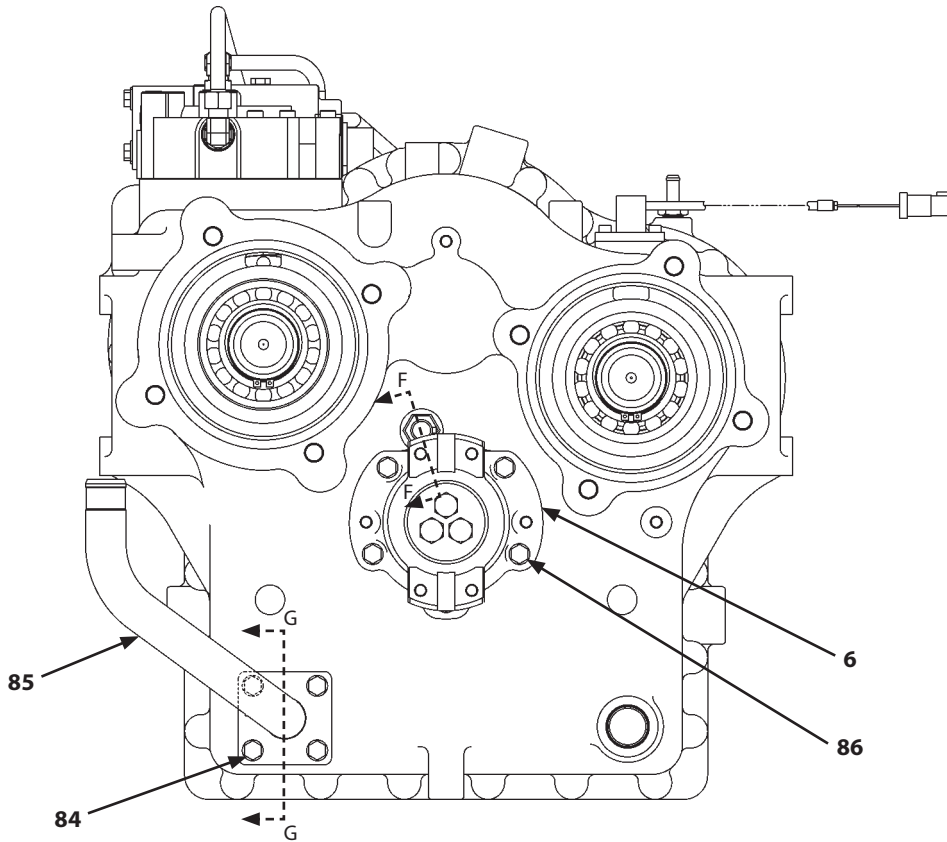
## Group 3 Transmission

View A



WMDF-04-03-010

View C

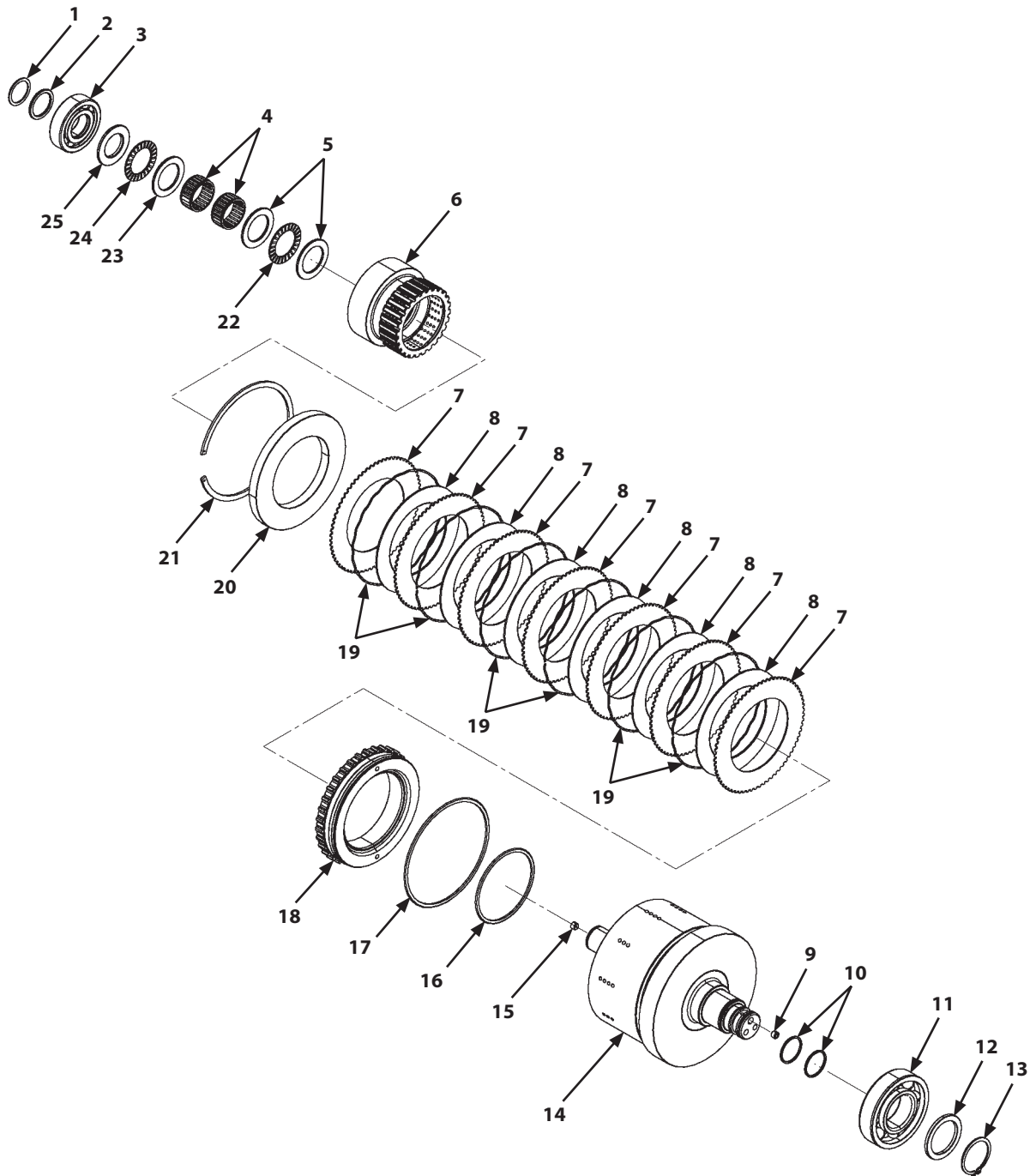


WMDF-04-03-011

# SECTION 4 TRAVEL SYSTEM

## Group 3 Transmission

### Disassembly of Clutch Assembly

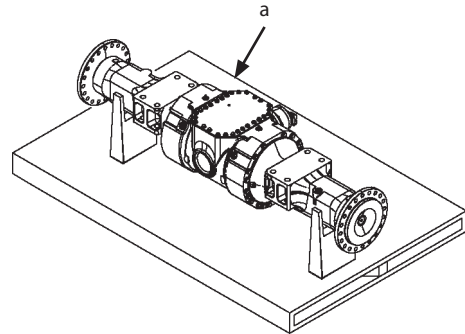
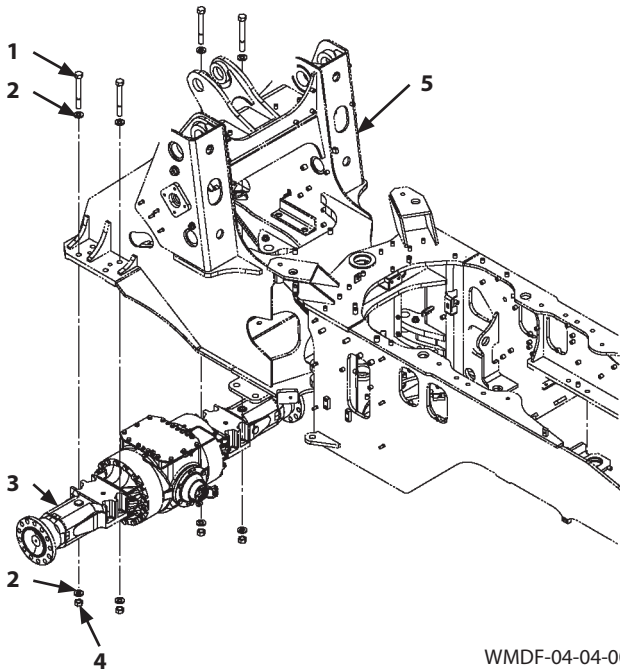


W4FC-03-04-021

- |                            |                        |                            |                    |
|----------------------------|------------------------|----------------------------|--------------------|
| 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



a- Stand


W4GB-03-03-106


#### Installation

1. Install all removed adapters to front axle (3).
2. Place front axle (3) onto stand (a). Set it under the mounting position of front frame (5).

#### **CAUTION:** Front axle (3) weight: 530 kg (1170 lb)

3. Attach nylon slings onto front axle (3). Hoist front axle (3).
4. Install front axle (3) with bolts (1) (8 used), washers (2) (16 used), and nuts (4) (8 used).

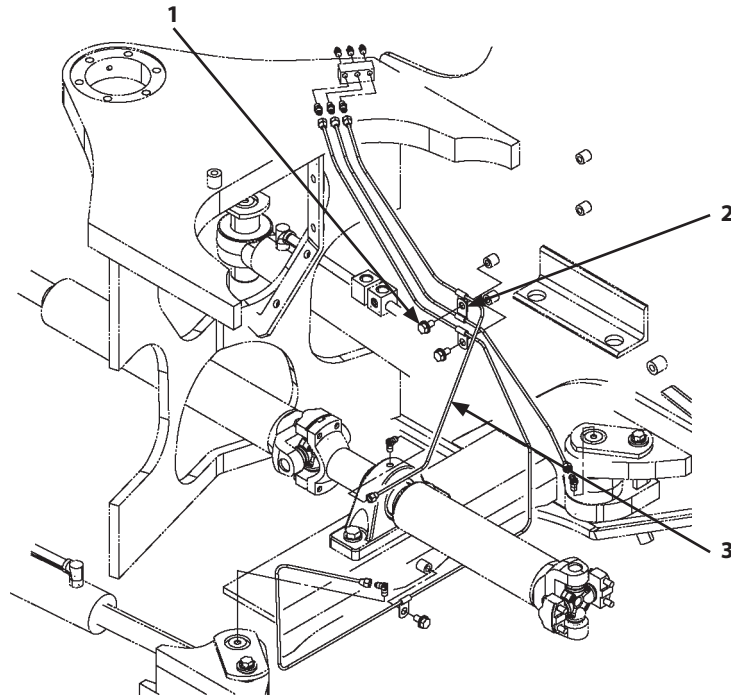
 : 36 mm

 : 785 N·m (78.5 kgf·m, 580 lbf·ft)

## 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).

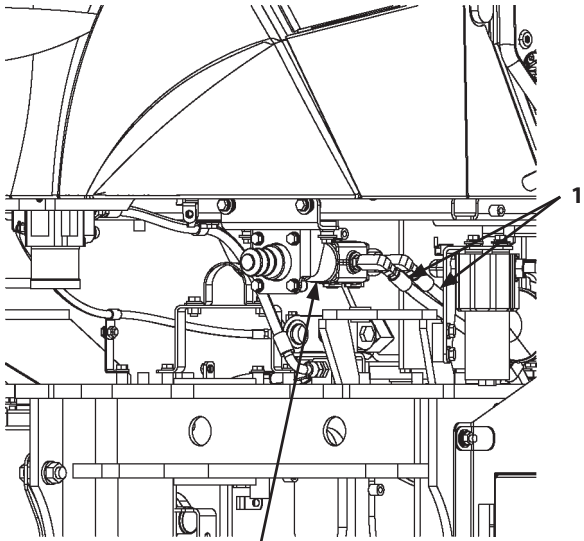
 : 17 mm

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

 : 14 mm

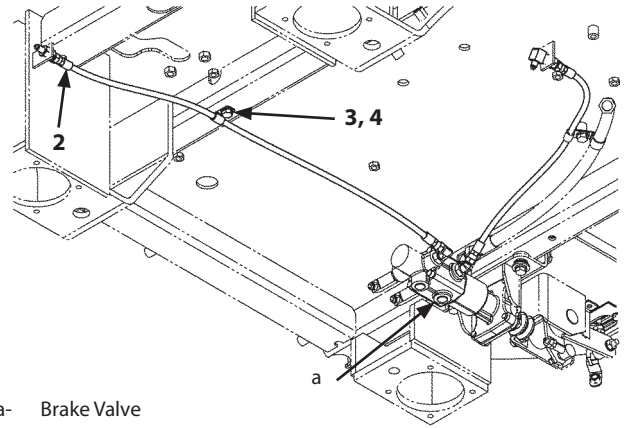
## SECTION 4 TRAVEL SYSTEM

### 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

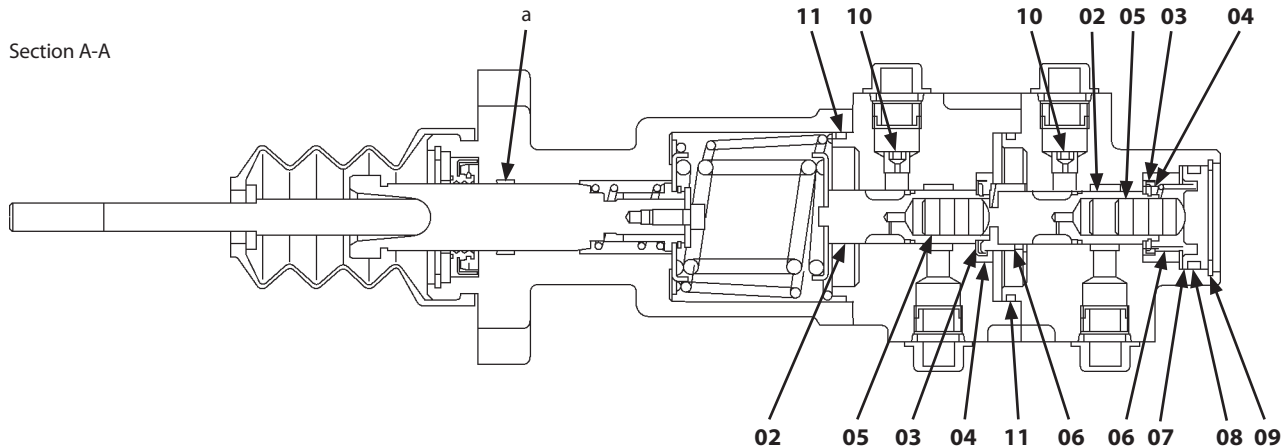
11. Disconnect hose (2).

 : 17 mm

# SECTION 4 TRAVEL SYSTEM

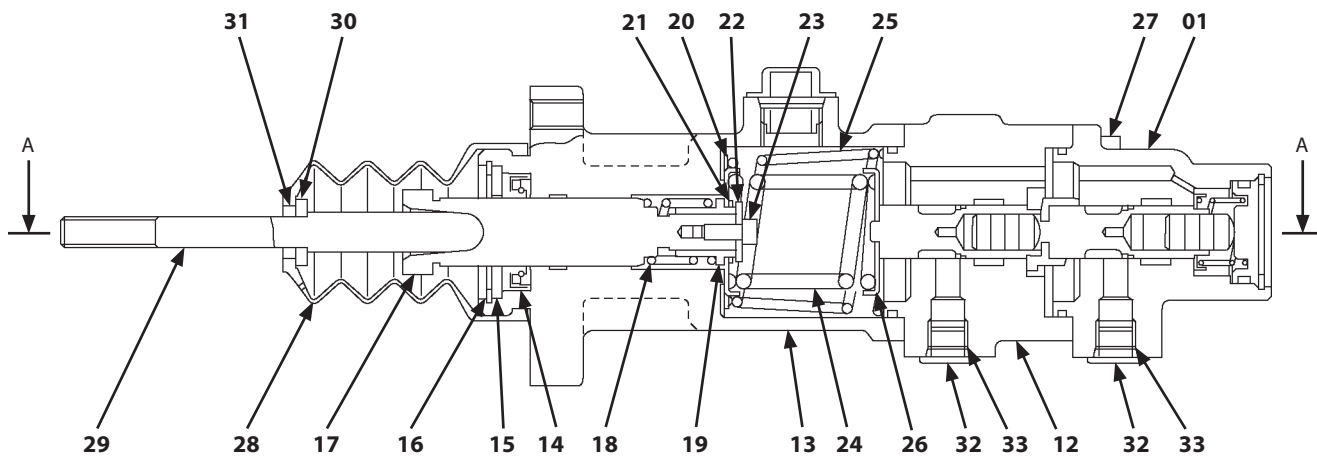
## Group 6 Brake Valve

### Assembly of Brake Valve



a- Lithium Grease Applying Position

WMDF-04-06-103



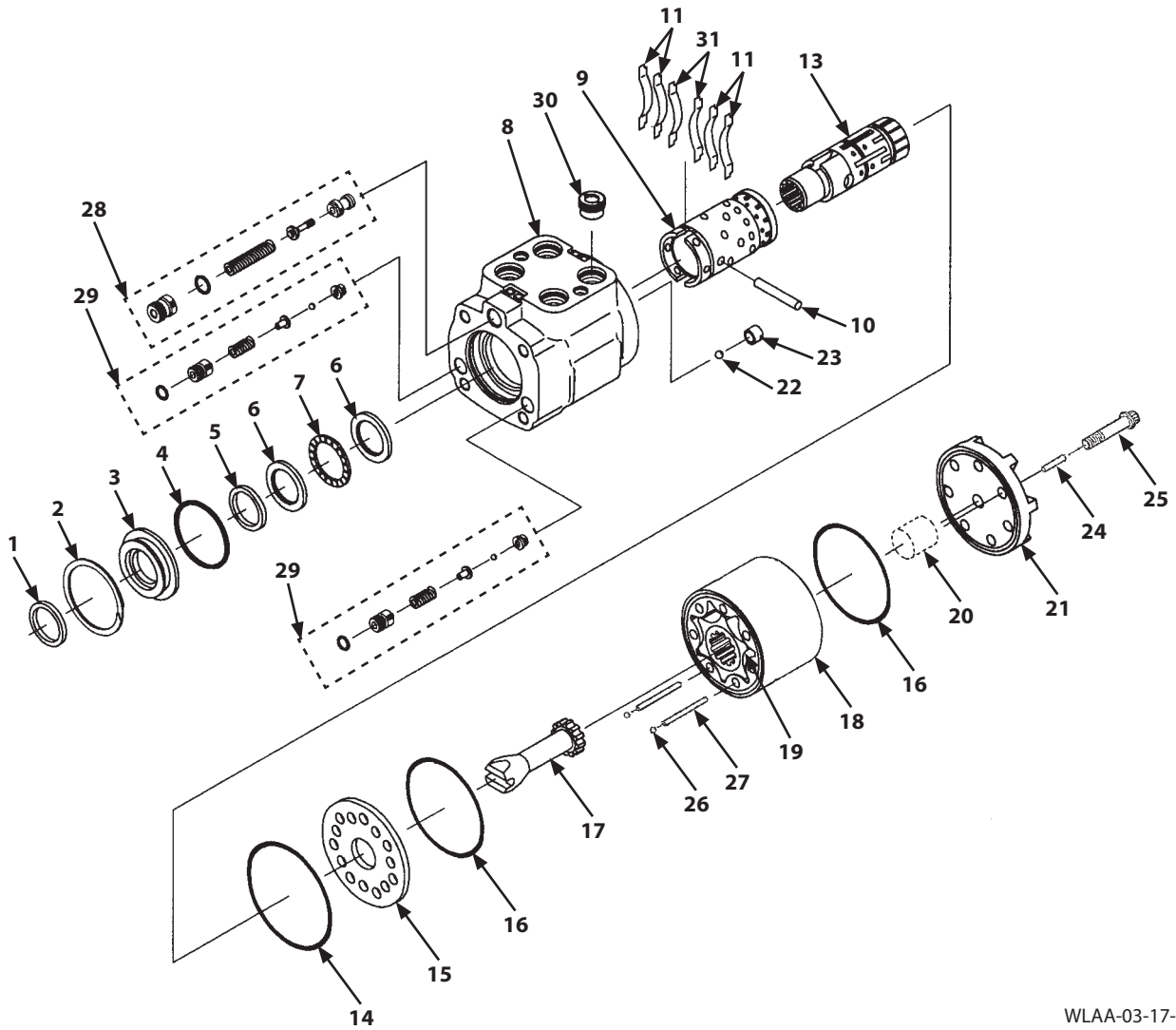
WMDF-04-06-104

- |                             |                      |                          |                     |
|-----------------------------|----------------------|--------------------------|---------------------|
| 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

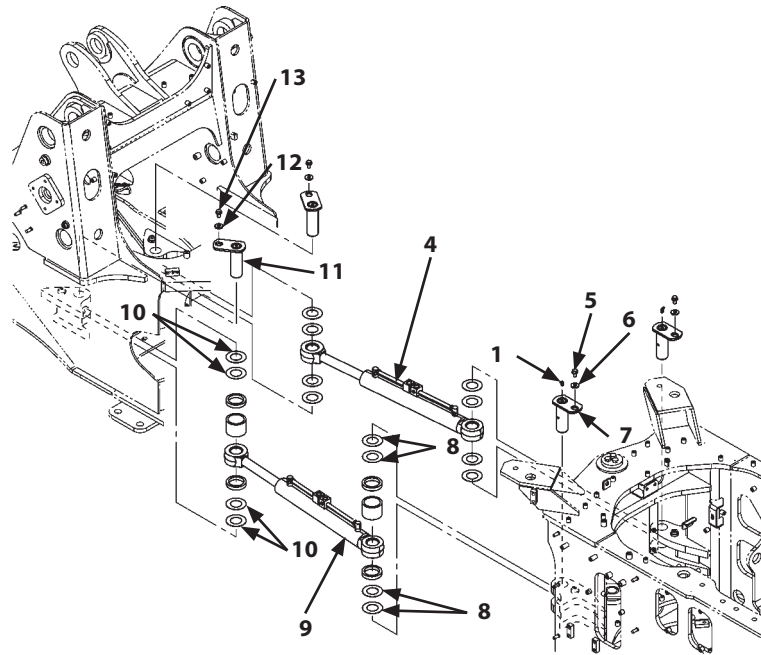


WLAA-03-17-001

- |                          |                               |                    |                                    |
|--------------------------|-------------------------------|--------------------|------------------------------------|
| 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).

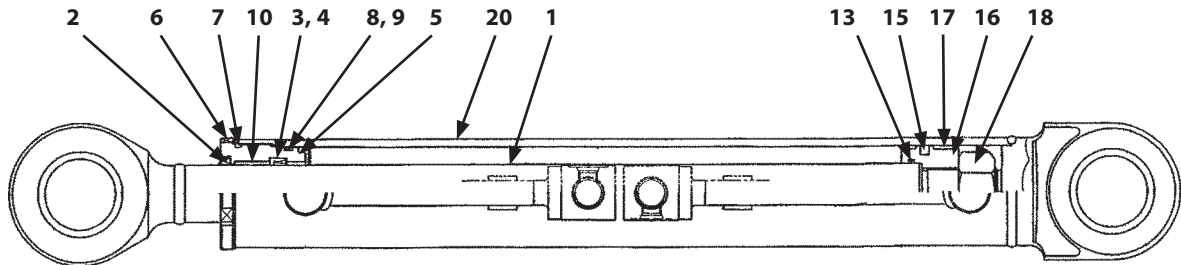
17. Remove the adapters with steering cylinder (9) attached if necessary.

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

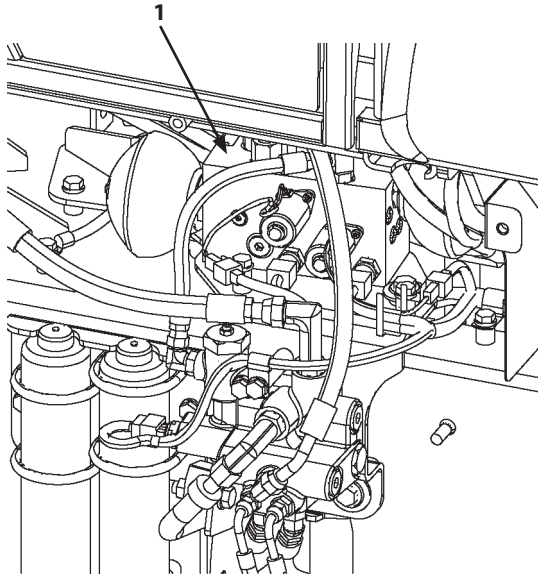


WMDF-04-07-101

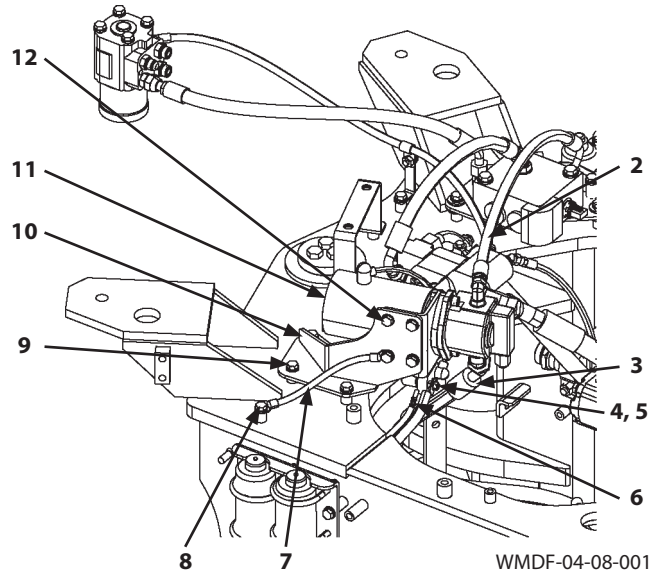
- |                 |                  |                |                   |
|-----------------|------------------|----------------|-------------------|
| 1- Cylinder Rod | 5- Cylinder Head | 9- Backup Ring | 16- Piston        |
| 2- Dust Seal    | 6- Washer        | 10- Bushing    | 17- Wear Ring     |
| 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

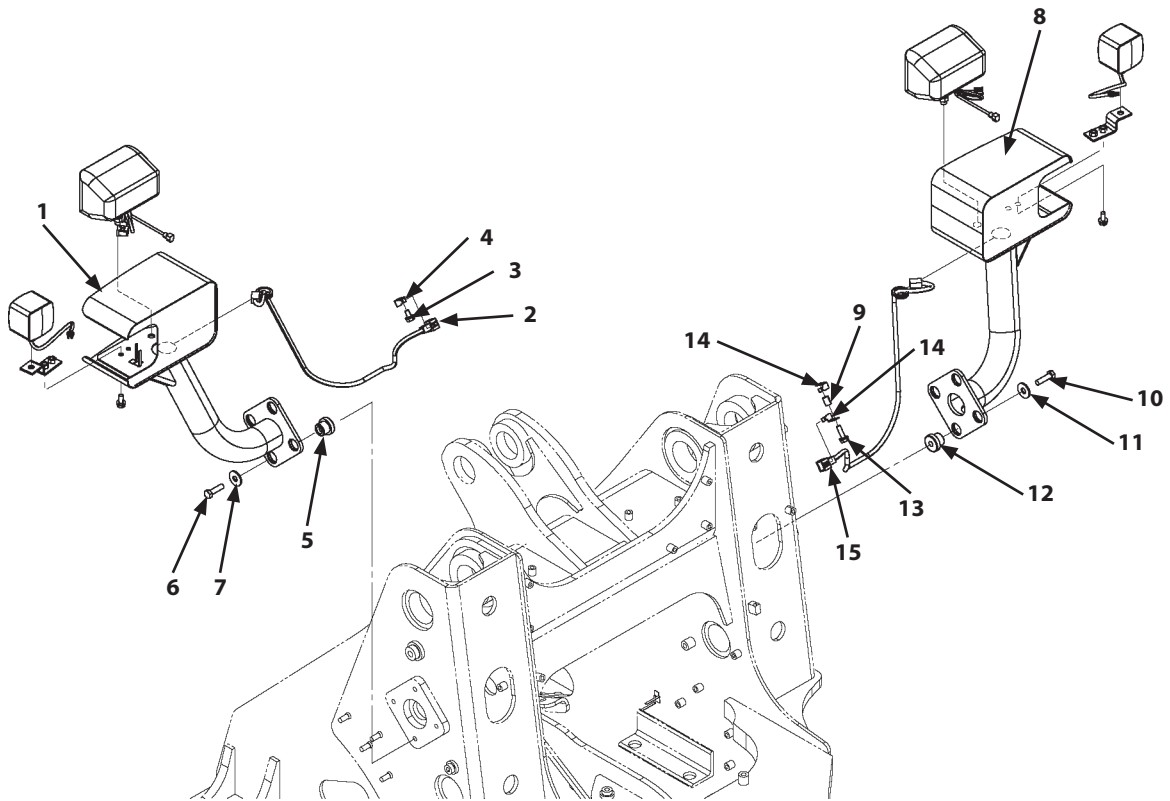
8. Remove the manifold valve (1) assembly. (Refer to W3-12-1.)
9. Remove bolt, washer (8). Disconnect ground (7).  
 : 17 mm
10. Remove nut (4). Disconnect terminal (5).  
 : 12 mm
11. Disconnect connector (6).
12. Disconnect hose (3).  
 : 36 mm
13. Disconnect hose (2).  
 : 22 mm

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).

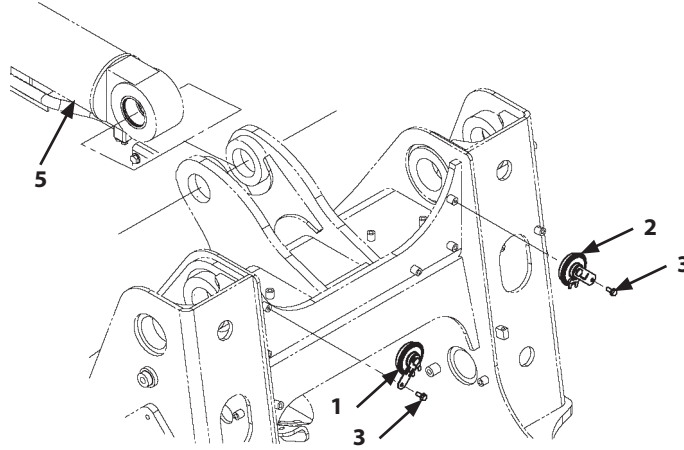
7. Remove bolts (10) (4 used) and washers (11) (4 used). Remove the head light (8) assembly and rubber cushions (12) (4 used).

 : 19 mm

## SECTION 5 FRONT ATTACHMENT

### Group 1 Front Attachment


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WMDF-05-01-102

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

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

 : 13 mm

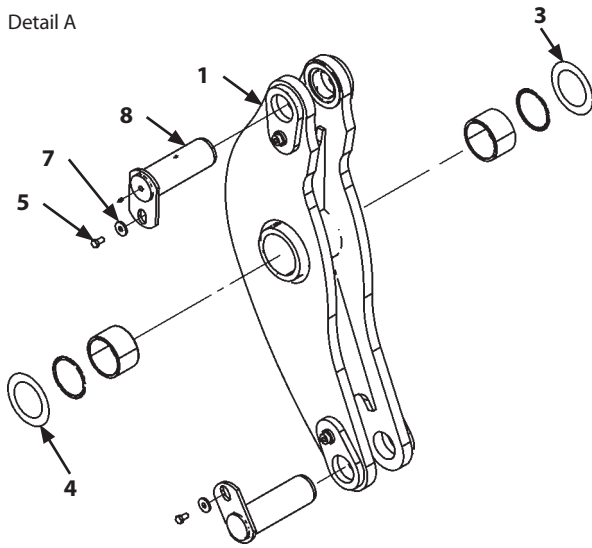
 : 10 N·m (1 kgf·m, 7.4 lbf·ft)

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

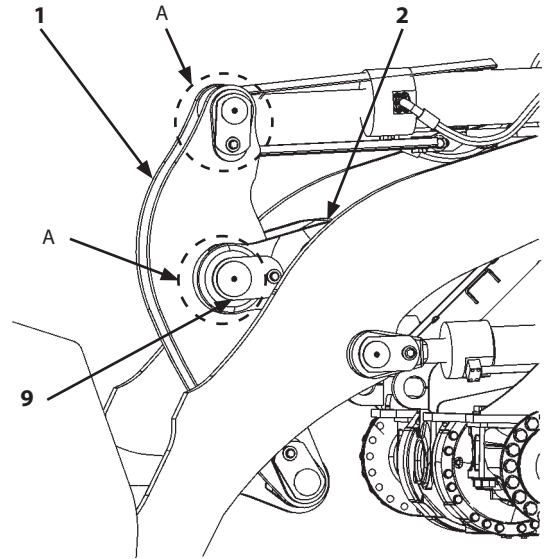
## SECTION 5 FRONT ATTACHMENT

### Group 1 Front Attachment

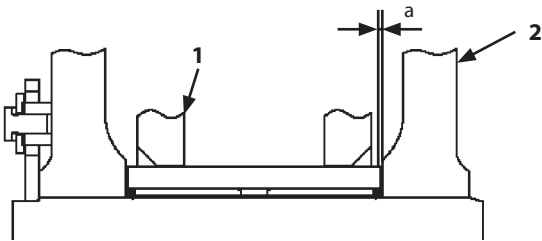
Detail A



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.


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)

**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)

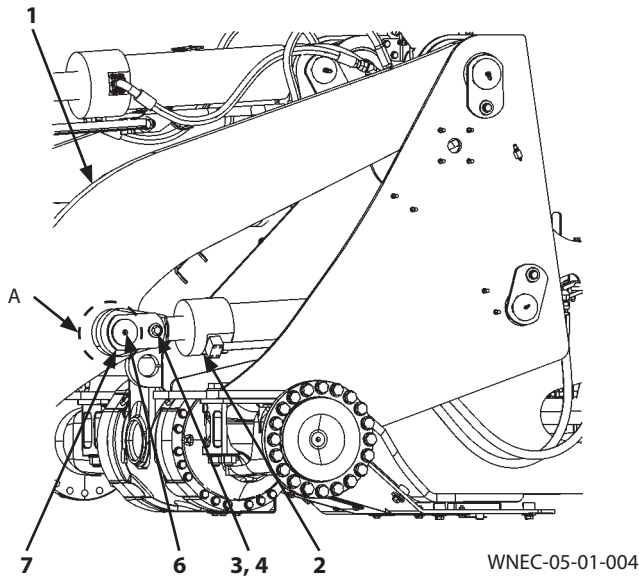
**CAUTION:** Bell crank (1) weight: 130 kg (290 lbf·ft)

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).

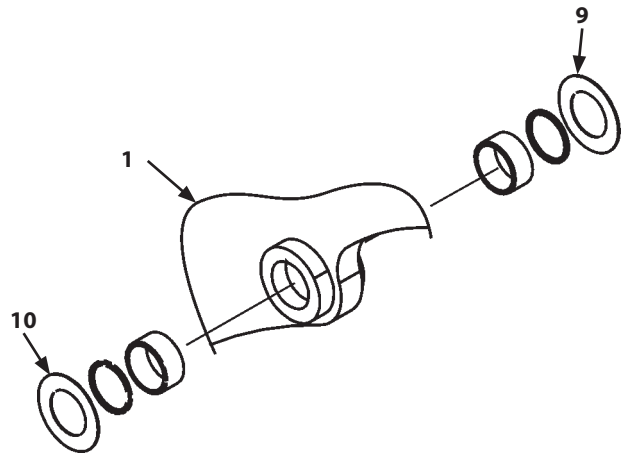
## SECTION 5 FRONT ATTACHMENT

### Group 2 Cylinder

#### Removal and Installation of Lift Arm Cylinder



Detail A



**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: 110 kg (245 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.

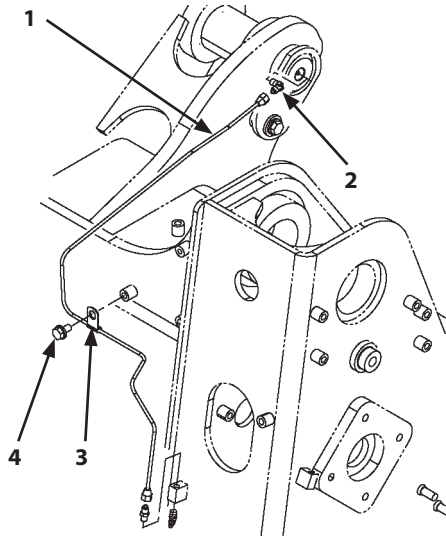
 : 19 mm

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

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WMDF-05-02-103


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

 : 17 mm

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

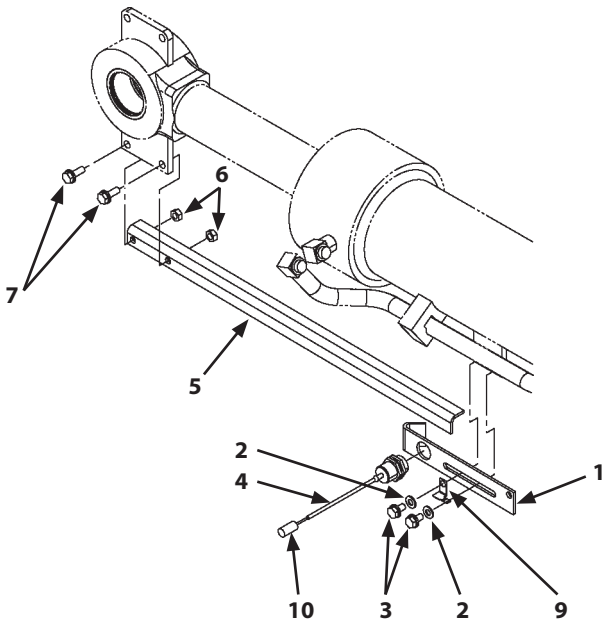
 : 17 mm

9. Remove elbow (2).

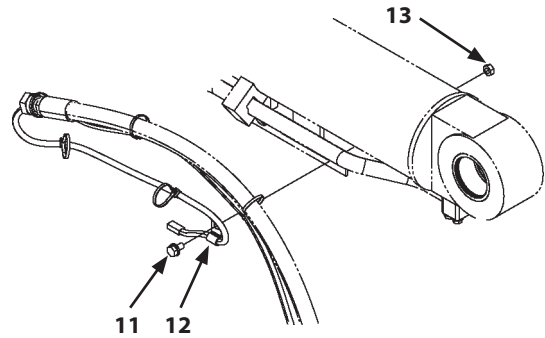
 : 12 mm

## 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).

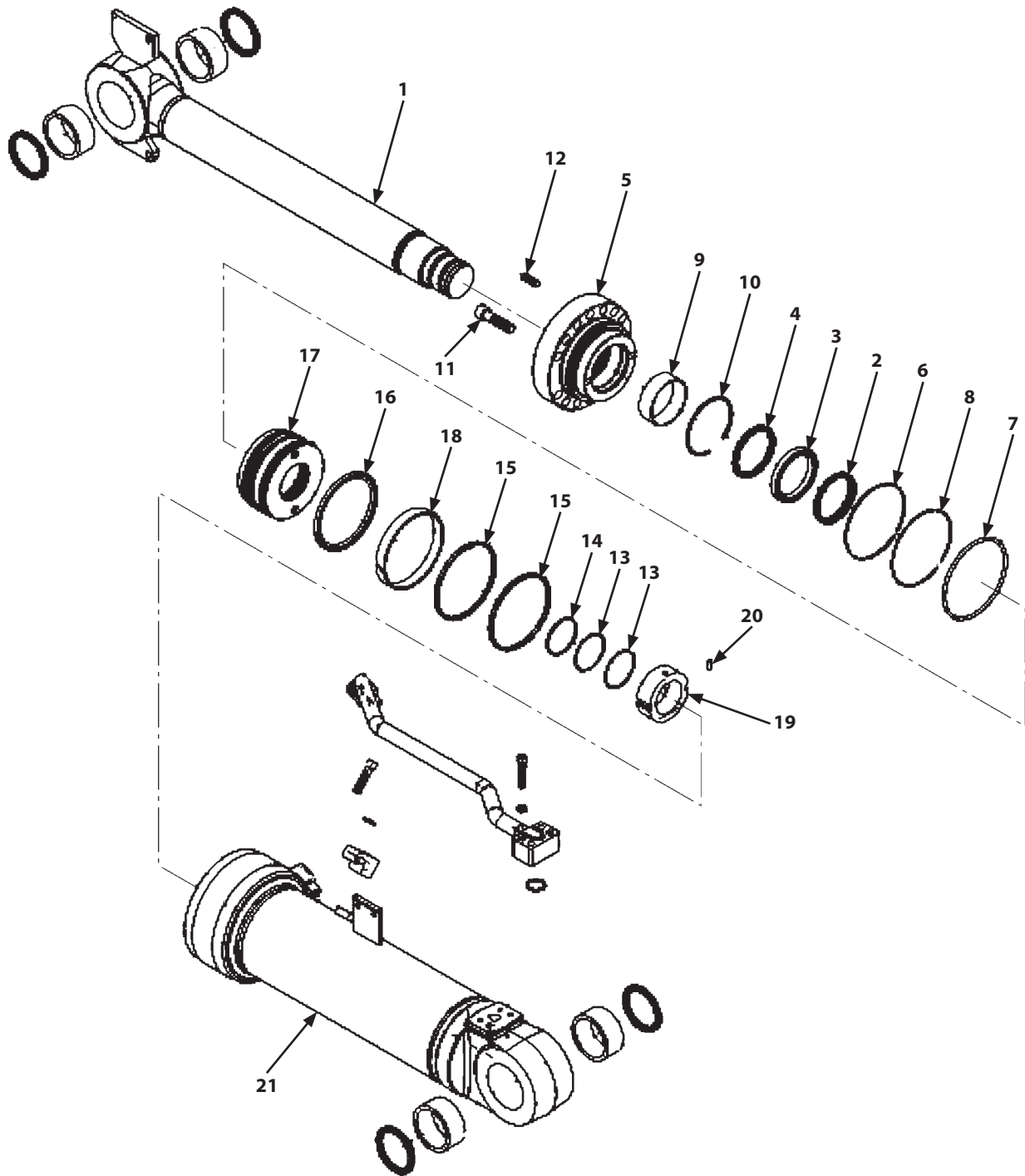
 : 17 mm

 : 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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