



Maintenance Manual of XGS28 MEWP



XCMG Fire-Fighting Safety Equipment Co., Ltd.



Maintenance safety instructions

Overview

This chapter includes fundamental safety instructions to be followed during the maintenance of aerial working platform. The maintenance personnel shall follow the safety warnings and precautions to prevent injuries to themselves or others and damages to the equipment. The maintenance plan shall be implemented to ensure safe operation of the machine.

WARNING

Any modification without authorization to the machine shall not be allowed until it is approved by the competent authority that the machine remains at the same level of safety as the original equipment.

The manual is emphasizing the specific instructions and precautions to be followed during the maintenance procedures. In most circumstances, such precautions must be followed during the maintenance and repair for hydraulic system and large components.

In maintenance of the equipment, the consideration of safety of working personnel and others shall be of first priority. Do not attempt to move any heavy components without the assistance of machinery and equipment. Do not place any heavy objects on unstable positions. The sufficient support shall be ensured when elevating any parts of the equipment. When elevating a part of the equipment, ensure that adequate support is provided.

WARNING

The owner/operator shall be responsible for the safety on maintenance site as the manufacturer is not capable to control the site inspection and maintenance procedures.

Safety of Hydraulic System

The hydraulic system of the machine is operating under the pressure of extreme danger. Therefore, please ensure to release the pressure of the system as much as possible prior to disassemble or remove certain parts of the system.

Under power switch-on, please repeat the cycle operation of proper control for several times and release the pressure of the system to guide the pressure from pipelines back to the oil tank. Please disconnect the hydraulic pipelines of the system components to minimize the loss of hydraulic oil.

Maintenance

DANGER

Any violations to the safety instructions of this chapter shall cause damages to machine or casualties to personnel.

- Ensure the replaced parts and components to be same or similar with the original ones.
- No smoking. No refueling during thunder and lightning. Ensure the fuel tank cap to be closed in safe conditions at any time.
- During maintenance, remove all rings, watches and jewelry.
- During maintenance, do not wear long hair or loose clothes or ties that are easy for winding to the equipment.
- Please follow all the safety warnings and precautions on the machine and written in the service manual.
- Clean any oil, grease and water on the standing surfaces and handrails.
- Please follow the instructions during the inspection of hot pressing coolant system.
- Prior to the operation below elevating big arm, the movement of the big arm shall be fixed or restricted through stop blocks or slings, or the safety support shall be applied.
- Please lubricate or maintain other components and turn off all the switches prior to adjustment.
- The battery shall be removed for the replacement of electronic components.
- Ensure all the supporting equipment and accessories are in correct positions.
- Only approved non-flammable cleaners shall be used.



Revision record

Initial issue on October 30, 2019



Table of contents

Maintenance safety instructions	III
Revision record	V
1 Specifications	1-1
1.1 Operating specifications	1-1
1.2 Specifications and performance parameters	1-2
1.3 Capacity	1-2
1.4 Component parameters	1-3
1.5 Tyres	1-3
1.6 Function and speed	1-4
1.7 Torque requirement.....	1-5
1.8 Lubrication.....	1-5
1.9 Main component weight	1-6
2 Maintenance precautions.....	2-1
2.1 Maintenance personnel responsibilities, requirements and PPE	2-1
2.2 Precautions before maintenance	2-2
2.3 Precaution during maintenance.....	2-3
2.4 Precaution after maintenance.....	2-7
3 Oil lubrication and maintenance	3-1
3.1 Lubrication.....	3-1
3.2 Oil and grease instruction	3-4
3.3 Inspection and regulation of telescopic wire rope	3-17
4 Maintenance.....	4-1
4.1 Periodic inspection of maintenance	4-1
4.2 Work platform.....	4-21
4.3 Slewing mechanism	4-22
4.4 Power system	4-26
4.5 Running system	4-35
4.6 Hydraulic system	4-41
4.7 Electrical system.....	4-48
5 Common faults and troubleshooting	5-1
5.1 Common faults and solutions	5-1
6 Schematic diagrams	6-1

6.1 Schematic diagram of hydraulic system.....	6-1
6.2 Schematic diagrams of electrical system.....	6-2
7 Appendix	7-1
7.1 Main components	7-1
7.2 Maintenance inspection record.....	7-2



Chapter 1 Specifications

1.1 Operating specifications

Table 1-1 Operating specifications

Maximum working load	
Unlimited	230 kg (507 lb)
Limited	340 kg (750 lb)
Maximum travel slope (longitudinal slope)	45%
Maximum travel slope (side slope)	5°
Maximum vertical platform height	26.2 m (85.9 ft)
Maximum operating radius of platform	23.2 m (76.1 ft)
Turning radius	6.7 m (22.0 ft)
Maximum travel speed	6.1 km/h (3.8 MPH)
Maximum pressure of hydraulic system	4500 psi (310 bar)
Maximum wind speed	12.5 m/h (28 MPH)
Max. hand-pushing force	400 N
Voltage of electrical system	12 V
Total weight (platform unoccupied)	16600 kg (36597 lb)

1.2 Specifications and performance parameters

Table 1-2 Specification and performance parameter

Turntable rotation	360° discontinuous
Turntable tail swing	1.50 m (4.92 ft)
Platform	0.9 m×2.4 m (2.95 ft×7.87 ft)
Total width	2.49 m (8.17 ft)
Stowed height	3.05 m (10.0 ft)
Stowed length	12.1 m (39.7 ft)
Wheelbase	3.00 m (9.84 ft)
Ground clearance	0.31 m (1.02 ft)
Travel speed	
Stowed:	6.1 km/h (3.8 MPH)
Raised:	1.1 km/h (0.68 MPH)
Ground loading capacity	5.5 kg/cm ² (78.3 psi)

1.3 Capacity

Table 1-3 Capacity

Fuel tank	180 L (47 gal)
Hydraulic oil tank	129 L (34 gal)
Engine oil capacity	
Cooling system	151 L (40 gal)
Crank case	9-10 L (10 quart)



1.4 Component parameters

Engine parameters

Table 1-4 Cummins engine

Type	Liquid cooling (engine oil)
Fuel oil	Diesel
Engine oil capacity	5 quart (4.5 L)
Cooling system	11 quart (10.5 L) (including filter)
Crank case	16 quart (15 L)
Idling rpm	900 rpm
Low speed	1600 rpm
High speed	2600 rpm
Generator	55 A, belt drive
Fuel consumption	
Low speed	7.19 L/h (1.90 gal/h)
High speed	9.46 L/h (2.50 gal/h)
Horsepower	66@3000 rpm, full load

Battery

Table 1-5 Battery specification

Voltage	12 V
Type	31-5
Cold boot current	1000CCA@0°F (-18°C)

1.5 Tyres

Table 1-6 Tyre specification

Dimension	Type	Layer	Load range	Weight
385/65/-22.5	Foam	14	G	193 kg (269 lb)

1.6 Function and speed

Table 1-7 Function and speed

Function	Time/s
Boom raising	60-75
Boom lowering	60-75
Turning left and right	125-150
Extending	55-70
Retraction	55-70
Platform rotates in a horizontal direction	18-25
Jib raising	33-45
Jib lowering	20-30
Traveling (forward)	33-45
Traveling (backward)	33-45
Traveling (boom elevated)	40-70

Machine positioning for speed test

Raising/lowering: The telescopic boom is retracted. Raise and record the time; lower and record the time.

Rotation: the boom is totally elevated. The telescopic boom is retracted. Rotate the turntable 360°.

Record the time. Rotate in reverse direction and record the time.

Telescopic boom: The boom is fully elevated; Retract the telescopic boom; Extend the telescopic boom and record the time. Retract the telescopic boom and record the time.

Driving (forward/backward): The test shall be conducted on smooth and level surface. The driving selection switch shall be set up in the position of high speed rotation. Test result shall be recorded at the distance of 200 ft. Drive forward and record the time. Drive backward and record the time.

Traveling (boom elevated): The test shall be conducted on smooth and level surface. The driving selection switch shall be set up in the position of high speed rotation. Test result shall be recorded at the distance of 50 ft. Drive forward and record the time. Drive backward and record the time.

Platform rotation: The platform is level and rotates towards one side to the end. Turn it in the other direction, of which time is recorded. Turn it in the other direction, of which time is recorded.

Jib elevation: The platform is level and take the boom as center. Start the test when the jib is lowered. Raise the jib and record the time. Lower the jib and record the time.

Test precautions

1. The stop watch shall be started in accordance with actual functions, other than the controller or switch.
2. All the speed tests shall be operated from the platform. All these speed tests shall not reflect operation from the ground.



3. During test, the action handle should be pushed to the end.
4. The speed of functions may be different due to the temperature and thickness of hydraulic oil. The temperature of hydraulic oil shall exceed 100°F during the test.
5. When the speed knob is turned to the slow gear, some flow-control function may be deactivated.

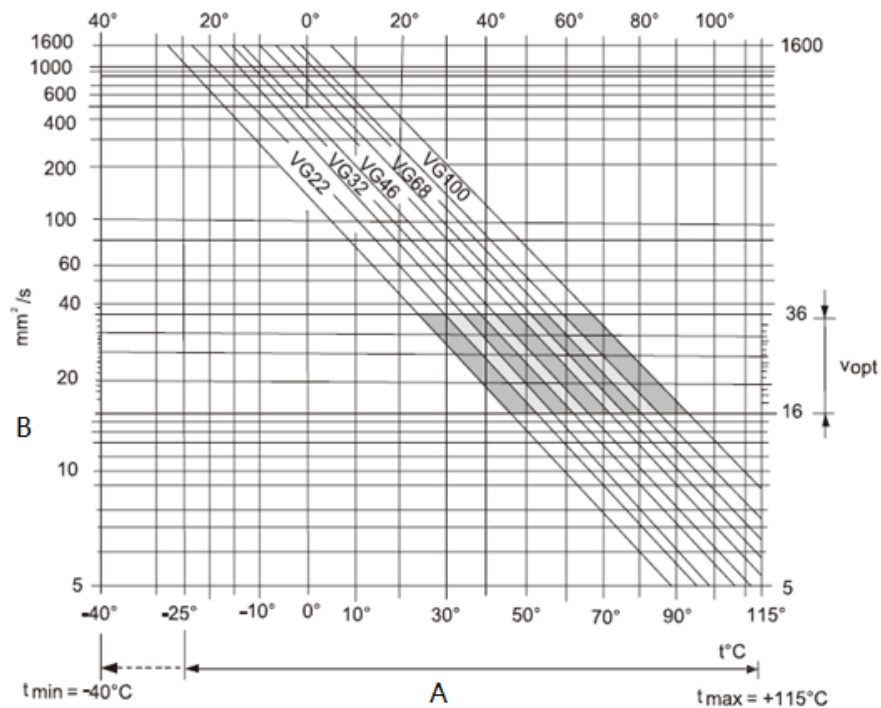
1.7 Torque requirement

Table 1-8 Torque requirement

Description	Torque value (dry)	Time interval (h)
Hub fastening bolt	320 Nm	150
Bolt for slewing bearing	250-280 Nm	50/600
Contact coil of excitation coil of starter motor	95 in*lb (9.5 N*m) 40 in*lb (4 N*m)	Depending on demand
After initial operation for 50 hours, please check the slewing bearing bolt every 600 hours to ensure it is safe.		
Note: In case the maintenance is required or fasteners become flexible, please refer to the Torque Table to confirm the proper torque value.		

1.8 Lubrication

Hydraulic oil



A. Oil temperature range

B. Viscosity

⚠ CAUTION

- **Note:** The hydraulic oil must contain anti-scaff agent complying to API GL-3 at least and possess the chemical stability enough to meet the operating requirement of mobile hydraulic system. XCMG recommends XCMG AE46 special anti-scaff hydraulic oil.
- Except the products recommended by XCMG, it is recommended not to mix different brands or types of oil because they may contain different necessary additives or do not have equivalent viscosity. If you need to use other hydraulic oils other than AE46, please contact XCMG for advice.

1.9 Main component weight

Table 1-9 Weight of main components

Component	Component weight	
	lb	kg
Turntable (excluding other components)	4072	1847
Counterweight	4003	8825
Mast	1050	394
Tower Boom	811	368
3rd section boom (SJ)	423.3	192
2nd section boom (SJ)	659	299
1st section boom (SJ)	1261	572
Boom assembly	2458	1115
Telescoping cylinder (800S)	551	250
Driven cylinder	600	272
Torque and wheel hub	50	23
Tyres and wheels (foam filling)	425.5	193

**Table 1-10 Torque table (1/3)**

The following values apply to galvanized/zinc chrome fasteners.							
8.8 metric bolts/8 metric nuts							
Dimension	Pitch	Tensile stress area	Applied load	Torque (Dry or Loctite 263)	Torque (Lubrication)	Torque (Loctite 262)	Torque (Loctite 242 or 271)
		Square millimeters	kN	Nm	Nm	Nm	Nm
3	0.5	5.0	2.2	1.3	1.0	1.2	1.4
3.5	0.6	6.8	2.95	2.1	1.6	1.9	2.3
4	0.7	8.8	3.82	3.1	2.3	2.8	3.4
5	0.8	14.0	6.2	6.2	4.6	5.6	6.8
6	1	20.1	8.74	11	7.9	9.4	12
7	1	28.9	12.6	18	13	16	19
8	1.25	36.6	15.9	25	19	23	28
10	1.5	58.0	25.2	50	38	45	55
12	1.75	84.3	36.7	88	66	79	97
14	2	115	50.0	140	105	126	154
16	2	157	68.3	219	164	197	241
18	2.5	192	82.5	301	226	271	331
20	2.5	245	106	426	320	383	469
22	2.5	303	132	581	436	523	639
24	3	353	153	737	553	663	811
27	3	459	199	1080	810	970	1130
30	3.5	561	255	1460	1100	1320	1530
33	3.5	694	302	1990	1490	1790	2090
36	4	817	355	2560	1920	2300	2690
42	4.5	1120	487	4090	3070	3680	4290

Note: The above torque value is not applicable for cadmium plating fasteners.

Table 1-11 Torque table (2/3)

The following values apply to galvanized/zinc chrome fasteners.							
Metric bolt at grade 10.9/metric bolt at grade 10/below hexagonal nut M6 at grade 12.9							
Dimension	Pitch	Tensile stress area	Applied load	Torque (Dry or Loctite 263)	Torque (Lubrication)	Torque (Loctite 262)	Torque (Loctite 242 or 271)
		Square millimeters	kN	Nm	Nm	Nm	Nm
3	0.5	5.0	3.13	1.9	1.4	1.5	2.1
3.5	0.6	6.8	4.22	3.0	2.2	2.4	3.3
4	0.7	8.8	4.47	4.4	3.3	3.5	4.8
5	0.8	14.0	8.85	8.9	6.6	7.1	9.7
6	1	20.1	12.5	15	11	12	17
7	1	28.9	18.0	25	19	20	28
8	1.25	36.6	22.8	37	27	29	40
10	1.5	58.0	36.1	72	54	58	79
12	1.75	84.3	52.5	126	95	101	139
14	2	115	71.6	200	150	160	220
16	2	157	97.8	313	235	250	344
18	2.5	192	119.5	430	323	344	473
20	2.5	245	152.5	610	458	488	671
22	2.5	303	189	832	624	665	915
24	3	353	220	1060	792	845	1170
27	3	459	286	1540	1160	1240	1690
30	3.5	561	349	2100	1570	1680	2310
33	3.5	694	432	2600	2140	2280	2860
36	4	817	509	3660	2750	2930	4020
42	4.5	1120	598	5860	4400	4690	6440

**Table 1-12 Torque table (3/3)**

The following values apply to galvanized/zinc chrome fasteners.						
Above hexagonal M6 at grade 12.9						
Dimension	Pitch	Tensile stress area	Applied load	Torque	Torque (Loctite 262)	Torque (Loctite 242 or 271)
		Square millimeters	kN	Nm	Nm	Nm
3	0.5	5.0			1.5	2.1
3.5	0.6	6.8			2.4	3.3
4	0.7	8.8			6.5	4.8
5	0.8	14.0			7.1	9.7
6	1	20.1	12.5	11	12	17
7	1	28.9	18	19	20	28
8	1.25	36.6	22.8	27	29	40
10	1.5	58.0	36.1	54	58	79
12	1.75	84.3	52.5	95	101	139
14	2	115	71.6	150	160	220
16	2	157	97.8	235	250	344
18	2.5	192	119.5	323	344	473
20	2.5	245	152.5	458	488	671
22	2.5	303	189.0	624	665	915
24	3	353	220.0	792	845	1170
27	3	459	286.0	1160	1240	1690
30	3.5	561	349.5	1570	1680	2310
33	3.5	694	432.5	2140	2280	2860
36	4	817	509.0	2750	2930	4020
42	4.5	1120	697.0	4400	4690	6440



LOG



Chapter 2 Maintenance precautions

2.1 Maintenance personnel responsibilities, requirements and PPE

1. Responsibility

Responsibilities of maintenance personnel: Maintain the MEWP and be responsible for safe and normal operation in accordance with the maintenance manual and safety rules provided by XCMG Fire-Fighting.

2. Basic requirements

Maintenance personnel shall comply with the following conditions:

- 1) Inspector and maintenance personnel should have the corresponding qualifications or be authorized.
- 2) Experienced professional technician or engineer.
- 3) Be familiar with the mobile elevating work platform to be maintained and its danger.
- 4) Received corresponding education and training, including the related courses in respects of special equipment usage.
- 5) Be familiar with the related working procedures and safety measures related to the maintenance of mobile elevating work platform.

CAUTION

- Only the trained personnel with certificate after examination can maintain this MEWP.
- Any operation or maintenance shall not be performed by the person unable to work normally due to medicine-taking, suffered from illness or excessive drinking.

3. Personnel protection equipment

- 1) The operator must use the PPE during operation on the machine.
- 2) Select the proper safety devices according to the working conditions, such as safety helmet, safety gloves, goggles, safety belt, safety shoes and hearing protection device.

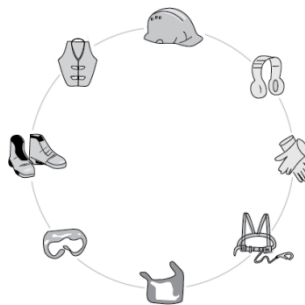


Figure 2-1 Personal protective equipment

- 3) Check the safety devices before and after work, and maintain or replace according to the stipulated procedure.
- 4) The inspection and maintenance records shall be saved as needed.
- 5) As some devices, such as the helmet and safety belt, may be damaged after used for a long time, regularly inspection and replacement shall be done.

⚠ CAUTION

- The safety device shall be inspected at an interval and replaced if damage is found.
- All PPE cannot provide 100% of protection.
- For your and others safety, please correctly wear the PPE and be familiar with the various danger encountered in the operation.

2.2 Precautions before maintenance

⚠ CAUTION

The periodic maintenance on mobile elevating work platform shall be carried out by the professionals.

1. Ventilation

⚠ WARNING

Inspection or maintenance in confined spaces with poor ventilation may result in poisoning.

Take forced ventilation measures when starting the engine in place with confined space. Connect a hose to exhaust pipe so as to get the exhaust outside. Open doors and windows for full air circulation.

2. Cleaning of work sites

Maintenance and inspection in disorganized site may lead to personal injury and falling accidents. Therefore, clean the site and remove all obstacles prior of operation.

3. Shut off the engine before inspection or maintenance.

To prevent accidents, do not check or maintain during the running of engine.

Remove the start key and place a warning board "Do Not Operate" on the door or the joystick of control panel for warning.

⚠ WARNING

It may result in mechanical damages or personal casualties if the engine is started by any unauthorized personnel by accident in the process of inspection and maintenance.

4. If inspection or maintenance has to be done while the engine is running, it should be done by 2 persons at least; One must be in front of turntable control panel or platform control panel to turn off the engine

at any time if necessary; The other performs inspection or maintenance. Personnel shall keep close contact with each other so as to complete operating tasks safely.

5. Before inspection or maintenance, ensure to clean up the mobile elevating work platform.

The dust or chip on the elevating platform is not only causing the faulty components/parts difficult to find, but also possible to get in the components/parts. Besides, dust or mud may cause eye damage or personnel injury due to slipping down.

6. Do not directly aim at electrical control cabinet and joints of wiring when cleaning the machine with high-pressure water; Otherwise, it will result in short circuit.

⚠ WARNING

Do not aim the water or steam jet to any electrical component! Otherwise, it will result in electrocution hazard!



2.3 Precaution during maintenance

1. Fire hazard prevention.

Clean the parts and components with incombustible detergent.

Fuel oil and grease articles shall be stored in the place far away from flame or spark sources.

No smoking.

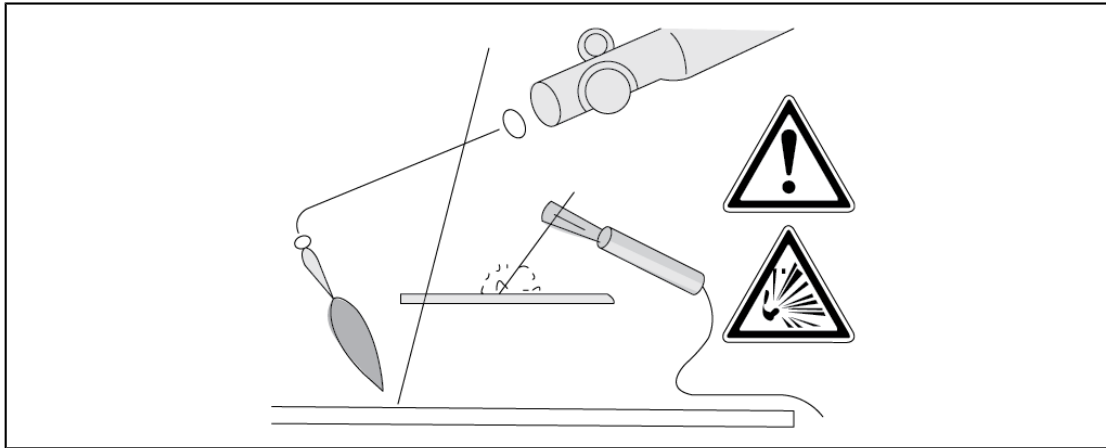
Do not allow any flame or spark source close to any inflammable.

Keep a fire extinguisher ready for use at any time and know how to use it.

Use explosion-proof lamps when checking fuel, oil and battery fluid.

Keep the inflammable away from flying molten sparks or molten metal in the process of grinding or welding operations.

2. Any welding and repair on each part of elevating platform shall be carried out by the professional personnel.

**CAUTION**

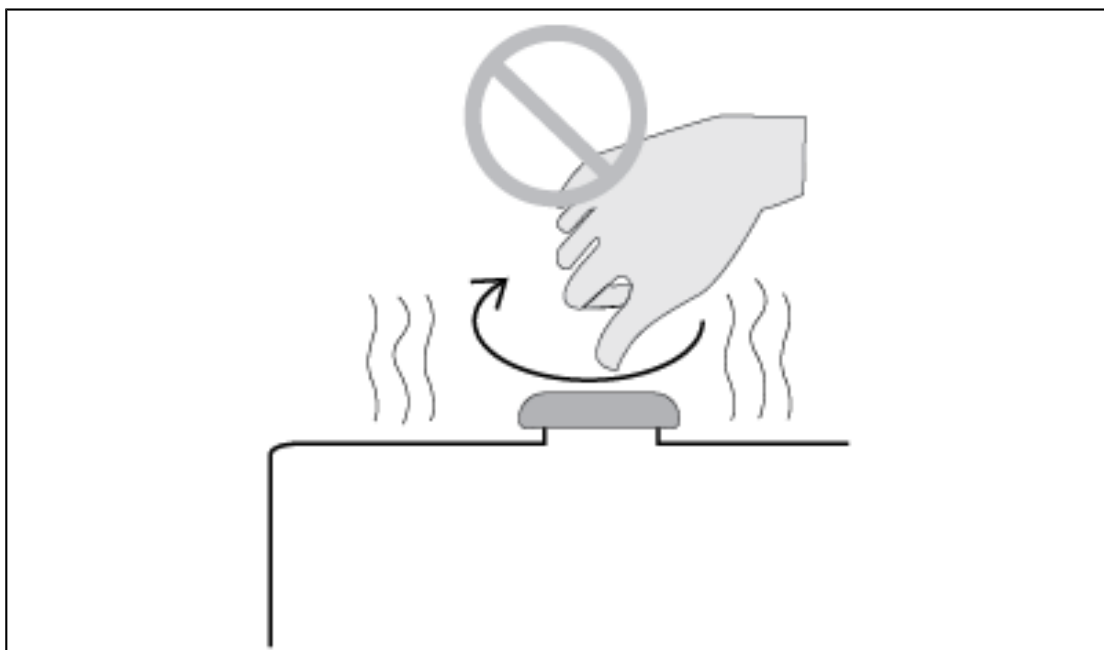
In order to prevent the electric components such as controller and sensor from burning out due to the electric circuit formed by the positive/negative electrodes of the welding machine and the vehicle body, the battery positive and negative wires must be removed during welding operation; Otherwise, the consequences shall be borne by the user.

WARNING

Do not use this machine as ground during welding.

3. Check or maintain the machine after its temperature reduced.

The temperature of each mechanical components is very high when the machine is operating and it can cause scalding by contacting with it. These components include the engine, muffler, engine coolant, radiator, hydraulic oil, reducer, hydraulic device and accessories. Before inspection or maintenance, it is needed to cool down these parts or components.



4. Pay attention to the mounting positions when removing the parts and components. Ensure proper installation during installation.

⚠ CAUTION

Do not disassemble electrical components.

5. Do not make tools or parts falling into the inspection hole.
Do not have any object falling into the inspection hole when the operation through this hole facing downwards. Otherwise, the object may damage or mistakenly start the machine.
Any tool or object that have fallen into the hole must be taken out.
6. Check and adjust the parts to be replaced according to data on schematic diagrams in case of replacing electrical, pneumatic or hydraulic components (valve, pump, etc.).

⚠ WARNING

Use the parts approved by the manufacturer only, especially parts that critical to bearing and safety.

7. Only after obtaining the approval from the manufacturer, can refit or modify the parts that may affect the platform stability, strength and serviceability, such as the structures, load-bearing parts, electrical components and hydraulic parts. Otherwise, do not modify or refit the mobile elevating work platform.
8. Be careful about high pressure oil.
High-pressure fuel oil or hydraulic oil may cause severe injuries to skin or eyes. To avoid such danger, it is necessary to comply with the following instructions:
 - 1) Release pressure from the pipeline before removing the pipe.

- 2) Wear protective goggles and gloves when checking for leakage. Leakage of high-pressure oil may result in blind so that it is necessary to use hard paper board or wood chip to confirm oil leakage. Do not confirm with hands.



9. Be careful about high-temperature parts of cooling system.

Steam or hot water will splash out and result in scald if the radiator cap is removed when the engine coolant is very hot.

After the coolant temperature reduced, stay away from the front of radiator cap, loosen the cap slowly on alert posture and take down the cap after the steam pressure is released.

10. Remove the cable of battery before inspection and maintenance electrical system.

It may result in short circuit and cause damages to wirings, electrical components and electronic components of electrical system if inspection and maintenance of electrical system before removing cables of battery.

Ensure to remove the cable on negative wiring terminal (the ground side) before starting inspection and maintenance of electrical system.

11. Be careful about battery fluid.

Battery fluid contains dilute sulfuric acid. The battery electrolyte may blind your eyes or burn your skin if get in touch with it. Therefore, when disposing of batteries, you must wear goggles, protective gloves and long-sleeved overalls.

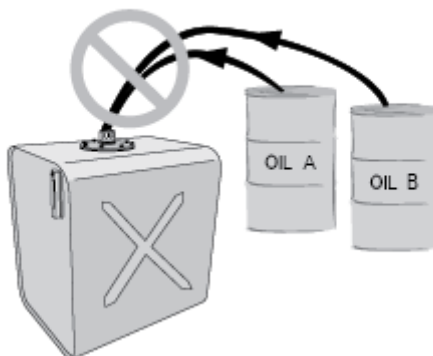
Please wash immediately with a lot of water and go to a doctor for treatment if battery fluid contacts eyes or skin.



12. Use specified oils or greases.



It is necessary to use oils and lubricating grease of recommended brands or of same grade to recommended brands. Chemical reaction will change characteristics of grease and cause adverse influence on mechanical performance if mixing greases of different grades. Ensure to remove original grease thoroughly before injecting new grease when using different grease on the machine.



13. Support the boom and platform when repairing.

Generally, it is prohibited to perform maintenance when the platform is elevated; In case of special demands, boom and platform shall be supported reliably so as to ensure the machine to be safe and reliable in the process of repair and maintenance.

2.4 Precaution after maintenance

1. After maintenance, the operation function must be checked for early detection of oil leakage or poor operation.
2. Mechanical maintenance positions must be validated for movement functions, oil leak, bolt looseness and other problems after maintenance.
3. Resume or reset the safety device, and if necessary, re-calibrate the safety protective devices.
4. Remove away the tools and equipment for maintenance, as well as the replaced parts and scattered objects, and clear the site.
5. Keep in mind that all "maintenance operations" shall include compulsory confirmation of mechanical normal movements.

CAUTION

Dispose of the hazardous waste legally such as oil, fuel, filter element, battery and hydraulic oil, etc. Reasonably recycled the used oil, coolant and filter element, which not only saves resources, but also protects the environment.

It is prohibited to dump waste liquids at will in sewers, surfaces, rivers, etc. Waste liquid from the machine shall be discharged into the appropriate container for proper treatment.

Whenever possible, the disposal of hazardous wastes shall comply with all environmental regulations and rules; Otherwise, it will be fined or punished by relevant departments.





Chapter 3 Oil lubrication and maintenance

3.1 Lubrication

In order to ensure the service life of the mobile elevating work platform, each part of the equipment with relative movement must be lubricated at regular intervals. See [Figure 3-1](#) and for the lubrication locations of this machine, see [Table 3-1](#) for the cycle and method.

CAUTION

Mixing of lubricating grease with different trade marks will change their characteristics and damage the equipment. When replenishing the hydraulic oil, the added oil must be the same as the hydraulic oil brand being used for the mobile elevating work platform.

Dust in the lubricating grease will result in the abrasion of the sliding surface earlier than expected and shorten the service life of the mobile elevating work platform. The grease cup and other surfaces must be clean up before the lubricating grease is added.

Nonobservance of lubrication interval or absence of lubrication will give rise to the equipment damage and increase the maintenance cost and downtime.

DANGER

During lubricating, operation of vehicles by irrelevant personnel is prohibited. The unexpected gesture of the mobile elevating work platform will bring the operating personnel serious fatal consequences.

In case that the lubricating grease enters into the eyes, immediately rinse thoroughly with water and see a doctor at once. In case that the skin is contacted with the lubricating grease, rinse thoroughly with water.

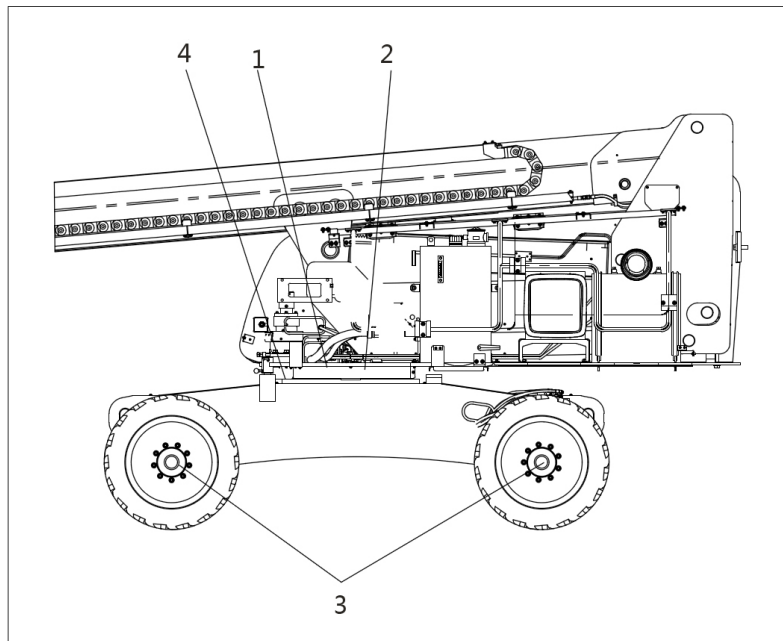


Figure 3-1 Schematic of chassis lubrication

Table 3-1 Lubrication cycle and methods

S/N.	Filling positions	Cycle	Grade of lubrication oil and grease	Filling method
1	Slewing bearing raceway	Per 100 working hours	Mobilux EP2 NLGI 2	Oil gun filling
2	Slewing bearing's gear	3 months	Mobilux EP2 NLGI 2	Lubricating
3	Running mechanism	6 months or per 500 working hours	L-CKD220 gear oil (GB5903)	
4	Slewing mechanism	6 months or per 500 working hours	L-CKD220 gear oil (GB5903)	

CAUTION

The unlisted sliding surface should be greased as the case may be.

When the hydraulic cylinder (luffing cylinder and steering cylinder, etc.) is retracted completely, the piston rod part exposed in the air and connecting rod and slipper lubricated before delivery are also required for proper lubricating maintenance.



⚠ CAUTION

The lubrication cycle is established on the basis of assuming the mobile elevating work platform to be used in normal operating conditions. If the mobile elevating work platform is used in poor conditions (like dusty), the inspection periods shall be shortened accordingly.

3.2 Oil and grease instruction

See [Table 3-2](#) for the oil grades of each parts and its filling quantity and maintenance period. See [Table 3-3](#) for the domestic and foreign similar oil type comparison.

Table 3-2 Use of oil and grease

S/N.	Filling position	Types	Applicable temperature and model	Theoretical filling quantity/L	Period of oil changing/h	Remark
1	Fuel tank	Fuel oil	Summer: 0# Winter: -10#	180	---	
2	Engine	Engine oil	Fill 15W/40 diesel engine oil when the environment temperature is above -10℃; Fill 10W/30 diesel engine oil when the environment temperature is between -20~ -10℃; Fill 5W/40 diesel engine oil when the environment temperature is between -30~ -20℃;	6~8	3 months or 250 hours	Oil meeting API CH4/CI4 is recommended.
3	Cooling system	Anti freeze s	Above -36℃	15~20	1 years or 1000 working hours	

**Table 3-2 Use of oil and grease(continued)**

4	Slewing mechanism		Gear oil	L-CKD220	1.0	See replacement cycle of gear oil for details	
5	Axle	OMN2		L-CKD220	2.5		
		RR			2.5		
6	Hydraulic system		Hydraulic oil	1. Fill AE46 anti-wear hydraulic oil for the area with the ambient temperature above -15°C; 2. Fill HS22 hydraulic oil in regions with $\leq$ -15°C environmental temperature. 3. For special application, choose hydraulic oil according to real demand.	400 L	2 years or 2000 working hours for normal use	

Table 3-3 Comparison table of equivalent oil models domestic and abroad

Classification	Engine oil capacity	Slewing reducer Running reducer	Hydraulic oil
Name	Diesel engine oil	Industrial gear oil	Anti-wear hydraulic oil
PetroChina Company Limited	CH-4	L-CKD220 L-CKD320	AE46, HS22
MOBIL	Delvac super	Mobilger630 Mobilger632	Mobil DTE 11M, 13M, 15M
SHELL	Rimula D	Omala220 Omala320	Tellus 22, 32, 46
CALTEX	EDLA500	Meropa220 Meropa320	Rando oil HD32, 46
CASTROL	RX Supper 15W/40 RX Super	Alpha Max220 Alpha Max320	Hyspin AWS 15, 32, 46 Hyspin AWH 15, 32, 46
TOTAL	Rubia XT	Carter EP220 Carter EP320	AZOLLAZS 32, 46
BP	Venellus c3 Extra	Energol GR-XF220 Energol GR-XF320	Bartran HV22 Energol HLP-HM 32, 46

CAUTION

- Please use lubrication oil, antifreeze and hydraulic oil recommended by XCMG and do not mix different brands of oil.
- The hydraulic oil shall not be used for more than 24 months. After more than 24 months, it cannot be used even after filtering.
- Maintain the oil level. Oil shall be replenished when the oil level is below the specified value.

WARNING

Before oil replenishing, it is necessary to wait for the equipment temperature to drop to indoor temperature; Otherwise, it may cause splashing and cause burn accident.

1. Fuel oil

Liquid level check

For the inspection of fuel level, turn the key switch to the platform or turntable position and observe the display of turntable panel; replenish the fuel if needed.

Replenishment



The fuel tank is on the right side of the rotary table. See Table 3-2 or reference to Engine Specification for the fuel tank capacity and the selection of fuel oil.

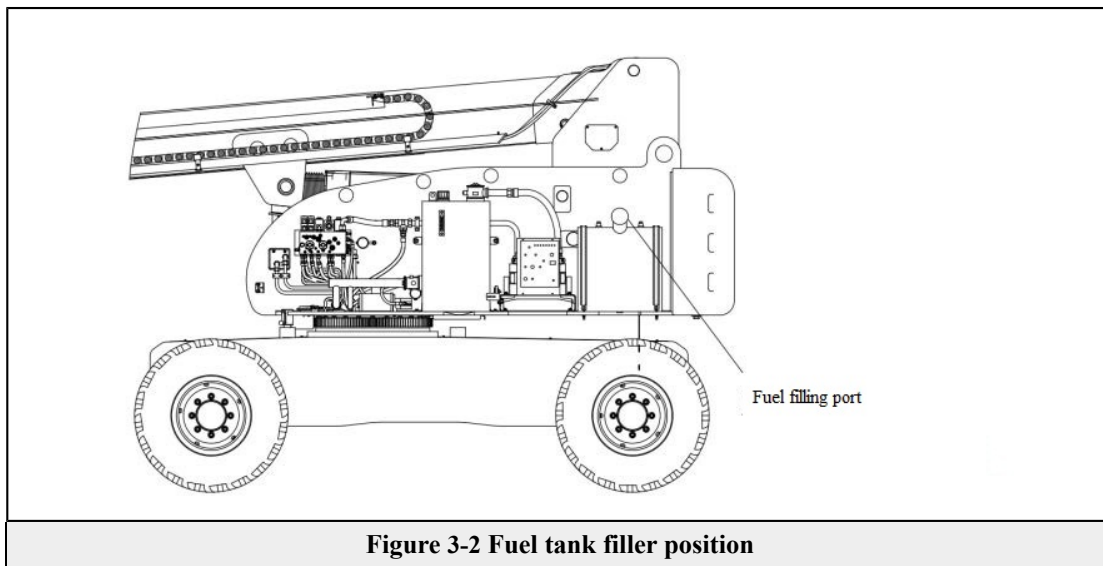


Figure 3-2 Fuel tank filler position

CAUTION

- Turn off the engine before adding the fuel oil to prevent fires.
- Tighten the fuel tank cap and lock after each refueling to prevent fuel tank cap from falling off or fuel oil from evaporating.
- After refueling, the scattered fuel oil must be cleaned up. No diesel oil is allowed on the engine to prevent fires.
- When refueling at emergency, the vessel used shall pass the safety inspection and meet the fire rating requirements if using the portable vessel to refuel. The portable vessel shall be able to lock the cap automatically to prevent the leakage of the interior fuel oil.

2. Engine oil

Liquid level check

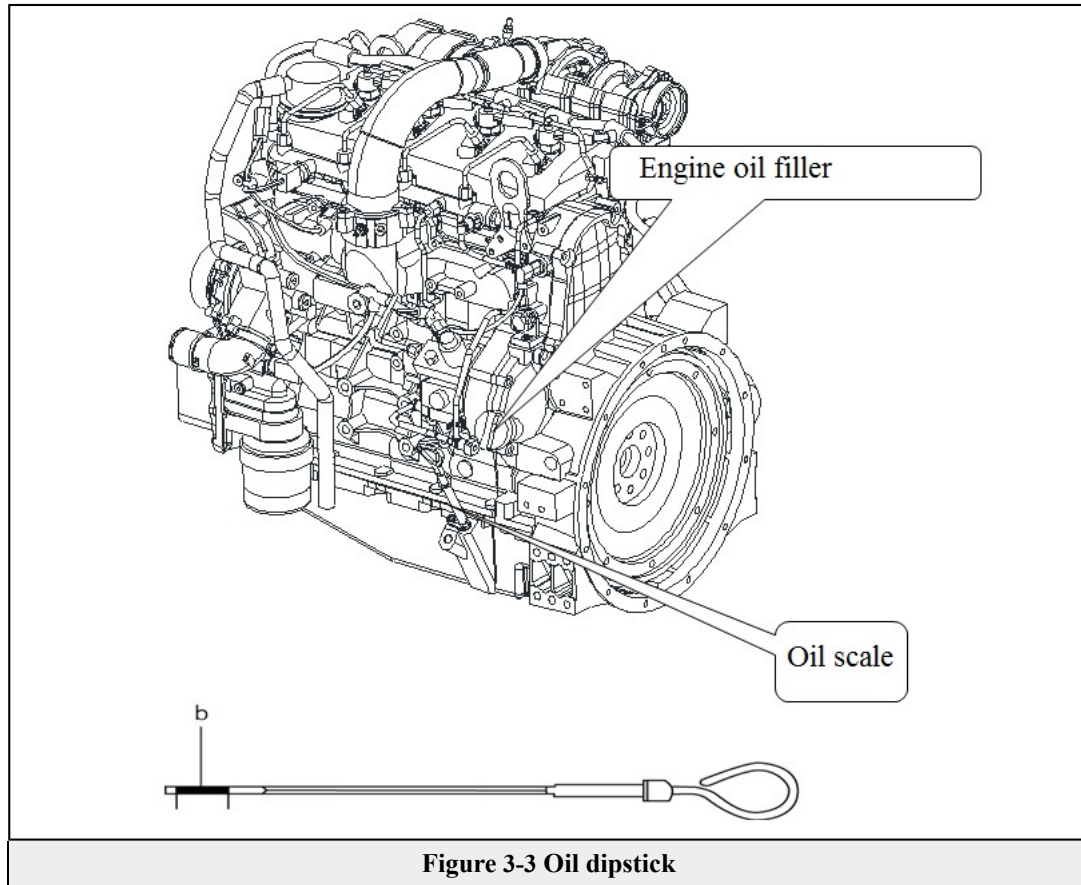
It is recommended to check the level of the engine oil according to the following steps:

- 1) Open the left-side frame panel of the rotary table;
- 2) Find out the engine dipstick (the engine head);
- 3) Take down the oil scale from the engine;
- 4) Observe whether the immersed part of the oil scale is in Identification Area b, as shown in [Figure 3-3](#);

Replenishment

- 1) If the oil level is too low, open the cap of the engine oil;

- 2) Fill the engine oil. See [Table 3-2](#) for the selection of the engine oil;
- 3) Tighten the oil cap to prevent the engine oil leaking.



3. Antifreeze

Liquid level check

Open the radiator cap and observe the liquid level of the antifreezes. The antifreeze level shall be at the bottom of the filling neck of the radiator under normal circumstances.

CAUTION

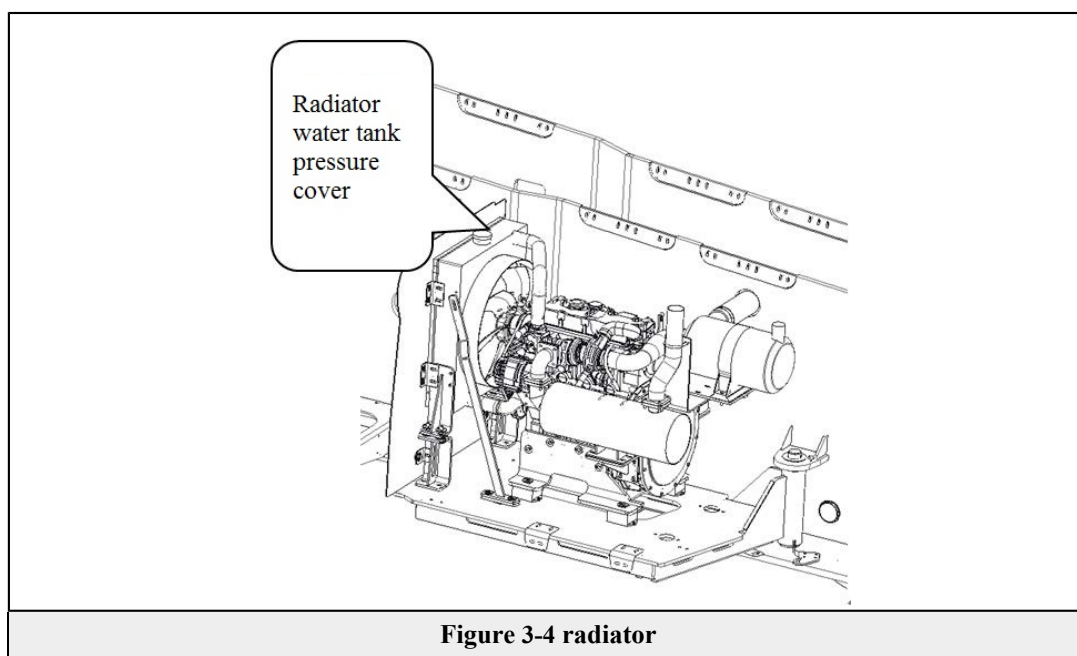
- When checking the engine fluid, the engine shall be in a stopped state and cooled to the environment temperature.
- When the machine is running normally, if you want to check the fluid level of the anti-freezes, you must shut down the machine and check after the engine shuts down and the water temperature drops below 104 °F (40 °C) to prevent high temperature liquid and steam wounding risk. Slowly remove the water filler cap to release coolant system pressure.

Replenishment



The radiator of this vehicle is in front of the engine, as shown in **Figure 3-4**. When the antifreeze is insufficient, supplement it in time. See **Table 3-2** for the selection of the antifreezes. The antifreeze supplement method is as follows:

- 1) The supplementary method of the antifreezes is as follows: Open the radiator cap in the engine-cooled state and supplement the antifreezes inwards to the bottom of the filling neck of the radiator;
- 2) Cover the pressure cap completely and then operate the engine until its temperature reach 82°C to check the cooling liquid for leakage.
- 3) Check the level of the cooling liquid to en-sure the cooling liquid of the cooling system is sufficient.

**⚠ WARNING**

When the engine is in condition of high temperature above 104 °F (40°C), do not fill the antifreezes, or it may result in an engine explosion.

This machine requires to use the specialized antifreezes as the engine fluid. And replace antifreezes of different models according to the minimum temperature in the environment of the vehicle.. Do not take pure water, tap water or seawater as a substitute for antifreeze even the temperature is above 0°C. Due to the lack of necessary preservatives, anti-rust agents and other additives in the water, it may cause the corrosion and blocking of the engine and cooling system to influence the use of the vehicle.

⚠ CAUTION

- The engine should not use the antifreeze made of “ethyl alcohol-water” for the engine.
- Do not use seawater to cool the engine directly.
- The antifreezes can be added according to the Engine Specification. Its freezing point shall be 5°C below the minimum temperature of the using area when applying the antifreezes.

4. Gear oil

Service life

The gear oil will be filtered or changed after three months from the date of delivery and every six months thereafter.

⚠ CAUTION

- The gear oil shall be replaced whenever it is found being polluted seriously, even if the oil change period is not reached.
- Check oil level frequently. Oil shall be replenished when the oil level is below the specified value.
- No mixture of gear oil in different marks is allowed.

Application of gear oil

See the specific sections for the application method of the gear oil for each main position.

5. Hydraulic oil

Service life

The replacement period of the hydraulic oil is normally 2 years or 2,000 hours for normal use.

The user shall sample and test the hydraulic oil on a regular basis. For products in normal use, it is recommended to take samples once a year; for products that work frequently and in harsh environments, it is recommended to take samples once every quarter. Whenever serious contamination of hydraulic oil is found, it shall be filtered or replaced in time.

⚠ CAUTION

- The hydraulic oil shall not be used for more than 24 months. After more than 24 months, it cannot be used even after filtering.
- Whenever serious contamination of hydraulic oil is found, it shall be filtered or replaced in time, and the suction oil filter element on hydraulic tank shall be replaced at the same time.
- Select the appropriate hydraulic oil in the grade provided according to the ambient temperature.
- The product is full hydraulic drive. The quality, viscosity and cleanliness of hydraulic oil are very important to the normal operation of mobile elevating work platform. If you ignore the replacement of hydraulic oil, it may cause various failures of the machine and seriously shorten its service life. The company will not be responsible for all the consequences of your failure to replace and filter the hydraulic oil as required in this instruction.

The contamination grade of hydraulic oil solid particles is: Do not exceed 17/14 when replenishing into hydraulic oil tank and 19/16 during use. See [Table 3-4](#) for the judgment of hydraulic oil contamination.

Table 3-4 Hydraulic oil contamination judgment

Appearance color	Smell	Contamination condition	Treatment measure
Transparency and no change	Normal	Non-contamination	Continue to use
Transparent but dark	Normal	Mix with other kinds of oil	If the viscosity is qualified, continue to use
Transparent and shiny	Normal	Mix with metal chips	Filtering or replacing the oil
Transparent with black spots	Normal	Mixed with foreign matter	Filtering or replacing the oil
Black brown	Frowziness	Oxidative deterioration	Replace oil
Milk white	Normal	Mix with air or water	Separate moisture or replace oil

If the hydraulic oil is seriously polluted but not spoiled, it is necessary to filter and reuse the hydraulic oil. If the hydraulic oil has been spoiled and can no longer be used, the hydraulic oil must be replaced. The selection of hydraulic oil is shown in [Table 3-2](#). The oil tank shall be cleaned at the same time while the hydraulic oil is replaced to prevent the contamination of the oil.

⚠ CAUTION

Effective measures shall be taken to prevent the hydraulic system from dirt during assembly, installation, maintenance and repair.

Operation temperature of hydraulic oil

1) Overhigh operation temperature

If the hydraulic oil is above 60°C for a long time, it will accelerate the deterioration and the life of the hydraulic components is reduced, so the filtration and replacement cycle need to be shortened; When the temperature of the hydraulic oil exceeds 60°C, measures should be taken to control the temperature of the oil even if the oil temperature is still within the operating temperature range. When the temperature of hydraulic oil system exceeds 80°C, the volumetric efficiency of the power components (gear pump) used for the hydraulic system will sharply drop and the sealing performance will also drop sharply, especially when the engine is at idle speed, which may lead to the hydraulic system not working.

2) Overflow operation temperature

When the temperature of oil in hydraulic system is below -20°C, the hydraulic system responds slowly and thus it is difficult to start up the engine. Pay attention to the hydraulic oil viscosity during operation.

When the temperature of the hydraulic oil is very low, its viscosity will increase and the mobility gets worse. In cold weather, if the mobile elevating work platform is allowed to be operated at high speed or with heavy load before the hydraulic oil temperature raising, the hydraulic components will be possibly damaged. Therefore, do not immediately go into service when the ambient temperature is relatively lower. The mobile elevating work platform shall be sufficiently heated by idling up to the hydraulic oil temperature rising around 20°C.

3) Choose of hydraulic oil

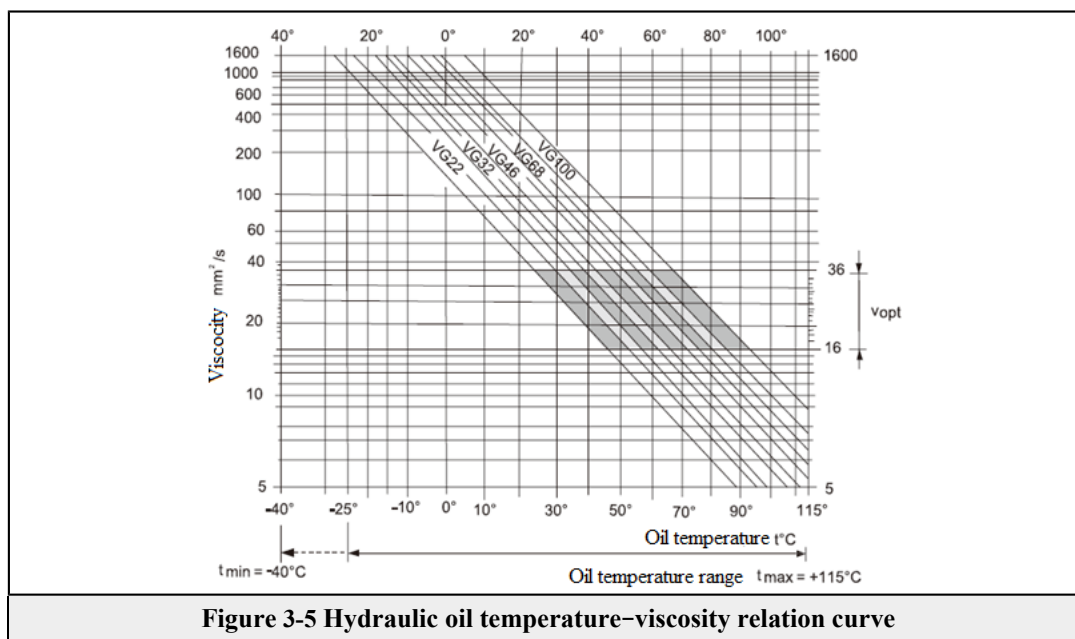


Figure 3-5 Hydraulic oil temperature-viscosity relation curve

Note: The temperature viscosity curve of L-HM series hydraulic oil, of which the range of application is between AE46 anti-wear hydraulic oil and HS22 hydraulic oil is described Figure 3-6.

Application of hydraulic oil

1) Liquid level check

You can find the hydraulic oil tank on the right side of the frame and the oil volume should be checked when the mobile elevating work platform is in transportation position. The temperature and level gauge could not only display the oil level scale, but also the hydraulic oil temperature. Besides, the oil level must be kept between Min. and Max, as shown in [Figure 3-6](#).

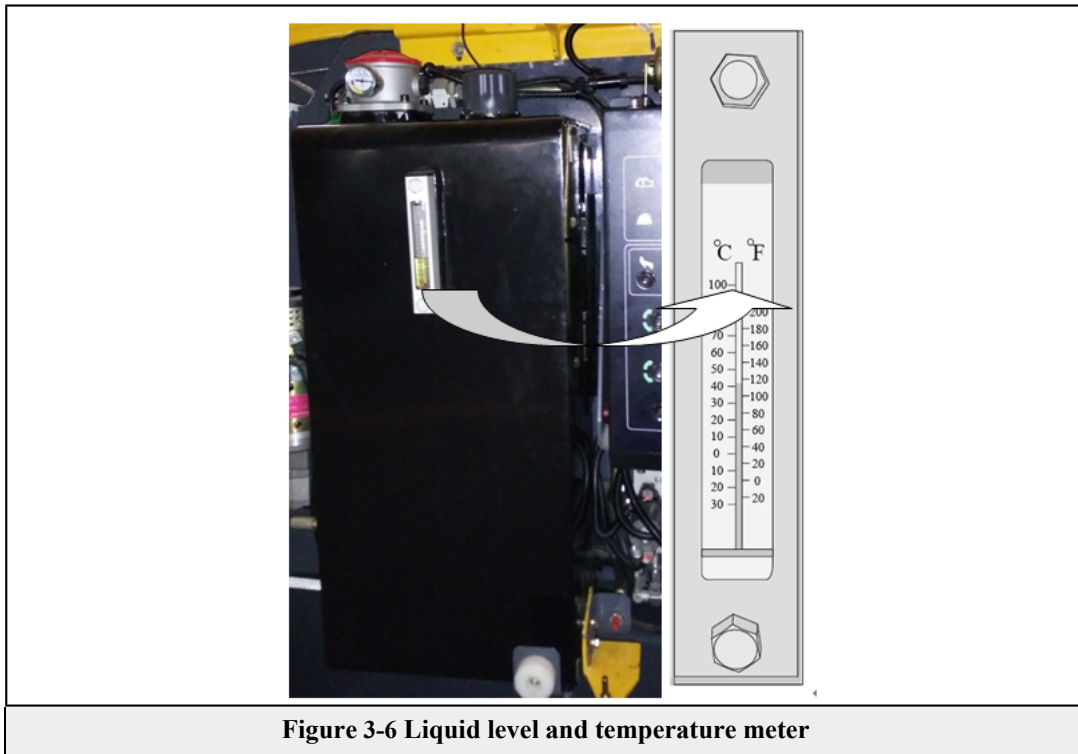


Figure 3-6 Liquid level and temperature meter

CAUTION

During the inspection of hydraulic oil level, the machine shall be in transportation status and the boom shall fully retract.

WARNING

The inspection of hydraulic oil level can only be carried out after the mobile elevating work platform stops operating and the hydraulic system completely cools down to the environment temperature. Otherwise, serious burns can be caused on you!

2) Replenishment

At transportation status, hydraulic oil level is not allowed to be lower than the scale of 80°C. If it's lower than the scale of 80°C, hydraulic oil shall be filled promptly.

Refilling measure: Open the air filter cover on the tank and refill the same hydraulic oil through the air filter screen. The selection of hydraulic oil is shown in Table 3-2.

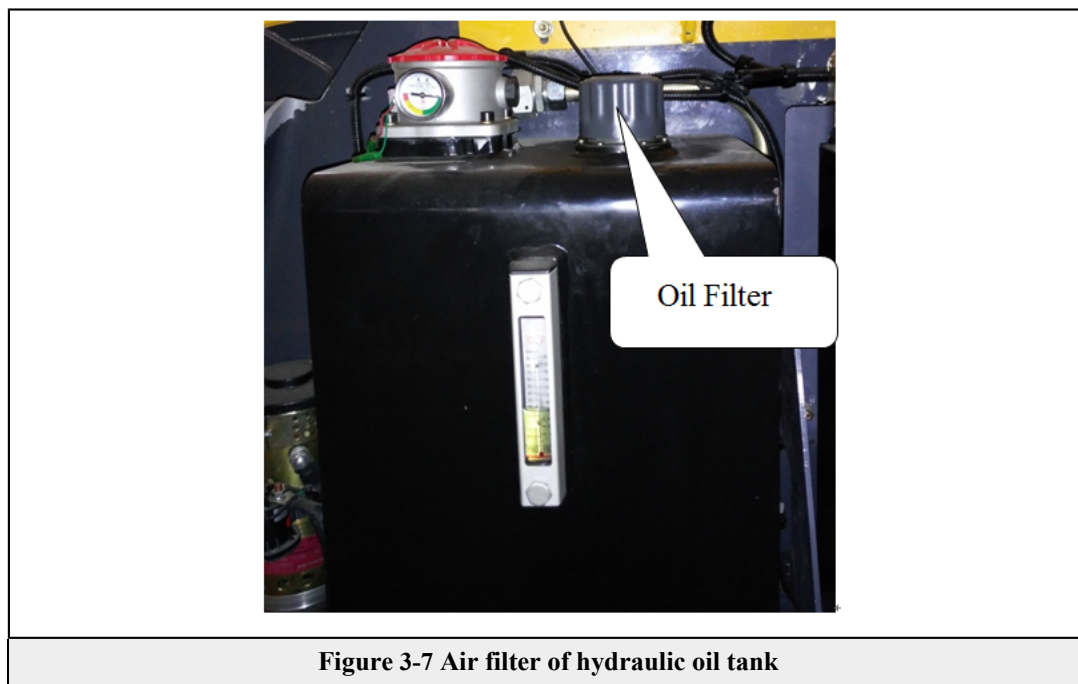


Figure 3-7 Air filter of hydraulic oil tank

Mixed hydraulic oils of different grades will change oil characteristics and cause damage to the equipment. When replenishing the hydraulic oil, the added oil must be the same as the hydraulic oil brand being used for the mobile elevating work platform.

Replacement of hydraulic oil

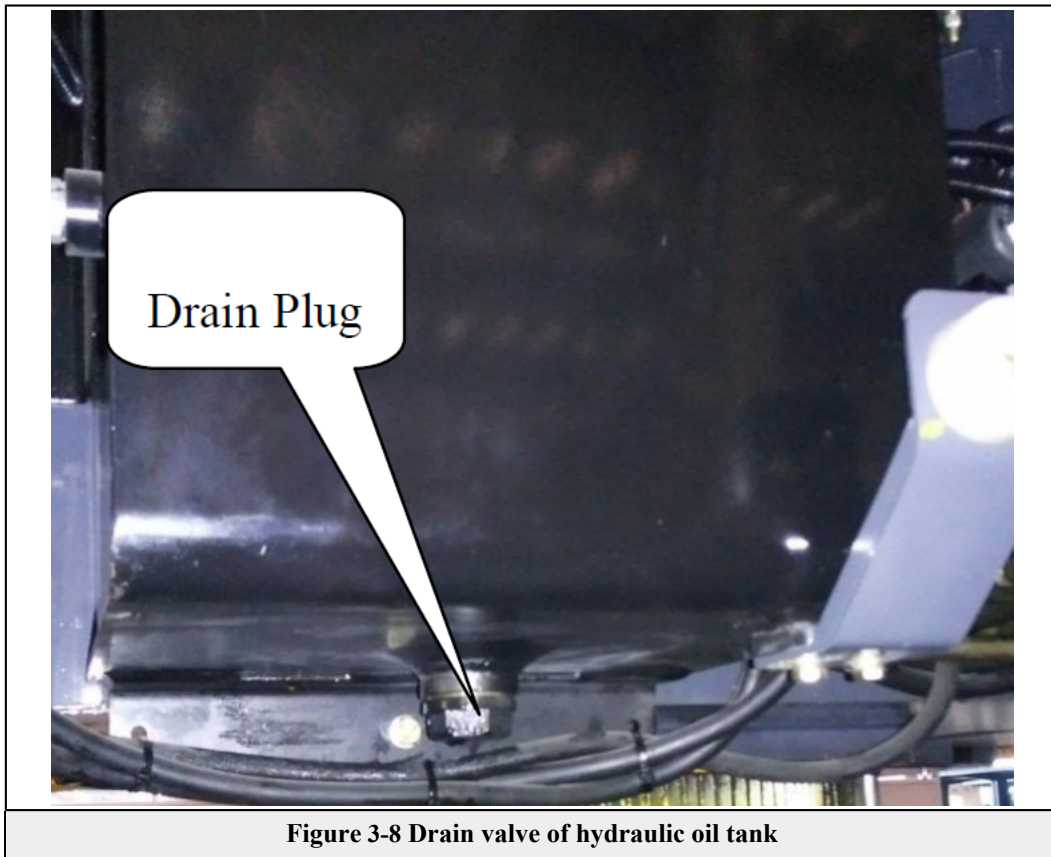
Cleanliness is the most important index to maintain hydraulic system. When oil filling, dusts and other contaminations shall be kept away from the system. Even a small grain can cause blocking in the components including valves and pumps, etc. The hydraulic oil shall be refilled by the filter rather than directly refilling fresh oil into the hydraulic system.

1) Preparation before replacement

Before replacing the hydraulic oil, elevate the boom to the maximum working height and shut down the engine. And prepare a container to hold waste hydraulic oil.

2) Replacement procedures

- ① Place the prepared container under the drain plug of the hydraulic oil tank.
- ② Unscrew the drain plug at the bottom of the tank and drain the hydraulic oil.



- ③ Remove all hoses from the tank and drain as much hydraulic oil from hoses as possible.

⚠ CAUTION

- Mark all hoses and fittings for easy reinstallation.
- Clean all the interfaces.

- ④ Remove the gaskets of all oil filters.
- ⑤ Replace the filter element and reinstall the filter components.
- ⑥ Replace the defective hoses.
- ⑦ Connect the suction and return hose and fill the tank with new oil.
- ⑧ Disconnect the return circuit to the oil tank and connect it to other empty container.
- ⑨ Start the engine to drive boom and outrigger to the driving state respectively. Keep the engine operating until the return circuit drains new oil and shut down the engine.

⚠ CAUTION

During the continuous operation of engine, attention shall be paid to the oil quantity of hydraulic oil tank at all times to prevent the pump from inhaling air.



- ⑩ Clean or replace the return hose of the oil tank.
- ⑪ Connect the return pipe of oil tank, check the oil level, and refill to the required capacity.

⚠ CAUTION

- The used hydraulic oil and filter liner shall be effectively dealt with in accordance with national laws and regulations.
- Injection is only allowed to be done through oil filter.
- The used hydraulic oil shall be properly dealt with to avoid its flow to the ground.
- When refilling or replacing hydraulic oil, make sure that the hydraulic oil meets the following cleaning standards. The pollution grade of solid grain in the hydraulic oil that will be filled into hydraulic oil tank should not be more than 17/14. The tank capacity of hydraulic tank is 210 L and the total capacity of the replacement hydraulic oil is about 300 L.

Treatment of waste oil and grease

All kinds of oil MEWP used, such as lubricating oil, fuel, antifreeze, etc. shall cause direct or indirect contamination to the environment. Antifreeze is toxic and shall be disposed in accordance with local environmental regulations if it cannot be continued to be used. Recycle waste antifreeze and lubricants by means of permitted waste disposal equipment (including urban maintenance shops and licensed facilities provided by vehicle maintenance plants). If any doubt, please contact the local environmental protection department for assistance to facilitate the proper handling of used lubricants.

⚠ WARNING

- It is prohibited to dump waste liquids at will in sewers, surfaces, rivers, etc. Waste liquid from the machine shall be discharged into the appropriate container for proper treatment.
- Whenever the harmful substances are recycled as much as possible; Otherwise, the involved will be fined or punished by the relevant departments.

3.3 Inspection and regulation of telescopic wire rope

Inspection of wire rope

In case of any one of following situations, the wire rope cannot be used any more:

1. Deformed or corroded
2. Kinked
3. On any one layer of wire rope, more than 10% of wires are broken.
4. The diameter at any part is reduced by 7% or more in comparison with the rated diameter.
5. Heat loss

Adjustment of wire rope

The telescoping wire rope will stretch and elongate after long-time use to cause the telescopic boom is not in place, the steel wire rope falls off from the pulley, the 3rd section boom vibrates during telescoping, the steel wire rope whips the boom frame and other problems. Therefore, check and adjust the tension of wire rope periodically. See [Figure 3-9](#) for assembly diagram of telescoping system.

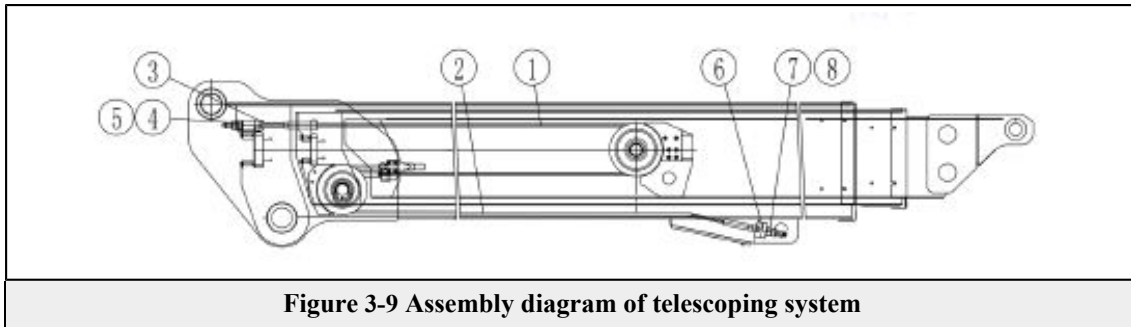


Figure 3-9 Assembly diagram of telescoping system

- | | | | |
|--------------------|-------------------------------------|-------------------------------------|------------------|
| 1. Stretching rope | 2. Retracting rope | 3. Balance block of stretching rope | 4. Adjusting nut |
| 5. Locknut | 6. Balance block of retracting rope | 7. Adjusting nut | 8. Locknut |

Checking method:

1. Luff the telescoping boom to horizontal status, extend the boom, and check 2nd, 3rd, 4th and 5th section booms for simultaneous motion during the telescoping of boom. If the motion of 5th section boom is later than that of 2nd section boom, it's necessary to adjust the tension of wire rope.
2. Luff the telescoping boom to horizontal status and telescope the boom. Upon detection of vibration of 3rd boom section or whipping of wire rope on the boom (A "flap" sound can be heard at the start of motion) during the telescoping of boom, it's necessary to adjust the tension of wire rope.
3. Check the counterweights 3 and 6 shown in above diagram. Upon detection of inclination of any counterweight towards one side, it's necessary to adjust the tension of wire rope.

Steps are as follows:

1. Luff the boom to horizontal status and loosen the lock nuts 5 and 6.
2. Extend the boom and adjust the adjusting nut 7 on left and right sides respectively to tension the retracting rope. En-sure that the counterweight 6 is paralleling with the end face of boom during the adjustment
3. Retract the boom and adjust the adjusting nut 4 on left and right sides respectively to tension the extending rope. Ensure that the counterweight 3 is paralleling with the end face of boom during the adjustment.
4. Repeat steps 2 and 3 as required, check the motions of boom as per above-mentioned checking method to ensure the proper adjustment of ropes, and securely tighten the lock nuts 5 and 6. The adjustment of wire ropes is completed.



Chapter 4 Maintenance

4.1 Periodic inspection of maintenance

The maintenance period of mobile elevating work platform is mainly divided into the following categories:

1. Daily Maintenance: Maintenance before and after work everyday.
2. Maintenance every 100 h (or one month): Maintenance of mobile elevating work platform after 100 h (or one month) operation.
3. Maintenance every 250 h (or three months): Maintenance of mobile elevating work platform after 250 h (or three months) operation.
4. Maintenance every 500 h (or six months): Maintenance of mobile elevating work platform after 500 h (or six months) operation.
5. Maintenance every 1000 h (or one year): Maintenance of mobile elevating work platform after 1000 h (or one year) operation.

Carry out inspection and maintenance operations in accordance with the prescribed period. The inspection and maintenance period are calculated on the basis of the reading of the chronograph or the month experienced, whichever arrives first.

The inspection periods are settled under the condition that the MEWP is used under normal working conditions. If the mobile elevating work platform is used in poor conditions (like dusty), the inspection periods shall be shortened accordingly.

CAUTION

- Attention shall be paid to the pre-inspection and regular inspection before the start of the operation, which is beneficial to the early detection of faults to prevent accidents.
- Develop the habit of pre-operation inspection and regular inspection. Measures shall be taken if any abnormal condition is found.

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
Work platform	Check work platform for cracks, deformation, installation status, and guard-rail damage	√	√	√	√	√	Operator	Visual check	
	Check leveling system for normal movement, leakage, installation status (pivot pin etc.)	√	√	√	√	√	Operator	Visual check and operation	
	Check work platform swing device for normal movement, noise, and leakage	√	√	√	√	√	Operator	Visual check and operation	
	Check the anchorage of safety belt		√	√	√	√	Operator	Visual check	



Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	for damage and crack								
	Check bolts of weighting sensor for looseness		√	√	√	√	Operator	Visual check	
Boom and telescopic system	Boom: Open welding, damage, distortion, indentation in overlapping part, local indentation, crack and damage, installation status (positioning pin, etc.)		√	√	√	√	Operator	Visual check and operation	
	Telescopic cylinder: Motion, oil leakage, and installation status	√	√	√	√	√	Operator	Visual check	

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	(positioning pin, etc.)								
	Wire rope: Slack and connection	√	√	√	√	√	Operator	Visual check	
	Telescopic cylinder: Natural shrinkage, sunken pits, and cracks					√	Operator	Visual check	
	Balance valve: Balance valve: Adjust the tightness of the nut			√	√	√	Operator	Visual check and operation	
Luffing system of boom	Luffing cylinder: Motion, oil leakage, and installation status (positioning pin, etc.)	√	√	√	√	√	Operator	Visual check and operation	
	Luffing cylinder		√	√	√	√	Operator	Visual check and	



Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
								operation	
Cables and hydraulic pipelines carrier system	Check carrier for damage			√	√	√	Operator	Visual check	
Slewing mechanism	Turntable: Crack, open welding, deformation and locking		√	√	√	√	Operator	Visual check	
	Rotary reducer: Abnormal noise, oil leakage	√	√	√	√	√	Operator	Visual check and hearing	
	Hydraulic motor: Oil leakage and abnormal noise	√	√	√	√	√	Operator	Visual check and hearing	
	Slewing connector: Abnormal	√	√	√	√	√	Operator	Visual check	

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	noise and oil leakage							and hearing	
	Slewing bearing: Filling lubrication oil		√	√	√	√	Operator	Operation	
	Check installation nut of slewing bearing and rotary reducer for looseness			√	√	√	Operator	Visual check	
	Slewing bearing and rotary reducer: Stable rotation, abnormal noise, gear crack and wearout and oil seal damage.					√	Operator	Visual check	



Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	Slewing mechanism clearance check and adjustment				√ ★	√ ★	Repair department	Professional maintenance	
	Counter weight: installation and crack of hoisting hook					√	Operator	Visual check	
	Rotary reducer: replace lubrication oil				●	●	Operator	Visual check and operation	
	Rotary reducer: abnormal heating, oil level and contamination				√	√	Operator	Visual check	
Power system	Engine								
	Engine	Strictly follow the requirements of Engine Maintenance Manual for inspection and maintenance.							

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	Check engine startup for abnormal sound	√					Operator	Visual check and hearing	
	Check engine oil level for leakage	√					Operator	Refer to Maintenance	
	Replace engine oil			●	●	●	Operator	Manual of engine	At least once a year
	Replace engine oil filter or filter element			When changing engine oil ●			Operator		
	Check engine oil level and oil leakage	√					Operator		
	Check fuel tank for fixation		√	√	√	√	Operator		
	Replace fuel oil filter or filter element			●	●	●	Operator		



Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	Clean fuel pump and strainer			★	★	★	Operator		
	Replace fuel strainer				●	●	Operator		
	Check and discharge water from fuel strainer	√ ★	√ ★	√ ★	√ ★	√ ★	Operator	Visual check and operation	
	Check fuel pipe for fixation, oil leakage, distortion and away from heating source more than 200 mm		√	√	√	√	Operator	Visual inspection	
	Check and tighten belt		★	★	★	★	Operator	Visual check and operation	
	Check turbocharger bearing for clearance					√	Repair department	Professional maintenance	

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

Sys-tem or com-po-nents	Project content	Daily Main-ten-ance	Ev-ery 1 mon-ths or every 100 hour-s	Every 3 mont-hs or every 250 hours	Every 6 mont-hs or every 500 hours	Every 1 year or every 1000 hours	Re-spon-sible entity	Inspec-tion and main-ten-ance meas-ures	Remark Inspec-tion √ Maintenance ★ Replace-ment ●
	Check fuel injection pump						Repair depart-ment	Profes-sional mainte-nance	
	Fuel injection pump exhaust				★	★	Opera-tor	Opera-tion	
	Check charging for normal function		√	√	√	√	Opera-tor	Visual check	
	Air filter								
	Check air filter negative pressure indicator	√	√	√	√	√	Opera-tor	Visual check	
	Clean dust cup of air filter		★	★	★	★	Opera-tor	Opera-tion	
	Clean main element of air filter	When the air filter negative pressure indicator displays or every 250 hours ★					Opera-tor	Opera-tion	
	Clean main element of air filter	When the main element of air filter is damaged ●					Opera-tor	Opera-tion	



Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	Replace safety element of air filter	After cleaning the main element for three times ●					Operator	Operation	
	Radiator								
	Check the capacity of coolant and leakage	√					Operator		
	Replace coolant	Every 36 months					Operator		
	Check coolant pipelines and tighten pipe clamp		√ ★				Operator		
	Clean radiator/ reverse dedusting		★	★	★	★	Operator	Hands	
	Check muffler for abnormal noise	√	√	√	√	√	Operator	Listen	
	Air intake system								
	Check and tighten		√ ★	√ ★	√ ★	√ ★	Operator	Visual check	

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	intake pipelines and connectors							and operation	
	Check air intake hoses for crack, holes and leakage				√	√	Operator	Visual check	
Running system	Axle: Damage, shape deformation, and damages in pin binding site.		√	√	√	√	Operator	Visual check	
	Wheels (tyres): Cracks, damages, partial abrasion, and foreign matters	√	√	√	√	√	Operator	Visual check	
	Wheels (tyres): Cracks, damages, deformations		√	√	√	√	Operator	Visual check	



Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

Sys-tem or com-po-nents	Project content	Daily Main-ten-ance	Ev-ery 1 mon-ths or every 100 hour-s	Every 3 mont-hs or every 250 hours	Every 6 mont-hs or every 500 hours	Every 1 year or every 1000 hours	Re-spon-sible entity	Inspec-tion and main-ten-ance meas-ures	Remark Inspec-tion √ Maintenance ★ Replace-ment ●
	of the mounting rim, etc.								
	Wheels (tyres): Clearance, abnormal sound and abnormal heat of bearing					√	Opera-tor	Visual check and hearing	
	Reducer: Abnormal noise, oil leakage	√	√	√	√	√	Opera-tor	Visual check and opera-tion	
	Reducer: Abnormal heating, oil level and contamination and installation				√	√	Opera-tor	Visual check and opera-tion	
	Hydraulic motor: Oil leakage, abnormal noise and	√	√	√	√	√	Opera-tor	Visual check and hearing	

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	abnormal vibration								
	Rods and booms: Damages, bending, tearing, damage and abrasion of dust jacket		√	√	√	√	Operator	Visual check and operation	
	Steering knuckle: Clearance and crack		√	√	√	√	Operator	Visual check	
	Steering wheels: Steering angle, installation and contacting status of catch bolt		√	√	√	√	Operator	Visual check	
	Steering hydraulic cylinder: Movement	√	√	√	√	√	Operator	Visual check and operation	



Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

Sys-tem or com-po-nents	Project content	Daily Main-ten-ance	Ev-ery 1 mon-ths or every 100 hour-s	Every 3 mont-hs or every 250 hours	Every 6 mont-hs or every 500 hours	Every 1 year or every 1000 hours	Re-spon-sible entity	Inspec-tion and main-ten-ance meas-ures	Remark Inspec-tion √ Mainte-nance ★ Replace-ment ●
	and oil leakage								
	Steering hydraulic cylinder: Indentation, cracks, bending, scratches, installation status (fulcrum pin, etc.)		√	√	√	√	Opera-tor	Visual check and opera-tion	
	Brake: Efficiency	√	√	√	√	√	Opera-tor	Visual check and opera-tion	
	Frame: Shape deformation and open weld		√	√	√	√	Opera-tor	Visual check	
	Axle balance/cylinder locking system					√	Opera-tor	Opera-tion	

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
Hydraulic system	Hydraulic pump: Oil leakage and abnormal sound	√	√	√	√	√	Operator	Visual check and hearing	
	Hydraulic pumps: Abnormal heat, installation condition		√	√	√	√	Operator	Visual check and operation	
	Hydraulic pumps: Overflow valve pressure					√	Operator	Operation	
	Hydraulic tank: Hydraulic oil level shall be above the 100℃ scale of the liquid level thermometer	√	√	√	√	√	Operator	Visual check	
	Hydraulic oil tank: Ventilation					√	Operator	Visual check	



Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	device blocking, oil filter contamination								
	Oil filter: Installation condition, oil leakage		√	√	√	√	Operator	Visual check	
	Oil filter element: Replace filter element					●	Operator	Operation	
	Valves: Motions, oil leakage	√	√	√	√	√	Operator	Visual check and operation	
	Valves: Abnormal noise and heat					√	Operator	Hearing and touching	
	Rigid pipes, hoses, and joints: Oil leakage		√	√	√	√	Operator	Visual check	

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	Rigid pipes, hoses, and joints: Cracks, damages, loosening, aging, twisting					√	Operator	Visual check	
	Hydraulic oil radiator: Oil leakage, abnormal sound of motor	√	√	√	√	√	Operator	Visual check and hearing	
	Hydraulic oil radiator: Oil temperature and function of oil temperature sensor					√	Operator	Visual check	
	Balance valve: Adjust the tightness of the nut			√	√	√	Operator	Visual check and operation	



Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
Electrical system	Lever, switch, button, etc.: Stroke and clearance		√	√	√	√	Operator	Visual check and operation	
	Check indicator lights, switches, instruments, etc. for damage; Check the lever sheath for installation condition or damage.	√	√	√	√	√	Operator	Visual check and operation	
	Safety devices								
	Overload alarm device: Check the movement (stop automatically) before	√	√	√	√	√	Operator	Visual check and operation	

Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	the operation starts								
	Emergency stop switch: Motion	√	√	√	√	√	Operator	Operation	
	Limit (boom fully retracted, rope) switch: Motion	√	√	√	√	√	Operator	Operation	
	Inclination sensor: Motion	√	√	√	√	√	Operator	Operation	
	Foot Pedal: Motion	√	√	√	√	√	Operator	Operation	
	Vehicle tilting alarm device: Motion	√	√	√	√	√	Operator	Operation	
	Platform tilt alarm device: Motion	√	√	√	√	√	Operator	Operation	
	Power unit: Motion	√	√	√	√	√	Operator	Operation	
	Audible alarms: Motion	√	√	√	√	√	Operator	Operation	



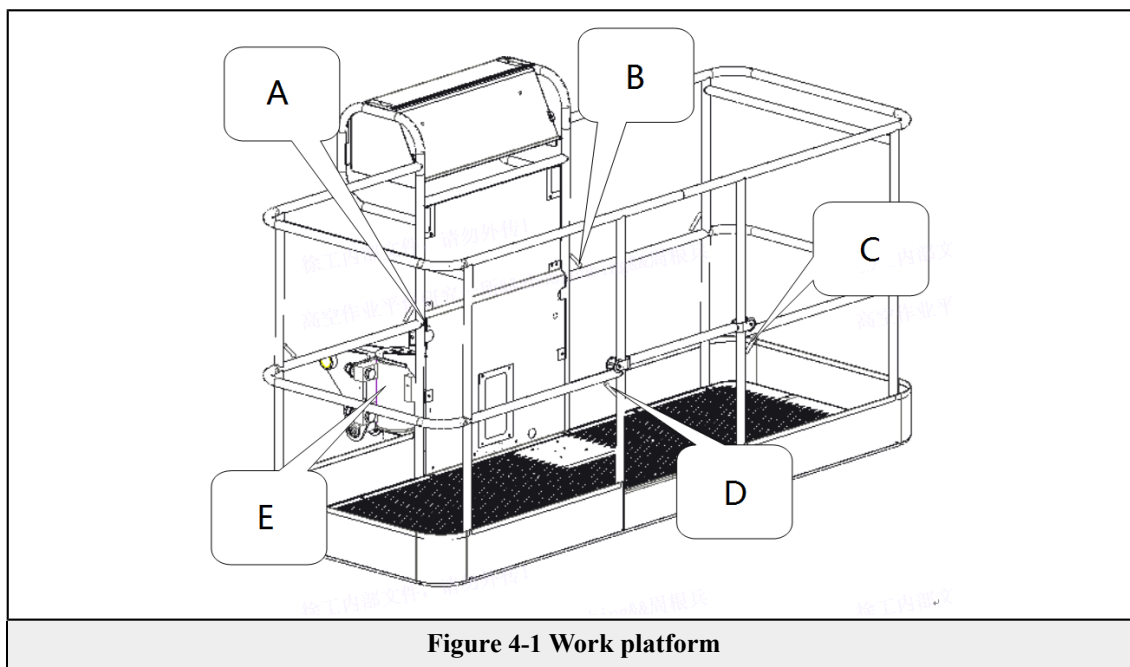
Table 4-1 Periodic inspection and maintenance items of mobile elevating work platform
(continued)

System or components	Project content	Daily Maintenance	Every 1 month or every 100 hours	Every 3 months or every 250 hours	Every 6 months or every 500 hours	Every 1 year or every 1000 hours	Responsible entity	Inspection and maintenance measures	Remark Inspection √ Maintenance ★ Replacement ●
	Display: Damage		√	√	√	√	Operator	Visual check	

⚠ CAUTION

Do not allow hydraulic oil to flow to the ground during maintenance.

4.2 Work platform



A. Safety belt fixing point 1	B. Safety belt fixing point 2	C. Safety belt fixing point 3
D. Movable guard rail	E. Work platform swing cylinder	

During the use of the machine, inspection and maintenance should be performed periodically:

1. Check if the swing cylinder on the work platform has oil leaked out and if the rotation of the cylinder is smooth and stable.
2. Check the safety belt fixing point for damage.
3. Check if the movable guard rail is damaged and check the abrasion status of guide wheels.
4. Check the installation status of weighing sensor and if the functions and precision are within normal arrange.

4.3 Slewing mechanism

Slewing mechanism is the drive device to realize the rotation of MEWP. The slewing mechanism is mounted on turntable and composed of slewing reducer and rotary motor as shown in [Figure 4-2](#). High-speed hydraulic motor drives rotary reducer to output power from output pinion which engages with external teeth of slewing bearing on the frame, i.e. conducts both rotation and revolution, so as to drive the rotation of superstructure of MEWP.

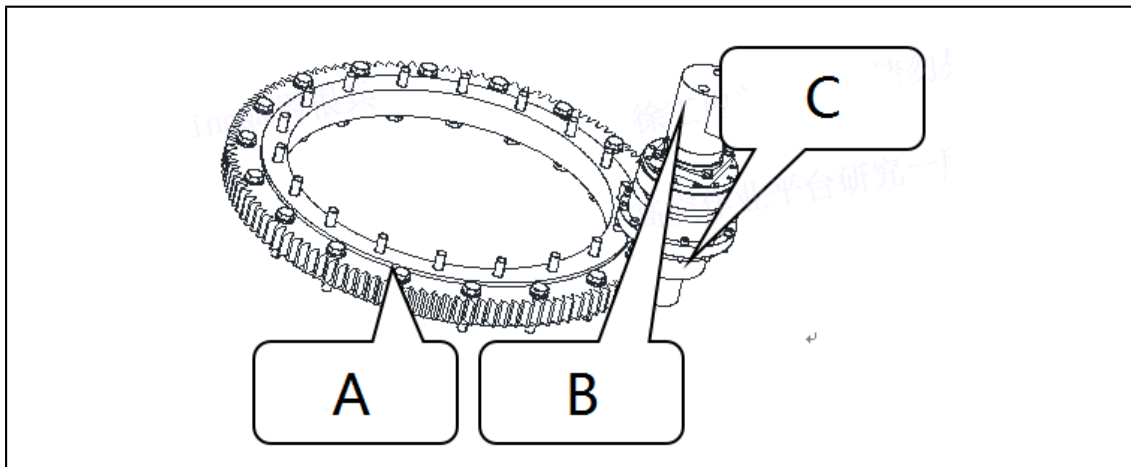


Figure 4-2 Composition of slewing mechanism

A. Slewing bearing	B. Rotary motor	C. Rotary reducer
--------------------	-----------------	-------------------

Slewing motor

The rotary motor for this model is gerotor motor and the actuator element of the system

1. Replace

Methods to remove and maintain the rotary motor:

- 1) The hydraulic hoses connecting to the motor shall be well marked and blocked after removal and the motor oil ports shall be properly blocked.



During the removal of oil pipes, loose the connections very slowly in order to prevent hydraulic oil from squirting or spraying and causing personnel injury.

- 2) Remove the connecting bolt between the motor and the reducer so as to remove the motor.

**⚠ CAUTION**

- It's not recommended that users remove hydraulic motor by themselves. If there is any problem in the motor, please directly contact with the closest XCMG office.
- Be sure to keep in mind the installation location of each joint and part during disassembly.
- Do not remove hydraulic motor with hard tools such as a hammer or by means of violent knocking.
- Clean all part in the motor before installation and impurities are not allowed into motor.

Slewing reducer

1. Inspection and maintenance

- 1) When the reducer runs for the first 100 h (discontinuous operation covered), please clean it and the inside of the brake with cleaning solution. And please replace oil every 2000-2500 h or at least once a year.

⚠ CAUTION

- Check if there is any metal particles left in the reducer or the brake.
- It is best to replace the oil when the oil temperature has not yet cooled, because it is more conducive to draining the oil in the tank at this time.

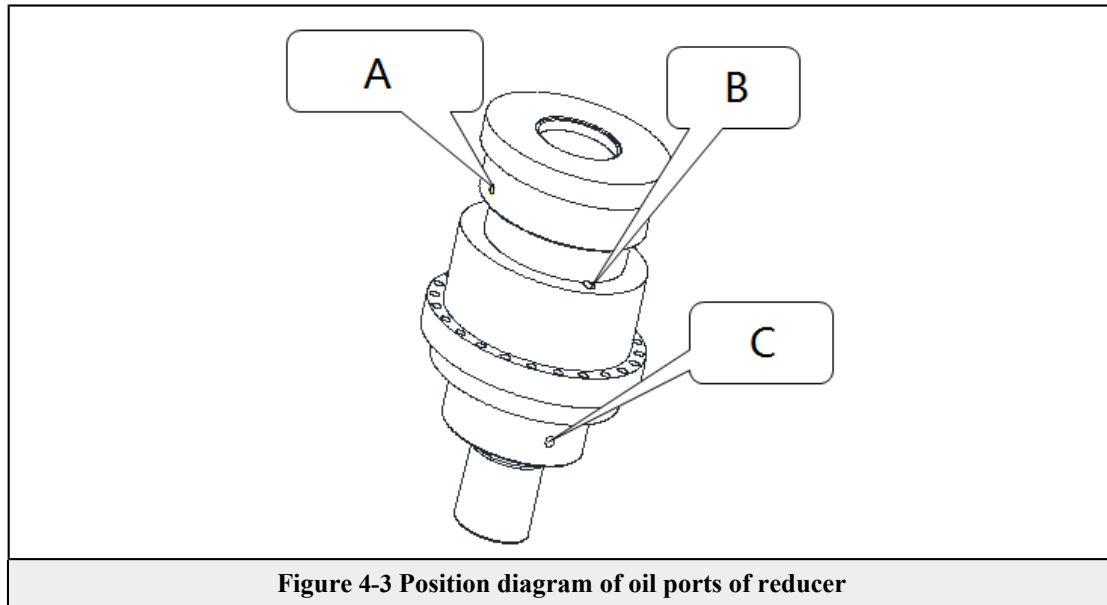
Mixed oil is not allowed to use.

- 2) There are more than one wet brake installed on the slewing reducer and the brakes are under normal close status. When pressure oil comes into the brake, the brake opens and the mechanism can freely slide. When any part of the brake has any of below conditions, the part in question shall be replaced or the brake shall be scrapped:

- ① Oil leakage happens at input end and the oil sealing on the brake shall be replaced due to damage.
- ② Low braking torque: serious abrasion cause lower torque or the deformation of abrasion parts which shall be replace.

2. Replace gear oil

Confirm the correct position of each oil port of reducer and brake.



A. Brake oil port

B. Oil filling port

C. Oil discharge port

Remove the drain plug and filler plug to drain oil in the reducer as well as oil in the brake.

⚠ CAUTION

- Before filling new oil, please clean the inside of the reducer and the brake with cleaning solution.
- Pour cleaning solution into the slewing reducer and the brake, install filler plug, operate the machine at high speed for few minutes and then drain the cleaning solution.

⚠ WARNING

The use of any erosive cleaning solution or improper lubricant products will change the characteristics of oil, thus causing damages to slewing reducer and relevant parts.

Slewing bearing

Slewing bearing is the bearing device of the rotation part of MEWPs. The inner ring of the slewing bearing is connected to the turntable and external gear ring is connected to the frame. The slewing bearing can bear the weight of the slewing part and the loads and applied moment.

1. Lubrication of slewing bearing

Proper lubrication is a must to the durability of the track and gears. Lubrication cycle is subject to the operation conditions and the environment. Generally, it's recommended to lubricate once per 100 h.

**⚠ CAUTION**

When the machine is not used for a long time, the slewing bearing should be lubricated. In area of tropical climate where temperature impact is irregular or with more wind or moisture, lubrication shall be more frequent.

- 1) Use grease gun to inject Mobilux EP2 NLGI 2 into the slewing bearing raceway via the grease fitting until the lubricant flow out of the sealing and fill the raceway and the slewing bearing is lubricated. Generally, lubricant shall be added once per 100 h of operation.
- 2) Gear lubrication. In principle, the tooth surface should be cleared of debris once every 80 h and coated with graphite-calcium based grease. No matter by spraying or brushing, the grease shall completely cover the gear surface of the pinion and toothed wheeling.

2. Inspection and maintenance

- 1) When the slewing ring is running for 100 h, please check the pretightening force of bolts; Tighten timely if any abnormal condition is found and the tightening torque is $250 - 280 \text{ N}\cdot\text{m}$. After that, check once every 500 h to ensure sufficient pretightening force; Generally, the bolts shall be replaced every 6 years or after 14000 working hours.
- 2) During the operation, do not expose the slewing bearing to the sun directly; do not wash the slewing bearing to prevent water from getting into rollaway; do not allow hard foreign objects to approach or get into engaging area.
- 3) Check the sealing condition of slewing bearing. Repair or replace if damaged.
- 4) Check the slewing gear for engagement. In order to reduce the wearing of pinion and gear, adjust the engagement clearance within $0.25 \sim 0.4 \text{ mm}$.

Gear clearance adjustment for slewing mechanism

The gear clearance of slewing mechanism means the engagement clearance between pinion and slewing bearing (gear). If the clearance is too tight, it will result in unsmooth rotation and even parts damage. If the clearance is too loose, it will result in violently shaking of superstructure while slewing brake. Excellent gear clearance can make the machine achieve full performance and extend the service life; therefore, it needs to be adjusted. Refer to [Figure 4-4](#) for adjustment.

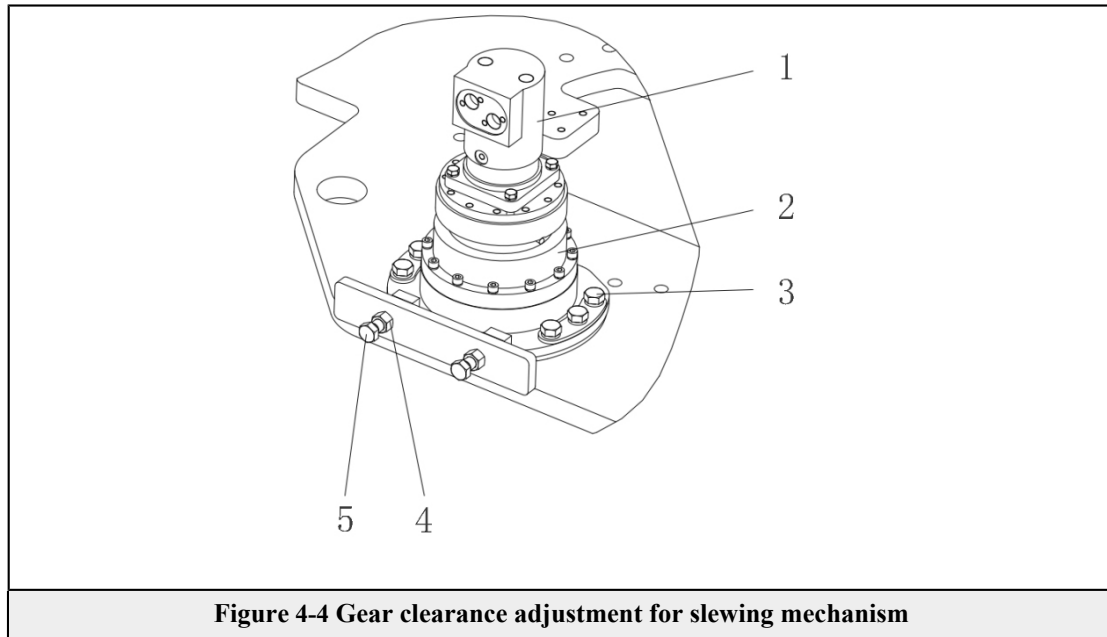


Figure 4-4 Gear clearance adjustment for slewing mechanism

- | | | |
|------------|-------------------|------------------|
| 1. Motor | 2. Reducer | 3. Mounting bolt |
| 4. Locknut | 5. Adjusting bolt | |

Steps are as follows:

- 1) Loosen the locknut (item 4) without screw out completely;
- 2) Loosen the locknut (item 3) without screw out completely;
- 3) Adjust the adjusting bolt (item 5) and measure the gear clearance between pinion and slewing bearing with plug gauge. Adjust and measure repeatedly until the gear clearance is within 0.2~0.4 mm;
- 4) Tighten the mounting bolt (item 3) with tightening torque within 250~280 N•m;
- 5) Hold the adjusting bolt (item 2) and tighten the locknut (item 4) with tightening torque within 250~280 N•m.

4.4 Power system

Engine

Details see Engine's Instruction Manual.

Engine oil filter

Proper maintenance of engine oil filter is essential to good engine operation. Improper maintenance of engine oil filter will cause the engine malfunction and component damage.

Replace filter after 200 - 250 h operation. Steps are as follows:

1. Remove the filter element with special filter wrench clockwise and pour the oil in the filter element into a waste liquid container.



⚠ CAUTION

Please dispose the waste liquid and filter element in an environmental way.

2. Wipe the base with clean cloth, especially to remove impurities on base mounting surface;
3. Pour the engine oil into the new filter element and refuel it with more than half the volume;

⚠ CAUTION

Fill the engine oil via oil inlet hole of the filter element but not directly from the thread hole in the center to avoid unfiltered engine oil getting into the engine.

4. Smear some engine oil evenly on the sealing ring with brush.
5. Place the filter element upright and install to the base thread; After the upper surface of filter element sealing ring contacts the base mounting surface, turn it counterclockwise for 3/4 round to 4/5 round to tighten it and check for oil leakage.

⚠ CAUTION

Check oil-resistant rubber washer and base sealing ring of filter element when replacing the filter element, replace the filter element if damaged or aged, otherwise, it would cause the engine oil leakage.

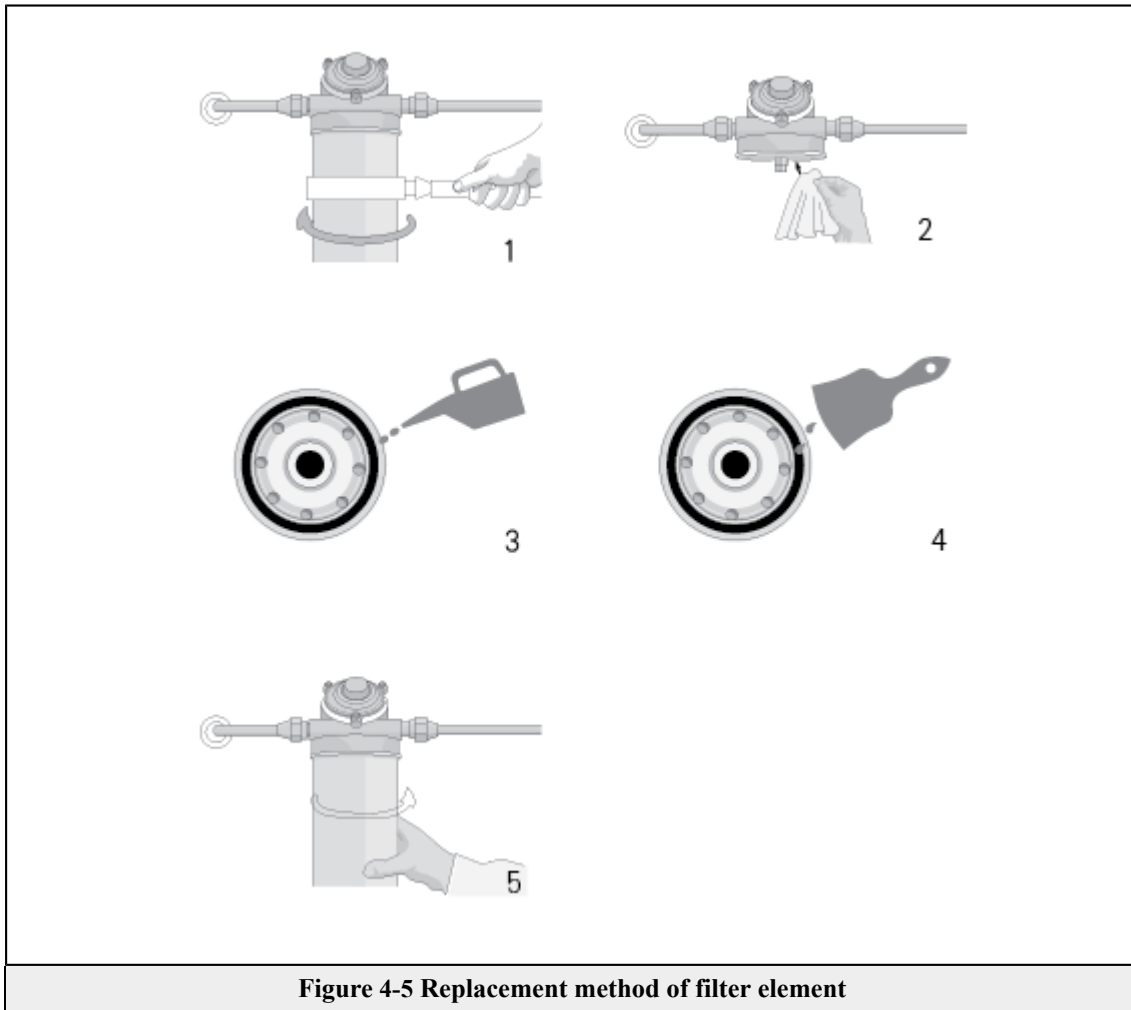


Figure 4-5 Replacement method of filter element

Oil-water separator

Proper maintenance of engine oil filter is essential to good engine operation. Improper maintenance of engine oil filter will cause the engine malfunction and components damage.

⚠ DANGER

Fuel oil of engine is inflammable and has the risk of explosion and fire. Operate in a place which is open, well ventilated and far away from heater, spark, naked light and lighted cigarette. Prepare qualified fire extinguisher within easy reach for each operation.

⚠ CAUTION

- Increase the testing frequency in case of inferior fuel quality or very moist environment.
- Take such testing after the engine is shut off.

1. Structure of oil-water separator

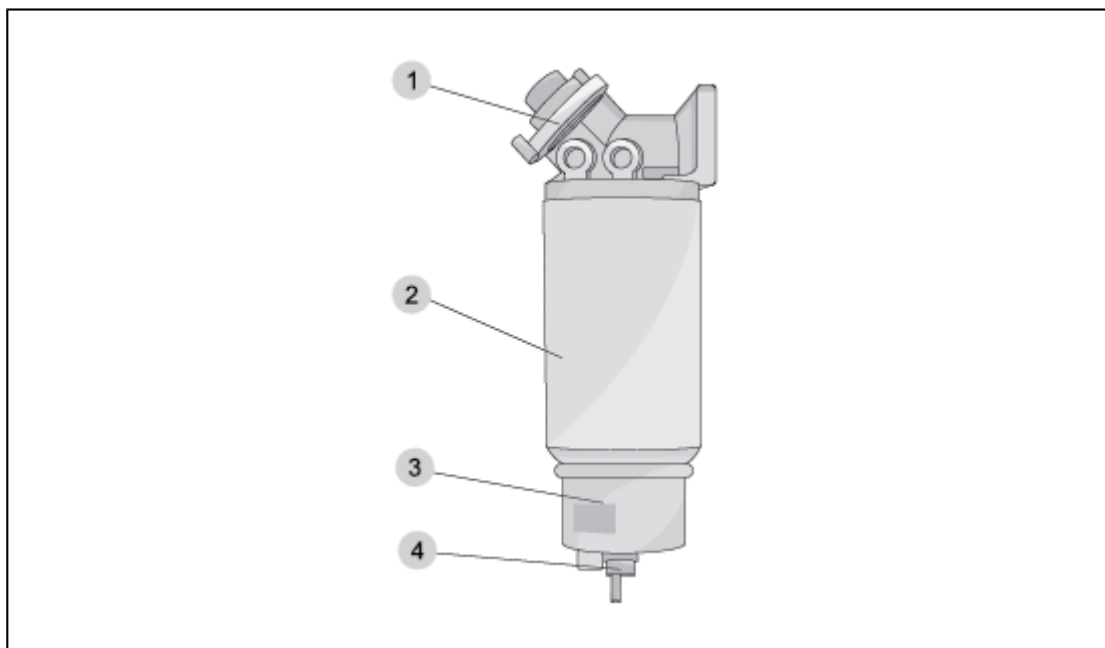


Figure 4-6 Oil-water separator

- | | |
|----------------------------------|---------------------------------|
| 1. Base assembly | 2. Oil-water separator assembly |
| 3. Water collection cup assembly | 4. Water discharge plug |

2. Discharge water from oil-water separator

The procedures for discharging water from oil-water separator are as follows:

- 1) Open the dock cover plate at one side of fuel tank, and find out the oil-water separator.
- 2) Loosen the drain plug at the bottom of filter bowl, discharge water to an appropriate container until the fuel begins to flow out, and immediately tighten the drain plug.

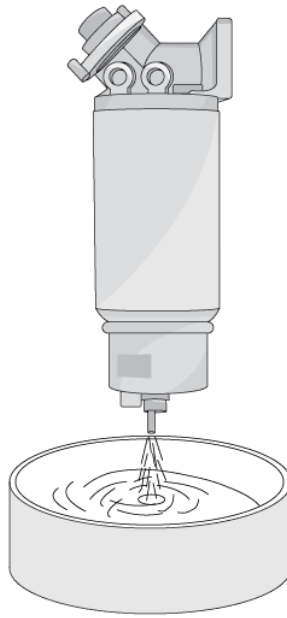


Figure 4-7 Discharge water to an appropriate container

CAUTION

Do not completely empty the filter bowl.

- 3) Clean the diesel fuel split out during the operation process.
- 4) Start the engine by turntable control panel, and check whether the oil-water separator has any leakage or not.

CAUTION

Dump and remove oil from the oil way if the engine can't be started or operates unsteadily.

3. Replace the filter element of oil-water separator.

Replacement of the filter element of oil-water separator is essential to excellent engine performance and service life. Dirty or clogged filters will cause poor engine working condition and continued use may cause components damage. Frequent replacement of the filter element may be required in highly dusty situations.

CAUTION

Take such testing after the engine is shut off.

- 1) Attach a label to fuel pipeline of fuel tank at the capping of oil-water separator, disconnect and block it.



- 2) Place an appropriate container under the filter bowl. Unscrew the drain plug at the bottom of the filter bowl. Drain the fuel oil of the filter bowl.
- 3) Turn the filter element assembly counterclockwise and dismantle it from the filter base.
- 4) Remove the filter bowl from used filter and install it to the new filter. Tighten the drain plug.
- 5) Fill the filter element and filter bowl with clean diesel oil.
- 6) Smear a thin layer of oil on the filter element washer.
- 7) Install the filter element/ filter bowl assembly to the top of filter, and screw it by hand safely.

⚠ CAUTION

When it is installed to the top of filter, the filter element/filter bowl assembly must be injected with fuel, otherwise, it is necessary to exhaust air of oil piping.

- 8) Clean diesel oil which might be split out during the operation process.
- 9) Write the dates and hours on filter hour meter with permanent marking pen.
- 10) Properly connect oil pipe with the capping of oil-water separator, and lock the snap ring of oil pipe.

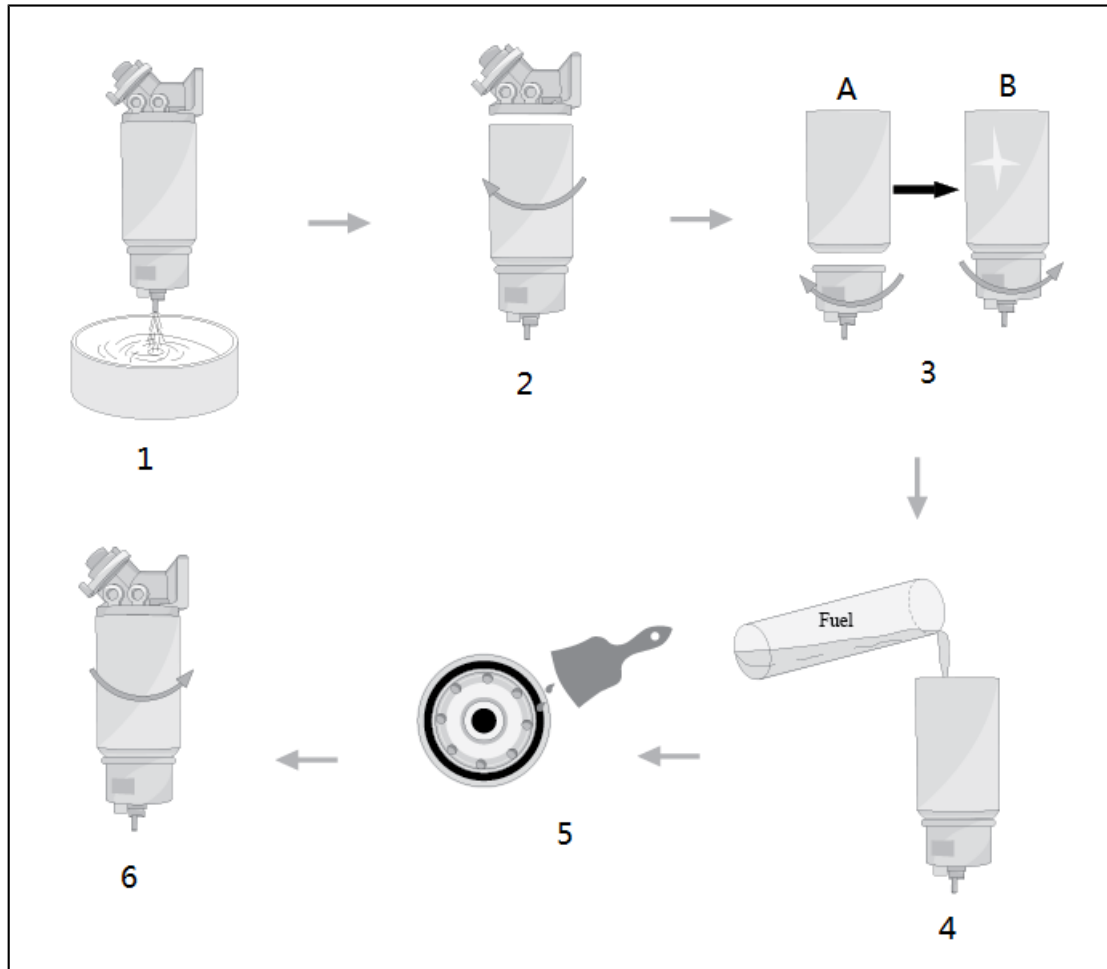


Figure 4-8 Schematic diagram of replacing filter element of oil-water separator

1. Drain the fuel oil.	2. Remove the filter element assembly.	3. Install the filter bowl in the new filter element.
4. Fill with clean diesel.	5. Smear a thin layer of oil on the filter element washer.	6. Install the oil-water separator.
A. Used filter element	B. New filter element	

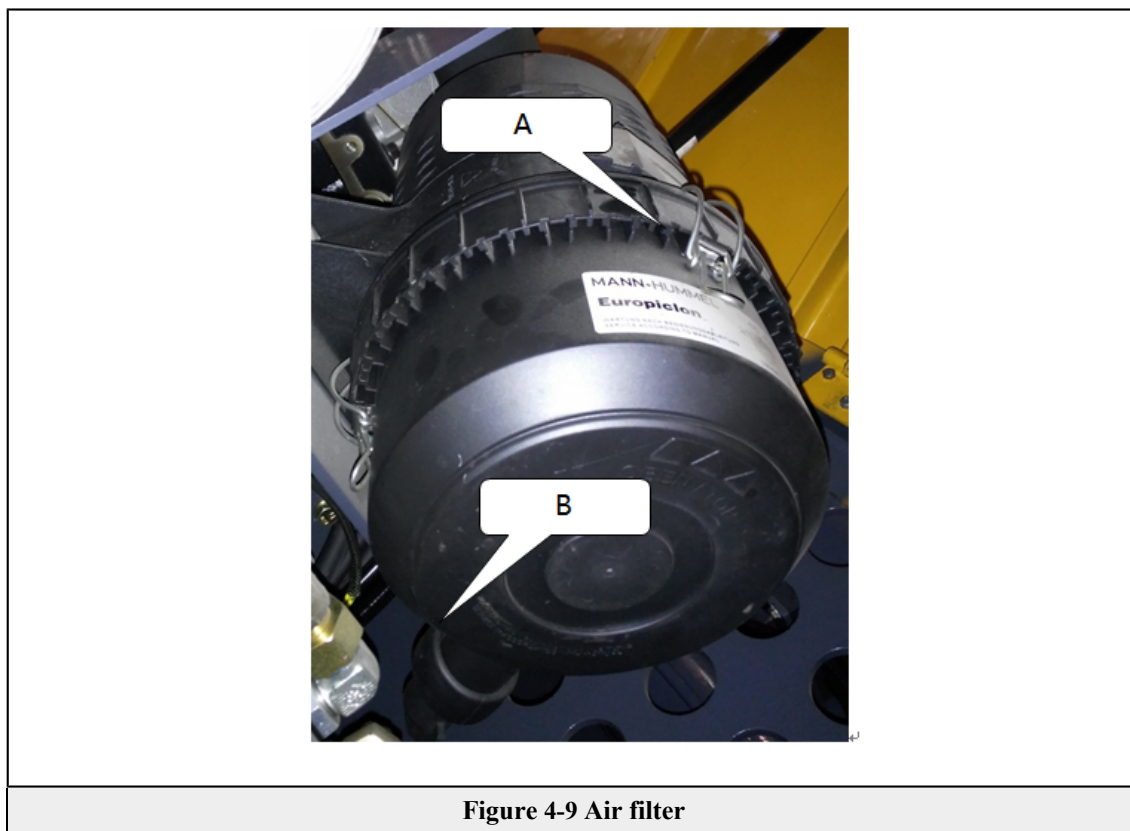
Air filter of engine

Maintaining the air filter of engine in good condition is essential for smooth operation and service life of engine. Failure to implement the maintenance procedure will result in poor operation of engine and damage components.

CAUTION

Take such testing after the engine is shut off.

Under normal condition, maintain the main filter element of air filter after operation for 50 – 200 h.



A. Spring buckle	B. Dust discharge valve
------------------	-------------------------

Steps for main filter element replacement:

1. Open engine hood. At the same time, press down two sides of discharge hole for empty dust discharge valve. Clean discharge hole if necessary.
2. Unbuckle the buckle on the cover at the end of air filter and remove rear cover;
3. Take out the main element carefully to avoid any dust falling into the case of filter;
4. Clean the inside of air filter and carefully wipe the inside of air filter assembly with a clean and wet cloth to ensure no dust inside;
5. Check and clean the filter element. Blow out the dust in element with dry compressed air with pressure not greater than 0.5 Mpa and be careful not to damage the filter element. Replace with a new one if the main filter element is found damaged.

⚠ CAUTION

Do not use oil or water for cleaning.

6. Reinstall main element back and place gasket stable to ensure well sealing after installation; otherwise, no protection will be provided for the engine;
7. Install rear cover and tighten the buckle, ensure the correct position of rear cover and well sealing.

CAUTION

Safety element may not be removed during maintenance and require no maintenance.

Replacement for main element and safety element should be provided in following situations:

- Main element damaged;
- 5 times of cleaning for main element;
- resistance alarm remains alarming after installation of maintained main element.

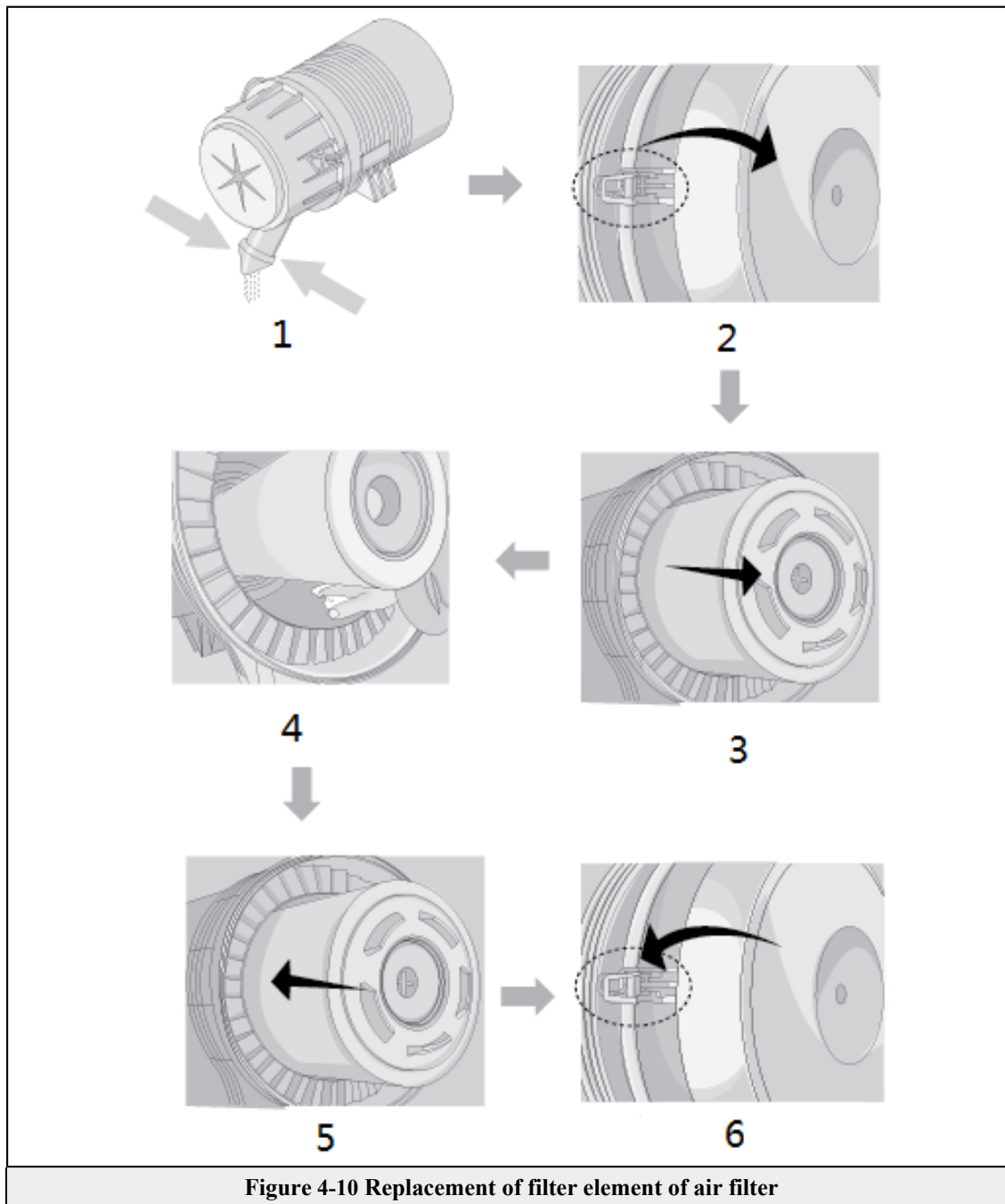


Figure 4-10 Replacement of filter element of air filter



1. Empty dust discharge valve.	2. Unlock the tail buckle and remove the rear cover.	3. Take out the main filter element carefully.
4. Clean the inside of the air filter.	5. Install the main filter element back.	6. Install the rear cover and buckle up.

radiator

For radiator used for a long time or used in dusty conditions, dust and sundries in the system structure are required to be cleaned.

Blow out sundries (dust, bug, etc.) in the radiator or spray water (against direction of cooling air flow) on the back of radiator to remove foreign matters. Only appropriate pressure is allowed to be used for cleaning; otherwise, radiator may be damaged. Water gun should be moved continuously during cleaning.

To avoid damaging parts, do not direct water gun to following parts:

1. Component;
2. Connector;
3. Sealing elements;
4. Core pin of radiator.

4.5 Running system

Running system consists of wheel, running reducer and running motor.

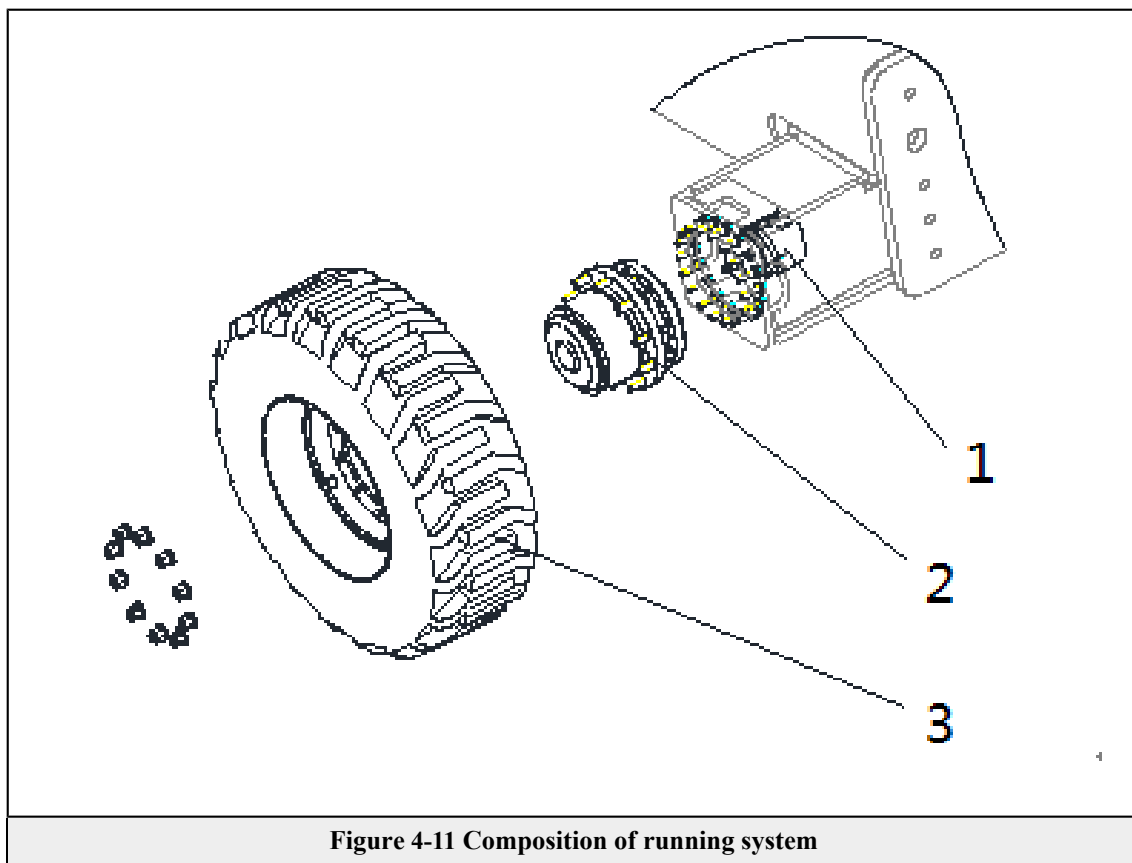


Figure 4-11 Composition of running system

1. Running motor	2. Running reducer	3. Tyre
------------------	--------------------	---------

Wheels

Wheels are composed of tyres and rims. Functions are: to support the vehicle; to ensure well adherence to road and transmit driving moment and retarding torque; to ensure the direction of vehicle; to moderate the impact produced during travel due to uneven road conditions; and to reduce vibration produced thereof.

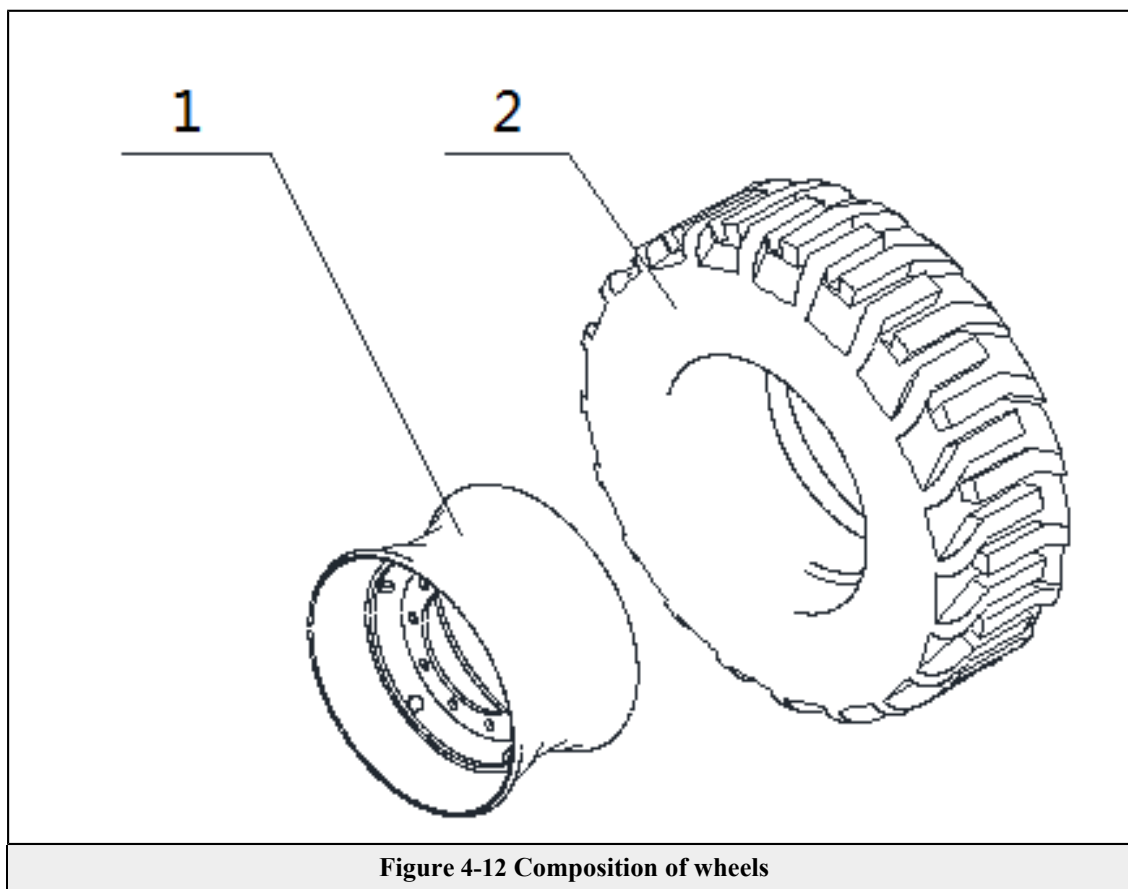


Figure 4-12 Composition of wheels

1. Rim	2. Tyre
--------	---------

1. Rim check

- 1) Rim rust;
- 2) Rim bending and deformation;
- 3) Cracks on all parts of rim;
- 4) Rim spigot, mounting hole and rim bolt and nut.
- 5) If there is damage or deformed parts for the rim after inspection, repair or replacement should be provided. If it is only the peeling of paint, make-up may be provided after rust removal.

**⚠ CAUTION**

Do not weld and repair deformed wheel bolt at bolt connection and replacement the old with the new should be provided for conditions aforesaid.

2. Wheel should be subject to periodic inspection for:

- 1) Consistency of types and specification of wheels at two sides of the same axle.
- 2) The depth of wheel crown for no less than 3.2 mm.
- 3) Local damage on tread for not exposing the body cord of wheel.
- 4) There should not be any crack and cut for 25 mm in length or long enough to expose body cord and other deficiency affecting use, abnormal wearing and deformation on the tread and side wall.
- 5) Sufficiency and tightness of wheel bolt and semi-axle bolt.

3. Wheel replacement

Following aspects should be considered in wheel replacement

- 1) Do not collide and damage thread on the wheel bolt.
- 2) The seal face of wheel nut should be kept clean.
- 3) Smear few grease or engine oil on threads of wheel bolt and nut and wheel spigot and its fitting surface.
- 4) All tire nuts have right hand threads. After installing wheels, with the suspension of wheels, tighten nuts in a change order of symmetry, cross, in turn and in series.
- 5) After each installation of wheel, wheel nut should be re-tightened, as required, after vehicle travels 50 km.

⚠ CAUTION

- **During tyre installation, attention should be paid to:**
- **The types and threads of wheel at the same axle should be same.**
- **Do not use retreaded tyre.**

Running reducer

1. Oil injection

Replacement of drive wheel oil for reducer is essential for its excellent operation and service life. In compliant (100 h for first replacement and 2500 h or 12 months for following replacement) replacement of driving wheel oil may cause poor working conditions of the equipment and sequential application may cause parts damaged.

See [Figure 4-13](#) for oil injection. Operation procedures are as follows:

- 1) Rotate the reducer until the hole is in horizontal status, as shown in [Figure 4-13](#).

- 2) The other refueling plug shall be above the horizontal plug.
- 3) Remove two plugs.
- 4) Refuel the reducer through the upper plug until the oil overflows from the horizontal plug.
- 5) Install plug back into the hole.
- 6) Run for minutes and check oil level. Continue to inject oil, if necessary.

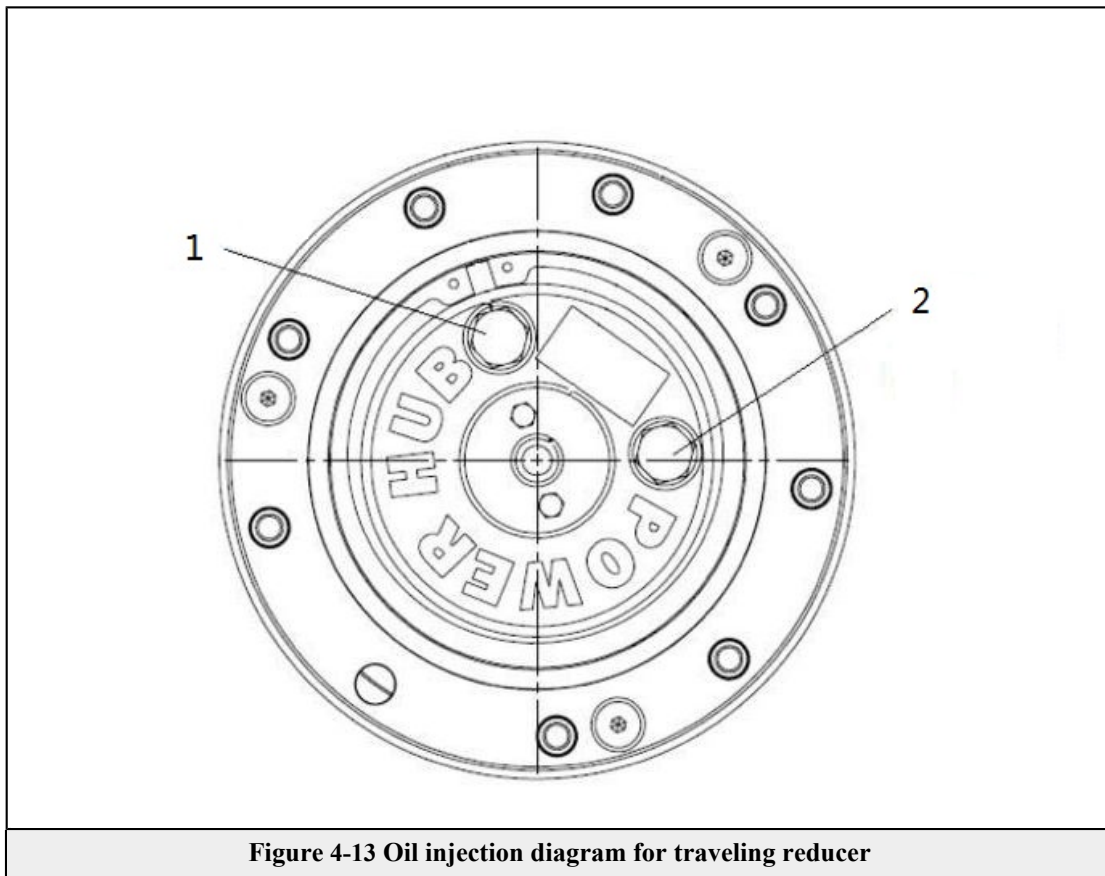


Figure 4-13 Oil injection diagram for traveling reducer

1. Fill oil from this hole.

2. Open it until the oil flows out.

2. Disengagement

See [Figure 4-14](#) for running reducer separating device. Steps are as follows:

- 1) Use spanner to remove the plug.
- 2) Insert the M6 bolt into the threaded hole of the sun gear which located in low torque planetary gear train.
- 3) Remove the sun gear.
- 4) Tighten the plug.

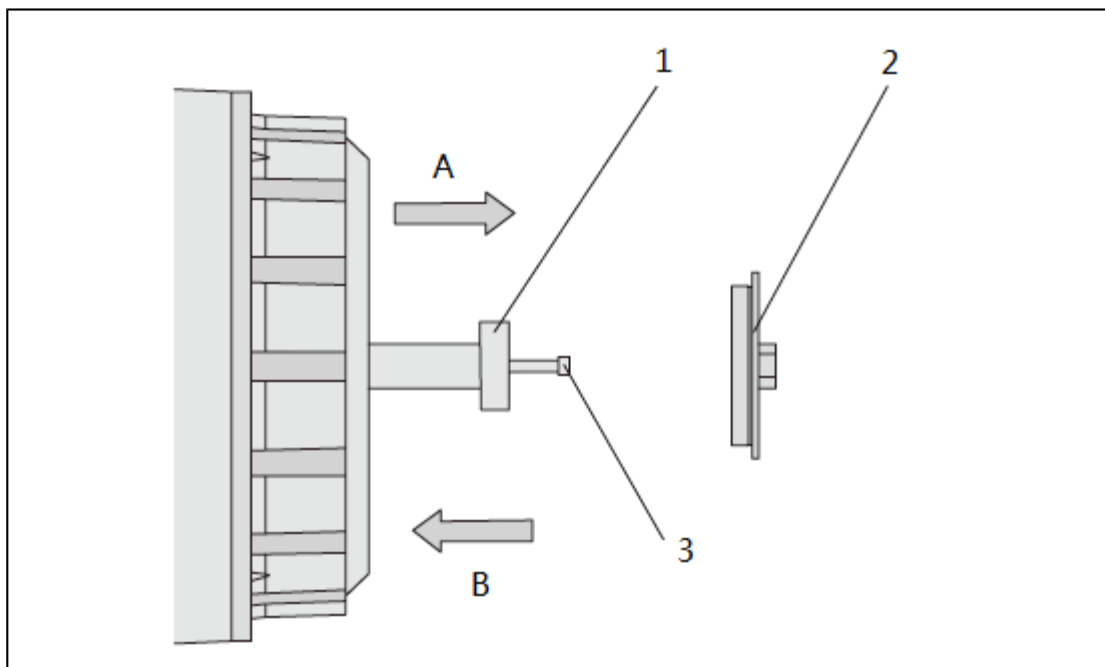


Figure 4-14 Diagram of traveling reducer separating unit

A. Disengage	B. Engagement	
1. Sun gear	2. Plug	3. Bolt M6

Running motor

1. The hydraulic hoses connecting to the motor shall be well marked and blocked after removal and the motor oil ports shall be properly blocked.

CAUTION

During the removal of oil pipes, loose the connections very slowly in order to prevent hydraulic oil from squirting or spraying and causing personnel injury.

2. Remove connecting screw of running motor and reducer and carefully remove running motor.

Axle balance system

The front balance axle is connected to frame with pins to maintain four wheels on ground while driving on uneven road. The balance axle adopts two axle balance cylinders which are located between frame and axle. Cylinder shall be adjusted only when the boom is in stowed position and driving operation is operated. Otherwise, the axle will be locked by the balance cylinders. When the system is applying pilot pressure on the balance valve, the balance valve will be opened and the cylinders will be unlocked, and vice versa. The pilot pressure is generated from the running system, it can be controlled by electromagnetic directional valve installed on the frame.

Locking test of axle balance (if applicable)

When the arm frame is in folding position and driving mode is selected, the front axle will be balanced automatically.

⚠ CAUTION

- **The balance shaft locking test shall be implemented once every quarter, or after the replacement of any system components, or in case there is any suspicion on improper operations of the system.**
- **Prior to balance cylinder locking test, the arm frame shall be retracted, declined and placed in the middle of rear wheels.**

1. Place a 150mm high inclined stop block before the front left wheel.
2. Start the engine through control on the platform.
3. Turn function speed selector and torque selector control switches to "low" position. Put the driving control joystick to forward gear and drive the machine carefully to the bevel until the front left wheel is on the top of the block.
4. Extend the boom carefully until it has just left the stowed position.
5. When the above actions are completed, put the driving joystick in reverse position, drive the equipment to leave the block and bevel.
6. Ask a support staff to check if the front left wheel and rear right wheel are maintained off the ground.
7. Carefully retract the boom to the stowed position. When the boom back to retraction position, drive the vehicle slowly to loosen the axle balance cylinders. Then the wheels will be laid on the ground.
8. Repeat the same test procedures to check the right balance cylinder to confirm if the front right wheel and rear left wheel are maintained off the ground.
9. In case the locking hydraulic cylinder is in abnormal operation, the qualified maintenance personnel shall complete the troubleshooting before further operations.: for starting the engine.



4.6 Hydraulic system

1. Main hydraulic components, pressure adjusting valve and pressure adjustment

1) Main hydraulic components of chassis and pressure control valve position

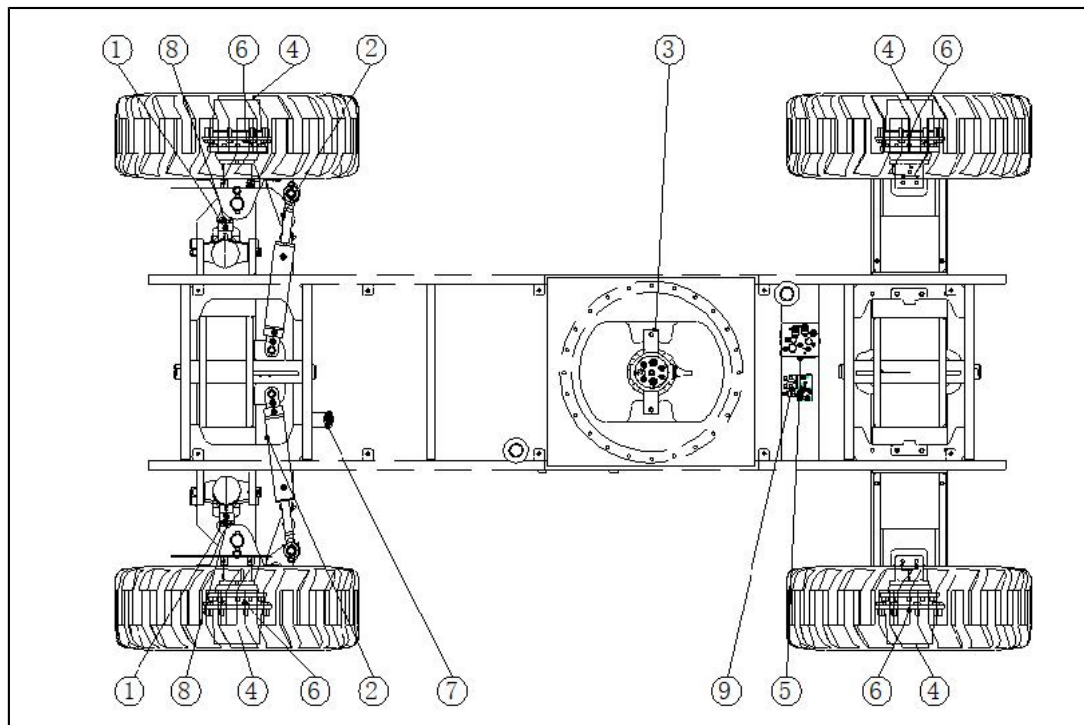


Figure 4-15 Main hydraulic components of chassis and pressure control valve position

- | | | |
|----------------------------------|-----------------------------|---------------------------|
| 1. Balance cylinder | 2. Steering cylinder | 3. Slewing center |
| 4. Running reducer | 5. Travelling control valve | 6. Running motor |
| 7. Axle floating reversing valve | 8. Balance valve | 9. Pilot oil source block |

2) Main hydraulic components of turntable and its pressure control valve position

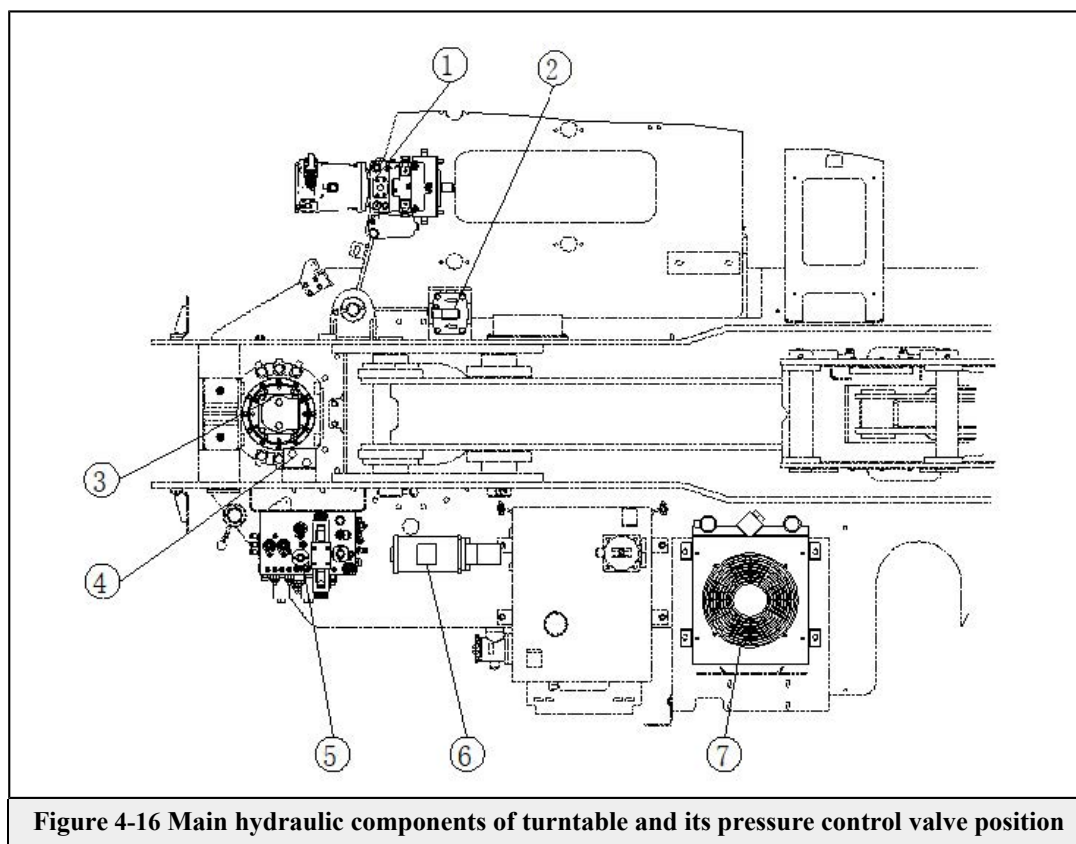
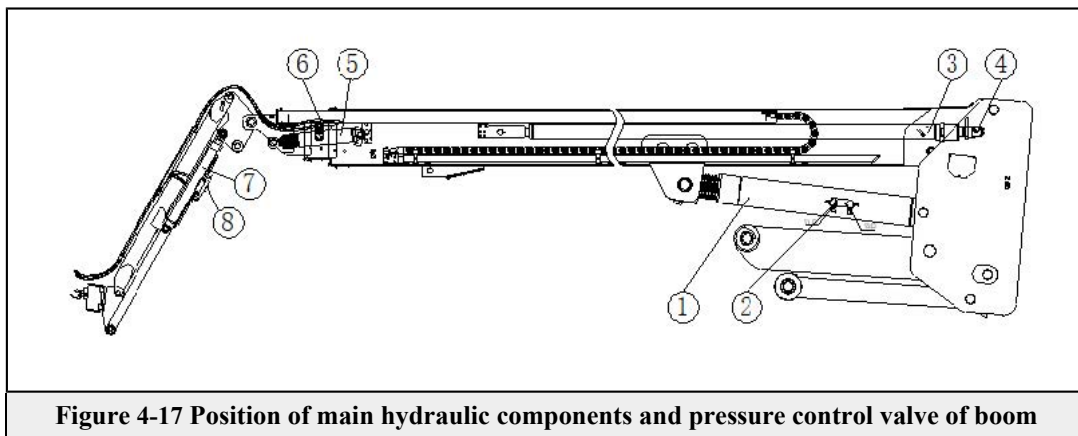


Figure 4-16 Main hydraulic components of turntable and its pressure control valve position

- | | | |
|-------------------------------|---------------------|--------------------------|
| 1. Radiator | 2. Power unit | 3. Luffing balance valve |
| 4. Control valve of turntable | 5. Luffing cylinder | 6. Slewing buffer valve |
| 7. Filter | 8. Oil pump | |

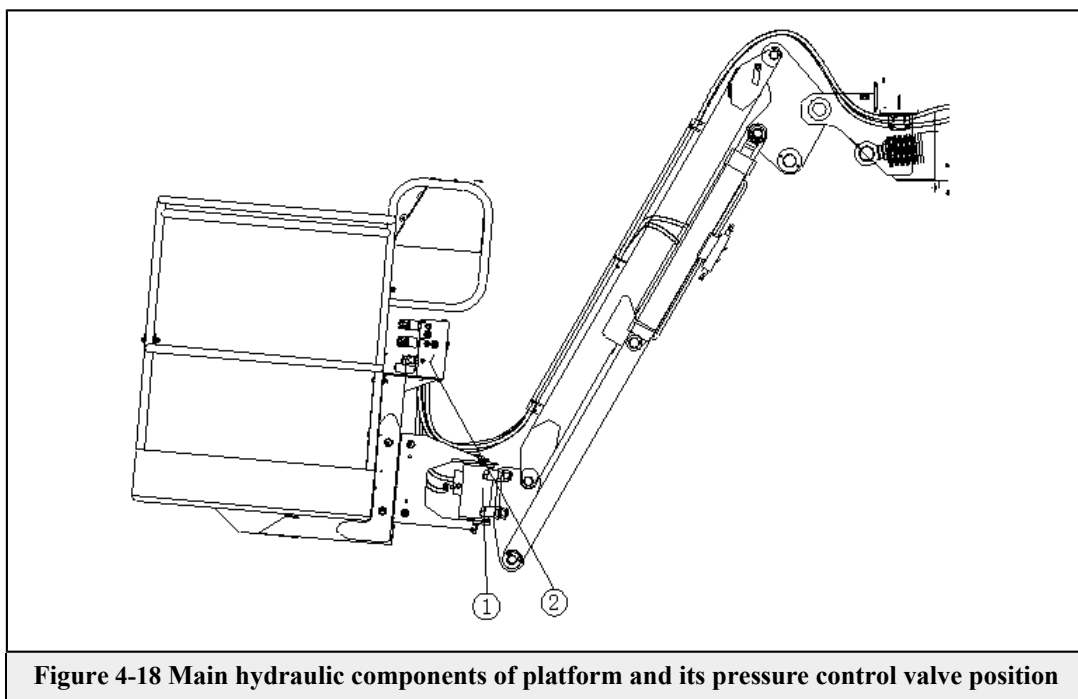


3) Position of main hydraulic components and pressure control valve of boom



- | | | |
|-----------------------------|--------------------------|----------------------------|
| 1. Luffing cylinder | 2. Luffing balance valve | 3. Telescopic cylinder |
| 4. Telescopic balance valve | 5. Levelling Cylinder | 6. Levelling balance valve |
| 7. Jib cylinder | 8. Jib balance valve | |

4) Main hydraulic components of platform and its pressure control valve position



- | | |
|-------------------|---------------------------|
| 1. Swing cylinder | 2. Platform control valve |
|-------------------|---------------------------|

2. Inspection and adjustment of hydraulic system pressure is as shown in [Table 4-2](#).

Table 4-2 System pressure

The default cut-off value of close variable pump pressure (MPa)	The default cut-off value of open variable pump pressure (MPa)	Power unit (MPa)
30	19	21

⚠ CAUTION

The pressure for variable pump and all balance valves are set before delivery. If any regulation is required, please contact our professional service person for adjustment.

Checking items:

- 1) Check the electro-hydraulic proportional valve lever and joint for oil leakage; If leakage is found, check and repair it.
- 2) Check the condition of each pin and lock device at each hinge and repair or replace timely if any problem is found.

Replacement of hydraulic oil

Cleanliness is essential for hydraulic system maintenance. When oil filling, dusts and other contaminations shall be kept away from the system. Even a small grain can cause blocking in the components including valves and pumps, etc. The hydraulic oil shall be refilled by the filter rather than directly refilling fresh oil into the hydraulic system.

1. Type of hydraulic oil

- 1) Select the appropriate hydraulic oil according to the ambient temperature:
 - ① Fill AE46 anti-wear hydraulic oil for the area with the ambient temperature above -15°C;
 - ② Fill HS22 hydraulic oil in regions with $\leq -15^{\circ}\text{C}$ environmental temperature.
 - ③ For special application, choose hydraulic oil according to real demand.
- 2) Do not mix different brand hydraulic oils. Before filling another brand of hydraulic oil, drain the old hydraulic oil in the hydraulic oil tank entirely.

2. Preparation before replacement

Before replacing the hydraulic oil, elevate the boom to the maximum working height and shut down the engine.

3. Replacement procedures

- 1) Unscrew the drain plug at the bottom of the tank and drain the hydraulic oil.
- 2) Remove all hoses from the tank and drain as much hydraulic oil from hoses as possible.

⚠ CAUTION

- **Mark all hoses and fittings for easy reinstallation.**
- **Wipe all openings with a clean cloth. Clean as deep as possible. Don't miss the hidden hole.**

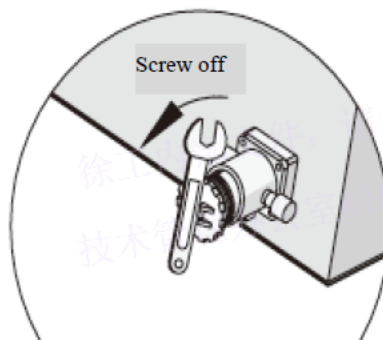
- 3) Remove all gaskets of oil filters.
- 4) Replace all oil filter elements and reinstall the filter components.
- 5) Replace the defective hoses.
- 6) Connect the suction and return hose and fill the tank with new oil.
- 7) Disconnect the return circuit to the oil tank and connect it to other empty container.
- 8) Start the engine to drive boom and outrigger to the driving state respectively.
- 9) Clean or replace the return hose of the oil tank.
- 10) Connect the return pipe of oil tank, check the oil level, and refill to the required capacity.
- 11) When refilling or replacing hydraulic oil, make sure that the hydraulic oil meets the following cleaning standards. The pollution grade of solid grain in the hydraulic oil that will be filled into hydraulic oil tank should not be more than 17/14. The tank capacity of hydraulic tank is 210 L and the total capacity of the replacement hydraulic oil is about 300 L.

Replacement of hydraulic oil filter element

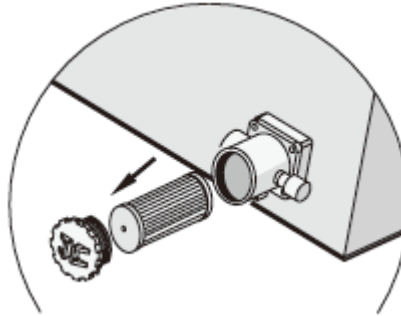
Replacement method as following:

1. Clean oil filter housing and exposed section with diesel and other cleaning agent.
2. Place a container under the oil filter to collect the oil of filter housing.
3. Unscrew hydraulic filter end cap and self-close valve of filter will close automatically to cut off the oil-way of oil tank and the oil will not flow out from oil tank, which is easy for cleaning.

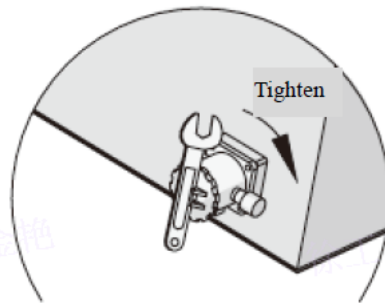
When loose and tighten the cover, there is no need of special tool, only a spanner is required.



4. Pull the filter element out and dispose properly.



5. The filter element of the oil suction filter of this product is a paper structure and cannot be cleaned or repaired. If the filter element is broken or clogged by dirt (the reading of vacuum guage is higher than 0.018 MPa), only replace with new filter. Only the filter element supplied by our company can be used.
6. Install the new filter element into the housing and then screw the end cap and tighten it.

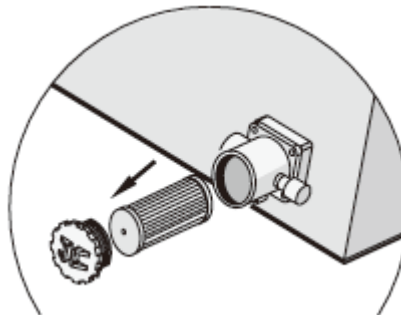


Disassembly of hydraulic oil pump

This machine adopts dual pump as main pump which connected with engine directly; one closed pump is used to drive traveling function and the other open variable-displacement pump is used to control other functions; In addition, there is a power unit used as auxiliary power.

Methods to disassemble and maintain the main oil pump:

1. Pull out the suction oil filter element of hydraulic tank before the disassembly of oil pump and cut off the oil piping of oil tank.





2. Disconnect, mark and plug hydraulic hoses connecting function pump. Cover the oil ports on pump properly.

⚠ CAUTION

During the removal of oil pipes, loose the connections very slowly in order to prevent hydraulic oil from squirting or spraying and causing personnel injury.

3. Remove and mark the cable connected to the motor and protect the cable connector properly.
4. Remove the ties fixing the electric unit and disassembly the pump carefully.

4.7 Electrical system

Battery

Battery can convert electricity into chemical energy stored in the battery or chemical energy into electricity to provide load. The battery mainly provides electrical energy for the whole machine.

1. Precautions for periodical inspection and maintenance.

- 1) Keep it clean and dry. If the terminal is contaminated, loosen it for cleaning and lubricate it with clean acid-free and acid-resistant grease.
- 2) Do not place tools on the battery and do not expose the battery to the sun for a long time.
- 3) Often check the vents on both sides of the upper cover of the battery to prevent blocking by dust, ice water and so on, resulting in the deformation of the battery case.
- 4) Battery shall be kept away from sparks and high temperature. Charging batteries in confined spaces is prohibited.
- 5) Do not remove battery wires when the engine is running.
- 6) When removing the battery wiring, remove the battery negative wire first, and then remove the battery positive wire.



When removing battery wiring, avoid connecting the battery positive wiring to the ground.

2. Battery charging

Charge the battery if the battery storage after 3 months storage or when the voltage of a single battery terminal is lower than 12.6V. Especially pay attention to the battery charging in cold seasons.

Direct current is used for charging. The positive pole of power is connected to that of battery and so as negative pole.

Constant voltage is used for battery charging. The charge voltage is $14.4 \text{ V} \pm 0.5 \text{ V}$, with the maximum permitted charge current of $0.5C_{20}A$ (C_{20} is the 20 h capacity of the battery). When charge voltage does not rise, charge current is close to zero value and the stable state maintains for 2~3 h, charging is completed.

Refer to instruction on battery for battery charging states.

3. Disassembly and assembly of battery

Steps for battery disassembly:

- 1) Disassembly of the battery shall be performed in ventilating conditions and spark should be eliminated.
- 2) Firstly disconnect negative pole and then positive pole.
- 3) Remove the battery.



4) Touch the grounding point to prevent electric spark caused by discharging.

4. Installation of battery

Steps for battery installation:

- 1) Install the battery on the machine;
- 2) Touch the grounding point to prevent electric spark caused by discharging.
- 3) Firstly connect the positive pole of the battery and then the negative pole (ground side);
- 4) Check connection on battery terminal for firmness.
- 5) Lubricate wiring terminal with acid free and acid resistant grease.

After major replacement or major repair of the machine, to ensure the normal performance and smooth operation of the machine as before, users should look for professional institution reference standard GB25849-2010 Mobile Elevating Work Platform-Design Calculation, Safety Requirements and Test Method for checking and testing. The “major replacement” and “major repair” mentioned means the complete or partial replacement that affects the stability, strength and performance of mobile elevating work platform.

CAUTION

- Tests shall be carried out by professional institutions and qualified personnel.
- Records shall be completed and kept after major changes or major repairs.
- The inspection and test results shall be recorded and retained.



LOG



Chapter 5 Common faults and troubleshooting

5.1 Common faults and solutions

CAUTION

Electrical control box and hydraulic system must be repaired by professionals; In case of special failure not mentioned in this manual, please contact our after-sales service department to solve.

Table 5-1 Common faults of hydraulic system and troubleshooting

S/N.	Fault	Possible causes	Solutions
1	The pressure of superstructure hydraulic system is too low or too high	Under-low setting of pressure cutoff value for open variable displacement pump	Adjust the pressure to 19 MPa
		Under-low pressure setting of main relief valve in turntable control valve	Adjust the pressure to 21 MPa
2	Low chassis hydraulic system pressure	Under-low setting of pressure cutoff valve for closed traveling variable displacement pump	Adjust the pressure to 30 MPa
		Under-low pressure setting of main relief valve in closed traveling variable displacement pump	Adjust the pressure to 32 MPa
3	All superstructure actuators are inoperative	No pressure in system or pressure is too low	Refer to Item 1 for checking
		Malfunction of electronic proportional pilot joystick	Check and repair electronic proportional pilot joystick
4	Individual superstructure actuator is inoperative	Under-low pressure setting of motion control circuit for turntable control valve and platform control valve	Turn up the setting pressure of each control valve
5	Luffing cylinder locking failure and lowering automatically	The locking performance of balance valve is bad and inner leaking is serious	Check balance valve
		Large leakage in cylinder	Inspect and repair cylinder
		The lock pressure of balance valve is set too low	Increase the lock pressure

Table 5-1 Common faults of hydraulic system and troubleshooting(continued)

S/N.	Fault	Possible causes	Solutions
6	Electro proportion pilot handle stops operation and actuator stops or is irresponsive	Relevant balance valve closes too slow	Check relevant balance valve
7	Rotary table shakes or is unstable when up vehicle rotates	Too large clearance of gear engagement of slewing mechanism	Adjust gear engagement clearance
		The set pressure of rotary cushion valve is too high, causing the impact when opening	Regulate the set pressure of cushion valve
		The brake enable pressure for slewing reducer is too high or malfunction	Repair the brake
8	Emergency power installation can retrieve the vehicle after starting	Malfunction of electro-hydraulic proportional valve	Check and repair electro-hydraulic proportional valve.
		Internal leakage of power unit	Check and repair power unit.
9	Machine travel failure	Too low system pressure	Measure system pressure and regulate it to corresponding value
		Travelling distribution valve fault results in the brake of travelling reduce can not be enabled.	Check travelling distribution valve
10	Only one side can move	The motor or reducer at the side that cannot move is damaged	Check the motor or reducer
11	Chassis cannot turn	Steering pressure is too low.	Measure system pressure and adjust to relevant value
		Malfunction of axle control valve	Check and repair axle control valve.
		Steering mechanism fault	Check and repair steering mechanism
12	The state of high-speed and low-speed	Shifting electromagnetic valve is with fault	Check shifting electromagnetic valve and controlling electrical signal

Table 5-1 Common faults of hydraulic system and troubleshooting(continued)

S/N.	Fault	Possible causes	Solutions
	in traveling cannot be shifted	Control pressure is insufficient	Check control pressure
13	Platform cannot level in operation	The hydraulic oil in levelling system is insufficient	Supply hydraulic oil to levelling system
		The set pressure of levelling overload valve is too low	Increase to set pressure
14	Platform cannot swing	Too low system pressure	Increase system pressure

Table 5-2 Common faults of electrical system and troubleshooting

S/N.	Fault	Possible causes	Solutions
1	Entire vehicle is with no power	Battery is damaged or with no power or connecting wire is peeled or fuse blew out.	Replace battery, charge battery, connect wire or replace fuse.
2	Starter does not work	Fuse is burnt out	Replace fuse
		Starting button works abnormally	Repair or replace
		Conductors between elements are disconnected or plug-ins and connecting parts are peeled	Re-lay and re-fix
		Bond strap is badly connected or the strap is damaged	Re-bond or replace the strap
		Starting relay is damaged	Repair or replace
3	Generator does not produce power	Insufficient power of battery	Repair or replace
		The connector of generator peels	Re-fix
		Generator is damaged	Replace generator
		Machine is with fault or generator is damaged	Check the belt for whether being loose
		Fuse is burnt out	Replace fuse
4	Generator does not strike spark	E-stop switch damage	Replace
		Shutdown electromagnetic valve is damaged	Replace
		Shutdown control circuit is with fault	Check faults in circuit
		Fuel oil filter element is blocked	Replace
		Damage of oil-water separator	Replace

Table 5-2 Common faults of electrical system and troubleshooting(continued)

S/N.	Fault	Possible causes	Solutions
		Oil piping faults, such as fuel pipe damage	Troubleshoot
5	Engine alarms faultily	Water temperature sensor (or switch) is damaged	Replace
		Sensor plug-ins and connecting parts are peeled or the pin is badly connected or line is disconnected	Find out loose point, closely insert plug-ins and connecting parts and eliminate line fault
		Water temperature sensor (or switch) is damaged	Replace
		Sensor plug-ins and connecting parts are peeled or the pin is badly connected or line is disconnected	Find out loose point, closely insert plug-ins and connecting parts and eliminate line fault
6	Fuel meter displays abnormally	Meter sensor is damaged	Replace meter sensor
		Meter is damaged	Replace meter
		Meter sensor does not match meter	Replace with a meter sensor that matches meter parameters
		Line is damaged	Check faults in circuit
7	Superstructure is with no power	Fuse is burnt out	Replace
		Power relay is burnt	Replace
		Conductor is in open circuit	Re-connect or re-lay
8	Turntable does not work	Fuse is burnt out	Replace
		Electromagnetic valve failure	Repair or replace
		Conductor is in open circuit	Re-connect or re-lay
		The switch to shifting upper and lower vehicle is damaged	Replace
9	Platform does not work	Fuse is burnt out	Replace
		Pedal switch failure	Replace
		Conductor is in open circuit	Re-connect or re-lay
		The switch to shifting upper and lower vehicle is damaged	Replace
		System bus is with fault	Check faults in circuit
		Electromagnetic valve failure	Repair or replace

**Table 5-2 Common faults of electrical system and troubleshooting(continued)**

S/N.	Fault	Possible causes	Solutions
		Handle or button and switch is damaged	Replace



LOG



Chapter 6 Schematic diagrams

6.1 Schematic diagram of hydraulic system

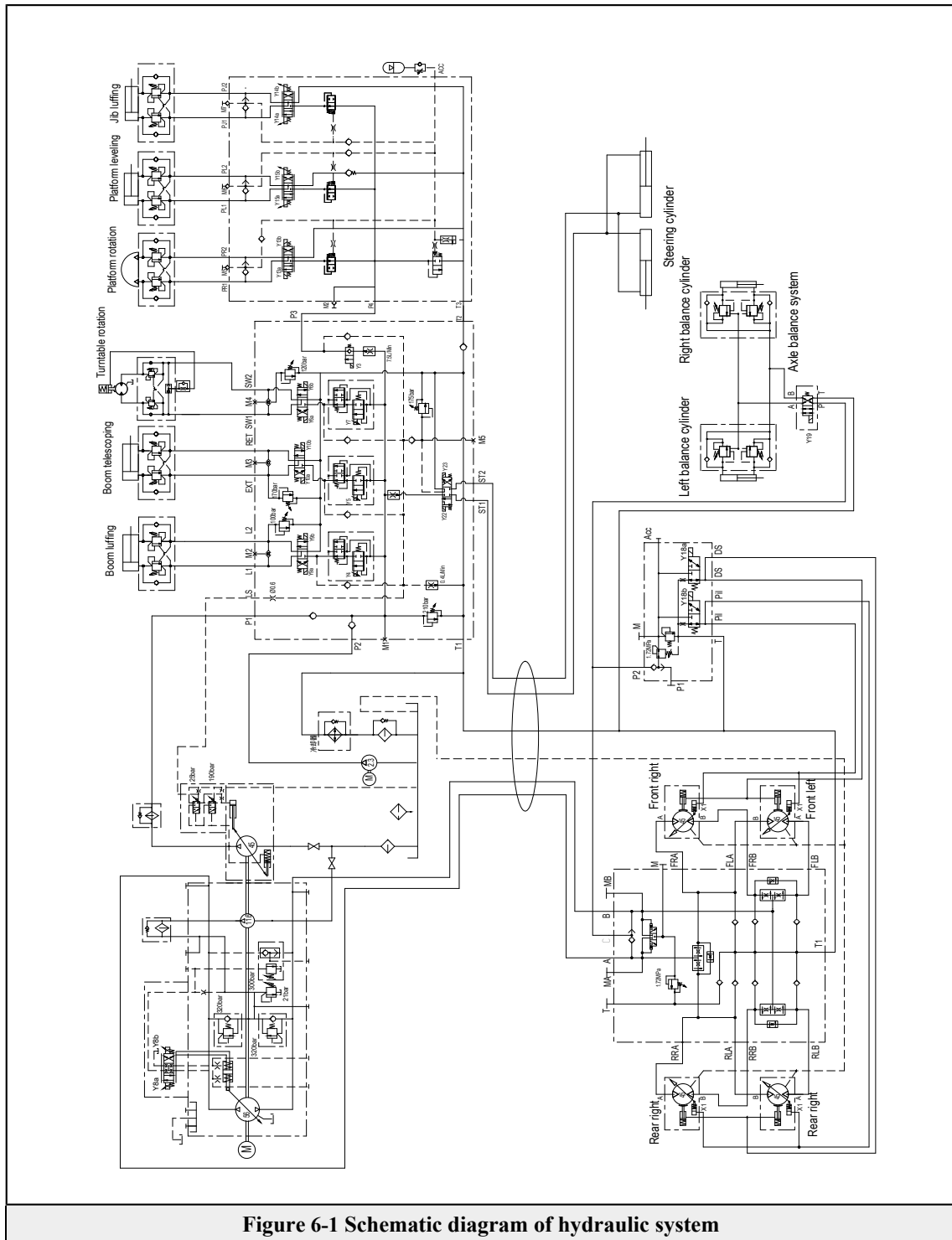
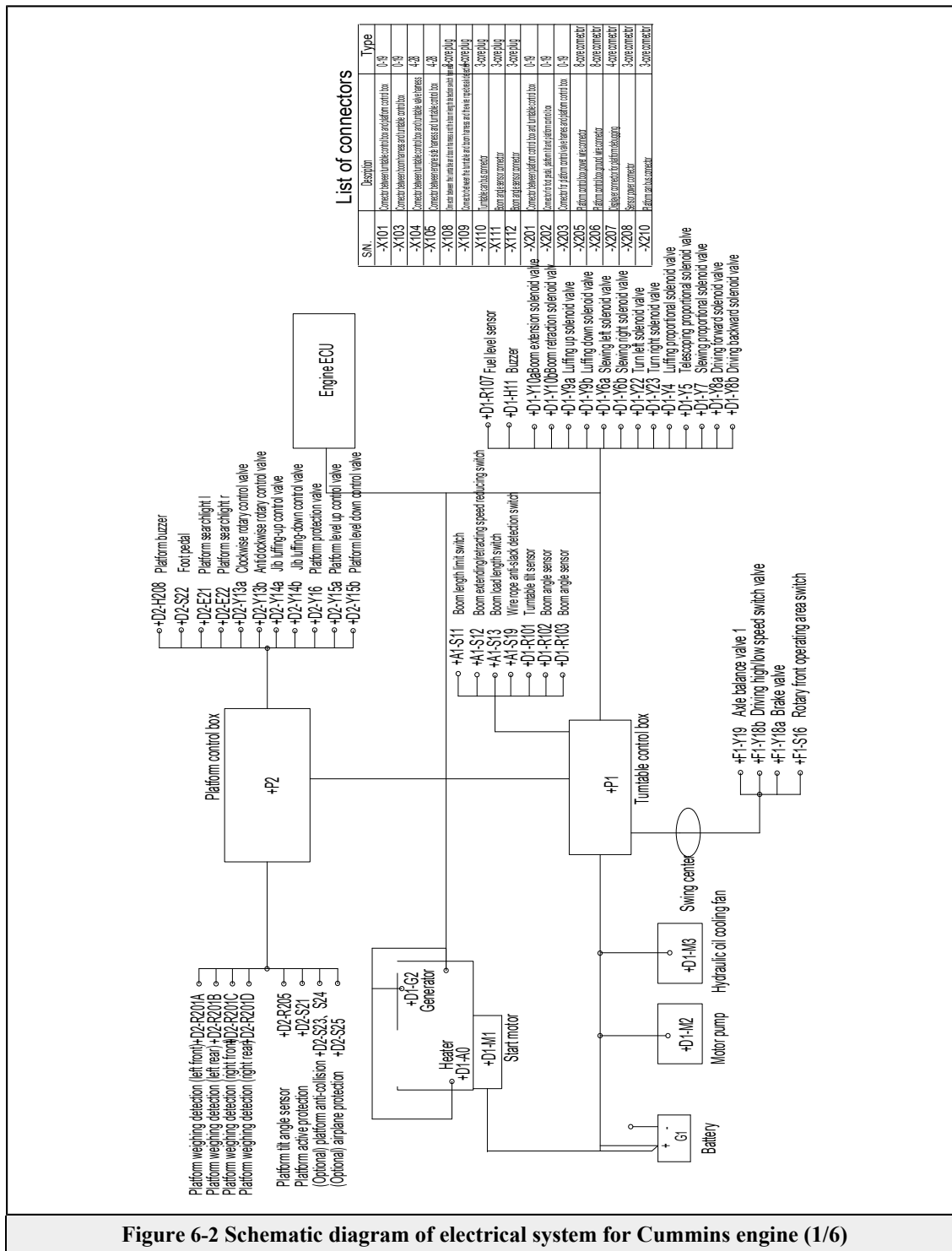


Figure 6-1 Schematic diagram of hydraulic system

6.2 Schematic diagrams of electrical system



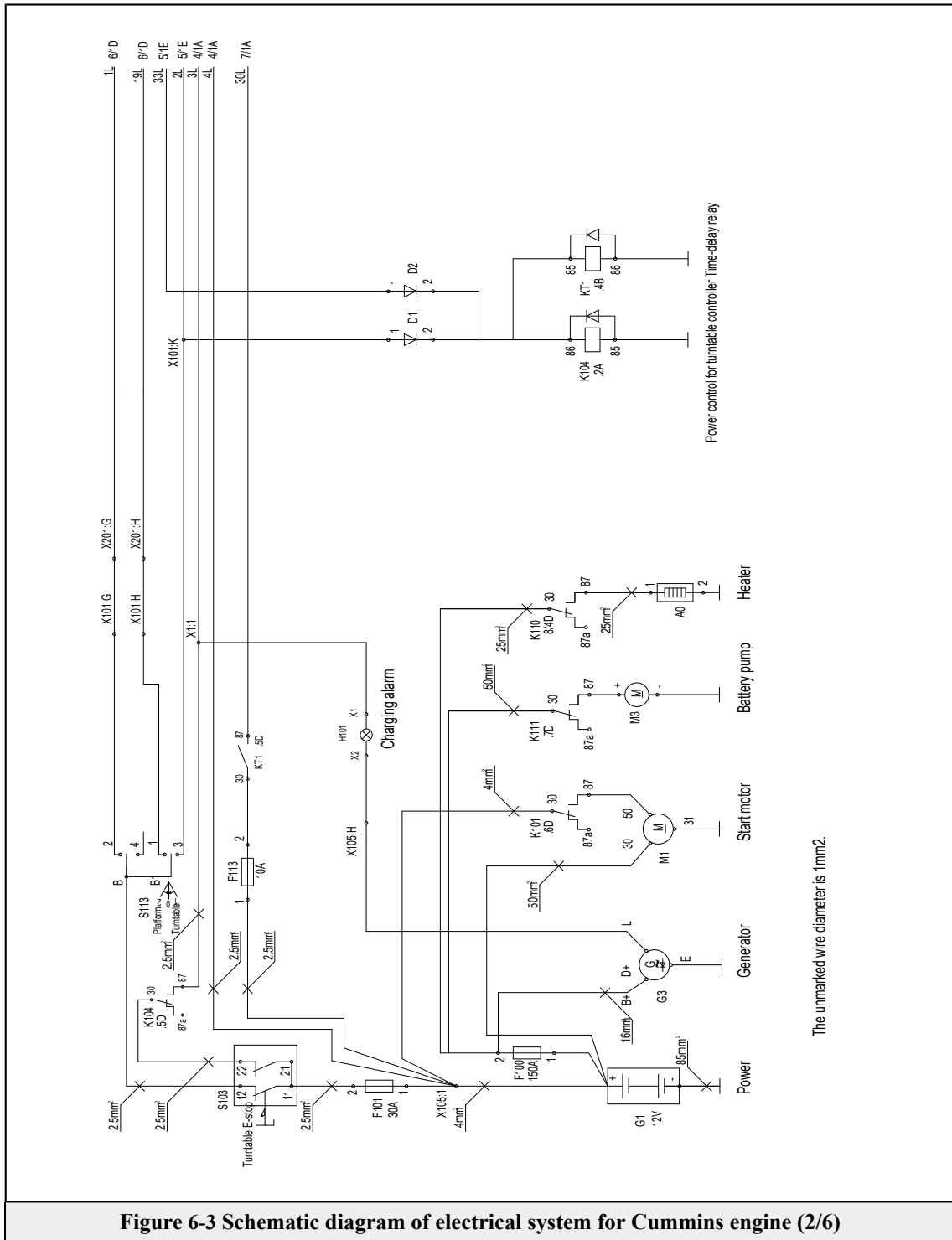


Figure 6-3 Schematic diagram of electrical system for Cummins engine (2/6)

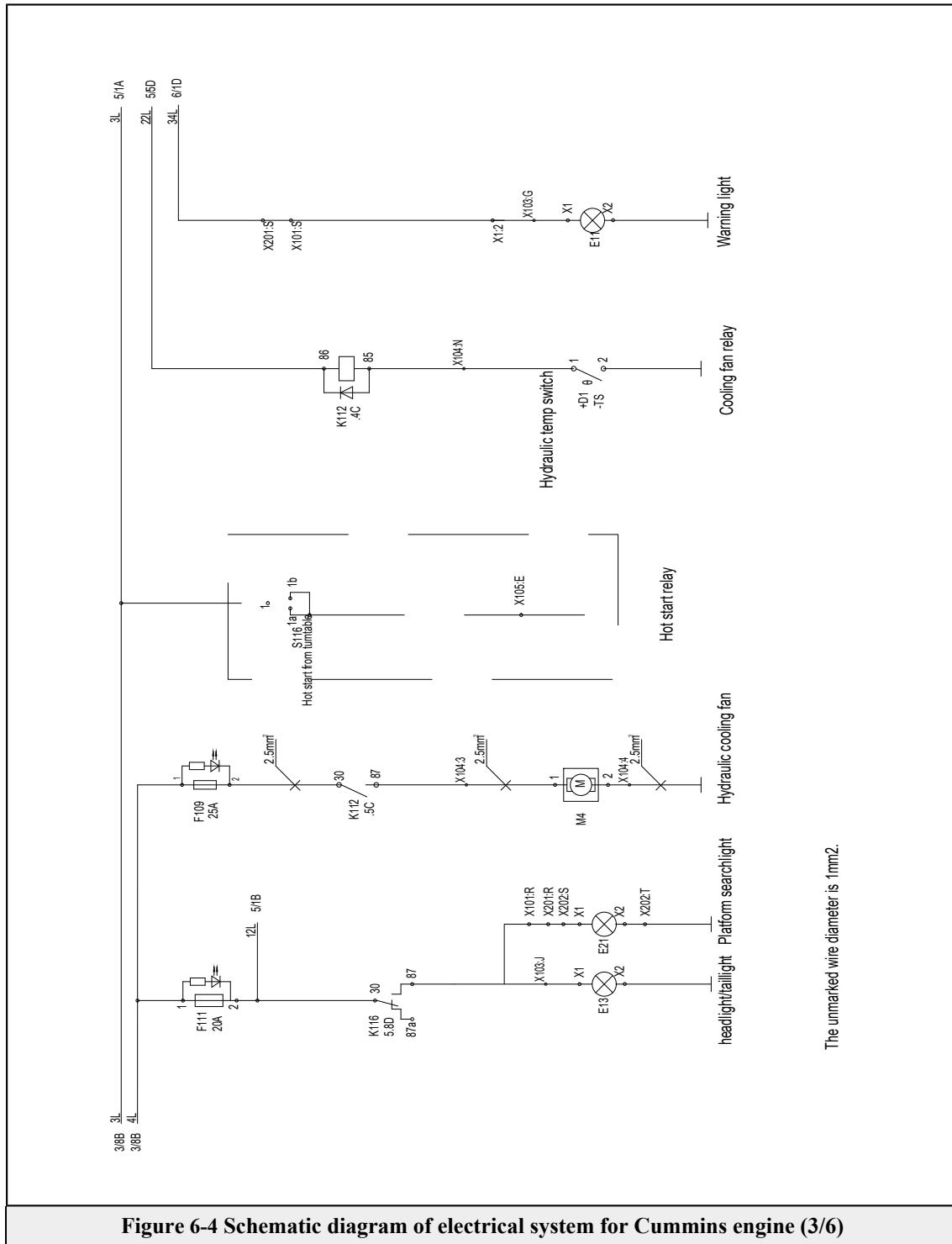


Figure 6-4 Schematic diagram of electrical system for Cummins engine (3/6)

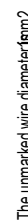
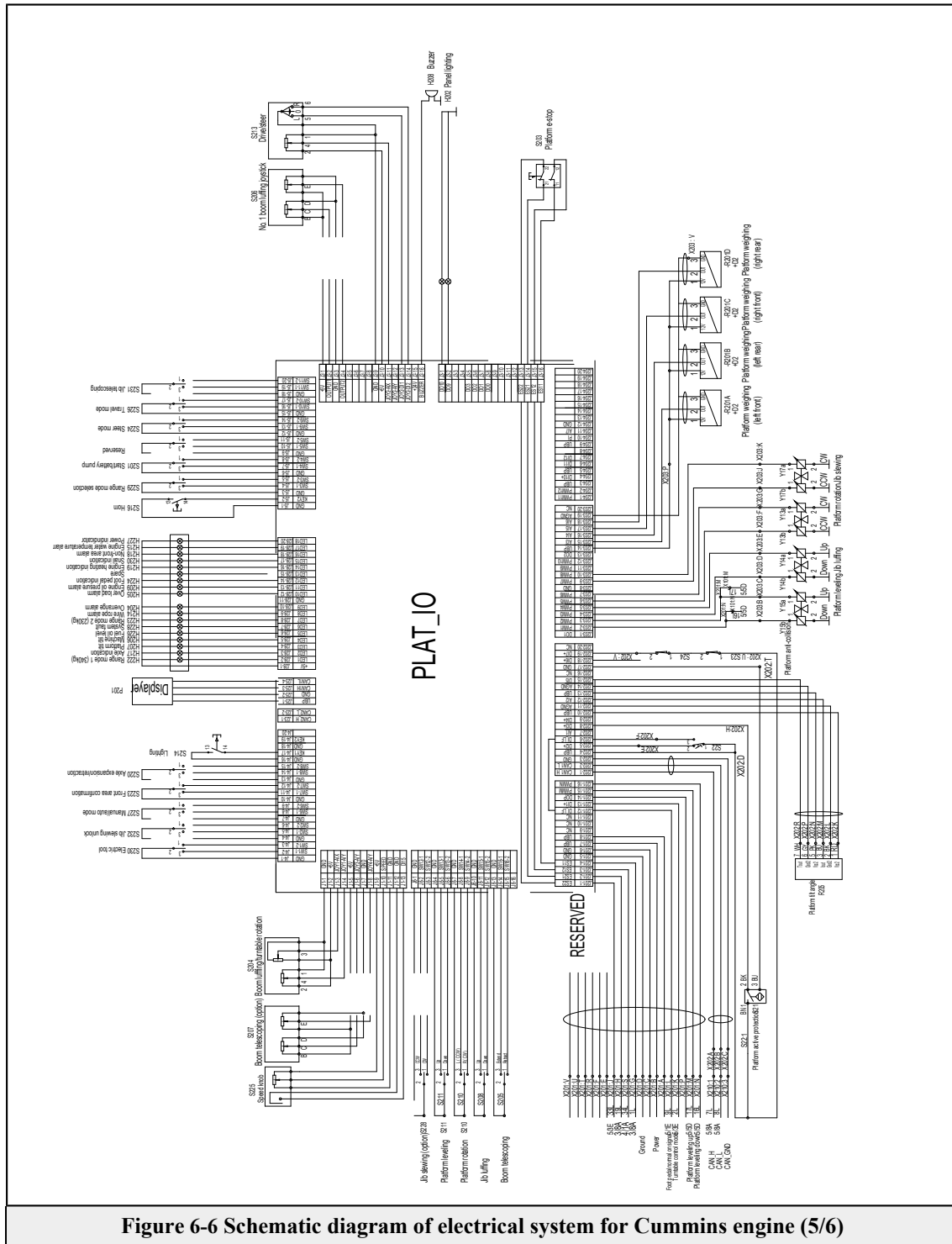
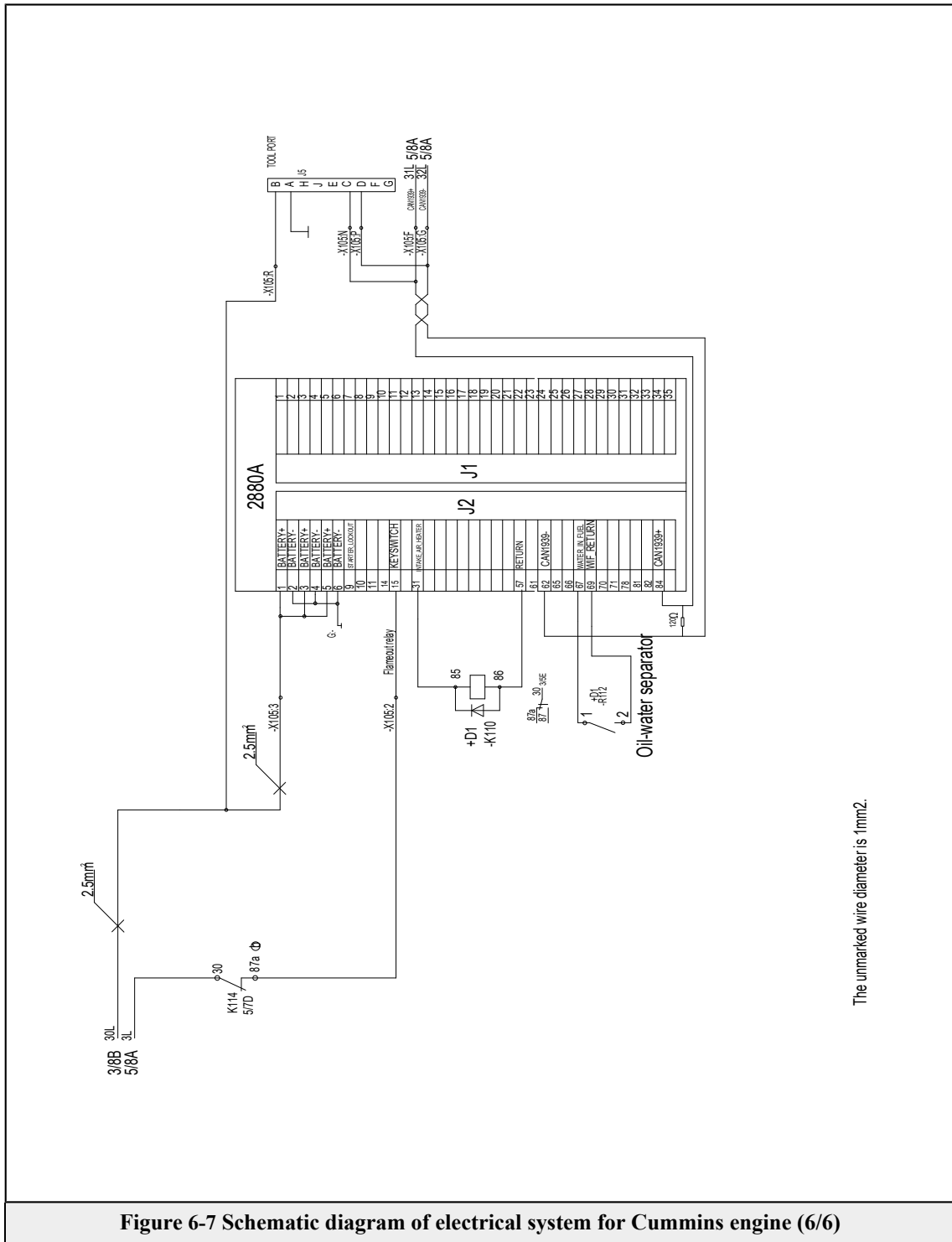
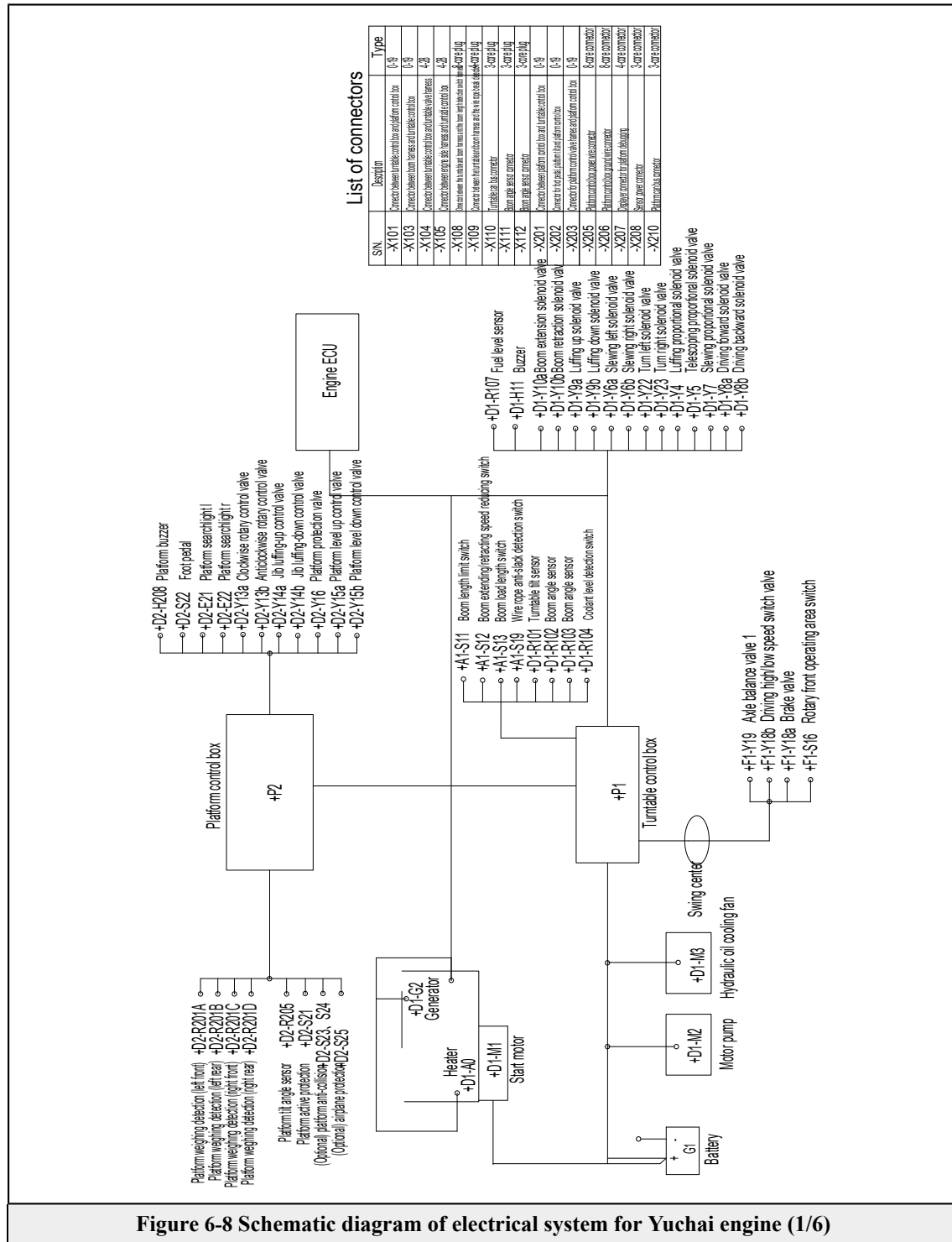


Figure 6-5 Schematic diagram of electrical system for Cummins engine (4/6)







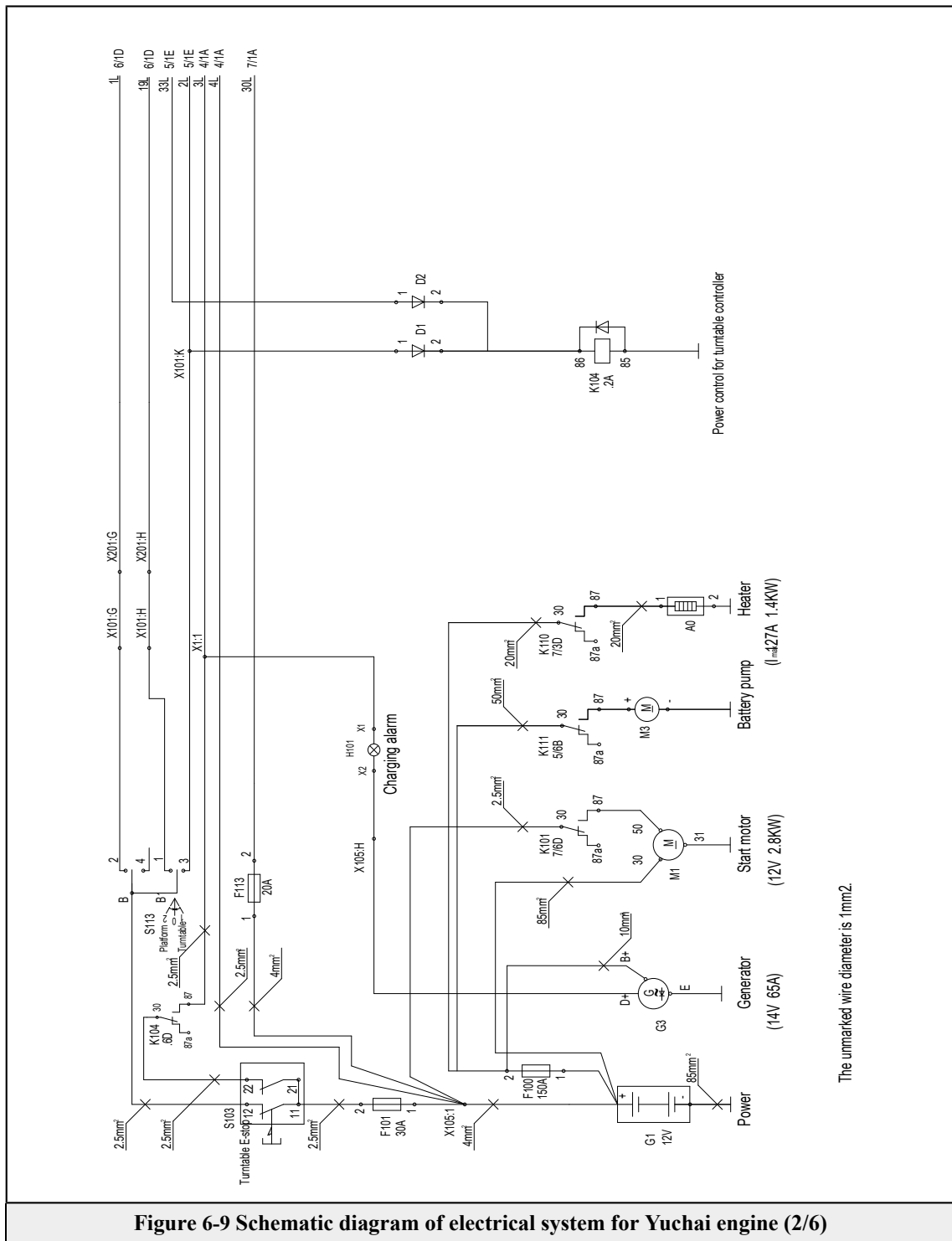


Figure 6-9 Schematic diagram of electrical system for Yuchai engine (2/6)

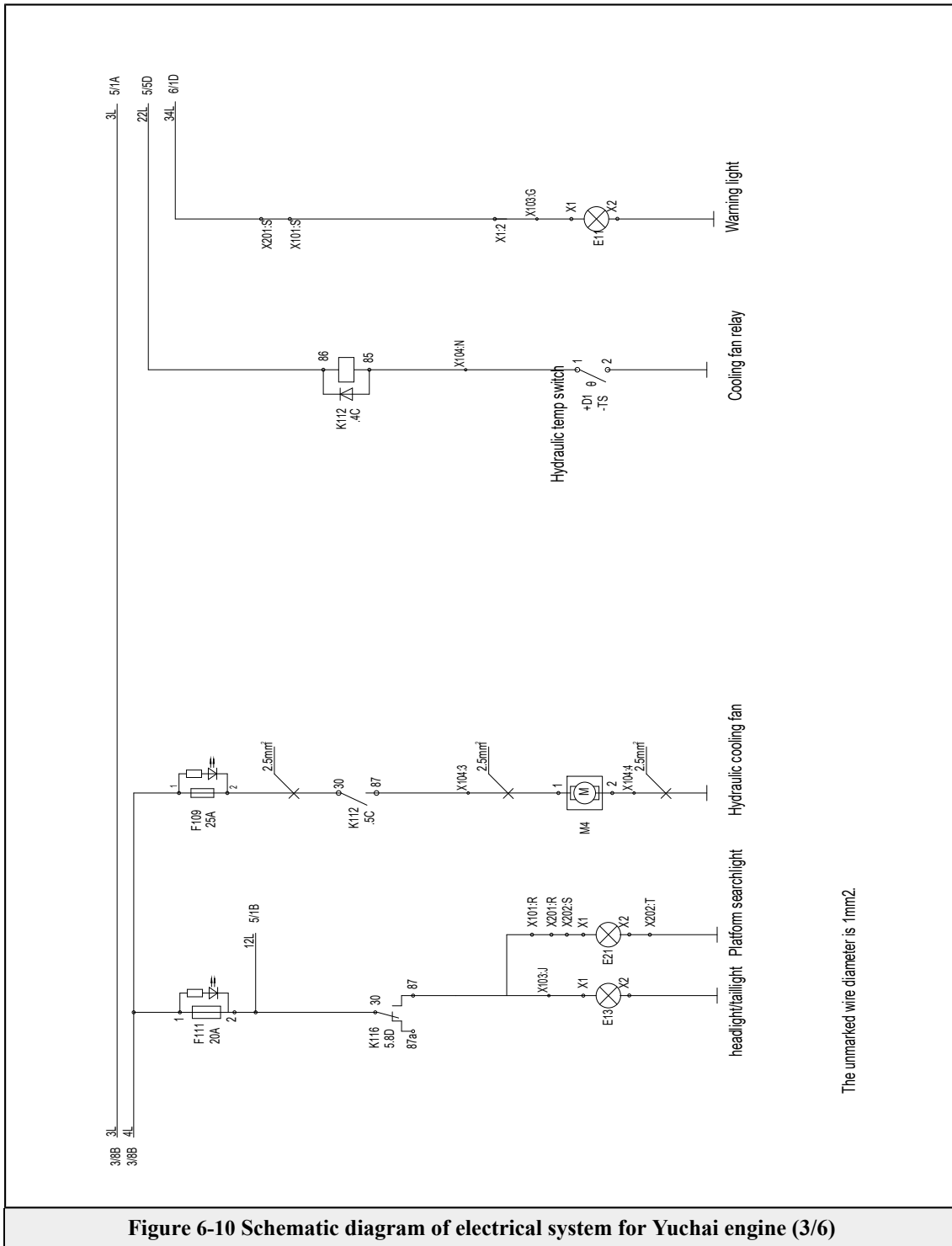


Figure 6-10 Schematic diagram of electrical system for Yuchai engine (3/6)

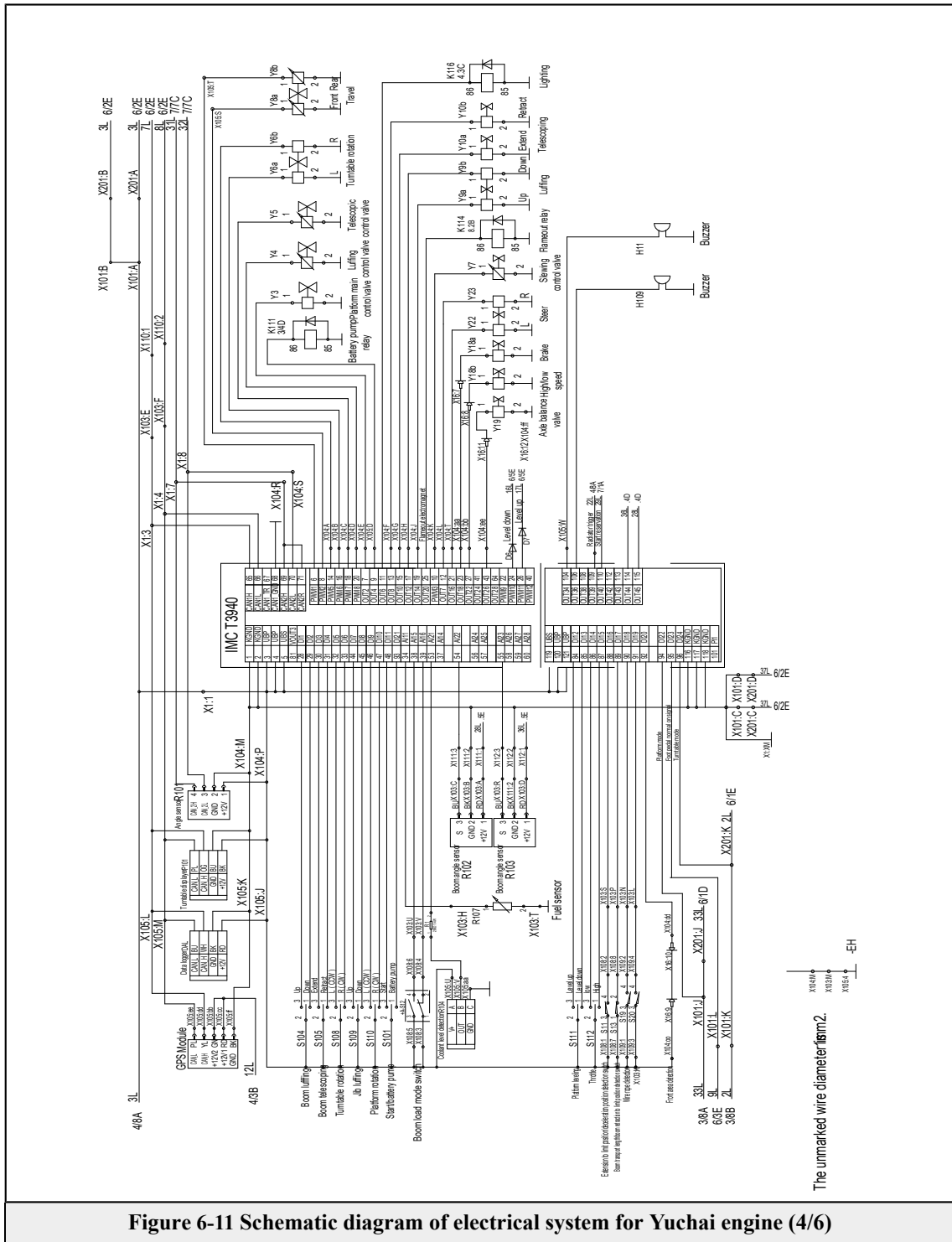


Figure 6-11 Schematic diagram of electrical system for Yuchai engine (4/6)

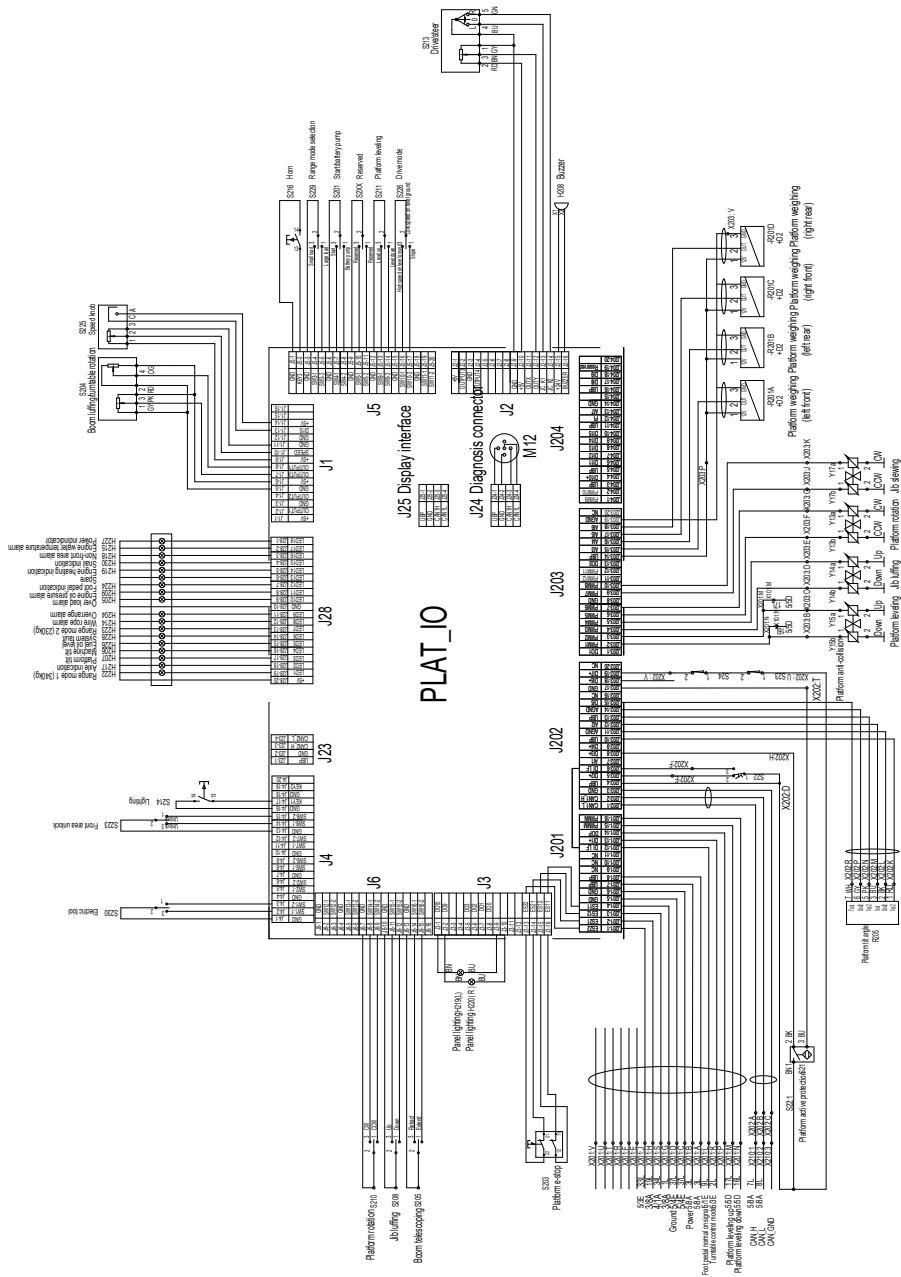
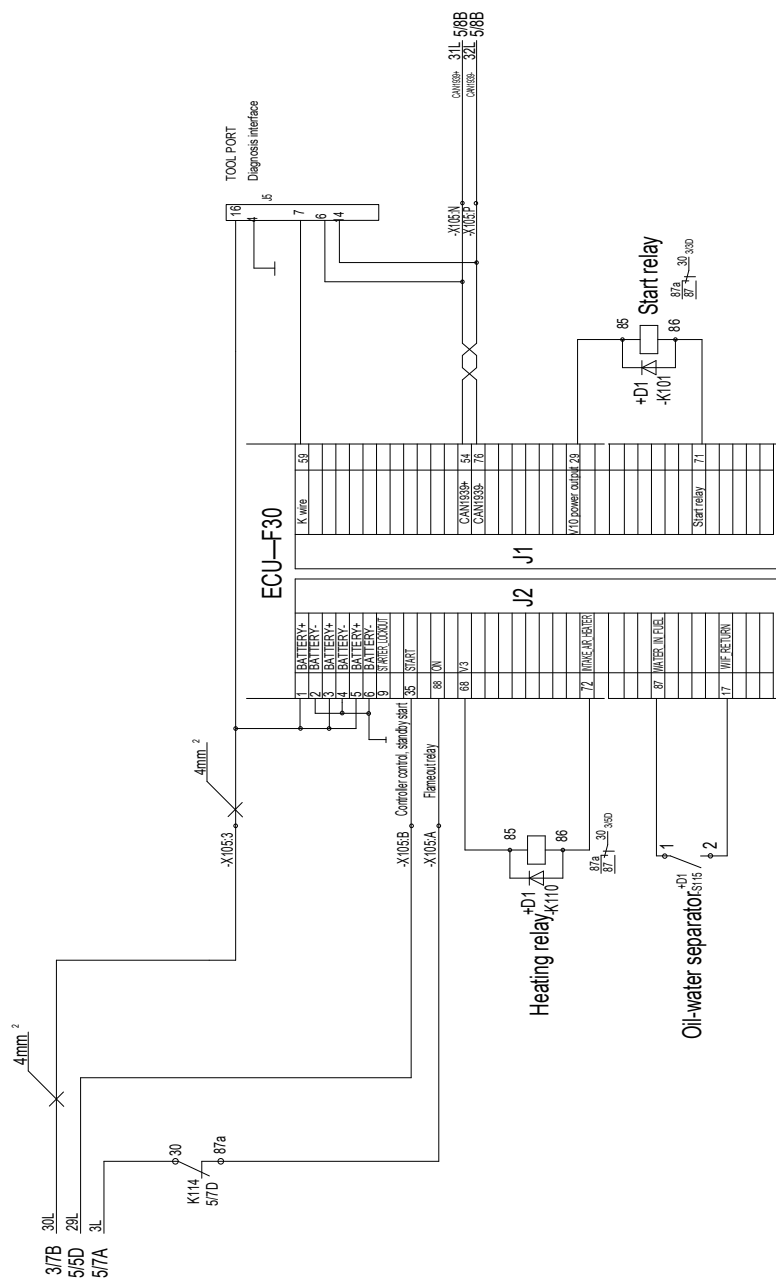


Figure 6-12 Schematic diagram of electrical system for Yuchai engine (5/6)



The unmarked wire diameter is 1mm2.

Figure 6-13 Schematic diagram of electrical system for Yuchai engine (6/6)



LOG



Chapter 7 Appendix

7.1 Main components

Table 7-1 List of main components

S/ N.	Name	Manufacturer	Certifica tion mark	Remark
1	Slewing bearing	Maanshan Fangyuan Slewing Bearing Co., Ltd.		
2	Slewing reducer	Xuzhou Ke Yuan		
3	Main oil pump	Rexroth		
4	Control valve of turntable	Shenzhen Sangte/ Zhejiang Shengbang		
5	Turntable control valve	Shenzhen Sangte/ Zhejiang Shengbang		
6	Luffing cylinder	Chengdu Chenggang Hydraulic Equipment Co., Ltd./ XCMG Hydraulic Parts Co., Ltd.		
7	Steering cylinder			
8	Leveling cylinder			
9	Jib cylinder			
10	Telescopic cylinder			
11	Rotary motor	Ningbo Zhongyi Hydraulic Motor Co., Ltd.		
12	Running reducer	RR/ Zhejiang Shengbang		
13	Running motor	DAFOSS/ Zhejiang Shengbang		
14	Engine	Cummins		

7.2 Maintenance inspection record

Table 7-2 Maintenance inspection record

[illegible]

Table 7-2 Maintenance inspection record(continued)

S/N.	Item	Maintenance content	Signature of maintenance personnel	Date	Remark



Manufacturer: XCMG Fire-Fighting Safety Equipment Co., Ltd.

Address: No. 17 Zhujiang East Road, Hi-tech Industrial Development Zone, Xuzhou, Jiangsu, China.

Post code: 221100

Tel: 0516 - 87981118

Service Tel: 0516-87981166

Quality Assurance Tel: 0516-87986966

Spare Parts Tel: +86 516 87989292

Version No. : Version in October, 2019.

All rights reserved.