

**KOMATSU**

# SHOP MANUAL

**FG10/15/18-21**

**FG15H/18H-21**

**FD10/15/18-21**

**FG20/25/30-17**

**FG20H/25H-17**

**FG20N/25N/30N-17**

**FG35A-17**

**FD20/25/30-16**

**FD20H/25H/30H-16**

**FD20N/25N/30N-16**

**FD35A-16**

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FG20HT-17	FD20HT-16	FD20HC-16	FG25T-17	FG25C-17	FD25T-16
Gasoline	Diesel		Gasoline		Diesel
Sitting	Sitting		Sitting		Sitting
2000	2000		2500		2500
500	500		500		500
1810	1810		2260		2260
460	460		465		465
1650	1650		1650		1650
3220	3310	3355	3590	3625	3680
4670	4700	4745	5420	5455	5460
550	610	610	670	670	720
1480	1510	1545	1430	1455	1460
1740	1800	1810	2160	2170	2220
Pneumatic	Pneumatic		Pneumatic		Pneumatic
7.00-12-12PR(I)	7.00-12-12PR(I)		7.00-12-12PR(I)		7.00-12-12PR(I)
6.00-09-10PR(I)	6.00-09-10PR(I)		6.00-09-10PR(I)		6.00-09-10PR(I)
2*2	2*2		2*2		2*2
965	965		965		965
960	960		960		960
6/12	6/12		6/12		6/12
1995	1995		1995		1995
150	150		155		155
3000	3000		3000		3000
4050	4050		4050		4050
2110	2070		2110		2070
3450	3450		3655		3655
2530	2530		2585		2585
1150	1150		1150		1150
36x122x920	36x122x920		40x122x1070		40x122x1070
Class 2, Type A	Class 2, Type A		Class 2, Type A		Class 2, Type A
1020	1020		1020		1020
115	115		115		115
160	160		160		160
3650	3650		3775		3775
3850	3850		3905		3905
2190	2190		2240		2240
19.0	18.5	8.0/18.5	18.5	8.5/18.5	18.5
19.5	19.0	8.5/19.0	19.0	9.0/19.0	19.0
620	660		545		630
670	710		600		685
450	450		450		450
500	500		500		500
19	22	21	14	14	18
38	45	44	23	22	31
Foot/Hydraulic	Foot/Hydraulic		Foot/Hydraulic		Foot/Hydraulic
Hand/Mechanical	Hand/Mechanical		Hand/Mechanical		Hand/Mechanical
FHPS	FHPS		FHPS		FHPS
12/33	12/64		12/33		12/64
NISSAN K25 GCT GK25	Komatsu 4D98E		NISSAN K21 GCT GK21		Komatsu 4D94LE
42.6@2400	53.0@2400		34.6@2450		46.3@2450
2400	2400		2450		2450
186@1600	216@1700		152@1600		186@1800
4-2488	4-3318		4-2065		4-3052
58	58		58		58
181	181		181		181
T/C	T/C	Dry	T/C	Dry	T/C
TORQFLOW	TORQFLOW	Synchromesh	TORQFLOW	Synchromesh	TORQFLOW

## SAFETY ITEMS FOR MAINTENANCE

### FOR SAFETY OPERATION



#### USE QUALIFIED PERSONNEL FOR INSPECTION AND MAINTENANCE

- Only persons authorized by the owner or operator of the equipment and having proper certification (local or national) may carry out inspection, maintenance and repairs of the lift truck. If inspection, maintenance, or repair work is carried out incorrectly, it is very dangerous.



#### MAINTENANCE LOCATION

- When carrying out inspection and maintenance, use a level, dry, dust-free area.
- If the work is carried out inside a building, make sure that there is ample ventilation.



#### PRECAUTIONS FOR INSPECTION AND MAINTENANCE

- To be prepared in the event of a fire, have a fire extinguisher nearby and make sure that you know how to use it.
- Before carrying out inspection, lower the forks to the ground and stop the machine.
- Do not run the engine unless it is necessary.
- Place the directional lever, speed lever, and work equipment control levers in neutral.



#### PRECAUTIONS WHEN CARRYING OUT INSPECTION AND MAINTENANCE

- Wipe off any oil or grease. Immediately wipe up any oil that has leaked.  
If the lift truck is dirty, it becomes difficult or impossible to find cracks or other problems. Always clean the lift truck before starting inspection.
- Do not smoke or allow any flame to exist under any circumstances.  
Do not use any cloth which is soaked in fuel, oil, or grease. There is danger that it may catch fire.
- Wear suitable clothes for the job.
- Use suitable safety and protective equipment (hard hat, safety boots, safety glasses, gloves) for the job.
- When working on top of the lift truck, be careful not to fall.
- Do not put your feet under the forks.
- When opening or closing the floor plate or engine hood, be careful not to get your hands or body caught.
- When carrying out inspection with the forks raised, insert a stand under the inner mast to prevent the forks and mast from dropping.
- When carrying out job with another worker, decide who is the leader and carry out the job in accordance with instructions from that person.
- After repairing, make sure that the trouble has been corrected by performing a trial run.
- During the trial run, start/operate the lift truck carefully because it is possible that the trouble has not been fully corrected or that defective parts have not been removed.

## 20. TESTING AND ADJUSTING

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## GASOLINE ENGINE



### WARNING

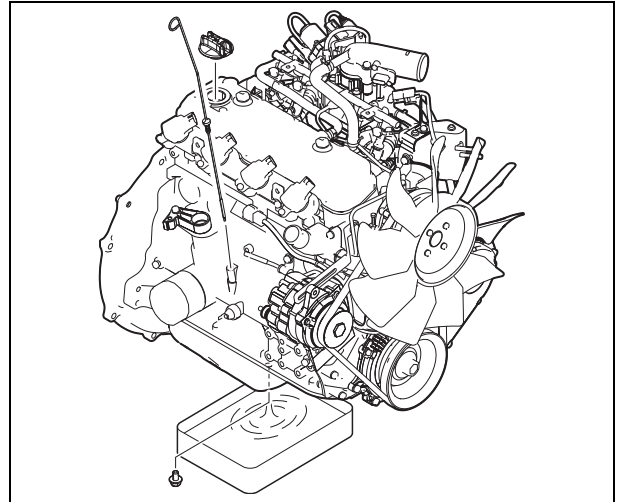
Before starting maintenance of the engine, stop the engine and wait until cooling down completely.

### 5. CHANGE OF ENGINE OIL

- 1) Removing the drain plug, drain the oil and tighten the plug again after draining.
- 2) Fill the engine oil up to the specified level.
- 3) Check the engine oil level with the oil level gauge.

#### Refill Engine Oil Level

K15 Engine	3.8 l
K21 Engine	3.8 l
K25 Engine	3.8 l
GK15 Engine	3.8 l
GK21 Engine	3.8 l
GK25 Engine	3.8 l

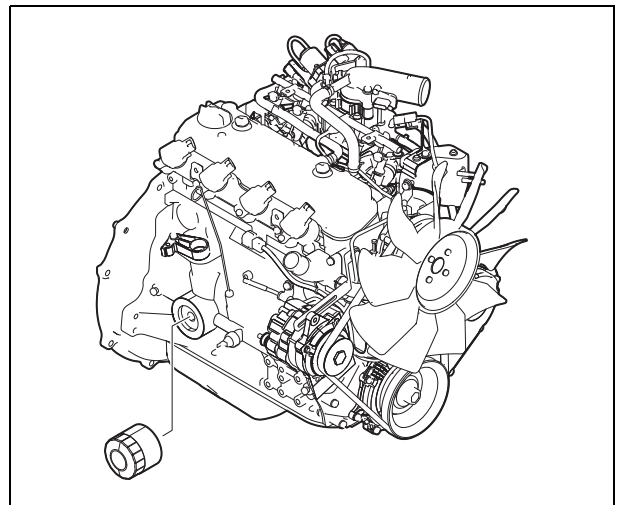


### 6. REPLACEMENT OF ENGINE OIL FILTER

- 1) Remove the cartridge with the filter wrench.
- 2) Clean the filter mounting up and apply the engine oil to the thread as well as the seal of the new cartridge before installation.

#### IMPORTANT


After installing the cartridge, start the engine and check to make sure that there is no oil leakage from the filter mounting surface.



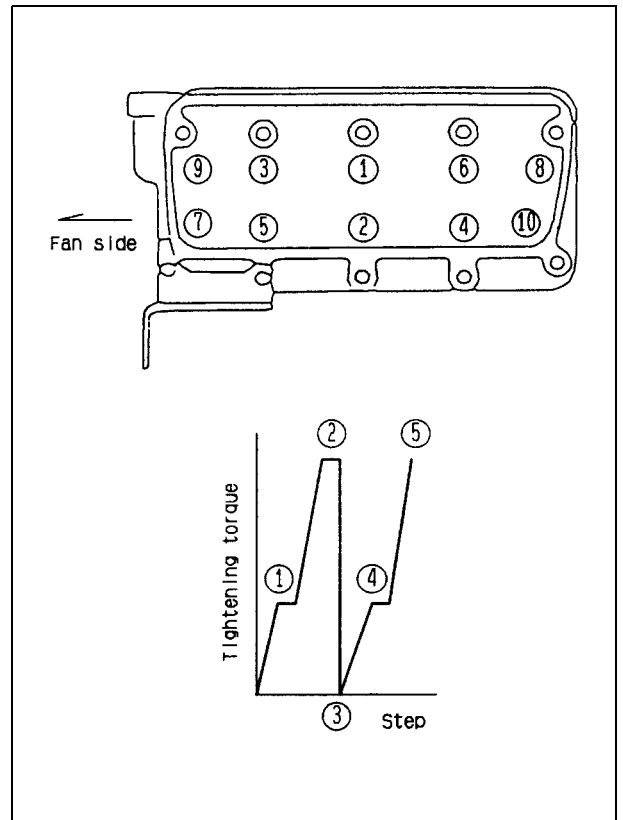
## TIGHTENING TORQUE OF CYLINDER HEAD MOUNTING BOLTS

### K21/K25, GK21/GK25 ENGINE

- Put the steel plate side of the cylinder head gasket on the cylinder block side. Then, set it on top of the cylinder block.
- Set the cylinder head in position, apply the engine oil to the cylinder bolts. Then, tighten in the order shown in the diagram on the right (① through ⑩) to the specified tightening torque as follows:

 Cylinder Head Bolt:

- |                                   |                       |
|-----------------------------------|-----------------------|
| 1) 29.4 Nm {3.0 kgm}              | } Tighten temporarily |
| 2) 78.5 Nm {8.0 kgm}              |                       |
| 3) 0 Nm {0 kgm}                   | } Loosen              |
| 4) 29.4 Nm {3.0 kgm}              | } Tighten again       |
| 5) 73.5 – 83.4 Nm {7.5 – 8.5 kgm} |                       |

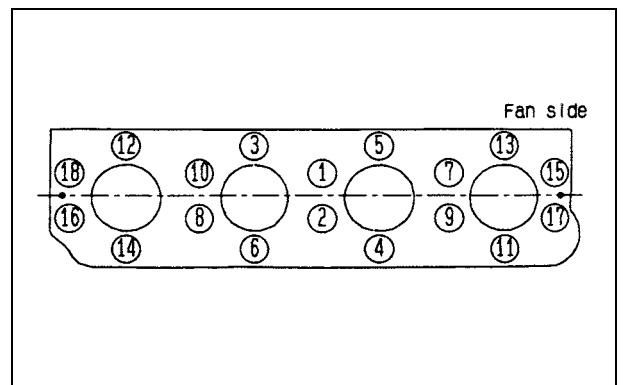


### 4D92E, 4D94LE and 4D98E ENGINE

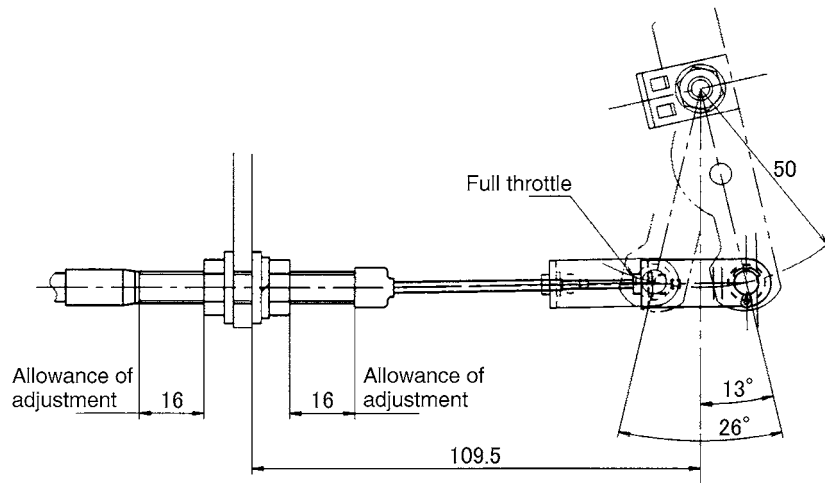
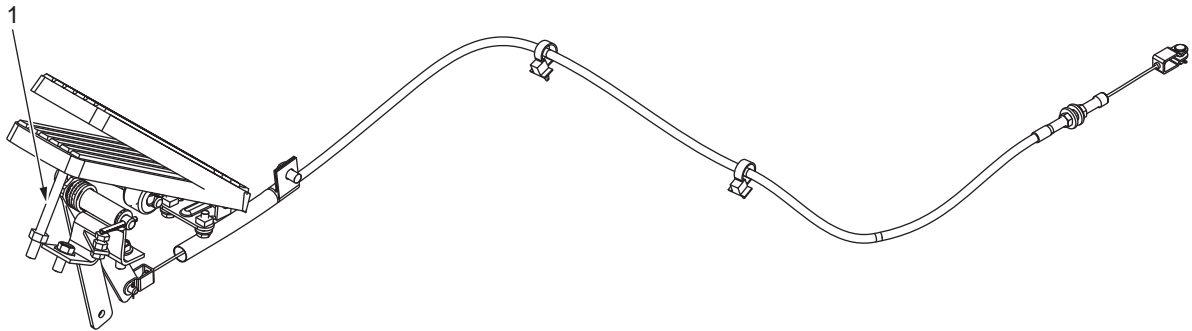
- Apply the engine oil to the cylinder head mounting bolts coating evenly by hand.
- Tighten twice in the order in the diagram on the right (① through ⑱) as follows:

 Cylinder Head Bolt:

- First Time: 58.8 Nm {6 kgm}  
 Second Time: 117.6 Nm {12 kgm}

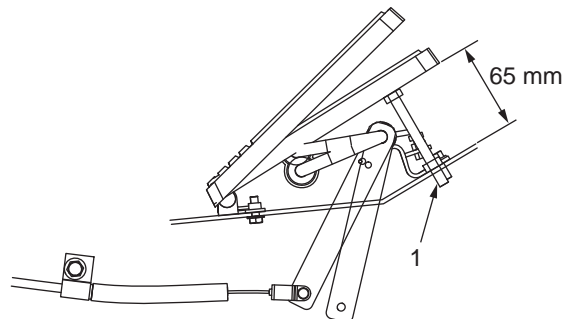


## 4D92E/4D94LE/4D98E ENGINE MODEL



### PROCEDURE FOR ADJUSTMENT OF ACCELERATOR PEDAL

1. Set the stopper bolt (1) temporarily with the height of 65 mm.
2. After assembling the cable, adjust the outer casing mount of the cable to allow the pedal play between 2 to 3 mm.
3. Adjust the height of stopper bolt (1) again to allow the engine full throttle when flooring the accelerator pedal.



**1.0 – 1.75 ton Forklift Trucks**

	Engine Oil Pan	TORQFLOW Transmission Case	CLUTCH Transmission Case	Differential Case	Hydraulic Tank
Capacity (ℓ)	K21 Engine: 3.8 GK21 Engine: 3.8	9.6 (Incl. Torque Converter 3.1)	4.6	4.5	40

	Fuel Tank	Brake Reservoir	Clutch Reservoir	Cooling System
Capacity (ℓ)	40	0.15	0.15	K21 Engine: 9.1 GK21 Engine: 9.1

**2.0 – 2.5 ton Forklift Truck**

	Engine Oil Pan	TORQFLOW Transmission Case	CLUTCH Transmission Case	Differential Case	Hydraulic Tank
Capacity (ℓ)	K21 Engine: 3.8 K25 Engine: 3.8 GK21 Engine: 3.8 GK25 Engine: 3.8	9.6 (Incl. Torque Converter 3.1)	4.6	6.0 5.8 (3.0 – 3.5 ton)	STD Type: 55 Compact Type: 40

	Fuel Tank	Brake Reservoir	Clutch Reservoir	Cooling System
Capacity (ℓ)	STD Type: 58 Compact Type: 40	0.15	0.15	K21 Engine: 9.1 K25 Engine: 9.1 GK21 Engine: 9.1 GK25 Engine: 9.1

**2.0 - 3.5 ton Forklift Trucks**

Name of Devices		2 ton	2.5 ton	3 ton	3.5 ton	Remarks
Engine Assembly	K21 (CNG) Engine	145			–	
	GK21 (CNG) Engine	145			–	
	K21 (electrically controlled) Engine	150				
	GK21 (electrically controlled) Engine	150				
	K25 (CNG) Engine	145				
	GK25 (CNG) Engine	145				
	K25 (electrically controlled) Engine	150				
	GK25 (electrically controlled) Engine	150				
	4D94LE Engine	226			–	
	4D98E Engine	226				
Clutch Assembly		45			–	
Toque Converter Assembly		30				
Transmission Assembly	Clutch Type	35			–	
	TORQFLOW Type	43				
Drive Axle		207		219	261	
Steering Axle		84				
Wheel (Standard type/compact type)	Front	35/45			35/–	
	Rear	15/30			15/–	
Overhead Guard Assembly		111				
Counterweight	Standard Type	1,130	1,485	1,880	2,267	
	Compact Type	1,164	1,553	1,900	–	
Mast Assembly (Incl. Forks)		644	663	773	969	
Cylinder	Lift	25		32	33	
	Tilt	12				
	Power Steering	16				
Fork Carriage		95		120		
Fork		42	50	62	90	
Backrest		20		27		
Pump		10				
Control Valve (2 valves)		8				
Steering system		22				

## DRIVE AXLE AND TRANSFER

### REMOVAL

#### 1. Remove the mast.

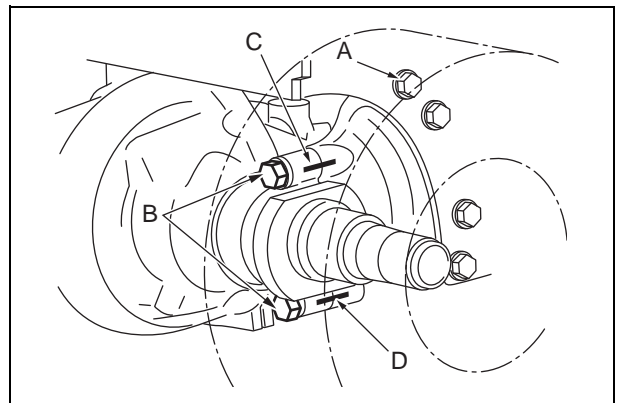
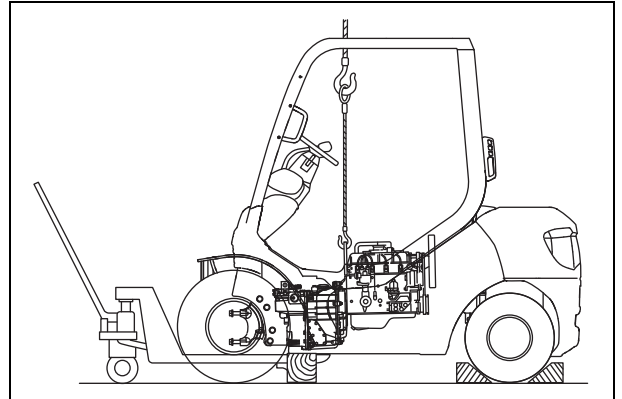
★ Refer to the item "MAST".

#### 2. Drive axle and Transfer

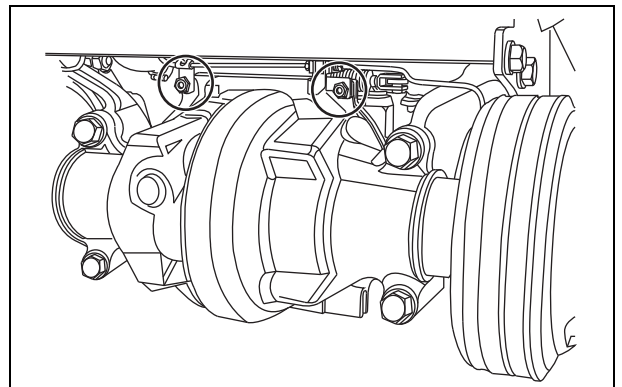
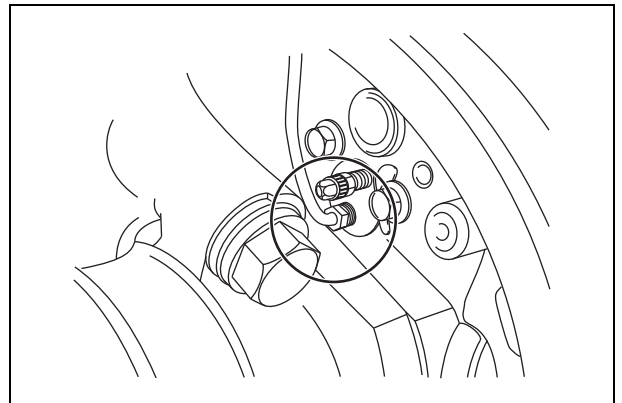
In case of normal removal/installation (except replacement of support of front axle), remove the front axle installing bolts (B). Do not remove the support bolts (A) of front axle.

- 1) To keep the frame about 10mm above the ground, place the blocks under the frame.
- 2) Place the carrier as shown in right figure to hold the front axle.
- 3) Mark the markings (C) and (D) on the support of differential and the front axle for aligning.

★ Mark at both left and right sides.



#### 3. Remove the brake pipe.

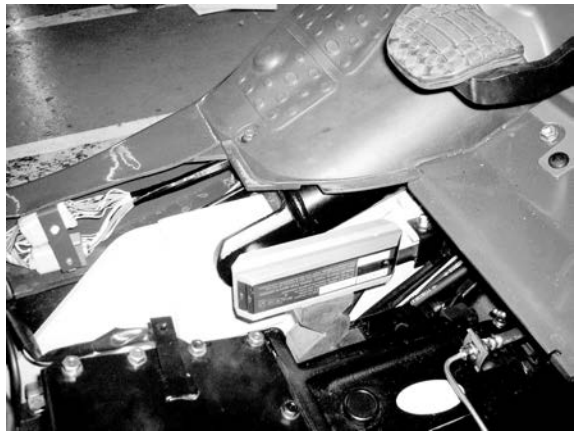


2. Remove Oil Level Plug from Front Axle and install the L type block by Plug.  
Then put Electric water level meter and measure leaning angle of front axle.



3. Measure leaning angle of Engine/Transmission.
  - Manual Transmission  
Remove the Neutral switch/ Back lamp switch from transmission.
  - Automatic Transmission  
Remove transmission control valve.

Then put electric water level meter on the machining surface of transmission as above.  
And reading the leaning angle of transmission.



(for Manual transmission)

4. Service limit of leaning angle of Transmission and Front axle.

**Maximum 0.5degree between Transmission/Axle leaning.**

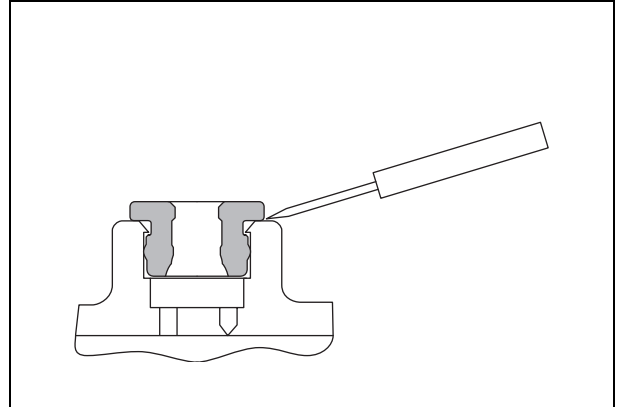
5. When angle of leaning is more than 0.5 degree, its shows wrong position in either the front axle or engine/transmission.  
Check he engine mounting and axle mounting.

**1. DISASSEMBLY**

- 1) Remove the bushing rod and the boot.
- 2) Remove the snap ring.
- 3) Remove the stop plate and the piston assembly.

**2. Disassembly of Filler Union**

- 1) Lift up the filler union holding the hose connection.
- 2) Insert the screw driver (negative type) between the bushing (9) and the cylinder (1) to remove the bushing.

**WARNING**

- Be careful not to damage the cylinder, the piston or the cup.
- When carrying out disassembly, make sure that you fully understand the structure of the cylinder so that you can lay out the disassembled parts in order.
- Whenever replacing, replace the whole piston assembly without disassembling the piston assembly.
- Never disassemble the piston assembly.
- Never push the surface of the cylinder with a vise.

**ASSEMBLY****1. Assembly of Master Cylinder**


- 1) Use alcohol or brake fluid to wash or clean all the parts to be reused.  
Never soak such parts as the cup or other rubber parts for more than 30 seconds when washing in alcohol.
- 2) Apply rubber grease or brake fluid evenly to the inside surface of the cylinder and the outside circumference of the piston.
- 3) Assemble the cylinder with the piston assembly, where no snap ring can be used.

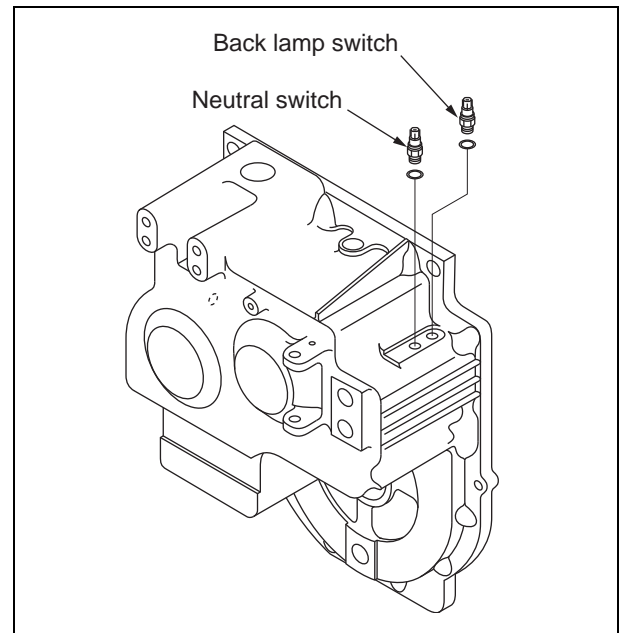
**WARNING**

- Never use any fluid oil other than alcohol or brake fluid to wash or clean the parts. In particular, never use mineral oil such as petroleum and gasoline. If mineral oil sticks on the rubber parts, they may swell and become unusable.
- Keep the parts in a clean place to prevent the parts from sticking dirt or dust after washing.
- Always keep such parts as the cylinder, the piston or the cup away from any foreign body that may damage those parts seriously.

- 6) Install the neutral switch and the back lamp switch.

**Tightening torque**

 kgm	22.6 – 33.3 Nm {2.3 – 3.4 kgm}
---	--------------------------------



**ASSEMBLY**

Carry out assembly work in the reverse order to disassembly work.


**IMPORTANT:**

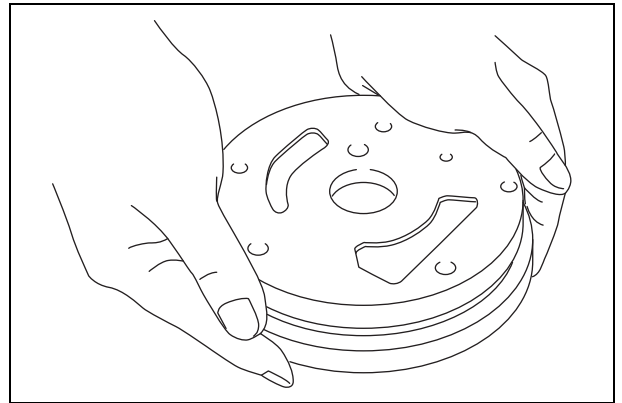
- Wash all the removed or disassembled parts with clean oil to remove foreign bodies completely. In particular, wash the oil groove and oil circuit with care.
- Replace such parts as the O-ring, the oil seal and the gasket with new ones after disassembly.
- Be careful to assemble correctly. For details, see the check items specified in the maintenance standard.
- When replacing the oil seal with a new one, apply a semi-dry gasket sealant (THREE BOND No.1211 or No.1104 for example) on the outside circumference of the oil seal. However, never apply it to the lip or the sliding surface of the shaft.

**1. Assembly of Gear Pump**


Insert a pair of the gears (3) (4) in the gear casing (2) and reverse the stator support (5) to assemble in the same steps taken for disassembly.

Tighten the countersunk head screw and check to make sure that the gear rotates smoothly. If it does not rotate, disassemble it and start to assemble again.

 kgm (Countersunk Head Screw)	0.98 – 2.94 Nm {0.1 – 0.3 kgm}
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
**2. Assembly of Main Relief Valve**

Insert the spring and the piston to the relief valve and tighten it with the plug. Check the piston for proper positioning when assembling.

 kgm (Plug)	60 – 80 Nm {6.1 – 8.2 kgm}
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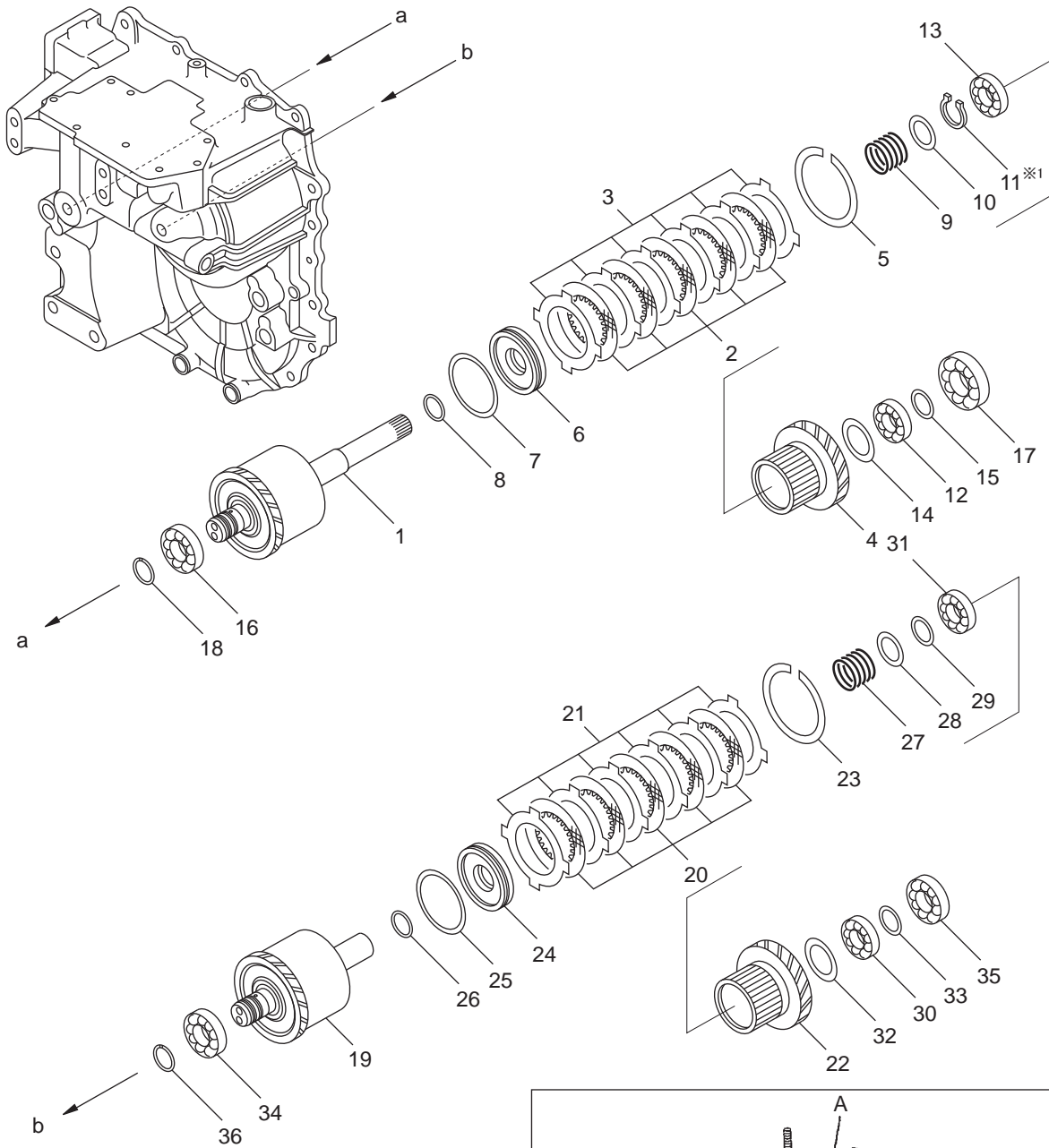
**3. Assembly of Torque Converter Inlet Port Valve and Lubrication Relief Valve**

Insert the piston and the spring to the valve. Then, insert the gasket and tighten the cover. There are two types of the valve and the spring is different from the torque converter inlet port valve and the lubrication relief valve. Be sure to assemble them correctly to their original position.

 kgm (Bolt)	8.5 – 11 Nm {0.9 – 1.1 kgm}
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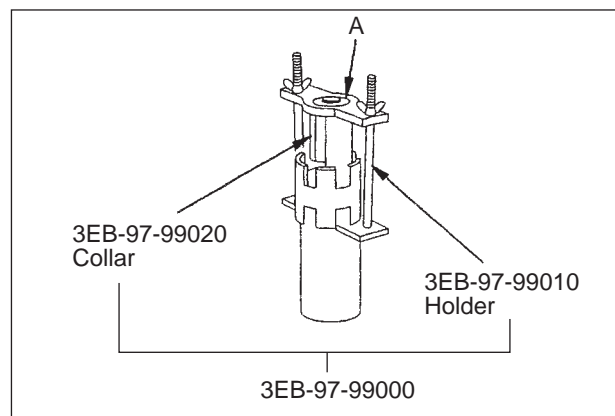
**10. Disassembly of Clutch Pack Assembly**

★ The numbers put on the diagram show the order for disassembly.



\*1. When removing the snap ring (11), it is dangerous as it is tensed by the spring. Be sure to use the special tool A to remove the snap ring.

Special tool A	3EB-97-99000
----------------	--------------



**ADJUSTMENT OF PINION GEAR CLEARANCE****1. Clearance (b)****2. Fix the pinion shaft pushing from the bottom.**

- 1) Take an alignment to the shaft with the jig.
  - 2) Turn the bearing about 10 times each to right and left to check its smooth movement.
  - 3) Measure the clearance (d).
- ★ Check to make sure the step (1) of the above for no clearance.

**3. Calculation of Shim Thickness S<sub>2</sub>**

- 1) Calculate the shim thickness **S<sub>2</sub>** applying the clearance (d) measured by the step 1 – 3 of the above.

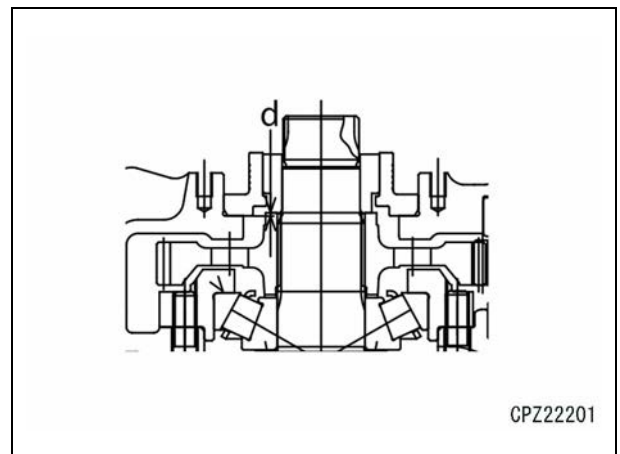
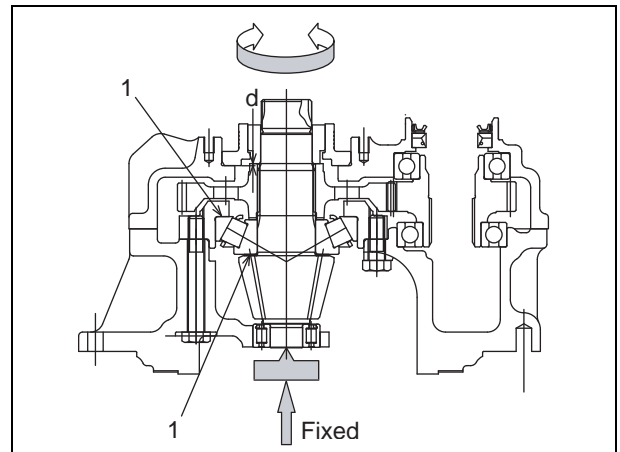
$$S_2 = 2.354 - d$$

- 2) Select the shim so as to meet the **S<sub>2</sub>** of the clearance.
- 3) Measure the starting torque and adjust the shim thickness **S<sub>2</sub>**.

**Starting Torque for Pinion Bearing**

**Starting Torque: 8.8 – 13.2 Nm {90 – 135 kgcm}**

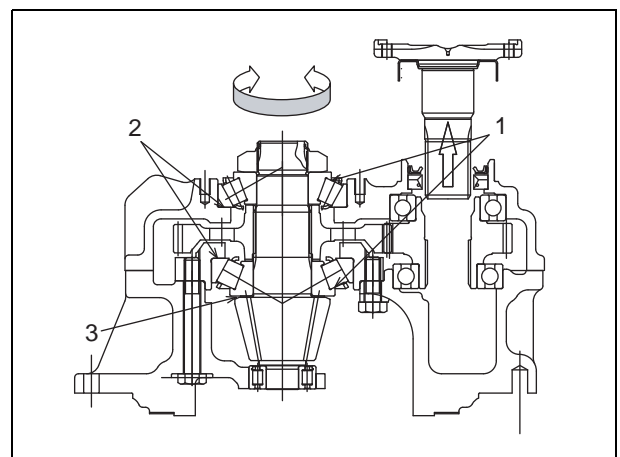
- ★ Make sure to measure the starting torque without the coupling shaft.

**INSPECTION OF PINION BEARING CLEARANCE**

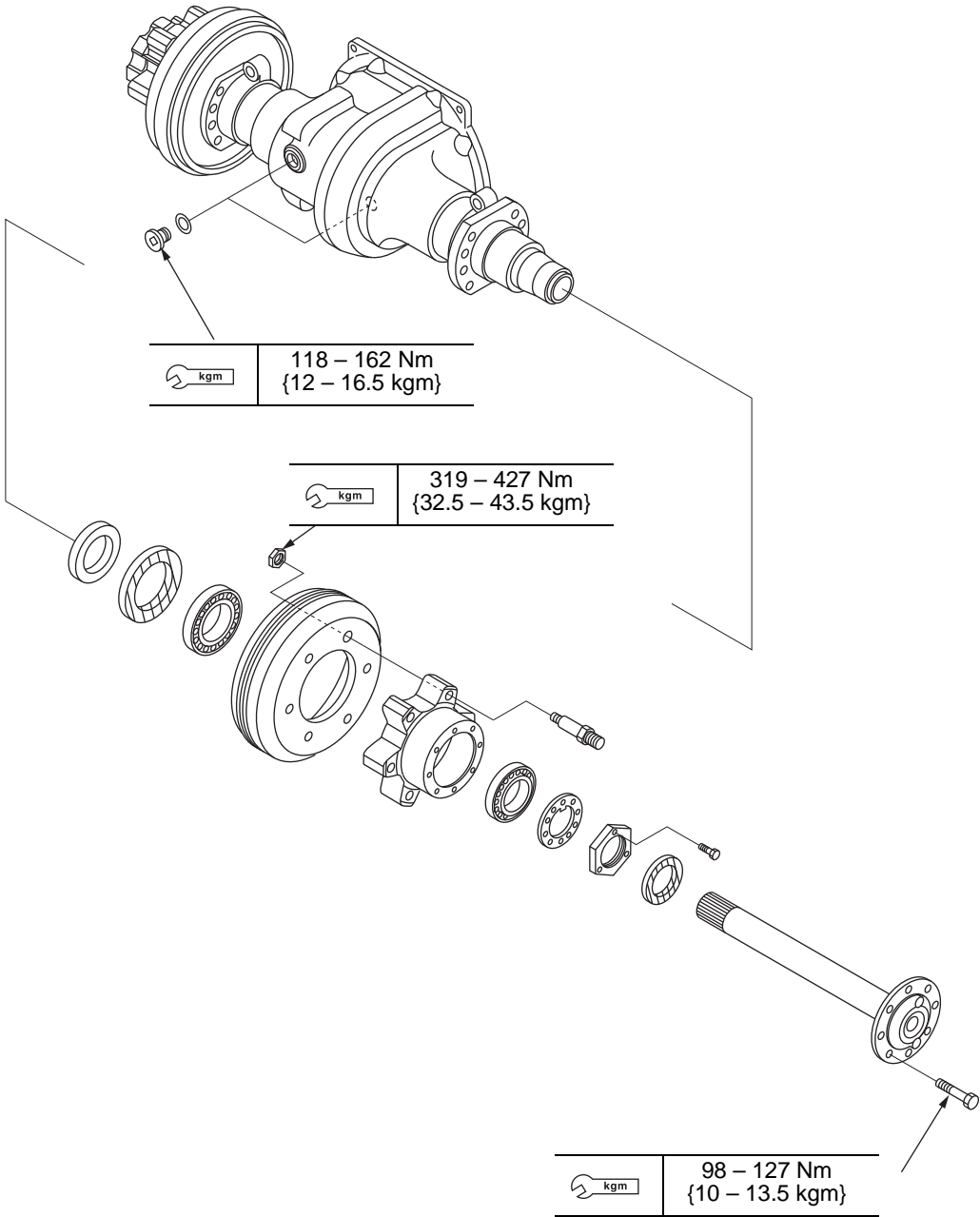
1. Apply the KOMATSU FORKLIFT genuine oil to the inner race big brim (1) when assembling.
2. Check to make sure for no clearance (2) when inserting the outer race.
3. Check to make sure the inner race big brim for no clearance (3) when pressing the inner race for installation.
4. After tightening the nut with specified torque, turn the bearing about 20 times each to the left and the right to check its smooth movement.
5. If the starting torque cannot get the specified torque as shown below, disassemble and adjust the shim thickness again.

**Starting Torque: 8.8 – 13.2 Nm {90 – 135 kgcm}**

- ★ If the starting torque T is greater than 13.2 Nm {135 kgcm}, increase the shim thickness.
- ★ If the starting torque T is less than 8.8 Nm {90 kgcm}, reduce the shim thickness.

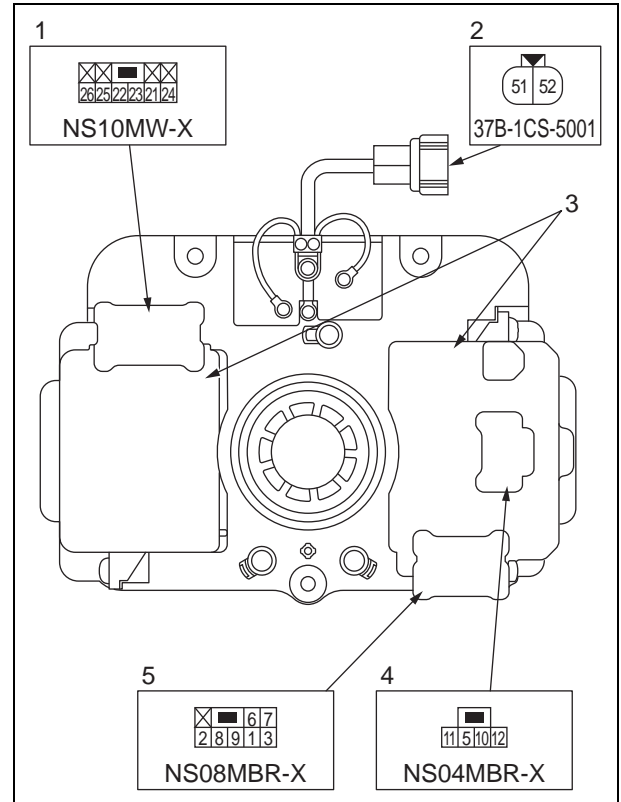


3.0 – 3.5 ton Forklift Truck



**Inspection of Switches**

1. Remove the connection of the 8-pin coupler between the combination switch cord and the main wiring harness.
2. Check continuity of electric current between the terminals at each position to make sure that there is continuity between the 0 to the 0.
3. Insulating resistance: More than 10 Ω at each terminal with a 500 V megohm meter.
  - 1) F/R switch connector
  - 2) Horn contact connector
  - 3) Protective plate
  - 4) Lighting connector
  - 5) Lighting and turn signal switch connector



Position of Turn Signal Switch Connection

No.	R	N	L	Connect to
1	○		○	Power Source
2	○		○	3/1 Lamp
3			○	3/1 Lamp

Position of Lighting Switch Connection

No.	Twist			Connect to
	OFF	1	2	
11	○		○	Power Source
12	○		○	Tail Lamp
			○	
5			○	
			○	
8			○	

No.	Up and Down			Connect to
	A	B	C	
	○	○	○	Power Source
6	○	○	○	H/Lamp Main
7		○	○	H/Lamp Main
5			○	Power Source
	○	○	○	Power Source
9	○	○	○	H/Lamp
10		○	○	H/Lamp Dimmer
8			○	Power Source

Position of F/R Switch Connection (TORQFLOW Type)

No.	F	N	R	Connect to
21	○		○	Earth
22	○		○	Relay
23			○	Relay
24			○	Relay
25		○		Power Source
26		○		Relay

When switching between F ↔ N ↔ R, it does not overlap between F ↔ N and N ↔ R.

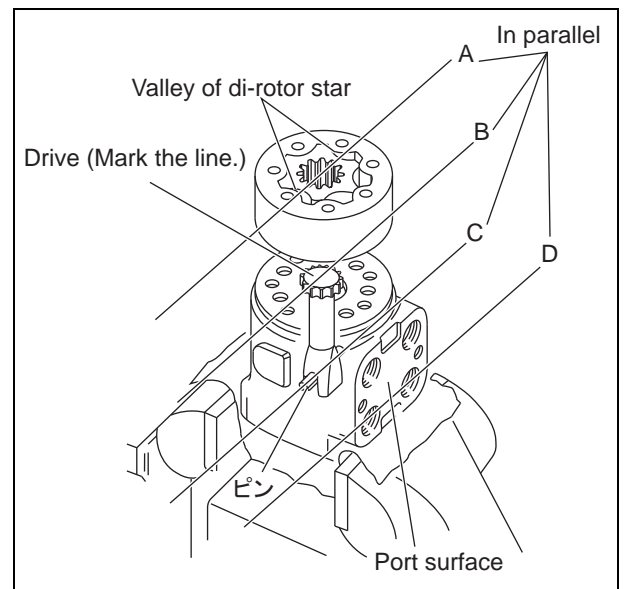
When switching between A ↔ B ↔ C, it overlaps between A ↔ B and B ↔ C each other. It returns automatically at C → B.

Horn Switch Circuit

No.	Connect to
51	○
52	○

**Assembly**

- ★ Replace all of the O rings and oil seals with new ones.
  - ★ The O ring (28) and the O ring (29) differ in size. Discriminate them.
1. Insert the O ring (32).
    - ★ The O ring (32) is the low slip specification. Do not use it for standard specification.
  2. Insert the O ring (28).
  3. Insert the O ring (29) in the housing (10).
  4. Place the spacer plate (7) on the housing (10) and align the positions of bolt holes.
    - ★ Discriminate the bolt hole from the oil hole as their diameters differ.
  5. Insert the drive (8) and engage the yoke of drive with the pin (13).
    - ★ To secure the positioning, mark the line on the end surface of drive (8) in parallel with the pin (13).  
(Perform this work precisely as it is important to meet the valve timing.)
  6. Install the gerotor (4) with the O ring side placed at the spacer plate (7) side, aligning the teeth-shaped valley of gerotor star with the line marked. At this moment, confirm that the pin, the marked line on the drive (8) and the valley of rotor star are in parallel as shown in figure.
  7. Keeping the drive (8) engaged with the gerotor star, align the bolt holes by rotating the gerotor ring.

**WARNING**

The incorrect aligning may lead to the serious operation trouble. Ensure to perform the positioning.

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](http://www.heydownloads.com) by clicking the link below

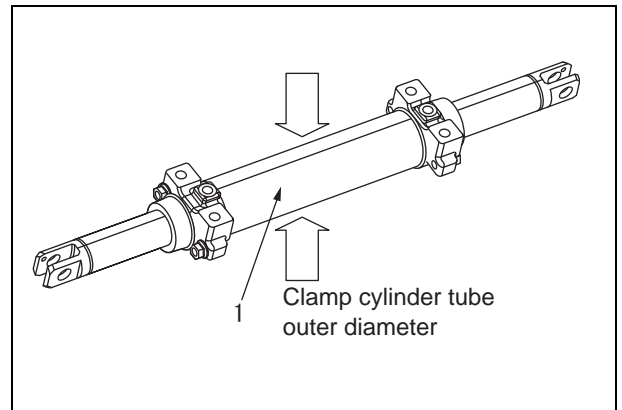


- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

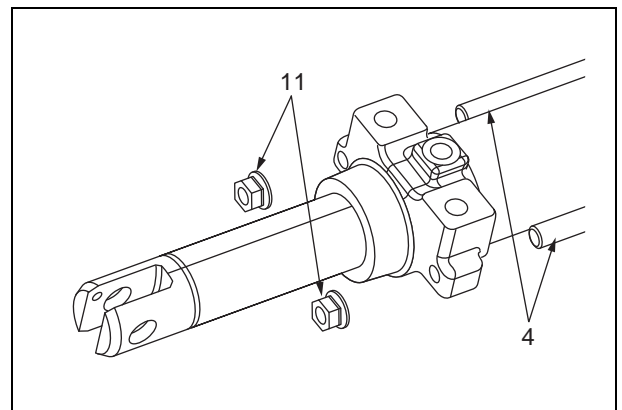
CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

**DISASSEMBLY**

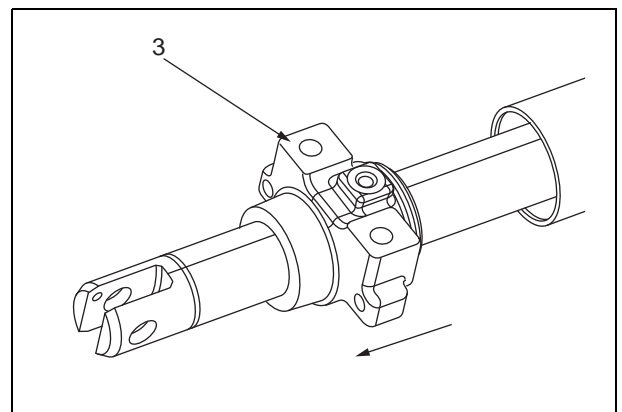
1. Clamp the outer diameter of the cylinder tube (1) and secure it.



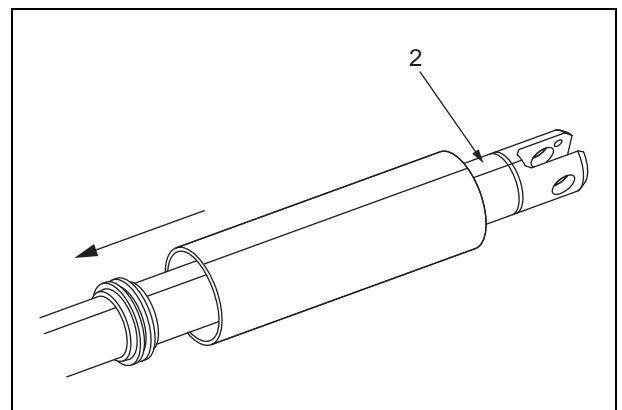
2. Loosen 4 pieces of the nut (11) and remove the tie rod (4).



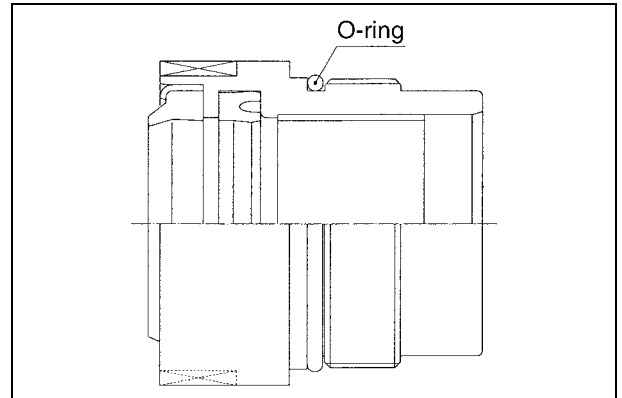
3. Pull the right and left rod guide (3) out slowly.  
★ Be Careful not to damage the packing when pulling out.



4. Pull the piston rod (2) straight  
 Cylinder Inner Diameter Standard Size: 75 mm  
 Cylinder inner Diameter Repair Limit: 75.2 mm  
 Rod Outer Diameter Standard Size: 50 mm  
 Rod Outer Diameter Repair Limit: 49.92 mm  
 Rod Outer Diameter Bed Limit: 0.5 mm



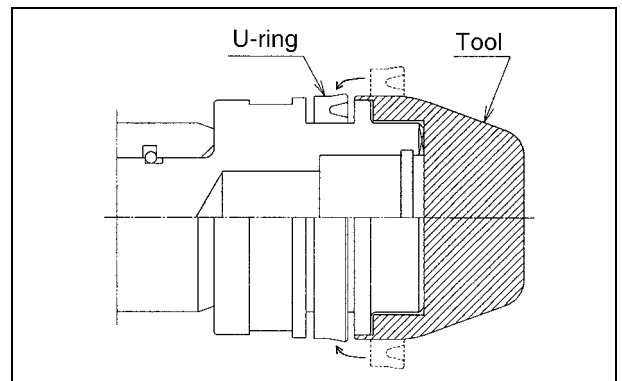
- 3) **Installing O-ring (7)**  
 Install the O-ring paying attention not to damage or cut it.  
 Check that there is no distortion after installation.



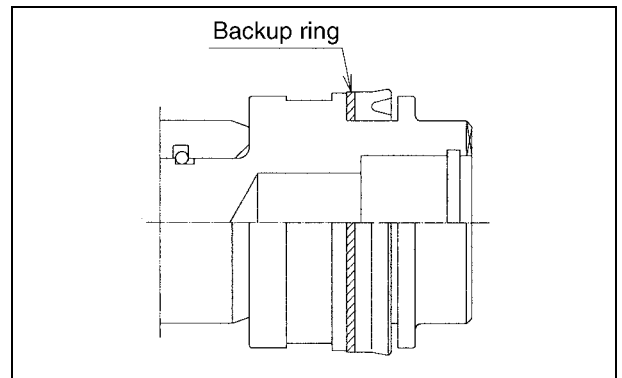
## 2. Reassembling piston assembly

Clean the piston and the peripherals well before reassembling.

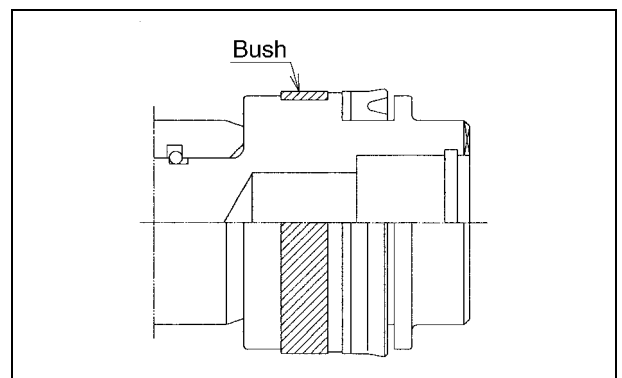
- 1) **Installing U-ring (8)**  
 Install the U-ring to the U-ring groove of the piston while expanding it. Pay attention to its orientation. If hydraulic oil is applied to the U-ring, it can be installed easily. An insertion tool as shown in the figure will make the installation safe.



- 2) **Installing backup ring (9)**  
 Install backup ring (9) to the back of U-ring (8) (see the figure).  
 If installed wrongly, the backup ring will not function normally and damage U-ring (8), which may inhibit normal cylinder operation.



- 3) **Installing bush (10)**  
 Install the bush to the bush groove of the piston while widening its mating face (see the figure).



**Cleaning**

Wash all the disassembled parts completely with clean mineral oil.

Then dry them with compressed air and put them on clean paper or cloth for inspection.

**Inspection**

Check all disassembled parts for burrs, scratches, flaws or any other defects on any surface.

1. Check that no scratch or dent is present on the outer surfaces of spools. If slight scratches are found, remove them with an oilstone or cloth dampened with lapping agent.
2. Check that all sliding parts move smoothly, and that no foreign matter is left in any groove or path.
3. Replace spring if it is damaged, deformed or worn.
4. Check that seal grooves of the valve housing are smooth with no dirt/dust, dent or rust.
5. If any dent and/or scratches are found on the check seat surfaces of the valve housing, remove them by lapping while paying attention not to leave lapping agent in the valve.
6. When the relief valve does not work normally, check it according to the relief valve maintenance manual.
7. When replacing O-rings or backup rings, always replace them with new ones.
8. When any cap or plug is detached, check that no paint scrap is left near the plug seats or holes of the machine body. If paint scraps enter the valve, they may cause catching or clogging, which may result in a malfunction or oil leakage.

**ASSEMBLY**

1. Pay attention to the following when handling O-rings.
  - 1) Do not use O-rings with a molding defect or scratches.
  - 2) Apply grease or hydraulic oil to O-rings and their installation places for adequate lubrication.
  - 3) Do not expand any O-ring to an extent where it is permanently deformed.
  - 4) When installing an O-ring, do not roll it. Once it is distorted, the distortion cannot be corrected naturally. This may cause oil leakage after installation of the O-ring.
2. Pay attention to the following when handling spools.
  - 1) Always observe the specified torques. Over-torque for tightening screws may cause spool malfunction.
  - 2) Put spools, springs, and spool ends in the same combinations as those before disassembling.
3. Pay attention to the following when reassembling section assemblies and valve assemblies.
  - 1) Check that the O-ring at the mating face is fitted within the O-ring groove.
  - 2) Check that no washing oil or hydraulic oil is remaining at the following places before reassembling.
    - Outer surface of the O-ring groove at the mating face of each section
    - Outer surface of the O-ring groove at the cap installation face

If reassembling is performed with oil remaining at these places, the oil may be misunderstood as oil leakage during operation.

**Valve housing**

1. Assemble poppet (10), spring (11), and O-ring (12) to be inserted into the mating face of sections.
2. [Fig. 40-1] Screw tie rods (2), (4) fully into the lift section, and then install the valve housings of each section one by one. Then tighten the tie rods with nuts (1), (3) to the specified torque. Be careful so that spring (11) at the mating face is not caught.
  - ★ For double-valve models, tighten the tilt housing to the lift housing with bolts (1), (3) and washers (2), (4).

**1. Section E-E (Cylinder Clamp)**

- 1) Insert the top of the lift cylinder in the inner cylinder so as to adjust it with shim (a).

Standard Thickness of Shim

2.5t	5 mm
3.0t	1.5 mm
3.5t	8.7 mm

Standard Thickness of Shim (Triple Mast)

2.5t	8.5 mm
3.0t	5.5 mm

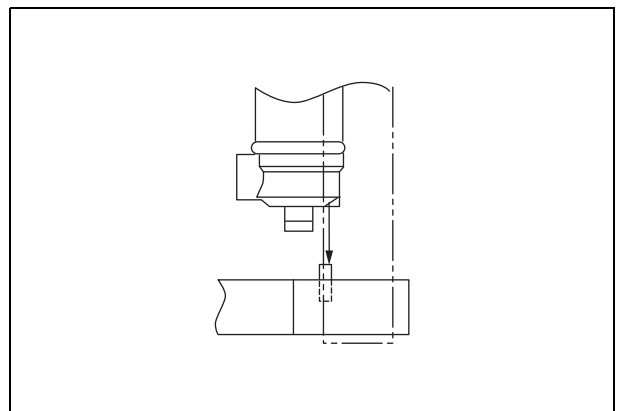
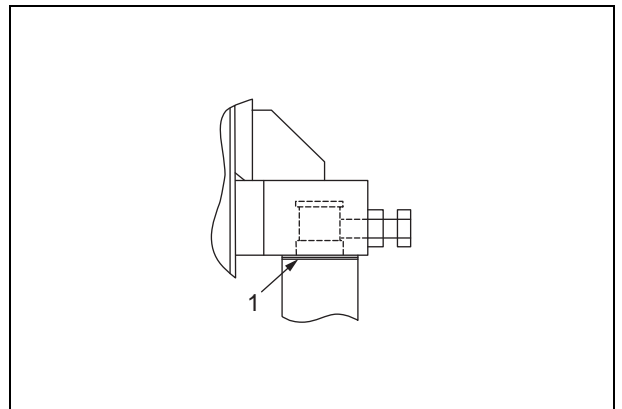
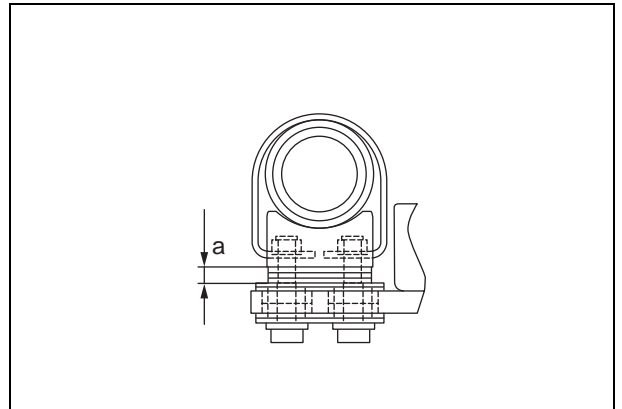
**2. Adjustment of Lift Cylinder Stroke End "Q"**

- Put the shim (1) to adjust the clearance of the lift cylinder stroke end so as to synchronize right and left lift cylinders when extending the lift cylinders to the maximum fork height.



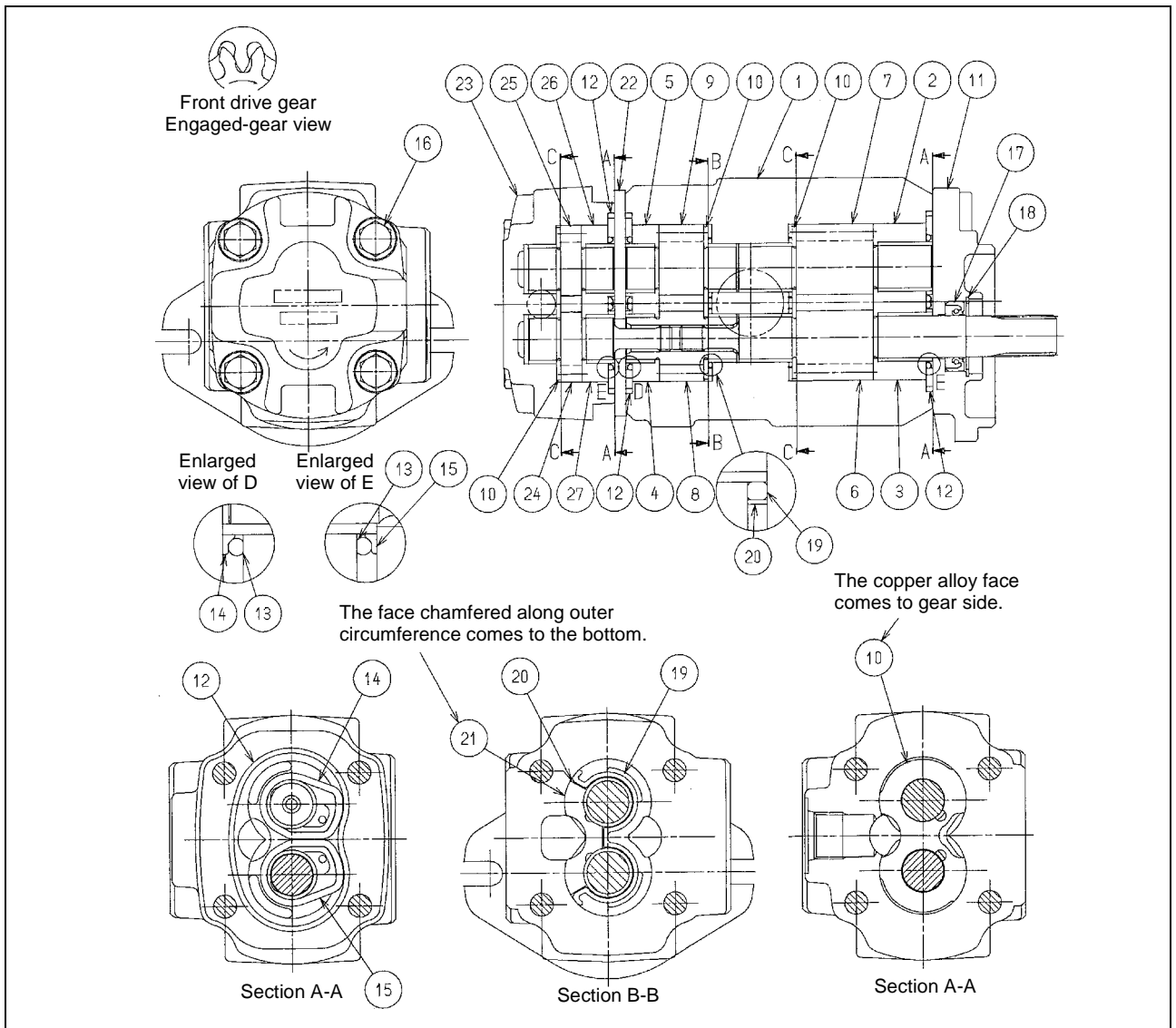
**WARNING**

Check to make sure that the lift cylinders are being secured firmly with stopper pins.



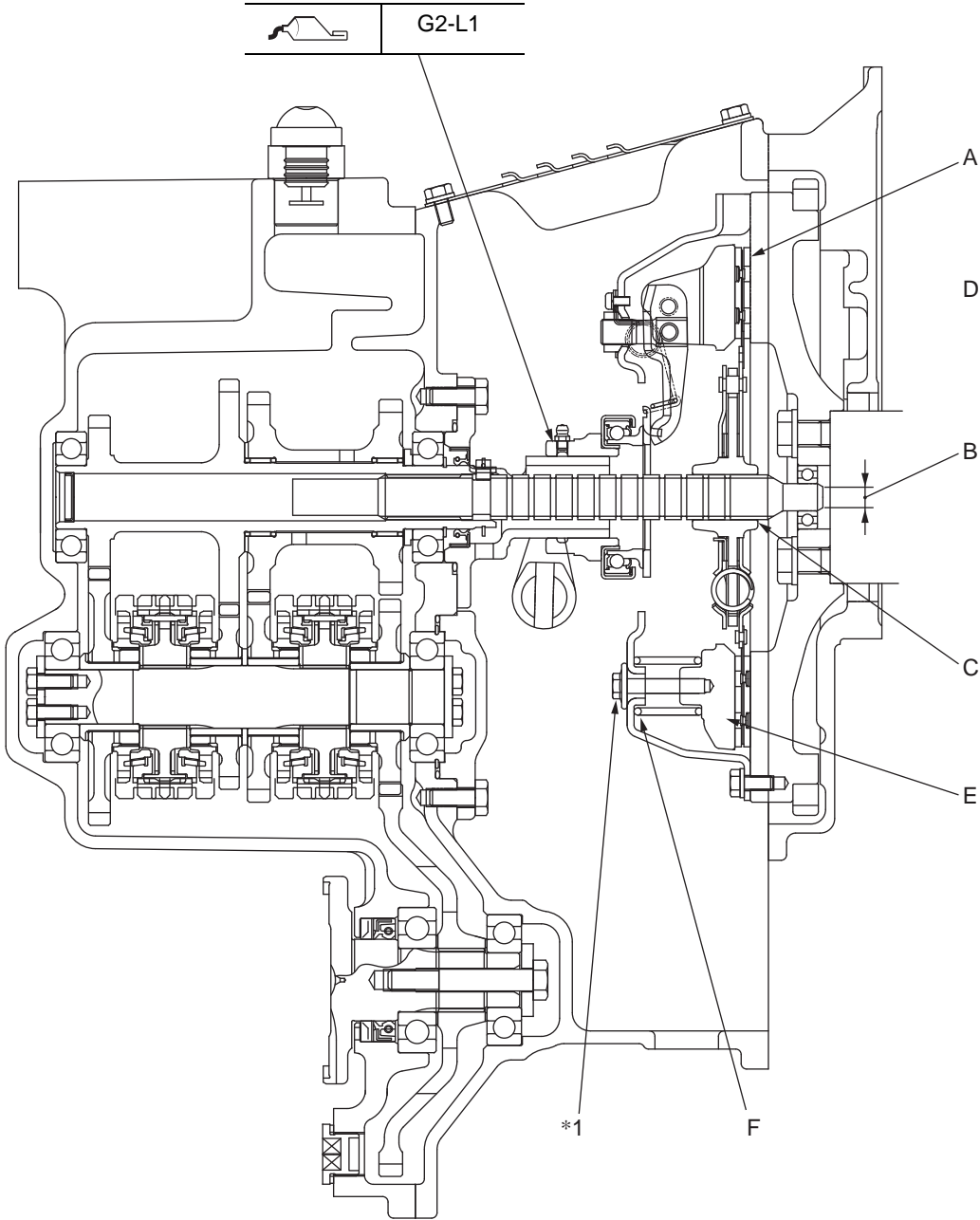
## HYDRAULIC PUMP

## DISASSEMBLY AND ASSEMBLY



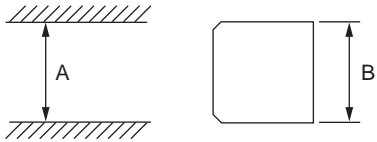
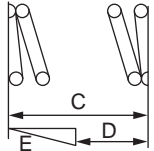
- |                                      |                                     |
|--------------------------------------|-------------------------------------|
| 1 Front body assembly                | 15 Packing ring L                   |
| 2 Bush BR assembly (for front pump)  | 16 Bolt with hexagon flange         |
| 3 Bush BL assembly (for front pump)  | 17 Oil seal                         |
| 4 Bush ER assembly (for center pump) | 18 Snap ring                        |
| 5 Bush EL assembly (for center pump) | 19 Plate seal                       |
| 6 Front drive gear (for front pump)  | 20 Backup                           |
| 7 Driven gear (for front pump)       | 21 Isolation plate                  |
| 8 Rear drive gear (for center pump)  | 22 Center plate                     |
| 9 Driven gear (for center pump)      | 23 Rear body assembly               |
| 10 Side plate                        | 24 Rear drive gear                  |
| 11 Flange                            | 25 Driven gear                      |
| 12 Body seal                         | 26 Bush ER assembly (for rear pump) |
| 13 Bush seal                         | 27 Bush ER assembly (for rear pump) |
| 14 Packing ring R                    |                                     |

CLUTCH



Note \*1: Remove the bolt at 3 locations after installation.

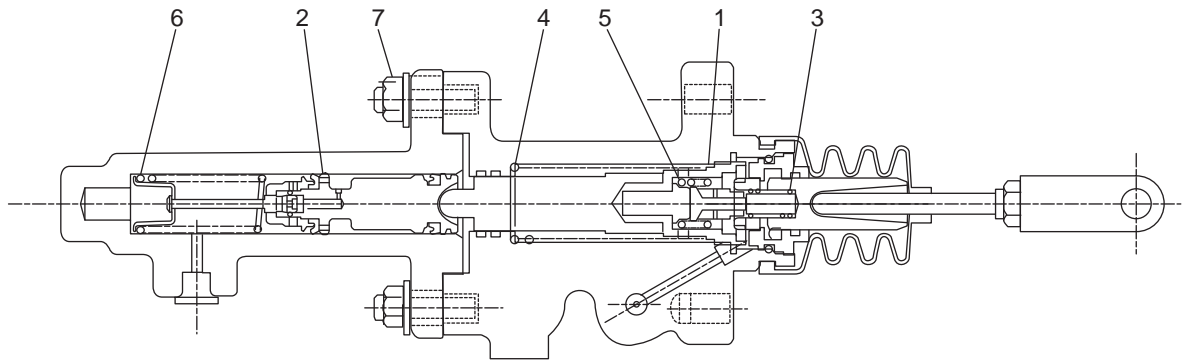
Unit: mm (in)

Mark	Check Item		Criteria		Remedy	Mark	
			Standard	Limit			
-	Piston or Spool and Body Hole A: Valve Body Inside Diameter B: Piston Spool Outside Diameter 		-	-	Replace	-	
1	Accumulator	Piston Outside Diameter Body Inside Diameter Clearance	27.959 - 27.980 (1.1007 - 1.1016) 28 - 28.021 (1.1024 - 1.1032) 0.020 - 0.062 (0.0008 - 0.0024)	0.082 (0.0032)		8 1	
2	Small Piston	Spool Outside Diameter Body Inside Diameter Clearance	21.98 - 21.99 (0.8654 - 0.8657) 22 - 20.021 (0.8661 - 0.8670) 0.010 - 0.041 (0.0004 - 0.0016)	0.061 (0.0024)		3 1	
	Inching Spool	Spool Outside Diameter Body Inside Diameter Clearance	17.473 - 17.484 (0.6879 - 0.6883) 17.5 - 17.518 (0.6890 - 0.6897) 0.016 - 0.045 (0.0006 - 0.0018)	0.065 (0.0026)		2 3	
-	Spring  C: Free Length D: Mount Length E: Mount Load		-	-		Replace	
3	Accumulator Large Spring	Free Length Mount Length Mount Load	46.5 46.5 0 N {0 kgf} ± 5 %	13.1 N {1.34 kgf}			10
	Accumulator Small Spring	Free Length Mount Length Mount Load	111 97.8 81.3 N {8.36 kgf} ± 5 %	73.2 N {7.47 kgf}			9
4	Inching Spool	Free Length Mount Length Mount Load	74.2 45 40.6 N {4.15 kgf} ± 5 %	36.8 N {3.76 kgf}	7		
	Small Piston	Free Length Mount Length Mount Load	28 20 34.4 N {3.51 kgf} ± 5 %	30.96 N {3.16 kgf}	4		

★ The numbers shown in the mark column of the table refer to the location of the component parts shown in the diagram.

# CLUTCH BOOSTER

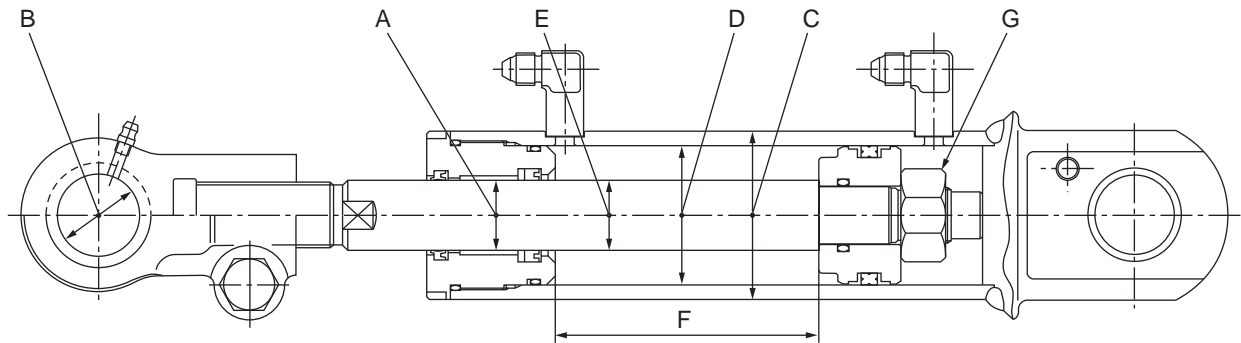
## CLUTCH BOOSTER ASSEMBLY



Unit: mm

No.	Check Item	Standard				Allowance	Remedy
		STD Size	Shaft	Hole	STD Clearance	Repair Limit	
1	Clearance between Cylinder and Piston	Ø25.4	-0.020 -0.053	+0.052 0	0.020 – 0.105	0.150	Replace
2	Clearance between Cylinder and Piston	Ø22.22	-0.020 -0.053	+0.052 0	0.020 – 0.105	0.150	
3	Deterioration of Spring	Free Length	Mount Length	Mount Load N (kgf)		Free Length	
		25.2	19.5	48.6 {4.96}		22.5	
4	Deterioration of Spring	103	63	23.5 {2.4}		92.5	
5	Deterioration of Spring	14.8	10	41.1 {4.2}		13.0	
6	Deterioration of Spring	73.6	51.8	41.2 {4.2}		66	
7	Tightening Torque	20 – 30 Nm {2.1 – 3.1 kgm}					Extra Tightening

2 ton Forklift Truck



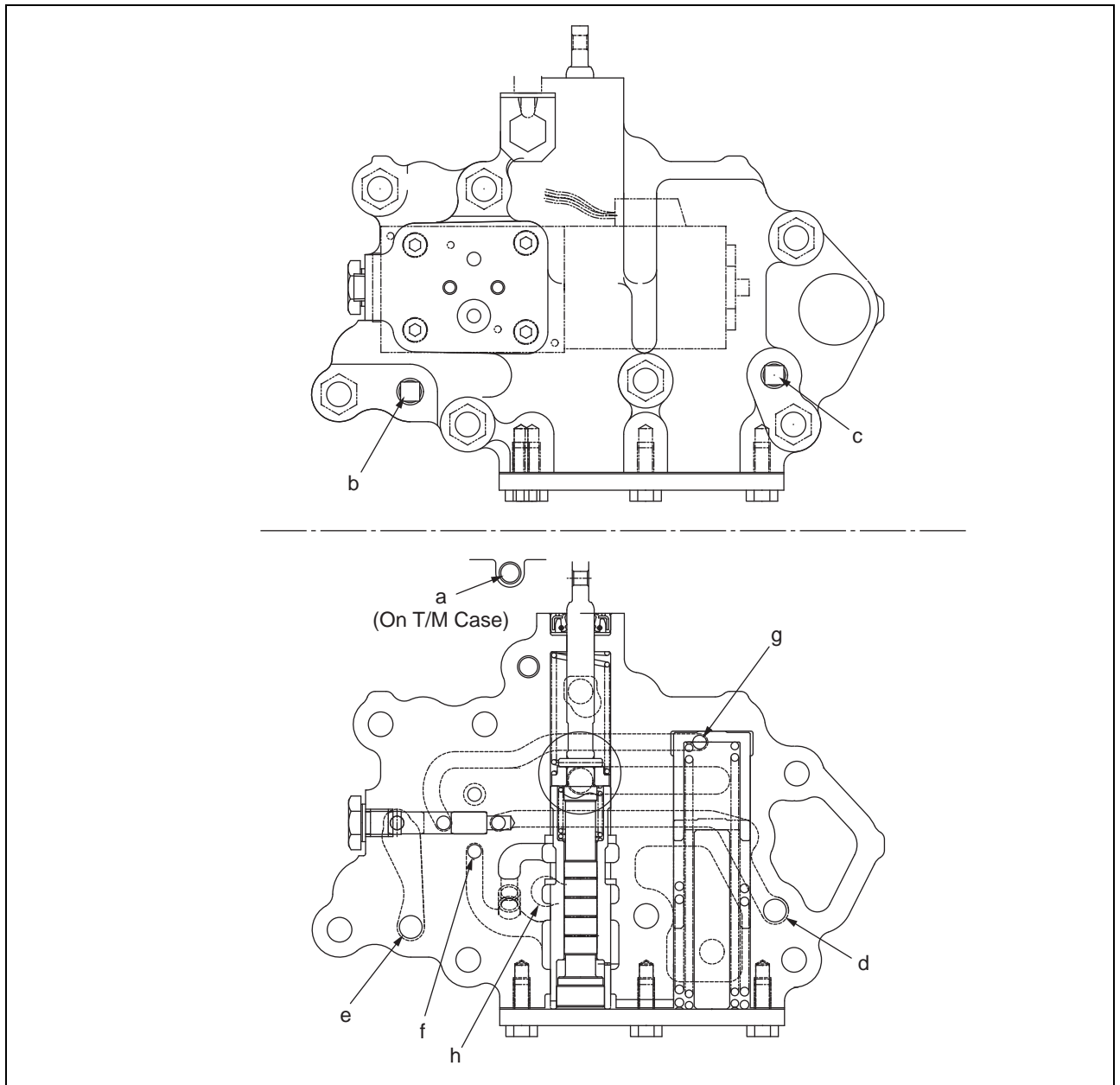
Unit: mm

Mark	Check Item		Criteria		Remedy
			Standard Size	Repair Limit	
A	Clearance between Piston Rod and Bushing		0.05 – 0.187	0.3	Replace bushing
B	Clearance between Piston Rod Head and Pin		0.10 – 0.35	0.6	
C	Outside Diameter of Piston Cylinder		84 (3.0 – 3.5 ton: 96)		-
D	Inside Diameter of Piston Cylinder		70 (3.0 – 3.5 ton: 80)		
E	Diameter of Piston Rod		30 (3.0 – 3.5 ton: 35)		
F	Stroke	6/12° (Compact Model: 6/10°)	127 (Compact Model: 115)		
		6/6° (Compact Model: 6/6°)	83 (Compact Model: 85)		
G	Tightening Torque for Cylinder Piston Mounting Nut		2.0 – 2.5 ton: 343 Nm {35 kgm}		
			3.0 – 3.5 ton: 647 Nm {66 kgm}		

## 60. STRUCTURE AND FUNCTION

TORQUE CONVERTER, GEAR PUMP AND CONTROL VALVE .....	60-2
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FLOW DIVIDER .....	60-13
CLUTCH BOOSTER .....	60-14
TILT CYLINDER .....	60-16
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## CONTROL VALVE ASSEMBLY HYDRAULIC PRESSURE PORT LOCATION



- a: Pump O/P Measure Port
- b: F Clutch Measure Port
- c: R Clutch Measure Port
- d: To R Clutch
- e: To F Clutch
- f: Drain
- g: Drain
- h: From Pump

## VEHICLE CONTROLLER

The AX50/BX0 Series is equipped with a vehicle controller (interlock box) conforming to ISO3691 Standard, which has functions to enhance safety of the vehicle.

### 1. Travel interlock function

#### (torque converter vehicles only)

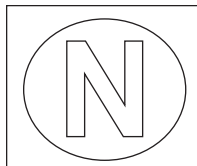
When an operator leaves operator's seat, the switch under the seat is activated to disable travel of the vehicle. To restart travel, it is necessary to reset the forward/reverse lever. This prevents malfunction of the vehicle.

Users can check operation status by the travel lock lamp on the meter panel.

If an operator leaves operator's seat with the forward/reverse lever set to F or R, the lamp blinks showing that travel is disabled.

When the operator takes seat again and returns the lever to N (resets), the lamp turns off and travel of the vehicle can be restarted.

The travel lock lamp is also used as neutral lamp.



**Travel lock lamp**

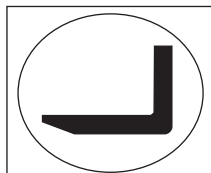
### 2. Load handling interlock function

When an operator gets out of the seat, the switch built in the seat works, causing the cargo operation of vehicle to be disabled.

A user can confirm the operation status by monitoring the cargo lock display lamp on the meter panel.

If improperly seated on the seat, the lamp blinks, showing that the cargo operation is disabled.

When properly seated and the lamp goes off, the cargo operation can be resumed.



**Load handling lock lamp**

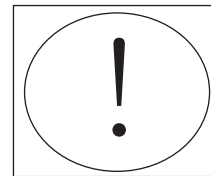
### 3. Parking brake warning

When an operator leaves operator's seat without applying the parking brake, the buzzer sounds to warn the operator to apply the parking brake.

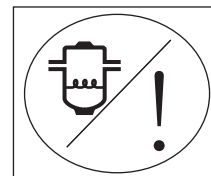
### 4. Failure detection

- 1) Seat switch failure detection
- 2) Relay output transistor failure detection
- 3) Forward/reverse lever failure detection
- 4) CPU failure detection

When any of these failures is detected, the alarm lamp on the meter panel blinks to warn users.



(Gasoline vehicle)

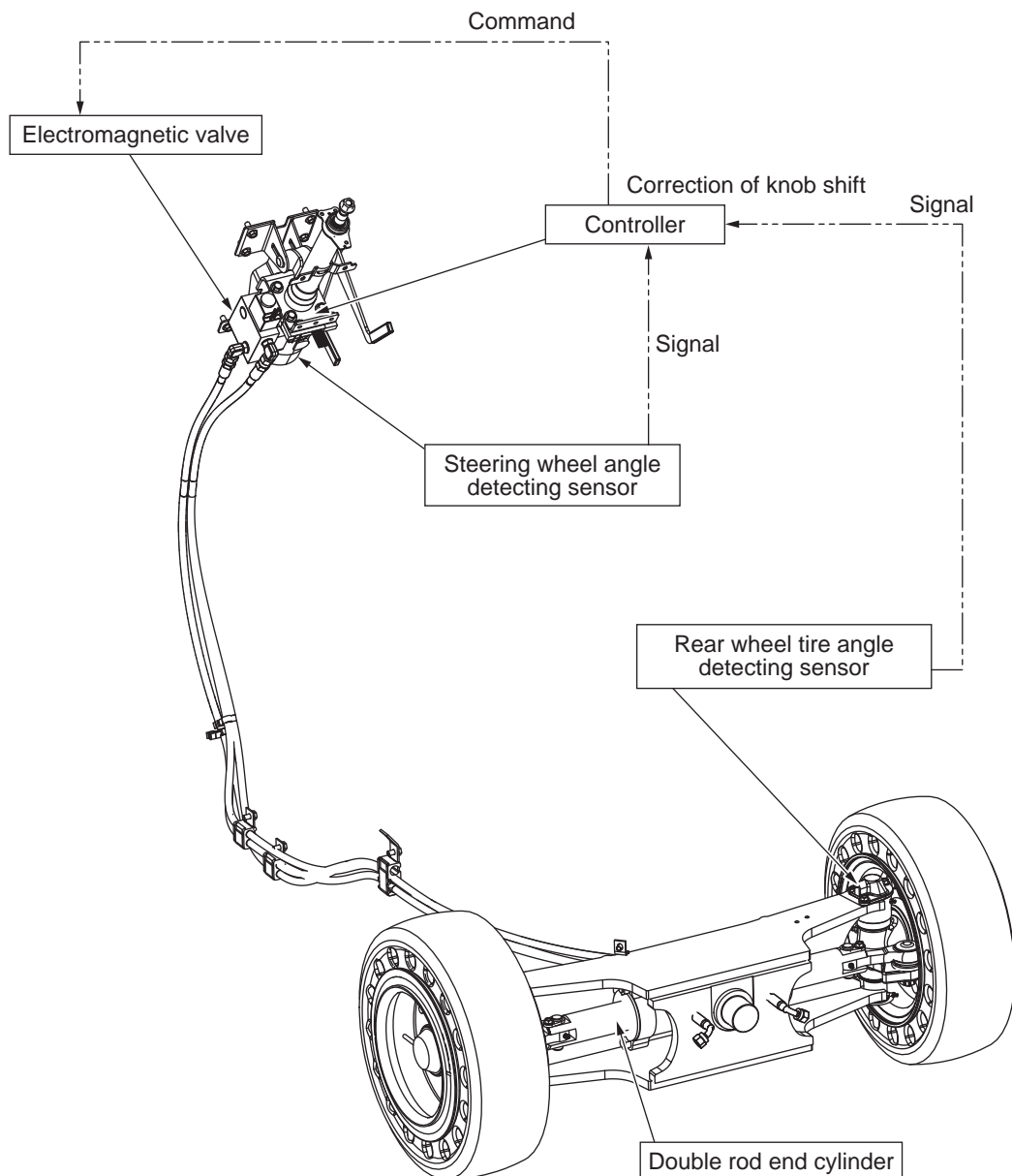


(Diesel vehicle: Together with sediment alarm lamp)

**Alarm lamp**

## HYDRAULIC STEERING SYSTEM

The hydraulic power steering system, that excels in the straightforward stability and ensures the light steering maneuverability, is equipped as standard equipment. This steering system has no kick-back and will relieve an operator from fatigue in a continued driving of long hours. And besides, the knob correction equipment built in the steering valve keeps always the knob position constant. Therefore, it can allow an operator to perform the work smoothly in a narrow area such as warehouse or freighter where frequent operations of steering are required.



## FUSE LOAD LIST (FORKLIFT TRUCK WITH SEAT BELT INTERLOCK)

### ELECTRICALLY CONTROLLED (GASOLINE)



**WARNING**

- When replacing the fuse, turn off the power first. (Turn the start switch to OFF position.)
- Be sure to replace the fuse with an identical capacity one.

#### SLOW BLOW FUSE BOX

Fuse capacity and related electrical parts

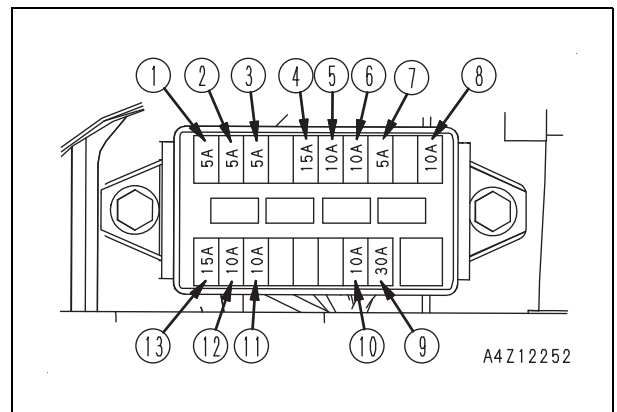
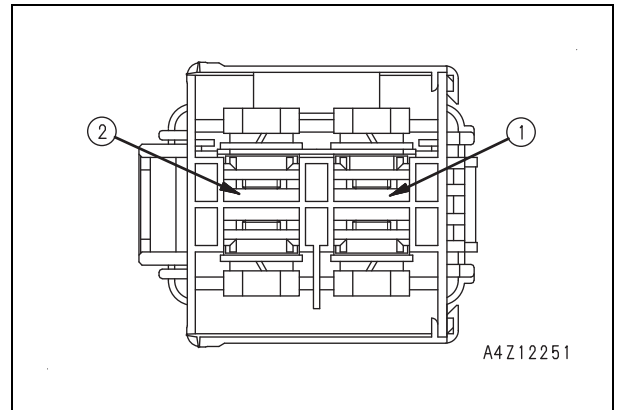
No.	Capacity	Part related
①	120A	Alternator
②	60A	Starting motor

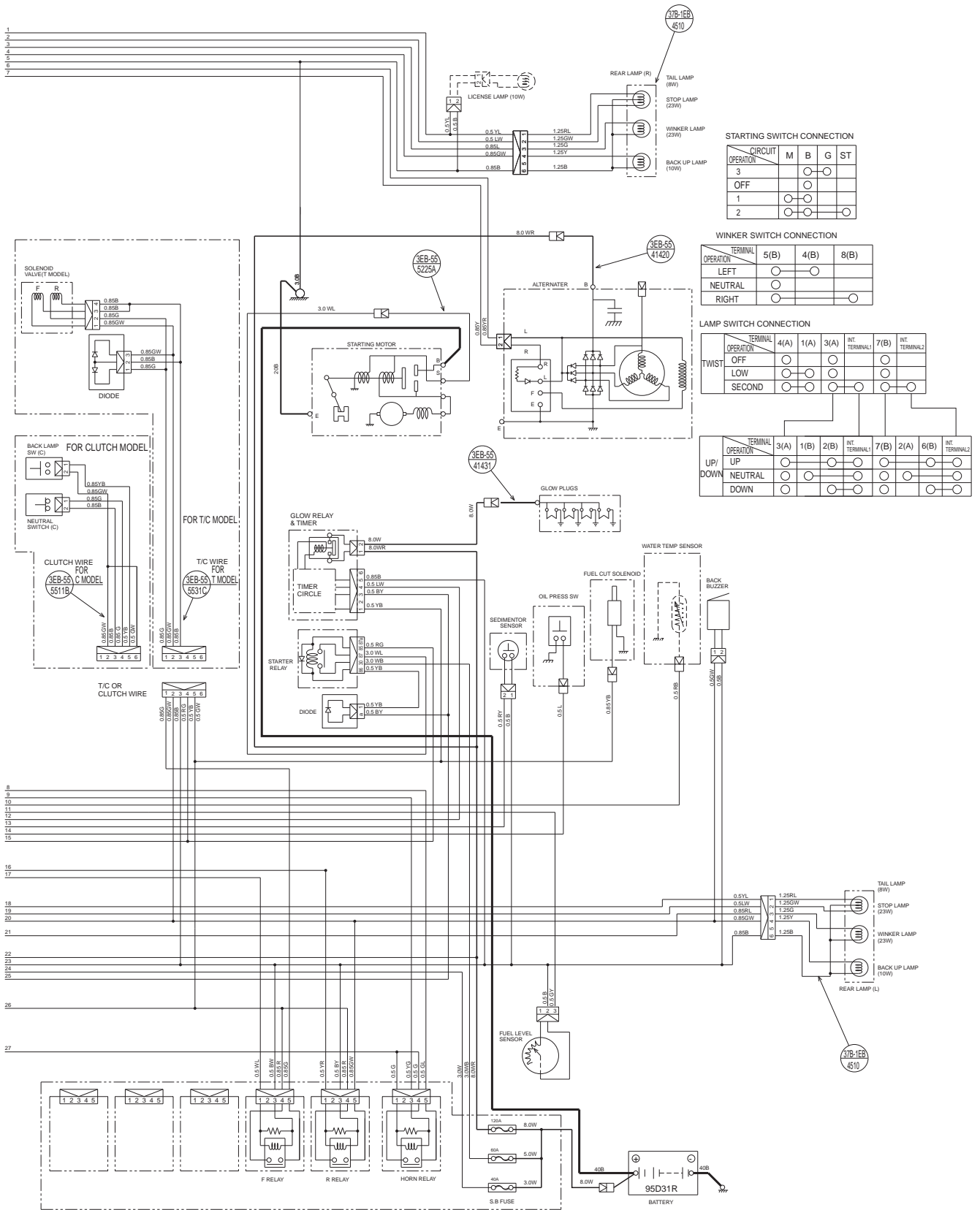
#### FUSE BOX

Fuse capacity and related electrical parts

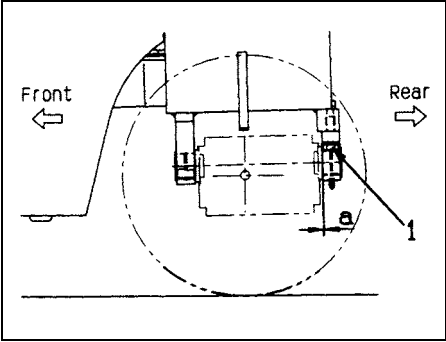
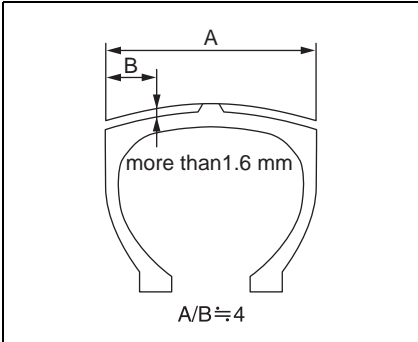
No.	Capacity	Color	Part related
①	5A	Yellowish-brown	Seat belt
②	5A	Yellowish-brown	Seat switch 2
③	5A	Yellowish-brown	Seat switch 1
④	15A	Blue	Head lamp
⑤	10A	Red	Position lamp, Stop lamp
⑥	10A	Red	Horn
⑦	5A	Yellowish-brown	LPG
⑧	10A	Red	Starter relay
⑨	30A	Green	Battery
⑩	10A	Red	Seat belt lamp
⑪	10A	Red	Nob control
⑫	10A	Red	Meters
⑬	15A	Blue	Backup lamp

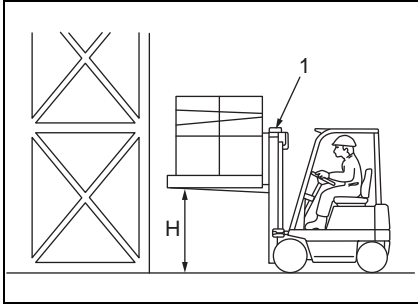
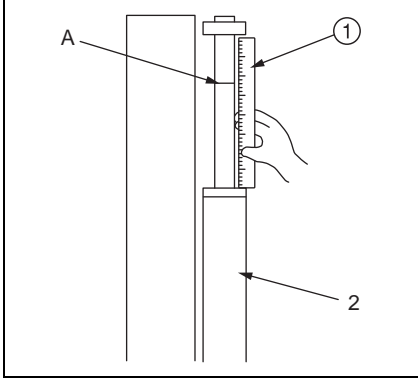
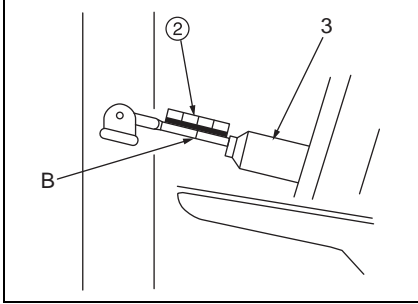
Fuses without mark (10A × 2, 15A × 1, 20A × 1) are spare.





Device	Check Item	Check Point																																																																																																		
Engine	<b>3. Idling Speed</b>	<ul style="list-style-type: none"> <li>• Warm up the engine and stay in idling to check the followings.</li> </ul> <p><b>Idling speed, Maximum speed</b></p> <table border="1" data-bbox="521 353 1476 1451"> <thead> <tr> <th data-bbox="521 353 730 421">Model</th> <th data-bbox="730 353 898 421">Engine</th> <th data-bbox="898 353 1107 421">Idling Revolution</th> <th data-bbox="1107 353 1355 421">Maximum Revolution</th> <th data-bbox="1355 353 1476 421">Ignition Timing</th> </tr> </thead> <tbody> <tr> <td data-bbox="521 421 730 510" rowspan="2">FG10 – 18</td> <td data-bbox="730 421 898 465">K15</td> <td data-bbox="898 421 1107 465">750 – 900 rpm</td> <td data-bbox="1107 421 1355 465">2,840 – 3,040 rpm</td> <td data-bbox="1355 421 1476 465">4/BTDC</td> </tr> <tr> <td data-bbox="730 465 898 510">GK15</td> <td data-bbox="898 465 1107 510">750 – 900 rpm</td> <td data-bbox="1107 465 1355 510">2,840 – 3,040 rpm</td> <td data-bbox="1355 465 1476 510">4/BTDC</td> </tr> <tr> <td data-bbox="521 510 730 600" rowspan="2">FG15H – 18H</td> <td data-bbox="730 510 898 555">K21</td> <td data-bbox="898 510 1107 555">750 – 900 rpm</td> <td data-bbox="1107 510 1355 555">2,840 – 3,040 rpm</td> <td data-bbox="1355 510 1476 555">2/BTDC</td> </tr> <tr> <td data-bbox="730 555 898 600">GK21</td> <td data-bbox="898 555 1107 600">750 – 900 rpm</td> <td data-bbox="1107 555 1355 600">2,840 – 3,040 rpm</td> <td data-bbox="1355 555 1476 600">2/BTDC</td> </tr> <tr> <td data-bbox="521 600 730 689" rowspan="2">FG20/25</td> <td data-bbox="730 600 898 645">K21</td> <td data-bbox="898 600 1107 645">750 – 900 rpm</td> <td data-bbox="1107 600 1355 645">2,840 – 3,040 rpm</td> <td data-bbox="1355 600 1476 645">2/BTDC</td> </tr> <tr> <td data-bbox="730 645 898 689">GK21</td> <td data-bbox="898 645 1107 689">750 – 900 rpm</td> <td data-bbox="1107 645 1355 689">2,840 – 3,040 rpm</td> <td data-bbox="1355 645 1476 689">2/BTDC</td> </tr> <tr> <td data-bbox="521 689 730 813" rowspan="2">FG20 – 30</td> <td data-bbox="730 689 898 745">Electronic Control K21</td> <td data-bbox="898 689 1107 745">700 – 800 rpm</td> <td data-bbox="1107 689 1355 745">2,650 – 2,750 rpm</td> <td data-bbox="1355 689 1476 745">0/BTDC</td> </tr> <tr> <td data-bbox="730 745 898 801">Electronic Control GK21</td> <td data-bbox="898 745 1107 801">700 – 800 rpm</td> <td data-bbox="1107 745 1355 801">2,650 – 2,750 rpm</td> <td data-bbox="1355 745 1476 801">0/BTDC</td> </tr> <tr> <td data-bbox="521 813 730 891" rowspan="2">FG20N/25N</td> <td data-bbox="730 813 898 857">K21</td> <td data-bbox="898 813 1107 857">750 – 900 rpm</td> <td data-bbox="1107 813 1355 857">2,840 – 3,040 rpm</td> <td data-bbox="1355 813 1476 857">2/BTDC</td> </tr> <tr> <td data-bbox="730 857 898 902">GK21</td> <td data-bbox="898 857 1107 902">750 – 900 rpm</td> <td data-bbox="1107 857 1355 902">2,840 – 3,040 rpm</td> <td data-bbox="1355 857 1476 902">2/BTDC</td> </tr> <tr> <td data-bbox="521 902 730 1025" rowspan="2">FG20N/25N/30N</td> <td data-bbox="730 902 898 958">Electronic Control K21</td> <td data-bbox="898 902 1107 958">700 – 800 rpm</td> <td data-bbox="1107 902 1355 958">2,650 – 2,750 rpm</td> <td data-bbox="1355 902 1476 958">0/BTDC</td> </tr> <tr> <td data-bbox="730 958 898 1014">Electronic Control GK21</td> <td data-bbox="898 958 1107 1014">700 – 800 rpm</td> <td data-bbox="1107 958 1355 1014">2,650 – 2,750 rpm</td> <td data-bbox="1355 958 1476 1014">0/BTDC</td> </tr> <tr> <td data-bbox="521 1025 730 1238" rowspan="4">FG20H/25H</td> <td data-bbox="730 1025 898 1070">K25</td> <td data-bbox="898 1025 1107 1070">750 – 900 rpm</td> <td data-bbox="1107 1025 1355 1070">2,720 – 2,920 rpm</td> <td data-bbox="1355 1025 1476 1070">0/BTDC</td> </tr> <tr> <td data-bbox="730 1070 898 1126">Electronic Control K25</td> <td data-bbox="898 1070 1107 1126">700 – 800 rpm</td> <td data-bbox="1107 1070 1355 1126">2,650 – 2,750 rpm</td> <td data-bbox="1355 1070 1476 1126">0/BTDC</td> </tr> <tr> <td data-bbox="730 1126 898 1182">GK25</td> <td data-bbox="898 1126 1107 1182">750 – 900 rpm</td> <td data-bbox="1107 1126 1355 1182">2,720 – 2,920 rpm</td> <td data-bbox="1355 1126 1476 1182">0/BTDC</td> </tr> <tr> <td data-bbox="730 1182 898 1238">Electronic Control GK25</td> <td data-bbox="898 1182 1107 1238">700 – 800 rpm</td> <td data-bbox="1107 1182 1355 1238">2,650 – 2,750 rpm</td> <td data-bbox="1355 1182 1476 1238">0/BTDC</td> </tr> <tr> <td data-bbox="521 1238 730 1328" rowspan="2">FG30/30N/35A</td> <td data-bbox="730 1238 898 1283">K25</td> <td data-bbox="898 1238 1107 1283">750 – 900 rpm</td> <td data-bbox="1107 1238 1355 1283">2,860 – 3,060 rpm</td> <td data-bbox="1355 1238 1476 1283">0/BTDC</td> </tr> <tr> <td data-bbox="730 1283 898 1328">GK25</td> <td data-bbox="898 1283 1107 1328">750 – 900 rpm</td> <td data-bbox="1107 1283 1355 1328">2,860 – 3,060 rpm</td> <td data-bbox="1355 1283 1476 1328">0/BTDC</td> </tr> <tr> <td data-bbox="521 1328 730 1451" rowspan="2">FG30/35A</td> <td data-bbox="730 1328 898 1384">Electronic Control K25</td> <td data-bbox="898 1328 1107 1384">700 – 800 rpm</td> <td data-bbox="1107 1328 1355 1384">2,650 – 2,750 rpm</td> <td data-bbox="1355 1328 1476 1384">0/BTDC</td> </tr> <tr> <td data-bbox="730 1384 898 1440">Electronic Control GK25</td> <td data-bbox="898 1384 1107 1440">700 – 800 rpm</td> <td data-bbox="1107 1384 1355 1440">2,650 – 2,750 rpm</td> <td data-bbox="1355 1384 1476 1440">0/BTDC</td> </tr> </tbody> </table>					Model	Engine	Idling Revolution	Maximum Revolution	Ignition Timing	FG10 – 18	K15	750 – 900 rpm	2,840 – 3,040 rpm	4/BTDC	GK15	750 – 900 rpm	2,840 – 3,040 rpm	4/BTDC	FG15H – 18H	K21	750 – 900 rpm	2,840 – 3,040 rpm	2/BTDC	GK21	750 – 900 rpm	2,840 – 3,040 rpm	2/BTDC	FG20/25	K21	750 – 900 rpm	2,840 – 3,040 rpm	2/BTDC	GK21	750 – 900 rpm	2,840 – 3,040 rpm	2/BTDC	FG20 – 30	Electronic Control K21	700 – 800 rpm	2,650 – 2,750 rpm	0/BTDC	Electronic Control GK21	700 – 800 rpm	2,650 – 2,750 rpm	0/BTDC	FG20N/25N	K21	750 – 900 rpm	2,840 – 3,040 rpm	2/BTDC	GK21	750 – 900 rpm	2,840 – 3,040 rpm	2/BTDC	FG20N/25N/30N	Electronic Control K21	700 – 800 rpm	2,650 – 2,750 rpm	0/BTDC	Electronic Control GK21	700 – 800 rpm	2,650 – 2,750 rpm	0/BTDC	FG20H/25H	K25	750 – 900 rpm	2,720 – 2,920 rpm	0/BTDC	Electronic Control K25	700 – 800 rpm	2,650 – 2,750 rpm	0/BTDC	GK25	750 – 900 rpm	2,720 – 2,920 rpm	0/BTDC	Electronic Control GK25	700 – 800 rpm	2,650 – 2,750 rpm	0/BTDC	FG30/30N/35A	K25	750 – 900 rpm	2,860 – 3,060 rpm	0/BTDC	GK25	750 – 900 rpm	2,860 – 3,060 rpm	0/BTDC	FG30/35A	Electronic Control K25	700 – 800 rpm	2,650 – 2,750 rpm	0/BTDC	Electronic Control GK25	700 – 800 rpm	2,650 – 2,750 rpm	0/BTDC
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<b>4. Air Cleaner</b>	<ul style="list-style-type: none"> <li>• Check the air cleaner and element for the following</li> </ul> <ol style="list-style-type: none"> <li>1. <b>Check air cleaner for cracks or scratches</b></li> <li>2. <b>Check air cleaner for looseness of air cleaner mounting</b></li> <li>3. <b>Check element for dirt or scratches</b></li> </ol> <p>★ See the INSPECTION AND ADJUSTMENT for cleaning and replacement of element.</p>																																																																																																			
<b>5. Cylinder Head</b>	<p><b>Check cylinder head for looseness of mounting bolt</b></p> <p>★ See the INSPECTION AND ADJUSTMENT for tightening torque for cylinder head mounting bolt.</p>																																																																																																			

Device	Check Item	Check Point														
Traveling System	<b>27. Front Axle</b>	<ol style="list-style-type: none"> <li><b>Deformation, cracks or scratches</b> Visual check on and around the main frame and mounting bolt or welded area</li> <li><b>Looseness of mounting bolt</b> Tightening torque for mounting bolt                             <table border="1" data-bbox="576 443 1299 566"> <tr> <td data-bbox="576 443 687 481">1.0 - 1.75 ton forklift trucks</td> <td data-bbox="687 443 971 481">343 - 427 Nm (35.0 - 43.5 kgm)</td> </tr> <tr> <td data-bbox="576 481 687 519">2.0 - 3.0 ton forklift trucks</td> <td data-bbox="687 481 971 519">490 - 608 Nm (50.0 - 62.0 kgm)</td> </tr> <tr> <td data-bbox="576 519 687 566">3.5 ton forklift trucks</td> <td data-bbox="687 519 971 566">662 - 829 Nm (67.5 - 84.5 kgm)</td> </tr> </table> </li> </ol>	1.0 - 1.75 ton forklift trucks	343 - 427 Nm (35.0 - 43.5 kgm)	2.0 - 3.0 ton forklift trucks	490 - 608 Nm (50.0 - 62.0 kgm)	3.5 ton forklift trucks	662 - 829 Nm (67.5 - 84.5 kgm)								
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<b>28. Rear Axle</b>	<ol style="list-style-type: none"> <li><b>Deformation, cracks or scratches</b> Check visually</li> <li><b>Play of center pin</b></li> <li><b>Clearance of thrust</b> <table border="1" data-bbox="576 837 959 904"> <tr> <td data-bbox="576 837 767 904">Clearance (a)</td> <td data-bbox="767 837 959 904">less than 0.5 mm</td> </tr> </table> <p data-bbox="576 913 1011 1010">Adjustment: In case of 2.0 mm and over, adjust with shims to less than 0.5 mm.</p> <p data-bbox="576 1019 987 1048">Tightening torque for mounting bolt (1)</p> <table border="1" data-bbox="576 1066 994 1133"> <tr> <td data-bbox="576 1066 687 1133">490 – 608 Nm (50 – 62.9 kgm)</td> </tr> </table> </li> <li><b>Looseness of cap mounting bolt</b></li> </ol> 	Clearance (a)	less than 0.5 mm	490 – 608 Nm (50 – 62.9 kgm)												
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<b>29. Tires</b>	<ol style="list-style-type: none"> <li><b>Air pressure</b> <table border="1" data-bbox="523 1305 991 1547"> <tr> <td data-bbox="523 1305 660 1384" rowspan="2">1.0 - 1.75 ton forklift trucks</td> <td data-bbox="660 1305 735 1384">Front</td> <td data-bbox="735 1305 991 1384">690 kPa {7.0 kgf/cm<sup>2</sup>}</td> </tr> <tr> <td data-bbox="660 1384 735 1462">Rear</td> <td data-bbox="735 1384 991 1462">790 kPa {8.0 kgf/cm<sup>2</sup>}</td> </tr> <tr> <td data-bbox="523 1462 660 1541" rowspan="2">2.0 - 3.0 ton forklift trucks</td> <td data-bbox="660 1462 735 1541">Front</td> <td data-bbox="735 1462 991 1541">690 kPa {7.0 kgf/cm<sup>2</sup>}</td> </tr> <tr> <td data-bbox="660 1541 735 1619">Rear</td> <td data-bbox="735 1541 991 1619">690 kPa {7.0 kgf/cm<sup>2</sup>}</td> </tr> <tr> <td data-bbox="523 1619 660 1697" rowspan="2">3.5 ton forklift trucks</td> <td data-bbox="660 1619 735 1697">Front</td> <td data-bbox="735 1619 991 1697">850 kPa {8.5 kgf/cm<sup>2</sup>}</td> </tr> <tr> <td data-bbox="660 1697 735 1776">Rear</td> <td data-bbox="735 1697 991 1776">890 kPa {9.0 kgf/cm<sup>2</sup>}</td> </tr> </table> </li> <li><b>Cracks in tread or side wall</b> Replace with a new one if necessary</li> <li><b>Depth of tread</b> Measure the groove depth at point of a quarter of the tread width, and check that the depth is at least 1.6 mm .</li> <li><b>Abnormal wear</b> Eccentric wear or stepped wear</li> <li><b>Metal pieces stuck in tire</b></li> </ol> 	1.0 - 1.75 ton forklift trucks	Front	690 kPa {7.0 kgf/cm <sup>2</sup> }	Rear	790 kPa {8.0 kgf/cm <sup>2</sup> }	2.0 - 3.0 ton forklift trucks	Front	690 kPa {7.0 kgf/cm <sup>2</sup> }	Rear	690 kPa {7.0 kgf/cm <sup>2</sup> }	3.5 ton forklift trucks	Front	850 kPa {8.5 kgf/cm <sup>2</sup> }	Rear	890 kPa {9.0 kgf/cm <sup>2</sup> }
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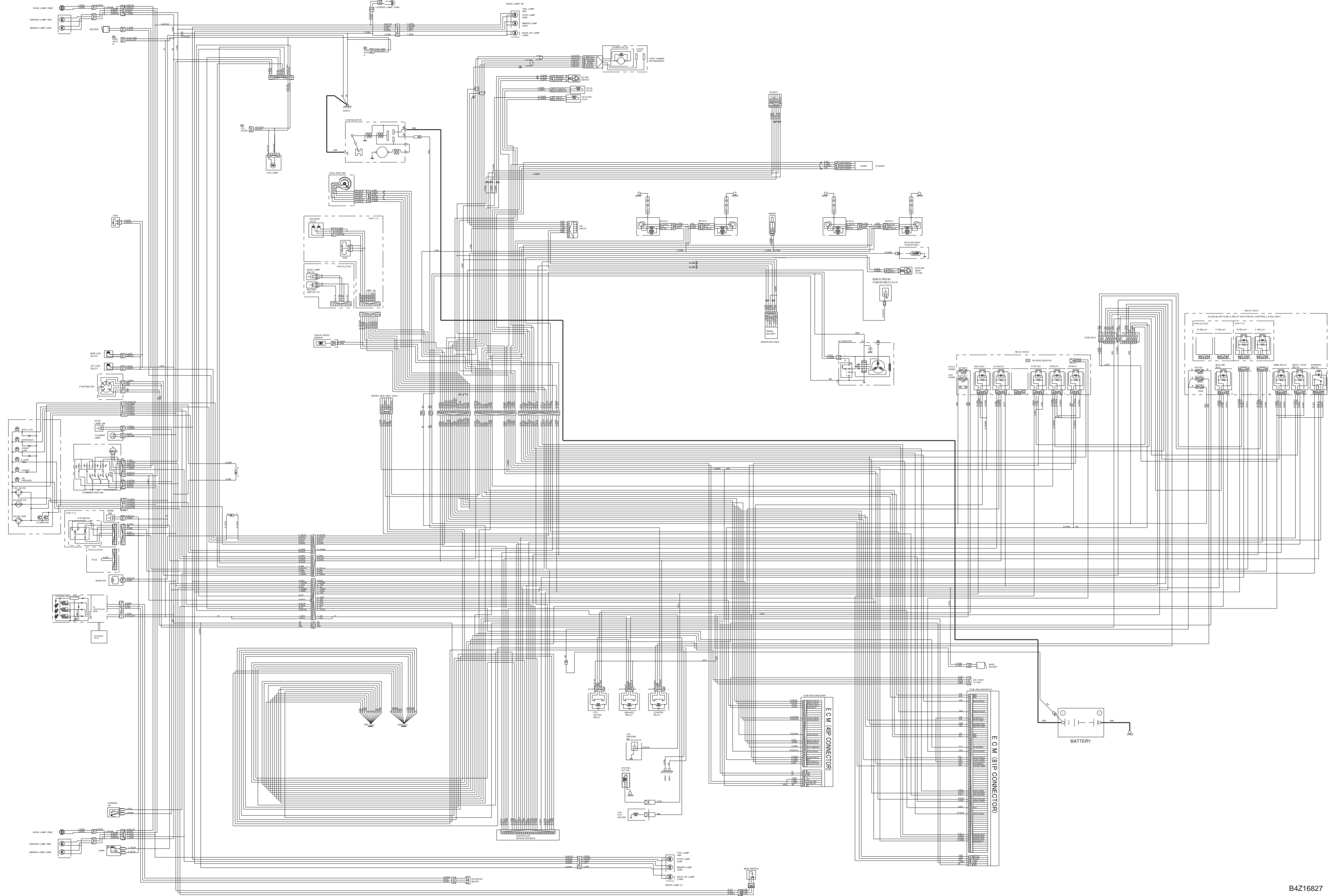
Device	Check Item	Check Point								
	<b>68. Tilt Cylinder</b>	<ol style="list-style-type: none"> <li>1. <b>Actuation, oil leakage</b></li> <li>2. <b>Dents, cracks, curvature or scratches</b></li> <li>3. <b>Looseness of mounting bolt</b></li> </ol>								
	<b>69. Reach Cylinder</b>	Not applicable for this model								
	<b>70. Work Equipment Cylinder</b>	<ol style="list-style-type: none"> <li>1. <b>Actuation, oil leakage</b></li> <li>2. <b>Dents, cracks, curvature or scratches</b></li> <li>3. <b>Looseness of mounting bolt</b></li> </ol>								
Hydraulic System	<b>71. Hydraulic drift of lift cylinder and tilt cylinder</b>	<ol style="list-style-type: none"> <li>1) <b>Load the forks with maximum payload and set the mast (1) upright, lift the forks approx. 1,500 mm from the ground.</b></li> <li>2) <b>Match the straight measure (1) on the piston rod of the lift cylinder (2) and put the mark (A) for measurement,</b></li> <li>3) <b>Match the straight measure (2) on the piston rod of the tilt cylinder (3) and put the mark (B) for measurement,</b></li> </ol> <table border="1" data-bbox="576 1137 1010 1339" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td data-bbox="576 1137 719 1205" rowspan="2">Hydraulic drift of lift cylinder</td> <td data-bbox="719 1137 863 1205">When measured at fork</td> <td data-bbox="863 1137 1010 1205">100 mm/ within 15 min</td> </tr> <tr> <td data-bbox="719 1205 863 1272">When measured at cylinder</td> <td data-bbox="863 1205 1010 1272">50 mm/ within 15 min</td> </tr> <tr> <td data-bbox="576 1272 719 1339">Hydraulic drift of tilt cylinder</td> <td colspan="2" data-bbox="719 1272 1010 1339">30 mm/15 min</td> </tr> </tbody> </table> <p data-bbox="523 1375 983 1442"><b>Adjustment:</b> Replace control valve and cylinder packing</p> <div style="display: flex; justify-content: space-around;">    </div>	Hydraulic drift of lift cylinder	When measured at fork	100 mm/ within 15 min	When measured at cylinder	50 mm/ within 15 min	Hydraulic drift of tilt cylinder	30 mm/15 min	
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**Kg/cm<sup>2</sup> to lb/in<sup>2</sup>**

**1Kg/cm<sup>2</sup> = 14.2233 lb/in<sup>2</sup>**

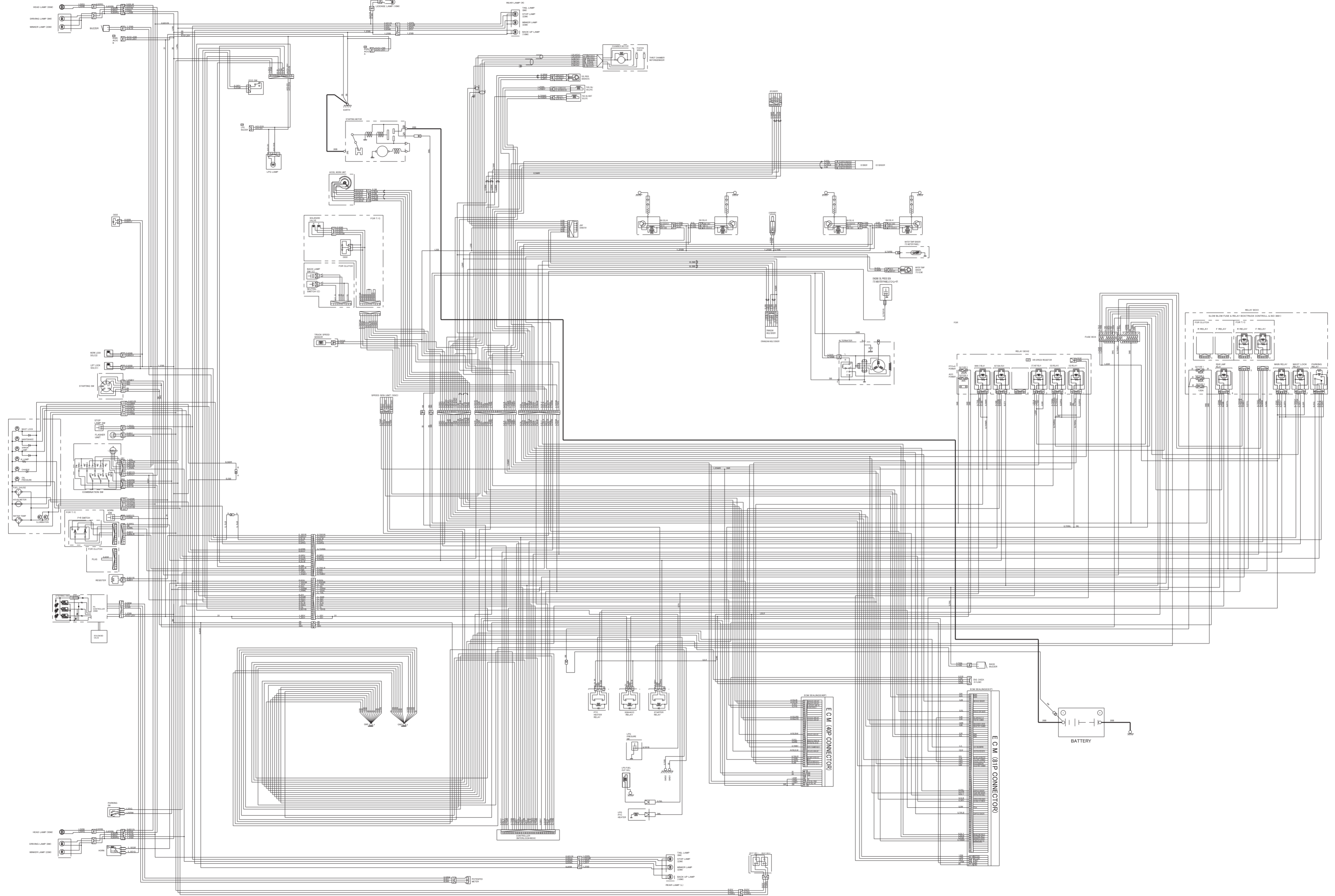
	0	1	2	3	4	5	6	7	8	9
		14.2	28.4	42.7	56.9	71.1	85.3	99.6	113.8	128.0
10	142.2	156.5	170.7	184.9	199.1	213.4	227.6	241.8	256.0	270.2
20	284.5	298.7	312.9	327.1	341.4	355.6	369.8	384.0	398.3	412.5
30	426.7	440.9	455.1	469.4	483.6	497.8	512.0	526.3	540.5	554.7
40	568.9	583.2	597.4	611.6	625.8	640.1	654.3	668.5	682.7	696.9
50	711.2	725.4	739.6	753.8	768.1	782.3	796.5	810.7	825.0	839.2
60	853.4	867.6	881.8	896.1	910.3	924.5	938.7	953.0	967.2	981.4
70	995.6	1010	1024	1038	1053	1067	1081	1095	1109	1124
80	1138	1152	1166	1181	1195	1209	1223	1237	1252	1266
90	1280	1294	1309	1323	1337	1351	1365	1380	1394	1408
100	1422	1437	1451	1465	1479	1493	1508	1522	1536	1550
110	1565	1579	1593	1607	1621	1636	1650	1644	1678	1693
120	1707	1721	1735	1749	1764	1778	1792	1806	1821	1835
130	1849	2863	1877	1892	1906	1920	1934	1946	1963	1977
140	1991	2005	2020	2034	2048	2062	2077	2091	2105	2119
150	2134	2148	2162	2176	2190	2205	2219	223	2247	2262
160	2276	2290	2304	2318	2333	2347	2361	2375	2389	2404
170	2418	2432	2446	2360	2475	2489	2503	2518	2532	2546
180	2560	2574	2589	2603	2617	2631	2646	2660	2674	2688
190	2702	2717	2731	2745	2759	2773	2788	2802	2816	2830
200	2845	2859	2873	2887	2901	2916	2930	2944	2958	2973
210	2987	3001	3015	3030	3044	3058	3072	3086	3101	3115
220	3129	3143	3158	3172	3186	3200	3124	3229	3243	3257
230	3271	3286	3300	3314	3328	3343	3357	3371	3385	3399
240	3414	3428	3442	3456	3470	3485	3499	3513	3527	3542

Electronic Control Engine: 1 ton LP FG10 – 18H-21/FD10 – 18-21: Serial No. 200017 and up with type B operator's seat



B4Z16827

Electronic Control Engine: 2 ton LP (3EB-55-60020) FG20 - 35A-17: Serial No. 700001 - 754191  
FD20 - 35A-16: Serial No. 300001 - Before seat switch is changed



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