

PART NO. WNEE-EN-00

HITACHI

Reliable solutions

Workshop Manual

ZW220-5B Wheel Loader

ZW220-5B WHEEL LOADER WORKSHOP MANUAL

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

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

PRINTED IN JAPAN (K) 2013, 04

WNEE-EN-00

Service Manual consists of the following separate Part No.
Technical Manual (Operational Principle) : Vol. No.TONEE-EN
Technical Manual (Troubleshooting) : Vol. No.TTNEE-EN
Workshop Manual : Vol. No.WNEE-EN

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

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



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

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

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

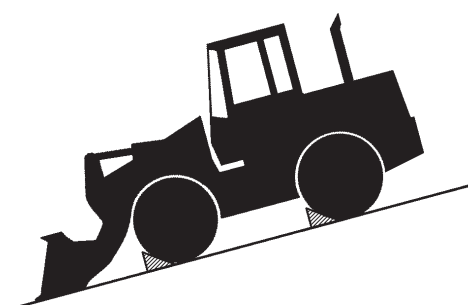
- Death or serious injury may result if you attempt to mount or stop a moving machine.

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

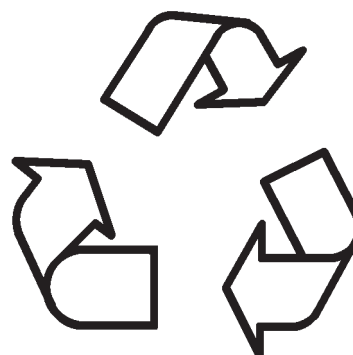
- Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with your machine include such items as lubricants, coolants, paints, and adhesives.
- A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, 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

CONTENTS

Group 1 Precautions for Disassembling and Assembling

Precautions for Disassembling and AssemblingW1-1-1-1

Group 2 Tightening

Tightening Bolts and NutsW1-2-1-1
Piping JointW1-2-1-4

Group 3 Painting

PaintingW1-3-1-1

Group 4 Bleeding Air

Bleeding Air from Hydraulic Oil TankW1-4-1-1
Bleeding Air from Hydraulic SystemW1-4-1-2
Bleeding Air from Fuel SystemW1-4-1-3
Bleeding Air from RadiatorW1-4-1-4
Bleeding Air from Brake (Axle)W1-4-1-5

Group 5 Pressure Release Procedure

Front Attachment Hydraulic Circuit Pressure Release ProcedureW1-5-1-1
Ride Control Accumulator Pressure Release ProcedureW1-5-1-2
Parking Brake Accumulator Pressure Release ProcedureW1-5-1-3

Group 6 Preparation

Preparation before Inspection and MaintenanceW1-6-1-1

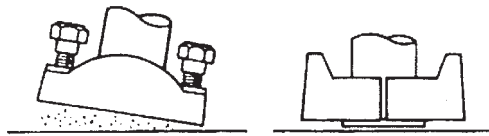
SECTION 1 GENERAL

Group 2 Tightening

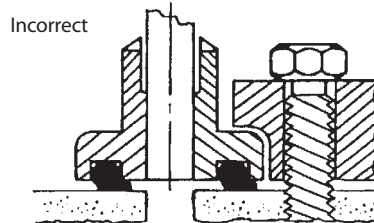
Precautions for Spilt Flange

IMPORTANT:

- Clean the sealing surfaces. Check if there are any scratches and roughness on the surface of the seal that cause oil leaks and damage to the O-ring.
- Use only specified O-rings. Inspect O-rings for any damage. Do not file the O-ring surfaces. When installing O-ring into a groove, use grease in order to hold O-ring in place.
- While tightening the bolt by hand, check that flange is installed to the port correctly. Do not pinch the O-ring.
- Tighten the bolts up and down, left and right alternately, in order to ensure even tightening to the specified torque.
- Do not use air wrenches. Using an impact wrench often causes tightening of one bolt fully before tighten the others, resulting in damage to O-rings or uneven tightening of bolts.



WDAA-01-02-005



WDAA-01-02-006



W105-01-01-008

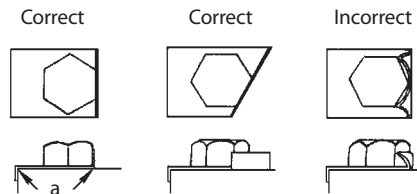
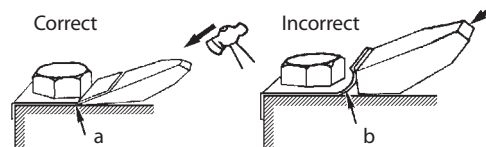
Nut and Bolt Locking

- Lock Plate

IMPORTANT: Do not reuse the lock plates. Do not try to bend the same point twice.

- Split Pin

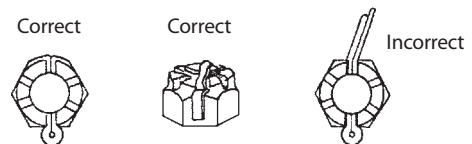
IMPORTANT: Do not turn in the loosening direction in order to align the grooves and holes on the nut. Always turn in the tightening direction. Do not reuse the split pins.



WDAA-01-02-007

a- Bend along edge sharply

b- Do not bend it round



c- Tighten

d- Loosen



WDAA-01-02-008

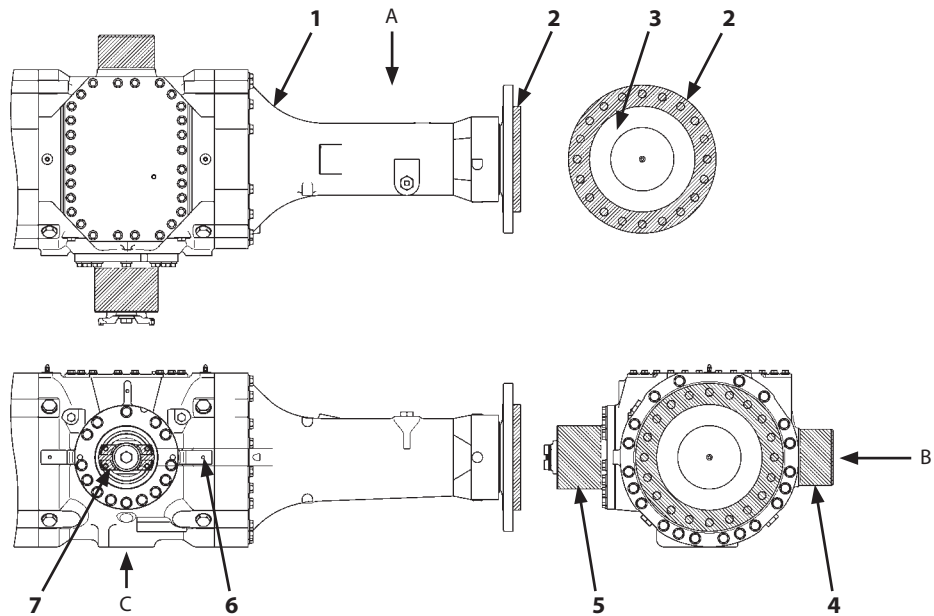
c- Tighten

d- Loosen

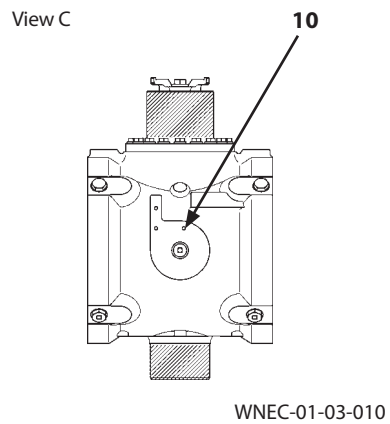
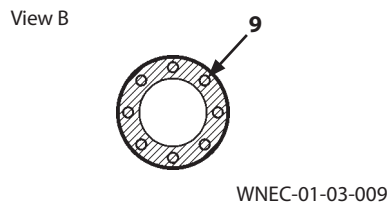
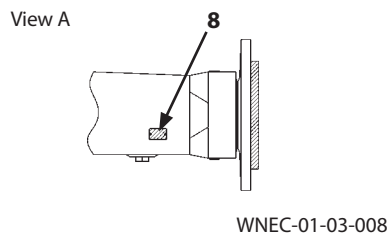
SECTION 1 GENERAL

Group 3 Painting

Rear Axle (3)



WNEC-01-03-007



	Surfaces to Be Painted	Painting Color
1	Rear Axle	High Grade Black
2	Rim (Wheel) Mounting Part	Do not paint it.
3	End of Axle and Rim (Wheel)	YR-01 (TAXI Yellow)
4	Boss Part	Do not paint it.
5	Boss Part	Do not paint it.
6	Guard Mounting Part (Thread Part)	Do not paint it.
7	Flange Part	Do not paint it.
8	Name Plate	Do not paint it.
9	End of Boss Part	Do not paint it.
10	Guard Mounting Part (Thread Part)	Do not paint it.


SECTION 1 GENERAL

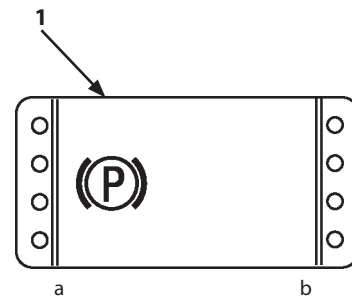
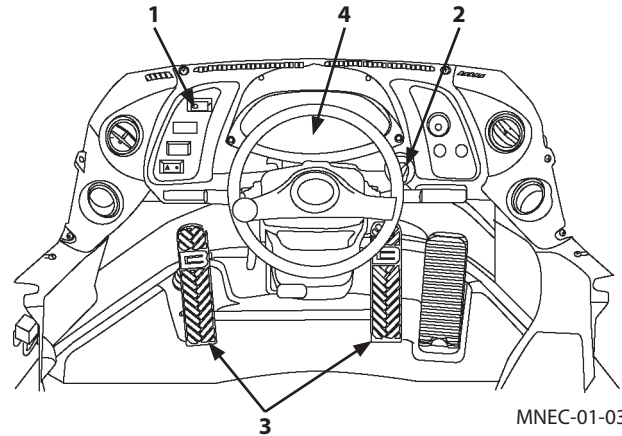
Group 5 Pressure Release Procedure

Parking Brake Accumulator Pressure Release Procedure

Release any remaining pressure as follows before removing/installing the parking brake accumulator.

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Run the engine at slow idle speed without load for five minutes.
4. Set key switch (2) to the OFF position. Stop the engine.
5. Depress brake pedal (3) at least 50 times in order to decrease the accumulated pressure left in the service brake circuit.
6. Set key switch (2) to the ON position again. Turn parking brake switch (1) ON or OFF at least 50 times in order to decrease the accumulated pressure left in the parking brake circuit.
7. Set parking brake switch (1) to ON position (b). Turn key switch (2) OFF.

 **NOTE:** The service brake primary pressure and parking brake pressure can be monitored by using the service menu of monitor (4). (Refer to TROUBLESHOOTING / Monitor in the separated volume, T/M.)



a- OFF

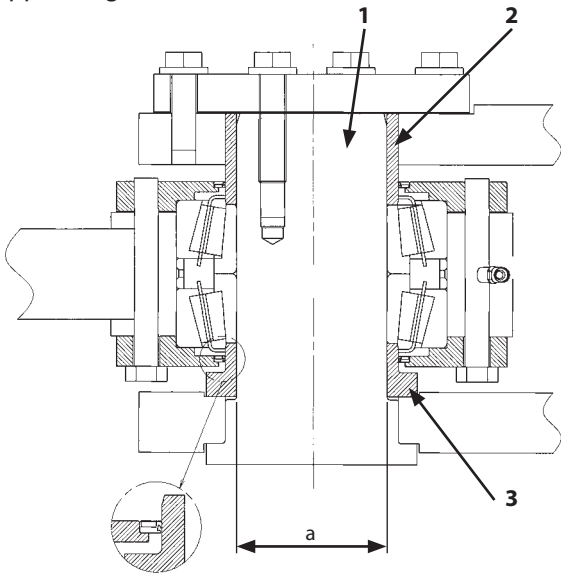
b- ON

SECTION 2 MAINTENANCE STANDARD

Group 1 Body

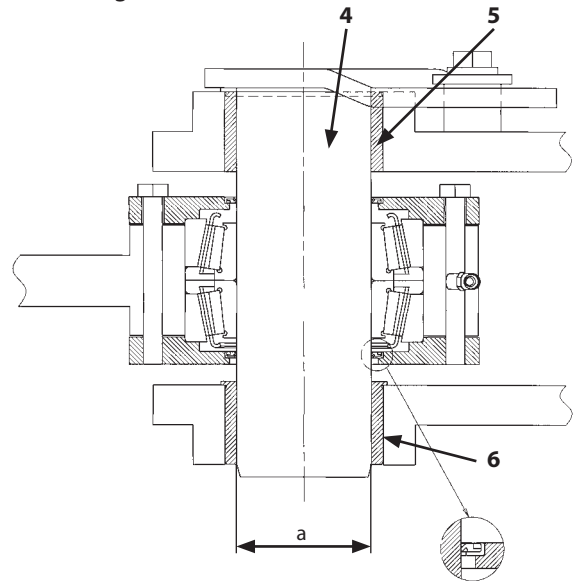
Center Hinge

- Upper Hinge Part (A)



WNEC-02-01-001

- Lower Hinge Part (B)



WNEC-02-01-002

				Unit: mm (in)
	Part Name	Standard (a)	Allowable Limit (a)	Remedy
A	Pin (1)	85 (3.35)	84.0 (3.30)	Replace
	Bushings (2), (3)	85 (3.35)	86.5 (3.40)	
B	Pin (4)	85 (3.35)	84.0 (3.30)	
	Bushings (5), (6)	85 (3.35)	86.5 (3.40)	

SECTION 3

BODY

CONTENTS

Group 1 Cab

Removal and Installation of CabW3-1-1-1

Group 2 Counterweight

Removal and Installation of Counterweight.....W3-2-1-1

Group 3 Center Hinge

Removal and Installation of Center Hinge.....W3-3-1-1

Removal and Installation of the Hydraulic
Hoses of Front Frame side.....W3-3-2-1

Group 4 Engine

Removal and Installation of EngineW3-4-1-1

Removal And Installation of Exterior PartsW3-4-2-1

Removal and Installation of the air cleaner.....W3-4-3-1

Group 5 Radiator Assembly

Replacement of Radiator, Oil Cooler,
Intercooler, and Torque Converter CoolerW3-5-1-1

Group 6 Hydraulic Oil Tank

Removal and Installation of Hydraulic Oil
Tank.....W3-6-1-1

Group 7 Fuel Tank

Removal and Installation of Fuel Tank.....W3-7-1-1

Group 8 Pump Device

Removal and Installation of Pump Device.....W3-8-1-1

Disassembly of Pump DeviceW3-8-2-1

Assembly of Pump Device.....W3-8-2-3

Disassembly of Main Pump.....W3-8-3-1

Assembly of Main Pump.....W3-8-3-5

Disassembly of RegulatorW3-8-4-1

Assembly of RegulatorW3-8-4-3

Disassembly of Priority Valve.....W3-8-5-1

Assembly of Priority Valve.....W3-8-5-3

Structure of Pilot PumpW3-8-6-1

Group 9 Control Valve

Removal and Installation of Control Valve.....W3-9-1-1

Disassembly of Control ValveW3-9-2-1

Disassembly of Control ValveW3-9-2-4

Assembly of Control Valve.....W3-9-2-9

Assembly of Control Valve.....W3-9-2-14

Group 10 Pilot Valve

Removal and Installation of Pilot ValveW3-10-1-1

Removal and Installation of Pilot Valve (Two

Lever Type)W3-10-2-1

Disassembly of Pilot ValveW3-10-3-1

Assembly of Pilot ValveW3-10-3-4

Disassembly of Pilot Valve (Two Lever Type).....W3-10-4-1

Assembly of Pilot Valve (Two Lever Type)W3-10-4-7

Group 11 Brake Charge Valve

Removal and Installation of Brake Charge

Valve.....W3-11-1-1

Structure of Brake Charge ValveW3-11-2-1

Removal and Installation of Brake

Accumulator.....W3-11-3-1

Group 12 Manifold Valve

Removal and Installation of Manifold Valve.....W3-12-1-1

Disassembly of Manifold ValveW3-12-2-1

Assembly of Manifold ValveW3-12-2-4

Group 13 Solenoid Valve

Removal and Installation of 3-Spool Solenoid

Valve UnitW3-13-1-1

Removal and Installation of Parking Brake

Solenoid Valve Unit.....W3-13-3-1

Group 14 Flow Regulator Valve

Removal and Installation of Flow Regulator

Valve.....W3-14-1-1

Structure of Flow Regulator ValveW3-14-2-1

Group 15 Cooling Fan System

Removal and Installation of Fan Valve.....W3-15-1-1

Structure of Fan Valve.....W3-15-2-1

Removal and Installation of Fan Motor.....W3-15-3-1

Structure of Fan MotorW3-15-4-1

Removal and Installation of Fan PumpW3-15-5-1

Disassembly of Fan Pump.....W3-15-6-1

Assembly of Fan PumpW3-15-6-3

Group 16 Muffler Filter

Removal and Installation of Muffler Filter.....W3-16-1-1

Disassembly of Muffler FilterW3-16-2-1

Assembly of Muffler FilterW3-16-2-3

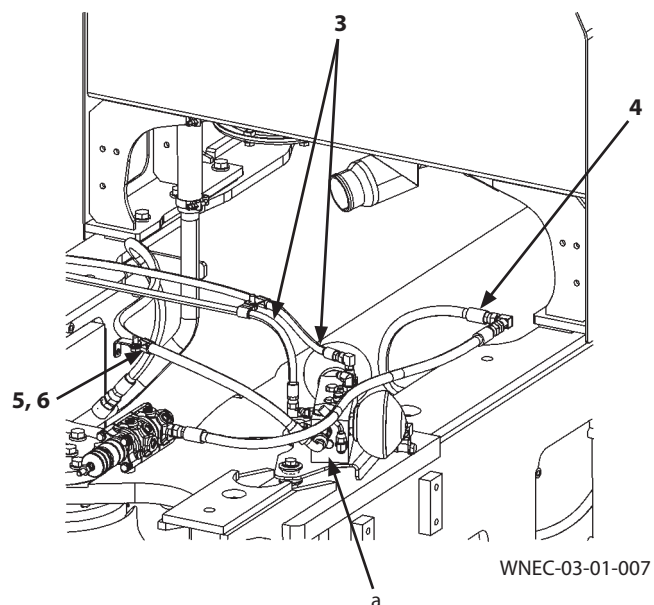
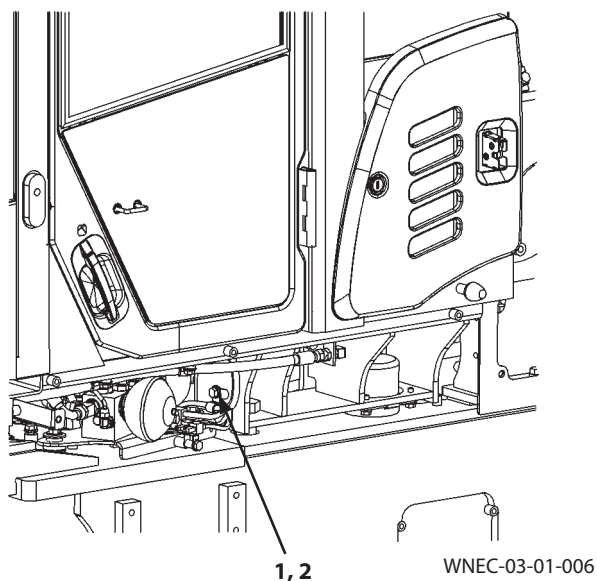
Group 17 Ride Control Accumulator

Removal and Installation of Ride Control

Accumulator.....W3-17-1-1


SECTION 3 BODY

Group 1 Cab




a- Manifold Valve


38. Remove bolt, washer (1) and clip (2).

 : 17 mm


39. Place a container under the disconnecting part of hose (4). Disconnect hose (4).

 : 22 mm

40. Place a container under the disconnecting part of hoses (3) (2 used). Disconnect hoses (3) (2 used).

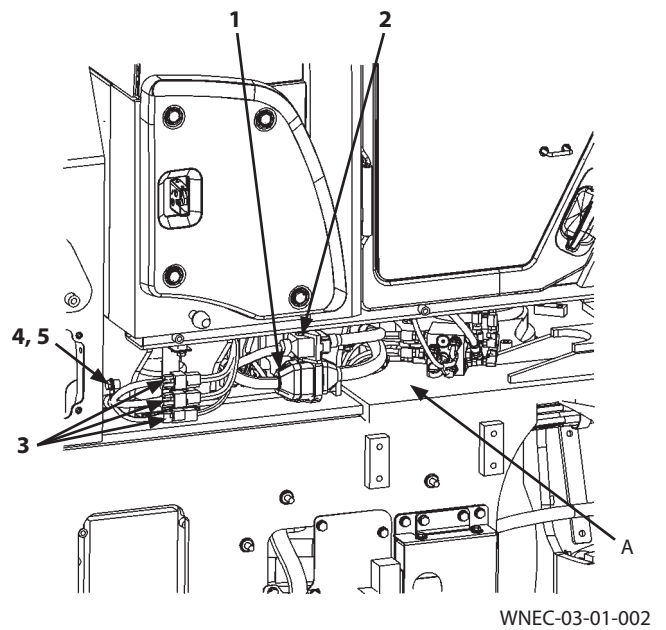
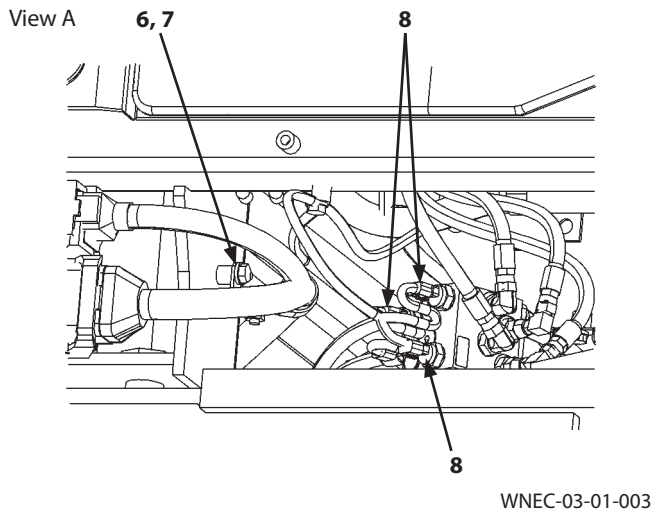
 : 19 mm

41. Remove bolt, washer (5) and clamp (6).


 : 17 mm


SECTION 3 BODY

Group 1 Cab



29. Install bracket (7) with bolt, washer (6).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)


30. Connect connectors (8) (3 used).


31. Connect connector (1).

32. Connect connector (2).

33. Connect connectors (3) (3 used).

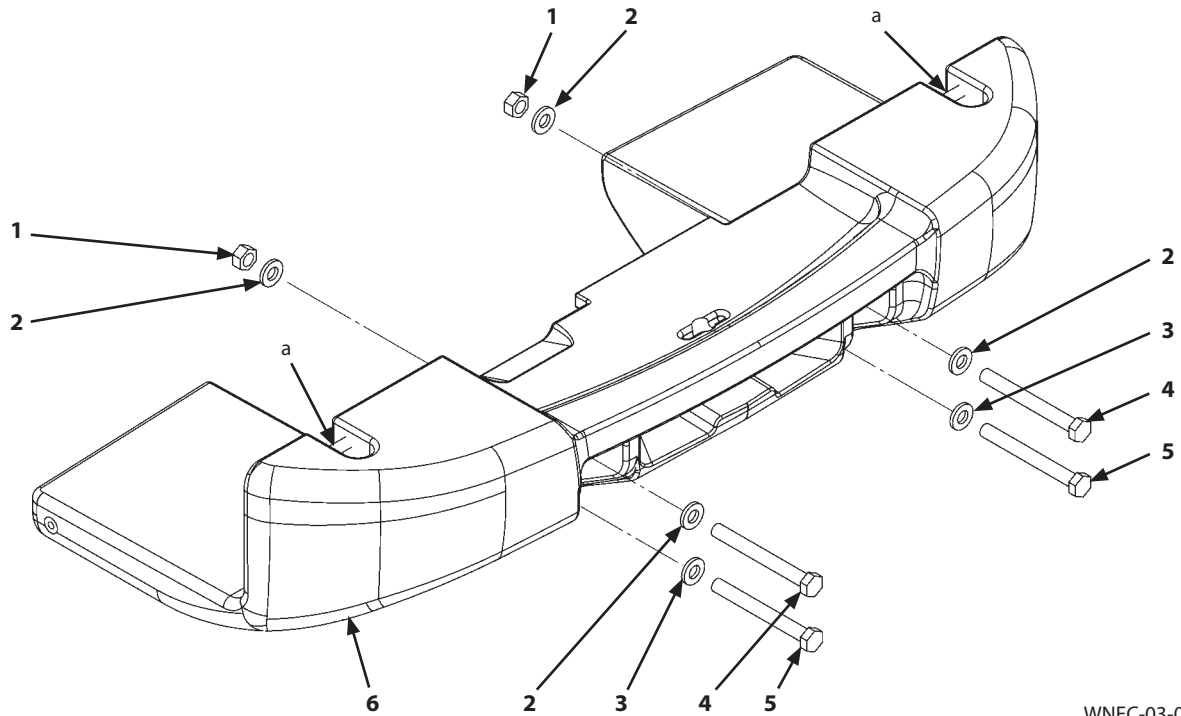
34. Install clip (5) with bolt, washer (4).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

SECTION 3 BODY

Group 2 Counterweight




a- Hoisting Position


WNEC-03-02-003

Installation


CAUTION: Counterweight (6) weight: 2270 kg (5005 lb)


1. Attach the nylon slings onto hoisting positions (a) of counterweight (6). Hoist and fit counterweight (6) to mounting hole on the rear frame.
2. Install counterweight (6) with bolts (4) (2 used), washers (2) (4 used), and nuts (1) (2 used).

 : 46 mm

 : 1510 N·m (151 kgf·m, 1110 lbf·ft)

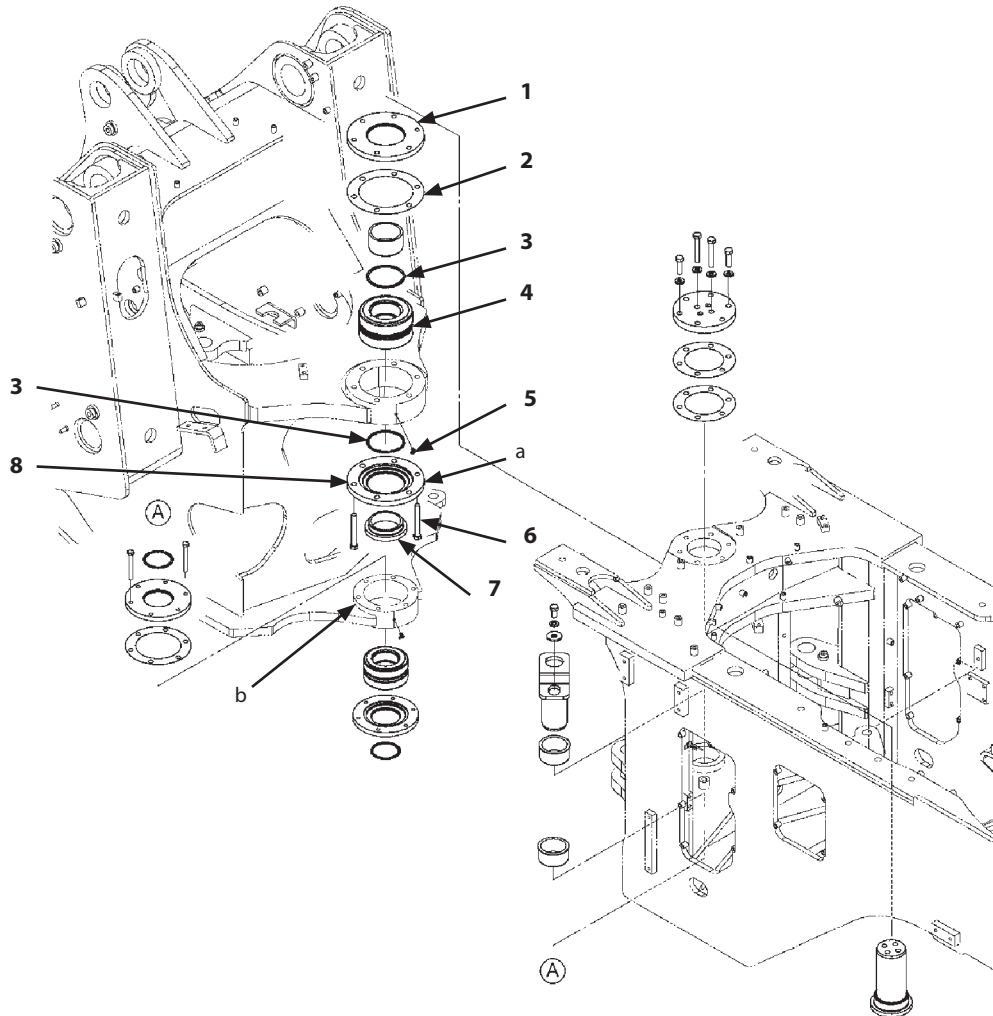
3. Install washers (3) (2 used) and bolts (5) (2 used).

 : 46 mm

 : 1510 N·m (151 kgf·m, 1110 lbf·ft)

SECTION 3 BODY

Group 3 Center Hinge




WNEC-03-03-001

a- Upper Hinge

b- Lower Hinge


• Upper Hinge (a) Side

9. Remove bushing (7).
10. Remove bolts (6) (6 used). Remove caps (8, 1) and shim (2).

 : 19 mm

11. Remove dust seals (3) (2 used) from caps (8, 1).

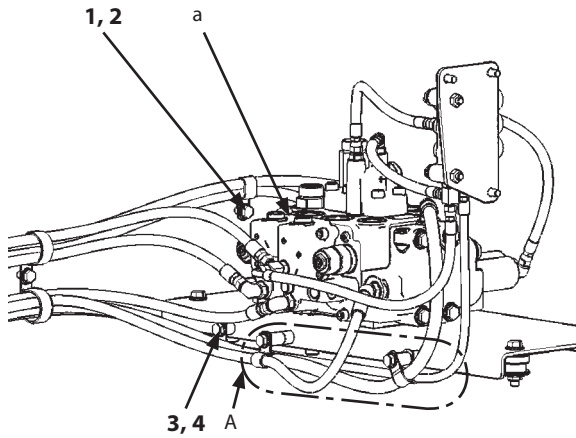
12. Remove grease fitting (5).

 : 10 mm

13. Remove bearings (4) (2 used).

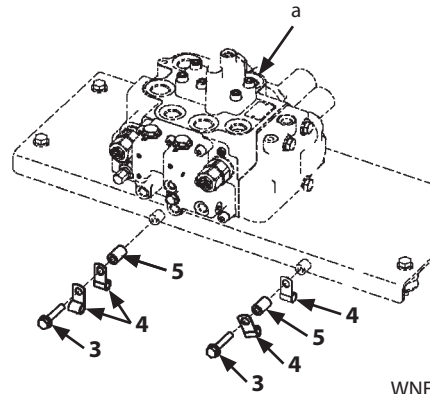
SECTION 3 BODY

Group 3 Center Hinge



WNEC-03-03-031


Detail A




WNEC-03-03-036

a- Control Valve

10. Remove bolt, washer (1) and clip (2).

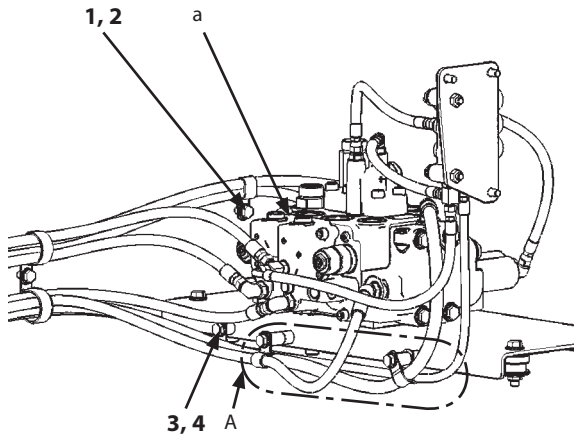
 : 17 mm

11. Remove bolts, washers (3) (3 used), collars (5) (2 used), and clamps (4) (4 used).

 : 17 mm

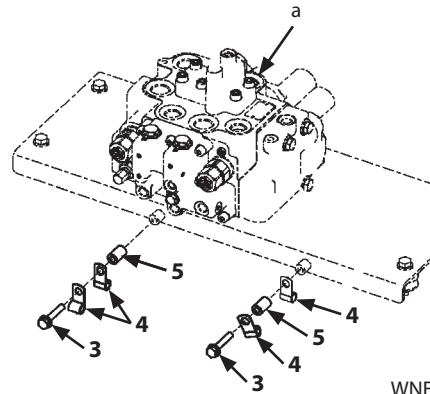
SECTION 3 BODY

Group 3 Center Hinge



WNEC-03-03-031


Detail A




WNEC-03-03-036


a- Control Valve


15. Install clamps (4) (4 used) with collars (5) (2 used) and bolts, washers (3) (3 used).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

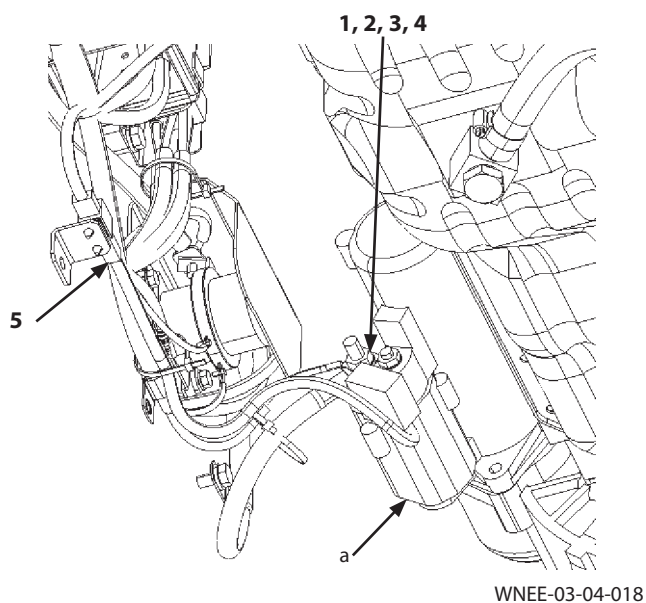
16. Install clip (2) with bolt, washer (1).

 : 17 mm

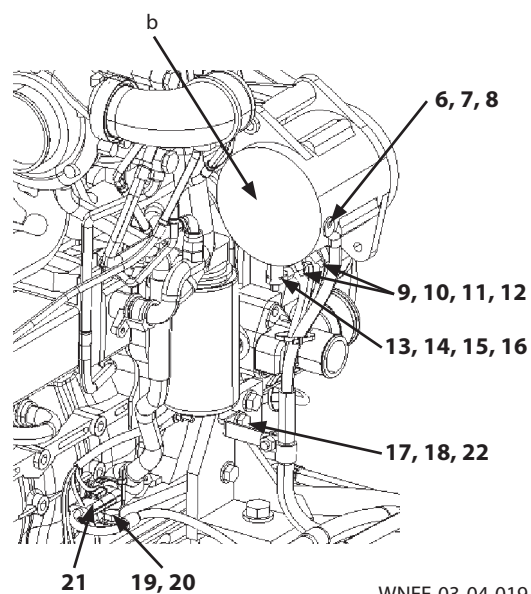
 : 50 N·m (5 kgf·m, 37 lbf·ft)

SECTION 3 BODY

Group 4 Engine




a- Starter




b- Alternator

32. Remove nut (1) and washer (2). Disconnect terminals (3, 4).

 : 19 mm

33. Disconnect connector (5).


34. Remove screw (6) and washer (7). Disconnect terminal (8).

 : 13 mm


35. Remove covers (9) (2 used), nuts (10) (2 used), and washer (11). Disconnect terminals (12) (2 used).

 : 8 mm


36. Remove cover (13), nut (14), and washer (15). Disconnect terminal (16).

 : 13 mm

37. Remove bolt, washer (17), clip (18), and bracket (22).

 : 17 mm

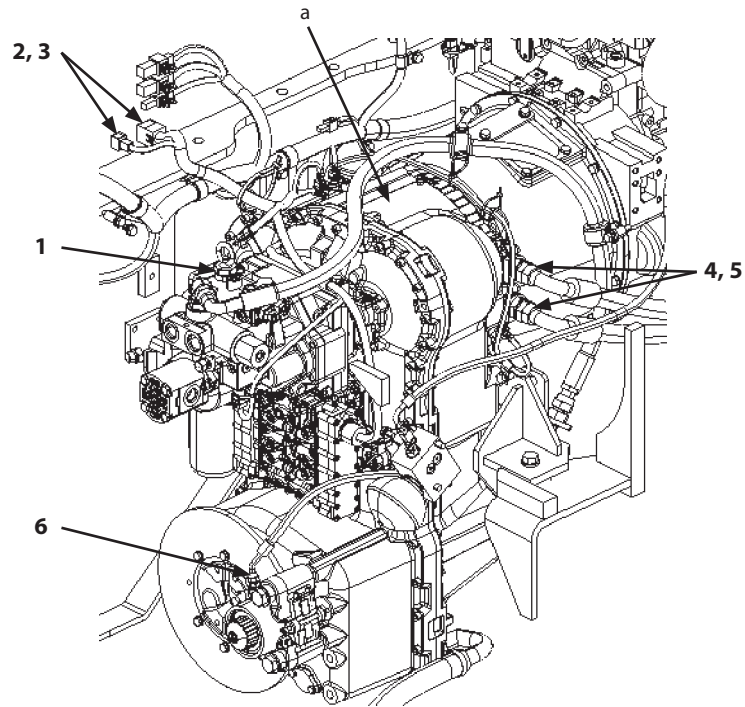
38. Remove bolt, washer (19) and clip (20).

 : 17 mm

39. Disconnect connector (21).

SECTION 3 BODY

Group 4 Engine




a- Drive Unit


WNEE-03-04-032


6. Connect hose (6).

 : 19 mm

 : 30 N·m (3 kgf·m, 22 lbf·ft)

7. Install O-rings (5) (2 used). Connect the drive unit (a) side of hoses (4) (2 used).

 : 41 mm

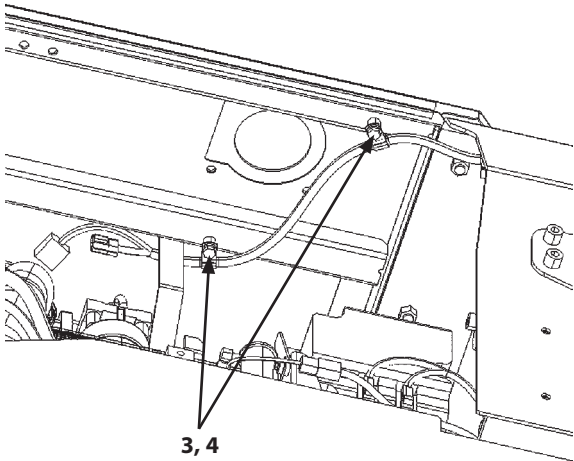
 : 110 N·m (11 kgf·m, 81 lbf·ft)

8. Connect connectors (2, 3).

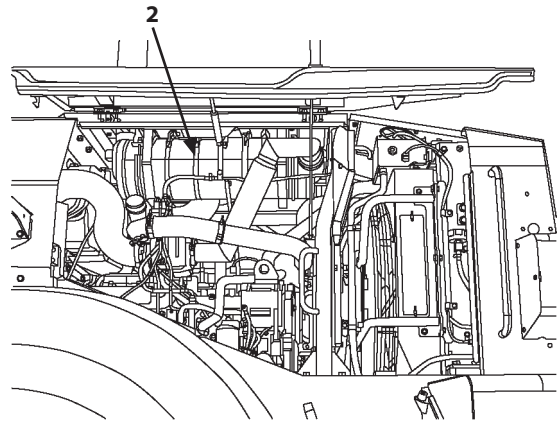
9. Install drive unit (a) to pump device (1). (Refer to W3-8-1.)

SECTION 3 BODY

Group 4 Engine





WNEE-03-04-028



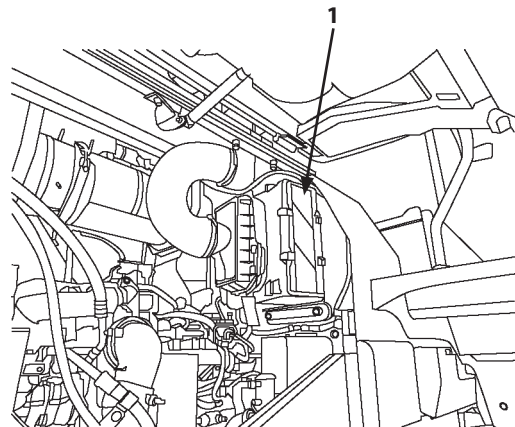
MNEC-07-091

55. Install clips (4) (2 used) with bolts, washers (3) (2 used).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

56. Install muffler filter assembly (2). (Refer to W3-16-1.)
57. Install air cleaner assembly (1). (Refer to W3-4-3.)

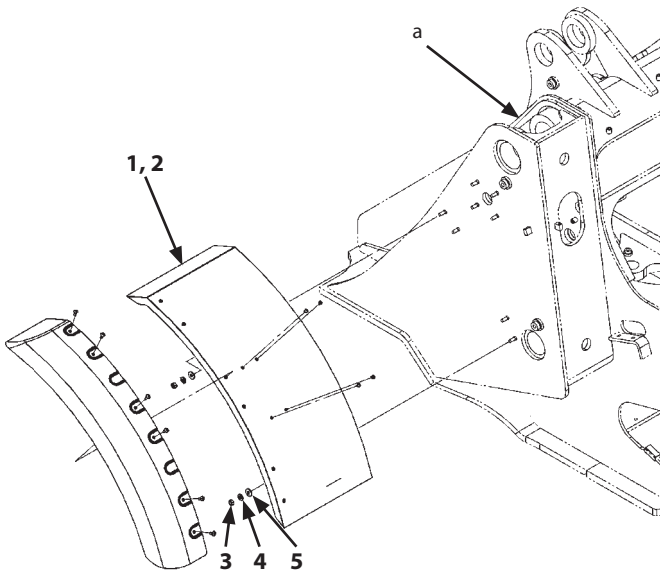


MNEC-07-104

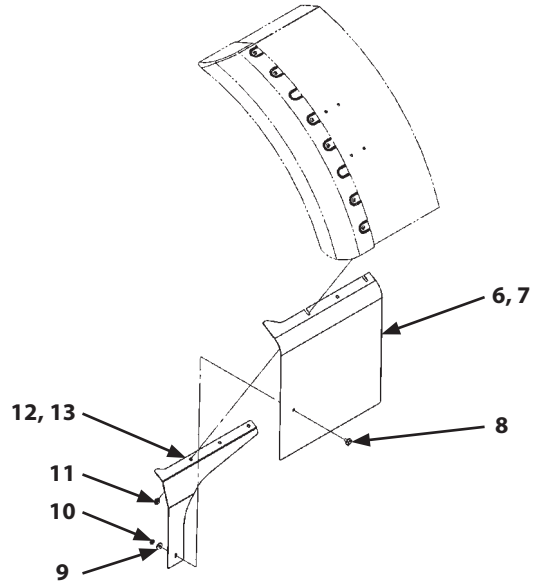
SECTION 3 BODY

Group 4 Engine

Removal and Installation of Front Fender



WNEE-03-04-049



WNEE-03-04-050

a- Front Frame

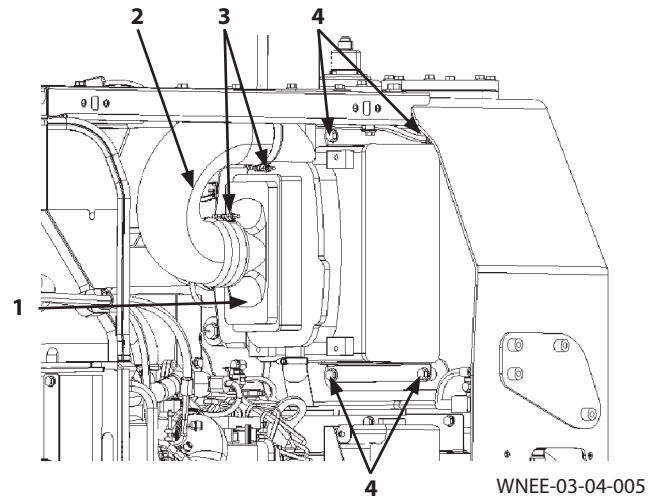
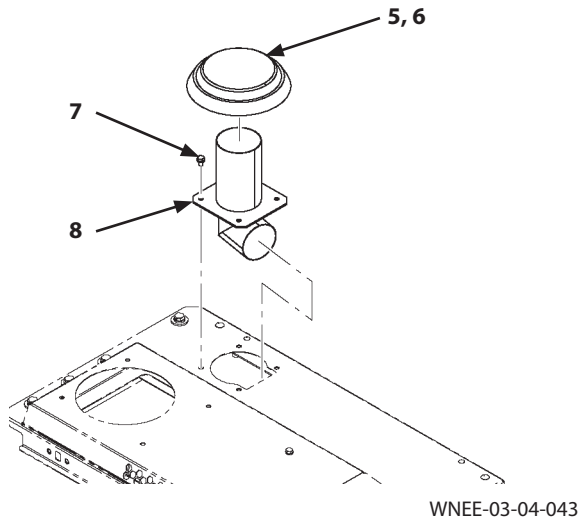
No.	Part Name	Q'ty	Wrench Size (mm)	Tightening Torque			Weight (kg, lb)
				N·m	(kgf·m)	(lbf·ft)	
1	Front Fender (Left)	1					(25.5, 57)
2	Front Fender (Right)	1					(25.5, 57)
3	Nut	8	: 19	90	(9)	(66)	
4	Washer	8					
5	Washer	8					
6	Mud Guard (Left)	1					
7	Mud Guard (Right)	1					
8	Bolt, Washer	2	: 17	50	(5)	(37)	
9	Washer	2					
10	Nut	2	: 17				
11	Bolt, Washer	6	: 17	50	(5)	(37)	
12	Plate (Left)	1					
13	Plate (Right)	1					

⚠ CAUTION: When removing and installing the following parts, hoist and hold them by using nylon slings.

- The front fender (1, 2) assembly weight: 25.5 kg (57 lb)


SECTION 3 BODY


Group 4 Engine



Installation


1. Install pipe (8) with bolts, washers (7) (4 used).


 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

2. Install rain cap (5) with clamp (6).


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

 : 19 mm

 : 90 N·m (9 kgf·m, 66 lbf·ft)

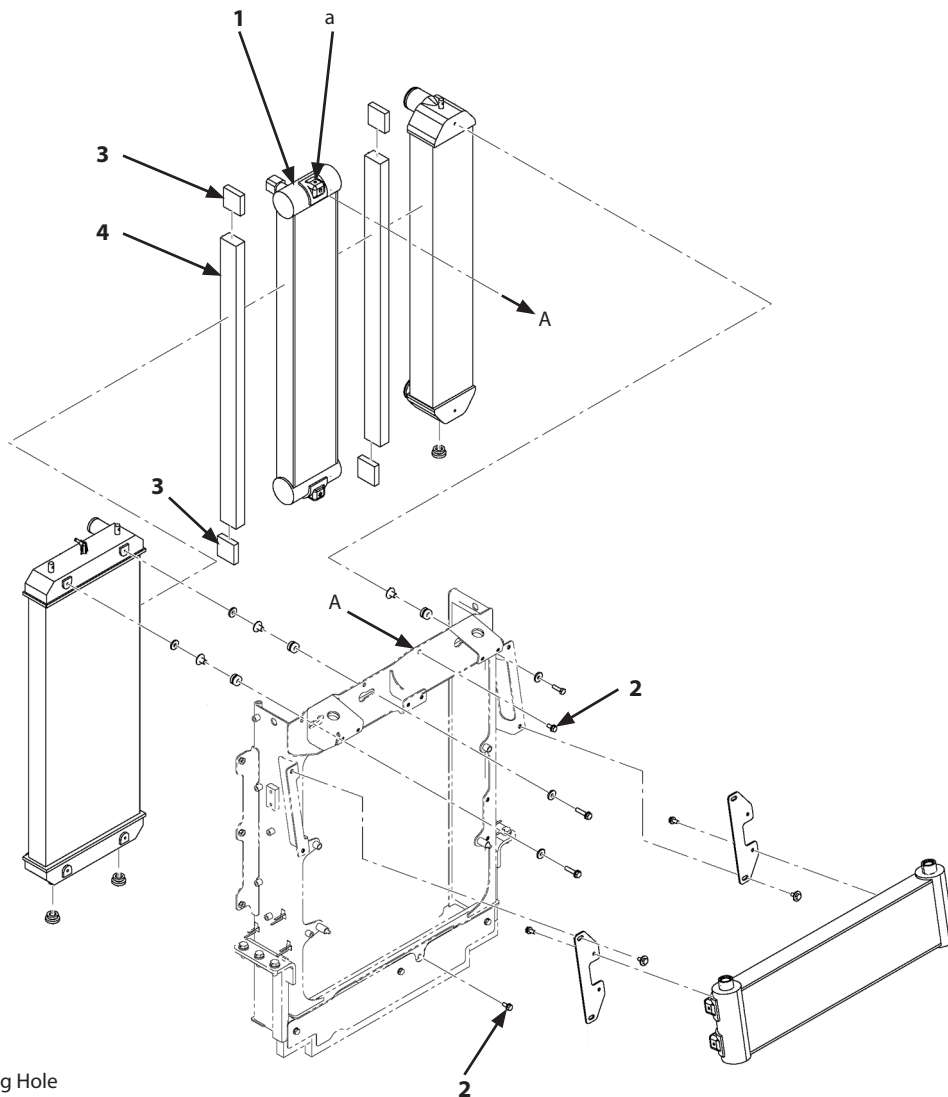
4. Connect hose (2) with clamps (3) (2 used).

 : 7 mm

 : 6 to 7 N·m (0.6 to 0.7 kgf·m, 4.4 to 5.2 lbf·ft)

SECTION 3 BODY

Group 5 Radiator Assembly




a- Eyebolt Mounting Hole


WNEE-03-05-031

42. Install eyebolts (M6, Pitch 1 mm) to eyebolt mounting holes (a) of oil cooler (1). Attach the nylon slings onto the eyebolts. Hoist and hold oil cooler (1).

44. Remove rubber seals (3) (2 used) and rubber seal (4) from oil cooler (1).

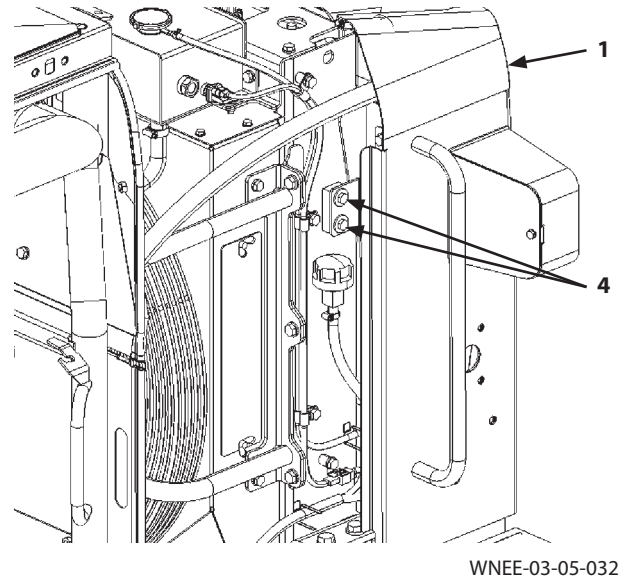
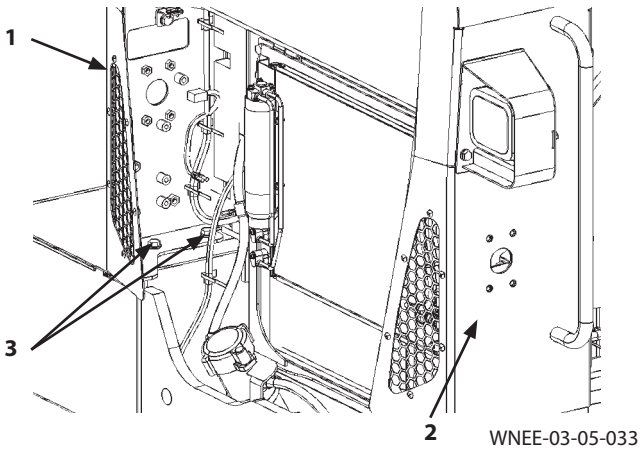
 NOTE: Oil cooler (1) weight: 12 kg (27 lb)





43. Remove bolts, washers (2) (2 used). Remove oil cooler (1).

 : 17 mm

SECTION 3 BODY

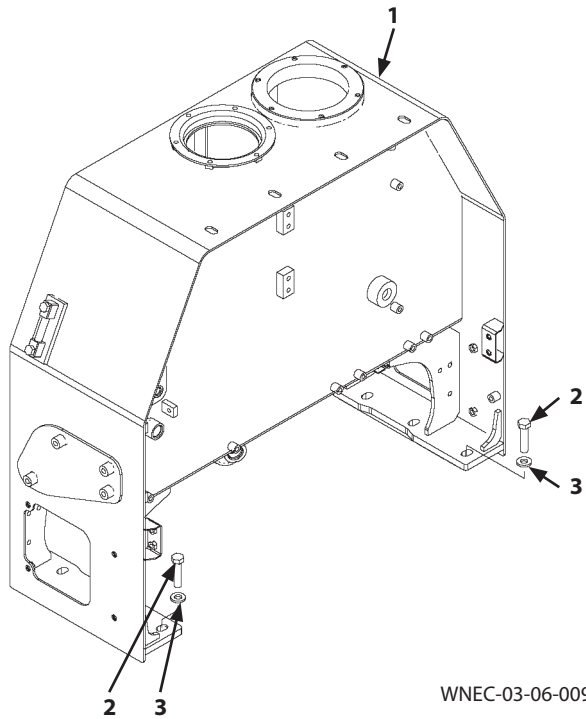
Group 5 Radiator Assembly



31. Attach the nylon slings onto rear side cover (1).
Hoist and hold rear side cover (1).
32. Install rear side cover (1) with bolts, washers (4) (2 used).
 : 19 mm
 : 90 N·m (9 kgf·m, 66 lbf·ft)
33. Install bolts, washers (3) (2 used).
 : 17 mm
 : 50 N·m (5 kgf·m, 37 lbf·ft)
34. Install rear side cover (2) in the same way as step 31 to step 33.

SECTION 3 BODY

Group 6 Hydraulic Oil Tank




⚠ CAUTION: Hydraulic oil tank (1) weight: 180 kg (400 lb)

27. Attach nylon slings onto hydraulic oil tank (1). Hoist and hold hydraulic oil tank (1).

IMPORTANT: Do not contact the cab rear glass and the rear work lights when removing and installing hydraulic oil tank (1) from the machine.

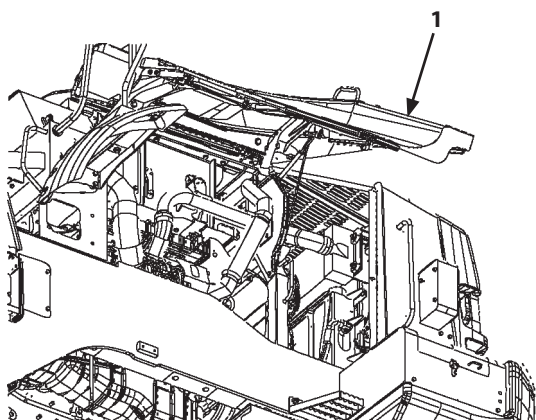
28. Remove bolts (2) (6 used) and washers (3) (6 used). Hoist and remove hydraulic oil tank (1).

 : 24 mm

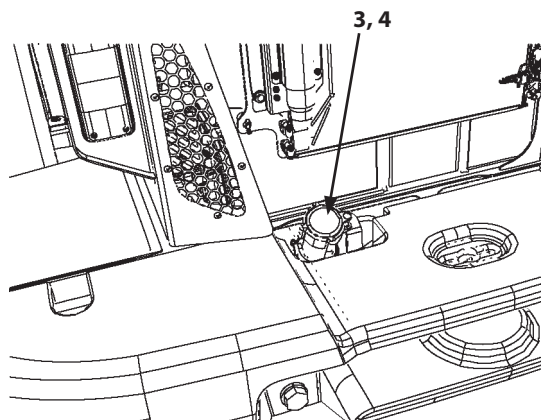
SECTION 3 BODY

Group 7 Fuel Tank

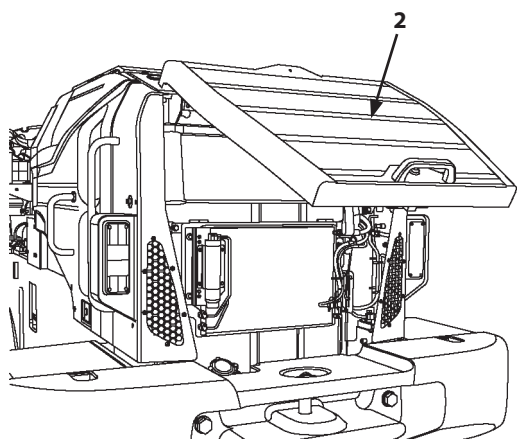
Removal and Installation of Fuel Tank



MNEC-01-065



MNEC-01-514



MNEC-01-511


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 cover (1) and rear grill (2).

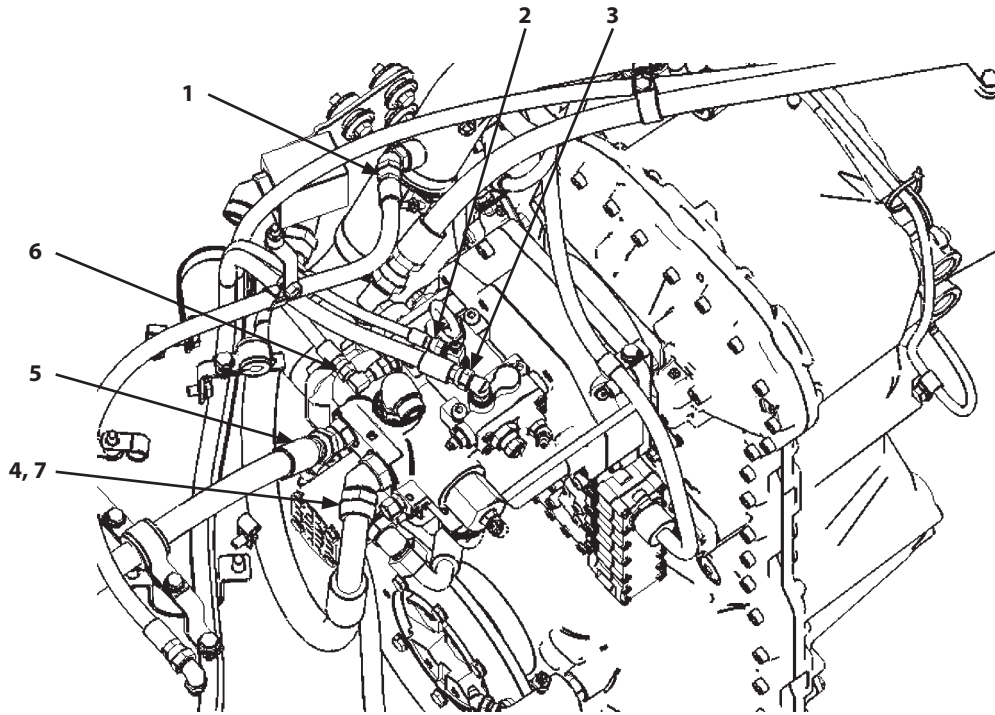
3. Remove cap (3).

4. Place a container. Drain off fuel by using an oil feed pump.

 **NOTE:** Total oil amount of fuel tank (4): 255 L (67 US gal)


SECTION 3 BODY

Group 8 Pump Device




WNEC-03-08-012


11. Disconnect hose (1).

 : 27 mm


12. Disconnect hose (3).

 : 22 mm


13. Disconnect hose (2).

 : 19 mm


14. Disconnect hose (6).

 : 22 mm

15. Disconnect hose (4). Remove O-ring (7).

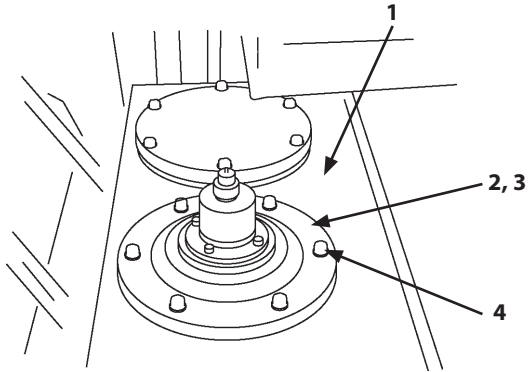
 : 41 mm

16. Disconnect hose (5).

 : 36 mm

SECTION 3 BODY


Group 8 Pump Device



M4GB-07-044


28. Install the cab assembly. (Refer to W3-1-1.)


29. Fill hydraulic oil tank (1) with hydraulic oil.

 **NOTE:** Specified oil amount of hydraulic oil tank (1):
115 L (45.2 US gal)

30. Install O-ring (3).

31. Install the cover (2) assembly with bolts, washers (4)
(6 used).

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

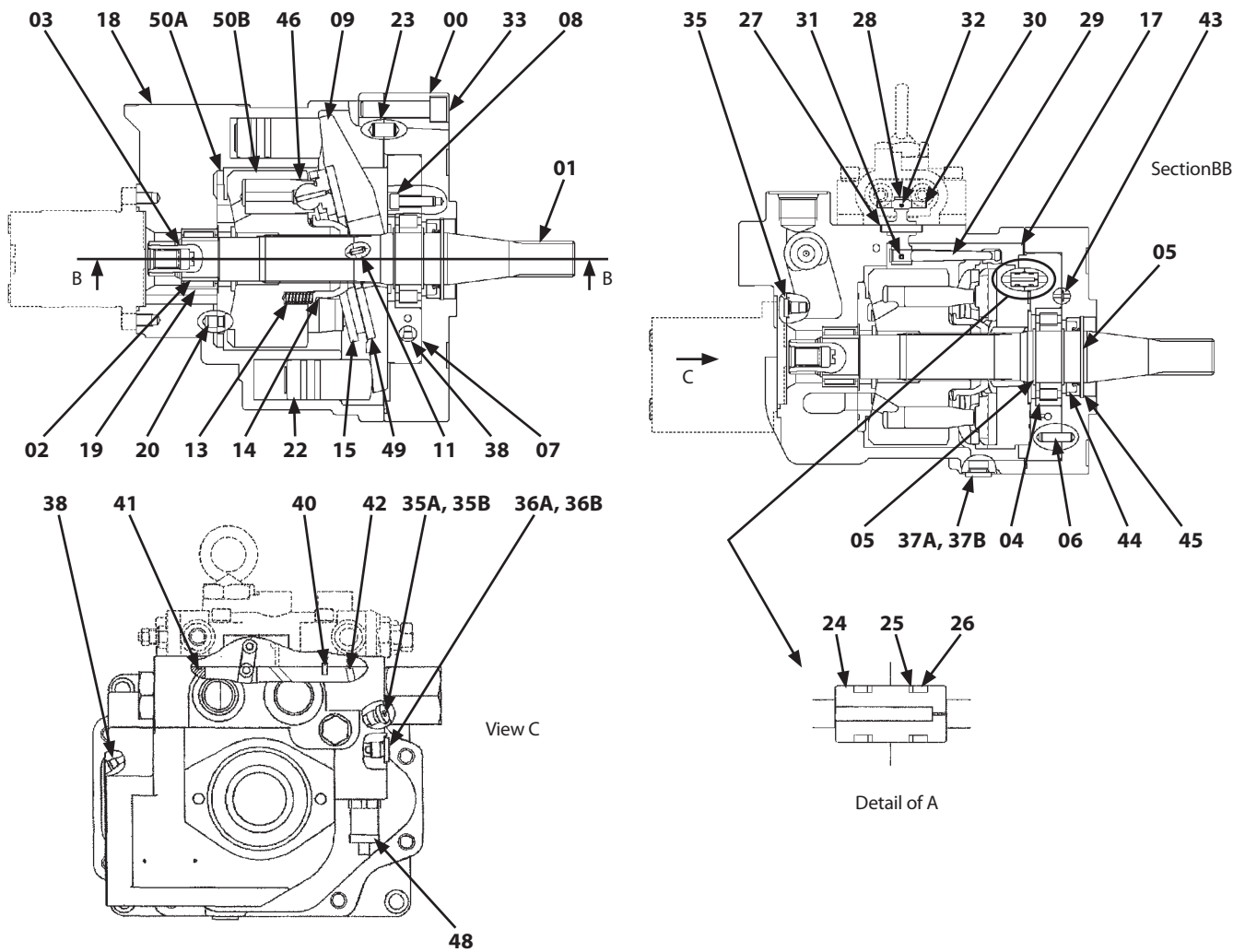
32. Bleed air from the hydraulic system. (Refer to W1-4-1.)

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

SECTION 3 BODY

Group 8 Pump Device

Assembly of Main Pump



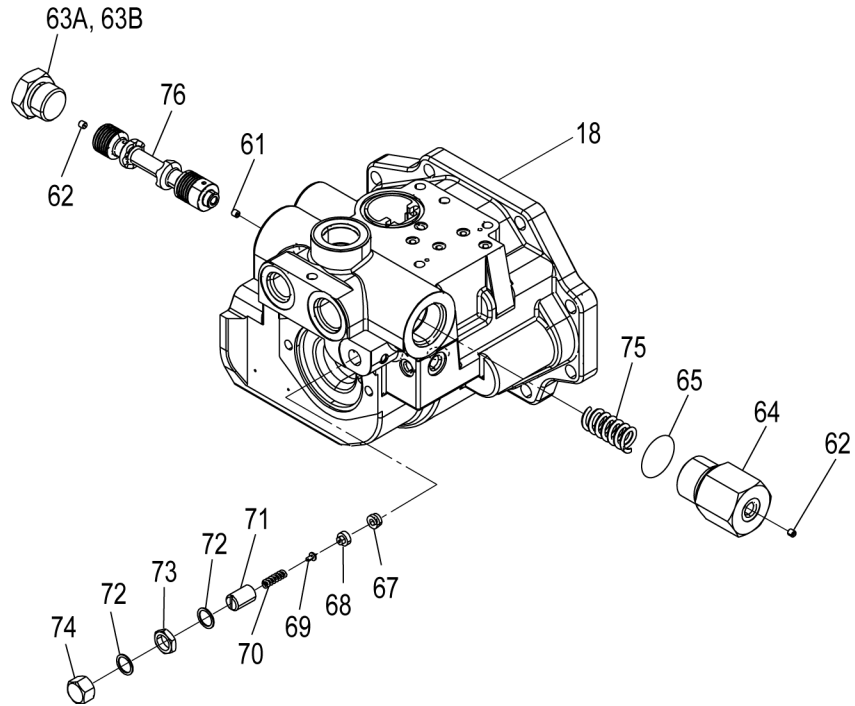
W4GB-02-04-003

- | | | | |
|-----------------------------|---------------------------|--------------------------|-------------------------|
| 00- Front Casing | 14- Bushing | 28- Feedback Link | 38- Plug (5 Used) |
| 01- Drive Shaft | 15- Retainer | 29- Link Pin | 40- Spring Pin (2 Used) |
| 02- Inner Race | 17- O-Ring | 30- Pin | 41- O-Ring |
| 03- Retaining Ring | 18- Pump Casing | 31- Spring Pin | 42- O-Ring (5 Used) |
| 04- Roller Bearing | 19- Needle Bearing | 32- Spring Pin | 43- O-Ring |
| 05- Retaining Ring (2 Used) | 20- Knock Pin | 33- Socket Bolt (8 Used) | 44- Oil Seal |
| 06- Knock Pin | 22- Servo Piston (3 Used) | 35A- Plug | 45- Retaining Ring |
| 07- Cradle Plate | 23- Knock Pin | 35B- O-Ring | 46- Piston (7 Used) |
| 08- Socket Bolt (4 Used) | 24- Restrictor Pin | 36A- Plug | 48- Pressure Sensor |
| 09- Swash Plate | 25- Backup Ring (2 Used) | 36B- O-Ring | 49- Cam Plate |
| 11- Knock Pin | 26- O-Ring (2 Used) | 37A- Plug | 50A- Valve Plate |
| 13- Spring (7 Used) | 27- Pin | 37B- O-Ring | 50B- Rotor |

SECTION 3 BODY

Group 8 Pump Device

Disassembly of Priority Valve

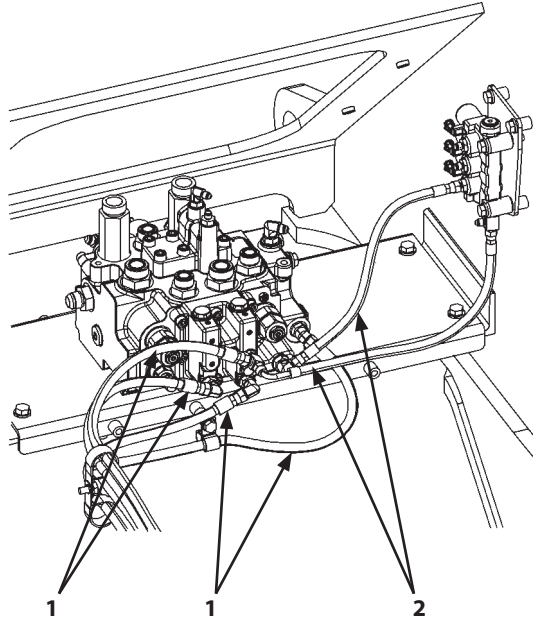


WNEC-03-08-002

- | | | | |
|----------------------|------------|---------------------|------------|
| 18- Pump Casing | 64- Plug | 70- Spring | 75- Spring |
| 61- Orifice | 65- O-Ring | 71- Screw | 76- Spool |
| 62- Orifice (2 Used) | 67- Plug | 72- Gasket (2 Used) | |
| 63A- Plug | 68- Seat | 73- Nut | |
| 63B- O-Ring | 69- Poppet | 74- Nut Cap | |


SECTION 3 BODY

Group 9 Control Valve




WNEC-03-09-014

17. Disconnect hoses (2) (2 used).

 : 17 mm

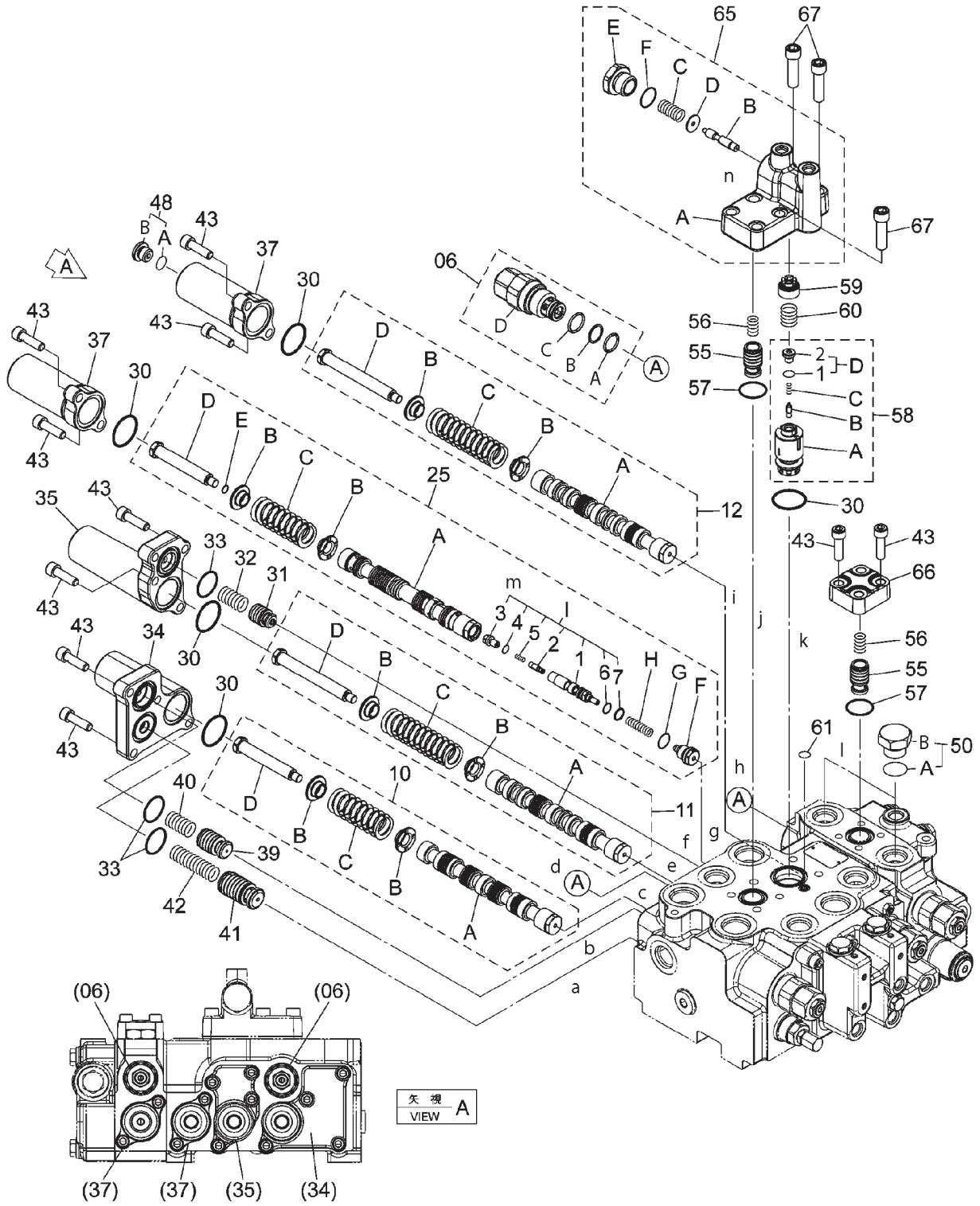
18. Disconnect hoses (1) (4 used).

 : 19 mm

SECTION 3 BODY

Group 9 Control Valve

Disassembly of Control Valve

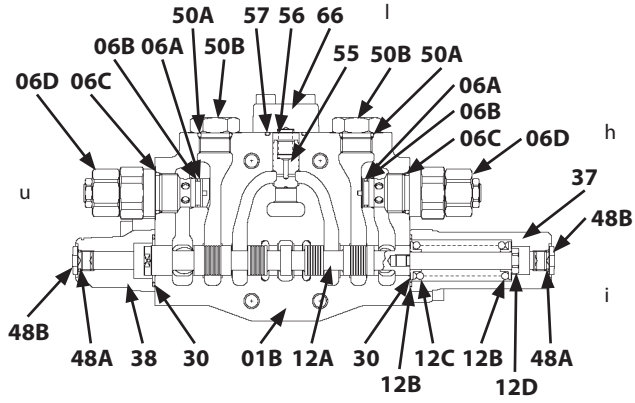


WNEC-03-09-001

SECTION 3 BODY

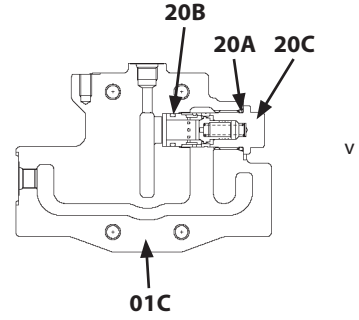
Group 9 Control Valve

Section E-E



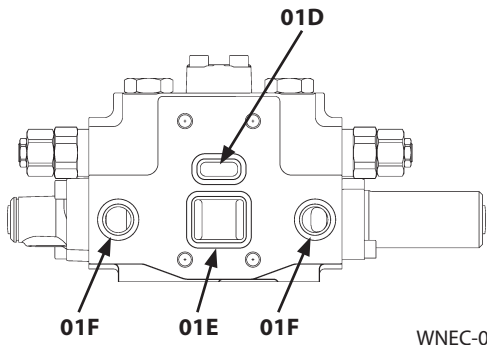
TNED-03-02-008

Section F-F



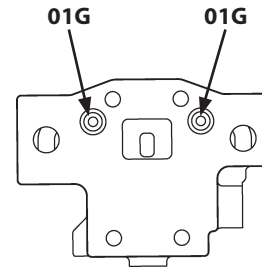
TNED-03-02-009

Section G-G



WNEC-03-09-003

Section H-H

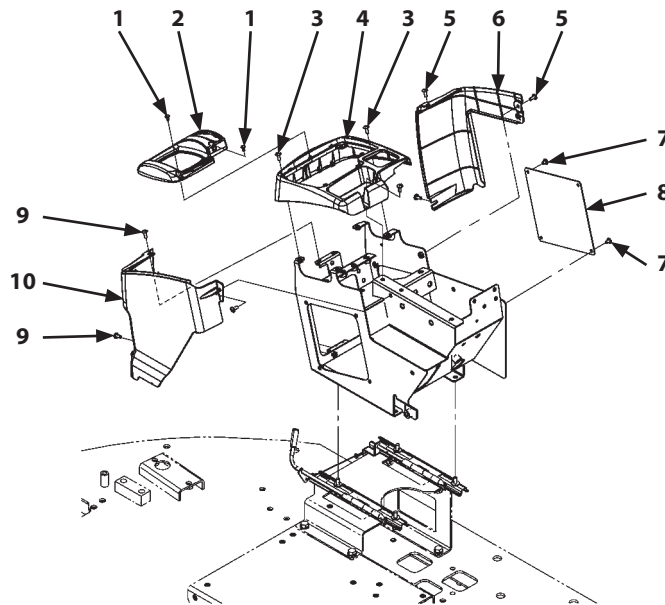


WNEC-03-09-010

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

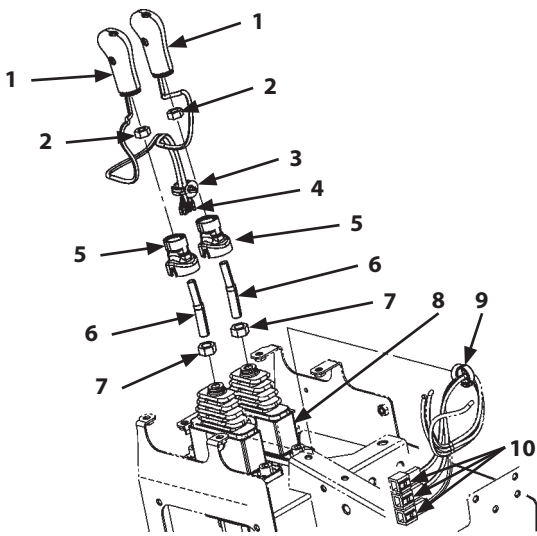
1. Set the machine position for inspection and maintenance. (Refer to W1-6-1.)

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

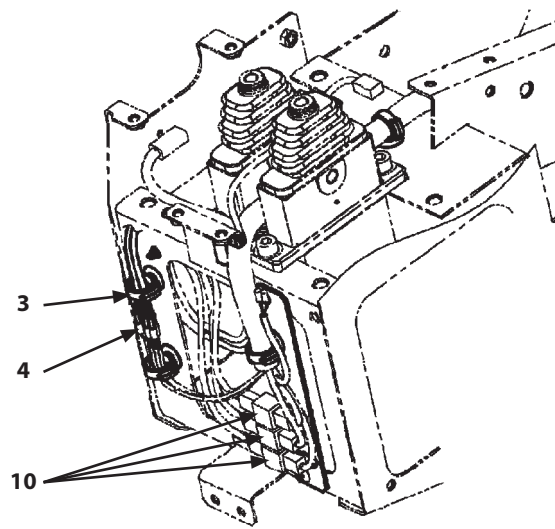
2. Remove cover (2) and screws (1) (2 used).
3. Remove cover (4) and screws (3) (5 used).
4. Remove cover (6) and screws (5) (3 used).

SECTION 3 BODY

Group 10 Pilot Valve




WNEC-03-10-015





WNEC-03-10-017

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


 : 19 mm

- 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)


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


 : 17 mm

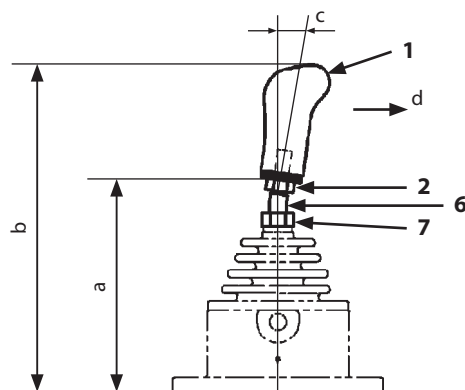
IMPORTANT: Check the mounting dimension to install grip (1).

- 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

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

- Install clips (3, 9).

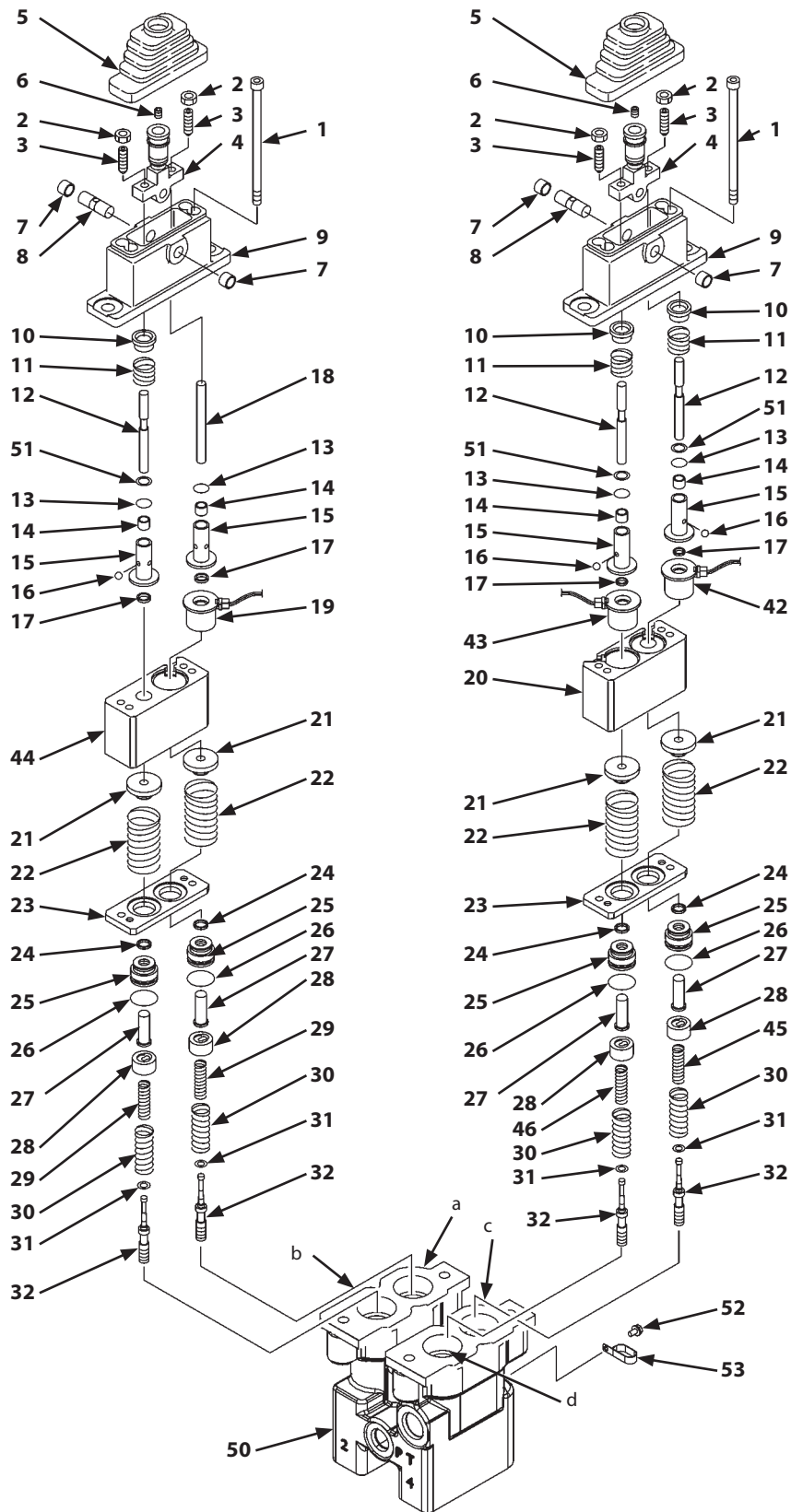
- Bleed air from the hydraulic system. (Refer to W1-4-1.)

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)



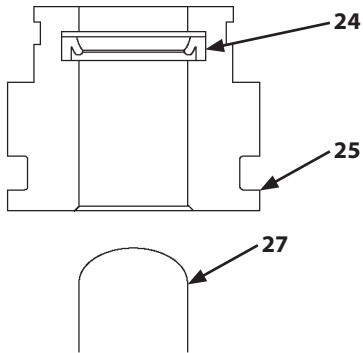
WNEC-03-10-006

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).

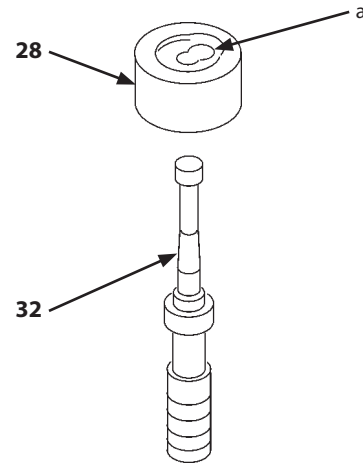


W4GB-02-06-015

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).

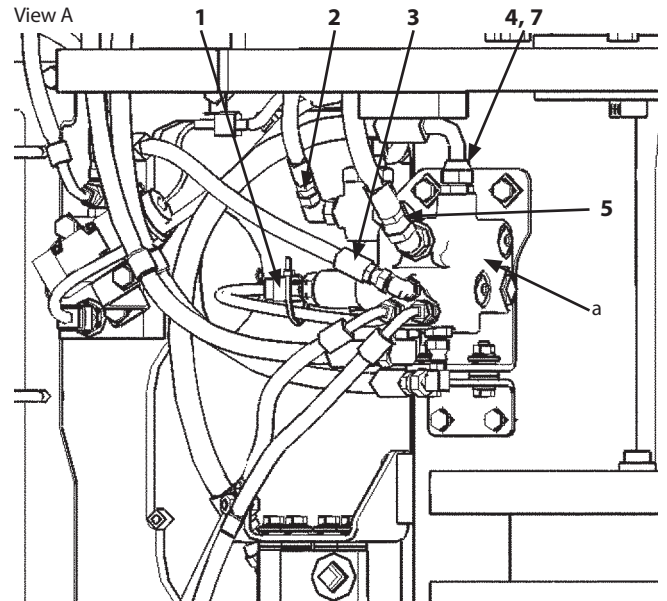
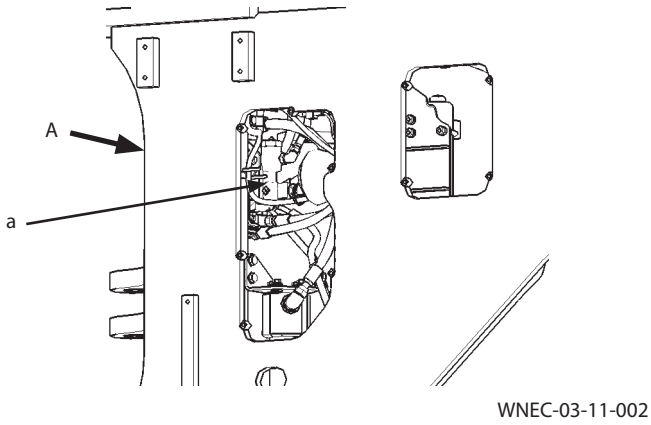


a - Hole

WNEC-03-10-008

SECTION 3 BODY

Group 11 Brake Charge Valve



a- Brake Charge Valve

IMPORTANT: Check the direction of hose (3).

9. Connect hose (3).

: 19 mm

: 30 N·m (3 kgf·m, 22 lbf·ft)

10. Connect hose (2).

: 22 mm

: 40 N·m (4 kgf·m, 30 lbf·ft)

11. Install O-ring (7). Connect hose (4).

: 27 mm

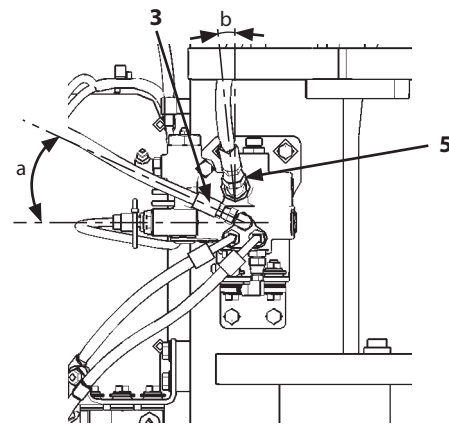
: 93 N·m (9.3 kgf·m, 69 lbf·ft)

IMPORTANT: Check the direction of hose (5).

12. Connect hose (5).

: 27 mm

: 80 N·m (8 kgf·m, 59 lbf·ft)



a- 20°

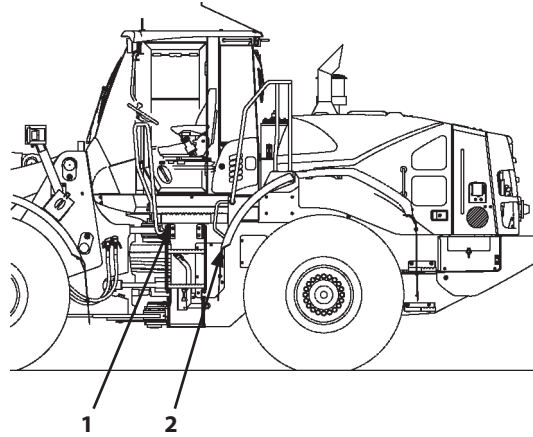
b- 10°

13. Connect connector (1).

SECTION 3 BODY

Group 12 Manifold Valve

Removal and Installation of Manifold Valve



WNEC-03-01-013

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: 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. (Refer to W1-4-1.)

CAUTION: Operate the steering wheel right and left several times, and release any pressure in the circuit.

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

2. Remove following parts. (Refer to W3-4-2.)
 - Rear Fender (Front) (2)
 - Deck (1)

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

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

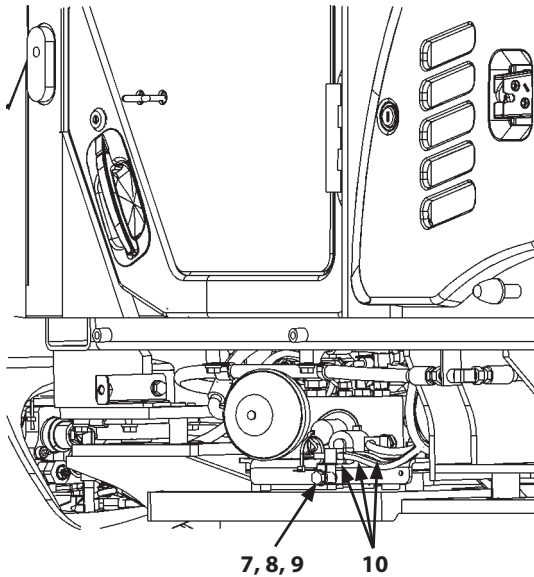


- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

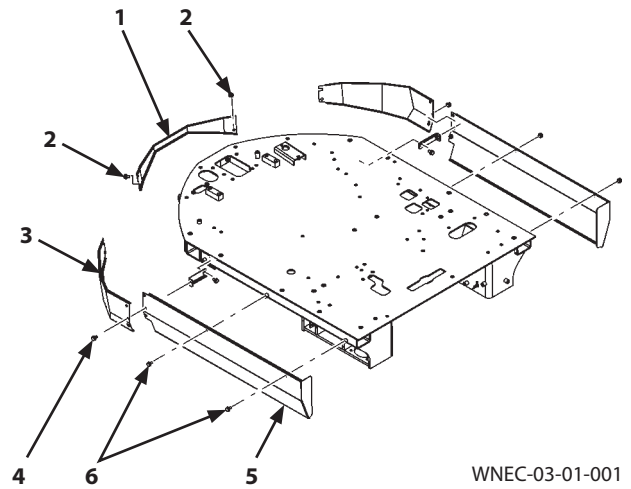
CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

SECTION 3 BODY

Group 12 Manifold Valve





WNEC-03-12-006



WNEC-03-01-001


12. Connect connectors (10) (3 used).
13. Install tube (9) and brackets (8) (2 used) with bolt, washer (7).


 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)


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


14. Bleed air from the hydraulic system. (Refer to W1-4-1.)
15. Install cover (5) with bolts, washers (6) (2 used).

 : 17 mm


 : 50 N·m (5 kgf·m, 37 lbf·ft)


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

 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

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

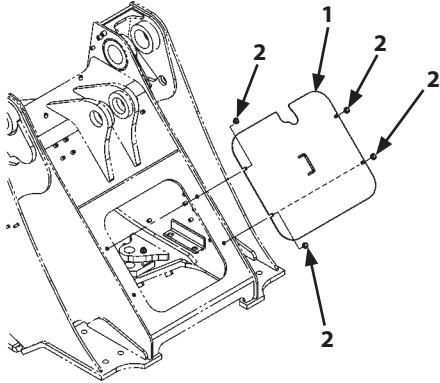
 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

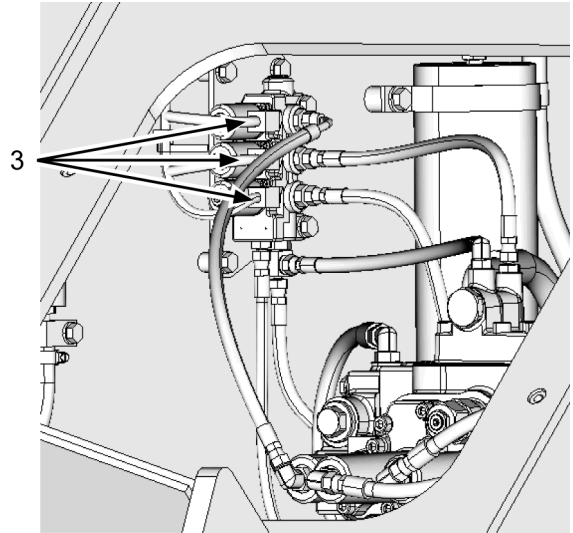
SECTION 3 BODY

Group 13 Solenoid Valve

Removal and Installation of 3-Spool Solenoid Valve Unit



WNEC-04-08-003



WNEC-03-13-002


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.)

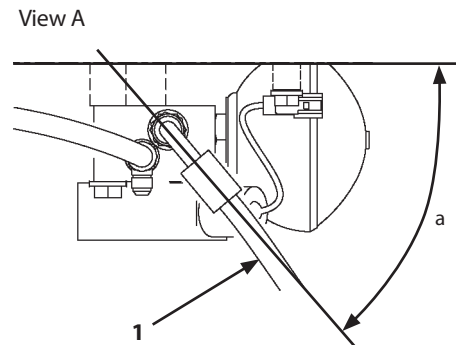
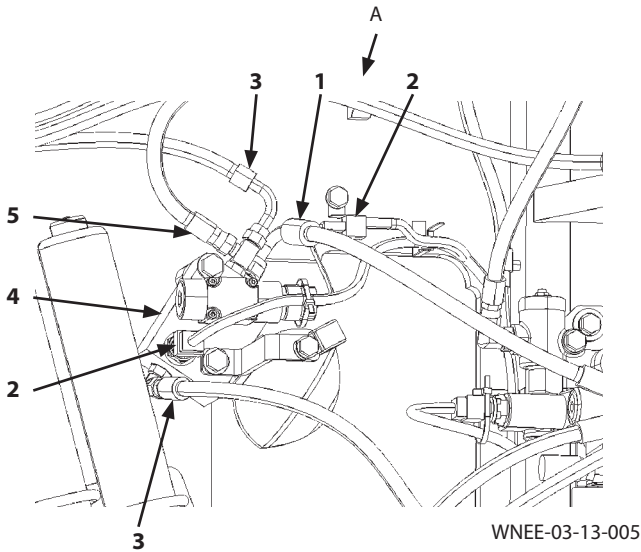
2. Remove bolts, washers (2) (4 used). Remove cover (1).

 : 17 mm

3. Disconnect connectors (3) (3 used).

SECTION 3 BODY


Group 13 Solenoid Valve




a- 70°

WNEC-03-13-006


4. Connect hoses (3) (2 used).


 : 19 mm

 : 30 N·m (3 kgf·m, 22 lbf·ft)

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


5. Connect hose (1).


 : 22 mm

 : 40 N·m (4 kgf·m, 30 lbf·ft)

IMPORTANT: Check the angle to install hose (5).

6. Connect hose (5).

 : 19 mm

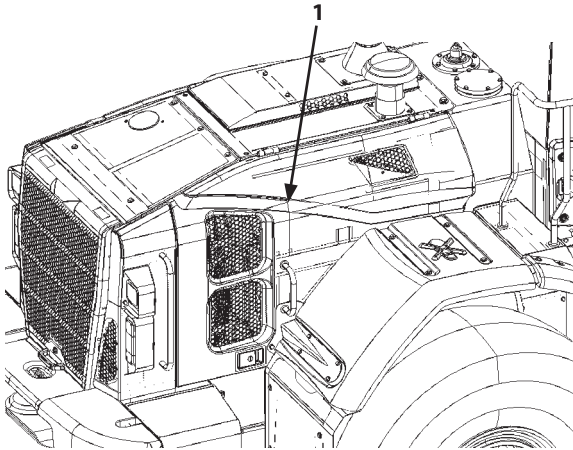
 : 30 N·m (3 kgf·m, 22 lbf·ft)

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

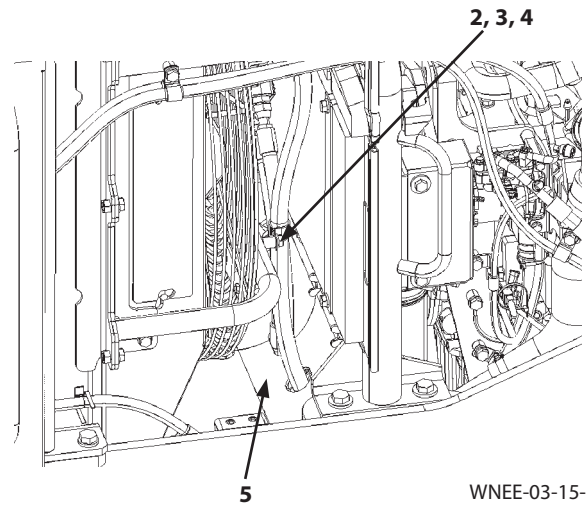
SECTION 3 BODY

Group 15 Cooling Fan System

Removal and Installation of Fan Valve



WNEE-03-15-005



WNEE-03-15-009


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

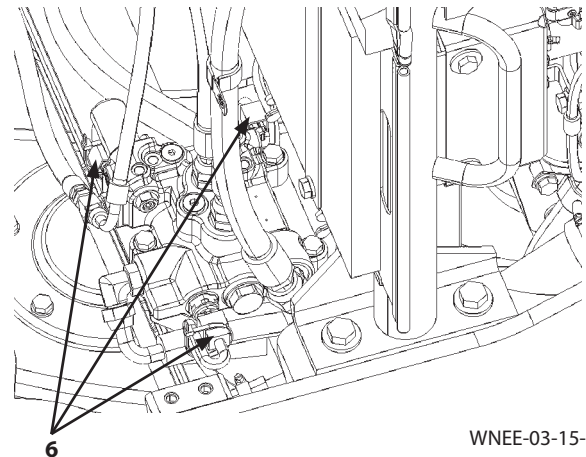
1. Set the machine for inspection and maintenance. (Refer to W1-6-1.)

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

2. Open side cover (1).
3. Remove rubber plate (5). (Refer to W3-4-2.)
4. Remove bolt, washer (2), collar (3), and clamp (4).

 : 17 mm

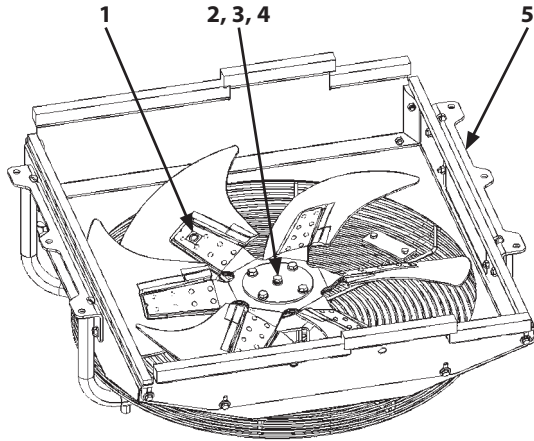
5. Disconnect connectors (6) (3 used).



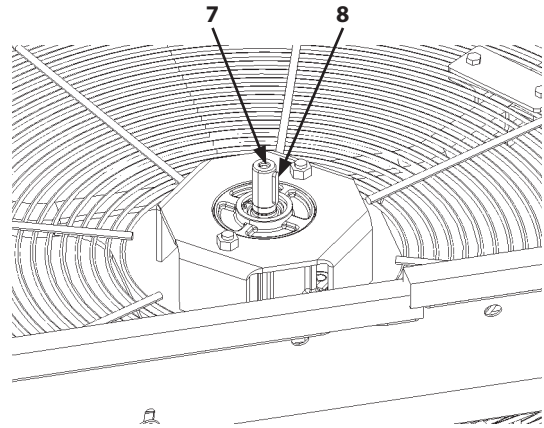
WNEE-03-15-010

SECTION 3 BODY

Group 15 Cooling Fan System




WNEE-03-15-025




WNEE-03-15-035

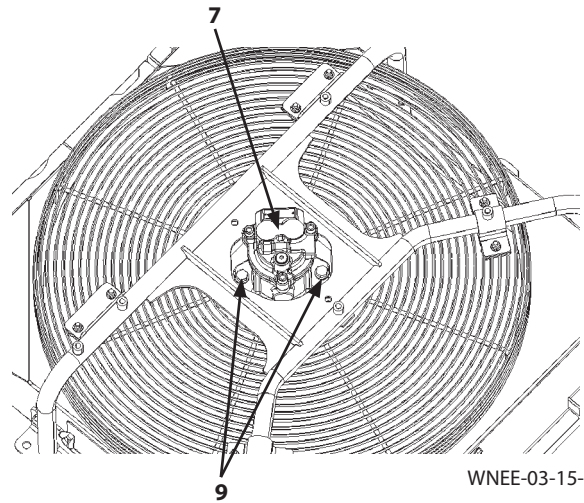
26. Remove bolt (2), spring washer (3), and washer (4). Remove the fan (1) assembly.

 : 17 mm

27. Remove key (8) from fan motor (7).
28. Hoist and place the hydraulic fan (5) assembly on the wooden blocks with the fan motor (7) side up.
29. Remove bolts, washers (9) (2 used). Remove fan motor (7).

 : 19 mm

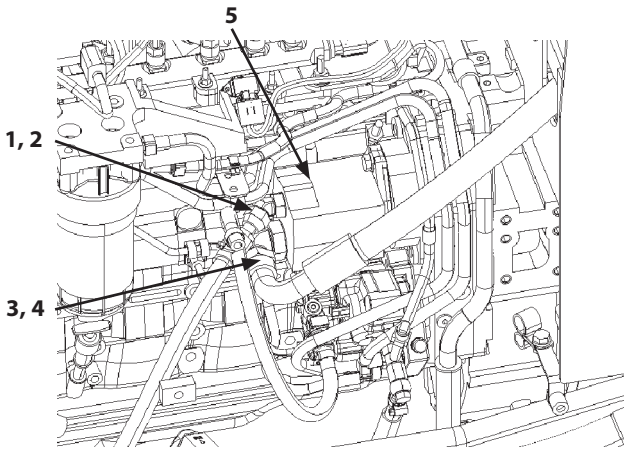
30. Remove the adapters with fan motor (7) attached if necessary.



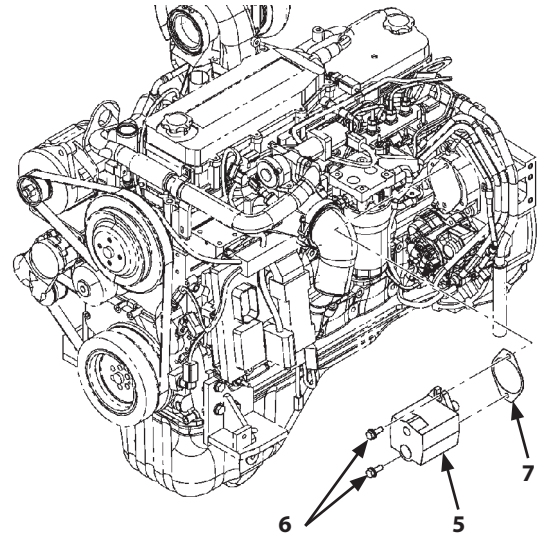
WNEE-03-15-026

SECTION 3 BODY

Group 15 Cooling Fan System




WNEE-03-04-014




WNEE-03-15-040


8. Place a container under fan pump (5). Disconnect hose (1) from fan pump (5). Remove O-ring (2).

 : 27 mm

9. Disconnect hose (3) from fan pump (5). Remove O-ring (4).

 : 41 mm

10. Remove bolts, washers (6) (2 used). Remove fan pump (5) and gasket (7).

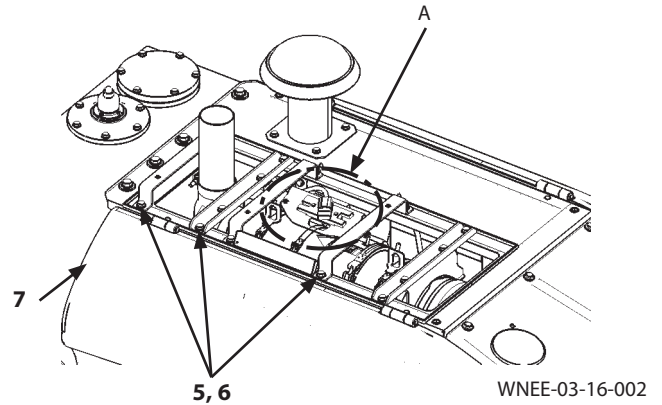
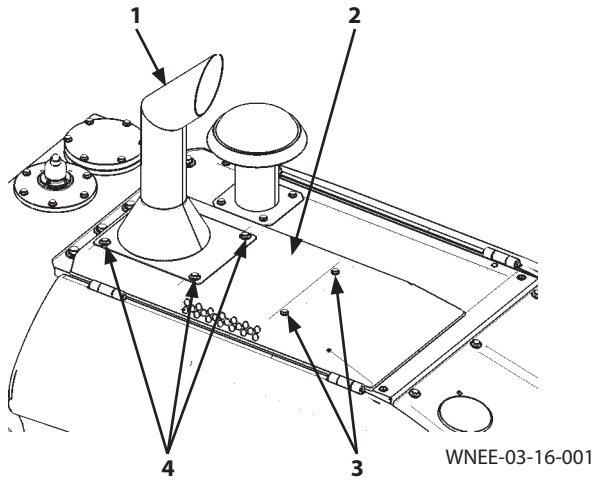
 : 17 mm

11. Remove the adapters with fan pump (5) attached if necessary.

SECTION 3 BODY

Group 16 Muffler Filter




Removal and Installation of Muffler Filter



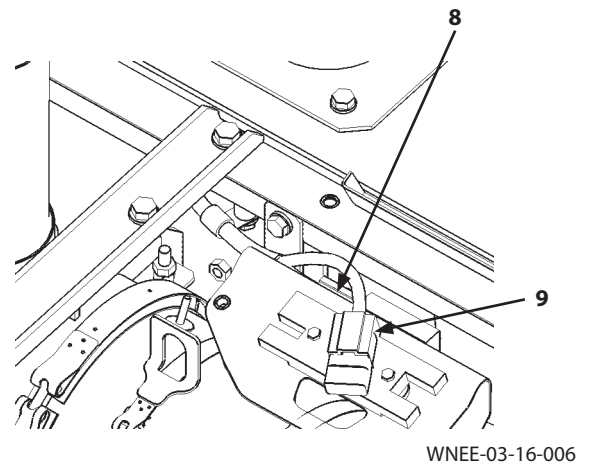
IMPORTANT: The hose and pipe contain hydraulic oil. When removing the hose and pipe, receive oils with a container in order to avoid spilling oils.

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 for inspection and maintenance. (Refer to W1-6-1.)
2. Remove bolts, washers (4) (4 used). Remove pipe (1).
 : 17 mm
3. Remove bolts, washers (3) (2 used). Remove cover (2).
 : 17 mm
4. Remove bolts, washers (6) (6 used). Remove brackets (5) (3 used).
 : 19 mm
5. Disconnect connectors (8) and (9).
6. Open side cover (7) at the left side.

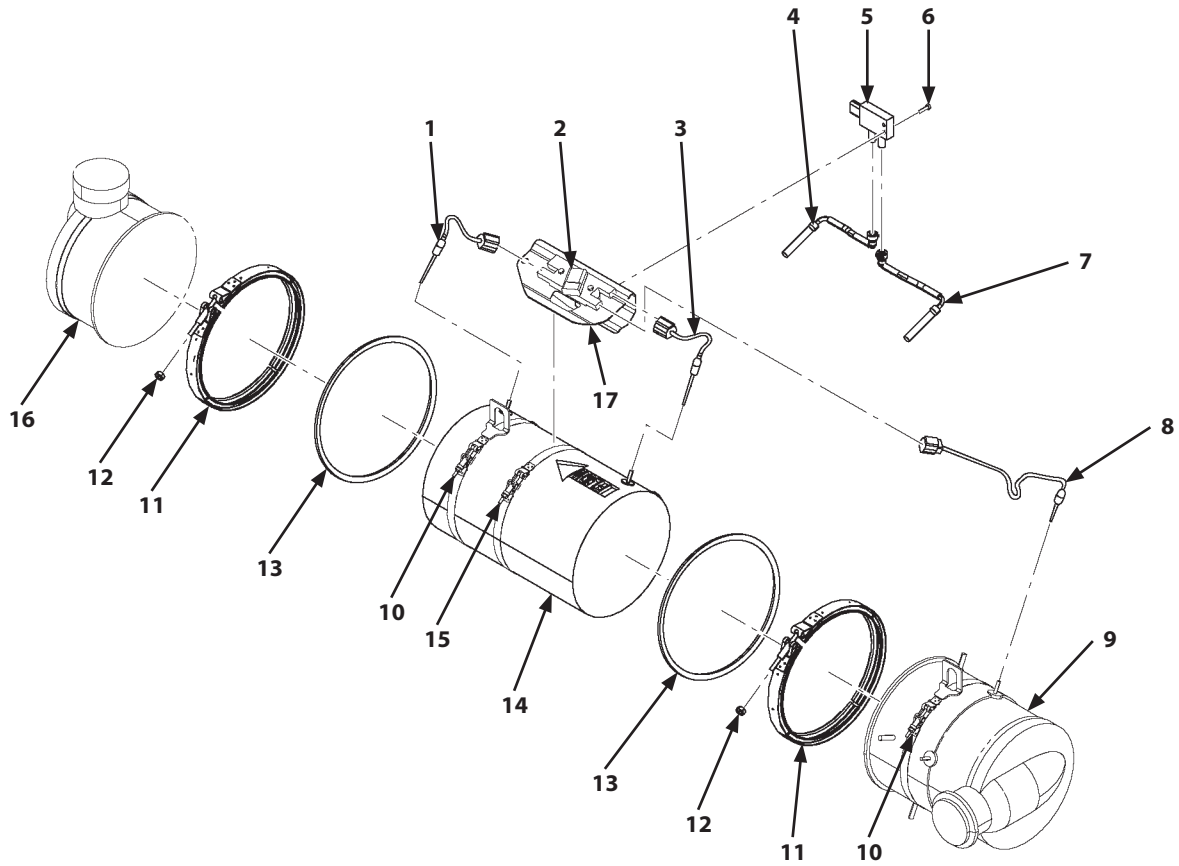
Detail A



SECTION 3 BODY

Group 16 Muffler Filter

Assembly of Muffler Filter



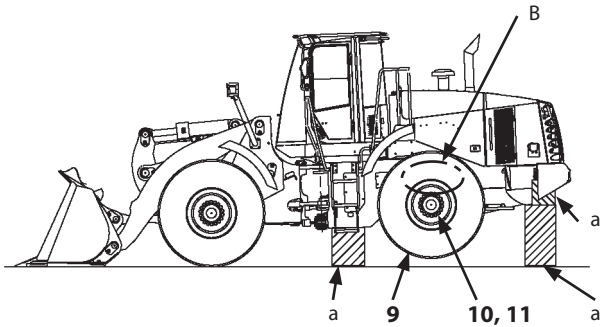
WNEE-03-16-008

- | | | | |
|---|-----------------------------------|---------------------|-------------|
| 1- Filter Outlet Gas Temperature Sensor | 5- Differential Pressure Sensor | 10- Clamp (2 Used) | 16- Muffler |
| 2- Module | 6- Bolt | 11- V Band (2 Used) | 17- Bracket |
| 3- Filter Intake Gas Temperature Sensor | 7- Pipe | 12- Nut (2 Used) | |
| 4- Pipe | 8- DOC Exhaust Temperature Sensor | 13- Gasket (2 Used) | |
| | 9- Diesel Oxidation Catalyst | 14- Filter | |
| | | 15- Clamp | |

MEMO

SECTION 4 TRAVEL SYSTEM

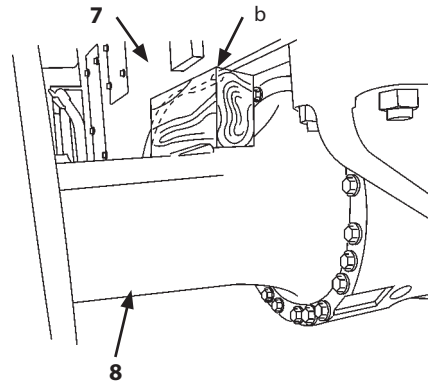
Group 1 Tire



W4GB-03-03-107

a- Stand

Detail B




W4FC-03-01-005

b- Wooden Block

Installation


CAUTION: Tire (9) weight: 500 kg (1105 lb) (23.5R25)


1. Hoist and install tire (9) to rear axle (8).
2. Temporarily tighten washers (11) (18 used) and wheel bolts (10) (18 used) to tire (9).

 : 36 mm

CAUTION: Machine weight: 17830 kg (39310 lb)

3. Remove wooden block (b) and stand (a) from the machine. Lower the machine and place tire (9) onto the ground.
4. Tighten wheel bolts (10) (18 used) according to the order as illustrated.

 : 36 mm

 : 890 N·m (91 kgf·m, 660 lbf·ft)



M4GB-07-102

IMPORTANT: Check air pressure of the tires. Check for abnormal wear and damage of the tires.

 NOTE: Air Pressure of Tires (9):

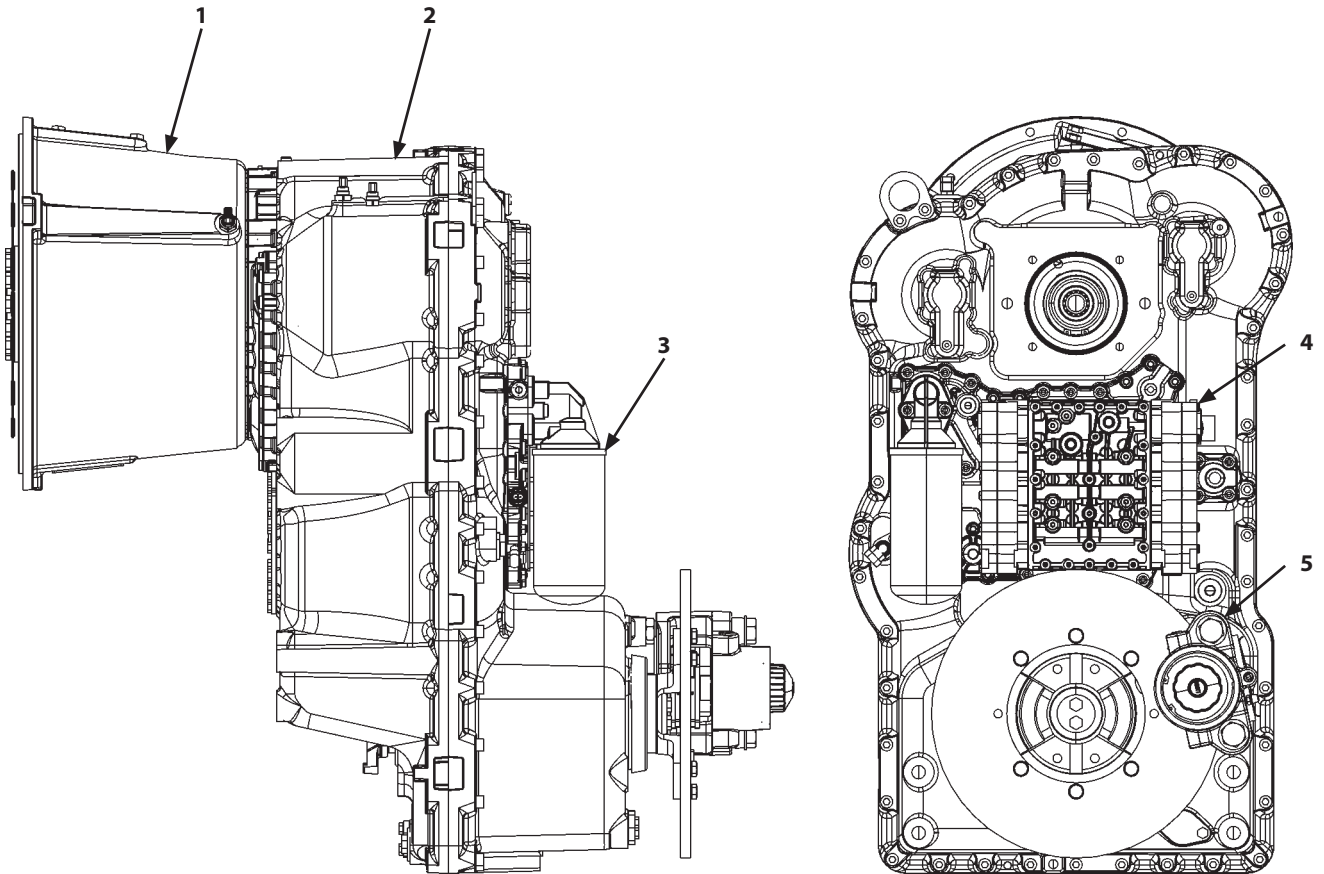
Standard Tire Size	Standard Air Pressure
23.5R25	375 kPa (3.75 kgf/cm ²)

SECTION 4 TRAVEL SYSTEM

Group 2 Drive Unit

Disassembly and Assembly of Drive Unit

Drive Unit Assembly



WNEC-04-02-008

1- Torque Converter
2- Transmission

3- Oil Filter
4- Transmission Control Valve

5- Parking Brake


SECTION 4 TRAVEL SYSTEM


Group 2 Drive Unit

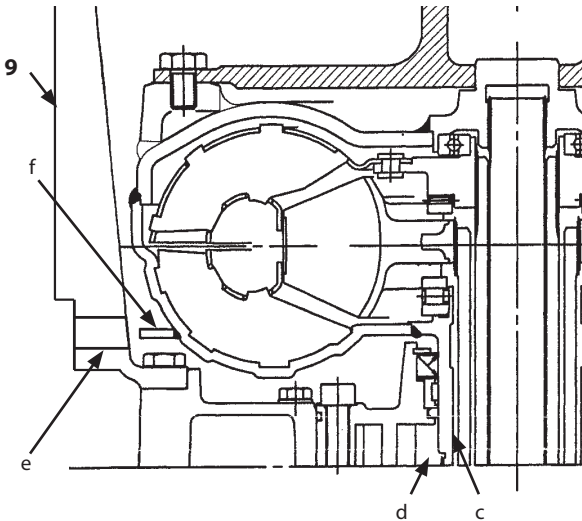
IMPORTANT: Check that pickup disc (f) can be seen through the center of mounting hole (e) for torque converter input speed sensor (12) in torque converter housing (9).

IMPORTANT: Apply grease onto the lip part in order not to damage the oil seal of hydraulic pump (d) due to the spline joint of drive tube (c).

6. Install O-ring (11) to torque converter input speed sensor (12). Install torque converter input speed sensor (12) to torque converter housing (9).

 : 22 mm


 : 30 N·m (3 kgf·m, 22lbf·ft)




WNEC-04-02-024

- | | |
|-------------------|---|
| c- Drive Tube | e- Mounting Hole for Torque Converter Input Speed Sensor (12) |
| d- Hydraulic Pump | f- Pickup Disc |

5. Remove the eyebolts (2 used). Install diaphragms (3) (2 used) and washers (4) (12 used) to spacer ring (6) with washers (2) (12 used) and bolts (1) (12 used).


 : 19 mm


 : 115 N·m (12 kgf·m, 85 lbf·ft)

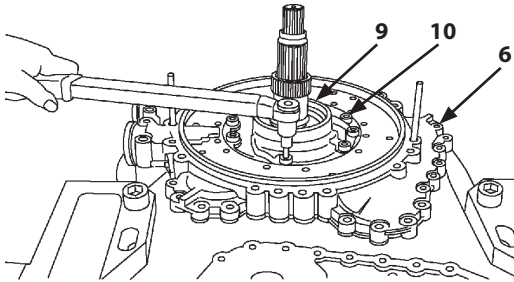
SECTION 4 TRAVEL SYSTEM

Group 2 Drive Unit

13. Install socket bolts (10) (8 used) to oil feeder housing (6). Remove special tools (b) (ZF No.: 5870 204 007) (2 used). Install socket bolts (10) (2 used) to the positions for removed special tools (b) (ZF No.: 5870 204 007) (2 used).

 : 8 mm


 : 46 N·m (4.7 kgf·m, 34 lbf·ft)

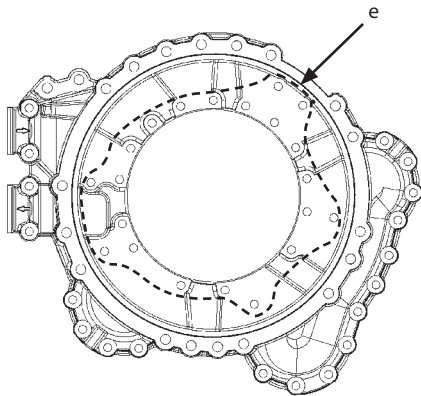


W4GB-03-02-060

14. Install socket bolts (2) (21 used) to bolt mounting position (e) by using a star key wrench.

 : T40 (Star Key Wrench)

 : 23 N·m (2.3 kgf·m, 17 lbf·ft)




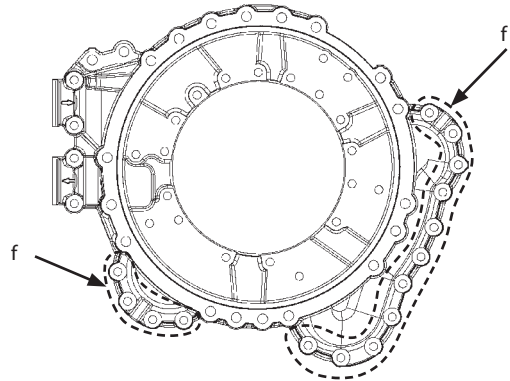
e- Bolt Mounting Position

WNEC-04-02-012

15. Install socket bolts (1) (15 used) to bolt mounting position (f) by using a star key wrench.

 : 40 (Star Key Wrench)

 : 23 N·m (2.3 kgf·m, 17 lbf·ft)




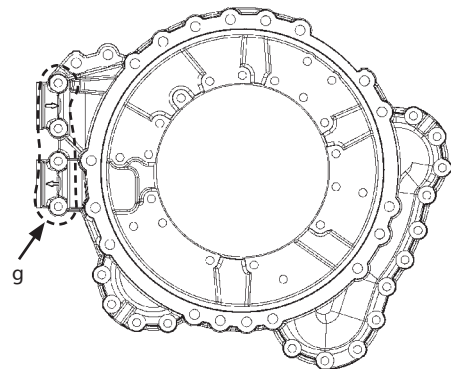
f- Bolt Mounting Position

WNEC-04-02-012

16. Install socket bolts (3) (4 used) to bolt mounting position (g) by using a star key wrench.

 : T40 (Star Key Wrench)

 : 23 N·m (2.3 kgf·m, 17 lbf·ft)



g- Bolt Mounting Position

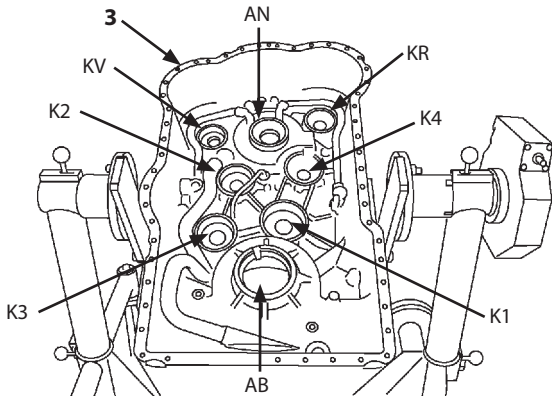
WNEC-04-02-012

SECTION 4 TRAVEL SYSTEM

Group 2 Drive Unit

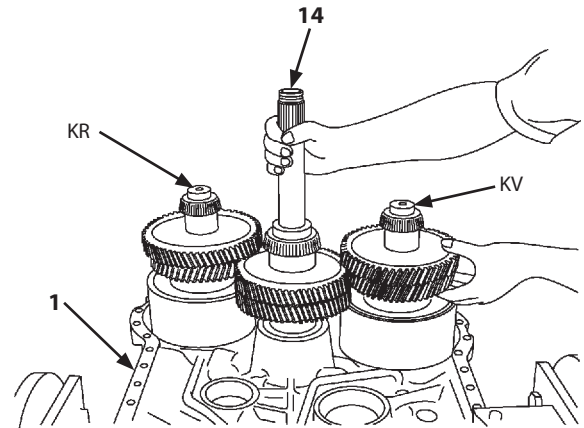
IMPORTANT: Refer to the following figure for the mounting position. Do not change the combinations of the outer rings and the inner rings of bearings.

7. Install the outer ring corresponding to the taper roller bearing at each clutch shaft end to transmission case (3) and transmission case cover (1).



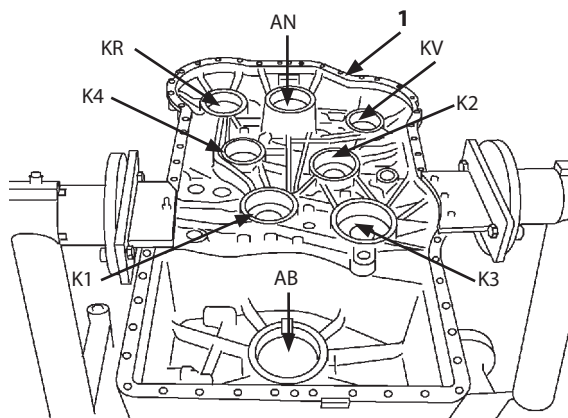
W4GB-03-02-099

8. Install reverse clutch (KR), input shaft (14), and slow-speed forward clutch (KV) to transmission case cover (1) at the same time.

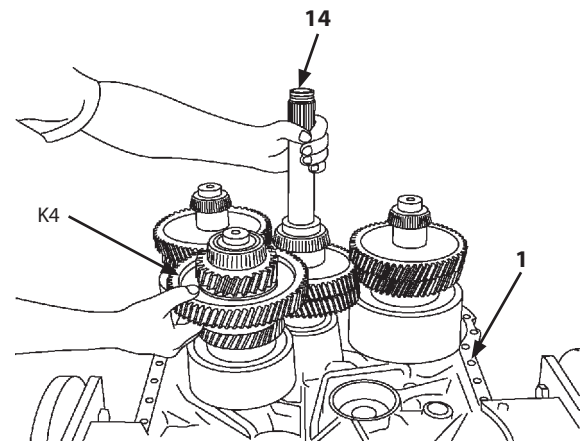


W4GB-03-02-101

9. Raise input shaft (14) a little and install fast-speed forward clutch (K4) to transmission case cover (1).



W4GB-03-02-100

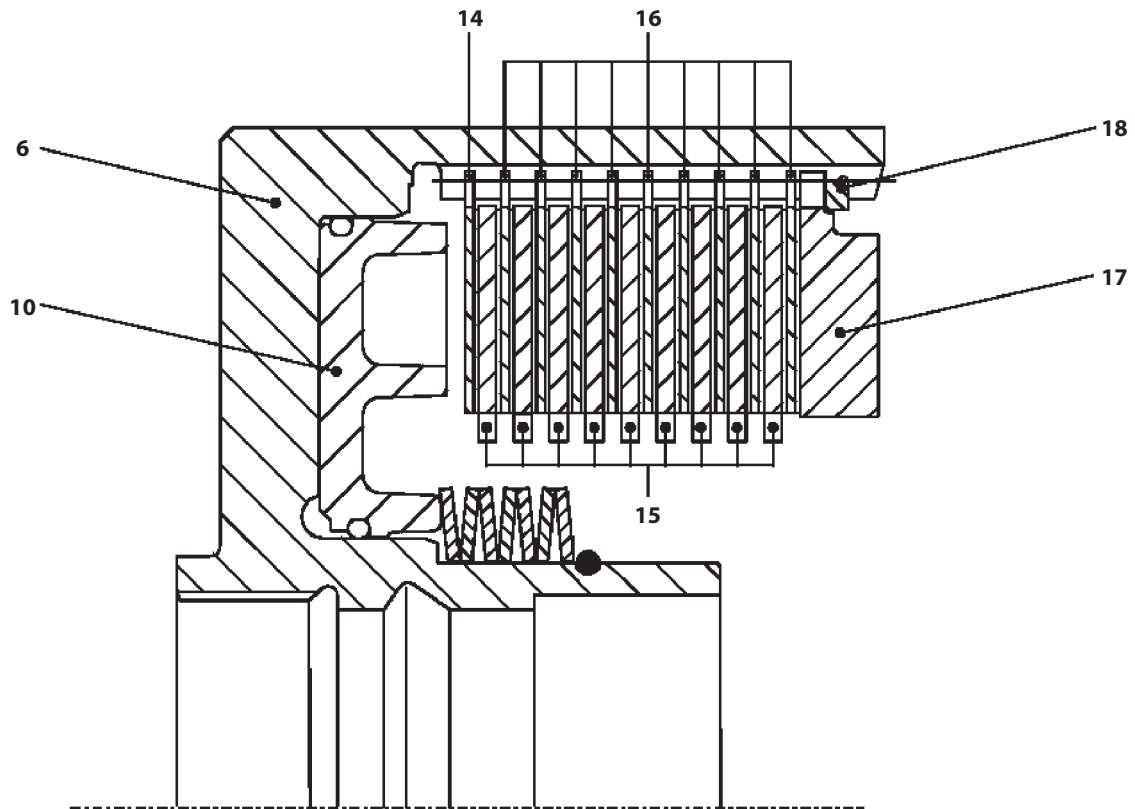


W4GB-03-02-102

SECTION 4 TRAVEL SYSTEM

Group 2 Drive Unit

First Speed Clutch (K1)



WNEC-04-02-021

- | | | | |
|--------------------------|--------------------------------|------------------------|---------------------------|
| 1- *Taper Roller Bearing | 8- *O-Ring | 17- End Shim | 24- *Axial Washer |
| 2- *Piston Ring | 10- Piston | 18- Snap Ring | 25- *Axial Needle Cage |
| 3- *Shaft | 11- *Cup Spring (7 Used) | 19- *Running Disc | 26- *Running Disc |
| 4- *Stud | 13- *Snap Ring | 20- *Axial Needle Cage | 27- *Retaining Ring |
| 5- *Piston Ring | 14- Disc | 21- *Axial Washer | 28- *Taper Roller Bearing |
| 6- Disc Carrier | 15- Inner Clutch Disc (9 Used) | 22- *Idler | |
| 7- *O-Ring | 16- Outer Clutch Disc (9 Used) | 23- *Needle Cage | |

 NOTE: As for the item with mark *, refer to W4-2-4-25.

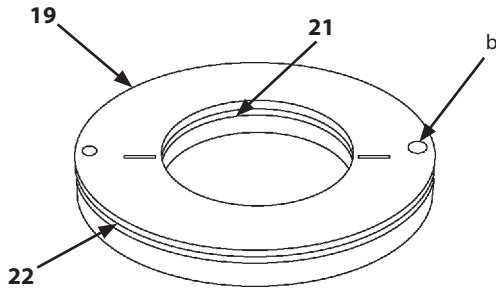
SECTION 4 TRAVEL SYSTEM

Group 2 Drive Unit

Assembly of Slow-Speed Forward Clutch (KV) and Reverse Clutch (KR)

IMPORTANT: Check that the ball part of valve (a) in piston (19) is not clogged.

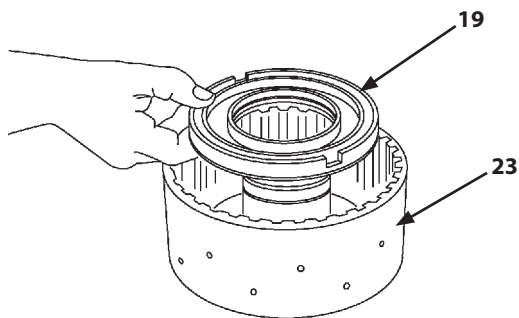
1. Apply oil onto O-rings (21, 22). Install O-rings (21, 22) to piston (19).



a- Valve

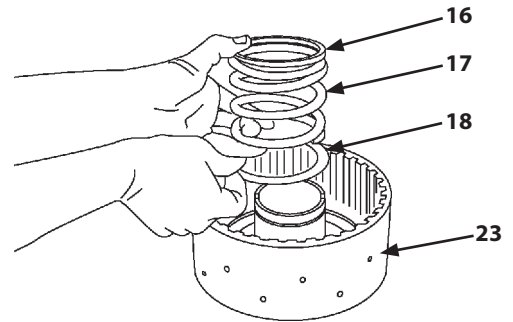
W4GB-03-02-126

2. Install piston (19) to disc carrier (23) by using special tool (b) (ZF No.: 5870 345 088). Check the direction of piston (19) in the figure.



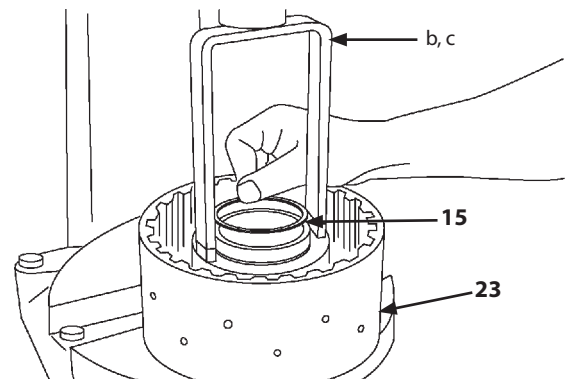
W4GB-03-02-127

3. Install washer (18), coil spring (17), and guide ring (16) to disc carrier (23).



W4GB-03-02-146

4. Compress coil spring (17) by using special tool (b) (ZF No.: 5870 345 088) and special tool (c) (ZF No.: 5870 345 124). Install snap ring (15) to disc carrier (23).



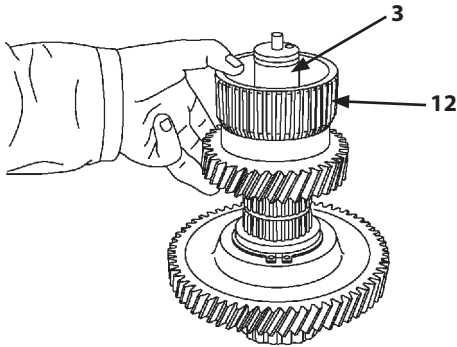
b, c- Special Tool

W4GB-03-02-129

SECTION 4 TRAVEL SYSTEM

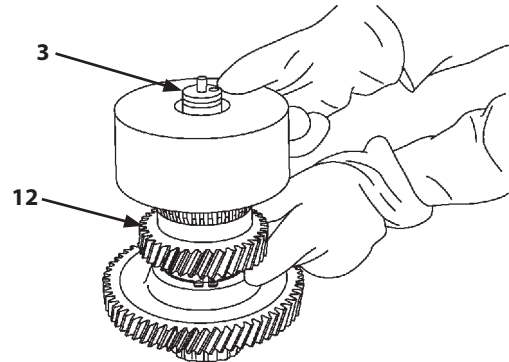
Group 2 Drive Unit

16. Install idler (12) to shaft (3).



W4GB-03-02-165

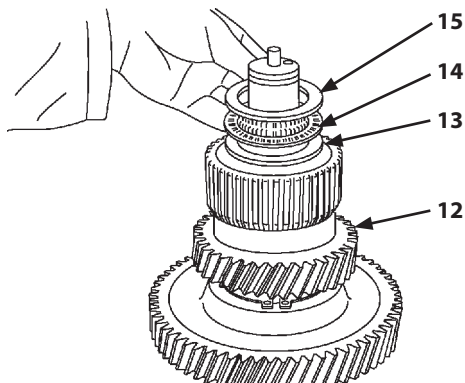
19. In order to engage the spline of idler (12) and the gear teeth of inner clutch disc (18) with shaft (3), install idler (12) to shaft (3) by turning it right and left.



W4GB-03-02-167

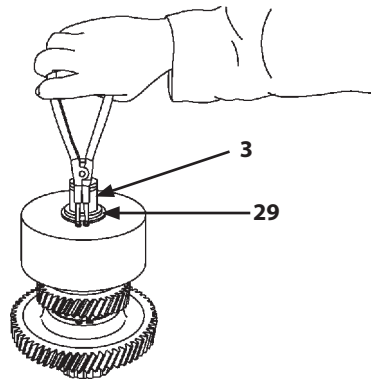
IMPORTANT: Install running disc (15) with the chamfered surface facing to the axial needle cage (14) side.

17. Install axial washer (13), axial needle cage (14), and running disc (15) to idler (12).



W4GB-03-02-166

20. Install retaining ring (29) to shaft (3).



W4GB-03-02-168

CAUTION: Put heat-resisting gloves when installing disc carrier (28).

18. Heat the center of disc carrier (28) to about +120 °C (248 °F).

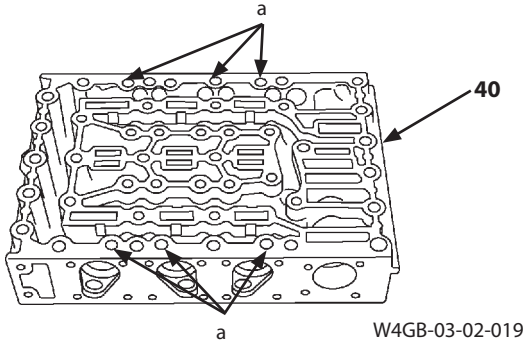
SECTION 4 TRAVEL SYSTEM

Group 2 Drive Unit

Assembly of Transmission Control Valve

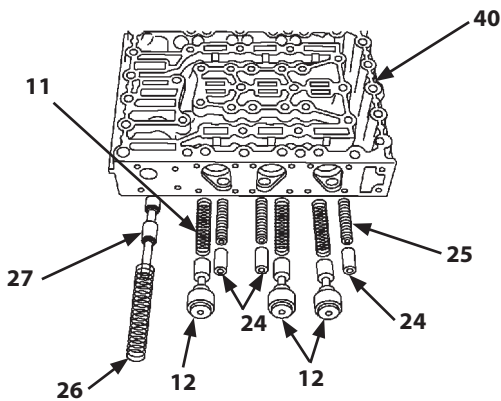
IMPORTANT: Check all disassembled parts and replace any defective parts if necessary. Check that each piston moves smoothly after it has been installed in housing (40). Replace defective pistons.

1. Install orifices (10) (6 used) to position (a) in housing (40) with the hollow up.



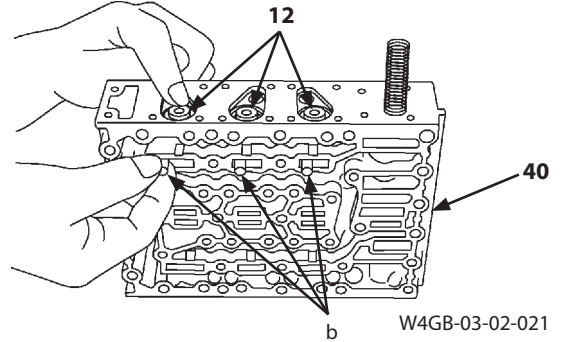
a- Mounting Position of Orifice (10)

2. Apply oil onto pistons (12, 24) (3 used for each) and piston (27). Place housing (40) in the direction as illustrated. Install pistons (12, 24) (3 used for each) and piston (27) to housing (40) with springs (25, 11) (3 used for each) and spring (26).



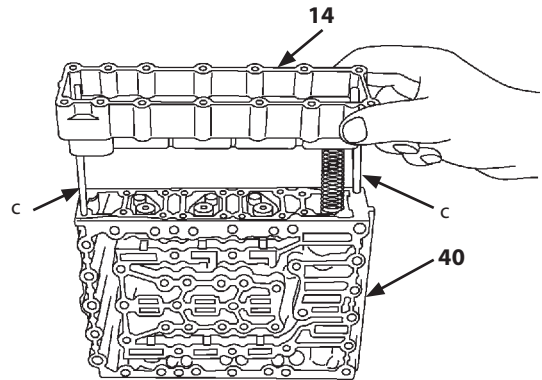
W4GB-03-02-020

3. Push pistons (12) (3 used). Install pins (dia. 5 mm) (3 used) to position (b) in housing (40). Secure pistons (12) (3 used) to housing (40).



b- Pin Mounting Position

4. Install special tools (c) (ZF No.: 5870 204 036) (2 used) to housing (40). Fit gasket (13) and housing cover (14) to special tools (c) (ZF No.: 5870 204 036) (2 used). Install gasket (13) and housing cover (14) to housing (40).



c- Special Tool

WNEC-04-02-015


SECTION 4 TRAVEL SYSTEM

Group 2 Drive Unit

Adjustment of parking brake

⚠ CAUTION:

- Once the parking brake is released, the machine can not stop by brake. Before releasing the parking brake or doing connecting work, secure the tire by wheel stopper.


 NOTE: Even if the parking brake is released, the service brake can be operated.

IMPORTANT: Confirm that the parking brake is activated normally before adjusting the parking brake.


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

2. Remove cap (4) from the parking brake (2) assembly.


3. Remove lock nut (6).

 : 24 mm


4. Release parking brake (2).

 NOTE: Release parking brake (2) only while pushing switch (a) of parking brake solenoid valve (3).


5. Turn set bolt (5) clockwise and contact with brake pad (7) to brake disc (1).


 : 8 mm

6. Turn set bolt (5) in one to three fourth counterclockwise in order to adjust the clearances (b) (2 places) between brake disk (1) and brake pads (7) (2 used): collecttly.

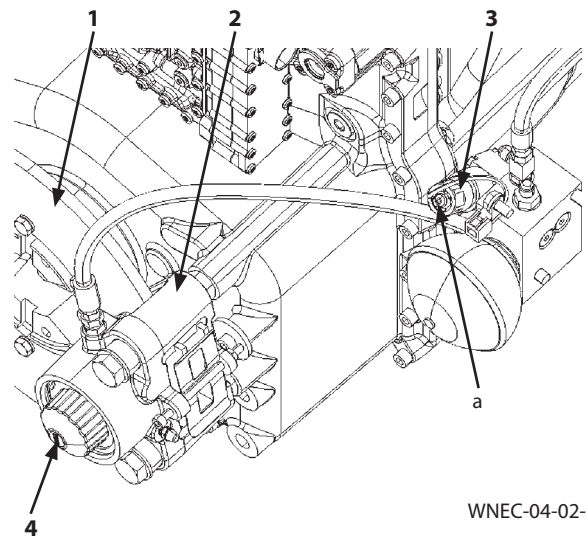
 NOTE: The clearances (b) (2 places) between the brake disc (1) and brake pads (7) (2 used): 0.25 to 0.75 mm

7. Install lock nut (6).

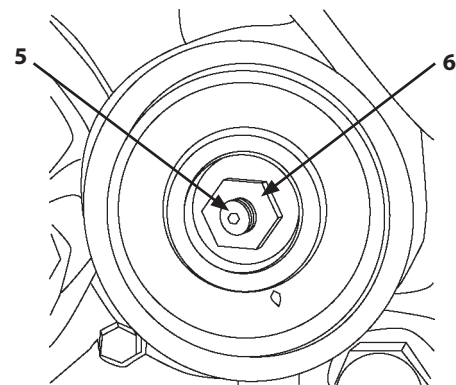
 : 24 mm

 : 80 N·m (8 kgf·m, 59 lbf·ft)

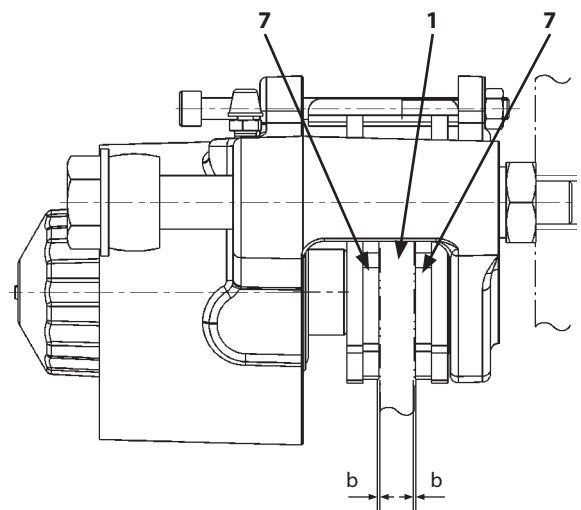
8. Install cap (4).



WNEC-04-02-049



MNEC-06-004



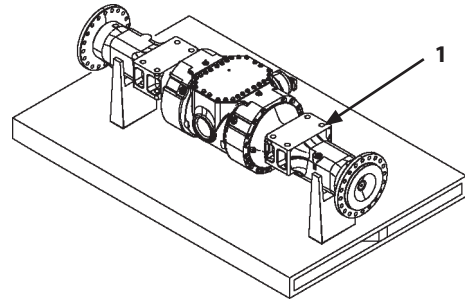
WNEC-04-02-047

SECTION 4 TRAVEL SYSTEM

Group 3 Axle

Installation

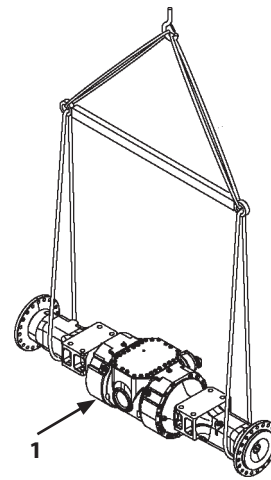
1. Place the front axle (1) assembly onto a stand. Set it under the mounting position of front frame.



W4GB-03-03-106


CAUTION: The front axle (1) assembly weight:
1190 kg (2630 lb)


2. Attach nylon slings onto the front axle (1) assembly. Hoist and hold the front axle (1) assembly.

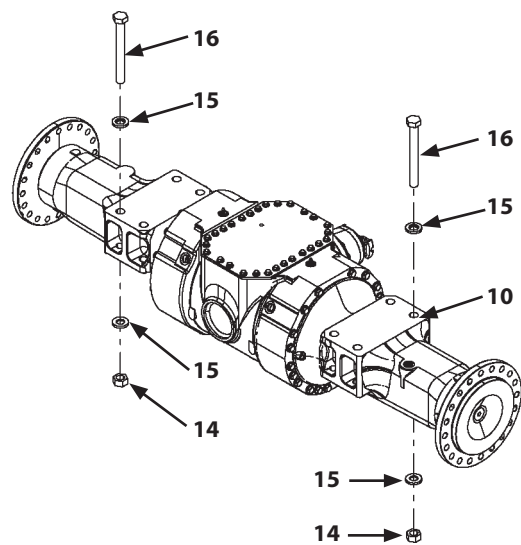


W4GB-03-03-104

3. Install the front axle (1) assembly with bolts (16) (8 used), washers (15) (16 used), and nuts (14) (8 used).

 : 41 mm

 : 1128 N·m (113 kgf·m, 1160 lbf·ft)




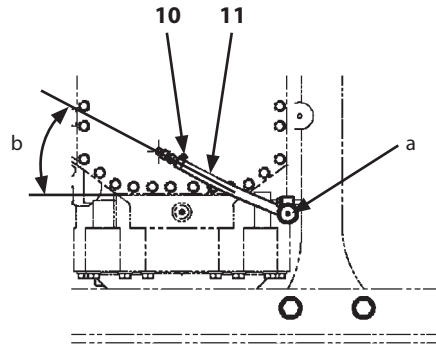
W4GB-03-03-105

SECTION 4 TRAVEL SYSTEM

Group 3 Axle

4. Connect hose (11) with clip (10) as shown in the illustration.

 : 3 N·m (0.3 kgf·m, 2.2 lbf·ft)



WNEE-04-03-003

a- Air breather

b- 30°

SECTION 4 TRAVEL SYSTEM


Group 3 Axle

Disassembly of Axle

CAUTION: The axle assembly weight: Front/rear: 1190 kg/1130 kg (2630 lb/2500 lb)

Removal of Housings (2, 7)

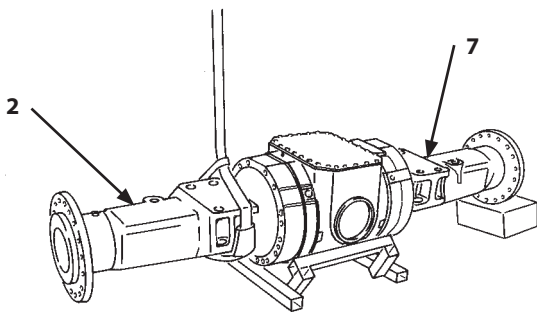
- Place a container under case (5). Remove drain plug (10) from case (5). Drain gear oil from case (5).

 : 0.5 in

 **NOTE:** Gear oil amount: 40 L (10.6 US gal)


CAUTION: The housing (2) assembly weight: Front/rear: 290 kg/260 kg (640 lb/574 lb)

- Attach nylon slings onto the housing (2) assembly. Hoist and hold the housing (2) assembly. Place the housing (2) assembly on a stand.



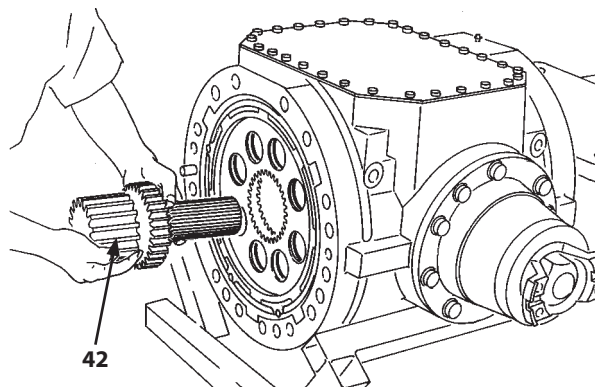
W4GB-03-03-004

- Remove bolts (11) (20 used) and washers (12) (20 used) from housing (2).

 : 24 mm

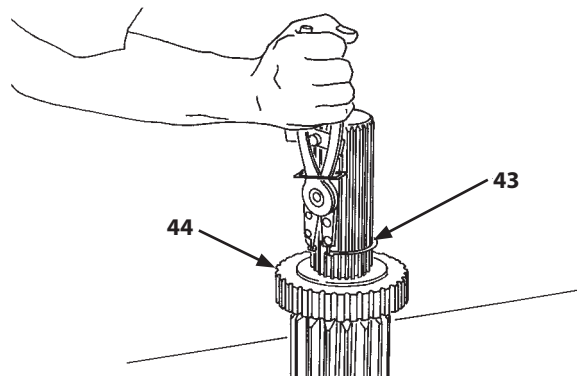
- Remove housing (2) from case (5) by using a plastic hammer.

- Remove the shaft (42) assembly from side gear (38).



W4GB-03-03-005

- Remove retaining ring (43) from the shaft (42) assembly. Remove disc hub (44) from the spline part of shaft (42).



W4GB-03-03-006

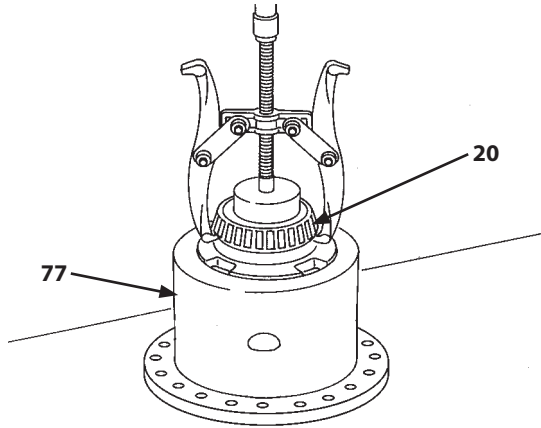
- Remove housing (7) and the shaft (42) assembly at the opposite side in the same way.

SECTION 4 TRAVEL SYSTEM

Group 3 Axle

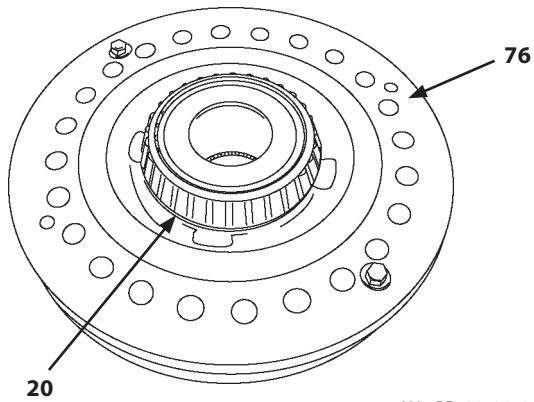
⚠ CAUTION: Differential case B (77) weight: 24 kg (53 lb)

67. Remove the inner race of bearing (20) from differential case B (77) by using a bearing puller.



W4GB-03-03-032

68. Remove the inner race of bearing (20) from differential case A (76) by using a bearing puller.




W4GB-03-03-040

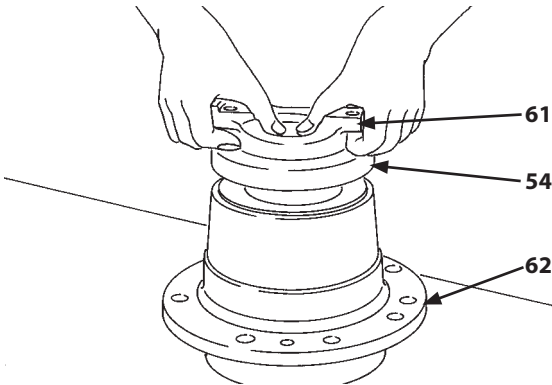
SECTION 4 TRAVEL SYSTEM

Group 3 Axle

28. Apply LOCTITE #262 onto the outer surface of oil seal (55). Install oil seal (55) to bearing cage (62).
29. Apply grease onto the lip part of oil seal (55).
30. Apply LOCTITE #262 onto the inner surface of dust cover (54). Install dust cover (54) to yoke (61). Fit yoke (61) to the spline of pinion (57). Install it. Up and down yoke (61) and fix any deformations on the seal-lip part of oil seal (55).
32. Insert O-ring (56) to the groove between yoke (61) and pinion (57). Install washer (60) to yoke (61).
33. Apply LOCTITE #262 onto the thread part of bolt (59). Install yoke (61) to pinion (57) with bolt (59) and washer (60). Check that pinion (57) rotates smoothly.

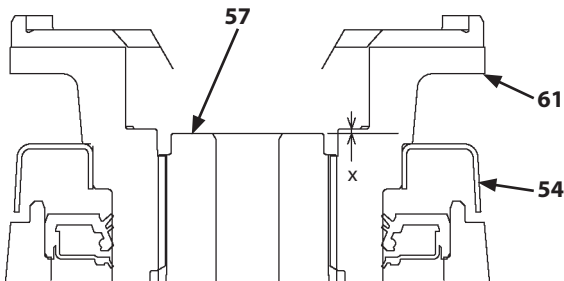
 : 30 mm

 : 680 N·m (68 kgf·m, 500 lbf·ft)



W4GB-03-03-046

31. Measure distance (x) between yoke (61) and the end of pinion (57). Adjust shim (58) so that level difference (x) is 0.05 to 0.1 mm (0.002 to 0.004 in).



W4GB-03-03-081

x- Level Difference

SECTION 4 TRAVEL SYSTEM

Group 3 Axle

Assembly of Housings (2, 7)

⚠ CAUTION: Ring gear (23) weight: 20 kg (44 lb)

66. When ring gear (23) has been replaced, install ring gear (23) to housing (2) by using a press or a plastic hammer. Install pins (3) (4 used).

⚠ CAUTION: Housing (2) weight: Front/rear: 140 kg/110 kg (309 lb/243 lb)

67. Attach nylon slings onto housing (2). Hoist and hold housing (2) with the wheel side up. Install the outer race and inner race of bearing (74) to housing (2).

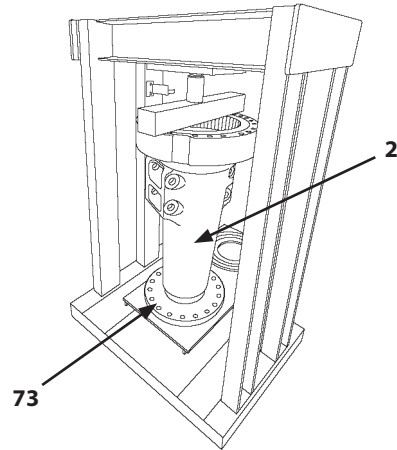
IMPORTANT: Oil seal (75) is a separate-type parts. Install oil seal (75) to housing (2) without disassembling.

68. Apply grease onto the inside of housing (2). Install oil seal (75) to housing (2) by using a plastic hammer.



W4GB-03-03-064

69. Turn over housing (2). Hoist housing (2) with the differential gear side up. Install housing (2) to axle shaft (73) by using a press.

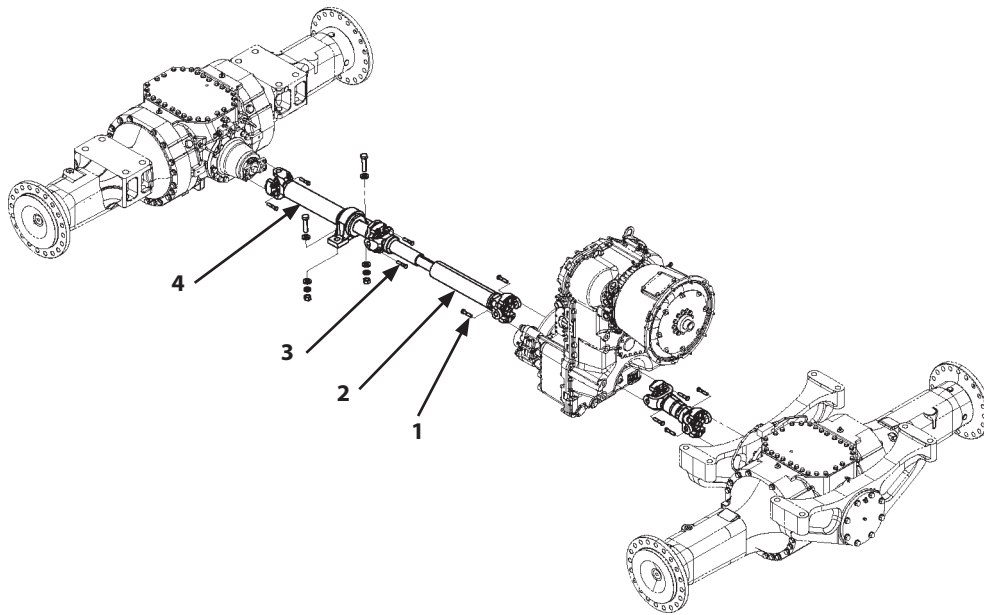


WNEC-04-03-022

70. Install the outer race of bearing (72) to housing (2).
71. Install the inner race of bearing (72) to axle shaft (73).
72. Assemble housing (7) at the opposite side in the same way.

SECTION 4 TRAVEL SYSTEM

Group 4 Propeller Shaft



WNEC-04-04-001

IMPORTANT: Remove grease fitting (5) in order to drain grease.

7. Remove grease fitting (5).

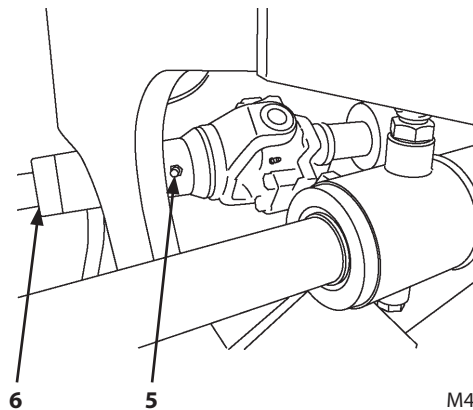
IMPORTANT: Remove propeller shaft (2) while holding it. Do not drop propeller shaft (2).

IMPORTANT: Do not disassemble propeller shaft (2) when removing it. Spline seal (6) may be damaged in case disassembling and removing propeller shaft (2). Remove propeller shaft (2) as an assembly.

CAUTION: The propeller shaft (2) assembly weight: 29 kg (64 lb)

8. Set a stand and a jack under propeller shaft (2). Hold propeller shaft (2).

9. Put the matching marks at the jointed part between propeller shaft (2) and propeller shaft (4).




M4GB-07-014

10. Remove bolts (1) (4 used).

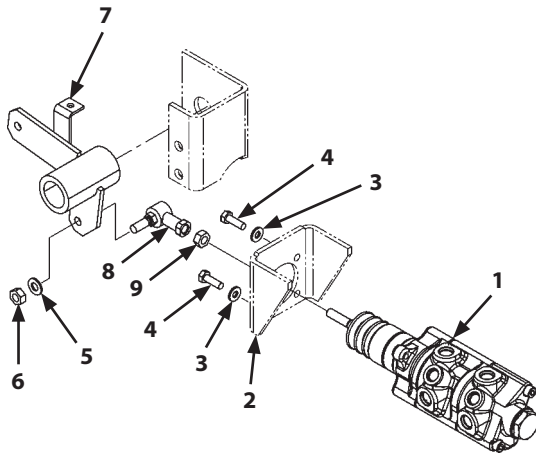
 : 3/4 in

11. Remove bolts (3) (4 used). Remove propeller shaft (2).

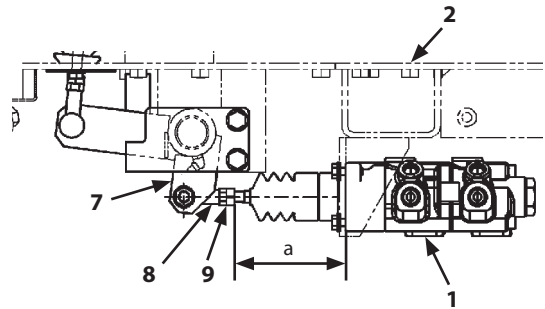
 : 19 mm

SECTION 4 TRAVEL SYSTEM

Group 5 Brake Valve



WNEC-04-05-009





WNEC-04-05-011

a 113 mm (4.4 in)


Installation


1. Install all removed adapters to brake valve (1).
2. Install brake valve (1) to frame (2) with bolts (4) (4 used) and washers (3) (4 used).

 : 13 mm

 : 20 N·m (2 kgf·m, 15 lbf·ft)


4. Install ball joint (8) to bell crank (7) with nut (6) and washer (5).


 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

IMPORTANT: Check the mounting dimension (a) to install ball joint (8) and nut (9).

3. Install ball joint (8) and nut (9) to brake valve (1).

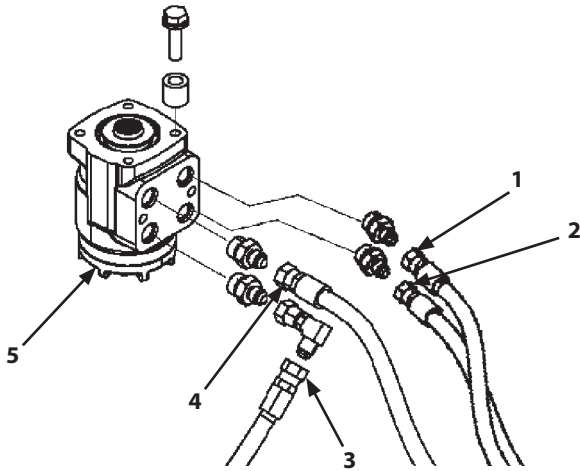
 : 17 mm

 : 50 N·m (5 kgf·m, 37 lbf·ft)

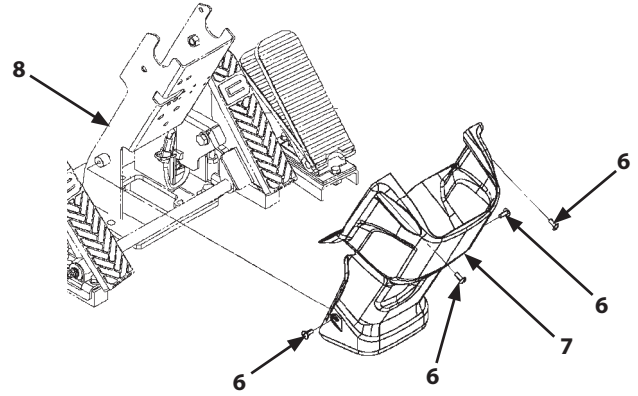
SECTION 4 TRAVEL SYSTEM

Group 6 Steering Pilot Valve

Removal and Installation of Steering Pilot Valve



WNEC-04-06-001



WNEC-04-06-002

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 steering wheel right and left several times, and release any pressure in the circuit.

2. Place a container under steering pilot valve (5).

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

3. Disconnect hoses (1, 2, 3, and 4) from steering pilot valve (5).

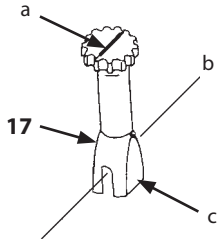
 : 19 mm

4. Remove screws (6) (6 used) from cover (7) by using a screwdriver. Remove cover (7) from steering column (8).

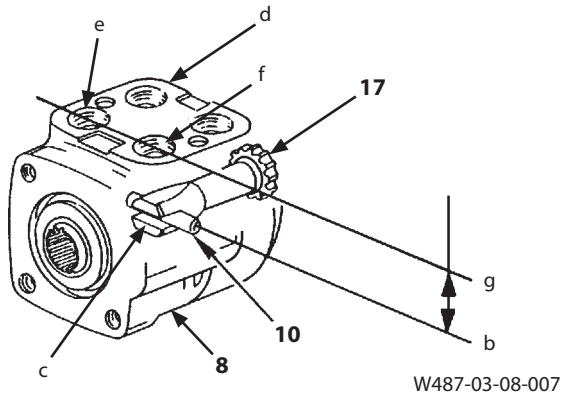
SECTION 4 TRAVEL SYSTEM

Group 6 Steering Pilot Valve

11. Turn the sleeve (9) assembly and set pin (10) and port side (d) of housing (8) in parallel. Draw a line (a) onto the spline side end so that line (a) is parallel to line (b) on yoke part (c) of drive (17). Install drive (17). Assemble yoke part (c) of drive (17) and pin (10). Set line (a) of the spline side edge of drive (17) and port side (d) of housing (8) in parallel position.



W487-03-08-006

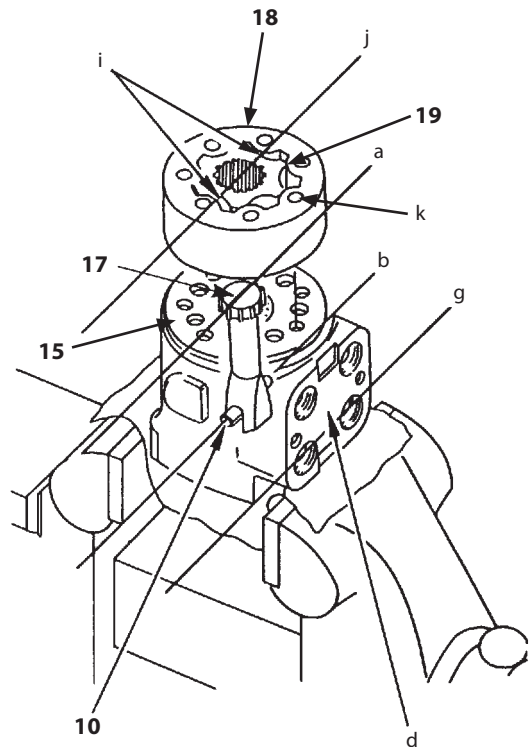


W487-03-08-007

- | | |
|--------------------------------|---|
| a- Line at the Spline Side End | e- Port L |
| b- Line on the York | f- Port T |
| c- Yoke Part | g- Line Connecting the Centers of Port L and Port T |
| d- Port Side | |

12. Install O-ring (16) to rotor (18).

13. Face the O-ring (16) side of rotor (18) to the plate (15) side. Install star (19) while aligning the splines of star (19) and drive (17) so that line (j) connecting concave parts (i) of star (19) is parallel to line (a) on the spline side end of drive (17). Check that line (j) connecting concave parts (i) of star (19), line (a) on the spline side end, line (b) on yoke part (c) of drive (17) and line (g) connecting the centers of port L and port T, are parallel. Fit the bolt holes (k) on rotor (18) to holes on plate (15) while mating drive (17) and star (19).

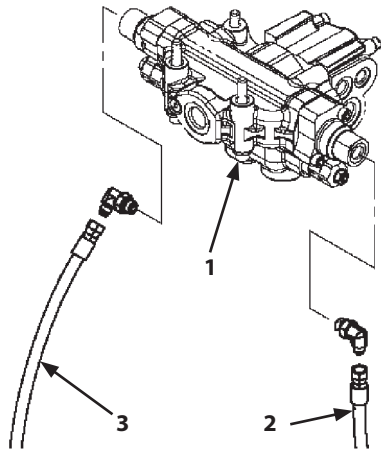


W202-02-14-031

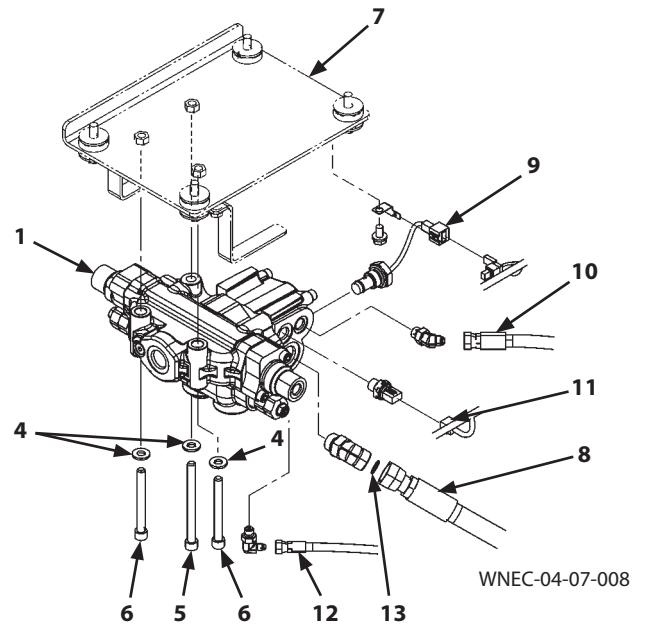
- | | |
|--------------------------------------|---------------|
| i- Concave Part | k- Bolt Holes |
| j- Line Connecting the Concave Parts | |

SECTION 4 TRAVEL SYSTEM

Group 7 Steering Valve




WNEC-04-07-010




WNEC-04-07-008

7. Disconnect hose (2, 3) from steering valve (1).


 : 22 mm

8. Disconnect hose (8) from steering valve (1). Remove O-ring (13).


 : 36 mm

9. Disconnect connectors (9, 11) from steering valve (1).


10. Disconnect hose (10) from steering valve (1).

 : 19 mm

11. Disconnect hose (12) from steering valve (1).

 : 17 mm

12. Remove socket bolt (5), socket bolts (6) (2 used), and washers (4) (3 used) from steering valve (1).

 : 10 mm

⚠ CAUTION: Steering valve (1) weight: 29 kg (64 lb)

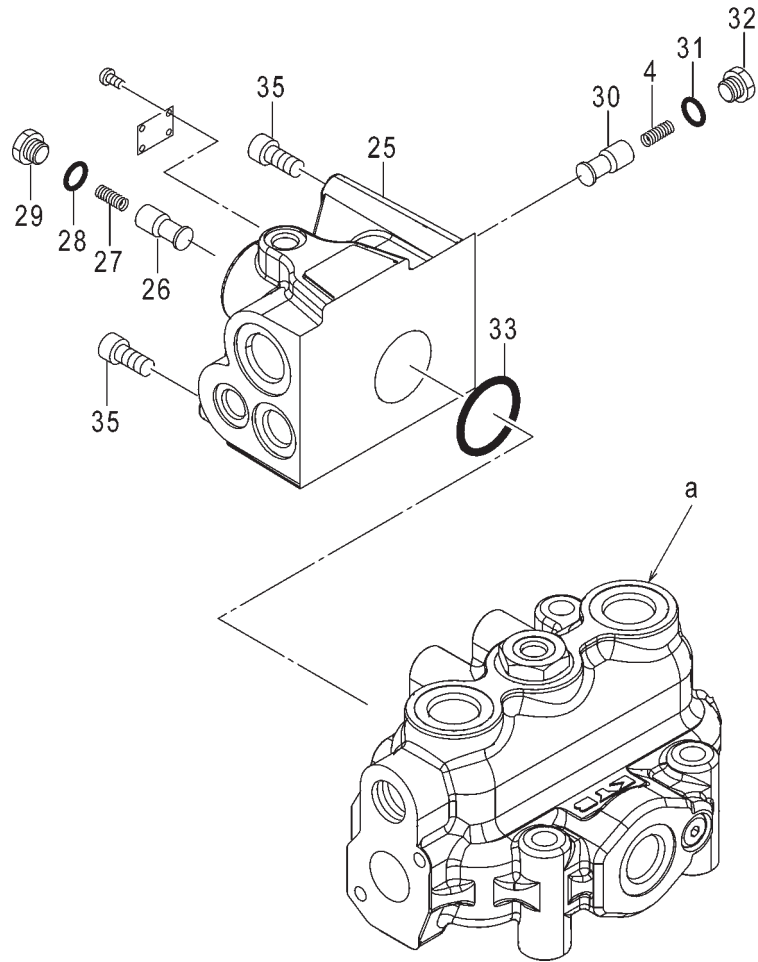
13. Remove steering valve (1) from the bracket (7) assembly.

14. Remove the adapter with steering valve (1) attached if necessary.

SECTION 4 TRAVEL SYSTEM

Group 7 Steering Valve

Disassembly of Emergency Steering Check Block



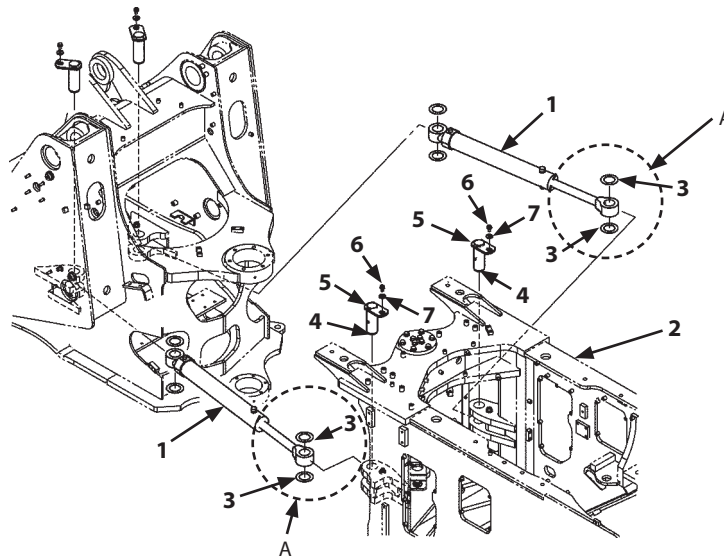
WNEC-04-07-005

- | | | | |
|-------------------|------------|------------|--------------------------|
| 4- Spring | 27- Spring | 30- Poppet | 33- O-Ring |
| 25- Valve Housing | 28- O-Ring | 31- O-Ring | 35- Socket Bolt (3 Used) |
| 26- Poppet | 29- Plug | 32- Plug | |

a- Steering Valve

SECTION 4 TRAVEL SYSTEM

Group 8 Steering Cylinder



WNEC-04-08-012

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


10. Remove the wires from the steering cylinder (1) rod side. Start the engine. Operate the steering. Fit the hole at the steering cylinder (1) rod side to mounting holes on rear frame (2).


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

11. Fit shims (3) to the mounting hole on rear frame (2) so that the clearance is adjusted within 1 mm (0.039 in). Install pin (5) to rear frame (2) by using a hammer.

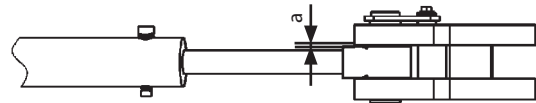
NOTE: Shim (3) thickness : 1mm (0.039 in), 0.5 mm (0.02 in)

12. Install bolt (6) and washer (7) to pin (5).

 : 19 mm

 : 90 N·m (9 kgf·m, 66 lbf·ft)


Detail A



WNEC-04-08-010

a- Clearance

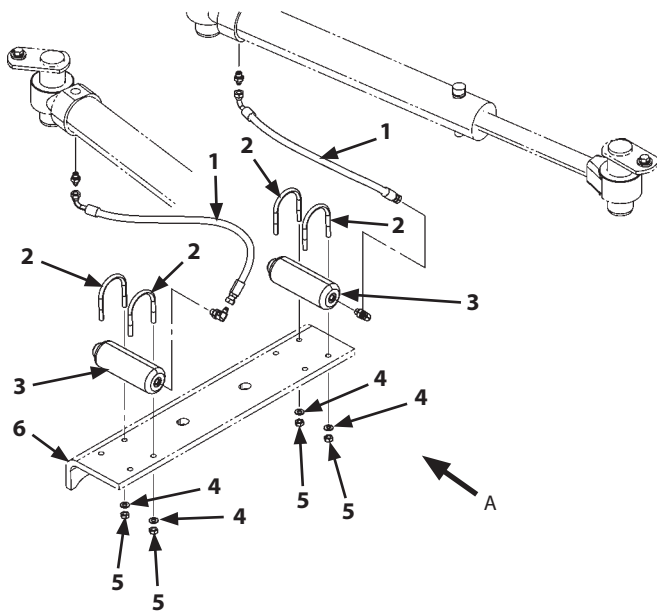
13. Install grease fitting (4) to pin (5).

 : 10 mm

14. Install other steering cylinder (1) in the same way as step 1 to step 13.

SECTION 4 TRAVEL SYSTEM


Group 8 Steering Cylinder




WNEC-04-08-007


Installation


1. Install steering accumulator (3) to frame (6) with U-bolts (2) (2 used), washers (4) (4 used), and nuts (5) (4 used) as shown in the illustration.

 : 17 mm

 : 20 N·m (2 kgf·m, 15 lbf·ft)

2. Connect hose (1) to steering accumulator (3) as shown in the illustration.

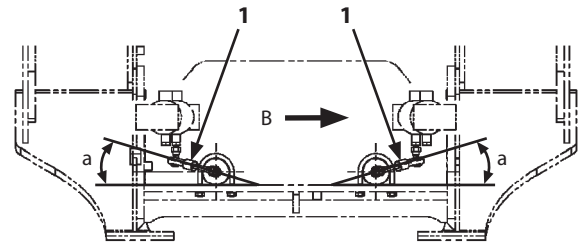
 : 19 mm

 : 30 N·m (3 kgf·m, 22 lbf·ft)

3. Install other steering accumulator (3) in the same way as step 1 to step 2.
4. 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.

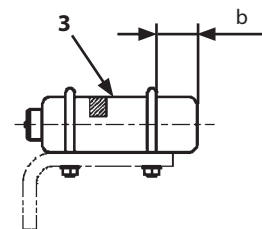
View A



WNEE-04-08-003

a- 15°

View B



WNEE-04-08-004

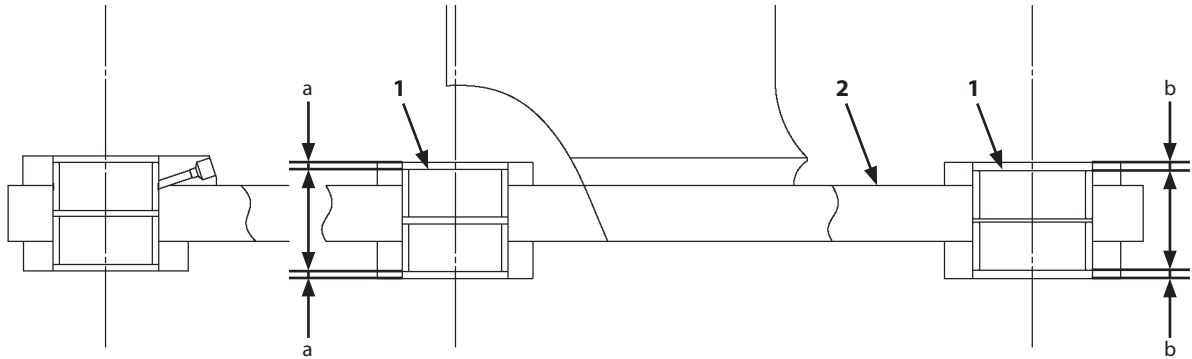
b- 47.5 mm (1.87 in)

MEMO

SECTION 5 FRONT ATTACHMENT

Group 1 Front Attachment

Position to Install (Lift Arm)



WNEC-05-01-024

- 1- Bushing
- 2- Lift Arm

- a- 7 mm (0.28 in)
- b- 7 mm (0.28 in)

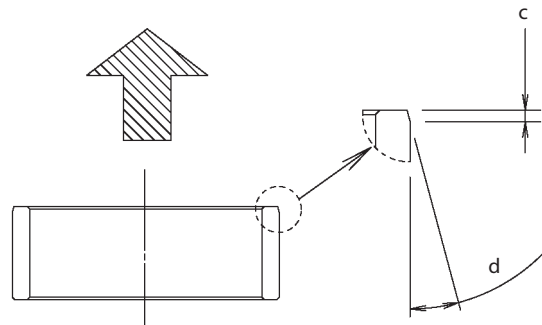
Installation

IMPORTANT: Check outer diameter, inner diameter, wear, and damage of all pins and bushings before installation. Replace them if there are some troubles. (Refer to W2-3-1.)

IMPORTANT: Apply grease onto the inner surface of bushings and dust seals when installing the pin.

IMPORTANT: Refer to the illustration when installing the bushing of lift arm.

Direction to Install (Lift Arm)



WNEC-05-01-028

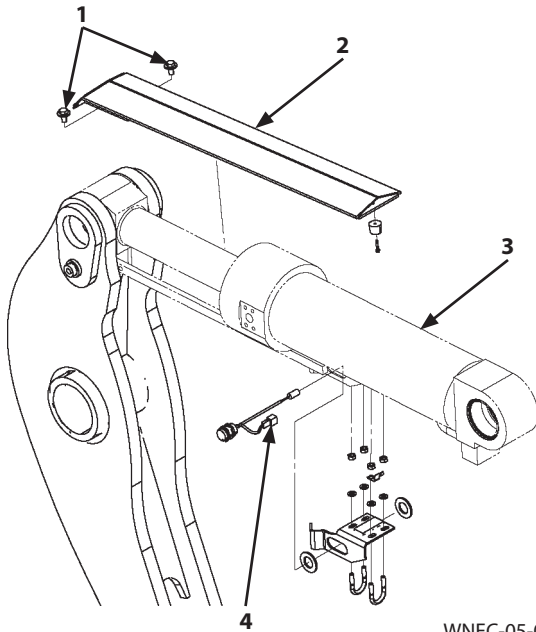
- c- 2.5 mm (0.098 in)

- d- 15°

SECTION 5 FRONT ATTACHMENT

Group 1 Front Attachment


Removal and Installation of Bell Crank



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 bolts, washers (1) (4 used). Remove guard (2) from bucket cylinder (3).

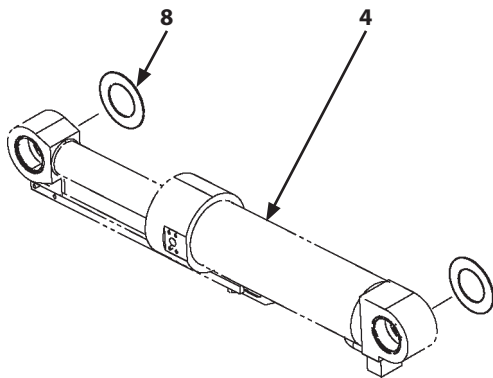
 : 19 mm

3. Disconnect connector (4).

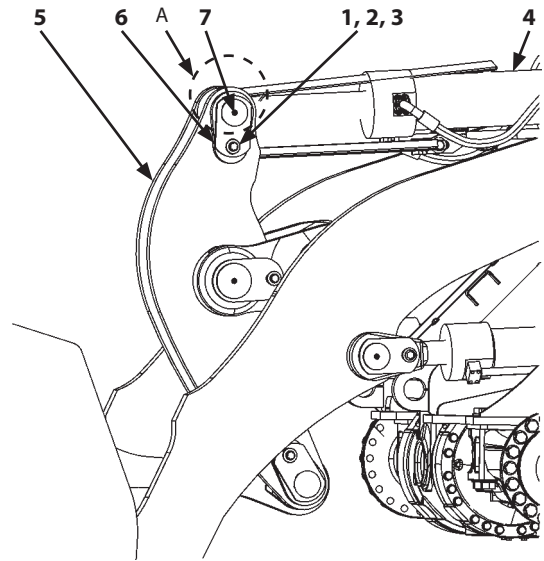
SECTION 5 FRONT ATTACHMENT

Group 1 Front Attachment

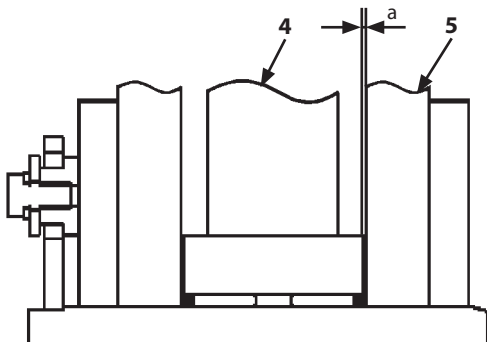
Detail A



WNEC-05-01-012



WNEC-05-01-016



WNEC-05-01-018

a- Clearance

CAUTION: Bucket cylinder (4) weight: 170 kg (375 lb)

8. Attach nylon slings onto bucket cylinder (4). Hoist and hold bucket cylinder (4).
9. Remove the wires from the rod holes of bucket cylinder (4). Start the engine. Extend the rod of bucket cylinder (4). Fit the rod of bucket cylinder (4) to bell crank (5) mounting holes. Stop the engine.


CAUTION: Pin (6) weight: 20 kg (45 lb)


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

10. Fit spacer (8) to bucket cylinder (4) mounting holes so that the clearance (a) is adjusted within 1.5 mm (0.059 in). Install pin (6) to bell crank (5) with using a hammer.


NOTE: Spacer (8) Thickness: 1.6 mm (0.063 in), 2.3 mm (0.091 in)


11. Install washers (2, 3) and bolt (1).

 : 24 mm

 : 210 N·m (21 kgf·m, 155 lbf·ft)

12. Install grease fitting (7). Apply grease.

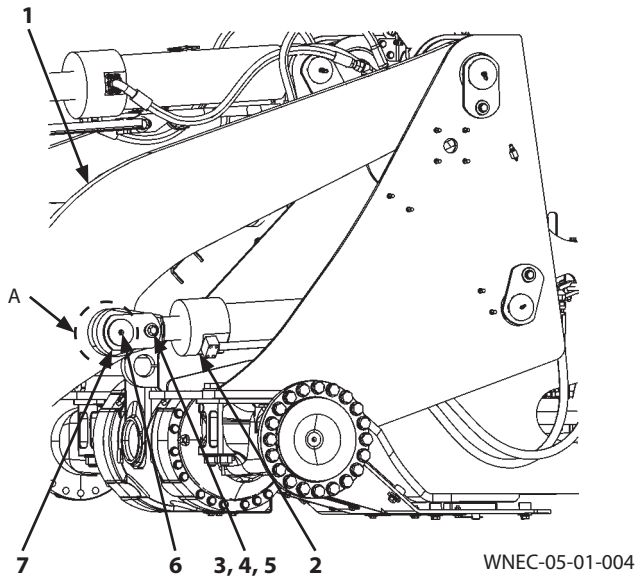
 : 10 mm

 : 4 N·m (0.4 kgf·m, 3 lbf·ft)

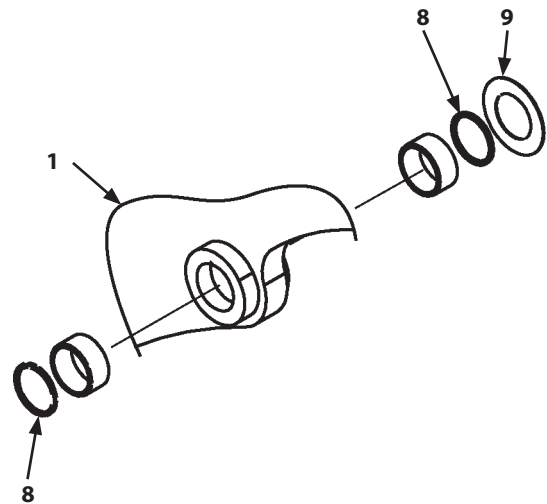
SECTION 5 FRONT ATTACHMENT

Group 2 Cylinder

Removal and Installation of Lift Arm Cylinder



Detail A




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: 162 kg (360 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, helmets, etc in order to prevent personal injury.

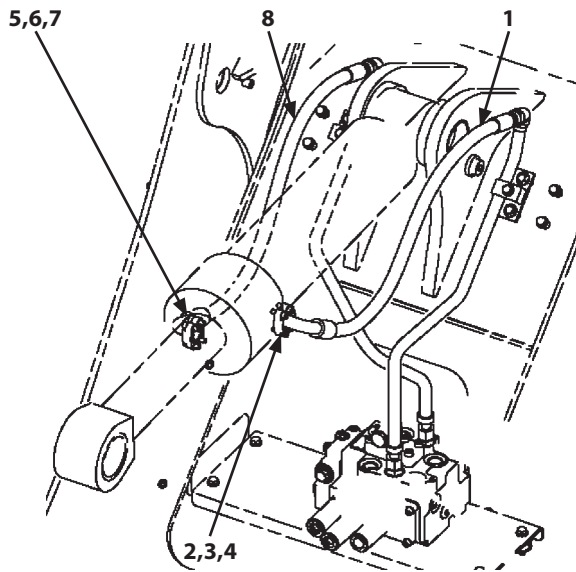
5. Remove bolt (3) and washers (4, 5). Remove pin (7) from lift arm cylinder (2) with using a bar and a hammer.

 : 24 mm

6. Remove spacer (9) from lift arm (1).
7. Start the engine. Retract lift arm cylinder (2). Remove lift arm cylinder (2) from lift arm (1).
8. Stop the engine. In order not to extend the rod, pass the wires through the rod hole of lift arm cylinder (2) and secure the rod to the cylinder tube.
9. Remove dust seals (8) (2 used) from lift arm (1).

SECTION 5 FRONT ATTACHMENT

Group 2 Cylinder




WNEC-05-02-030


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

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

13. Place a container under the disconnecting part of hose (1). Remove socket bolts (2) (4 used) and flanges (3) (2 used). Disconnect hose (1). Remove O-ring (4).

 : 8 mm

14. Place a container under the disconnecting part of hose (8). Remove socket bolts (5) (4 used) and flanges (6) (2 used). Disconnect hose (8). Remove O-ring (7).

 : 8 mm

SECTION 5 FRONT ATTACHMENT

Group 2 Cylinder

Disassembly of Lift Arm Cylinder and Bucket Cylinder

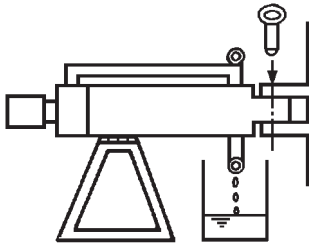
- The procedure starts on the premise that the pipes and the bands securing the pipes have been removed.

 **NOTE:** The bucket cylinder is explained here.

 **CAUTION:** Lift arm cylinder weight: 162 kg (357 lb)


Bucket cylinder weight: 170 kg (375 lb)

1. Hoist the cylinder. Secure the cylinder on a workbench horizontally. Drain hydraulic oil from the cylinder.



W102-04-02-027

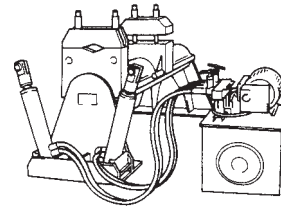
2. Fully extend and support cylinder rod (1). Remove socket bolts (11) (14 used) (lift arm cylinder: 12 used) from cylinder head (5).

 : 14 mm

IMPORTANT: Pull out cylinder rod (1) straightly in order not to damage the sliding surface.

3. Tap and remove cylinder head (5) with cylinder rod (1) together from cylinder tube (21) by using a plastic hammer.

4. Secure cylinder rod (1) on the special tool (ST 5908) for cylinder. Put the matching marks on the ends of cylinder rod (1), piston (17), and nut (19).



Special Tool for Cylinder: ST 5908

W158-04-02-022

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

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



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

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL