XGS58E Instruction Manual

XCMG Fire-Fighting Safety Equipment Co., Ltd.

Original instruction

Foreword

This Instruction Manual contains information and instructions for safe operation and maintenance of your XCMG machine.

In the interest of yours and bystanders' safety as well as to prevent accidents and ensure environmental protection, you shall:

- Carefully read the included information before use of the machine,
- Familiarize yourself with its content and
- **This Instruction Manual is an integral part of the machine! Keep it on the machine at all times for reference!**

In case of damage or loss of this manual it is mandatory to replace it immediately!

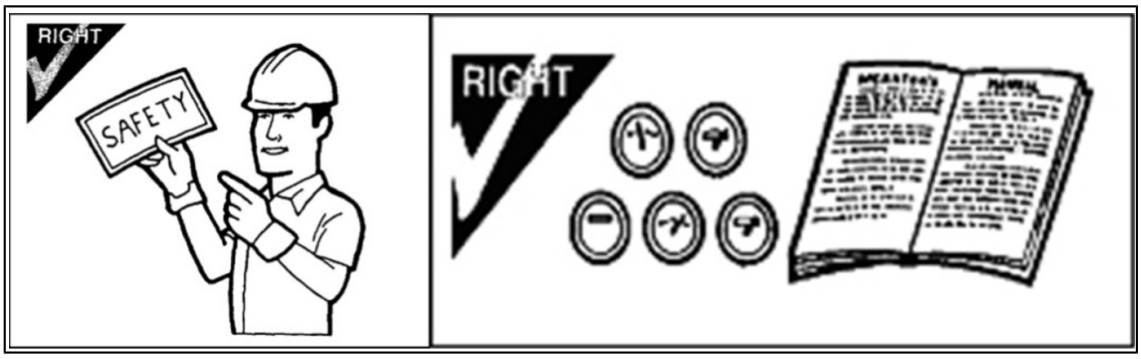

Fig. 0-1: Familiarize yourself with applicable safety regulations in your location and this manual as well as with the machine.

This Instruction Manual is not suitable reference for extensive maintenance and repair work. Such work shall be performed by XCMG' service personnel or authorized specialists.

The Operator's safety is XCMG's most important point of interest during XCMG's efforts in designing, producing and maintaining their products.

Please note that improper application or maintenance may increase the risk of hazards.

Therefore, always operate and maintain your **XCMG** machine according to the instructions in this Instruction Manual.

Doing so you will increase the reliability and availability of your machine.

- Repair defective machines immediately to ensure safe operation and environmental protection.
- Please contact your XCMG representative if you have any additional questions concerning the operation or maintenance of your machine.

In case of additional questions **concerning operation or maintenance of your machine**, do not hesitate to contact your XCMG representative.

Important!

Please fill in the machine's identification information to enable optimum customer support:

Type:	XGS58E
Year of manufacturing:	2021
Product identification number:	

NOTICE

Make sure you are familiar with the content of this manual before start to operate the machine!

Your **XCMG** representative’s contact data:

Add：

Manufacturer:	XCMG Fire-Fighting Safety Equipment Co., Ltd.
Address:	No. 17, Zhujiang East Road, Hi-tech Industrial Development Zone, Xuzhou, Jiangsu, China.
National Customer Service Tel:	400-110-9999

Service Service and Spare Parts Tel: 0516-83461280 87888290	MARKETING Marketing Department Tel: 0516－87981118

Imprint

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Reviewed by	Data contained in this Instruction Manual meets the current state-of-the-art
XCMG reserves the right to improve or modify the content, information, diagrams and specifications in this Instruction Manual at any time and without any notice.	

Table of contents

Chapter 1 About this document

1.1 Main purpose

This includes safety, operation and regular maintenance instructions for the machine. Further documents and manuals may be attached if necessary.

This supports you in:

- Getting familiar with your machine
- Reducing probability of risks and hazards
- Preventing incorrect operation, unintended use and foreseeable misuse
- Improving your machine’s reliability and availability
- Enhancing machines performance and
- Reducing maintenance costs

Following the instructions of this Instruction Manual is mandatory.

- This is intended for and maintenance persons for the machine.
- Additionally to it, you shall adhere rules and regulations applicable at your location.
- It is mandatory to keep this always available to and maintenance personnel at the machine (**Figure 1-1**).
- For repair and maintenance supplementary documents may apply (i.e. for the engine), please contact your XCMG representative for further information.

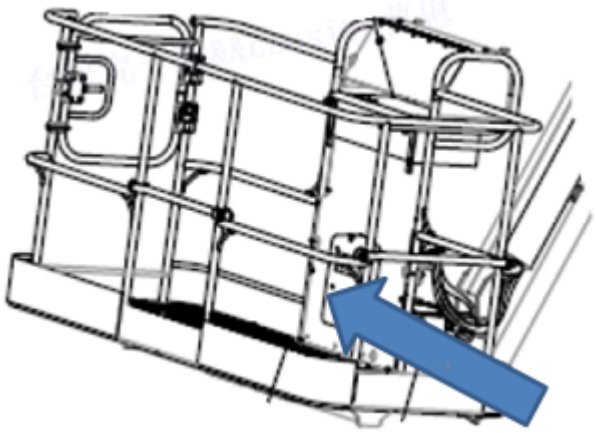


Figure 1-1 Designated storage location of this Instruction Manual on the machine is the box beneath work platform control box.

Before operating, maintaining or repairing any machine part:

- read carefully and master the content of this Instruction Manual
- learn how to correctly operate and maintain the machine
- note the instruction for use’s safety information, the attached to the machine and how both are related
- understand the safety requirements and their purpose.

The documentation supplied with the machine shall enable the reader to:

- operate the machine safely
- use it in all permitted situations
- maintain/service the machine within the required schedules

To prevent accidents during operation or maintenance, always comply with all the precautions measures specified in this .

Ensure the documentation is always complete, up to date and available if needed:

- Do not remove individual pages from the .
- Request any missing or uncomprehensive parts of the from XCMG after sales service.

Include new documents supplied as a result of modifications immediately.

- Replace obsolete versions of the with the amended contents

The delivered documentation is compiled for the indicated serial number only.

It cannot be used for the same machine of the same series that has a different serial number.

NOTICE

The Instruction Manual is considered as a construction part of the machine

Disclaimer:

We are committed to and we do our best to provide you complete and correct information with this instruction manual. However, errors cannot be totally excluded thus this instruction manual as well as the machine may be subject of modifications without prior notice. For resulting downtime, damages or malfunctions, XCMG assumes no liability.

1.2 Product information

XCMG produces and delivers high quality products. Your machine and its components have passed numerous inspections before delivery, ensuring compliance to XCMG’s high company standards.

You can ensure reliability and prologue availability by following the instructions of this , by correct use and careful maintenance. Use only genuine XCMG spare and wear parts.

Within period, XCMG’s specialists as well as our representatives will help you in repairing or even maintaining your machine. Please refer to your warranty conditions attached to your purchase contract.

After period elapsed, we will continue to provide our services to you, helping you maintaining the machine in best condition through its entire lifetime.

claims cannot be accepted in case of:

- Operation faults and operations not in line with this manual
- Use of the wrong consumable
- Deficient maintenance
- Maintenance/repair errors by service personnel not authorized by XCMG

- In case of use of non-genuine XCMG parts
- In case of not XCMG approved modifications of the machine
- Resulting damage/defects due to delayed warranty/repair request
- Follow-up damage is unexceptionally excluded from warranty.

1.3 Target group(s)

This is intended for use by:

1. (i.e. XCMG, the producer of the unit/machine)
2.
3. **All operators and maintenance personnel conducting overhaul or repair.**
4. Make this accessible to all persons who operate or work with this machine.

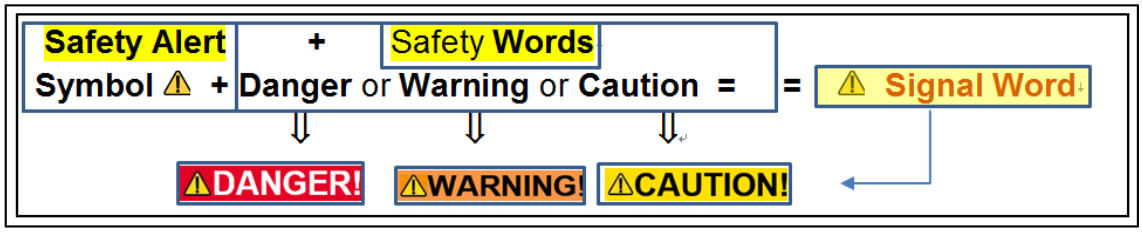
1.4 Layout of user’s instructions

1.4.1 Safety notes

1.4.1.1 Layout of warning notice

Warning notice:

Warning notice is composed from **signal word** and **information on hazard**!



Signal Word as DANGER, WARNING, CAUTION requires Safety Alert Symbol placed in front of the signal word to emphasise and alert the reader of instructions

Warning notice draw attention and communicate information on hazard :

⚠ Signal Word	1. Hazard type of hazard explained 2. Consequence of not avoiding the hazard noted 3. Avoidance how to prevent the hazard proposed The signal word is selected according to the risk by hazard. The risk is determined according to probability of an accident and probability of worst credible severity occurring

1.4.1.2 Graduation of the warning notices

Warning notices addressed to hazards affecting human vary with decreasing hazard gravity as follows:

⚠ DANGER

——"Danger", a signal word used to indicate imminently hazardous situation. If not avoided, will result in death or serious injuries.

⚠ WARNING

Signal word used to indicate a hazardous situation which, could result in death or irreversible serious injury.

⚠ CAUTION

——"Caution", a signal word used to indicate hazardous situation. If not avoided, could result in minor or moderate injuries.

NOTICE

Notice is used to address situation not related to physical injuries. Indicates environmental or property damage if ignored.

1.4.2 Text structure and symbols of the manual

1.4.2.1 Text symbols

Indicates a single instruction or a regulation to be observed (e.g. for safety reasons)

Indicates useful additional information or further detailed explanations.

May also show a notice of protective measures to prevent minor damages to the machine or environment.

1.4.3 Additional text types

- **Operation instruction**
- **Handling instructions are demanding you to undertake an activity or to perform a work step.**

Always carry out handling instructions stepwise and in pre-defined sequence.

Step I Indicate the potential Hazard (and if appropriate the cause of it)

Step II Describe the consequence of Hazard – if not avoided

Step III Describe how to avoid the mentioned Hazard – further Steps

– Handling instructions are structured as follows:

Lists:

Not-numbered Lists are structured as follows:

List-Level 1

List-Level 2

Not-numbered Lists are structured as follows:

1. List-Level 1
2. List-Level 1

2.1 List-Level 2

2.1.1 List-Level 3

2.1.1.1 List-Level 4

2.2 ⋯

3. **etc.**

1.4.4 Additional information

1.4.4.1 Figures

1. Figures and associated position numbers are given in bold in the text.
2. Position lines in an image end with:


a dot, if they denote visible parts,


an arrow when pointing towards invisible/indicated direction

1.4.4.2 Dimension

Dimensions are given in metric, ISO units.

1.4.4.3 Applicable documents

Pay attention to additional documents as repair and maintenance documents of equipment that may apply (i.e. for the engine or other additional equipment installed).

1.4.4.4 Accessibility

Make the contents of this including the applicable documents available to all persons who operate or work with this machine.

Chapter 2 Product description

2.1 General description

The straight-arm mobile elevating work platform at the elevation of 56.6 meters developed by XCMG is self-equipped with a small-sized jib boom, thus having a certain capacity in obstacle crossing, and being stretchable to any inaccessible position; the double-load control system may automatically adjust the operating radius as the loads may be, which will satisfy the different demands of the users on different loads. It is an ideal choice for users engaged in building construction, bridges, steel structures and installation & construction both inside and outside the venue.

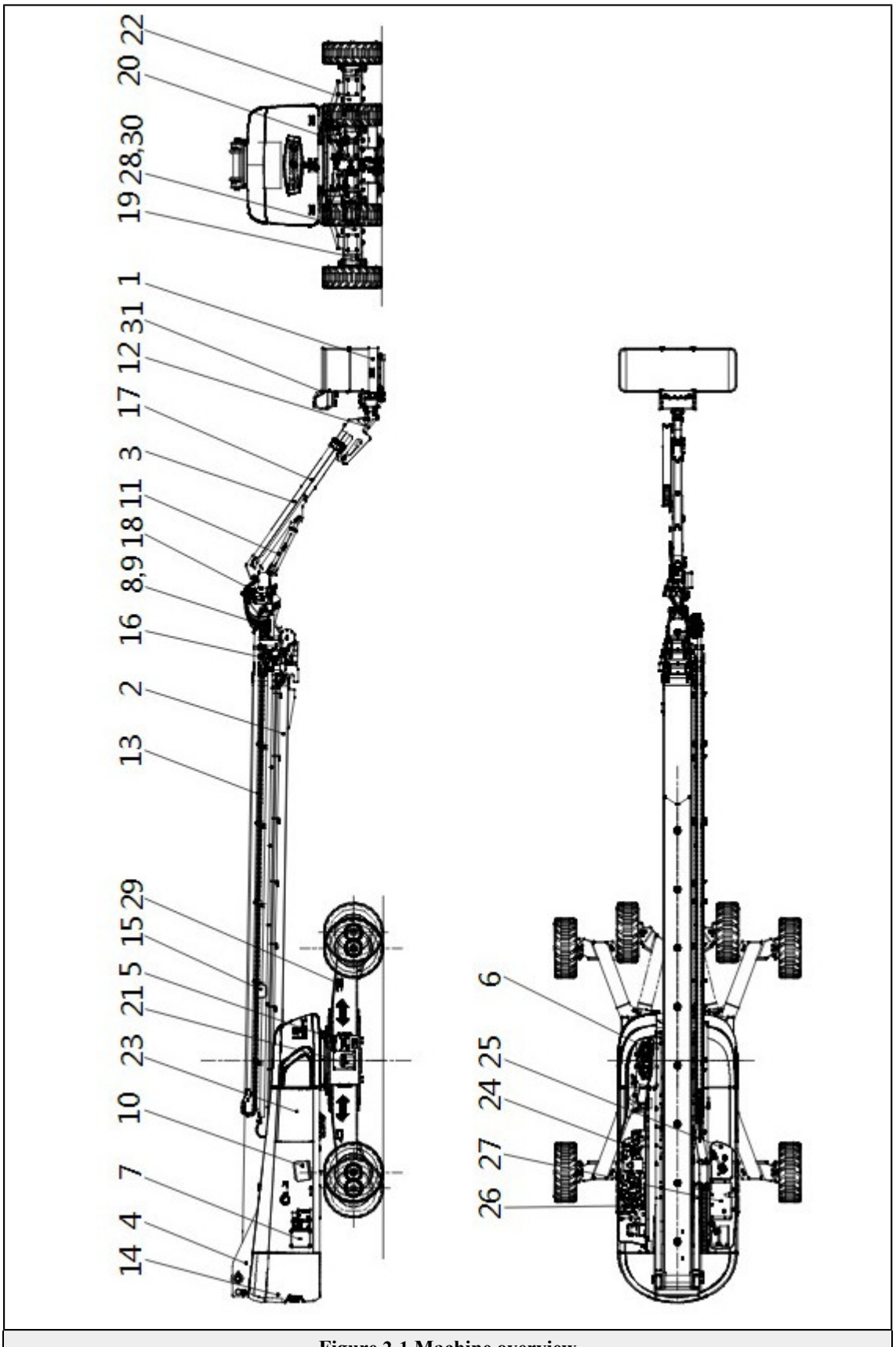


Figure 2-1 Machine overview

Main Sections – see **Table 2-1**

Table 2-1 Main components of machine:

S/N.	Name	S/N.	Name	S/N.	Name
1	Work platform	2	Elevating boom assembly	3	Jib
4	Turntable assy	5	Slewing bearing	6	Slewing mechanism
7	Electrical system	8	Hydraulic system schematic	9	Hydraulic system piping
10	Luffing cylinder	11	Jib luffing cylinder	12	Levelling cylinder
13	Cables and hydraulic piping carrier	14	Counterweight Assembly	15	Boom telescopic cylinder
16	Telescopic system	17	Jib telescopic cylinder	18	Jib lock cylinder
19	Steering cylinder	20	Horizontal outrigger cylinder	21	Swing center
22	Frame assy	23	Cover	24	Oil pump
25	Hydraulic oil tank	26	Engine installation	27	Fuel tank
28	Supplied tools	29	Label assembly (EN)	30	Supplied spare parts
31	Anti-squeezing detection device V				

2.1.1 Type/ nameplate locations

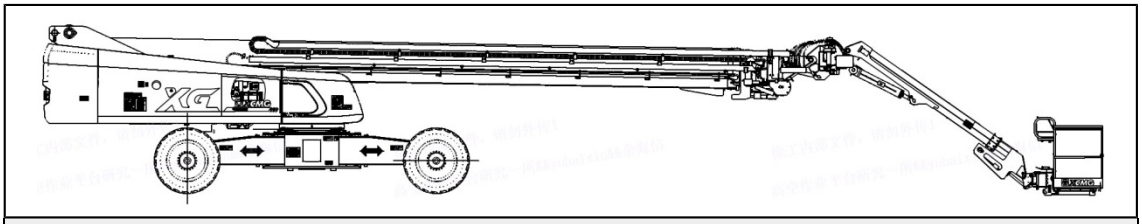
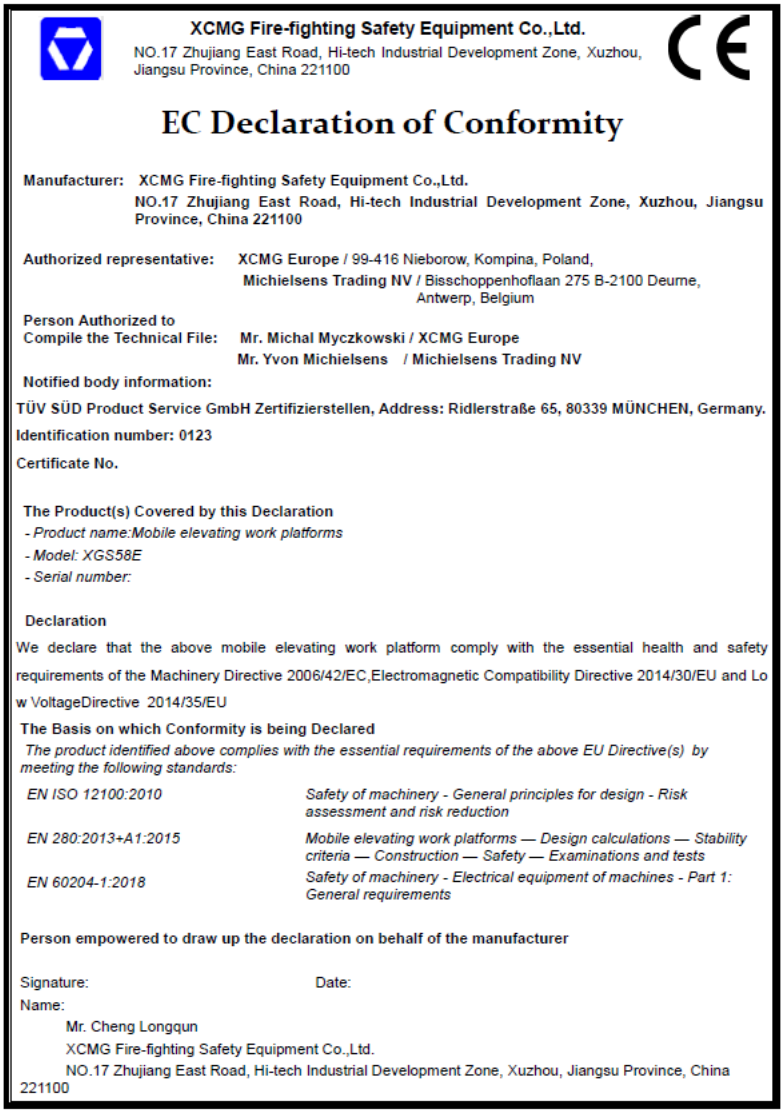


Figure 2-2 Nameplate locations

2.1.1 Declaration of conformity



XCMG Fire-fighting Safety Equipment Co.,Ltd.

NO.17 Zhujiang East Road, Hi-tech Industrial Development Zone, Xuzhou, Jiangsu Province, China 221100

CE

EC Declaration of Conformity

Manufacturer: **XCMG Fire-fighting Safety Equipment Co.,Ltd.**
NO.17 Zhujiang East Road, Hi-tech Industrial Development Zone, Xuzhou, Jiangsu Province, China 221100

Authorized representative: **XCMG Europe** / 99-416 Nieborow, Kompina, Poland,
Michielsens Trading NV / Bisschoppenhoflaan 275 B-2100 Deurne, Antwerp, Belgium

Person Authorized to Compile the Technical File: **Mr. Michal Myczkowski / XCMG Europe**
Mr. Yvon Michielsens / Michielsens Trading NV

Notified body information:

TÜV SÜD Product Service GmbH Zertifizierstellen, Address: Ridlerstraße 65, 80339 MÜNCHEN, Germany.

Identification number: 0123

Certificate No.

The Product(s) Covered by this Declaration

- Product name:Mobile elevating work platforms
- Model: XGS58E
- Serial number:

Declaration

We declare that the above mobile elevating work platform comply with the essential health and safety requirements of the Machinery Directive 2006/42/EC,Electromagnetic Compatibility Directive 2014/30/EU and Low VoltageDirective 2014/35/EU

The Basis on which Conformity is being Declared

The product identified above complies with the essential requirements of the above EU Directive(s) by meeting the following standards:

EN ISO 12100:2010	*Safety of machinery - General principles for design - Risk assessment and risk reduction*
EN 280:2013+A1:2015	*Mobile elevating work platforms — Design calculations — Stability criteria — Construction — Safety — Examinations and tests*
EN 60204-1:2018	*Safety of machinery - Electrical equipment of machines - Part 1: General requirements*

Person empowered to draw up the declaration on behalf of the manufacturer

Signature: Date:

Name:
Mr. Cheng Longqun
XCMG Fire-fighting Safety Equipment Co.,Ltd.
NO.17 Zhujiang East Road, Hi-tech Industrial Development Zone, Xuzhou, Jiangsu Province, China 221100

Figure 2-3 Declaration of conformity

2.2 Intended use of the machine

2.2.1 Intended use

as defined in this Section is a basic requirement for any safe operation!

Your XCMG machine is designed by following recognized standard (BS EN 280-2013+A1-2015) and manufactured according the state of art methods and technologies at the time of placing to the market.

- **of the machine is construction work**, and other related and construction areas
- of the machine is only for construction and above mentioned purposes.

- Utilization is limited only to the work areas and conditions of use listed and described in this Instruction Manual.
- Move the machine with care.

Use and park the machine only over surfaces capable of supporting it.

- The installation and safety requirements specified in the documentation must be observed.
- Any other use or a use beyond this shall be deemed a use not to the intended purpose.
- Intended application of the machine is only for installation and above mentioned purposes.
- Utilization is limited only to the work areas and conditions of use listed and described in this Instruction Manual.
- Use and park the machine only over surfaces capable of supporting it.
- Protect the working areas of use (i.e. by fences) to prevent the access of an unauthorized and uninstructed persons (e.g. children).

Non-observation of the intended use of machine as defined in 2.5.1 may result in the following consequences:

- Life-threatening or fatal injuries
- Severe damage to the machine, the assets or environmental contamination for which the owner/operator may be held liable.
- Loss of warranty and guarantee claims
- **The machine may only be operated in enabled setup condition and modes as provided in this operating and maintenance Instruction Manual.**
- **Any application, not described in the Instruction Manual must be authorized in writing by the manufacturer beforehand.**
- Any divergent use without the ’ s written consent is considered as “non-intended use”
-
- The is not liable for injuries resulting from improper use or misuse of the machine.
- The associated risks are the owner’ s, operator’ s or ’ s responsibility. Responsibility for errors or omissions is not accepted.

This also applies to unauthorized changes to the machine

Refer to the information in Section 10,
and Performance Data.
Comply with this information completely.

requires the following:

- Install all safety devices properly and ensure their correct function
- Provide and perform all maintenance and repair work as stated in this Instruction Manual and according to the given specifications
- Involve only qualified maintenance personnel or authorized personnel
- Take utmost care during use on operational safety as instructed in this Instruction Manual

- Apply all valid local, national and international safety regulations
- Use only the operating materials as listed in this Instruction Manual
- All persons involved with the machine’s operation must follow the safety instructions according to this Instruction Manual.
- All persons involved in the machine’s operation must comply with their respective responsibilities according to the Instruction Manual.
- Regard and respect the technical information values and their limits

Follow and respect the operating capacities as listed in this Instruction Manual and take into account the corresponding machine model and its maximum loads.

2.2.2 Not intended use of the machine

The machine is not intended to be used:

- as transport vehicle (i.e. for materials and persons),
- use over unstable sites (i.e. the ground is uneven, holes, steep slope),
- on sites with potentially explosive environment and
- Do not operate the machine when the wind speed is over 12.5 m/s,
- on sites with insufficient ventilation (i.e. within closed spaces) is prohibited.
- Use other than described here as intended is not authorized by the and is outside legal limits of manufacturers’ liability.

2.3 Reasonably foreseeable misuse

means the use of machine in a way not prescribed in the Instruction Manual, but which may result from readily predictable human behavior. This includes any undeclared application or type of misuse listed

Basically:

State of art technologies control a number of such “foreseeable misuses” but not all misuse cases can be managed by technological means.

Misuse or improper use of the machine may lead to severe injuries or death and consequently to expiration of the warranty!

The machine and/or owner will be fully responsible for all damages done due to machine “unintended use”.

Any use that is not described in this Instruction Manual is considered as “unintended use”.

Reasonably foreseeable misuse is considered-but not limited to:

- Not reading and follow this safety Instruction Manual.
- Operating the machine while the Instruction Manual is missing, is incomplete or is not available in the contractually agreed language at the machine.
- Operating the machine by uninstructed or unqualified personnel.

- Operating the machine ignoring safety requirement applicable at your site.
- Expose the machine to physical quantities that exceed the limits prescribed by the manufacturer. (e.g. ambient temperature, ASL-altitude, carried load, operating restrictions for soil with slope inclination etc.)
- Reflex-operators behavior.
- Transport of materials and/or passengers.
- Towing loads.
- Place items on the work guardrail
- When there are people on the work platform, the ground staff operates the equipment.
- Operating the machine without being buckled-up properly.
- Remove of bypass protective equipment .
- Perform maintenance/repair tasks with engine running or machine not secured.
- Operating the machine when the machine is not in a proper technical condition.
- Use and/or park the machine in areas exceeding environmental limits specified for this MEWP including (but not limited to):
- allowable ambient temperature
- Lateral and transversal surface gradient.
- Surface stability and load-bearing ability.
- Areas that may be flooded (i.e. in water channels).
- Moving the machine without adequate vision, or without a supervising coworker
- Carrying out any structural modification on the machine or interchangeable equipment which may affect operational safety without the manufacturer’s written declaration of approval.
- Not following maintenance instructions and intervals
- Skip and/or delay repairs and activities meant to prevent or to detect damage.
- Improper maintenance and repair work.
- Not use of approved spare parts.
- Unauthorized modifications of the machine.
- Inappropriate use or use high-pressure cleaners and/or inappropriate cleaning agents and other devices.
- Transport the machine without appropriate lashing on the transport vehicle.
- Parking, storing the machine unsecured or accessible to unauthorized persons
- (i.e. in inclined areas, open areas, with ignition key at the machine, open covers, etc.).
- Open fire or smoking while handling inflammable materials (i.e. during refueling)

2.4 Limits of application

2.4.1 Limitation factors of intended use

- Range of applications (see Section 2.2)

In accordance to the operator’s experience with and knowledge of the machine (industry, commerce, private, public sector)

- Intended use (see Section 2.2)
  (refer to specifications in the Instruction Manual)
- Foreseeable misuse (see Section 2.3)
- Various steps within product life cycle
  Assembly, /delivery, set up, regular operation, cleaning, maintenance & servicing, appropriate disposal
- ’s skills, experience and knowledge
  Operator, in terms of training, experience, skills
- Inexperienced/more vulnerable people
- Vulnerable groups
- (e.g. apprentices, pregnant women, volunteers, disabled persons with health conditions)
- Collateral damages
  unrelated to the company (e.g. employees from other workplaces, visitors etc.)

2.4.2 Space boundaries

- Safety ranges/distances during movement/deployment
- Safety boundaries for people during installation and maintenance
- Material supply/removal
- Working places/area Interfaces

2.4.3 Time related limits

- Limits of the service period of the whole machine or specific components
- Recommended inspection, maintenance and repair intervals

2.4.4 Environment-related limits

The following environmental factors define the limits for the safe operation and the performance of the machine:

- Environmental factors-related limits
  - weather
  - Altitude
  - slope inclination
  - steepness
- Energetic limits

– Types of energy

– Interfaces supply/discharge

– Material limits

– **Starting materials/auxiliary operating materials, waste products**

2.4.5 Permitted environmental conditions

Considerations on environmental conditions shall be taken in order to ensure machine’s safe operation, to improve machine’s reliability and to prologue machine’s service life.

⚠ CAUTION

Operate or park the machine always over ground, stable enough to carry the maximum possible load applied by the machine (see Table 2-3 for ground bearing capacity).

Table 2-2 Type bearing capacity

Maximum tyre load	17500 kg/38580 lb
Ground pressure	12 kg/cm²/ 171 psi

Note: Floor loading information is approximate and does not incorporate different option configurations. It should be used only with adequate safety factors.

Table 2-3 Ground bearing capacity

S/N.	Soil type	Ground loading capacity kg/cm^2
1	Natural soil:	
	Sludge, peat, and wetland	0
2	Non-compacted soil:	
	Construction debris	0-10
3	Non-cohesive soil:	
	Sand, gravel, rock, and mixture	20
4	Clayed soil	
	a. Mixture of clayed silt and topsoil	12
	b. Powdered coal, composed of coarse clay and few clay	13
	c. Pottery clay, composed of plastic clay and filler	
	Hard	9
	Half-solid	14
	Solid	20

Table 2-3 Ground bearing capacity(continued)

S/N.	Soil type	Ground loading capacity kg/cm^2
	d. Mixed granule ground (mixture of clay, sand, gravel, and rock)	
	Hard	15
	Half-solid	22
	Solid	33
5	Uniform solid rock:	
	a. easily broken or decomposed	150
	b. Non-fragile	300
6	Artificially compacted road:	
	a. Asphalt road	5-15
	b. Concrete:	
	1) General concrete (grade BI concrete)	50-250
	2) High strength concrete (grade BII concrete)	350-550

WARNING

Do not exceed maximum lateral and longitudinal inclinations.

⚠ Environmental temperatures influence machine’s behavior, especially acceleration, deceleration and stopping behavior.

⚠ Please check/adjust mainly the used fluids to your environment (fuel, hydraulic oil viscosity, coolant antifreeze, etc.) and avoid changing the battery at temperatures below 0°C.

WARNING

Do not operate this machine with the wind speed in excess of 12.5 m/s (28 MPH) (see Table 2-4 for wind scale).

Table 2-4 Beaufort scale (for reference only)

Beaufort scale	Wind speed		Description	Land conditions
	m/s	MPH		
0	0-0.2	0	Calm	Calm. Smoke rises vertically.
1	0.3-1.5	1-3	Light air	Wind motion visible in smoke.
2	1.6-3.3	4-7	Light breeze	Wind felt on exposed skin. Leaves rustle
3	3.4-5.4	8-12	Gentle breeze	Leaves and smaller twigs in constant motion.

Table 2-4 Beaufort scale (for reference only)(continued)

Beaufort scale	Wind speed		Description	Land conditions
	m/s	MPH		
4	5.5-7.9	13-18	Moderate breeze	Raises dust and loose paper. Small branches moved.
5	8.0-10.7	19-24	Fresh breeze	Smaller trees begin to sway.
6	10.8-13.8	25-31	Strong wind	Large branches in motion. Flags waving near horizontal. Umbrellas used with difficulty.
7	13.9-17.1	32-38	Near gale/ moderate gale	Whole trees in motion. Inconvenience felt when walking against the wind.
8	17.2-20.7	39-46	Fresh gale	Twigs break off trees. Cars veer on road.
9	20.8-24.4	47-54	Strong gale	Slight structure damage.

2.4.6 Environmental protection limitations

Environmental protection shall be a common task. XCMG implemented several measures to enhance environmentally friendly design, production, operation and maintenance methods on this machine.
s, operators and are responsible to take sustainable precautions to further contribute to environment protection:
Follow environmental protection rules and regulations applying in your area.
Dispose all materials (packaging, exchanged maintenance and wear parts, cleaning agents, residual fluids, etc.) according the local environmental protection rules and make use of the local available recycling systems.
Do not operate the machine unnecessary (keep the engine off as reasonable possible).

2.5 Residual risks

2.5.1 Overview

XCMG evaluated and designed the machine having safety as main task. Although it is not possible to foresee all events that may occur, existing residual risks are mentioned in this manual as possible at the time this manual has been edited.

- By following instructions provided in this manual and consider the warning signs put on the machine’s decals you can avoid risks and operate the machine as safe as possible.
  - As an entrepreneur/operating company, take care that all persons working on and with the machine are aware of the residual risks.
  - Follow the instructions to prevent residual risks that may end in accidents or damages.

– Set-up work may require a disassembly of the protective equipment by the customer, resulting in miscellaneous residual risks and potential hazards every operators has to be aware of.

⚠ DANGER

Dangerous injuries during operation of the machine

- **Unintended operation may cause personnel crushed in a life-threatening manner.**
- **Install and approve the function of machine protective devices prior to commissioning**

⚠ DANGER

Danger by electrical shocks

⚠ An electrical shock may result in fatal injuries.

- **Use the mains disconnection device to de-energize the machine prior to all repair, set-up and maintenance work.**
- **Secure the machine against inadvertent activation.**
- **Close off the mains disconnection device and put up warning signs.**
- **In addition, press down the .**

⚠WARNING

Danger of slipping skidding and falling
Danger of burns

- **Weather influences, such as wetness, snow, ice, frost and dirt, change the grip of the treads, walkways and handrails.**
- **Persons may seriously be injured or even killed!**
- **The machine may be damaged.**
- **Step on and treading surfaces taking account of the conditions, e.g. winter slipperiness or soiling.**
- **Only access the platform on approved walking and tread surfaces.**
- **Observe the signs.**
- **Replace damaged safety labels (warning signs) immediately.**
- **If the road is contaminated due to technical defects, unsealed fuel or tank or leaking hydraulic oil, this will represent a serious traffic hazard. This may result in fatal accidents.**
- **Remove traces of oil immediately and thoroughly**

⚠ Risk of burns on the surfaces of heated components 

- **This applies in particular to the exhaust system and the engine of the machine**
- **Allow the components to cool sufficiently before touching them.**
- **Be particularly cautious near heated components.**

Residual risks may occur likely in the following situations:

Note： Residual risks may occur likely in the following situations:

2.5.2 Risks of injury up to death by

- not obeying to local guidelines, requirements and directives for **Occupational Health and Safety**.
- misuse or wrong operation, ignoring the content of this manual.
- improper machine transportation, by transporting the machine on unsuitable vehicles or lack in securing measures.
- hesitation of repair/replace of defect parts.
- operation under influence of medication, drugs, alcohol or any other substance, which may impair your ability of safe use.
- operation by unable to operate the machine (too young, handicapped in respect to machine operation, untrained or uninstructed).

- unclean machine, slippery access systems (steps, handles, etc.), unreadable or damaged safety decals and operation elements.
- insufficient secured machine when parked, maintained, serviced or repaired.
- insufficient safety precautions at your site.
- insufficient use of personal protective equipment.
- smoking and/or open fire when dealing with flammable substances (i.e. when refueling).
- refueling while engine is running or spilling fuel over hot surfaces.

2.5.3 Risks of damaging the machine and property:

- misuse or wrong operation, ignoring the content of this manual.
- operation of the machine in or on inadequate environment (i.e. operation on surfaces or on structures with insufficient load-bearing capacity).
- use of unsuitable ware and spare parts.
- insufficient maintenance and/or repairs.

2.5.4 Environmental risk

- misuse or wrong operation, ignoring the content of this manual.
- this includes also unnecessary noise and exhaust gas generation by leaving the engine unnecessary running.
- use of unsuitable consumable, ware and spare parts.
- Insufficient maintenance and/or repairs.
- Clean machine in inappropriate area or with an environmentally unfriendly cleaner.

2.5.5 Performance and service life reduction due to:

- misuse or wrong operation, ignoring the content of this manual.
- use of unsuitable consumable, ware and spare parts.
- Insufficient maintenance and/or repairs.
- Unnecessary operation (*i.e. engine runs when not required*).

Figure 2-4 Get familiar with your local Occupational Health and Safety regulations and rules.

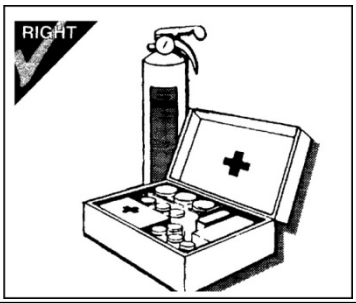


Figure 2-5 Become familiar with safety precautions and devices installed at your site.

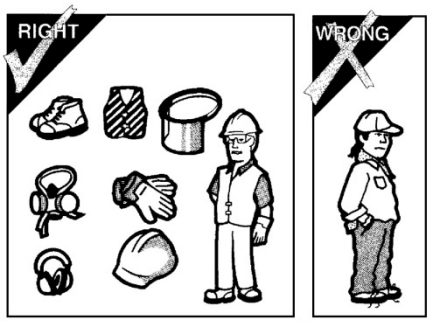


Figure 2-6 Use personal protective equipment according local Occupational Health and Safety regulations.

Chapter 3 General safety information and instructions

3.1 Introduction

To prevent or property and/or environment damage, observe and respect the stated in this Section.
The following advice to s and s:
Read and respect all .

3.2 Responsible parties

For the purpose of communication, this Instruction Manual defines the following participant’ s groups:
1. – as producer of the unit/machine (XCMG)
2.
3.
4.
5. s
6.
7.
8.
9.
Owner
as any natural or juristic person/entity who owns permanent or temporary a (set) machine(s), with legal rights duties and responsibilities, and:

- uses purchased or lent machines to manage a site job (eg. Construction Company) or
- generates sales merely through the distribution of machines (eg. Reseller or renter).

The operator:

- **a person in charge** for as well as specific job/project and machine, (eg. as natural user, skilled individual for all functions of machine)
- an operator**,** who physical simply driving the machine (but does not necessarily be a skilled operator for all functions of the machine)
- a company that operates technical equipment, (as eg. juristic user, entity)

Maintenance Personnel/Service Provider:
The natural person responsible for the machine’ s flawless functioning and all processes influencing it (maintenance, overhaul, repairs, functional control adjustments etc.)

3.3 Detailed tasks and responsibilities

3.3.1 General requirements for all responsible parties

Any responsible party involved should be committed to:

- use and apply the for operation of machine.
- notify involved parties of any safety related defects observed on a machine.
- check the machine for damage every day before using it, do not operate in case of safety related defects.
- wear PPE as recommended or required in your site/area.
- operate any machine correctly, which means according to parameters and intended use prescribed in this .
- stop work with a machine immediately if its safe operation is not guaranteed.
- repair the machine prior further operation in case of defects.

⚠ Only qualified and authorized personnel shall conduct machine operation, transport and maintenance

⚠ Qualified persons shall meet the following minimum requirements:

- be at least 18 years of age
- possess the physical and mental abilities to perform the assigned tasks
- be able to read and understand the technical documentation of construction machinery (i.e. this manual)

be knowledgeable in

- accident prevention
- performing first aid,
- applicable occupational safety regulations.

be sufficient trained/instructed for the assigned machine tasks,

- possibly including valid driving license for machines, if legally required.
- introduced at least on basics of machines operation and effects.

Marshalling machines shall be done by instructed personnel with proven skills, meaning of signals between the marshallers and the driver shall be commonly agreed and be unambiguous.

3.3.2 Dealer

⚠ Given that the reasonable principles of personnel, safety, training, inspection, maintenance, application and operation shall be applied in personnel training, inspection, maintenance, application and operation, these principles shall be consistent with all available data on rational use and external environment parameters.

- Operation manual and maintenance manual shall be supplied with each lease, rental or sold machine in weatherproof storage box of MEWP. Manuals are considered as an indispensable part of MEWP, which is an important media to send necessary safety information to s, s and operators.
- The current responsibilities manual for distributors, s, s, operators, s, leasers and agents of MEWPs shall be provided in a weatherproof storage box.
- The shall be inspected, maintained and regulated according to 's requirement before delivery (sale, rental or lease).
- The s shall perform preventive maintenance of MEWP on the basis of the operating environment and safety and in accordance with the ’ s recommendations.

- The s shall perform routine and annual inspections according to the manual and instruction supplied by the manufacturer.
- The repair process to eliminate faults and problems shall be in accordance with the manual and instruction supplied by the .
- When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.
- The s shall provide appropriate training to assist the , s and operators to comply with the requirements for the inspection, maintenance, use, application and operation of MEWP set out in this standard.
- Modification, alteration or remanufacturing of MEWPs shall only be made with prior written permission from the .

3.3.2.1 Maintenance safety precautions

Before performing adjustment and repair of MEWP, the following precautions should be taken:

1. Power plants stopped and start switches do not work
2. All control mechanisms are in "off" gears to protect all control systems from unintentional action caused by braking, obstruction, or other means
3. Boom and platform shall be lowered to the stowed position as much as possible or shall be secured with block or constraint to prevent falling
4. Release oil pressure from all hydraulic circuit before loosening or removing hydraulic components
5. Safety props and latches shall be installed in proper location according to manufacturer's specification

3.3.2.2 Familiarization on Delivery

For delivery by sale, rental, lease or other means, the and the recipient assigned by receiving unit of MEWP shall share responsibilities:

1. Verify the weatherproof storage box (manual box)
2. Verify the manuals specified by the s is on
3. Check all control functions
4. Check all safety devices specified during the delivery of

3.3.2.3 Dealer as a user

Whenever the dealer orders its personnel to operate the MEWP (loading, unloading, inspection, sales demonstration or other forms of use), the shall assume the user’ s responsibilities specified in Section 3.3.3 of this manual. All authorized operators of MEWP shall accomplish:

1. Training
2. Familiar with the to be operated
3. Aware of outlined in section 3.3.5 of this manual.

3.3.2.4 Record preservation and distribution

1. Record preservation

   The shall preserve the following records at least 4 years:

   1) Name and address of each MEWP purchaser by delivery number and date

   2) Pre-delivery preparation record completed before delivery

3) Complete records of routine inspection and annual inspection for MEWP

4) Repair record for conducting troubleshooting and troubleshooting

5) Names of trainee

6) Names of trainer

7) Training date

8) The name of the person receiving the high altitude platform specifications for each delivery, unless the individual has specifications on the same model or the product has characteristics consistent with the product delivered within 3 months.

2. Training proof

The owner should provide the trained person who has successfully completed the training with documentary evidence to prove they are trained. If the trainee requires, the shall provide evidence. The documentary evidence should includes following information:

1) Name of trainee

2) Name of entity providing training or retraining

3) Name of trainer

4) Clear proof of training covered Boom-Supported Elevating Work Platforms

5) Training date

3. Record distribution

Upon request, the dealer shall provide the following information:

1) To the of MEWP, copy of routine inspection and annual inspection completed

2) To the of MEWP, copy of repair completed

3) To the , proof of training for operators (including name of trainer and training date)

4) To the , the name of the person receiving delivery details of MEWP

3.3.2.5 Safety bulletin from manufacturer

The shall observe the bulletins from the .

3.3.2.6 Sales responsibilities

When the MEWP is sold, the : Shall ensure that the delivered to the

1. Shall provide the copy of current responsibilities manual.
2. Shall provide repair and parts manuals within 2 months after sale.
3. Shall notify the and its sale successor (if existing), providing full name and address of the purchaser.
4. Shall carry out an annual inspection prior to delivery and provide a copy to the purchaser within 2 months if the MEWP is used.
5. Shall notify the person assigned by the receiving entity when the MEWP was delivered.

3.3.3 User responsibilities

3.3.3.1 Basic principle

The information in this standard must be supplemented by good job management, safety control, and the application of sound principles of safety, training, inspection, maintenance, application and operation, consistent with all data available regarding the parameters of intended use and expected environment. Since the user has direct control over the application and operation of aerial platforms, conformance with good safety practices in this area is the responsibility of the user and the operating personnel, including the operators.Decisions on the use and operation of the aerial platform must always be made with due consideration for the fact that the aerial platform will be carrying personnel whose safety is dependent on those decisions.

3.3.3.2 Manual storage

The shall preserved and keep a copy of Instruction Manual provided by the manufacturer in weatherproof storage box on . Manuals are considered as an indispensable part of MEWP, which is an important media to send necessary safety information to users and operators.

3.3.3.3 Inspection and repair

The shall inspect and maintain the as required to ensure normal operation. Routine inspection and maintenance shall be carried out as recommended by the and in coordination with the operating conditions and the severity of the operating environment. MEWPs under abnormal operating conditions should be promptly removed from operation until repair is completed. The repair shall comfort to the recommendation of the manufacture and shall be performed by the qualified person.

1. Routine inspection

   The user of shall perform routine inspection according to the outlines in section 3.3.4.6 of this manual.

2. Annual inspection

   The user of shall perform routine inspection according to the outlines in section 3.3.4.7 of this manual.

3.

   Visual inspection and function testing of shall be carried out daily or before each shift, including but not limited to:

   1) Operation and emergency control

   2) Safety devices

   3) Leakage of gas, liquid and

   4) Harness for cable and wire

   5) Loose or missing parts

   6) Tires and wheels

7) Notices, warnings, control signs and operation manual

8) Outriggers, stabilizers, stretchable shafts and other structures

9) Guardrail device

10)Other items specified by the

4. Maintenance safety precautions

Before performing adjustment and repair of , the following precautions should be taken:

1) Power plants stopped and start switches do not work

2) All control mechanisms are in "off" gears to protect all control systems from unintentional action caused by braking, obstruction, or other means

3) Boom and platform shall be lowered to the stowed position as much as possible or shall be secured with block or constraint to prevent falling

4) Release oil pressure from all hydraulic circuit before loosening or removing hydraulic components

5) Safety props and latches shall be installed in proper location according to ’ s specification

6) Other items specified by the

3.3.3.4 Replacement of components or parts

When parts or components are replaced, they shall be identical or equivalent to original parts or components of .

3.3.3.5 Repair training

The shall ensure that the is inspected and repaired by qualified personnel in accordance with the ’ s recommendations and the requirements in this section.

3.3.3.6 Training and retraining of the operator

Whenever the user orders or authorizes an individual to operate \, the shall ensure that the person has been:

1. Trained prior to being assigned to operate .
2. Familiar with the to be operated
3. Aware of responsibilities outlined in section 3.3.5 of this manual.
4. Retrained if necessary based on the 's observation and evaluation of the operator.

Trainee record

The shall preserve the record of trainee of for at least 4 years.

3.3.3.7 Notice before use

User shall only permit personnel who have completed the training to operate the .The shall ensure that the operator is familiar with the model of the MEWP to be operated prior to use, especially:

1. Know where the weatherproof storage box is located.
2. Know that ’ s operation and maintenance manuals are stored in weatherproof storage boxes and be familiar with the .
3. Be ware of all control functions, bulletins and warnings.
4. Be ware of and understand all safety devices for the model of used.

3.3.3.8 Work site inspection

Before and during the use of the MEWP, the user shall check the potential hazards of the work site, including but not limited to:

1. A sharp slope or a pit, including those covered by water, ice, mud, etc.
2. Slop
3. Bumps and obstacles on the ground
4. Debris
5. Obstacles overhead and cables
6. Hazardous places and gas
7. The surface and support are not sufficient to withstand all the loads of the MEWP under various working conditions
8. Wind and weather conditions
9. Presence of unauthorized personnel
10. Other possible hazardous conditions

3.3.3.9 Identification of hazardous sites

The shall be responsible to identify the hazard classes of intended work sites. The operation of in dangerous work site shall be approved and meet and achieve the requirement of ANSI/NFPA 505-1996.

3.3.3.10 Operators warnings and instructions

The users shall direct the operator to operate the MEWP according to clauses specified in this manual. The user shall monitor their performances and work to ensure that the use, application and operation of MEWPs comply with the clauses specified in section 3.3.5: warn personnel of potential hazards, provide means to protect against identified hazards, and explain the potential consequences of not following proper operating guidelines.

Instructions and guidelines for proper operation shall include, but are not limited to the following terms and subjects:

1. slope and slope grade

The shall not be operated in any manner on slopes, side slopes or ramps exceeding rated slope grade specified by the .

2. Deployment of stability improvement device

Outriggers, stabilizers, stretchable shafts, swing axles or other stability enhancement devices shall be deployed and locked in place as required by the .

3. Guardrail device

The guardrail shall be installed and secured, and entrance doors or openings shall be properly closed as directed by the .

4. Load distribution

The load on the platform and its distribution and any the extension of platform shall comply with the rated load requirements specified by the for a given condition.

5. Maintain overhead clearance

The shall, as instructed, ensure that adequate clearance is maintained with overhead obstacles and live wires and bodies.

6.

The qualified person shall specify and explain to the all applicable safety requirements regarding the prevention of electrocution during work practice. Especially, this person shall instruct the operator to maintain a minimum proximity distance (MAD) to the live conductors and equipment according to its own conditions.

7. Personnel protection equipment (PPE)

The should instruct the operator to ensure that all personnel on the platform wear a personal protection device (PPE) as required.

8. Personnel footing

Staff working on the platform should maintain a stable foothold on the bottom plate. Personnel are forbidden to climb the mid-rail and top rail of the . Brackets, ladders or any other equipment used to achieve or reach the target height on a MEWP are prohibited.

9. Precautions for other mobile devices

When other mobile devices and vehicles are present, special precautions should be taken to comply with local laws or established workplace safety standards. Warning signs including, but not limited to, flags, trapped areas, flashing lights and roadblocks shall be used appropriately.

10.Reporting problems and malfunctions

The shall instruct the operator to report any apparent problems or malfunctions to the manager in time. The user shall make sure that all problems and malfunctions affecting safe operation are resolved before continuing use.

11.Report potential hazardous locations

The user shall instruct the operator to report any potential hazardous locations to the manager in time.

12.Working on hazardous location

Unapproved or unmarked s are prohibited from operating in dangerous places.

13.Entanglement

Attentions shall be paid to prevent ropes, wires and hoses from entanglement into the platform.

14.Load limitation

When the load is applied to a platform at any height, it shall not exceed the rated load and the rated capacity.

15.Working area

The shall instruct the operator to ensure that there are no personnel or equipment around the MEWP before lowering platform.

16.Oil filling

The engine shall be turned off (if operating) during fueling the fuel tank. Fueling should be performed in well-ventilated areas away from open flames, sparks or other fire and explosion hazards.

17.Battery charging

Charging should be performed in well-ventilated areas away from open flames, sparks or other fire and explosion hazards.

18.Incorrect platform stability

The shall not be placed against other objects to stabilize the platform or increase stability.

19.Misused as a machine

The shall not be used as a crane.

20.Abnormal operating support condition

The shall not be used on trucks, trailers, train vehicles, ships, lifting platforms or similar equipment unless it is approved in writing by the manufacturer or by a qualified person.

21.Travel speed

The shall instruct the operator to limit the travel speed according to the environment, including support surface condition, congestion, visibility, inclination, personnel position, and other risk factors that may cause collisions and result in injuries.

22.Travel requirement

When platform is elevated, the shall instruct the to:

1) Maintain a clear view of the supporting surfaces and driving routes.

2) Make sure that personnel in the working area who can be harmed are aware of the motion of the machine. Inform and relocate as required to protect personnel from injury.

3) Maintain a from obstacles, debris, holes, potholes, ramps and other hazards to ensure safe driving.

4) Keep a from overhead obstacles and charged conductors.

23.Stunt driving

Stunt driving and horseplay are prohibited.

24. protection

The shall order the operator to prevent unauthorized use of the tools provided.

25.Modification of safety devices

Interlocks or other safety equipment shall not be altered or removed.

26.Blocked platform

If the platform or elevation assembly is stuck, obstructed or otherwise prevented from performing its normal operation by an adjacent building or other obstacles. Withdrawing control can not free the platform. Before attempting to use the chassis control to free the platform, all personnel on the platform should be removed.

27.Exit (or enter) elevated platform

If approved by the manufacturer, workers shall only leave or enter the elevated platform in accordance with the instructions and guidance provided by the manufacturer, subject to the manufacturer’ s approval.

28.Alteration of an aerial platform or the fabrication and attaching of frameworks, or the mounting of attachments for holding tools or materials onto the platform or the guardrail system shall only be accomplished with the prior written permission of the .

29.Assistance to the

If the encounters any suspected failure, hazard or potential unsafe situation that affects the carrying capacity, normal use or safe operation of the MEWP, the operator shall stop operation and consult the user for more information.

30.Reporting problems and malfunctions

Any problem or malfunction affecting safe operation should be repaired prior to use of the .

31.Carried material (larger than the platform)

The shall ensure that they carry only safe and reliable tools and materials that are evenly distributed and can be used safely by platform personnel.

32.Rated horizontal force

The shall supervise the operator not to exceed the rated horizontal force specified by the manufacturer.

33.Bridge crane

When bridge machine or similar equipment operates within its stroke, measures shall be taken to prevent collisions with MEWP.

34.Appropriate supporting requirement

The shall ensure that the supporting surface is sufficient to bear MEWP.

35.Stopping unauthorized use

The shall instruct the operator not to use, rent, lease or supply the for any benefit without prior permission.

3.3.3.11 User as operator

If the is also an of , the user shall assume the operational responsibilities specified in section 3.3.5 of this manual and the user responsibilities specified in section 3.3.3 of this manual.

3.3.3.12 Shutdown of MEWP

In case of any suspected failure or dangerous or potentially unsafe conditions, the shall approve and instruct the to stop the MEWP operation and consult the , or manufacturer for more information on safe operation before resuming work.

3.3.3.13 Record preservation and distribution

1. Record preservation
   The dealer shall preserve the following records at least 4 years:
   1) Name of operator received training and retraining.
   2) Name of the operator received the familiarization.
   3) The owner (or an individual designated by the owner) is responsible for ensuring that routine and annual inspections are carried out and the written records are maintained. Records shall include the date of inspection, defects found, recommended correction, and a certificate from the person who performed the inspection.
   4) The user shall maintain a written record of the completion of repairs to the MEWP by the owner’s employees. Records shall include the date of repair, a description of the repair completed and a certificate of the person who performed the repair.
2. Record distribution
   1) When the user instructs the employee to complete the routine inspection or annual inspection, the correct records shall be provided to the owner within 2 months of the completion of the inspection.
   2) When the user instructs the employee to complete the repair, the correct records shall be provided to the owner within 2 months of the completion of the repair.
3. Training proof
   The owner should provide the trained person who has successfully completed the training with documentary evidence to prove they are trained. If the trainee requires, the owner shall provide evidence. The documentary evidence should includes following information:
   1) Name of entity supplying training and retraining
   2) Name of trainer
   3) Clear proof of training covered MEWPs
   4) Training date
   5) Names of trainee

3.3.3.14 Modification

Modification, alteration or remanufacturing of s shall only be made with prior written permission from the .

3.3.3.15 Safety bulletin from manufacturer

The shall comply with the relevant safety bulletins received from the manufacturer, dealer or owner.

3.3.4 Owner

- specifies and verifies the skills and responsibilities of personnel working with the machine or specific parts of it
- offers the necessary PPE to individuals working with the machine
- is responsible for the safety state (smooth and safe functioning) of the machine and its accessories
- performs inspections on the machine based on local regulations in addition to the inspections defined by manufacturer’s Instruction Manual
- informs the manufacturer of any accident involving the machine that may lead to serious injury or major damage to property
- provides unrestricted access to the machine to the manufacturer’s authorized service personnel
- carries out the work planning for the machine carefully and conscientiously
- consults with the manufacturer or their authorized representative before making any modification to the machine
- Use or add configurations according to the original XCMG configuration table.

3.3.4.1 Basic principle

Given that the reasonable principles of personnel, safety, training, inspection, maintenance, application and operation shall be applied in personnel training, inspection, maintenance, application and operation, these principles shall be consistent with all available data on rational use and external environment parameters.

3.3.4.2 Purchasing responsibilities

When purchasing MEWP, the purchaser should:

1. Confirm the receiving of operation and maintenance manuals.
2. Obtain maintenance and parts catalogue within 2 months of purchase.
3. Provide the name and address of the buyer as well as the model and the code number of the MEWP purchased to the manufacturer within 2 months of purchase.
4. Make sure the routine inspection and annual inspection are latest if the MEWP is used.
5. Be familiar with and follow the owner’s responsibilities as specified in Instruction Manual for MEWPs.

3.3.4.3 Manuals

The owner shall provide a copy of the operation and maintenance manuals for each machine by lease, rental or sale and ensure that it is properly stored in the weatherproof box on the MEWP. Manuals are considered as an indispensable part of MEWP, which is an important media to send necessary safety information to owners, users and operators. In addition, each machine sold shall be equipped with a repair and parts manual.

3.3.4.4 Maintenance, inspection and repair

1. Maintenance

The owner of the MEWP shall ensure that the maintenance detailed in this standard is implemented on the principle of timeliness. The owner shall establish a preventive maintenance program in accordance with the manufacturer’s recommendations and the operation environment and intensity of the MEWP.

2. Inspection

The owner shall arrange routine inspection and annual inspection as recommended by the manufacturer. All faults and problems identified during the inspection should be solved before the MEWP resumes operations.

3. Repair

When the MEWP is damaged or repair is required, all faults and problems identified should be fixed before the MEWP resumes operation.

3.3.4.5 Pre-delivery preparation

The MEWP shall be inspected, maintained and regulated according to manufacturer’s requirement before delivery (by sale, rental or lease).

3.3.4.6 Routine inspection

The owner of the MEWP shall ensure that the routine inspection of the MEWP is performed in accordance with the manufacturer’s instructions:

1. Purchased used machine The routine and annual inspections shall be conducted unless it is confirmed that the inspections are current.
2. Machine servicing for three months or 250 hours (whichever comes first)
3. No operation for more than 3 months

The inspection shall be carried out by a qualified technician on MEWP or one has similar design characteristics. Inspections shall be carried out in accordance with the manufacturer's requirements for routine inspections, including but not limited to the following:

All functions and controls for speed, stability and motion limits.

Chassis control includes provisions for overriding of upper controls.

All wire rope devices used for adjustment and worn or damaged parts.

All emergency safety equipment.

Lubrication of all movable parts, inspection of filter, hydraulic oil, engine oil and refrigerant as specified by manufacturer.

Visual inspection of structural parts and other critical components such as fasteners, pins, shafts and latching devices.

Bulletins, warnings and control labels.

Other items specified by the manufacturer.

Emergency descent method.

3.3.4.7 Annual inspection

The owner of the MEWP shall ensure that the annual inspection is carried out within 13 months from the date of the last annual inspection. The inspection shall be carried out by a qualified technician on MEWP or one has similar design characteristics. The inspection shall be carried out in accordance with the manufacturer's annual inspection program. The owner should not arrange MEWP operation until all faults and problems have been solved.

3.3.4.8 Maintenance safety precautions

Before performing adjustment and repair of MEWP, the following precautions should be taken:

1. Power plants stopped and start switches do not work.
2. All control mechanisms are in "off" gears to protect all control systems from unintentional action caused by braking, obstruction, or other means.
3. Boom and platform shall be lowered to the stowed position as much as possible or shall be secured with block or constraint to prevent falling.
4. Release oil pressure from all hydraulic circuit before loosening or removing hydraulic components.
5. Other precautions specified by the manufacturer.

3.3.4.9 Spare parts

When parts or components are replaced, they shall be identical or equivalent to original parts or components of MEWP.

3.3.4.10 Maintenance training

The owner shall train the maintenance personnel for inspection and maintenance of the MEWP as recommended by the manufacturer and as required in section 3.3.4.

3.3.4.11 Training

1. Training of the operator

   Whenever the owner orders or authorizes the employee to operate the MEWP (loading, unloading, inspection or other purpose), the owner shall undertake the user’s responsibilities specified in Section 3.3.3 of this manual and ensure that the employee has been:

   1) Trained

   2) Familiar with the MEWP to be operated

   3) Aware of operator responsibilities outlined in section 3.3.5 of this manual.

2. Assisting users

   When, at the request of the user, the owner sells, rents, leases or supplies the MEWP in any form for benefits, the owner shall provide for training or recommend to the user a relatively reliable place for training.

3.3.4.12 Familiarization on delivery

For delivery by sale, rental, lease or other means, the dealer and the recipient assigned by receiving unit of MEWP shall share responsibilities:

1. Verify the weatherproof storage box (manual box)
2. Verify the manuals specified by the manufactures is on MEWP
3. Check all control functions
4. Check all safety devices specified during the delivery of MEWP

3.3.4.13 Operation

When operating the MEWP, the owner shall be liable for the user’s responsibilities under section 3.3.3 of this manual: his operator shall be liable for the operator’s responsibilities under section 3.3.5 of this manual.

3.3.4.14 Assisting user and operator

If the owner is unable to answer the user or operator’ s questions regarding the rated capacity, intended use, maintenance, repair, inspection or operation of the MEWP, the owner shall ask correct information from the manufacturer or a qualified person (if the manufacturer is no longer in business) and provide it to the user or operator.

3.3.4.15 Record preservation and distribution

1. Record preservation

   The owner shall specify the record date and preserve the record at latest 4 years:

   1) Name and address of each MEWP purchaser by delivery number and date

   2) Written record of routine inspection and annual inspection performed. Records include documentation of defects found, modification completed, and certificates of personnel who performed the inspections and repairs.

   3) Written record finished on MEWP. The record shall include a certificate of the person who made the modification and performed the repair.

   4) Pre-delivery preparation record completed before delivery

   5) Names of trainee

   6) Names of trainer

   7) The name of the person receiving the MEWP details for each delivery, unless the person has delivery details on the same model or the product has characteristics consistent with the product delivered within 3 months.

   8) Name of personnel providing delivery details

2. Training proof

   The dealer should provide the trained person who has successfully completed the training with documentary evidence to prove they are trained. If the trainee required, the owner shall provide the evidence. The documentary evidence should includes following information:

   1) Name of entity providing training or retraining

   2) Name of trainer

   3) Clear proof of training covered MEWPs

   4) Training date

   5) Name of trainee

3. Record distribution

   Upon request, the dealer shall provide the following information:

   1) To user, proof of training for operators (including name of trainer and training date)

2) To user, the name of the person receiving delivery details of MEWP

3.3.4.16 Modification

Modification, alteration or remanufacturing of MEWPs shall only be made with prior written permission from the manufacturer.

3.3.4.17 Safety bulletin from manufacturer

The dealer shall observe the bulletins from the manufacturer or dealer.

3.3.4.18 Sales responsibilities

When the MEWP are sold, the sales person shall:

1. Shall ensure that the operation and maintenance manuals delivered to the owner
2. Provide the copy of current Instruction Manual.
3. Provide the new owner Parts Catalogue
4. Provide training as the new owner requested or recommend a relatively reliable training location.

3.3.5 Operators

The operating personnel need:

- training or instructions, according to the local regulations, enable them to operate the machine in a safe manner
- the authorization to operate the machine
- being physical and mental able to operate the machine and is not under the influence or substances affecting operation ability
- be instructed to the safety precautions at the site
- take suitable safety measures for himself and bystanders
- check qualification of persons working next to machine
- manage the activities of persons around the machine
- ensure the machine’s safe-mannered operation according to intended use
- immediately take the machine out of operation in case of safety-impairing defects
- perform on-time maintenance and inspections on the machine according to XCMG’s Instruction Manual
- report every accident involving the machine, especially:
  - serious injuries
  - major property damage
- use original XCMG spare parts for maintenance
- always consider operating conditions, assesses possible hazards and acts accordingly

3.3.5.1 Basic principle

The information in this manual shall be supplemented according to the principles of good judgment, safety control and warning during elevating and lowering conditions. Due to the operator controls the MEWP

directly, it is the operator’s responsibility to follow good safety regulations in the area. Operators shall make decisions about the use and operation of the MEWP with considering their own safety and the safety of others.

3.3.5.2 Instruction manual

The operator shall ensure that operation and maintenance manuals are kept in the weatherproof storage box of MEWP. This manual is an essential part of sending the necessary safety information to the operator of MEWP. The operator shall know and consult the manual as required.

Manual of responsibilities

The operators should be familiar with the requirements for operators, see the responsibility manuals of dealers, owners, users, operators, lessee and lessor and agents for Boom-Supported Elevating Work Platforms as specified in section 3.3.5. Latest manual of responsibilities should be kept in the MEWP at all times and stored in a weatherproof storage box when it does not in use.

3.3.5.3 Inspection before operation

Visual inspection shall be conducted every day before operation or every change of operation environment, and shall include but not limited to the following functional tests:

1. Operation and emergency controls
2. Safety devices
3. PPE
4. Leakage of pneumatic pressure, hydraulic pressure and fuel system
5. Harness of cables and wires
6. Loosen or missing parts
7. Tires
8. Labels, warnings, control labels and operation instruction
9. Outriggers, stabilizers, stretchable shafts and other devices like guardrail
10. Items identified by the manufacturer.

3.3.5.4 Problems and malfunctions

Any problems and malfunctions that may affect the safety of the operation shall be fixed before the use of the MEWP.

3.3.5.5 Training, retraining and familiarization

General training

Only those who have received instructions on the inspection, application and operation of the MEWP and who understand and avoid the risks associated with their operation, shall operate the platform. The training shall include, but not limited to the following questions and requirements:

1. Purpose and use of the guidance
2. Working instructions are an integral part of the MEWP and must be properly stored in the weatherproof storage box when not in use
3. Inspection before operation
4. Responsibilities relating to problems and malfunctions affecting MEWP operation
5. Factors affecting stability
6. Purpose of labels and decals

7. Operating environment checking
8. Safety regulation
9. Operating license
10.Operator warnings and instructions
11.Actual operation of MEWP
12.The trainee shall, under the guidance of qualified personnel, operate the MEWP for a sufficient period of time to achieve proficiency in practical operation.

3.3.5.6 Retraining

When instructed by the user, the operator shall be retrained based on the user's observation and evaluation of the operator.

3.3.5.7 Proficiency

When the operator is instructed to operate a MEWP with which he/she is not familiar, the operator shall be provided with instructions that include the following:

1. The location of the weatherproof storage box (preserving guidance)
2. Purpose and function of all controls
3. Safety devices and operational performance for MEWPs

3.3.5.8 Before working

Before working, the operator shall:

1. Read and understand the manufacturer’s operating instructions and the user’s safety regulation, or received related explanation.
2. Understand the meaning of all labels, warning and instructions on MEWP or received related explanation.
3. Ensure that all operators on MEWPs wear appropriate personal protective equipment, including the working environment.

Operating environment checking

Before or during the use of the MEWP, the operator shall check the possible risks in the working area, for example, but not limited to:

1. A drop or pit, including one covered by water, ice, mud, etc.
2. Slop
3. Bumps and obstacles on ground
4. Debris
5. Overhead obstacles and cables
6. Hazardous places and environment
7. The support surface is insufficient to undertake the loads applied by MEWP under all operating conditions
8. Wind and weather conditions
9. Presence of unauthorized personnel
10.Other possible unsafe conditions

3.3.5.9 Before operation

Before each operation of the MEWP, the operator shall ensure that:

1. Outriggers, stabilizers, stretchable shafts or other equipment to improve stability should be operated according to manufacturer’s requirements
2. The guardrail shall be installed and the hatch closed according to the manufacturer's instructions.
3. The load and its distribution on platform and extension structure is accord with the rated capacity for that specific configuration.
4. All personnel on a MEWP are equipped with appropriate safety devices for the intended work and environment

3.3.5.10 Understanding of hazardous locations

It is the operator’s responsibility to understand the hazard classification of the work place according to ANSI/NFPA 505-1996.

3.3.5.11 Operating warning and regulation

⚠ The operator directs personnel to operate the MEWP in accordance with the provisions of this manual. The operator shall supervise the work to ensure that the operation and use of the MEWP comply with the provisions of section 3.3.5 of this manual, warn personnel of potential hazards, provide protective measures for identified hazards, and explain the potential consequences of failure to follow the instructions. **Instructions for appropriate operation shall include, but not limited to, the following terms and topics:**

1. Falling protection

   Although the guardrail of MEWP provides basic fall protection, all operators of MEWP should wear fall prevention devices under the guidance of the owner.
2. Inclined surface and slop

   The MEWP shall not be operated in any way on any inclined surface or slop that exceeds the rated slop specified by the manufacturer.
3. Use of equipment to improve stability

   Outrigger, stabilizer, stretchable shaft or other equipment to improve stability shall be stretched and locked in place as manufacturer required.
4. Guardrail device

   The guardrail shall be installed and the hatch closed according to the manufacturer’s instructions.
5. Load distribution

   The load and its distribution on platform and extension structure (if equipped) is accord with the rated capacity for that specific configuration.
6. Maintaining overhead clearance

   The operator shall ensure that sufficient clearance is maintained with the top barriers and live conductors and parts.
7. Electrocution hazard

   Operators should only perform work within their capacity and observe safety regulation related work practices intended to prevent electric shock covered by local regulations and rules. The skill level of the operator can only be determined by the professionals. The minimum approach distance (MAD) from energized power lines shall be maintained.
8. PPE

The operator shall ensure that all personnel on the platform wear personal protective equipment as required.

9. Foothold of worker

The worker shall ensure a secure foothold when working on the platform. It is forbidden to climb the top rail and mid-rail of MEWPs. Do not use boards, ladders or any other equipment on the platform for additional height or distance.

10.Precautions for other mobile equipment

In the presence of other mobile equipment and vehicles, special precautions should be taken to comply with local regulations or safety standards related to the work environment. Warning signs, such as but not limited to flags, rope-fenced zones, flashing lights and barricades, shall be used appropriately.

11.Reporting problems and malfunctions

The operator shall immediately report any problems or risks found during the operation to the manager. The user shall make sure that all problems and hazards affecting safe operation are resolved before continuing use.

12.Reporting potential hazardous environment

The operator shall immediately report any hazardous environment found during the operation to the manager.

13.Operating in hazardous environment

Unlicensed or unmarked MEWPs are prohibited from operating in dangerous environments.

14.Entanglement

Attentions shall be paid to prevent entanglement of ropes, wires and hoses of MEWPs.

15.Load limitation

The load transmitted to the platform at any height shall not exceed the rated load.

16.Working area

The user shall ensure that there are no personnel or equipment around the MEWP before lowering platform.

17.Oil filling

18.Turn off the engine when replenish oil to the oil tank. Replenish oil in a well-ventilated area away from open flames, sparks or other hazards of fire or explosion.

19.Battery charging

Replenish oil in a well-ventilated area away from open flames, sparks or other hazards of fire or explosion.

20.Inappropriate platform stability

The MEWP shall not be placed against another object to improve stability.

21.Misused as a machine

The MEWP shall not be used as a crane.

22.Abnormal operating support condition

The MEWP shall not be used on trucks, trailers, train vehicles, ships, lifting platforms or similar equipment unless it is approved in writing by the manufacturer or by a qualified person.

23.Travel speed

The user shall instruct the operator to limit the travel speed according to the environment, including support surface condition, congestion, visibility, inclination, personnel position, and other risk factors that may cause collisions and result in injuries.

24.Travel requirement

When platform is elevated, the user shall instruct the operator to:

1) Maintain a clear view of the supporting surfaces and driving routes.

2) Make sure that personnel in the working area who can be harmed are aware of the motion of the machine.

3) Maintain a safe distance from obstacles, debris, holes, potholes, ramps and other hazards to ensure safe driving.

4) Keep a safety distance from overhead obstacles and charged conductors.

25.Stunt driving

Stunt driving and horseplay are prohibited.

26.MEWP protection

The user shall order the operator to prevent unauthorized use of the tools provided.

27.Modification of safety devices

Interlocks or other safety equipment shall not be altered or removed.

28.Blocked platform

If the platform or elevation assembly is stuck, obstructed or otherwise prevented from performing its normal operation by an adjacent building or other obstacles, withdrawal of the control shall not free the platform. Before attempting to use the chassis control to free the platform, all personnel on the platform should be removed.

29.Exit (or enter) elevated platform

If approved by the manufacturer, workers shall only leave or enter the elevated platform in accordance with the instructions and guidance provided by the manufacturer, subject to the manufacturer’s approval.

30.Modification

Modification or alteration of MEWP, structure and accessories of structural frame, brackets of tool box, and equipment and guardrail on platform shall only be accomplished with the prior written permission of the manufacturer.

31.Assistance to the operator

If the operator encounters any suspected failure, hazard or potential unsafe situation that affects the carrying capacity, normal use or safe operation of the MEWP, the operator shall stop operation and consult the user for more information.

32.Reporting problems and malfunctions

Any problem or malfunction affecting safe operation should be repaired prior to use of the MEWP.

33.Carried material (larger than the platform)

The users shall ensure that they carry only safe and reliable tools and materials that are evenly distributed and can be used safely by platform personnel.

34.Rated horizontal force

The user shall supervise the operator not to exceed the rated horizontal force specified by the manufacturer.

35.Bridge crane

When bridge machine or similar equipment operates within its stroke, measures shall be taken to prevent collisions with MEWP.

36.Appropriate supporting requirement

The user shall ensure that the supporting surface is sufficient to bear MEWP.

37.The user shall instruct the operator not to use, rent, lease or supply the MEWP in any way for benefit without prior permission.

3.3.5.12 Training proof

The owner should provide the trained person who has successfully completed the training with documentary evidence to prove they are trained. If the trainee requires, the owner shall provide evidence. The documentary evidence should includes following information:

1. Name of entity supplying training and retraining
2. Name of trainer
3. Clear proof of training covered Boom-Supported Elevating Work Platforms
4. Training date
5. Names of trainee

3.3.6 Responsibilities of lessor

3.3.6.1 Basic principle

⚠ Given that the reasonable principles of personnel, safety, training, inspection, maintenance, application and operation shall be applied in personnel training, inspection, maintenance, application and operation, these principles shall be consistent with all available data on rational use and external environment parameters.

3.3.6.2 Lessor as dealer

When a lessor uses the MEWP as a dealer, the lessor shall assume the dealer’s responsibilities specified in section 3.3.2.

3.3.6.3 Lessee as user

When a lessor uses the MEWP as a user, the lessor shall assume the user’s responsibilities specified in section 3.3.3.

3.3.6.4 Lessor as owner

When a lessor uses the MEWP as an owner, the lessor shall assume the owner’s responsibilities specified in section 3.3.4.

3.3.6.5 Lessor as operator

When a lessor uses the MEWP as an operator, the lessor shall assume the operator’s responsibilities specified in section 3.3.5.

3.3.7 Lessee responsibilities

3.3.7.1 Basic principle

Given that the reasonable principles of personnel, safety, training, inspection, maintenance, application and operation shall be applied in personnel training, inspection, maintenance, application and operation, these principles shall be consistent with all available data on rational use and external environment parameters.

3.3.7.2 Lessee as dealer

When a lessee uses the MEWP as a dealer, the lessee shall assume the dealer’s responsibilities specified in section 3.3.2.

3.3.7.3 Lessee as user

When a lessor uses the MEWP as a user, the lessor shall assume the user’s responsibilities specified in section 3.3.3.

3.3.7.4 Lessee as owner

When a lessee uses the MEWP as an owner, the lessee shall assume the owner’s responsibilities specified in section 3.3.4.

3.3.7.5 Lessee as operator

When a lessee uses the MEWP as an operator, the lessee shall assume the operator’s responsibilities specified in section 3.3.5.

3.3.8 Agent responsibilities

3.3.8.1 Sales responsibilities

The agent shall:

1. Ensure operation and maintenance manuals are provided to new users on delivery
2. Preserve the sales record for at least 10 years

3.3.8.2 Re-rent, lease or other forms for profit

When compensation is received as a result of a re-rent, lease or any form of beneficial use of a MEWP, the agent shall:

1. Ensure operation and maintenance manuals are provided to new users on delivery
2. Provide new users the cope of current manual of responsibilities
3. Maintain transaction records for at least 10 years

3.3.9 The maintenance personnel (technician/engineer):

1. Must have knowledge of the supplied documentation including:
   1) operating instructions of the machine and its components
   2) operating instructions from other manufacturers (e.g. interchangeable equipment)
   3) where required, knowledge of the technical data sheets
2. Maintain the machine regularly to ensure safe and reliable operation.
3. Perform all prescribed maintenance activities.
4. Shall wear PPE where required or recommended.
5. Observe safety regulations at the place of use.
6. Inform the operator of any safety-related changes/modifications on the machine.

3.3.10 General requirements for all responsible parties

The operating personnel needs to:

- be physically and mentally suitable to operate the machine. This includes:
  - Good eyesight and hearing
  - Good spatial perception
  - Physical capacity
  - Good reflexes
  - Craftsmanship
- be qualified by appropriate training and instructions for operating the machine.
- be over 18 years old.
- have passed the required health checks.
-

- Persons with the following physical limitations are not, or only partially qualified to operate a machine if they follow a required special medical treatment:
  - epilepsy
  - fainting spells
  - heart attack risk
  - Electrical/electromagnetic implants (e.g. pacemakers)
  - Absents of Limbs (e.g. missing fingers) if expected to impede the capability of operating the machine

3.4 Personal protection equipment

Become familiar with safety related precautions at your site

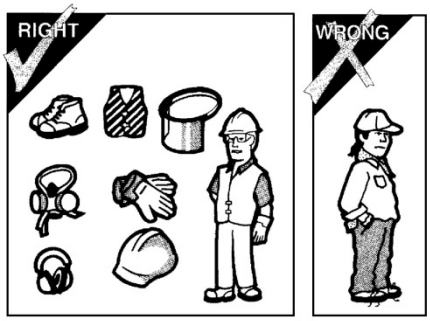


Figure 3-1 Personal protection equipment is recommended and possibly mandatory at your site.

è Wear PPE when working on any machine as required.
PPE may include:
Safety helmet, if head injuries are possible due to swinging, falling, or flying particles or parts
Safety goggles when in contact with corrosive and pressurized liquids loose parts and dust Respiratory protection/breathing masks in case of dangerous gases, vapor, smoke or dust in the working environment
Hearing protection when working very close to the machine/on the platforms and roof
must not reduce the operator’s attention in communication with the environment
Protective gloves
Safety shoes
Special protective clothing (to prevent burns, chemical burns, or cutting injuries in respected work places)
Boldly-colored or reflective clothing (when working at night or if recognition by other personnel is needed).

3.5 Hazards and risks of injury

3.5.1 General precautions

- **Before putting the machine into operation, check the following:**
  - Machine indications and safety are not reporting any fault or warning
  - Machine work correctly
  - When driving the machine, make sure that nobody is on the working track.
- **During operation, observe the followings:**
  - Do not enter dangerous zones with the machine
  - Do not reach into areas with moving machine parts (such as engine, fan)
  - Keep cover and platform gate closed

3.5.2 Fire and explosion hazards

- Before refueling or filling with hydraulic fluid, shut off the machine and secure against unintentional restart.
- Immediately wipe spilled fuel off the machine with a suitable cloth.
- Immediately bind spilled fuel to substrate with binder.
- Dispose of used binder safely and in an environmentally friendly manner.
- Do not use booster sprays containing ether-solvents to start the engine.
- Do not store or use flammable liquids near the machine.
- Do not use flammable cleaning agents to clean the machine.
- Do not place flammable materials such as rags or clothing near the engine.

Warning!	Fire and explosion hazards
	• Danger of fire and danger of explosion due to easily flammable operating materials or gas mixtures resulting from these. • No fire, naked flames or electrostatic discharges by handling flammable materials or fluids! • Observe handling-specific and situation-specific safety notes.

	• Dusty environment and improper handling of the machine in dusty environments (e.g. surface dust formation) follows in: • Increased risk of fire. • Increased risk of dust-explosion • Make sure that the operator prevents dust formation through technical or organizational measures. • Shorten cleaning intervals and maintenance intervals.
	Observe the following safety notes: • Keep a fire extinguisher ready • Make sure that the fire extinguisher is filled and ready for use • Know how to use the fire extinguisher in case of emergency. • Do not hang any transparent knickknack on the window glass. • Because they are possible to focus the sun and cause a fire. • Ensure that the engine is free from inflammable deposits and soiling (oil buildup, leaves, pine needles, coal dust, waste) • When refueling via a tank supply line, make electrical compensation to avoid electrostatic charging between the machine and the refuel unit. • Immediately wipe spilled fuel off the machine with a suitable cloth. • In case that oil is spilled on the ground or floor, use the binder to collect it. • Dispose of any used binder safely and in an environmentally friendly manner. • After refueling, remove the fuel supply line from the machine and close the fuel tank again. • Only commission the machine as described in this Instruction Manual. • Do not use booster sprays containing ether-solvents to start the engine. • Do not store or use flammable liquids in the vicinity of the machine. • Do not use flammable cleaning agents to clean the machine. • Do not place flammable materials such as rags or clothing near the engine/electric motor. • Regularly check all protective covers, cables and wire brackets or completeness and tightness. • Ensure that loose cables or lines are firmly re-installed. • Check all hydraulic lines regularly (at least once a year) for damage and leaks. • Replace damaged hydraulic lines immediately. • Do not smoke near the battery. • Close the cover of ashtray to extinguish the match and cigarette butt • Ensure that there are no open flames or sources. • Check regularly the electrical machine of the machine by qualified personnel.

	No open fire when handling flammable materials.

3.5.3 Lighting strike

Warning!	Lighting strike
	**Electric shock from lightning!** • Contact with a direct or indirect current flow caused by a voltage flash-over or step voltage can be fatal. • Fall hazard when working at heights. • It can also cause a total loss of control, damage to the electronics or to local welding spots on supports, especially on the swing ring. Observe handling-specific and situation-specific safety notes.
	Observe the following safety notes: • Do not operate the machine during a thunderstorm! • The charge is channeled through the machine and into the ground • Always stay away from large, free-standing metal parts (e.g. machine) during a thunderstorm. • Machines without direct contact between steel structure and ground must be grounded. • Evacuate the machine in the case of fire.
	Measures after experienced storm strike: • Inspect the electrical machine of the machine by qualified personnel • Thoroughly inspect the machine by paying attention to any damaged cable, hose or rope. Check machine for leaks of fuels or supplies • Inspect the operational capability of the machine’s control systems. • Move the slewing device slowly to watch any abnormal noise or action. • Move the boom to watch any abnormal noise or action. Check boom and belt buckle for damage. Contact XCMG for after-sales service.

Warning!	Injury from mechanical parts
	• Mechanical actions due to moving machinery! • When operating the machine, numerous hazards and situations can arise that can cause life-threatening injuries. Observe handling-specific and situation-specific safety notes.
	Observe the following safety notes: • Switch off the machine and power supply! • Wear suitable PPE. • Only work on non-moving parts. • Do not reach into areas with moving machine parts (e.g. drive shafts, drive belt, fan, etc.). • Examples of mechanical impact: • Standing under a suspended load. • Danger of being drawn in by moving drive units or machine parts. • Danger of falling when working without safety gear. • Danger of crushing due to unsecured components such as doors or sliding elements.

Warning!	Hazards and Injuries from Hydraulic Devices
	**Leaking of hydraulic oil under high pressure!** Leakages in hydraulic lines can cause injuries to skin, destroy tissue and can cause blood poisoning due to the high pressures involved. Observe handling-specific and situation-specific safety notes.
	**Observe the following safety notes:** • Repairs to hydraulic machines may only be carried out by qualified technicians with specialized knowledge and experience of hydraulics. • Make sure that the whole machine is pressure-free before start. • Never attempt to locate the leakage point with your hand or other parts of the body • Damaged hydraulic components must be replaced immediately with original XCMG spares • Check all hydraulic lines regularly (at least once a year) for damage and leaks. • Replace damaged hydraulic lines immediately. Examples of hydraulic energy: • Tissue damage from high pressure leaks. • Sepsis from hydraulic oil entering bloodstream.

Warning!	Risk of physical burns
	**Contact with hot surfaces and consumables!** **High surface and equipment temperatures can lead to burns or scalding.** **Observe handling-specific and situation-specific safety notes.**
	**Observe the following safety notes:** • Always wear suitable protective gloves when working on hot components. • Only carry out work on the machine after it has cooled down and is stopped. **Examples of burns and scalding:** • in contact with the entire drive machine. • on engine exhaust parts. • on hydraulic pumps or motors • on electric components • engine cooling radiator and pipes

Warning!	Chemical burns
	**Contact with corrosive and chemical consumables!** • Acids and bases cause chemical burns to skin and tissue, and blindness if they come in contact with the eyes. • Acids and bases will damage clothing. Observe handling-specific and situation-specific safety notes.
	Observe the following safety notes: • Replace damaged battery immediately. • Wear safety goggles and protective gloves when replacing battery. • Wear safety goggles and protective gloves when working on the battery. • Do not smoke near the battery. • Ensure that there are no open flames or sources of ignition (e.g. electrical equipment) near the battery. • Do not short connect the battery terminals. • Do not place conductive materials on the battery. • Replace discharged battery immediately or charge battery in heated area Examples of chemical burns: • Chemical burns from handling acidic consumables. • Chemical burns from leaking battery acid.

Warning!	Asbestos dust
	Contact with the asbestos dust! If too much asbestos dust in the air is breathed, it is possible to suffer a lung cancer. Observe handling-specific and situation-specific safety notes.
	Observe the following safety notes: • Use the dust filtering masks, when there is asbestos dust in the air • Follow the rules, regulations and the environment standard at the work place. • Do not allow other personnel to come to close to the machine during operation. • Operate the machine in the upwind position If there is asbestos dust in the air. • Do not use the compressed air to reduce the dust.

Warning!	Poisoning and Suffocation Hazard
	• Inadequate ventilation or fresh air! • Poisonous vapors or other atmospheres hazardous to health can lead to poisoning or suffocation. Observe handling-specific and situation-specific safety notes.
	Observe the following safety notes: • Only operate machine in well-ventilated areas • Use breathing apparatus when working with hazardous materials. • Regularly replace filter of respiratory mask –**Examples of intoxication and choking:** • Engine exhaust gases contain carbon monoxide and other hazardous gases. • Machine is used in areas where hazardous substances are present, and contact with hazardous gases is a possibility.

Warning!	Environmental Risk
	**Risk of damage to the environment caused by pollutants!** If their release is not controlled, fuels, oils, cleaning agents, coolant, etc. can enter the ground or rivers and cause environmental damage. Observe handling-specific and situation-specific safety notes.

	Observe the following safety notes: • In the event of leakage of fuel or operating consumables, rectify the causes immediately. • Eliminate leaking fuels or operating materials immediately with binders. • Dispose of used binder safely and in an environmentally friendly manner. • When disposing of fuels or operating materials, observe national disposal regulations. • If necessary, clarify the disposal with the local authorities. • Use a suitable container when draining fuels or fluids. • Sump is sufficiently large, dense and chemically resistant to the corresponding fuel or hydraulic oil. • Do not mix fuels or operating consumables when draining. • Store or dispose of fuel or operating consumables separately. • Examples of hydraulic energy: • Leakages in the operating machines. • Refilling consumables incorrectly.
	First Aid Notify the emergency services/authorities of any large amounts leaks of environment endangering substances!

3.6 Safety distance

3.6.1 Power cables/pipelines

- Start working only after explicit approval or confirmation of the shutoff of the power supply lines by the responsible authority.
- Treat the power lines as live until shutoff has been confirmed in writing by the responsible authority.
- Pay attention to distances between power supply lines and working position.
- If necessary, consult a second person for observation.
- Break the operation off in case of doubt.

3.7 How to act in dangerous situations

3.7.1 If the machine contacts with a power supply line

	First response Remain calm. Alert the relevant power supply company. • **If the control machine is still functioning:** • **Move the machine out of the danger area.**
	• Leave the machine • Never touch the machine’s live parts when touching the ground. • Jump in a direction that avoids any contact with live parts. • Jump to a safe distance from the machine and land on both feet at the same time. • Land on both feet at the same time with legs closed (do not straddle). • Never hold on to the machine or any live parts. • Jump away on both feet with both legs pressed together. • While jumping away, keep well clear of any live parts.
	First Aid • Alert Emergency Services • Leave the personnel rescue to the professionals!
	• Assure medical attention after electrical accidents. The person affected may experience symptoms of an irregular heartbeat sometime after the accident.

3.7.2 Machine on fire

In case of Fire

	First response • Incorrect behavior in case of fire • Danger of backlash! • Even if the fire appears to be extinguished, leaking fuel or oil coming in contact with hot components may reignite • Shut off the engine. • Alert the emergency services. • Move people out of the danger zone, • Perform first aid if required • Only start to fight the fire if there is no risk to your personal safety.
  	Fire Fighting • Regard Fire Classes Requirements: • **Appropriate extinguishers must be used!** • **If unsuitable extinguishers are used, they may be ineffective or even lead to additional hazards.** **Use extinguishers matching the fire class (see symbols on the left below)** • **Fire extinguishers are subject to national regulations!** • **Take fire extinguishers on the machine off the holders** • **Make it ready for operation.** • **Fight the source of the fire with several short bursts.** • **While fighting the fire, ask personnel to alert the fire brigade.**
Class of Fire	**Class of Fire and Reliable Extinguish Agents** The assignment of extinguishing agents to fire classes prevents risks and damage through a wrong extinguishing agent:
	**A = Solid organic materials** (as wood, paper, cloths etc. …) extinguish by using: Water, ABC-Powder
	**B = Liquids and liquefying materials** (as Gasoline, Wax, White Spirit Solvent etc. …) **extinguish by using:** BC-Powder, ABC-Powder, CO2

	**C = Gases and other vapors** (as Propane, Butan, Natural gas etc. …) **extinguish by using: Shut-off Valve**, BC-Powder, ABC-Powder, CO2
	**D = Flammable Metals** (as Aluminum, Magnesium, Lithium…) **extinguish by using:** Metal fire powder, Dry sand
	First Aid **Alert Emergency Services** Only experts rescue the personnel!

3.8 Safety signs and labels

3.8.1 Introduction

Make sure to understand all safety signs contained in this Instruction Manual and the safety symbols related to the machine.

- Keep safety signs clean, undamaged and readable.
- If any safety sign is missing/damaged, contact XCMG Fire-fighting Safety Equipment Co. Ltd. immediately to have them replaced.
- Do not hesitate to contact an XCMG agent for any other ambiguity or issue as well

3.8.2 Mandatory signs

A “mandatory sign” is a safety sign enforcing behavior preventing or reducing a risk to health or safety. **Common mandatory signs**

Meanings	Mandatory signs:		Meanings
Wear ear protection			Wear safety footwear
Wear protective gloves			Wear protective clothing

Meanings	Mandatory signs:		Meanings
Wear a face shield			Wear head protection
Wear a safety harness			Wear safety belts
Read operating Instruction Manual			Refer to Instruction Manual

3.8.3 Prohibition signs

A “prohibition sign” is a safety sign prohibiting behavior likely to cause a risk to health or safety.

Common prohibition signs

Meanings	Prohibition signs		Meanings
Smoking prohibited			Fire, open ignition sources and smoking are prohibited
Pedestrians prohibited			Forbidden for ground conveyors
Access for persons with pacemakers or implanted defibrillators prohibited			No access for unauthorized personnel
Entering the area prohibited			Switching prohibited

Do not lift load			No climbing for unauthorized personnel
High-pressure cleaning prohibited			

3.8.4 Warning signs

Warning signs indicate potential risks or hazards. (ISO 7010)

Common warning signs:

Meanings	Warning signs		Meanings
Warning of non-ionizing radiation			Warning of obstacles on the ground
Warning of fall hazard			Warning of slipping hazard
Warning of electric voltage			Warning of automatic start
Warning of hot surfaces			Warning of crushing hazard from above
Warning of crushing hazard			Warning of getting rolled over
Warning of hand injuries			Warning of getting drawn into winches
Warning against staying the swing range			Warning of hazards through battery charging

Meanings	Warning signs		Meanings
Warning of crushing hazard from above			Warning of dangers through hydraulic oil
Warning of getting rolled over			Refer to Instruction Manual

3.8.5 Rescue signs

Rescue signs mark the locations of first aid equipment and emergency exits.

Common signs

Meanings	Rescue signs	Description
First Aid		Place where to find a first aid kit or similar
Emergency exit (door)		Door usable to exit in case of emergency (alarm may turn on when opened; do not misuse)
Emergency exit (window)		Window to escape in case of emergency. (use the mallet/hammer nearby to smash open)

3.8.6 Fire protection signs

Fire protection signs mark the location of fire alarms or fire extinguishing equipment

Common fire protection signs

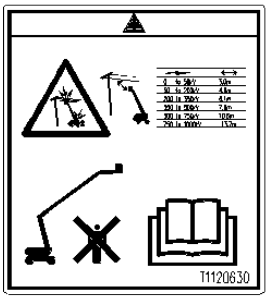
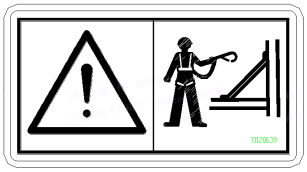
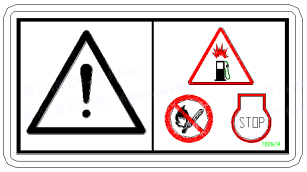
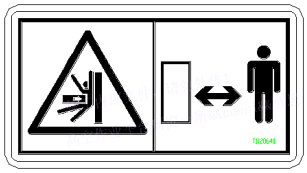
Meanings	Fire protection signs		Meanings
Fire extinguisher			Fire detector

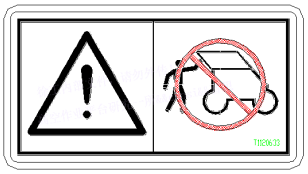
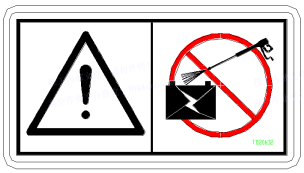
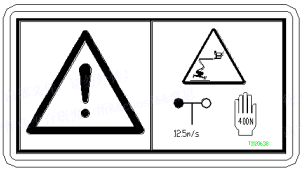
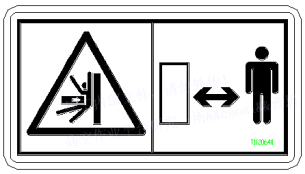
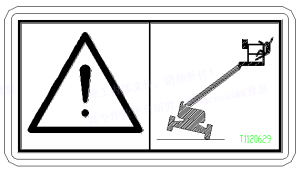
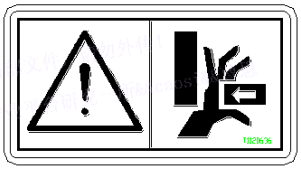
3.9 Machine-specific signs and labels

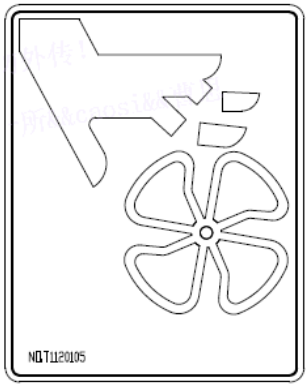
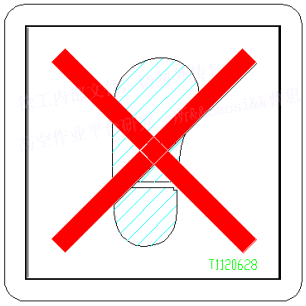
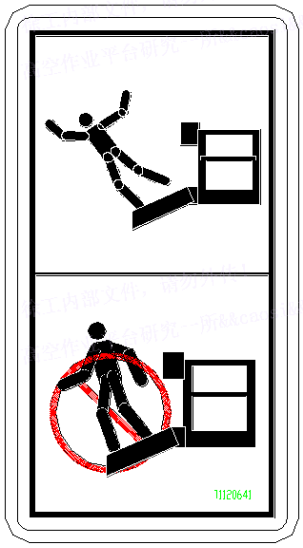
3.9.1 Introduction

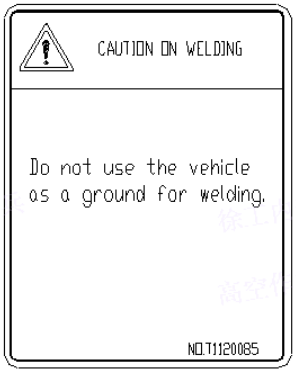
- Be sure to read and memorize all safety instructions in this Instruction Manual and all safety signs and symbols associated with the machine.
- Ensure that the safety signs and symbols remain legible. If one is missing, damaged or unrecognizable, have it replaced immediately.
- If you have any questions, contact an XCMG representative or XCMG Fire-fighting Safety Equipment Co. Ltd.

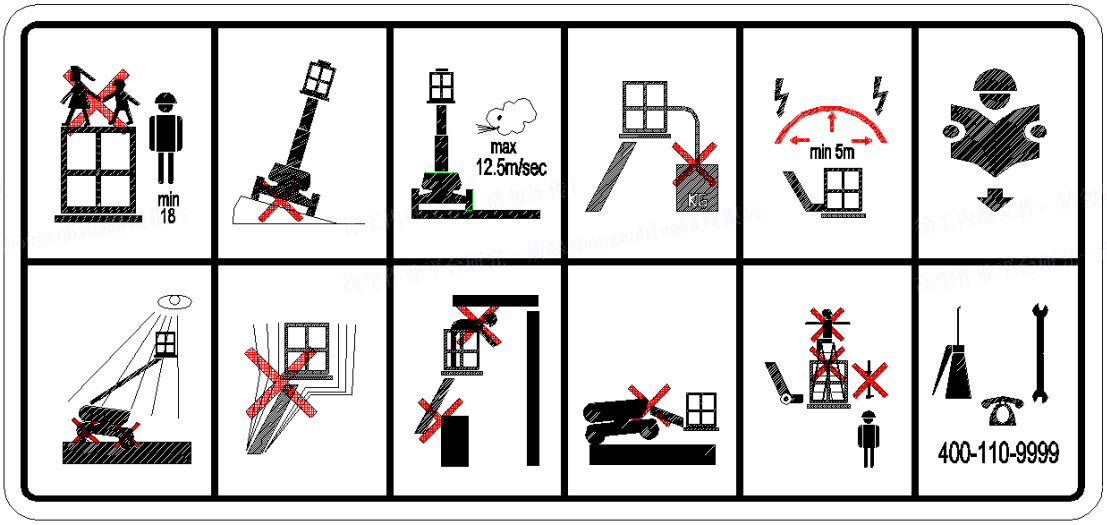
3.9.2 Machine-specific warning signs

Labels	Meaning and description
	Warning! – Danger from high-voltage lines within the working area! If the machine gets too close to the power lines, electric shock may occur. Keep a safe distance between the machine and the power lines when operating/driving the machine.
	Anchorage Personnel on platform must wear safety belts and attach them to designed anchorage.
	Warning! – Burn hazards from hot surfaces! Risk of 2nd and 3rd degree burns. Watch out for hot surfaces of the machine immediately after switching off (e.g.: radiator or hydraulic oil tank), as well as for hot oil or water spots on the surfaces.
	Warning! Risk of crushing! Keep away from path of moving parts.

Labels	Meaning and description
	Warning! Non-professional is not allowed to changer internal elements!
	Warning! Electrical devices are inside and do not directly spray pressurized water for washing!
	Warning! Tip-over Hazard! • Max manual force: 400 N. • Max wind speed: 12.5 m/s.
	**Warning!** Risk of crushing! Stay away from the moving zone of movable parts.
	Warning! Tip-over Hazard. No altering limit switches.
	**Warning!** Risk of crushing! • **Contact with moving parts may result in death or serious danger.** • Keep away from mowing parts.
	Warning! －Improper operation or maintenance can result in serious injury or death. Read and understand Operator’s Manual, and all safety signs before using or If you do not understand the information in the manuals, consult your supervisor, the owner or the manufacturer.

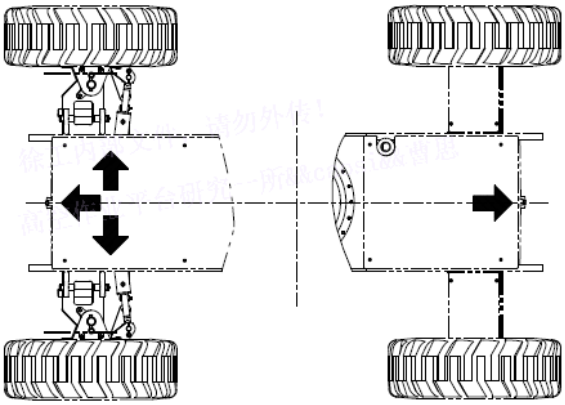
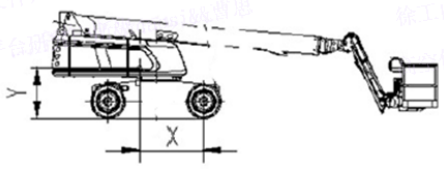
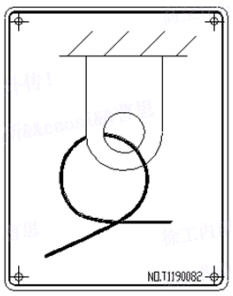
Labels	Meaning and description
	**Warning!** Risk of severe crushing or cutting injuries! • Fingers or hands can be crushed or severed by the motor fan. • Do not start any maintenance/repair work before the fan has come to a complete stop.
	Warning! – Unstable/uneven area! There is a risk of tripping and falling in the marked area. Standing in this area is prohibited to avoid injury.
	**Warning!** There is a risk of falling at any time from the boom. Climbing or riding on the boom may cause death or serious injury.

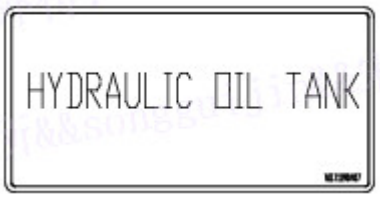
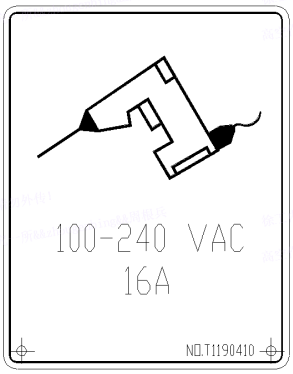
Labels	Meaning and description
	Warning! Do not use the vehicle as a ground for welding.



1. Minors under age of 18 are prohibited from entering the platform.
2. Do not operate the machine at a tilt angle that exceeds the allowable angle specified by the manufacturer.
3. Do not operate the machine when the wind speed may exceed 12.5 m/s.
4. Do not use the machine as a crane.
5. The distance from the power line is not less than 5 m during operation.
6. Read Instruction Manual before operation.
7. Do not operate on uneven ground at night.
8. Do not shake violently in the platform.
9. Do not hit the obstacles over the platform and under the boom during operation.
10. Do not allow the platform encounter with the obstacles when the boom is lowered.
11. Do not set a ladder within the platform and prevent tools in platform from falling.
12. Service Hotline: 400-110-9999

3.9.3 Information signs-machine-specific functions

	defines which function is triggered by moving the respective operating lever in the corresponding direction.
	Machine’s moving direction display Indicates the machine current movement direction.
 GC position | X axis | Y axis XGS28E | 1.43 | 1.48	Position of the machine’s center of gravity indicates the usual/actual position of the machine’s center of gravity.
	Lifting point symbol Shows the position of spots made for attaching loads to be lifted.

	Hydraulic oil tank symbol It indicates hydraulic oil inlet/outlet/tank position.
	Diesel tank symbol Indicates a diesel inlet/outlet or the location of the oil tank.
	Electric equipment sign Volt: 100-240 V AC Current: 16 A

Chapter 4 Safety guidelines

4.1 Safety regulations

- Become familiar with the machine’s .
- Become familiar with:
- Safety instructions, rules and regulations applicable at your area/site.
- Safety devices installed and available at your site.
- Personal Protection Equipment as required at your area/site.

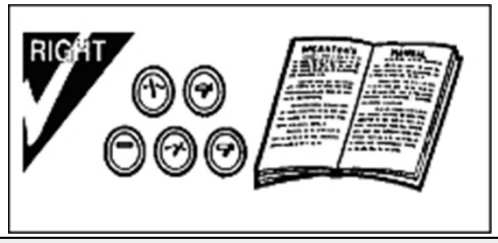


Figure 4-1 Become familiar with this instruction manual and other safety instructions applying at your site

- Comply with additional regulations, standards and laws that may apply in your area or at your job site.
- If required wear , such as reflective vest, gloves, safety glasses, safety shoes, etc. In dusty environments, dust masks may be required.

Become familiar and comply with the rules and regulations applying at your area

Figure 4-2 Personal protection equipment

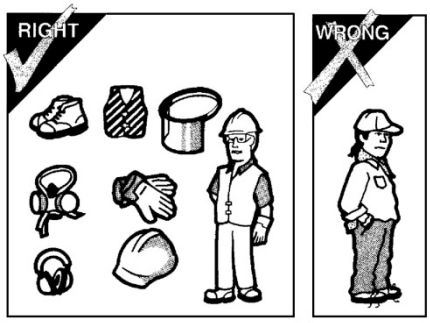


Figure 4-3 Personal protective equipment

- Personal protection equipment is recommended and possibly mandatory at your site.
- Become familiar with safety related precautions at your site.
- This equipment is a non-road vehicle and can not travel on road. In case of transportation, follow local road traffic regulations including driving rules and machine’s condition.

- In case additional documents related to machine’s safety and its operation, they must be attached to this .
- Ensure safety related systems are operational and not damaged:
- Same apply to the related bolts and nuts.

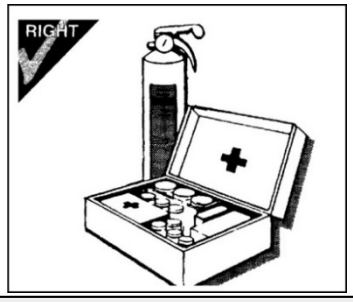


Figure 4-4 Safety devices

- Be familiar with safety precautions at you site (i.e. emergency phones, fire extinguishers, first aid kits, defibrillators, etc.)
- Bolts and nuts shall be screwed tightly. In case of damage, contact immediately your XCMG service partner.
- Seatbelt and seatbelt lock shall be undamaged and functional.

4.2 The platform provided with entrances

Personnel enter or leave the via entrance doors (see **Figure 4−5**).

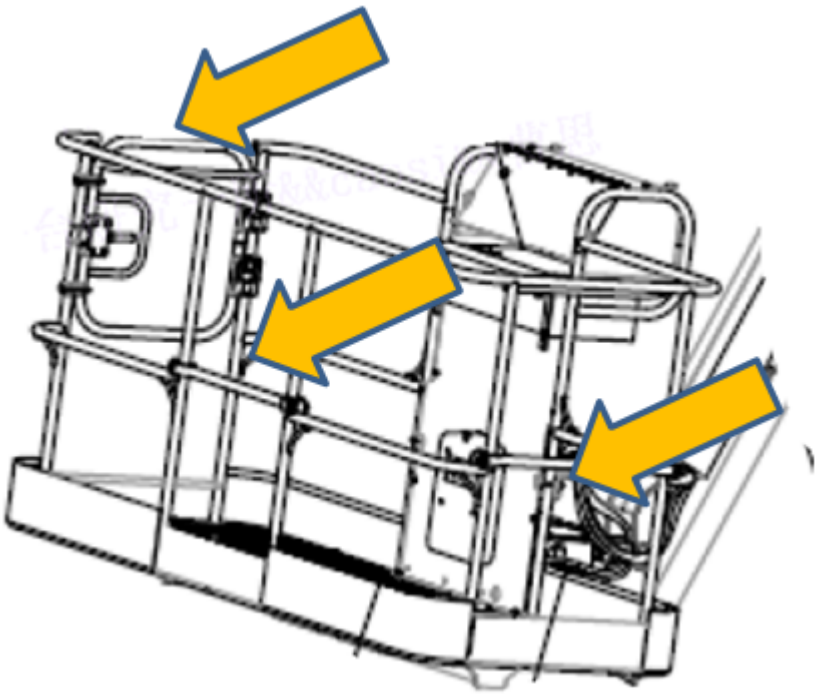


Figure 4-5 The platform provided with entrances

4.3 Installation and assembly

DANGER

Beware of risks and hazards during installation and assembly

- **Installation and assembly tests can present the hazards for the life (operator himself, co-workers, bystanders) and/or property!**
- **Be careful! Not respecting the basic safety rules presented hereafter – serious injuries or death casualties and/or significant property damage will result!**

4.3.1 Requirements for the installation and assembly personnel

- Only trained personnel of XCMG or its local representative may be involved in tasks of the machine.
- Wear always basic personal protective equipment for your own protection and protection of co-workers

4.3.2 Requirements for the installation site

- Place the machine and components for installation and assembly on flat solid area ground – suitable for the machine size and weight.
- Use lifting appliances of sufficient capacity to carry out installation and mounting of heavy components.
- Note down all important local emergency phone numbers
- **doctors,**

- **ambulances,**
- **hospitals and**
- **fire departments**

4.3.3 Assembly of the machine

- The scope of the installation depends on the delivered condition of the machine. Smaller units are delivered usually complete
- For bigger units – the delivery is always suited to the shipping – in most cases defined by the customer.
- Depending on the condition of delivered machine
  - delivered complete (ready for immediate operation) or delivered as separate sections
  - boom delivered complete or boom delivered in separate sections
- Refer to the installation documents and procedure supplied with the machine.

4.4 Commissioning

4.4.1 Requirements for commissioning personnel

- The will be carried out only by trained personnel of XCMG or his local representative
- The will be carried out according to the commissioning check-list and when completed – will be countersigned from the customer or his representative. For further details read, understand and follow the recommendations of Sections 4.6, 4.7.1 and 4.8.

⚠ DANGER

Beware of risks and hazards of any machine function

- **Any machine's operation can present the hazards for the life (operator himself, co-workers, bystanders) and/or property!**
- **Be careful! Not respecting the basic safety rules presented hereafter – serious injuries or death casualties and/or significant property damage will result!**

- Before start installation – assembly – commissioning and operation of the machine - note down all important local emergency phone numbers
  - doctors,
  - ambulances,
  - hospitals and
  - fire departments
- Before doing anything not related to specific machine operation :
  - Lower the boom always completely down to the ground prior you park and leave the machine.
  - Shut down the engine. Keep the safety devices always in good working condition Never dismantle safety devices on your own
- Ensure safety before boarding or leaving the machine. Before entering the always remove the mud/ oil remains on the shoes to prevent serious accidents due to slipping when entering or leaving the work platform.
- To prevent accidents due to distraction, do not use cell phones, the radio or earphones when operating machine
- Do not put any flammable or explosive materials in the work platform
- When servicing the machine, do not use any worn-out/damaged tools to prevent injuries or unsatisfactory machine operation.
- Check the fire extinguisher regularly and replace/refill them if needed.
- Ensure effective emergency training of all field personnel.
- Know how to act in case of fire.

4.5 Construction sites safety

DANGER

Site conditions may have significant impact on safety of the , bystanders and property around.

- **The hazards on the site may lead to people injuries or even deaths and significant property damages!**
- **Inspect the site and take necessary safety measures.**
- **Comply to the site local regulations and safety guidelines**

NOTICE

Be aware of soil and surface stability! A significant machine damage may result.

- safety shall be guaranteed;
- Limit access of unauthorized persons entering your construction site according your local regulations and best practices, i.e. as per:
- In your area and for your specific construction site other, different regulations may apply! Ask your **supervisor, your dealer or inform yourself**, further reference is not provided in this .
- While the machine is not operational, ensure no bystanders are within 1 m radius around the machine before .
- While the machine is operating, ensure that no persons are around, in front or behind the machine on the path of operation.

4.6 Safety for children

⚠ DANGER

- **No children are allowed on the construction site!**
- **Ignoring the following rules may result in serious injuries or even death**

⚠Always observe the following rules of conduct:

- **Never assume that children will remain where you last saw them.**
- **Keep children away from the working area and always under supervision of adults.**
- **Be vigilant and switch the machine off when children enter the working area.**
- **Children could fall off the machine and be run over or affect its controls causing unexpected results.**
- **Children must never operate the machine, even under the supervision of an adult.**
- **Never let children play on the machine or attachments.**
- **Always check the machine’s vicinity and ensure that there are no children in the area before operating it.**
- **Before leaving the machine, park it so that it cannot move. When leaving the machine (e.g. for breaks or at the end of work), stop the engine, remove the key**

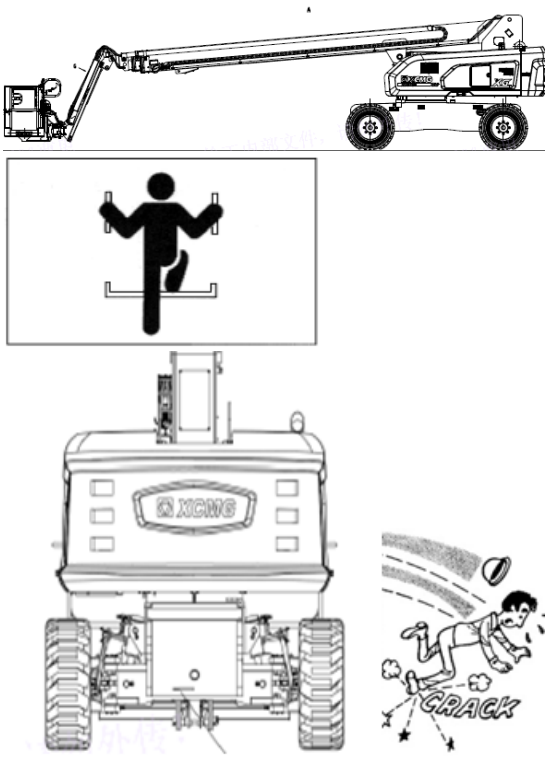
4.7 Operator’ s safety

DANGER

Fasten your seat-belt always before start to operate the machine.

- **Be careful! Not respecting the basic rules presented hereafter – serious injuries or deaths and/ or significant property damage may result!**
- **Wear your PPE (see Section 3.4.)**

Safe boarding the machine



- To avoid injury when stepping up and down the machine, use the handrails and steps! See the arrows marked in the sketch below.
- Check the handrails and steps for any oil, lubrication grease or mud remains before use.
- Always face the machine while boarding or leaving it.
- Never step on the engine without non-slip mat or cover plate protection
- Never hold onto any control element when boarding.
- Always hold on to at least three points at any time while grabbing the handrails (either two feet and one hand or two hands and one foot).
- If the machine suddenly moves on its own, do not try to stop the machine by jumping on it.
- Do not jump on and off the machine, especially while it is moving!
-
- Jumping off the machine may cause injuries!

WARNING

	Signals and gestures of the signalman
 	• **If there is poor sight, ask for a co-worker to act as a signalman.** • **The operator shall pay close attention to the signs and follow the signalman’s commands diligently.** • **Only one signalman shall send the signals.** • **Before operating, make sure all of the workers understand all of the signals and gestures.** • **Place the required warning signs when working on the roadside or other unstable ground.**

4.8 Pre-inspections before machine operation

4.8.1 Pre-operation safety rules

1. Become familiar with the machine’s instruction manual.
   - Become familiar with:
   - , rules and regulations applicable at your area/site.
   - Safety devices installed and available at your site.
   - Place PPE (Personal Protection Equipment) as required at your area/site.

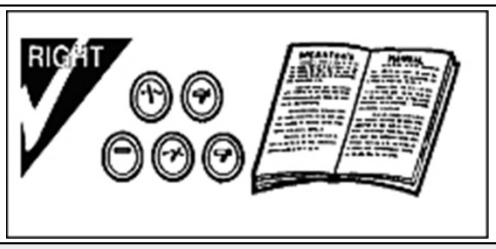


Figure 4-6 Become familiar with this instruction manual and other safety instructions applying at your site

- Comply with additional regulations, standards and laws that may apply in your area or at your work site.
- If required wear , such as reflective vest, gloves, safety glasses, safety shoes, etc. In dusty environments, dust masks may be required.
  Refer also to Sections 3.4 and 4.1:

2. Become familiar and adhere rules and regulations

Figure 4-7 Rules and regulations

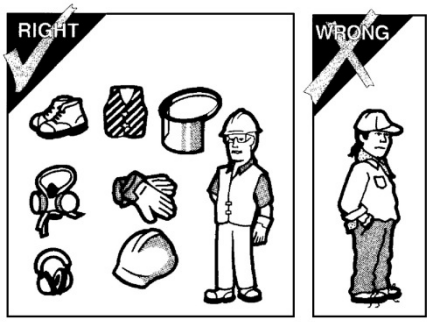


Figure 4-8 Personal protection equipment

Become familiar and comply with the rules and regulations applying at your area

- Personal protection equipment is recommended and possibly mandatory at your site.
- Become familiar with safety related precautions at your site.
- In case additional documents related to machine’s safety and its operation, they must be attached to this instruction manual.
- Ensure safety related systems are operational and not damaged: Same apply to the related bolts and nuts.

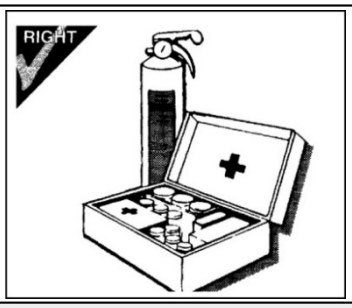


Figure 4-9 Safety devices

- Be familiar with safety precautions at you site (i.e. emergency phones, fire extinguishers, first aid kits, defibrillators, etc.)
- Bolts and nuts shall be screwed tightly. In case of damage, contact immediately your XCMG service partner.
- Seatbelt and seatbelt lock shall be undamaged and functional.

⚠ DANGER

Beware of risks and hazards during any machine operation Take always outmost care!
Be careful! Not respecting the basic rules presented hereafter and Section 4.8.1 and 4.8.4. serious injuries or death and/or significant property damage may result!

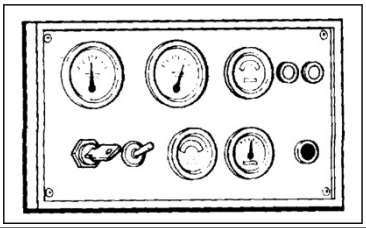


Figure 4-10 Ensure all operation elements are operational.

⚠ Approve all indicators are operational and display indicated no error code.

- Same applies to all illumination devices as well as to audible and visual warning devices (i.e. horn, beacon light, set occupation light or seat belt-indicator if installed, etc.).
- Keep machine clean, avoiding slippery steps and surfaces.
- Perform regularly recommended maintenance check according the this .

4.8.2 Location of safety signs on the machine

The overview list below shows all stickers attached on your machine.
Please replace damaged or lost decals immediately, the exact part numbers you can find in the attached spare parts list, in case you need support please contact your XCMG service partner.

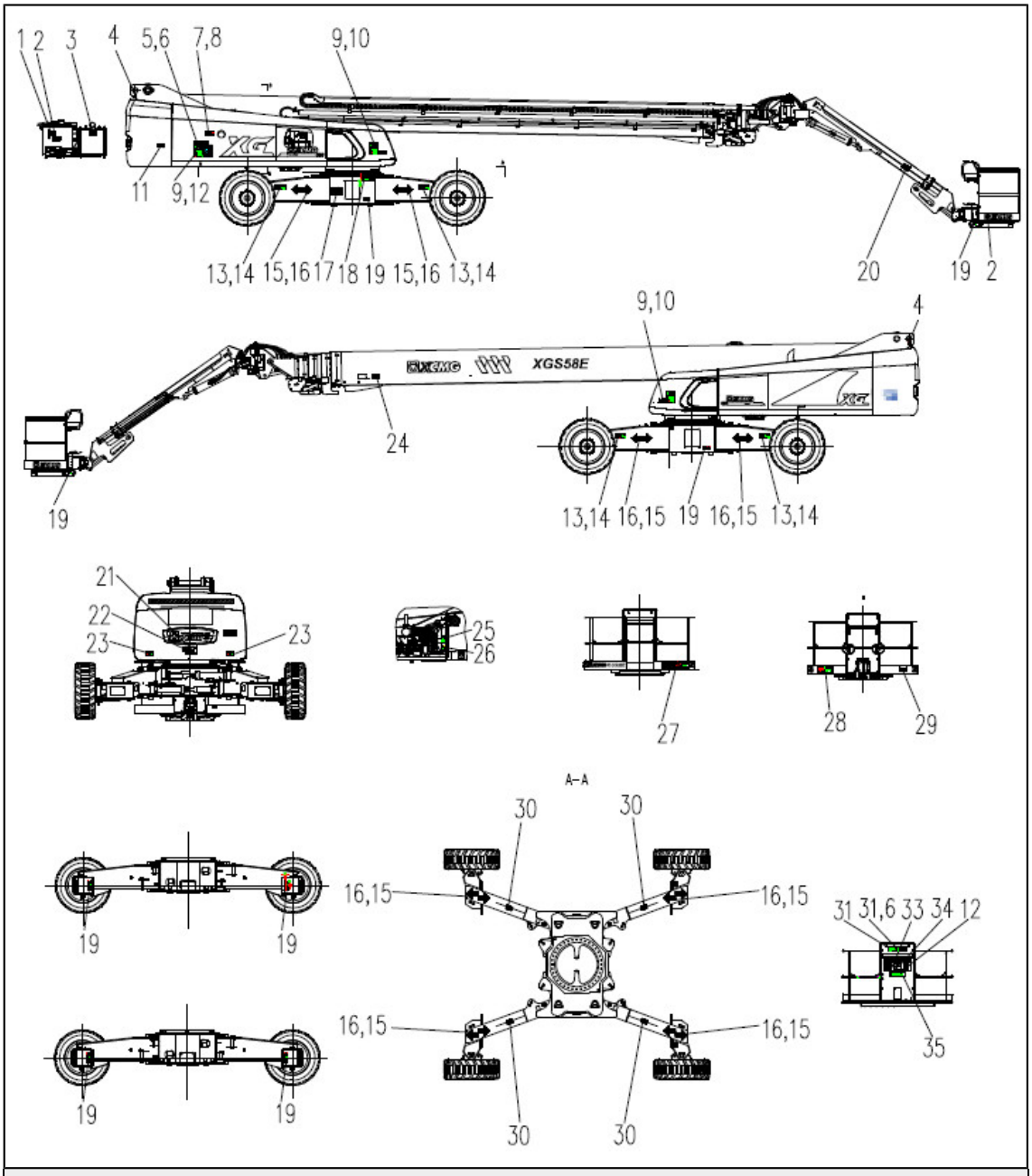


Figure 4-11 Location of safety signs and labels

Limit hydraulic indication
Hydraulic tank indication sign
Diesel tank indication sign
Lifting indication sign
Cover warning sign
Washing warning sign
Anti-explosion warning sign
Fuel tank indication sign
Comprehensive warning sign (boom)
Anti-collision warning sign (boom)
Optional components weight sign (EN)
Operation curve chart
Tyre load sign
“Read Instructions” warning sign
Machine travel arrow (yellow)
Machine travel arrow (front axle)
Engine nameplate (Diesel, English, CE)
Towing operation notice sign
Lashing position indication sign
Anti-falling warning sign
Lifting sign
Transporting notice sign
Anti-collision warning sign (counterweight)
Tip-over warning sign
Warning sign of disabling starter fluid
Anti-cutting warning sign
Tip-over hazard warning sign
Safety belt anchoring warning sign
Anti-collision warning sign (platform)
No stepping warning sign
User’s notice sign
Welding notice sign
Tip-over warning sign (straight boom)
Warning sign for driving on slopes
Driving operation notice sign

Table 4-1 Signs description

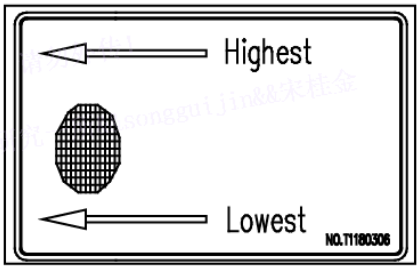
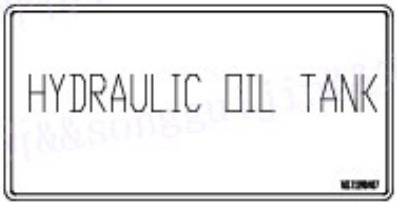
Item	Labels	Description
1		Limit liquid level indicator T1180306 Highest liquid level Lowest liquid level
2		Hydraulic tank indication sign T1190407 It indicates hydraulic oil inlet/outlet/tank position.

Table 4-1 Signs description(continued)

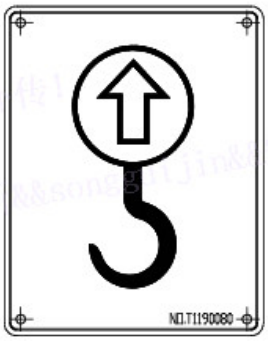
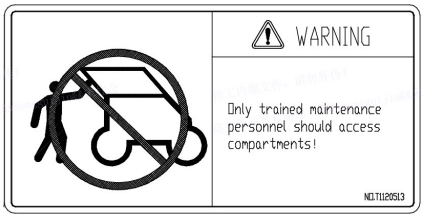
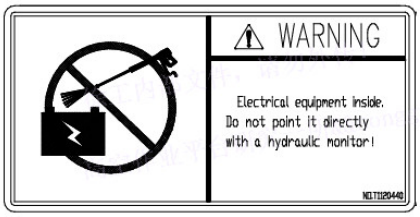
Item	Labels	Description
3		Diesel tank indication sign T1190406 It indicates diesel inlet/outlet/tank position.
4		Lifting indication sign T1190080 Indicate it is the lifting position.
5		Cover warning sign T1120513 Non-professional is not allowed to changer internal elements!
6		Washing warning sign T1120440 Electrical devices are inside and do not directly spray pressurized water for washing!
7		Anti-explosion warning sign T1120065 Explosion hazard! Do not smoke or star the engine during refueling.

Table 4-1 Signs description(continued)

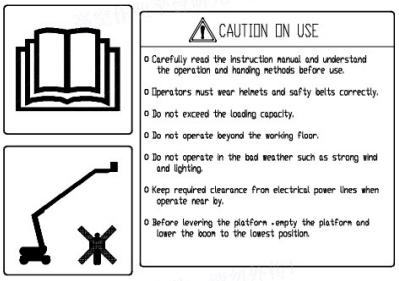
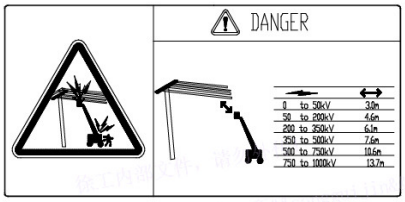
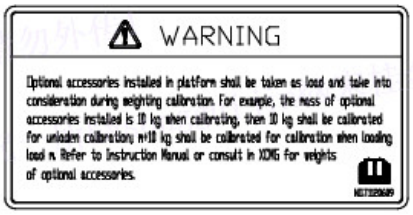
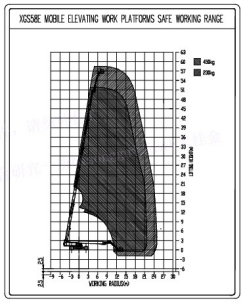
Item	Labels	Description
8		Fuel tank indication sign T1190088
9		Comprehensive warning plate (straight-boom series) T1120521
10		Anti-collision warning sign (boom) T1120441 Warning! Crush Hazard! Stay away from the moving zone of movable parts.
11		Optional components weight sign (EN) T1120609
12		Operation curve chart XGS58E.97-1

Table 4-1 Signs description(continued)

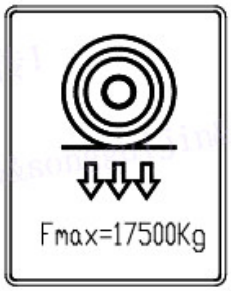
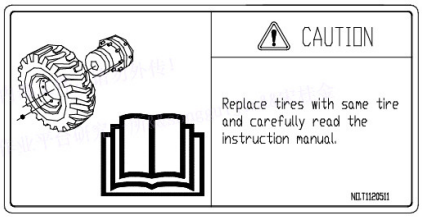
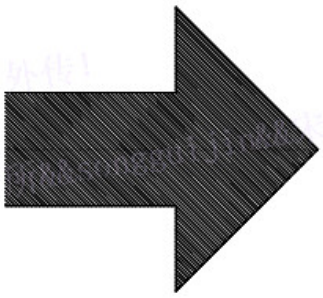
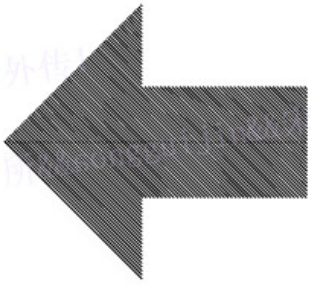
Item	Labels	Description
13		Tyre load sign XGS58E.97-3 The max. carrying capacity is 17500 kg.
14		Warning sign for reading instruction manual T1120511 Read files Before using or maintaining, please read and understand operation and maintenance manual, as well as all safety signs. If you don’ t understand the content of this manual, please consult with your leader, employer or manufacturer.
15		Traveling directional arrow (yellow) T1190085 Indicate the right-turn and (or) travel backward.
16		Traveling directional arrow (front axle) T1190086 Indicate the left-turn and (or) travel forward.

Table 4-1 Signs description(continued)

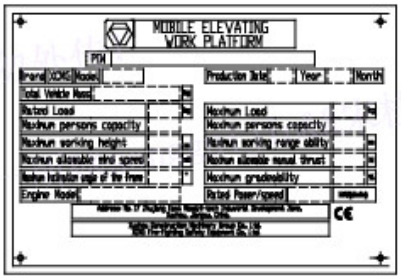
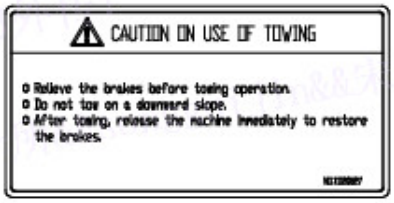
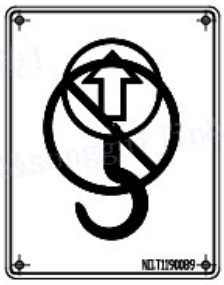
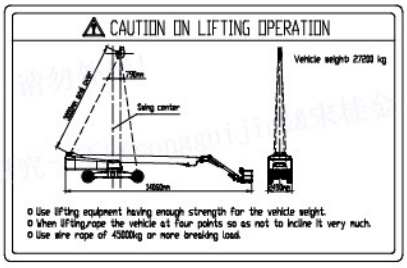
Item	Labels	Description
17		Engine nameplate (Diesel, English, CE) T1180684
18		Towing instruction label T1120527 Release the brake prior to towing operation. Do not tow when traveling downhill. Immediately release the towing state and resume brake after towing operation.
19		Lifting position Instruction label T1190082 Indicate it is the lifting position.
20		Anti-falling warning sign T1120304 Fall hazard! Please stay away from this surface.
21		Lifting label XGS58E.97-4 Select a high-quality sling according to machine weight. Anchoring wire ropes to 4 lashing points to prevent machine tilting. Use wire ropes with cut-off load over 45,000 kg.

Table 4-1 Signs description(continued)

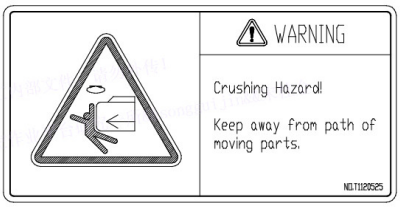
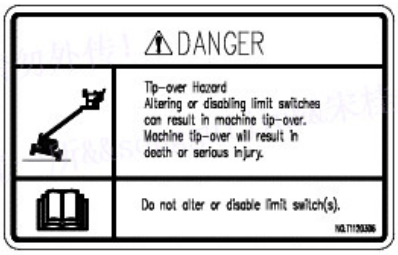
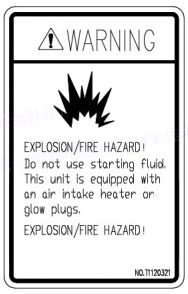
Item	Labels	Description
22		Transportation instruction label T1120523 Do inert slewing lock pin during machine transportation!
23		Anti-collision warning sign (counterweight) T1120525 Warning! Crush hazard! Stay away from the moving zone of movable parts.
24		Tip-over warning sign T1120306 Tipping hazard! Do not alter limit switch
25		Warning sign of disabling starter fluid T1120321
26		Anti-cutting warning sign T1120105 Cutting hazard: Stay away from the moving zone of rotary parts.

Table 4-1 Signs description(continued)

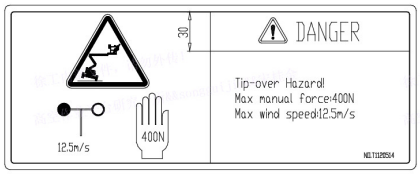
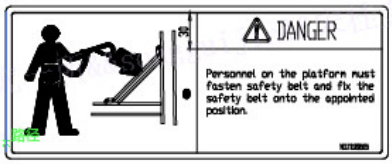
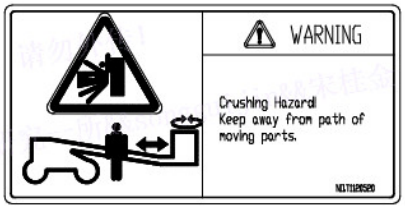
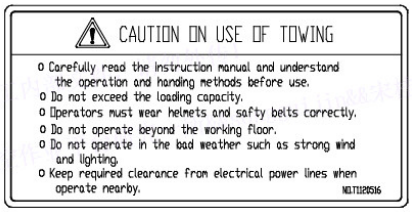
Item	Labels	Description
27		Tip-over hazard warning sign T1120514 Tipping hazard! The maximum manual force: 400 N. The maximum working wind speed is 12.5 m/s.
28		Safety belt attachment warning sign T1120515 Occupants accessing to the platform must wear a safety belt. Attach the lanyard to the anchorage point provided in the platform.
29		Anti-collision warning sign (platform) T1120520 Warning! Crush hazard! Stay away from the moving zone of movable parts.
30		No step warning sign T1120328
31		Operation instruction label T1120516 Read instructions carefully and fully understand the content before operation. Operating personnel must properly wear safety helmets and safety belts. Strictly observe the rated loading capacity and do not overload. Do not operate out of the safe operation range. Do not operate in the harsh weather conditions, like strong wind and thundering. Keep a safe distance from electrical power lines when operate nearby.

Table 4-1 Signs description(continued)

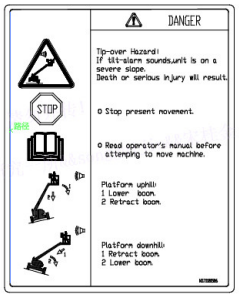
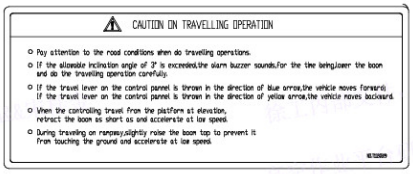
Item	Labels	Description
32		Welding instruction label T1120517 Do not use the machine as a round for welding.
33		Tip-over warning sign (straight-boom series) T1120526 Platform uphill: 1. Lower the boom. 2. Retract the boom. Platform downhill: 1. Retract the boom. 2. Lower the boom.

Table 4-1 Signs description(continued)

Item	Labels	Description
34		Warning sign for driving on slope XGS58E.97-9
35		Travelling operation instruction label T1120519 Pay attention to the road conditions when perform driving operation. If the machine body tilts more than 3%%d, the alarm sounds; lower the boom and drive slowly. Push the joystick to the blue arrow direction on control panel, the machine moves forward. Push the joystick to the yellow arrow direction on control panel, the machine moves backward. When the travel limit warning light turns on, pull the travel confirmation switch and push the traveling/ steering joystick slowly, the machine shall moves/ turns to the opposite direction. When operation on high altitude, try to retract the boom and drive with low speed. When traveling on a slope, raise the front part of boom to avoid touching the ground and drive with low speed.

4.8.3 Daily inspection and visual checks before operation

⚠ The scope of inspections depends on the operator knowledge about condition of the machine:

1. The operator solely use this particular machine frequently and takes it into operation after a short interruption (i.e. daily). He knows the condition of the machine he left and the scope can be reduced on standard visual safety checks.

2. **In all cases not included into the above point, operator who intends to operate the machine shall** provide extended detailed inspection of the machine condition, safety devices and functions prior machine start and operation.
3. In case the machine has **just been under maintenance or repair** operator need inform himself on the status of maintenance/repair progress and result. Machine shall be released for safe operation prior taken into service.

Do the following:

- **Confirm your Personal Protective Equipment**
  Helmet, gloves, goggles, shoes are in good condition
- **Check machine for damage!**
- **Inspect mechanical connections**
  - safety locks and - any other interchangeable equipment connected.
  ⚠ Do not start to operate if any safety split-pin is missing!
  Insert spare split-pin!
- Lubricate lightly connections according to ’ s specification if required.
- Check switches, controls, joysticks and function pedals to ensure these are in sound condition Arrange for immediate repair of any faults.
- Inspect all available levels of operating fluids - engine luboil level - engine coolant level - engine exhaust fluid - hydraulic oil level.
  Fill-up if necessary. Take care to use approved fluid quality!
  Refer to the Section 9 – Qualities of service fluids.
- **Insert the start-key and initiate the power supply to control system**!
  ⚠ Do not start the engine!
  Pay attention to strange noise or signals from control system!
- **Start to check all control functions**
- for any failure-or error message
- Check any failure or error massage and rectify it!
- **Check** engine compartment**.**
- **Ensure** driving belts on engine, alternator and water pump are properly tight and in good condition before use.
- **Check** – and empty existing water
- Clean air filter. Replace if damaged.
- Ensure that no person can be endangered before .
- Prior to , refer to Sections 4.8.4 to 4.8.6!
- Start the engine!
- Check for any leaks on hydraulic components
-

- Inform site manager or service to enable service department to schedule workflow and more importantly, order parts required.
- Ensure that no person or animal can be endangered before operating

4.8.4 Inspection before engine starting

- There is a blind spot in the machine’s rear: a signalman may be needed to supervise your movements.
- Pay close attention not to bump into other machines, persons or structures while driving.
- Be aware of your surroundings at any time during work

4.8.5 Engine start check-list

- Keep people away from the machine during the inspection.
- Remove all obstacles in the area before starting the inspection.
- Check around the vehicle for oil leaks, looseness, improperly adjusted safety devices and possible damage on any components -
- Check the level of:
  - Coolant antifreeze
  - fuel and engine oil
  - Check the air filter and for any damage in the circuit.
  - Check and drain collected water

  ⚠ In case the boom is facing towards the machine’s rear, the control joysticks for travel and slewing need to be operated in reverse direction.
- Check if all lights are functioning properly, and if they have the correct angles
- Check if the safety belt and/or the attaching clamp is damaged or worn out.
- Check if the main control joysticks lie in the central position.
- In case of any abnormality, solve it right away to prevent accidental injury or machine failure later on.
- Ensure that the horn, motion alarm (if installed) and other warning/safety devices are set up/working properly.
- If there is noticed any damage or wearout/tear, replace the parts before using the machine again.
- Don’t forget to fasten your seat belt!
- NOTE: abnormalities of the machine may not be found out right away after engine starts, so that personal or machine breakdown may occur.
- Maintenance and engine warm-up are required before start of operation if:
  - the machine has not been used recently or

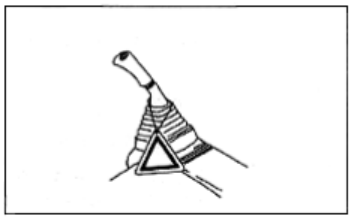
– ambient temperature is very low

4.8.6 Start the engine

⚠WARNING

	Check all safety guards prior engine start

- **Approve prior to engine starting!**
  CAUTION!
- **Any not approved start may lead to injuries and/or additional property damage!**



Do not start ever the engine or touch any part of the machine

- **during maintenance/service/repair by other personnel or**
- **when a warning sign is hung on the joystick control**
- **in the above last case, wait for the warning sign to be removed by the placer before operating the machine again.**

- and/or hydraulic oil before operation.
- Do not in a way that may short-circuit the ignition of the machine. This will increase the risk of injuries and/or damage the machine.
- Right after start-up, check the meters and monitor instruments for abnormal values or warning sounds.
- Make sure that all safety devices are in place to prevent accidents

4.8.6.1 Engine cold-start

NOTICE

and hydraulic system

- **Preheating prevent a logy response of the joystick control or other machine parts**
- **Not practicing preheating increases the risk of accident and/or damage to the machine's components**
- **If the battery's electrolyte is frozen, do not charge it or start the engine with external power. Both may cause the battery to catch fire.**
- **Make sure that the battery's electrolyte is dissolved before charging it or starting the engine with external power.**

Cold weather precautions

NOTICE

Hazards on frozen and slippery ground,
Move machine slowly and extra carefully!

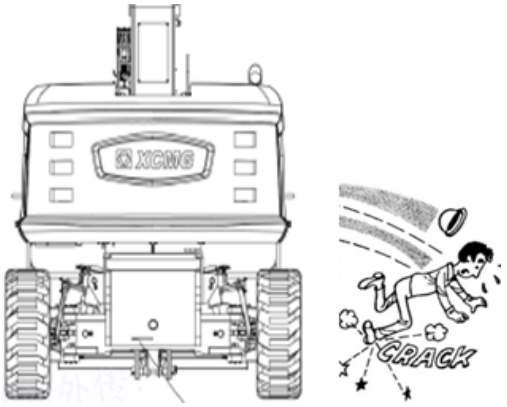
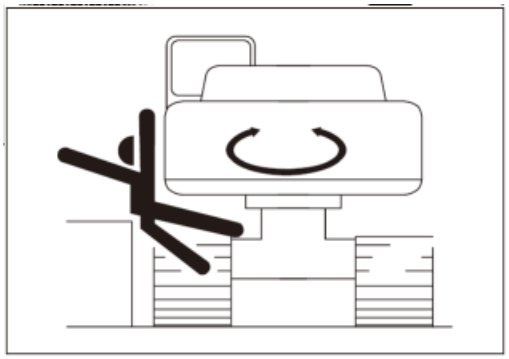
- The iced ground surface becomes soft when the temperature rises up, and the machine will tip over.
- If the machine enters into deep snow areas, it may tilt or become buried in the snow.

4.8.7 Inspection after starting the engine

- Make sure again that there is no person or obstacle in the surrounding area.
- Check if the instruments on the dashboard show unusual values after start-up
- Always monitor on your surroundings for potential hazards during operation.
- Check for unusual sounds, s, abnormal heat emissions or peculiar smells
- Check if all components respond without delay or difficulties, including:
  - The mobility of the machine
  - The boom’s mobility
  - The function of upper structure’s rotation axis
  - The machine’s flawless moving and .
  - Any oil or fuel leaks
- **Fix any abnormality at once to prevent serious injuries and/or damage to the machine during work**
- **Chose the mode suitable for your task.**
- Before start to operate, sound the warning horn to alert people in the area

4.8.8 Inspection before starting to operate machine

⚠WARNING

Ensure that no person or animal can be endangered before operating	
	• **Before moving, check always that there is no person or obstacle in the action radius.** • **Sound the horn to alert other people working in the nearby area.**
	• **Take always above precaution measures.** • **When the machine turns or swings, there should be a signalman at the rear of the machine.** • **Take the most care not to touch people or other machines or property.**

4.9 Safe machine operation

4.9.1 Recommended use of machine

⚠DANGER

Beware of risks and hazards when operating machine
Not respecting the rules presented hereafter – accidents with serious injuries or even death may result!

To avoid possible injuries or mechanical damages during operation caused by unexpected shock movements of the machine or extensive vibrations:

- Select the appropriate machine, required equipment and ancillary devices for a function/purpose/task of the machine.

- Use the machine according to their only (see also Section 2.2)!
- Always read – understand – and apply the recommendations as described in this Instruction manual.
- In case of recent faults, make sure maintenance and repairs on the machine was done thoroughly.
- Pay special attention to the tyre pressure and the function of brakes, gear, crawler tracks and related components after provided maintenance or repair on those components!
- Always operate the machine with care to avoid extensive wear process of the parts and to keep the frequency of repairs to a minimum (e.g. when , braking, accelerating, changing gears, moving the boom and jib boom)
- Do not drive through the obstacles and rough terrain – bypass it whenever possible to reduce unexpected shock movements of the machine.
- If compelled to drive through/over it, slow down the speed and act with great care.
- Include the ground maintenance into your project’ s schedule
- Keep moderate speed when traveling longer distances (e.g.: on the road)
- Adjust the gear to the road surface and traffic situation to avoid sudden acceleration.
- Keep the machine’ s working area in good shape by:
- removing the large rocks and other obstacles in the way.
- plugging the ditches and potholes

4.9.2 General risks in operation

⚠ DANGER

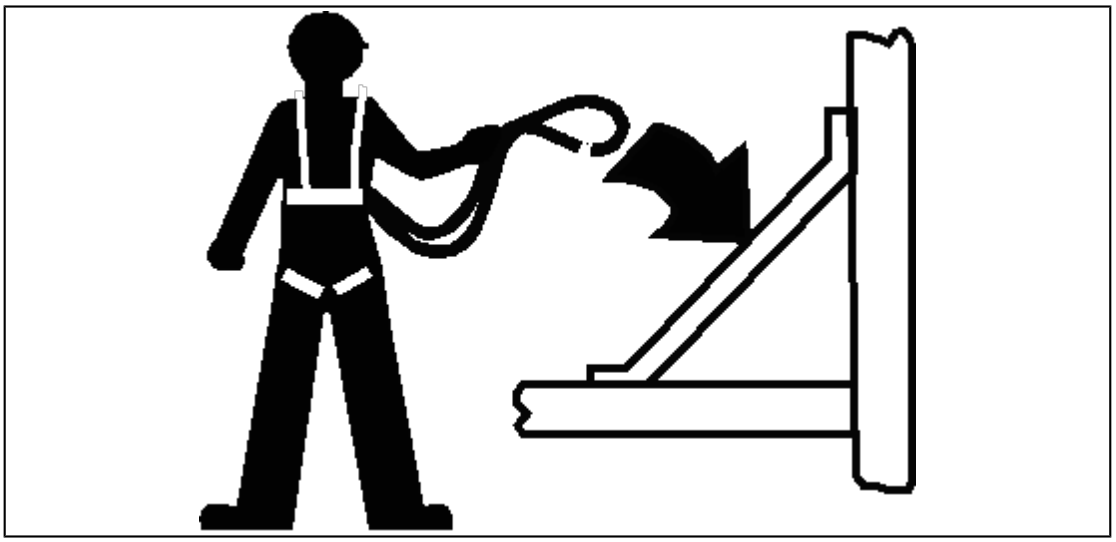
- **Beware of risks and hazards for life and property!**
- **Take outmost care!**
- **Any hereafter presented machine operation represent always the possible hazards for the life, to the driver himself, co-workers, bystanders and/or to property.**

- Check the machine prior to start operation – especially if you were not present during installation of interchangeable or other equipment!
  Refer to s in Sect. 3.5, i.e. 3.5.3.
- Any sudden uncontrolled movement may result in life hazard for driver and/or bystanders and/or any property.
- Install only interchangeable equipment authorized by the !
- Check properly installation of the interchangeable equipment!
- Avoid lifting the equipment while driving a slope downhill.
- Do not drive across slopes or protective walls
- Take extra care when swinging the upper structure while on a slope.
- Make sure enough space is available to stop the swing process.

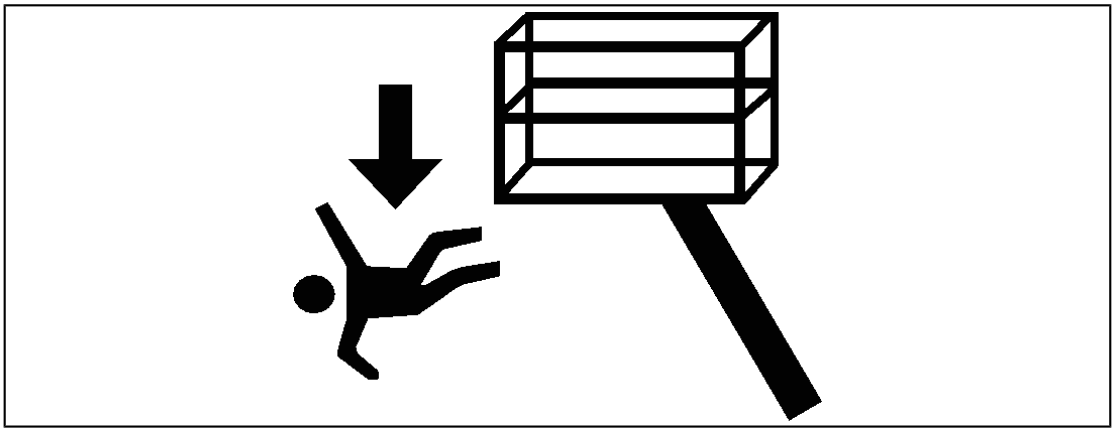
- The swing of a long and heavy equipment will increase danger of slippage of the equipment additionally.
- Be careful! Not respecting the basic rules presented hereafter – serious injuries or deaths and/or significant property damage may result!
- Machine operation requires full attention of the . Bring the machine to a full stop before using any device like cell phones, wireless walkie-talkies, etc., which will distract operators' attention from safe operation.
- Do not use the machine for any purpose other than lifting personnel with their tools and materials.
- Do not operate a malfunctioning machine. If any failure occurs, shut down the machine. Remove the machine from service and inform the proper authorities.
- Do not dismount, modify, or disable any safety devices.
- Do not hard move any control switch or lever through neutral to an opposite direction. Ensure to return switch to neutral and stop before moving to the next function. Operate controls with slow and uniform force.
- Unless it is an emergency, staff are not allowed to adjust or operate equipment from the ground when there is a person on the platform.
- If there are two or more workers on the platform, the must be responsible for all machine operations.
- Ensure that power tools are properly stored and never hang its wires in the working area of the .
- During the moving process of the equipment, the lifting boom should always be placed above the rear shaft along the moving direction. Note: if the boom is above the front axle, the direction of and driving functions will be reversed.
- Do not assist a stuck or disabled machine by pushing or pulling without chassis device.
- Fully lower the work platform and shut off the power before leaving the machine.
- Remove all rings, watches, and jewelry when operating machine. Do not wear any loose fitting clothing or keep long hair unrestrained which may be caught or entangled in equipment.

Tripping and falling hazards

- During the operation, the workers on the must wear the whole-body safety belt and fix the safety belt to an approved anchorage by a hook. Attach only one hook per fixing point.



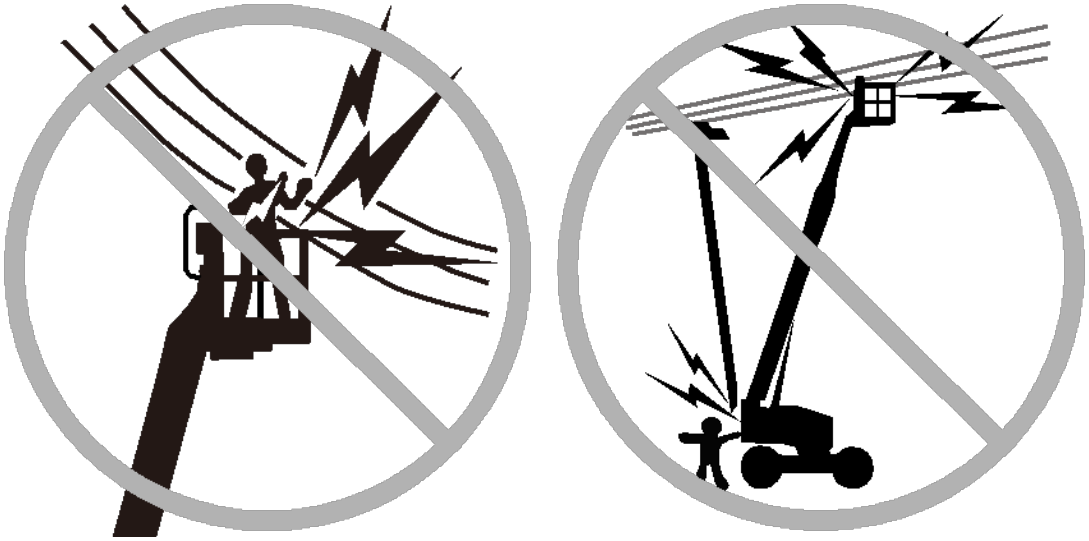
- Only enter and exit through the door. Pay extreme attention when entering or leaving the platform. Ensure that the work platform assembly is fully lowered. Face the machine when entering or leaving the platform. Ensure to maintain "three-point contact" with the machine, using two hands and one foot or two feet and one hand at all times during entry and exit.



- Ensure that all doors are closed and secured in the correct position before operating the equipment.
- Keep both feet firmly positioned on the platform floor at all times. Do not place ladders, boxes, steps, planks, or similar items in the platform to add additional stretch areas.
- Keep any oil, mud, and slippery substances away from the working shoes and the PLATFORM floor.

Electrocution hazard

- This machine is not electrically insulated and will not provide protection from contact with or proximity to electrical current.



- Maintain safety distance from electrical power lines, apparatus, or any electrified (exposed or insulated electrical) parts according to the Minimum Approach Distance (MAD) as shown in **Table 4-2**.
- The factors of machine movement and electrical line swaying shall be taken into consideration.
- Minimum approach distance (M.A.D.)

Table 4-2 Minimum approach distance (M.A.D.)

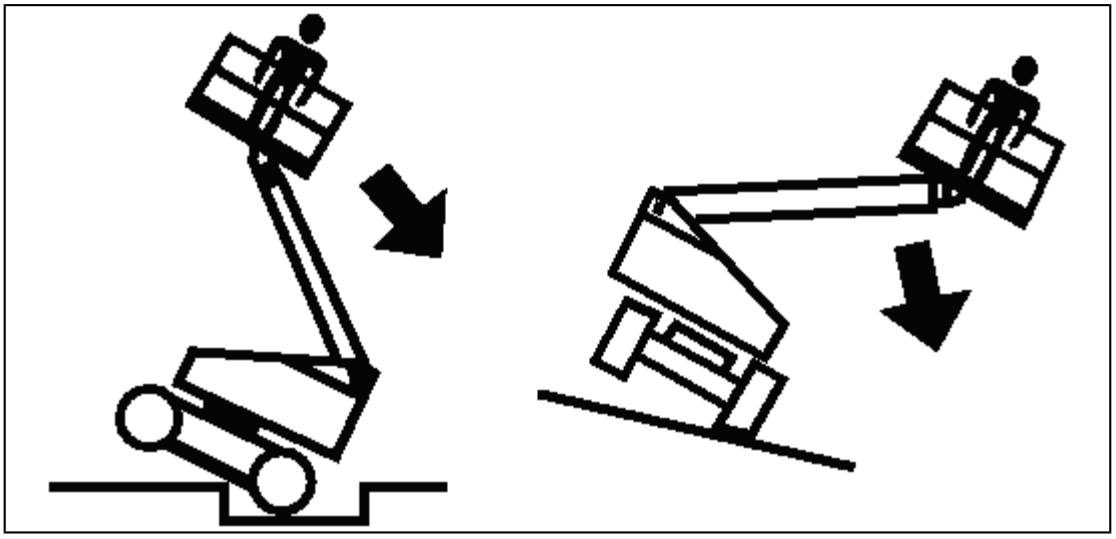
Voltage range (phase to phase)	Minimum approach distance M (ft)
0 – 50 KV	3 (10)
51 KV – 200 KW	5 (15)
201 KV – 350 KW	6 (20)
351 KV – 500 KW	8 (25)
501 KV – 750 KW	11 (35)
751 KV – 1000 KW	14 (45)
Notice: This rule must be followed unless there are more stringent laws and regulations from the employer, the local authorities or government.	

- Any part of the machine, operators, tools and devices must keep at a distance of 3 m (10 ft) at least from any electrical line or apparatus with a maximum voltage of 50,000 V. 1 ft additional clearance is required for every additional 30,000 volts or less.
- The minimum approach distance may be reduced if insulating barriers are installed to prevent contact, and the barriers are rated for the voltage of the line being guarded. These barriers shall not be part of (or attached to) the machine. The minimum approach distance shall be reduced to a distance within the designed working dimensions of the insulating barrier. This decision must be made by qualified personnel in accordance with the regulations of the employer, the local authority or the government regarding working near electric equipment.

- Do not operate the machine or transport any personnel in prohibited area (MAD). Assume all electrical parts and wires are live unless known otherwise.

Tip-over hazard

- The user must be familiar with road condition before driving. Do not exceed the allowable side slope grade and positive slope grade while driving.



- Do not elevate the platform or drive with platform elevated on or near a slope or an uneven, soft surface. Ensure the machine is on a firm, level and smooth surface before elevating the platform or driving with the platform elevated.
- Before driving onto rounds, bridges, trucks, and other surfaces, check the allowable capacity of the surfaces.
- Do not exceed the maximum working load as specified on the platform. Keep all loads within the loading capacity of the platform unless authorized by XCMG.
- Before operating the equipment, ensure that the chassis of the machine is at least 0.6 m (2 ft) away from holes, bumps, depressions, obstructions, debris, hidden holes and other potentially hazardous objects on the floor/road.
- Do not use the boom push or pull any objects.
- Do not use the machine as a crane. Do not anchor this machine to any adjacent structure. Do not contact any wire, cable, or any similar items to the platform.
- Do not operate the machine at wind speed greater than 12.5 m/s (28 MPH). See table 1-2 for Beaufort scale (for reference only).
- Do not increase the area or load of the .Increasing the windward area will results in stability reduction.
- It's prohibited to enlarge the dimension of work platform by extending platform face or adding accessory without permission.
-

- If the boom assembly or platform is in a position so that one or more wheels are suspended off the ground, remove personnel before attempting to release the machine. Use cranes, forklift or other appropriate equipment to stabilize the machine.

Crushing and collision hazards

- Approved safety helmet must be worn by all s and ground personnel.
- Clearances above, around and below the working area must be checked when raising or lowering the and when traveling.

- Keep all body parts inside the platform guard-rail during operation.
- Make the work platform approach to obstacles by elevating function but not driving function.
- Assign a lookout when driving in areas where vision is obstructed.
- Keep non-stuffs at least 1.8 m (6 ft) away from the machine during driving and steering.
- In all driving conditions, the s must limit the driving speed based on the ground conditions, congestion, visibility, slope, location of persons, and other conditions that may cause collisions or injuries.
- Be aware of braking distances in all driving speeds. When driving at high speed, switch to low speed before stopping. Only use low speed while driving the machine on a slope.
- Do not use high speed while driving the machine in confined space or close areas or reversing.

- Pay extreme attention at all times to prevent obstacles from striking or interfering with operating controls and personnel in the platform.
- Ensure that the s from the equipment overhead or on floors are aware of the 's presence. Disconnect the power to overhead cranes.
- The workers shall be warned not to work, stand, or walk under the elevated platform. Place roadblocks on the ground if necessary.
- Notice: Not respecting the basic rules presented hereafter – serious injuries or deaths and/or significant property damage may result!
- Follow the :
- The graphical symbols on controls indicate theirs function and purpose
- Learn the position and function of each control element before operation
- When released, most control elements will automatically return to their centered neutral position and stop the executed function or command immediately
- Check your surroundings before slewing and operate the lever carefully.
- Accidental movement of the machine can cause physical injuries. Avoid it!
- The boom can move and hurt bystanders if you accidentally hit the boom joystick lever or joggle it by any other reason

4.9.3 Safety rules for towing

⚠ DANGER

The ropes can brake!

- **Any movement, especially towing the machine represents unexpected risks and hazards for the operator himself, bystanders and/or environment!**
- **Do not allow anybody to stand between towing machine and towed machine during the towing process!**
- **Wear leather gloves when handling s.**
- **Be careful! Not respecting the basic rules presented hereafter – serious injuries or deaths and/or significant property damage may result!**

If a winch is required for the , disengage the brake.

4.9.4 Risk in special working conditions

NOTICE

- **Be aware of special working conditions!**
- **Special working conditions may have impact to the lifetime of machine, machine functions and finally safety of machine operation!**
- **Not respecting the safety steps and notices presented hereafter – can reduce the machine lifetime, may lead to machine damage and loss of the product warranty**

4.9.41 Operating in harsh environmental conditions

NOTICE

- **Be aware of operations at low temperatures:**
- **Not respecting the safety steps for special working conditions may have impact to the lifetime of machine, machine functions and finally safety of machine operation!**
- **Loss of the product warranty may also result!**
- **Protective measures must be taken to ensure normal operation in freezing days**

The following inspection can ensure flawless operation of the machine at extremely low temperature.

- Check if the correct antifreeze is added in the . Also check the cooling system itself carefully and record any leakage.
- Keep the battery fully charged to prevent it from freezing. If water has been added into the battery, run the engine for at least 1 hour to enable it to mix with the electrolytes.
- Maintain the engine at its optimum to enable an easy start and operation, even in adverse weather conditions.
- Use the engine oil of proper specifications according to the ambient temperature. Refer to “Lubrication and Specifications” in the Engine for further information.
- Ensure that the fuel tank is full at any time. Always drain any condensate built-up in the fuel tank before resuming operation.
- Remove and service the fuel filter element regularly. Drain any concretions (e.g. wax), and ensure that the used fuel’s solidification point is below the lowest ambient temperature.
- Lubricate the machine completely according to either the “Lubricants and Maintenance Schedule” or the lubrication diagram on the machine.
- to warm it up to the usual operation temperature before load-on operation.
- While in idle state, if there are any dirt or ice deposits on the running gears, heat the machine up to thaw the frozen impurities before attempting machine operation.
- Operate the hydraulic units with care until the temperature required for normal operation is reached.
- Check all control units and their function status to ensure flawless operation.

- If assisted start becomes compulsory refer to the “start in cold days” - section located in the chapter “Engine Start” in this .
- Clean up all dirt, snow and water on the machine’s surface to prevent ice coating. If possible, cover the machine with canvas and prevent its edges from getting frozen on the ground.

4.9.4.2 Operations in very hot areas

NOTICE

- **Continuous operation in a very hot environment will cause overheat.**
- **Not respecting the safety steps for special working conditions may have impact to the lifetime of machine, machine functions and finally safety of machine operation!**

- Make sure to monitor the engine’s temperature and stop the machine regularly to enable a cooldown when needed.
- The dirt inside the will accumulate faster under high temperature. Change the antifreeze at least once a year to maintain the corrosion resistance property.
- Flush the regularly to keep its pipes clean. Do not use highly alkaline water limit the deposit of dirt and rust inside the pipes
- Do not store acidic batteries close to a large number of tires as the acidic gases will damage the rubber.
- Lubricate according to “Lubricants and Maintenance Schedule” or the lubrication label attached on the machine.
- When leaving the machine for a longer period, park it in a shelter to prevent exposure to sunlight, dirt and dust.
- If there is no appropriate covering available, use a canvas to prevent the dust from entering the engine or hydraulic system.

  The machine components will corrode faster in a hot and humid climate; especially during the rainy season.
  Rust and paint bubbles will build up on the metal surfaces and spots may appear on other components’ surfaces, too.
- Apply corrosion resistant lubricant on the machine’s unpainted or exposed areas.
- Protect conductors and terminals with an insulating mixture.
- Apply paint or appropriate antirust materials on damaged surfaces to prevent the rust from spreading.

4.9.4.3 Operations in dusty or sandy areas

NOTICE

- **Take special care in dusty or sandy environments**
- **Not respecting the safety steps for special working conditions may have impact to the lifetime of machine, machine functions and finally safety of machine operation!**

- Take extra protective measures when working in dusty or sandy environments.

- Clean the machine with compressed air frequently to keep the cooling system dustfree.
- Wear safety goggles when using compressed air for cleaning.
- When servicing the fuel machine, take extra care to prevent dust or sand from entering the oil circuit.
- Always keep the air cleaner in good shape. Check its clogging indicator everyday.
- Prevent dust and sand from entering engine parts and/or components as well as possible.
- Lubricate and service according to “maintenance schedule” or the lubrication diagram attached on the machine.
- Clean all the lubrication connections before lubricating the machine.

  Sand mixing in with the lubricant will cause the machine parts to wear faster. Keep the machine as sand- and dust-free as possible.
- Park the machine under a shelter or cover it with a tarpaulin to prevent potential damage caused by sandstorms.

4.9.4.4 Working in rainy and humid environment

NOTICE

Be aware when working in rainy, humid environment!

- Not respecting the safety steps for special working conditions may have impact to the lifetime of machine, machine functions and finally safety of machine operation!
- The measures are similar to those for working in hot areas.
- Coat all exposed surfaces with lubricant
- Pay extra attention to damaged or unpainted areas.
- Apply lubricant where paint starts to crack as soon as possible to prevent corrosion.

4.9.5 Optional components/equipment

The standard package include/Not include optional equipment

- Contact an authorized special parts or XCMG.
- Listen carefully to the installation instructions to manage the task by yourself in the future
- Only use optional equipment according to their intended range of application.
- Make sure to install optional equipment properly by observing the instruction manual.
- Do not attach optional equipment on your own.
- Never remove safety devices without prior approval.

Without proper working safety devices, the machine will lose its conformity according to the machine directive (2006/42/EG) and other applicable directives and regulations.

WARNING

- **Installation of optional equipment may be hazardous for life and property!**
- **Installation of the optional equipment may bring possible hazards and risks for the service stuff and environment.**
- **Be careful! Not respecting the basic rules presented hereafter–serious injuries or deaths and/or significant property damage may result!**

- Foam tyres or solid tyres are optional for the equipment. It is required that four wheels shall be replace with tyres of the same specification.
- Refer to section 4.2 for requirement when replacing the optional equipment.

4.9.6 Hazards related to the battery

DANGER

Be aware of highly flammable, explosive hydrogen gas!

- **Use protective gloves and goggles when handling battery**
- **When charging the battery, beware of the highly flammable and explosive hydrogen gas generated in the process!**
- **The battery’s electrolytes contain corrosive sulfuric acid!**

⚠ Hazards related to the battery

- Never smoke or use open fire at any time when close to the battery
- Wash out clothes or skin thoroughly with water if sulfuric acid splashes on any.
- In case sulfuric acid has entered your eyes, wash them out abundantly with water and contact the closest hospital for immediate treatment.
- Beware of sparks the battery may generate during operation/handling and
- make sure that the machine’s engine is turned off before starting the maintenance process.

⚠ Carry out the maintenance by keeping the following in mind:

- When disassembling the battery, start by disconnecting the negative terminals (grounding side).
- Do not let tools or other metal objects get into contact with the battery’s terminals or drop them on/close to the battery.
- Before charging, disconnect the battery from the machine and carry it to a well-ventilated place.
- Finally, solidly reinstall the battery in its original position after maintenance

4.9.6.1 Power switch

The battery’s main switch

⚠ ***Switch the battery OFF when:***

- Not operating the machine for more than one month.
- Maintaining the electrical system.
- Disposing of the battery.
- Replacing the fuse and/or fuse link.
- Connecting the auxiliary cables.

⚠ ***To avoid damaging the electrical system, do not turn off the battery while the engine is still running.***

Notice:

Switch off the accumulator’s jar switch at least one minute after the engine has been turned off

After disconnecting the accumulator jar switch, the whole electrical system will be cut off.

Cut off the power supply between the storage battery and the machine’ electrical system.

i The switch is located either on the battery container frame or in the machine’s engine compartment close to the battery’s location.

(O) (=“OFF”-position): Cuts off the electric current.

Keep the switch at a free sagging state while in this position.

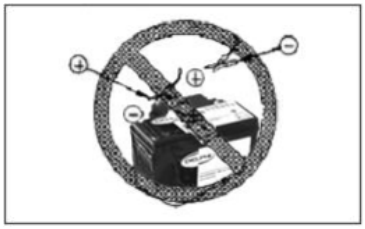
(I): (=ON”-***position***): Electric current is flowing through the circuit.

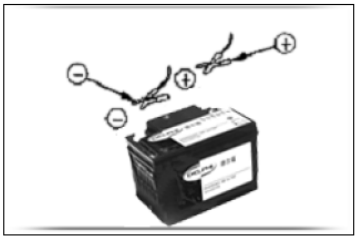
Make sure the switch is turned on before starting the .

4.9.6.2 Engine start using auxiliary battery cables

⚠WARNING

- **Battery may explode**
- **Check the starting cables connection!**
- **Always wear goggles and rubber gloves when handling the batteries and cables**
- **Wrong connected cables will damage the battery and may even explode**





⚠ Observe the following instructions:

- **Starting the engine using auxiliary start-cables requires 2 people:**
- When using another machine’s battery to start your own, do not connect the two machines together.
- Turn all engines off before connecting the cables to prevent un-expected movements when supplying power.
- When installing the auxiliary cables, first connect the positive (+) pole.
- When removing the cables, start by disconnecting negative (-) pole (grounding side).
- After removing the auxiliary cables, do not let the clamps contact with any metallic substance.

4.10 Safety related parts

NOTICE

- **Replacement of critical safety-related parts Follow regulations of the operating area**
- **Periodically replacement of safety related parts for enhanced security (eg. hydr. hoses in European community) is the requirement of safety regulations (Machinery Directive 2006/42/ EC/ EN-ISO 13849-1).**
- **Exceeding the assigned time (10 years), due to different kind of wear (mechanical/chemical) the material of parts and part itself will naturally change. Re-used – such parts may cause earlier failure of the system.**
- **– Safety parts can fail and by any defects in safety-critical parts, repair or replace it! Depending on kind of the part and its function, serious damage or even physical injury can follow.**
- **In operation, as it is difficult to judge how long these parts can keep working, and if an external inspection could not give the reliable judgment, replace the safety related part regularly – even if it has not reached the assigned time.**

Table 4-3 Safety related parts

1	803429756	F431CACA080804-1050(J)	1
2	803429756	F431CACA080804-1050(J)	1
3	803429761	F431CACA080804-2300(J)	2
4	803429764	F431CACA101005-1800(J)	1
5	803429770	F481CACA101005-1650(J)	1

Table 4-3 Safety related parts(continued)

6	804404689	F431CACA080804-1750-PG(J)	1
7	803450899	F431CACA080804-1950-PG(J)	1
8	803429782	F431CACA060804-1800(J)	1
9	803429779	F431CACA060804-1400(J)	1
10	803401840	F481CACF121206-2400(J)	1
11	804404692	F481CACA081204-1700-PG(J)	1
12	803386811	F431CACA101005-2600(J)	8
13	803378797	F431CACA121206-1150(J)	2
14	803378794	F431CACA101005-2300(J)	1
15	803386814	F431CACF101005-2400(J)	1
16	803429740	F431CACF101005-1500(J)	2
17	803429700	F431CACF101005-3900(J)	1
18	803429715	F431CACA101005-2500(J)	1
19	803429699	F431CACF101005-2700(J)	1
20	803429700	F431CACF101005-3900(J)	1
21	803429714	F431CACF151206-1100(J)	2
22	803150526	F481CACF121206-1100(J)	2
23	803173019	F481CACF101005-450(J)	1
24	803196015	F381CACA080804-1000	1
25	803496671	F381CACE080804-1150	1
26	803429696	F462CACF121206-4300(J)	4
27	803429697	F462CACF121206-4100(J)	4
28	803413328	F481CACF080804-800(J)	1
29	803429710	F481CACF080804-3700(J)	2
30	803429691	F481CACF080804-3200(J)	2
31	803413328	F481CACF080804-800(J)	1
32	803401876	F481CACF151508-3500(J)	4
33	803180074	F481CACA181810-850(J)	2
34	803110823	F372CACA181810-800(J)	2
35	803429713	F372CACA181810-850(J)	1
36	803429712	F372CACA181810-500(J)	1
37	803413328	F481CACF080804-800(J)	2

Table 4-3 Safety related parts(continued)

38	803429690	F481CACF080804-3300(J)	2
39	803429689	F481CACF080804-3400(J)	2
40	803433989	F481CACE424224-1750(J)	1
41	803414847	F481CACA181810-3000(J)	1
42	803429693	F481CACE282816-1800(J)	1
43	804404688	F372CAC9182010-2760(J)	1
44	803498257	F372CAC9182010-2650(J)	1
45	804404695	F372CAC9182010-2960(J)	2
46	803445833	F481CACA181810-3900(J)	1
47	804404690	F481CACF181810-3610(J)	1
48	803429711	F431CACF080804-2300(J)	1
49	803111807	F481CACA151508-800(J)	1
50	803429646	F481CACA151508-650(J)	1
51	803429622	F462CACA181810-800(J)	1
52	803429648	F431CACA121206-4150(J)	1
53	803401528	F381CACA151508-4000(J)	1
54	803303857	F481CFCF121206-400(J)	1
55	803429623	F431CFCF121206-400(J)	1
56	803434220	F481CACE151206-700(J)	1
57	803303857	F481CFCF121206-400(J)	1
58	803434212	F481CACE151206-700(J)	1
59	803422531	F381CACA181810-1800(J)	1
60	803429625	F431CACA080804-2150(J)	1
61	803429654	F481CACE222812-1350(J)	1
62	813408804	F481CACF121508-3200(J)	1
63	803401880	F481CACF151508-500(J)	1
64	803429781	F431CACF121206-700(J)	1
65	803309011	F481CACF121206-950(J)	1
66	803429774	F481CACA151508-5650(J)	1
67	803436287	F431CACA121206-5650(J)	1
68	803071713	F481CACA121206-4500(J)	1
69	803429767	F431CACA151508-15500(J)	1

Table 4-3 Safety related parts(continued)

70	803429772	F481CACA151508-14600(J)	1
71	803429769	F431CACE151508-19700(J)	1
72	803429775	F481CACE151508-19700(J)	1
73	803429768	F431CACA151508-20100(J)	1
74	803429773	F481CACA151508-20100(J)	1
75	803429765	F431CACA101005-8700(J)	1
76	803429771	F481CACA121206-8700(J)	1
77	803429763	F431CACA080804-8800(J)	1
78	803429757	F431CACA080804-1400(J)	1
79	803429758	F431CACA080804-1500(J)	1
80	803429762	F431CACA080804-800(J)	1
81	803429755	F431CACA080804-1000(J)	1
82	803693448	SZL-VL-S-I	1
83	803697632	0-1432791-1	1
84	803688243	ETA 1626-3 10A	1
85	803688261	ETA 1626-3 5A	2
86	803688261	ETA 1626-3 5A	2
87	803764374	IMCT4050S-2M	1
88	803747799	IMCT4050S	2
89	803751003	ICA3601-043H (with cable)	1
90	803697603	684-1221-212 -17	2
91	803803802	THH1-200	1
92	803589618	DST P92S	1
93	803594188	RG2266-L570	1
94	803592059	MHE0660MT10A3C0147F	1
95	803592058	MHE0385MT10A3C0147E	1
96	803592046	9960-120-CC-5D-DD150	5
97	803802309	VTS2021-GNC-0006	1
98	803754294	J1798-JC4000-0023	1
99	803800586	P261S-S1BF3CB5K	1
100	803754295	J1796-JC4000-0022	1
101	803697043	INX360D-F99-I2E2-V15	1
102	803800251	LEINE&LINDE RSA507	1
103	803802329	772-1412-022 -02	1
104	803592048	9960-210-NS-5D-DD150	1

Table 4-3 Safety related parts(continued)

105	803695557	NBB8-18GM50-E2-V1	9
106	803694064	FS-5G-20-C-HR	1
107	803592047	9960-060-CC-5D-DD150	4
108	803697601	ADS-200MKII-D-2.0-MC3-0-44-N-PC-B-NOT	1
109	803697602	TT_-01000-35-23-115-1-8G-8F-I-L04000-NOT	1
110	803593778	CET10000-2-6-1-IR	1

Chapter 5 Operation

5.1 General overview of machine

5.1.1 Machine overview

- This equipment is a mobile self-propelled mobile elevating work platform with work platform attached at the end of boom structure.
- It is widely used in municipal construction ,bridge construction, shipyard and petrochemical industries and general supporting construction work at other related construction areas.

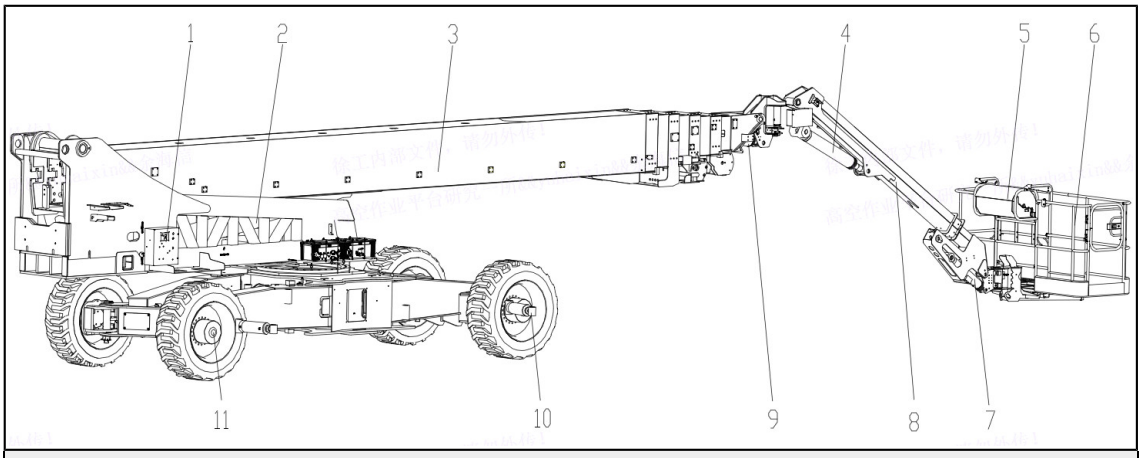


Figure 5-1 Basic moving parts

Table 5-1

1	Control cabinet	2	Luffing cylinder of telescopic boom
3	Telescopic boom	4	Luffing cylinder of jib
5	Control box in work platform	6	Work platform
7	Levelling cylinder	8	Telescopic jib
9	Levelling cylinder	10	Rear drive/steer wheel
11	Front drive/steer wheel		

5.1.2 Basic functional description

⚠ XGS58E straight-arm mobile elevating work platform, the maximum height of the whole machine is 58.6 m, the maximum load is 450 kg, and the maximum climbing rating is 45%; The vehicle is equipped with a five-section telescopic boom + a telescopic jib, with a certain ability to overcome obstacles, large

working radius; The dual-load control system can automatically adjust the working radius according to the load to meet the different load requirements of users.

Table 5-2 Functional overview of the machine

Driving system	The motor and speed reducer are integrated with the built-in , which is equipped with two speeds of fast and slow speed to meet the requirements of vehicles in different environments.
Brake	While running on a slope, the walking mechanism has the function of self-braking and the clutch device is provided for easy traction when the machine malfunctions.
Engine	Adopting electronic-controlled engine and oil pressure, water temperature, rotation speed and other sensors are integrated into engine and controlled by ECU. The power system is safe, reliable and easy for maintenance with fault diagnosis interface.
Leveling system	The leveling system adopts electro-hydraulic proportional leveling.
Steering	4 wheel
Electrical system	PLC control technology - each controller on turntable, chassis and platform. Turntable and platform separately are equipped with control box to realize the control of chassis, turntable, boom, jib boom and platform.
Control lever	The one control handle controls the machine traveling and , the other one controls boom elevating and turntable rotating
Control monitor	It adopts diagnostic controller to monitor the real-time condition of the machine.

5.1.3 Environmental machine limits

NOTICE

Respect environmental machine limits	
Altitude:	**below 1000 m above sea level**
Ambient Temperature:	**-20℃ to +40℃**

- **All machines must be inspected, prepared and adjusted before delivery by the or his authorized representative.**
- **The steps in Section 5.1 must be followed during initial start-up process and/or the running-in period.**
- **Ignoring them may damage the machines or produce other negative impacts on their performance.**

5.1.4 Machine start-up and operating hours

NOTICE

- **Regard a safe running-in period of the machine!**
- **Avoid working at full load within the running-in period (first 50 h of service)**
- **It will affect the lifetime and safe operation of the machine, eventually leading to accidents!**
- **When changing the lubricant or grease, refer to the "Maintenance" section of this .**

5.1.4.1 Recommendations for a safe running-in period

- Check the coolant, fuel, engine oil and hydraulic oil every day for leakage.
- Check the lubricating liquids every day and refill them if needed.
- Always observe infos and indications on and various instruments during operation.
- Avoid engine overload.
- Keep below 80% of the maximum load until the engine and other components have reached the standard working temperature.
- During operation, pay attention to proper function of the machine.
- Check for looseness, wear or damage caused during delivery
- Check the wires and terminals for looseness, the meters for abnormal values, and the battery's electrolytes for concentration.
- Check the lubricating liquids and filter elements for contamination, dirt or damages.
- After the first 50 h of service, change the engine oil and oil filter elements.
- After the first 250 h working hours:
  - Replace the oil and return the original filter elements in the hydraulic oil circuit.
  - Change the gear oil in the swing reducer.
- After the first 1000 working hours, change the gear oil in the travel reducer.

5.2 Platform control box

5.2.1 Control panel

Figure 5-2 Control panel

Most of the control functions need to be implemented on the control panel. See the following table for details: **Table 5-3**

Table 5-3 Switches on control panel

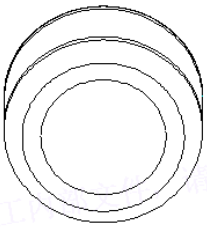
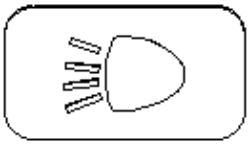
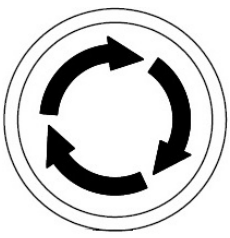
Code no.	Switch	Symbol	Function
S214			Platform searchlight switch and platform panel lighting
S203			E-stop Button: In the case of emergency, press this button to stop current movement and turn off the engine; Reset this button manually after troubleshooting.

Table 5-3 Switches on control panel(continued)

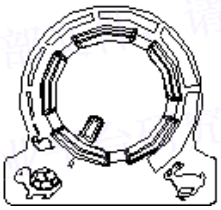
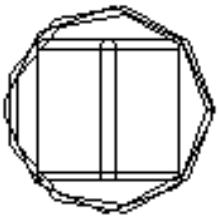
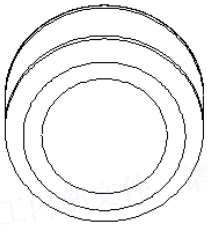
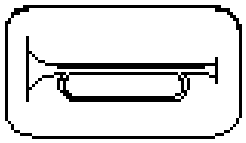
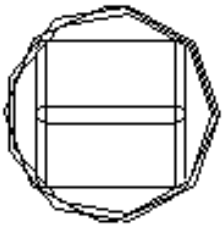
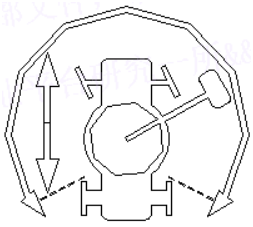
Code no.	Switch	Symbol	Function
S225			Function speed selection knob Rotate the knob to the leftmost "turtle" position, the engine will operates in the lowest set speed. Rotate the knob to the rightmost "rabbit" position, the engine will operates in the highest set speed. Rotate the knob clockwise or anticlockwise to increase or decrease the engine rotation speed.
S229			Load selector switch-Left: The maximum load is 230 kg
			Load selector switch-Right: The maximum load is 450 kg
S216			Horn: Horn alarm switch
S223			Driving directional unlock switch: When the driving function is selected, if the boom rotates beyond any rear wheel or further more clockwise or anticlockwise, the driving directional indicator light turns on. Press and release this switch, then

Table 5-3 Switches on control panel(continued)

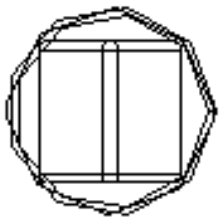
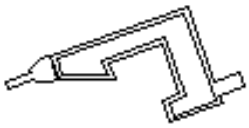
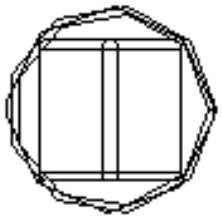
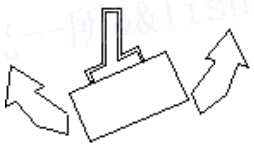
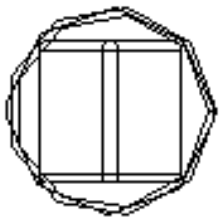
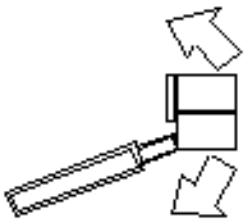
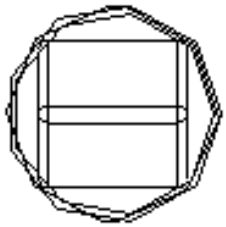
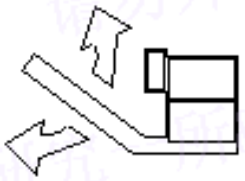
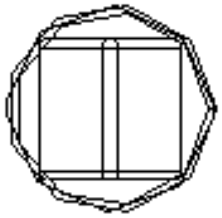
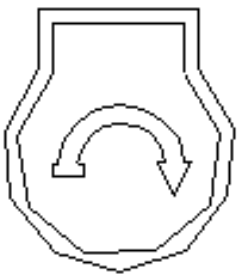
Code no.	Switch	Symbol	Function
			move driving/steering control joystick in 3 seconds to enable driving or steering function.
S230			Generator switch (optional): Pull this switch to either side, the hydraulic generator starts; Return the switch to neutral, the hydraulic generator stops working.
S210			Platform rotation switch: Pull left to rotate the platform clockwise. Pull right to rotate the platform anticlockwise.
S211			Platform levelling switch: Pull up the switch, the level of platform will raise; Pull down the switch, the level of platform will lower.
S208			Jib boom raising/lowering switch: Pull up to raise and pull down to lower.
S201			Engine start switch: Push the switch to the left to start engine.

Table 5-3 Switches on control panel(continued)

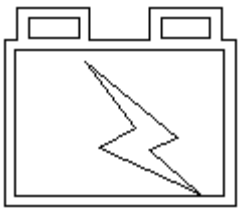
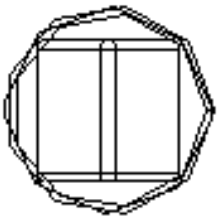
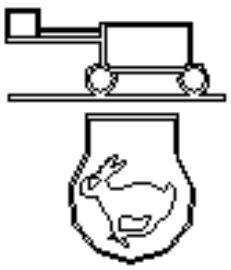
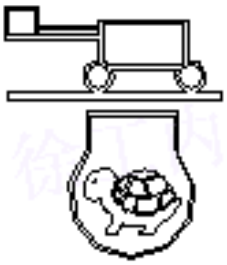
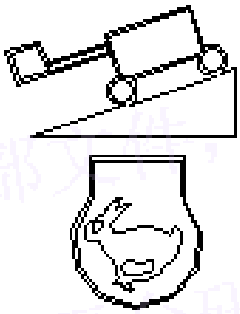
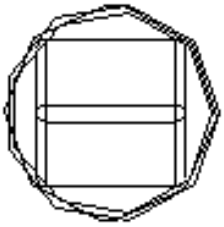
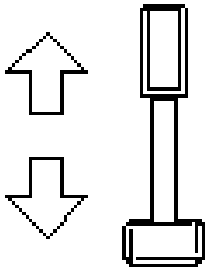
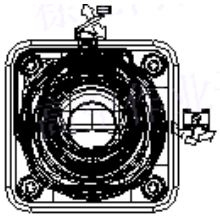
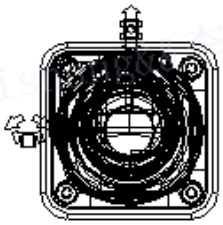
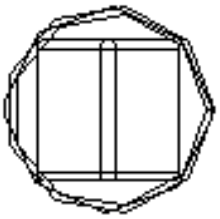
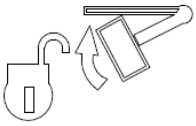
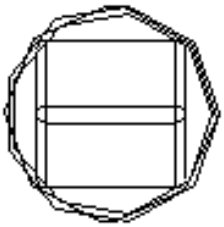
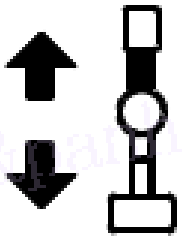
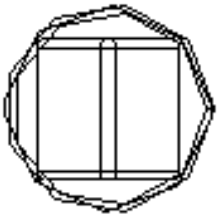
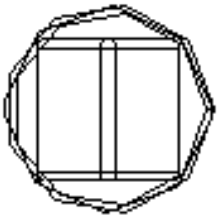
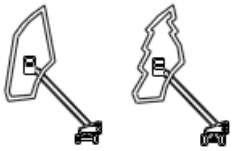
Code no.	Switch	Symbol	Function
			Battery pump start switch; Push the switch to the right to start auxiliary battery pump and shut off the engine at the same time.
S226			Travel mode selector switch Turn to the left to choose ground high speed gear.
			Travel mode selector switch Turn to the middle to choose ground low speed gear.
			Travel mode selector switch Turn to the right to choose climbing gear.
S205			Boom extend-retract switch: Pull up to retract the boom; pull down to extend the boom.

Table 5-3 Switches on control panel(continued)

Code no.	Switch	Symbol	Function
S204			Boom movement joystick: Control boom luffing and slewing
S213			Travel joystick: Control machine traveling and steering
S232			Jib swing locking switch: When the jib slewing to the center position, pull the switch to lower the jib swing locking pin and the jib is locked.
S231			Boom extend-retract switch: Pull up to retract the jib; pull down to extend the jib.
S228			Jib swing switch**:** The switch can make the jib back to the stowed position for transportation or get off the transportation position for operation.
S227			Boom control mode selection switch: Pull left, the boom lowers out of range and the boom can be retracted manually; pull right, the boom lowers out of range and can be retracted automatically.

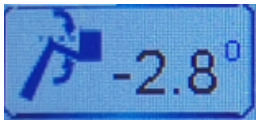
5.2.2 Indicator lights panel

Figure 5-3 Platform display

Table 5-4 Display function introduction

Indicator light symbols	Content
	Basic setting options: can realize basic setting, such as language selection, inch or metric, time, and brightness.
	Debug setting option: the platform displayer can not indicate relevant parameter setting.
	Background data query: I/O port query, CAN-bus information, GPS information and other data query.
	Main pages switching option: It can switch main pages to show machine dynamic information, fuel volume, temperature, engine rotation speed, pressure and other data.
	Machine status option: it can reflect boom movement, chassis movement and jib boom status in real time.
	Faults query: it can shows the real-time faults and query history faults.
	Machine body balance angle display: it can show the horizontal angle of axle.

Table 5-4 Display function introduction (continued)

Indicator light symbols	Content
	Platform load display: it can show the current platform load, unit kg.
	CAN-bus status display
	Machine retraction status display
	Turntable slewing angle display: it display current turntable slewing angle and range to remind the operator of the position of boom and front/rear position of the machine.
	Food pedal switch display: it display current connection status of food pedal switch.
	Axle in place display: turns on when the axle is in place.
	Low speed display: turns on when the low speed operates.
	Platform weight display: indicate the current platform load.
	Platform leveling angle display: it can show current horizontal angle of the platform for easy level operation and hazard warning.
	Jib angle display: indicate the current horizontal angle of the jib.
	Turntable slewing angle display: it display current turntable slewing angle.

5.2.3 Control joystick

Figure 5-4 Dual-axle proportional joystick-L

The on the left side of control box adopts dual-axle proportional to control boom luffing and rotating.
Operation of : pull upward to raise boom; pull down to lower boom. Pull rightward to rotate platform clockwise; pull leftward to rotate platform anticlockwise. The faster the joystick moves, the faster the platform rotates.

Figure 5-5 Proportional joystick-R

The joystick on the right side of control box adopts proportional with thumb rocker on the top.
Operation of joystick: Move the joystick to the direction of blue arrow on control panel to drive the machine forward; Move the joystick to the direction of yellow arrow on control panel to drive the machine backward. Press the left of thumb rocker to turn left; press the right of thumb rocker to turn right.

5.3 Control cabinet

Figure 5-6 Control Cabinet

5.3.1 Turntable display

Figure 5-7 Display interface

Figure 5-8 Display interface

Table 5-5 Display function introduction

Icon	Content
	Basic setting options: can realize basic setting, such as language selection, inch or metric, time, and brightness.
	Debug setting options: can perform sensor calibration, movement speed debug, function option configuration, controller parameter backup, etc.
	Background data query: I/O port query, CAN-bus information, GPS information and other data query.
	Main pages switching option: It can switch main pages to show machine dynamic information, fuel volume, temperature, engine rotation speed, pressure and other data.

Table 5-5 Display function introduction(continued)

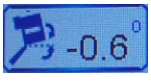
Icon	Content
	Machine status option: it can reflect boom movement, chassis movement and jib boom status in real time.
	Faults query: it can shows the real-time faults and query history faults.
	Machine body balance angle display: it can show the horizontal angle of axle.
	Platform load display: it can show the current platform load, unit kg.
	Platform leveling angle display: it can show current horizontal angle of the platform for easy level operation and hazard warning.
	CAN-bus status display
	Turntable slewing angle display: it display current turntable slewing angle and range to remind the operator of the position of boom and front/rear position of the machine.
	Food pedal switch display: it display current connection status of food pedal switch.
	Machine retraction status display
	Axle in place display: turns on when the axle is in place.
	Low speed display: turns on when the low speed operates.
	Platform weight display: indicate the current platform load.
	Platform leveling angle display: it can show current horizontal angle of the platform for easy level operation and hazard warning.

Table 5-5 Display function introduction(continued)

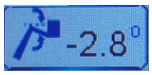
Icon	Content
	Jib angle display: indicate the current horizontal angle of the jib.
	Turntable slewing angle display: it display current turntable slewing angle.

Figure 5-9 Display interface

Table 5-6 Display function introduction

	Working time display: Display the current total working time of the machine, unit: hour.
	Engine oil pressure display: Show current engine oil pressure, unit: bar.
	Engine oil pressure display: Show current engine oil temperature, unit: ℃.

Table 5-6 Display function introduction(continued)

	Battery pressure display: Display current battery pressure, unit: V.
	Fault code: Display current fault code.

5.3.2 Key function description

1. Ground/platform selection key switch: When the key switch turns to OFF position, the machine will be shut down. Turn the key switch to GROUND position, the ground controller will operate. Turn the key switch to PLATFORM position, the platform controller will operate.
2. Engine start/auxiliary : Pull up and hold until engine starts; If the main power (engine) malfunctions, please use auxiliary power switch; Pull right and hold, the auxiliary power starts and enable required function.
3. Engine speed selection/function enable switch: Turn the switch to rabbit position, the engine operates at high speed. Turn the switch to turtle position, the engine operates at middle speed. This switch is also used as enable switch, pull the switch to either side to enable functions on ground for operation.
4. Jib boom raising/lowering switch: Pull up to raise jib boom; pull down to lower jib boom.
5. Platform leveling switch: Pull up to raise the platform level; Pull down to lower the platform level;
6. Platform rotation switch: Pull up to rotate the platform clockwise. Pull down to rotate the platform anticlockwise.
7. Buzzer: When the machine malfunctions, the buzzer will send out an sound and light alarm to warn the operator.
8. Charging Indicator light: When the engine is working normally, the engine will charge the battery and the indicator light will be on to indicate the generator is working normally; if the indicator light is not on after engine starting, immediately inspect generator and indicator light for malfunction.
9. : The screen will display machine operating status parameters, engine status parameters, as well as service information such as fault code and fault query.
10. Red E-stop button: push in the red E-stop button to “OFF” position to stop all functions and close the engine. Rotate clockwise and release the rotating button switch, the button will return back to “ON” position and can operate the machine.
11. Boom extension/retraction switch: Pull up to extend the boom.
12. Turntable rotation switch: Pull left to rotate the turntable leftward. Pull right to rotate the turntable rightward.
13. Boom raising/lowering switch: Pull up to raise the boom. Pull down to lower the boom.

5.3.3 Components in control cabinet

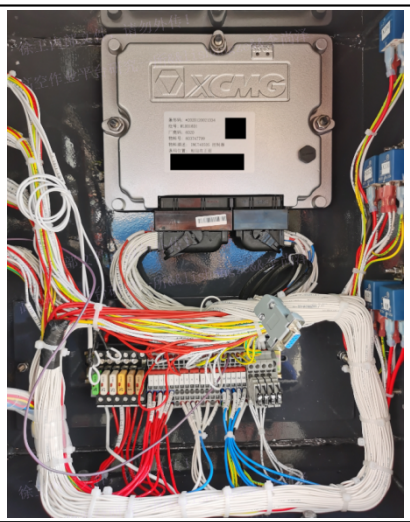


Figure 5-10 Components in control cabinet

Table 5-7 Functions of control components

Component	Function
1. Controller	The controller is the core of the machine operation, which directs and coordinates the orderly work of various components of machine. It supplies logic operation and date storage for machine.
2. Relay	The internal relay of the control box is composed of program control route to realize switch control, safety protection, self-regulation and other functions.
3. Diode	Rectification: transfer the alternating current into direct current which small components required. Voltage limiting: limit voltage output amplitude to protect components.
4. Mini breaker	As the infrequent operation of the circuit conversion, it can also be automatically cut off when the circuit overload, short circuit and other faults occur to protect the circuit.
5. Terminal strip	It is used as the base holding components to fix components and calibrate each socket position.

5.4 Compartment electrical devices

5.4.1 Warning light

	• The warning light is located above the right housing. • **OFF:** In this state, the warning light does not work. • **ON:** In this state, the warning light works. Note: When the machine is started, the warning light will get into work state; When machine is shut down, the warning light turns off. When the machine is on different state or perform different motions, the warning light shall flash to remind.

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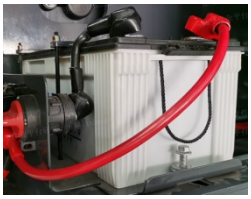
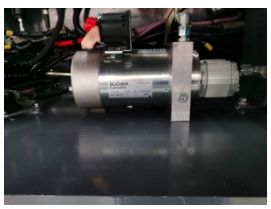
5.4.2 Electrical components

	Battery: – Battery is located on the left side of turntable and the right side of turntable. – The battery, the power input of which is provided by the engine, is taken as the auxiliary power output for the electrical system of the machine.
	Breaker – The breaker is located on the right side of the turntable and is fixed on the rear panel of the battery device. – The breaker is connected among the power supply, the generator and air intake heating. In case of abnormal circuit load, the breaker disconnect the power supply to protect the circuit.
	Battery pump: – The battery pump is located on the right side of turntable, where the hydraulic tank locates. – The battery drives the battery pump. When the engine malfunctions, the battery pump performs platform lowering, boom retraction and other movement as an emergency power to ensure machine and personnel safety.

	Acoustic: – The battery pump is located on the right side of turntable, where the hydraulic tank locates. – The acoustic gives the alarm when the machine perform motions to remind the operator and surrounding personnel for safety of the machine and personnel.
	Data logger: – The data logger is located on the right side of the turntable and fixed above the control box of the turntable. – The data logger turns on and off along with the machine to record each machine motion, data parameters, faults information, etc., which can be used for vehicle data consultation, fault information inquiry and other operations.
	Foot pedal: – The foot pedal is located in the work platform and under the control box. – The foot pedal, as an enable switch, should be pressed while the operator controls motion of the machine to ensure the safety position of the operator for personnel safety.

⚠ CAUTION

- **Replacing fuses may cause hazards**
- **When replacing a fuse, make sure to use one that has the same electric current magnitude.**
- **Otherwise, a fire accident may ignite in the wiring or other circuit elements due to overheat.**
- **Use the manufacturer's original spare parts!**

5.4.3 Sensor device

	Tilt sensor – The tilt sensor can monitor the inclination of chassis and show the inclination in real time. The sensor will give an alarm when the inclination of the chassis is greater than 3°;
	Platform levelling sensor: – The platform levelling sensor is used to test the inclination of the platform. The sensor will give an alarm when the platform tilts to guarantee the stability of automatic leveling.

	Length and angle sensor: – The length and angle sensor can be used to detect extension length and raising angle of the boom; The sensor will give an alarm when the length or angle reaches the limit to ensure the safety of the machine operation.
	Weighting sensor: – The weighing sensor can detect the total mass of the work platform and set the maximum load to ensure the normal operation of the work platform.

5.5 Machine startup and shutdown

5.5.1 Starting the engine

⚠WARNING

Beware of risks and hazards by !

- **Become familiar with the manual and engine manual before operating the machine.**
- **Wear safety belt during machine operation.**
- **Engine start may be dangerous for the maintenance stuff, co-workers and bystanders.**
- **Require all bystanders to leave the area close to the machine!**
- **Approve the engine compartment before start and close the compartment door!**
- **Be aware of all moving parts, drive belts and fan in engine compartment!**
- **Be aware of any leakage of fuel, lubricant or hydraulic oil.**
- **Combustible materials may start a fire.**
- **Remove tree leaves, paper, etc. away from the high-temperature components such as the muffler/turbocharger to prevent fire.**
- **Do not use any aerosol or chemical fluids as a startup aid**
- **Be careful – not following the instructions hereafter may cause damage and/or serious personal .**

NOTICE

- **Check the engine compartment!**
- **may result in damage of the equipment or drive system components.**
- **Always make checks/inspections if you come to the machine for the fist time.**
- **Inform you always by the if the is allowed when performing maintenance/repair.**

5.5.1.1 Starting operation

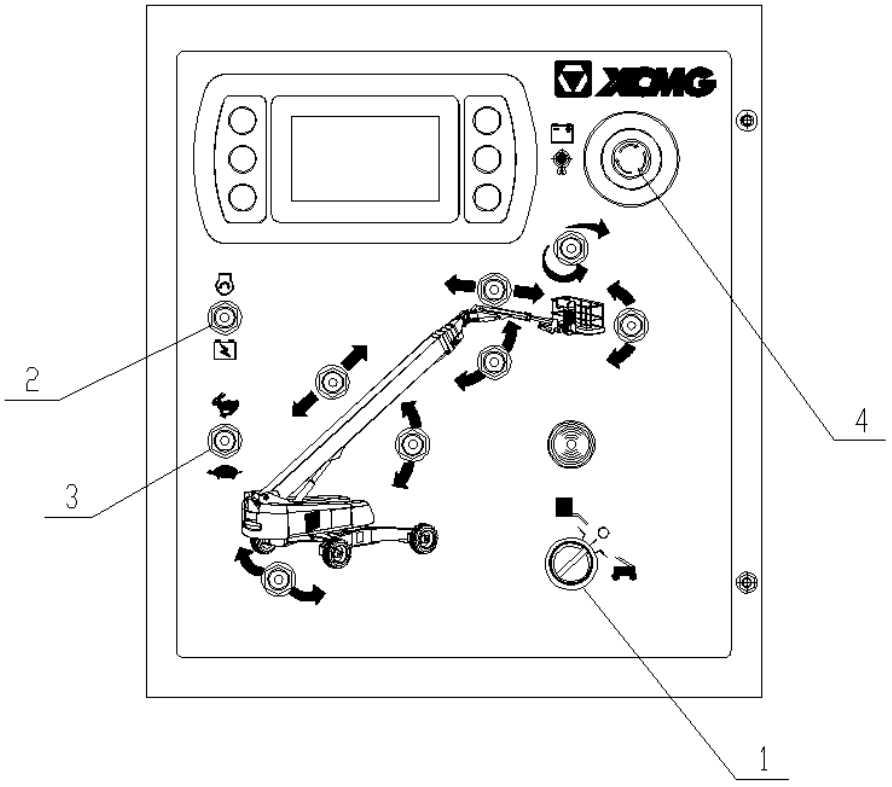


Figure 5-11 Control box on turntable

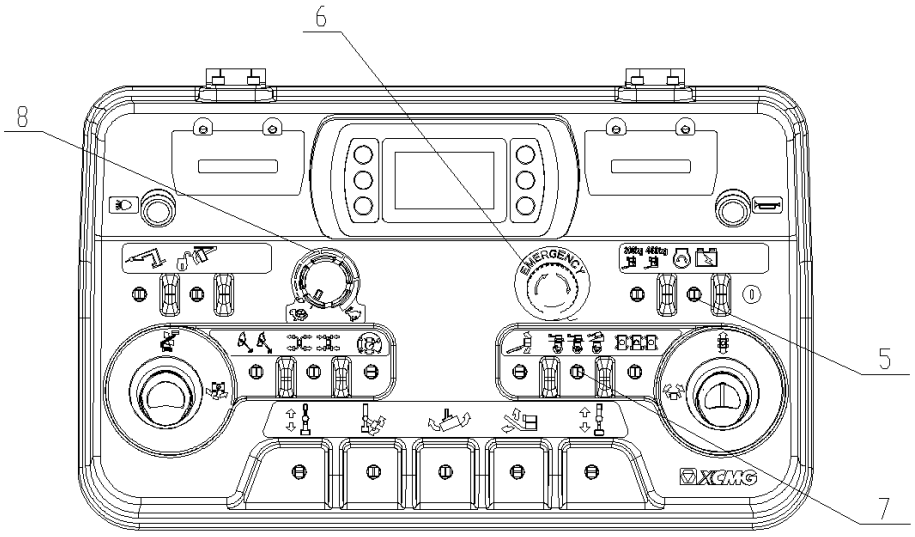


Figure 5-12 Control box on platform

- Ground/platform selector switch
- Engine start/auxiliary power switch (turntable)
- Engine speed selection/function enable switch (turntable)
- Emergency stop button (turntable)
- Engine start/auxiliary power switch (platform)
- Emergency stop button (platform)
- Travel speed/torque selector switch
- Speed selection rotary knob

5.5.1.2 Inspection before engine starting

1. Machine inspection

1) Ensure that the Operation Manual, Maintenance Manual, and Parts Atlas are intact and are preserved on the machine.

2) Ensure all labels are legible and in the appropriate places. Refer to manuals for inspection.

3) Check engine oil for leakage and level. Replenish if necessary. Please refer to section oil lubrication and maintenance of the maintenance manual for details.

4) Check engine oil for leakage and level. Replenish if necessary. Please refer to section oil lubrication and maintenance of the maintenance manual for details.

5) Check engine antifreeze for leakage and level. Please add antifreeze as required. Please refer to section oil lubrication and maintenance of the maintenance manual for details.

6) Ensure that all accesses and work platform are clean and oil-free.

7) Check the following parts or areas for presence of damage, improper installation, missing part, and unauthorized modification:

①Electrical components, wirings and cables;

②Hydraulic hoses, connectors, hydraulic cylinders, and manifolds;

③Fuel oil and hydraulic oil tank;

④Drive motor, turntable motor and drive hubs;

⑤Boom wear pads;

⑥Tires and wheels;

⑦Engine and related components;

⑧Limit switch and horn;

⑨Alarms and indication lights (if equipped);

⑩Nuts, bolts, and other fasteners

⑪Entrance or rail of work platform.

8) Check machine components for:

①Welds and cracks on structural parts;

②Indentation or damage to the machine;

③Excessive rust, corrosion, or oxidation;

④Any other dangerous deterioration (rupture, wear, etc.).

9) Ensure that all structural and other critical components are in place and all relevant fasteners and pins are properly screwed.

10)Check device related safety. Check the items of safety device, warning device, e-stop device, etc. to ensure normal operation before using the machine.

11)After checking and verifying, ensure that all components are covered properly and securely.

2. Work site inspection

Before or during the use of the MEWP, the work site shall be inspected for possible hazards, including but not limited to:

1) Slopes, edges and potholes;

2) Protrusions and obstacles on ground;

3) Overhead obstacles and high-voltage lines;

4) Hazardous locations;

5) Surface supports in the working area that cannot bear all the load applied by the MEWP;

6) Wind, rain, thunder, lightening and other weather conditions;

7) Presence of unauthorized personnel;

5.5.1.3 Starting procedure

1. Turn platform/ground selection switch to "ground" position;
2. Pull the e-stop button out to "ON" position;
3. Push the engine start switch for 3 seconds until the engine is started;
4. After sufficient engine pre-heating time, push the power/ into to turn off the engine;
5. Turn platform/ground selection switch to "platform" position;
6. Pull the e-stop button out to "ON" position on platform;
7. Push the engine start switch until the engine is started;

NOTICE

The initial boot must always be from the ground console.
If the engine does not start immediately, do not start for a long time. If the engine fails to start again, the starting motor should be cooled for 2~3 min. If the engine fails to start after several attempts, refer to the engine maintenance manual.
Let the engine run at a low speed for a few minutes to warm up before loading any load.
When start the engine on platform, the pedal switch must be released first and the engine cannot be started when the pedal switch is stepped down.
If an unexpected shutdown is caused by an engine failure, the problem must be solved before the engine can be started up again.
The following actions may damage the starter:

- **Each starting time is more than 10 seconds**
- **Start continuously without cooling**
- **Start again while the engine is running!**

Do not start engine by dragging to prevent engine damage.
Retrying immediately after a startup failure will cause the battery to run out quickly or even damage the starter.
If the battery power is not enough to start the engine, refer to section jump starting, connect the battery at normal voltage.

5.5.1.4 Shutdown of engine and parking

Shutdown:

Press the emergency stop button or turn the ground/platform key selector switch to the "O" position to shut down.

Parking:

1. Drive the machine to a secured place.
2. Endure the boom is fully retracted and lowered over the (drive) rear axle; All maintenance panels and doors are closed and latched.
3. Remove all load and let the engine run at low speed for 3-5 minutes to further reduce the engine temperature.
4. In the ground control box, turn the key selector switch to the "O" position, press the emergency stop button and take down the key.
5. Cover the platform console to protect indication nameplates, warning signs, and operating controls from severe environment damage

5.5.1.5 Inspection after shutdown

⚠ Inspection

- Check the machine for abnormal phenomenon or malfunction.
- Refuel if the fuel is short.
- Remove combustible material, such as leaves, sticks, or paper, that has accumulated near the engine.

5.5.2 Engine jump starting

⚠WARNING

	Beware of explosive gas leakage while charging or use the battery
• **Wrong procedure may result in an explosion and cause severe injuries.** • **When starting , wear safety goggles and gloves.** • **Charge the battery at a well-ventilated place** • **Keep the area around it free of sparks or static electricity**	

⚠ ***Follow further safety instructions***

	• Start on a dry and solid ground but avoid ungrounded metallic roads or surfaces. • When starting with other equipment connected, make sure that the facilities do not contact. • When charging, connect the positive pole of the subsidiary battery to that of the feeding battery and the negative pole of the former to bracket of the latter. **When installing the battery, connect the positive connection poles first, when dismounting it, start by removing the negative pole.** **Important: The voltage of the electrical machine is 12 V (negative ground).** During assisted start, be sure to use a 12 V boosting battery of the same capacity.

5.5.2.1 Connecting boosting battery

NOTICE

	– Connect correct the boost battery! Wrong connecting may damage or cause fire
	**1. Shut off the engine on the equipment connected with the boosting battery.** **2. Connect one end of the red wire (a) to the positive pole of the battery on and the other end to that of the boosting (c).** **3. Connect one end of the black wire (b) to the negative pole of the boosting battery and the other end to the upper bracket (e) on the machine for grounding.** **4. When connecting the upper bracket, keep connections away from the battery as far as possible and do not connect it to the negative pole of the directly.** **5. .**

First the ignition is switched off

To start the engine there are two ways:

from the additional battery or from another vehicle

In case the supply system is another vehicle, check the battery voltage of supporting vehicle.

i Switch ignition off on supporting vehicle as well

NOTICE

	Take care of the cross-section of the cables

- **Connecting cables for provide jump start support to the machine should have a cross-section above 25 mm² (complying to DIN 72553 or ISO 6722).**
- **Batteries may be already frozen if kept discharged at temperatures below freezing point (0°C / 32°F)..**
- **Ensure is defrosted prior charging of jump starting.**
- **Avoid unnecessary engine operation as often as possible to ensure environmental protection**
- **The battery may explode if the auxiliary cables are connected the wrong way.**

Connect the cables in the following order to minimize hazards:

1. Connect an end of the red cable with the (+)-pole of the “empty” battery
2. **Then connect the other end of the red cable with the (+) pole of the “full” battery.**
3. Connect the black cable with a GND pole close to the battery on the receiving machine
4. Then connect the other end of the black cable to the (-) pole of the “full” battery.

In case battery of the machine is empty connect it with an external power supply (i.e. as shown in figure). Ensure GND pole (-) is connected to machine’s frame!

5.5.2.2 Connection scheme

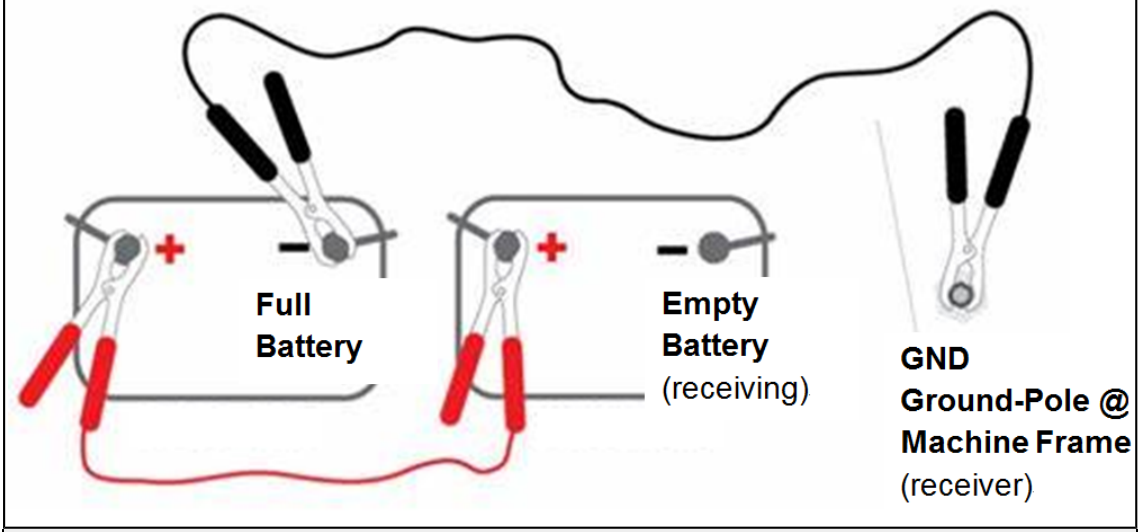


Figure 5-13 Jump starting of loading battery

DANGER

Make sure that life cables’ ends do not contact.

- Charge battery for at least 5 minutes before any starting attempt.

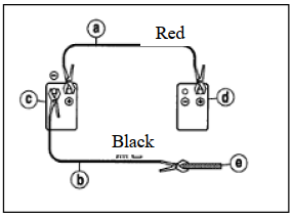
- If engine start was successful, keep the cables connected for another 3 minutes before disconnecting them.
- In case the supply system is another vehicle, keep its engine running during the entire charging process.

5.5.2.3 Removing boosting battery

Disconnecting the auxiliary battery

1. **Before disconnecting, open the lights on receiving machine to avoid overload.**
2. **Disconnect the cables in exactly the opposite order as described below in Notice**
3. **Let engine run to charge battery.**

NOTICE

Remove correctly the boost-battery:	
	**1. First, remove the black negative connection (b) from the main frame of the equipment.** **2. Remove the other end of the black negative connection from the boosting battery** **3. Remove the red positive connection (a) from the boosting battery.** **4. Then, remove the other end of the red positive connection (a) from the on the machine.**

5.6 Driving the machine

DANGER

- **Ensure no bystanders are in the zone of danger while machine is operated.**
- **Ensure driving path is stable and secured**
- **Unexpected moving parts may cause burns or injury**

CAUTION

- **Driving over notches may cause the machine tip over.**
- **Consider that application and release and of parking brake may be delayed at low hydraulic oil temperature.**

5.6.1 Travel

NOTICE

Please refer to the operation parameters table for the allowable range of forward and lateral slopes. All allowable ranges of forward and lateral slopes are based on the fact that the boom is in stowed position and completely lowered and retracted.

Traveling will be restricted by the following two factors:

1. Slope grade, the percentage of slope gradient that the device can climb.

2. Side inclination, the side slope grade of the road that the machine can pass through.

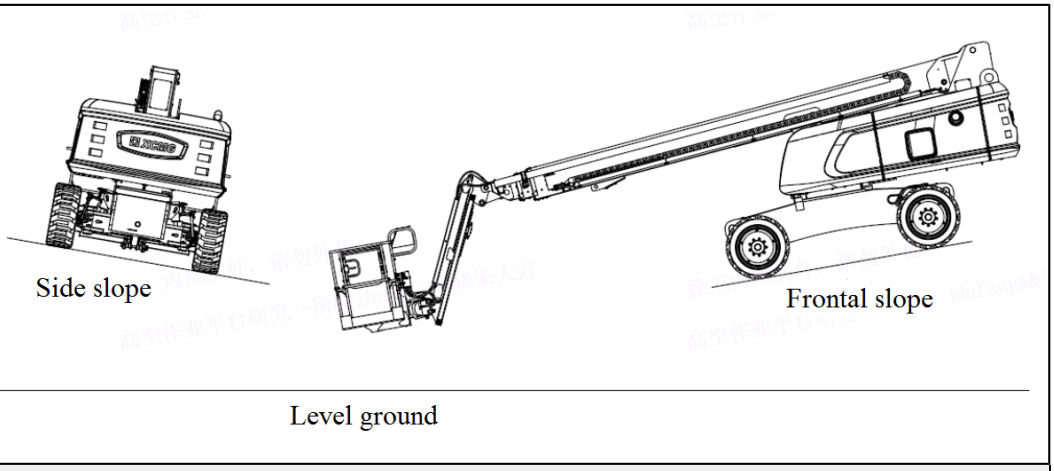


Figure 5-14 Diagram of driving slope

WARNING

- **Do not allow the machine to be driven with the boom above the horizontal position unless it is on a flat, solid, and horizontal surface. Do not drive the machine on a slope with a slope grade greater than that marked on the nameplate to avoid losing control or overturning.**
- **Make sure the turntable lock is engaged before moving on.**
- **Do not drive on roads with a side slope grade more than 8 degrees.**
- **Extra care must be taken when driving in reverse or with the platform raised.**
- **Before driving, ensure the boom is placed over the rear drive axle. If the boom is above the front axle, the direction of and driving functions will be reversed.**

Drive forward and backward

1. Pull the emergency stop switch out on the and then press the foot switch.
2. Move the drive control lever to "forward" or backward position according to requirement.

The machine is equipped with driving direction indicator light. The yellow indicator light on the platform control box indicates that the swing of the boom has exceeded the rear-drive wheel and the device may be run/turn against the direction of the control handle movement. If the indicator light is on, the driving function should be operated as follows:

1. Match the blue and yellow directional arrows on the platform and chassis to determine the driving direction of the device.
2. Press and release the drive direction unlock switch. Move the driving control handle slowly toward the arrow in the same direction as the device is intended to travel in 10 seconds. Do operate driving control handle in 10 seconds of indicator light flashing.

5.6. 2 Steering

Move the thumb switch on the drive/ joystick to the right position to turn right or the left position to turn left.

5.6.3 Work platform

⚠WARNING

Only levelling override function can be used to level the platform slightly. Improper operation may result in displacement or falling of load/occupants. Failure to follow above instructions may result in serious injury or death.

Platform Levelling

To adjust the level up and down—Move the platform/level control switch to "up" or "down" position and hold it until the platform is level.

Platform rotation

To rotate the platform left and right—Operate the platform rotation control switch to select the direction, then press and hold the switch until the desired position is reached.

5.6.4 Swing of boom

⚠WARNING

Do not swing or raise the boom beyond the horizontal position when the machine tilts.

Do not use the tilt alarm as a levelness indicator for the chassis.

To avoid overturning, the platform should be lowered to ground level. Then drive the machine to a level surface before raising the boom.

To avoid death and serious injury, do not operate the machine if any control lever or toggle switch controlling the movement of platform does not turns back to off position or neutral position when released.

If the platform does not stop after releasing the control switch or the control handle, remove the foot from the foot switch or use the emergency stop switch to stop the machine.

Swing of boom

To swing the boom, you can select "left" or "right" with the handle.

NOTICE

When swinging the boom, make sure it is sufficiently far away from the surrounding walls, dividers, and equipment.

Elevation of boom

To raise or lower the boom, move the boom lift switch up or down until the desired height is reached.

Extension of boom

To extend or retract the boom, select "extension" or "retraction" with boom extension switch.

5.7 Braking and stopping the machine

WARNING

- **An emergency stop switch must be used to stop the machine in case of emergency**
- **Triggering the anti-squeeze device can also stop the machine in an emergency**

5.7.1 E-stop switch

Figure 5-15 Devices for stopping the machine

The emergency stop operation can be fulfilled from either turntable or platform. The operations are same as follows:

1. 1. E-stop operation

   When E-stop switch is pressed, the engine turns off. After the shutdown of engine, all operation of MEWP can not be carried out.

   E-stop switch is used for following conditions:

   1) When the machine can not be controlled by a joystick or switch, or an immediate stop is required in case of hazards.

   2) To prevent personnel in platform from misoperation or unintended touching on any switch or joystick to cause hazards.

2. 2. Reset of E-stop switch

Rotate the E-stop switch again to reset the E-stop switch. After the reset of E-stop switch, the engine can be restarted. After the shutdown of engine, all operation of MEWP can be carried out.

If you operate the joystick or switch after completing above reset, the machine may still not be able to move. In this case, pull the joystick or switch back to the neutral and ask a professional to perform maintenance before use.

5.7.2 Parking of machine and shutdown of engine

5.7.2.1 Parking of machine

NOTICE

- **Park the machine in monitored area to prevent possible accidents or the entrance of unauthorized personnel.**
- **Remove the ignition key and cover the machine with engine hood to avoid misuse.**
- **Park the machine on stable and flat ground to prevent hazards or damage to the machine.**
- **Obey local traffic regulations and rules when parking in public area.**

5.8 Operation of battery pump

As an auxiliary power source, the battery pump will be used for machine retraction in case of emergency. Keep pressing the battery pump button on turntable or platform for battery pump operation and the service time should not exceed 30 minutes.

Operation steps:

1. Ensure the breaker switch next to battery bracket is on “ON”;
2. Turn turntable/platform selector switch to platform or turntable;
3. Pull and hold the battery pump switch on turntable or platform;
4. If operated on platform, press the foot pedal;
5. Carry out the retraction operation normally to retract the machine.

⚠WARNING

- **Only use this switch when engine fails.**
- **The battery pump is used for emergency retraction only. Do not use for other purpose.**

5.9 Work functions

5.9.1 Oil filling

WARNING

- **Clean up any spilled fuel immediately**
- **Let the engine cool down prior fueling.**
- **Always use sulfur free fuel specified in the operation instructions.**
- **Engine and EGR may suffer severe damage.**
- **Dirt or soiling will damage the engine.**
- **Keep all fuel related components and systems thoroughly clean.**

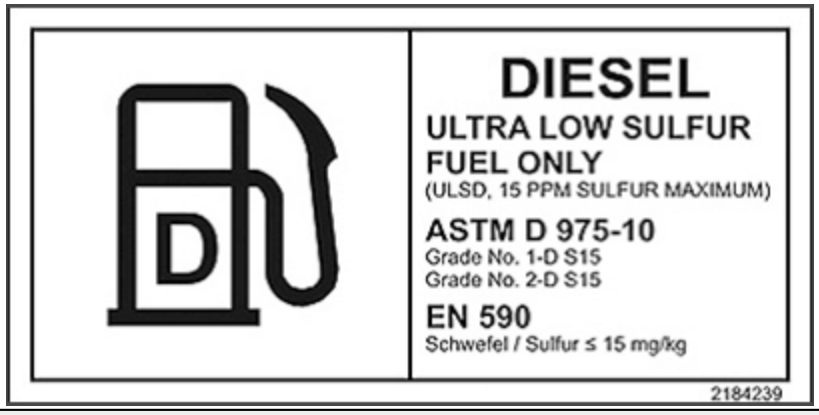


Figure 5-16 Use only approved fuel!

NOTICE

- **Use of fuel supplements is prohibited**
- **Always Refuel the machine with sulfur free fuel according to EN 590 or ASTM 975-10 grade No. 1 or 2 -S15, containing less than 15 mg/Kg sulfur.**

- Warranty is void in case non-compliant fuel is used.
- Non-approved fuels cannot guarantee compliance to European or US emission regulations.
- Fill up with clean fuel only!
- Refuel with caution and avoid spilling.

Ensure the tank cap is properly closed after refueling.

⚠ Keep an eye on the fuel level: never let the engine completely run out of fuel!

Observe the fuel level and refuel the machine timely before the tank gets empty.

Otherwise, deaeration of the fuel system may become necessary prior to next engine’s start.

To avoid condensation of water within the fuel tank, make sure to park the machine while fuel is remaining in the tank.

Do not fill up fuel tank above the lower edge of the filler neck.

⚠ Use winter fuel as soon temperatures may approach the freezing point (0°C/32°F).

In case temperature falls far below freezing point (i. e. arctic regions), use fuels approved for arctic regions.

Chapter 6 Maintenance

6.1 General hints and overall safety

DANGER

Beware of maintenance risks and hazards!

- **Maintenance of the machine may lead to potential hazards for , co-workers and bystanders, to possible death casualties and/or damage to property.**
- **For every maintenance step noticed in this Section 6 – obey the rules and recommendations to prevent serious injuries and accidents!**
- **Attention! Not respecting the basic rules presented hereafter–serious injuries or deaths and/or significant property damage may result!**

6.1.1 Safety during maintenance

WARNING

Respect the rules and recommendations!
Maintenance may cause risk and hazards!

- **Take all precautions in order to prevent hazards for s and bystanders, which may lead to serious and even to death casualties.**
- **Attention! Not respecting the basic rules noted hereafter in this Section 6 serious injuries or deaths and/or significant property damage may result!**

⚠ ***To avoid any accident:***

Be sure to remember the maintenance regulations before you start working.

Keep your workplace clean and dry.

Do not lubricate or maintain the machine while moving.

Avoid body limbs contact, or clothes getting sucked in, rotating parts.

Before starting maintenance:

Park the machine on flat ground.

Run the engine for 5 minutes at low speed and empty load.

Stop the engine, turn off electric power and remove the key from the switch

Set a warning sign of “No Operate” on control lever.

Let the engine cool down.

⚠ ***If the inspection or maintenance is to be carried out while the engine is running, at least 2 persons should be appointed to carry it out.*** *One person should stand in front of the turntable or platform control panel to stop the engine if necessary and to ensure that others can inspect or maintain the machine.Maintenance persons should maintain close communication to ensure the mission is completed safely.*

Be aware of moving or falling parts and objects

Check the parts at regular intervals and repair or replace them according to the needs.

Keep all the parts in good working state and install them correctly.

Replace the worn or damaged parts in time, and remove any accumulated grease, oil or scrap.

Use non-flammable cleaning oil and do not use fuel, gasoline or other highly flammable substances to clean the parts or surface.

If spilled on any machine parts, or surfaces, clean them instantly.

Disconnect the grounding cable (-pole) of the battery before regulating the electric system or performing any welding on the machine.

Ensure adequate lighting at the workplace. If working below or inside the machine, always use guarded work lights. Otherwise, the bulb may ignite any of the flammable liquids (fuel, engine oil, anti-freezing or washing fluid) it contact or in case it breaks.

Protection against flying debris, particles or parts

⚠ ***Avoid flying parts:***

Flying debris, particles or parts can cause severe injuries!

Use the safety goggles or safety glasses to avoid injuries due to flying particles, fragments or debris of any material.

Prevent others from entering the working place in case of hazard of flying objects.

⚠ ***During the maintenance process:***

Warn the others that any unexpected machine movement may cause severe injuries and hang up the warning plate “No Operate” on the control joystick before maintaining the machine.

⚠ ***Support machine parts in a safe manner:***

Always secure the affected machine parts safely before starting maintenance or repairs on them.

Always lower the equipment to the ground before maintaining and repairing the machine.

Do not use slag bricks, cord tires or racks to secure the machine parts that need maintenance or repairs. Those may topple or even break under the parts’ steady load.

Do not work below machine parts secured with a single jack.

⚠ ***Keep away from rotating parts:***

- The entrapment of limbs within rotating parts causes severe injuries.
- In case of working next to rotating parts, do not let your limbs, clothes or hair get sucked-in by the rotation.

⚠ ***Pressure hazards with the reducer:***

- The gear oil is hot. Avoid contact to prevent burns or scalds.
- After cooling the gear oil, loosen the air bleed plug gradually to release the pressure.

⚠ Pay attention to hot fluids

Avoid burns caused by sprayed high-temperature fluid. After the operation, the engine’s cooling water is hot and pressurized. There is hot water or steam inside the engine or the , too. If the skin contacts the spilled hot water or steam, the severe skin burns will be caused.

⚠ ***Prevent burns from hot water.*** - Do not open the cover of before the engine has cooled down. When opening the cover, turn the cover to bottom slowly, and remove the cover after the pressure is completely released.

	• High-temperature fluid and surface. During the operation, engine oil, gear oil and hydraulic oil may become hot; engine, hose, pipe and other parts will also become hot. • After the oil and parts cooled, start to check or maintain them.
⚠ Periodic replacement of rubber hose	
	• Machinery directive and local regulations require regular exchange of rubber hoses! Refer to Section 6.4. • Due to aging, fatigue and wear, the rubber hose containing flammable fluid may be broken under the pressure. It’s difficult to judge the poorness of rubber hose due to its ageing and wear and replace the rubber hose at regular intervals. • Irregular replacement of rubber hose may cause the fire, the injection of fluid into skin or the knock of working device to persons around it will cause severe heat injury, dermal gangrene, other injuries or death.
⚠ Be careful about high pressure oil.	
	If the fuel, hydraulic oil or other fluids injected under high pressure can penetrate the skin or rip into the eyes, it will cause severe injury, blindness or death. • Release the pressure before removing the hydraulic or other pipes to avoid this risk. • Fasten all connections before repressurizing. • Use cardboard to find leaks, and protect your hands and body from high-pressure liquids. Wear the face mask or safety goggles to protect your eyes. • In case of any accident, let the doctor who’s familiar with this type of wound cure immediately. • Any fluid injected into skin must be removed through surgery within several hours, otherwise the dermal gangrene will be caused.
Correct treatment of **discards**	
	• Any improper treatment of discards will harm the environment and ecology, and the potential harmful discards include hydraulic oil, fuel, engine oil, coolant, filter and battery, etc. – When discharging the fluid, use the leak-proof container. – Do not use the food or drink vessel, because it may cause the wrong drinking. – Do not pour the waste liquid on the ground, into sewerage or any water source. Inquire the correct recovering or treatment methods of discards from local environmental protection or recovery center or your assigned .

NOTICE

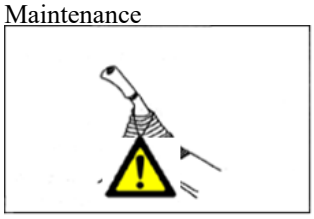
- **Regularly maintain the machine for normal operation and safety!**
- **Regular maintenance is the essential for the expected machine function and safety!**
- **Use recommended oil products, greases and anti-freeze fluid only.**
- **Any use of incorrect oil in the grease may lead to machine damage!**
- **Use original service parts only when required!**
- **Not respecting the maintenance, schedules and steps presented hereafter- can reduce the machine lifetime, may lead to machine damage and loss of the product warranty!**

6.1.2 Pre-start inspection

⚠WARNING

Beware of risks and hazards at start!

- **Starting machine may lead to hazards for operator and bystanders, and finally to death casualties and/or damage to property.**
- **Always place "No Operation" warning label clearly visible on the one of the working joysticks to warn that someone is maintaining the MEWP.**
- **or joysticks operation during maintenance may cause serious personal or damage to the machine.**
- **Attention! Not respecting the basic rules presented hereafter , serious or deaths and/or significant property damage may result!**

⚠ Warning label for Maintenance 	When the warning sign is not in use, put it in the tool box.
	⚠ Keeping the work area clean and tidy • Do not scatter the hammer or other tools in the work area. • Wipe off all slippery grease, oil or other substances. Keep the work area clean and tidy, so as to secure the working process. • If the work area is not kept clean and tidy, persons may stumble, slip or drop, and cause injury. • There are several special safety labels on the machine, • Please get familiar with all these safety labels. • Ensure that you can see and understand all the safety labels clearly. • If the words of a safety label are unclear, clean the label or replace it. • If the illustrations of a safety label are unclear, replace them. • Clean the safety labels with soft cloth, water and soap. • Do not clean safety labels with solvents, gasoline or caustic chemical agents. Labels could be not readable or destroyed. • If any safety label is damaged or lost, it must be replaced immediately. • If the part to be replaced wear a safety label, ensure that the part to be replaced with also has the safety label on itself. ⚠ ***When working with others, appoint a conductor!*** • When repairing the machine or when disassembling or installing components, a conductor should be appointed and follow his command during the operation. • When working together, persons that not familiar may cause serious accidents.

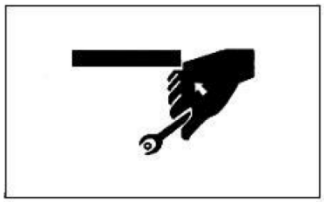
⚠ Shut off the engine before maintenance

- The machine should be stopped on solid and flat ground.
- The place without fallen stones, collapses or is of no danger of being submerged should be chosen.
- Lower the boom completely and shut off the engine.
- Put stopper blocks under the wheels in order to prevent the machine moving.

⚠ When the engine is running, two persons carry out the maintenance

- To prevent injury, do not carry out the maintenance when the engine is running. If the maintenance must be carried out when the engine is running, operate it with at least two people, and follow the rules below:
- One staff shall stand in front of the turntable or platform , so as to stop the engine at any time if necessary.
- When operating near the fan, the fan belt or other rotating parts, the must pay special attention to prevent being coiled.
- Prohibit touching any operating lever. If necessary, the needs to send signals to other people to warn them to move to a safe place.
- It is forbidden to drop or insert tools or other objects into the fan or fan belt, otherwise the parts may break or fly out.

Suitable tools

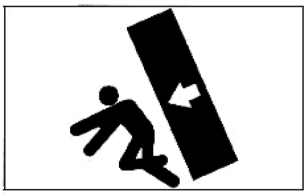


- Proper use of suitable tools, such as the use of damaged, inferior, defective, temporary tools or unsuitable tools may cause serious personal .

⚠WARNING

- **Beware of risk and hazards from maintenance.**
- **Only trained personnel is allowed to maintain or to repair the .**
- **Appoint an observer if necessary**
- **Attention! Not respecting the basic rules presented hereafter−serious or even deaths and/or significant property damage may result!**

⚠ *Follow the safety instructions:*

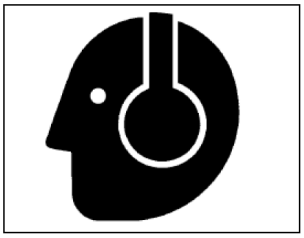


⚠ Accessories:

- Before removing or installing the accessories, a conductor will be appointed.
- The accessories which are removed from the should be put in a stable place where the accessories do not fall. Measures should be taken to prevent unauthorized persons from entering storage area.

⚠ *Working under the work platform of MEWP*

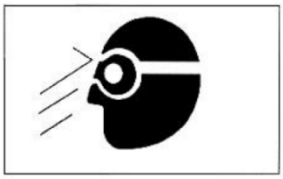
- If you need to carry out maintenance under the machine or working equipment, firmly support the working equipment and machine with pads and brackets strong enough to support the weight of the working equipment and machine.
- If the wheel leaves the ground, the machine is only supported by the working equipment; if the control levers or hydraulic pipes are accidentally touched, the equipment or the machine may suddenly fall. If the pads or the frames are not used to support the machines, working under the machine is prohibited.



⚠ *Noise:*

- If the noise of the machine is too loud, temporary or permanent hearing problems can be caused.
- When persons maintain the engine and suffer the noise for a long time, ear covers or earplugs should be worn.

⚠ Safety instructions for using the hammer



⚠ When using the hammer, pins may fly out, metal particles may scatter, the serious damage can be caused, and then, the following steps need to be followed:

- If the hammer is used to strike hard metal parts, such as pins, , blade or bearings, fragments may scatter and cause harm, and therefore, goggles and gloves should be worn during operating.
- When striking the pins the fragments may fly out, ensure there are no people around to avoid personnel .
- If struck strongly, the pins may fly out and cause injury to surrounding people.

⚠ *Welding operation:*

Only the proper device can be used, and the operation shall be performed by qualified welders.

⚠ *Removing the battery terminals:*

When repairing electrical systems or welding, the terminals of the battery negative electrode (-) will be dismantled

⚠ *Checking the machine:*

- To avoid injury, carry out a patrol inspection around the machine before starting it per day or per shift.
- Inspect around the machine according to the chapter “inspection before starting” of this instruction manual.

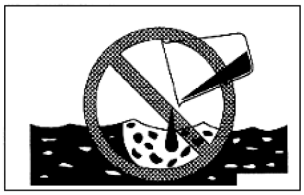
⚠ Relevant safety rules for high-pressure hydraulic system:

There is always pressure inside the hydraulic system; check the pressure of hydraulic oil pipe for release when checking or replacing pipes or hoses. If the oil pipe is still under pressure, it may result in serious injury or damage; therefore, the following rules should be followed:

- When the hydraulic system has the pressure, do not check or replace before the pressure is released.
- If the surrounding area of the pipes or the hoses is wet, checked pipes or hoses for fracture and check the hoses for inflation.
- When checking, wear goggles and leather gloves.
- The high-pressure oil which leaks from small orifices can penetrate skin and may cause blindness if contact eyes directly. If skin or eyes contacted with the high-pressure oil were injured, skin or eyes should be flushed by clean water and go to hospital for treatment immediately.

⚠ *Safe operation of high-pressure hose*

- If the hose leaks, it may cause fire or faulty operation, resulting in serious or damage.
- If the bolt looseness is found, stop operations and fasten the bolts to the specified tightening torque. If there is any damage to the hose, stop the operation immediately, and contact with the dealer of XCMG.
- If there is any of the following problems, replace the hose:
  - Damage or leakage of hydraulic pipe connection.
  - Cladding frayed or disconnected, and or strengthening layer wire exposed.
  - Cladding expands in some places.
  - Movable parts distorted or crushed.
  - Impurities inside cladding.



⚠ *Waste*

To prevent pollution, attention should be paid to the treatment of waste:

- Discharge the oil from the machine into the container; do not discharge it directly to the ground, or into the sewers, rivers, oceans or lakes. When dealing with hazardous materials, such as engine oil, fuel oil, cooling fluid, solvents, filter and batteries, it is necessary to comply with the laws and regulations.
- According to the requirements of laws and regulations, the whole machine, parts and accessories that need to be disposed of must be properly handled in accordance with laws and regulations.

⚠ *Compressed air*

- When cleaning with compressed air, it may be caused by flying particles causing personal injury or machine damage.
- When using compressed air to clean the filter element or , wear goggles, dust masks, gloves and other protective equipment.

6.1.3 Installation of accessories and other safety instructions

⚠ DANGER

- **Beware of risks and hazards when operating machine**
- **Installation of different accessories and optional parts are related to different hazards for himself, co-workers and bystanders**
- **that may end with accidents, injuries or death.**
- **Be careful! Not respecting the basic rules presented hereafter – serious injuries or deaths and/or significant property damage may result!**

NOTICE

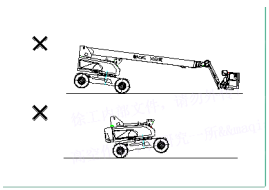
- **Always use approved accessory or equipment**
  Contact XCMG distributor in advance
- **When installing and using the accessories, combine the operating accessories according to the Instruction Manual of the accessories and the general instruction about the accessories in this .**

⚠ *Installation for the accessories and other safety instructions*

When installing the optional parts or accessories, please contact the **XCMG** in advance.

Any injury, accident or product fault caused by using the accessories or parts without approval from **XCMG** will be unrelated with our company.

⚠ *Removal of boom and counterweights*



⚠ **Removal of counterweights or boom or any other component from the machine will affect its stability and this will result in its sudden move causing serious injury and death.**

– You can remove counterweights or boom only when the top structure and the bottom structure are disposed of in the same direction.

Once counterweights or front-end equipment is removed, do not rotate the top structure

Work site inspection

Before operating, check the work area thoroughly for dangers.

- When operating near the flammable materials (cottage roof, dry leaves or grasses) stored, it is possible to cause a fire, so it is necessary to be careful during operating.
- Check the ground situation in the workplace and finalize the safest operation method. It is forbidden to operate in the place with collapses or falling stones.
- If there are water pipes, gas pipes or high voltage electrical wires buried under the workplace, please contact the related companies and mark their positions, note: do not break or damage any pipe and wire.
- It is forbidden for any unauthorized person to enter the working area, some necessary warning measures should be taken.
- Before moving or operating in the shallow water or on the soft ground, check the types and situation of the sill and the depth and the flow rate of the water.

6.2 Lubrication of machine

6.2.1 General precautions

WARNING

Beware of risks and hazards of machine maintenance

- **Prior and during maintenance, respect the rules and take all precautions in order to prevent hazards for operator himself, co-workers and bystanders that may lead to serious injuries and even to death casualties.**
- **Before any maintenance, read carefully the related content in this .**
- **The s of the MEWP need to carry out the maintenance according to the area or local regulations!**
- **For extensive maintenance or/and repair involve trained and qualified service personnel!**
- **Ensure good ventilation condition if diesel engines is operated indoors**
- **Be careful! Not respecting the basic rules presented hereafter for this Section 5−serious injuries or deaths and/or significant property damage may result!**

NOTICE

Provide regular lubrication!

- **Regular maintenance is the essential for the expected machine safety!**
- **Regular maintenance keeps your machine functioning and safe!**
- **Use recommended quality lubricants.**
- **Do not mix oil quality from different manufacturers.**
- **Select only the oil suppliers which oil qualities always meet or exceed the required standards**
- **Excessive lubricant or grease may lead to overheating and even speed up the abrasion.**
- **Use special lubricant when working in specially high/low temperature regions.**
- **Use good judgment in selecting lubricant types that are appropriate for climate conditions.**
- **Contact MEWP , agent or XCMG after-sales department.**
- **Not respecting the maintenance schedules and steps presented hereafter−can reduce the machine lifetime and may lead to machine damage!**

⚠ Correct procedures of maintenance and check

In order to maintain and repair the machine correctly, follow the correct maintenance and check procedures described in this .

For diesel engine refer to of diesel engine included in the documents along with the MEWP (besides this).

⚠ ***Make and save the record of the maintenance or repair of this machine!***

- Maintain and ensure MEWP normal function.
- Keep the machine clean in order to spot failure such as leakage, looseness of screw or connection.
- Pay attention to the environmental protection!
- Do not spill the oil and other fluids to pollute the environment.
- Dispose the waste according to the local laws and regulations.

⚠ ***The content of this chapter includes items related to regular check, maintenance and repair***

⚠ ***Extensive maintenance or repair is subject of separate instruction for maintenance or repair***

⚠ ***Regular daily checks***

- Check the levels of coolant, fuel and hydraulic oil.
- Check the hoses and pipes for leaks, twists, wears or damages.
- Check the controller and instruments.
- Make a patrol inspection of common conditions, noises or heat around the machine.
- Check the part for looseness or missing.
- If anything is wrong with the machine, repair it before the operation, or contact with your assigned XCMG .

⚠ **Check the hour meter frequently**

- Determine the time of machine check and maintenance according to the operating hours shown by the engine working hour meter.
- The intervals shown in List of Maintenance Periods are determined as per the normal operation and maintain the machine in shorter interval in case of running the machine under the bad conditions.
- Make a periodic check and adjustment of lubrication or maintenance as per the readings of periodic maintenance meter on the inner side of tool-box cover.
- When the hours of hourmeter reach the replacement time of recommended lubricant and filter element, or during the periodic check every day or every month, replace the lubricant and filter element.

Important:

- Always use oil products, grease and anti-freeze fluid recommended in this !
  Otherwise the machine can be damaged and the warranty of this machine will be lost.
- Ask your XCMG or for approval if some products are not available.

6.2.2 New machine

Table 6-1 New machine used and refilled with the following lubricants.

Item	Specification
Engine oil (API CJ4/CK4)	SAE 15W/40
Hydraulic oil	ISO VG 46
Fuel oil	ASTM D975 No.2
Lubrication oil	NLGI No.2
Coolant antifreeze	FD-28 (distilled water)
Gear oil	L-CKD220

Description:

SAE: Society of Automotive Engineers
API: American Petroleum Institute
ISO: International Organization for Standardization
NLGI: National Lubricating Grease Institute
ASTM: American Society of Testing and Material
*** Engine oil must meet API CH4/CI4**
*** Hydraulic oil change interval is 2,000 hours, only when XCMG Genuine Oil is used. If other brand of oil is used, guaranteed change interval is 1,000 hours.
**** Diesel fuel must be ultra low sulphur diesel. Sulfur content ≤15 ppm.

6.2.3 Recommended oils

Table 6-2 Use listed below or equivalent only. Do not mix different brand oils.

Service point	Kind of fluid	Capacity /(imperial gal)	Ambient temperature ℃ / °F -50 -30 -20 -10 0 10 20 30 40 -58 -22 -4 14 32 50 68 86 104
Engine oi l	* Engine oil	7 (1.6)	SAE 5W-40 NLGI 10W-30 SAE 15W-40
Travel reducer	Gear oil	2.5×2(0. 6×2)	SAE 90 L-CKD220
Hydrauli c oil tank	*** Hydraulic oil	Tank: 129 (34) System: 80/(21)	ISO VG 32 ISO VG 46 ISO VG 68
Fuel tank	**** Diesel fuel	40 (180/(47)	-10# 0#
Grease fitting	Greas e	As required	NLGI No.1 NLGI No.2
Cooling system	Coola nt	15 (3.5)	Add antifreeze (50% antifreeze-50% distilled water)

6.2.4 Grease qualities

Table 6-3 Oil and grease-qualities and quantities

Lubricant varieties	Brand	Purpose	Capacity (Lit.)	Remark
Lubrication oil	Mobilux grease EP2 NLGI 2	. Pin shaft of equipment	0.3	-20～40℃
		raceway	11	
			2×0.11	
Engine oil	CF 15W/40 oil	Diesel engine	7	-10℃
	CF 10W/30 oil	Diesel engine	7	-20～-10℃
	CF 5W/40 oil	Diesel engine	7	-30～-20℃
	L-CKD220		2×2.5	
			1	

6.2.5 Critical lubrication points

Table 6-4 Lubrication points

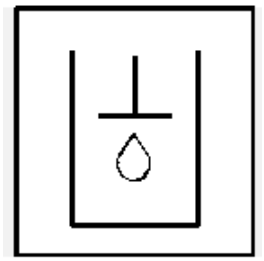
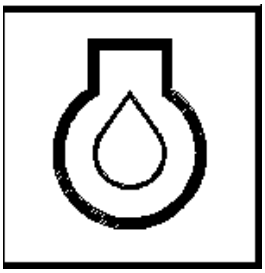
Symbol	Name	Specification	Purpose
	Grease	Mobilux grease EP2 NLGI 2	For slewing bearing raceway and slewing bearing
	Hydraulic oil	Comply with DIN51524 as the minimum requirement	Typical ambient operation temperature -10℃～+40℃
	Engine oil	In summer: 15W/40 In winter: 15W/30 or APICH4/CI4 (Lubrication oil for heavy duty Water-cooled diesel engine)	Typical ambient operation temperature -10℃～+40℃

Table 6-4 Lubrication points(continued)

Symbol	Name	Specification	Purpose
	Fuel oil	Sulfur free diesel according to EN 590	
		0 # diesel oil	＞0℃
		-10 # diesel oil	＜0℃
	Coolant antifreeze	FD-2B	Ambient temperature ＞ -36℃

6.2.6 Periodic maintenance

Overview of the minimum required maintenances shown in hereafter

1. Daily maintenance: Maintenance of MEWP before and after work everyday.
2. First 50-hour maintenance: Maintenance of MEWP after initial operation for 50 hours.
3. Maintenance every 50 hours: Maintenance of MEWP after 50 hours operation.
4. Maintenance every 250 hours: Maintenance of MEWP after 250 hours operation.
5. Maintenance every 500 hours: Maintenance of MEWP after 1000 hours operation.
6. Maintenance every 1000 hours: Maintenance of MEWP after 1000 hours operation.

Overview:

Check frame, boom and slewing bearing connection every 1000 hours and at least once a year. The checking works shall be fulfilled by our trained professionals. Check content: Check conditions of all welds and hinge points of frame and boom; Check slewing bearing connection for looseness and luffing cylinder for oil leakage.

Table 6-5 Scheduled service intervals

Maintenance Items	Regular Service Interval					
	Daily	First week	Weekly	Monthly	Semi-annual	Annual
	8h	First 50 h	50 h	250 h	500 h	1000 h
Visual Inspection	●					

Table 6-5 Scheduled service intervals(continued)

Maintenance Items	Regular Service Interval					
	Daily	First week	Weekly	Monthly	Semi-annual	Annual
	8h	First 50 h	50 h	250 h	500 h	1000 h
Check and drain	●					
Check coolant level	●					
Check engine oil level	●					
Check fuel level	●					
Check/clean engines air filter	●					
Check auxiliary platform locking mechanism (if equipped)	●					
Check platform	●					
Inspection	●					
Check battery charger	●					
		●				
Replace engine oil filter		●				
Replace fuel filter		●				
Replace the fuel prefilter		●				
filter		●				
Check the bolt pre-tightening force of slewing bearing, tighten if necessary		●				

Table 6-5 Scheduled service intervals(continued)

Maintenance Items	Regular Service Interval					
	Daily	First week	Weekly	Monthly	Semi-annual	Annual
	8h	First 50 h	50 h	250 h	500 h	1000 h
Clean the inside of the reducer and brake, and replace the oil		●				
Perform E-stop test on platform			●			
Check for loose parts, bolts, etc. tighten if necessary			●			
Check the safety belt anchoring point			●			
Lubrication of the slewing bearing			●			
Parking brake test				●		
Check battery				●		
Replace engine oil				●		
Replace engine oil filter				●		
Check engine V-belts				●		
Check engine air-inlet pipes				●		
Check and clean				●		
Check and replace damping elements as required					●	

Table 6-5 Scheduled service intervals(continued)

Maintenance Items	Regular Service Interval					
	Daily	First week	Weekly	Monthly	Semi-annual	Annual
	8h	First 50 h	50 h	250 h	500 h	1000 h
Replace fuel filter cartridge					●	
Check fuel tank, clean if required					●	
Replacing the V-Belt					●	
Replace hydraulic filter cartridges					●	
Check the bolt pre-tightening force of , tighten if necessary					●	
Check engine valves clearance						●
Check engine installation						●
Change hydraulic oil filter						●

6.3 Maintenance schedules

6.3.1 Lubrication schedule and lubrication progress label

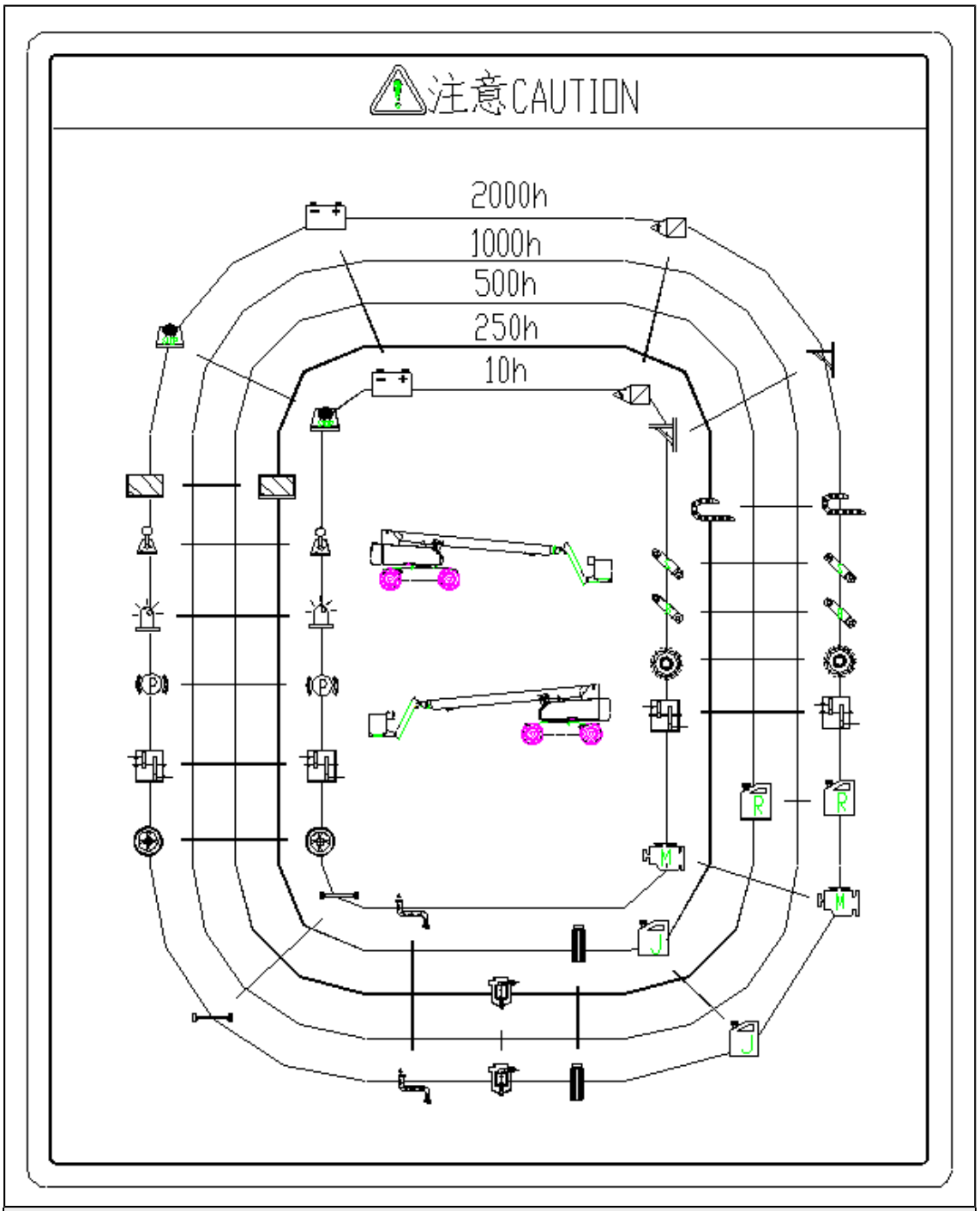


Figure 6-1 Maintenance chart decal on the machine

NOTICE

Regular maintenance intervals or engine lubrication oil shall be performed/renewed every 12 months, even in case operating hours interval have not been achieved.

6.3.2 Operator maintenance checklist

Table 6-6 Check items

⚠ Check items		Service	Maintenance intervals
Walk-around inspection		Inspection	Daily
Hydraulic oil level		Check, add	Daily
and indicator lights		check, add	Daily
s and pipes	Leak or crack	check, clean and tighten	Daily
	Crack or bend, etc.	Check, replace	250 h
Fuel level		check, refill	Daily
Engine oil level		check, add	Daily
		drain	Daily
Oil tank		drain	Daily
Fuel hoses and air intake hoses	Leak or crack	check, clean, and tighten	Daily
	Crack or bend, etc.	Check, replace	250 h
Coolant level		Inspection	Daily
Coolant antifreeze, coolant and oil cooler core or intercooler		check, clean, and tighten	200 h
Front mesh enclosure of oil cooler (if equipped)		check, add	500 h
Fan belt tension and damage		Check and adjust	Daily
Air cleaner (outer, inter)		check, clean, and tighten	250 h
Cylinder head bolt		check, refill	Daily
Electrical equipment		Inspection	Daily
Battery		Inspection	50 h
Lubricate the front-end attachments	raceway	Check, grease	100 h
		Grease	250 h
		Check, grease	500 h
		Check, setting	Daily

6.4 Specific maintenance instructions

6.4.1 Hydraulic system

6.4.1.1 Checking hydraulic oil level and temperature in tank

Figure 6-2 Indicator for hydraulic level and temperature inside the hydraulic tank

6.4.1.2 Hydraulic oil filling requirement

The machine is ex-works filled with AE46 mineral oil.

Always comply with maintenance requirements on hydraulic oil accurately to avoid machine damages. Only use clean oil for refill to avoid contamination of the hydraulic tank.

⚠WARNING

- **Low viscosity of hydraulic oil is not recommended!**
- **Hydraulic oil with too high viscosity may delay application or release of parking brake.**

NOTICE

- **Use of other than recommended mineral oils is prohibited.**
- **Use of biological hydraulic oils is prohibited.**
- **Contamination of hydraulic oil voids warranty.**
- **Using hydraulic oil with too low viscosity may cause overheating due to increased leakage or cavitation. This will reduce viscosity further and lead to extreme losses and finally will lead to the loss of oils lubrication properties.**
- **The hydraulic oil grade is 20/18/15 when leaving the factory.**
- **The hydraulic oil grade is 20/18/15 when leaving the factory. Filter or replace the hydraulic oil if it is subpar. Refer to Table 6-7 for hydraulic oil cleanliness classes.**

Table 6-7 Hydraulic-oil cleanliness classes

Particles per 100ml		Scale
Greater than	Less than or equal to	
8,000,000	16,000,000	24
4,000,000	8,000,000	23
2,000,000	4,000,000	22
1,000,000	2,000,000	21
500,000	1,000,000	20
250,000	500,000	19
130,000	250,000	18
64000	130,000	17
32000	64000	16
16000	32000	15
8000	16000	14
4000	8000	13
2000	4000	12
1000	2000	11
500	1000	10
250	500	9
130	250	8
64	130	7
32	64	6

20 / **18** / **15**
> 4 µm > 6 µm > 14 µm

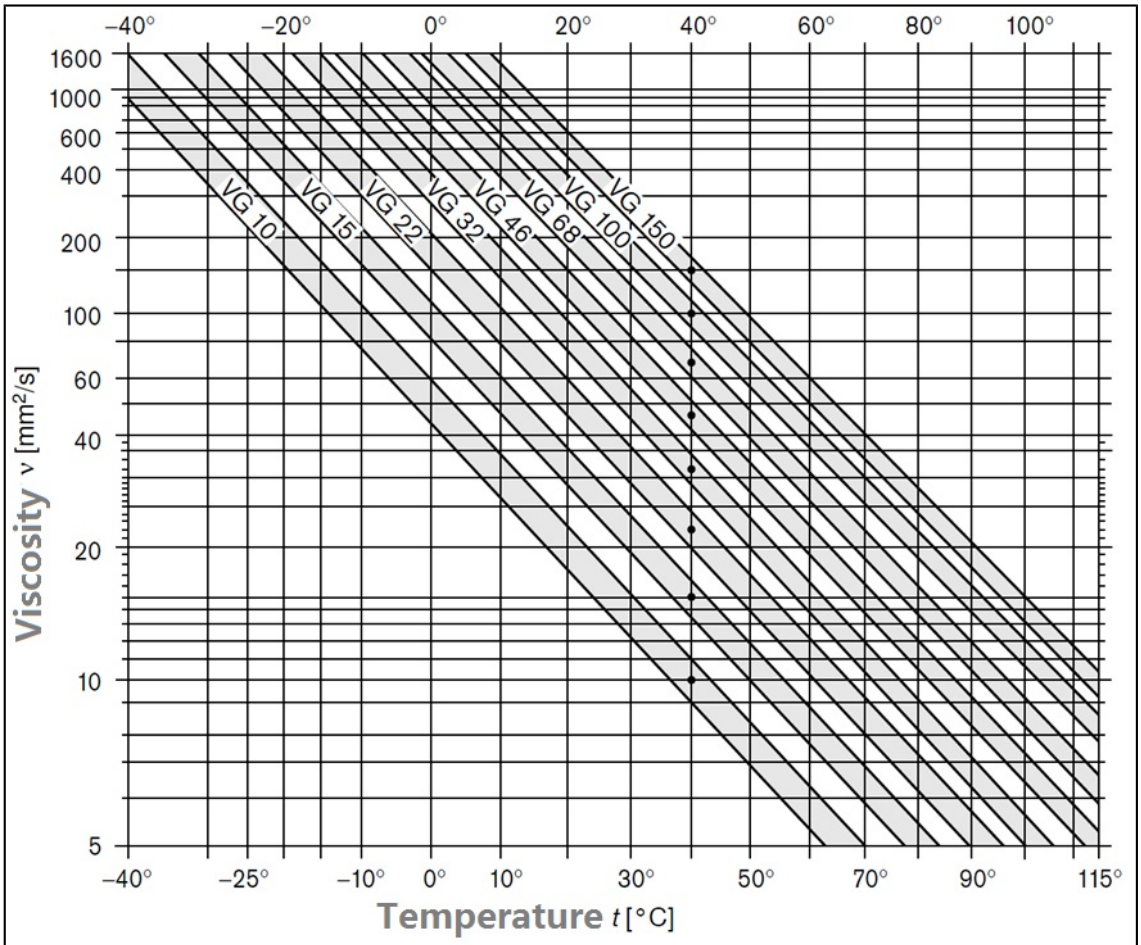


Figure 6-3 Hydraulic-oil viscosity vs temperature charts

6.4.1.3 Refilling the hydraulic oil tank

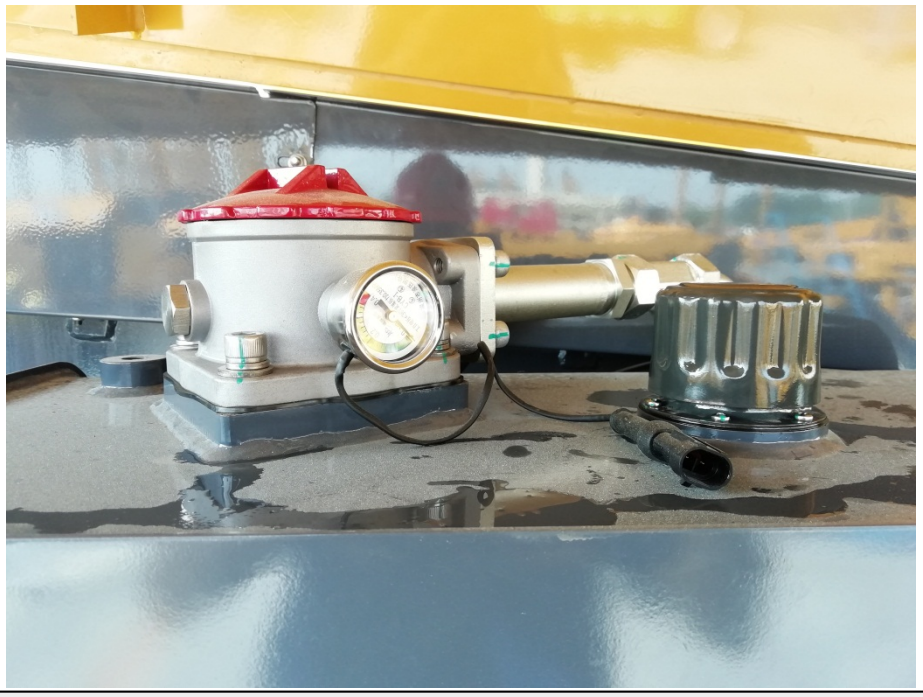


Figure 6-4 Hydraulic oil filler

Refilling the hydraulic oil tank

1. Switch off engine and remove ignition key.
2. Enable hydraulic oil to cool down if necessary.
3. Open the air filter cover on the upper plane of oil tank.
4. Remove the gasket of oil filter.
5. Replace the oil filter element.
6. Fill the hydraulic of the same grade through the air filter strainer.
7. Reinstall the oil filter component.

The hydraulic tank is located at the machine’s front left side, below the guard board.

Do not fill above the maximum indication line.

Use only approved hydraulic oils

Make sure the port does not leak.

NOTICE

- **Fill hydraulic oil through a special filter. Do not fill the new oil into hydraulic tank directly.**
- **When , it is recommended to replace hydraulic oil filter and air filter at the same time.**
- **When exchanging the hydraulic oil, drain the old hydraulic oil in tank and system totally and then fill the new hydraulic oil.**

After a few minutes of deaeration, run the engine at low idle speed for a few minutes and confirm that the oil level in the tank is within limits.

6.4.1.4 Hydraulic oil replacement

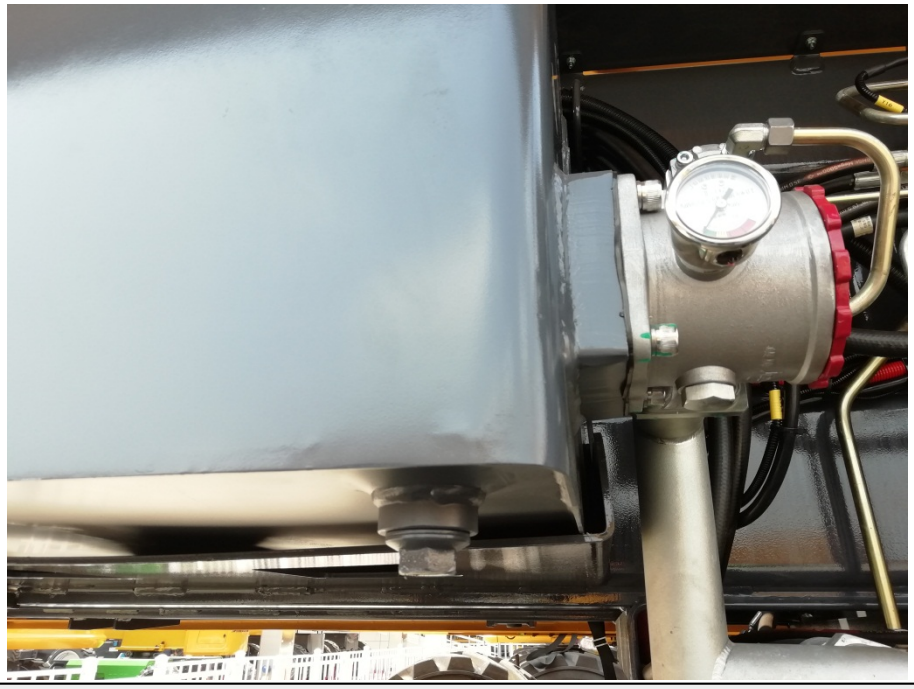


Figure 6-5 Drain valve of hydraulic oil tank

For draining the hydraulic oil tank proceed as follows:

1. Lift the boom to the maximum working height and switch the engine
2. Open the engine hood and let the engine cool down completely.
3. Remove all hoses from the tank and drain as much hydraulic oil from hoses as possible.
4. Put a container under the drain valve
5. Open the drain valve and drain the hydraulic oil
6. Disconnect the return circuit to the oil tank and connect it to other empty container.
7. and operate boom and outrigger (if equipped) to travelling state.
8. Clean or replace the return hose of the oil tank.
9. Connect the return pipe of oil tank, check the oil level, and refill to the required capacity. Restart engine and operate boom and outrigger to travelling state.

NOTICE

- **Let hydraulic oil cool down before maintenance**
- **Recuperate and dispose of all the drained hydraulic oil according to local recycling regulations in your area.**
- **Mark all hoses and joints for reinstallation.**
- **Clean all opening with clean cloth as deep as possible. Remember to clean hidden holes.**
- **Fill oil into oil tank through oil filter.**

6.4.1.5 Hydraulic hoses

⚠WARNING

- **Maintenance of hydraulic lines shall only be carried out by qualified personnel.**
- **Always follow your local rules and regulations regarding permitted hose service life.**

Figure 6-6 Hydraulic hoses at the platform

⚠WARNING

- **Severe gangrene or death due to high pressured oil!**
- **Damaged hydraulic lines will cause high-pressurized oil squirt, penetrating the skin up to the inner tissue layer.**
- **In case of occurrence, call an ambulance immediately.**
- **Risk of fire!**
- **Make sure to prevent all leakage of high-pressured oil into the atmosphere.**

Inspect all lines, pipes, hoses and connections regularly on leakage and any visible damage.

1. Damaged parts must be replaced immediately.
2. Operating machine with potentially damaged hydraulic lines is prohibited.

Figure 6-7 Hose identification

Production date of hose assemblies is stamped on the Hose – DD/MM/YY.

1. Regardless of the wear extent, the hose should be replaced in 6 years after production (i.e. DIN 20066:2018-03, DGUV rule 113-020).
2. Production date of the hoses are stamped on the hose.
3. Use of hoses stored longer than 2 years may be prohibited in your area.

6.4.1.6 Replacing the hydraulic oil filter

Figure 6-8 Hydraulic oil filters

For replacing the hydraulic oil filters proceed as follows:

1. Switch off engine, open engine hood and enable engine and to cool down if necessary.
2. Clean the exposed section of oil filter housing with diesel or other cleaning agents.
3. Place a container under the oil filter to recycle the oil from oil filter housing.
4. 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.
5. When unscrew or screw the end cap of oil filter, only insert a wrench into the slot in the middle of the oil filter end cover and pull, as shown in **Figure 6-9**.

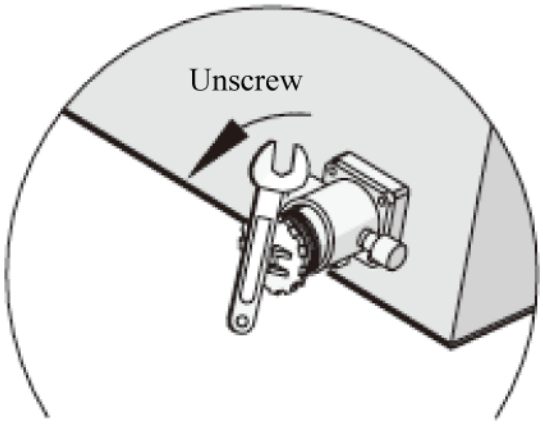


Figure 6-9 Unscrew the hydraulic filter end cap

6. Pull the filter element out and dispose properly.

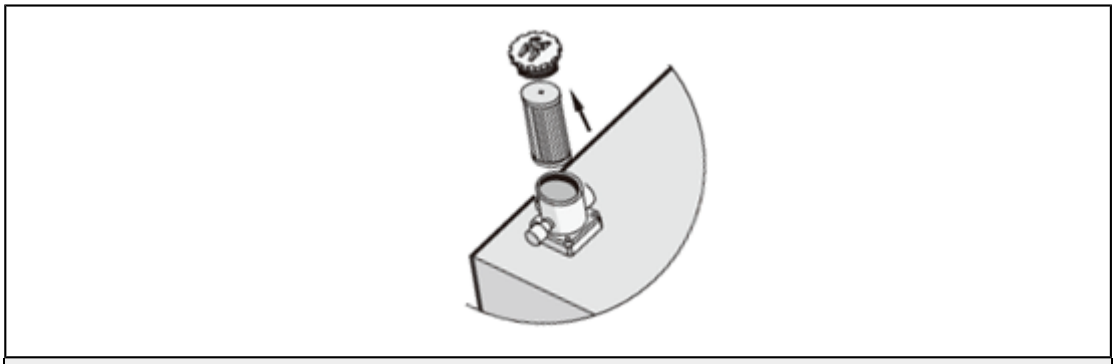


Figure 6-10 Pull out the filter element

7. 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 gauge is higher than 0.018 MPa), only replace with new filter. The filter element shall be only replaced with the spare parts supplied by our company.
8. Install the new filter element into the filter housing and then the filter end cap and tighten it.

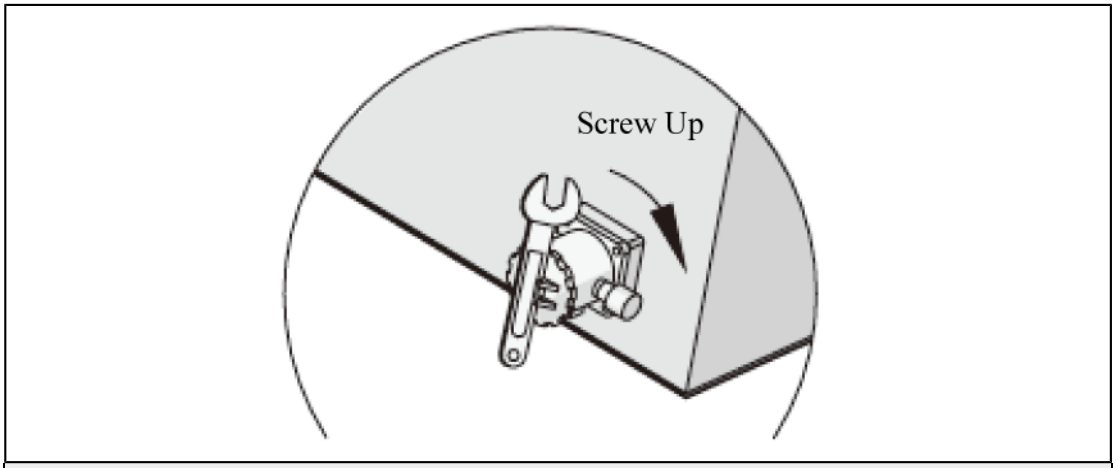


Figure 6-11 Screw the hydraulic filter end cap

The steps to are same as above. After removal, replace the whole filter.

6.4.2 Wire rope inspection

6.4.2.1 Wire rope inspection

The wire rope shall not be reused in case of any following situation:

1. Deformation or corrosion
2. Twisting
3. More than 10% of metal wires are broken on any layer of rope
4. The diameter of any part is reduced by 7% or more in comparison with the rated diameter

5. Heat damage

6.4.2.2 Adjustment of wire rope

The telescoping wire rope would stretch and elongate after long-time use, which will cause improper telescoping of telescoping boom, falloff of wire rope from pulley, vibration of boom section during telescoping and whipping of wire rope on boom. Therefore, it's necessary to periodically check and adjust the tension of wire rope. The assembly diagram of telescoping system is shown in **Figure 6-12**.

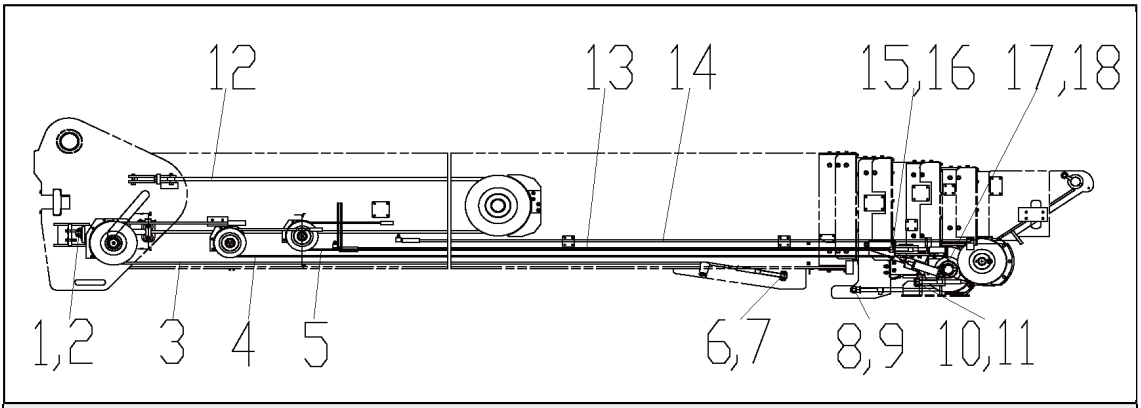


Figure 6-12 Assembly diagram of telescopic system

No	Name	No	Name
1	Locknut for 3rd extension rope	10	Locknut for 5th extension rope
2	Locknut	11	Locknut
3	3rd retraction rope	12	3rd extension rope
4	4th retraction rope	13	4th extension rope
5	5th retraction rope	14	5th extension rope
6	Locknut for 3rd retraction rope	15	Locknut for 5th retraction rope
7	Locknut	16	Locknut
8	Locknut for 4th extension rope	17	Locknut for 4th retraction rope
9	Locknut	18	Locknut

Inspection method:

1. Luff the telescope boom to be horizontal, extend and retract the boom, check if 2nd, 3rd, 4th and 5th boom sections simultaneously start moving accordingly. Adjust the tightness degree of wire rope if the movement of 3rd section boom lags behind 2nd section boom.

2. Luff the telescope boom to horizontal, extend and retract the boom, check the boom during telescoping, if boom shakes or the wire rope beats the boom (with “creak, creak, creak” sound at the beginning of movement), adjust the tightness degree of wire rope;

The detailed adjustment steps are as follows:

1. Luff the boom to be horizontal, loosen No. 1, 6, 8, 15 and 15 locknuts.
2. Extend the boom outward, respectively adjust No. 6, 15 and 17 adjustable nuts at both left and right sides, tension the retraction rope.
3. Retract the boom inward, respectively adjust No. 1, 8 and 10 adjustable nuts at both left and right sides, tension the extension rope.
4. According to the demand, repeat Step 2 and 3, check the boom movement according to the above-mentioned inspection methods, confirm that the rope is properly adjusted, tighten and No. 2, 7, 9, 11, 16 and 18 locknuts. The adjustment of wire rope is completed.

6.4.3 Work platform

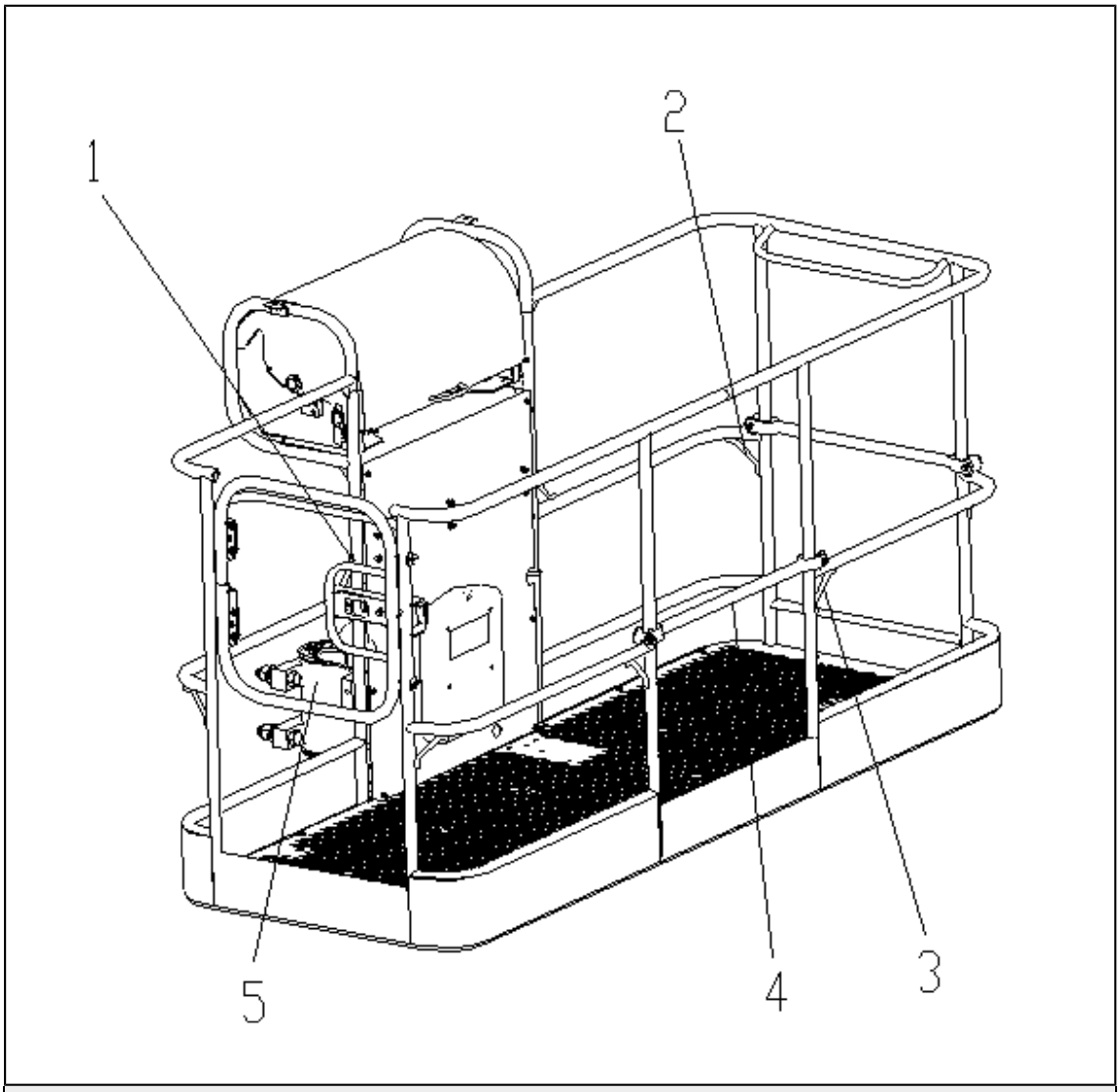


Figure 6-13 Work platform

S/N.	Name	S/N.	Name
1	Safety belt fixing point 1	4	Movable fence
2	Safety belt fixing point 2	5	Work platform swing cylinder
3	Safety belt fixing point 3		

During the vehicle use, the work platform shall be regularly checked and maintained:

- Check whether the slewing cylinder of work platform has oil leakage, and whether the rotation action is flexible and stable.

- Check whether the fixation point of the safety belt is damaged.
- Check whether the moveable guardrail is damaged and check wear conditions of the pulley.
- Check whether the installation state, detection function and precision of the weighing sensor are normal.

6.4.4 Slewing mechanism

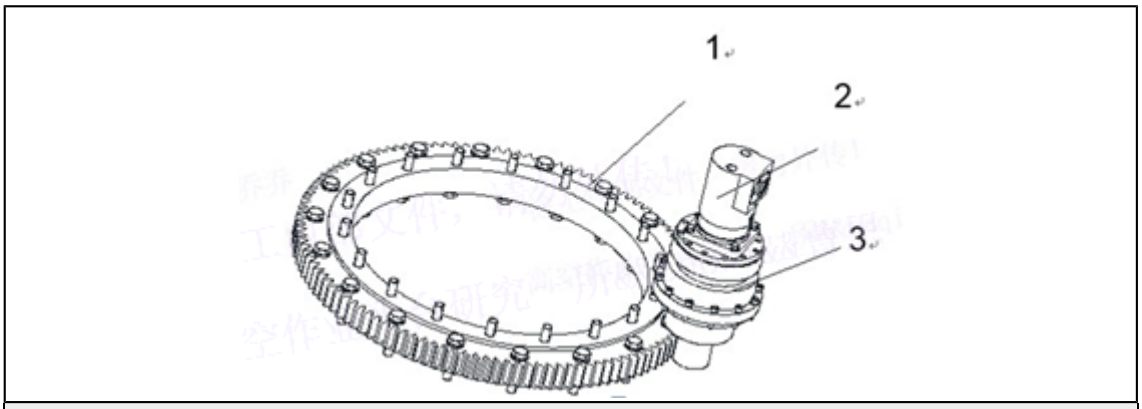


Figure 6-14 Slewing mechanism

S/N.	Name	S/N.	Name
1		3	
2	Slewing motor		

6.4.4.1

The is a kind of gerotor motor, which is the actuator component of the system.

1. 1. Replacement

1) a. Remove the connecting s of the motor; Make marks and properly seal it, and block the motor oil port.

WARNING

When removing the oil pipe, the connector shall be removed and loosened slowly to prevent personal by high pressure hydraulic oil squirt.

2) a. Remove the connecting bolt between the motor and reducer, and remove the motor.

⚠WARNING

- **The is not recommended to remove the hydraulic motor without permission. If the hydraulic motor has problems, please directly contact the nearest XCMG agency.**
- **Please be sure to remember the position of the interfaces and spare parts during removal.**
- **It is forbidden to remove the hydraulic motor with hard tools (hammer, etc.) or by forcible knocking.**
- **The spare parts to be installed in the motor shall be cleaned before installation, and no impurities can be brought into the motor.**
- **When removing the oil pipe, the connector shall be removed and loosened slowly to prevent personal by high pressure hydraulic oil squirt.**

6.4.4.2

1. Inspection and maintenance

1) After initial 500 h operation time (including the intermittent operation), please clean the inside of the reducer and brake with the cleaning solution, and change the oil. Subsequently, after every (2000 ~ 2500) h operation time, please change the oil, or change the oil once every year at least.

⚠WARNING

- **Check whether there are metal chips in the reducer and brake.**
- **It is recommended to change the oil when the oil has not been cooled down, so as to facilitate oil drainage.**
- **Don't use mixed oil. When removing the oil pipe, the connector shall be removed and loosened slowly to prevent personal by high pressure hydraulic oil squirt.**

2) The slewing reducer is equipped with the multi-disc wet brake, and the brake is in a normally closed state. When pressure oil enters the brake, the brake will be started and the mechanism can freely slip. When the parts of the brake have one of the following conditions, the parts shall be replaced or the brake shall be rejected:

①When the input end has oil leakage and oil seal is damaged, the brake oil seal shall be replaced.

②Insufficient brake torque: When the brake torque is reduced or the friction plate has deformation due to serious friction, the friction plate shall be replaced.

2. Gear oil change

Determine the correct position of the oil ports on the reducer and brake.

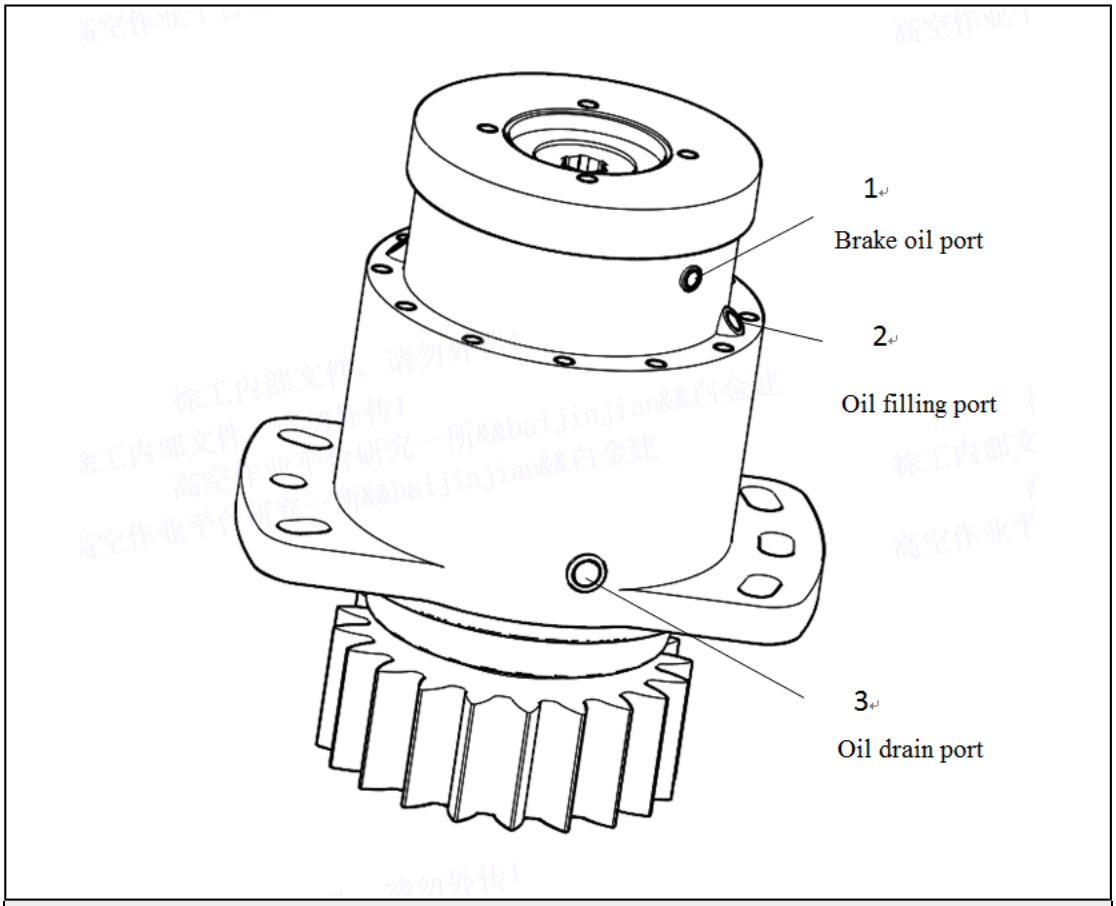


Figure 6-15 Schematic diagram of the position of the oil ports of the reducer

S/N.	Description	S/N.	Description
1	Brake oil port	3	Oil discharge port
2	Oil filling port		

Remove the oil discharge plug and oil filling plug, and drain out oil in the reducer and brake completely.

⚠WARNING

- **Before filling new oil, clean the inside of the slewing reducer and brake with the cleaning solution.**
- **Inject the cleaning solution into the slewing reducer and brake, and install the oil filling plug. After several minutes of high sped operation, completely drain out the cleaning solution.**

⚠WARNING

Use of corrosive cleaning agent or improper lubrication product will change the ester characteristics and damage the slewing trajectory and relevant parts.

6.4.4.3

1. Lubrication of the :

Proper lubrication is a must for the durability of track and gear. The lubrication cycle is determined according to the service condition and the environment, and one lubrication is recommended every 50 h in general case.

⚠WARNING

When the equipment is not used for a long time, the slewing bearing shall be lubricated. The lubrication times shall be increased in the irregular tropical climate affected by temperature as well as sandy or wet areas.

1) Use the grease gun to fill Mobilux grease EP2 NLGI 2 to the slewing bearing raceway from the grease nozzle of the extended lubrication pipe (see the drawing volume of spare parts) of the slewing bearing, until the lubricating grease overflows from the seal and the raceway is full of grease. Lubricate the , and fill the lubricating grease once every 50 h work time generally.

2) In principle, the impurities on the gear surface shall be removed once every 80 h work time, and the surface shall be coated with graphite calcium base lubricating grease. No matter whether oil spraying or brushing is applied, the lubricating grease shall completely cover the pinion and the gear surface with gear ring.

2. Inspection and maintenance

1) After 100 h operation time of the slewing bearing, the bolt pre-tightening force shall be checked. If there is any abnormality, timely fasten the bolt. The bolt tightening torque is as shown in Table 5-2. The bolt shall be checked once after every 500 h operation time and it shall keep enough pre-tightening force. The bolt shall be replaced every 7 years or after 14000 h generally.

2) During use, the shall be avoided from direct sun exposure, and it shall not be washed with water directly. No water can enter the raceway, and no harder impurities can get close to or enter the meshing area.

3) Check the seal soundness of the , and the damaged one shall be timely repaired and replaced.

4) Check the meshing work condition of the . In order to reduce the wear of the pinion and large gear, the meshing clearance between the pinion and large gear shall be adjusted within (0.25~0.4) mm.

6.4.4.4 Gear backlash adjustment of the

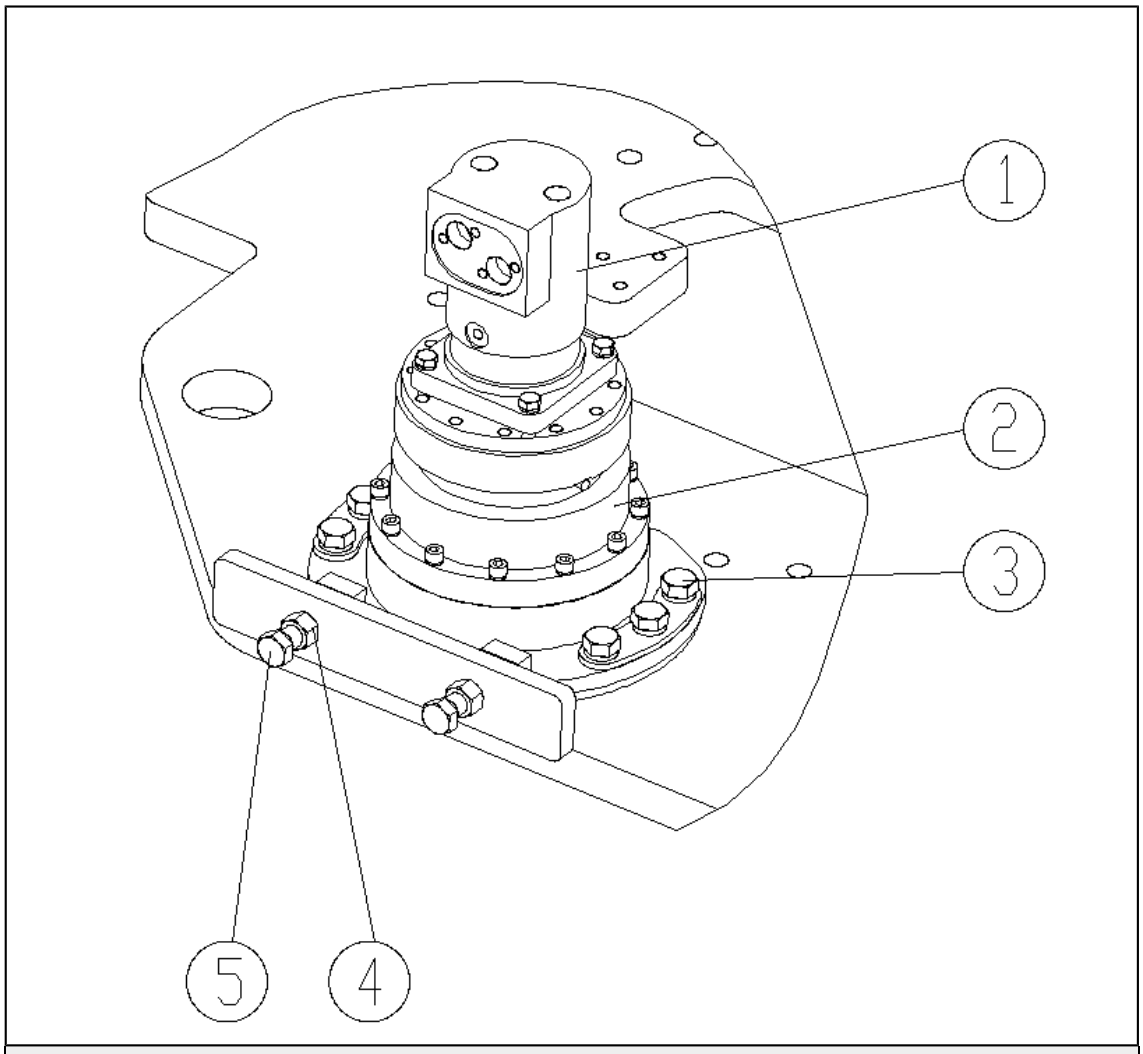


Figure 6-16 Clearance adjustment of the slewing gear

No.	Name	No.	Name	No.	Name
1	Motor	2		3	Mounting bolt
4	Locknut	5	Adjustable bolt		

The adjustment steps are as follows:

1. Loosen the locknut (No. 4), and it is unnecessary to completely screw out the locknut;
2. Loosen the mounting bolt (No. 3), and it is unnecessary to completely screw out the mounting bolt;
3. Adjust the adjustable bolt (No. 5), and measure the backlash between the and with the feeler gauge. Make adjustment and measurement repeatedly until the clearance is between (0.2~0.40) mm;
4. Screw down the mounting bolt (No. 3), with the tightening torque of (540~650) N·m;
5. Press down the adjustable bolt (No. 5), and screw down the locknut (No. 4), with the tightening torque of (119~141) N·m.

6.4.5 Running system

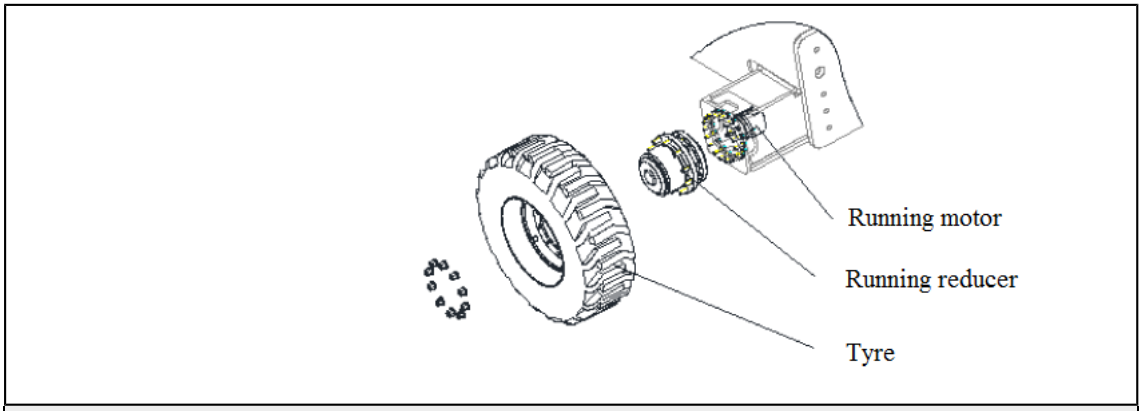


Figure 6-17 Running mechanism

6.4.5.1 Tyre

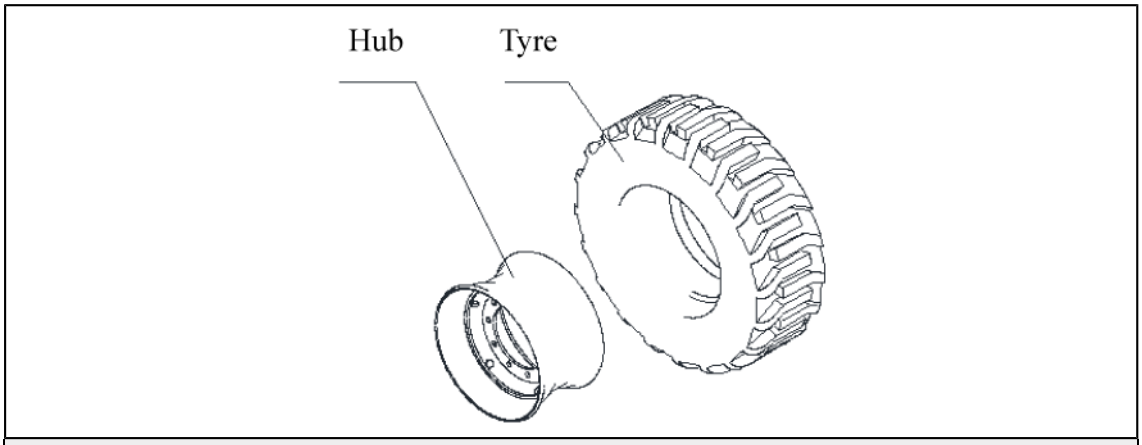


Figure 6-18 Compositions of the wheel

1. Rim checking

   1) Rust conditions of the rim;

   2) Rim bending and deformation conditions;

   3) Whether the rim parts have cracks;

   4) Conditions of the rim spigot, mounting hole, and wheel and rim bolt and nut.

   5) If discovering that the rim has damaged and deformed parts by inspection, they shall be repaired or replaced immediately. In case of paint peeling off, the parts can be repainted after dust removal.

⚠ CAUTION

It is forbidden to weld and repair deformed tyre bolts at the bolt connection. If above problems occur, the old parts shall be replaced by new ones.

2. The following content of the tyre shall be regularly checked:

1) Consistency of types and specification of wheels at two sides of the same axle.

2) The tyre crown tread depth shall not be less than 3.2 mm.

3) The tyre texture shall not be exposed due to local wear of the tyre tread.

4) The tyre tread and wall shall not have the fracture and cutting longer than 25 mm or deep enough to expose the tyre texture and other defect, abnormal wear and deformation affecting the use.

5) Whether the bolts of the tyre and half shaft are completed and tightened.

3. Tyres replacement

Pay attention to followings during the wheel replacement

1) Don’t damage the tread on the tyre bolt.

2) The tyre nut pressure surface shall be kept clean.

3) Apply a little lubricating grease or engine oil onto the thread of the tyre bolt and nut, rim spigot and its matching surface.

4) The thread of the nuts of all the tyres is right hand thread. After the tyre is installed, screw down the nuts according to the symmetry, cross, alternate, succession sequence with suspended wheels.

5) After each tyre reinstallation, the tyre nut shall be retightened as specified once after the vehicle has been driven for 50 km.

⚠ CAUTION

- **Pay attention to followings during the tyre installation:**
- **The tyre on the same shaft shall have the same model and pattern.**
- **The retreaded tyre can’t be used.**
- **It is forbidden to weld and repair deformed tyre bolts at the bolt connection. If above problems occur, the old parts shall be replaced by new ones.**

6.4.5.2

1. Oil filling

The oil replacement of the drive wheel is vital to its normal operation and service life. If the drive wheel oil is not changed as specified (the first oil change shall be made after 50 h operation time, and then the oil shall be changed every 2500 h or every 12 months subsequently), the equipment working condition will become poor, and even the parts will be damaged.

The correct oil filling steps are as follows:

1) Rotate the reducer till the “Oil level” horizontal plug is in a horizontal state, as A shown in Figure 6-16.

2) The “Oil drain” oil filling plug shall be above the “Oil level” horizontal plug.

3) Remove two plugs.

4) Fill oil to the reducer from the “Oil drain” oil filling plug till the oil quantity reaches the “Oil level” horizontal plug.

5) Reinstall the plug in the hole.

6) After several minutes’ operation, check the oil quantity. If necessary, continue filling oil.

2. Oil drain

The oil drain position is as shown in **Figure 6-19**. The operation steps are as follows:

1) Rotate the reducer till the “Oil level” horizontal plug is in a horizontal state, as shown in **Figure 6-19**.

2) The “Oil drain” drain plug is located at the bottom.

3) For convenient oil drain, it is recommended to remove the horizontal oil plug.

4) Remove the oil drain plug for oil discharge.

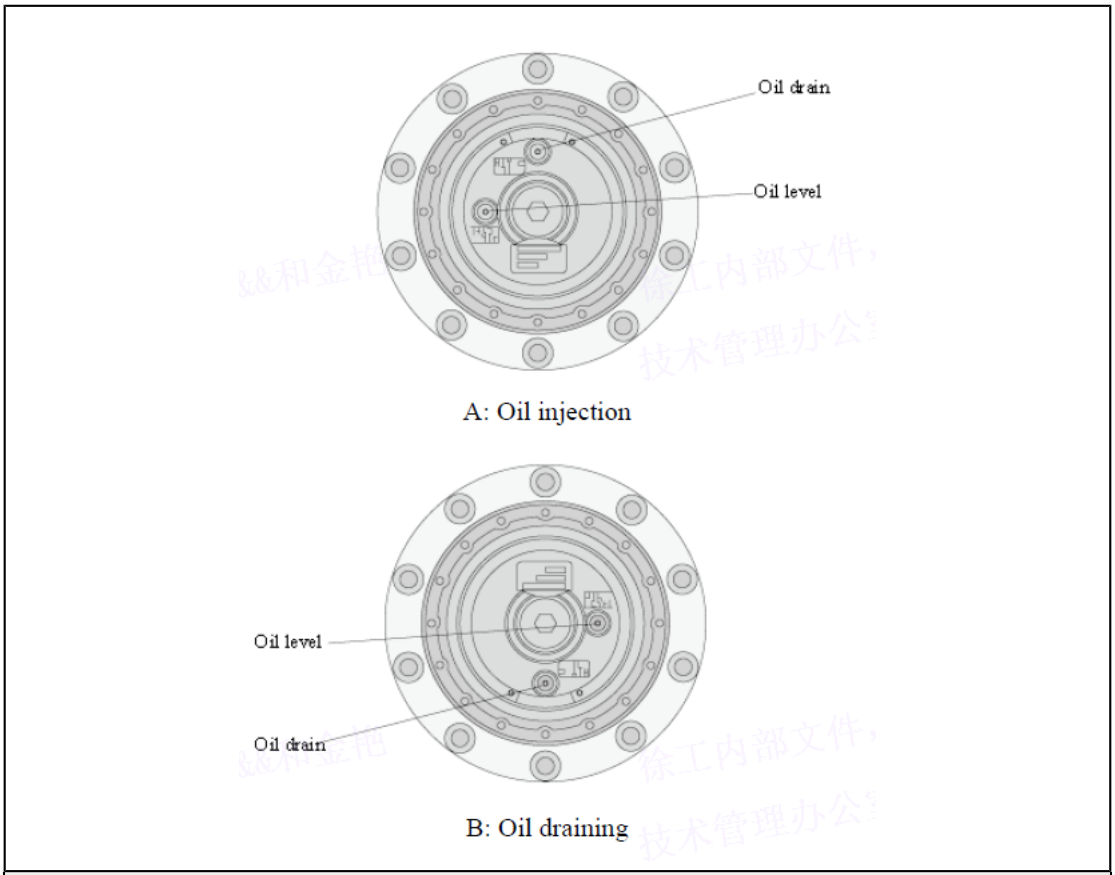


Figure 6-19 Running reducer

3. Disengage

The separator of the is as shown in **Figure 6-20**. The separation steps are as follows:

1) When the is in “ON” state, remove the bolts with a wrench.

2) Remove the plug.

3) Flip the plug and install it to the original position.

4) Tighten bolts and now the is in “OFF” state.

5)

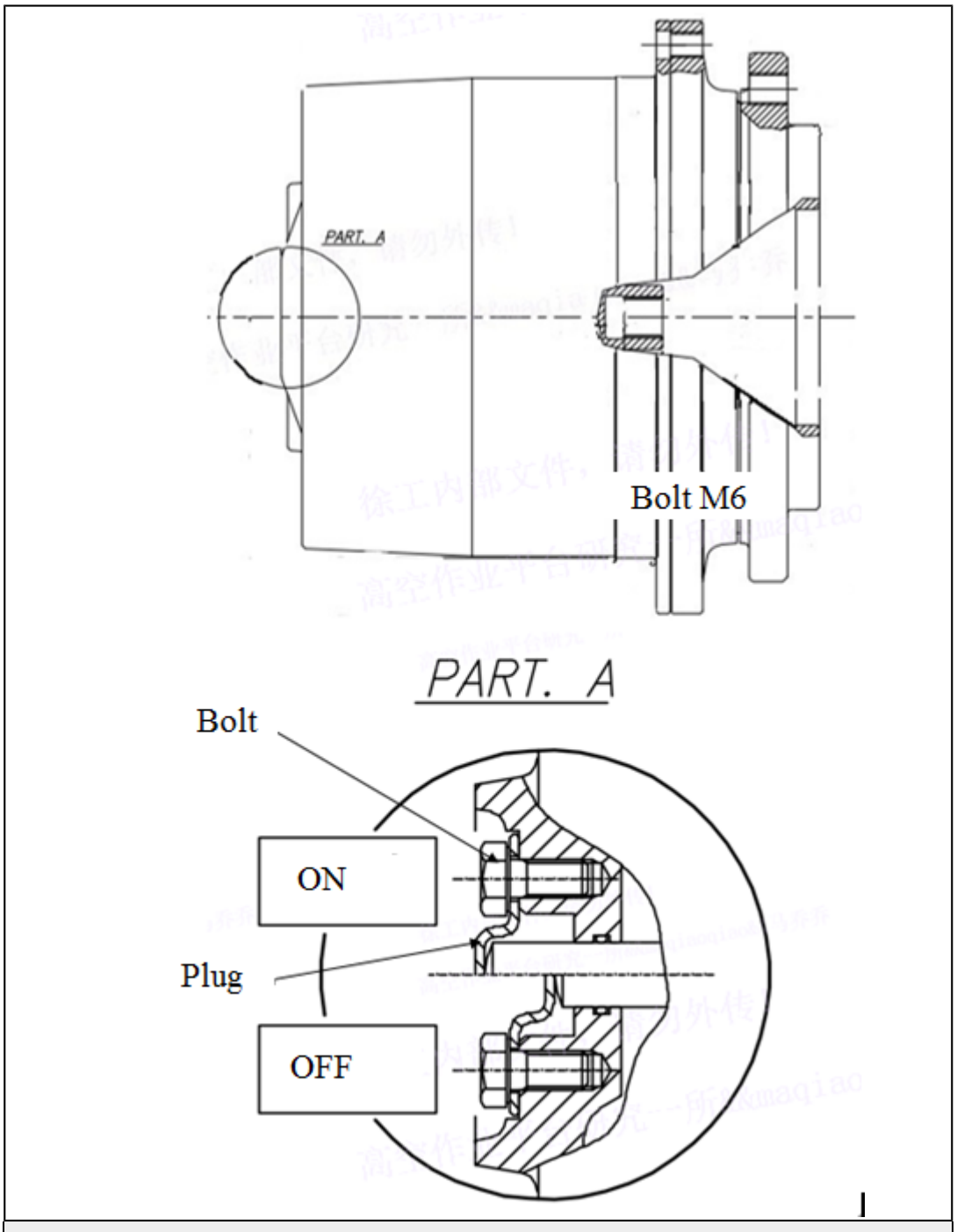


Figure 6-20 Schematic diagram of the separator of the running reducer

6.4.5.3

Remove the connecting to the travel motor; make marks and properly seal it, and then block the motor oil port.

Loosen the connecting bolt between the and the frame, and carefully remove the travel motor.

⚠ CAUTION

During the removal of the oil pipeline, the joint shall be loosened slowly to prevent the high-pressure hydraulic oil from splash damage.

6.4.6 Checking the electric system and controls functions

NOTICE

- **The installation of improper radio communicators and accessories may corrupt the machine's electronic elements and cause it to move in an unexpected matter.**
- **The installation of improper electric devices may also cause faults or an accidental fire.**
- **During the installation of radio communicators or additional electric components or replacement of these components, be sure to consult with the assigned dealer.**
- **Don't attempt to disassemble or modify any electric or electronic component.**
- **If it's necessary to replace or modify these components, contact with the assigned dealer.**

6.4.6.1 Starter battery and main fuse

⚠WARNING

- **The battery can start the fire or burst out.**
- **The gas of battery during loading can cause the explosion!**
- **Prevent the spark and flame from approaching the battery.**
- **During loading keep the battery in well ventilated room!**

NOTICE

- **The battery can start the fire or burst out.**
- **The gas of battery during loading can cause the explosion!**
- **Prevent the spark and flame from approaching the battery.**
- **During loading keep the battery in well ventilated room!**

NOTICE

- **Replacement of the battery**
- **If battery system malfunctions, replace the maintenance free battery with new one.**
- **Different types of batteries may charge at different speeds, which may cause one of the batteries is overloaded or malfuctions.**

6.5 Diesel engine maintenance

DANGER

- **Serious injury hazards due to rotating machine parts!**
- **Always keep a safety distance to running machine parts.**
- **Serious injury hazards due to hot surfaces. (engine – hydraulic – components of the cooling system)!**
- **Serious injury hazards due to high pressures. (fuel pipeline and cooling system)**

6.5.1 Replacement of engine oil

6.5.1.1

Engine is filled with CJ-4 or higher grade engine oil before leaving factory, which should cover most realistic climatic conditions.

NOTICE

For the prescribed amount of lubrication oil, see section 6.3.2. The shall be replaced every 12 months, whether a maintenance schedule date is due or not.

6.5.1.2 Checking the engine’s lubrication oil level

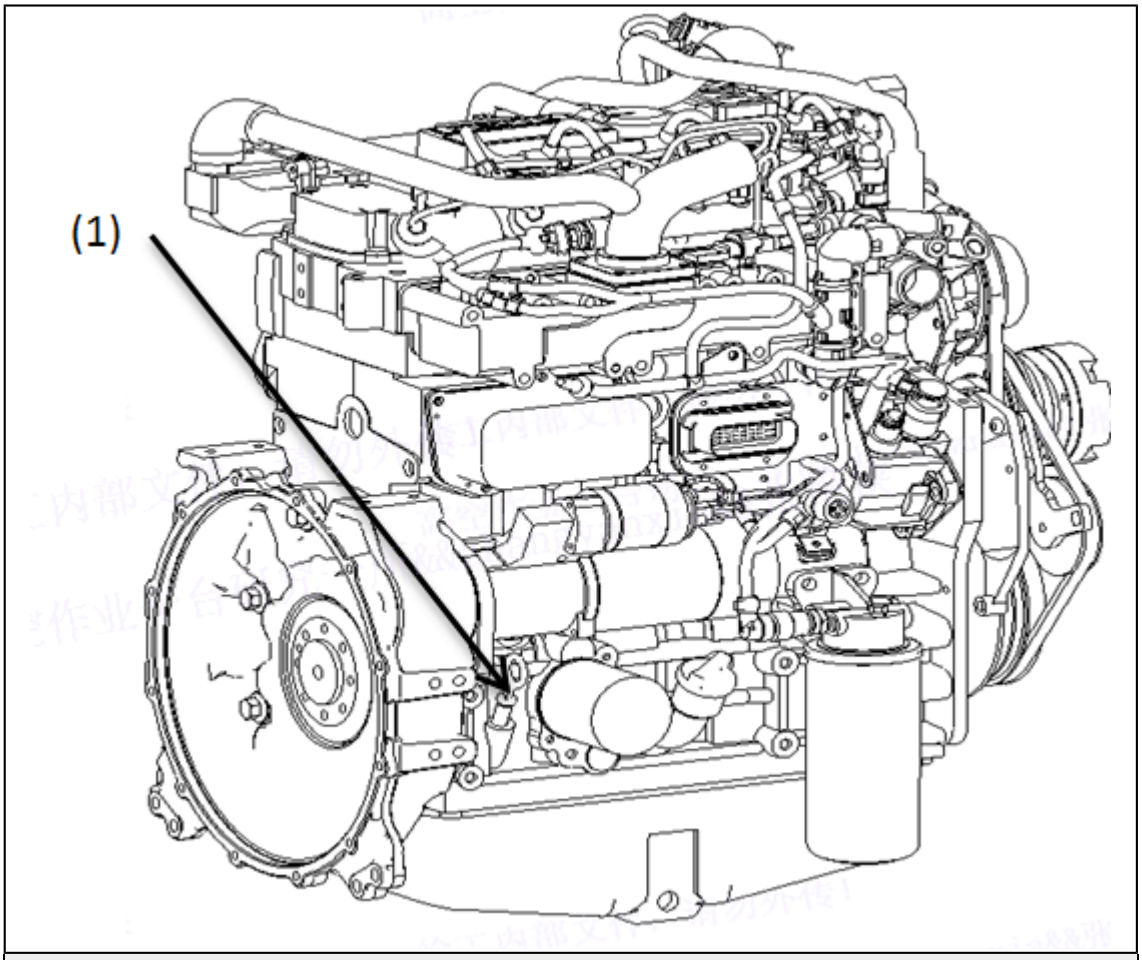


Figure 6-21 Oil dipstick location

To check level:

1. Park the machine on flat ground.
2. Shut down the engine, remove ignition key and open engine side panel.
3. When the cools, check oil level with the dipstick.
4. Replenish engine oil if necessary.

1) Pull out oil scale (1) and clean up. Insert the **oil scale** again and then pull out.

2) Make sure oil level is between the upper scale (a) and the lower scale (b).

• If the oil level is below (b), please add engine oil to keep the engine oil level is between the upper scale (a) and the lower scale (b).

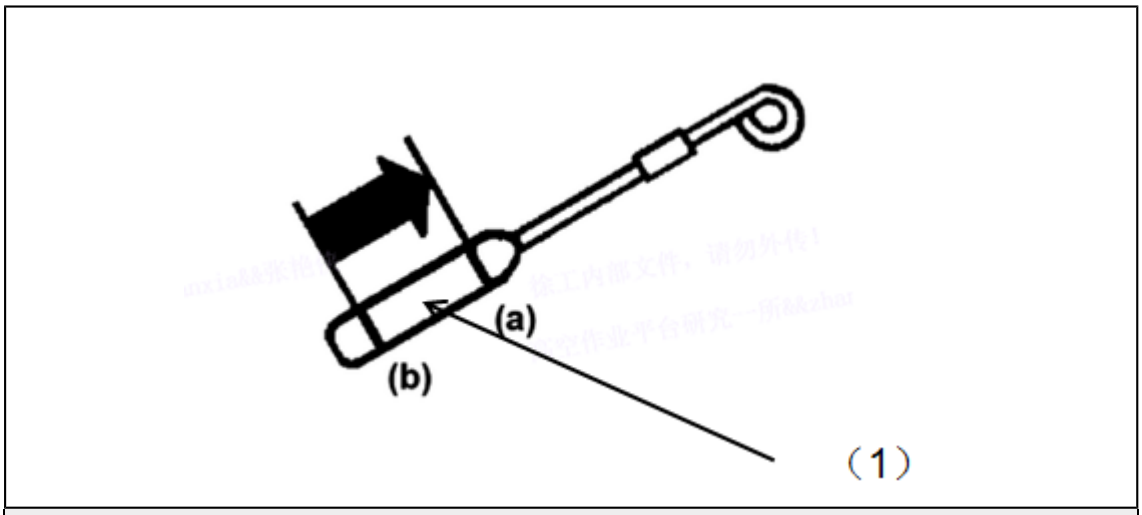


Figure 6-22 Engine oil level

6.5.1.3 Refilling the engine’s lubrication oil

NOTICE

- Shut down the engine before replacing engine lubrication oil or oil filter.
- Only use lubrication oil specified either in the engine’s manual or this manual.
- If the oil level exceeds the upper limit of the oil scale, it means that the oil has been over diluted and will cause a failure. In this case, replace with new oil immediately.
- Before draining the , let the engine run for 5 minutes to increase the oil temperature.
- Replace the oil filter immediately when the oil is discharged completed.

⚠ If you want to use an oil of a different brand or viscosity from the previous one, please drain residual oil. Do not mix 2 different types of engine oil

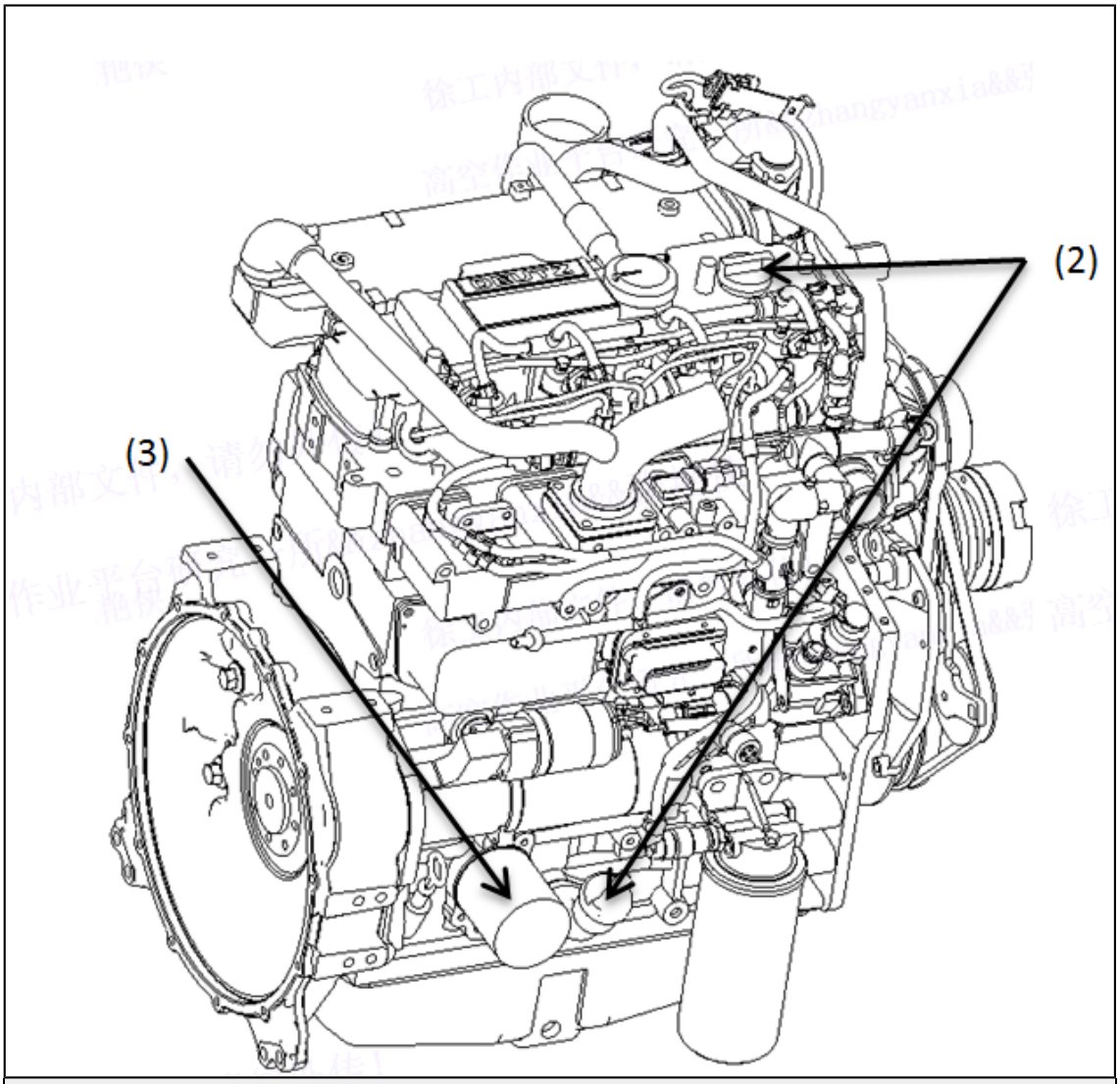


Figure 6-23

(2) Oil filling port

(3) Engine lubrication oil filter

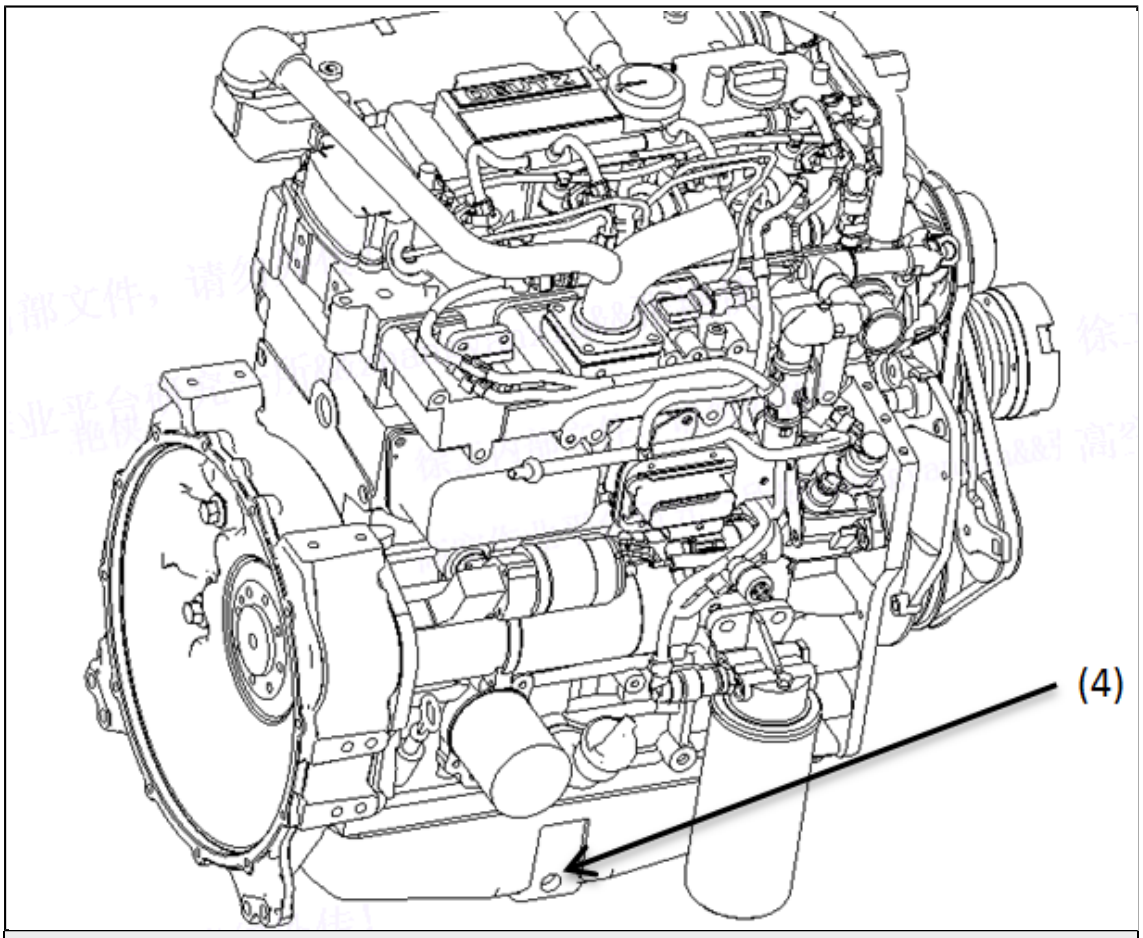


Figure 6-24

(4) Engine lubrication oil drain

1. Replace engine oil

   1) Start the engine and warm up for about 5 minutes.

   2) Place a 15 L container for engine oil under the engine.

   3) Remove the plug (4) to drain the oil completely.

   4) After draining, tighten the drain plug.

   5) Fill engine oil to the upper mark of the oil scale (1).

2. Refilling the engine’s lubrication oil

   1) Shut down the engine and place an appropriate container under the engine.

   2) Open oil filling port (2) and oil drain port (4).

   3) Drain the hot lubrication oil and replace engine lubrication oil filter (3). Unscrew the oil filter out by hand or a wrench (90-95 mm).

4) Wipe the sealing surface of base of filter and remove residues on the seal ring of engine oil filter.

5) Pour clean lubrication oil into filter before filter installation.

6) Paint a layer of oil film for the new seal ring.

7) Screw in the new filter element by hand.

8) Screw one more half a turn after it matches with the seal ring.

9) Check engine oil level and fill hydraulic oil to the specified oil level.

Figure 6-25 Engine lubrication oil filter

6.5.1.4 Checking the engine's crankcase ventilation valve

WARNING

in contact with hot surfaces!

For details, see engine operation and maintenance instructions or contact your XCMG-partner.

6.5.1.5 The engine's lubrication hose

WARNING

in contact with hot surfaces!

NOTICE

Shut down the engine and wait for complete cool down before maintenance

Replace the hose of the filter in case they are worn out or broken.

For details, refer to the engine’s operation and maintenance handbook.

6.5.2 Engine fuel system

6.5.2.1 Fuel tank

WARNING

- **Before maintenance, shut down the engine and carry out maintenance after the engine cools down.**
- **maintenance**
- **Inflammable Fluid! Do not smoke or use open fire**
- **Do not breath in the fuel vapors**
- **Avoid environmental pollution by engine fluids or coolant dispose of the drained oil as environmentally friendly as possible; follow disposal regulations valid in your area**

6.5.2.2 Deaerating the fuel line

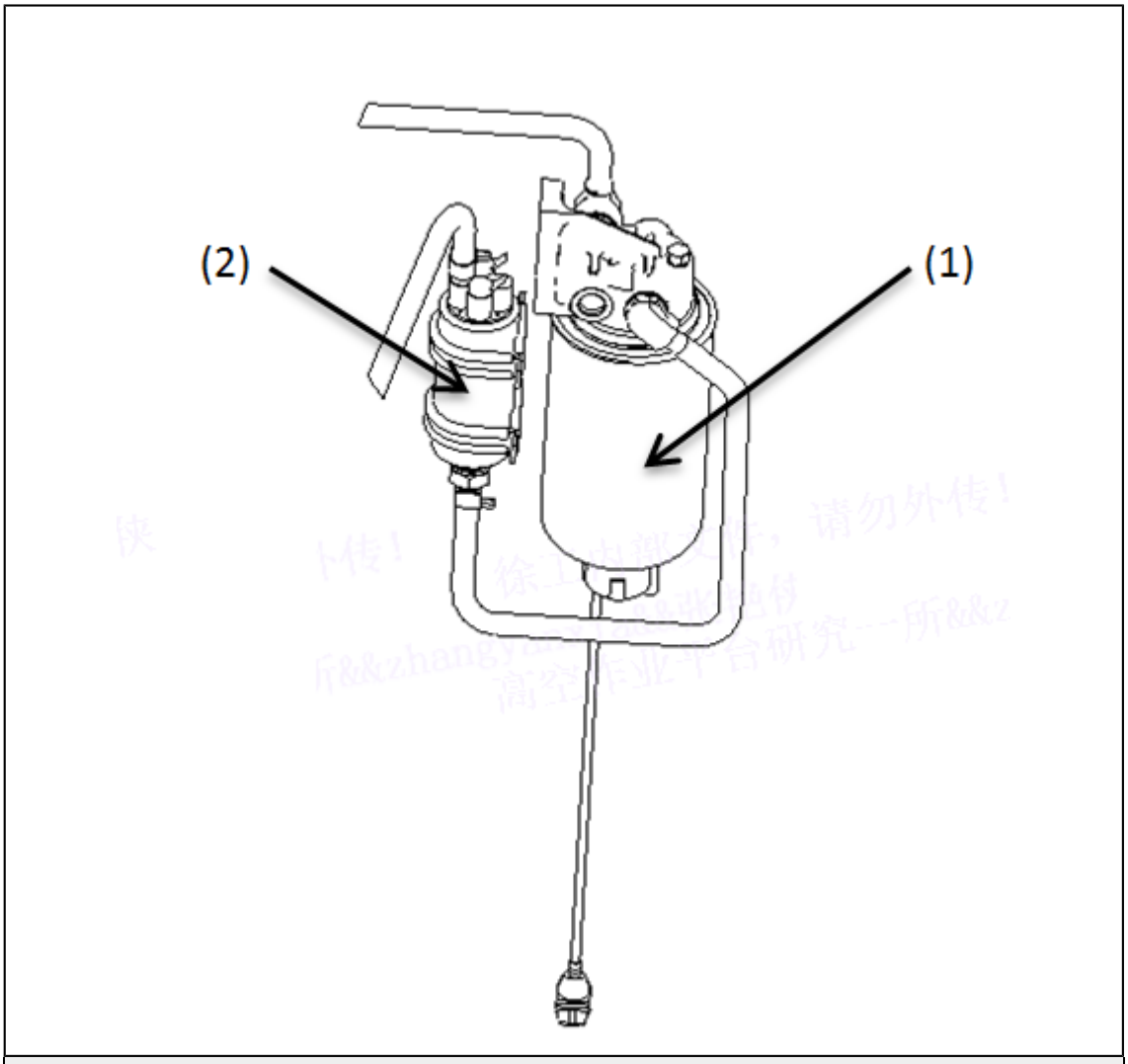


Figure 6-26 Pump

(1) Oil-water separator cartridge

(2) Electric pump in the fuel line

To reduce air in the fuel pipes, energize the electric pump in the running line.

6.5.2.3 Fuel-water separator cartridge

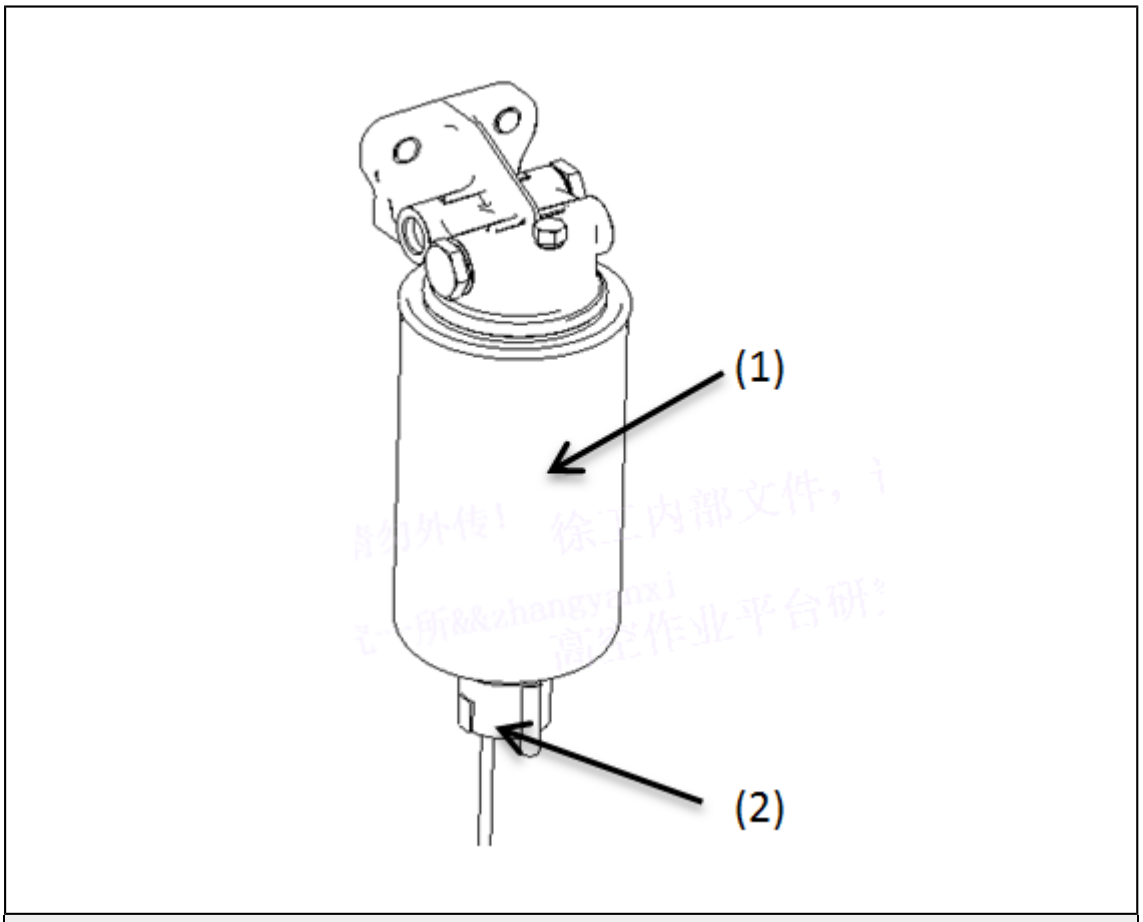


Figure 6-27 Fuel-water separator

(1) cartridge

(2) Blocking sensor

The fuel-water separator is equipped with a blocking sensor (2). Its status will be shown on the Dashboard’s display screen in a manner similar to Error code: XXXXXX explanations…

Replace the separator filter’s cartridge when the message appears pops up.

6.5.2.4 Cleaning the oil-water separator

1. Unplug the electrical connector at the bottom of the separator, unscrew the sensor (2), and unscrew the cartridge (1).
2. Clean the sealing surface of the cartridge cover; Wet the sealing ring of the new oil-water separator cartridge (1) with clean diesel.
3. Fill the clean diesel into the new cartridge and screw it hand-tight on the separators housing.
4. At the end, turn it another half-circle with a suitable tool to ensure leak-proof tightness.
5. Deaerate the and start diesel engine for fuel leakage inspection.

6.5.2.5 Replacing the fuel pre-filter

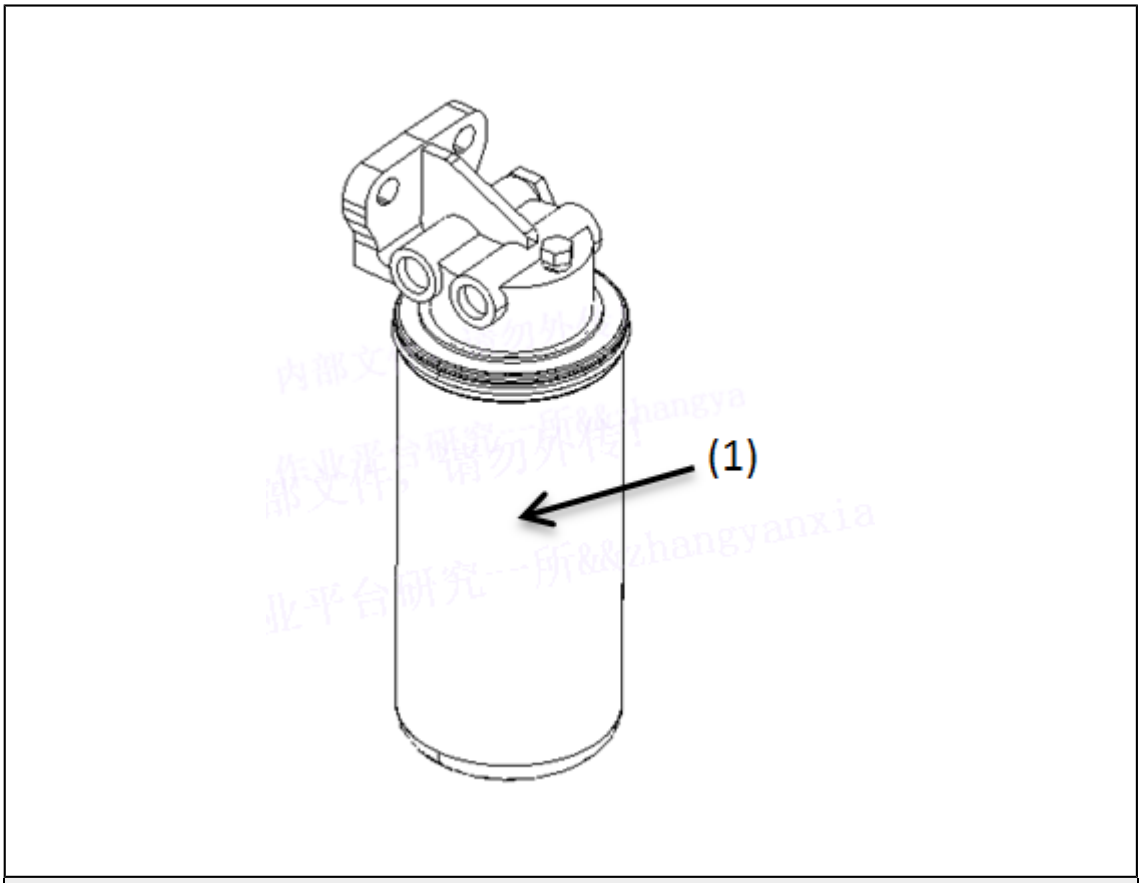


Figure 6-28 Fuel filter (1)

NOTICE

- **Before maintenance, shut down the engine and carry out maintenance after the engine cools down.**
- **Avoid spilling fuel on the ground to prevent risk of fire or environmental pollution.**
- **Dispose of the drained oil as environmentally friendly as possible; follow disposal regulations valid in your area.**

Before

1. Switch the engine off and remove ignition key, enable engine to cool down.
2. Screw out the fuel filter cartridge (1).

Replacing the fuel filter

1. Clean the sealing surface of the cartridge cover; Wet the sealing ring of the new filter (1) with clean diesel.
2. Fill clean diesel into the new filter and screw it hand-tight on the pre-filter housing.
3. Before installation, pour clean diesel into filter. Screw on new filter element by hand or belt spanner. Screw another half a circle after is matched with seal ring;
4. At the end, turn it another half turn with a suitable tool to ensure leak-tightness.

5. Deaerate the and start diesel engine for fuel leakage inspection.

Replace filter element isolating filter when the info pops up.

6.5.2.6 Inspecting the fuel lines

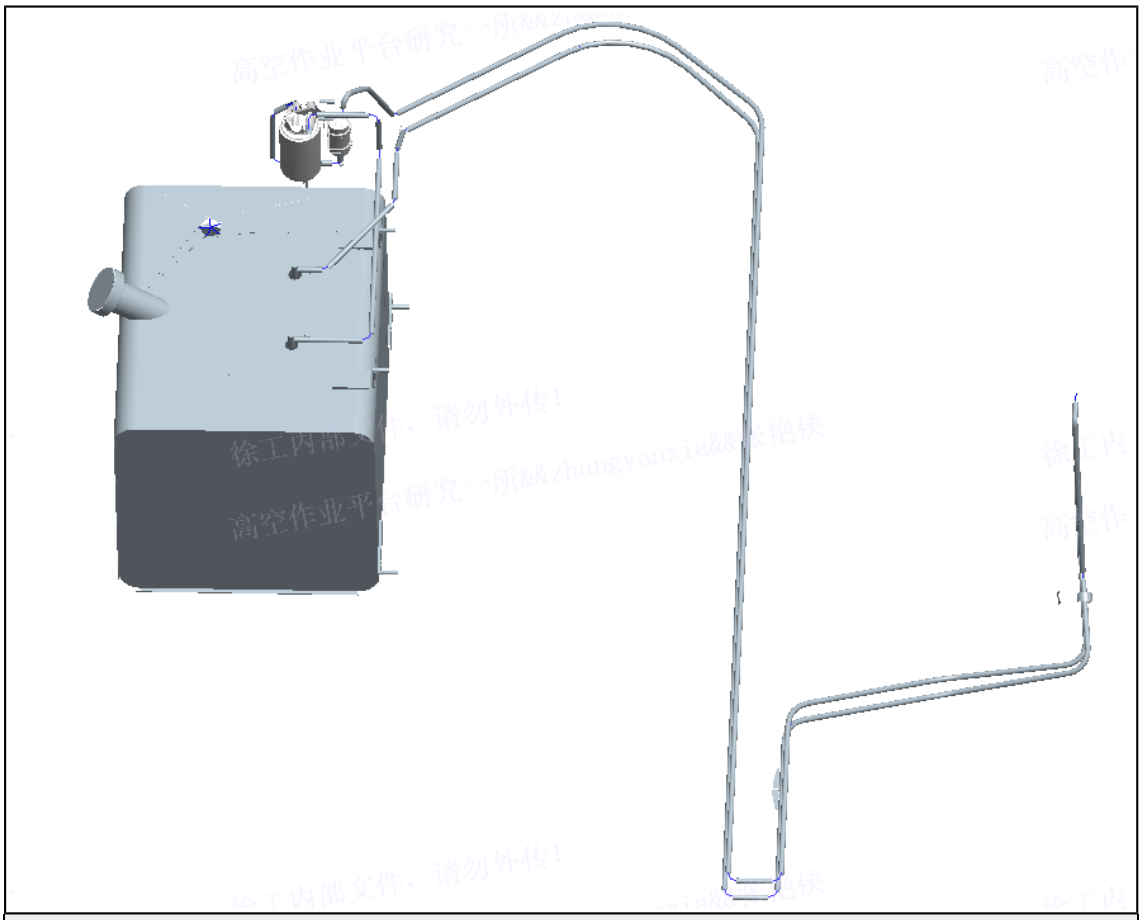


Figure 6-29 Fuel piping

Inspect the fuel supply piping regularly.

In case of any signs of damage, replace them immediately.

After replacement, de-aerate the fuel supply and start engine. Ensure leakage free operation.

Replace filter element isolating filter when the info pops up.

6.5.2.7 Draining the fuel tank

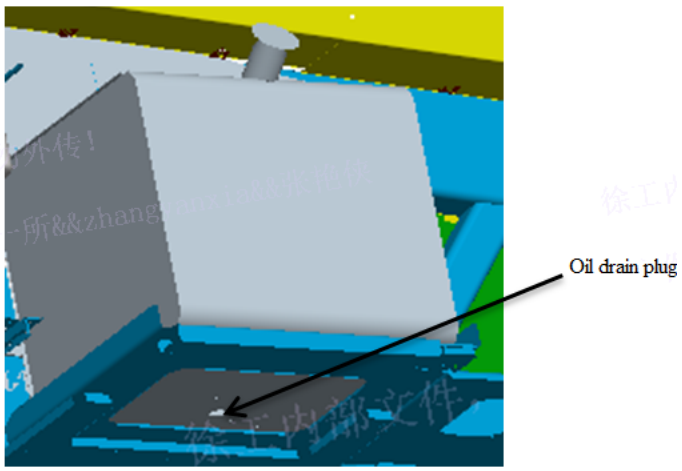


Figure 6-30 Fuel tanks drainage plug

(1) is located on the lower left-hand side of the front frame

(1)oil drain pug, located on the left side of the turntable

⚠WARNING

- **Inflammable fuel or vapors!**
- **No smoking or open fire while handling the fuel**

NOTICE

- **Let fuel level fall as low as possible before ing.**
- **Refill tank only with clean fuel.**
- **Dispose of the ed oil as environmentally friendly as possible; follow disposal regulations valid in your area.**

6.5.3 Engine system

6.5.3.1 Checking engine’s filter

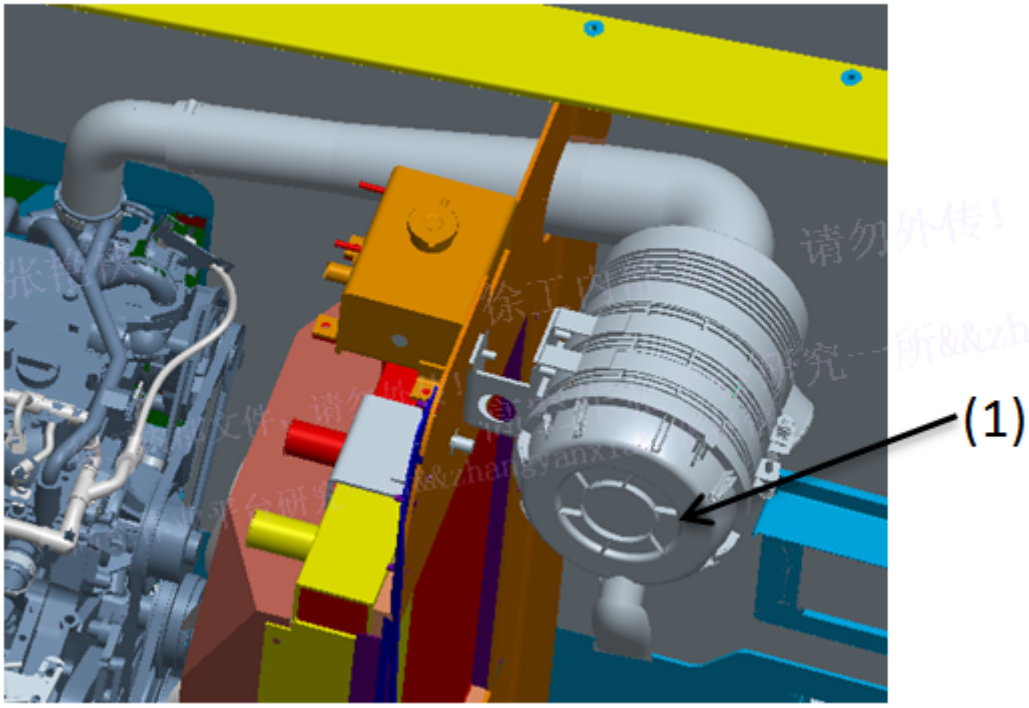


Figure 6-31 Engines air intake filter (1) location

NOTICE

Any engine damage due to inappropriate maintenance of the intake filter voids the warranty.

- Check whether the dust discharge valve is clean or clogged (e.g. by wet deposits).
- If so, squeeze it, to enable the deposits to fall out.
- In case this is not sufficient, remove the filter’s cover (1) by opening the clips and clean it from the inside.
- Ensure the cover is fixed correctly prior starting the engine.

6.5.3.2 Replacing the engine’s air intake filter

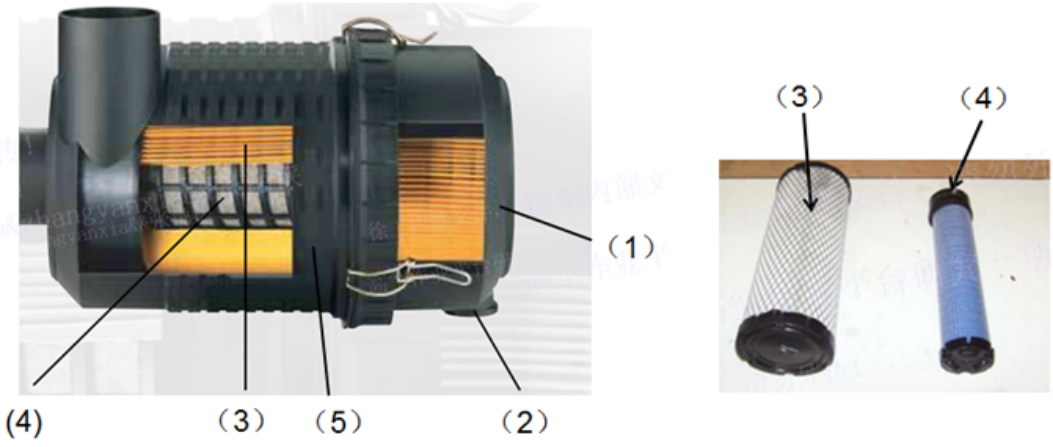


Figure 6-32 Engines air intake filter

(1) Air filter cover

(2) Dust valve

(3) Main filter element

(4) Safety filter element

(5) Housing

Replacing the air intake filter

1. Switch off engine, remove the ignition key.
2. Let the engine cool down if necessary.
3. Remove the filter’ s cover (1) by opening the clips
4. Remove the main filter element (3)
5. Clean the dust valve (2) and the filter housing (5) if necessary.
6. Insert the new main filter element, then close and lock the cover.
7. If required, (after 2000 operating hours at the latest) replace the safety filter element (4) as well.

6.5.3.3 Replacing the air intake pipe

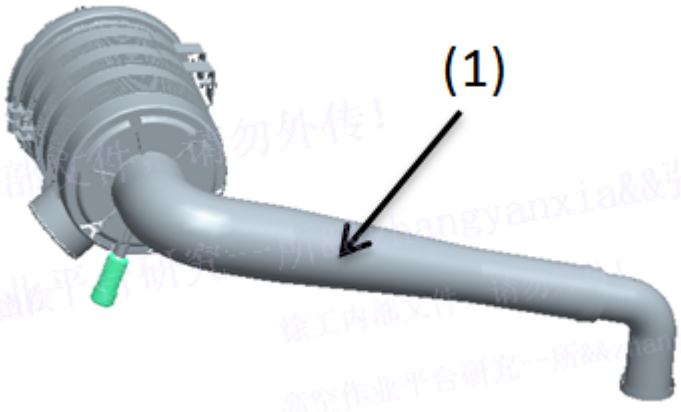


Figure 6-33 Air intake system

Inlet filter

NOTICE

- **Shut down engine and await complete cool down before maintenance**
- **Do not operate the engine while the system is not correctly assembled.**
- **Replace the filter element instead of cleaning it every 6th time**

Replacing the air intake pipe

1. Open the engine hood and enable engine system to cool down if necessary.
2. Loosen the clamps at both ends of the intake pipes (1), remove and replace the new ones.
3. If clamps are corroded or damaged, replacement is also required.
4. Tightened the clamps properly and close and secure engine hood.

6.5.4 Replacement of engine's cooling system

⚠ DANGER

- **Protect your eyes and wear gloves for handling the cooler**
- **Serious injury hazards due to rotating machine parts! (Ventilator and V-belts)**
- **Risk of burns due to hot surfaces!**
- **Risk of burns due to hot cooling fluids!**
- **Risk of high vapour pressure through hot steam!**
- **Do not open the coolers filling tap until complete cooldown**
- **Filling tap has two stage opening release (to prevent that pressure lift the tap)**
- **Open filling tap always covered with large cloth!**
- **Open with caution to the first stage!**
- **Wait until the steam pressure is released/reduced!**

NOTICE

- **Always use the minimum concentration of protective agent, even if temperatures never fall below freezing point.**
- **Do not exceed maximum recommended protection agent concentration.**
- **Refer to the recommendation of the engine in engine .**

6.5.4.1 Coolant requirements

Liquid-cooled engines rise have specific requirements on the used coolant to avoid overheating or freezing, corrosion of engine or as well as cavitation.

To avoid damage of the engine or the observe the coolant regularly in respect to coolant level and protection agent concentration.

Follow instructions on engine manual as well as those provided by the coolant agent .

Ensure protection agent concentration is at least 50% of what do we recommend.

The cooler is filled ex works with 50% protective agent enabling operation up to －109°C/228°F.

6.5.4.2 Inspecting the radiator

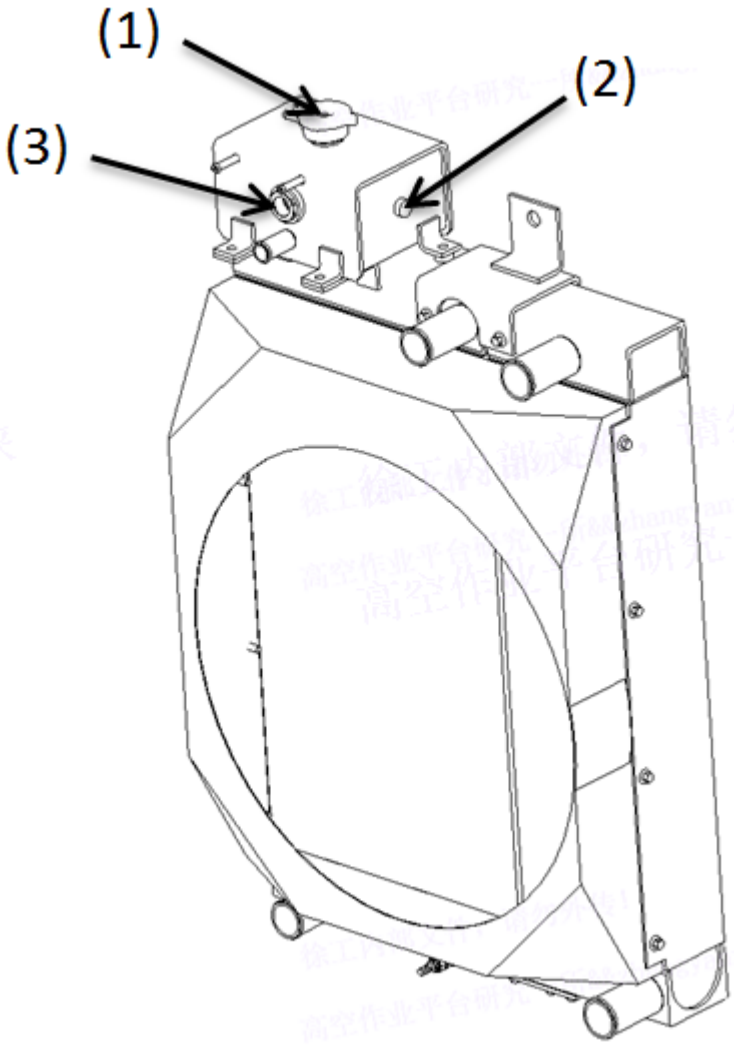


Figure 6-34 Radiator

(1) Cooling liquid filling port

(2) Liquid level sensor

(3) Liquid level observation window

Switch off engine, remove the ignition key and open engine hood; let engine and to cool down if necessary.

Inspect the and clean it if it is dirty.

Only use pressurized air or water and clean it from inside to outside.

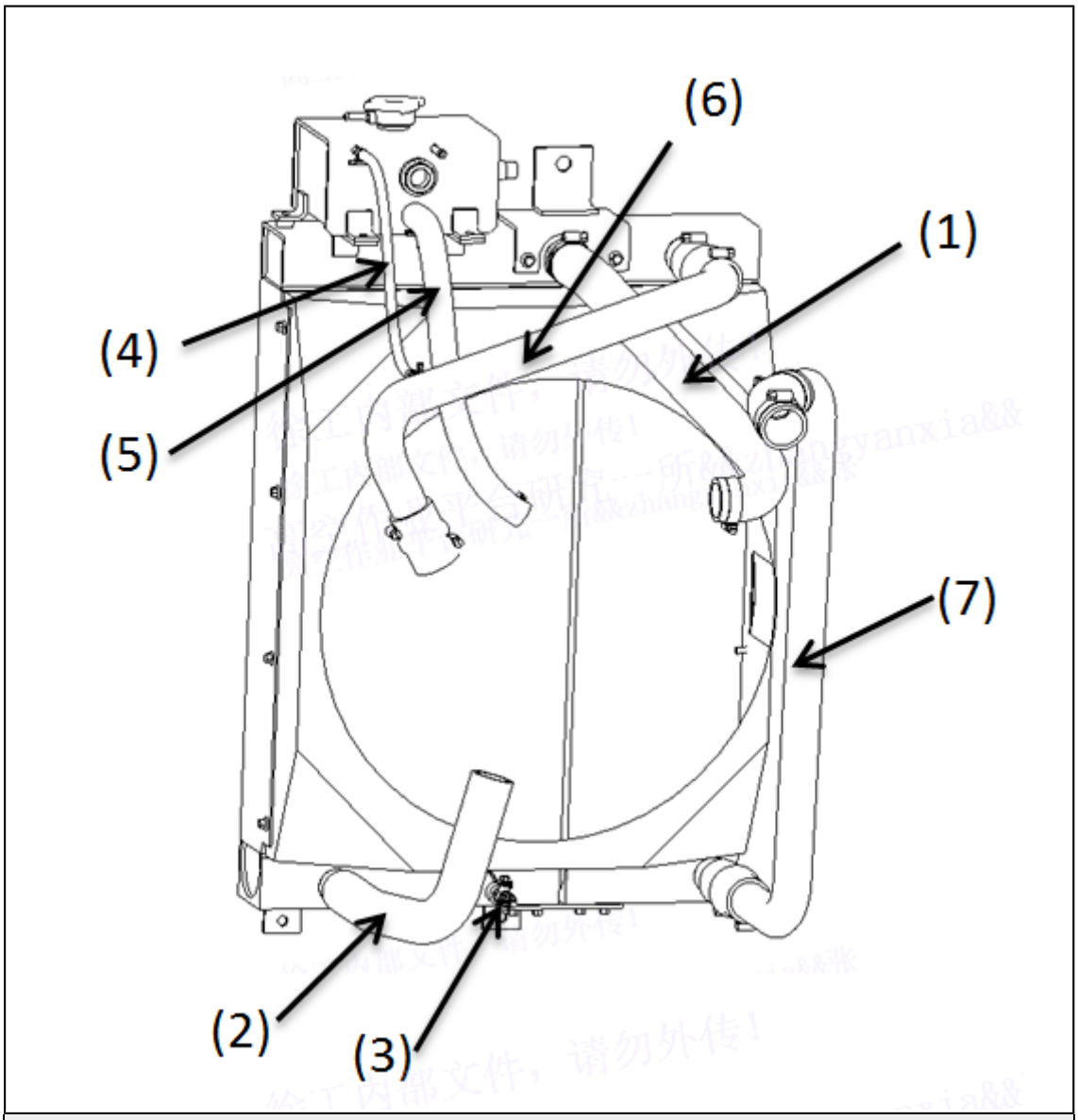


Figure 6-35 Cooling systems piping(1)

(1) water inlet pipe
(2) water outlet pipe
(3) Water drain switch
(4) Vent pipe
(5) Water supply pipe
(6) Intercooler air inlet pipe
(7) Intercooler air outlet pipe

- Inspect the ’ s piping regularly on fractures and leaks.
- Replace any damaged pipes and tighten all loosened connections.
- Check the hoses of the cooling system for aging or break.

- Check the hose clamp at the pipe joint for tightness.
- The inlet pipe (1) shall be tightened or replaced when it is loose, aging, fracturing or damaged.

6.5.4.3 Replacement radiator coolant (persistent effect coolant)

Attention: When the engine temperature is high, please do not dismantle the cap. After the engine cooling, loosens the radiator cap relief pressure slightly and then completely dismantles again the cover.

1. 1. Stops the engine, causes refrigerant temperature drop.
2. Dismantles the cap (1), turns on the row of fluid valve (2) and discharges completely the coolant.
3. 3. After discharges all coolant, closure row of fluid valve (2).
4. 4. Pours into the coolant to fill to the up to.
5. and run for few minute.
6. Stops the engine to drop the coolant temperature. Inspect the coolant level of the . Refill if necessary.

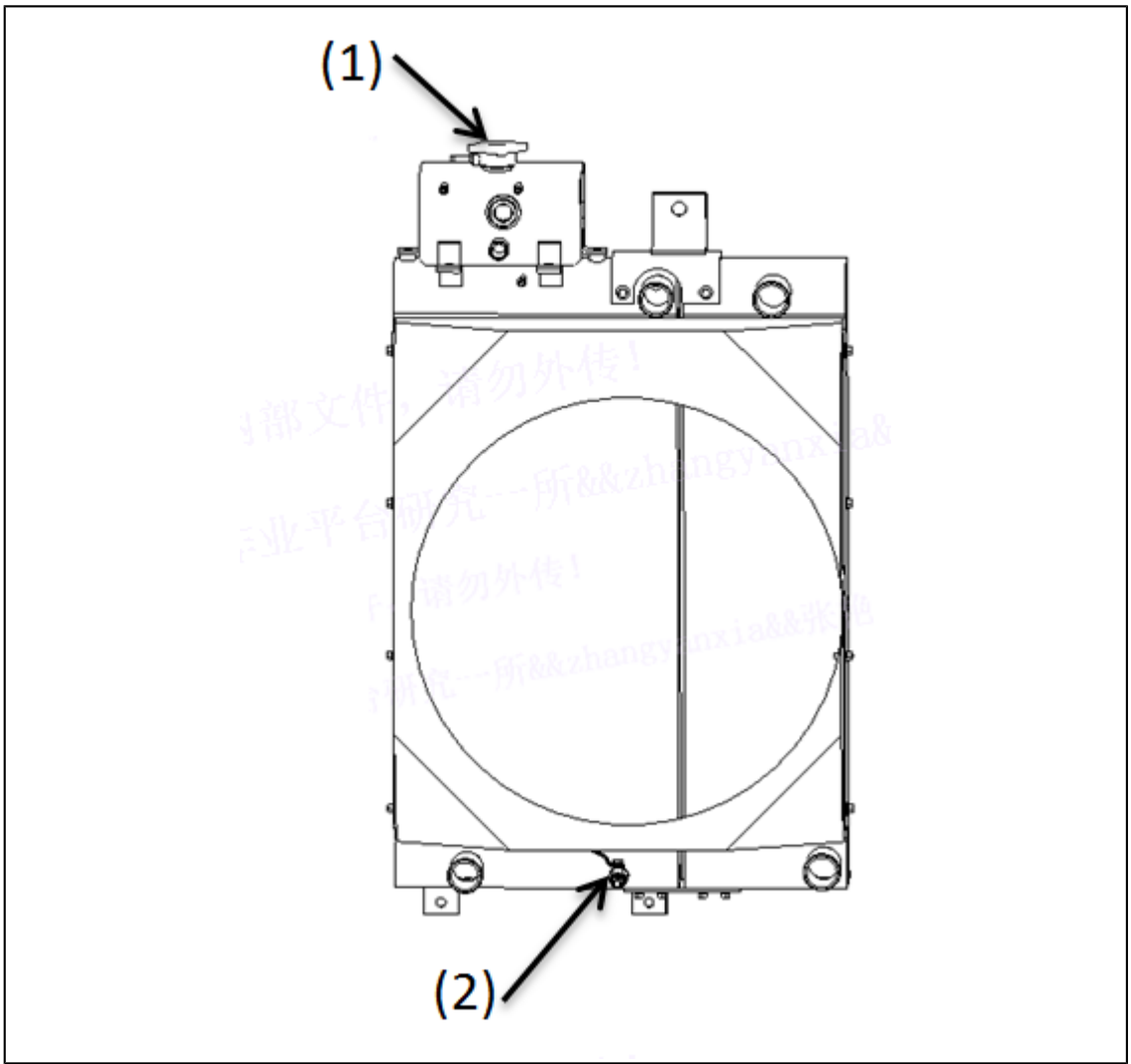


Figure 6-36 Fig. Coolant drainage port

Filler cap

(2) Water drain switch

for a short time and check the coolant level.

Refill if necessary.

Inspect EGR system.

NOTICE

- **Shut down engine and await complete cool down before maintenance.**
- **Do not operate the machine while EGR is not fully operational.**
- **Ignoring this equals to violating the exhaust regulations.**

Inspection of the EGR system

For details, see engine operation and maintenance instructions or call your assigned XCMG partner.

Replacing the EGR cooling hose

NOTICE

Do not operate engine while engine’s EGR system is not correctly assembled!

For details, see engine operation and

Engine’s V-belt

⚠WARNING

- **Danger due to rotating parts: -V-belt-Alternator-Cooler Ventilator**
- **Risk of limb cutting or squeezing by rotating parts.**
- **Keep the engine’s hood closed while it is running.**
- **Refer to the engine’s**

Preliminary actions:

1. Switch the engine off, remove the ignition key and disconnect battery insulation switch.
2. Open the engine hood, and if necessary, enable the engine cool down.

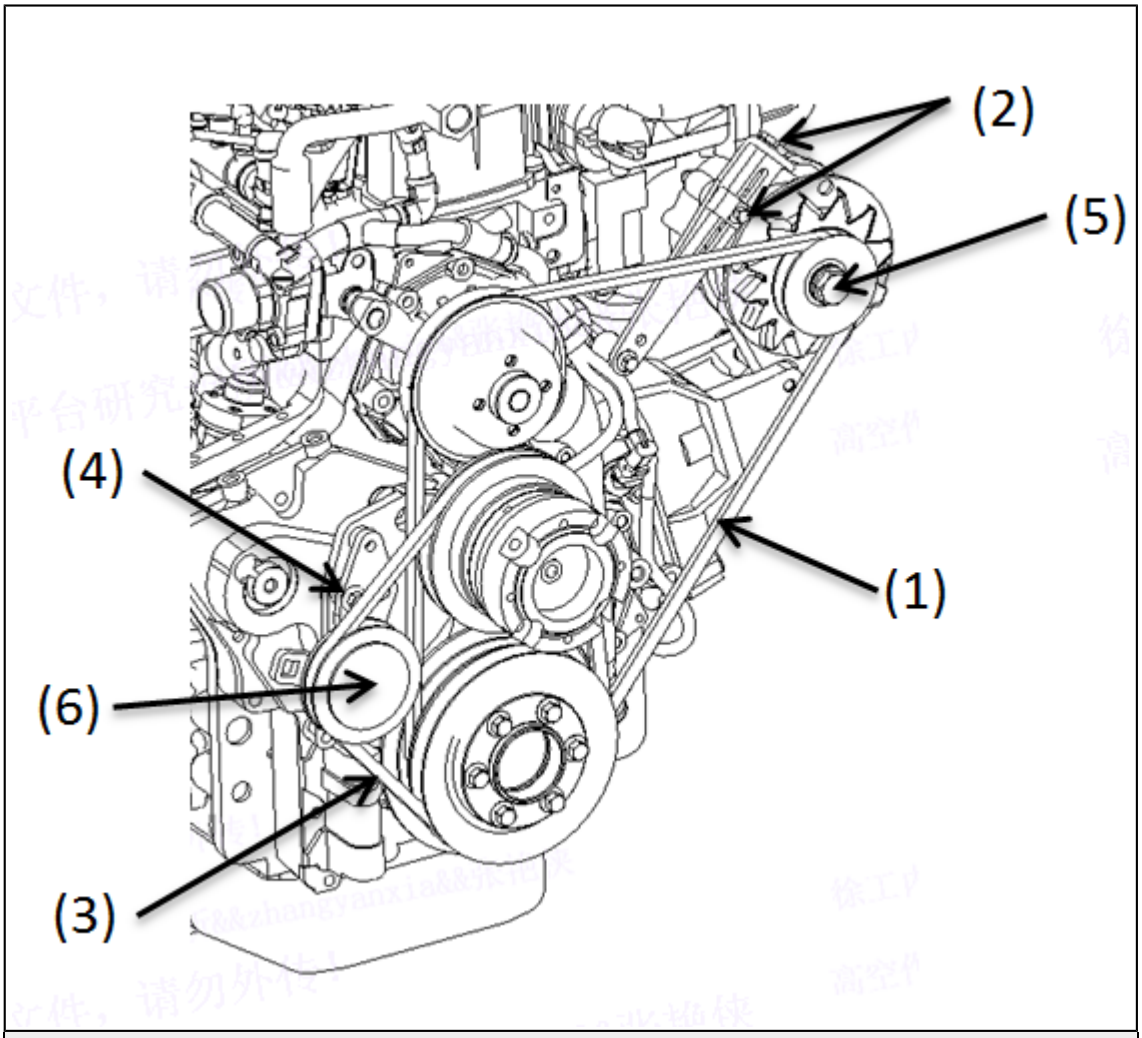


Figure 6-37 Fig. V-Belt installation

1. V-belt 1
2. Tension bolt of V-belt 1
3. V-belt 2
4. Tension bolt of V-belt 2
5. Electric generator
6. Tension wheel of V-belt 2

Tensioning the V-Belt

Push the V-Belt in the middle between the shaft wheel and the alternator (see figure 6－37)

V-belts tension is sufficient as long as maximum deflection stays below 8 mm.

Replacing the V-Belt 1

1. Screw off the alternator’s tensioning bolt (2).
2. Swing the generator to the engine’s side.
3. Loosen and remove the V-belt.

4. Mount the new V-belt, press the generator to the outside of the engine with lever until the tension is within the required limits.

Replacing the V-Belt 2

1) Screw off the tension bolt (4) at the tension wheel of V-belt 2.

2) Turn the tension wheel inward.

3) Loosen and remove the V-belt.

4) Mount the new V-belt, press the generator to the outside of the engine with lever until the tension is within the required limits.

6.6 Bolt tightening torques

NOTICE

- **Inspect the tightening torques of bolt and nut every 500 hours.**
- **Inspect the tightness of bolts and nuts after the breaking-in period of the machine. (usually first 50 hours of operation)**
- **Perform the next periodic checks every 250 hours of operation.**
- **If loose, tighten the bolt up to the torque shown in Tightening of bolt.**
- **In case of replacement, replace it with the same or higher-class bolt and nut.**
- **For bolts and nuts not listed in the "Tightening of bolts"- section , refer to "Tightening Torques"-section.**
- **Use a torque wrench when checking or tightening bolts and nuts.**

Table 6-8 Bolt tightening torque table (1/3)

The following values apply to galvanized/zinc chrome fasteners.							
8.8 metric bolts/8 metric nuts							
Dimen-sion	Pitch	Tensile stress area	Applied load	Torque (Dry or Loctite 263)	Torque (Lubrica-tion)	Torque (Loctite 262 glue)	Torque (Loctite 242 or 271)
		Square millime-ters	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

Table 6-8 Bolt tightening torque table (1/3)(continued)

The following values apply to galvanized/zinc chrome fasteners.							
8.8 metric bolts/8 metric nuts							
Dimen-sion	**Pitch**	**Tensile stress area**	**Applied load**	**Torque (Dry or Loctite 263)**	**Torque (Lubrica-tion)**	**Torque (Loctite 262 glue)**	**Torque (Loctite 242 or 271)**
		Square millime-ters	**kN**	**Nm**	**Nm**	**Nm**	**Nm**
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 6-9 Bolt tightening 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							
Dimen-sion	Pitch	Tensile stress area	Applied load	Torque (Dry or Loctite 263)	Torque (Lubrica-tion)	Torque (Loctite 262 glue)	Torque (Loctite 242 or 271)
		Square millime-ters	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 6-10

The following values apply to galvanized/zinc chrome fasteners.						
Above hexagonal M6 at grade 12.9						
Dimension	Pitch	Tensile stress area	Applied load	Torque (Dry or Loctite 263)	Torque (Lubrica-tion)	Torque (Loctite 262 glue)
		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

Table 6-11 Bolt/wrench size and required tightening torques

S/N.	Item	Bolt size mm	Qty.	Torque Nm
1	Engine shock absorber fixing bolts	M10	12	65-78
2	Engine support fixing bolts	M12	8	110-130
		M14	4	180-210

Table 6-11 Bolt/wrench size and required tightening torques(continued)

S/N.	Item	Bolt size mm	Qty.	Torque Nm
3	Hydraulic tank fixing bolts	M12	4	110-130
4	Hydraulic pump fixing bolts	M12	2	110-130
5	Main valve fixing bolts	M8	2	30-36
6	Running motor mounting bolts	M12	8	110-130
7	Tyre mounting nuts	M16	20	210-240
8	Slewing bearing mounting bolts	M24	72	800-900
9	Fuel tank fixing nuts	M10	4	50

Chapter 7 Faults and troubleshooting

7.1 Engine

Table 7-1 Engine faults and troubleshooting

Fault	Cause	Solution
Abnormal operation of engine	Blockage of air filter	Replace
	Blockage of fuel oil pipe	Repair or replace
	Fuel oil contaminated	Drain the fuel tank and clean the filter screen
	Blockage of fuel filter	Replace
	Blockage of tank cover vent	Clean or replace
	Fuel oil error	Use the correct fuel oil
	error	Use the correct engine oil
	Blockage of exhaust port	Contact your assigned XCMG - XCMG Fire-Fighting Safety Equipment Co., Ltd.
	Injection pump faults	
	Failure of preheating circuit or igniter plug	
	Low compression ratio	
	dirty nozzle or improper operation	
	Nozzle inoperation	
Engine overheat	Low coolant level	Replenish coolant
	Engine overloaded	Check hydraulic safety valve
	cover wearout	Replace the cover
	Blockage of core and oil cooler core	Clean and oil cooler
	Blockage of mesh cover	Clean the mesh cover
	Fan damaged	Replace
	Blockage of air filter	Replace the filter element
	Loose belts of alternator and fan	Tighten or replace the belts
	Belts wearout	Replace
	pipeline contaminated	Wash
	Thermometer fault	Contact your assigned XCMG
Over low coolant temperature	Thermostat fault	Contact your assigned XCMG
	Thermometer or transfer device fault	

Table 7-1 Engine faults and troubleshooting(continued)

Fault	Cause	Solution
Engine oil burns.	Engine oil type error	Drain and replace with correct engine oil
	Engine oil leakage	Check engine drain plug
	Engine internal components wearout	Contact your assigned XCMG
High fuel consump tion	Blockage or dirt of air suction or discharge system	Clean system
	Wrong fuel oil type	Use the correct fuel oil
	Dirty fuel oil nozzle	Contact your assigned XCMG
	Injection pump inoperation	
Too dark or grey exhaust gas	Wrong fuel	Empty fuel tank and refueling
	Blockage or dirt of air suction or discharge system	Clean air intake or exhaust system
	Injection pump inoperation	Contact your assigned XCMG
	Dirty fuel nozzle or its incorrect operation	
	Trouble of engine body	
Insufficient capacity of battery	Loose or corroded wiring	Wash, tighten or replace the battery
	Loose generator belt	Tighten generator belt or replace
	Fuse damaged	Replace
	Generator failure	Contact your assigned XCMG - dealer
Starting motor can’t rotate.	Insufficient capacity of battery or damaged	Recharge or replace
	Poor connection of battery circuit	Check connection of circuit
	Fuse damaged	Replace fuse
	The starting motor pinion is clamped in the flywheel gear.	Repair or replace
	Trouble of engine body	Repair or replace
	Trouble of engine body	Contact your assigned XCMG
	Trouble of starting relay	
	Trouble of starting motor magnetic coil	
	Insufficient capacity of battery or damaged	
Magnetic vibration of starting motor	Poor connection of battery or start motor short-circuit	Clean the connection section
	Low capacity of battery	Charge or replace the battery
	Open magnetic holding coil of start motor	Contact your assigned XCMG

Table 7-1 Engine faults and troubleshooting(continued)

Fault	Cause	Solution
The starting motor rotates but it can’ t be started.	Disengagement of starting motor pinion with the flywheel gear	Contact your assigned XCMG
	Seizure or trouble of pinion shift mechanism	
	Fracture of pinion teeth	
	Fracture of flywheel gear teeth	
Slow starting of engine	Inner damages or fracture of battery leads	Check and replace the leads.
	Loosening of battery or starting motor connection or corrosion	Clean and tighten the connection.
Engine takes white smoke.	Wrong fuel.	Empty the oil tank, and adopt the correct fuel.
	Low temperature of engine	Run the engine until it becomes hot.
	Trouble or overcooling of thermostat	Contact your assigned XCMG
	Injection pump inoperation	
	Leak of cooling water into the cylinder of engine	
Large noise or vibration of turbo charger	Bearing is not lubricated.	Insufficient oil pressure, check the blocked oil pipe of turbo charger
	Worn bearing	Contact with your assigned
	Air leaks of engine, suction or drain pipe	Check or repair.
	Improper gap between the turbine and turbine case	Contact your assigned XCMG
	Breakage of turbine blade	Remove the exhaust elbow and air inlet hose, and check them.
Oil dripping of turbo charger joint	Damage or wear of bearing and/or worn seal	check if the service interval of engine is due or if dirt is inside the engine.
	Over high pressure of crankcase	Blockage of turbo charger return pipe at the exhaust pipe
	Blockage of air return pipe of turbocharger at exhaust pipe	Remove the pipe and check or clean

Table 7-1 Engine faults and troubleshooting(continued)

Fault	Cause	Solution
Too large resistance of turbo charger rotating member	The combustion deposits cause the blockage of coal behind the turbine.	check or clean
	Leaks of air suction pipe cause the blockage of dirt behind the compressor wheel.	check or clean

7.2 Electrical system

Table 7-2 Electric system−faults and troubleshooting

S/N.	Fault	Possible causes	Solutions
1	Entire vehicle is with no power	is damaged or without power, connecting line is peeled or fuse is burnt out	Replace or recharge the battery, connect line 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	has insufficient power	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	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

Table 7-2 Electric system-faults and troubleshooting(continued)

S/N.	Fault	Possible causes	Solutions
		is damaged	Replace
		Fuel line damaged and other oil line fault	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 7-2 Electric system−faults and troubleshooting(continued)

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

7.3 Hydraulic system

Table 7-3 Hydraulic system faults 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 21 MPa
		Under-low pressure setting of main relief valve in turntable control valve	Adjust the pressure to 25 MPa
2	Low chassis hydraulic system pressure	Under-low setting of pressure cutoff valve for closed traveling variable displacement pump	Adjust the pressure to 28 MPa
		Under-low pressure setting of main relief valve in closed traveling variable displacement pump	Adjust the pressure to 31 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	Increase the pressure with reference to section 2.2 - the pressure adjustment method of main hydraulic parts
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 7-3 Hydraulic system faults 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	: The gap in gear engagement of rotary mechanism is too large	Regulate gear engagement gap
		The set pressure of rotary cushion valve is too high, causing the impact when opening	Regulate the set pressure of cushion valve
		: The opening pressure of slewing reducer brake is too high or malfunctions	Check 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
		Travel selector valve is with fault, causing brake cannot be opened	Check travel selector 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	Too low pressure	Measure system pressure and regulate it to corresponding value
		Malfunction of axle control valve	Check and repair axle control valve.
		mechanism fault	Check mechanism
12	The state of high-speed and low-speed in traveling cannot be shifted	Shifting electromagnetic valve is with fault	Check shifting electromagnetic valve and controlling electrical signal

Table 7-3 Hydraulic system faults and troubleshooting (continued)

S/N.	Fault	Possible Causes	Solutions
		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

7.4 Parts that need periodic replacement

Table 7-4 Parts for periodic replacement

<table>
<tr><th colspan="3">Parts that need periodic replacement</th><th>Replacement interval</th></tr>
<tr><td colspan="2" rowspan="3">Engine</td><td>Fuel hose (from fuel tank to filter)</td><td rowspan="11">Every 2 years</td></tr>
<tr><td>Fuel hose (from fuel tank to injection pump)</td></tr>
<tr><td>Oil filter hose (from engine to oil filter)</td></tr>
<tr><td rowspan="8">Hydraulic system</td><td rowspan="3">Basic body</td><td>Oil pump inlet hose</td></tr>
<tr><td>Oil pump outlet hose</td></tr>
<tr><td>Hydraulic hoses of</td></tr>
<tr><td rowspan="5">Accessories</td><td>Hose of boom hydraulic cylinder pipeline</td></tr>
<tr><td>Hose of handle hydraulic cylinder pipeline</td></tr>
<tr><td>Hose of bucket hydraulic cylinder pipeline</td></tr>
<tr><td>Hose of pilot pipeline</td></tr>
</table>

Chapter 8 Transport storage and protection

8.1 Transport safety requirements

8.1.1 Transport on public roads

8.1.1.1 General requirements

NOTICE

- **Secure the machine properly while transporting!**
- **Do not engage untrained or insufficient qualified personnel in loading, transport and unloading the machine.**
- **Additional/deviating requirements may apply in your region!**

Most common transportation occurs via lorries, trailers or semitrailers.
Regardless the transportation vehicle, proper securing of the machine is mandatory.
Personnel executing loading, transport and unloading shall be sufficient
Vehicles, rams and securing items shall be qualified for the transport of the machine.
The machine must remain safe fastened in its position on the vehicle also during typical common traffic unexpected invents as:

- emergency stopping,
- sudden maneuvers
- road unevenness!

If the safe transport is not provided due to

- improper or damaged fixation equipment,
- insufficient fixation,
- unsuitable or damaged transport vehicle,
- involved untrained, unqualified personnel,

transport of the machine is prohibited!

NOTICE

- **Do not overload the transport vehicle**
- **Company/person executing the transport is always responsible for the safe transport.**

8.1.1.2 Loading & unloading instructions

DANGER

- **Risk of serious injuries or death.**
- **Consider the load distribution on transport vehicle!**
- **Machine may slip uncontrollable on blank, slippery ramps!**
- **Make sure the slope is wide enough for safety loading and unloading**
- **Indicates an imminent and inescapable danger that causes certain death if not prevented.**

Prior driving the machine on the lorry, trailer or semi-truck ensure not exceeding overall permitted weight and dimensions of loaded vehicle.

Do not attempt to climb a blank metal ramp.

- Ramps, planks, loading areas as well as the machines drums must be clean and free potential slippery elements such as grease, dirt, ice, etc.
- In case surfaces are slippery (friction factor below 0.6), use of anti-slip mats is highly recommended.

Proceed as follows to load the machine:

1. Drive the machine carefully to the edge of the ramp, keep it in direction of the slope.
2. Lose machine parts shall be secured or disassembled and stored separately. Drive the machine slowly and carefully the ramp up on the loading surface.
3. Park the machine under consideration of machine’s center of gravity indicated also on the machine.
4. Apply articulation lock and apply lashing for machine safely during transport

Transport requirements

Center of gravity

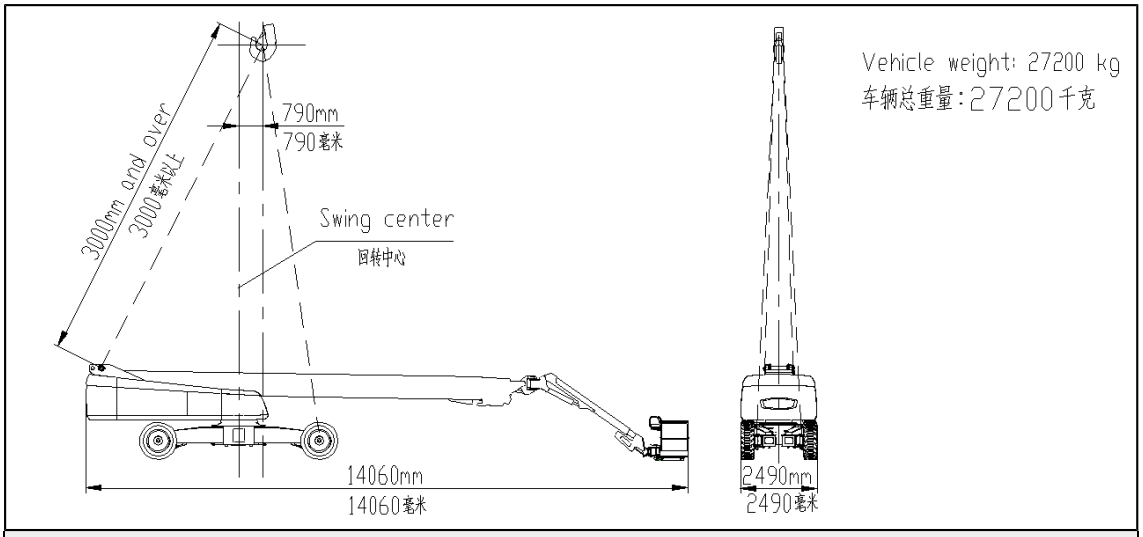


Figure 8-1 Machine gravity center

Transport lashing

Before transportation, securely fix the chassis on the transportation vehicle and take corresponding safety protection measures. The chain cable with sufficient load-bearing capacity is required and the number is at least 5. The rigging should be adjusted appropriately to avoid damage to the chain cable. As shown in the following figure.

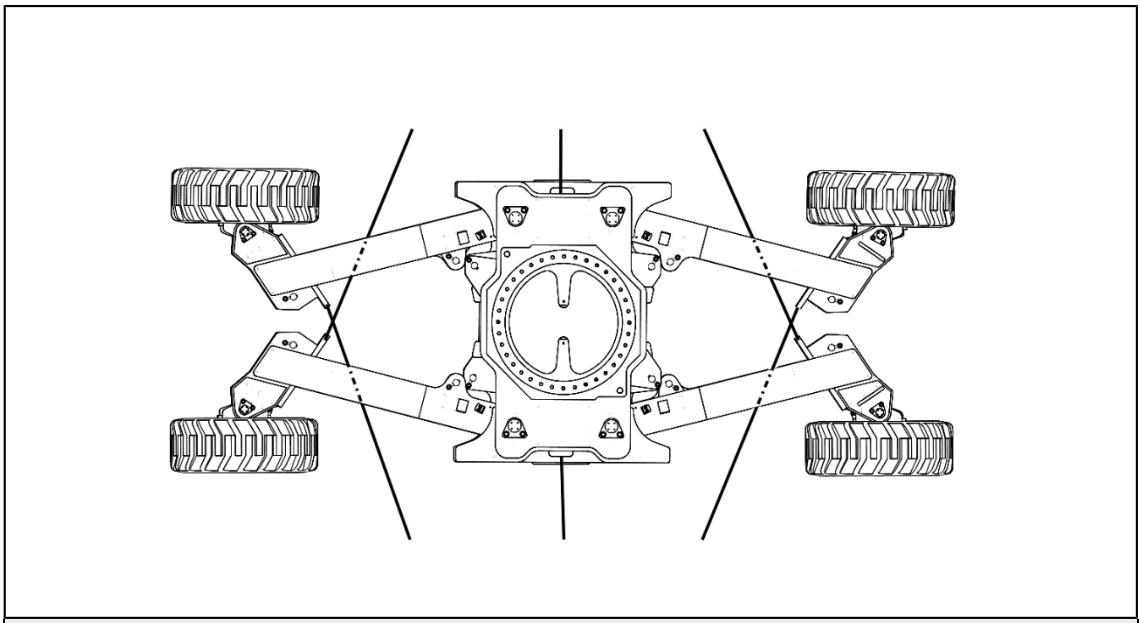


Figure 8-2 Schematic diagram of chassis fixing during transportation

Before transportation, securely fix the on the transportation vehicle and take corresponding safety protection measures.

1. Place a block under the rotating part of the to prevent it from rotating. However, it is necessary to avoid contact between the block and the platform cylinder.
2. The nylon rope shall pass through the plane near the supporting point on the lower point of the platform and shall be fixed on the transport machine to protect the platform, but the excessive downward force shall not be applied to avoid damaging the boom.

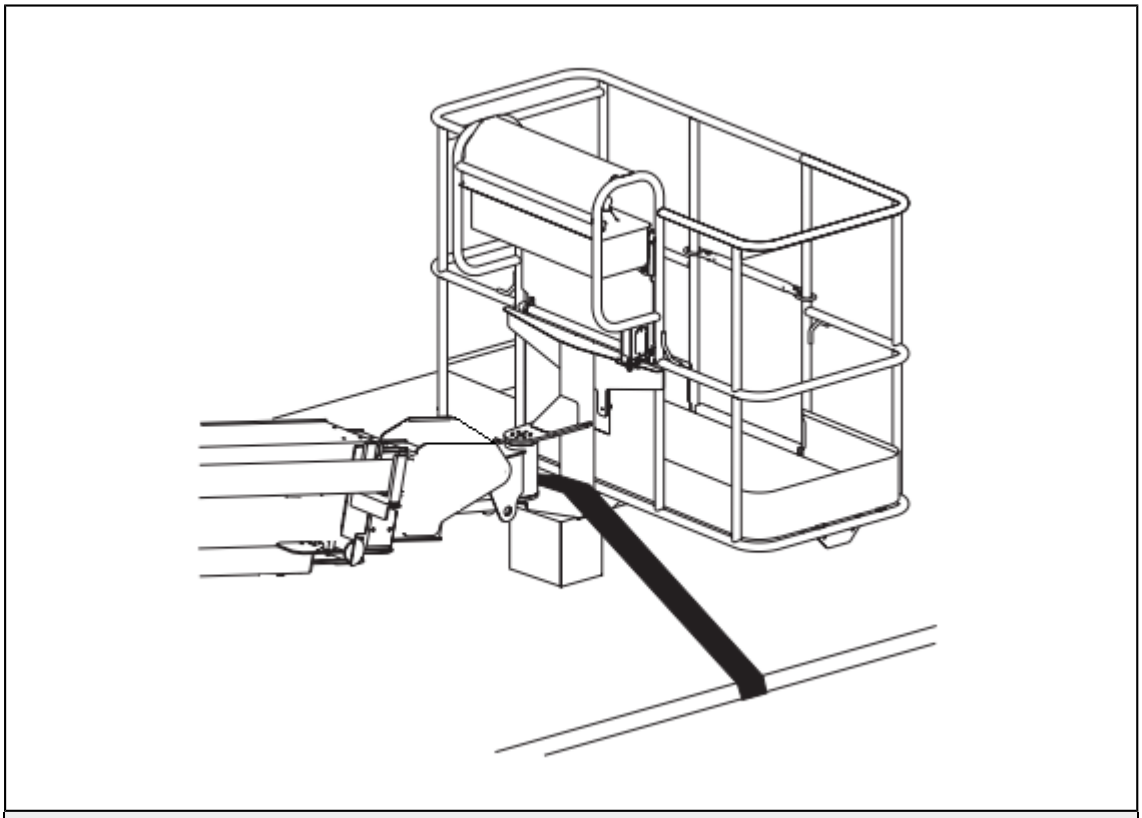


Figure 8-3 Schematic diagram of work platform fixing during transportation

Note: Please use chains or ropes with sufficient bearing capacity to fix the chassis and the .

WARNING

Disengage articulation lock prior driving the machine.

8.1.2 Hoisting the machine

DANGER

- **Risk of serious injuries or death.**
- **Consider the load distribution!**
- **Follow the loading machine's instructions for use precisely!**
- **Do not overload the machine!**
- **Consider and follow the limitations given by the machine's load chart!**
- **Do not stand beneath the load or the machine's boom!**
- **Loading/unloading presents an imminent and inescapable danger that causes certain death if not prevented.**
- **Handle with caution and care!**
- **Protect and secure the loading/unloading environment**
- **Hoisting machine is prohibited if not all safety requirements are fulfilled**

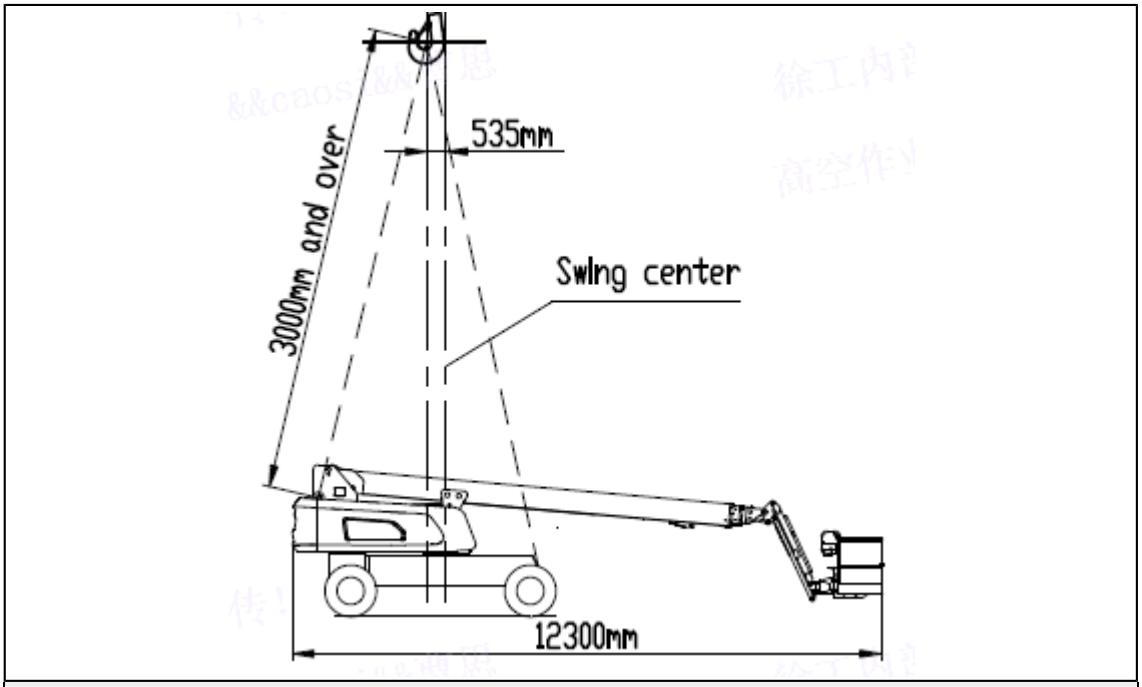


Figure 8-4 Lifting the machine with a crane

Residual activities of positioning, securing and towing down the machine on the transport vehicle remain identical as described in section 7.1.4 that follows below.

- **Drive the machine in the required position.**
- Prior hoisting machine ensure all precautions mentioned in machines safety and operation manual are met, including securing the potential danger zone.

- Use only permitted tools, lugs, ropes, etc. and ensure grounds stability as required for the machine.
- The machine’s load table must correspond to the machine to be lifted.

8.1.3 Towing the machine

DANGER

- **Risk of serious injuries or death!**
- **The machine’s brakes are disabled during process.**
- **That means the machine can roll unintentionally at any time.**
- **Secure machine with wedges to prevent damage or injuries**
- **When the machine on a slope,**
- **Secure the machine with wedges.**
- **Only tow the machine uphill.**

NOTICE

- **and related tasks shall be executed only by experienced personnel with knowledge on hydrostatic propel systems and spring-loaded brakes;**
- **Always keep these safety rules in mind while machines:**
- **The maximum speed is 4.5 km/h.**
- **The maximum slope rating is 25%.**

8.1.3.1 preparation

To the machine properly and safely, follow the steps below:

1. Retract and lower the boom, and place it above the rear drive wheels in same direction with the driving direction, and lock the turntable;
2. Switch off the engine – if operational.
3. Secure the machine with wedges.
4. Bring the vehicle in position.
5. Switch off the engine – if operational.
6. Secure the machine with wedges.
7. Open the engine hood and bring the towing vehicle in position.

Prepare the rope, chains or bar,

Do not attach to machine yet and get the tool kit.

8.1.3.2 Disengage the drive hub

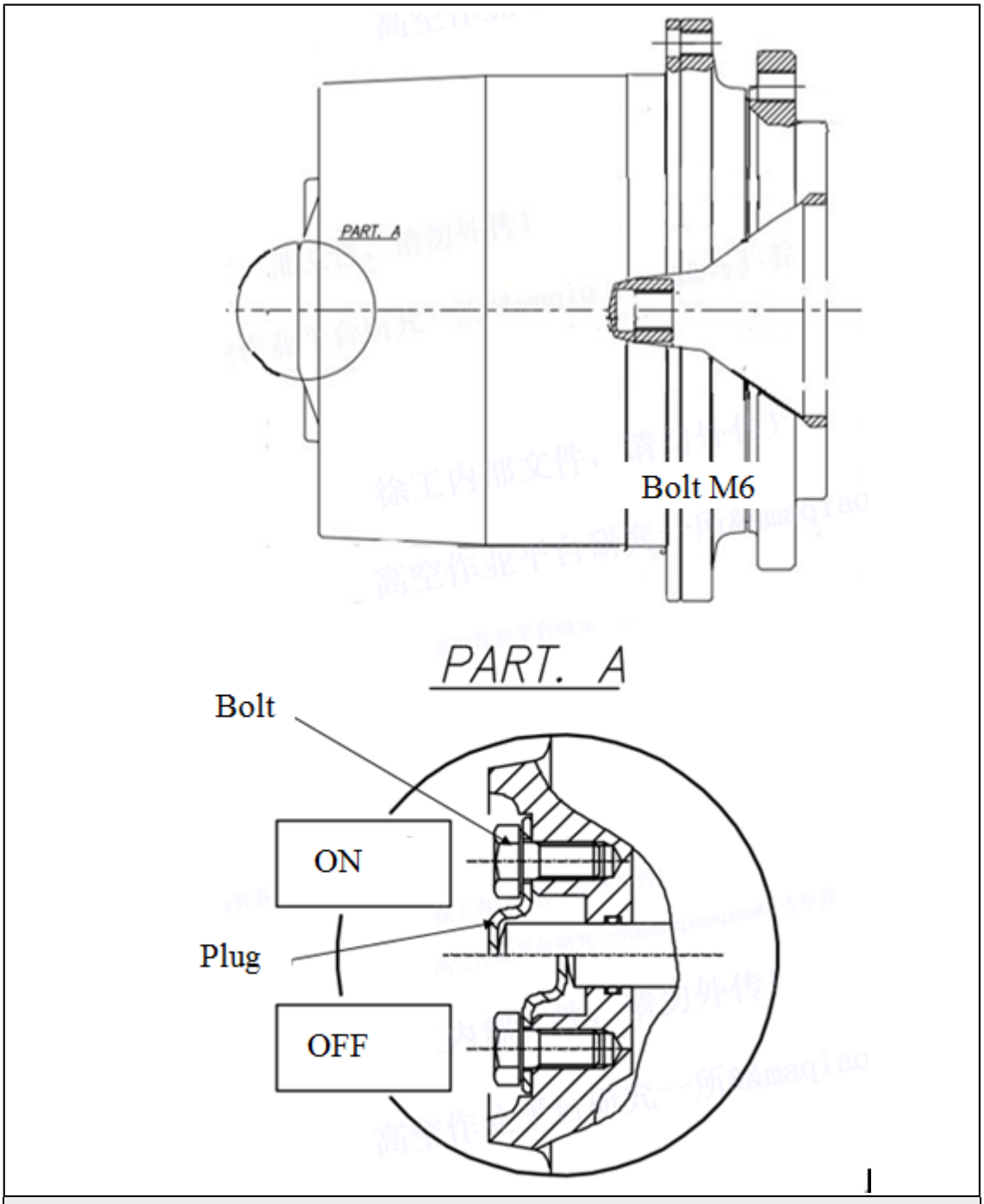


Figure 8-5 Disengagement of drive hub.

To disengagement of drive hub:

- When the is in “ON” state, remove the bolts with a wrench.
- Remove the plug.
- Flip the plug and install it to the original position.
- Tighten bolts and now the is in “OFF” state

8.1.3.3 Towing process

DANGER

- **Risk of serious injuries or death!**
- **Use only approved devices.**

Carry out the steps in the following order:

1. Connect the towing bar to the front of framework by accessory pin and tow the machine by traction bar.
2. Proceed with towing under respect or the limit conditions (maximum towing speed is 4.5 km/h, maximum towing slope rating is 25%).
3. After reaching destination secure machine immediately against unintended motion, i.e. with wedges.
4. Rotate the drive hub cover to engage the drive hub
5. Disengage the bar from the steering hook and the traction vehicle. Now the machine is in driving mode.

8.2 Parking, storage and protection

NOTICE

- **Starter batteries suffer self discharge.**
- **Starting may not be possible depending on storage duration, batteries condition and temperatures.**

- Park the machine on even ground.
- If parking on a ramp is inevitable, park it facing to the inclination slope
- Alternatively, you can use stoppers to secure the machine.
- Ensure propulsion joystick is in park position and engine switched off.
- Empty the water tank and ensure all spray water lines are empty.

8.2.1 Mid-term storage (up to 4 weeks)

NOTICE

- **Starting may not be possible depending on storage duration, batteries condition and temperatures.**
- **While temperatures may fall below freezing point, insert antifreeze agent into the spray system.**

In case the machine needs to be stored for a period of up to 2 months, carry out the following tasks additional to the previous:

- Inspect and fill up all lubricants and fluids but spray water, in particular:

  – ;

  – Hydraulic oil;

– Coolant including required protective fluids;

– Fuel.

- Grease all ;
- Secure greasing points with the respective caps;
- Grease all plain metal surfaces (i.e. cylinder rods)
- Clean the machine with appropriate cleaning agent dry it with soft rags.

8.2.2 Long-term storage (longer than 1 month)

In case long term storage is required following shall be carried out additional to the previous points.

Park the machine in a protected, dry and ventilated place on even, load-bearing ground.

If the parking place is open, it is recommended to cover the machine appropriately.

If storage period significantly extends 4 weeks, you should remove starter battery and store it separately

Regular Maintenance during storage period:

Carry out maintenances according to the instructions

Every month:

Charge the battery;

Connect and let engine run for 30 minutes

Grease all ;

Grease all plain metal surfaces;

Inspect machine for leakage and take measures if necessary

Every 3 months (additionally to the previous):

Visual inspection of appearance for signs of corrosion;

Drain if necessary;

Grease all hinges.

8.2.3 Use preparation after storage

1. Keep the engine idling for 30 minutes and propel slowly for another 30 minutes to enable hydraulic oil to heat up;
2. Remove the covers;
3. Clear the protection materials that have been applied on exposed parts
4. Charge, install and connect the ;
5. Ensure lubricants, fuel and coolant levels are sufficient.

Chapter 9 Cleaning

9.1 Cleaning exterior of the machine

Do not directly aim at electrical control cabinet and joints of wiring when cleaning the machine with high-pressure water;

Never aim water or steam jet at electrical components! Otherwise, it will result in short circuit!

⚠WARNING

Personal

- **Risk of slipping and falling**
  Do not climb onto the machine when cleaning with water or water containing cleaning agents and/or cleaning by a high-pressure cleaner!
  When use the , do not climb onto the machine!
- **Injury hazard due to rotating parts!**
  Rotating parts can cause serious injuries or death.
  Open the engine cover only at engine standstill.
  Switch-of the engine,
  Pull the start-key out of key-slotted to avoid any unintentional .
  Keep all guards and covers securely fastened to the equipment.

Wear suitable protective clothing and personal protective equipment! Do not wear loose clothing or jewelry that can get caught on rotating equipment and could result in death injuries.

⚠ CAUTION

Personal

- **Burn hazard due to hot engine parts!**
  Can cause severe physical burns.
  Stop the engine and let it cool down.
  Wear protective equipment.
  Clean machine, the engine and the combi-cooler only when the engine is switched off and cooled down
  Keep all guards and covers securely fastened to the equipment.
- **Injury hazards when using compressed air**
  Wear suitable protective clothing.
- **Hazard due to missing safety warning labels**
  Cleaning with high pressure may remove safety warning labels on the machine.
  All safety warning labels on the machine must be available and clearly legible.
  All safety labels must not be damaged
  Damaged or missing safety labels must be replaced.

Refer to the Section 4.7.2: List of safety warning labels Ordering s according to the List of labels, Section 4.7.2.

If necessary, specify the language.

Use mild cleaning agents and water to clean the s.

Do not to use cleaning agents containing solvents.

NOTICE

Property damage

- **Damage to machine due to cleaning work.**
  Do not clean the engine compartment with high-pressure cleaners, steam jets or high-pressure water. High pressure water can penetrate seals get into the electrical system cause short circuits and disable the controls.
- **Environmental damage**
  Clean the machine only in wash bays and places provided to this tasks in order to avoid damage to the environment
  cleaning without an oil separator may cause environmental damage.
  clean the machine, the engine and the combi-cooler if an oil separator is available.
- **Property damage**
  Damage may occur when cleaning with a high-pressure cleaner.
  The first cleaning with a high-pressure cleaner may only be carried out six weeks after the has been put into operation.
  Do not spray into the openings of the air filter and exhaust.

Keep the machine clean. Remove dirt, oil, tools and other objects from the , walkways and steps.
Depending on the degree of contamination, different cleaning methods can be used. Follow the information below:
The wrong choice of cleaning equipment and agents may have impact on the operating safety of the machine and to the health of the persons cleaning the machine.
When unsuitable cleaning agent is used – the surface will be damaged
When insufficient or incorrect preservation agents are applied the machine will be damaged!
Do not use any aggressive cleaning agents.
Do not use any abrasive cleaning agents.
Do not use any phosphate cleaners.
Do not use and solvents or solvent-containing cleaning agents.
Only use cleaning agents with a pH value of ⩽ 12.
Ensure that the cleaning agent to water ratio does not exceed 3%.
Rinse with clear water (not salt water).
Involve authorized qualified personnel for preservation of the machine.
Take care that inspection and re-application intervals are strictly followed.
Dry cleaning with compressed air
For cleaning minor dry-dust contamination use oil-free compressed air! Compressed air and/or a high-pressure cleaner can be used to blow out dirt and/or hot water. Set the maximum air pressure for cleaning below 205 kPa (~ 2 bar) when nozzle is removed.

Wear protective clothing, safety shoes, goggles and protective mask for cleaning work with compressed air and/or a high-pressure cleaner.
With PPE use an effective deflector shield for particles
Work carefully.
Do not direct the compressed air at the skin or at other persons.
Do not use compressed air for cleaning your clothing
When cleaning with air, allow the machine to cool down to minimize the possibility that blown fine dirt deposits will ignite in contact with hot surfaces.
Cleaning with water and detergents
In case of minor dust contamination in combination with oil and fuel:
Use only neutral or alkaline cleaning agents.
Apply cleaning agent with a brush,
Allow cleaning agent time to act and spray off with water.
Lubricate the after cleaning, see section 6.2.
The maximum water pressure for cleaning must be less than 275 kPa (~2,5 bar)
Never spray water directly on electrical connections, connections and components. When cleaning with air, allow the machine to cool so that the likelihood that fine dirt deposits will not be ignited if they are deposited again on hot surfaces.
Cleaning with washing solvents
Ensure adequate room ventilation.
Wear suitable protective clothing.
Do not use flammable liquids, such as gas or diesel.
Cleaning with a high-pressure cleaner or steam jet In case of heavy dirt contamination with dust mixed with oil and fuel
Cover electric parts.
Do not directly expose electrical components and damping material to the jet.
Cover the vent filter on the hydraulic oil reservoir and the filler caps for fuel, hydraulic oil etc.
Protect the following components from moisture:

- Electrical components such as the alternator etc.
- Control devices and seals.
- Air intake filters etc.

Cleaning with a high-pressure cleaner:
Keep the distance of at least 300 - 400 mm from the nozzle of the high-pressure cleaner to the cleaning surface!
Spray pressure must not exceed 100 bars.
Apply spray temperature of 80-90 °C.
Use only neutral or alkaline cleaning agents.
Use a brush or similar to assist cleaning of firmly adhering dirt.
Lubricate the after cleaning, see page 89. Lubrication (refer to maintenance section)
s: cleaning with volatile and easily flammable anticorrosion agents/inhibitors/sprays:

⚠WARNING

Fire, explosion and inhalation hazards

Volatile, easy flammable cleaning solvents, agents inhibitors and sprays in closed compartments or rooms always present danger of fire or even explosion.

Provide fully ventilation with fresh air in rooms or compartments prior to further work when cleaning with solvents was necessary.

Do not use unprotected lights or open flames.

Do not smoke or and avoid any cause of sparks. (electrostatic discharge or possible short circuit caused by open live wires).

When cleaning do not use objects containing metal! There is an increased risk of explosion due to possible sparks.

Only use brushes without metal parts.

NOTICE

Property damage

Damage to rubber and electrical parts when cleaning with solvents.

Do not use solvents, gasoline or other aggressive chemicals.

Cleaning exterior of the machine

To clean the exterior of machine use of the following aids is recommended:

High-pressure cleaner

Steam jet

Excessive pressure during power washing can damage the safety warning labels and design film foils on machine surfaces by forcing water underneath the labels/films.

These problems are also critical for the perforated film foils on windows.

To avoid lifting of the edge or other damage to the labels and films foils, follow these important steps:

Use a wide-spray pattern spray nozzle

Adjust maximum pressure below 100 bars

Use water with maximum temperature of 50°C

Keep the nozzle always perpendicular to the label/film foils at a minimum distance between 300-400 mm

Do not direct a stream of water at a sharp angle to the edge of the label or film foils.

Clean the interior of engine side panel.

Clean the engine panel as follows:

1. Park the machine in a wash bay or place.
2. Switch-of the engine,
3. Open the engine panel to clean the panel interior.

Screw connections

Check once a day the screw connections of the protective structures for tightness.

Loose screw connections must be immediately retightened

Chapter 10 Technical specifications/performance data

10.1 Operating limits

1. Carry out the comprehensive checking to the vehicle functions before the operation.
2. If the vehicle can’t work normally or hasn’t been correctly maintained, the corresponding operation shall be forbidden.
3. Do not use the MEWP as a crane.
4. It is forbidden to contact the fixed object (building, etc.) or the moveable object (vehicle, MEWP, etc.).
5. Don’t carry out illegal operation which will cause the stability of machine:
   1) It is forbidden to use the boom to push the machine or other object.
   2) It is forbidden to use the boom to touch the adjacent building.
   3) It is forbidden to tie the boom or platform onto the adjacent building.
   4) It is forbidden to place the load on the platform edge.
   5) It is forbidden to change or disable the machine components which may affect safety and stability.
   6) It is forbidden to use components with different weight or specifications to replace the components affecting the machine stability.
   7) It is forbidden to use tyres or air tyres with different specifications to replace the original tyres. The wheel weight is critical to the stability.
   8) The original high-flotation tyre shall be used. It is forbidden to use other high-flotation tyres to replace the original standard tyres.
6. It is forbidden to use the additional equipment to increase the extension length and work height (such as the ladder) of the MEWP.
7. It is forbidden to place the additional object which may increase the load in the platform, such as advertising board, etc.
8. No staff can climb up and down the platform when the platform is lifted.
9. Without prior approval of the , it is forbidden to modify or change the MEWP.

10.2 Overall dimensions

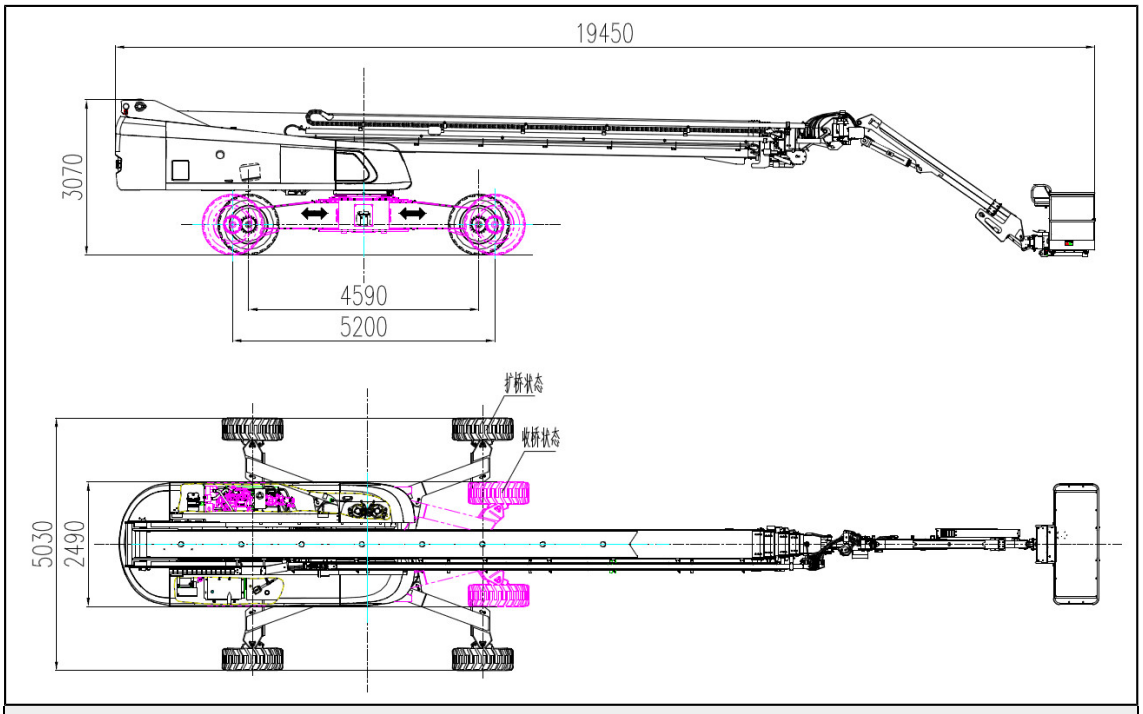


Figure 10-1 Dimension of machine

10.3 Main technical data

Table 10-1 Main technical data

Machine Height	3.05 m
Equipment length	19.45 (14.6) m
Equipment width	2.49/5.03 m
Wheelbase	5.22/4.59 m
Platform height	56.6 m
Tail swing (stowed)	2.32 m
Maximum carrying mass Unlimited: Limited	 230 kg 450 kg
Maximum driving slope	45%
Maximum driving side slope	8°
Maximum travel speed Collection status Elevated status	 4.5 km/h 0.5 km/h

Table 10-1 Main technical data(continued)

Maximum main hydraulic system pressure	4500 psi
Maximum wind speed	12.5 m/s
Maximum hand thrust	400 N
Min. turning radius (axle extended)	6.6 m
Total weight of equipment	27900 kg
Turntable rotation	360°
Fuel tank	200 L
Hydraulic oil tank	250 L
Engine oil capacity Crankcase	 151 L 9-10 L
Electrical system voltage	12 V

10.4 Emissions

10.4.1 Noise emissions

The sound emissions of the machine have been measured following the EC Sound Directive (For Outdoor Machinery) 2000/14/EC.

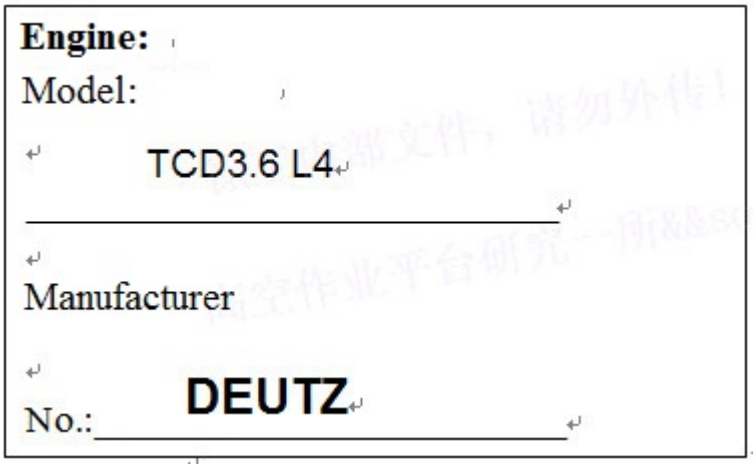
Sound pressure ats' ear as well as values are in line with the requirements of the EC Machinery Directive 2006/42/EC.

WARNING

- **Working in close the machine noise levels may exceed 85 dB(A).**
- **Wear personal noise protection**

10.4.2 Engine’s nameplate

Table 10-2 Engine’s nameplate



10.5 Vibration

The in the ambient environment will cause resonance and impact problems of MEWP. Ensure that all vibrations in the ambient environment will not impair the working of MEWP and the safety of the personnel; otherwise it is necessary to avoid operating in a environment.

The total vibration value to which the hand-arm system is subjected does not exceed 2.5 m/s^2. The highest root mean square value of weighted acceleration to which the whole body is subjected does not exceed 0.5 m/s^2.

10.6 Hydraulic schematics

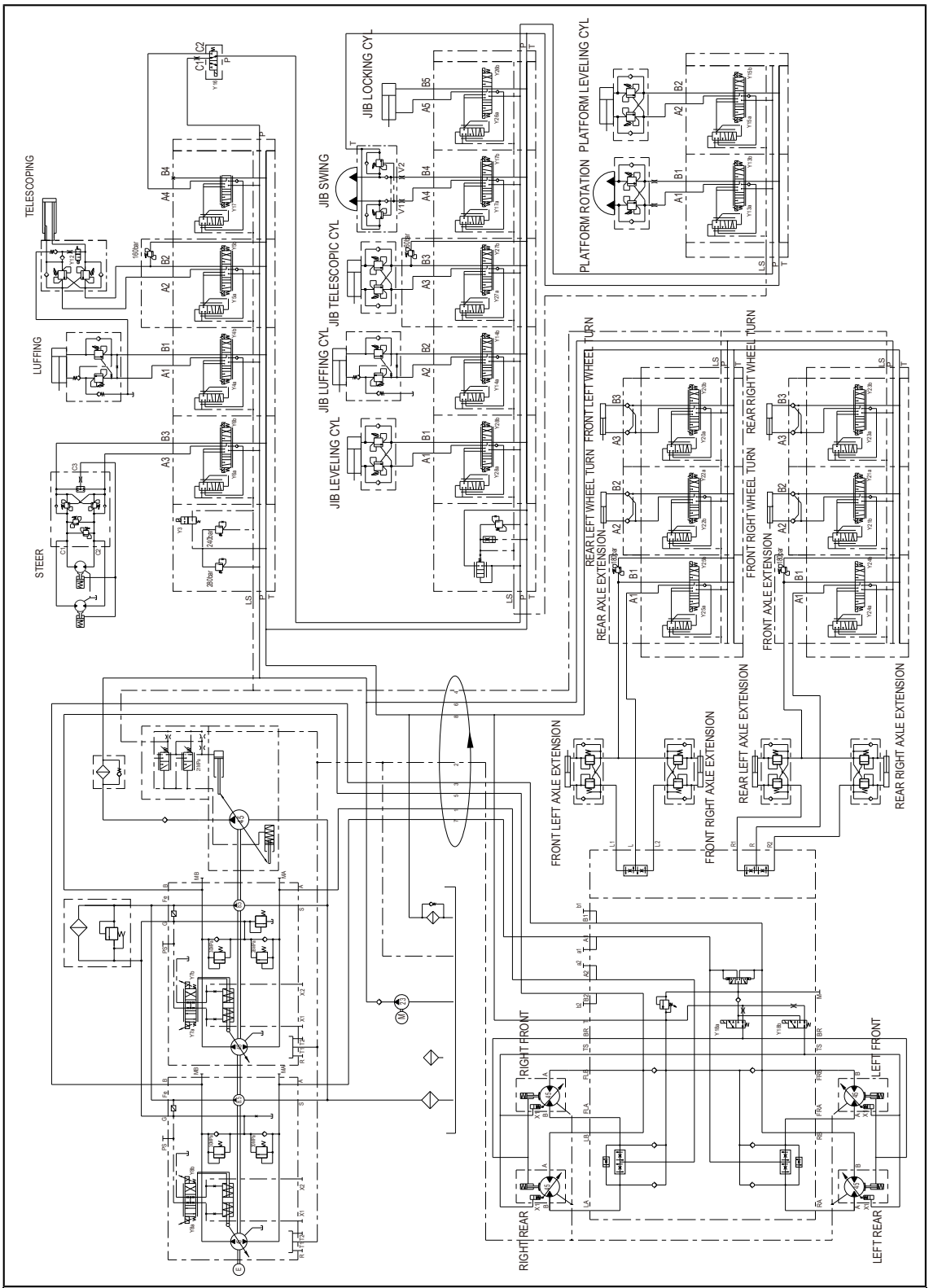


Figure 10-2 Hydraulic schematics 1: Overview

10.7 Electric schematics

Table 10-3 Electric schematics 1: Components list

S100	Power switch
S103	Turntable
S113	Platform/turntable mode switch
H14	Charging warning light
K120	Power connecting relay
K104	Power supply relay
K110	Heating relay
K111	Battery pump relay
F100	Breaker

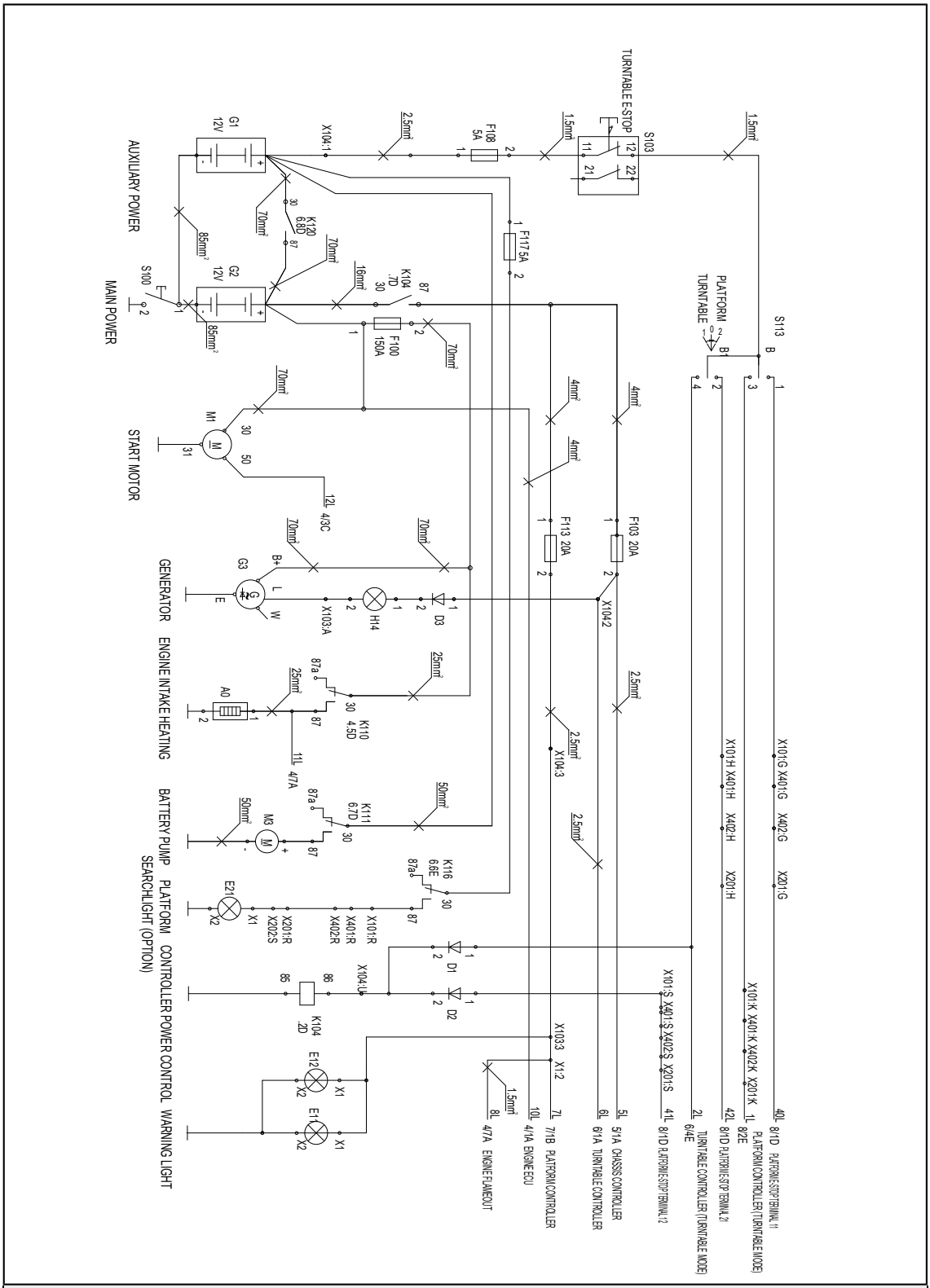


Figure 10-3 Electric schematics 1:

Table 10-4 Electric schematics 2: *components list*

R113	Coolant level inspection
K101	Starting relay
R112	Fuel-water separator
R1	120 Ω resistance
K112	Electronic pump relay
K114	Shutdown relay
K110	Heating relay
M5	Electronic pump

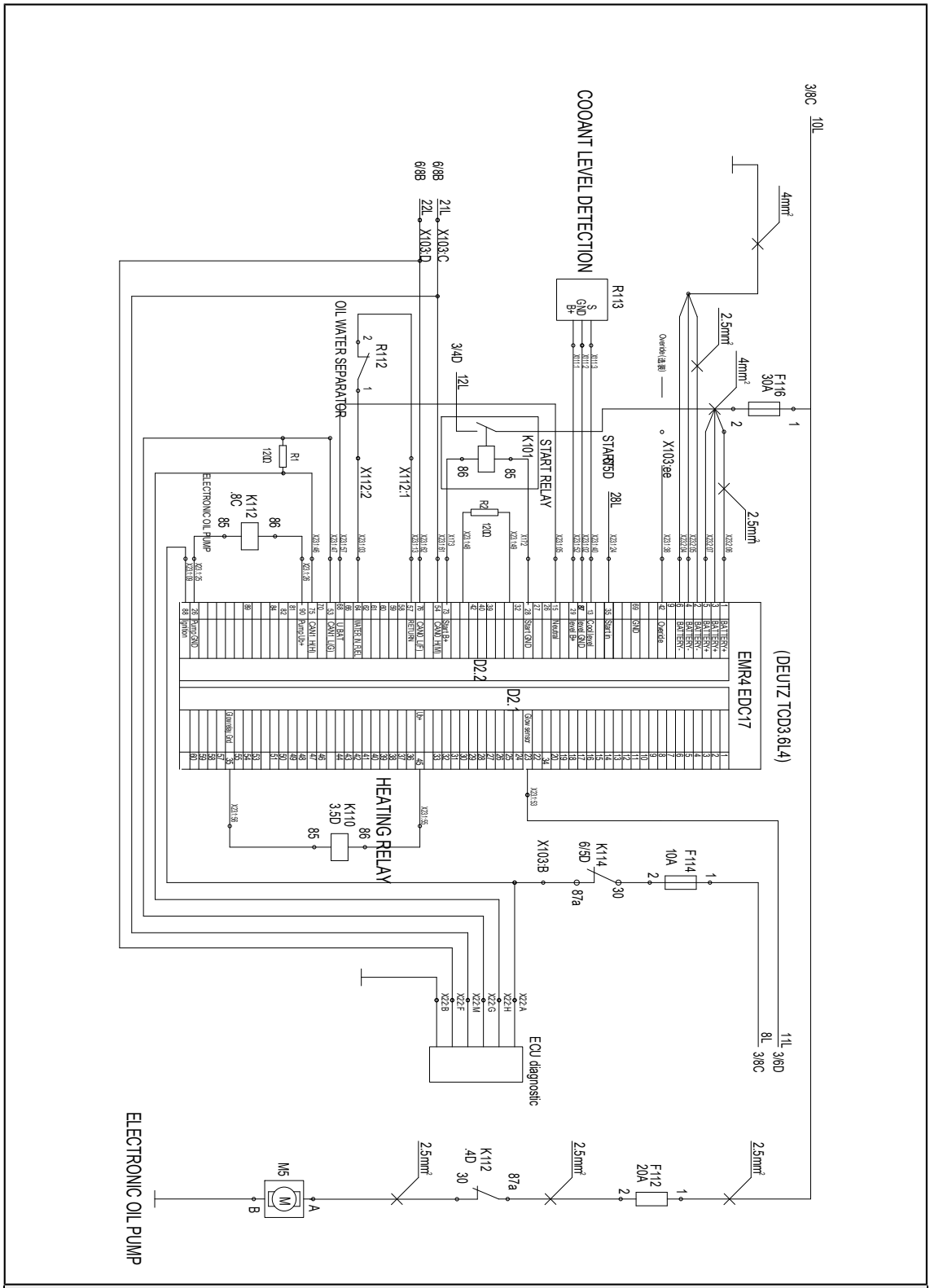


Figure 10-4 Electric schematics 2:

Table 10-5 Electric schematics 3: *components list*

R113	Coolant level inspection
K101	Starting relay
R112	Fuel-water separator
R1	120 Ω resistance

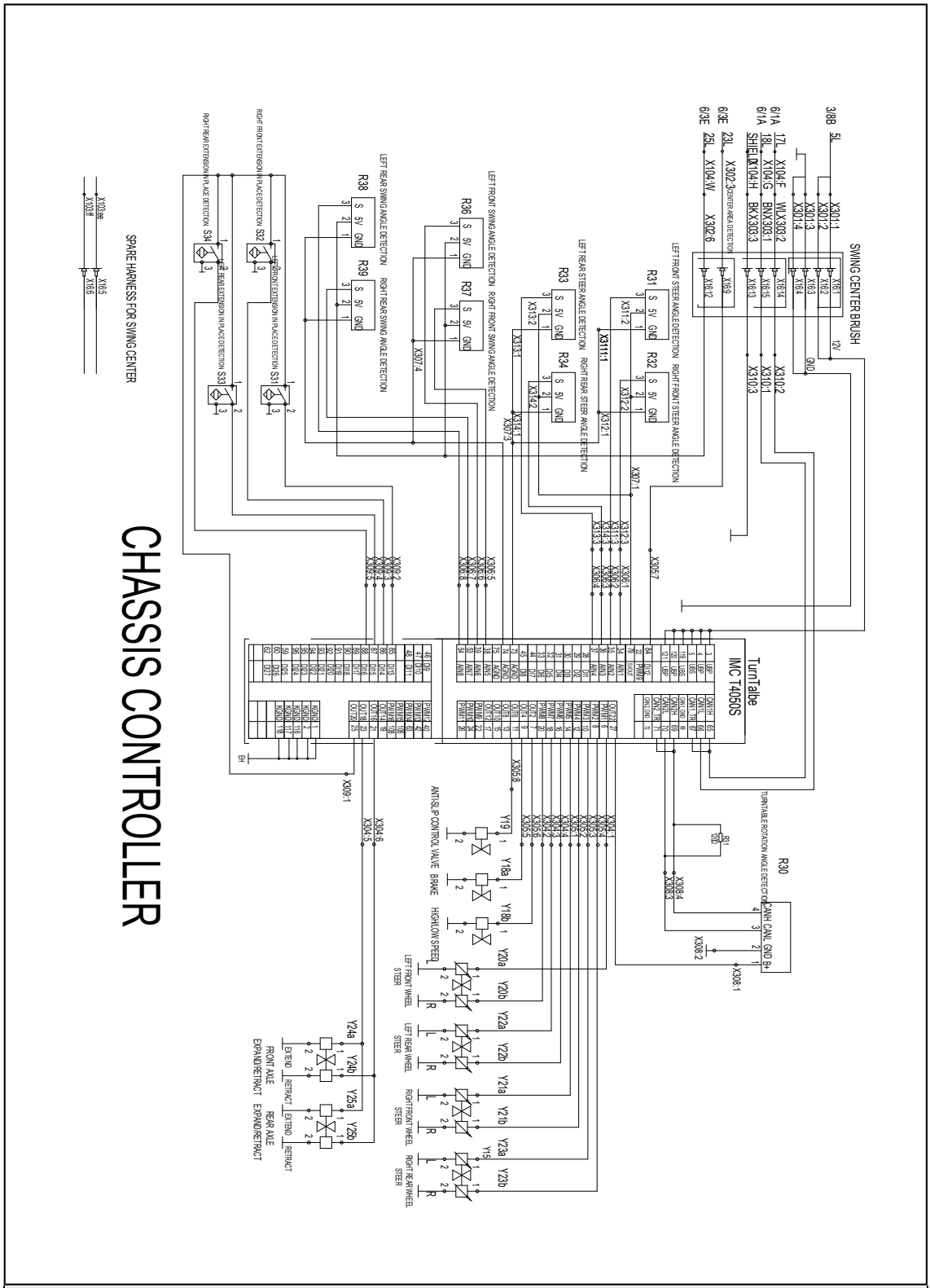


Figure 10-5 Electric schematics 3:

Table 10-6 Electric schematics 4: *components list*

S112	Acceleration switch
S26	Boom length detection switch
S19/S20	Wire rope detection switch
S101	Start/battery pump switch
R104	Hydraulic system pressure detection
R107	Fuel sensor
H12	Acoustic
H109	Buzzer
P101	Turntable display
DRE	Data logger
R101	Turntable inclination sensor
R102	Length and angle sensor
K114	Acceleration switch
K116	Boom length detection switch
K111	Battery pump relay
K120	Power connecting relay

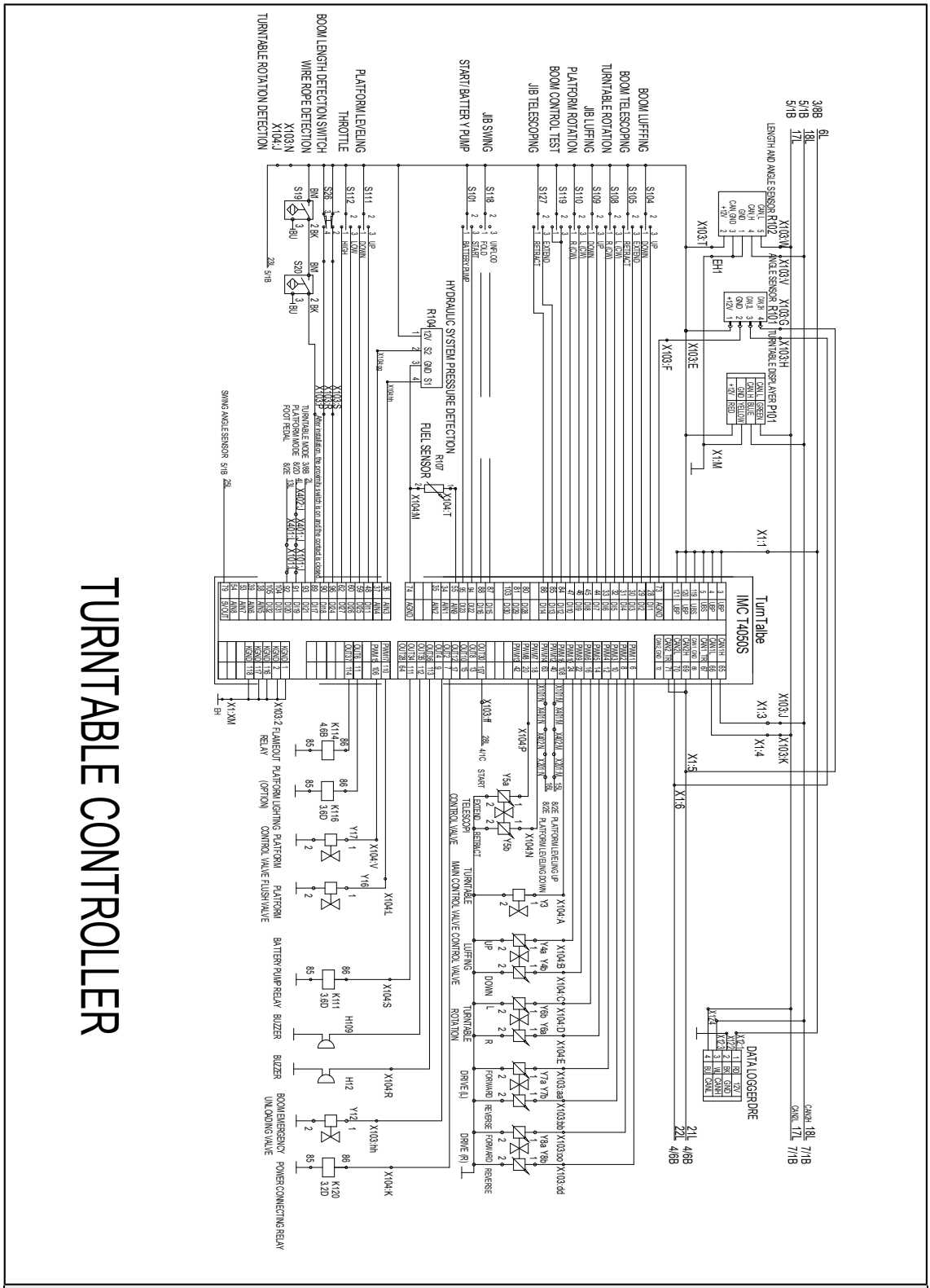


Figure 10-6 Electric schematics 4:

Table 10-7 Electric schematics 5: *components list*

R208	Jib luffing angle detection sensor
R209	Jib swing angle detection sensor
R210	Jib levelling angle detection sensor
R211/R212	Jib fully retraction detection switch
R213	Jib locking detection switch

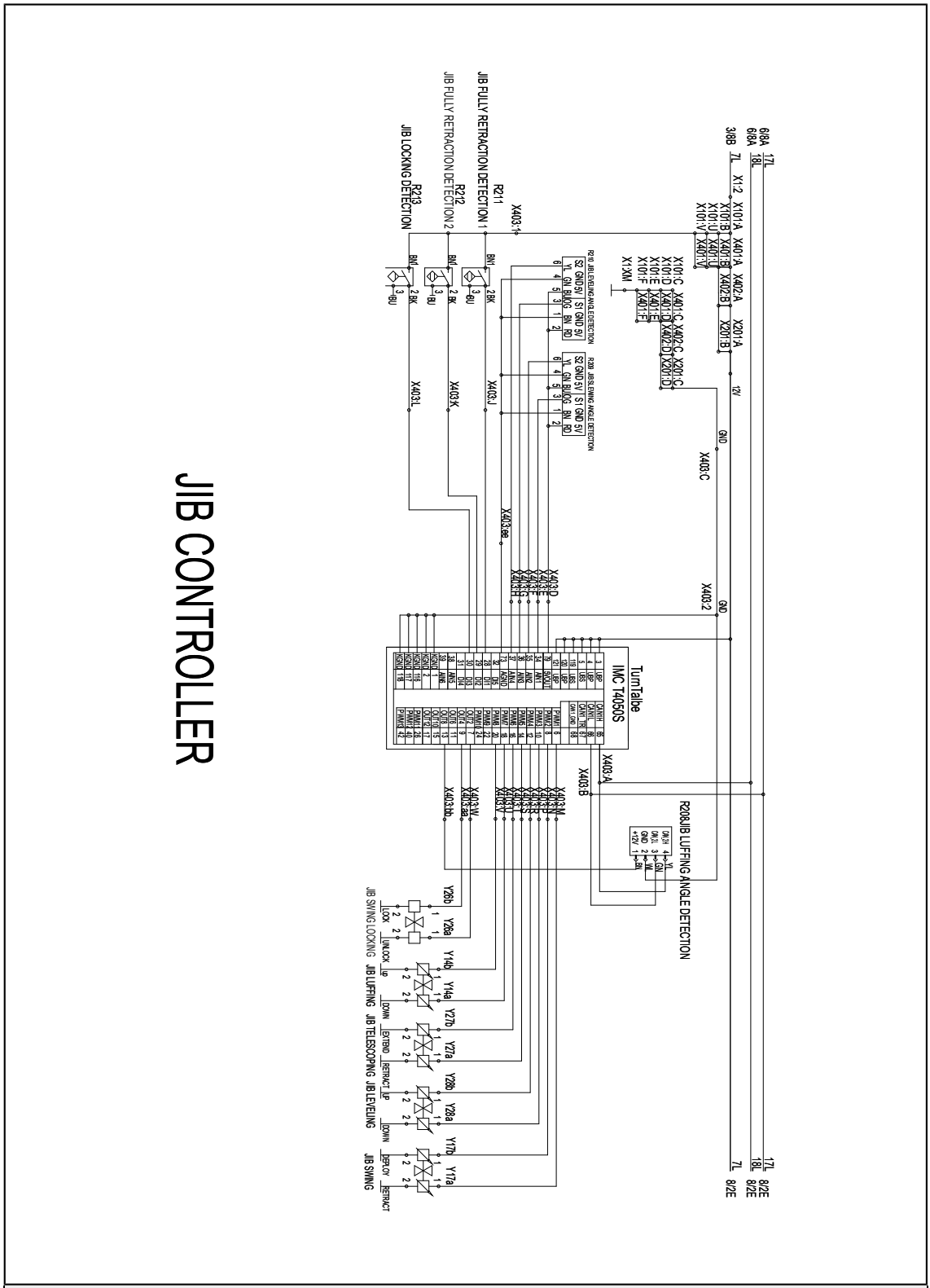
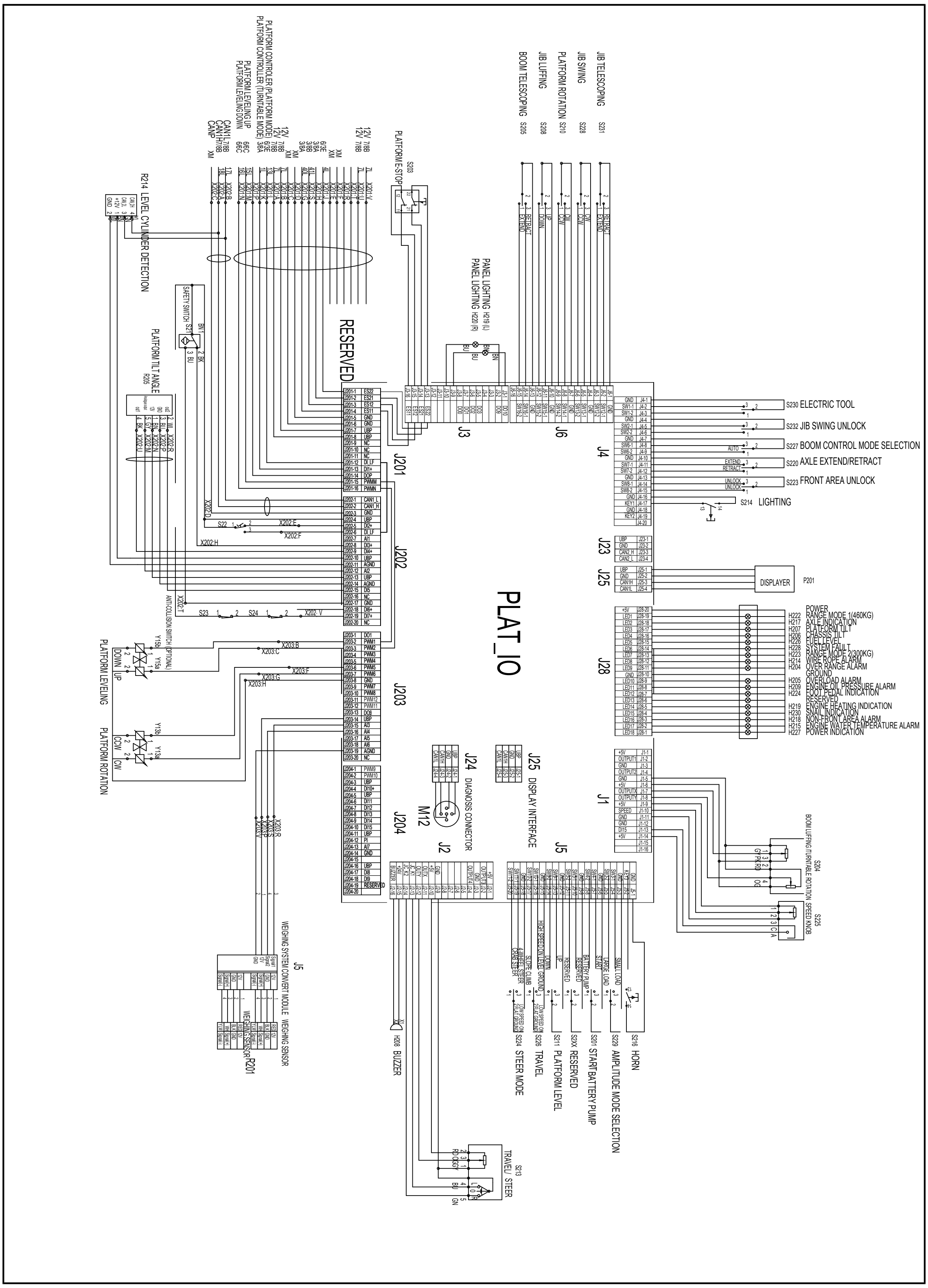


Figure 10-7 Electric schematics 5

Table 10-8 Electric schematics 5: *components list*

R201	Weighting sensor
R205	Turntable inclination sensor
S21	Platform active defense switch
S22	Foot Pedal
P201	Platform display
H219/H220	Platform panel light
H208	Buzzer
S203	E-stop switch on turntable
S216	Horn
R214	Levelling cylinder detection


PLAT_IO
RESERVED
J201
J202
J203
J204
J3
J6
J4
J23
J25
J28
J1
J5
J2
J24 DIAGNOSIS CONNECTOR
J25 DISPLAY INTERFACE
M12
S230 ELECTRIC TOOL
S232 JIB SWING UNLOCK
S227 BOOM CONTROL MODE SELECTION
S220 AXLE EXTEND/RETRACT
S223 FRONT AREA UNLOCK
S214 LIGHTING
DISPLAYER
P201
JIB TELESCOPING
JIB SWING
PLATFORM ROTATION
JIB LUFFING
BOOM TELESCOPING
PLATFORM E-STOP
PANEL LIGHTING
R214 LEVEL CYLINDER DETECTION
PLATFORM TILT ANGLE
SAFETY SWITCH
PLATFORM LEVELING
PLATFORM ROTATION
WEIGHING SYSTEM CONVERT MODULE
WEIGHING SENSOR
H208 BUZZER
S213 TRAVEL/ STEER
S216 HORN
S229 AMPLITUDE MODE SELECTION
S201 START/BATTERY PUMP
S20X RESERVED
S211 PLATFORM LEVEL
S206 TRAVEL
S224 STEER MODE
POWER
RANGE MODE 1(460KG)
AXLE INDICATION
PLATFORM TILT
CHASSIS TILT
FUEL LEVEL
SYSTEM FAULT
RANGE MODE 2(300KG)
WIRE ROPE ALARM
OVER RANGE ALARM
GROUND
OVERLOAD ALARM
ENGINE OIL PRESSURE ALARM
FOOT PEDAL INDICATION
RESERVED
ENGINE HEATING INDICATION
SNAIL INDICATION
NON-FRONT AREA ALARM
ENGINE WATER TEMPERATURE ALARM
POWER INDICATION

Chapter 11 Decommissioning and disposal

11.1 Decommissioning and disposal

⚠WARNING

- **Improper disassembly increases the risk of accidents!**
- **Contact your XCMG partner for proper disassembly of the machine.**
- **Disassemble the machine into its individual parts according to the instructions of your XCMG partner**

NOTICE

Property and environmental hazards

Safety and environmental protection should be in focus

Please ensure negative impacts during disposal of packing materials, cleaning agents, consumables, components and after end of life, the entire machine

11.1 Properly disassemble the unit

If the product needs to be taken out of service, different regional regulations apply for decommissioning/ disposal the product.

The product must be disposed of in accordance with the respective regional regulations. Contact your local XCMG dealer for more information.

Follow all local regulations for the disposal of materials liquids.

Improper waste disposal endangers the environment.

Potentially harmful liquids must be disposed of in accordance with the applicable regulations.

Always use leak-proof containers when draining fluids. Do not pour used fluids onto the floor, down a drain, or into a water source.

XCMG equipment do not contain asbestos.

⚠WARNING

- **Hazards from asbest dust**
- **Avoid inhaling dust generated dust that may be generated when handling asbestos fiber can be generated. Inhalation of this dust is harmful to health.**

When handling parts containing asbestos fibers or asbestos debris, during disposal follow these guidelines:

Components that may contain asbestos fibers include

Brake pads, brake bands, brake linings, clutch plates and some gaskets. The asbestos contained in these parts is bound or sealed with resin. bound or sealed. Normal handling is not dangerous as long as no asbestos dust is generated is produced that can become airborne.

If asbestos dust is present, the following guidelines must be followed:

Never use compressed air for cleaning.

Do not brush on asbestos-containing material.

Do not grind on asbestos-containing material.

Clean asbestos-containing material wet.

You can also use a vacuum cleaner with a HEPA, High Efficiency Particulate Air filter

Use an air-suction system for machining during disposal work.

If the dust cannot be kept away in any other way, use an approved dust mask.

Avoid places where asbestos particles may be in the air.

When disposing of asbestos, follow the relevant environmental regulations when disposing of asbestos.

European Directive 98/391/EWG for Occupational Safety and Health (OSH) by the European Agency for Safety and Health at Work.

The rules and regulations are applicable to the workplace. The rules and regulations are applicable to the workplace. In the USA, the Occupational Safety and Health Administration (OSHA) Administration (OSHA) regulations must be followed. These OSHA regulations can be found in “29 CFR 1910.1001”.

In Japan, in addition to the requirements of the Industrial Safety and Health Act, the requirements in “Ordinance on Prevention of Health Impairment due to Asbestos” must be observed.

11.1.2 Disposition

Follow regulations that apply to your region and dispose the materials in a professional safe and environmentally friendly way.

recycling may become easier in case when materials meant for disposal are properly sorted.

Hydraulic accumulators contain high pressure gas and oil. DO NOT disconnect or disassemble any lines or components of a pressurized accumulator.

Before servicing or disposing of the accumulator or its components, completely relieve the gas charge pressure according to the instructions in the service manual must be completely removed.

Failure to follow the instructions and warnings could result in injury and fatal accidents.

Chapter 12 Warranty

12.1 Warranty

NOTICE

Indicates a situation that may cause property or environmental damage if ignored.

12.1. 1 Warranty regulation

12.1.1.1 Application area

This article is applicable to all regions in Chinese mainland.

12.1.2 Application product

This clause is applicable to boom-type MEWPs manufactured by XCMG FIRE-FIGHTING SAFETY EQUIPMENT CO., LTD (hereinafter referred to as XCMG Fire-Fighting).

12. 1. 1. 3 Warranty period and coverage:

The warranty time of boom-type MEWPs manufactured by XCMG Fire-Fighting is: calculated from the delivery date (date of filling in customer pick-up registration form), the warranty coverage is as follows:

1. The following items enjoy 60-month warranty period:
   Main structural components: frame structure, outrigger structure, turntable structure, boom structure, and welding structure of .
2. The following items enjoy 24-month warranty period:
   1) (1) Main hydraulic system components (under normal use and maintenance): hydraulic cylinder, hydraulic pump, hydraulic control valve lock, , , and .
   2) (2) Main electrical system components (under normal use and maintenance): tilt sensor, length and angle sensor, weighting sensor, angle sensor, controller and solenoid valve.
3. The following items enjoy 12-month warranty period:
   1) Parts/components of electrical control system: detection switches, s and joysticks.
   2) Other main components: , slewing center, shaft, pin, bearing, fuel tank, hydraulic tank, etc.
4. With regard to the replacement service for damaged components provided by XCMG Fire-fighting, the replaced components are to be owned by XCMG Fire-fighting.
5. The warranty period of replaced parts within warranty coverage during the warranty period of machine will be automatically terminated with the machine’s warranty period.
6. For products with special requirements, the warranty regulation shall be executed according to the contract signed by both parties.

For product faults due to above product quality problems, XCMG Fire-fighting will provide repair service for free, and if the product cannot be repaired or the repair cannot make the product meet product performance requirements, XCMG Fire-fighting will replace the components with fault for you.

12. 1. 1. 4 Parts not covered by warranty

1. Fading, damage, peeling, etc. of paint on the appearance of the machine and its components.
2. The parts that are easy to damage, wear, age and break, such as rubber (plastic) parts, tires, transmission belts, exhaust cylinders, , sealing elements, standard fasteners, slides, copper sleeves, brake friction pads for walking and s, etc.
3. Electrical components: batteries, bulbs, fuses, wires, cables, connectors, etc.
4. Various oils, greases, antifreeze, various filters, external decorative sheet parts, etc.

12.1.1.5 Limited warranty coverage for other special parts:

1. For the warranty of the engine, please refer to “Operation and Maintenance Manual” or “Warranty Manual” from the engine supplier. Please refer to the specific regulation from the manufacturer of the engine configured on the MEWP you purchased for the first maintenance.
2. Various high-pressure and low-pressure hoses: within 12 months from the purchase date (subject to the effective repair feedback record), under normal use and maintenance, the hoses shall be repaired or replaced if there is any oil leakage and fracture at hose head or bubble burst of hose wall.
3. Electrical instruments and switches: within 12 months from the date of purchase (subject to the effective repair feedback record), under normal use and maintenance, if there is any damage due to quality problems of electrical switches and electrical instruments, they will be repaired or replaced according to the warranty article.
4. Sound-light alarm elements, door lock folds, gas spring and other hardware: Within 12 months from the date of purchase (subject to the effective repair feedback record), under normal use and maintenance, there may be burnout of horn, buzzer, stroboscope lamp and other sound-light alarm elements due to water incoming; and there may be severe corrosion and fracture of hardware such as door lock fold, and these will enjoy warranty or replacement service of our company.
5. For products with special requirements, it is required to be subject to relevant contents agreed in the product purchase and sale contract signed by both parties.
6. For the imported components of the whole vehicle, there will be a 12-month quality warranty period; and only for the domestic components, the quality period may be longer than 12 months.

12.1.1.6 Malfunctions or damages caused by the following reasons is excluded from the warranty

1. Machine malfunctions caused by use, maintenance and adjustments that fail to comply with the “” from XCMG Fire-Fighting and related component instructions.
2. Machine malfunctions caused by use, maintenance and adjustments that fail to comply with the “” from XCMG Fire-Fighting and related component instructions.
3. Machine damages caused by continued use after malfunction without the authorization of XCMG Fire-Fighting.
4. Any disassembly and refitting to the product without authorization.
5. Parts or components from other manufacturers is used to replace original parts/components or approved replacements or accessories without the authorization of XCMG Fire-Fighting.
6. Machine or parts/components is damaged or malfunctioned by failure to fill and replace engine oils, gear oils and fuels in accordance with the grades specified in the “” of XCMG Fire-Fighting.

7. Customers shall check and tighten the bolts at each part of the machine regularly according to service condition. XCMG Fire-Fighting shall not be liable for product damage and other responsibilities caused by bolts not tightened in place.
8. The subsequent machine damages or malfunctions caused by maintenance work in a repair shop which is not authorized by XCMG Fire-fighting.
9. If the actual product is not consistent with the machine nameplate, qualification certificate or serial number of XCMG Fire-Fighting and valid proof cannot be provided, the warranty will not be provided.
10. If there is no complete maintenance record of the machine, the warranty will not be provided.

12.1.1.7 XCMG Fire-Fighting's products are special products, so employee must operate and regularly maintain according to the operation and maintenance manuals; Otherwise, XCMG Fire-Fighting will not accept product damage and operation accidents caused thereby.

12.1.2 Agreements about machine return and replacement:

12.1.2.1 Agreement on machine change:

1. The customer must submit a replacement application (subject to valid application record) within 1 month after sale and the main function of the product has a serious failure that cannot be repaired (due to manufacturing or design reasons).
2. If the rule in Article 1 is not met, the Customer is willing to assume the traffic fee and transportation fee paid for handling vehicle change formalities, and pay the vehicle depreciation cost (calculated as per 3‰ per day), and is willing to assume the cost incurred caused by damage of product or other components due to itself.

   If the above terms are met and approved by XCMG Fire-Fighting in accordance with the prescribed procedures, the customer can replace machine after signing a machine replacement agreement with XCMG Fire-Fighting. The change of machine of same model, specification, configuration and engine is not affected by the change of sales price. The change of machine with different models, specifications, configurations and engines shall be carried out after filling price difference based on the sales price.

12.1.2.2 Agreement on machine return:

1. The customer must submit a return application (subject to valid application record) within 15 month after sale and the main function of the product has a serious failure that cannot be repaired (due to manufacturing or design reasons).
2. If the rule in Article 1 is not met, the Customer is willing to assume the traffic fee and transportation fee paid for handling vehicle change formalities, and pay the vehicle depreciation cost (calculated as per 3‰ per day), and is willing to assume the cost incurred caused by damage of product or other components due to itself.

   After meeting above articles, and after being reviewed and approved by XCMG Fire-fighting according to ruled procedures, the vehicle can be returned after the Customer signs a vehicle replacement agreement with XCMG Fire-fighting. After completion of agreement fulfilling, the rights and obligations between XCMG Fire-fighting and the Customer will be terminated.

12.1.3 Agreement on handling major accidents:

In the process of using the machine, boom fracture, operating tipover, travelling tipover, or accidents involving heavy personal casualties and property losses are classified as serious accidents. If a major

accident has happened, the customer shall preserve the accident site and notify local representative office of XCMG Fire-Fighting as soon as possible.

After the accident handling personnel of XCMG Fire-Fighting arrive at the site, the customer shall help to collect relevant data actively, describe the process of the accident truly and completely, assist to question the person concerned and collect evidence, and cooperate to make relevant record, so that XCMG Fire-Fighting can quickly and effectively handle the accident and related aftermath matters for customers.

If a major accident occurs due to product quality, XCMG Fire-Fighting shall take corresponding compensation liability. If a major accident occurred is not caused by product quality (caused by a customer or a third party's illegal operation, illegal driving, etc.), XCMG Fire-Fighting will not be responsible for any consequences and will not assume relevant responsibility.

12.1.4 Limited liabilities

Regardless of whether the customer’s claim against and s can be found in the warranty clauses, whether the claim complies with the provisions of the contract, or weather the claim involves civil torts caused by negligence or dereliction of duty, XCMG Fire-Fighting or authorized dealers only assume limited liability for the losses, damages or expenses incurred by problems in the design, production, and sales process. Unless that the rules in the contract or the laws of china are violated, under any circumstances, the cost of XCMG Fire-Fighting or its authorized dealers for fulfilling the liability shall not exceed the value of the machine or accessory itself that caused such liability.

12.1.5 Exemption clauses

In addition to fulfilling the obligations stipulated in the warranty clauses, XCMG Fire-Fighting or authorized s shall not be liable for any loss, damage or expense caused by the following reasons:

1. They will be responsible for warranty of components of the sold products which are within the quality warranty period, excluding any liability for personal and property damage caused by any illegal operation.
2. Only the loss of function caused by material quality and manufacturing process within the warranty period is covered by the warranty and no other related loss liability (such as construction period delay, etc.) is assumed.
3. Be not responsible for compensation for contracts, agreements and other civil, commercial, and maritime related-disputes (such as profit and loss, breach of contract or lease losses) caused by machines or parts.
4. The product and its accessories are stolen or there is any damage not caused by the product itself.
5. Any other economic or commercial losses and special or serious damages (unless the compensation for a certain serious loss is the obligation of manufacturers and s expressly given by local law).
6. Product which the customer refuses to let XCMG Fire-Fighting inspect and maintain.
7. The customer shall not occupy, discard or detain the defective parts replaced for any reason or excuse. If the customer does not return the defective parts in their entirety to the service personnel of XCMG Fire-Fighting, XCMG Fire-Fighting has the right to refuse or terminate after-sales service.
8. The fault is caused by wrong behavior of the third Party or the Customer or the Distributor.
9. Accidents or force majeure which can not be controlled or overcome.

10.Circumstances which can exempt the Company or the authorized dealer from obligations as ruled in the governmental (state) laws and regulations, or agreed by both Parties.

12.1.6 Risk and interest

The Customer agrees that the above warranty and exception clause are part of agreed price in case of product purchasing. The customer and XCMG Fire-Fighting can also reach a supplementary agreement on the warranty and exemption clauses, but the corresponding product price should be renegotiated and determined in writing. If the customer disagrees with the price change according to this article, it will be regarded as agreeing Article IV of the Agreement, and the Customer agrees that the XCMG Fire-fighting assumes limited liabilities.

XCMG Fire-Fighting Safety Equipment Co., Ltd. reserves the right to interpret this warranty manual.

This warranty manual is an integral part of the product sales contract and has the same legal effect as the sales contract. XCMG Fire-Fighting has clearly informed customers about the warranty coverage, return and replacement agreement, exemption clauses, limited liability clauses, risk and advantage, etc.; The customer has understand their rights and obligations; Both parties agree that this warranty manual is binding on both parties.

★In order to maintain your machine in normal operation, please pay attention to regular maintenance according to the technical requirements of this .

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Copyright

XCMG Fire-Fighting Safety Equipment., LTD. keeps abreast of the latest technical developments and constantly improves their products.
For this reason, we may from time to time need to make changes to figures and descriptions in this documentation which do not reflect products that have already been delivered and that will not be attached on these machines.
Technical data, dimensions and weights are only given as an indication. Responsibility for errors or omissions is not accepted. Non-metric weights and measurements are approximate. Translation of original Operation and Maintenance Manual.
The cover features the machine with possible optional equipment.
Photographs and graphics are symbolic representations and may differ from the actual products.

The Operation and Maintenance Manual and any amendments to it must be constantly available at the place of use of the vehicle. Possible amendments are included at the end of the Operation and Maintenance Manual.

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

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

Post Code: 221100

Tel: +86 516 87981118

Service Tel: +86 516 87981166

Quality Assurance Tel: +86 516 87986966

Spare Parts Tel: +86 516 87989292

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