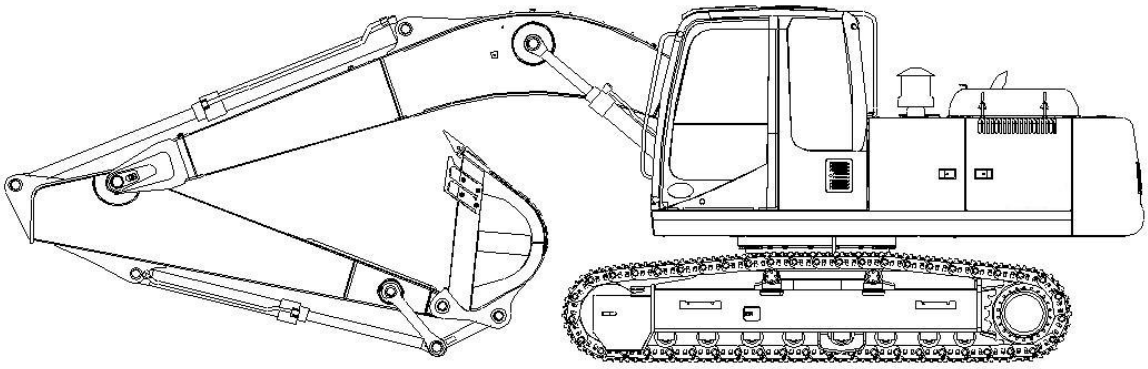
XE210CU/XE240LC

HYDRAULIC EXCAVATOR

OPERATOR'S MANUAL

original instruction



XUZHOU XUGONG EXCAVATOR MACHINERY CO.,LTD

Preface

This manual provides the safety guidance and correct use and maintenance of the machine. Before starting and operating the machine for the first time, before maintenance of the machine, before operation, maintenance and repair of the equipment, please read carefully and master this manual, and learn how to correctly operate, maintain and repair your machine. Read the manual safety information and safety signs fixed to the machine, and understand the safety requirements.

During operation and maintenance, you must always comply with all the precautions specified in this manual. Accidents are all caused due to fail to comply with the basic safety rules of machine operation and maintenance.

This safety warning symbol indicates the important safety information in this manual. When you see this warning symbol, you should be vigilant to the possible injury, carefully read the information under the symbols and promptly inform other operators.

Keep the manual in the cab so that all staff can refer and regularly read the manual. If the manual is lost, damaged or illegible, please immediately contact with Xuzhou Xugong Excavator Machinery Co., Ltd. or your dealer for timely replacement of the manual.

This manual should be considered a permanent part of the machine. When you sell the machine, the manual must be attached.

Intended use:

XE210CU/XE240LC hydraulic excavtor is intended to be used for earth moving construction like municipal construction,road and bridge building, construction of agricultural irrigation, port and habour construction, and mining.

This machine of standard specification is applicable to the following operating conditions: Ambient temperature: -15℃~40℃(-59℉～104℉)

Altitude: 0m～2100m/(6890ft)

Slope of the ground is limited to less than 35°.

When the machine is used beyond the above conditions, please contact with our company or its distributors.

California Proposition 65 Warning:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer birth defects, and other reproductive harm.

Battery posts, terminals and other related accessories contain lead and lead compunds, chemicals known to the State of California to cause cancer and other reproductive.

Wash hands after operation

Xuzhou Xugong Excavator Machinery Co., Ltd. cannot predict the potentially dangerous situations in the operation and maintenance, so the safety information in this manual and on the machine does not include all possible safety measures. If method or actions not specifically recommended or allowed in the manual are adopted, you have the responsibility to take the necessary measures to guarantee the safety.

Important：If your manual does not accord with your machine, please contact with your boss, dealer

or manufacturer to obtain the right safety manual. Keep this manual well and read it carefully.

All the information, figures and specifications in this manual are the latest acquired upon publication. All information shall be subject to changes without additional notices.

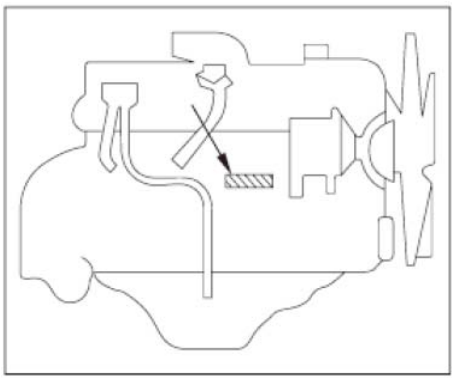
Machine Number

Please record all numbers correctly for future maintenance. In addition, your distributors also need this information. If this manual is on the machine, please put the machine numbers in safe places except the machine, in order to search the machine after missing.

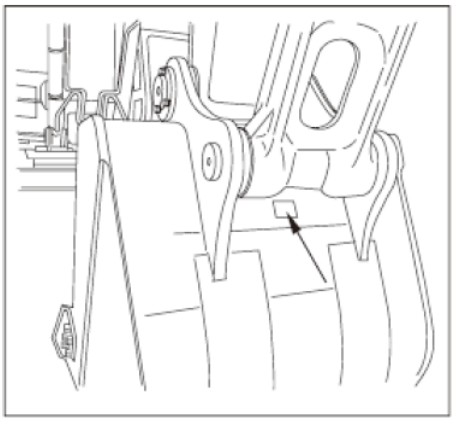
The numbers listed in this group are the unique identification numbers serial numbers) of each machine and the hydraulic parts; please fill these identification numbers in the corresponding places for quick putting forward when required.

Machine
Model: _____
Product identification number_____

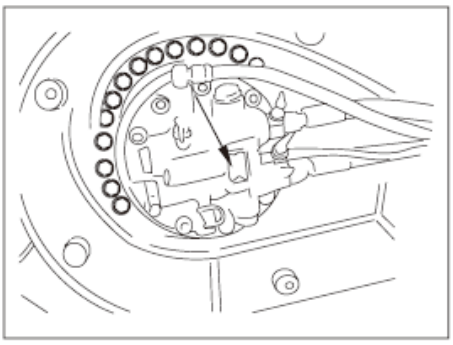
Engine
Model: _____
Manufacturing No.:_____



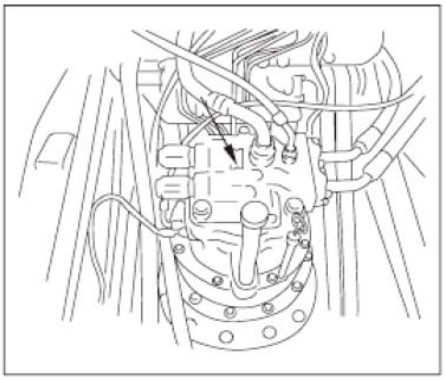
Bucket
No.: _____



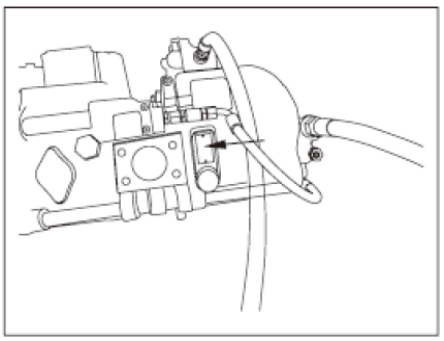
Travel motor
No.:_____



Rotary motor
No.:_____



Hydraulic pump
No.:_____



Content

Safety

Instruction of safety and warning signs

The safety signs in the manual and on the machine are the "dangerous" DANGER), "warning WARNING), or "Caution"), to indicate the three levels of danger of hazards and unsafe operation. Whenever you see the safety warning triangle sign, whether which warnings follow, you should carefully read the content.

Danger—— indicating the case with direct danger. Without avoidance, it will lead to the death or serious injury.

Warning —— indicating the direct potential danger. Without avoidance, it will lead to the bad injury or death.

Caution—— indicating the potential danger. Without avoidance, it will lead to the slight or medium-level injury.

Sometimes some safety signs are also used on this machine as follows in addition to the above three danger levels.

Caution——To prompt the attention to safety indication.

Important——to avoid of the confusion between the indication of machine protection and person safety, signal vocabulary "IMPORTANT" is used to show the case probably leading to the damage on machine.

"Note"——additional introduction to certain information

Since it is impossible to list all the potential dangers in all working conditions in advance, the safety must be ensured for you and the others and the damage are avoided of if the operation is not recommended. Without approval from our company, any modification made by operator will lead to the danger. So before correcting, you should inquire our company or empowered franchiser. Otherwise, our company will not be responsible for any bad result from unapproved renovation.

Our company will not be responsible for any equipment damage or unsafe running due to the following reasons:

- Carrying out modification on machine without any approval
- The operation does not fit the normal mode
- The equipment failure due to non-original product or unauthorized repair by company or individual
- Beyond the usage range for the equipment

Our company will not compensate for any equipment damage or unsafe running due to the following reasons:

- Improper operation
- Insufficient maintenance
- Using the fuel or lubricant beyond the recommendation

For the continuous improvement of product design and the difference of the customer's demand on assignment, it is possible that the content, specification and icons etc. will have some change at any time, which will influence the maintenance and repair of machine. The pictures in the book is only used to describe the concerning part vividly, varying from the practical machine probably.

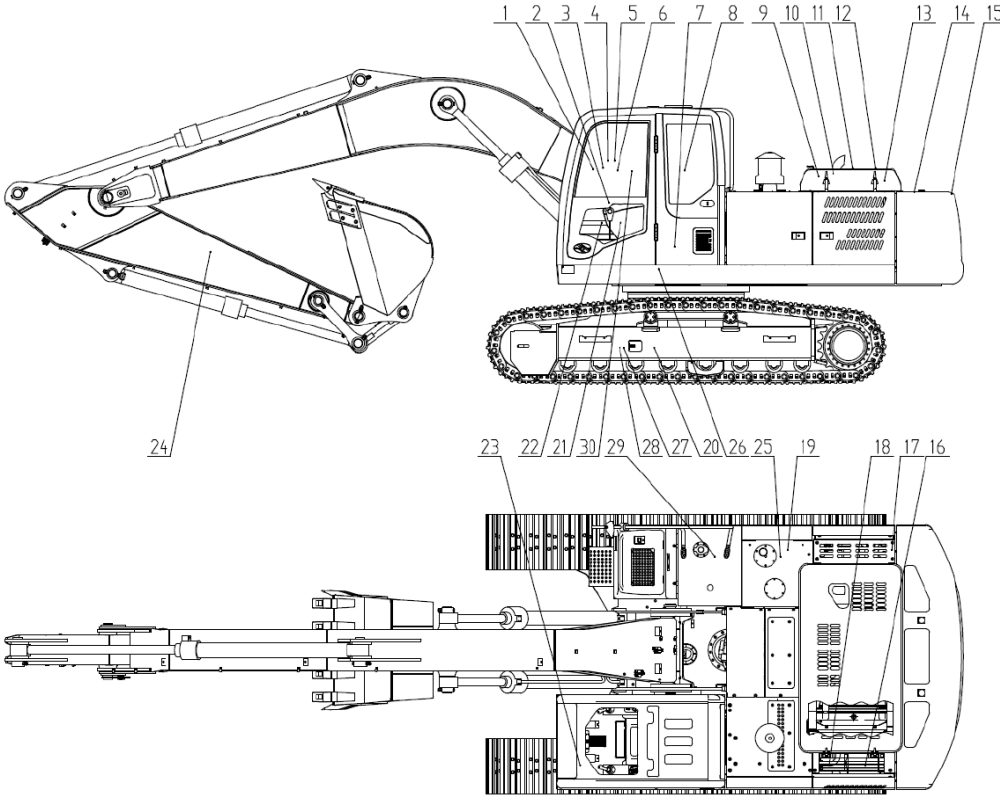
Our company reserves the rights to modify all materials, drawings and specifications in this manual at anytime without any notice.

Safety sign and other signs

There are safety sign and other signs on many positions of this machine, so the operator should fully understand the content and location of all signs and abide by the following requirements:

- Maintain the safety signs clear, undamaged and existing; if there is the loss, damage of sign or dim characters or pictures, please repair or replace them timely.
- While the part with safety signs is needed for a replacement, the new one must be ensured to have corresponding signs.
- When cleaning the safety signs, it is proper to use cloth, water and soup solution, other than those tools and detergent which will spoil the signs or any solvent, gasoline and other pungent chemical agent to avoid of the shedding of those signs.
- The assignment of safety signs and other signs is shown as follows:

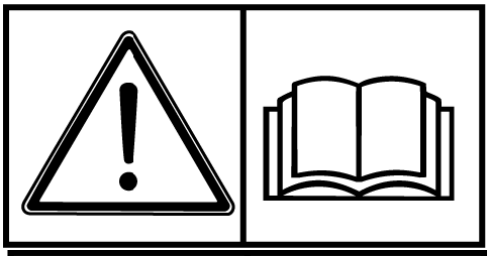
Location of safety signs



Instruction of safety signs

1) Read warning sign of the operation manual.

WARNING! Before the operation, maintenance, decomposition, assembly and transport of the machine, you should read the operation and maintenance manual.

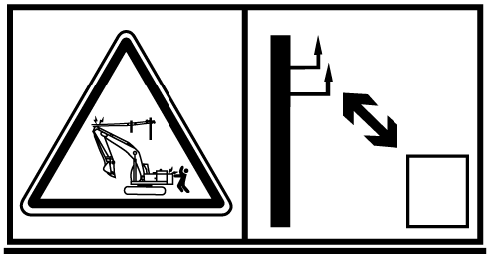


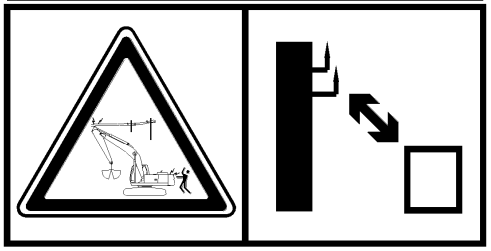
2) Precaution for seat belts!

Warning! The machine operator should wear seatbelt.

3) Warning sign for keeping away from high-voltage.

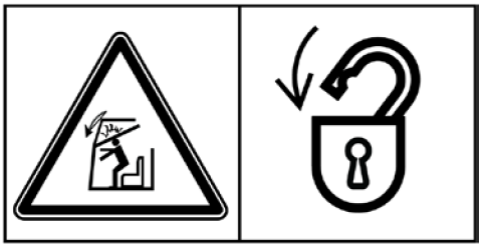
If the machine gets too close to the power lines, there is the risk of electric shock, and a safe distance from power lines should be kept.





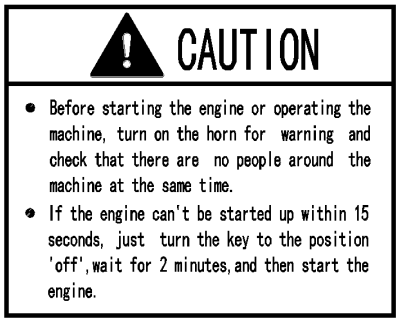
(4) Warning sign for locking the front window

Danger during falling off the front window, after lifting the windows, you must lock it with locking pin.



(5) Warning sign for starting the machine!

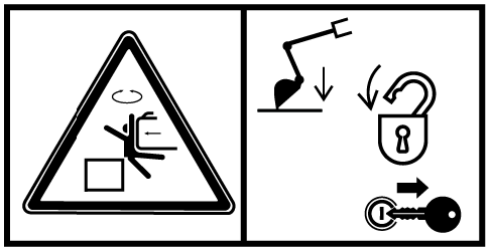
Before start the engine, you should note the precautions on the sign.



(6) Warning sign for leaving the seat

There is danger of extrusion or rolling down when the parked machine is accidently moved.

Before leaving the machine, lower the working devices down to the ground, and move the safety joystick to the lock position and remove the engine key.

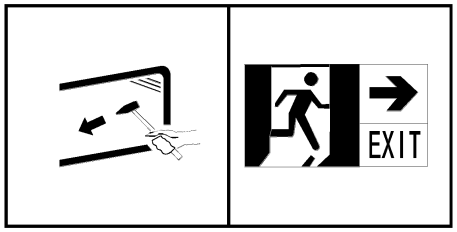


(7) Precaution for storage prohibit

WARNING! Any should not be stored at the sign.

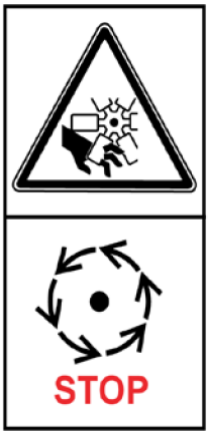
(8) Warning sign at safety exit

In case of emergency, when the cab doors and windows cannot be opened, smash the front window or rear window with the hammer, and evacuate from the cab.



(9) Warning sign for checking the engine

There is danger of hand twisted by fan, and repair and maintenance should be carried out when the fan stops rotating.



(10) Warning sign for checking the engine and air conditioning

There is danger of hand twisted by pulley, and repair and maintenance should be carried out when the fan stops rotating.

(11) Warning sign for tread prohibited

There is danger to drop, and standing is prohibited at this position.

(12) Warning sign to prevent burns

In or just after the operation, touching the heating components of the engine, motor, muffler can cause burns, so hand touching is prohibited.

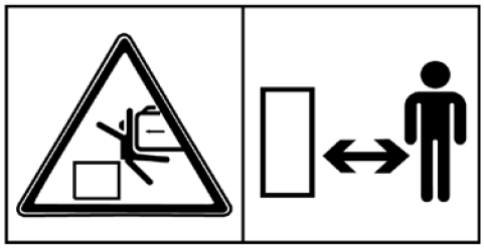
(13) Warning signs to prevent high temperature coolant and hydraulic oil burns

If open the radiator or hydraulic oil tank cover at high temperatures, the sprayed hot oil or hot water may cause burning danger.

(14) Warning sign for beware of falling

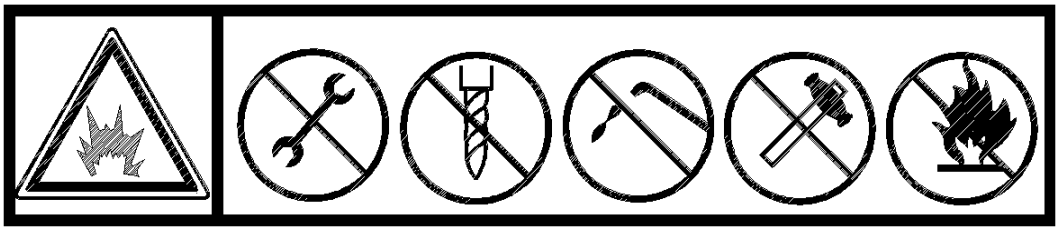
There is danger of falling from the hood or baffle, not standing close to the edge.

(15) Sign for being away from the action radius
There is danger extruded by the machine upper structure, so keep away from the region of the rotation of the machine during operation.

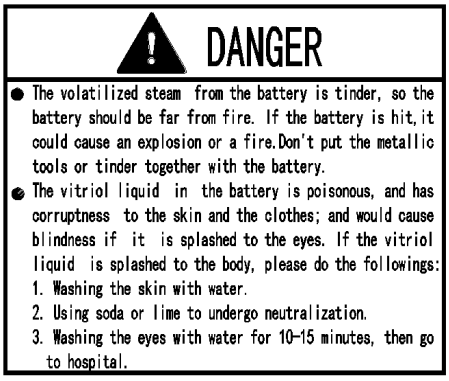


(16) Warning sign to prevent hot water or steam burns
There is danger of burns to open the engine vice water tank at high temperature, and check after the engine cools down.

(17) Warning sign for use of the accumulator There is danger of explosion, so do not drill, cut, impact or decompose, and keep away from open flames.

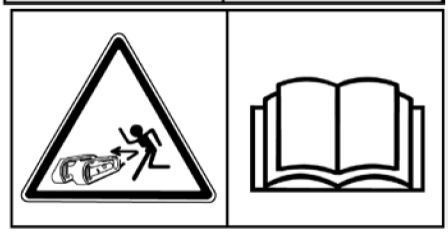


(18) Warning sign for using the battery
Danger! Prevention of the danger posed by the battery

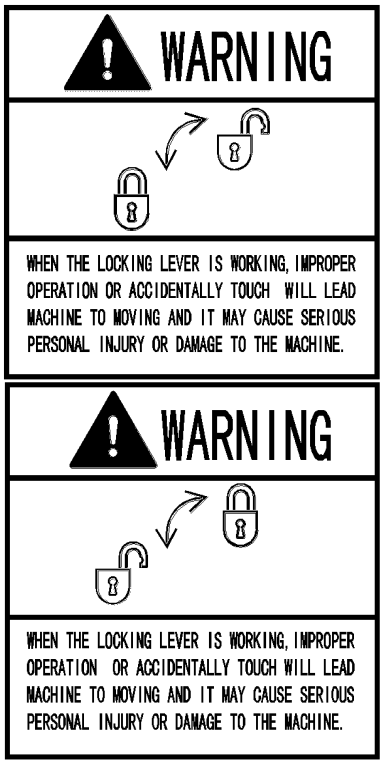


(19) Warning sign to prevent explosion
In parts such as the fuel tank, fire and open flame is prohibited to avoid explosion hazard.

(20) Precaution for adjusting the crawler tension
Adjusting track tensioning flying out can cause danger of injury, so read carefully the maintenance manual before correctly adjusting the track.



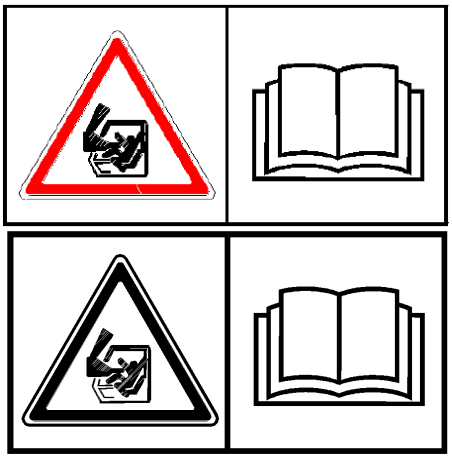
(21) Warning sign for locking lever operation!
You should be careful when opening and closing the locking lever.



(22) Warning sign for operation prohibited after shutdown
When this sign is hung on the working device joystick, do not start the engine or touch the joystick.

(23) Warning sign for hammer

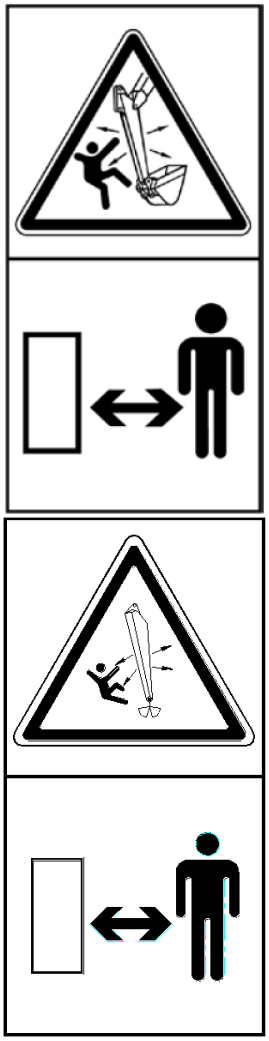
Using hammers or bucket to contact with the cab may cause injury, and you shall comply with the provisions of the operation manual and safely operate the machine.



(24) Warning sign for extrusion

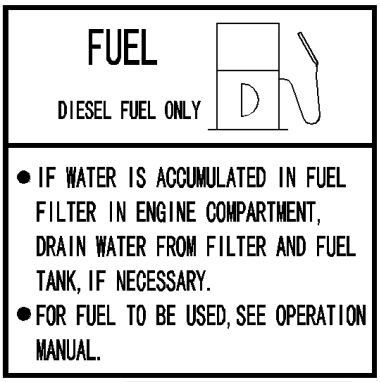
(25) Warning sign for keeping away from the working scope of arm

There is danger of collision by the machine working device, so you should stay away from the machine during operation.



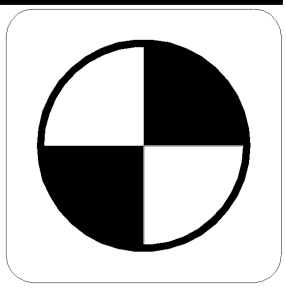
(26) Fuel sign

Indicating the diesel oil can only be used.



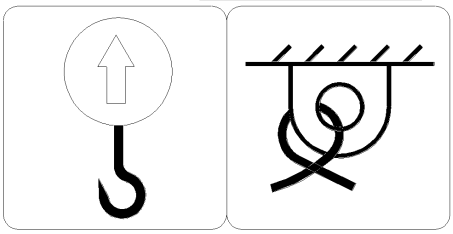
(27) Center of gravity

Here is the center of gravity position of the machine.



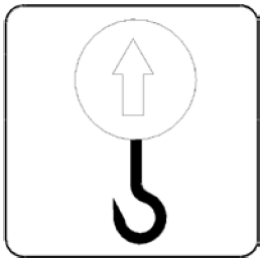
(28)Lifting and bundling point sign

Here is the lifting and bundling point.



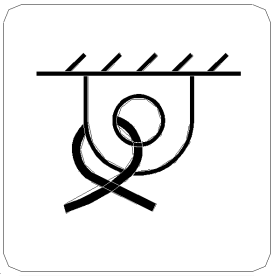
(29) Lifting sign

Here is the lifting point.

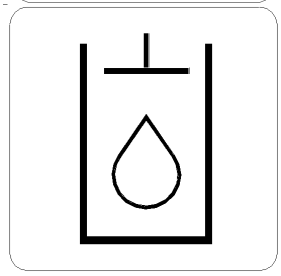


(30) Bundling point sign

Here is the bundling point.

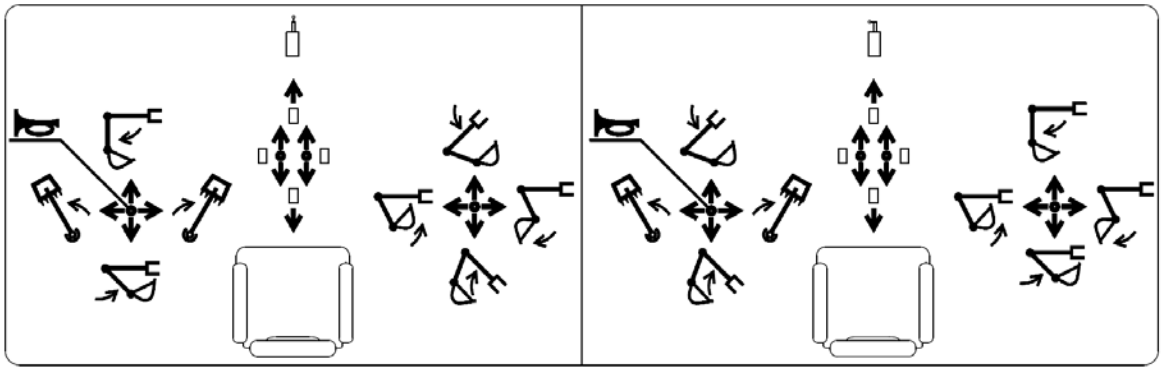


(31) Hydraulic oil sign



(32) Operation indication figure

The direction of the operating lever of the excavator

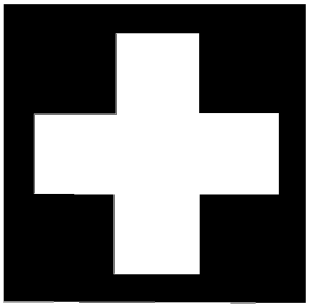


(33) Extinguish sign

Here is the extinguish sign

(34) Medicine cabinet sign

Here is the medicine cabinet sign



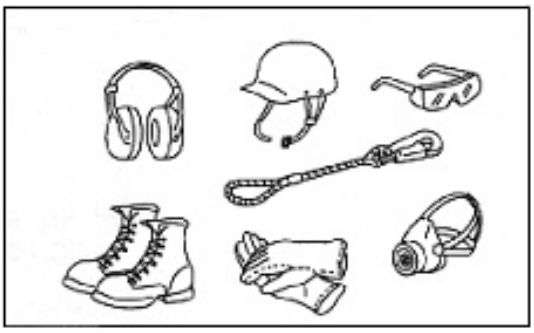
Safety rules

- Only the personnel trained and guided can operate and maintain the machine.
- In operation and maintenance of the machine, you should obey to all of the safety rules, notes and instructions.
- Do not operate or repair the machine after drinking or being sick to avoid injury to yourself or others.
- While working with other operators or site command personnel, be sure to use the gestures that all of them can understand.

If abnormalities are found

If any abnormality (noise, vibration, smell, abnormal display for the instruments, smoke, oil leakage or any abnormal display on the alarming devices and the monitors) is found during operation or maintenance, report it to the person in charge and take proper measures. Do not operate the machine before troubleshooting.

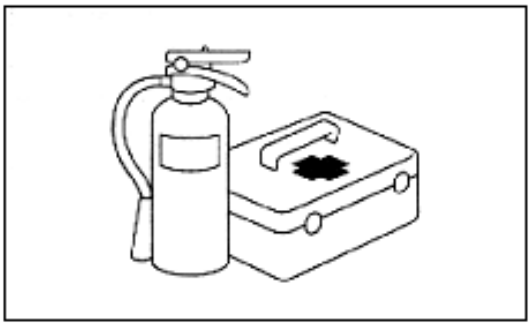
Working suit and the protection articles for the operators



- Do not wear loose clothes and jewelries which are dangerous to be caught on the operating levers or other protruding parts.
- If the hair is too long and extends outside the safety hamlets, it is dangerous to be winded into the machine, so it is necessary to tie the hair before operation.
- Wear the safety hamlet and safety shoes always. When operating and maintaining the machine, wear the safety glasses, masks, gloves, earplugs, and seat belts if necessary.
- Check the functions of all the protection devices for normality.

Fire extinguisher and first-aid kit

In order to prevent possible fire or injuries, attention must be paid to the following:



- Prepare the fire extinguisher and read the user's manual to ensure you know how to use in emergency.
- Check and maintain regularly to ensure the fire extinguisher is in a good condition at anytime.
- Prepare the first-aid kit, check regularly, and add or replace the drugs.

Safety equipment

- Ensure all shields and cover plates are in the proper positions. If any damages happen to them, please repair immediately.
- Understand the use methods of the safety devices and use them correctly.
- It is prohibited to dismantle any safety device, and keep them in a good working condition.

Keep the machine clean

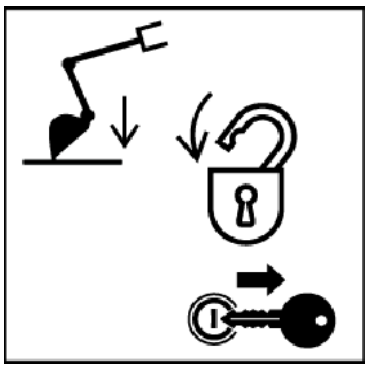
- If the water flows into the electrical system, it will cause the instruments failure and machine faulty. **It is prohibited to use the water or steam to flush the electrical system (such as the sensors and connectors, etc.)**.
- If the machine brings with mud or oil contamination, it is dangerous to slide over and fall down in check or maintenance.
- Please always keep the machine clean.

Keep the cab clean

- Be sure to remove the mud and the oil contamination on the soles before entering the cab. If the mud or oil contamination is adhered on the soles, it is sliding when operating the pedals and possible to result in serious accidents.
- Do not put the parts or tools around the cab.
- Do not stick the plastic sorbent pad to the window glass because its magnifier role may cause fire.
- When driving or operating the machine, do not use wireless telephone in the cab.
- It is prohibited to bring dangerous goods (such as the flammable and exposable goods) into the cab.

Leave the operator's seat after locking the working devices

- Before leaving the seat (e.g. when opening or closing the front window or the roof window, dismantling or installing the bottom window and adjusting the seat), lower the working devices down to the ground completely and then shut down the engine to avoid touching the operating lever and make the machine move suddenly to cause serious injury or damage the machine.

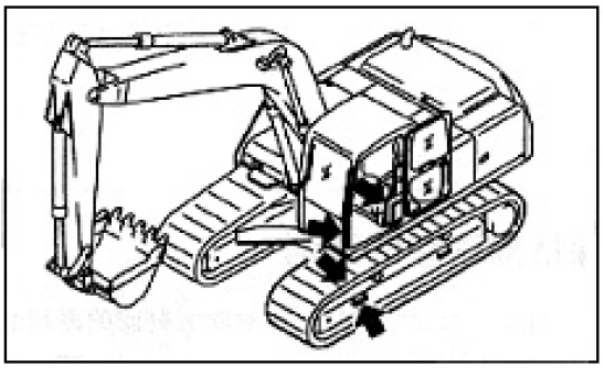


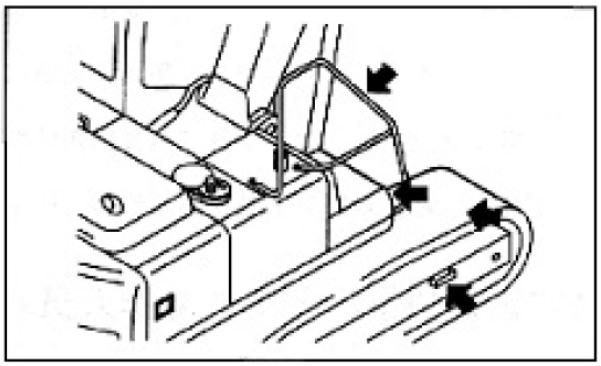
- When leaving the machine, be sure to lower the working devices down to the ground completely and then shut down the engine. Lock all equipment, take off the keys and put them in the safe places.

Handrails and ladder

To avoid injury to the person getting on and off the machine, the following requirements must be followed:

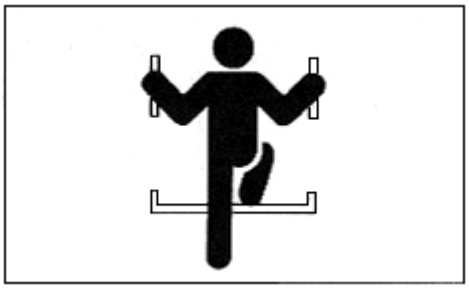
- When getting on and off the machine, use the handrails and ladder marked by the arrows in the figure.





To ensure the safety, face the machine, keep hold at the three points (two feet and one hand or two hands and one foot) tightly, and step on the handrails and steps (including the track shoes) tightly.

- When getting on and off the machine, do not hold the operating lever, and do not drive on the engine or cover plate without non-slip mat.
- When getting on and off the machine, check the handrails and ladder (including the track shoes) for oil contamination, lubrication grease or mud. If there are these materials there, wipe off immediately.
- It is prohibited to climb up and down the machine with tools in the hand.



Installation and dismantlement

- Do not jump on and off the machine.
- Do not get on and off the machine when the machine is moving.
- If the machine moves suddenly without operations, it is prohibited to jump on the machine and attempt to stop the machine.

No person is allowed on the accessories

It is prohibited for anyone to sit on the scoop, grab or other accessories, because it is dangerous to fall down or cause serious injury.

Prevent scalding

Hot cooling liquid

- When discharging the cooling liquid, to avoid the hot water or steam spraying and causing burning，before starting to operate, ensure to reduce the temperature of the radiator cap to that can be touched by the hands. When dismantling the radiator cap, loosen the cap slowly to reduce the internal pressure of the radiator.

Hot oil

- When checking or discharging the oil, to prevent burning caused by the oil sprayed or touching the hot parts, be sure to cool the temperature to the degree before operating that the cap or the screw plugs of the oil tank can be touched by hands. Before dismantling the oil tank cap or the screw plugs, loosen the cap or screw plugs slowly to reduce the internal pressure.

Fire protection and explosion proof

Prevent fire caused by fuel or engine oil

The fuel, engine oil, antifreeze and window washing fluid are very flammable and dangerous goods. To prevent the fire, the following regulations must be followed:

- Do not smoke or use any open fire near fuel or engine oil.
- Before oil filling, shut down the engine.
- When filling fuel and engine oil, do not leave the machine.
- Tighten the caps of fuel tank and engine oil tank.
- Prevent the fuel overflowing to the overheat surface or the parts of the electrical system.
- Ensure good ventilation in the oil filling or storage places.
- The fuel or engine oil shall be kept in the designated places, and entrance is not allowed without permission.

- After filling fuel or engine oil, wipe off the fuel or engine oil overflowed.
- When grinding or welding on the lower part of the machine, transfer all the flammable materials to the safe places.
- When flushing the parts with the engine oil, use the inflammable engine oil. It is prohibited to use the diesel and gasoline to flush the parts to avoid fire.
- Put the towel sticking with oil or other flammable materials into the safe vessel.
- Do not weld or use the cutting torch to cut the pipe with flammable liquid.

Prevent the fire caused by the pile of the flammable materials

- Remove the leaves, weeds, dry wood chips, paper scraps, dust or other flammable materials piled or stuck in the engine, exhaust pipe, silencer, accumulator cell and the engine cover.

Prevent the fire caused by the electrical wires

- Prevent the fire caused by the short circuit of the electrical system.
- Keep the connections for the electrical wires clean and fixed firmly every day.
- Check the electrical wires for looseness or damage, timely tighten the loose connections or wire clamps, repair or replace the damaged electrical wires immediately.

Prevent the fire caused by the hydraulic pipeline

- Check all of the clamps, shields and the buffer pads of the hoses and pipes for fixedness, during operating, if the parts of the hydraulic pipelines are loose, they will rub with other parts to cause damage for the hoses, result in the high pressure oil spraying and cause fire.

Prevent explosion caused by the lighting equipment

- When checking the fuel, engine oil, battery electrolyte, window cleaning solution and the cooling liquid, use the lighting equipment with explosion proof functions, if do not use such equipment, there is danger to cause serious injury by the explosion.
- When using the power supply of the machine for lighting, the related regulations in this manual shall be followed.

Action in a fire

If there is a fire, leave the machine soon according to the following requirements:

- Turn the starting switch to OFF and shut down the engine.
- Leave the machine with the handrails and the ladder.

Washing liquid for the windscreen

Use the Ethanol based as washing liquid. (Suggest not to use the harmful methanol based cleaning solution)

Prevent the falling objects, flying objects and intrusive objects

In the working place where the falling objects, flying objects and intrusive objects hit or enter the cab, install the necessary shields to protect the operators according to the operation situation.

- When working in the mine or quarry with the risk of falling stones, install the falling object protection device and the front protection device, and stick the transparent glass paper on the front glass.
- Close the front window during the above operations. Additionally, ensure other personnel are not within the falling object area and keep a certain distance from the dangerous area.
- The above contents are for the critical working conditions, it is possible to install other additional shields according to different conditions in the working site.

If the machine is used in the environment which is harmful to health, you should install the cab and antifouling system.

Installation of the accessories

- **When installing the optional parts or accessories, please contact with the Xugong excavator distributor in advance.**
- Any injuries, accidents or product faults caused by using the accessories or parts without approval of Xugong Excavator Machinery Co., Ltd. will be unrelated with our company.
- When installing and using the accessories, combine the operating accessories according to the general instruction about the accessories in the instruction manual and this manual.

According to different types or combinations of the working devices, there is the risk that the working device crashes with the cab or other parts of the machine. Before using the unfamiliar working device, check whether there is the risk to influence each other and operate carefully.

Window glass of the cab

- If the glass close to the working device in the cab crushes, the working device has the risk to contact the operator body directly, please stop operating and replace the glass immediately.

Modification without approval

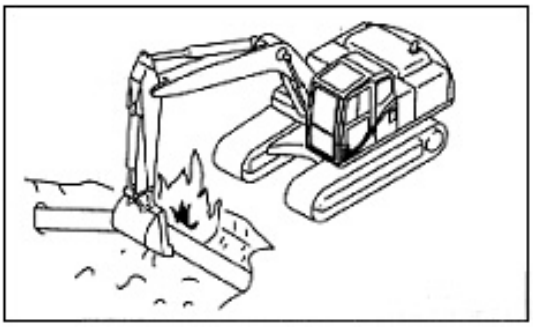
Any modification without approval from Xugong Excavator Machinery Co., Ltd. is possible to cause danger. Therefore, before modifying, please contact the distributor of Excavator Mechanical Co., Ltd.

- For any injuries, accidents or product faults caused by modification without approval from Xugong Excavator Machinery Co., Ltd., the company will not bear any responsibilities.

Safety in the working site

Before operating, check the working site thoroughly for dangers.

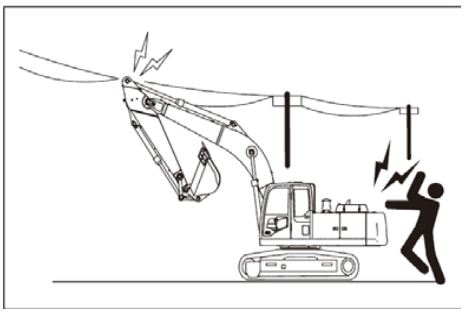
- When operating near the places where flammable materials (cottage roof, dry leaves or grasses) are stored, it is possible to cause a fire, so it is necessary to be careful during operating.
- Check the ground situation in the working site and determine the safest operation method. **It is prohibited 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 working site, please contact with the related companies and mark their positions, pay attention not to break or damage any pipes and wires.
- Any unauthorized person is prohibited to enter the working area, some necessary warning measures to 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.



Working on the loose ground

- Avoid driving or operating the machine near the cliff side, road side and the deep ditch. Because the ground in these areas is very soft, if the ground is collapsed under the role of the weight or vibration of the machine, it will cause the machine to collapse or roll over.
- When working on the dyke or near the groove dug, there is a risk that the earth collapses due to the weight and vibration of the machine. Before operating, necessary measures shall be taken to guarantee the safety of the ground and prevent the machine tipping over or fall off.

Do not get close to high-voltage cables



Do not drive or operate the machine near the cables, because there is a risk to suffer from electric shock and cause serious injuries or accidents. In the working site close to the cables, operate according to the following steps:

- Before starting to work near the cables, inform the local electric power company to invite them to take necessary measures.
- It is possible to suffer from electric shock in the area close to the high-voltage cables, which may cause serious burning even death. So a safe distance must be kept between the machine and the cables (shown in the table below).

Before starting to operate, please develop the related safety operating measures together with the local electric power company.

- In order to prepare for the possible accidents, wear the rubber shoes and gloves, lay a layer of rubber mat on the seat and note that the exposed part of the body not to contact other parts.
- If the machine is too close to the cables, a signal man is arranged to send the warning signal.
- When operating near the high-voltage cables, anyone is not allowed to close to the machine.
- If the machine is too close to or touches the cables, before the power supply is cut, the operator shall not leave the cab to prevent being shocked by the electricity. Additionally, anyone is not allowed to close to the machine.

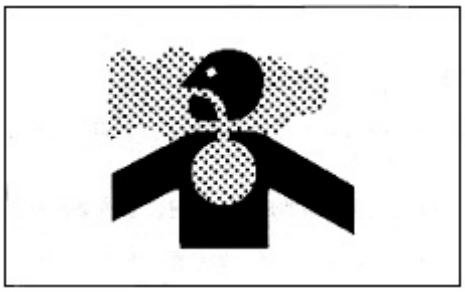
	Voltage	Min. Safety Distance
Low Voltage	100V,200V	2 m(6.6 ft)
High Voltage	6600V	2 m(6.6 ft)
	22kV	3 m(10 ft)
	66kV	4 m(13 ft)
	154kV	5 m(16.4 ft)
	187kV	6 m(19.7ft)
	275kV	7 m(23 ft)
	500kV	11 m(36 ft)

Ensure good sight

In order to ensure safe operating or driving, please check whether there are persons or obstacles around the machine and check the situation of the working site.

- When operating in the dark area, please turn on the work light and the headlight, and set the auxiliary lighting in the operating area in necessary.
- If the sight is poor, such as there is fog, snow, rain or dust, please stop operation.

Ventilation of closed area



If it is necessary to start the engine, treat fuel, clean oil or paint in the closed area, you should open the doors and windows to ensure good ventilation to prevent gas poisoning.

Signals and gestures of signal man

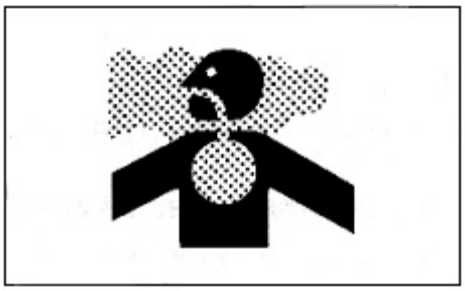
- When working on the road side or the loose ground, you should set signs, and arrange one signal man if the sight is poor. The operator shall pay attention to the signs particularly and follow the commands from the signal man.
- Only one signal man can send the signals.
- Before operating, ensure all the workers understand all the signals and gestures.

Emergency exit for the cab

- In emergency, if the door of the cab cannot be opened normally due to certain reasons, crush the rear window glass and escape from the dangerous place soon.

Prevention of asbestos dust danger

If too much asbestos dust in the air is breathed, it is possible to suffer the lung cancer. When dismantling or treating the industrial wastes in the working site, there is a risk to breathe the asbestos, the following rules shall be followed:



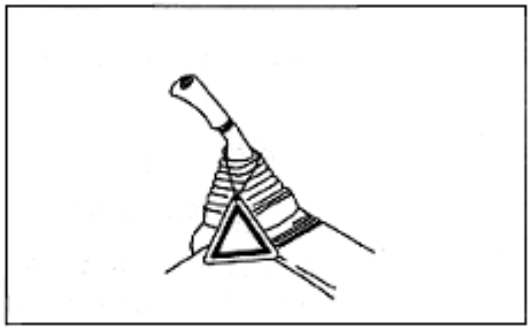
- In cleaning, spray some water to eliminate the dust but not to use the compressed air.
- If there is asbestos dust in the air, operate the machine in the upwind position and all of the operators should use the dust filtering masks.
- During operation, other personnel are not allowed to close to.
- Follow the rules, regulations and the environment standard in the working site.

This machine does not use any asbestos, but the counterfeit parts may contain asbestos. Therefore, it is necessary to use real parts of Xugong Excavator Machinery Co., Ltd.

Safe Operation of Machine

Start the engine

If the warning sign is hung on the operating lever of the operating device, do not start the engine or touch the operating lever.



Inspection before starting

When carrying out daily work, the following inspection must be carried out before starting the engine:

- Wipe off the dirt on the surface of the window to ensure good sight.
- Wipe off the dirt on the surface of the lenses of the headlight and the operating light and check up whether the lights work normally.
- Check up the liquid level of the cooling liquid, the fuel level of the fuel and the engine oil level of the engine, check up if the air filter is blocked, and check up if the circuit is damaged.
- The seat of the operator is fit to a position easy for operation, and check up if the seat belt or the attaching clamp is damaged or worn.
- Check up if the instrument works normally, check up the angle of the operating light, and check up if the whole controlling lever lies in the central position.
- Adjust the wing mirror to be convenient for seeing the rear of the machine on the driving seat.
- Check up the regions above, below or around the machine to ensure that there is no person or obstacle.

Safety rules for starting the engine

- Honk the horn as a warning when starting the engine.
- Only allow to start or operate the machine on the seat.
- No one is allowed to sit in the machine besides the operator.
- Do not start the engine in a manner which can result in short circuit of the starting motor because it is not only dangerous, but can also damage the device.

Starting the engine in cold weather

- Preheating operation should be sufficient. If the machine is not thoroughly preheated before manipulating the operating lever and the machine may lag in response, which may cause accident.
- If the electrolyte of the battery is frozen, do not charge the battery or start the engine by other power, to avoid fire on the battery. Ensure that the electrolyte of the battery is dissolved before charging or starting the engine by other power.

Operation

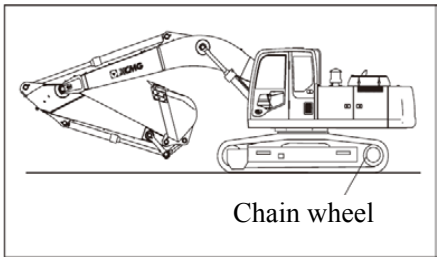
Inspection after starting the engine

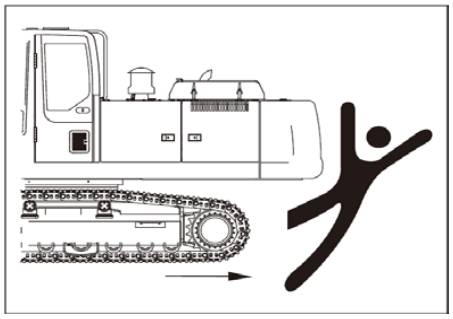
When carrying out the inspection, move the machine to a wide area without any obstacle to operate slowly. **No one is allowed to approach the machine.**

- Check up if the action of the machine is the same as the display on the controlling mode instrument. If not, change it into the right mode at once.
- Check up the operation of the instrument and the device, and check up the operation of the bucket, the arm, the swing arm, the moving system and the steering system.
- Check up if the sound, the vibration, the heating, the smell and the instrument of the machine works normally, and check up if the engine oil or fuel is in leakage.
- Repair the machine at once if there is any unusual thing.

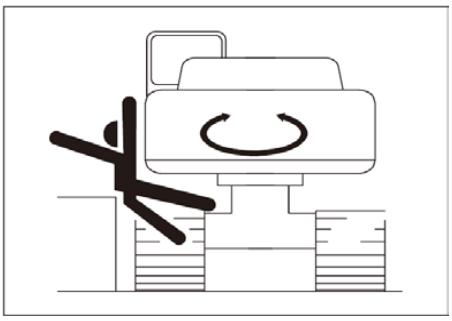
Safety rules for changing the direction of the machine

- Before traveling, the upper structure should be placed in the proper position to make the chain wheel located to the rear of the cab. If the chain wheel is in front of the cab, the operating direction is reversed (for example: going forward is changed into going backward and the left into right).
- Before traveling, make sure again that there is no person or obstacle in the peripheral region.
- Before traveling, honk the horn to warn the person in the area.
- Only sit on the seat to operate the machine.
- No one is allowed to sit on the machine besides the operator.
- Check up if the traveling warner (if there is a warner) works normally.
- Ensure that the door or the window of the cab is locked.



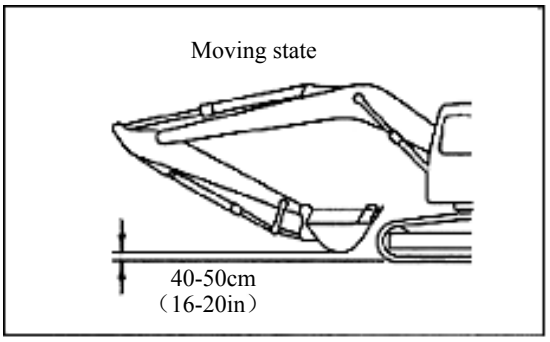


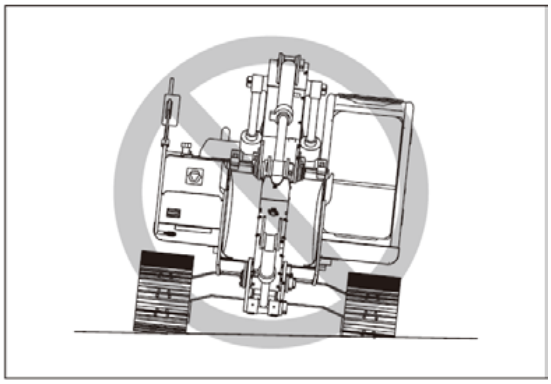
There is a blind area at the rear of the machine. When the machine is turning a corner or turning around, a signalman is needed. Ensure that no other machines or persons are within the safe revovling area of 12m/ 39.4ft. Especially pay attention not to touch other machine or person. Abide by the matters of attention above even if the wing mirror is arranged on the machine.



Safety rules for moving

- Do not exceed the maximum permissible load when using the machine in order to prevent that the machine is unstable because of overload and avoid the damage to the working device.
- When moving on the flat ground, withdraw the working device and the bottom of the bucket must be kept 40 to 50cm（16 to 20 in） above the ground.
- When moving on the rough ground, move slowly and do not turn suddenly to avoid roll-over. If the working device touches the ground, the machine may lose balance and be damaged.
- When moving on the rough ground or the abrupt slope, turn off (cancel) the automatic speed reducing switch, if the machine is equipped with the automatic speed reducing device. If the automatic is turned on, the rotate speed of the engine is increased, and the moving will be suddenly accelerated.
- Avoid moving on the obstacle as far as possible. If the machine has to move on the obstacle, make the working device close to the ground and move slowly.
- When moving or carrying out operation, keep a certain safety distance from person or building to avoid collision.



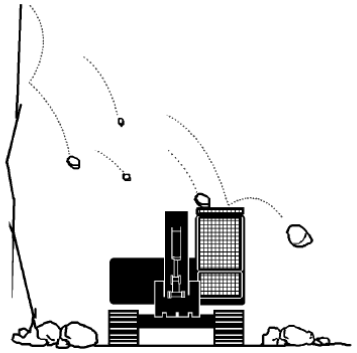


- When passing the bridge or building, first check up if the structure is strong enough to support the weight of the machine. When moving on the road, consult with relevant sector to inspect and then comply with their guidance.
- When operating in a tunnel, under a bridge, a wire, or other places with limited height, you should operate slowly, and especially avoid the working device to touch anything.

Equipment Protection Top, ROPS or FOPS

If the machine is operated in the region with falling stores and aggregates, the machine should be provided with devices of the equipment protection top, ROPS or FOPS according to the potential dangerous situation. (The standard cab of the machine is equipped with devices of ROPS and FOPS)

ROPS: Roll Over Protection Structure
FOPS: Falling Object Protection Structure
TOPS：Turning Over Protection Structure

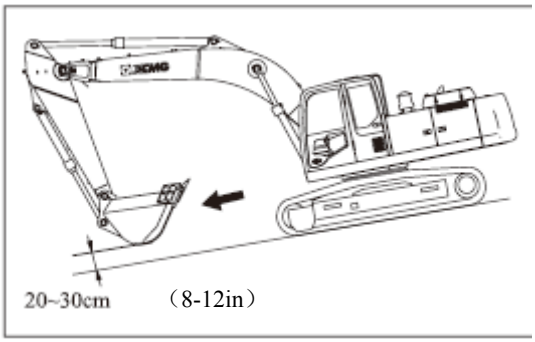


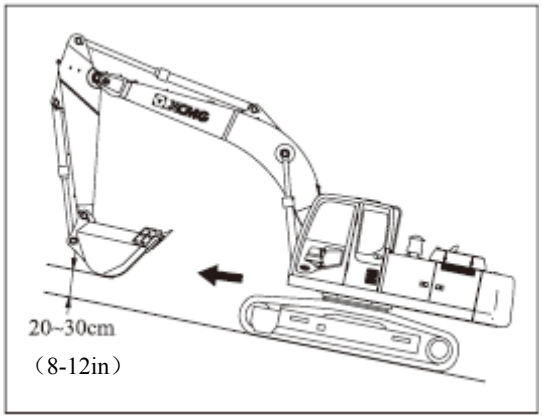
If any part of the Equipment Protection Top, PORS, FOPS and TOPS protection structures has plastic deformation or fracture, you should contact with Xugong Excavator Machinery Co., Ltd. after-sales service for replacement or repair.

Moving on the Slope

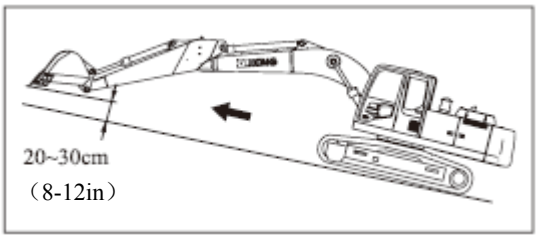
In order to prevent the roll-over or the sideslip of the machine, the following requirements must be achieved:

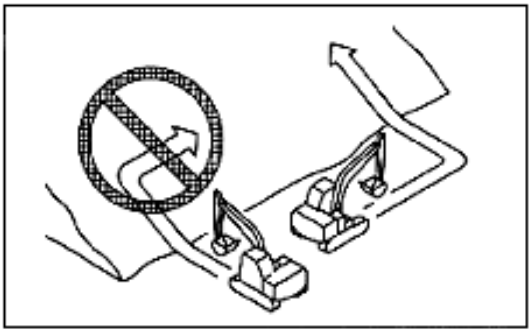
- When the machine moves on the slope, the bottom of the bucket should be 20 to 30 cm (8 to 12 in) from the ground. In an emergency, the working device can rapidly drop down to stop the machine.
- When the machine moves up on slope, the cab is adjusted to the direction of the upslope. When the machine moves on the slop downwards, the hardness of the ground surface in front of the machine must be examined.





- When the machine moves on the abrupt slope, the working device extends towards the front direction to maintain the balance, and the operating equipments keep the distance of 20 to 30 cm (8 to 12 in) from the ground, and keep at low speed.
- When the machine moves on the slop downwards, the moving operating lever is maintained at the neutral position, and the machine moves at low speed.

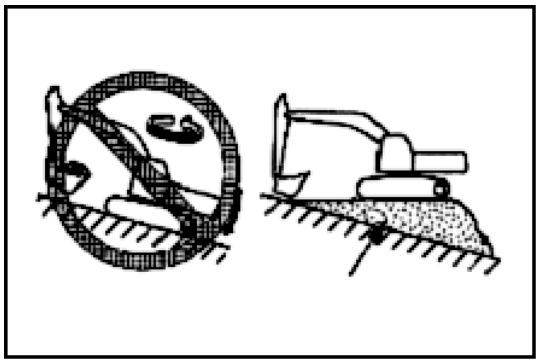




- The machine directly moves on the slop upward and downwards, because it is very dangerous to make a turn or traverse on the slop.
- Do not make a turn and transverse on the slop. The machine should change the position of the machine at the flat area, and then, go up to the slope.
- Because the slipping of the machine on the slop of a small degree is dangerous, the machine should drive on the slop at low speed.
- If the engine misses when the machine is moving on the slop, the operating lever must be shifted to the neutral position, and start the engine again.

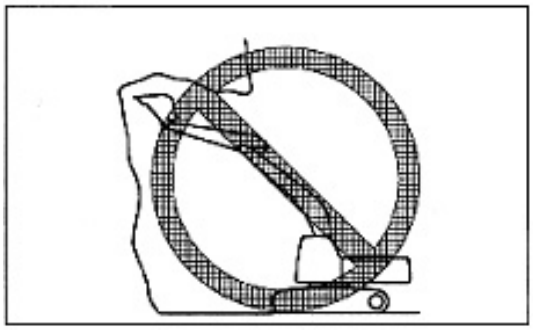
Operation on the Slope

- When the machine works on the slope and the revolution or working device is operated, the machine will lost balance and incline to cause the serious damage or equipment breakdown. Therefore, when these operations are carried out, a small flat area should be provided, and the operation needs to be carried out carefully.
- Do not make the working device turn from the side of the up slope to the side of the down slope when the bucket is fully filled. The operation of making the working device turn will make the machine roll-over.
- If the machine must be used on the slope, a platform must be piled up to maintain the balance of the machine.

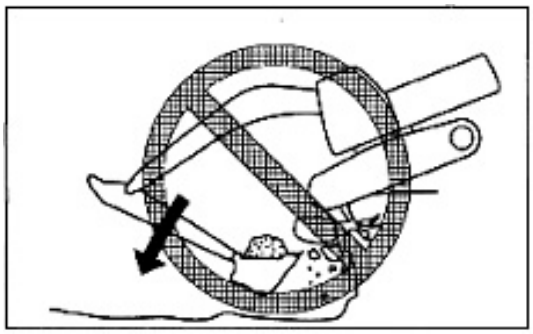


Operation prohibited

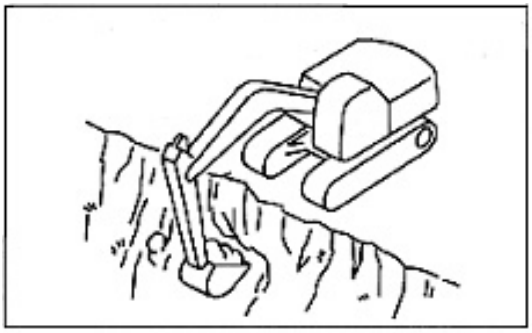
- Do not dig the working surface under the suspended part. The operation will cause the danger of store falling or collapse of the suspended part, and the danger of store falling on the machine.



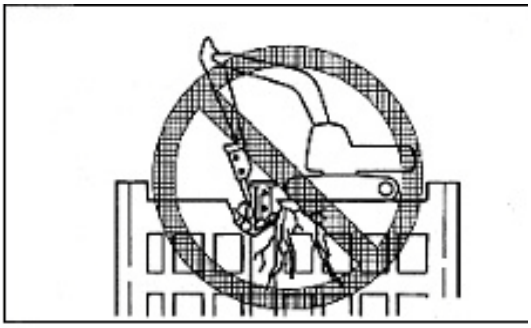
- Do not deeply dig the ground in front of the machine. Otherwise, the ground under the machine will collapse to make the machine fall.



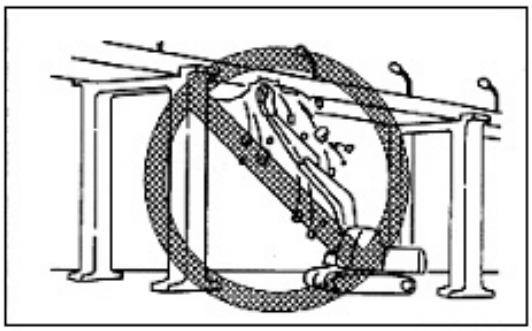
- When the digging operation is carried out, the caterpillar band is adjusted to form a right angle with waysides or cliffs at the base of chain wheels in order to easily make the machine leave at any situation.



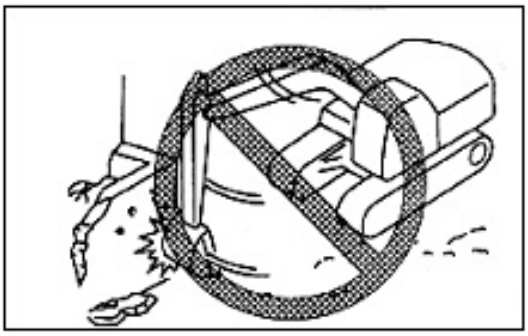
- The dismantling operation is prohibited to carry out under the machine, and the dismantling operation will cause the unsteadiness of the machine and has the risk of roll-over.
- When the machine operates on the buildings and the upper part of other structures, the buildings will be seriously ruined or damaged.



- Removing the part above the machine is prohibited when the dismantling operation is carried out. The ruin or the damage caused by the broken part falling or the building collapse is prevented.
- The breaking operation carried out by the impact of the working device is prohibited
  to avoid the injury or damage caused by flying objects.



- Generally, the working device on the side is easy to incline than the working device in the front or at the back.
- When crushers or other heavy working device is used, the machine has the danger of losing balance and tipping over. When the machine operates on the flat area and slopes:
  - Do not suddenly drop, rotate or stop the working device.
  - Do not make the swing arm hydro-cylinder suddenly stretch out or shrink. In this way, the impact will cause the danger of the tipping of the machine.
- Do not put the bucket above the heads of other workers or seats of other transport equipments. Because the loaded goods may drop, the bucket can contact the dump trucks to cause serious injuries or damages.

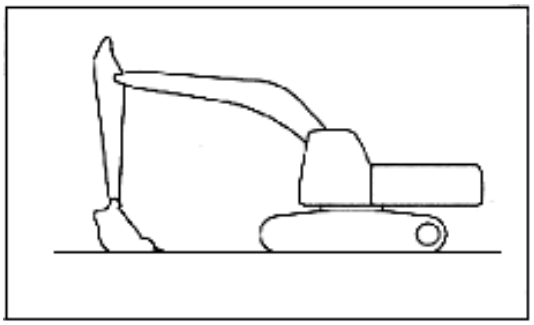


Operation in snow

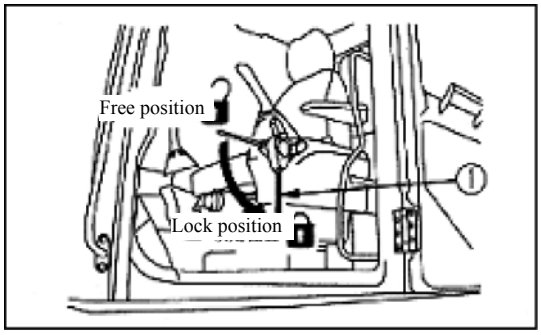
- Do not put the bucket above the heads of other workers or seats of other transport equipments. Because the loaded stuffs may drop, the bucket can contact the dump trucks to cause serious ruin or damage.
- The iced ground surface becomes soft when the temperature increases, and the machine will easily roll over.
- If the machine enters into the snow, it will incline or be buried in the snow.

Parking

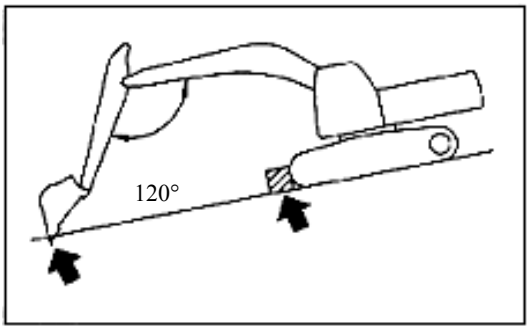
- The machine is parked on the firm and flat ground.
- The machine should be parked on the place free of falling rock or collapse.
- Descend completely the working device to the ground.



- When leaving the machine, the safety locking lever ① is adjusted to the locking positions, and then shut down the engine.
- In order to prevent people without permission from moving the machine, the door of the cab needs to be locked, and the key needs to be removed to carry or put to the specified place.



- If the machine must be parked on the slope, the following rules must be abided by.
- The bucket is adjusted to one side of the down slope, and the bucket is inserted to the ground.
- Pads are put under the caterpillar band in order to prevent the move of the machine.



Transportation

In order to conveniently transport the machine, the machine can be divided into several parts. Therefore, please contact with the dealers of Xugong excavator to carry out the transportation work.

Machine Transportation

When the machine is transported by trailers, the following rules need to be abided by:

- The trailers are selected and the transportation route is determined according to the weight, the width and the length of the machine. User can contact with Xugong excavator dealer to carry out the equipment disassembling work if necessary.
- When the machine passes through bridges or buildings, the structural strength must be examined to determine whether the structural strength can bear the weight of the machine. When the trailers drive on the road, the trailer must be examined by relative departments and obey the guidance of relative departments.

Battery

Prevention of Danger Caused by Battery

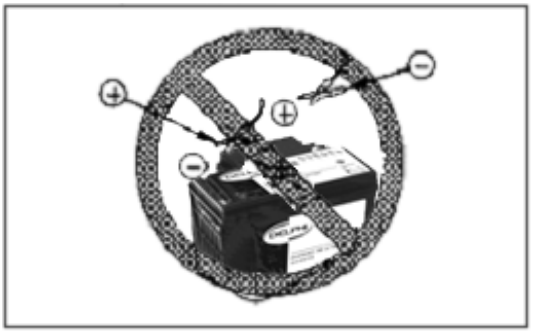
The electrolyte of the battery contains sulfuric acid, so the inflammable and explosive hydrogen is generated by the battery. The wrong operation can cause serious damage or fire hazards, so the following items must be abided by:

- If the display of the densimeter is black, it must be charged. If the display of the densimeter is bright, the battery must be changed.
- When operating the battery, you should wear goggles and rubber sleeves.
- It is prohibited to smoke or use open fire near the battery.

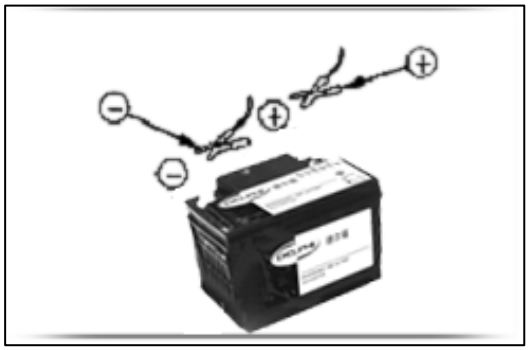
- If the sulfuric acid splashes onto the clothes or the skin, the clothes or the skin must be washed with a large amount of water.
- If the sulfuric acid enters into the eyes, the eyes must be washed with a large amount of water, and the injured must go to hospital.
- During the battery operation, the battery may generate sparks, and the key switch must be turned to the 'close' position. The operations must be carried out according to the following steps:
- Do not make tools or other metal objects contact between the battery terminals. Do not let tools or other metal objects drop around the battery.
- When the battery is disassembled, the negative terminals (grounding side) must be disconnected at first. When the battery is installed, the positive terminals must be connected at first, and then, the positive terminals are connected to the ground.
- At the time of charging the battery, the inflammable and explosive hydrogen is generated. Before charging, the battery must be disassembled from the machine and put to a drafty place.
- The battery should be firmly installed to the original position.

Starting engine with auxiliary cable

If the auxiliary cable is connected in the wrong way, the battery may explode, and therefore, the following rules should be followed:



- When the engine is started with the auxiliary cable, two persons are necessary to carry out operation (one person sits on the operation seat and the other operates the battery).
- When using another machine to start, the two machines should not contact with each other.
- Before the auxiliary cable is connected, the start switches of normal machine and machine with fault should be turned to ‘off”. Otherwise, when the power is supplied, the machine may move.



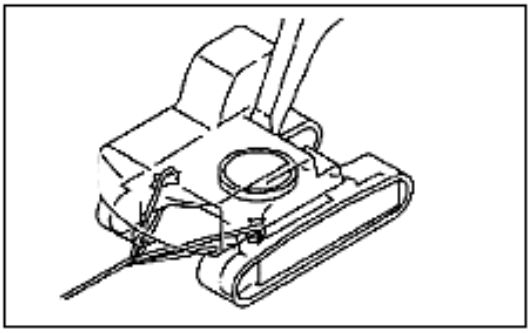
- When the auxiliary cable is installed, positive (+) must be firstly connected. When the auxiliary cable is removed, ground or negative (-) cable (grounding side) must be firstly disconnected.
- When the auxiliary cable is removed, auxiliary cable clamps should not contact with each other, and cable clamps and machine also should not touch together.
- When the engine is started with the auxiliary cable, you must wear goggles and rubber gloves.
- When the normal machine and the machine with fault are connected by the auxiliary cable, the normal machine which has the same battery voltage with the machine with fault should be used.

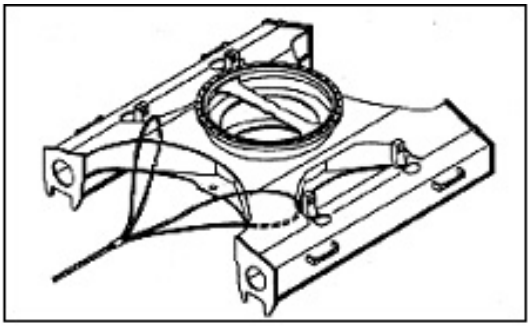
Traction

Safety rules for traction

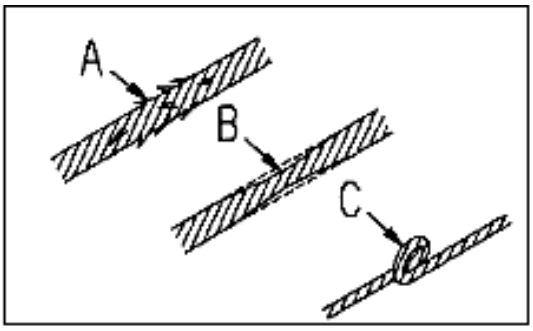
If the machine with fault is not correctly pulled, or the selection and check of wire ropes are wrong, serious injury or death will be resulted.

- When the wire ropes are used, wear leather gloves.
- The wire ropes are fixed on a machine frame.
- In the traction process, persons should not stand between traction machine and machines which are pulled
- The machine should not be pulled on slopes.





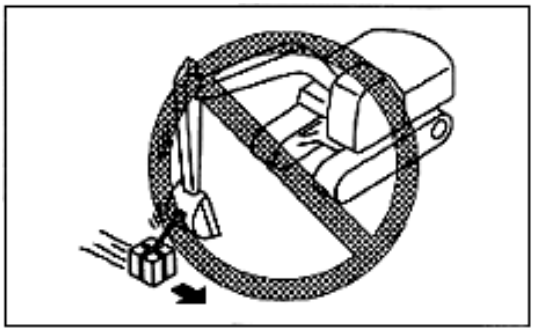
- The wire ropes with broken wires (A), diameter reduction (B) or bending (C) should not be used. In the traction process, the wire ropes may be broken easily, and then danger will be caused.

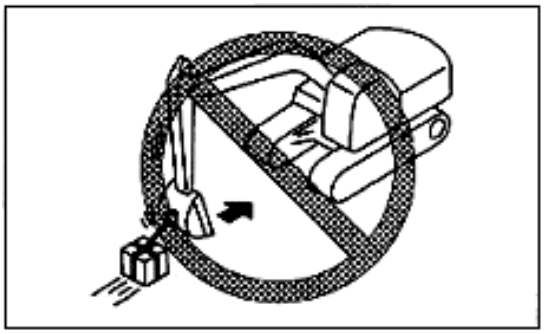


Lifting objects by the bucket

The safety rules for lifting objects

- The lifting operation should not be carried out on slopes, soft ground or other places where machine is unstable.
- The wire ropes must meet the required standard.
- Observe at any moment, and notice whether machines roll over.
- Before the machine rotate or turn, you must inspect carefully whether there are other persons or buildings around, and the collision should be avoided.
- Do not suddenly start, turn, or stop the machine, to avoid object oscillation.
- Do not lift objects at the side or towards the machine.
- When the objects are lifted, the operators should not leave seats.
- **It is very dangerous to lift the objects with the machine, which is prohibited in principle.**





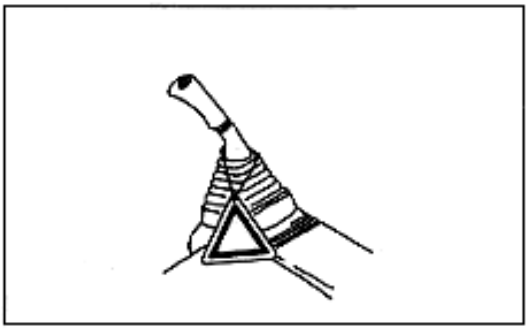
Warning!

- The appropriate accessory devices are selected according to the machine which is installed with the accessory devices. The installed machine types will be different according to the accessory device types.
- Please contact with the authorized special service center of Xugong excavator.

Safety maintenance instructions

Warning signs

- 'No operation' warning sign must be hung on working device operating lever in the cab to warn that someone is maintaining the machine. If necessary, the warning signs should also be attached around the machine.
- Put the warning sign away in the tool box when not using.



- In maintenance, if someone starts the engine contacts or operates the operating lever of the working device, serious injury or damage will be caused.

Keeping the working site clean and tidy

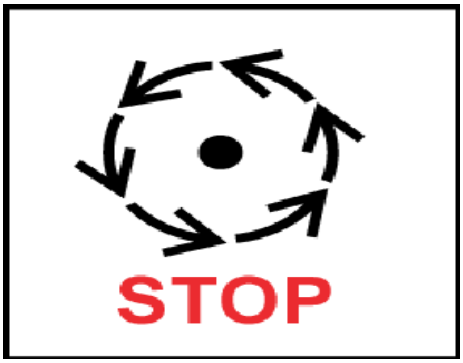
- Do not scatter the hammer or other tools in the working site. Wipe off all slippery grease, oil or other substances. Keep the working site clean and tidy for safe working.
  If the working site is not kept clean and tidy, there is stumble, slip or dropping danger, and cause injury.
- Top window made by organic glass (polycarbonate) should be cleaned with water, any alkaline solvent is not allowed. If benzene, toluene, methanol or other basic solvent are used, chemical reaction will be caused, such as the glass is dissolved or decomposed, and polycarbonate will age.

When working together with others, one commander should be specified.

- When the machine are fixed, or when the working device is removed or installed, one commander should be specified, and then other persons should follow his command in the operating process. When working together, not understanding with each other can lead to serious accidents.

Shut down the engine before maintenance

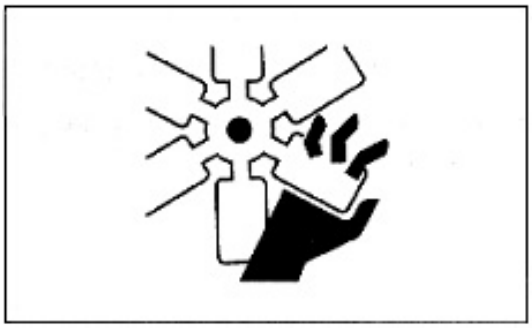
- The machine should be stopped on solid and flat ground surface.
- The places without falling stones, collapses or flood should be selected.
- Completely lower the working device onto the ground, and shut down the engine.
- Put stopper blocks under the track in order to prevent the machine from moving.



When the engine is running, two persons are needed for maintenance.

To prevent damage, when the engine is running, the maintenance should not be carried out. Otherwise, at least two persons are needed to carry out in accordance with the following rules:

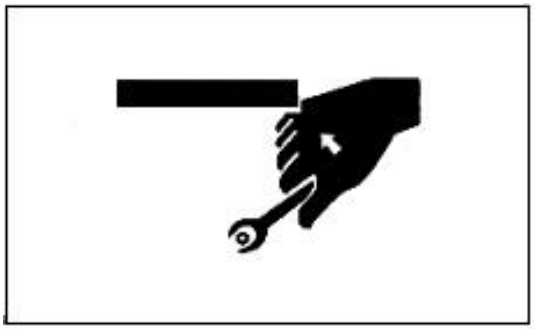
- One person must sit on seat and get ready to shut down the engine. All persons must keep in communication with each other.



- Pull the safety locking control rod to the locking position.
- When operating near fan, fan belt or other rotating parts, the operator must pay special attention to prevent from winding.
- It is prohibited to touch any operating lever. If necessary, the operator needs to send signals to other persons to warn them to move to a safe place.
- Never insert tools or other objects into the fan or the fan belt, otherwise the parts will break or fly out.

Suitable tools

The suitable tools should be correctly used, and damaged, inferior, flawed and temporary tools or inappropriate tools may cause serious injury.



Accumulator

The accumulator is filled with high pressure nitrogen.

When operating the accumulator, the careless operation will cause explosion, and cause serious injury or damage. Therefore, the following precautions should be abided by:

- Do not decompose the accumulator.
- Do not get the accumulator close to the fire.
- Do not drill and weld, or use the welding torch on the accumulator.
- Do not collide or roll the accumulator, and do not make the accumulator suffer any impact.
- When disposing the accumulator, gas must be discharged.

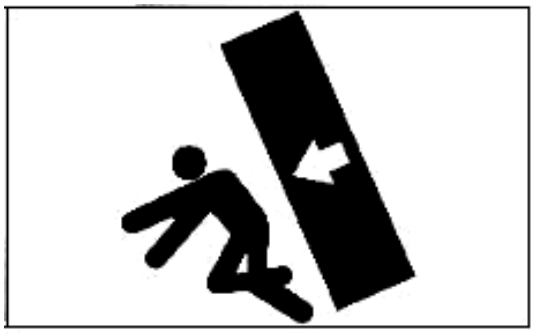
Please contact with XUGONG excavator dealer to carry out this work.

Personnel

Only trained personnel are allowed to maintain or repair the machine, no one without training is allowed to enter the area.

Accessories

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



Working under the machine

- If maintenance is needed under the machine or the working device, pads and frames strong enough should be used to support the working device and the machine.
- If the track leaves the ground, the machine is only supported by the working device; if the operating lever or hydraulic pipes are accidentally touched, the working device or the machine may suddenly fall. If the pads or the frames are not used to support the machine, it is prohibited to work under the machine.

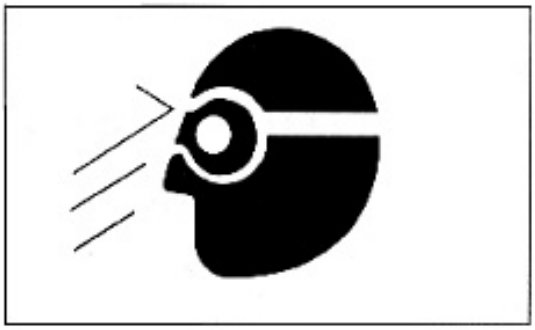
Noise

- If the noise of the machine is too large, temporary or permanent hearing problems can be caused.
- When maintaining the engine and suffer the noise for a long time, you should wear ear covers or earplugs.

When using the hammer

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

- If the hammer is used to strike hard metal parts, such as pins, bucket teeth, blade or bearings, fragments may scatter and cause harm, and therefore, wear goggles and gloves during operating.
- When striking the pins or the bucket teeth, the fragments may fly out, any person is not allowed to stay around to avoid injury.
- If struck strongly, the pins may fly out and cause damage to persons around.



Welding operation

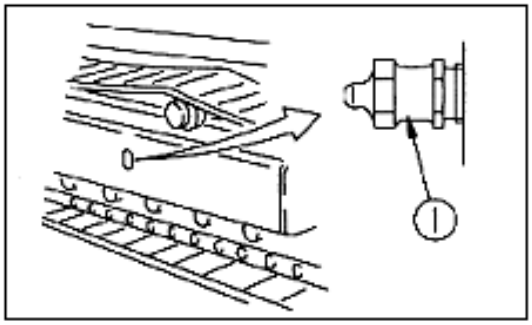
Only proper devices can be used, and the operation shall be performed by qualified welders.

Removing battery terminals

When repairing electrical system or welding, the terminals of the battery cathode (-) should be dismantled, to prevent the current.

When the track tension is adjusted with high-pressure grease, you should be carefully.

- The grease is pressed into the track tension adjustment system under the condition of high pressure. When adjusting, if the maintenance procedure is not followed, the grease emission plug ① will fly out, which will cause serious injury or damage.
- In order to relax the track tension, the grease emission plug ① is loosened, the emission plug which is loosened is not turned over one lap, and simultaneously, the grease emission plug must be loosened slowly.
- Do not get face, hands, feet or other body parts close to the grease emission plug ①.



Do not remove buffer spring

The buffer spring assembly, used to reduce the impact of tension pulley, includes a high-tension spring, if the high-tension spring is removed in a wrong way, the spring will fly out, causing serious injury or death.

Relevant safety rules of high pressure oil

The internal part of the hydraulic system always has pressure; when checking or replacing pipes or hoses, the pressure in the hydraulic oil pipe must be checked whether has been released. If oil pipe still has pressure, serious injury or damage can be caused, so do as the following rules:

- When the hydraulic system has pressure, do not carry out inspection or replacement before releasing the pressure.
- If the surrounding area of the pipes or the hoses is wet, the pipes or the hoses should be checked for breakage, and whether the hoses inflate. In inspection, wear goggles and leather gloves.
- The high-pressure oil leaking from small orifices can penetrate into skin, and cause blindness if contact directly. If skin or eyes were injured by high pressure oil, they should be flushed with clean water and go to hospital for treatment.

Safe Operation of High Pressure Hose

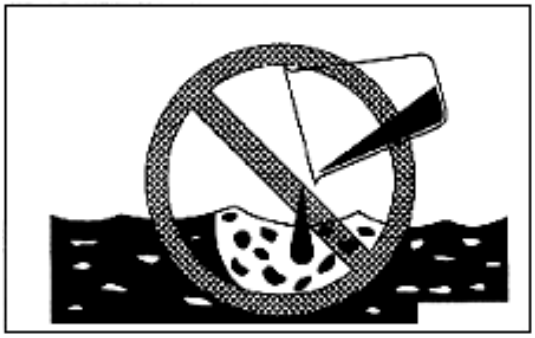
- If the hose leaks, it may cause fire or faulty operation, resulting in serious injury or damage.
  If the bolts loose, stop operations and screw the bolts to the specified tightening torque. If there is any damage to the hose, stop the operation immediately, and contact with the dealer of XUGONG excavator.
- If there are any of the following problems, replace the hose:

– Damage or leakage of hydraulic pipe connection.
– Cladding frayed or disconnected, or strengthening layer wire exposed.
– Cladding expands in some places.
– Movable parts distorted or crushed.
– Impurities inside cladding.

Waste

To prevent pollution, particular 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, cooling fluid, solvents, filter and batteries, it is necessary to comply with the laws and regulations.



Air Conditioner Maintenance

If the air conditioner refrigerant gets into the eyes, it may cause blindness; if the refrigerant contacts with skin, it can cause frostbite.

Compressed Air

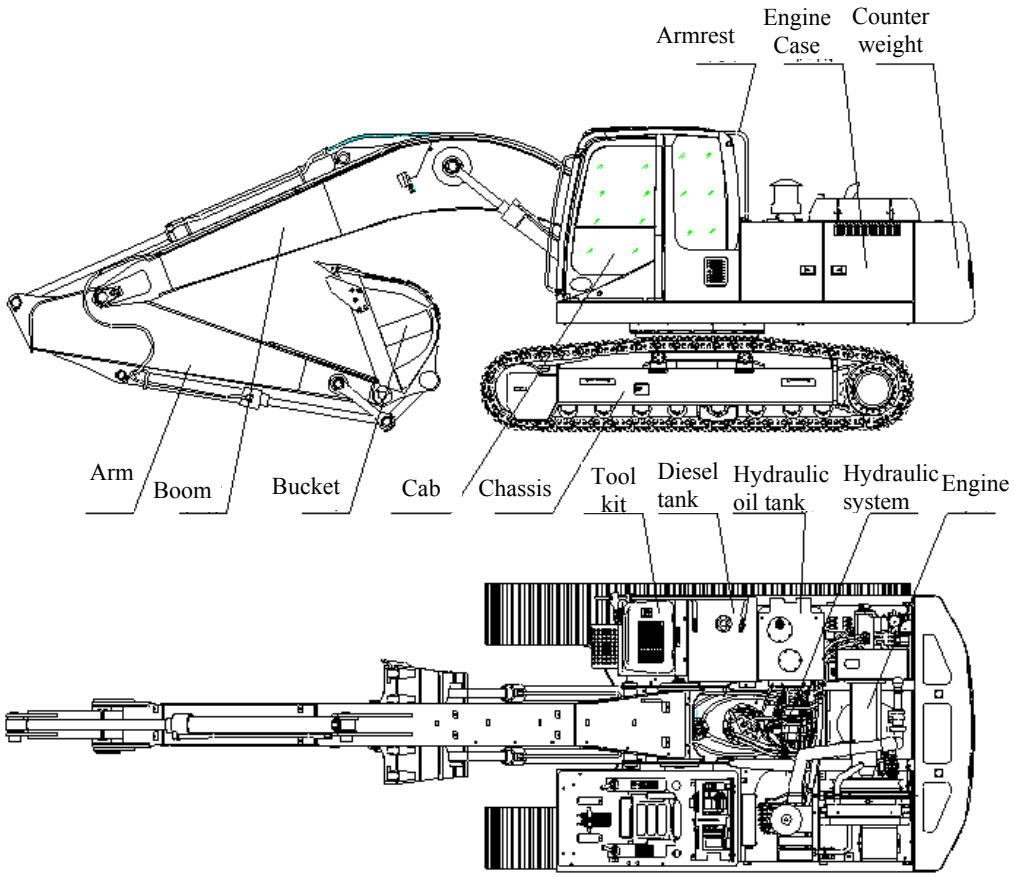
- When cleaning with compressed air, the particles flying out may cause injury to person or damage to the machine.
- When cleaning filter or radiator with compressed air, make sure to wear goggles, dust masks, gloves and other protective equipments.

Regular Replacement of Safety-critical Parts

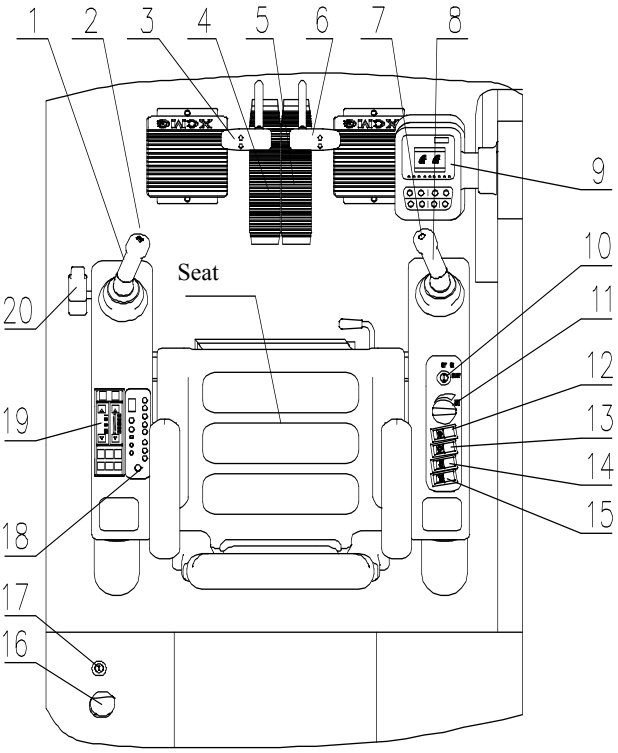
- For long-term safety of in operation of the machine, there is need for regular lubrication and maintenance. To further enhance security, the safety-related parts such as hoses, seat belts should be regularly replaced.
- When exceeding the specified time, the material of parts will change in nature. Reuse will cause deterioration, wear and damage. Finally, these parts may break down and cause serious injury or damage. When the operating, it is difficult to judge how long these parts can keep working according to an external inspection or touch, so replace it regularly
- If there are any defects in safety-critical parts, replace or repair it even it has not reached the specified time.

Name of Parts

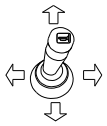
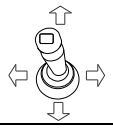
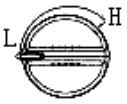
General drawing

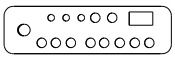
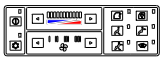
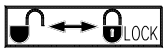


Cab

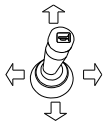
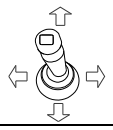


1 Left Operating Lever
2 Horn Switch(Above Left Operating Lever)
3 Left Travelling Operating Lever
4 Left Travelling Pedal
5 Right Travelling Pedal
6 Right Travelling Operating Lever
7 Boosting Switch (Above Right Operating Lever)
8 Light Operating Lever
9 Monitor
10 Engine Key Switch
11 Engine Speed Knob
12 Arm Lamp Switch
13 Working Lamp Switch
14 Wiper Switch
15 Washer Switch
16 Emergency Cutoff Button (Optional Attachment)
17 Cigarette Lighter
18 Radio Switch
19 Control Button For Air Conditioner
20 Safe Locking Lever

No.	Name	Sign	Function
1*	Left operating lever		Control the lift and drop of arm as well as the swing
2	Horn switch (above left operating lever)		Enable the horn to sound after being pressed
3	Left travelling operating lever		Forward and backward control of left track
4	Left travelling pedal		Forward and backward control of left track
5	Right travelling pedal		Forward and backward control of right track
6	Right travelling operating lever		Forward and backward movement of right track
7	Reinforcement switch (above right operating lever)		After being pressed, the max. excavation force can be obtained in short time
8*	Right operating lever		Control the lift and drop of boom as well as excavation and unload of bucket
9	Monitor		Operation, indication and warning(for details, see the latter introduction)
10	Engine key switch		Start, run and stop the engine
11	Engine speed knob		Adjust the engine speed
12	Arm lamp switch		Control the working lamp of boom
13	Working lamp switch		Control the right working lamp
14	Wiper switch		Control the wiper of front window of cab
15	Washer switch		Control the washer of front window of cab
16	Emergency cutoff button		Emergency cutoff of engine

17	Cigarette lighter		Control the lighting
18	Radio switch		Control the radio
19	Control button for air conditioner		Control the air conditioner
20	Safe locking lever		Control hydraulic guidance oil

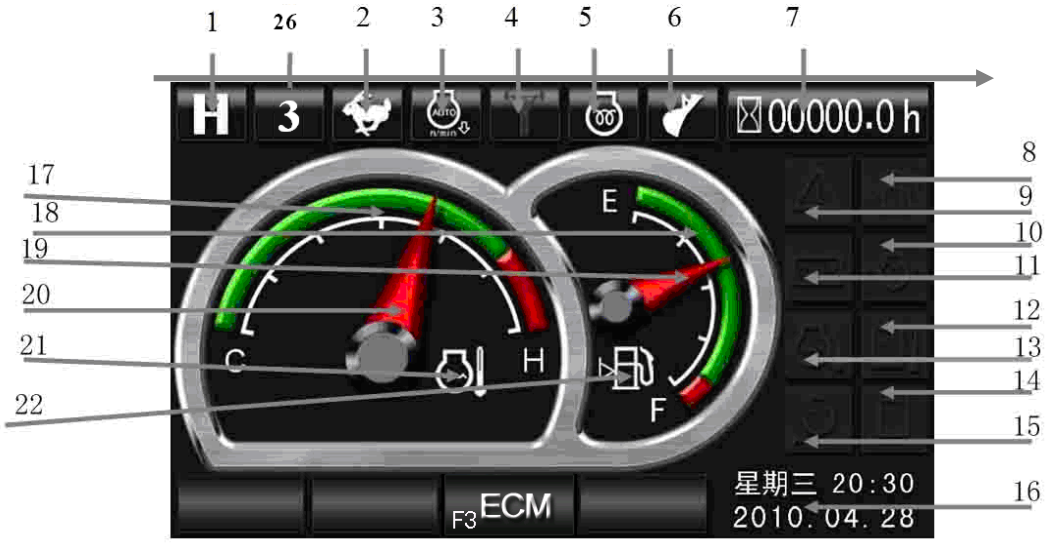
Remark: The machine comes equipped from the factory with the excavator control lever pattern and the corresponding labels must be installed on the left and right control consoles.

1*	Left operating lever		Control the lift and drop of boom as well as the swing
8*	Right operating lever		Control the lift and drop of arm as well as excavation and unload of bucket

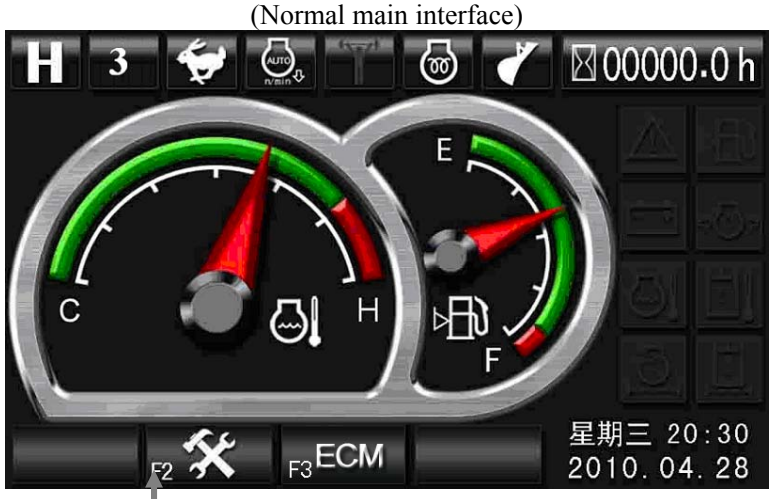
Monitor

There are three main machine instrument display interfaces. The first is the normal main interface, which is the interface the instrument displayed, when the machine is in no fault and alarm conditions. The second is the maintenance prompt interface when the maintenance time reaches. The third is the alarm display interface when the machine has fault.

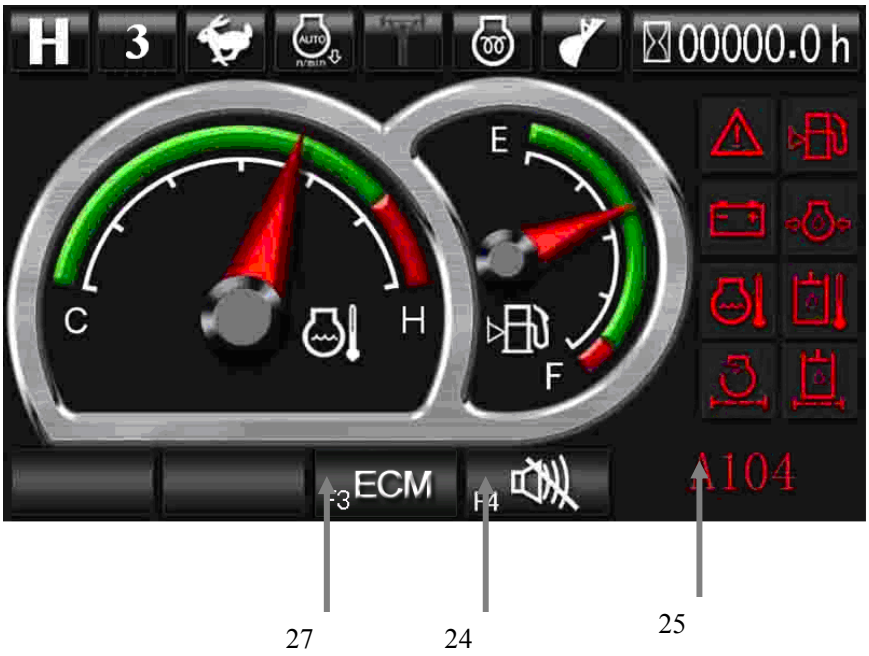
The three instrument display interfaces are introduced as follows:



(Normal main interface)



(Display interface of maintenance information)



(Alarm information display interface)

1. Work mode sign
2. Traveling mode sign
3. Automatic idle sign
4. Reinforcement sign
5. Preheating indicator sign
6. Work mode sign
7. Work hour meter
8. Fuel oil level alarm sign
9. Total fault alarm
10. Engine oil pressure alarm
11. Generator charging alarm
12. Hydraulic oil temperature alarm
13. Coolant temperature alarm
14. Hydraulic oil filter alarm
15. Air filter alarm
16. Real time clock/date
17. Coolant temperature dial
18. Fuel oil level dial
19. Fuel level simulation indicator
20. Coolant temperature simulation indicator
21. Coolant temperature indicator icon
22. Fuel level indicator icon
23. Maintenance information viewing function button
24. Sign of mute function
25. Alarm code hinting
26. Gear display
27. Engine fault code viewing function button

Operating Instructions of Monitor:

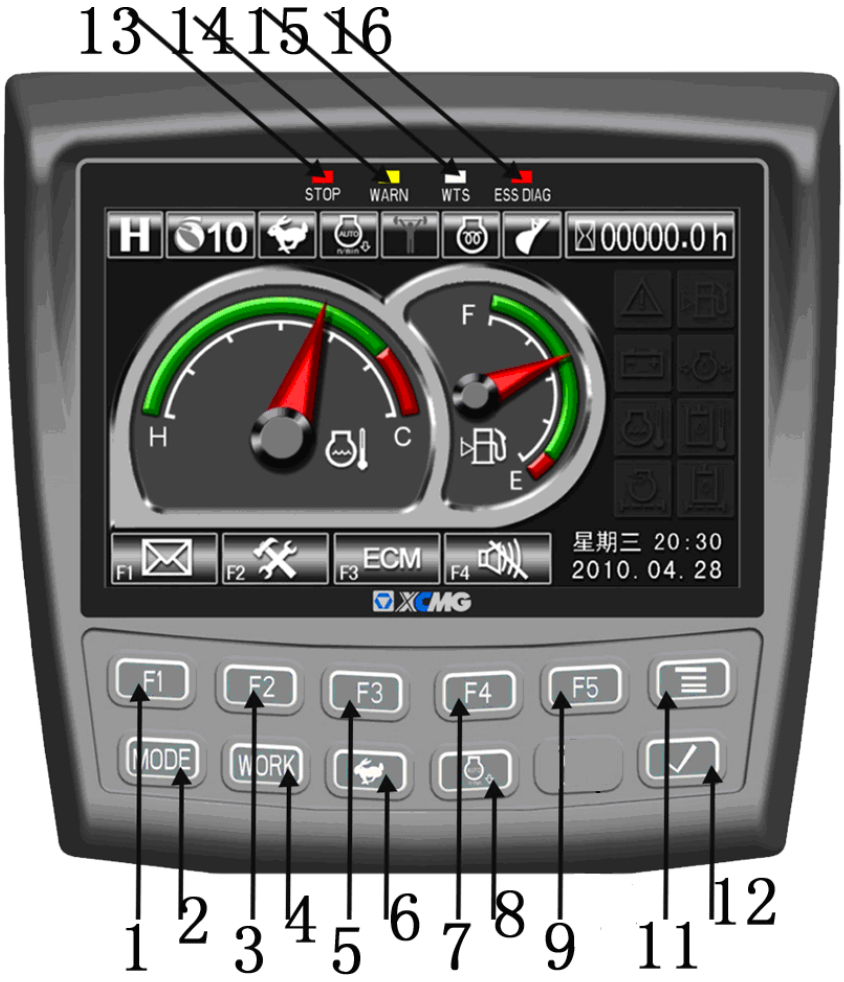
Items and display of monitor

Symbol	Display items	Display mode
	Work mode	Work mode: Displayed in switching of work mode H ->S->L->B->H 
	Gear	Displayed in switching of gear 1 -> 10
	Preheating	Preheat condition:  Non-preheating condition: 
	Walking speed	Machine is walking at a high speed:  Machine is walking at a low speed: 
	Automatic idle speed	Machine is in the state of automatic idle speed:  Machine is in the state of non-automatic idle speed: 
	Work mode	Work mode of machine is digging:  Work mode of machine is crushing: 
	Reinforcing	Machine is in reinforcing state:  Machine is in non-reinforcing state: 
	Work hour meter of machine	Work hour meter of machine displays the working time of the machine. Unit: hours (h) If in starting data transferred from the controller is not received, there will be no display.

Items and display of alarm monitor

Sign	Meaning	Alarm and normal display model
	Generator charging alarm	Normal display  Alarm display 
	Low engine oil pressure alarm	Normal display  Alarm display 
	Air filter clog alarm	Normal display  Alarm display 
	Coolant temperature alarm	Normal display  Alarm display 
	Hydraulic oil filter alarm (including oil inlet filter alarm and oil outlet filter alarm)	Normal display  Alarm display 
	Hydraulic oil temperature alarm	Normal display  Alarm display 
	Low fuel oil level alarm	Normal display  Alarm display 
	Total fault alarm indicator	Normal display（when there is no fault information）  Alarm display（when there is fault information） 

Layout and introduction of buttons



1. Function buttons
2. Work mode selection button
3. Function buttons
4. Work mode selection button
5. Function buttons
6. Walking speed choice selection button
7. Function buttons
8. Automatic idle speed button
9. Function buttons
11. Menu/Cancel button
12. Confirmation button
13. Engine failure indicator light
14. Engine failure indicator light
15. Engine failure indicator light
16. Controller failure indicator light

- **Automatic idle speed button**

Automatic idle speed button can open and close the automatic idle speed function. When it is set to ON, automatic deceleration monitor will shine.

Automatic idle speed opened		
Automatic idle speed closed		

- **Buzzer cancel switch**

Press this switch when the alarm buzzer rings. This switch can automatically stop the ringing of alarm buzzer caused by current fault. If a new fault is detected, the alarm buzzer will ring. Depending on the type of alarm buzzer, some buzzers will not stop ringing even if you press the buzzer cancel switch. Without alarm message, icon will not be displayed.

When there is no alarm information	No icon
When there is alarm information and buzzer rings	
When there is alarm information and buzzer is mute	

- Work mode selection button

Work mode selection button can switch common work mode and crushing work mode. When crushing work mode is selected, selected of work mode will not work. When common work mode is selected, press work mode button to switch between H->S->L->H.

Crushing work mode	
Normal work mode	

- Work mode selection button

Work mode selection button can choose H/S/L model for working of machine.

Display of work mode is as follows：

H Mode	
S Mode	
L Mode	
B Mode	

- **Walking speed selection button**

Walking speed selection button can choose walking at high speed and walking at low speed. Switch method: When the current state is walking at high speed, press this function button to switch to walking at low speed; when the current state is walking at low speed, press this function button to switch to walking at high speed.

Walking at high speed	
Walking at low speed	

- **Indicator icon and switch function**

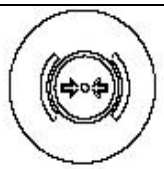
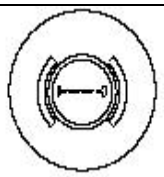
This function will vary according to the interface display. The indicator icons display functions of corresponding switch below it. Without indicator icon, the switch is invalid.

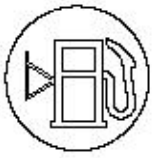
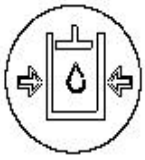
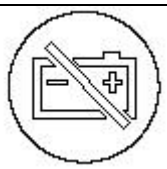
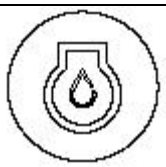
Functions displayed by indicator icon are shown in the table below.

Icon	Interface	Function	Remarks
	The main interface	Icon for checking the engine fault code	

	The main interface	At this time press Key F4 for muting	Only when there is failure it will be displayed in the main interface
	The main interface	At this time press Key F4 to open the alarm sound	Only when there is failure it will be displayed in the main interface
	The main interface	Icon for checking the maintenance information	With this function button, we can check all maintenance information.
	Menu interface/information view interface/setting interface	Previous/Increase	In the menu interface press this function button to the previous record. When setting interface, press this button to increase data at focal point.
	Menu interface/information view interface/setting interface	Next/Decrease	In the menu interface press this function button to the next record. When setting interface, press this button to decrease data at focal point
	Menu interface/information view interface/setting interface	Move to the left	
	Menu interface/information view interface/setting interface	Move to the right	
	Menu interface/information view interface/setting interface	The next page	
	Menu interface/information view interface/setting interface	The next page	
	Menu interface/information view interface/setting interface	Cancel button	Cancel the settings of data currently set. In the menu interface, press this button to return to the higher level of menu.
	Menu interface/information view interface/setting interface	OK button	Confirm the settings of data currently set. In the menu interface, press this button to enter into the next level of menu.

Code list of Monitor fault

Classification	Item	Code	Icon	Instruction
Hydraulic class	High hydraulic oil temperature alarm	A101		When the hydraulic oil temperature is above 90℃, the alarm will work.
	Hydraulic oil inlet clogging alarm	A102		
	Hydraulic oil outlet clogging alarm	A103		
	Pilot oil filter clogging alarm	A104		
	Brake pressure abnormal alarm	A105		When the rotating speed is above 600rpm, and the brake pressure is under 70bar orabove 190bar, the alarm will work.
	Brake oil filter clogging alarm	A106		
	Low transmission pressure alarm	A107		When the rotating speed is above 600rpm and transmission pressure is low, the alarm will work.
Engine class	High engine temperature alarm	A301		When the engine water temperature is over105℃, the alarm will work.

	Low fuel level alarm	A302		When the fuel oil level is under 10%, the alarm will work.
	Fuel oil filter clogging alarm	A303		
	Low engine oil pressure alarm	A304		
	Filter 1 clogging alarm	A305		
	Filter 2 clogging alarm	A306		
	Oil water separator 1water excess alarm	A307		
	Oil water separator 2 water excess alarm	A308		
Electrical class	Battery charging abnormal alarm	A501		When there is speed , the system voltage is below 24.5V and 12V system is below 13V, the battery charging alarm will work.
	Centralized lubrication alarm	A502		

II、Failure information statistics

Classification	Item	Code	Instruction	Remark
GPS Failure	GPS first stage lock	E0010		
	GPS communication failure	E0020		
	GPS power cutoff	E0030		
	GPS antenna abnormal	E0040		
	GPS secondary lock	E0050		
	GPS card abnormal	E0060		
	GPS third stage lock	E0070		
Hydraulic sensor failure	Main pump 1 pressure sensor failure	E1010		
	Main pump 1 pressure sensor short circuit	E1011		
	Main pump 1 pressure sensor disconnect	E1012		
	Main pump 1 pressure sensor extra low range	E1013		
	Main pump 1 pressure sensor extra high range	E1014		
	Main pump 2 pressure sensor failure	E1020		
	Main pump 2 pressure sensor short circuit	E1021		
	Main pump 2 pressure sensor disconnect	E1022		
	Main pump 2 pressure sensor extra low range	E1023		
	Main pump 2 pressure sensor extra high range	E1024		
	Stick withdrawal pressure sensor failure	E1030		
	Stick withdrawal pressure sensor short circuit	E1031		
	Stick withdrawal pressure sensor disconnect	E1032		
	Stick withdrawal pressure sensor extra low range	E1033		
	Stick withdrawal pressure sensor extra high range	E1034		
	Stick extension pressure sensor failure	E1040		
	Stick extension pressure sensor short circuit	E1041		
	Stick extension pressure sensor disconnect	E1042		
	Stick extension pressure sensor extra low range	E1043		
	Stick extension pressure sensor extra high range	E1044		
	Boom rising pressure sensor failure	E1050		
	Boom rising pressure sensor short circuit	E1051		
	Boom rising pressure sensor disconnect	E1052		
	Boom rising pressure sensor extra low range	E1053		
	Boom rising pressure sensor extra high range	E1054		
	Boom descending pressure sensor failure	E1060		
	Boom descending pressure sensor short circuit	E1061		
	Boom descending pressure sensor disconnect	E1062		
	Boom descending pressure sensor extra low range	E1063		
	Boom descending pressure sensor extra high range	E1064		

	Bucket retraction pressure sensor failure	E1070		
	Bucket retraction pressure sensor short circuit	E1071		
	Bucket retraction pressure sensor disconnect	E1072		
	Bucket retraction pressure sensor extra low range	E1073		
	Bucket retraction pressure sensor extra high range	E1074		
	Bucket extension pressure sensor failure	E1080		
	Bucket extension pressure sensor short circuit	E1081		
	Bucket extension pressure sensor disconnect	E1082		
	Bucket extension pressure sensor extra low range	E1083		
	Bucket extension pressure sensor extra high range	E1084		
	Swing pressure sensor failure	E1090		
	Swing pressure sensor short circuit	E1091		
	Swing pressure sensor disconnect	E1092		
	Swing pressure sensor extra low range	E1093		
	Swing pressure sensor extra high range	E1094		
	Left travel pressure sensor failure	E1100		
	Left travel pressure sensor short circuit	E1101		
	Left travel pressure sensor disconnect	E1102		
	Left travel pressure sensor extra low range	E1103		
	Left travel pressure sensor extra high range	E1104		
	Right travel pressure sensor failure	E1110		
	Right travel pressure sensor short circuit	E1111		
	Right travel pressure sensor disconnect	E1112		
	Right travel pressure sensor extra low range	E1113		
	Right travel pressure sensor extra high range	E1114		
	Travel pressure sensor failure	E1120		
	Travel pressure sensor short circuit	E1121		
	Travel pressure sensor disconnect	E1122		
	Travel pressure sensor extra low range	E1123		
	Travel pressure sensor extra high range	E1124		
	Brake pressure sensor failure	E1130		
	Brake pressure sensor short circuit	E1131		
	Brake pressure sensor disconnect	E1132		
	Brake pressure sensor extra low range	E1133		
	Brake pressure sensor extra high range	E1134		
	Hydraulic oil temperature sensor failure	E1140		
	Hydraulic oil temperature sensor short circuit	E1141		
	Hydraulic oil temperature sensor disconnect	E1142		
	Hydraulic oil temperature sensor extra low range	E1143		
	Hydraulic oil temperature sensor extra high	E1144		

	range			
Solenoid valve failure	Torque valve 1failure	E2010		
	Torque valve 1overcurrent	E2011		
	Torque valve 1undercurrent	E2012		
	Torque valve 2 failure	E2020		
	Torque valve 2overcurrent	E2021		
	Torque valve 2undercurrent	E2022		
	Swing priority proportional valve failure	E2030		
	Swing priority proportional valve over current	E2031		
	Swing priority proportional valve undercurrent	E2032		
	Bucket confluence proportional valve failure	E2040		
	Bucket confluence proportional valve over current	E2041		
	Bucket confluence proportional valve undercurrent	E2042		
	Boom 1 proportional valve failure	E2050		
	Boom 1 proportional valve over current	E2051		
	Boom 1 proportional valve undercurrent	E2052		
	Boom 2 proportional valve failure	E2060		
	Boom 2 proportional valve over current	E2061		
	Boom 2 proportional valve undercurrent	E2062		
	Travel high/low speed selection valve failure	E2070		
	Travel high/low speed selection valve over current	E2071		
	Travel high/low speed selection valve undercurrent	E2072		
	Instantaneous boost solenoid valve failure	E2080		
	Instantaneous boost solenoid valve over current	E2081		
	Instantaneous boost solenoid valve undercurrent	E2082		
	Crushing solenoid valve failure	E2090		
	Crushing solenoid valve over current	E2091		
	Crushing solenoid valve undercurrent	E2092		
		E2101		
		E2102		
	First speed solenoid valve failure	E2110		
	First speed solenoid valve over current	E2111		
	First speed solenoid valve undercurrent	E2112		
	Second speed solenoid valve failure	E2120		
	Second speed solenoid valve over current	E2121		

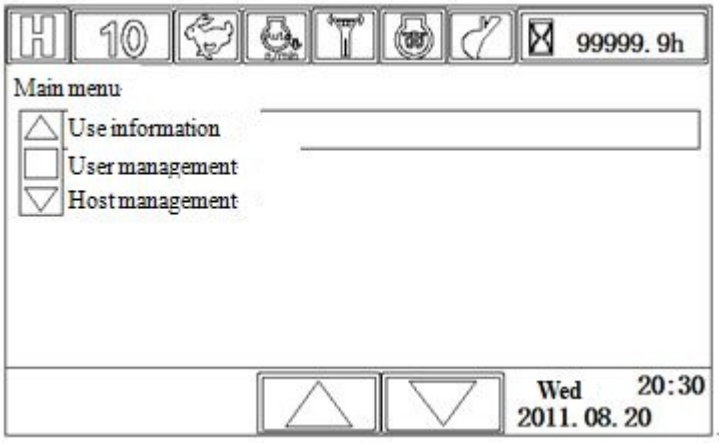
	Second speed solenoid valve undercurrent	E2122		
	Climbing solenoid valve failure	E2130		
	Climbing solenoid valve over current	E2131		
	Climbing solenoid valve undercurrent	E2132		
	Forward solenoid valve failure	E2140		
	Forward solenoid valve over current	E2141		
	Forward solenoid valve undercurrent	E2142		
	Back solenoid valve failure	E2150		
	Back solenoid valve over current	E2151		
	Back solenoid valve undercurrent	E2152		
	Cruise solenoid valve failure	E2160		
	Cruise solenoid valve over current	E2161		
	Cruise solenoid valve undercurrent	E2162		
	Outrigger 1 solenoid valve failure	E2170		
	Outrigger 1 solenoid valve over current	E2171		
	Outrigger 1 solenoid valve undercurrent	E2172		
	Outrigger 2 solenoid valve failure	E2180		
	Outrigger 2 solenoid valve over current	E2181		
	Outrigger 2 solenoid valve undercurrent	E2182		
	Suspension solenoid valve failure	E2190		
	Suspension solenoid valve over current	E2191		
	Suspension solenoid valve undercurrent	E2192		
		E2201		
		E2202		
	Cooling proportional valve failure	E2210		
	Cooling proportional valve over current	E2211		
	Cooling proportional valve undercurrent	E2212		
	Reverse valve 1 failure	E2220		
	Reverse valve 1 over current	E2221		
	Reverse valve 1 undercurrent	E2222		
	Reverse valve 2 failure	E2230		
	Reverse valve 2 over current	E2231		
	Reverse valve 2 undercurrent	E2232		
	P1 pump shut off solenoid valve failure	E2300		
	P1 pump shut off solenoid valve over current	E2301		
	P1 pump shut off solenoid valve undercurrent	E2302		
	P2 pump shut off solenoid valve failure	E2310		
	P2 pump shut off solenoid valve over current	E2311		
	P2 pump shut off solenoid valve undercurrent	E2312		
Engine class	Speed sensor failure	E3010		
	Low engine speed alarm	E3013		
	High engine speed alarm	E3014		
	Engine water temperature sensor failure	E3020		

	Engine water temperature sensor short	E3021		
	Engine water temperature sensor disconnect	E3022		
	Fuel oil level sensor failure	E3030		
	Fuel oil level sensor short circuit	E3031		
	Fuel oil level sensor disconnect	E3042		
Controller class	Controller failure	E4010		
	CAN communication failure	E4020		
	J1939 bus failure	E4030		
	Controller RAM failure	E4040		
	Internal controller temperature abnormal	E4050		
	Low internal controller temperature alarm	E4053	Controller's temperature is below－30℃.	
	High internal controller temperature alarm	E4054	Controller's temperature is above 80℃.	
	5V current abnormal	E4060	To detect that the sensor is abnormal, short circuit or disconnect.	
	5V current short circuit	E4061	Short circuit	
	5V power interruption	E4062	Disconnect	
	Extra low backup battery voltage	E4073		Only alarm
Other classes	Throttle knob failure	E5010		
	Throttle motor failure	E5030		
	Throttle motor undercurrent	E5031		
	Throttle motor over current	E5032		
	Motor positive failure	E5033		
	Motor reverse failure	E5034		
	Throttle motor is beyond the scope of action	E5035		
	Supply voltage abnormal	E5040		
	Low battery supply voltage	E5043		
	High battery supply voltage	E5044		

Electric monitor failure	Auxiliary GPS first stage lock	E6010		
	Auxiliary GPS communication failure	E6020		
	Auxiliary GPS power cutoff	E6030		
	Auxiliary GPS antenna abnormal	E6040		
	Auxiliary GPS secondary lock	E6050		
	Auxiliary GPS card abnormal	E6060		
	Auxiliary GPS third stage lock	E6070		
	Controller RAM failure	E6100		
	Internal controller temperature abnormal	E6110		
	Low internal controller temperature alarm	E6113	Controller's temperature is below－30℃.	
	High internal controller temperature alarm	E6114	Controller's temperature is above 80℃.	
	5V current abnormal of monitor	E6120	To detect that the sensor is abnormal, short circuit or disconnect.	
	5V current short circuit of monitor	E6121	Short circuit	
	5V current short disconnect of monitor	E6122	Disconnect	
	Extra low backup battery voltage of monitor	E6133	Backup battery voltage is below...	Only alarm

Menu Operating Instructions:

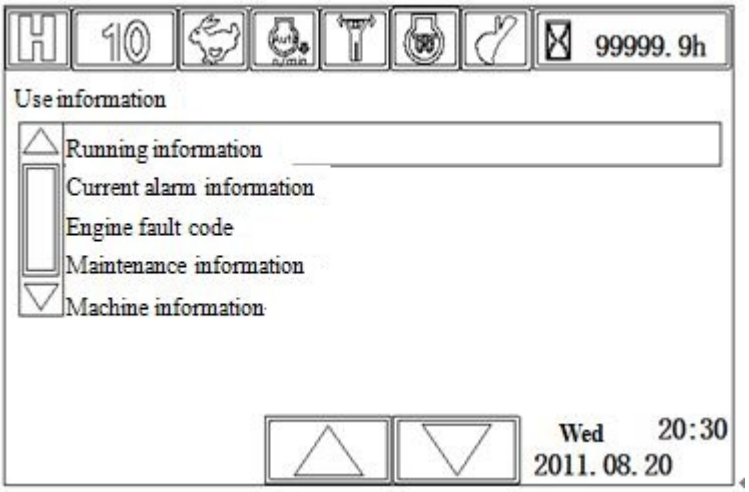
Main menu: enter through main menu button, it has 3 options: use information, user management and host management.



(Main menu interface)

1. Use information menu:

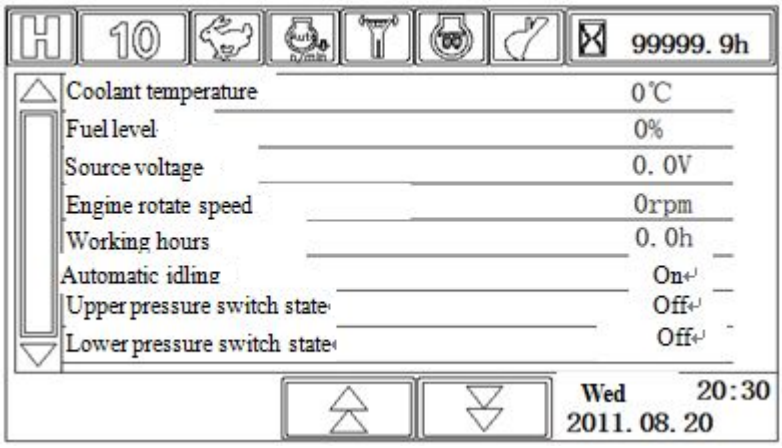
Press confirm button at main menu to enter use information menu, it has 5 submenus: running information, current alarm information, engine fault code, maintenance information and machine information.



(Use information interface)

1.1 Running information:

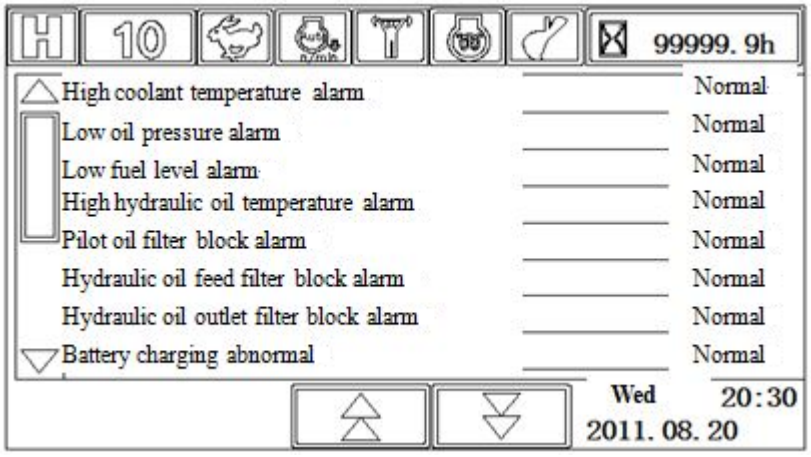
Press confirm button to enter running information menu, this menu mainly shows analog information such as the coolant temperature, source voltage, fuel level and engine rotate speed with Arabic numerals when the machine is running, shown as the following figure:

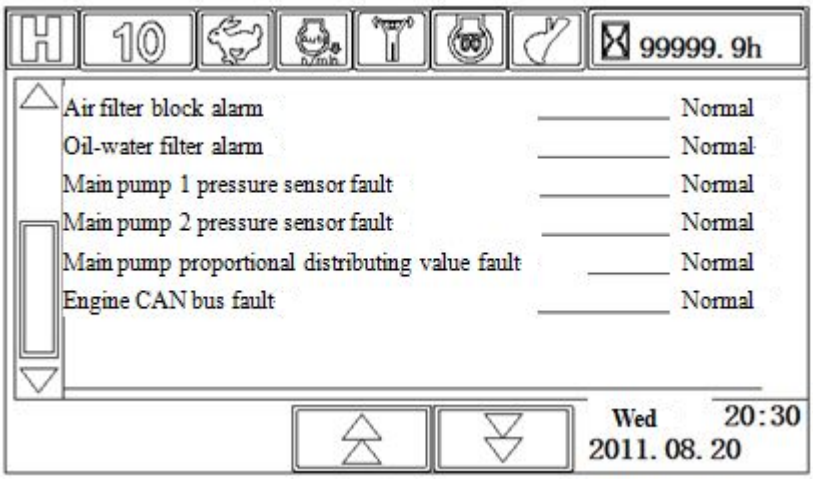


(Running information interface)

1.2 Current alarm information

Press confirm button to enter current alarm information menu, this menu indicates machine running state through “alarm” “normal” text, press page turning button to check all alarm information.



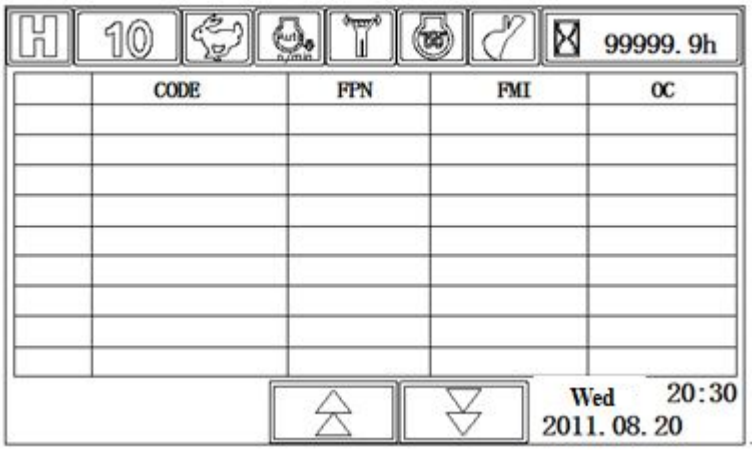


(Current alarm information interface)

1.3 Engine fault code check

Press confirm button to enter engine fault code check menu, this menu mainly shows engine fault code. Press F3 icon 

on the instrument interface to expediently check engine fault code.

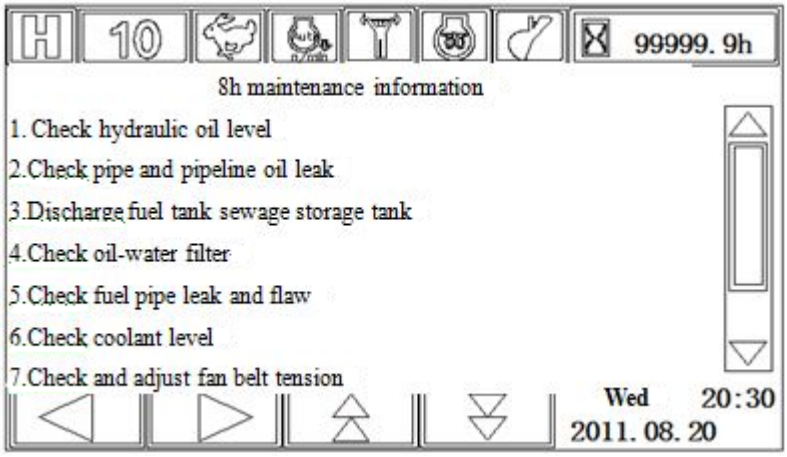


(Engine fault code check interface)

1.4 Maintenance information

Press confirm button to enter maintenance information menu, this menu mainly shows specific information about 8h-2000h maintenance to easily guide maintenance worker an entire maintenance. When working time reach maintenance, the instrument interface will show F2 icon 

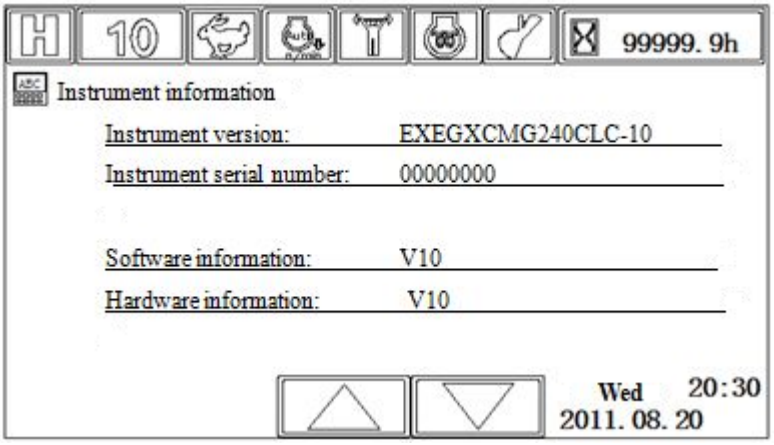
to indicate that it need to maintenance, please ensure timely maintenance.



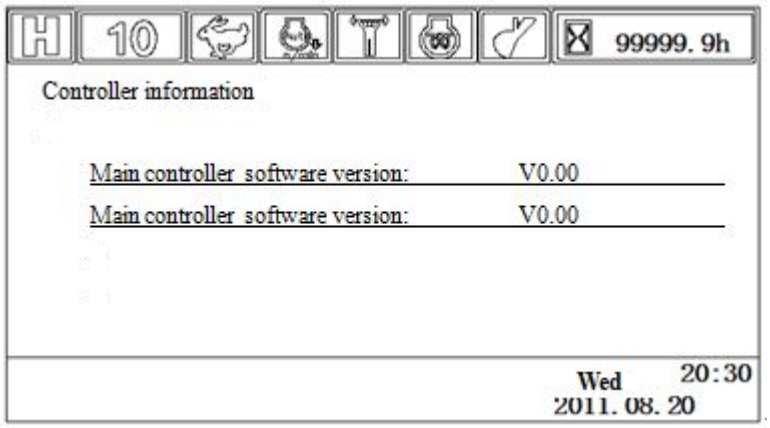
(Maintenance information interface)

1.5 Machine information

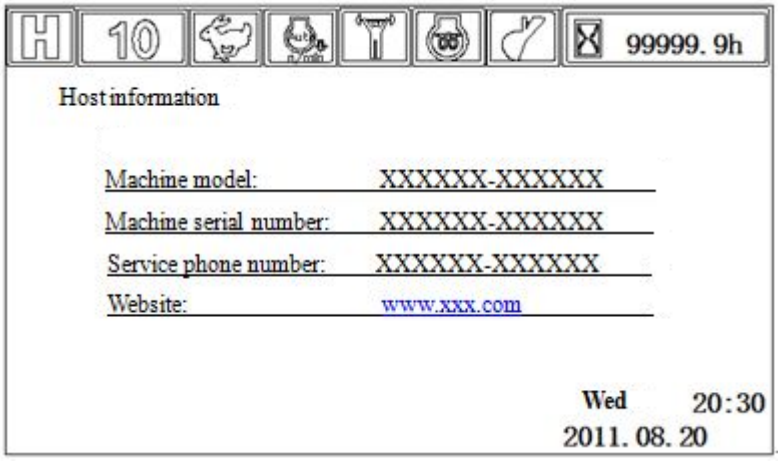
Press confirm button to enter machine information menu, it has 3 submenus: instrument information, controller information and host information. It mainly shows instrument version/serial number, software/hardware version, number, host model and serial number etc.



(Instrument information interface)



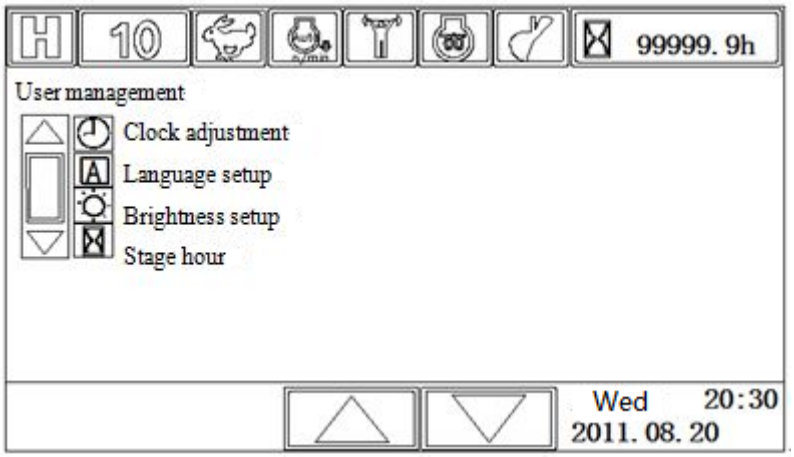
(Controller information interface)



(Host information interface)

2. User management menu:

Choose user management menu in main menu and press confirm button to enter it, which has 4 submenus: clock adjustment, language setup, brightness setup and stage hour.

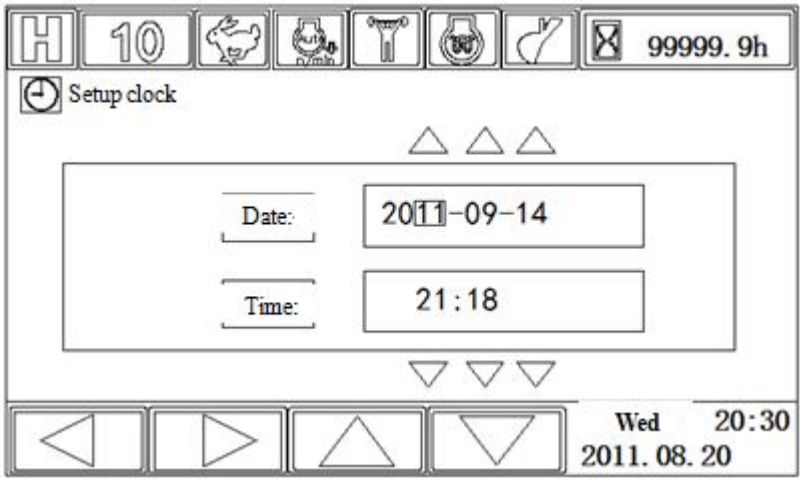


(User management interface)

2.1 Clock adjustment

Press confirm button to enter clock adjustment menu, you can change the current time according to the

indicating button and press confirm button to save it, the real time display region will display the current correcting time.



(Clock adjustment menu)

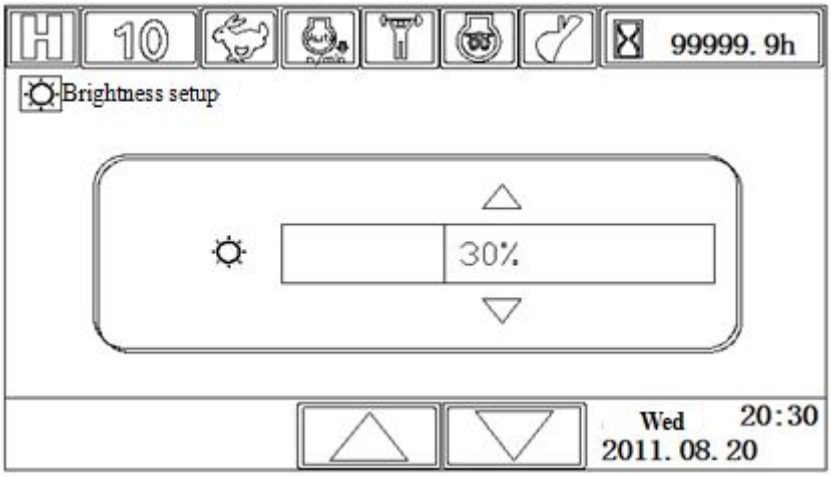
2.2 Language setup

Press confirm button to enter language setup menu, this product provides 4 languages to be selected: Chinese, English, Russian and Portuguese, which can be selected by customers' need. In order to operate easily, the corresponding national flag icons are added.

(Language setup interface)

2.3 Brightness setup

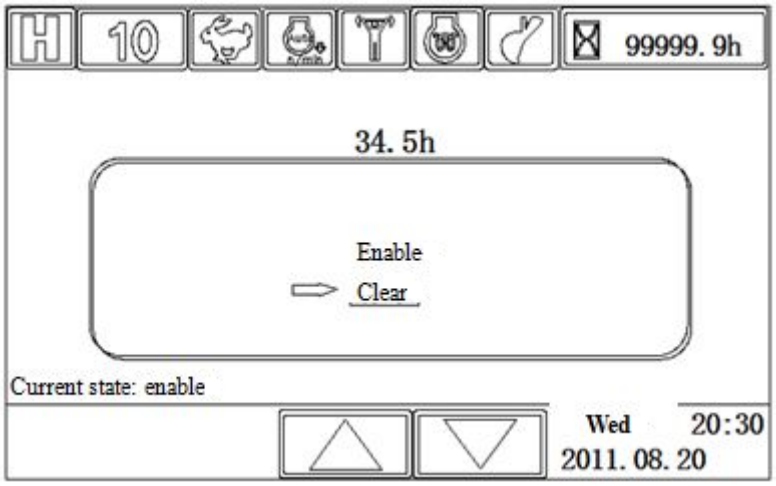
Press confirm button to enter brightness setup menu, the change of light intensity of external world will influence the visual effect of the instrument, at this time, you can change brightness to adapt to current environment.



(Brightness setup interface)

2.4 Stage hour

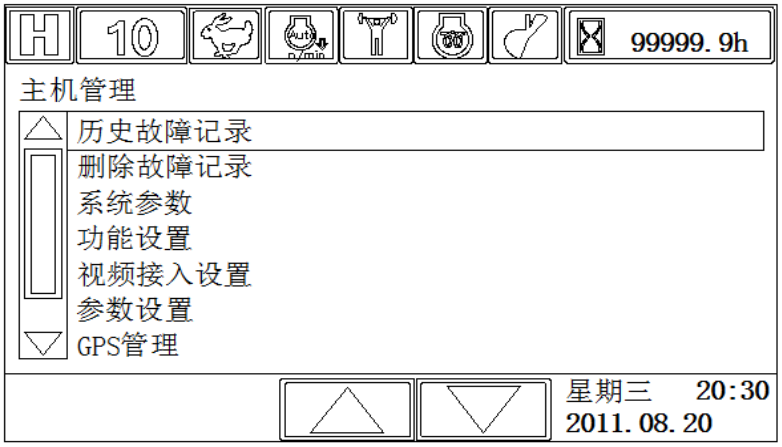
Press confirm button and input password to enter stage hour menu when you need individual accumulative timing on a certain construction, after this function is enabled, the instrument will timing from the current time until it is clear to zero.



(Stage hour interface)

3 .Host Management menu:

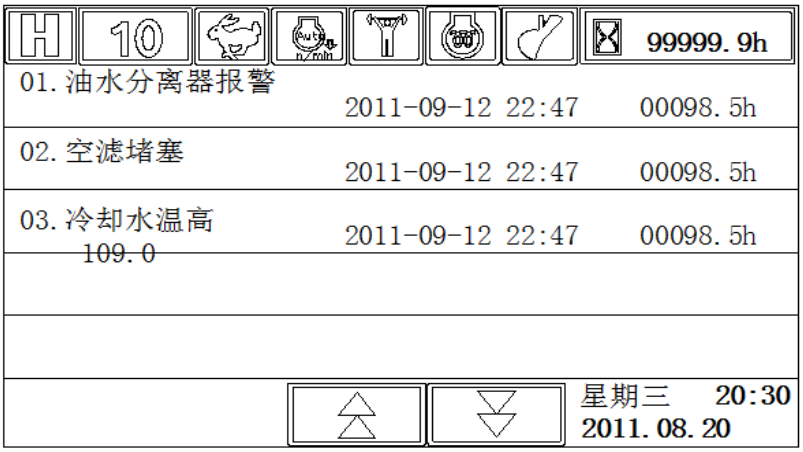
Enter the host administration menu password, click OK to enter the submenu visible 9, respectively: Fault records, delete records failures, system parameters, feature set, video access settings, parameter settings, GPS management, clear-hour meter, instrument management, as authorized in this section is limited, only part of the menu will be explained;



(Host Management Interface)

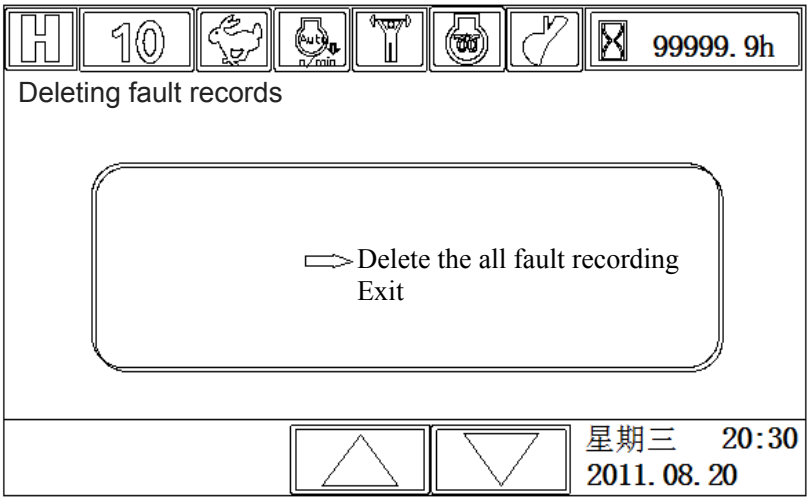
3.1 Fault record:

Click the OK button to enter the fault history menu, when a fault occurs and the records that meet the conditions, the instrument automatically stores the error information, check the vehicle for easy post-targeted cumulative failure can store 50 records;



3.2 Deleting fault records:

Click the OK button to enter the recording menu to delete fault, when a known fault and exclusion, To clear the fault log, enter the menu, follow the prompts;



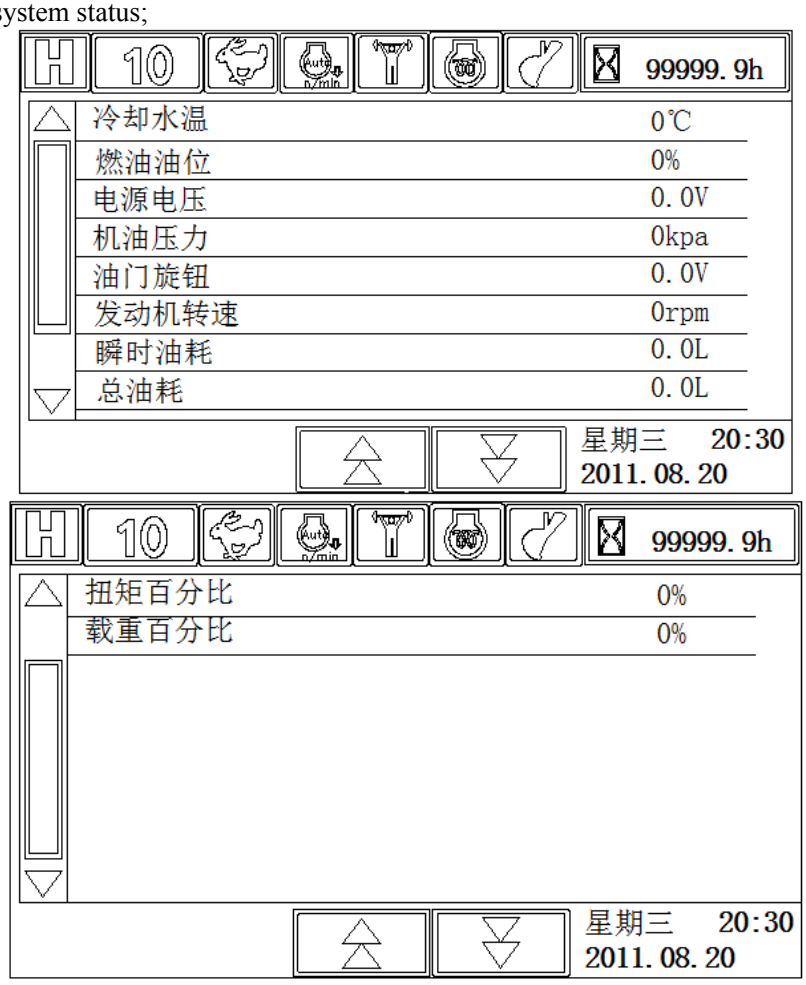
3.3 System parameters:

Click the OK button to enter the system parameters menu, which contains three sub-menus, namely:

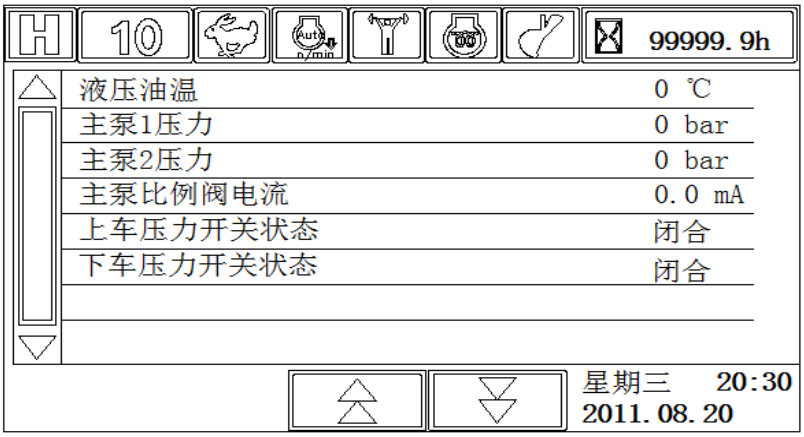
operating status, fault information, GPS positioning information;

3.3.1 Operating status:

Click the OK button to enter the running state menu, which contains two sub-menus, namely: the state of the engine, hydraulic system status;



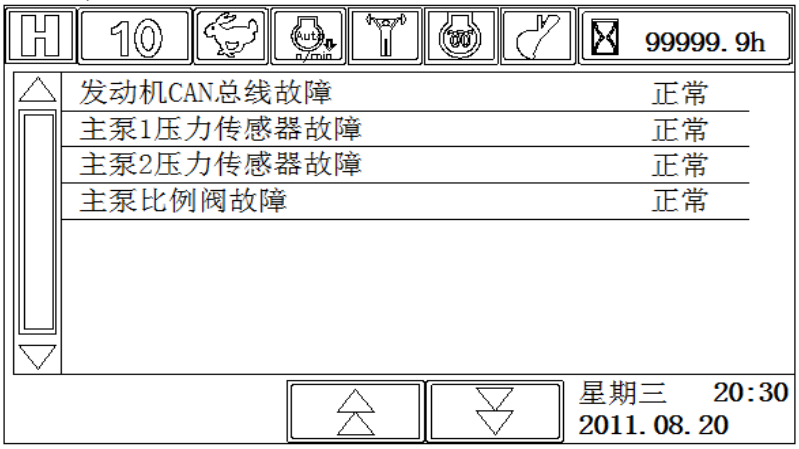
(Engine Status Interface)



(Hydraulic System Status screen)

3.3.2 Error message:

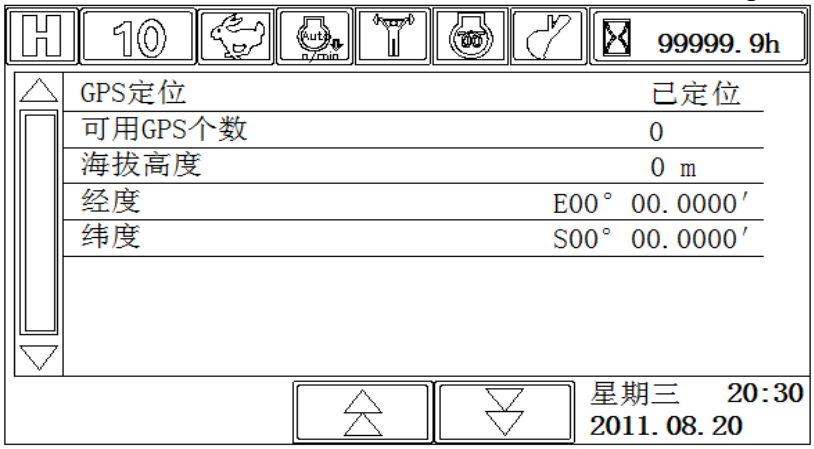
Click the OK button to enter the fault information menu, which contains four faults, namely: the engine CAN bus failure, the main pump a pressure sensor failure, the main pump 2 pressure sensor failure, the main pump proportioning valve failure;



(Fault information interface)

3.3 .3 GPS positioning information:

Click the OK button to enter the GPS positioning information menu that includes 5 monitoring, namely: GPS positioning information, the number of available GPS satellites, altitude, latitude, longitude;



(GPS positioning information interface)

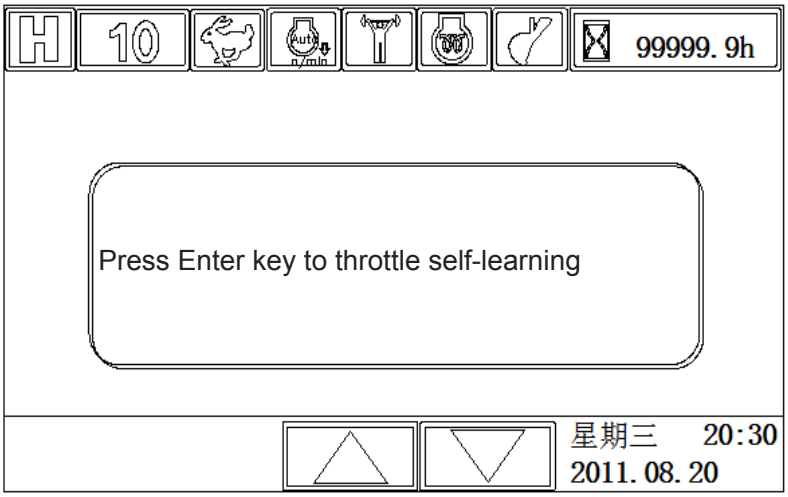
3.4 Feature set :

Click the OK button to enter the function setting menu, which contains four sub-menus, namely: self-learning throttle, speed changes, restore the default parameters, the engine control mode;

(Function setting interface)

3.4.1 Throttle self-learning:

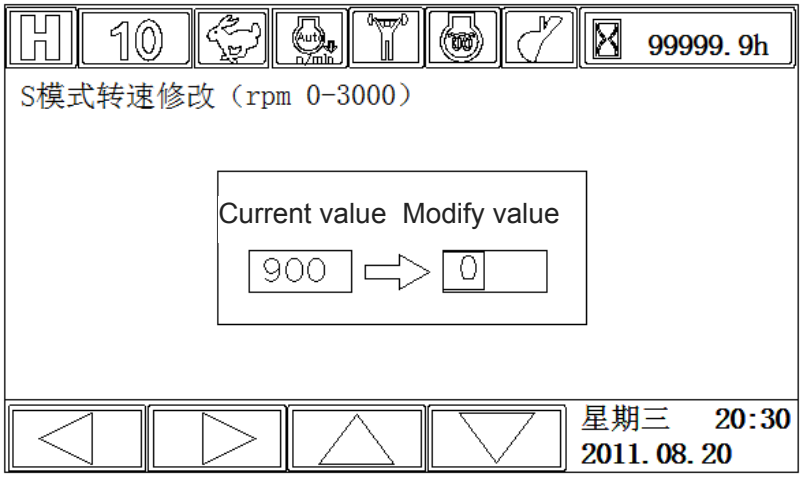
Click the OK button to enter the menu throttle self-learning, in accordance with the interface prompts;



(Throttle self-learning interface)

3.4.2 Speed Review:

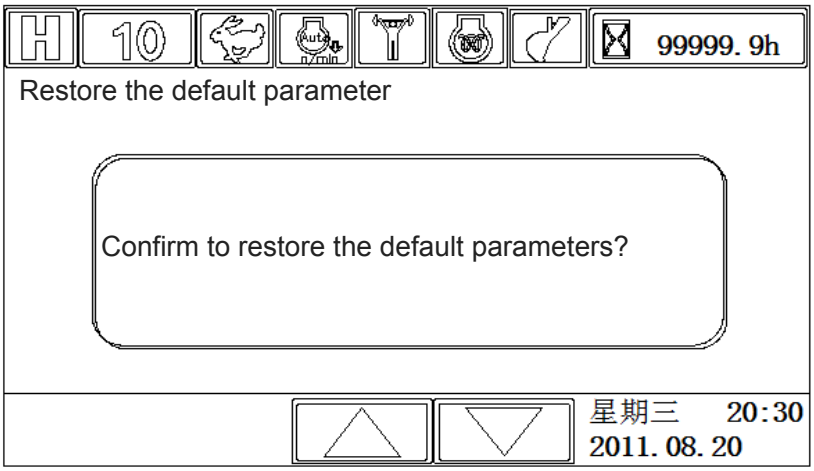
Click OK to enter speed modification menu, this interface can S, H, B, L mode speed modification, modify the interface as follows;



(S \ H \ B \ L mode speed modification interface)

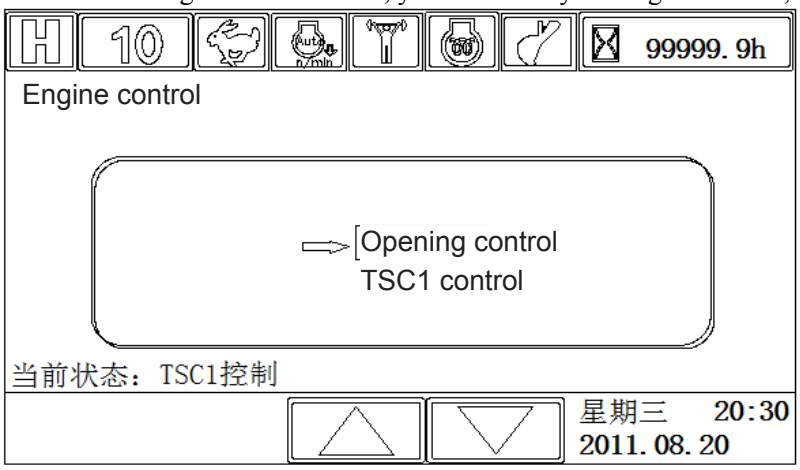
3.4.3 Restore default parameters:

Click the OK button to enter restore the default parameter menu, press confirm button to restore the default controller parameters, modify the interface as follows;



2.3.4.4 Engine Control:

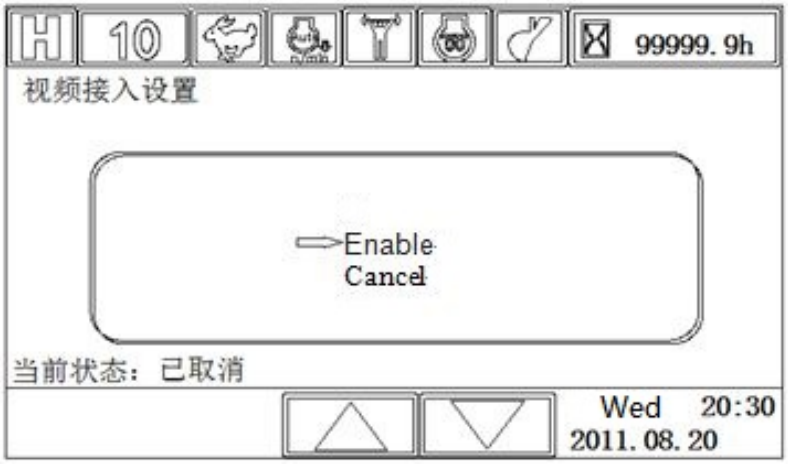
Click the OK button to enter the engine control menu, you can modify the engine control;



(Engine control interface)

3.5 video access settings:

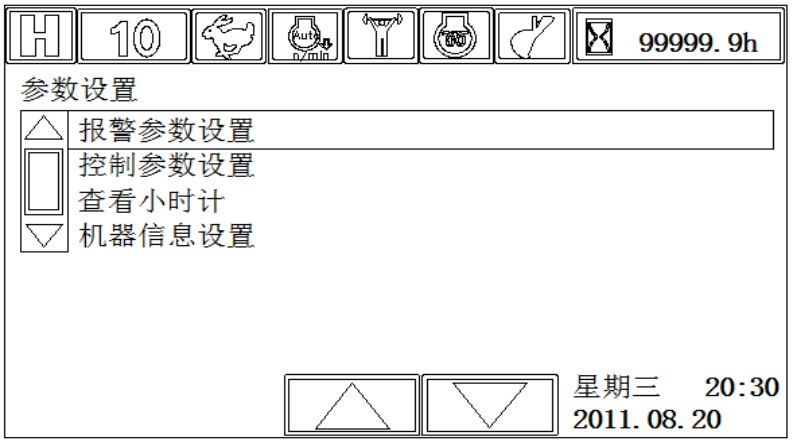
Click the OK button to enter the video access settings menu, which can control the video signals to open and close;



(Video access settings interface)

3.6 Parameter settings:

Click the OK button to enter the parameter setting menu, which contains four sub-menus, namely: the alarm parameter settings, control parameter settings, view hour meter, machine information set;



(Parameter setting interface)

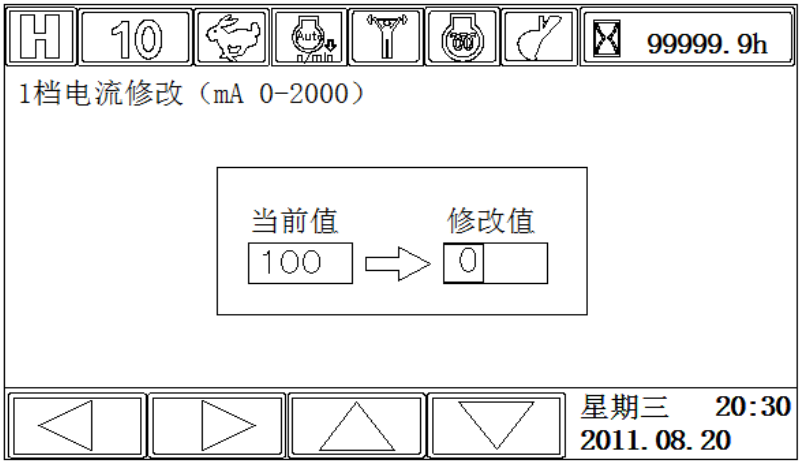
3.6.1 Alarm parameters:

Click the OK button to enter the alarm parameter settings menu, which contains two sub-menus, namely: the cooling water temperature points, hydraulic oil temperature point, the cooling water temperature and hydraulic oil temperature alarm modifications;

(Water \ oil alarm interface)

3.6.2 Control parameters:

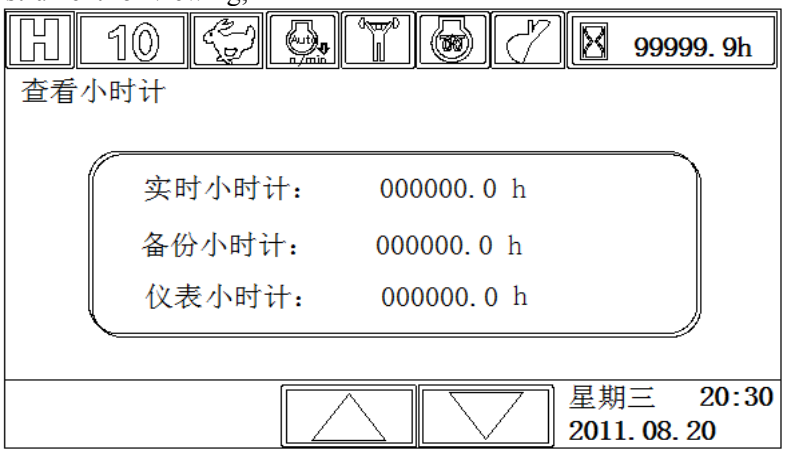
Click the OK button to enter the control parameter settings menu, which contains a sub-menu, the menu for the current modification. Click OK button, enter the current modify menu, which contains four sub-menus, namely: H-mode current modification, S-mode current modification, B-mode current modification, L-mode current changes, from 1 to 10 can be modified stall currents;



(Current modification interface)

3.6.3 View of hours:

Click the OK button to enter the check-hour meter menu, which can be real-time hour meter, backup-hour meter, hour meter instrument for viewing;



(See hour meter interface)

3.6.4 machine information settings:

Click the OK button to enter the machine information set menu, which contains four sub-menus, namely: machine model, machine serial number, website, telephone service, this former factory excavator manufacturers enter the vehicle information that can enter the corresponding menu do enter the appropriate information on the virtual keyboard;

(Machine Model \ machine serial number \ Web \ Service phone settings interface)

3.7GPS Management:

Click the OK button to enter the GPS management menu, which contains two sub-menus, namely: GPS Installation, GPS installation status, enter the password to install GPS, GPS can be installed and removed, GPS monitoring state input password, you can monitor the status of the GPS turned on and off;

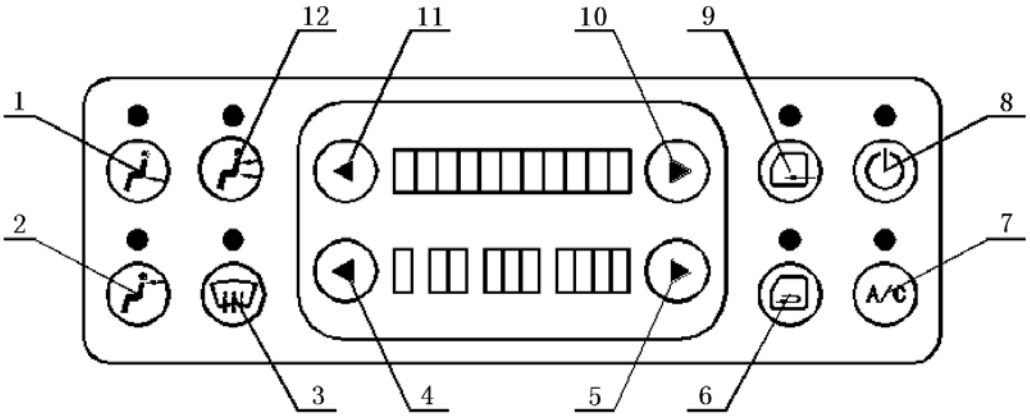
(GPS installation interface)

(GPS monitoring status interface)

3.8 Cleared hour meter:

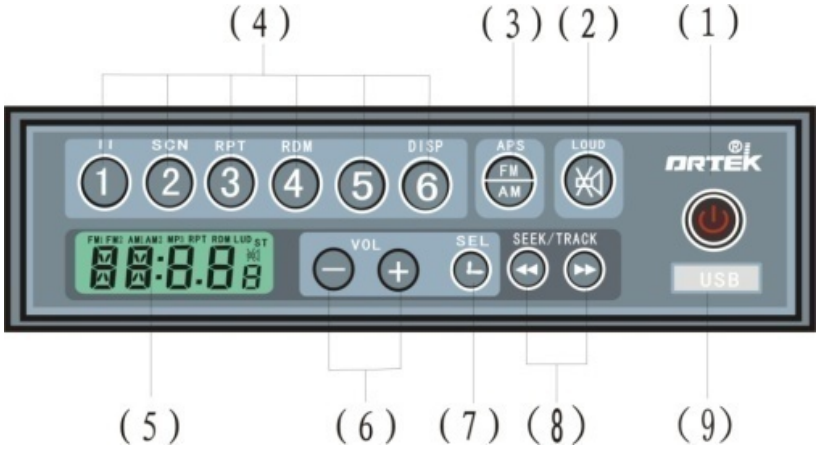
Enter cleared hour meter dynamic password, enter cleared hour meter menu, can be cleared for operation hour meter;

Control panel of Air Conditioner



1. Control Button of Air-out (Foot direction)
   When this button is pressed, the motor of foot direction part of air conditioning unit is started and the ventilation door is opened to have the air blown out from the lower air duct.
2. Control Button of Air-out (Face direction)
   When this button is pressed, the motor of face direction part of air conditioning unit is started, the ventilation door is opened to have the air blown out from the upper air duct.
3. Control Button of deforestation
   When this button is pressed, the warm air passes through the air duct and directly blows towards the window in front of the driver.
4. Air Volume Regulation Button (Small)
   When this button is pressed, the indicator light for air volume is on; the air volume shifts from high to low (the volume is from level 4 to 3, and from 2 to 1).
5. Air Volume Regulation Button (Large)
   When this button is pressed, the indicator light for air volume is on; the air volume shifts from low to high (the volume is from level 1 to 2, and from 3 to 4).
6. Control Switch for Internal Ventilation
   When this button is pressed, the fresh air motor of air conditioning unit is off while other motors are started, and then the air inside the cab is transmitted to the inner of the unit through evaporator blower, and then the air is transmitted into the cab by the evaporator blower to form ventilation.
7. Refrigerating switch
   When this button is pressed, the cooling indicator light is on and the air conditioning system is switched to the cooling mode.
8. Power Switch
   When this button is pressed, the indicator light of control panel is on; the control panel is powered on, and the system is switched to operation mode.
9. Control Button for Fresh Air Ventilation
   When this button is pressed, the motor for fresh air of air conditioning unit motor starts, and then the fresh air from outside fills into the cab and removes the stale air inside.
10. Temperature Adjustment Button (Large)
    When this button is pressed, the temperature indicator light is on, and the temperature is adjusted from low to high. When it hits 30℃, the air conditioner automatically converts from cold air to warm air.
11. Temperature Adjustment Button (Small)
    When this button is pressed, the temperature indicator light is on, and the temperature is adjusted from high to low.
12. Air Direction Control Button (Face & Foot Direction)
    When this button is pressed, all motors of air conditioning unit is started to have the air blown out from the wind duct freely.

Radio



（1） Power supply/mode switch

◇ Power supply on, please turn on the radio by short pressing the button and turn off the radio by long pressing.

◇ When the radio is powered on, press the button to toggle between Radio⇔ MP3 (⇔IN Optional function). (Short Press: less than 2s; long press: over2s)

（2） Mute/Auto volume

◇ Press to toggle mute on/off.

◇ Hold to toggle auto volume on/off

（3） Band switch/auto tuning

◇ Switch between FM1/ FM2/AM1/ AM2 by short pressing.

◇ Hold to detect and store new stations available in the preset

（4） Preset Button

◇ In FM mode, please press to select preset station and hold to store station.

◇ In MP3 mode,

<1/PAUSE> Pause/play.

<2/SCN> Scan/ normal play.

<3/RPT> Repeat/ normal play.

<4/RDM> Random/ normal play.

<6/DISP> Display track number/duration.

（5） Screen

（6） VOL+/- Volume

Press VOL+/- to turn up or down the volume.

（7） SEL Effect/Time setting

◇ Press to display time and date on screen; press within 5 seconds to view effect settings

◇ In time display, hold to reset time

◇ Display returns to screen information if no button is pressed within 5 seconds

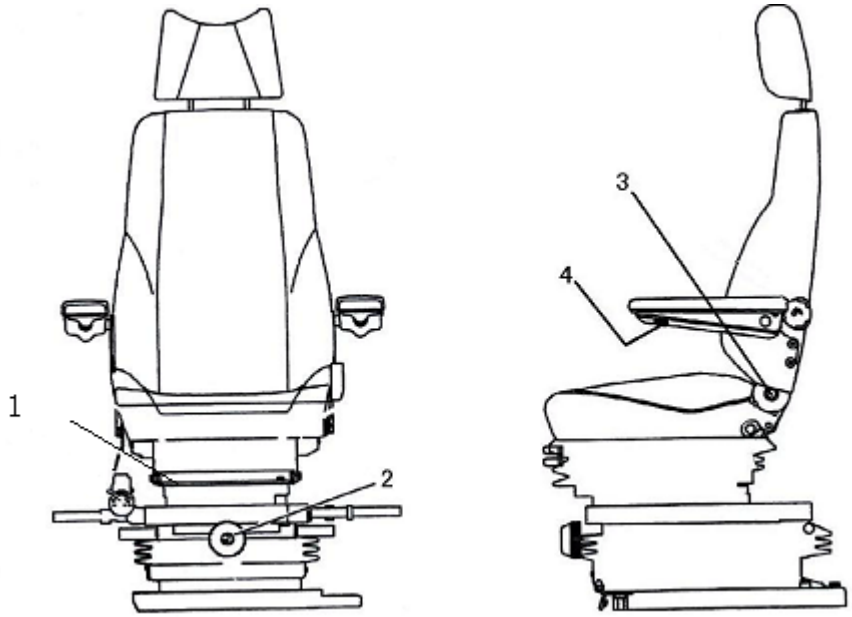
（8） ◄◄ / ►► FM scan & MP3 file selection

◇ In FM mode, press to change frequency forward or backward

◇ In MP3 mode, press to select files

（9） USB.

Adjustment of driver seat



1. Forward and backward adjustment
2. Weight adjustment
3. Backrest adjustment
4. Armrest angle adjustment

Warning!

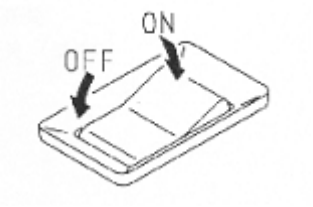
- The seat is designed for one person at a time.
- Do not adjust the seat during digging actions.
- Avoid moving objects.
- Assembly and maintenance should be performed by qualified personnel.

Switches

Lighting switch

Rocker Switch 1#

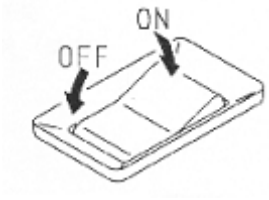
Press this switch (1＃), the illuminating lamps for the movable arm and the platform are turned on.



Switch for the windshield wiper

Rocker Switch 2#

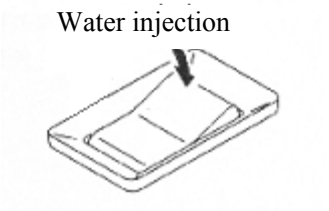
Press this switch (2＃), the windshield wiper for the front glass swings continuously.



Switch for the watching window wiper

Rocker Switch 3#.

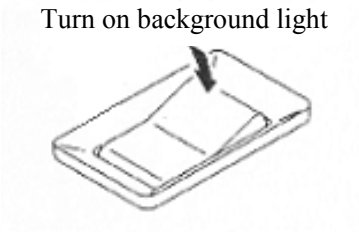
Press this switch (3#) continuously, the cleaning solution of the window is sprayed on the front glass, when releasing, spraying stops.



Switch for the background lights of air conditioner and radio

Rocker Switch 4#.

Press this switch (4＃) continuously, the cleaning solution of the window is sprayed on the front glass, when releasing, spraying stops.



Starting switch

The switch is use for starting or shutting down the engine.

OFF position

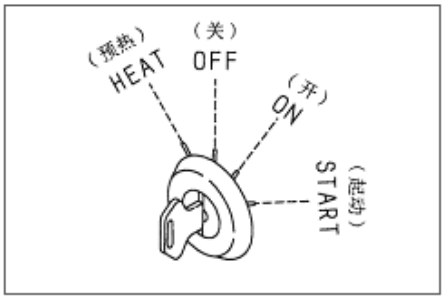
The key can be plugged in and pulled out. All switches of the electrical system are closed. The engine is stopped.

ON position

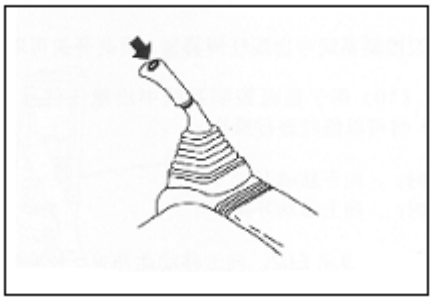
When the engine is running, keep the key of the starting switch in the ON position.

START position.

This is the starting position for the engine. When starting the engine, keep the key in this position. After the engine is started, release the key immediately and the key will come back to the ON position automatically.

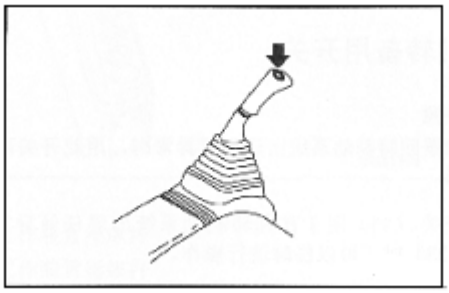


Switch for the horn



When pressing the button switch on top of the operating lever of the right working device, the horn honks.

Boost switch



The button switch on the operating lever of the left working device is used to start the contact-mode strength function. As long as pressing the (click) switch, the hydraulic system pressure can be increased, which plays a role of increasing the power output of the excavator and the excavating force. But the maximum time to use the maximum power is 8 seconds to prevent damaging the hydraulic system.

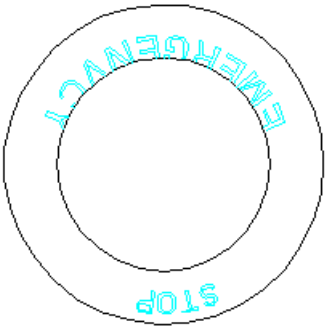
Emergency stop switch

When has an emergency, press this switch, stop the engine!

Important: this way can only have a significant risk situation for emergency shut off the engine in the matter of personnel and equipment.

In general, this feature is disabled. .

Before starting the engine, Please make sure that the switch is open.



Operation

General principle

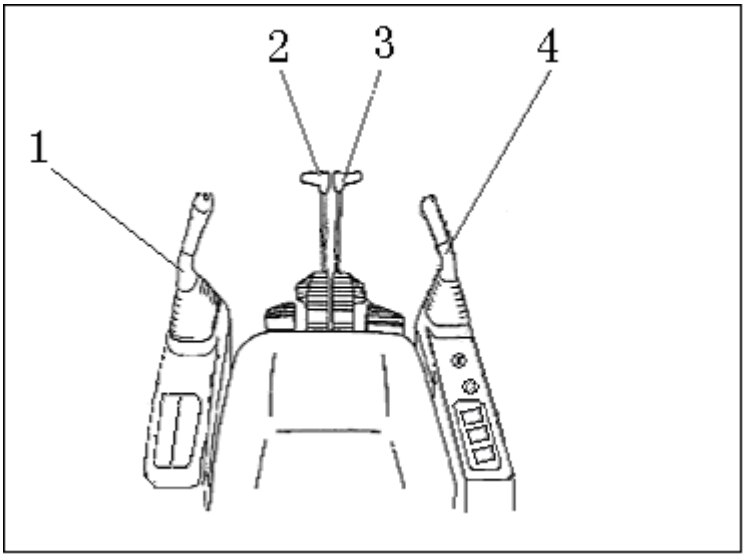
This machine can only be operated, inspected and maintained by qualified, experienced operators with excavator operating certificate. Precautions are:

- Read carefully and command this book before the starting or the first operation of machine.
- This book should be placed accessible for the convenience of timely replacement or supplement when it is lost, damaged or unable to read.
- Careful check should be done before starting this machine. Use and operate it strictly according to the safety procedure.
- Immediate high-speed running is avoided for the engine started at low temperature. The normal working temperature for oil is 50℃~80℃（122℉～176℉）, if it is below 25℃（77℉）, warm-up running should be done so that the oil temperature can be raised to the required one for the operation.
- While the machine is transferred out of factory, there has been long-term rustproof and anti-freeze fluid in the radiator, which should be drained out totally to protect the machine from rust if the machine is stopped for a long time.
- Winter-use lubricant and diesel fuel should be used in cold winter. The brand is according to this book. For the cold-start of engine, please refer to operating manual of diesel engine and this book.
- When a refill is needed for the loss of hydraulic oil, make sure to use the identified clean hydraulic oil. Oil of different brand is prohibited.
- Pay attention to the cleanliness of hydraulic oil at any time. If it is aging, bad or not clean enough, be sure to replace it at once with the new oil. Normally a replacement happens after the running -in of new machine.
- The key parts of hydraulic system have been sealed by lead. During the warrant period, the seal can't be opened privately by the customer, or it won't be guaranteed.
- Before the delivery, the machine has been checked and adjusted strictly. But proper running-in must be gone through will using the machine, so that all parts can run in very well and the life span of the machine can be lengthen. The running-in period is 100 hours. For the first 50 hours, only L working mode namely weak excavating mode is allowed, also the engine power is limited within 80% of full load to run the machine. During this period, overdue idling is avoided, and all indicating meters should be checked. The machine should be maintained everyday to avoid of the oil leakage. At the first 50 hours or working in mud, pins should be lubricated once every 200 hours. After 50 hours, the torque of tighten parts should be checked and the maintenance be made for the machine. After 50 hours, new lubricant should be added for the diesel engine.

Operating procedure

Operating environment

Operating lever



1. Left control handle
2. Left control handle for the track
3. Right control handle for the track
4. Right control handle

Traveling pedal

Warning!

- Except the machine moves, do not put your feet on the pedal, if you put your feet on the pedal and step by mistakes, the machine will move suddenly and cause serious accidents.
- When the track frame is installed towards the rear part, the machine will move in the reverse direction of moving forward and the heading direction of the reverse moving.
  When using the operating lever, check the track frame is towards the rear part or the front part. (If the chain wheel is in the rear part, then the track frame is towards the front part.)
- When using the pedal for operating and moving, special attention should be paid.

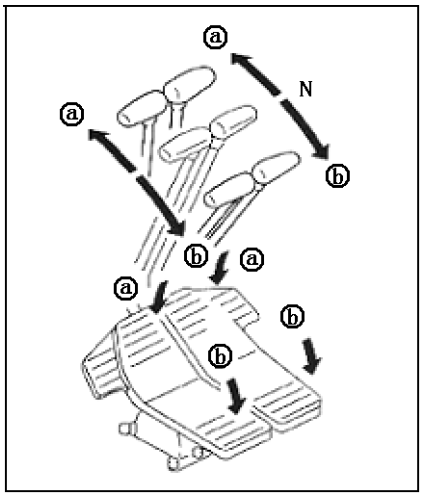
The operating levers (2，3) are used to exchange the moving directions of the machine.

The operations for the pedal are described in ( ).

(a) Moving forward: push the operating lever forward (the pedal will tilt forwards);

(b) Reverse moving: pull the operating lever backwards (the pedal will tilt backwards):

N (neutral position): the machine stops

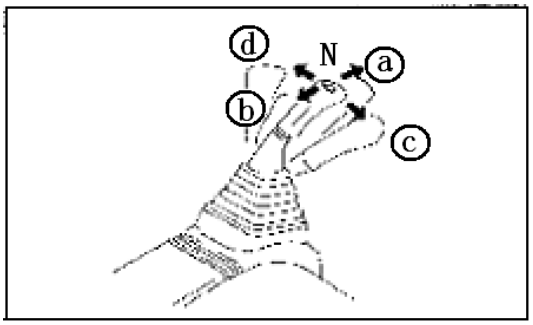


Operating lever for the working device

The operating lever (1) of the left working device is used to operate the arm and the rotation of the upper part of the machine.

(a) Arm out
(b) Arm in
(c) Swing left
(d) Swing right

N (neutral position): the upper part of the machine and the arm keep immovable.

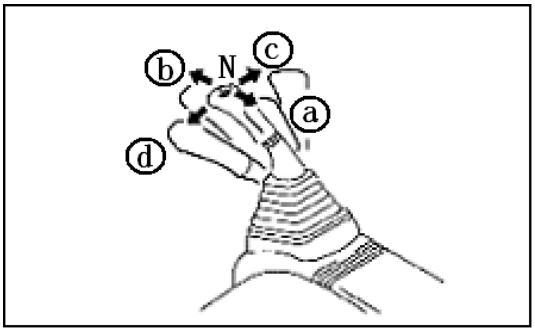


The operating lever (4) of the right working device is used to operate the movable arm and the scoop.

Movable arm operating/scoop operating

(a) Bucket dump
(b) Bucket load
(c) Boom down
(d) Boom up

N (neutral position): the movable arm and the scoop keep immovable.



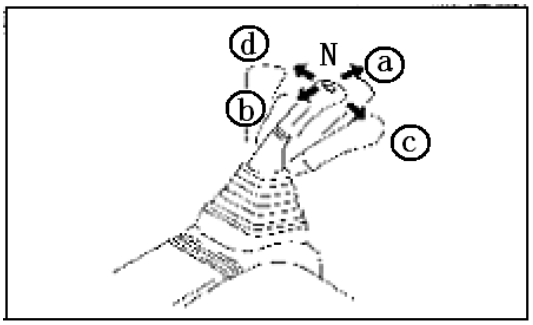
Remark:

The machine comes equipped from the factory with the excavator control lever pattern and the corresponding labels must be installed on the left and right control consoles.

The operating lever (1) of the left working device is used to operate the arm and the rotation of the upper part of the machine.

(a) Boom down
(b) Boom up
(c) Swing right
(d) Swing left

N (neutral position): the upper part of the machine and the arm keep immovable.

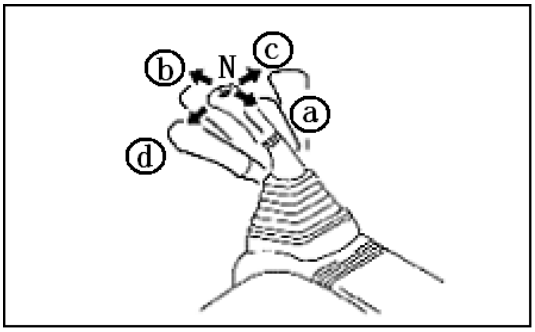


The operating lever (4) of the right working device is used to operate the movable arm and the scoop.

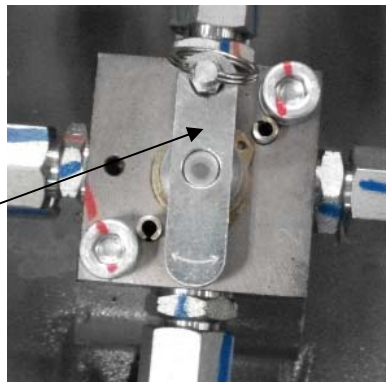
Movable arm operating/scoop operating

(a) Bucket dump
(b) Bucket load
(c) Arm out
(d) Arm in

N (neutral position): the movable arm and the scoop keep immovable.



lever pattern



Operation for the accumulator

Warning!

The accumulator is filled with high pressure nitrogen, wrong operation may cause explosion and result in serious injury or damage. When operating the accumulator, the following steps must be followed:

- Control the pressure in the pipeline not to be discharged thoroughly, and do not stand in the direction of the oil spraying when dismantling the hydraulic devices, and loosen the bolts slowly.
- Do not dismantle the accumulator.
- Do not put the accumulator close to the open fire or expose in the fire.
- Do not drill holes or weld on the accumulator.
- Do not collide, roll or make the accumulator suffer from hit.
- When disposing the accumulator, the gas must be emitted. Please contact Xugong Excavator or its distributor

In the control line, the machine is equipped with an accumulator, which is a device to store pressure. When it is equipped with this accumulator, it can operate the control line in short time even after the engine is stopped. Thus, the working device can be lowered by operating the joystick, under its own weight.

The pressure relief method for machine control line equipped with an accumulator:

1. Lower the working device to the ground, and then close the hammers or other accessories.

2.Turn off the engine.

3.Turn the start switch key to the **ON** position, so that the circuit is energized.

4.Adjust the safety lock control lever to the free position, then operate the joystick of the working device and accessories control pedal (if equipped) to the front, rear, left and right to release the pressure in the control line.

5.Adjust the safety lock control lever to the lock position to lock the working device joystick and accessories control pedal.

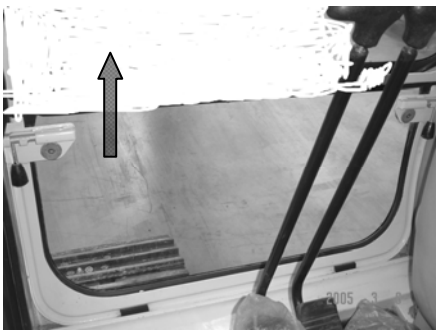
Windows of cab

Open the window

1. Put the auxiliary devices on the ground, and then shut down the engine.
2. Hold two handles (A), heave outwards and pull upwards, the front window can be opened.
3. Put the window in the locking position after opening them.

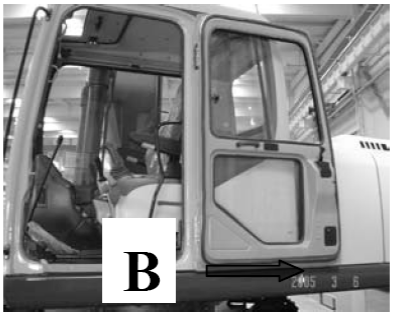
Close the windows

1. Put the auxiliary devices on the ground, and then shut down the engine.
2. Hold two handles (A), heave outwards and pull downwards, the front window can be closed.
3. Install the windows firmly and use the key to lock them.



Dismantle the front window

1. For opening the front window, see the "open the windows".
2. Hold the upper part with two hands and pull upwards.

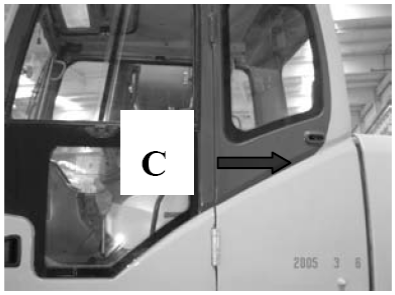


Store the windows dismantled in the inner side behind the cab, which is shown as (B) in the right graph.

Locking system for the cab

It is used to operate the door of the cab to be in open state.

1. The operator pushes the door of the cab out of the cab.



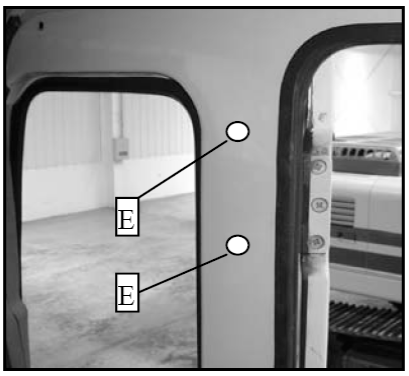
2. Ensure the door of the cab is fixed on the lock (C) firmly.
   Press the handle (D) in the cab of the operator, release the door of the cab

Fire extinguisher and emergency exit

Fire extinguisher (optional part)

The fire extinguisher is installed on the two bolts (E) in the right and rear side of the cab.

Use the fire extinguisher when fire alarming.



Emergency exit

When emergency, use the emergency escape hammer (G).

There are two emergency exits---the door and the rear window. Whether the rear window is fixed mode or sliding mode, the emergency escape hammer hung in the rear side in the cab to crush the glass.

F——rear window

G——emergency escape hammer

H——door

Start preparation and operation

- **Follow the safety regulation**

a) Read carefully and abide by all the safety signs as well as all the safety-related information in this book.
b) If necessary, please install, maintain or replace safety signs.
c) If safety signs or this book are lost or damaged, please order the new ones from appointed dealer in the same way of purchasing other parts (type and delivery number of the machine must be written clearly).
d) Learn how to operate the machine correctly and safely. Only those operators qualified after the training are allowed to operate and maintain the machine.
e) While carrying out the operation and maintenance, all the safety rules, warnings and requirements must be strictly followed.
f) Keep the machine under proper working condition. Any modification unapproved may spoil the function or safety of the machine; even shorten its life span.
g) Safety indications are the basic regulation for the safe of the machine. However, they won't involve you into any kind of danger that you may run into. If there is some question, please report to your higher-up at first before operating or maintaining this machine.
h) You can't operate this machine in the case of bad health, weariness due to the medicine or unease in the environment, which will reduce your response towards the contingency and lead to the accident.
i) While working with other driver or traffic keeper on the spot, it is necessary to ensure the hand language and working environment are familiar to all the personnel.
j) Please pay attention to all the factors affecting safety at any time.

- **Take precautions against the emergency**

Guard against the happening of fire disaster or any accident.

a) Install first-aid kit and fire extinguisher nearby.
b) Read carefully and understand the information on the fire extinguisher, user it correctly.
c) To ensure the fire extinguisher can always be used in emergency, regularly maintain it according to the recommended maintenance interval in operational manual of fire extinguisher.
d) Map out the emergency countermeasure guidance to cope with fire disaster or accident.
e) Attach the phone numbers of doctors, ambulance, hospital and fire department near the phone.

- **Notice for the inside the cab**

a) While entering the cab, you should first remove the mud and oil on the sole, or you may slip when stepping on the pedal and be trapped into an accident.
b) After using the ashtray, at first you should check if the match and cigarette have been placed in order, and then shut the cover of ashtray to avoid of a fire disaster.
c) Don't stick a couple on the window glass, which can serve as a lens and cause a fire disaster.
d) Don't put the lighter in the cab casually, which may explode if the temperature in the cab is very high.
e) To ensure the safety, don't wear earphone to tune in the radio or music to avoid of a severe accident.
f) When operating, don't extend your hand or head out of the window.
g) When you need to stand on the seat, make sure the safe locking lever is locked. If not, with the careless touch on the lever, the equipment will move suddenly and cause a accident.
h) While leaving the machine, you should lower it to the ground, lock safe locking lever, stop the engine, lock all the equipment with key and withdraw the key to keep it always with you.

- **Wear working clothes and individual protection outfit**

a) Wear tight clothes and safety products suitable for the work.
You may need the following safety products:
Hard safety helmet
Safety shoes
Safety glasses, goggles and mask
Thick gloves
Hearing protector
Glistening clothes
Rain wheel
Respirator or filtration mask

When working, you must wear working clothes and safety products without taking your chance.

b) Fix the long hair, avoid of wearing large clothes, ornaments or other things, which will hook on to operating lever or other parts of the machine and cause the casualty.

c) Don't wear clothes full of oil stains, for it is flammable.

d) Make sure to wear goggles, head helmet, safety shoes and gloves.

e) While repairing the equipment, don't use tool of weak strength, because it is easy to be broken or slippery, leading to injury or incompetent installment.

f) Don't ignore those factors without immediate danger to your health, such as exhaust gas and noise pollution, which, though invisible, may breed disability or permanent injury.

g) Being in big noise for a long time may result in the injury or loss of your hearing. Wear proper hearing protector like earcap or earplug to avoid of harmful or uncomfortable big noise.

h) do not operate underground or in place with poisonous gas. If the machine has to work in such conditions, proper precautions shall be applied.

- **Inside ventilation**

Engine's exhaustion will cause fatal casualty, making people lose consciousness, vigilance, judging and controlling ability, even leading to a severe accident.

a) Before starting the engine in closed area, please confirm good ventilation.

b) Beware the opening door or window, where exhaust gas may enter or be blown in by wind, leading to the danger.

- **Check the machine**

a) To avoid of the injury on people, check the machine before starting it every day or in every shift. Repeated inspection surrounding the machine should be done in earnest.

b) While doing the repeated check, it is necessary to check all the items described latter in "checking the engine before the start".

- **Investigate the construction site beforehand**

When working near the ditch or on the road shoulder, the machine is possible to roll over，causing a severe casualty.

a) Investigate the land form and floor condition of construction site beforehand, such as ground, material heap and other place easy to collapse to prevent the machine from turning over.

b) Map out working schedule, use machine suitable to work or construction site.

c) Reinforce the ground, ditch side or road shoulder according to the requirement, so that certain distance is kept between the machine and ditch side or road shoulder.

d) When working on slope or road shoulder, employ a signaler according to the demand.

e) While working where some blocks or gravel may fall off, ensure that the FOPS (FALLING OBJECTS

PROTECTION STRUTURE) is equipped in the cab.

f) When the groundwork turns soft, reinforcement on ground should be implemented before the work.

g) While working on icy surface, you should be alert specially, for the going-up of environment temperature will make the groundwork soft and slippery.

h) When operating the machine beside some flammable things like dry grass, pay more attention to the possibility of catching the fire.

- **Normal notice for the cab**

a) While entering the cab, the operator should first remove the mud and oil on the sole, or he may slip when stepping on the pedal and be trapped into a accident.

b) Don't surround the seat with parts and tools, which should be placed according to the regulation.

c) Try to avoid of placing transparent bottles in the cab and don't hang any transparent ornaments around the window glass, for they man focus the sunlight and result in a fire disaster.

d) During the operation on machine, don't tune in the radio or use earphone or mobile phone etc.

e) Don't put any flammable or explosive objects in the cab.

f) After using the ashtray, always cover it to put out the match and cigarette or so. Don't leave a lighter inside the cab, because it may explode when the temperature in the cab goes up.

The preparation and operation of starting

- **Adjust the seat**

Any seat position unsuitable to the operator or operation will lead to the fatigue of the operator very soon even an operational error.

a) Every time when changing the operator, the seat should be adjusted again.
b) When the operator leans against the back of seat, he should be able to push the pedal to the bottom and operate the operating lever correctly.
c) If he cannot, he can move the seat up and down, to and fro, and make a second adjustment.

- **Buckle the safety belt**

In the case of turning over a machine, the operator may be injured or thrown out of the cab, even crushed by the machine being turning over, trapped into a severe casualty.

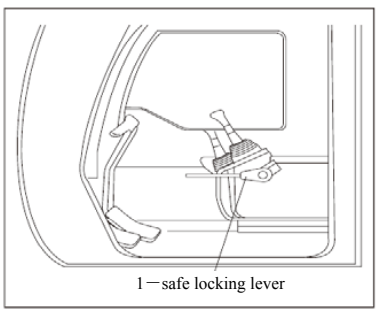
a) Before the operation, the operator should check carefully the belt, buckle and tightening parts. If there is any damage or wear and tear, he should replace the belt or its components.
b) During the running of machine, the operator must always be sitting on the seat and buckle the safety belt perfectly to minimize the possibility of injury from an accident.
c) However the belt is safety, it is better to be renewed once every 3 years.

- **Operating only when the operator is on the seat**

a) Incorrect starting procedure of engine may cause a severe casualty.
b) Start the engine only when the operator is on the seat.
c) Make sure not to stand on track or ground to start the engine.
d) Don't starts the engine through short-circuit starting motor terminal.
e) Before starting the engine, confirm all the operating levers are in neutral position.

- **Check the machine before starting the engine**

f) Electric control system: check if there is any worn or broken electrical wire or loosen connector.
g) Don't starts the engine through short-circuit starting motor terminal.
h) Before starting the engine, confirm all the operating levers are in neutral position.
i) Structural parts and track：Check boom, bucket and metal sheet etc; check if the track has bending, damaged or lost parts.
j) Tightening parts：Check if there is loose or lost part.
k) Fuel system：Drain off water or deposit from fuel tank.
l) Hydraulic system: check if there is leakage, hose distortion and friction mutually between pipe and hose or between pipe and other parts.
m) lubrication：Check the lubrication points mentioned in lubrication schedule.
n) Protection mechanism：Check protection mechanism and mudguard.
o) safety：Keep all the people away from the machine and remove the obstacle.



- **Check the cab before starting the engine**

a) Confirm the safe locking lever in LOCK position and all the operating levers in neutral position.
b) Check the indication of indicator: if the key switches turned to START position, charge warning and oil

pressure for the engine will be indicated, meanwhile the machine will automatically check if preheat and warm-up are needed. If there is the need, preheat indicator will flash, if a warm-up is needed, warm-up indicator will be on.

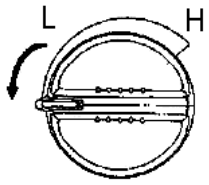
Important: monitor will show the operational condition of the machine. If the indicator has some malfunction during the work of machine, it will only have warning sound rather than indication. So, if some malfunction is happened on the indication of indicator, an immediate check and repair is needed. After the check, if indicating lamps for engine oil pressure and alternator don't flash and the warning doesn't sound, it means the machine is abnormal and needs an immediate repair.

c) Adjust the seat. It is better for the operator to step the pedal to the bottom while leaning

Note：To avoid of damaging the surface of monitor, while cleaning the monitor or switch, it is advisable that cloth is used rather than sharp objects like screwdriver, since they will spoil the screen of monitor.

- **Start the engine**

a) Pull the safe locking lever to LOCK position.
b) Turn the engine speed knob to low-speed idle position.
c) Press the horn to remind the surrounding people.
d) Turn the key switch to START position.



Important: prevent the damage on starting motor.

To avoid of the damage on starting motor, it is advisable that 10 seconds should not be exceeded to operate the starting switch every time. If the engine still can't be started, the key switch should be turned to OFF position for a restart after another 30 seconds. After the failure in starting the engine, if the key switch is turned for a restart before the starting motor stops, the starting motor will be damaged.

e) After starting the engine, key should be able to return to POWER position after the release.

- **Start and warm up the engine in cold weather**

a) Preheat must be carried out when starting the engine in cold weather.
1) Turn the engine speed knob to the almost neutral position between L (LOW) and H (HIGH).
2) Turn the key switch to START position.
3) The machine will automatically check if preheat is needed, if so, preheat indicator will be on for about 8 seconds when the engine cannot be started

Note：If preheat indicator does not show, it means preheat is not necessary.

4) As the preheat indicator goes out, turn the key switch to START position again, and release it as soon as the engine is started.
b) Warm up the engine after the start.

Important: the best working temperature for hydraulic oil is 50℃～80℃ (122℉～176℉). If the temperature is below 30℃（86℉）, overwork of the machine will damage it and hydraulic parts seriously. Before the work, the hydraulic oil should be heated up to 25℃（77℉）. Before the completion of warm-up operation, it is prohibited to operate the operating lever **or increase engine speed suddenly. Don't let the engine run continuously for over 20 min. at the idling or high speed.**

1) After the start of engine, the machine will automatically check if a warm-up is needed for the engine, if so, warm-up indicator will be on.

Note：if warm-up indicator does not shine, it means the warm—up is not needed.

2) At this moment, the bucket and arm can be operated by turns in full stroke for 5 min. with the interval of

30 seconds.

3) When the hydraulic oil temperature reaches the required value, warm-up indicator will go out showing the completion of warming up the engine.
4) After heating the hydraulic oil, increase the engine speed and begin working.

Important: operate the machine at lower load and speed until the engine and hydraulic system have a normal temperature.

- **Check after the start of engine**

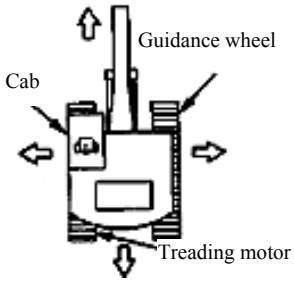
a) Check or engine's water temperature and oil pressure, as well as fuel level on all meters, indicators or monitors, to see if they are normal.
b) If the following indicators on the monitor continue to shine or the sound and exhaustion of engine are not normal after the engine is started, the engine must be stopped immediately to remove the cause. After starting the engine, the following should be confirmed:

1) Indicator of alternator goes out.
2) Oil pressure indicator of engine goes out.
3) Sound and exhaustion of engine are normal.

c) Check the level meter on hydraulic oil tank to see if oil level is within the regulated range.
d) Check if fuel, oil or cooling fluid leak out.

Important: prevent the engine from possible damage.

Operation procedure of running

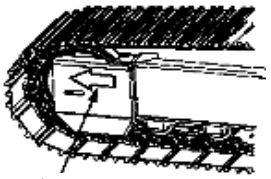


- Confirm the travelling direction of machine
  Operational errors on travelling pedal and operating lever will lead to a severe casualty.
  Before driving this machine, confirm the relation between the positions of machine's low body and the operator.

If the travelling motor is in the front of cab, the machine will move backward when the travelling pedal or operating lever is pushed forward.

⚠ Caution: the standard travelling position is: guiding wheel is in the front of the machine, while travelling motor and driving wheel at the rear. If the travelling motor is in the front, the travelling pedal will function in reverse. Before travelling, it is a must to confirm the position of travelling motor.

Note: at the side of chassis bodyframe, there is an arrow sign indicating the front direction of machine.



- **Travelling, rotation alarm (optional)**

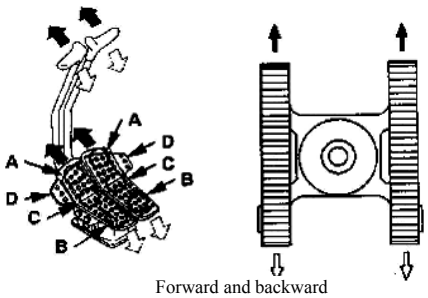
In working and rotation operation, turn on alarm switch. Travelling and rotation alarm will shine and ring to warn people near the machine of walking and rotation. To stop the alarm, operate the alarm switch again.

- **Prevent the machine from carrying the passengers.**

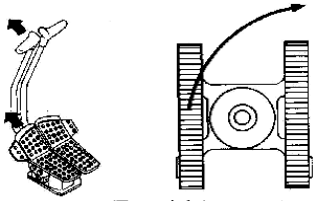
a) The passengers are easy to be wounded on the machine, for example, hit by foreign object or cast away by the machine.
b) Only the driver rather than other passenger is allowed to be on the machine.
c) Sometimes the passenger will block the view of driver, leading to the operation of machine under unsafe condition.

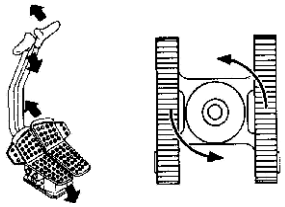
- **Use pedal to drive the machine**

a) travel forward：Step down the front of two pedals (A in picture).
b) travel backward：Step down the rear of two pedals (B in picture).
c) Neutral position： when travelling pedal in neutral position(C in picture), the machine will be braked by travelling brake.
d) Turn right: step down the front of left pedal.
e) Turn left: step down the front of right pedal.
f) Rotate at the original position (self-rotation): step down the front of one pedal and the rear of another one.

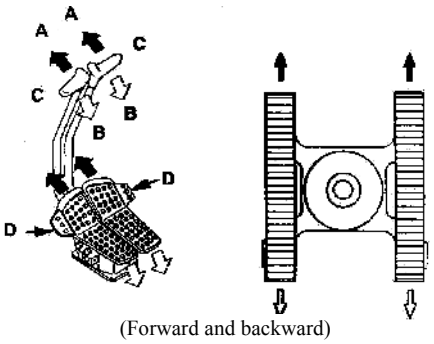


Forward and backward


(Turn right)


(Rotate at original point)

Note: during a long journey, you can relax your feet by stepping on continuously the protruding part of pedal (D in picture). To achieve the smooth operation, a damper has been installed on travelling **guidance valve. When the weather is cold, operational force will be increased. At this time, you can operate first the travelling operating lever for several times when the safe locking lever is at LOCK position.**



(Forward and backward)

- **Drive the machine through** travelling operating lever

a) Travel forward：push forward two travelling operating levers (A in picture).

b) Travel backward: pull backward two travelling control levers (B in picture).

c) Neutral position：when travelling operating lever is in neutral position(C in picture), the machine will be stopped by travelling brake.

d) Turn right: push forward the left travelling operating lever.

e) Turn left: push forward the right travelling operating lever.

f) Rotate at the original position (self-rotation): push forward one travelling operating lever while pull another one.

- **Switch of travelling mode**

Caution: since rolling over of the vehicle will result in the casualty, so don't change the travelling mode frequently, especially during the downgrade. Changing to a fast mode will produce a very severe result. Remember to stop the machine before changing the travelling speed.

You can choose travelling mode (fast/slow) through the switch of travelling mode on monitor, which will give you the following two choices by turns with every press.

a) Fast: sign. 

b) Slow: sign 

- **Notes on travel**

Note: when moving, rotating or operating the machine in narrow area, one signaler is sure to be employed. Before starting the machine, hand signs should be coordinated.

a) Before moving the machine, the operator should be clear how to operate the travelling pedal/operating lever towards the desired direction. When travelling motor is at the rear, the machine will move forward in the direction of guidance wheel by stepping down the front of travelling pedal or pushing forward the travelling operating lever.

b) Try to choose level ground and drive the machine in straight line, change the direction slowly and slightly.

c) Before the travel, check the strength of bridge and groundwork, reinforce them if necessary.

d) To avoid of damage on road surface, it is advisable to use wooden board. When travelling on pitch road in summer, pay more attention to the drive.

e) When crossing the rail, it is advisable to use wooden board to avoid of damage on road surface.

f) Don't let the machine contact with the edge of bridge.

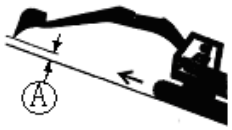
g) When crossing the river, the operator should measure the depth of river with bucket and cross the river slowly. Don't cross the river when the water exceeds the top edge of supporting-chain wheel.

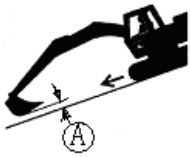
h) When travelling on uneven ground, engine speed should be decreased and the slow travelling mode should be chosen to reduce the possibility of damage on the machine.

i) Don't travel across some obstruction, such as mud block, stone and metallic objects around the machine. While running, other people are not allowed to stay around the machine.

j) When running on slope, the machine may skid or turn over, causing some severe injury or even death.

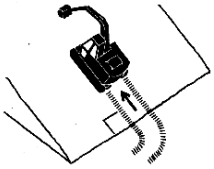
k) When upgrading or downgrading, bucket should be placed in the direction of travelling with a distance of 0.2-0.3 meters /(8-12in) in from the ground (see A in the picture below).

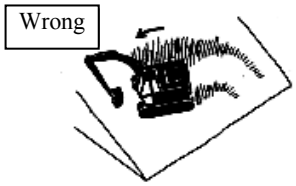




l) If the machine begins to skid or becomes unstable, the bucket must be lowered immediately.

m) Crossing the slope sideling or changing the direction may lead to the danger of side-slipping or turning over the machine, for the moment, it is better to travel safely through a detour after landing on even ground





n) Try to avoid of the operation, which may damage the track and lower machine parts.

o) In frozen weather, before loading and unloading the machine, make sure to remove the deposited snow and ice on track board to guard against the slip.

● Operation on soft land

a) Avoid running on very soft ground when there is no enough strength to support the machine.

b) If the machine works on very soft ground or gets trapped, it is necessary to clean the chassis bodyframe.

c) One side of track should be lifted away from the ground by rotating the lower machine body by 90°and lowering down the bucket, the angle between the boom and arm should be kept 90°～110°, and the arc part of bucket should be placed on ground.

d) Remove the mud on track board by lifting the track with front and rear rotating arms.

e) After landing the track, the travelling speed should be lowered and the machine should be transferred to solid ground with care.

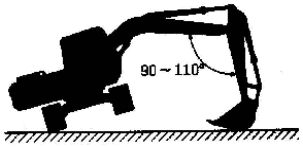
f) Operate the boom to coordinate with the arm, tow the machine to solid ground.

g) If the machine gets trapped but the engine remains working, towing the machine is possible but must be done with towing rope equipped correctly(refer to the following part of "towing the machine in short distance).

● **Lift single-side track with boom and arm**

⚠ **Caution: the angle between the boom and arm should be kept 90°～110°, and the arc part of bucket should be placed on ground.**

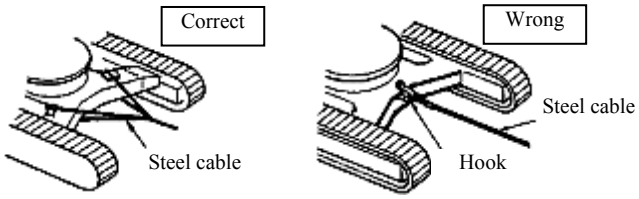
Track should be lifted away from the ground by rotating the lower machine body by 90°and lowering down the bucket. The wedge should be placed under the chassis bodyframe to support the machine.



● **Tow the machine in short distance**

Caution: it is possible that steel cable, strap or rope will be broken and cause a serious casualty, so damaged chain and worn steel cable, hook, strap or rope must not be used to tow the machine. When dealing with steel cable, strap or rope, the gloves must be worn all the time.

When the machine fails to run but the engine can be operated, please connect the towing steel cable and tow your machine to solid ground by other machine according to the picture. You must fix the steel cable on chassis bodyframe of two machines.



To avoid the steel cable being worn out and broken, put some protection material between the chassis bodyframe and steel cable.

Important: don't tow the machine through hook hole on chassis bodyframe, this hole is only for towing light-weight object.(refer to the introduction about how to use hook hole correctly).

- **Operate in water or mud**

a) Only when the groundwork of construction site is strong enough to prevent the going-down of machine from exceeding the upper edge of supporting-chain wheel, is the machine allowed to be operated in water whose surface is below the upper edge of supporting-chain wheel (An in picture below).

b) When operating under such condition, you should check the position of machine frequently, if necessary, readjust it.

c) Try to prevent water from submerging the rotary support, small rotary gear and central connector.

d) If the rotary support, small rotary gear and central connector are submerged, you should dismantle the drain plug to remove mud and water, cleaning rotary area, putting on the plug, lubricating the small rotary gear and rotary support.

e) The capacity of gear oil of rotary gearbox：B.

f) Lubricate the rotary support (refer to the instruction of lubrication, maintenance and repair).

Parameter / Type	A	B
XE210CU/XE240LC	890mm/35in	10.5L/2.31 US gal

Operation of cutoff

- The procedure of stopping the engine

a) Land the machine on even ground.

b) Lower the bucket down the ground.

c) Turn the engine speed knob to low-speed idling position and run the engine for 5 min. to cool it.

Important: if the procedure of stopping the engine is incorrect, turbocharger may be damaged.

d) Turn the key switch to OFF position and stop the engine.

e) Withdraw the key from key switch.

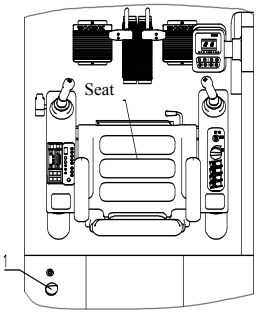
f) Pull the safe locking lever to LOCK position.

Important: in bad weather, make sure to protect internal electric parts in the cab. When parking the machine, always shut the windows, roofhatch and the door.

g) Shut the window and cab door.

h) Lock all the maintenance hatches and compartments.

- **The procedure of engine's emergency cutoff (optional attachment)**



1—Emergency cutoff button

a) Land the machine on even ground.

b) Lower the bucket down to the ground.

c) Press the emergency cutoff button and stop the engine.

Important: Normally being prohibited, this mode is used to stop the engine only there is some big danger involving the person and equipment.

d) Turn the key switch to OFF position and stop the engine.

e) Withdraw the key from key switch.

f) Pull the safe locking lever to LOCK position.

- **Prevent the machine from causing the injury**

If you try to climb on or block the moving machine you may expect a serious casualty. To prevent the machine from out of control, you should:

a) Try to choose even ground when parking the machine.

b) Don't park the machine on slope.

- **Park the machine on slope**

Caution: avoid parking the machine on slope, for it may roll over and lead to the person injury.

If you want to park the machine on slope, you should:

a) Park it with proper distance away from other machine.

b) Lower the bucket and (or) other working equipments down to the ground.

c) Insert the bucket teeth into ground, position the machine perfectly and prevent it from rolling by supporting the tracks on both sides with stop blocks.

d) Without load, run the engine 5 min. at low idling speed to cool the engine.

e) Stop the engine and withdraw the key from switch.

f) Pull the safe locking lever to LOCK position.

g) Shut the windows and cab door.

h) Lock all the maintenance hatches and compartments.

Getting on and off the machine

- **Use railing and ladder**

Falling off is one of the major causes for person's Injury. When getting on or off the machine, make sure to keep three touching points (two feet and one hand or two hands and one foot) with railing, pedal and track all the time, facing the machine.

a) Before getting on or off the machine, you should clean and dry the oil, butter, mud or sand on railing, board or track immediately if they exist, then keep these parts clean. If some part is damaged, you should repair it and tighten the loose screw.

b) When getting on or off the machine, don't grip the operating lever.

c) Don't jump on or off the machine, especially those moving one, for these behaviors may make you suffered from injury.

d) While leaving the machine, pay attention to the slippery platform, ladder or railing.

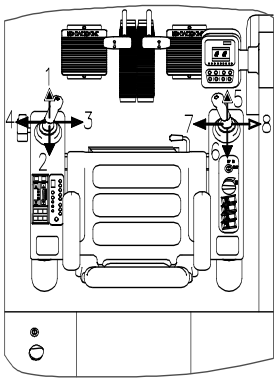
Operating procedure

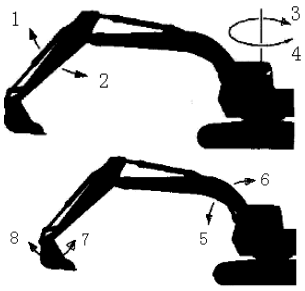
Operating lever

Caution: Don't extend any part of your body out of the right window frame of the cab. If touching the right operating lever due to careless collision or other reason, you may be injured by boom. If some window is lost or broken, you should add or replace into a new one. Before the operation, you should know very well the position and function of every operating lever to prevent yourself from injuring by accidental movement of the machine.

Important: don't let hydraulic cylinder of boom contact with the track. When excavating near one end of the track, you should place the travelling motor at the rear to maximize the machine stability and lifting ability.

On the machine, there is a scutcheon indicating the control mode of operating lever and travelling pedal. After being released, the operating lever will return to the neutral position automatically followed by the stop of the machine.





Serial number	Function
1	Arm protrudes
2	Arm withdraws
3	Turn right
4	Turn left
5	Boom goes down
6	Boom goes up
7	Bucket excavates
8	Bucket dumps

Safe locking lever

When leaving or entering into the cab, the operator may touch the operating lever accidentally and this can be prevented by safe locking lever.

Caution:

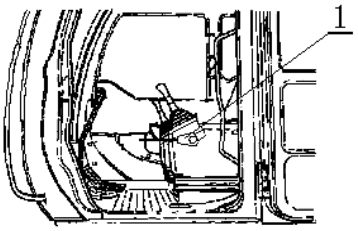
1) Always pull the safe locking lever to full LOCK position, or it won't function.

2) When leaving the machine, stop the engine and then pull the safe locking lever to full LOCK position.

3) Always verity the following cases to ensure safe locking lever has been pulled to LOCK position.

When transporting the machine;

When leaving the machine after the duty.



1－safe locking lever

The operation of safe locking lever:

a) Before leaving the machine:

1) Place it on level ground, lower the bucket on ground, and return all the operating levers to neutral position and Shut down the engine correctly.

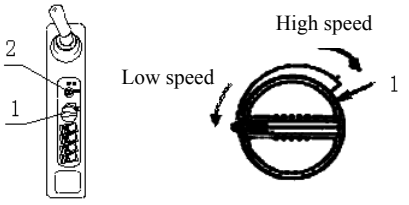
2) Pull the safe locking lever to full LOCK position.

b) Before starting the engine, confirm that safe locking lever is located at LOCK.

c) After starting the engine, confirm that all the operating levers and pedals are in neutral position and there is no movement in all parts of machine, then lower the safe locking lever to release position.

d) When all the operating levers are in neutral position, lower the safe locking lever to release position, if some part of machine moves, it means there is a failure. At this moment, you should pull the safe locking lever back to LOCK position and stop the engine. Then you can carry out a repair or contact with appointed dealer.

- **Engine's speed control**



1－knob of engine speed 2－key switch

According to this picture, increase or decrease engine speed through engine speed knob on right control box,

a) Increase engine speed by turning the engine speed knob clockwisely; on the contrary, decrease engine speed by turning the engine speed knob counter-clockwisely.

b) Before stopping the engine, always turn the engine speed knob counter-clockwisely to the bottom (low-speed idling setting), run the engine for 5 min. to cool it, and then turn the key switch to OFF position to stop the engine.

Note: in every working mode, the highest speed of engine can only reach the max. one designed by this mode.

- **Self-idling speed**

In self-idling state, if all the operating levers return to neutral position, then after about 4 seconds,

Engine speed will reduce to designed self-idling speed to save the fuel consumption. If any operating lever is operated, engine speed will immediately increase to the designed one on engine speed knob.

Attention: always verity the brightness of self-idling indicator before the operation. If it is on, showing the self-idling is functioning.

a) Self-idling function is on: self-idling indicator is on.

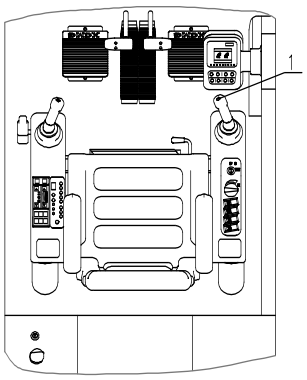
b) Self-idling function is off: self-idling indicator goes out.

c) When self-idling function is on, it can be released by pressing the button of canceling self-idling.

d) When restarting the engine, self- idling function will restore.

- **Boost**

Boosting switch is at the top of right operating lever, it can be used to get the maximum digging force. By pressing this switch, working machine will achieve a boosted force of about 8 seconds.



1－Boosting switch

- **Working mode**

through working mode switch, one of the following 4 modes namely H、S、L、B can be chosen for work.

a) Mode S (standard excavating mode)
It can save fuel consumption best and should be adopted in normal work. When it works, mode S indicator shines.

b) Mode L (weak excavating mode and mode of leveling up ground)
In this mode, engine speed may be reduced, but excavation force remains the same with mode S. although the output is little less than that of mode S, but the fuel consumption and noise have been reduced for the machine to do some light-duty work such as leveling up ground. In this mode, indicator of mode L shines.

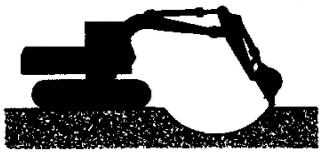
c) Mode H (strong excavating mode)
It is suitable for excavating hard ground in short time. It can give full play of the max. power of engine to enhance the working efficiency. When this mode works, indicator for mode H is on.

d) Mode B (knapping hammer mode)
It is suitable for the work of hydraulic knapping hammer. When this mode works, indicator for mode B is on.

Important: if the machine is equipped with knapping hammer, then this mode must be adopted or the machine will be damaged.

Note: after the start of machine, the default working mode is S.

- **Operation of counter-shoveling**



a) Let the bottom of bucket be 45°with ground, and place the bucket teeth on ground.

b) Take the arm as a main excavation force to pull the bucket towards the machine.

c) When the soil is attached on bucket, dump away the soil in a way of boom and (or) bucket to and fro quickly.

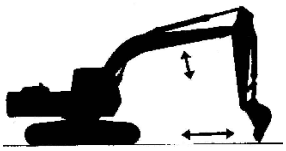
d) When digging a straight ditch, place the tracks parallel with the ditch. When the desired depth is reached, move the machine and continue the digging according to the demand.

Important: 1) a sudden stop should be avoided when lowering the boom or the machine may be spoiled by the impact.2) when using the arm, it should be avoided to stretch the hydraulic cylinder of arm fully, so that the cylinder won't be damaged.3) when digging in one angle, bucket teeth should be avoided to collide with the track**.4) when digging a deep ditch, you should prevent the boom or hose of bucket's hydraulic cylinder from knocking on the ground.**

- **Operation to level up the ground**

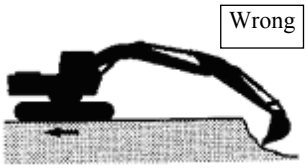
Important: don't push the soil with bucket while travelling**.**

When you need to level up the earth, put the arm a litter further from the vertical position like that in the picture. When turning the bucket back and lifting the boom slowly, you should operate the arm's withdrawing function, so that when the lever is beyond the vertical position, the bucket can maintain stable horizontal movement by lowering down the boom slowly. The work of leveling up the earth can be more accurate by operating the boom, arm and bucket synchronously.

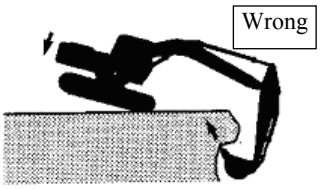


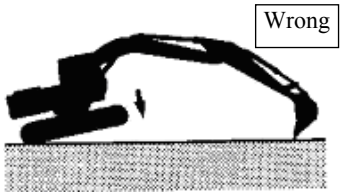
- **Operational technology**

a) Don't treat the travelling as an additional digging force, or the machine will be destroyed.

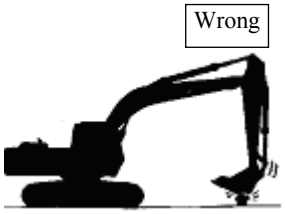


b) Don't lift up the rear of machine body and treat the body weight as an additional digging force, or the machine will be destroyed.





c) When digging, don't let the bucket knock the track. Try to place the machine on level ground, don't use the bucket as a hammer or pile driver, and don't try to move stone or crash wall through rotation.



Important: to avoid the damage on hydraulic cylinder, don't knock or harden the ground with bucket when the hydraulic cylinder of bucket stretches fully (the bucket withdraws fully).

d) Every time, adjust the length and depth of excavation so that every digging can achieve a full bucket, which will yield more than that made by fast cycle of partly filling bucket. To improve the productivity, full-bucket should be the first target, followed by speed.

e) Once the ditch is opened, the stone can be dug out and pulled upward the bucket from the soil layer. It can be achieved by lifting one or two layers and the top layer is pulled out at first. Don't let the bucket bear the side load and level up the material by rotating the bucket or knock with the object with the bucket from the side.

Important: don't try to extend the arm fully and abandon the bucket and don't penetrate the ground with bucket teeth to dig out the stone, which will lead to serious damage on machine.

f) When the machine is driven out of the water, the incline angle of machine should is less than 15°. Don't

submerge the machine into water whose surface is over permitted depth (normal water depth should not exceed the upper edge of supporting-chain wheel). For those parts soaked in water for a long time, they must be lubricated with butter till the old butter is squeezed out of the lubrication point.

- **Choose suitable** track **board**

Important: the track **board may bend and (or) the screws may be loose also other debarkation parts may be demolished by using wide** track **board on uneven ground.**

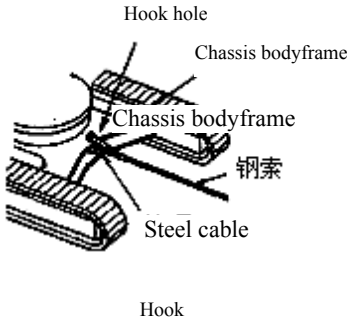
Don't use wide track board on uneven ground full of rock, sand pile or gravel. Wide track board is designed for soft ground and its screw should be checked on fixation regularly.

- **Use hook hole**

One hook hole is made on chassis bodyframe to tow the object whose weight is listed in the table below.

Important: while using hook hole on chassis bodyframe, **the following limitation and notices must be identified, or the chassis bodyframe and (or) hook hole may be destroyed.**

a) The max. towing force is：A.



List 1-9 Parameter list

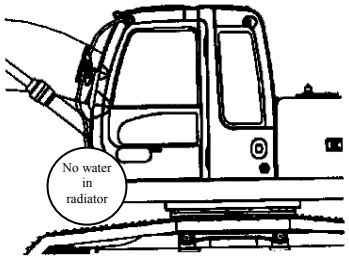
Type	A
XE210CU	58800N/6T
XE240LC	83400 N/8.5 T

b) Hook must be used.

c) Make sure that steel cable is towed horizontally and in the same direction of track.

d) Choose slow travelling mode, drive the machine slowly when towing.

- **Pay attention when stopping the machine and staying overnight**



a) After finishing the duty of that day, drive the machine to the place where there is no falling stone, ground collapse or flood, then park the machine on solid and level ground.

b) Top up the fuel tank

c) Clean the machine.

d) In winter, if there is no anti-freeze fluid or cooling fluid with long lifespan, make sure to drain off cooling water in radiator and engine. After that, you must also hang up the plate of "no water in radiator" in visible plate.

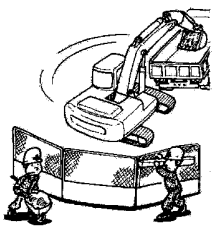
- **Notes for the work**

Attention: check working site beforehand

1) When working on site where some object may drop, you must install a roof protector for cab.

2) If it is needed to work on soft land, the ground should be fully hardened in advance.

a) When working on the machine, you must wear tight clothes and other safety products like safety helmet, which are suitable for work.



b) Let other person go out of the moving range of the operation and the machine, clean all the obstruction. During the operation, you should pay attention to the surrounding all the time, and don't let the boarding run into obstruction when working in small area surrounded by obstruction.

c) While loading the material for the truck, you should lift the bucket above the truck bucket from the rear of the truck, try not to rotate the bucket above the

cab or anyone.

d) When operating, fence should be installed at the side and rear of the bucket's rotating radius to prevent any unconcerned person enter into the working area.

- **Operate the machine safety**

Attention：Prevent the machine from rolling over and influenced by ground collapse.

Pay attention to the followings:

a) Ensure the work site is strong enough to support the machine hardly. When working in ditch or road shoulder, operate the machine by making the track vertical to the wall and the travelling motor at the rear. In this way, even the wall collapses, the machine can withdraw easily.

b) If it is necessary to work on cliff or under high bank, make sure to check working site at first and confirm there is no possibility that cliff or bank will collapse, if there is, don't work in this area.

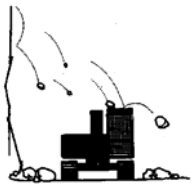
c) When working on soft land, the ground may collapse leading to the rolling over of the machine. When you need to work on soft land, you must strengthen the ground at first with big steel board to support the machine.

d) When operating on uneven ground or slope, try to prevent the happening of turning over your machine:

1) Reduce the engine speed.

2) Choose slow travelling mode.

3) Operate the machine slowly and pay attention to the movement of machine.



- **Guard against the falling of stones or gravels**

When working in the place where there may be falling stones or gravels, make sure FOPS(FALLING OBJECT PROTECTION SYSTEM)cab is contained in the machine.

- **Move or operate the machine safely**

When moving or operating the machine, the surrounding people may be knocked down. So pay attention to:

a) Pay special attention not to knock down the people around. Before moving, turning or operating the machine, identify the position of those people.

b) Always keep the travelling annunciator and horn in working state (if there are). When the machine begins to move, they can warn the surrounding people. When the machine is travelling, rotating or being operated, the signaler should be employed and coordinate the hand signs with others before starting the machine.

- **Unified signals in multi-machine work**

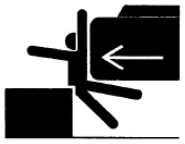
In the case of multi-machine work, the signal known by all the working staff must be used. One signaler should be appointed to organize the operation to ensure all the people follow the command of this signaler.

- **Prevent the reversing and injury suffered from rotation**

When reversing or rotating the upper machine body, if someone is near the machine, he will be knocked down or crushed, suffered from a severe casualty.

To guard against the reversing and rotating accident:

a) Before reversing or rotating, confirm there is nobody around the machine.



b) Keep the travelling annunciator and horn in working state (if there are). Always look out if there is other person entering into working area. Before moving the machine, please warn others with horn or other signals.

c) When reversing, if your view is blocked, please use a signaler, always keeping him in your visual field and using the hand signs in accordance with local rules.

d) Only when the signaler and operator understand the signals very well, can the

machine be moved.

e) Understand the meaning of all the banners, signals and signs used in the work and confirm who should be responsible for issuing the signals.

f) Keep the window, rearview mirror and lamps clean and perfect.

g) Dust, heavy rain and fog will reduce the visibility, if the visibility is low, please decrease the speed and use proper illumination.

h) Read and understand all the operational procedure in this book.

- **Don't place the bucket above anyone**

It is prohibited to lift, move or rotate the bucket above anyone or truck cab. Falling material from bucket or running into other bucket may lead to the serious injury on people or damage on machine.

- **Guard against the undercut**

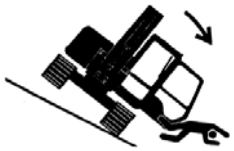
To withdraw from the ditch side in case of collapsing groundwork, always keep the travelling motor at the rear and the lower machine body vertical to the ditch side to place the machine.

When the groundwork begins to collapse and the machine can't be withdrawn, don't get nervous. Instead, you should fix the machine by lowering down the working equipments.

- **Avoid turning over the vehicle**

Don't try to jump out of tipping machine, or you will be suffered from serious or fatal crush since the inclining speed of machine is faster than yours. Buckle your safety belt when working.

a) The danger of turning over always exists when operating on slope, leading to a severe casualty accident.



b) To prevent from turning over, be careful when working on slope:

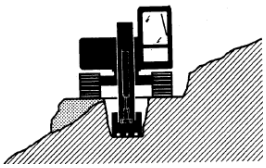
1) In working site of leveling up.

2) Lower the bucket down to the ground and keep it near to the machine.

3) Decrease the operational speed to guard against turning over the vehicle or skidding.

4) When travelling on slope, avoid changing the direction.

5) If crossing the slope is a must, also you must not cross one whose gradient is over 15º.



6) When rotating the load, decrease the rotating speed according to the situation.

c) Look our when working on icy ground, since the going up of temperature will make the land soft and unstable for travelling on ground.

- **You mustn't undercut a high bank**

Undercutting a high bank may lead to the collapse of edge or landslide, causing a severe casualty.

- **Dig with care**

Accidentally cutting off underground electric cable or gas pipe may lead to a explosion or fire, causing a severe casualty.

a) Before the excavation, check the position of electric cables, gas pipes and water pipes.

b) Keep a legal min. distance with electric cables, gas pipes and water pipes.

c) If optical fiber cable is cut off due to the accident, don't look at the end of cable which otherwise may lead to serious wound in your eyes.

d) Please contact directly with local related department, ask them to mark

out the position of all the underground cables and pipes.

- **Pay attention to mutual interference between working device and machine body**

When it is equipped with extended arm, if the bucket is close to the body, the arm will interfere with the body. Be careful in operation of extended arm.

In the mining process at an oblique angle, the boom will interface with the lower body when the boom is completely down. Be careful of the operation of the boom.

Operation under special conditions

- **Attention on operation**

a) If the front working equipments of machine or other part collide with high objects such as overpass, both the machine and overpass will be damaged even the person will be injured.

b) Look out to prevent the boom or arm from bumping with high object.

- **Avoid the electric wires**

a) If there is no safe distance between the machine or working equipments with electric wires, a casualty accident may be resulted from an electric shock.

b) When working near high-voltage wires, don't move any part of machine or load into a range, namely 3 meters away from electric wire plus double length of insulator.

c) Verify and follow all the local regulations in point.

d) Wet ground will increase the electric shock range for the people, so the surrounding people should be far away from working area.

- **Drive the machine prudently**

Important: in cold weather, you must park your machine on hard ground to avoid the track **frozen with ground. Remove the oddments on tracks and chassis bodyframe. If the track has been frozen with ground, lift the track with boom and arm and move the machine with care to avoid destroying the driving wheel and tracks.**

a) Try to choose even road surface, make all the efforts to operate the machine and change the direction through straight line and slight change.

b) When driving on uneven area, engine speed should be decreased to lower the possibility of damaging the lower machine body.

Filling procedure of fuel, hydraulic oil, lubricant and anti-freeze fluid

- **Fuel system**

a) Recommended fuel brand

Time and area	Fuel products
Non-winter	0#(Above 4℃)
Winter	-10# (Above -5℃)
Frigid area	-35# (Above -29℃)

b) Capacity of fuel tank

Type	Capacity of fuel tank
XE210CU	380 L/100.39 US gal
XE240LC	410L/108.31 US gal

c) Refilling method

1) Park the machine on even ground.

2) Lower the bucket on the ground.

3) Run the engine for 5 min. at low-speed idling speed without load.

4) Turn off the engine; withdraw the key from key switch.

Important: if the procedure of shutting the engine is not right, the turbocharger may be damaged.

5) Pull the safe locking lever to LOCK.

Attention: deal with fuel with prudence. Before adding the fuel, engine must be Shut down**. No smoking when the fuel tank is refilled or when fuel system is working.**

6) Check level meter of fuel or fuel meter on monitor, add new fuel if necessary.
Important: prevent any dirt, dust, water or other foreign things into fuel system.

7) To prevent from condensation, fuel tank should be refilled after the completion of operation every day. Be careful not to splash the fuel on machine or ground. While refilling, regulated capacity should not be exceeded.

8) After the refill, replace the oil inlet cap on fuel tank to avoid losing or damage.

- **Hydraulic system**

a) Recommended hydraulic brand and name

Supplier	-20～15℃（-4～59℉）	-10～40℃（14～104℉）
Xugong	Special hydraulic oil used for Xugong excavator (32#)	Special hydraulic oil used for Xugong excavator (46#)
Remark	Anti-abrasion hydraulic oil	

b) Capacity of hydraulic oil tank

Machine type	Capacity of oil tank
XE210CU	240L/63.40 US gal
XE240LC	270L/71.33 US gal

- **Engine oil**

c) Recommended engine oil brand and name

Supplier	-20～30℃（-4～86℉）	20～40℃（68～104F）
Xugong	Special hydraulic oil used for Xugong excavator	
	SAE10W/30	SAE15W/40
Remark	API CF grade	

d) Refilling quantity:

XE210CU、XE240LC:30L/6.6 US gal

- **Driving equipment**

e) Gear oil brand and name recommended

Supplier	-20～40℃(-4～104℉)	
	Travel reducer	Swing reducer
Xugong	Special hydraulic oil used for Xugong excavator(90#)	Special hydraulic oil used for Xugong excavator (140#)
Remark	API GL-4 grade	

f) Refilling capacity

Parameter / Machine type	Travel reducer	Swing reducer
XE210CU	6.8L×2 / 1.79 US gal×2	6.2L/1.64 US gal
XE240LC	6.8 L/1.79 US gal X2	6.2 L/1.64 US gal

- **Cooling system**

g) Recommended cooling fluid

Supplier	-20～30℃	-10～40℃
Xugong	Special coolant used for Xugong excavator (30#)	Special coolant used for Xugong excavator (45#)

h) Capacity of cooling liquid

Parameter / Machine type	Anti-freeze fluid	Antirust fluid
XE210CU	23 L/6.6 US gal	0.46 L/0.12US gal
XE240LC	23 L/6.07 US gal	0.46 L/0.12 US gal

i) Pay attention when preparing cooling fluid by the customer himself:

1) Cooling water：Putting soft and pure water or bottled water in radiator.

2) Antirust fluid：While changing cooling fluid, you should add antirust fluid whose capacity refers to list1-18, into new cooling fluid. Antirust fluid in not needed when using anti-freeze fluid.

3) Anti-freeze fluid：if the temperature is predicted to be below 0℃, the cooling system should be added with the mixed fluid composing of anti-freeze fluid and soft water. The mixing rate of anti-freeze fluid refers to List 1-19, normally between 30% and 50%. If the rate is less than 30%, the system will be rusted; if the rate is over 50%, engine will be overheated.

j) Mixing rate list of anti-freeze fluid

Temperature		Mixing rate	Mixing capacity			
			Anti-freeze fluid		Soft water	
℃	℉	%	L	US gal	L	US gal
-1	30.2	30	6.9	1.82	16.1	4.25
-4	24.8	30	6.9	1.82	16.1	4.25
-7	19.4	30	6.9	1.82	16.1	4.25
-11	12.2	30	6.9	1.82	16.1	4.25
-15	5	35	8.1	2.14	14.9	3.93
-20	-4	40	9.2	2.43	13.8	3.64
-25	-13	45	10.4	2.75	12.6	3.32
-30	-22	50	11.5	3.03	11.5	3.03

Attention：

1) Anti-freeze fluid is poisonous. If taken in, it will result in a severe casualty accident. Once drinking it by mistake, the patient should be channeled off to vomit and obtain an immediate emergent treatment.

2) While storing anti-freeze fluid, make sure to store it in a container with sealing cap and remarkable mark. Always keep it away from the contact with children.

3) If anti-freeze fluid is splashed into eyes carelessly, you should wash your eyes with water for 10-15 min. and then seek out an emergent treatment.

4) When storing or abandoning anti-freeze fluid, you must abide by all the local regulations.

Safe operating procedure against fire

- **Treat the liquid safely**

a) Handle the fuel with care, since it is highly flammable. If fuel is ignited, it will explode and cause a fire and person's casualty.

1) When smoking or being near the spark or burning object, don't add fuel to the machine.
2) Before refilling, you must stop the engine.
3) Refill the fuel outdoors.
4) Static electricity can produce spark at the fuel inlet.

b) When the weather is cold and dry or there is possible static electricity, always keep fuel inlet contact with fuel supply pipe to guarantee a good earth.

a) All the fuel, majority of lubricant and some cooling agents are flammable.

1) Store the flammable liquid away from where there is fire danger.
2) Don't burn or pierce pressured container.
3) Don't save oil-contained rag, which can be ignited or burning automatically.
4) Tighten the cover of fuel tank or other liquid tank and it is prohibited to start the equipment before tightening.

- **Guard against a fire disaster**

a) Check leakage: the leakage of fuel, hydraulic oil and lubricant may lead to a fire disaster.

1) Check the loss or loose of pipe clamps, the distortion of hoses, mutual friction between pipes and hoses, the damage on fuel cooler and the loose of flange screw of fuel cooler to avoid the leakage.
2) Tighten, repair or change any pipe clamp, pipe, hose, fuel cooler and flange screw of fuel cooler which have been lost, flexible or damaged.
3) Don't bend or knock high-pressure pipe.
4) Don't install any bending or damaged pipes or hoses.

b) Check short circuit: it may lead to a fire disaster.

1) Clean and tighten all the electric connection.
2) Before every shift or after 8-10 hours' operation, check if the cables and electric wires have been loose, distorted, hardened or broken.
3) Before every shift or after 8-10 hours' operation, checks if the terminal covers have been lost or damaged.
4) If the cables and electric wires have been loose or distorted, don't operate the machine.

c) Remove flammable objects: a fire can be causes by some flammable things such as splashed fuel, hydraulic oil, anti-freeze fluid, washing fluid, garbage, lubricant, oddment, deposited cinder and etc. check and clean the machine every day, remove splashed or deposited flammable things timely to avoid a fire.

d) Check key switch: when catching a fire, the engine failing to stop will aggravate the fire, which is a disadvantage to putting out the fire. So before operating the machine every day, always check the function of key switch:

1) Start the engine and run it at low idling speed.
2) Turn the key switch to OFF and confirm if the engine has stopped.
3) If there is something abnormal, make sure to repair the machine before operating it.

e) Check the emergency cutoff switch of engine: when catching a fire, if the pressured air in hydraulic oil tank fails to be released, it will aggregate the fire and cause a trouble. So once every 250 hours, always

check the function of emergency cutoff switch of engine.

1) Start the engine and run it at low idling speed.
2) Press down emergency cutoff switch of engine.
3) Confirm the engine has stopped and the pressured air in hydraulic oil tank has been released (you can hear the sound of deflation).
4) If there is something abnormal, make sure to repair the machine before operating it.

f) Check insulation cover: a fire will be caused by the damage or loss of it, which if existing, should be repaired or renewed before operating the machine.

- **Withdraw when catching a fire**

a) If catching a fire, leave from the machine according to the following method:

1) If time is permitted, turn the key switch to OFF and stop the engine.
2) If time is permitted, use fire extinguisher.
3) Leave from the machine.

b) At the emergency, if the cab door and front window can't be opened, smash front or rear window glass with emergency hammer and then withdraw from the cab.

- **Beware of exhaustion**

Beware of exhaustion and suffocation. The exhaustion may lead to disease or death.

If you must work in the building, fully air ventilation should be guaranteed. The smoke can be discharged by lengthened exhaust pipe or opening door or window to introduce enough external air into working area.

- **Notices for welding and polishing**

a) Before welding, plug of controller should be cut off.

b) The welding will produce gas and flame. So :

1) The welding must be carried out in fully ventilated and prepared place. Before welding, place the flammable things into safe area.
2) Rather than unqualified, only those qualified through examination can do the welding.

c) Polishing machine will give out sparks, so before the polish, put the flammable things into safe area.

d) After the welding and polishing, check again if there is smoke around the welding area.

- **Avoid heating near the high-pressure hydraulic pipe**

Flammable sprayer will be produced by heat near the high-pressure hydraulic pipe, leading to a severe burning injury for you and the surrounding people.

a) Don't weld or use welding torch near high-pressure hydraulic pipe or other flammable material.

b) When the heat is accumulated to certain degree, high-pressure hydraulic pipe will be cut off. When doing the work like welding, the fireproofing cover must be installed to protect the hoses and other material.

- **Avoid heating pipes with flammable fluid inside**

a) Don't weld or gas-cutting any pipes or hoses with flammable fluid inside.

b) Before welding or gas cutting any pipes, remove flammable fluid completely with non-flammable solvent.

- **Remove the paint before welding or heating**

Because heated by welding or using welding torch, the paint will produce poisonous gas, which will cause a vomit if being taken in.

a) Prevent the happening of latent poisonous gas and dust.

b) Carry out removing-paint work outdoors or in drafty place, dispose the paint and solvent correctly.

c) Remove the paint before the welding or heating.

1) If the sand paper or grinding wheel is to get rid of paint, pay attention not to suck in dust by wearing qualified respirator.

2) If using the solvent or removing-paint agent, you should get rid of removing-paint agent with soap and water before welding. Clean the solvent, removing-paint agent container or other flammable object in working area. Before welding or heating, you should use at least 15 min. to disperse the volatile gas.

- **Avoid the explosion of battery**

a) The gas in battery will explode.

1) Prevent spark or burned match from getting close to the top of battery.

2) Don't check the electricity of battery by placing one metallic object cross the terminal.

3) Don't charge frozen battery, or there will be explosion. Warming up battery to 16℃（60.8℉）。.

4) The loose of terminal may produce a spark, so all the connector should be tightened.

b) Electrolyte of battery is poisonous, if the battery explodes, the electrolyte will enter into eyes, causing the blindness.

Other operating procedures

- Lift or move objects **[Excavator does not have professional lifting function, and it is very dangerous to lift objects with the machine, which is prohibited in principle.]**

Attention:

1) When using the machine to lift or move objects, you must abide by all the local regulations. Since the steel cable, strap or rope may be broken and lead to a severe casualty, so don't use damaged chain, broken steel cable or strap or rope to lift heavy thing. Move the object slowly and carefully. Sudden movement of load even above the person's head is not allowed. Don't let anyone get close to the load.

2) If the machine is used for the shipment of roundwood like objects, front guards should be installed, and top guards should also be installed if there is associated danger.

3) Ensure all the people are away from the load lifted or tied with steel cable and placed on ground, until the load has been supported by supporting block or placed on ground stably.

4) Position the upper machine body perfectly and keep the travelling motor at the rear. Don't connect sling/chain with bucket teeth, which may come off and result in the falling of lifted object.

5) Don't let the sling entwine your hand and body.

6) When wind speed is high, don't use sling to lift or raise originally rated weight. When the exterior area of the cargo is relatively big, watch out any kinds of gust.

a) Bind the sling or chain tightly on the load supposed to be lifted. When binding the sling or chain, make sure to wear gloves.

b) Turn the bucket and withdraw the arm, connect the sling or chain with bucket ring. Before starting, hand signs must be coordinated with the signaler.

c) Know very well the position of all the working staff in working site.

d) Connect hand-pulling rope with the load and ensure the puller is far away from the load.

e) Before the lift, measure the load weight and lift up.

1) Lift the load to the height of 50mm away from the ground or lift it only to demanded height.

2) Let the load go around nonstop to one side.

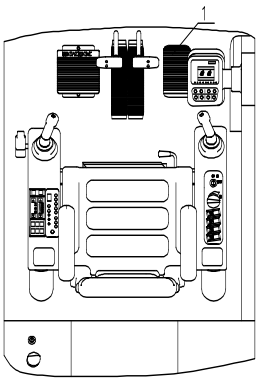
3) Keep the load close to the ground and take it away from the machine.

f) If there is any unstable phenomenon, lower the load immediate down to the ground.

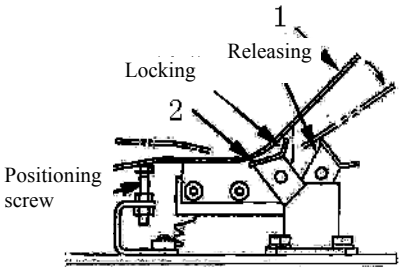
- **The operation of hammer-style knapper**

As the picture, if there is hammer-style knapper in the machine, operate it with operating pedal front and right to the seat.

Attention: when not using the hammer-style knapper, you must lock operating pedal with pedal lock.



1—operating pedal



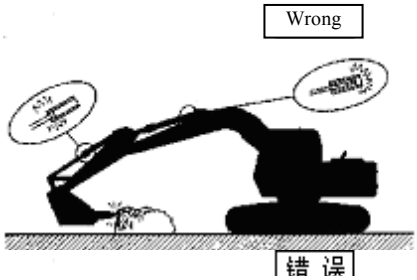
1—operating pedal
2—pedal lock

Choose knapping hammer mode (mode B) through working mode switch, the indicator of mode B will shine.

a) Move the pedal lock and release the operating pedal.
b) Step down the operating pedal and operate hammer-style knapper.
c) Move your foot away from the operating pedal and stop the hammer-style knapper.
d) When the operating pedal is not used, always lock the pedal with pedal lock.

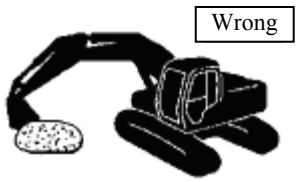
● **Notices for operating hammer-style knapper**

Attention:



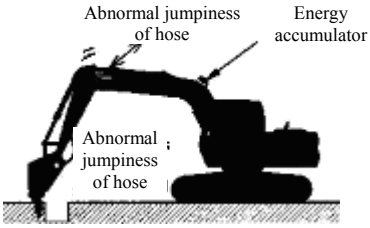
1) Since the hammer-style knapper is heavier than bucket, so the stability of machine may be reduced.

2) When using hammer-style knapper, the machine is easier to incline and the flying or bouncing object may bounce into cab or other part of machine. Please abide by the following and other necessary notices to avoid the happening of accident and damage on machine.

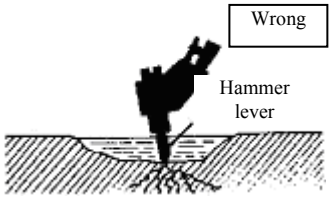


a) Avoid using hammer-style knapper to bump into other object. Since the knapper is heavier than the bucket, so it will go down faster. Be careful, don't use the knapper to bump into other thing, or the knapper, front working equipment and machine's upper structure may be shattered. Before operating the knapper, always move (lower down) the knapper slowly and put it on broken object.

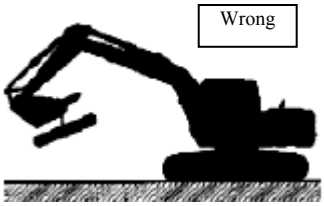
b) Don't use the knapper to rotate and move something, or the boom, arm and knapper will be damaged.



c) Prevent the damage on hydraulic cylinder or machine. When operating the knapper, don't retract or stretch the hydraulic cylinder lever fully.



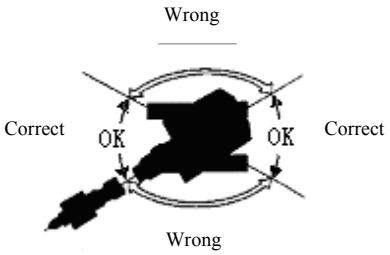
d) If there is abnormal jumpiness in hydraulic hose of knapper, please stop the operation at once. the pressure change inside the battery of knapper or damaged battery will lead to abnormal hose jumpiness and even cause the damage on knapper and (or) machine.



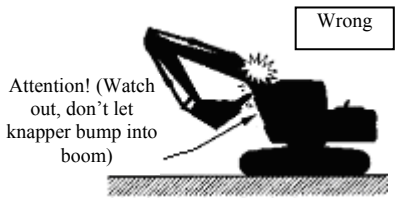
e) Don't operate the knapper in water, which may make it rusted even damage the seal and components in hydraulic system.

Don't use knapper to lift heavy things, which may make the machine rave about and (or) lead to the damage of knapper.

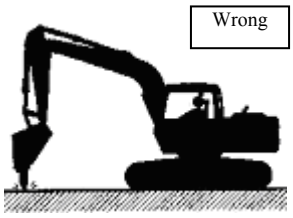
f) Don't rotate the upper machine structure to the side to operate the knapper. This action will make the machine unstable and even shorten the lifespan of lower machine parts.



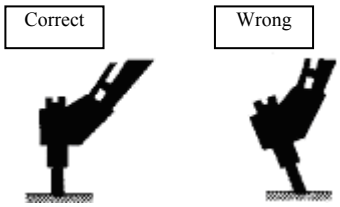
g) Operate the hydraulic excavator carefully and prevent the knapper from bumping into boom.



h) Don't place the arm on vertical position to operate the knapper, which may lead to the excessive vibration of hydraulic cylinder of arm and even the oil leakage.

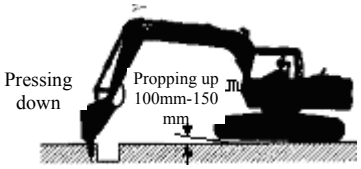


i) Press down the knapper and place the hammer head(axial center)vertically on object and push it in.



j) Don't operate the knapper continuously for over 1 min., which may cause the excessive abrasion of hammer's head. If the object can't be shattered in 1 min., place the hammer's head to other positions, every change of which should not exceed 1 min.

k) It is possible to damage the front working equipment by relying on pressing down the knapper to prop up the lower machine body. Though it is permitted to prop up the front edge of lower body within 150mm(6 in), but normally this method is not necessary. You mustn't prop up the front edge of lower body for over 150mm (6 in) only relying on pressing down the knapper.

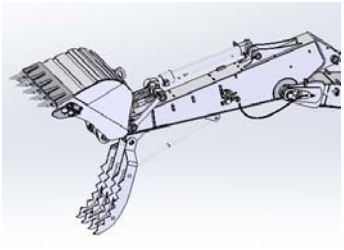


- **The operation of hydraulic thumb assy**

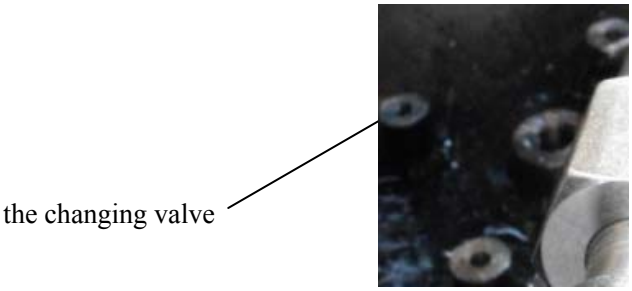
Attention:

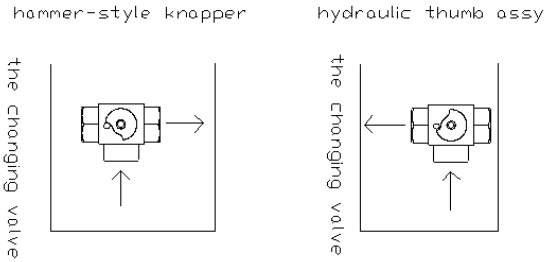
1) since equipped the hydraulic thumb assy is heavier, so the stability of machine may be reduced.

2) When using the hydraulic thumb assy, the machine is easier to incline and the flying or bouncing object may bounce into cab or other part of machine. Please following and other necessary notices to avoid the happening of accident and damage on machine.

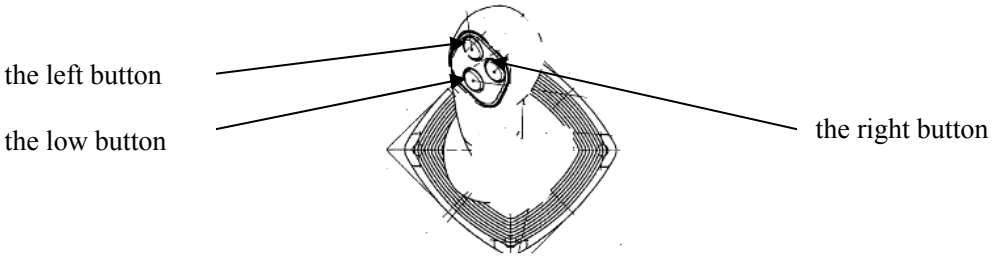


a) When using the hydraulic thumb assy, the user should set the changing valve, seen in the following picture.



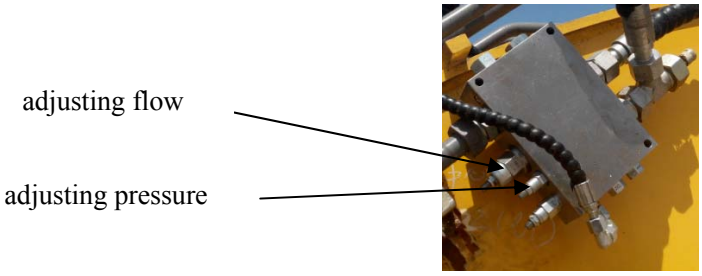


b) When operating the hydraulic thumb assy, the user should observe the following rules:



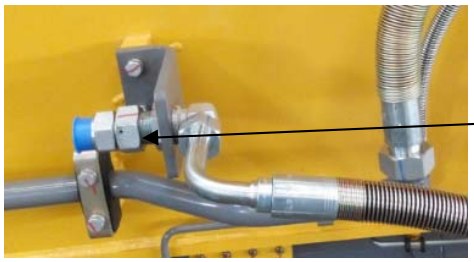
The left button: clamping
The right button: loosening
The low button: boosting

c) When adjusting the flow and the pressure of the hydraulic thumb assy, the user can do in the following way.



The max out pressure: 350Bar
The flow scope:0L--209L/Min

d) The equipped head of the hydraulic thumb assy.



- **The operation of quick coupler**

Attention：

1) since equipped the quick coupler is heavier, so the stability of machine may be reduced.

2) When using the hydraulic thumb assy, the machine is easier to incline and the flying or bouncing object may bounce into cab or other part of machine. Please following and other necessary notices to avoid the happening of accident and damage on machine.

3) While using the quick coupler, the machine is easier to roll over and it is possible for the flying objects to bounce off the cab and other parts of the machine. Observe the following and other necessary precautions to prevent the happening of the accidents and damaging of the machine.

4) After the modification, the interference phenomenon will occur between the bucket and the cab when the arm withdraws. So, it is needed to operate carefully.

Note: For the specific operation items, please refer to the instructions provided by the quick coupler manufacturer.

Lubrication, maintenance and repair

General principle

Warning：Only those trained and qualified can repair and maintain this machine.

Attention：Before any maintenance, read carefully the related content in this book.

Attention：If diesel engine is running indoors, ensure good ventilation condition.

Attention：For the details of diesel engine, see OPERATING MANUAL OF DIESEL ENGINE, which is included in the documents along with the excavator.

- While carrying out maintenance or repair for this machine, the related record should be made and saved.
- For the excavator, it is important to maintain and ensure its normal function. So the machine should be kept clean so that any failure such as leakage, looseness of screw or connection will be spotted.
- Pay attention to environmental protection! Don't let oil and other things harmful to environment pollute our environment.
- The content of this chapter includes items related to regular check, maintenance and repair. The operator of excavator should carry out according to the regulation.

Lubrication of equipment

Attention: High-quality lubricant should be added according to appointed quantity. Excessive lubricant or grease may lead to overheating and even speed up the abrasion.

The kinds of lubricant

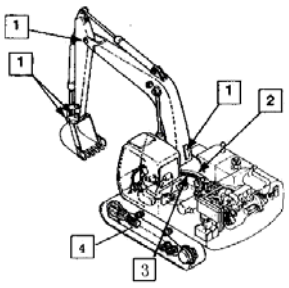
Lubricant varieties	Brand/name	Used for	Capacity (L/US gal)	Remark
Grease	2# highly pressured lithium-based grease	Pin shaft of working equipments	0.3/0.11	-20 ～ 40 ℃ (-4～104℉)
		Swing bearing	4/0.88	
		Swing reducer	1/0.22	
		Rotation equipment oil-bath	12/2.64	
		Tension equipment	2/0.44	
Engine oil	CF 15W/40 oil	Diesel engine	25/6.6	-15 ～ 40 ℃ (-4～104℉)
	CF 10W/30 oil	Diesel engine	25/6.6	-30 ～ 30 ℃ (-13～86℉)
Lubricant	GL-4 SAE140 gear oil	Swing reducer	6.2/1.64	-20 ～ 40 ℃ (-4～104℉)
	GL-4 SAE90 gear oil	Travel reducer	2×6.8/2×1.8	

Attention：If the excavator works in specially high or cold condition, special lubricant should be used. You are suggested to contact with excavator dealer appointed by Xugong.

Attention：If the above requirements can't be satisfied, please contact with Xugong excavator agent or its after-market department.

Lubrication Points

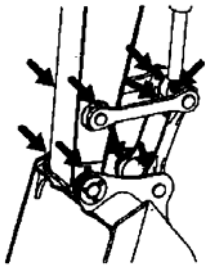
- **Main lubrication points**



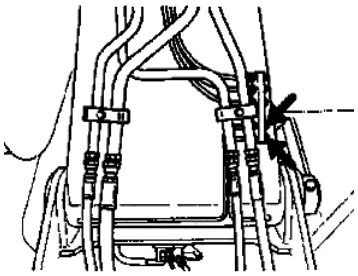
Serial number	Position		Quantity
1	Connection points of working equipments	Bucket, arm and pin of connection rod	9
		Others	11
2	Swing reducer		1
3	Swing bearing		2
	Rotation device oil-bath		1
4	Tension device		2

● **Connection points of working equipments**

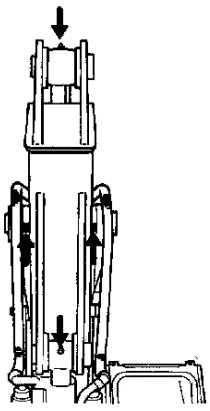
a) Bucket, arm and pin of connection rod



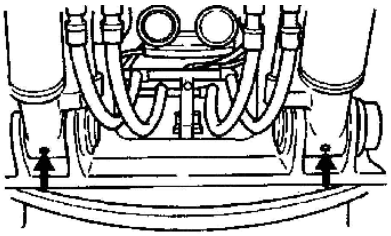
b) Pin at the root of boom



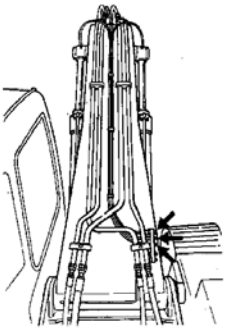
c) Connection pin between boom and arm, hydraulic cylinder piston and bottom pins of arm



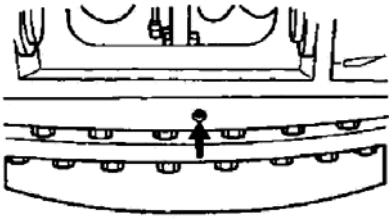
d) Bottom of moving-arm hydraulic cylinder



e) Pin of moving-arm hydraulic cylinder and bottom pin of bucket-lever hydraulic cylinder

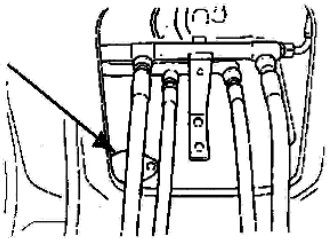


- **Rotary support area**

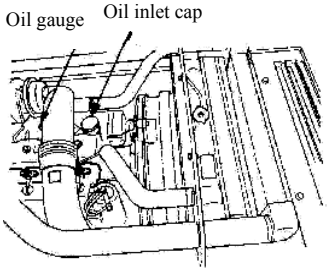


3 lubrication points for rotary support

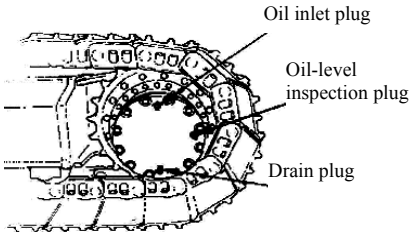
- **Rotation device oil-bath**



- **Engine**

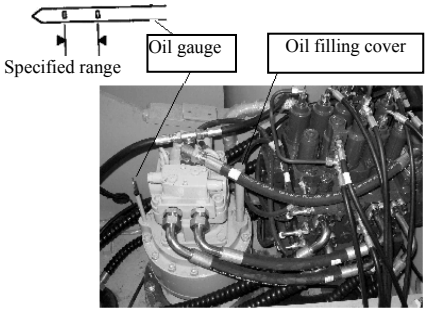


- **Travel reducer**



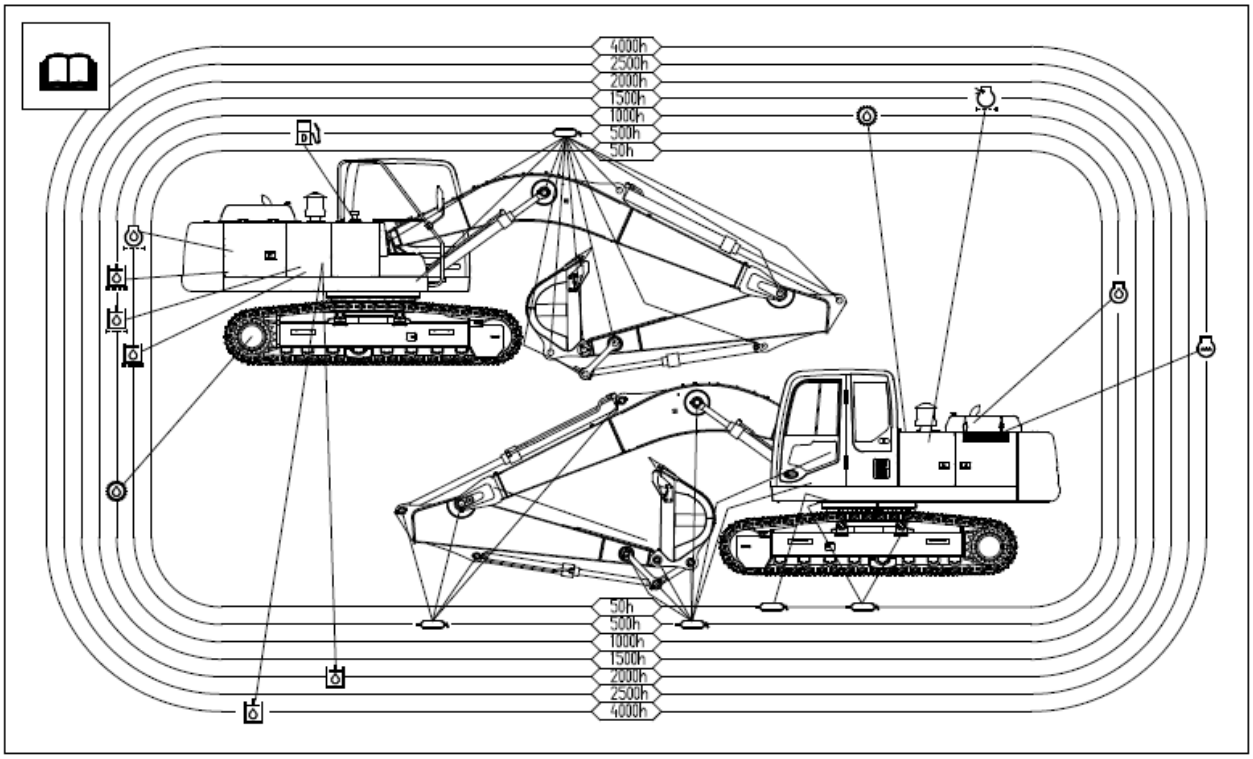
——2 lubrication points for treading gearbox

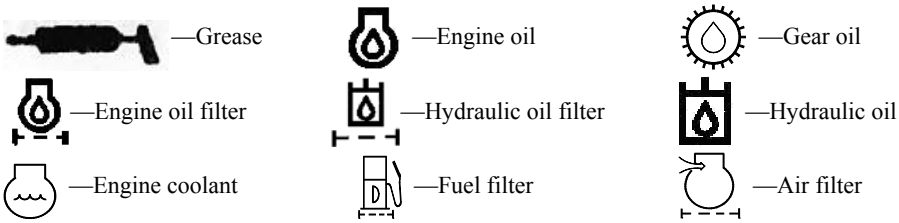
- **Rotary speed reducer**



Lubrication Period

- **Schematic of lubrication and maintenance**





- **Table of lubrication periods:**

Item	S/N	Maintenance point		Qty	Interval (hour)							
					8	50	200	250	500	1000	1500	2000
Grease	1	Working device	Bucket and link pin	9			√					
			Others	1			√					
	2	Rotary bearing		2		√						
	3	Rotation reducer		1					√			
	4	Rotation device oil-bath		1					√			
Engine	1	Check of engine oil level		1	√							

oil	2	Replacement of engine oil				★		√				
	3	Replacement of engine oil filter		1		★		√				
Gear oil	1	Traction reducer	Check of oil level	2				√				
			Replacement	2				★		√		
	2	Rotary reducer	Check of oil level	1				√				
			Replacement	1					★	√		

Note: ★ Maintenance shall be required only for the first check.

Safety points for attention and precautionary measures

a) Summarize the working hours correctly to determine the lubrication time.
b) Stop in case of filling the grease, and don't apply any lubrication work if not parked as per the requirements of this manual.
c) Adopt the fire-prevention measures during the lubrication.
d) Prevent hot oil and harmful substances from harming the operators.
e) Avoid mixing the lubricating oils of different brands.
f) Clean the lubricated parts and vent hole, etc before filling; keep the tightness of seal ring after filling.
g) Clean or replace the filter at regular intervals, make a mark after draining the engine oil off, and don't start the filter without oil.
h) Remove the spilled lubricant.

Maintenance and repair

Safety rules

- **Safety maintenance**

a) In order to avoid any accident:

1) Learn of the maintenance regulations before the work.
2) Keep the working site clean and dry.
3) Don't spray water or steam in the cab.
4) Don't lubricate or maintain the machine with oil during the movement.
5) Prevent the hand, foot and clothes from contacting the rotating part.

b) Before maintaining the machine:

1) Park the machine on the level ground.
2) Fall the bucket to the ground.
3) Run the engine for 5 minutes at low speed and empty load.
4) Turn the key switch to OFF (off), and stop the engine.
5) Move the operating lever several times to release the pressure in hydraulic system.
6) Remove the key from the key switch.
7) Hang up the nameplate "No Operation" on the operating lever.
8) Pull the safety locking rod to LOCK (lock).
9) Cool the engine.

c) If the maintenance must be applied during the running of engine, a qualified driver must exist in the cab.

d) If the machine must be lifted during the maintenance, maintain the angle between the movable arm and bucket arm within 90° to 110°, support any lifted part of machine firmly, and don't work under the machine lifted by the movable arm.

e) Check the parts at regular intervals, and repair or replace them as per the demands.

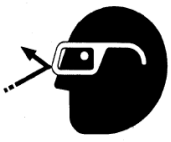
f) Keep all the parts in good working state, and install them correctly.

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

h) Adopt inflammable cleaning oil, and prohibit using the fuel or gasoline or other easily flammable oil to clean the part or surface.

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

j) Apply the sufficient illumination to the working places. In case of working under or inside the machine, use the working lamps with shields always, otherwise the breakage of bulb may ignite the spilled fuel, engine oil, anti-freezing fluid or washing fluid, etc.



- **Protection against separation of fragments**

If the fragments（are filled） into the eye or bounced to any other part of body, they will cause the severe injuries to body.

a) Use the safety goggles or safety glasses to avoid the injuries of splashed metal pieces or fragments.

b) In case of hitting the object, prevent others from entering into the working place.

- **During the maintenance of machine, warn the others that any unexpected**

Machine movement will cause the severe injuries, and hang up the nameplate "No Operation" on the operating lever before maintaining the machine.

- **Correct supporting of machine**

Don't maintain and repair the machine before supporting the machine.

a) Fall the front-end working device always to the ground before maintaining and repairing the machine.

b) If the machine or front-end working device must be lifted for maintenance and repair, support the machine or front-end working device. Don't use the slag bricks, cord tires or racks to support the machine, because they may be fallen-in under the continuous load. Don't work under the machine supported with single jack.

- **Far from the rotating parts**

a) The entrapment of rotating part may cause the severe injuries.

b) In case of working beside the rotating part, don't make the hand, foot, clothes, Jewellery or hair entrapped by the rotating part.

- **Avoiding the fly out of part**

a) The grease in track-tension device is under a high pressure. In case of not obeying the following matters, severe injury, blindness or death may be caused:

1) Don't remove the grease coupler or valve body.

2) The body and face must be far away from valve body because it may fly out.

b) The traction reducer has a certain pressure:

1) Due to the possible flyout of part, the body and face must be away from the air bleed bolt to avoid any injury.

2) The gear oil is hot, which may lead to scald injury. After cooling the gear oil, loosen the air bleed plug gradually to release the pressure.

- **Safety storage of fittings**

The stored fittings such as bucket, hydraulic hammer and grafter may fall, resulting in severe injuries.

Store the fittings and apparatus safety to avoid falling, so the children and other personnel should be far away from the storage area.

- **Pay attention to high-temperature fluid.**

a) Avoid the heat injury caused by the sprayed high-temperature fluid. After the operation, the cooling water of engine is hot and has a certain pressure; there is hot water or steam in engine or radiator.

If the skin contacts the spilled hot water or steam, the severe skin burns will be caused.

1) Avoid the burning of hot water that may be sprayed out. Don't open the cover of radiator before cooling the engine. In case of opening the cover, turn the cover to bottom slowly, and remove the cover after releasing the pressure fully.

2) Pressure exists in the hydraulic oil tank. Ensure the pressure is released before removing the cover.

b) 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.

c) After cooling the oil and parts, start to check or maintain them.

- **Periodic replacement of rubber hose**

a) Due to ageing, 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.

b) Irregular replacement of rubber hose may cause the fire, the injection of fluid into skin or the knock of front-end working device to persons around it will cause severe heat injury, dermal gangrene, other injuries or death.

- **Pay attention to high-pressure fluid**

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.

a) Release the pressure before removing the hydraulic or other pipes to avoid this risk.

b) Tighten all the connections before pressurizing them.

c) Check the leaks with a paper board, and protect your hands and body to avoid the contacts with high-pressure fluid. Wear the face mask or safety goggles to protect your eyes.

d) 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.

- **Treatment of accumulator**

The pilot control system is equipped with an accumulator filled with high-pressure nitrogen, so the pressure of system must be relieved during the maintenance of pilot control system. It's very dangerous in case of incorrect operation.

a) Don't drill on the accumulator, or don't make it contact the flame, fire or heat source.

b) Don't weld the accumulator, or don't attach any article on it.

c) In case of removing, maintaining or treating the accumulator, the filled gas must be discharged. Contact with our company or supplier.

d) In case of treating the accumulator, wear the safety goggles and protective gloves. The high-pressure hydraulic oil will stab the skin or cause the injury.

- **Safety maintaining air-conditioning system**

The splash of refrigerant on skin will cause the frost injury.

a) During the maintenance of air-conditioning system, use Freon correctly as per the instructions for Freon container.

b) Adopt the recovery or recirculation system to prevent Freon from discharging into the atmosphere.

c) Don't make Freon fluid contact the skin.

- **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.

a) In case of discharging the fluid, use the leak proof container. Don't use the food or drink vessel, because it may cause the wrong drinking.

b) Don't pour the waste liquid on the ground, into sewerage or any water source.

c) The air-conditioning refrigerant is leaked into the air, which will damage the atmospheric layer of the earth. According to the government regulations, an air-conditioning service center with desired certificates may be required to recover and regenerate the air-conditioning refrigerant.

d) Inquire the correct recovering or treatment methods of discards from local environmental protection or recovery center or your assigned dealer.

Maintenance

- **Check and maintenance of hydraulic device**

Note: during the operation, the parts of hydraulic system will become very hot, and cool the machine before starting the check or maintenance.

a) During the maintenance of hydraulic device, ensure that the machine shall be placed on the flat or hard ground.

b) Fall the bucket to the ground, and turn the engine off correctly.

c) Maintain the hydraulic device after cooling the machine part, hydraulic oil and lubricating oil fully, because the residual heat and pressure will exist in the hydraulic device soon after finishing the operation.

1) Drain the air in the hydraulic oil tank to release its inner pressure.

2) Cool the machine. Check and maintain the high-temperature or high-pressure parts, because they may cause the sudden flyout or spray of parts or hydraulic oil and the personal injury.

3) In case of removing the plug, don't make your body and face against them, because any hydraulic part may still have a certain pressure even if the part has been cooled.

4) Don't try to maintain or check the traction or rotary motor circuit on the slope, because they can have high pressures due to their own weights.

d) During the connection to the hydraulic hose and pipe, pay special attention to the seal surfaces to ensure no dirt exists on them, and avoid the damages to them. Please remember the following points for attention:

1) Clean the inner face of hose, pipe or oil tank with cleaning fluid, and dry them thoroughly before connecting them.

2) Use non-destructive or defective O rings, and don't damage them during the assembling.

3) During the connection of hose, don't make the high-pressure hose distorted, because the lifetime of twisted hose will be greatly reduced.

4) Tighten the low-pressure hose clamp cautiously, and ensure they can't be screwed too tight.

e) In case of filling the hydraulic oil, use the oil of the same brand always, and don't mix the oils of different brands. In case of wishing to use the oil listed in "Brands and Names of Recommended Hydraulic Oils", ensure that all the hydraulic oil in the system is fully replaced.

f) Don't run the engine without oil in hydraulic oil tank.

- **Check of hydraulic oil level**

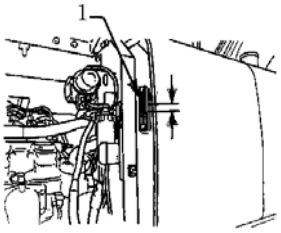
Important: don't run the engine without oil in hydraulic oil tank.

a) Check the level of hydraulic oil every day.

b) Park the machine on the flat ground.

c) Retract the state positioner fully with arm hydraulic cylinder, and stretch it out fully with a bucket hydraulic cylinder.

d) Stop the engine as per the shutdown steps of engine (P20).



1—liquid-level meter

Important: if the shutdown steps of engine are incorrect, the turbo supercharger may be damaged.

e) Pull the safety locking rod to LOCK (Lock).

f) Open the access door at the hydraulic pump, check the liquid-level meter on hydraulic oil tank.

The oil level must be between the marks on the level meter, otherwise add in the hydraulic oil.

Note: the hydraulic oil tank has a certain pressure. Release the pressure of oil tank and remove the cover carefully before removing the oil tank cover.

g) Add in the hydraulic oil, and check the level meter again.

h) Attach the cover, and ensure the components of filter and hanger rod are correctly positioned.

● **Drain the dirt reserve tank of hydraulic oil tank**

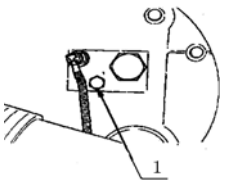
Important: don't run the engine without oil in hydraulic oil tank.

a) Drain the dirt reserve tank of hydraulic oil tank once every 250 hours.

b) For the convenience of access, rotate the upper car by 90°, and park the machine on the flat ground.

c) Stop the engine as per the shutdown steps of engine (P20).

Important: if the shutdown steps of engine are incorrect, the turbo supercharger may be damaged.



1—Dirt drain plug

d) Pull the safety locking rod to LOCK (lock).

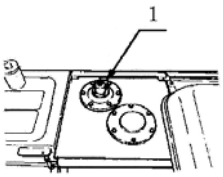
⚠ **Note: the hydraulic oil tank has a certain pressure. Release the pressure firstly, don't loosen the drain plug before cooling the oil, because the oil may be hot and cause the severe scald injury.**

e) After cooling the oil, loosen the drain plug in the bottom of hydraulic oil tank, and drain the water and deposits.
Don't remove the plug fully, and you'd better loosen it enough to drain the water and deposits.

f) After draining the water and deposits, tighten the drain plug again.

● Replacement of hydraulic oil or cleaning of oil suction filter

⚠ **Note: the hydraulic oil may be hot, and the oil must be cooled before starting the work.**



1—Oil tank cover

a) Replace the hydraulic oil or clean the oil suction filter every 2000 hours.

b) For the convenience of access, rotate the upper car by 90°, and park the machine on the flat ground.

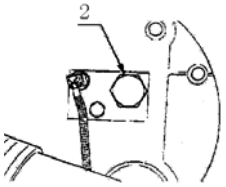
c) Retract the state positioner fully with arm hydraulic cylinder, and stretch it out fully with a bucket hydraulic cylinder.

d) Stop the engine as per the shutdown steps of engine (P20).

Important: if the shutdown steps of engine are incorrect, the turbo super charger may be damaged.

e) Pull the safety locking rod to LOCK (lock).

f) Clean the top of hydraulic oil tank, and prevent the dirt from intruding into the hydraulic system.

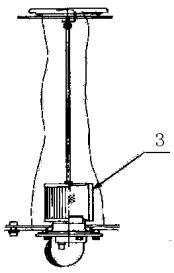


2—Oil drain plug

⚠ **Note: the hydraulic oil tank has a certain pressure. Release the pressure, and then remove the oil tank cover.**

g) Remove the oil tank cover.

h) Draw off the hydraulic oil with a pump. The capacity of hydraulic oil in the tank: XE210CU：350 L/77 US gal。



3—Components of oil suction filter and hanger rod

i) Remove the drain plug to make the hydraulic oil discharged.

j) Take out the components of oil suction filter and hanger rod.

k) Clean inner sides of filter and oil tank. In case of replacing the filter, attach a new filter to the hanger rod as shown in right figure.

l) Attach the components of filter and hanger rod, and ensure the filter is correctly fixed on the outlet.

m) Replace the oil filter of hydraulic oil tank (refer to "List of Maintenance Periods").

n) Clean, attach and tighten the drain plug.

o) Fill the hydraulic oil up to its level between the marks of level meter.

p) Attach the oil tank cover, and ensure the components of filter and hanger rod are in correct positions.

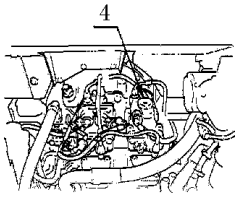
Important: in case of starting the engine without oil in hydraulic pump, it will damage the hydraulic pump.

q) Remove the air bleed plug from the top of hydraulic pump.

r) Fill up the hydraulic pump with hydraulic oil through the hole of air bleed plug.

s) Attach the air bleed plug.

t) Start the engine and run it at low speed and empty load. Hang "No Operation" nameplate to the safety locking rod, and ensure the safety locking rod in LOCK (lock) position.



4—Air bleed plug

u) Loosen the air bleed plug slowly to discharge the accumulated air. When the flow of air stops and the oil is discharged out of the plug hole, tighten the plug.

v) Run the engine at low speed and empty load, and actuate the operating lever slowly or stably for 15 minutes to discharge the air out of the hydraulic system.

w) Retract the state positioner fully with arm hydraulic cylinder, and stretch it out fully with a bucket hydraulic cylinder.

x) Stop the engine as per the shutdown steps of engine (P20).

y) Pull the safety locking rod to LOCK (lock).

z) Check the level meter of hydraulic oil tank. If necessary, open the oil tank cover to add in the oil.

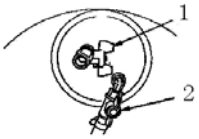
- **Drain the dirt reserve tank of fuel tank.**

a) Drain the dirt reserve tank of fuel tank every day.

b) For the convenience of access, rotate the upper car by 90°, and park the machine on flat ground.

c) Stop the engine as per the shutdown steps of engine (P19).

Important: if the shutdown steps of engine are incorrect, the turbo supercharger may be damaged.



1—Drain ball valve
2—Fuel ball valve

d) Pull the safety locking rod to LOCK (lock).

e) Open the drain ball valve in the bottom of fuel tank for several seconds to discharge the water and deposits, and then close the ball valve.

- Check of water separator

Check the water separator before the operation every day.

The water separator may mix the water in fuel. With the use of filter, the pollutants will focus on the filter from down to up side. Fuel in the filter will roll up, and when the filter element is fully covered by the fuel, the oil water separator should be discharged.

Important: if the fuel contains excessive water, shorten the check interval of water separator.

Drain steps:

a) Shut down the engine，the water separator is located on fuel prefilter near to the hydraulic pump, open the right side shed door, and fix the door with a fixing bar.

b) Close the fuel ball valve in the bottom of fuel tank (figure 2-35) to stop the supply of fuel.

c) Open the vent cap and drain valve and close the drain valve to drain the fuel as much as possible when the fuel begin to flow out of the water pipe.

d) Tighten the vent cap by hands.

e) Start the engine, enhance the speed and run it for one minute to purify the system air.

f) Start the engine, enhance the speed and run it for one minute to purify the system air.

Note: ensure that the air is bleed out of the hydraulic system after drawing the water.

- **Bleed the water out of hydraulic system.**

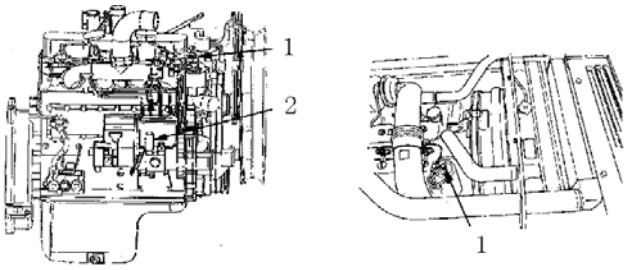
Important: the air in fuel system may cause the starting difficulty or abnormal starting of engine. After draining the water and deposits in oil-water separator, replacing the fuel filter or drying the fuel tank, ensure the air must be bleed out of hydraulic system.

a) Ensure the drain valve in the bottom of the filter has been closed.

b) Ensure the fuel ball valve in the bottom of fuel tank has been opened.

c) Remove the vent cap on the upper part of the transparent cover.

d) Fill the filter with clean fuels.



1—Air bleed plug 2-Fuel supply pump

e) Reinstall the vent cap and tighten it by hands only.

f) Start the engine. When the lubrication system reaches the normal operation pressure, enhance the engine speed and run it for one to two minutes at empty load. After the air is purified, loosen the vent cap until the fuel level drop down just below the collar. Retighten the vent cap by hands only.

g) When the engine is running, retighten the collar by hands.

- **Replacement of fuel filter**

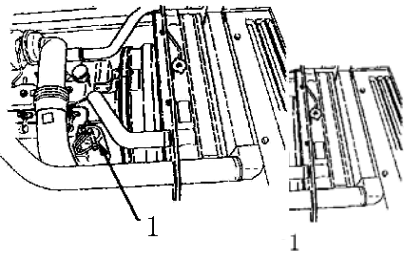
a) Replace the fuel filter every 500 hours.

b) For the sake of safety and environmental protection, use t containers always for draining the fuel. Don't pour the fuel on th into the ditch, river, pond or lake, and treat the waste fuel proper

c) Remove the cartridge filter with a filter spanner.

d) Apply a thin layer of clean fuel to the gasket of new cartridge filter.

e) Tighten the cartridge filter by hands until the gasket contacts the seal face.



1—Cartridge filter

f) Turn the cartridge filter by ca. 2/3 circle with a filter spanner to tighten it, but it shall not be screwed too tight.

g) After replacing the cartridge filter, bleed the air out of hydraulic system.

The above methods are for the replacement of second-class fuel filter on the engine side, and those of first-class fuel filter on the pump chamber side are the same as the above methods:

a) Remove the vent cap and open the drain valve to drain the fuel below the collar.

b) Use the collar cap or vent cap wrench to remove the collar and then remove the transparent cover.

c) Remove the filter, head cover and vent cap seal ring and use the rag to clean the threads of the head cover, collar and filter.

d) Install the new filter and seal ring of head cover and vent cap.

e) Reinstall the transparent cover and collar. Tighten the collar by hands.

f) Fill the transparent cover with clean diesel fuel to perfuse the components until the fuel reaches the top of the filter.

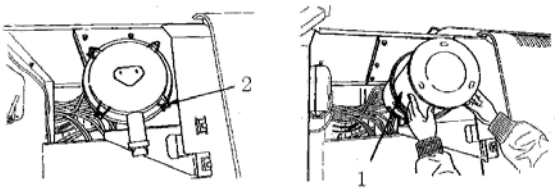
g) Install the vent cap and tighten it by hands only.

h) Start the engine and run it for one minute. Open the vent cap slowly and make the fuel in the collar drop down about 32mm.

i) Close the vent cap and tighten it by hands only. During the period of initial start and the whole engine's running, the fuel level change is normal and the performance of filter will not be affected.

Cleaning of outer element of air filter

Clean the outer element of air filter every 250 hours or when the warning lamp of air filter element brightens, clean the outer element of air filter.



1—Outer filter element 2—Fixing clip

- **Replacement of inner and outer elements of air filter**

After six-time cleanings or one year, replace inner and outer elements of air filter.

a) Park the machine on flat ground.

b) Stop the engine as per the shutdown steps of engine (P20).

Important: if the shutdown steps of engine are incorrect, the turbo supercharger may be damaged.

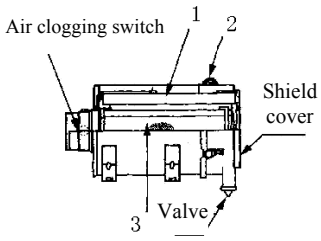
c) Pull the safety locking rod to LOCK (lock).

d) Loosen the fixing clip, and remove the end cover.

e) Remove the outer filter element.

f) Flap outer filter element lightly by hands, and don't on any hard object.

g) In case of cleaning outer filter element with compressed air, blow outward from inner side of outer filter element.



1—Outer filter element
2—Fixing clip
3—Inner filter element

⚠ **Note: adopt low-pressure air (less than 0.2MPa) to clean, have the personnel in the adjacent area away, protect against the splashed fragments, and wear the personal protection equipment, including safety goggles or safety glasses.**

h) Attach the outer filter element.

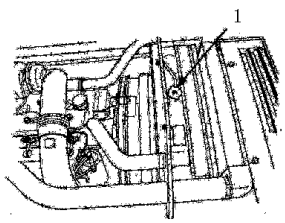
i) Attach the end cover, and tighten the fixing clip.

j) Start the engine, and run it at low speed and empty load.

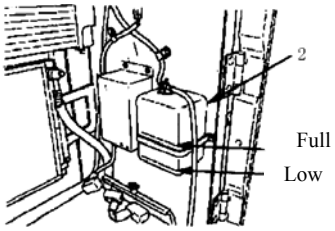
Check the warning indicator of air filter element on the monitor. If the indicator goes on, stop the engine immediately and replace the outer filter element.

k) In case of replacing the element of air filter, replace inner and outer filter elements together. Remove the outer filter element; clean inner sides of filter before removing the inner filter element; remove the inner filter element; install the inner filter element, and then install the outer filter element.

- **Check of coolant level**



1—Radiator cap



2—Cooling water tank

⚠ **Note: unless the system has been cooled, don't loosen the radiator cap. Release the whole pressure before removing the cover, and then screw it off slowly.**

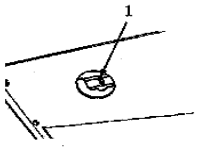
Check the level of coolant every day.

The level of coolant must be between the marks FULL and LOW on coolant tank. The water tank shall be located behind the radiator shed door. If the coolant level is below LOW mark, add the coolant into the water

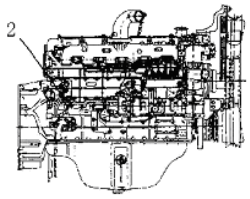
tank. If the water tank is empty, add the coolant into the water tank after adding the coolant into the radiator.

- **Cleaning of radiator inner side**

Note: don't loosen the radiator cap before cooling the engine. Release the whole pressure before removing the cover, and then screw it off slowly.



1—Radiator drain cock



2—Engine drain cock

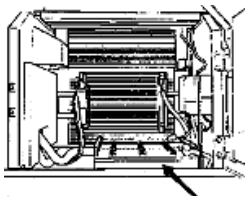
a) During the replacement of coolant, clean the inner side of radiator.
b) Remove the radiator cap, open the drain cocks of radiator and engine body to empty the coolant.
c) Close the drain cock, add fresh water and radiator cleaner into the radiator, start the engine, and run it at the speed higher than low idle speed. When the pointer of cooling water thermometer enters into the green area, continue to run the engine for ca. over ten minutes.
d) Close the engine, open the drain cock, and flush the cooling system with fresh water until the drained water becomes clean so as to remove the dirt and deposits.
e) Close the drain cock, add the fresh water, and add the antirust agent and antifreeze agent into the radiator as per the specified mixing ratio. In order to prevent the air bubble from mixing into the system, add in the coolant slowly.
f) Run the engine to bleed the air of cooling system fully.
g) After adding in the coolant, make the engine running for several minutes. Check the level of coolant again, and add in the coolant again according to the demands.

● **Electric control system**

Important: the installation of improper radio communicators and accessories will influence the electronic elements of machine and cause the unexpected movement of machine. The installation of improper electric devices may also cause the fault or 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, please contact with the assigned dealer.

• **Battery**

⚠ **Note: the gas of battery can cause the explosion, prevent the spark and flame from approaching the bat**tery.



Position of battery

a) This machine adopts the maintenance-free battery, so it's unnecessary to add in the water frequently.
b) Check the capacity of battery frequently to increase its lifetime.

● **Check of battery**

a) Check the capacity of battery at least once every month.
b) Park the machine on flat ground.
c) Stop the engine as per the shutdown steps of engine (P20).
d) Check the capacity of battery. Observe the densimeter from the upper part of battery.
If the following circles are seen from round porthole:
Green circle——indicate the normality of battery
Black circle——indicate the low capacity of battery that needs to be charged
White circle——indicate the discarding of battery that needs to be replaced.

1—Level meter 2—Porthole

e) Keep the terminal of battery clean always to avoid the discharge of battery. Check the terminals for loosening or rusting, and apply the grease or Vaseline to avoid the corrosion.

● **Replacement of battery**

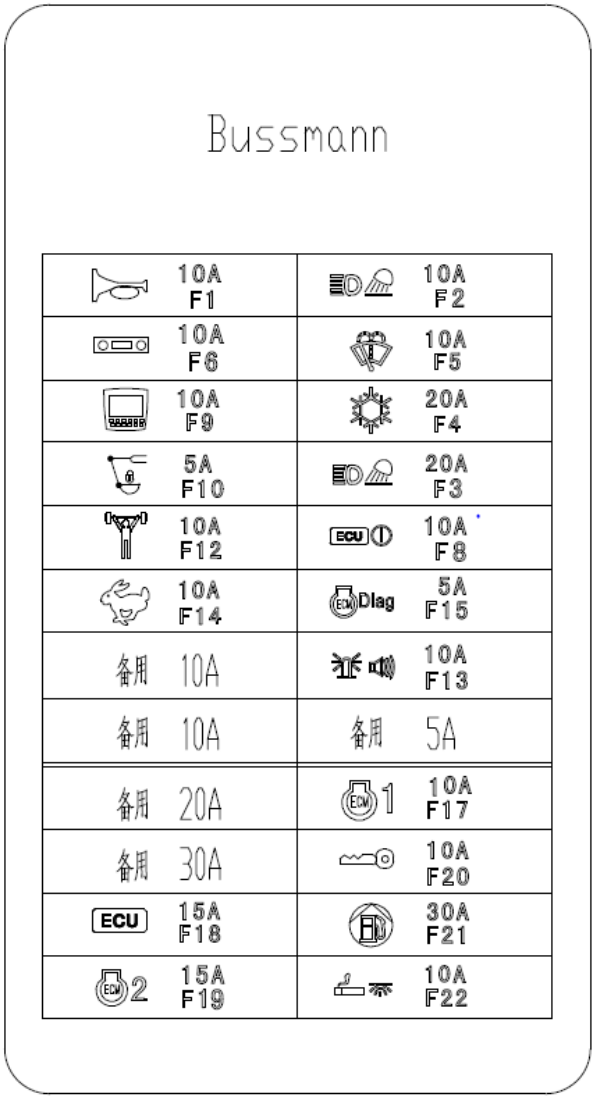
There are two negative (-) grounded 12V batteries on the machine. If one battery of 24V system fails but the other is still good, replace the failed battery with the battery of the same type. For example, replace the failed and maintenance-free battery with new battery. The charging speeds of batteries in different

forms may be different, which may make one of these batteries fail due to overload.

- **Replacement of fuse**

  If the electric device doesn't work, check the fuse at first. The fuse box is located behind the seat, open the fuse box cover up, and the spare fuse is located under the cover.

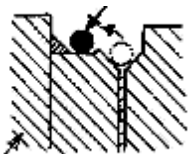
  Important: avoid the damages to electric device due to overload, and install the fuse with correct amperage.



- **Replace the bucket**

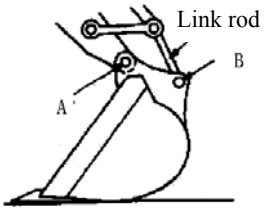
Note: avoid the injury caused by the flyout of metal filling or fragments in case of hitting out or in the connecting pin, and wear the safety goggles or safety glasses and safety appliances applicable for operation.

Movement of O-ring



Bucket sleeve

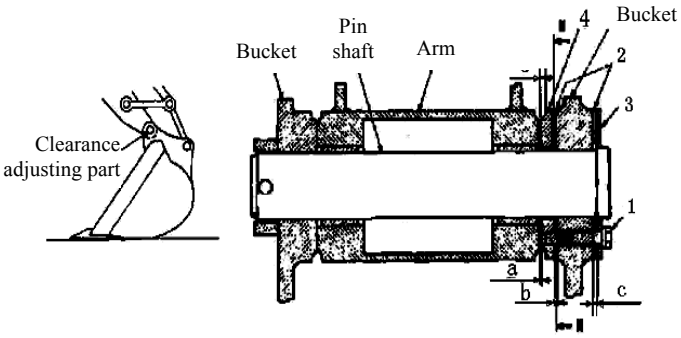
a) Park the machine on flat ground. Fall the bucket to ground, fix its plane on the ground, and ensure the pin shaft can't be rolled after removing the pin shaft.
b) Side O-ring out as shown in Fig.
c) Remove bucket pin shafts A and B, separate the arm and bucket, clean pin shaft and pin hole, and apply enough lubricating oil to pin shaft and pin hole.
d) Align the bucket rod and new bucket, and ensure the bucket can't roll.
e) Attach the bucket pin shafts A and B.
f) Attach the lock pin and retaining ring to pin shafts A and B.
g) Adjust connecting clearance of bucket at pin shaft A (see "Adjust connecting clearance of bucket").
h) Apply the grease to pin shafts A and B.
i) Start the engine, and run it at low idle speed. Turn the bucket slowly in both directions to check if the rotation of bucket is disturbed. Don't use any disturbed machine. If any disturbance, deal with it in time.



- **Adjustment of bucket joint gap**

There is a regulation system of bucket connection gap capable of eliminating the connection slashing. When the connection slashing is increased, remove or attach the tab as described below.

a) Park the machine on flat ground, fall the bucket to ground with its plane down to avoid rolling the bucket.
b) Run the engine at low idle speed, turn the bucket clockwise on the ground until left boss top of bucket contacts the bucket rod.
c) Stop the engine. Pull the safety locking rod to LOCK (lock).



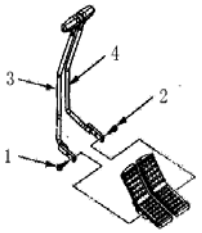
1-Bolt 2-Adjusting shim 3-Pressure plate 4-Cam

Note: in case of removing the tab, don't remove the bolt (Item 1 shown in Fig). The tab is half round, so it's easy to push them out with a screwdriver after loosening the bolt.

d) Loosen the bolt slightly with a spanner. Push out all the tabs in the clearance c between the pressure plate and bucket.
e) Push the bolt to one side of bucket rod, and eliminate the whole clearance a between bucket rod and cam. Push the cam onto the bucket rod to increase the clearance b, and measure the clearance b with a feeler gauge, which shall not be adjusted below 0.5mm.
f) Attach the adjusting shims as much as possible in the clearance b.

Note: be sure to the residual adjusting shims in the clearance c to avoid the damages to bucket rod tail end face or bolt.

g) Attach the residual tabs in the clearance c, and tighten the bolt.



1, 2—Bolt
3, 4—Traction control lever

Note: the total number of tabs is 12 (6 pairs).

h) If the measured value d is below 5mm, replace the cam.

- **Removal of traction operating lever**

If necessary, remove the traction operating lever.

a) Fall the bucket to ground.

b) Stop the engine as per its shutdown steps (P20).

c) Pull the safety locking rod to LOCK (lock).

d) Remove the bolts 1 and 2, and remove the traction operating levers 3 and 4 from the control valve.

- **Check and replacement of safety belt**

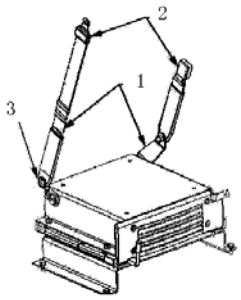
Check the safety belt every day; replace the safety belt every 3 years.

Keep the safety belt always good, and replace it if necessary to ensure its good performance.

Check the safety belt; lock latch and connector thoroughly before the operation.

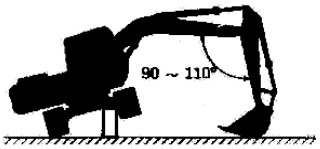
If the safety belt or its part is damaged or worn, replace it before the operation.

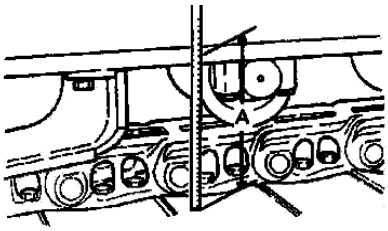
We suggest that the safety belt shall be replaced once every three years, regardless of its conditions.



1－Safety belt 2－Lock latch
3－Connector

- **Check of track sag**





Check the track sag every day.

As shown in Fig, rotate the upper car by 90°, and then fall the bucket to lift the track away from the ground, keep the angle between the movable arm and bucket rod within 90° to 110°, place the arc part of bucket on the ground, place the cushion block under the frame of chassis to support the machine, rotate the track back by two circles, rotate it forward by two circles, and measure the distance A between frame bottom and track plate back from middle part of chassis frame.

Requirements of track sag:

XE210CU：A=300～335 mm(11.8～13.2 in)

Note: check the slag of track after removing the soil on the track plate.

Adjust the sag of track**.**

a) Points for attention for adjusting the track sag

1) If the track sag is not within the desired range, loosen or tighten the track as per the steps below.

2) During the adjustment of track sag, fall the bucket to ground, and jack the track on one side. Apply the same methods to the track on the other side. Place the cushion block under the frame every time to support the machine.

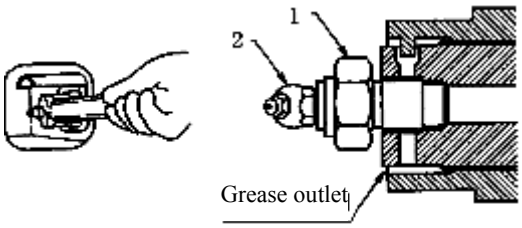
3) After adjusting the track sag on both sides, move the machine forward and backward several times.

4) Check the sag of track again. If the track sag can't reach the specified value, continue to adjust it until it's satisfactory.

b) Loosen the track.

Note:

1) **Don't loosen the valve body rapidly or Excessively, otherwise the grease in the tensioner will spray. Loosen the valve body carefully, and don't make the body and face against it.**
2) **Don't loosen the grease coupler.**
   Important: if the crushed stones or soils are clipped between the driving wheel and track, remove them after loosening the track.



1—Valve body 2—Grease coupler

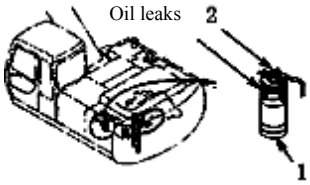
1) In case of loosening the track, rotate the valve body slowly anticlockwise with a deep socket wrench, and the grease will drain out of its outlet.
2) Rotate the valve body by 1 to 1.5 circles enough to loosen the track.
3) If the grease can't be smoothly drained, lift the track away from the ground, and rotate the track slowly.
4) After reaching the proper track sag, tighten the valve body clockwise.

c) Tighten the track.

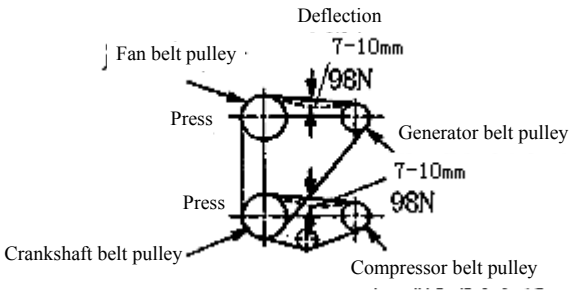
Note: if the track is still too tight after tightening the valve body anticlockwise, or it is still loose after applying the grease into the grease coupler, this is abnormal. At this time, don't try to remove the track or track-tension device, because the high-pressure grease of track-tension device is dangerous. Therefore, overhaul it or contact with your assigned dealer.

If it's necessary to tighten the track, connect the grease gun to grease coupler, add in the grease until the track sag reaches the specified value.

- **Check of air conditioner**



1—Liquid reservoir 2—Interface



a) Check the air conditioner every day.
b) Check the cooling gas at the connections of pipe for leaks (as shown in above figure). If the oil leaks are found near to the connections of pipes, the air leak may occur to these connections.
c) Check of refrigerant amount: after running the engine at 1500r/min for 1 to 3 minutes, check the amount of refrigerant through a sight glass on the liquid reservoir.
d) Check of condenser: if the blade of condenser is blocked by dirt or bugs, its cooling effects will be reduced. Therefore, keep them always clean.
e) Check of compressor: after using the air conditioner 5 to 10 minutes, touch the pipes on high- and low-pressure sides. If they are normal, the pipe on high-pressure side shall be hot, while that on low-pressure side shall be cold.
f) Check the mounting bolt for loosening: ensure the mounting bolt and other mounting or tightening bolts of compressor are well tightened.
g) Check of belt and adjustment of tension: Check the compressor and fan belt for wears visually. According to the above figure, check and adjust the tension of belt. The pressure of fan and compressor belt: about 98N, deflection: 7 to 10mm.

- **Check the tightening torques of bolt and nut.**

Check the tightening torques of bolt and nut every 250 hours.

After the first 50 hour breaking-in period of machine, check the tightness of bolt and nut, and then check it once every 250 hours. 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 the bolt and nut outside Tightening of Bolt, refer to "Tightening Torques".

Important: check or tighten the bolt and nut with a torque wrench.

a) Tightening Torques of Bolt

S/N	Item	Bolt diameter mm	Qty	Sleeve size mm	Torque Nm/lbf ft
1	Fixing bolt of engine vibration isolating rubber gasket (pump side)	18	2	27	410/295
	Fixing nut of engine vibration isolating rubber gasket (fan side)	12	4	18	120/88.6
2	Fixing bolt and nut of engine bearer	10	14	16	70/51.7
3	Fixing bolt of hydraulic oil tank	18	4	27	300/221.4
4	Fixing bolt of fuel tank	16	4	24	210/155
5	Fixing bolt of hydraulic pump	20	4	30	600/442.8
6	Fixing bolt of multi-way valve	12	3	18	120/88.6
7	Fixing bolt of multi-way valve holder	16	4	24	210/155
8	Fixing bolt of rotation gear	20	13	30	600/442.8
9	Fixing nut of battery	10	2	16	50/37
10	Fixing nut of cab	16	4	24	210/155
11	Fixing bolt of rotary bearing (upper car)	22	40	34	800/590.4
12	Fixing bolt of driving device	22	36	34	800/590.4
13	Fixing bolt of driving wheel	16	60	24	300/221.4
14	Fixing bolt of drag chain wheel	16	44	24	300/221.4
15	Fixing bolt of bearing wheel	16	16	24	300/221.4
16	Fixing bolt of track plate	18	72	27	410/302.6
17	Fixing bolt of rail clamp	18	408	27	400/302.6
18	Supporting bolt and nut of working device pin shaft	16	8	24	210/155
19	Counterweight mounting bolt	16	–	24	280/206.6
20	Low-pressure pipe adapter and T-shape bolt clip	36	4	55	3000/2214
		8	–	13	22/16.2
		5	–	8	9/6.6

b) Tightening Torques

Bolt specification	Size of socket wrench mm	Size of inner hexagonal wrench mm	Torque Nm/lbf ft	
			10.9 class	8.8 class
M8	13	6	30/22.1	20/14.8
M10	16	8	70/51.7	50/37
M12	18	10	120/88.6	90/66.4
M14	21	12	195/143.9	140/103.3
M16	24	14	300/221.4	210/155
M18	27		410/302.6	300/221.4
M20	30	17	600/442.8	400/302.6
M22	34		800/590.4	550/406
M24	36	19	1000/738	700/516.6
M27	41		1500/1107	1050/775
M30	46	22	1850/1365.3	1450/1070
M36	55	27	3000/2214	2450/1808

- **Maintenance of hammer crusher**

The operation of hydraulic hammer crusher will accelerate the pollution and deterioration of hydraulic oil. Therefore, in comparison with the machine with a bucket, require to replace the hydraulic oil and hydraulic oil tank filter frequently, otherwise the hammer crusher, hydraulic oil pump and other components of hydraulic system may be damaged, and adopt the following recommended replacement intervals.

Table 2-6 Replacement Intervals (Hours)

Accessory	Utilizing rate	hydraulic oil	Filter element
Bucket	100%	2000	500
Hammer crusher	100%	600	100

- **Maintenance under special environment conditions**

Operating conditions	Maintenance cautions
Mud field, rainy or snowy	Pre-operation: check if the screw plug and all the drain plugs are tightened. After-operation: clean the machine, and check if there are broken, damaged, loose or missed nut and bolt, and lubricate all the required parts immediately.
Seaside	Pre-operation: check if the screw plug and all the drain plugs are tightened. After-operation: clean the machine thoroughly with clean water to remove the salt content, and maintain the electric appliances frequently to avoid their corrosion.
Dusty air	Air filter: clean the filter elements at regular service intervals. Radiator: clean the mesh enclosure of oil cooler to avoid the blockage of radiator core. Fuel system: clean the filter elements and sieve at regular short service intervals. Electric appliances: clean them at regular intervals, especially the terminals of AC generator and starting motor.
Frosty weather	Fuel: adopt the appropriate low-temperature high-quality fuel. Lubricant: adopt the high-quality low-viscosity hydraulic oil and engine oil. Engine coolant: be sure to adopt the anti-freezing agent. Battery: charge the battery up at short regular intervals. In case of not charging the battery up, the electrolyte may be frozen. Track: keep the track clean, and park the machine on the hard ground to avoid freezing the track on the ground.
Stony ground	Track: careful operation. Check if there are broken, damaged or missing bolt and nut frequently, and loosen the track a little looser than usual. Working device: in case of digging the stony ground, the standard accessories may be damaged, adopt the front reinforced bucket or heavy-duty bucket.
Falling rocks	Cab: if necessary, install the cab roof support to avoid the damages of falling rocks to the machine.

- **Maintenance of engine**
  —See "***Operating Instructions of Engine***" in details
- **Maintenance of air conditioner**
  —See "***Operating Instructions of Air Conditioner***" in details

List of Maintenance Periods

Item	S/N	Maintenance point		Qty	Intervals (hours)							
					8	50	100	250	500	1000	1500	2000
Hydraulic system	1	Check the level of hydraulic oil.		1	√							
	2	Drain the oil reserve of oil tank.		1				√				
	3	Replace the hydraulic oil.										√
	4	Replace oil suction filter		1						√		
	5	Replacement of oil tank filter		1					√			
	6	Replacement of pilot oil filter		1						√		
	7	Replacement of breathing vavle		1					√			
	8	Check of hose and pipe	Oil leak		√							
			Crack or bend, etc					√				
Fuel system	1	Drain the dirt reserve tank of fuel tank		1	√							
	2	Check of water separator		1	√							
	3	Replacement of fuel filter (second class)		2				√				
	4	Check of fuel hose	Leak or crack		√							
			Crack or bend, etc					√				
Air filtering system	1	Outer element of air filter	Clean	1	Or when the indicator goes on			√				
			Replace	1	Clean six times or after one year							
	2	Inner element of air filter	Replace	1	When replacing the outer filter elements							
Cooling system	1	Check of coolant level		1	√							
	2	Check or adjustment of fan belt tension		1	√							
	3	Replacement of coolant (anti-freeze fluid)			Twice per year							
	4	Cleaning of radiator and oil cooler core or intercooler	Inner	1	If required				√			
			Outer	1	When replacing the cooling water							
	5	Cleaning of front mesh enclosure of oil cooler		1	If required				√			
	6	Cleaning of air conditioner condenser		1	If required				√			
Others	1	Check the bucket teeth for wears and loosening.			√							
	2	Adjustment of bucket connection		1	If required							
	3	Check and replacement of safety belt		1	√	Every three years (replacement)						
	4	Check the level of front window glass washing liquid.		1	If required							

	5	Check of track sag			2	If required							
	6	Check of air conditioner filter	Recirculation air filter	Clean	1					√			
				Replace	1	After at least six cleanings							
			Fresh air filter	Clean	1					√			
				Replace	1	After at least six cleanings							
	7	Check of air conditioner				√							
	8	Fastening of cylinder head bolt				If required							
	9	Check and adjustment of valve clearance									√		
	10	Check of fuel injection timing				If required							
	11	Check of starter and AC generator									√		
	12	Check of bolt and nut tightening torque					★		√				

Note: ★ Maintenance is required only for the first check.

Trouble shooting

- **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 manual.

a) Check the machine before starting it every day.

1) Check the controller and instruments.
2) Check the levels of coolant, fuel and hydraulic oil.
3) Check the hoses and pipes for leaks, twists, wears or damages.
4) Make a patrol inspection of common conditions, noises or heat around the machine.
5) Check the part for loosening or missing.
6) If anything wrong with the machine, repair it before the operation, or contact with your assigned dealer.

Important: 1) Adopt the correct oil products, grease and anti-freeze fluid. 2) Any use of incorrect oil product, grease or sterling part will lead to the loss of product warranty. 3) Don't adjust the engine speed limiter or hydraulic system safety valve. 4) Avoid any contact of electric component with water and steam. 5) Don't disassemble the main controller, sensor or other electric components.

b) Check the hour meter frequently:

1) Determine the time of machine check and maintenance according to the operating hours shown by the engine working hour meter.
2) 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.
3) 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.
4) 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.

c) Adopt the correct oil products, lubricant and anti-freeze fluid.

Important: adopt the correct oil products, grease and anti-freeze fluid always, otherwise the machine will be damaged and the warranty of this machine will be lost.

- **Trouble shooting**

a) Engine

Trouble	Cause	Remedy
Engine rotates, but it can't be started or difficult to start.	No fuel	Add in fuel, and exhaust the air.
	Wrong fuel	Empty the oil tank, and adopt the correct fuel.
	Polluted fuel	Empty the oil tank, and add in clean fuel.
	Low capacity of battery	Charge or attach a new battery.
	Trouble of injection pump	Contact with the assigned dealer of XEM (Xugong Excavator Machinery Co., Ltd.)
	Trouble of preheat circuit or igniter plug	Contact with the assigned dealer of XEM (Xugong Excavator Machinery Co., Ltd.)
	Poor contact of circuit	Clean and fix the connection of battery and starting motor.
	Trouble of starting motor	Replace the starting motor.
	Wrong engine oil	Drain the oil, and adopt the correct oil.
	Blockage of air filter	Replace the filter elements.
	Blockage of fuel filter	Bleed the air out of fuel system, and clean the sieve of fuel tank.
	Low compression ratio of engine	Contact with the assigned dealer of XEM.

	Dirty nozzle or incorrect operation	Contact with the assigned dealer of XEM.
	Trouble of fuel cutoff linkage	Adjust or repair the linkage.
	Leakage of fuel system	Check the connection of fuel system.
	Air exists in fuel system.	Bleed the air.
	Pop-up of fuel supply pump plunger	Push down and tighten the hand wheel.
	Dirty transfer pump sieve	Clean or replace
Shot noise, abnormal running or stoppage of engine	Low level of engine oil	Add in engine oil.
	Blockage of air suction system	Clean the filter system.
	Dirty transfer pump sieve	Clean or replace
	Off-time of injection pump	Contact with the assigned dealer of XEM.
	Blockage of fuel filter	Renew the filter.
	Low temperature of cooling water	Incorrect operation of thermostat or it's too cold.
	Water, dirt or air exists in fuel system	Drain the air out of fuel system, and clean the outlet sieve of fuel tank.
	Dirt or trouble of nozzle.	Contact with the assigned dealer of XEM.
	Fuel cutoff linkage trouble	Adjust or repair the linkage.
The engine can't function fully.	Blockage of air filter	Replace the filter elements.
	Blockage of fuel pipe	Repair or replace the fuel pipe.
	Polluted fuel	Empty the fuel tank and clean the outlet sieve, and add in the oil again.
	Blockage of fuel filter	Replace the filter.
	Blockage of fuel tank cover vent hole	Clean or attach a new cover.
	Dirt or trouble of fuel nozzle	Contact with the assigned dealer of XEM.
	Adjustment required for injection pump linkage	Contact with the assigned dealer of XEM.
	Wrong fuel	Adopt the correct fuel.
	Wrong engine oil	Adopt the correct engine oil.
	Trouble of turbo charger	Contact with the assigned dealer of XEM.
	Off-time of injection pump	Contact with the assigned dealer of XEM.
	Blockage of emission	Remove the muffler and run the engine.
	Overheat or overcooling of engine	See below
	Trouble of engine	Contact with the assigned dealer of XEM.
	Leaks of air suction or bleeding system	Contact with the assigned dealer of XEM.
Overheat of engine	Low level of cooling water	Add in cooling water.
	Trouble of thermostat	Contact with the assigned dealer of XEM.
	Overload of engine	Check the hydraulic safety valve.
	Wear of radiator cap	Attach a new cap.
	Blockage of radiator core and oil cooler core	Clean the radiator and oil cooler.
	Blockage of radiator mesh enclosure	Clean the mesh enclosure.
	Off-time of injection pump	Contact with the assigned dealer of XEM.
	Damage of fan	Replace the fan.
	Blockage of air filter	Clean the air filter.
	Loosening of AC generator and fan belt	Tension the belt or attach a new belt.
	Wear of belt pulley	Replace the belt pulley
	Dirty cooling system pipe	Flush the cooling system.
	Trouble of thermometer or transfer	Contact with the assigned dealer of XEM.

	unit	
Overlow temperature of cooling water	Trouble of thermostat	Contact with the assigned dealer of XEM.
	Trouble of thermometer or transfer unit	Contact with the assigned dealer of XEM.
Low pressure of engine oil	Trouble of engine oil pump or pump drive	Contact with the assigned dealer of XEM.
	Low level of engine oil	Add in engine oil.
	trouble of engine oil pressure control valve	Contact with the assigned dealer of XEM.
	Blockage of oil pump suction mesh enclosure	Contact with the assigned dealer of XEM.
	Blockage of oil filter	Renew the oil filter.
	Leak of engine oil	Leak check.
	Engine oil is diluted by fuel or cooling water.	Contact with the assigned dealer of XEM.
	Overhigh temperature of engine	Check the cooling system.
	Wrong engine oil	Drain the oil, and adopt the correct oil.
Excessive consumption of engine oil	Wrong engine oil	Drain the oil, and adopt the correct oil.
	Leak of engine oil	Check the engine oil drain plug.
	Overheat of engine	Check the cooling system.
	Blockage of air filter	Clean the filter element or attach new filter elements.
	Wear of inner parts of engine	Contact with the assigned dealer of XEM.
Excessive consumption of engine fuel	Blockage or dirt of air suction system	Clean the air suction system.
	Wrong fuel	Adopt the correct fuel.
	Dirty fuel nozzle	Contact with the assigned dealer of XEM.
	Off-time of injection pump	Contact with the assigned dealer of XEM.
Too black or grey exhaust fume	Wrong fuel	Empty the oil tank, and adopt the correct fuel.
	Blockage or dirt of air suction or discharge system	Clean the air suction or discharge system.
	Off-time of injection pump	Contact with the assigned dealer of XEM.
	Dirty fuel nozzle or its incorrect operation	Contact with the assigned dealer of XEM.
	Trouble of engine body	Contact with the assigned dealer of XEM.
Failure of engine	Trouble of battery	Charge or replace.
Insufficient capacity of battery	Loose connection or corrosion	Clean, tighten or replace the battery.
	Loosening of AC generator belt	Tension the belt or attach a new belt.
	AC generator fails to charge.	Contact with the assigned dealer of XEM.
	Broken fuse	Replace the fuse.
	Trouble of key switch	Replace the key switch.
Starting motor can't rotate.	Insufficient capacity of battery or damaged	Charge or replace the battery.
	Poor connection of battery circuit	Clean the connection.
	Broken fuse	Replace the fuse.
	Trouble of key switch	Contact with the assigned dealer of XEM.
	Trouble of starting relay	Contact with the assigned dealer of XEM.
	Trouble of starting motor magnetic coil	Contact with the assigned dealer of XEM.
	Trouble of starting motor	Repair or replace the starting motor.
	The starting motor pinion is clamped	Repair or replace starting motor.

	in the flywheel gear.	
	Trouble of engine body	Contact with the assigned dealer of XEM.
Magnetic vibration of starting motor	Poor connection of battery or starting motor circuit	Clean the connection part.
	Low capacity of battery	Charge or replace battery
	Opening of starting motor magnetic "hold" coil	Contact with the assigned dealer of XEM.
The starting motor rotates but it can't be started.	Disengagement of starting motor pinion with the flywheel gear	Contact with the assigned dealer of XEM.
	Seizure or trouble of pinion shift mechanism	Contact with the assigned dealer of XEM.
	Fracture of pinion teeth	Contact with the assigned dealer of XEM.
	Fracture of flywheel gear teeth	Contact with the assigned dealer of XEM.
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.
The engine bleeds white gas.	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 with the assigned dealer of XEM.
	Off-time of injection pump	Contact with the assigned dealer of XEM.
	Leak of cooling water into the cylinder of engine	Contact with the assigned dealer of XEM.
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 dealer.
	Air leaks of engine, suction or drain pipe	Check or repair.
	Improper gap between the turbine and turbine case	Contact with the assigned dealer of XEM.
	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	Contact with the assigned dealer of XEM, check and clean the air filter, check if the service interval of engine is proper or dirt enters into the engine.
	Overhigh pressure of crankcase	Check the vent pipe, ensure the pipe is not blocked, and clean it.
	Blockage of turbo charger return pipe at the exhaust pipe	Remove the pipe, and check or clean it.
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
	Overhigh temperature, unbalanced impeller, dirty oil, lack of oil or insufficient lubrication causes the seizure, dirt and wear of bearing.	Contact with the assigned dealer of XEM.

b) Electrical system

Trouble	Cause	Remedy
Slow starting of engine	Current leakage of battery or it can't hold the charge capacity.	Replace the battery.
	"Draggle" of starting motor	Contact with the assigned dealer of XEM.
	Low voltage of battery	Charge or replace battery
The starting motor continues to run after starting the engine.	Trouble of starting relay	Contact with the assigned dealer of XEM.
	Suction of starting motor magnetic coil	Contact with the assigned dealer of XEM.
	The starting motor can't be disconnected.	Contact with the assigned dealer of XEM.
	Trouble of key switch	Contact with the assigned dealer of XEM.
The charging indicator goes on during the running of engine.	Loosening or slipping of AC generator belt	Check the belt, if slipped, replace; if loose, tension.
	Low speed of engine	Adjust the speed to the specified value.
	Attached accessories cause the electric overload.	Remove the attached accessories or install higher-output AC generator.
	Loosening of battery, grounding steel strip, starting motor or AC generator, corrosion of electric connection	Check, clean or tighten the electric connection.
	Low voltage of battery	Charge or replace the battery.
	AC generator trouble	Contact with the assigned dealer of XEM.
	Trouble of monitor	Contact with the assigned dealer of XEM.
Fracas of AC generator	Worn driving belt	Replace the belt.
	Worn belt pulley	Replace the belt pulley and belt.
	Improper adjustment of belt pulley	Adjust the installation of AC generator
	Trouble of AC generator bearing	Loosen the belt of AC generator, and turn the belt pulley by hands. In case of feeling difficult to turn, repair AC generator.
Indicator of monitor can't go on.	Trouble of monitor	Contact with the assigned dealer of XEM.
	Trouble of electric wiring	Contact with the assigned dealer of XEM.
	Damaged fuse	Replace the fuse.
	Trouble of sensor.	Check the sensor.
The cooling water thermometer fails to work.	Damaged fuse	Replace the fuse.
	Trouble of thermometer	Contact with the assigned dealer of XEM.
	Trouble of temperature sensor	Check the sensor of cooling water thermometer.
	Trouble of electric circuit	Contact with the assigned dealer of XEM.
The automatic idling indicator goes out.	Damaged fuse	Replace the fuse.
	Trouble of automatic idling switch	Contact with the assigned dealer of XEM.
The fuel meter can't work.	Damaged fuse	Replace the fuse.
	Damaged fuel meter	Contact with the assigned dealer of XEM.
	Trouble of electric circuit	Contact with the assigned dealer of XEM.
Working mode toggle fails to work.	Trouble of mode toggle	Contact with the assigned dealer of XEM.
	Damaged electric joint	Contact with the assigned dealer of XEM.
	Trouble of monitor	Contact with the assigned dealer of XEM.
Fast/slow driving speed deactivates.	Trouble of driving mode switch	Contact with the assigned dealer of XEM.
	Trouble of monitor	Contact with the assigned dealer of XEM.
	Trouble of solenoid valve	Contact with the assigned dealer of XEM.
	Damaged running motor	Contact with the assigned dealer of XEM.

Automatic idling deactivates.		Damaged fuse	Replace the fuse.
		Trouble of pilot pressure switch	Contact with the assigned dealer of XEM.
		Trouble of electric circuit	Contact with the assigned dealer of XEM.
		Trouble of engine control motor	Contact with the assigned dealer of XEM.
		Trouble of main controller	Contact with the assigned dealer of XEM.
The trouble indicator flashes.	Once or brighten.	Contact with the assigned dealer of XEM.	Contact with your assigned dealer.
	Twice	Abnormal current of motor	Contact with the assigned dealer of XEM.
	Three times	Pause of motor action	Contact with the assigned dealer of XEM.
	Four times	Motor poor in the range of action	Contact with the assigned dealer of XEM.
	Five times	Broken circuit or short circuit of built-in potentiometer of motor	Contact with the assigned dealer of XEM.
	Six times	Set broken circuit or short circuit of potentiometer	Contact with the assigned dealer of XEM.
	Seven times	Abnormal current of magnetic coil	Contact with the assigned dealer of XEM.
	Eight times	Overlow speed of engine	Contact with the assigned dealer of XEM.
	Extinguish	Trouble of controller	Contact with the assigned dealer of XEM.

c) Hydraulic system

Trouble	Cause	Remedy
Slow hydraulic function	Low level of hydraulic oil	Fill the hydraulic oil up to full scale.
	Low temperature of hydraulic oil	Preheat the machine.
	Wrong use of hydraulic oil	Empty the oil tank, and adopt the correct hydraulic oil
	Overlow speed of engine	Accelerate or contact with your assigned dealer.
	Wear of hydraulic pump	Contact with the assigned dealer of XEM.
	Blockage of pump suction pipeline	Contact with the assigned dealer of XEM.
Overheat of hydraulic oil	Wrong use of hydraulic oil	Adopt the correct hydraulic oil
	Air leak of pump oil suction pipeline	Contact with the assigned dealer of XEM.
	Blockage of hydraulic pipeline	Contact with the assigned dealer of XEM.
	Low level of hydraulic oil	Fill the hydraulic oil to full scale.
	Blockage of filter	Attach a new filter
	Wear of hydraulic pump	Contact with the assigned dealer of XEM.
	Blockage of radiator or oil cooler	Clean and straighten the blade.
	Bypass of oil cooler	Contact with the assigned dealer of XEM.
	Trouble of safety valve	Contact with the assigned dealer of XEM.
	Polluted hydraulic oil	Drain the oil and fill it up.
	Improper adjustment of hydraulic components	Contact with the assigned dealer of XEM.
Foaming of hydraulic oil	Air leak of the pipe from oil tank to pump	Contact with the assigned dealer of XEM.
	Twist or depression of hydraulic pipeline	Check the pipeline.
	Wrong hydraulic oil	Adopt the correct hydraulic oil.
	Water in hydraulic oil	Replace the hydraulic oil.
	Overhigh or overlow oil level	Calibrate the oil level.
Low or no oil pressure	Wrong hydraulic oil	Adopt the correct hydraulic oil.
	Improper adjustment of hydraulic components	Contact with the assigned dealer of XEM.

	No hydraulic oil in the system	Fill up the correct hydraulic oil.
	Worn hydraulic cylinder packing	Contact with the assigned dealer of XEM.
	Trouble of safety valve	Contact with the assigned dealer of XEM.
No hydraulic function (fracas of pump)	Wear of hydraulic pump	Contact with the assigned dealer of XEM.
	Reduction of set pressure of main safety valve of control valve	Contact with the assigned dealer of XEM.
	Low level of hydraulic oil	Fill up the hydraulic oil.
	Damage of oil suction pipeline or hose	Contact with the assigned dealer of XEM.
	Blockage of suction filter, and air sucked in oil suction.	Clean the filter system.
The hydraulic cylinder acts but it can't lift the load.	Wear of hydraulic pump	Contact with the assigned dealer of XEM.
	Low pressure of main safety valve	Contact with the assigned dealer of XEM.
	Low level of hydraulic oil	Fill up the hydraulic oil.
	Blockage of suction filter	Clean the filter system.
	Leakage of pump suction pipeline	Check the oil suction pipeline.
One operating lever fails to work.	Low pressure of safety valve	Contact with the assigned dealer of XEM.
	Damage of pipe or hose	Repair or replace
	Loosening of hydraulic joint	Tighten.
	Damage of O-ring in the joint	Attach a new O-ring.
	hydraulic pump trouble	Contact with the assigned dealer of XEM.
	Trouble of pilot valve	Contact with the assigned dealer of XEM.
	Damage of pilot pipeline	Repair or replace
One hydraulic cylinder fails to work.	Control valve column is damaged or polluted by dirt.	Contact with the assigned dealer of XEM.
	Damage of hydraulic pipeline	Repair or replace
	Loosening of joint	Tighten.
	Damage of O-ring in the joint	Attach a new O-ring.
	Trouble of pilot valve	Contact with the assigned dealer of XEM.
	Damage of pilot pipeline	Repair or replace
One hydraulic cylinder fails to work or almost deactivates.	Leakage of hydraulic cylinder seal	Contact with the assigned dealer of XEM.
	Damage of hydraulic cylinder lever	Contact with the assigned dealer of XEM.
	Damage of pilot pipeline	Repair or replace
	Trouble of pilot valve	Contact with the assigned dealer of XEM.
	Trouble of circuit	Contact with the assigned dealer of XEM.
Two travel motors fail to work.	Trouble of center sub body	Contact with the assigned dealer of XEM.
One travel motor fails to work	Trouble of travel motor	Contact with the assigned dealer of XEM.
	Unreleased of brake	Contact with the assigned dealer of XEM.
	Trouble of pilot valve	Contact with the assigned dealer of XEM.
	Damage of pilot pipeline	Repair or replace
Unstable travel	Adjustment required for track	Adjust the track sag
	Damage of track guide wheel, supporting	Contact with the assigned dealer of XEM.

	wheel or carrying wheel	
	Bend of chassis frame	Contact with the assigned dealer of XEM.
	Seizure of stone block or soil in the chassis frame	Remove and repair.
	Unreleased of moving brake	Contact with the assigned dealer of XEM.
Rotation deactivates.	Trouble of rotary motor	Contact with the assigned dealer of XEM.
	Trouble of pilot valve	Contact with the assigned dealer of XEM.
Unsmooth rotation.	Trouble of rotary gear	Contact with the assigned dealer of XEM.
	Trouble of rotary bearing	Contact with the assigned dealer of XEM.
	Lack of grease	Add in the grease.

Periodic replacement of parts

In order to make sure the safety of operation, be sure to check the machine at regular intervals. If any of the following parts is damaged, it may cause a severe accident or fire. The deterioration or damage of these parts is difficult to determine via a visual check, so these parts shall be replaced at the intervals shown in the table below, however, if they are found to be poor during the check, they shall be replaced before the operation of machine, regardless of the interval of replacement.

In case of replacing the hose, it's also required to check their pipe clips for deformations, breakage or damages, and replace them according to the demands. Be sure to check all the following hoses at regular intervals, and replace or tighten any poor part as per the demands.

Part replaced at regular intervals			Replacement interval
Engine		Fuel hose (from fuel tank to filter)	Every two years
		Fuel hose (from fuel tank to injection pump)	Every two years
		oil filter hose (from engine to oil filter)	Every two years
Hydraulic system	Basic body	Oil pump inlet hose	Every two years
		Oil pump outlet hose	Every two years
		Hydraulic hose of rotation gear	Every two years
	Accessories of working device	Hose of movable arm hydraulic cylinder pipeline	Every two years
		Hose of bucket rod hydraulic cylinder pipeline	Every two years
		Hose of bucket hydraulic cylinder pipeline	Every two years
		Hose of pilot pipeline	Every two years

Cnsumable Part list

NO.	Symbol Specification	Description	Q'ty	Remarks
1	803169358	Oil Filter Core	1	3101869
2	800105027	Fuel Filter Core（Fine）	2	3329289
3	800104948	Fuel Filter Core（Coarse）	1	R120T
4	803172684	Air cleaner Filter Core（inner）	1	P777869
5	803172683	Air cleaner Filter Core（outer）	1	P777868
6	800107886	Resistor, Corrosion	1	3100308
7	803379571	Hydraulic Fluid Filter Core (oil absorbing)	1	TLX235RK /100
8	803379572	Hydraulic Fluid Filter Core(oil return)	1	TLX468B/10
9	803182167	Hydraulic Fluid Filter Core (pilot)	1	FE040FD1
10	803608734	Fuse (5A)	5	0257005
11	803608735	Fuse (10A)	10	0257010

12	803608737	Fuse (20A)	5	0257020
13	803608736	Fuse (15A)	5	0257015
14	803608738	Fuse (30A)	5	0257030
15	803608835	Fuse（60A）	1	153.5631.560
16	803602240	Fuse（50A）	1	153.5631.550
17	803202234	Fuse（125A）	1	153.5631.612
18	800306030	Fan Belt AV13×1100	1	GB/T13352-2008
19	803172581	"O" Ring 170X14G	1	Buket
20	801102871	"O" Ring 165×5.3	1	fuel oil tank
21	801100224	"O" Ring 136X3.55	1	Hydraulic oil tank
22	803172578	"O" Ring 195X3.55	1	Hydraulic oil tank
23	801102863	Grease Cup R1/8	10	25102-11
24	819908812	Tape 300×8	10	

Transport, storage and protection

Transport

Cautions of transport

- **During the attachment of machine to the platform of truck or trailer, or removal of machine from them**

a) During the transport of machine on the road, be sure to follow the local laws and regulations.
b) Provide the appropriate truck or trailer for the convenience of machine transport.

- **Cautions of machine removal**

a) Choose the firm or flat ground.
b) Be sure to adopt the platform or slope.
c) During the removal of machine, there must be a signalman.
d) Choose the slow-speed mode with a travel mode toggle to avoid high-speed.
e) The steering on the slope is very dangerous, and avoids the steering when going up or down the slope.
If the steering is required, transport the machine back to the ground or trailer platform, and drive it on the slope after rectifying the direction.
f) In case of driving up or down the slope, don't use any other operating lever other than the traction operating lever.
g) The intersection of slope top and trailer platform is convex, and drive the machine by this intersection.
h) Avoid the possible injuries caused by the turnover of machine during the rotation of upper car.
i) Keep the bucket rod retracted down and rotate the upper car slowly to achieve the optimum stability.
j) Fix the frame of machine with a chain or rope.

Road transport

During the transport of machine on the road, learn of and follow all the local laws and regulations.

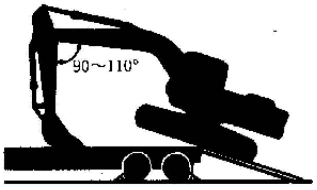
- During the transport of trailer, verify the length, width, height and weight of trailer for loading the machine.
  Note: the transport weight and size may be different due to the type installed track plate or front working device.
- Observe the conditions of transport route in advance, e.g. size, weight limit and traffic regulations. In case of disassembling the machine, meet the local specified size or weight limit.

Removal of trailer

Remove the machine always on firm and flat ground.

Note: be sure to use the platform or slope during the loading and unloading.

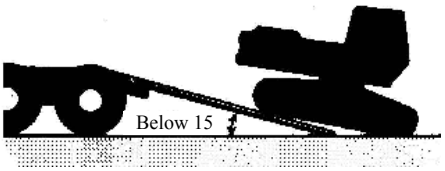
- **Adopt the slope or platform.**



a) Clean the slope or platform and trailer platform thoroughly before loading and unloading, the risk of slipping may exist on them with oil dirt, soil or ice.
b) During the use of slope or platform, place the damp block under the wheel of front body and trailer.
c) The slope or platform must have enough width, length and strength to make the inclination angle of slope or the gradient of platform below 15°.

- **Loading**

a) The direction of machine is down: with front-end working device: move the working device forward with it placed on front body; without front-end working device: travel in reverse direction as shown in above figure.
b) The centerline of machine shall be on the centerline of trailer.



c) Drive the machine slowly on the slope. With front-end working device:
1) Support the plane bucket on the trailer, and the angle between bucket rod and movable arm should be within 90º to 110º.
2) Upon inclining the machine to trailer platform, support the bucket to the trailer, move the machine slowly forward, until the whole track moves on the trailer and contacts the platform.

3) Lift the bucket slightly, retract the bucket rod and make it under the machine, and rotate the upper car slowly by 180º.
4) Fall the bucket to sleeper.
d) Stop the engine, and remove the key from key switch.
e) Move the operating lever several times until the whole pressure of hydraulic cylinder is released.
f) Pull the safety locking rod to LOCK (lock).
g) Close the window, skylight and door of cab, and cover the air outlet to prevent the wind and rain from entering into it.

Note: in the cold weather, be sure to heat the machine before loading/unloading it.

- **Transport**

Note: tie the chain or rope to the frame of machine, and don't make the chain or rope pass through or pressed on the hydraulic pipe or hose.

a) Place the damp blocks before and behind the track to fix the machine.

b) Fix four corners of machine and front-end working device to the trailer with a chain or rope.

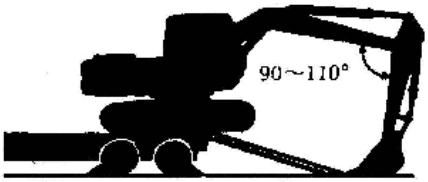
● **Unloading**

⚠ **Note: make the intersection of trailer platform rear end and slope convex, and drive the machine by it carefully.**

Important: avoid any possible damage of front-end working device. During the unloading, keep the angle between the bucket rod and movable arm within 90° to 110º always, retract the bucket rod, and any unloading may cause the damages to machine.

a) Upon moving the tail end of machine through the trailer to the slope or platform, support the bucket plane on the ground, and make the angle between bucket rod and movable arm within 90º to 110º.
Important: avoid any possible damage of hydraulic cylinder, and avoid any fierce collision of bucket to the ground.

b) Place the bucket on the ground before the machine starts to incline forward.



c) During the forward movement of machine, lift the movable arm and stretch the bucket rod until the machine drives fully under the slope or platform.

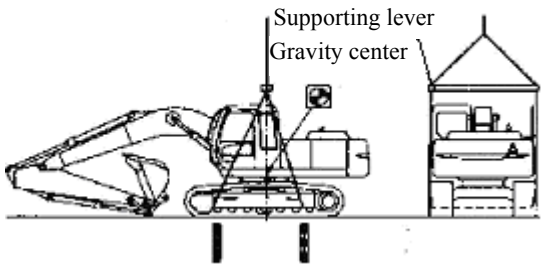
● **Lifting method of machine**

⚠ **Note:**

1) **Lifting steel rope and other lifting tools may be broken, which results in the serious injury of person. Don't use any damaged or aged steel rope or lifting tool.**
2) **For correct lifting methods, types or sizes of lifting steel rope and lifting tools, contact with the assigned dealer.**
3) **Pull the safety locking rod to LOCK (lock), and avoid any unexpected movement of machine during the lifting.**
4) **Incorrect lifting methods and incorrect mounting of steel rope will cause the movement of machine during the lifting, which results in the damages to machine and injuries to the persons.**
5) **Don't lift the machine rapidly, otherwise the lifting steel rope and lifting tools will be overloaded and may lead to their fracture.**
6) **Don't let any person approachable to the lifted machine or drive under it.**
7) **Linfting man is forbidden**.
8) **The gravity center marked on the machine is for the machine of standard specifications, but the actual gravity center will be changed as per the type of installed accessory or chosen device and their position. Therefore, ensure the balance of machine can't be lost in case of lifting the machine.**

For the bucket rod and bucket hydraulic cylinder that are fully extended, fall the movable arm until the bucket contacts the ground.

a) Pull the safety locking rod to LOCK (lock).
b) Stop the engine, and remove the key from key switch.
c) Adopt the steel rope and supporting rod with enough length, make them not contact the machine during the lifting. Wrap some protective material around the steel rope or supporting rod as per the demands to avoid the damages to machine.
d) Drive the crane in proper lifting position.
e) As shown in Fig, make the steel rope pass under the chassis frame on both sides, and attach it to the crane.



Storage and protection

Daily and short-term storage and protection

- Check the machine, repair the worn and damaged parts. If necessary, attach new parts.
- Clean the air filter element.
- If possible, retract all the hydraulic cylinders; if impossible, apply the grease to the exposed rod of hydraulic cylinder.
- Lubricate all the lubrication points.
- Place the track on the long and stable damp block.
- Clean the machine.
- After charging the battery up, remove the battery and store it at dry and safe place. If not, separate the connection of battery negative-pole cable on the wiring terminal (-).
- Add the anti-rust agent into engine coolant. In winter, adopt the anti-freezing agent or drain the coolant off. If the cooling system is emptied, be sure to hang a nameplate "No Water of Radiator" in conspicuous position.
- Loosen the belts of AC generator and cooling fan.
- Apply the paint to desired positions to avoid rusting.
- Store the machine at dry and safe place. In case of storing it outdoor, adopt the water shield.

Long-term storage

- **Storage place**

a) Commonly store in the ventilated and dry warehouse.
b) If the device is stored in open air, park it on the concrete ground easy to drain the water, cover and fix the canvas or hood, and store it at the place that can't be invaded by natural disaster and without corrosive or harmful substance or gas.

- **Storage**

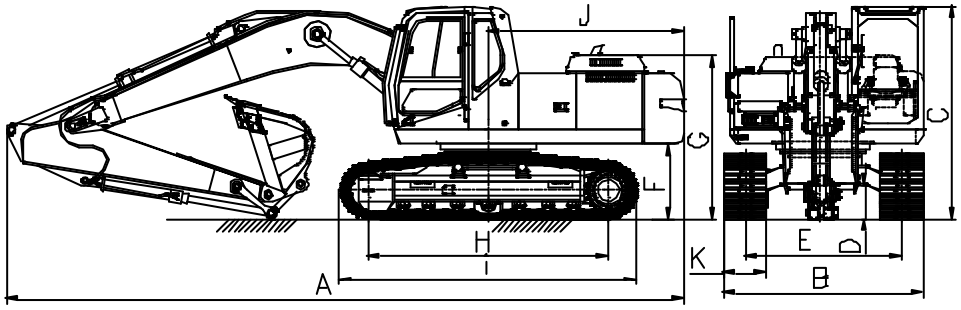
a) Use the hydraulic functions of moving, rotation and digging twice to three times every month to lubricate all the parts. Check the level of coolant and lubrication state before the operation.
b) Check the appearance quality, protection side and anti-corrosion substances, etc at regular intervals
c) .temperature requirements for long-term storage(-25℃～75℃)/(-77℉～167℉）

Use preparation after storage

- Remove the coverings.
- Remove the protective substances painted on the exposed part.
- Charge the battery, mount or connect it.
- After draining the oil of engine crankcase, renew the oil.
- After draining the gear oil in the rotary and traction reducer, renew the gear oil.
- Drain the inclusions and mixed water out of the hydraulic oil tank and fuel tank.
- Apply the grease to each hinged position.
- Fill in the coolant as per the specification.
- For the check before the operation, refer to the relevant regulations of operation.

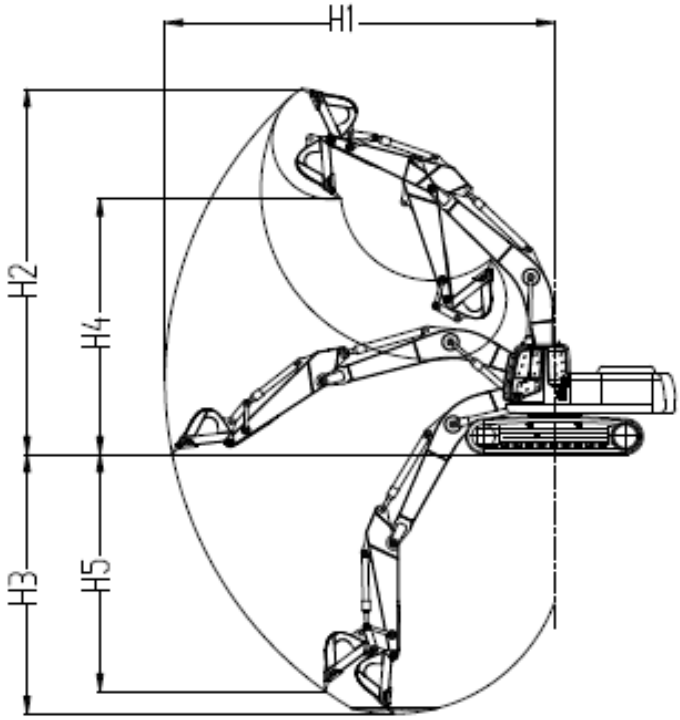
Technical specifications

Product specification



Model		XE210CU	XE240LC	unit
Kerb mass		21450/47288	24867/54822	Kg/lb
Standard bucket capacity		1.0/1.3	1.2/1.7	m^3 /yd^3
发动机	Model	Cummins	Cummins QSB6.7	-
	Rated power	116/155	142/190	KW/HP
	Rated speed	2000 r/min	2200 r/min	r/min
A	Total length (transport)	9550/376	10195/400	mm/in
B	Total width (transport)	3000/118	3390/133.5	mm/in
C	Cab height (transport)	3100/122	3100/122	mm/in
D	Height of cab	485/19	485/19	mm/in
E	length of track	2390/94.1	2590/102	mm/in
F	Width of track plate	1056/41.6	1053/41.5	mm/in
G	Track gauge	2325/91.5	2325/91.5	mm/in
H	Minimum ground	3647/143.6	3842/151	mm/in
I	Rotating radius of tail	3570/140.5	3570/140.5	mm/in
J	Min swing radius	2800/108.2	2985/117.5	mm/in
K	Shoe width	800/31.5	800/31.5	mm/in
	Max. traveling speed	5.5/3.3	5.2/3.5	km/h
	rotary speed	12.1	11.3	r/min

Operation range

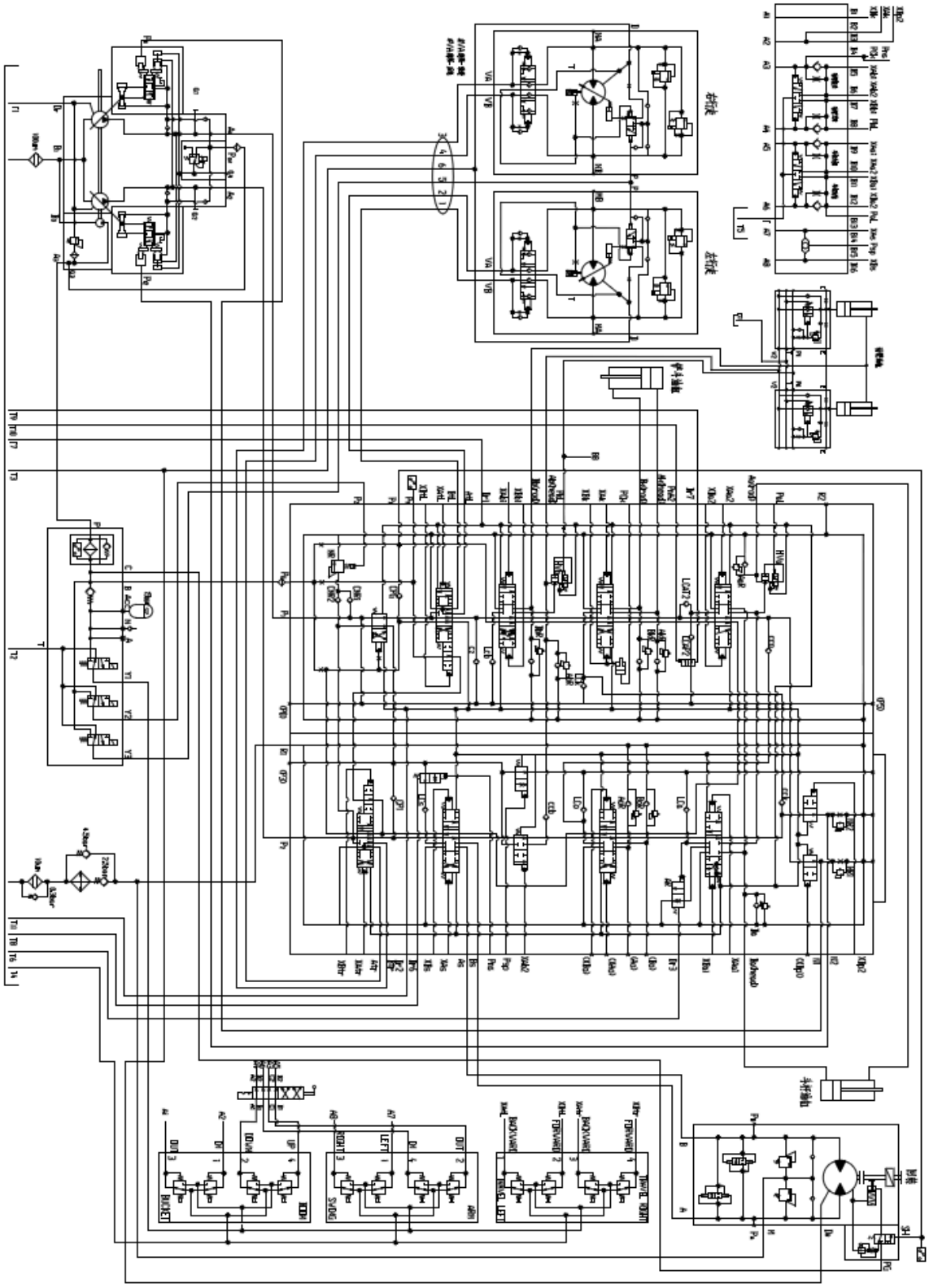


Item		XE210CU	XE240LC	unit
H1	Max imum digging radius	9925/391.2	10240/403.6	mm/in
H2	maximum digging height	9640/379.9	9595/378.2	mm/in
H3	maximum digging depth	6927/273	6960/274.3	mm/in
H4	maximum unloading height	6800/268	6947/273.8	mm/in
H5	maximum aplomb digging depth	6470/255	6750/266	mm/in

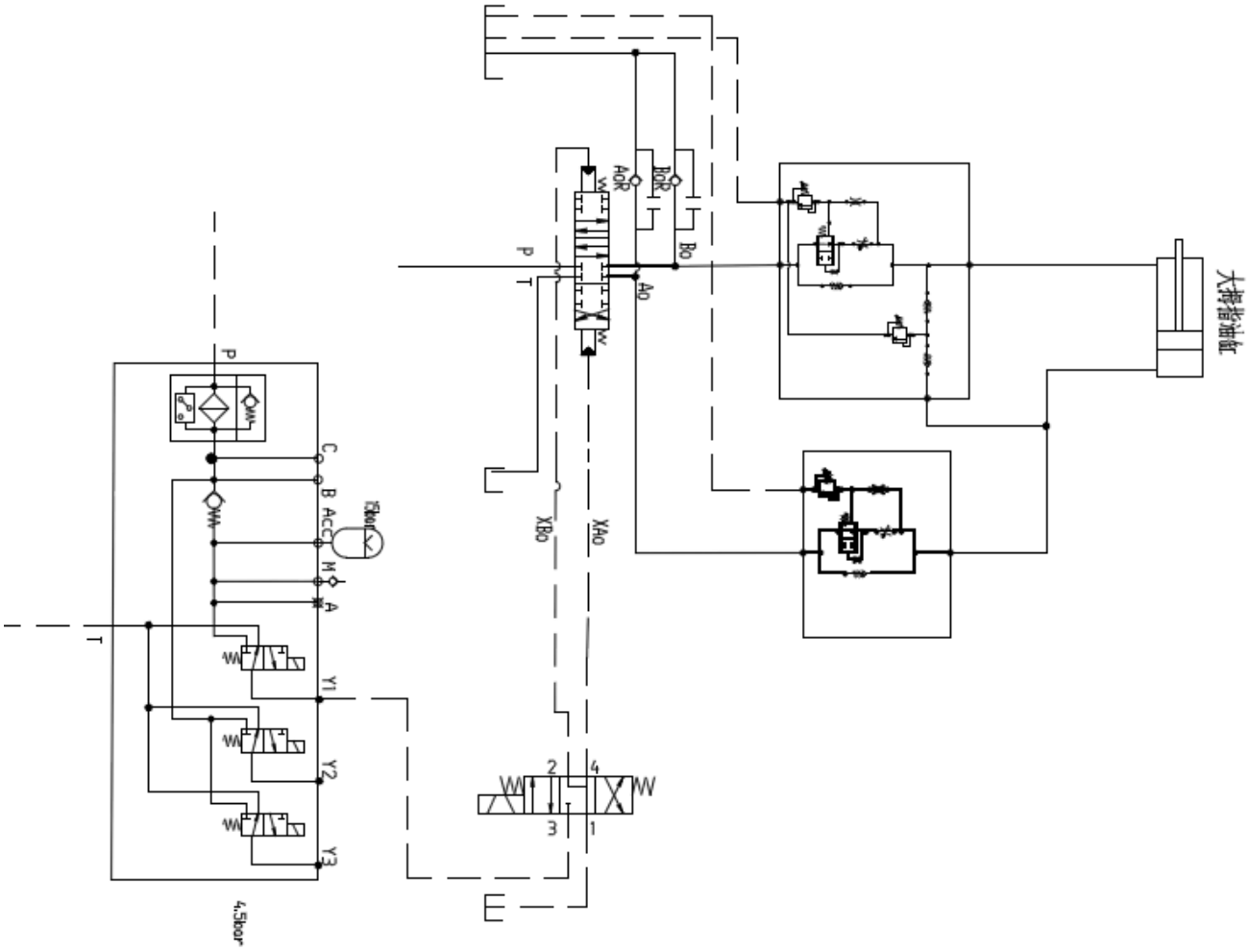
noise and vibracation test

1. Noise level of the cab: 78dB(A)
2. The damping ability of the cab seat shall be subject to the requirements of EM6 in GB/T8419—2007
3. The uncertainty degree of the whole machine is 0.1

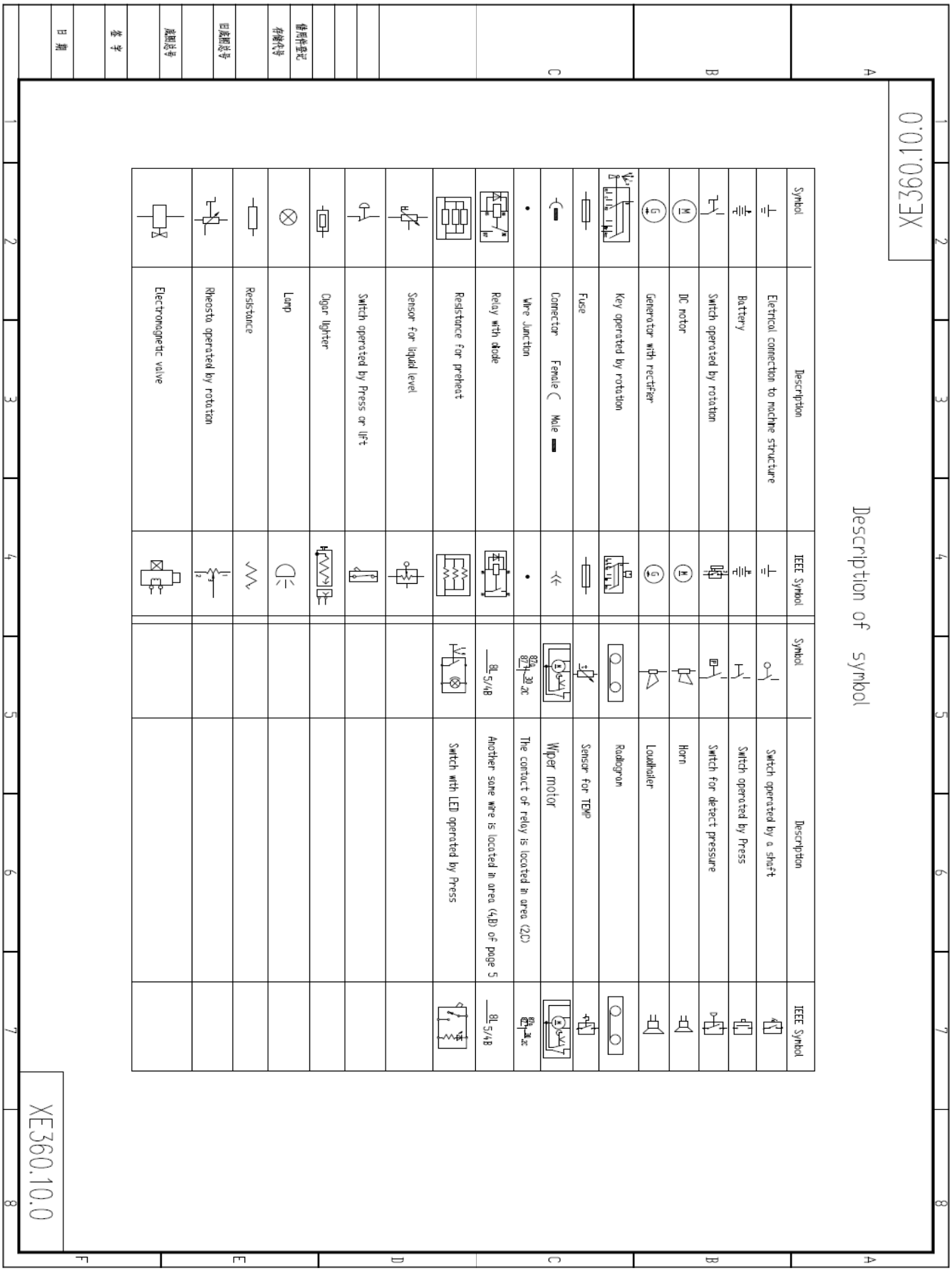
Hydraulic System Schematic

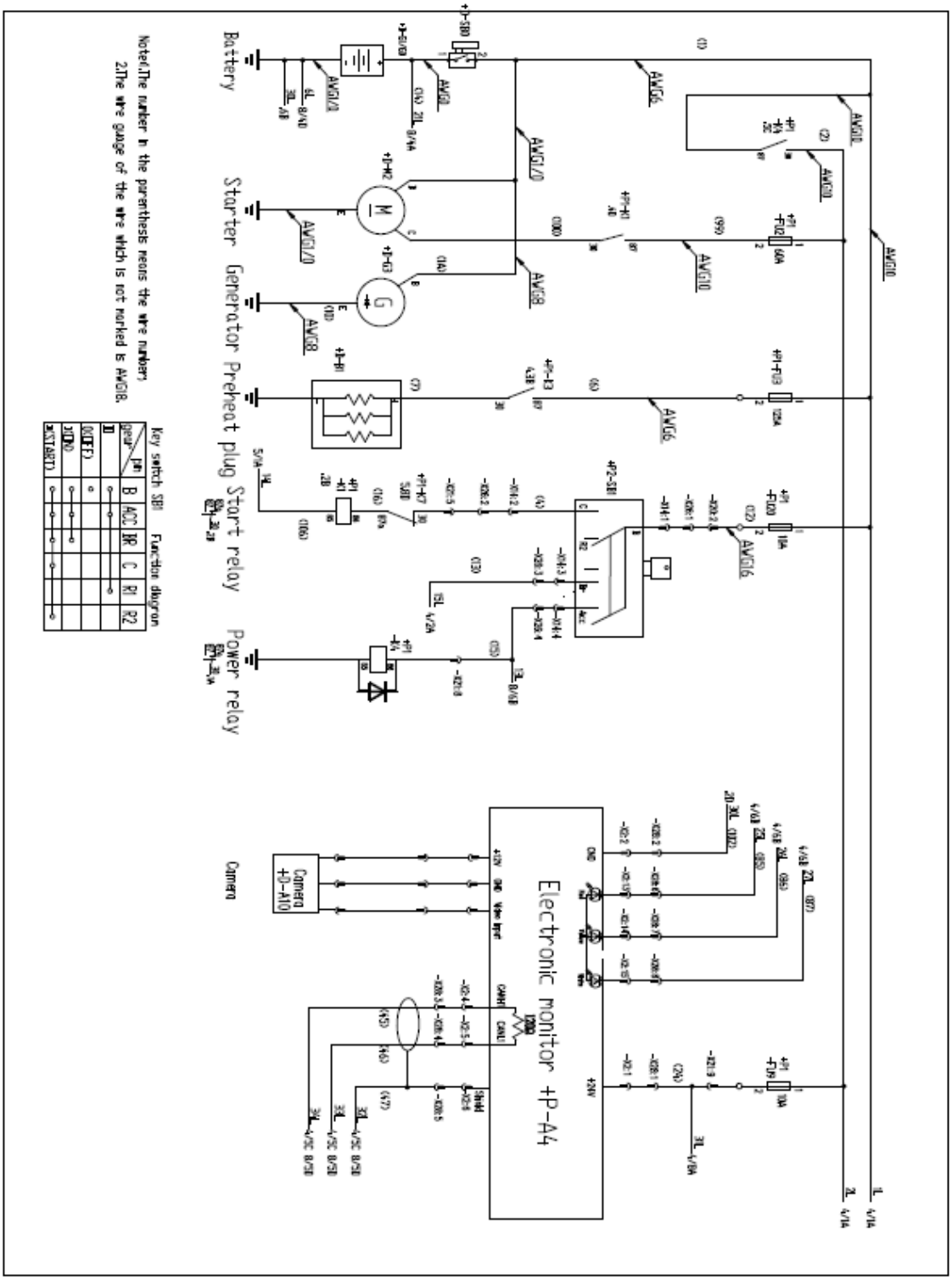


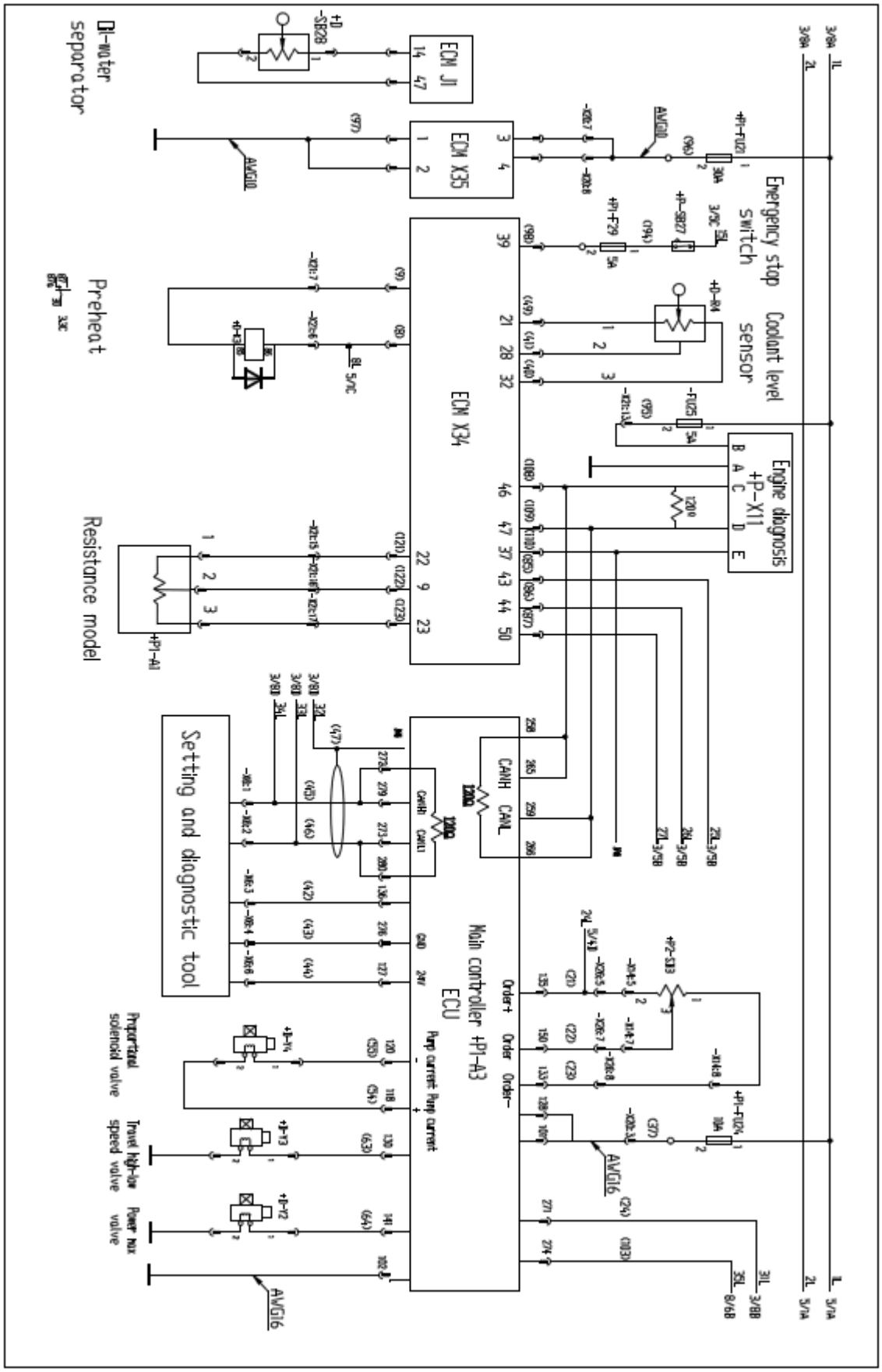
The hydraulic thumb assy

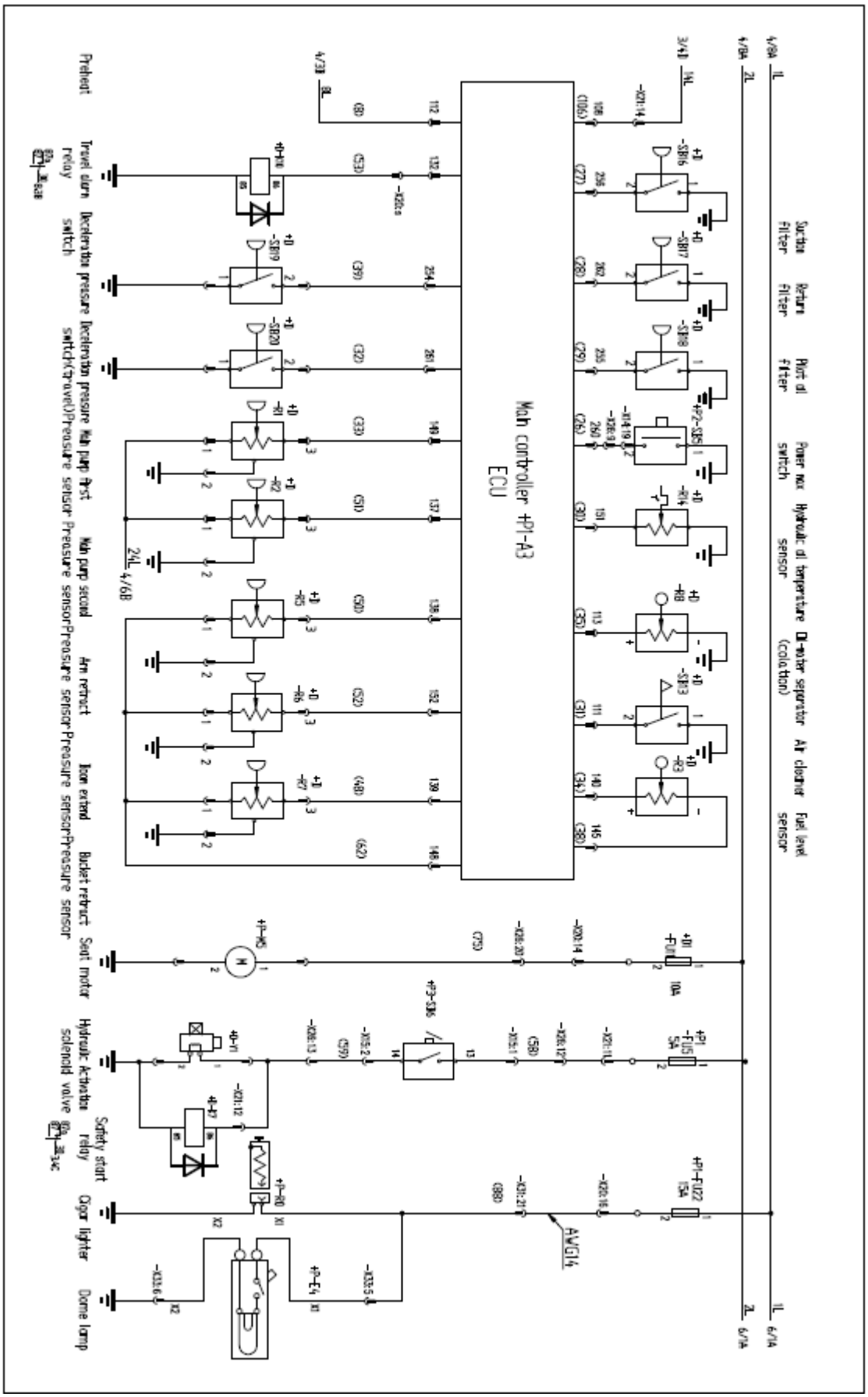


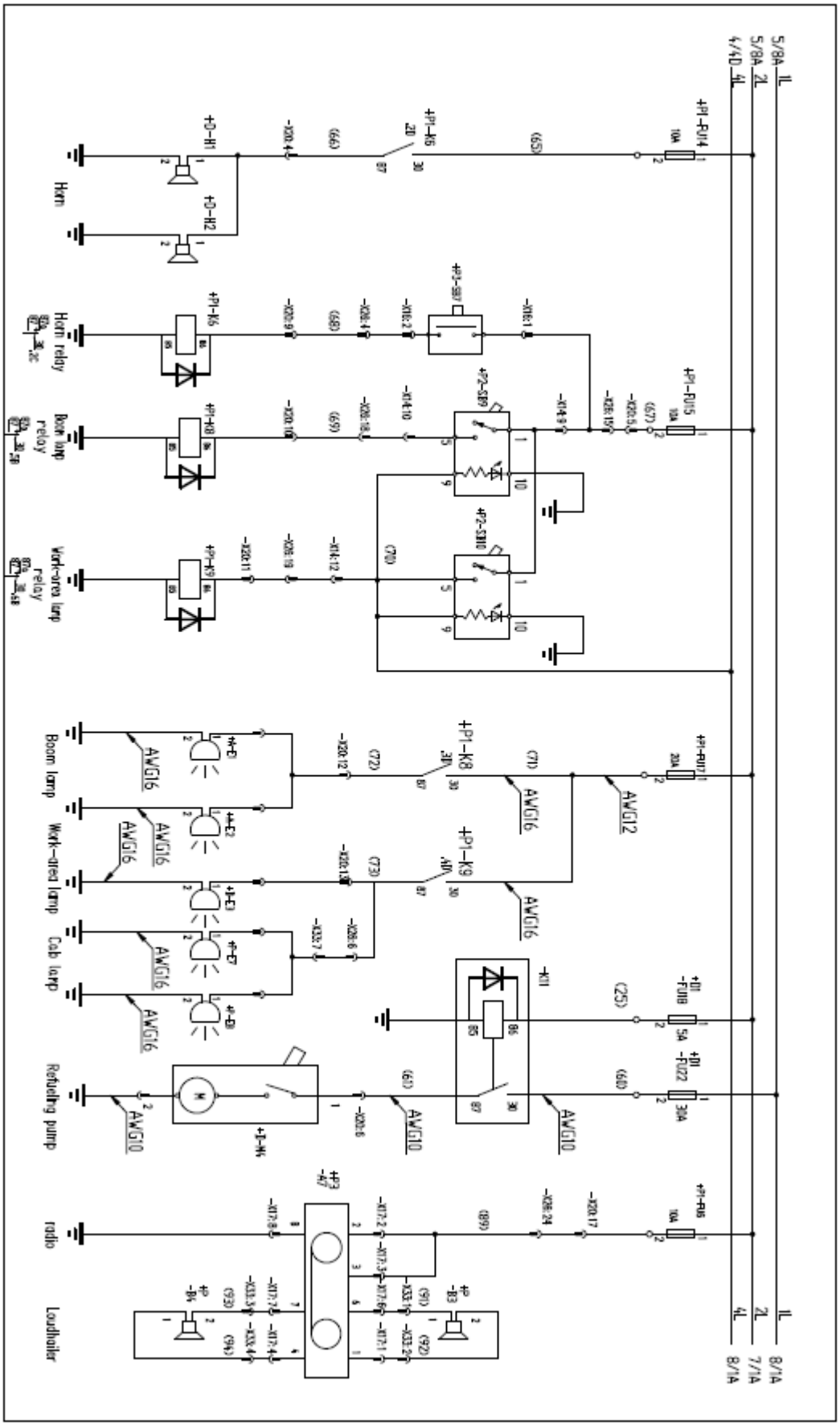
Electrilal System Schematic

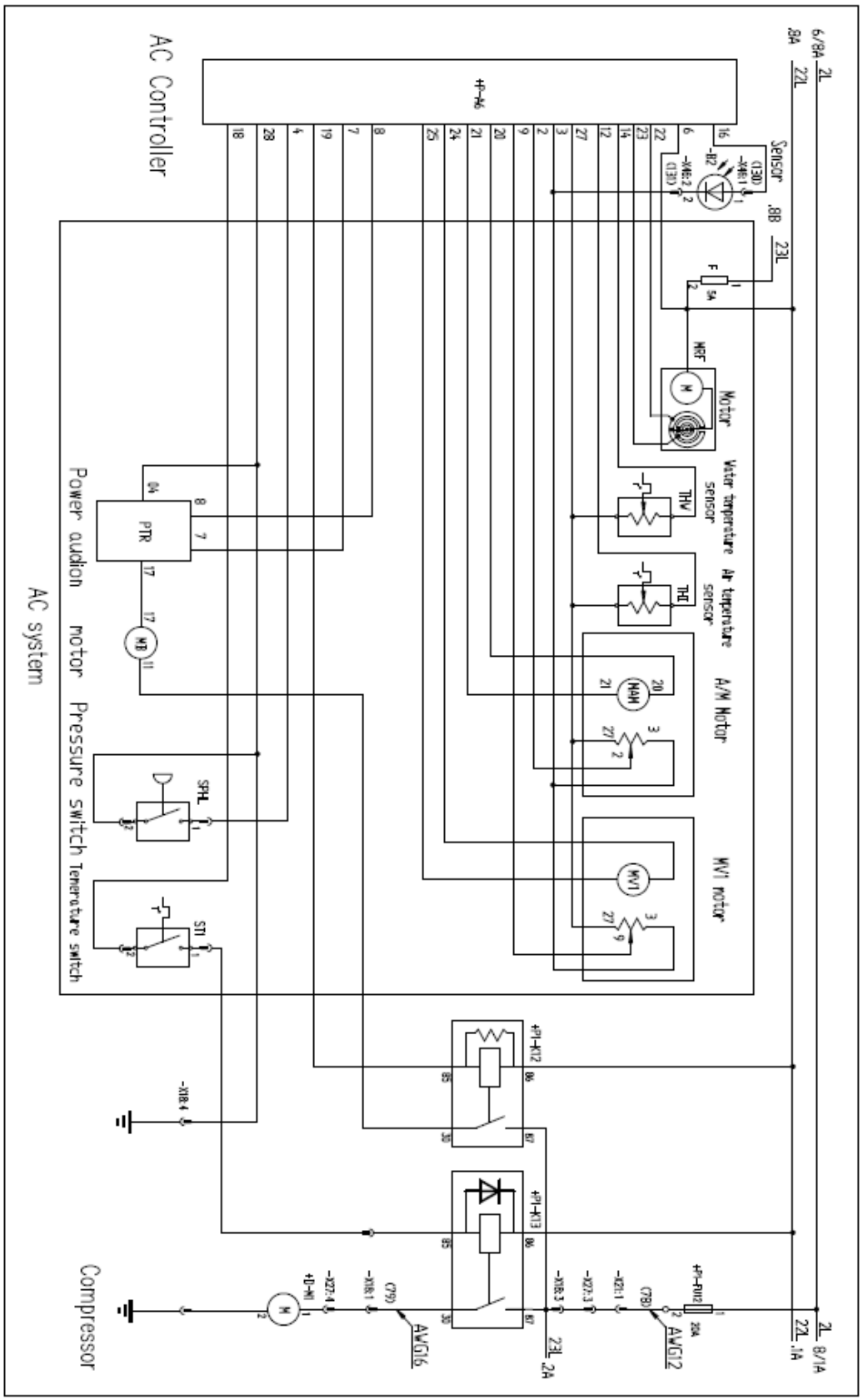


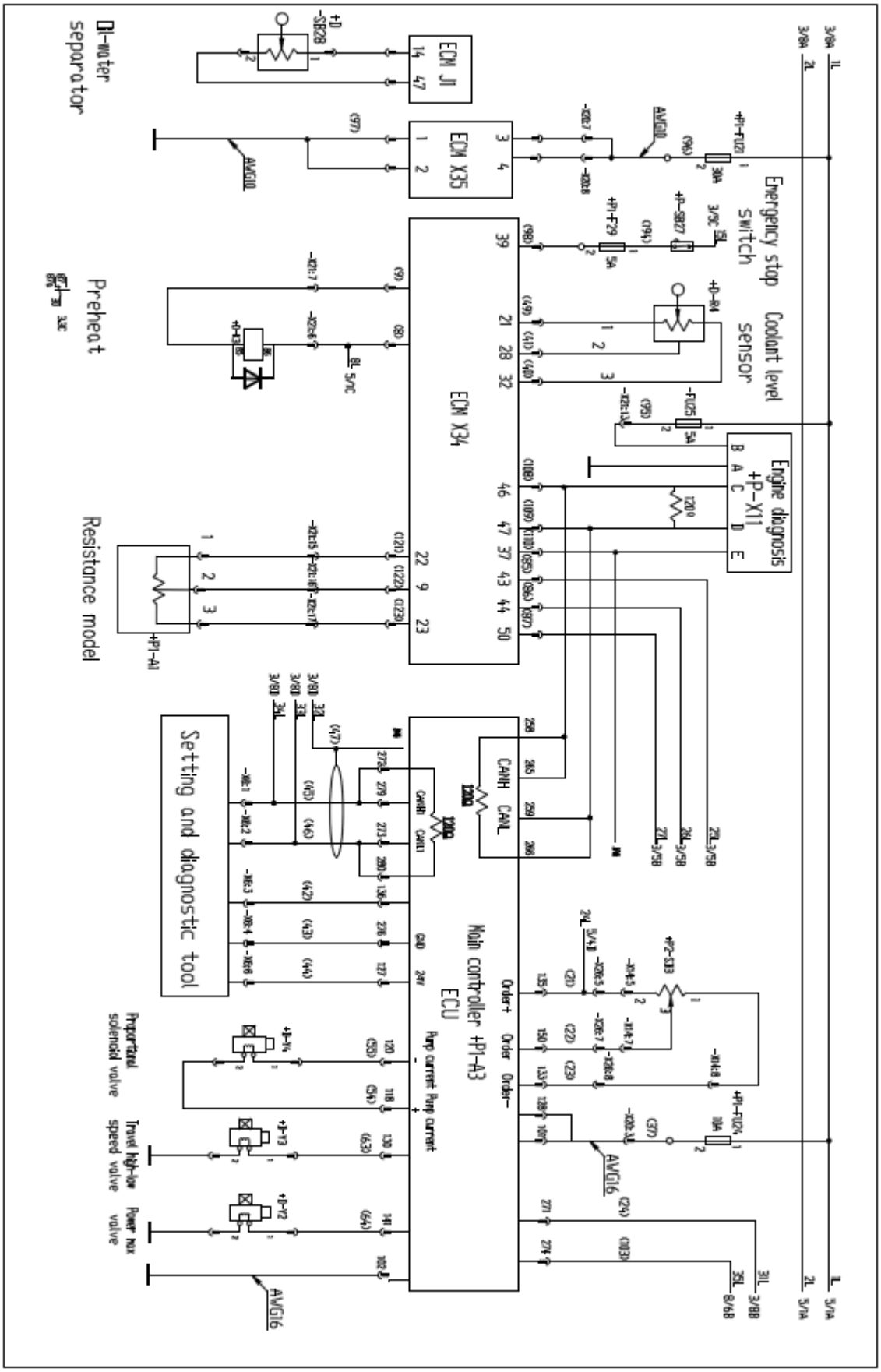

Battery
Starter Generator
Preheat plug
Start relay
Power relay
Electronic monitor +P-A4
Camera
Camera +D-A10
Key switch SB1 Function diagram
Note:The number in the parenthesis means the wire number.
2.The wire gauge of the wire which is not marked is AVG0.8.


Oil-water separator
Preheat
Resistance model
Setting and diagnostic tool
Emergency stop switch
Coolant level sensor
Engine diagnosis +P-X11
ECM J1
ECM X35
ECM X34
Main controller +P1-A3 ECU
Order+
Order-
CANH
CANL
Proportional solenoid valve
Travel high-low speed valve
Power max valve
Pump current+
Pump current-
AVG10
AVG16


Main controller +P1-A3
ECU
Suction filter
Return filter
Pilot oil filter
Power max switch
Hydraulic oil temperature sensor
Oil-water separator (collation)
Air cleaner
Fuel level sensor
Preheat
Travel alarm relay
Deceleration pressure switch
Deceleration pressure switch(Travel)
Main pump first Pressure sensor
Main pump second Pressure sensor
Arm retract Pressure sensor
Boom extend Pressure sensor
Bucket retract Pressure sensor
Seat motor
Hydraulic Activation solenoid valve
Safety start relay
Cigar lighter
Dome lamp
AWG14


Horn
Horn relay
Boom lamp relay
Work-area lamp relay
Boom lamp
Work-area lamp
Cab lamp
Refueling pump
radio
Loudhaler


AC system
AC Controller
Power audion motor
Pressure switch
Temperature switch
Compressor
Sensor
Motor
Water temperature sensor
Air temperature sensor
A/M Motor
MV1 motor
PTR
SPHL
STI
THV
THE
MRF
MB
M4M
MV1
AWG16
AWG12
6/8A
8A
22L
2L
8B
23L
8/11A
11A
2A


Emergency stop Switch
Coolant level sensor
Engine diagnosis +P-X11
ECM X34
ECM X35
ECM J1
Bi-water separator
Preheat
Resistance model
Setting and diagnostic tool
Main controller +P1-A3 ECU
CANH
CANL
Proportional solenoid valve
Travel high-low speed valve
Power max valve
AVG10
AVG16

Appendix

Track type and application

Choosing the track shoe meet the operating requirements.

According to the floatability and grounding pressure to choose the width of the track shoe, choose the narrowest track shoe possibly. If the used track shoe is wider than needed, it will increase the load of the track shoe, and lead the track bend, link broken pin-axis broken, loosen of the track shoe and other kinds of problems.

Type	Use	Notices when using
A	Stony ground, riverbed, common earth	If the ground has big obstacles, like cobble, down-tree and rough ground, using the low speed to travel.
B	Common earth, and soft ground	Only can use the high speed and medium speed on the level ground; if passing the obstacles cannot be avoided, slow down the machine and use the half speed of the low speed to travel; cannot be used on the rough ground with cobble and down-tree.
C	Extra-soft ground （marshland ground）	Only use this type when the machine sinks and the places where the type A or B cannot be used.

	XE210CU/XE240LC	
	Technical specification	Type
Standard	600mm(24 in) three grousers track shoe	A
Selective purchasing	700mm(28 in) three grousers track shoe	B
Selective purchasing	800mm(32 in) three grousers track shoe	C

Attention：700, 800mm width track shoe cannot be used on the ground with lots of gravels and stones.

Bucket type and application

Bucket type	Bucket capacity (m^3/yd^3) (Pileup)	Working device configuration			
		XE210CU		XE240LC	
		2.52m 8' 3" Arm	2.91m 9' 7" Arm	2.52m 8' 3" Arm	2.96m 9' 8" Arm
Strengthened	0.8/1.05	△	△	×	×
Strengthened	0.91/1.19	△	△	×	×
Strengthened	1.0/1.3	△	×	△	△
Strengthened	1.1/1.44	×	×	△	△
Light load bucket	1.0/1.3	○	○	○	○
Rock bucket	0.7/0.92	■	■	×	×
Rock bucket	0.8/1.05	■	■	×	×
Rock bucket	0.9/1.18	■	×	■	■
Rock bucket	1.0/1.3	×	×	■	■

Notice：the meanings of the symbols on the table above

△: Common digging

○: Light load digging

■: Heavy load digging

×: Cannot be used

- **Application type**

  Heavy load digging: digging or loading mountain gravel, explosion stone, hard clay, and soft stone and so on.

  Common digging: digging or loading sand, gravel, clay and common earth.

  Light load digging: digging or loading dry and incompact earth, sand, mud and so on. Their volume density is required below 1600kg/m^3.

Importance: Using the improper bucket may lead serious damage of the boom, arm, hydraulic cylinders and other working device elements.

- For digging or loading hard soil or stone, suggested to use the rock bucket with high intensity and high degree anti-wear ability.

Weight of work load

Note: the weight is an approximate value of estimated average volume and capacity.

Material	Low density ≤1100kg/m^3	Intermediate density ≤1600kg/m^3	High density ≤2000kg/m^3
Charcoal	400		
Coke	500		
Coal, asphalt	880		
Coal, stone coal	900		
Dry ball clay	1000		
Wet clay of raw subgrade			1750
Dry particles of common concrete		1500	
Dolomite fragments		1500	
Dry or soft soil		1200	
Firm and dry soil		1500	
Wet muddy soil			1750
Burned lime paste (hot powder)	960		
3" crushed lime paste		1500	
Overstacked dry gravel fragments			1800
Overstacked wet gravel fragments			1900
At least 2-class limestone		1300	
Crushed limestone		1500	
Good limestone		1600	
Rock phosphate		1300	
Salt	930		
Small-density snow	530		
Dry and soft sand		1500	
Overstacked wet sand			1900
Broken shale		1400	
Broken sulphur	530		

Lifting capacity table

Lifting capacity table for XE210CU crawler type hydraulic excavator

Don't try to lift or hold any loading amount that exceeds the machine's rated lifting radius and height. The lifting point is located in the lifting hole of arm.

Height of lifting point(m/ft)	Rated lifting capacity – right ahead (astern) (kg/lb)					
	Radius of lifting point (m/ft)					Lifting capacity at the maximum radius
	1.5/4.9	3/9.8	4.5/14.8	6/19.7	7.5/24.6	
7.5/24.6				*5030.7/11091		*4638/10225
6/19.7				*4938.2/10887		*4326.2/9537
4.5/14.8				*5363.9/11825	4725.7/10418	4259.4/9390
3/9.8				*6080.1/13404	4620.8/10186	3904.5/8608
1.5/4.9			*9324.9/20558	6251.2/13781	4499.3/9919	3776/8325
Ground		*4968.2/10953	9440.8/20813	6064.9/13370	4399.3/9698	3850.9/8490
- 1.5/4.9	*5614.4/12377	*9343.5/20599	9332/20573	5972.6/13167	4375.8/9646	4169.5/9192
- 3/9.8	*10251/22599	*14177/31254	9413/20751	6016.9/13264		4925.3/10858
- 4.5/15		*11822/26063	*8325.4/18354			*6430.7/14177

All that marked with（*）refers to the lifting capacity limited by the hydraulic capacity.

Height of lifting point(m/ft)	Rated lifting capacity–abeam (kg/lb)					
	Radius of lifting point (ft)					Lifting capacity at the maximum radius
	1.5/4.9	3/9.8	4.5/14.8	6/19.7	7.5/24.6	
7.5/24.6				4411.4/9725		4229.7/9325
6/19.7				4420.6/9746		3173.2/6996
4.5/15				4266.2/9405	2986.8/6585	2681.9/5912
3/9.8			6103.6/13456	4027.5/8879	2890.9/6373	2435.3/5369
1.5/4.9			5615.9/12381	3799/8375	2779.8/6128	2334.2/5146
Ground		9907.3/21841	5357.4/11811	3633.5/8010	2688.3/5927	2365/5214
- 1.5/4.9	*5614.4/12377	*9343.5/20599	5266.4/11610	3551.6/7830	2666.7/5879	2548.7/5619
- 3/9.8	*10251/22599	10150/22376	5334.2/11760	3590.9/7916		2996.6/6606
- 4.5/15		10478/23100	5532.1/12196			4153/99158

All that marked with（*）refers to the lifting capacity limited by the hydraulic capacity.

The weight of the lifting chain and some auxiliary lifting equipment should be deducted from the related load to calculate the net loading amount. Lifting capacity should be based on that the excavator is on the same solid level surface. The user should take the working conditions into consideration, such as soft or uneven ground. Before operating the machine, the operator should be very familiar with the operator's manual and safe operation manual provided by the manufacturer.

I The lifting capacity refers to the upward pressure without the outside intervention.

II The lifting capacity displayed should not exceed 75% of the minimum tipping amount or 87% of the hydraulic capacity.

III The critical stable position is on the side of the machine.

IV The lifting capacity is only applicable for the machine produced originally by the manufacturer and the machine assembled normally by the manufacturer.

V The machine weight is 21500 kg/47399lb, including track shoe steel (800 mm/31.5 in), boom (5.68 m/18.6ft), arm (2.91 m/9.55ft), counterweight (4250 kg/9369lb), bucket (803 kg/1770lb) and the operator (75kg/165 lb).

VI The lifting capacity is in accordance with ISO 10567:2007.

Rating over front

Rating over side or 360 degrees

A–Reach from swing centerline to bucket hook
B–Bucket hook height above/below ground
C–Lifting capacities in kilograms
Max discharge pressure: 34.3 Mpa

XE240LC Standard Arm: 2.95m(9.68ft), Bucket: 1.0~1.2m³ (1.31~1.57cubic yard). Shoe: 800mm(2.7ft)

B \ A		1.5m/5.0ft		3m/10.0ft		4.5m/15.0ft		6.0m/20.0ft		7.5m/25.0ft		At Max. Reach		MAX.
7.5m 25.0ft	kg lb											*4412 *9,727	*4412 *9,727	6.600
6m 20.0ft	kg lb							*5650 *12,457	*5650 *12,457	*4793 *10,567	4334 9,555	*4186 *9,230	*4186 *9,230	7.629
4.5m 15.0ft	kg lb					*7315 *16,127	*7315 *16,127	*6404 *14,118	5982 13,189	*6675 *14,716	4260 9,392	*3918 *8,639	3611 7,962	8.302
3.0m 10.0ft	kg lb					*6500 *14,331	*6500 *14,331	*7477 *16,484	5666 12,492	6512 14,357	4113 9,069	*3947 *8,702	3321 7,322	8.642
1.5m 5.0ft	kg lb					*11608 *25,592	7941 17,507	*8538 *18,824	5367 11,834	6342 13,983	3961 8,732	*4147 *9,142	3213 7,084	8.709
Ground Line	kg lb					*12670 *27,933	7629 16,820	8603 18,968	5161 11,380	5925 13,063	3586 7,905	*4569 *10,073	3265 7,195	8.510
−1.5m −5.0ft	kg lb			*9452 *20,838	*9452 *20,838	*12841 *28,310	7543 16,630	8501 18,742	5073 11,184	6170 13,603	3806 8,391	*5370 *11,839	3509 7,736	8.025
−3.0m −10.0ft	kg lb	*10358 *22,835	*10358 *22,835	*15194 *33,498	14757 32,535	*12236 *26,975	7611 16,780	8539 18,825	5106 11,257			6612 14,578	4078 8,992	7.194
−4.5m −15.0ft	kg lb			*17013 *37,508	15176 33,458	*10570 *23,303	7844 17,293					*7771 *17,133	5477 12,074	5.869

Capacities marked with an asterisk(*) are limited by hydraulic capacities.

The mass of slings and any auxiliary lifting devices shall be deducted from the rated load to determine the net load that may be lifted. Lift capacities are based on the machine standing on a firm, uniform supporting surface. The user shall make allowances for job conditions such as soft or uneven ground. The operator should be fully acquainted with the operator's manual and the operating safety manual furnished by the manufacturer before operating the machine.

NOTE 1 Lift capacities shown are without the power boost feature engaged.

NOTE 2 Lift capacities shown do not exceed 75% of minimum tipping loads or 87% of hydraulic capacities.

NOTE 3 The least stable position is over the side.

NOTE 4 Lift capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.

NOTE 5 The total mass of the machine is 24500kg(54,013 lb). Included in this mass are 800 mm(2.7ft) steel crawler, 6.00 m(19.7ft) boom, 2.95 m (9.7ft)arm, 5416kg(11,940 lb) counterweight, bucket weighing 1024 kg(2,258 lb) all ooperating fluids and a 75 kg(165 lb) operator.

NOTE 6 Lift capacities are in compliance with ISO 10567: 2007.

Lifting capacity table for XE240LC crawler type hydraulic excavator

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