



Maintenance

**GP080UX, GP090UX,
GP100UX [A7S6];
GP110UX, GP135UX,
GP155UX [A7T0]**

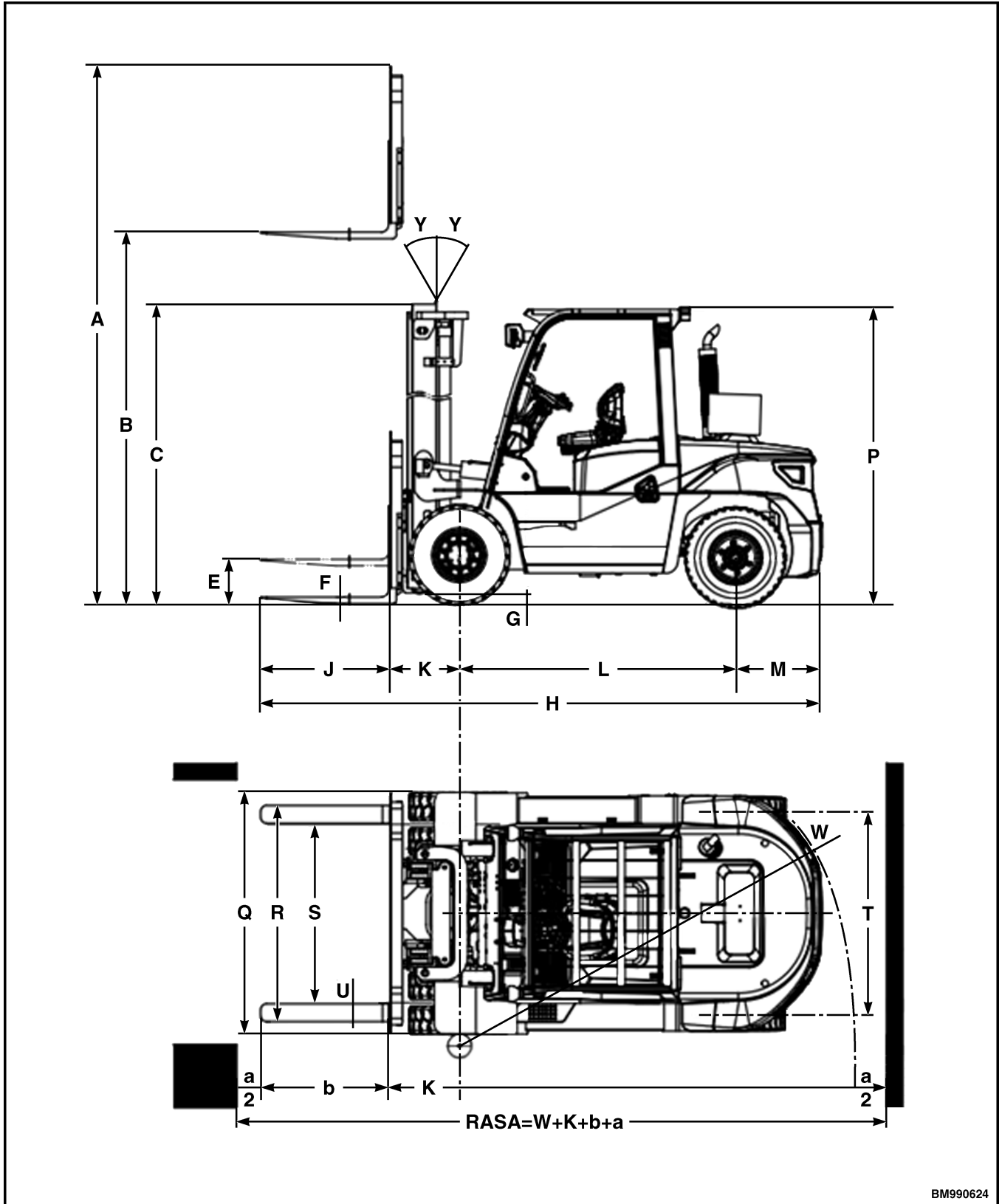
CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- 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



BM990624

Figure 2. Forklift Truck Exterior GP50UX6 (GP110UX), GP60UX6 (GP135UX), and GP70UX6 (GP155UX)

Table 9. Main Technical Parameters (Continued)

		GP50UX6 (GP110UX)	GP60UX6 (GP135UX)	GP70UX6 (GP155UX)
Max Traction Force	No-Load	36000 N (8093 lbf ft)	36000 N (8093 lbf ft)	36000 N (8093 lbf ft)
	Full-Load	61000 N (13713 lbf ft)	61000 N (13713 lbf ft)	61000 N (13713 lbf ft)
Gradeability	No-Load	20%	20%	20%
	Full-Load	30%	26%	23%
Minimum Turning Radius W		3250 mm (128 in.)	3300 mm (129.9 in.)	3360 mm (132.3 in.)
Minimum Turning Radius Width		5260 mm (207.1 in.)	5310 mm (209.1 in.)	5370 mm (211.4 in.)
Total Length H (Without Fork)		3430 mm (135 in.)	3500 mm (137.8 in.)	3545 mm (139.6 in.)
Total Width Q		2020 mm (79.5 in.)	2020 mm (79.5 in.)	2020 mm (79.5 in.)
Total Height C (Mast Retracted)		2500 mm (98.4 in.)	2500 mm (98.4 in.)	2625 mm (103.3 in.)
Total Height A (Mast Extended)		4370 mm (172 in.)	4370 mm (172 in.)	4370 mm (172 in.)
Wheelbase L		2300 mm (90.6 in.)	2300 mm (90.6 in.)	2300 mm (90.6 in.)
Track Width	Front S	1489 mm (58.6 in.)	1489 mm (58.6 in.)	1489 mm (58.6 in.)
	Rear T	1700 mm (66.9 in.)	1700 mm (66.9 in.)	1700 mm (66.9 in.)
Front Overhang K		590 mm (23.2 in.)	590 mm (23.2 in.)	590 mm (23.2 in.)
Rear Overhang M		605 mm (23.8 in.)	675 mm (26.6 in.)	720 mm (28.3 in.)
Fork Dimension	Length J	1220 mm (48.0 in.)	1220 mm (48.0 in.)	1220 mm (48.0 in.)
	Width U	150 mm (5.9 in.)	150 mm (5.9 in.)	150 mm (5.9 in.)
	Depth F	65 mm (2.6 in.)	65 mm (2.6 in.)	65 mm (2.6 in.)
Fork Spacing R Adjustable Range		300-1805 mm (11.8-71.1 in.)	300-1805 mm (11.8-71.1 in.)	300-1805 mm (11.8-71.1 in.)
Ground Clearance G (Bottom of Mast)		200 mm (7.9 in.)	200 mm (7.9 in.)	200 mm (7.9 in.)
Total Weight		8360 kg (18430.6 lb)	9010 kg (19863.6 lb)	9650 kg (21274.6 lb)

Table 10. Main Technical Parameters

	GP50UX6 (GP110UX)	GP60UX6 (GP135UX)	GP70UX6 (GP155UX)
Engine Model	V3800-TIE4B-HYM-1		
Manufacturer	KUBOTA		
Power Source	Diesel		
Rated Capacity	5000 kg (11023.1 lb)	6000 kg (13227.7 lb)	7000 kg (15432.3 lb)
Load Center	600 mm (23.6 in.)	600 mm (23.6 in.)	600 mm (23.6 in.)
Lifting Height	3000 mm (118.1 in.)	3000 mm (118.1 in.)	3000 mm (118.1 in.)
Free Lift Height E	205 mm (8.1 in.)	205 mm (8.1 in.)	205 mm (8.1 in.)
Mast Tilt Angle Y Forward/Back	10/12°	10/12°	10/12°

Table 17. GP40UX (GP080UX), GP45UX (GP090UX), and GP50UX (GP100UX) Diesel Engine (Continued)

Model		KUBOTA V3800-CR-TE5CB-HYM-2, KUBOTA V3800-CR-TE4CB-HYM-1, and KUBOTA V3800-TIE4B-HYM-1
Cylinder: Number of Cylinders - Cylinder Diameter x Stroke		100 x 120 mm (3.9 x 4.72 in.)
Total Displacement l		3.769 liter (230 in. ³)
Compression Ratio		17.5:1
Rated Power/Speed kw(ps)/rpm		55.4@2200 (kw@rpm) 74.3@2200 (hp@rpm)
Maximum Torque/Speed N.m (kg.m)/rpm		310@1500 (N.m@rpm) 273@1500 (lbf-ft@rpm)
No-Load Minimum Speed		800 rpm
Whole Length x Whole Width x Whole Height		771 x 581 x 852 mm (30.1 x 22.9 x 33.5 in.)
Movement Direction		Counter-Clockwise (Viewed from Flywheel Side)
Firing Order		1-3-4-2
Valve Timing	Inlet Valve Open before Top Dead Center (BTDC)	14°
	Inlet Valve Close after Top Dead Center (ABDC)	36°
	Exhaust Valve Open before Bottom Dead Center (BBDC)	45°
	Exhaust Valve Close after Top Dead Center (ATDC)	17°
Cooling System		Pressurized, Forced circulation with water pump
Lubricating System		Forced Lubrication by Trochoid Pump
Fuel Pump		DENSO common rail system
Air Filter		Paper Element Filter
Engine Oil Pump		Gear Type
Oil Rough Filter		Paper Filtration
Water Pump		Trochoid Pump
Thermostat		Wax Type
Alternator	Voltage	12V
	Current	100A
Starter	Voltage	12V
	Output Power	3kw (4.02hp)
Battery	Voltage	12V
	Capacity	120Ah
Engine Oil		12.2 liter (12.9 qt)with filter

Table 23. Fault Codes for KUBOTA ENGINES (Continued)

DTC	J1939-73		SPN Name SAE J1939	Detection Item
	SPN	FMI		
ECU CPU (Main IC) error	1077	2	Engine Fuel Injection Pump Controller	Failure of CPU and/or IC
ECU CPU (Monitoring IC) error	523527	2	Proprietary	Failure of monitoring IC of CPU
Injector charge voltage: Low	523525	1	Proprietary	Injector charge voltage: Low Failure of charge circuit of ECU
Open circuit of SCV (MPROP)	1347	5	Engine Fuel Pump Pressurizing Assembly #1	Open circuit of SCV (MPROP)
SCV (MPROP) drive system error	1347	4	Engine Fuel Pump Pressurizing Assembly #1	Ground short circuit of SCV (MPROP)
+B short circuit of SCV (MPROP)	1347	3	Engine Fuel Pump Pressurizing Assembly #1	+B short circuit of SCV (MPROP)
Injector drive IC error or Open circuit	1077	12	Engine Fuel Injection Pump Controller	Injector drive IC error or Open circuit of No. 1&4 cylinder injector or Open circuit of No. 2&3 cylinder injector
Internal injector drive circuit short	523605	6	Proprietary	Short circuit in Injector driver IC
Sensor supply voltage 1: Low	3509	4	Sensor supply voltage 1	Sensor supply voltage 1 error or recognition error
Sensor supply voltage 1: High	3509	3	Sensor supply voltage 1	Sensor supply voltage 1 error or recognition error
Sensor supply voltage 2: Low	3510	4	Sensor supply voltage 2	Sensor supply voltage 2 error or recognition error
Sensor supply voltage 2: High	3510	3	Sensor supply voltage 2	Sensor supply voltage 2 error or recognition error
Sensor supply voltage 3: Low	3511	4	Sensor supply voltage 3	Sensor supply voltage 3 error or recognition error
Sensor supply voltage 3: High	3511	3	Sensor supply voltage 3	Sensor supply voltage 3 error or recognition error
Main relay is locked in closed position	1485	2	ECM Main Relay	Failure of main relay
Ground short of Starter relay driving circuit	677	4	Engine Starter Motor Relay	Ground short of Starter relay driving circuit

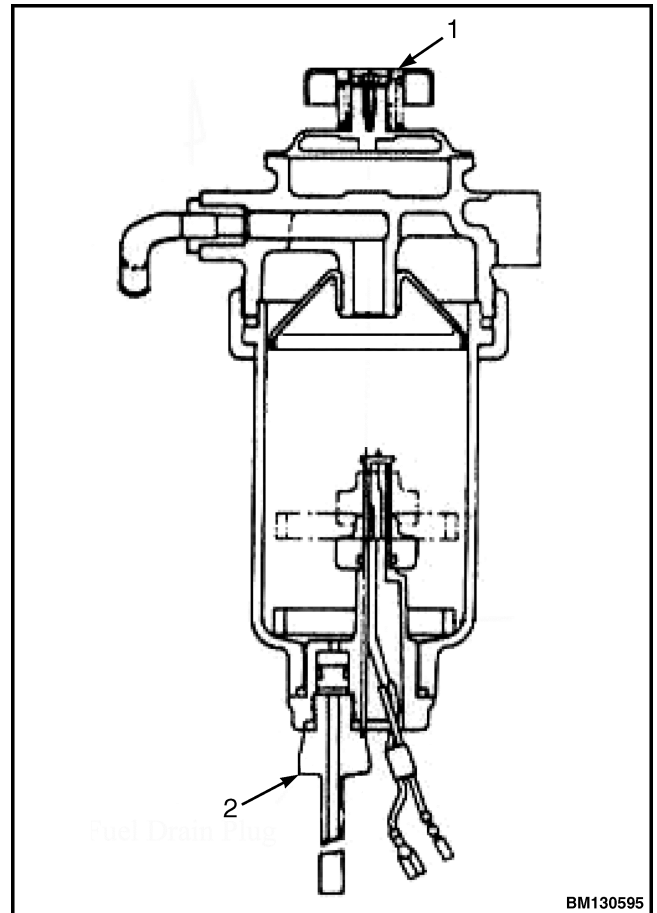
Fuel-Water Separator (Sediment Bowl)

As fuel enters the VE type fuel injection pump, water content in fuel must be separated. If the indicator light on the fuel-water separator turns on, water is being drained into the sediment bowl.

1. Loosen the drain plug and allow water to drain.
2. Re-install the drain plug and tighten lightly. Start the pump for several times.
 - Confirm no fuel leak.
 - Confirm engine is restarted.
 - Confirm warning light remains off.
3. Loosen and remove the air exhaust plug (overflow valve) oil injection pump.
4. Press the main pump until no air emits.
5. Check for fuel leaks.

Clean Fuel Tank

The fuel tank is to be cleaned every 1200 hours.



1. MANUAL FUEL PUMP
2. FUEL DRAIN PLUG

Figure 10. Fuel Drain Pump

Maintenance of the Air Filter

1. Remove the filter.
2. Check for dust and damage to the filter element and clean with low pressure air. Replace when it is seriously blocked and cannot be cleaned or if it is damaged.
3. Clean the dust inside the cover (Figure 11).

Precautions in case of forklift failure

The following Precautions must be followed when the forklift truck come to malfunction and need some other equipment to drag it:

Remove the output transfer shaft between Gearbox and Speed Differential. This is applied to 5-7T trucks only.

This is because the lubrication can not work functionally if the oil pump does not work, this will damage the transmission gear and clutch.

Trouble Shooting

Table 24. Underpower

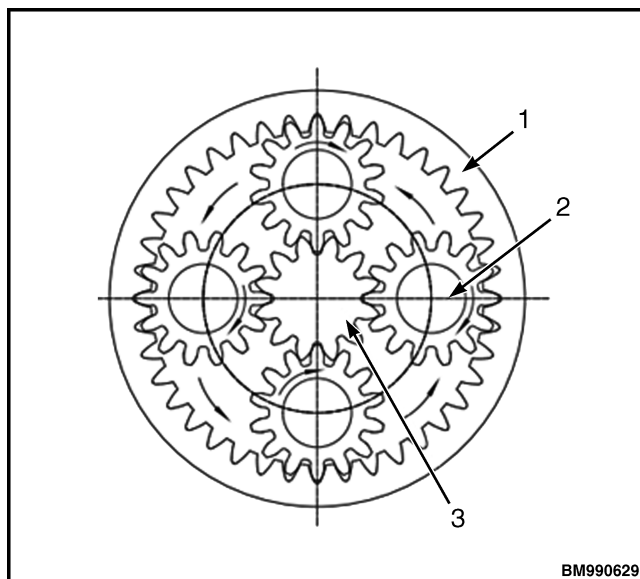
Part	Cause		Inspection Method	Solution
Torque Converter	Oil pressure is too low.	Oil level is too low.	Check the oil level.	Add oil if necessary.
		Air enters in the suction side.	Check the connector and oil hose.	Tighten the connector and replace the seals.
		Oil filter clogs.	Dismantle and inspect.	Clean or replace.
		The displacement of the oil pump is insufficient.	Dismantle and inspect.	Replace.
		The spring in the main relief valve disc becomes distorted.	Check the tension of spring.	Clean or replace.
		Seal or "O" ring get damaged or wears.	Dismantle and inspect.	Replace.
	Flywheel get damaged or collides with other parts.		Draw out a small amount of oil sample to check for the foreign material.	Replace.
Transmission Case	Improper use of Oil or oil is foaming.	Air enters in the suction side.	Check the connector and oil hose.	Tighten the connector and replace the seals.
		Oil pressure is low in Torque Converter or oil is foaming.	Measure the oil pressure.	Adjust the pressure if necessary.
	Clutch slips.	Oil level is too low.	Measure the oil pressure.	Adjust the pressure if necessary.
		Seal or "O" ring get damaged or wears.	Dismantle and inspect.	Replace.
		Piston ring wears.	Dismantle and inspect.	Clean or replace.
		Fraction plates wear or steel plates become distorted.	Dismantle and inspect the engine. Put the shifting lever to Forward, Backward and Neutral Position, and forklift truck does not work when the lever is put in Neutral position.	Replace.

Hub Reduction Gear

- a. The hub reduction gear consists of a sun gear, a set of planetary gears and an annular gear. Two sets of hub reduction gears are installed at both ends of the drive axle housing, respectively. The sun gear is splined on the axle shaft and blocked by a circlip. The planetary gear holder is installed on the wheel housing. The sets of planetary gear shafts installed in the holder have one set of planetary gears installed, respectively. The annular gear is splined (or through the annular gear seat) on the drive axle housing.

The principle of power transmission is as follows (refer to Figure 24).

When the sun gear rotates (i.e., the half shaft rotates), the rotation is transmitted to the planetary gear and the annular gear. However, since the annular gear is fixed to both ends of the drive axle housing, the planetary gear rotates around the sun gear and revolves on its' own axle at the same time. The planetary gear is installed on the planetary gear holder which is connected with the wheel hub, while the rim is also connected with the hub. In this way, the power of the half shaft makes the whole wheel rotate.



1. SUN GEAR
2. PLANETARY GEARS
3. ANNULAR GEAR

Figure 24. Hub Reduction Gear

Installation of the Annular Gear and Adjustment of Wheel Hub Bearing Clearance

- b. Put the assembly of the annular gear and the inner ring of tapered roller bearing 32221 into the wheel hub to ensure that the internal spline of the annular gear matches the external spline of the axle housing shaft nose correctly. Tighten the round nut at the shaft end, turn back about 1/8 turn, and then tighten it again to ensure that the starting torque of the hub is 110-160 N•m (81-118 lbf ft), and finally tighten the stop block by tightening bolts and spring pad.

Installation Procedures of the Planetary Gear Holder Assembly

- (1) The surface of the planetary gear is in good condition. Put the needle bearing and its sleeve into the planetary gear. Make sure the sleeve is between the two needle bearings. Put a planetary gear gasket on the lower portion of the planetary gear holder. Put the planetary gear on the upper surface of the planetary gear gasket and put another planetary gear gasket on the upper surface of the planetary gear. Finally, insert the planetary gear shaft into the planetary gear holder and the planetary gear. At the same time, make sure to put a steel ball into the holed groove hole of the planetary gear shaft. Ensure that the direction of the groove hole on the planetary gear holder is consistent with that of the planetary gear shaft. Secondly, knock in the planetary gear shaft to stick the steel ball in the planetary gear holder. Finally, install the o-ring into the o-ring slot of the planetary gear holder.
- (2) Apply sealant on the joint surface of the hub and planetary gear holder assembly. Put the planetary gear holder assembly into the hub to ensure that the planetary gear is meshed with the sun gear and annular gear, respectively. Due to improvement of installation accuracy, use patience and carefulness in the installation process.
- (3) Tighten bolts and spring pad with a tighten torque of 78-104 N•m (58-77 lbf ft) and a reference value of 92 N•m (68 lbf ft).

Steering Knuckle and Steering King Pin

2. Steering knuckle is mounted between the upper and lower shaft sleeves on the ends of steering axle body using steering knuckle king pin, thrust bearing and gasket. The middle part of king pin is locked on steering knuckle using grub screw, while the two ends of king pin are supported by needle roller bearings pressed on the axle body. Oil seals are mounted on the two ends of needle roller bearings and the oil cup is fitted on the king pin.

Steering Wheel Bearing Pre-Load Information

- a. As indicated in Figure 31, grease for the hub, inner and outer bearings, and inner cavity of the wheel hub. Meanwhile grease for the oil sealing at the contact area.
- b. Fix the bearing outer Ring onto the wheel hub, mount the hub on the shaft of steering knuckle.
- c. Tighten the inside round nut to the hub with sleeve and socket wrench to a required hub-starting torque of 70-110 N•m (51.6-81.1 lbf ft).
- d. Install thrust washer and the outside nut, tighten the nut to a required hub-starting torque of 110-160 N•m (81.1-118.0 lbf ft).

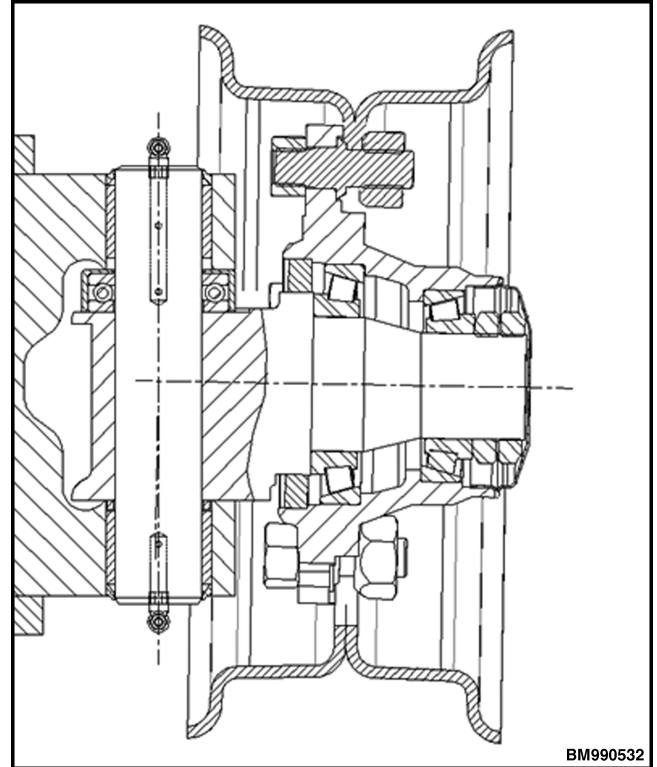
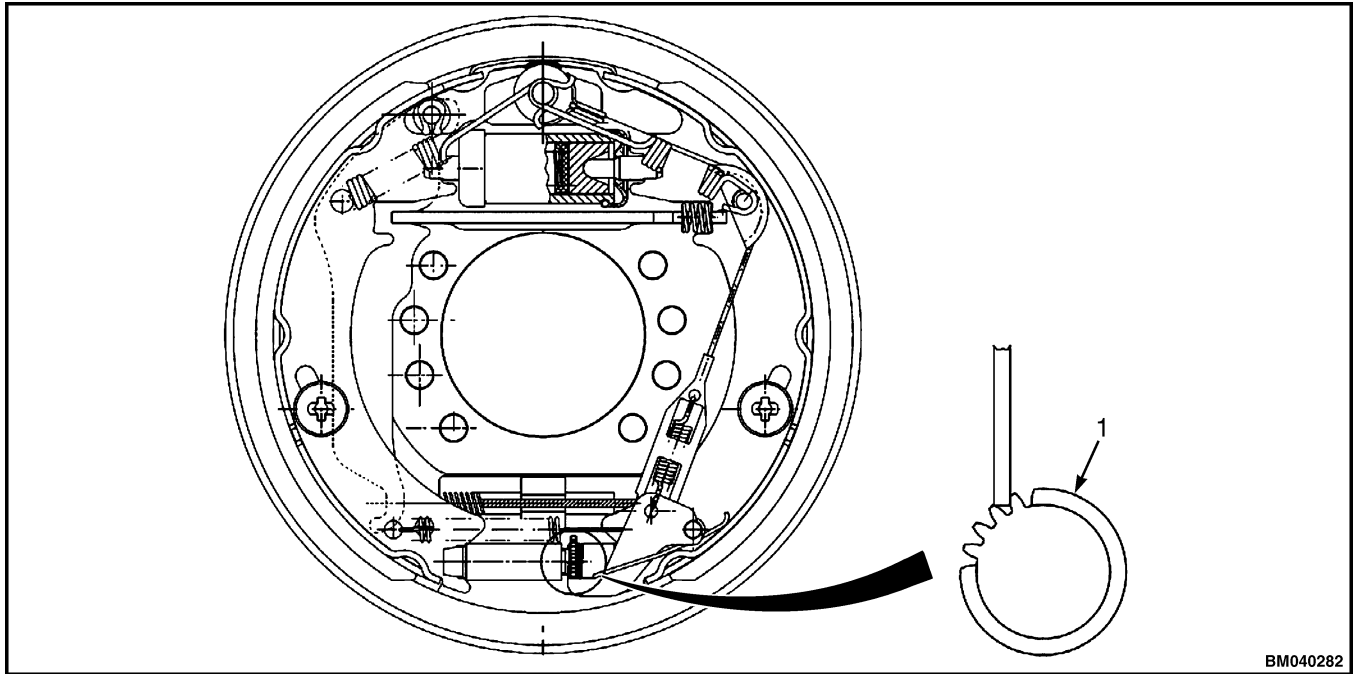
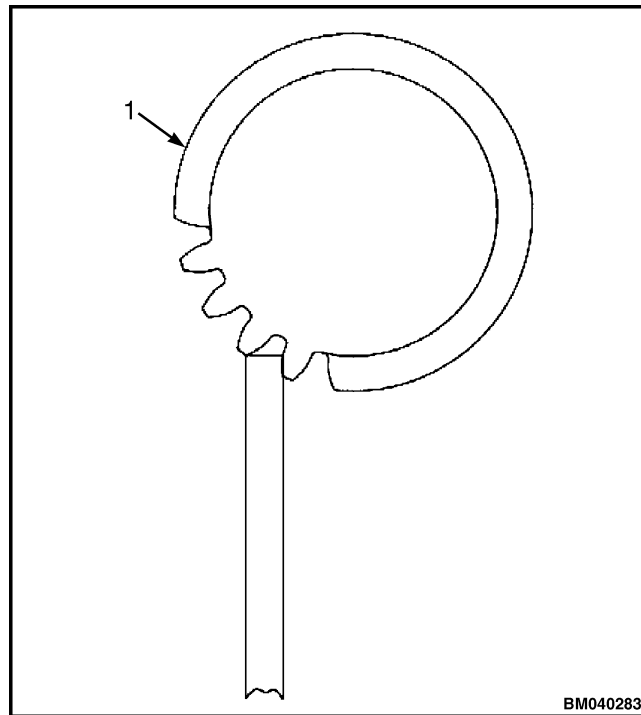


Figure 31. Adjustment for Pre-Tightened Load



BM040282

1. ADJUSTER GEAR



BM040283

1. ADJUSTER GEAR

Figure 39. Adjustment Gears

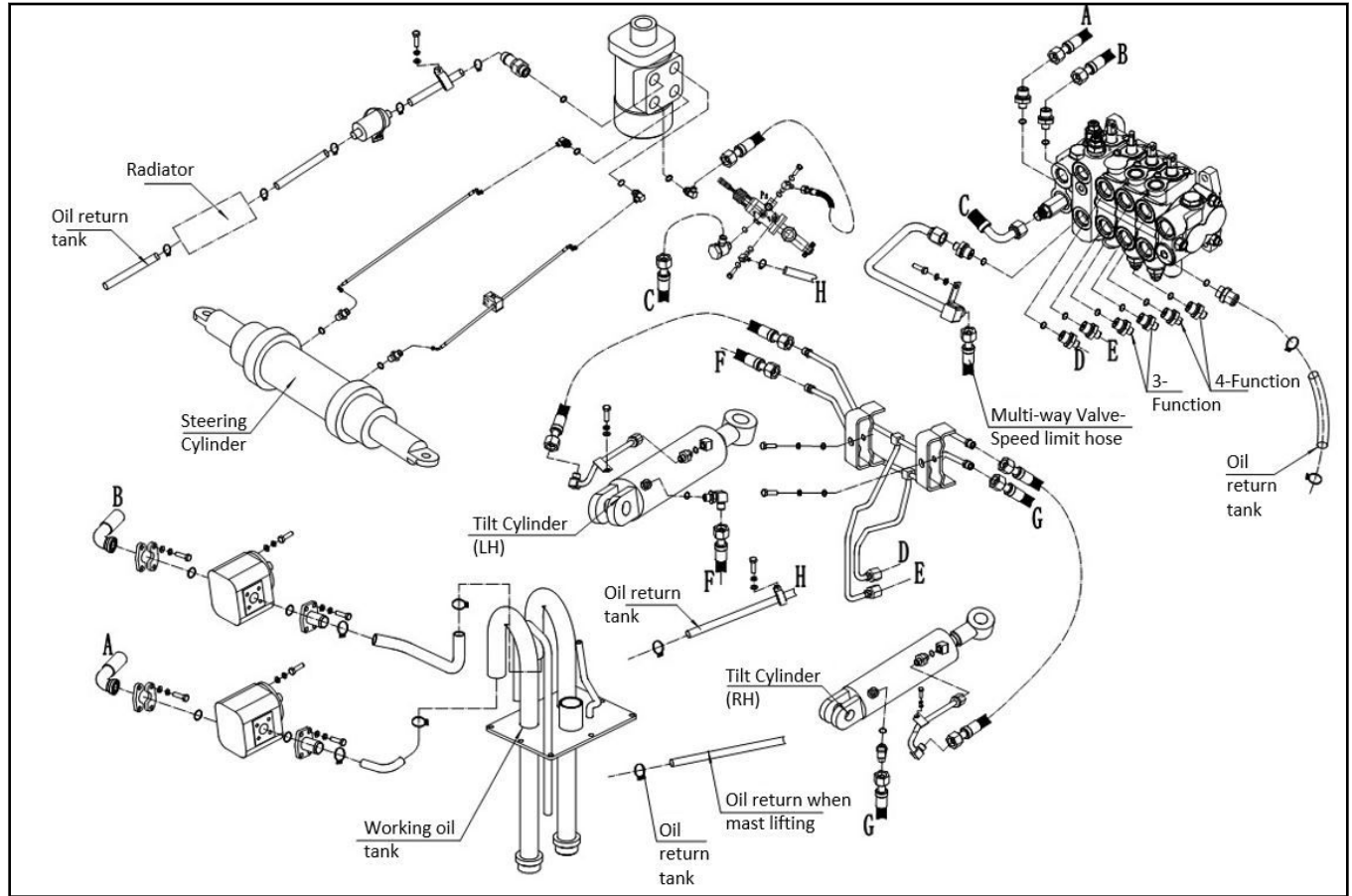


Figure 47. Hydraulic System Oil Circuit

3. Increase rotating speed to 1500-2000 rpm, and allow to idle for 10 minutes.
4. Keep the rotating speed at 1500-2000 rpm, increase the pressure to 2-3 MPa (290.08-435.11 psi) for 5 minutes. Repeat until maximum pressure is reached. Use overflow valve to increase the load to adjust pressure. Allow each fluid circuit to work for 5 minutes, and replace or clean the filter core of return filter. When pressure is boosted, monitor fluid temperature, surface temperature and proper function of pump body. If fluid temperature or pump temperature are too high, flush the pump immediately to lower the temperature, and repeat the process.
5. After the previous procedure is completed, adjust the overflow valve to the original condition and test and confirm pump reaches proper speed.

OIL FILLING INSTRUCTIONS

General Inspection Requirements

1. Wait five minutes after operating the forklift truck before checking the oil level.
2. Turn the truck on and exercise all functions to get hydraulic oil up to operating temperature.
3. Park the truck on flat ground. Turn the power OFF.
4. Move the mast to upright position, with forks lowered to the ground. Retract all attachments.
5. Use the dipstick to check the oil level of the hydraulic oil tank.

Inspection

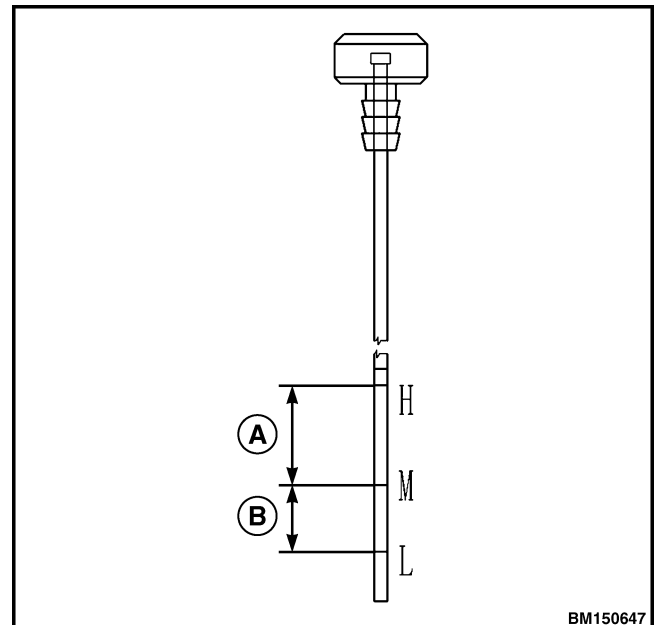
1. Locate the dipstick and clean with a towel or cotton cloth.
2. Insert the dipstick into the tank until seated.

3. Carefully remove the dipstick and observe the oil level.

Fill Level Requirements

NOTE: For items below, refer to Figure 59:

- **L** line indicates the lowest level of hydraulic oil required to operate the mast up to 4 m (13.1 ft) in height (including the full free lift mast and mast with special attachment).
- **M** line indicates the lowest level of hydraulic oil required to operate the mast **ABOVE** 4 m (13.1 ft) in height (including the full free lift mast and mast with special attachment).
- **H** line indicates the maximum level of hydraulic oil required. If the reading on the dipstick is above this line, flush oil from the tank.



- A. A. FILL LEVEL REQUIRED FOR MAST ABOVE 4 m (13.1 ft), WITH ATTACHMENTS.
- B. A. FILL LEVEL REQUIRED FOR MAST BELOW 4 m (13.1 ft), WITH ATTACHMENTS.

Figure 59. Oil Fill Stick

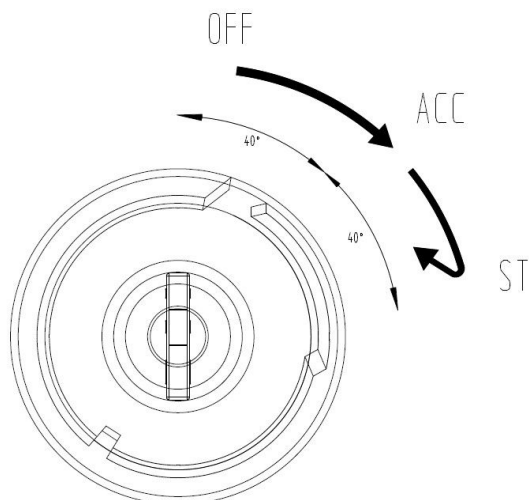


Figure 64. Key Switch

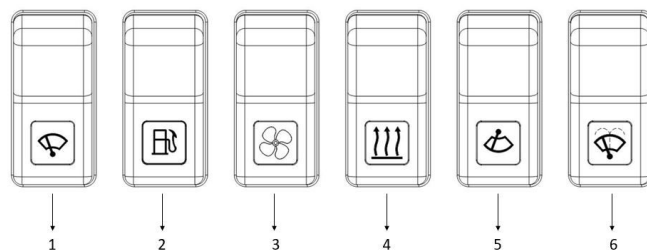
NOTE:

- 1) After the engine has stopped, do not place the key switch to ACC gear, so as to avoid the power loss to the battery.
- 2) When the engine is running, do not start rotating the key switch to ST gear, to prevent damage to the motor.
- 3) When starting, the one-time start time should not exceed 5S, and the twice starting interval is above 120S; if it is impossible to start the engine after starting three times in a row, you should first find out the cause before you start it.

Driving Operations

Press the inching pedal after the engine starts, operate the direction control lever to **Forward** position to make the forward gears mesh in Transmission Case, and decide the truck forward speed by controlling the accelerator pedal. Put the direction control lever to **Reverse** position to make the backward gears mesh in Transmission Case, and decide the truck backward speed by controlling the accelerator pedal.

Combination Switch



1. FRONT WINDSCREEN WIPER
2. FUEL SWITCH
3. FAN SWITCH
4. FAN HEATER SWITCH
5. REAR WINDSCREEN WIPER
6. GLASS DETERGENT

Horn Button

The Horn Button locates in the center of steering wheel, press the button, the horn rings.

Reverse Light and Signal

Put the shifting lever at **Reverse** positions, reverse light and alarm work. If rear light is equipped, rear light turns on. See Figure 65.

Light Controls

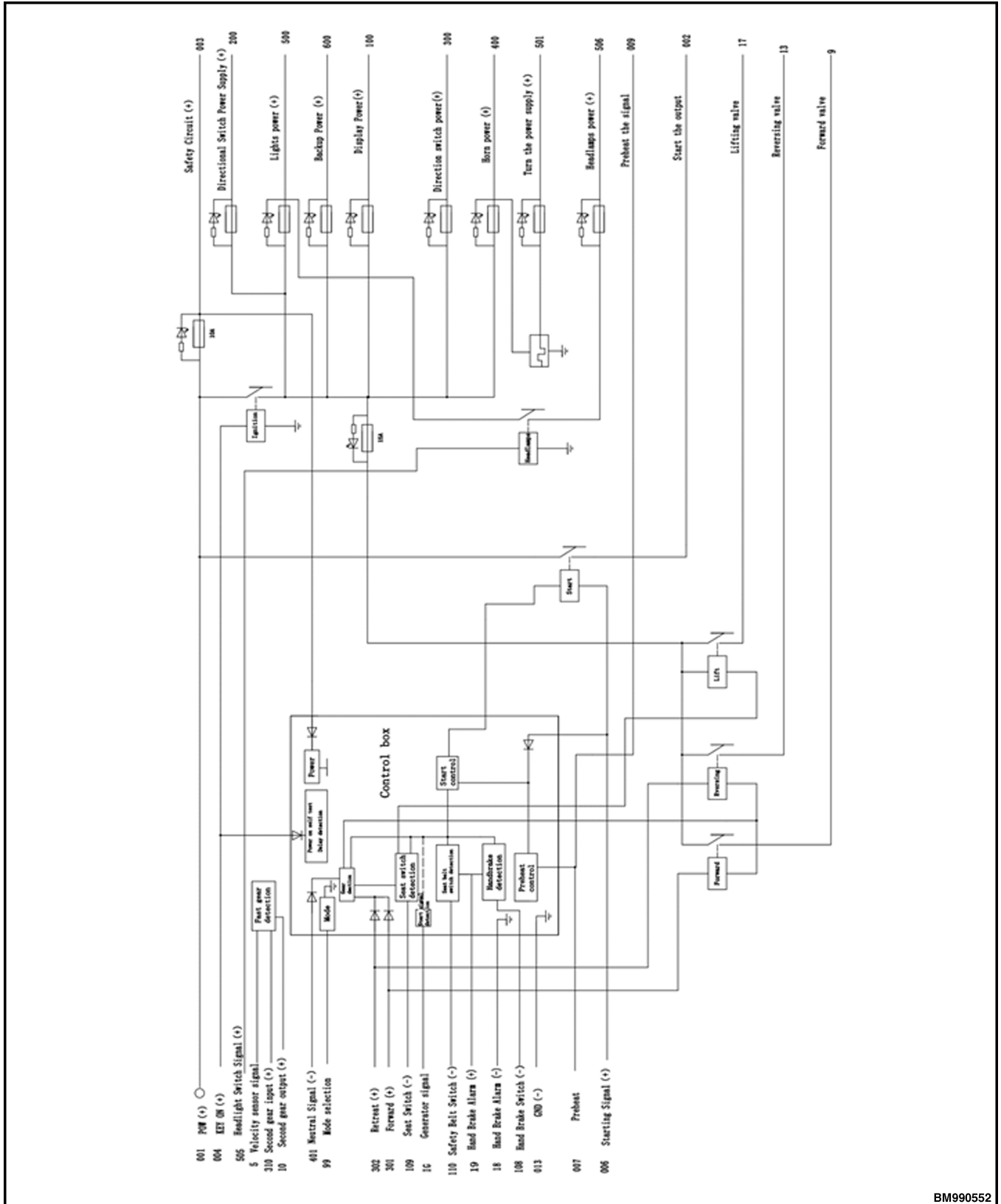
Turn the light switch to first stop (I), side lamps turn on. Turn the light switch to second stop (II), front working lamps turn on, the side lamps keep on.

Steering Signal

Push forward the steering control lever to **Left turn** to indicate the truck is going to turn left, the steering signal lamp at the left side of the truck flashes at a certain frequency.

Pull backward the steering control lever to **Right turn** to indicate the truck is going to turn right, the steering signal lamp at the right side of the truck flashes at a certain frequency.

See Figure 65.



BM990552

Figure 75. Electrical PDM

TROUBLESHOOT WITH ELECTRICAL SYSTEM



WARNING

When examining the electrical wires, the key switch and battery grounding wire should be turned off and the wiring harness with the same serial number should be connected. Check the voltage of the electrical components. Avoid contact with conductive accessories to prevent short. Use the electric box wiring and schematic drawings as reference, and follow the steps below to inspect the wiring harness of the truck.

- No damage on each electrical part.
- Each plug should be connected properly with no rust and dirt.
- Each plug should maintain a safe distance of 10 mm (0.40 in.) from its ambient metal part.
- The main wire shows no damage or decay.
- Each plug is labeled to avoid possible wrong connection.
- All wiring should be kept away from high temperature objects like the exhaust system.

When the truck fails, first check the electric box to inspect for damage to the time relay and fuse (the time relay will smell burned, if it is damaged). The fuse will be blown. Use a multi-meter to check when these instances are not visible. Replace the damaged parts with new ones. The specification of the new fuse should not exceed that of the removed fuse.

Example 1: The IC truck could not be started

- Turn the key and listen to hear if the starting motor is working (engine will turn over). If starting motor is not functioning, perform the following.

1. Check the power supply, check whether the negative end of the wiring is well connected.
2. Check if the gear is at neutral position (with OPS installed, whether the seat, seat belt and hand brake are in place).
3. Check the start system (key switch) to confirm it functions correctly.
4. Check for damage at the starting motor. If the starting motor functions properly, check if the oil supply system is working.

Example 2: The IC truck could be started but could not move forward or backward

- For manually controlled truck, the gear is controlled by the lever.
- For the hydraulic controlled truck (With OPS installed, make sure that the seat and seat belt switch are off and hand brake is on), check the gear switch's input and output voltage to see if it is 12V.
 1. If there is no input, then check the power supply for gear switch.
 2. If it is with input voltage but without output voltage, it means that the gear switch is damaged.
 3. If it is with both input and output voltage, then check the voltage at where the directional valve is located.
 4. If voltage exists, the valve or transmission is damaged. If there is no voltage, the wiring between the gear switch and directional valve is disconnected.

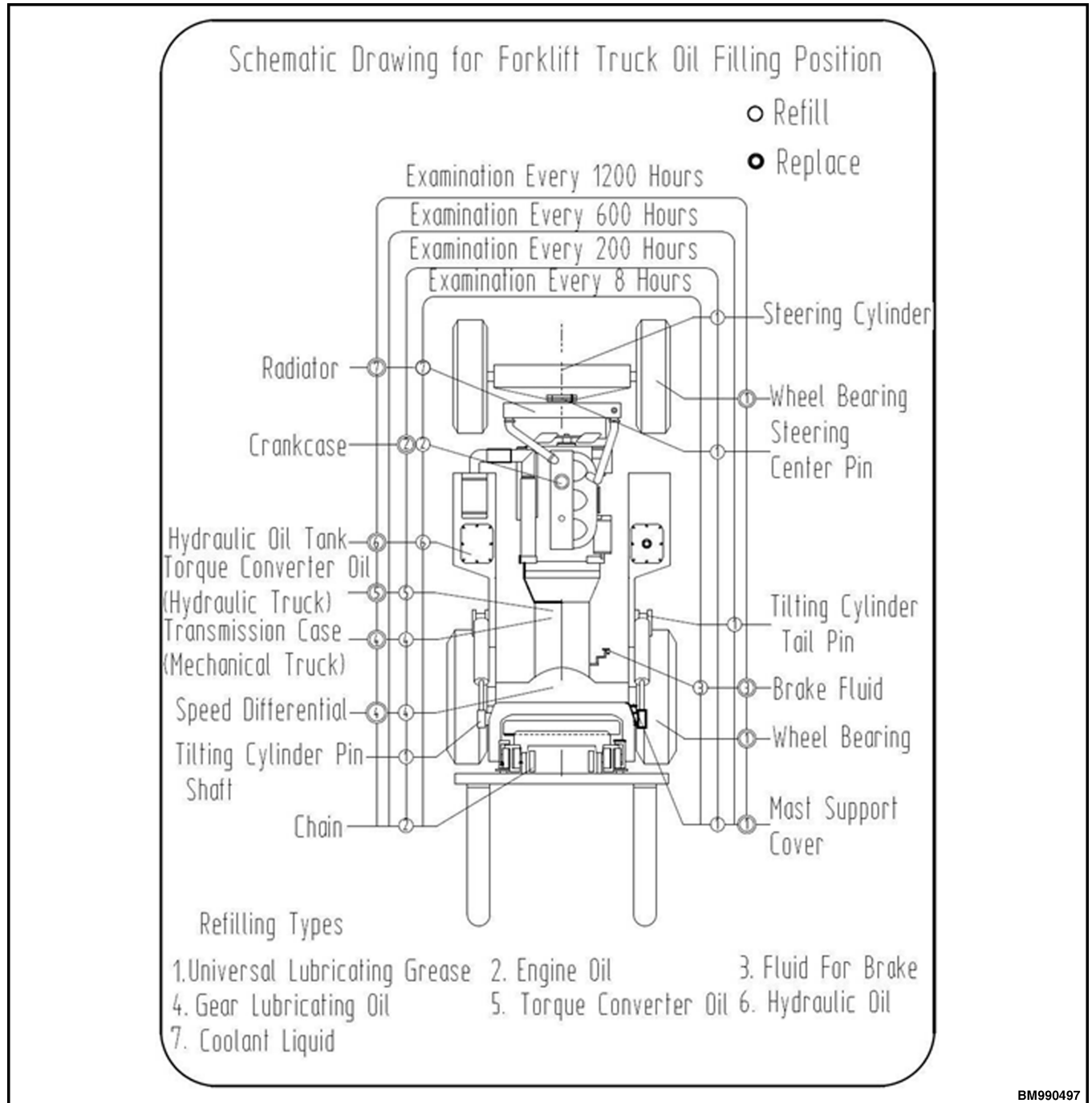


Figure 90. Lubrication Points

Table 37. Engine Kubota V3800 (Continued)

Item	Examination Item	Daily	Initial 50 Hours	Every 50 Hours	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 1500 Hours	Every 3000 Hours	Every 3000 to 6000 Hours	Every 1 years	Every 2 years
	Exhaust throttle valve hose (for BG model) - Replace											•
	Lubricant hose - Replace											•
	Radiator coolant - Change											•
	Replacing radiator hose and clamp bands - Replace											•
	Fuel hose and clamps - Replace											•
	Intake air line - Replace											•

Table 42. Brake System (Continued)

Item	Examination Item	Tool	Daily (8 Hours)	Monthly (200 Hours)	Quarterly (600 Hours)	Semiannually (1200 Hours)	Annually (2400 Hours)
	Examining whether or not clearance is proper during operation of automatic adjusting device						○
	Wear and injury status of brake drum						○
Bottom Plate of Brake	Whether or not bottom plate is distorted						○
	Whether or not cracked						○
	Whether or not loosened during assembly						○

Table 43. Lifting System

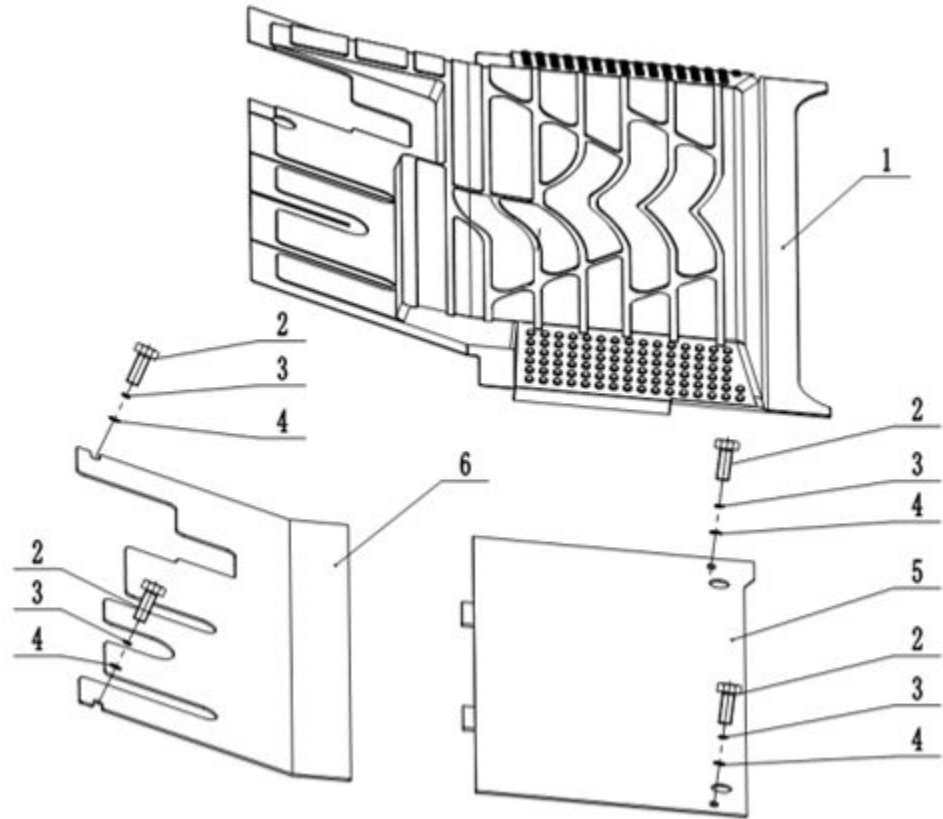
Item	Examination Item	Tool	Daily (8 Hours)	Monthly (200 Hours)	Quarterly (600 Hours)	Semiannually (1200 Hours)	Annually (2400 Hours)
Cargo Fork	Injury, distortion, and wear status of cargo fork		○	○	○	○	○
	Injury or wear status of positioning pin				○	○	○



FRAME

GP40UX, GP45UX, GP50UX,
GP50UXS6 (GP080UX, GP090UX,
GP100UX, GP110UXS) [A7S6]

GP50UX6, GP60UX6, GP70UX6
(GP110UX, GP135UX, GP155UX)
[A7T0]



- 1. RUBBER MAT
- 2. BOLT
- 3. WASHER

- 4. WASHER
- 5. REAR FLOOR PLATE
- 6. FRONT FLOOR PLATE

Figure 4. Front and Rear Floor Plate (4-5T Trucks)

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

Counterweight Replacement

REMOVE (4-5T TRUCKS)



WARNING

The truck must be put on blocks for some types of maintenance and repair. The removal of the following assemblies will cause large changes in the center of gravity: mast, drive axle, engine and transmission, and counterweight. The ground must be solid, even, and level for truck maintenance and repair. Make sure that any blocks used to support the truck are solid, one-piece units. Put blocks on each side (front and back) of tires to prevent truck from moving.

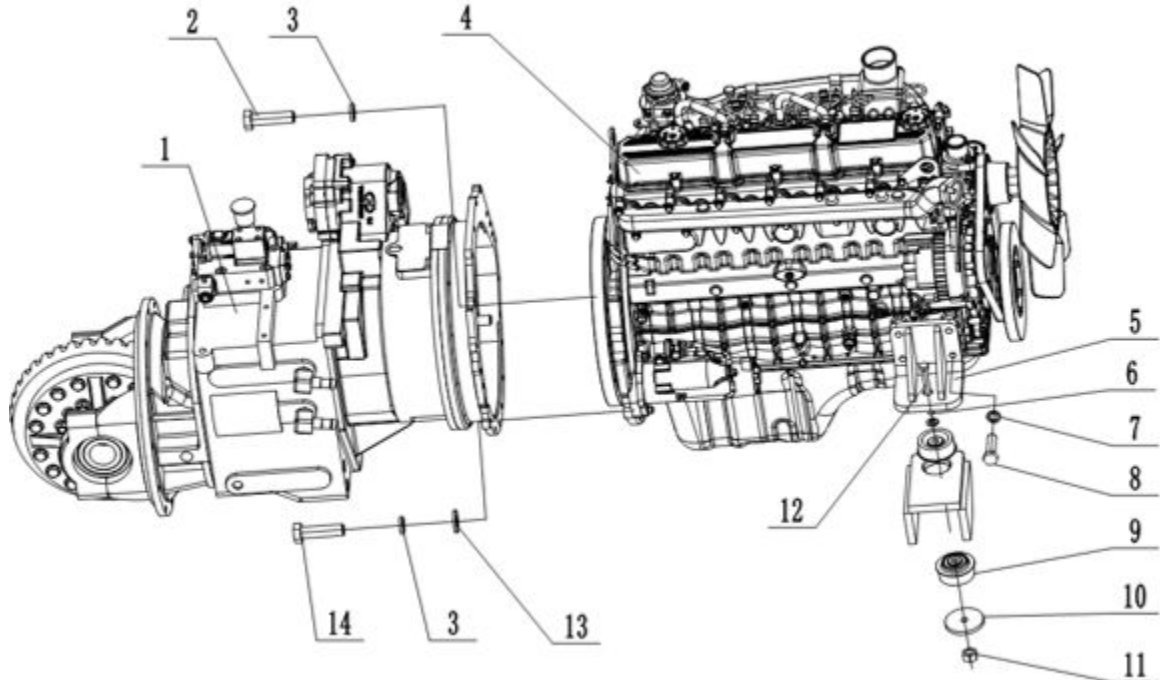
- Before removing the mast and drive axle, put blocks under the counterweight so the truck cannot fall backward.
- Before removing the counterweight, put blocks under the mast assembly so the truck cannot fall forward.



WARNING

DO NOT operate the truck if the capscrew for the counterweight is not installed. When the capscrew is removed, the counterweight can fall from the truck.

1. Remove screw (5, Figure 12) and washer (6, 7, Figure 12) to remove grill (4, Figure 12) from the counterweight.
2. Remove counterweight plug (2, Figure 12) and open radiator cover, then wrap sling through lifting hole of counterweight.



- | | |
|---------------------|----------------------|
| 1. TRANSMISSION | 8. BOLT M12×50 |
| 2. BOLT M10×1.25×30 | 9. RUBBER DAMPER |
| 3. WASHER 10 | 10. GASKET I |
| 4. ENGINE | 11. NUT M12 |
| 5. ENGINE BRACKET | 12. BOLT M12×120 |
| 6. WASHER 12 | 13. WASHER 10 |
| 7. WASHER 12 | 14. BOLT M10×1.25×40 |

Figure 17. Engine Mounting (4-5T Trucks)

DISASSEMBLE (5-7T TRUCKS)

1. Remove rubber mat, front and rear floor plates. See Hood, Seat, Floor Plate and Covers Replacement .
2. Remove hood and cross beam. Hood, Seat, Floor Plate and Covers Replacement
3. Remove engine wiring harness, intake pipe, exhaust pipe, oil pipe, water pipe, and remove oil pipe of transmission gear pump and foot brake.
4. Remove cooling system. See **COOLING SYSTEM** 0700YRM5003 .
5. Remove bolts (2, 13, Figure 18) that connect engine to transmission.
6. Wrap sling through engine hook, and then connect a crane to sling and raise crane until it holds the weight of engine.
7. Remove bolts that mounted engine bracket to frame.
8. Use a crane to lift engine from truck frame. Place engine on floor so that it has stability and will not fall over. Take care not to damage other parts of truck.
9. Remove the brake pedal and master brake cylinder. **Brake System** 1800YRM5008 .
10. Remove parking brake cable. **Brake System** 1800YRM5008 .
11. Remove accelerator pedal. See **ELECTRICAL SYSTEM** 2200YRM5010 .
12. Wrap sling through transmission hook, and then connect a crane to sling and raise crane until it holds the weight of transmission and drive axle.

ADDITIONAL PREPARATIONS FOR REPAIR

If nitrogen gas or carbon dioxide gas is available, prepare tank for welding using these gases. See manual *Safe Practices for Welding and Cutting Containers That Have Held Combustibles* by the American Welding Society, F4.1 - 1999. If these gases are not available, another method using water can be used as follows:

1. Fill tank with water to just below point where work will be done. Make sure space above level of water has a vent.
2. Use acceptable welding practices to repair tank. See the American National Standard *Safety in Welding and Cutting*, AWS Z 49.1 - 1999.

SMALL LEAKS, REPAIR

Use following procedure to repair small leaks:

1. Use steam to clean area around leak. Remove all paint and dirt around leak.

2. Apply Loctite® 290 to leak. Follow instructions of manufacturer.

LARGE LEAKS, REPAIR

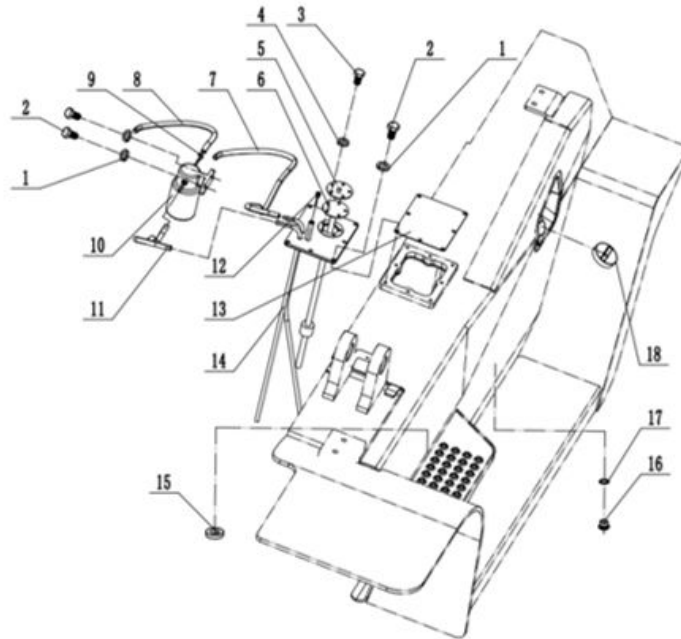
1. Use one of procedures described under Clean to clean and prepare tank for repairs.
2. Contact your dealer for trucks for welding instructions.
3. Use acceptable welding practices to repair tank. See the American National Standard *Safety in Welding and Cutting*, AWS Z 49.1 - 1999.

PREPARATIONS FOR USE AFTER REPAIR

1. Add more water to tank so that water goes above point of where work was done. Check for any leaks coming from tank.
2. If there are no leaks coming from tank, remove all water from the tank.

TABLE OF CONTENTS

Air-Intake and Exhaust System.....	1
Air-Intake and Exhaust System (Mitsubishi S6S and Mitsubishi S6S-T Engine).....	1
Remove.....	1
Inspect.....	1
Install.....	1
Air-intake System (Kubota Engine).....	3
Remove.....	3
Install.....	3
LPG Tank and Bracket Replacement with Swing-Out Bracket (Kubota WG3800 Engine).....	4
Remove LPG Tank	4
Install LPG Tank	5
Remove LPG Bracket	5
Install LPG Bracket	6
Fuel Filter and Fuel Level Sensor Repair.....	7
FUEL FILTER ELEMENT (4-5T Trucks).....	7
Remove.....	7
Install (4-5T Trucks).....	8
Fuel Level Sensor (4-5T Trucks).....	8
Remove (4-5T Trucks).....	8
Install (4-5T Trucks).....	8
FUEL FILTER ELEMENT (5-7T Trucks).....	8
Remove.....	8
Install (5-7T Trucks).....	9
Fuel Level Sensor (5-7T Trucks).....	9
Remove (5-7T Trucks).....	9
Install (5-7T Trucks).....	9
LPG Converter (Kubota WG3800 Dual Fuel Engine).....	10
Remove.....	10
Exhaust System.....	13
Remove (4-5T Trucks).....	13
Install (4-5T Trucks).....	15
Remove (5-7T Trucks).....	19
Install (5-7T Trucks).....	24



- | | |
|----------------------|----------------------|
| 1. WASHER | 10. DIESEL FILTER |
| 2. BOLT | 11. FUEL HOSE |
| 3. SCREW | 12. VENTILATION PLUG |
| 4. WASHER | 13. SEALING GASKET |
| 5. FUEL LEVEL SENSOR | 14. COVER PLATE |
| 6. SEALING RING | 15. MAGNET |
| 7. FUEL HOSE | 16. OIL DRAIN PLUG |
| 8. FUEL HOSE | 17. GASKET |
| 9. CLAMP | 18. REFUELING CAP |

Figure 6. Remove and Install Fuel Filter (5-7T Trucks)

Install (5-7T Trucks)

1. Install new fuel filter. See Figure 6.
2. Install cover plate with new sealing gasket. See Figure 6.
3. Install bolt and washer onto the top section of fuel cover plate. See Figure 6.
4. Connect two fuel hoses to cover plate.
5. Connect negative battery cable.
6. Turn truck key to the **ON** position and back to the **OFF** position to pressurize the fuel system.
7. Check for leaks at connections by using a soapy solution or electron leak detector. If leaks are detected, make proper repairs.

FUEL LEVEL SENSOR (5-7T TRUCKS)

Remove (5-7T Trucks)

1. Raise hood and disconnect battery.
2. Remove bolt and washers from fuel level sensor. See Figure 6.
3. Remove fuel level sensor.

Install (5-7T Trucks)

1. Install new fuel level sensor.
2. Install bolt and washers onto fuel level sensor. See Figure 6.
3. Connect negative battery cable and lower hood.

REMOVE (5-7T TRUCKS)

NOTE: Always use new O-rings, seals, and gaskets when servicing the fuel and exhaust systems.

**WARNING**

Exhaust system components are hot to touch. Be sure exhaust system components are cool before starting disassembly, or personal injury may occur.

1. Open the cover of the water tank and remove the u-bolt II connecting the high exhaust pipe to remove the high exhaust pipe.
2. Raise hood to disconnect negative battery cable and remove the nut and gasket connecting the exhaust pipe II and the engine, then disconnect the electrical sensor connector on the exhaust pipe II. See Figure 14. (Take Kubota WG3800 engine as an example).
3. Disconnect the sensor on the three-way catalytic converter, and electrical connectors on DPF and DOC. (Only for trucks equipped with Kubota WG3800 and V3800 engines).
4. Remove the bolt, nut, washer, and sealing gasket that connect exhaust pipe II and three-way catalytic converter, and then remove exhaust pipe II. See Figure 14.
5. Remove bolt, nut, washer, and sealing gasket that connect exhaust pipe I and three-way catalytic converter, and then remove exhaust pipe I. See Figure 14.
6. Remove the bolt and washer that connect three-way catalytic converter and bracket, and then remove three-way catalytic converter. See Figure 14. (Take Kubota WG3800 engine as an example).



WARNING

Installing improper electrical accessories or installing an electrical accessory incorrectly can increase the risk of equipment damage, personal injury and fire. **DO NOT** install electrical accessories to the truck unless you have been trained and authorized to do so. Personnel installing the electrical accessories must document the changes made to the truck. **DO NOT** install accessories which affect the truck's compliance with standard ANSI/ITDF B56.1, UL 558, or UL 583, or which otherwise affect the safe operation of the truck.



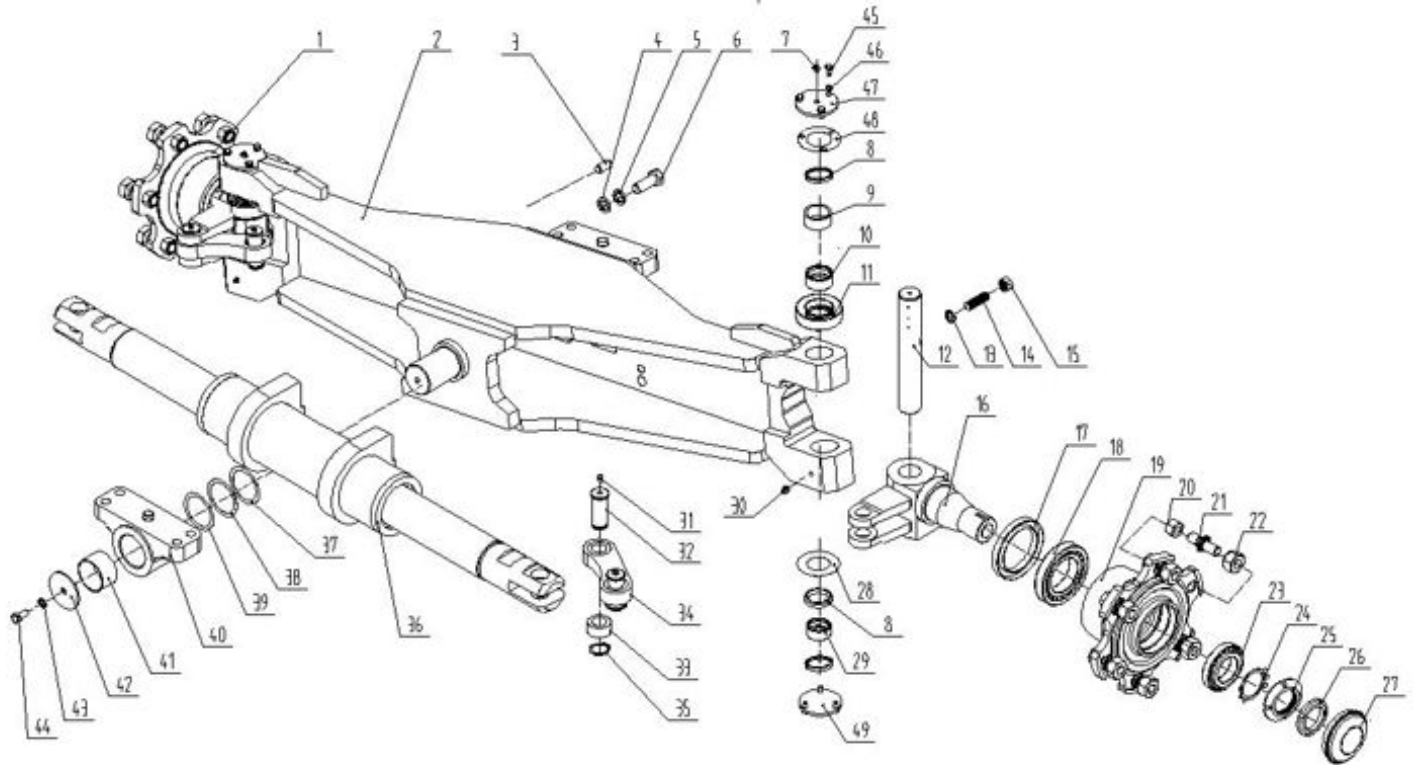
WARNING

Installing improper electrical accessories or installing an electrical accessory incorrectly can increase the risk of equipment damage, personal injury and fire. **DO NOT** install electrical accessories to the truck unless you have been trained and authorized to do so. Personnel installing the electrical accessories must document the changes made to the truck. **DO NOT** install accessories which affect the truck's compliance with standard EN 1175:2020.



WARNING

California Proposition 65 - Operating, servicing and maintaining a powered industrial truck can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.



- | | |
|---|--|
| 1. LEFT STEERING SPINDLE | 26. NUT M55×2 |
| 2. STEERING AXLE | 27. HUB CAP |
| 3. PIN $\Phi 16 \times 32$ | 28. ADJUSTING GASKET $\Phi 45.5 \times \Phi 85 \times 0.2$ |
| 4. WASHER 20 | 29. BUSHING $\Phi 46 \times \Phi 53 \times 10$ |
| 5. ELASTIC WASHER 20 | 30. GREASE FITTING |
| 6. BOLT M20×1.5×50 | 31. GREASE FITTING |
| 7. GREASE FITTING | 32. CONNECTING ROD PIN |
| 8. OIL SEAL $\Phi 45 \times \Phi 55 \times 8$ | 33. BEARING |
| 9. NEEDLE ROLLER BEARING $\Phi 45 \times \Phi 55 \times 24$ | 34. CONNECTING ROD |
| 10. BUSHING $\Phi 45 \times \Phi 55 \times 25$ | 35. RETAINING RING 30 |
| 11. THRUST BALL BEARING 198911K | 36. STEERING CYLINDER |
| 12. KING PIN | 37. ADJUSTING GASKET $\Phi 66 \times \Phi 85 \times 2.3$ |
| 13. ELASTIC WASHER 16 | 38. ADJUSTING GASKET $\Phi 66 \times \Phi 85 \times 1$ |
| 14. SCREW M16×45 | 39. ADJUSTING GASKET $\Phi 66 \times \Phi 85 \times 0.5$ |
| 15. NUT M16 | 40. STEERING AXLE SUPPORT |
| 16. RIGHT STEERING SPINDLE | 41. BEARING $\Phi 90 \times \Phi 61 \times 1$ |
| 17. OIL SEAL $\Phi 95 \times \Phi 130 \times 12$ | 42. PLATE |
| 18. TAPERED ROLLER BEARING 32215 | 43. ELASTIC WASHER 12 |
| 19. HUB | 44. BOLT M12×1.25×25 |
| 20. NUT M20×1.5 | 45. BOLT M8×16 |
| 21. HUB BOLT | 46. ELASTIC WASHER 8 |
| 22. HUB NUT | 47. KING PIN UPPER CAP |
| 23. TAPERED ROLLER BEARING 32211 | 48. SEALING RING |
| 24. WASHER 55 | 49. KING PIN LOWER CAP |
| 25. ENLARGED NUT M55×2 | |

Figure 5. Disassemble and Re-assemble Steering Axle (5-7T Trucks)



Maintenance

HYDRAULIC SYSTEM

GP40UX, GP45UX, GP50UX,
GP50UXS6 (GP080UX, GP090UX,
GP100UX, GP110UXS) [A7S6]

GP50UX6, GP60UX6, GP70UX6
(GP110UX, GP135UX, GP155UX)
[A7T0]

FREE-LIFT CYLINDER

REMOVE



WARNING

Before working on the mast, see **Safety Procedures When Working Near Mast**.

1. Remove the carriage as described in the carriage removal procedures in **MAST REPAIR** 4000YRM5011 .
2. Lower the mast completely.



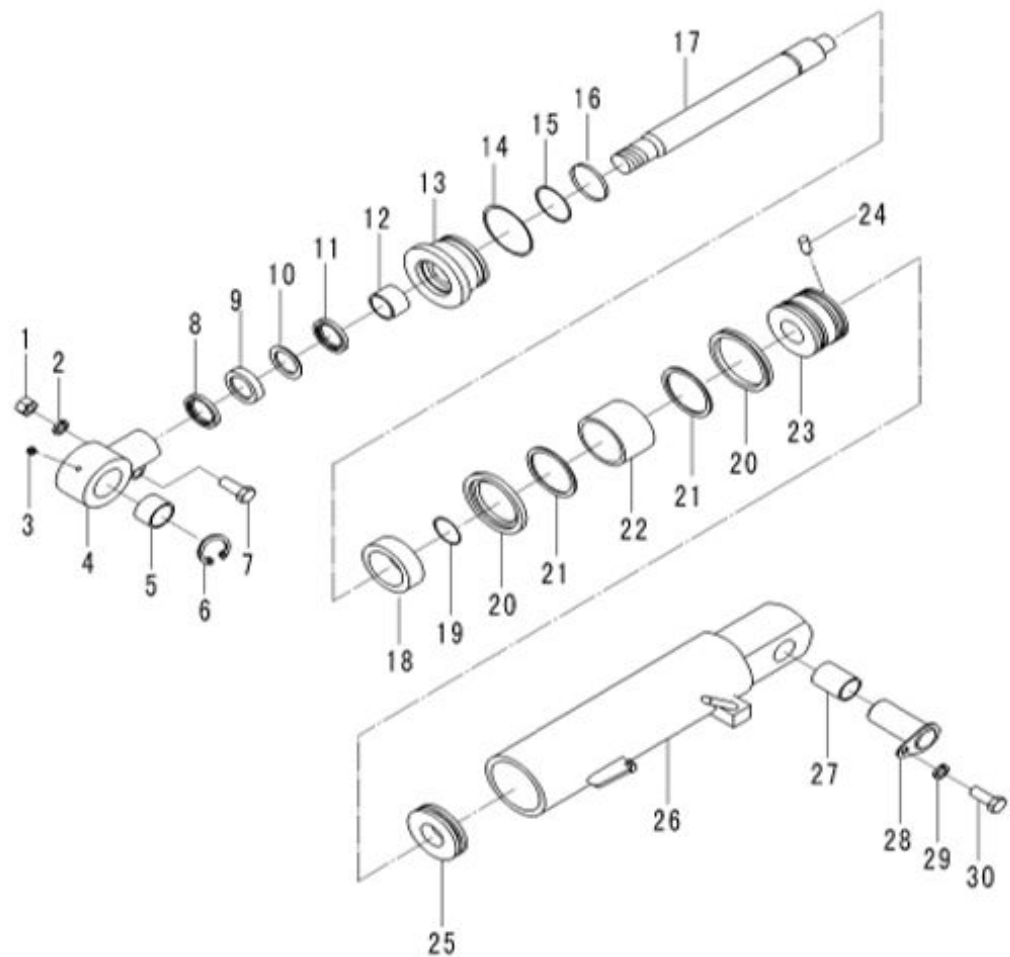
WARNING

Hydraulic oil is hot after system operation and can cause burns. **DO NOT** disconnect any hydraulic hoses until the oil in the system is cool.

3. Put a drain pan under the area of the hydraulic fittings. Disconnect and cap hydraulic line at the free-lift cylinder. See Hydraulic Hose.

NOTE: Be sure to tag header hoses before disconnecting them to aid in re-connecting.

4. Remove roller seat (4, Figure 5).
5. Remove chain protector (3, Figure 5), bolt (1, Figure 5), and washer (2, Figure 5) from roller seat.
6. Remove chain (7, Figure 5) from chain roller (5, Figure 5).
7. Remove washer (2, Figure 5) and bolt (1, Figure 5) from free-lift cylinder.
8. Use a lifting device to remove free-lift cylinder from mast.



- | | |
|---------------------|----------------------|
| 1. NUT | 16. SNAP RING |
| 2. WASHER | 17. PISTON ROD |
| 3. NIPPLE | 18. ADJUSTING SLEEVE |
| 4. ROD END | 19. O-RING |
| 5. BEARING | 20. ORIFICE SEAL |
| 6. SNAP RING | 21. SNAP RING |
| 7. BOLT | 22. O-RING |
| 8. DUST-PROOF SEAL | 23. BEARING RING |
| 9. BEARING RING | 24. PISTON |
| 10. SNAP RING | 25. SPACER |
| 11. SHAFT SEAL | 26. CYLINDER BODY |
| 12. BUSHING BEARING | 27. BUSHING BEARING |
| 13. GUIDE SLEEVE | 28. PIN SHAFT |
| 14. O-RING | 29. WASHER |
| 15. O-RING | 30. BOLT |

Figure 9. Tilt Cylinder

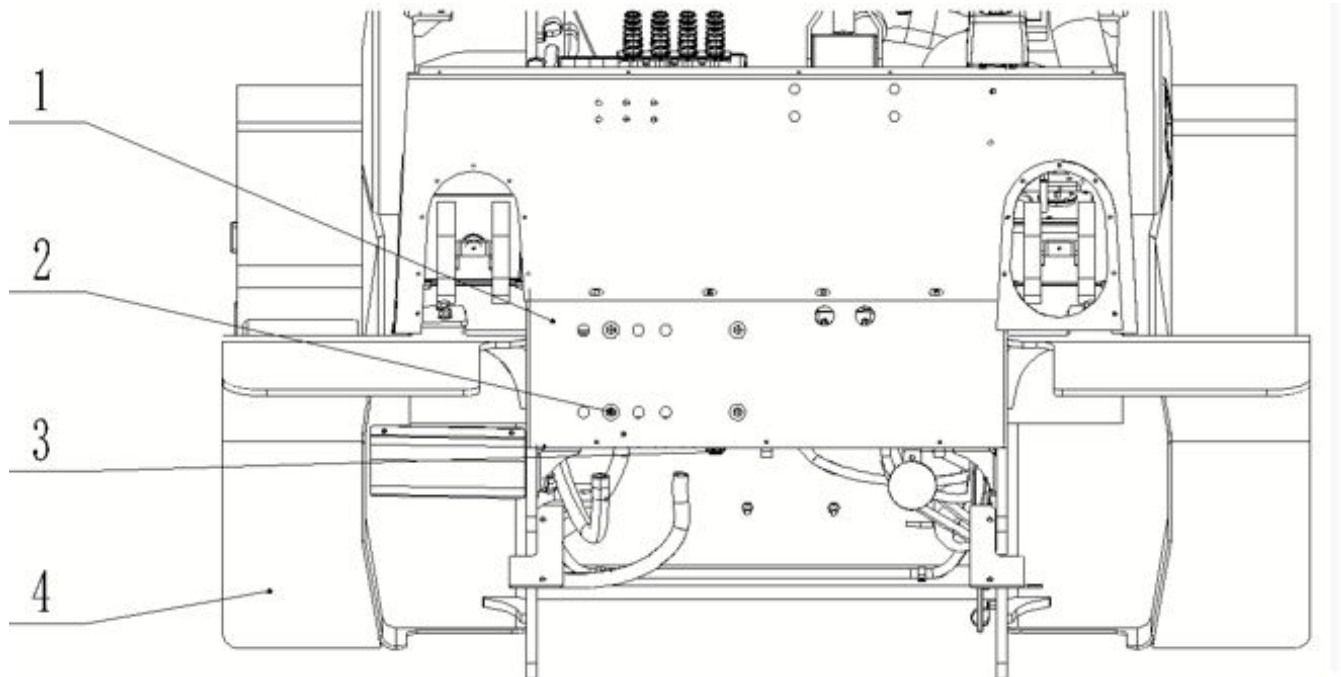
Main Control Valve

GENERAL

This section describes the repair procedures for both manual and Operator Presence System (OPS) main control valves used in the hydraulic system for this series of trucks. There are two main control valves available for this series of trucks. One is controlled

manually (manual main control valve) and the other is controlled electronically (electro-hydraulic main control valve). The main control valves are mounted to the cowl using three mounting bolts. See Figure 21.

NOTE: Major components are not shown for clarity. View is from the front of lift truck.



1. FRONT CROSS BAR
2. BOLT

3. MAIN CONTROL VALVE
4. FRAME

Figure 21. Typical Main Control Valve Mounting

MAIN CONTROL VALVE

DESCRIPTION

The manual control valve is an open-center valve which utilizes parallel hydraulic circuitry. The valve is used with a fixed displacement pump. The hydraulic circuitry incorporates dual pressure logic. The lift function operates on the primary relief pressure setting. The tilt and auxiliary functions operate on the lower secondary relief pressure setting.

If the lift function is operated simultaneously with the tilt and/or auxiliary function, the maximum lift pressure is limited to the secondary relief pressure setting. The manual main control valve assembly without operator presence sensing (OPS) is divided in the following sections:

- Monoblock (lift and tilt control)
- Auxiliary
- Outlet (see Figure 22) for truck models



WARNING

Installing improper electrical accessories or installing an electrical accessory incorrectly can increase the risk of equipment damage, personal injury and fire. **DO NOT** install electrical accessories to the truck unless you have been trained and authorized to do so. Personnel installing the electrical accessories must document the changes made to the truck. **DO NOT** install accessories which affect the truck's compliance with standard ANSI/ITDF B56.1, UL 558, or UL 583, or which otherwise affect the safe operation of the truck.



WARNING

Installing improper electrical accessories or installing an electrical accessory incorrectly can increase the risk of equipment damage, personal injury and fire. **DO NOT** install electrical accessories to the truck unless you have been trained and authorized to do so. Personnel installing the electrical accessories must document the changes made to the truck. **DO NOT** install accessories which affect the truck's compliance with standard EN 1175:2020.



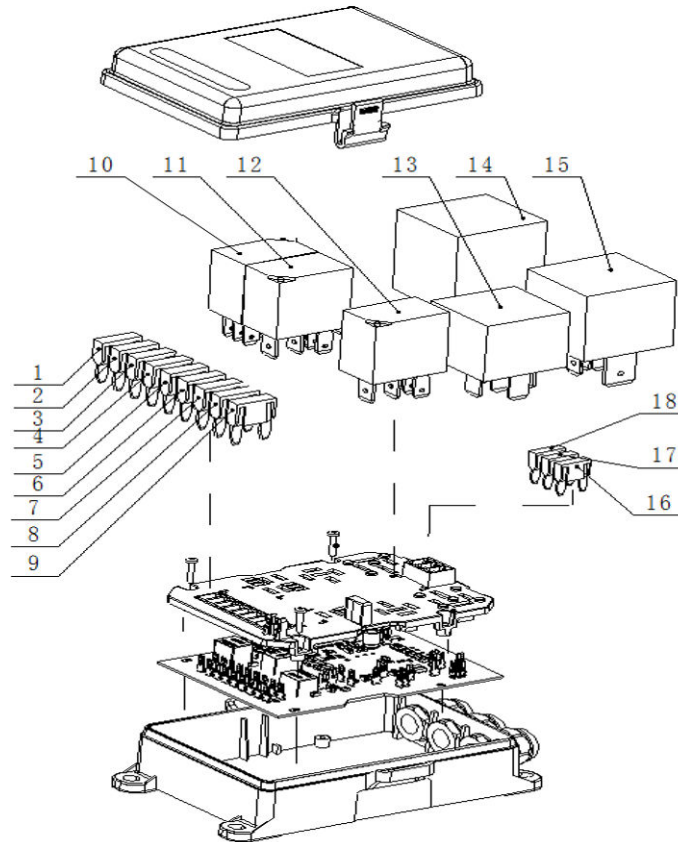
WARNING

California Proposition 65 - Operating, servicing and maintaining a powered industrial truck can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

Auxiliary Relay and Fuse Box

REMOVE AND INSTALL

1. Remove PDM from the truck. See Battery and Power Distribution Module.
2. Remove PDM cover.
3. Remove auxiliary relay and fuse box. See Figure 7.
4. To install the auxiliary relay and fuse box, perform the steps above in reverse order.



- | | |
|---------------------|------------------------|
| 1. HORN POWER | 10. VALVE RELAY |
| 2. TURN POWER | 11. VALVE RELAY |
| 3. LIGHT POWER | 12. VALVE RELAY |
| 4. ELECTROVALVE | 13. MAIN RELAY |
| 5. DIRECTION POWER | 14. START RELAY |
| 6. DISPLAY POWER | 15. ECU RELAY (KUBOTA) |
| 7. EXCITATION POWER | 16. FUSE |
| 8. HEADLIGHT POWER | 17. FUSE |
| 9. BACKUP POWER | 18. FUSE |

Figure 7. Auxiliary Relay and Fuse Box

Lights

LIGHTS

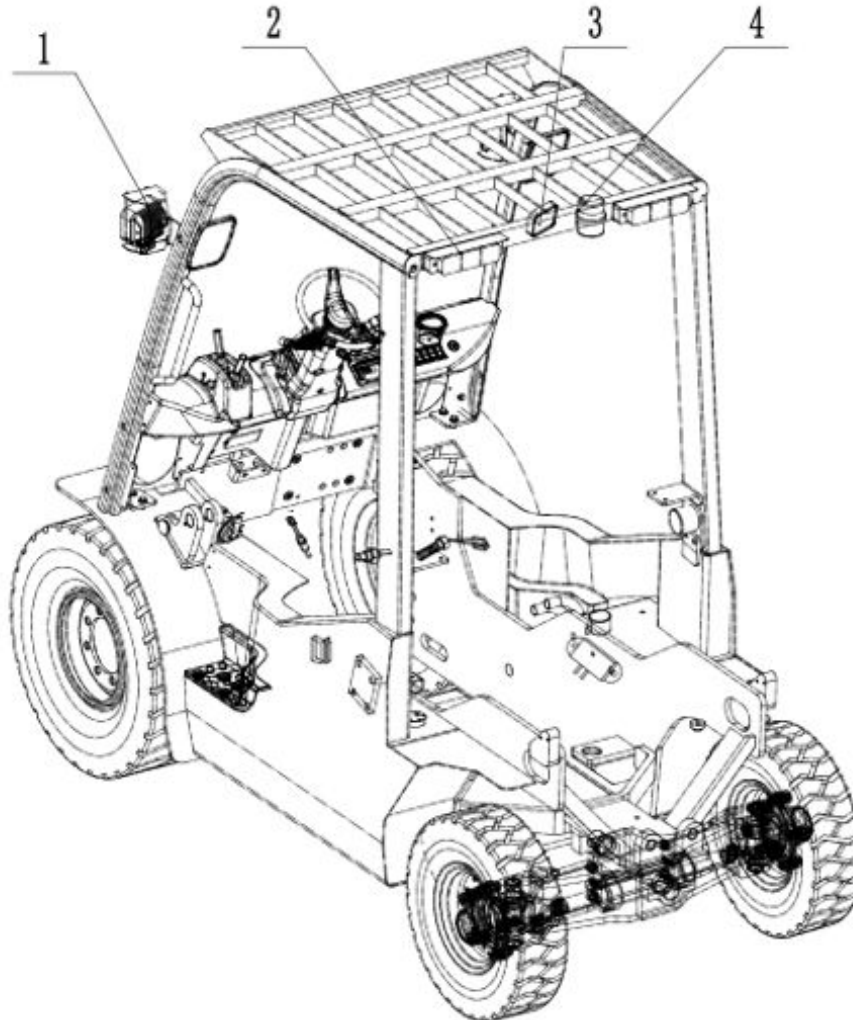
Remove and Install

1. Raise hood and disconnect battery negative wire.

NOTE: DO NOT touch lamp or inner reflector without gloves, or the skin sebum may cause lamp damage or reduce service life. Wear clean gloves or use lint-free

cloth to install or remove lights. Use alcohol and lint-free or napkin to clean surface oil or dirt. Any foreign particles or materials may cause hot spots on lamps, which may lead to lamp failure.

2. Remove bolts that hold lamp frame onto the truck frame to remove lamps. See Figure 20.



1. HEADLIGHT
2. TAIL LIGHT

3. REAR WORKING LIGHT (OPTIONAL)
4. WARNING LIGHT

Figure 20. Lights

Fork Replacement

STANDARD CARRIAGE AND INTEGRAL SIDESHIFT CARRIAGE

On trucks equipped with a standard carriage or an integral sideshift carriage, the forks are held on the carriage by hooks. Forks are held in position by pins that fit through the top fork hooks and into slots in top carriage bar.

If the pin does not remain engaged in the carriage slot, replace with a new pin. Always check that the pins for the forks keep the forks in position on the carriage. Replace damaged fork pin parts.

Remove

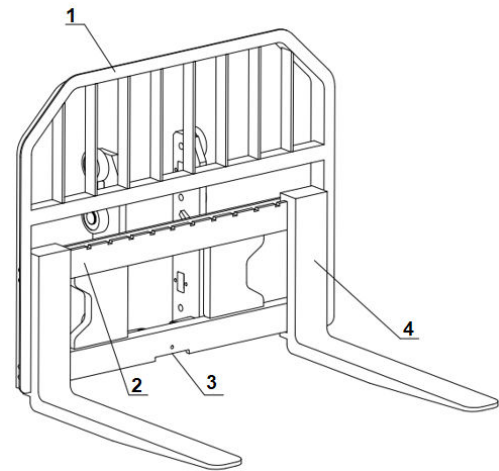


WARNING

DO NOT try to remove a fork without a lifting device. Each hook fork for these trucks can weigh 95 kg (209 lb) - 230 kg (507 lb).

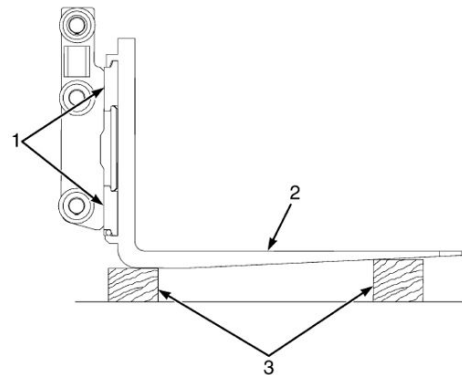
NOTE: Forks are to be replaced in sets by trained personnel only. **DO NOT** replace forks individually.

1. Slide the fork to the fork removal notch on the bottom bar of the carriage. See Figure 1.
2. Lower the fork onto blocks (see Figure 2), so the bottom hook of the fork moves through the fork removal notch.
3. Lower the carriage further so the top hook of the fork is disengaged from the top carriage bar. See Figure 1.
4. Move the carriage away from the fork or use a lifting device to move the fork away from the carriage.



- | | |
|------------------|-----------------------|
| 1. LOAD BACKREST | 3. FORK REMOVAL NOTCH |
| 2. CARRIAGE | 4. FORK |

Figure 1. Carriage and Forks



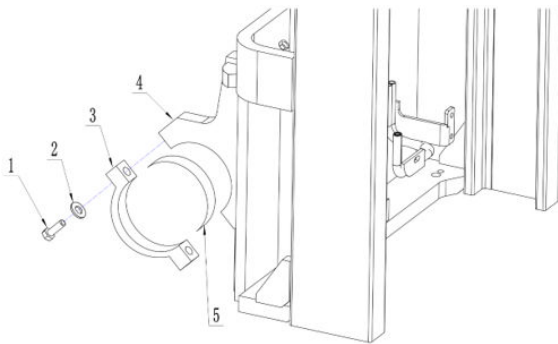
- | |
|------------------|
| 1. CARRIAGE BARS |
| 2. HOOK FORK |
| 3. BLOCKS |

Figure 2. Hook Fork

! ALERT

Allow mast to tilt forward enough to gain access to the mast mount capscrews.

7. Disconnect lower mast mounts from lift truck by removing bolts that hold bearing cap to the mounts on the drive axle. See Figure 15.
8. Use crane to lift the mast assembly from lift truck. Position mast across wooden beams on the floor with the carriage side up.
9. Check mast and bushing for wear or damage by removing bearing cap from the outer mast. See Figure 15.



1. BOLT
2. WASHER
3. TRUNION BEARING CAP
4. TRUNION BEARING SEAT
5. TRUNION BUSHING

Figure 15. Mast Mount Pivot Pins

DISASSEMBLE AND RE-ASSEMBLE

! WARNING

Always wear the proper protective equipment including eye protection and petroleum-resistant gloves when handling hydraulic oil. Thoroughly wash oil from exposed areas of skin as soon as possible.

! WARNING

Hydraulic oil is hot after system operation and can cause burns. **DO NOT** disconnect any hydraulic hoses until the oil in the system has cooled.

Completely lower forks to relieve hydraulic pressure before disconnecting any hydraulic hoses.

! CAUTION

Protect the hydraulic system from dirt and contaminants when disconnecting hydraulic hoses from the mast. If hydraulic system becomes contaminated, damage to the hydraulic system can occur.

1. Remove all hydraulic hoses, free-lift cylinder, and main lift cylinder. See **Cylinder** section in **HYDRAULIC SYSTEM** 1900YRM5009 .
2. Move the inner mast downward until the lower load roller is fully exposed. See Figure 16 or Figure 17.
3. Remove load roller from inner mast and middle mast. See Figure 16 or Figure 17.
4. Remove adjusting shim and slide block from middle mast. See Figure 16 or Figure 17.
5. Move inner mast upward until load roller mounting shaft reaches the gap above middle mast. Then move inner mast forward to remove it. See Figure 16 or Figure 17.
6. Perform steps of removing inner mast to remove middle mast.
7. For re-assembly, perform the steps above in reverse order. When installing side roller to the outer mast with bolts adjusting shim and washer, tighten nuts to 45-55 N•m (33-41 lbf ft). See Figure 16 or Figure 17.



WARNING

Installing improper electrical accessories or installing an electrical accessory incorrectly can increase the risk of equipment damage, personal injury and fire. **DO NOT** install electrical accessories to the truck unless you have been trained and authorized to do so. Personnel installing the electrical accessories must document the changes made to the truck. **DO NOT** install accessories which affect the truck's compliance with standard ANSI/ITDF B56.1, UL 558, or UL 583, or which otherwise affect the safe operation of the truck.



WARNING

Installing improper electrical accessories or installing an electrical accessory incorrectly can increase the risk of equipment damage, personal injury and fire. **DO NOT** install electrical accessories to the truck unless you have been trained and authorized to do so. Personnel installing the electrical accessories must document the changes made to the truck. **DO NOT** install accessories which affect the truck's compliance with standard EN 1175:2020.



WARNING

California Proposition 65 - Operating, servicing and maintaining a powered industrial truck can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

Combination Switch

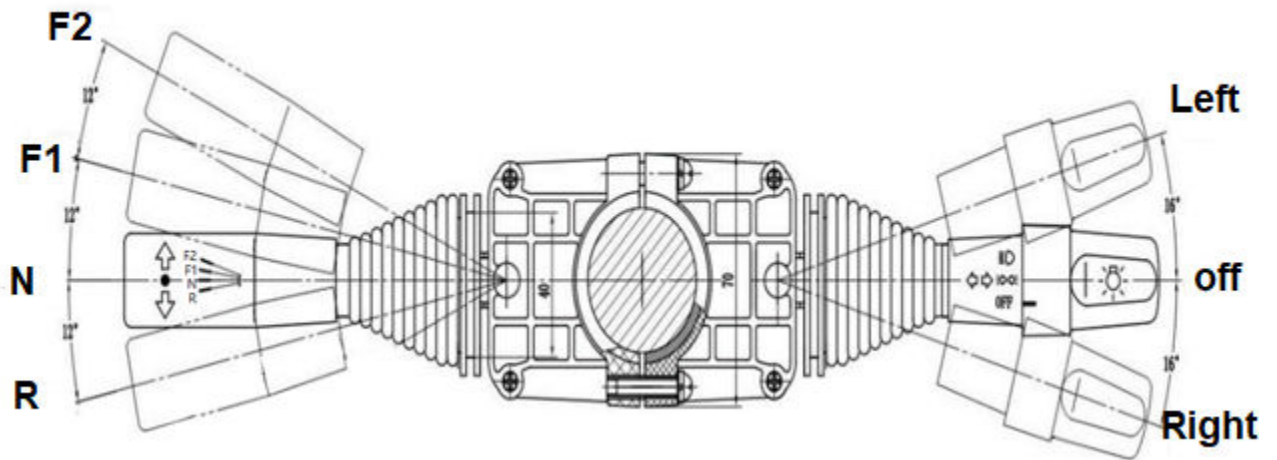


Figure 4. Combination Switch

The left handle represents turn directions of truck. When the handle is in turn position, the turn signal indicator begins to flash.

Table 1. Turn Signal Combination Switch

Left	Turn left. Left turn signal indicator flashes.
Off	Off. Turn signal indicator is off.
Right	Turn right. Right turn signal indicator flashes.

Table 2. Gear Shift Combination Switch

F1	Forward II (faster)
F2	Forward I
N	Neutral
R	Reverse

The Electro-hydraulic Transmission drive is controlled by a combination switch mounted on the steering column. Forward has two speed gears, and backward has one speed gear. Completely stop the truck before changing gears. When moving the lever to backward gear, the reversing light will be on.



CAUTION

Before starting the engine, move the shift gear to Neutral position.

Lift Cylinders

DESCRIPTION

Two single-acting lift cylinders are fixed on the back side of the outer mast channel, and the bottom part of cylinder are attached to the outer mast channel using pins and bolts, while the top part of cylinder is connected to the crossbeam of the outer mast channel. The piston strokes for the two cylinders shall be adjusted consistently, so the two cylinders lift synchronously.

The lift cylinder is mainly composed of cylinder body, piston, piston rod, cylinder cover, cylinder bottom, and sealing parts. One oil port is available in the lower part of cylinder body, while one return oil pipe is mounted in the upper part of cylinder body for a small amount of leaked oil above the piston to return to oil tank. The piston is fastened onto the piston rod using slot nut and cotter pine, and one YX seal ring, retainer ring and

wear ring are fitted on the outer edge of piston. This piston moves along the inner surface of cylinder body under the action of high-pressure oil. Shaft sleeve and dust ring pressed and matched are mounted in the inner hold of cylinder cover, and this shaft sleeve supports the piston rod, while the wiper keeps dust out of the cylinder. The piston stroke can be adjusted by cylinder cover.

When commanding lift, the high-pressure oil enters through the bottom part of lift cylinder to push the piston and the piston rod, and mast lifting is operated. When commanding lowering operation, the piston of lift cylinder drops under the effect of piston rod, mast, and cargo weight, for the oil under the piston to flow out. The oil drained out from lift cylinder is controlled by velocity fuse, and returns to tank through multi-way valve.

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